### Log of Revisions to the Merced County Improvement Standards and Specifications

<table>
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<tr>
<th>Revision Number</th>
<th>Description of Revision</th>
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<tr>
<td>1</td>
<td>Section 9.02, Added discussion about change to Class I soils description to eliminate allowed use of clean angular material as backfill around pipelines. Table EW-1, Revised description of Class I Soils.</td>
<td>10/13/2010</td>
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<td>2</td>
<td>Section 9.03.G.3, Eliminated reference to CIPCP and NRCP since these pipe types are not allowed to be used in Merced County. Sections 9.05.B.7 and 10 combined to eliminate repetition. Drawing EW-02, Eliminated unnecessary note referencing the Storm Drainage Design Manual. Minor font and paragraph formatting throughout.</td>
<td>6/30/2011</td>
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<td>3</td>
<td>Chapter 8 – Roadway Lighting, completely rewritten to specify the use of LED fixtures.</td>
<td>3/13/2014</td>
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<td>4</td>
<td>Minor revisions throughout manual to correct errors and clarify requirements. Most significant revision is the change in sidewalk cross slope to be 1.5% to provide better compliance with ADA requirements.</td>
<td>5/20/2015</td>
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<td>5</td>
<td>Minor revisions to standards for curb ramps to improve compliance with ADA requirements</td>
<td>12/18/2015</td>
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<td>6</td>
<td>Minor revisions to Chapter 5 to correct references to Storm Drainage Design Manual and to add Storm Drain Marker requirement.</td>
<td>1/4/2016</td>
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<td>7</td>
<td>Replace HDPE pipe in Chapter 5 with PP pipe. Add section on Hydrodynamic Separators in Chapter 5.</td>
<td>10/14/2016</td>
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CHAPTER 1

Introduction

1.01 Purpose:
This manual has been written to provide Developers and Design Engineers with minimum design standards for infrastructure improvements subject to the approval of the Department of Public Works.

It is recognized that it is not possible to anticipate all situations that may arise and to prescribe criteria and guidelines applicable to every situation. The design policies in this manual will be applicable to the majority of design cases, but are not inflexible rules without exceptions. The Department of Public Works may make exceptions where the application of the design policies to a specific situation results in unreasonably difficult requirements.

Any deviation from the standards presented in this manual must be approved by the Director of Public Works.

1.02 Definitions:

Board: The Board of Supervisors of Merced County.

California MUTCD: The most recent version of the California Manual on Uniform Traffic Control Devices (MUTCD).

CALTRANS Standard Plans: The most recent edition of the Standard Plans of the California Department of Transportation, including all revisions.

CALTRANS Standard Specifications: The most recent edition of the Standard Specifications of the California Department of Transportation, including all revisions.

Contractor: Any person, firm, corporation, partnership, association, or agent thereof who has entered into a contract with a Developer for the construction of any improvements within the County of Merced.

County: The County of Merced.

Department of Public Works: The Merced County Board of Supervisors working through the Director of Public Works and his authorized representatives.

Design Engineer: Any person, firm, corporation, partnership, or agent thereof, legally authorized to practice Civil Engineering in the State of California, who prepares or submits improvement plans and specifications to the Department of Public Works, and who may represent the Developer during planning, design, or construction of an improvement project within the County of Merced.

Developer: Any person, firm, or corporation, partnership, or agent thereof who has applied for a permit or subdivision within the County of Merced.

Director of Public Works: The Director of the Merced County Department of Public Works acting either directly or through properly authorized agents. Such agents will act within the scope of the particular duties delegated to them.

Fire Department: The Merced County Fire Department or California Department of Forestry and Fire Protection (CAL FIRE).

Health Department: The Environmental Health Division of Merced County.

Improvement Plans: Plans prepared by a Design Engineer and approved by the Director of Public Works.

Inspector: Any person employed by the County under the authority of the Director of Public Works to inspect ongoing construction projects.

Special Provisions: Specific clauses or instruction setting forth conditions or requirement peculiar to the project under construction that are not covered by the improvement standards and specifications presented in this manual.

Surveyor: A person, firm, corporation, partnership, or agent thereof, legally authorized to perform engineering surveys in the State of California.
CHAPTER 2
Improvement Plans

2.01 General Requirements:
Improvement Plans and supplemental information shall be approved by the Director of Public Works for all projects that are subject to the approval of the Department of Public Works prior to any construction being allowed to begin.

The improvement plans and supplemental information described herein shall be prepared by an engineer legally authorized to practice Civil Engineering in the State of California. All plans and calculations submitted for review shall be stamped and signed by a Civil Engineer.

2.02 Improvement Plan Details:
The following details and supplemental information shall be shown on plans submitted for approval:

A. General Requirements: Improvement plans shall show all existing facilities and all improvements to be constructed. The plans shall be original drawings.

1. Size: The size of the improvement plan sheets shall be 24” x 36”.

2. Scale: The scales selected shall be sufficient to clearly show all required details when reproduced. Preferred horizontal scales are 1” = 50’ or 1” = 40’. Preferred vertical scales are 1” = 2’ in flat areas or 1” = 4’ in steep areas.

3. Title Block: Each sheet within the set shall have a title block showing the project name, County assigned number, sheet title, date of drawing and revisions, scale of drawings, page number, and the Design Engineer’s name, registration number, expiration date of registration, and signature.

4. Vertical Control: If a project is located within a special flood hazard zone, the elevations shown in the improvement plans may be based on an assumed elevation; however, if the project is located adjacent to a recently completed project, the elevations should be based on elevations contained in the as-built plans of the adjacent project.

5. Orientation and Stationing: Insofar as practical, the plans shall be arranged so North is at the top of the sheet. The stationing on the plan and profile sheet shall read from left to right or from the bottom to top.

B. Title Sheet: On improvement plans exceeding two sheets per set, a title sheet shall be prepared showing all the following:

- The entire project, drawn at whatever engineering scale seems appropriate, complete with street names and lot numbers.
- Vicinity map and North Arrow.
- Index of sheets.
- A legend of symbols.
- Location, description and elevation of the reference Benchmark as well as the temporary benchmark used for the project.
- The name, address and telephone number of any agency whose facilities will be installed or modified as part of the improvements as well as a signature block for their approval.
- The name, address and telephone number of the developer or his authorized representative.
- A signature block for the Director of Public Works.
- The following notes shall be placed on the Title Sheet:

If a project is not located within a special flood hazard zone, the elevations shown in the improvement plans may be based on an assumed elevation; however, if the project is located adjacent to a recently completed project, the elevations should be based on elevations contained in the as-built plans of the adjacent project.
• This set of plans is valid for construction purposes only after being signed by the Director of Public Works.

• All Contractors involved in the construction of this project shall attend a pre-job conference arranged by the Developer at the Department of Public Works for construction and inspection coordination.

• The Merced County Department of Public Works Standards and Specifications referenced in these plans shall be considered part of these plans.

• The Contractor shall comply with all applicable requirements of the San Joaquin Valley Air Pollution Control District. Regulation VIII Record Keeping Forms and District Rules and Regulations may be obtained at www.valleyair.org or by calling (209) 557-6400.

• The Contractor shall comply with Federal Regulations for storm water runoff issued by the U.S. EPA on November 16, 1990 (40 Code of Federal Regulations Parts 122, 123, and 124). For information and direction, contact the State Water Resources Control Board’s Construction Activity Storm Water Hotline at (916) 341-5537, e-mail: stormwater@swrcb.ca.gov, or visit their website at www.swrcb.ca.gov.

The topo sheets may also be used to indicate demolition activities.

D. Grading and Drainage Sheets: Grading and drainage sheets shall be included in the improvement plan set and shall show the following:

• A typical lot grading detail. See Drawing EW-02 for a sample.

• Proposed lot corner elevations and building pad elevations as well as any elevation differential between the project boundaries and the adjoining properties.

• Where fills or cut and fills are used to create building pads having a total depth greater than 12”, special inspection is required for existing site conditions, and continuous special inspection is required for fill placement and compaction in accordance with Section 1704.7 of the 2007 CA Building Code.

• Finished floor elevations shall be shown when the project is located within a designated flood plain or flood zone.

• Gutter or ditch flow arrows, slopes, and grade breaks.

• Storm drainage pipes, manholes, valley gutters, and catch basins.

• Retention basin location and details.

• Location of any retaining walls or retaining fences.

E. Utilities Sheets: Utilities sheets shall be prepared as part of the improvement plan set and shall show streetlights and streetlight conduit, fire hydrants, water lines, valves, blow-offs, sanitary sewer lines and manholes, leach fields, clean outs, sewer and water service locations, water wells, power lines, gas lines, TV cable lines, utility boxes, telephone lines, PUE’s, driveways, centerlines monuments, street signs, etc.
Some of the above utilities may not be able to be finalized prior to improvement plan approval. Schematic drawings with details identifying the location of planned utilities shall be submitted to the County at the pre-job construction conference. These utilities shall be shown on the required Record Drawings prior to acceptance of improvements.

F. **Plan and Profile Sheets**: Plan and profile sheets shall be included in the set of improvement plans showing the existing and proposed profiles of all roadways. These sheets shall show elevations, grade breaks, vertical curves, percent slope, road stationing, storm drainage lines, water lines, sewer lines, irrigations lines and any areas of possible conflict between underground utilities. Indicate length and type of pipe between manholes and catch basins. Show elevations of pipe inverts and finished surfaces of catch basins. Show elevations of pipe inverts in manholes.

G. **Landscaping Sheets**: Landscaping sheets shall be included whenever landscaping is included in the project. The landscaping sheets shall clearly show a planting plan as well as an irrigation plan. If the project includes the development of a neighborhood park, any playground or other equipment that will be constructed in the park shall be shown on the landscaping sheets.

H. **Detail Sheets**: Detail sheets shall be included in improvement plans showing typical road cross sections, pump stations, and any other design standard that is not covered in this manual. It is not necessary for the standards included in this manual to be reproduced in the set of improvement plans. However, each standard from this manual utilized in a set of improvement plans shall be clearly referenced.

1. **SCP Sheets**: Sediment Control Plan (SCP) sheets shall be included in the improvement plans set. The SCP shall conform to the requirements of Chapter 9.53 of the Merced County Code and the Regional Water Quality Control Board.

I. **Combining Required Sheets**: Some of the above sheets may be combined onto single sheets when doing so will not lead to a confusing, overly detailed sheet.

2.03  **Supplemental Information**:

The following supplemental information is required to be submitted with the improvement plans:

A. **Soils Report**: The required soils report shall be prepared by an Engineer legally authorized to practice Civil Engineering or Geotechnical Engineering in the State of California. Two original copies of the soils report shall be submitted. The soils report shall include:

1. The results of an “R” value test taken in the project site.
2. All required tests as indicated in Section 1.05.A of the Merced County Department of Public Works Storm Drainage Design Manual.
3. Recommendations to ensure proper slope stability for road side slope cuts and fills.
4. Soils reports on parcels that include building sites shall comply with all applicable parts of CA Building Code Sections 1802.2 through 1802.2.7.

B. **Survey Notes and Calculations**: For projects located in a special flood hazard zone, survey notes and calculations that tie the temporary or construction benchmark with the USGS Benchmark Datum shall be submitted.

C. **Miscellaneous Calculations**: Submit calculations for pavement structural section determination plus any calculations used in the design of any retaining walls or other miscellaneous items not covered in these standards.

D. **Quantities List and Engineer’s Estimate**: Quantities list and Engineer’s Estimate shall show estimated quantities, unit costs, descriptions and total costs of each item of work. Engineer’s estimate shall be separated into items that deal with storm
drainage, domestic water systems, sanitary sewers, etc. and shall include a 10% contingency for the total value of work to be done.

E. **Product Specifications:** When a product is mentioned in the improvement plans such as pumps, motors, streetlights, etc., the Design Engineer shall submit the manufacturer’s specifications upon request.

### 2.04 Departmental Review:

The Design Engineer shall submit the following items to the Department of Public Works to initiate review of improvement plans:

- Two complete sets of improvement plans stamped and signed by the responsible Civil Engineer; plans will not be accepted if they are stamped “preliminary,” or “not-for-construction,” or with any other markings indicating the plans may be incomplete; and,
- Two original paper copies of the soils reports stamped and signed by the responsible Civil or Geotechnical Engineer; and,
- An additional copy of the soils report shall be submitted in pdf format; and,
- Storm drainage calculations stamped and signed by the responsible Civil Engineer; and,
- Pavement structural section calculations stamped and signed by the responsible Civil Engineer; and,
- Quantities list and engineer’s estimate; and,
- Improvement plan review fee.

When corrections are required, one set of improvement plans will be returned to the Design Engineer showing the required changes.

The Design Engineer shall submit two sets of the corrected improvement plans for subsequent reviews. In order to reduce the man-hours required in checking resubmittals of Improvement Plans, the Design Engineer shall highlight, in yellow, all changes that have been made on one of the required sets.

The Department of Public Works will make every attempt to find the required corrections in the first improvement plan review submittal. However, it is not always possible to find every item that needs correction. Thus, the Design Engineer is cautioned not to assume that all the corrections have been found in the first submittal review process.

The Department of Public Works will adhere to the improvement plan review timelines stipulated in Section 66456.2 of the California Government Code (Subdivision Map Act). The Department of Public Works will only extend the time to review plans upon mutual agreement with the developer.

After all corrections have been made to the satisfaction of the Director of Public Works, the entire set of originals shall be submitted to the Department of Public Works for signature. The originals will be returned to the Design Engineer subsequent to the Developer entering into an Improvement Agreement with Merced County.

If the Improvement Agreement is not returned within 90 days after release to the Developer, the Director of Public Works may elect to remove his signature from the improvement plans and return the originals to the Design Engineer.

### 2.05 Record Drawings:

Prior to the acceptance of the improvements by the County of Merced, the Design Engineer shall compile and submit a set of Record Drawings showing final improvement details, corrected improvement elevations and locations, as well as any changes that occurred during construction.

A. Record Drawings shall consist of mylar originals.

B. Original data that has been superseded shall be crossed out, but not eradicated.

C. All utilities that could not be shown on the construction plans shall be drawn on the record Drawings.

D. The Design Engineer shall provide final elevations of all lot corners, building pads, catch basin grates, storm drainage pipe inverts, sewer flowline elevations at
manholes as well as curb and gutter flowline.

E. All lettering must be clear and legible. Extensive changes which cannot be shown clearly on an original sheet should be drawn on a supplemental sheet. Any supplemental sheets shall be signed by the Design Engineer and included as part of the Record Drawings. The Design Engineer shall put his original stamp and signature on the Record Drawings.

F. Record Drawings shall become the property of the Department of Public Works.

**2.06 As-Built Plans:**

The Inspector shall review the Record Drawings to confirm that they reflect what has actually been constructed. After this review, the Inspector shall sign the record drawings and clearly label them as being the official As-Built Plans for the improvement project.

The Department of Public Works will scan the Record Drawings into pdf format. The pdf files of as-built plans will be made available to the public as requested.
CHAPTER 3
Construction Inspection

3.01 General Requirements:

All work done and all materials and equipment furnished shall be subject to the inspection and approval of the Director of Public Works. He and his representatives shall at all times have access to work during construction and shall be furnished with every reasonable facility and assistance for ascertaining that the materials and workmanship are in accordance with the requirements and intent of these standards, the approved Improvement Plans and the Improvement Agreement.

Any work constructed without proper notification to the Department of Public Works, such as but not limited to trenching, placing pipe, backfill, etc., may be required, at the discretion of the Director of Public Works, to be uncovered for examination and properly restored at the Developer’s expense.

The inspection of work does not relieve the Developer of any of his obligations to fulfill the Improvement Agreement or Improvement Plans as prescribed.

3.02 Project Liaison:

The Developer shall arrange with the Department of Public Works for a prejob conference prior to starting construction. All of the contractors involved in the construction of the project shall attend the prejob conference and all affected agencies shall be invited for coordination of construction and inspection.

Prior to beginning any new phase of construction, the Developer shall give the Inspector from the Department of Public Works a minimum of 1 working day notice. The Developer shall also notify the Inspector whenever improvement work is to be done on Saturdays, Sundays, Holidays, or during hours of the day when such work is normally not performed so that inspection may be provided.

Items of work, which are intended to be relinquished to agencies other than the County, shall be inspected by the appropriate authority of the agency. A minimum of 1 working days notice shall be given to the responsible agency when work is to be performed on any of their existing or future facilities. It shall be the responsibility of the Developer to see that notice to perform work is given to the appropriate agency when required.

When improvements are to be done that will be privately owned and maintained, but the County wants assurance that the improvements have been constructed in accordance with good practices to protect the general public, the Developer shall hire an Engineer legally authorized to practice Civil Engineering in the State of California to verify that all improvements have been done in accordance with the Approved Improvement Plans.

3.03 Workmanship and Materials:

Workmanship and materials shall be in accordance with this manual, the approved Improvement Plans, and the Improvement Agreement. Any defective workmanship or materials or improvements constructed contrary to the requirements of this manual, the approved Improvement Plans, or the Improvement Agreement will not be accepted by the County of Merced for maintenance.

3.04 Changes:

Any proposed changes in design or materials specified in the approved Improvement Plans or Improvement Agreement shall first be approved in writing by the Director of Public Works. When a change is desired by the Developer or any of his contractors, the Developer shall have his Design Engineer submit the proposed change in writing plus any supporting calculations or product specifications to the Department of Public Works for approval. The Director will then judge the merits of the proposed change and either approve or deny the request in writing.
3.05 Final Inspection:

A final inspection for improvements to be relinquished to the County of Merced shall be performed by the Director of Public Works. The request for a final inspection shall be made in writing by the Developer.

Within 10 days after receiving the request, the Director of Public Works or his authorized representative shall inspect the work. The Developer will be notified in writing concerning any particular defects or deficiencies that need to be remedied. The Developer shall notify, in writing, when all concerns have been corrected and request a re-inspection. Improvements will not be accepted for maintenance until such time as all of the required improvements have been completed to the satisfaction of the Director of Public Works.

Prior to requesting a final inspection, the area shall be thoroughly cleaned of all rubbish, excess materials and equipment. All portions of the work shall be left in a neat and orderly condition satisfactory to the Director of Public Works.

3.06 Accepting Improvements for Maintenance:

Improvements that are to be relinquished to the County will be accepted for maintenance only after the following have been completed:

A. The Department of Public Works must receive written notice from all agencies, such as the sanitary sewer or water district, stating that all pertinent work has been completed to their satisfaction and has been accepted for maintenance.

B. The Department of Public Works must receive written notice from the Fire Department stating that adequate fire flows have been verified.

C. The Department of Public Works must receive written notice from the surveyor for the project stating that all required property monuments have been installed.

D. A final inspection shall be performed by the Director of Public Works.

E. A Notice of Completion shall be filed. If a final or parcel map is associated with the improvements, but has not been filed at this stage, the Notice of Completion shall be filed by the Developer. Otherwise, the Notice of Completion will be filed by the Department of Public Works.
4.01 **Required Right-of-Way Widths:**
The required minimum right-of-way width shall be that width which is sufficient to contain all of the required roadway improvements.

Section 16.08.040 of the Merced County Code includes a requirement for the dedication of right-of-way as may be necessary to serve proposed projects.

4.02 **Typical Roadway Design Sections:**
The functional classification of roadways within the County is based on the functional classification contained within the Circulation Chapter of the Merced County General Plan. The required right-of-way width of roadways within the County is based on projected traffic densities, the expected speed of the traffic traveling on the roadway, whether or not curb and gutter is to be constructed, the design requirements of the CALTRANS Highway Design Manual, and the book, “A Policy on Geometric Design of Highways and Streets” published by AASHTO. Drawings of required design cross sections can be found at the end of this Chapter. Additional right-of-way and paving may be required if a bike path is designated to be installed and at approaches to intersections for turn pockets.

The County has established special design cross sections for certain roadways. Drawings of these special cross sections are included, in alphabetical order, as the last drawings in this chapter. Additional right-of-way and paving may be required at approaches to intersections for turn pockets.

General Specifications for the typical roadway cross sections shown on the drawings at the end of this chapter are as follows:

A. **Pavement Cross Slope:**
   1. The design cross slope of newly constructed residential roadways with a design speed of 25 miles per hour shall be 2%.
   2. The design cross slope of all other County roadways shall be 2%.
   3. The design cross slope within a knuckle shall be 2%.
   4. At intersections of Local Roads, the crowns of the intersecting roadways may be designed to match at the center of the intersection.
   5. The minimum cross slope within an intersection shall be 1%. The maximum cross slope within an intersection shall be 5%. The preferred cross slope within an intersection is 2%. Improvement plans shall include elevations of critical points in an intersection that are required to be “blue-topped” by the contractor during construction.
   6. The cross slope of the paved shoulder on Drawing ST-04 shall be 5%. See Section 4.02.F for paveout requirements.

B. **Structural Section Design:**
   1. The required structural section for all roadways shall be designed in conformance with Chapter 630 of the Caltrans Highway Design Manual. A sample structural section design is shown on Drawing ST-09.
   2. Traffic Index (TI): The design TI should be based upon the expected amount and type of truck traffic that will occur over a 20 year period.

Large projects that are anticipated to generate significant truck traffic or include a significant mixed use of automobile and truck traffic should follow the procedures contained in the Caltrans Highway Design Manual to determine the appropriate design TI.

Table 4-1 lists the minimum TI that shall be used for design of certain roadway types. Roadways that are expected to carry significant truck volumes may require a higher design TI.
C. Structural Section Construction:

Specifications for the construction of the structural section are as follows:

1. **Earthwork:** All earthwork shall comply with Section 19 of the CALTRANS Standard Specifications with the exception that only 6” of the material below sub-grade needs to be compacted to 95% relative compaction. The following note shall be placed on the plans:

   - In the event unstable (pumping) subgrades are encountered, a heavy, rubber-tired vehicle (typically a loaded water truck) shall be used to visually test the load/deflection characteristics of the finished subgrade materials. The vehicle shall have a minimum rear axle load (at the time of testing) of 16,000 pounds with tires inflated to at least 65 psi pressure. If the tested surface shows a visible deflection extending more than 6 inches from the wheel tracks at the time of loading, or a visible crack remains after loading, corrective measures will be required. A Geotechnical Engineer shall, at the developer’s expense, develop and recommend corrective measures to the Director of Public Works for approval. The Geotechnical Engineer shall be retained by the developer to be present during construction to monitor implementation of the corrective measures.

2. **Aggregate Subbase (AS):** All proposed AS works shall comply with Section 25 of the CALTRANS Standard Specifications and consist of Class 3 material. AS shall be compacted to 95% relative compaction.

3. **Aggregate Base (AB):** All proposed AB works shall comply with Section 26 of the CALTRANS Standard Specifications and consist of Class 2 material with 3/4 inch maximum aggregate. AB shall be compacted to 95% relative compaction. The following note shall be placed on the plans:

   - Class 2 Aggregate Base shall consist of ¾ inch maximum material conforming to aggregate grading and sand equivalent tests specified in the “Operating Range” in Section 26 of the Caltrans Standard Specifications. If the material does not pass visual inspection by the Merced County representative, the Contractor shall cease import and placement until the project Geotechnical Engineer has sampled and tested, at Contractor’s expense, the material from undisturbed windrows. Only material conforming to the “Operating Range” requirements shall be incorporated into the work and noncompliant material shall be removed from the site. The Contractor may, at Contractor’s expense, have the project Geotechnical Engineer test aggregate material supplied from loaded trucks prior to leaving the aggregate supplier’s plant.

4. **Asphalt Concrete (AC):** At a minimum, all proposed AC works shall comply with Section 39 of the CALTRANS Standard Specifications. Residential Roadways that are not expected to experience heavy truck traffic shall use Type B Asphalt Concrete with 1/2 inch maximum, medium graded aggregate. The
following construction notes shall be placed on the plans:

a. Prior to construction, the asphalt supplier shall submit an AC mix design to the Department of Public Works for approval.

b. Asphalt concrete, including base lifts, shall be placed only when the atmospheric temperature is 50 degrees Fahrenheit and rising.

c. In accordance with Section 39-5.02 of the Caltrans Standard Specifications, the following equipment shall be used when placing asphalt concrete:

- Steel-tired roller weighing not less than 8 tons; and,
- Steel-tired, 2-axle or 3-axle tandem or 3-wheel roller weighing not less than 12 tons and having rolling wheels with a diameter of 40 inches or more; and,
- Pneumatic-tired roller.

d. Any trenches previously covered with temporary patch material shall be paved in conjunction with the asphalt concrete paving operation for the project. Before paving, any temporary patch material shall be completely removed, any uneven trench edges shall be saw cut, and the trench backfill shall be compacted to 95% relative compaction. See Drawing EW-01 for more detailed requirements.

5. Fog Seal: A fog seal in conformance with Section 37 of the CALTRANS Standard Specifications is required to be placed over the finished AC at a rate of 0.10 gallons per square yard.

6. Compaction Testing: Compaction testing for each layer of the structural section shall be done in conformance with either California Test 216 or 231 by a certified soils lab as arranged and paid for by the Developer. When deemed necessary by the County, asphalt concrete compaction testing shall be done in conformance with California Test 375. The number of tests shall be subject to the Department of Public Works approval.

D. Curb and Gutter: See Section 5.02 of these standards for design information.

E. Roadside Ditch Details:

1. See Drawing ST-05.

2. Flowline Slope: The minimum required design flowline slope for roadside earth ditches shall be 0.0025 (0.25%). Where A.C. Dikes are to be installed, the minimum required design flowline slope may be reduced to 0.0020 (0.2%)  

3. Cross Slopes: The maximum cross slopes for various components of a roadside ditch are shown in Table 4-2.

<table>
<thead>
<tr>
<th>Ditch Component</th>
<th>Maximum Cross Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreslope (Collector or Arterial)</td>
<td>4:1</td>
</tr>
<tr>
<td>Foreslope (Local Roadway)</td>
<td>4:1</td>
</tr>
<tr>
<td>Back slope</td>
<td>3:1</td>
</tr>
</tbody>
</table>

If the maximum foreslope cannot be obtained, it may be necessary to extend the pavement width to the edge of the gravel shoulder and install a “Type A” A. C. Dike as shown in CALTRANS Standard Plan A87B.

F. Paveout on Existing Roadways: Whenever pavement widening is to be done on an existing roadway, the following will be required

1. Cross Slope: It is important that the paveout closely match the profile of the existing portion of the pavement. Where roadside ditches are to provide pavement drainage, the cross slope shall match that of the existing pavement, but shall not be less than 2%. Where paveout is to match curb and gutter, the cross slope of the paveout shall be between 2% and 6%.
2. **Flowline Slope:** Whenever the minimum flowline slope cannot be achieved because of the existing pavement edgeline slope, the minimum required flowline slope shall be determined by consulting with the Department of Public Works.

3. The existing edge of pavement shall be sawcut prior to placement of the paveout.

4. If the existing roadway is in poor condition or if the existing cross slope does not meet acceptable design tolerances, as determined by the Director of Public Works, the Developer shall reconstruct the existing roadway to its centerline along the entire frontage of his property.

5. **Transition Taper:** Whenever an existing roadway is widened, a transition taper is required to be constructed in order to provide for a smooth transition from the new wider roadway to the existing narrower roadway. The length of this taper shall be 8 times the width of the widening. Thus, a 4 foot widening will require a 32 foot taper. Tapers shall be delineated as directed by the Department of Public Works.

A transition taper is not required when entering a new wider roadway from an existing narrower roadway.

G. **Partial Width Roadways:** Whenever a Developer proposes or is required to construct a new roadway along the edge of his property, it will be required that a partial width roadway section be constructed by the Developer. (See Drawing ST-06C) A partial width roadway shall consist of half of the required street as shown in the appropriate drawing plus an additional 10 feet of pavement on the opposite side of the centerline plus a 2 foot AB shoulder. The minimum right-of-way width that the County can accept for maintenance is 40 feet.

When developing a project with a partial width roadway, it is very important the design accommodate storm water runoff. Runoff shall be prevented from entering onto private property owned by others. The construction of an AC Dike and supporting storm drainage system may be necessary.

H. **Bicycle Paths:** It is important that the design engineer determine whether or not a bicycle path is proposed along the frontage of the property being developed. Depending on what class of Bikeway is proposed, a roadway may require up to 12 feet of additional right-of-way and/or pavement width. The Bikeway Design Standards can be found in the “Merced County Regional Bikeway Plan”, published by the Merced County Association of Governments. Proposed Bikeways are shown in the aforementioned document and additional proposed bikeways can be found in the Community Specific Plan of each community.

I. **Miscellaneous Details:** Details that may not be covered by these standards should be designed in conformance with CALTRANS Standards and Specifications.

4.03 **Roadway Geometrics:**

A. **Cul-de-Sacs:**

1. See Drawings ST-10 through ST-12.

2. Right-of-way radii shall be as shown.

3. Cul-de-sacs shall be extended as shown in Drawing ST-11B to provide for improved pedestrian circulation and to eliminate the construction of continuous walls or fences along main streets.

4. A cul-de-sac shall not serve more than 25 lots.

B. **Street Knuckle Connections:**


2. The radii shall be as shown.

C. **Intersections:**

1. All roadways should intersect as nearly as possible at right angles.

2. Roadways entering on opposite sides of any perpendicular roadway shall have their centerlines directly opposite or shall be offset by a minimum of 100 feet.
3. Roadway intersections with curb and gutter shall have a curb ramp constructed on all curb returns. Curb ramps are not required in areas where sidewalk is not required.

4. The minimum right-of-way radius for a rural intersection with no curb and gutter shall be 35 feet.

5. The intersection of a local roadway with a collector or arterial roadway shall be designed according to Chapter 400 of the Caltrans Highway Design Manual.

D. Valley Gutters:

1. See Section 5.02 of these standards for design information.

2. Valley gutters will only be allowed on either the minor leg of a “T” intersection or the minor legs of a stop sign controlled intersection.

3. Valley gutters will not be allowed to cross a roadway in the middle of a block.

4. Valley gutters will be allowed only in areas where curb and gutter is to be constructed.

E. Vertical Curves: Vertical Curves shall be designed in accordance with Chapter 200 of the CALTRANS Highway Design Manual.

F. Horizontal Curves: The minimum centerline radius of horizontal curves should be as follows:

1. Residential cul-de-sacs should have a minimum centerline radius of 150 feet.

2. Local through roadways serving R1 and more densely zoned residential areas should have a minimum centerline radius of 200 feet.

3. Local through roadways serving A-R zoned areas should have a minimum centerline radius of 200 feet.

4. Local roadways in commercial, manufacturing, or industrially zoned areas should have a minimum centerline radius of 300.

5. On higher classified roadways, the minimum centerline radius shall be based upon the appropriate section of the most recent edition of “A Policy on Geometric Design of Highways and Street”, published by AASHTO or the Caltrans Highway Design Manual.
A - TRAVEL LANE
B - PAVED SHOULDER
C - AGGREGATE BASE (AB) SHOULDER
D - ROADSIDE DITCH (SEE DRAWING ST-05)
A - TRAVEL LANE
B - PAVED SHOULDER
C - AGGREGATE BASE (AB) SHOULDER
D - ROADSIDE DITCH WITH 4:1 SIDE SLOPES
E - CLASS 1 BIKE PATH

N.T.S.
A - TRAVEL LANE
B - PAVED SHOULDER
C - AGGREGATE BASE (AB) SHOULDER
D - ROADSIDE DITCH (SEE DRAWING ST-05)
90' RURAL ROADWAY (SPECIAL MAJOR COLLECTOR) DRAWING ST-03

A – CONTINUOUS LEFT TURN LANE
B – TRAVEL LANE
C – PAVED SHOULDER
D – AGGREGATE BASE (AB) SHOULDER
E – ROADSIDE DITCH (SEE DRAWING ST-05)

N.T.S.
A - CONTINUOUS LEFT TURN LANE
B - TRAVEL LANE
C - PAVED SHOULDER (5% CROSS SLOPE)
D - AGGREGATE BASE (AB) SHOULDER
E - ROADSIDE DITCH (SEE DRAWING ST-05)
NOTES:
1. THE MAXIMUM SLOPE OF THE FORESLOPE SHALL BE 4:1 ON LOCAL ROADWAYS. THE MAXIMUM SLOPE OF THE FORESLOPE SHALL BE 4:1 ON COLLECTOR AND ARTERIAL ROADWAYS.
3. THE CATCH POINT SHOULD BE LOCATED WITHIN THE RIGHT-OF-WAY. IF LOCATED OUTSIDE THE RIGHT-OF-WAY, A SLOPE EASEMENT MAY BE NECESSARY.
4. THE FLOWLINE OF THE DITCH SHOULD BE LOWER THAN THE ROADWAY STRUCTURAL SECTION.

N.T.S.

MERCE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

ROADSIDE DITCH DETAILS

DRAWING ST-05
VERTICAL CURB ROADWAYS

ROLLED CURB ROADWAYS

A - A.C. SURFACE
B - CURB & GUTTER (SEE DRAWING SD-01 OR SD-01A)
C - SIDEWALK (SEE DRAWING MS-08A)
NOTES:

1. ROLLED CURB IS STANDARD FOR INTERIOR ROADWAYS. HOWEVER, VERTICAL CURB MAY BE SUBSTITUTED FOR ROLLED CURB.

2. VERTICAL CURB SHALL BE USED ON PERIPHERAL ROADWAYS.

3. CURB AND GUTTER MAY BE WAIVED ON PERIPHERAL ROADWAYS FOR SMALL INFILL PROJECTS THAT LIE BETWEEN BUILT-OUT AREAS THAT HAVE BEEN DEVELOPED WITH EARTH DITCHES.

4. CURB AND GUTTER MAY BE WAIVED ON PERIPHERAL ROADWAYS AT LOCATIONS WHERE SIGNIFICANT DESIGN CONSTRAINTS EXIST.

5. THE DESIGN TRAFFIC INDEX (TI) SHALL BE:
   - INTERIOR ROADWAYS - 4.5
   - PERIPHERAL ROADWAYS - 7.0

6. KEY TO CROSS SECTION REFERENCES:
   - A = TRAVEL LANE
   - B = PAVED SHOULDER
   - C = ROLLED CURB (SEE DRAWING SD-01A)
   - D = VERTICAL CURB (SEE DRAWING SD-01)

MERCEDES COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

ONE-ACRE RESIDENTIAL AREA ROADWAYS (LOCAL) DRAWING ST-06B

N.T.S.

G:\MASTERS\STANDARDS\2009 Update\Chapter 4 - Roadway Standards\ST-06B.dwg

APPROVED: 2/24/2009
A - A.C. SURFACE
B - CURB & GUTTER (SEE DRAWING SD-01 OR SD-01A)
C - PLANTING STRIP (OPTIONAL, DEPENDING ON ROAD TYPE)
D - SIDEWALK (OPTIONAL, DEPENDING ON ROAD TYPE)
E - AB SHOULDER (AC DIKE OPTIONAL IF NEEDED FOR DRAINAGE)

NOTE:
IT IS VERY IMPORTANT TO DESIGN THE PARTIAL WIDTH ROADWAY TO DRAIN PROPERLY. RUNOFF SHALL BE PREVENTED FROM ENTERING ONTO PRIVATE PROPERTY OWNED BY OTHERS. THE CONSTRUCTION OF AN AC DIKE AND SUPPORTING STORM DRAINAGE SYSTEM MAY BE NECESSARY.
A – TRAVEL LANE
B – PAVED SHOULDER
C – CURB & GUTTER (SEE DRAWING SD-01)
A - TRAVEL LANE
B - CLASS 2 BIKE LANE
C - CURB & GUTTER (SEE DRAWING SD-01)
D - LANDSCAPE AREA
E - SIDEWALK
F - LANDSCAPED MEDIAN/LEFT TURN POCKET

MERCEDE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

4 & 6 LANE URBAN ARTERIALS

DRAWING ST-08

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APPROVED: 2/24/2009
**SAMPLE DESIGN**

A. GIVEN:
1. R = VALUE SUBGRADE = 50
2. T.I. = 4.5
3. R = VALUE CL. II BASE = 78
4. SAFETY FACTOR = 0.20

B. TOTAL:

GE = 0.0032(T.I.)(100−R)
    = 0.0032(4.5)(100−50)
    = 0.72

C. A. C. REQUIRED:

GE = 0.0032(4.5)(100−78) + 0.20
    = 0.52

THICKNESS = GE/GI
            = 0.52/2.50
            = 0.21

MINIMUM THICKNESS = 0.20

USE: 0.20' A.C.
GE = 0.20(2.50) = 0.50

D. AGGREGATE BASE REQUIRED

GE = 0.0032(4.5)(100−50) − 0.50
    = 0.22

THICKNESS = GE/GI
            = 0.22/1.1
            = 0.20

MINIMUM THICKNESS = 0.35'

USE: 0.35' A.B.
SYMMETRICAL

OFFSET

RIGHT OF WAY

ROLLED CURB

PAVEMENT EDGE

R=49'

R=42'

120.375'

77.445'

R=127'

R=134'

15'

30'

CROWN

R=75'

32'

46'

68.89

R=82'

R=89'

26'

1. SEE DRAWING ST-06B FOR ONE-ACRE RESIDENTIAL ROADWAY STANDARD.
1. SEE DRAWING ST-06 FOR URBAN LOCAL ROADWAY STANDARD.
1. SEE DRAWING ST-06 FOR URBAN LOCAL ROADWAY STANDARD.

MERCEDE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

URBAN RESIDENTIAL CUL-DE-SAC BULBS

DRAWING ST-11A
NOTES:

1. **CUL-DE-SACS SHALL BE EXTENDED TO ADJACENT ROADWAY TO PROVIDE FOR CONTINUITY OF PEDESTRIAN SIDEWALK AND TO ELIMINATE UNDESIRABLE CONTINUOUS WALLS OR FENCES LOCATED ALONG PRIMARY ROAD.**

2. **A BOLLARD SHALL BE PLACE IN THE CENTER OF THE 10' WIDE CONNECTOR SIDEWALK TO PREVENT VEHICLES FROM DRIVING THROUGH THE SIDEWALK CONNECTION.**

3. **LOTS FRONTING ON THE END OF THE CUL-DE-SAC SHALL BE DEVELOPED AS IF THEY WERE CORNER LOTS. BUILDING AND FENCE SET BACKS SHALL BE DETERMINED AS IF THESE LOTS WERE CORNER LOTS.**

4. **PRIVATE FENCE SHALL NOT CROSS OVER THE 10' PUBLIC UTILITY EASEMENT. ANY FENCE PLACED ALONG PRIMARY ROAD SHALL BE SET BACK 10 FEET FROM THE RIGHT-OF-WAY.**
1. SEE DRAWING ST-07 FOR INDUSTRIAL PARK ROADWAY STANDARD.
NOTES:
1. D3 = D2 + 20'
2. THE CENTER POINT OF D3 IS THE SAME AS FOR D2
NOTES:

1. THE DESIGN TRAFFIC INDEX (TI) SHALL BE: 7.5
2. THE DESIGN SPEED SHALL BE 35 MPH.
3. KEY TO CROSS SECTION REFERENCES:
   A - CONTINUOUS LEFT TURN LANE
   B - TRAVEL LANE
   C - CLASS 2 BIKE LANE
   D - VERTICAL CURB (SEE DRAWING SD-01)
   E - SIDEWALK (SEE DRAWING MS-09)
4. NO SIDEWALK REQUIRED ALONG PORTIONS OF ASHBY ROAD ABUTTING CALTRANS RIGHT OF WAY.
5. NO PARKING WILL BE ALLOWED ON EITHER SIDE OF ASHBY ROAD WITH THIS CROSS SECTION.
NOTES:
1. THE DESIGN TRAFFIC INDEX (TI) SHALL BE: 8.5
2. THE DESIGN SPEED SHALL BE 45 MPH.
3. KEY TO CROSS SECTION REFERENCES:
   A = CONTINUOUS LEFT TURN LANE
   B = TRAVEL LANE
   C = CLASS 2 BIKE LANE
   D = VERTICAL CURB (SEE DRAWING SD-01)
4. NO PARKING WILL BE ALLOWED ON EITHER SIDE OF BUAHACH ROAD WITH THIS CROSS SECTION.
NOTES:
1. THE DESIGN TRAFFIC INDEX (TI) SHALL BE: 7.5
2. THE DESIGN SPEED SHALL BE 35 MPH.
3. KEY TO CROSS SECTION REFERENCES:
   A – RAISED MEDIAN & TURN POCKET
   B – TRAVEL LANE
   C – CLASS 2 BIKE LANE
   D – VERTICAL CURB (SEE DRAWING SD-01)
   E – SIDEWALK (SEE DRAWING MS-09)
4. NO PARKING WILL BE ALLOWED ON EITHER SIDE OF LETTEAU AVENUE WITH THIS CROSS SECTION.
DESIGN SPEED = 35 mph
DESIGN TRAFFIC INDEX = 7.5
NOTES:
1. THE DESIGN TRAFFIC INDEX (TI) SHALL BE: 7.5
2. THE DESIGN SPEED SHALL BE 35 MPH.
3. KEY TO CROSS SECTION REFERENCES:
   A – CONTINUOUS LEFT TURN LANE
   B – TRAVEL LANE
   C – CLASS 2 BIKE LANE
   D – VERTICAL CURB (SEE DRAWING SD–01)
   E – SIDEWALK (SEE DRAWING MS–09)
4. NO PARKING WILL BE ALLOWED ON EITHER SIDE OF SHANKS ROAD WITH THIS CROSS SECTION.
NOTES:

1. THE DESIGN TRAFFIC INDEX (TI) SHALL BE: 8.5
2. THE DESIGN SPEED SHALL BE 45 MPH.
3. KEY TO CROSS SECTION REFERENCES:
   A – RAISED MEDIAN (TURN POCKETS AT INTERSECTIONS)
   B – TRAVEL LANE
   C – CLASS 2 BIKE LANE
   D – VERTICAL CURB (SEE DRAWING SD-01)
   E – SIDEWALK

4. NO PARKING WILL BE ALLOWED ON EITHER SIDE OF WINTON WAY WITH THIS CROSS SECTION.
5. THIS CROSS SECTION SHALL BE USED FOR THE SEGMENT OF WINTON WAY FROM THE CITY OF ATWATER TO SANTA FE DRIVE.
CHAPTER 5
Storm Drainage System

5.01 General Specifications:
The storm drainage system for any proposed project within the County of Merced shall be designed to conform to:

- Chapter 9.53 of the Merced County Code, “Regulation of Stormwater”; and,
- The Merced County Department of Public Works Storm Drainage Design Manual.

5.02 Curb and Gutter & Valley gutters:

A. Design Constraints:

1. The minimum design flowline slope of curb and gutter shall be 0.0020.
2. The minimum design flowline slope of a valley gutter shall be 0.0035.
3. The minimum allowable fall around a curb return shall be 0.20 feet.
4. The maximum capacity of curb and gutter shall be determined by consulting Exhibit 4-1 of the Storm Drainage Design Manual.

B. Construction Specifications:

1. See Drawing SD-01 for Vertical Curb and Gutter Standard.
2. See Drawing SD-01A for Rolled Curb and Gutter Standard.
3. See Drawing SD-01B for Vertical Curb to Rolled Curb transition detail.
4. See Drawing SD-02 for Valley Gutter Standard.

5. Concrete shall conform to Section 73 of the Caltrans Standard Specifications. The minimum cement content shall be 463 pounds per cubic yard, except when extruded or slip-formed curbs are constructed the minimum cement content shall be 548 pounds per cubic yard.

6. Four inches of Class II Aggregate Base (AB) with 1½ inch maximum aggregate compacted to 95% relative compaction shall be placed under curb and gutter.

7. One half inch (1/2”) thick felt expansion joints shall be placed at 60 foot intervals and at both ends of driveways and curb returns. Expansion joints shall be full depth and extend through the entire thickness of concrete. Expansion joints shall be braced by steel backing during pour. When curb is adjacent to sidewalk, expansion joint locations shall match.

8. Weakened plane joints shall be placed at 10 foot intervals between expansion joints. Weakened plane joint shall be constructed to a minimum depth of one inch (1”) by scoring with a tool which will leave the corners rounded and insure a free movement of the concrete at the joint.

9. A non-pigmented curing compound shall be applied to freshly finished concrete in accordance with Section 90-7 of the Caltrans Standard Specifications.

10. Curbs through driveway sections 24 feet wide and greater shall have one No. 4 rebar placed as shown in Drawing SD-01.

11. When not otherwise specified by the Merced County Department of Public Works Improvement Standards and Specifications, Section 73 of the CALTRANS Standard Specifications shall be followed.

5.03 Catch Basins:

A. General Specifications:

1. Catch basins shall not be located within 2 feet of a curb return.

2. Catch basin floors shall be designed to have a wood trowel finish with a minimum slope of 4:1 (horizontal:vertical) from all direction toward the outlet pipe.

4. All miscellaneous concrete shall have a minimum cement content of 463 pounds per cubic yard.

5. All grates, frames, bolts, face anchors and other miscellaneous steel components shall be hot-dipped galvanized.

B. Type 24 x 36 Catch Basins:
1. See Drawing SD-04.

2. Type 24 x 36 catch basins shall be installed in gutter depressions as shown in Drawing SD-03.

3. The approved grate types are shown in Drawing SD-05. Grates that satisfy the standards in Drawing SD-05 are as follows:
   a. Christy U43-HT
   b. South Bay Foundry Steel Grate
   c. Alhambra A-1555

4. Curb sections shall match adjacent curb.

5. When the overall height of a catch basin is 8 feet or more, reinforcing steel shall be required in the walls. Reinforcing steel shall be No. 4 bars placed at 18 inch center with 1½ inches clear to inside of box.

6. A ¾ inch hot-dipped galvanized steel bar shall be placed across the open face of the curb opening (to block large debris and trash from entering into the catch basin).

7. A Storm Drain Marker, as shown on Drawing SD-04A, shall be placed at every catch basin location.

C. Type 36RX Catch Basins:
1. See Drawing SD-07.

2. Type 36RX catch basins shall be installed within ditch depressions as shown in Drawing SD-06.

3. Catch basins shall be constructed from 36 inch, Class III Reinforced Concrete Pipe.

4. The approved grate type is shown in Drawing SD-07. Grate shall conform to Caltrans Type 36RX Grate. Available grates that satisfy the standards in Drawing SD-07 are as follows:
   a. South Bay Foundry Steel Type 36RX

5.04 Storm Drainage Outlets:
A. General Specifications:
1. The Type 1 or Type 2 storm drain outlet may be used in conjunction with storm drainage systems.

2. A modified Type 1 storm drain outlet as shown in Drawing SD-10 may also be used for percolation based storm drainage system.

3. The minimum diameter of a Type 2 storm drain outlet shall be 15 inches.

4. All miscellaneous concrete shall have a minimum cement content of 463 pounds per cubic yard.

B. Type 1 Storm Drain Outlets:
1. See Drawing SD-08.

2. An available grate and frame that satisfies the standards in Drawing SD-08 is South Bay Foundry C21.

C. Type 2 Storm Drain Outlets:
1. See Drawing SD-09.

2. The grate may be fabricated as shown in Drawing SD-09. Alternate designs must be shown on the improvement plans for review.

3. The pipe protruding into the basin shall be Class III Reinforced Concrete Pipe.

4. Rip-rap shall be placed at the outlet to prevent erosion.

5.05 Storm Drain Manholes:
A. Design Constraints:
1. Manholes shall be provided at all junctions, at all changes in pipe size and at any alignment difference greater than 15 degrees. Manhole spacing shall not exceed...
500 feet for 21 inch and smaller pipes and 1000 feet for 24 inch and larger pipes. Manholes will not be allowed within curb, gutter, sidewalk or driveways.

2. The Type 1 storm drain manhole should be specified whenever possible. The Type 2 storm drain manhole should be specified only when the Type 1 storm drain manhole cannot be used.

3. The minimum inside diameter of a Type 1 or Type 2 storm drain manhole shall be 48 inches.

4. The maximum diameter of a Type 1 storm drain manhole shall be 60 inches.

5. When manholes are located within the roadway, the frame and lid shall be raised to finish grade after the street has been paved.

B. Construction Specifications:

1. See Drawing SD-11 for Type 1 Manhole.

2. See Drawing SD-12 for Type 2 Manhole.

3. Precast concrete sections shall conform to ASTM C-478.

4. Joints between precast sections shall be filled with butyl rubber sealant.

5. Concrete for collar shall have a minimum cement content of 463 pounds per cubic yard.

6. Concrete for the Base of the Type 2 Manhole shall have a minimum cement content of 673 pounds per cubic yard with a smooth troweled surface.

7. Manhole frame and cover shall be set at finished grade after asphalt has been place.

8. Adjustable grade rings shall be provided as necessary to bring manhole frame to grade.

9. Manhole frame and cover shall be cast iron, rated for heavy traffic and shall closely resemble the frame and cover shown in Drawing SD-11. All mating surfaces shall be machined so that cover will be non-rocking.

5.06 Approved Storm Drainage Pipes:

A. General Specifications:

1. Definition: The term “roadbed” will be defined in these standards as follows: A “roadbed” is the area within the Merced County road right of way that acts as a structural component in maintaining the traveled road surface. This area shall include the ultimate pavement width plus 4 feet on both sides of the ultimate pavement width.

2. Pipe shall not be placed directly on a hardpan or rock layer.

3. The minimum allowable diameter for storm drainage pipe are as follows:
   a. Rural driveways culverts: 12 inches
   b. Storm drainage system pipe: 15 inches.
   c. Isolated inverted siphon: 18 inches.

4. Pipe should not be placed longitudinally under curb, gutter, or sidewalk except when no other feasible alternative exists.

5. The minimum easement width for storm drainage pipelines located outside road right-of-way shall be 10 feet. Easement width shall be located all on one property.

6. The minimum flowline slope for storm drainage pipe 24 inches in diameter and smaller should be 0.002.

B. Corrugated Metal Pipe (CMP):

1. Definition: The term “Corrugated Metal Pipe” will be defined to include the following types of pipe:
   a. Corrugated Aluminum Pipe (CAP)
   b. Corrugated Steel Pipe (CSP)
   c. Ribbed Steel Pipe (RSP)
2. **Allowed Uses:**
   a. Rural driveway culvert pipe (12 inch diameter minimum).
   b. Non-siphon, gravity flow road drainage cross culverts (18 inch diameter minimum).

3. **General Specifications:** Corrugated Metal Pipe (CMP) shall conform to the material and construction methods of Section 66 of the CALTRANS Standard Specifications and as modified herein.
   a. Allowable Mannings Coefficient for design shall be:
      i. Corrugated Aluminum Pipe (CAP) or Corrugated Steel Pipe (CSP) with 2 2/3 x ½ inch corrugations: \( n = .024 \).
      ii. Corrugated Aluminum Pipe (CAP) or Corrugated Steel Pipe (CSP) with 3 x 1 inch corrugations: \( n = .026 \).
      iii. Ribbed Steel Pipe (RSP): \( n = .015 \).
   b. The minimum backfill required for CMP shall be as follows (See Section 9.02):
      i. Within the Merced County roadbed: If native soil is Class IV or V, then Type backfill. If native soil is Class III or better, then Type B backfill.
      ii. Outside the Merced County roadbed: If native soil is Class IV or V, then Type C backfill; If native soil is Class III or better, then Type D backfill.
   c. The minimum cover required when utilizing the above backfill types shall be 2 feet.
   d. Before CMP will be allowed for use, California Test 643 shall be conducted in the pipe bedding zone to assure a minimum service life of 50 years. The criteria set forth in Chapter 850 of the CALTRANS Highway Design Manual shall be adhered to when determining service life of CMP.
   e. The minimum allowable metal thickness for CMP shall be based upon the results of California Test 643 as well as the manufacturer’s recommendations for H20 live loads.
   f. Universal coupling bands shall be fabricated and placed in accordance with Section 66 of the CALTRANS Standard Specifications except that all universal bands shall be either asphalt coated, fitted with a 12 inch rubber gasket or sealed with an approved mastic compound.

C. **Polyvinyl Chloride (P.V.C) Pipe:**

1. **Allowed Uses:**
   a. Ribbed P.V.C. pipe is not allowed to be used in Merced County.
   b. Solid Wall P.V.C. pipe may be allowed for use both within and outside of the Merced County roadbed.
   c. P.V.C. pipe shall not be allowed for use in an unstable trench area. (See Section 9.03.G).

2. **General Specifications:**
   a. Solid Wall P.V.C. pipe shall conform to ASTM D3034 (15” pipe) or ASTM F679 (18’’-24’’, T-1 Wall Thickness).
   b. The allowable Mannings Coefficient for design shall be .011.
   c. The minimum pipe stiffness shall be 46 psi when tested in accordance with ASTM method D2412.
   d. The date of manufacture of P.V.C. pipe shall not exceed one (1) year prior to installation.
   e. The minimum backfill required for P.V.C. pipe shall be Type A as specified in Section 9.02.
   f. The minimum cover required for P.V.C. pipe shall be 3 feet. The minimum cover for P.V.C. pipe that will
not be subject to live loads may be reduced to 2 feet.

g. Subsequent to final backfilling and compaction, P.V.C. pipe shall be tested for deflection by hand pulling a 9 rod mandrel through the pipe. Maximum allowable deflection shall not exceed 5% from the average measured inside diameter before installation. Pipe not meeting this requirement shall be removed. “Re-rounding” of the pipe will not be permitted.

D. Reinforced Concrete Pipe (RCP):

1. **General Specifications:** Reinforced Concrete Pipe (RCP) shall conform to the material and construction methods of Section 65 of the CALTRANS Standard Specifications, ASTM C76 and as modified herein.

   a. Allowable Mannings coefficient for design shall be .013.

   b. RCP shall be strength Class III or better as specified in ASTM C76.

   c. Pipe shall have rubber gasket joints as specified in Section 65-1.06 of CALTRANS Standard Specifications.

   d. The minimum backfill required for RCP shall by Type D as specified in Section 9.02 of this manual.

   e. The minimum cover required when utilizing the above backfills shall be 1½ feet.

   f. RCP which does not exhibit good workmanship and finish shall be rejected.

E. Polypropylene (PP) Pipe:

1. **General Specifications:** Polypropylene (PP) pipe shall conform to the following specifications:

   a. 12” – 30” smooth interior, double-wall pipe shall meet ASTM F2736.

   b. 30” – 60” smooth interior, triple-wall pipe shall meet ASTM F2764.

   c. The Manning’s coefficient (n-value) for use in design shall be 0.012.

   d. Pipe shall have gasketed integral bell & spigot joints meeting ASTM F2736.

   e. Joints shall utilize double-gaskets meeting the requirements of ASTM F477 and be watertight according to the requirements of ASTM D3212.

   f. The backfill material used in the embedment zone shall be Class I or Class II materials as specified in Chapter 9 of these standards.

   g. The minimum cover over the pipe shall be 2 feet (24 inches).

2. Available PP pipe that satisfies the requirements of these standards are as follows:

   a. ADS Sanitite HP Pipe.

F. Other Pipe Types: Other pipe materials may be considered for use on a case by case basis.

5.07 Storm Water Pump Stations:

A. **Definition:** A storm water pump station will be defined to include the following:

1. Duplex Pumps, Trash Rack and Wet Well

2. Stilling Well

3. Outlet Discharge Pipe

B. **Design Constraints:**

1. The rate of discharge into a creek or canal shall be in accordance with Section 4.02.C of the Storm Drainage Design Manual.

2. The appropriate irrigation district or other agency that is accepting storm drainage water may have more restrictive discharge constraints that must be satisfied.

C. **Notes on Plans:**

The following notes shall be placed on improvement plans whenever a pump station is required to be installed:
1. The Contractor shall submit to the County the following information on the pumps which are to be supplied for the pump station for approval prior to ordering:
   a. Make and Model Number
   b. Impeller Size
   c. Pump Curve Data
   d. Pump Efficiency expected to be achieved in the field
2. Prior to final construction acceptance, the Contractor shall submit to the County a copy of the Operations and Maintenance Manual for the installed pumps.

D. Duplex Pump Station and Wet Well:

1. Pump and Motor Construction: Pump shall be designed as a completely submersible wastewater system capable of pumping unscreened sewage consisting of water, fibrous material, heavy sludge and spherical solids up to 3 inches in diameter. Motor shall be 3 phase and designed to operate with the chosen pump (single phase motors will be considered only if 3 phase motors are not manufactured for the required pump). Pump volute, motor enclosure and seal housing shall be ASTM A-48 Class 30 cast iron or better. All fasteners exposed to the pumped liquid and the motor shaft on which the impeller is mounted shall be stainless steel. Impeller shall be single or multiple port enclosed type. Impeller diameter shall be trimmed to meet specified system flow and head conditions. The inner seal shall operate in a sealed, oil-filled chamber containing moisture sensing probes capable of detecting any influx of conductive liquid past the outer seal. Certain pumps and motors may not be approved for use due to the lack of availability of replacement parts. Replacement parts must be locally available (within a 200 mile radius). Approved manufacturers are Gould and Paco.

2. Electrical Controls: All controls for the pump station shall be mounted in a NEMA 3R double-door, dead-front enclosure with a padlock hasp. The controls for each pump shall include a thermal magnetic circuit breaker, rotary hand-off-automatic switch, and magnetic motor starter with ambient compensated overload relays and quick trip heaters. Pump operation shall be controlled by four bulb-type liquid level sensors (Flygt Model EMN-10 or equivalent); one for each pump turn-on, one for pump turn-off, and one for high water alarm control. The controls shall provide for lead/lag sequencing of the pumps. The pumps shall operate singly with each pump designed to operate at the maximum discharge rate. An automatic alternator shall alternate the lead-standby duty on each succeeding pump cycle. The pump shall be set to be activated at the bottom elevation of the detention basin. A 30 minute delay timer be included in the lead pump activation circuit to reduce pump cycling. The second pump shall activate if the lead pump fails to turn-on. The pumps shall be set to run off two feet above the bottom elevation of the wet well. A flashing light alarm visible from outside the fence shall be supplied and activated at the 10-year high water elevation within the detention basin. Both pumps shall be capable of being activated by a rotary switch on the control panel in an emergency when authorized by the agency accepting storm water. An all-pump-off circuit shall be included that will interrupt all pump operation if the stilling well detects the receiving canal or pipeline already operating at capacity.

3. Disconnect System: The design of the disconnect system shall permit the easy removal of the pumping unit for inspection or service. The pump, when lowered into place, shall automatically connect to the discharge pipe. There shall be no need for personnel to enter the wet well to inspect or service the pump. Pump shall be securely attached to a sliding guide bracket with a stainless steel lifting chain or cable. A minimum schedule 40 standard galvanized steel pipe guide rail shall be furnished and installed by the contractor. The sliding guide bracket shall have non-sparking
material at the point of contact with the guide rail to prevent spark ignition of explosive wet well gases during pump installation and removal. A cast iron discharge elbow, located on the floor of the wet well, will receive the pump discharge when the pump is lowered into place. The receiving edge of the discharge elbow shall be fitted with non-sparking material to prevent spark ignition of explosive wet well gases during pump installation and removal. The pump discharge shall be fitted with a resilient seal which provides a positive hydraulic seal for maximum pump system efficiency. The lower guide rail bracket shall be mounted by the pump manufacturer on a steel base plate, in alignment for proper operation of the disconnect system. The base assembly shall provide stable, three point support of the pumping unit during pump operation. The entire quick disconnect pumping system must be listed and labeled by Underwriter’s Laboratory (UL) as suitable for operation in the Class I, Division 1 location as defined in Article 500 of the California Electric Code.

4. Warranty: All material including pumps, valves, electrical controls, etc. shall be warranted for a minimum one-year period from the date of final acceptance by the County of Merced.

5. Operation and Maintenance: Contractor shall furnish the County of Merced with a complete set of manufacturer’s operation, maintenance, and parts manual for all equipment installed. He shall also provide the County of Merced with the name, address and phone number of the nearest local distributors for all parts. A complete wiring diagram shall also be furnished.

6. Trash Rack: Before entering the wet well, storm water shall pass through a separate trash rack sump. See Section 5.09.A for additional requirements for trash rack.

7. Wet Well: Wet well shall be constructed of precast reinforced concrete to the dimensions required by the manufacturer’s specifications. See Drawing SD-13 for a standard wet well configuration. It will be required that a drawing of the wet well, stilling well and all appurtenances be included in the improvement plans.

8. Testing: The entire installation shall be tested in the presence of a representative of the Department of Public Works and the appropriate irrigation district or other agency accepting storm water. Panel and circuits shall be tested for shorts and grounds with mains and disconnect from feeders. Each individual circuit shall be tested at the panel with all equipment connected for proper operation. The actual flow rates shall be measured for all phases of operation. The actual flow rates should be within 20% of the specified design flow rates.

9. Fencing: The entire pump station, including the electrical controls, shall be fenced in accordance with Section 10.04 of this manual. The electric meter shall be visible from outside the fence to eliminate the need for the utility company from entering the fenced area.

10. Access: A driveway serving the pump station shall be provided as discussed in Section 7.05 of these standards.

E. Stilling Well: A stilling well that detects whether or not a canal, lateral or creek is at capacity may be required. The elevation of the liquid level sensing device shall be set by the agency accepting the storm water or by the Department of Public Works when no such agency exists. See Drawing SD-14 for a standard stilling well configuration. The stilling well shall be drawn on the Improvement Plans.

F. Outlet Discharge Pipes: See Drawing SD-15 for standard pipe outlet discharge configurations.
5.08 Gravity Discharge:
Storm Detention Basins with a gravity discharge shall have a metered, interruptible outlet as shown in Drawing SD-16.

The maximum design discharge shall be in accordance with Section 4.02.C of the Storm Drainage Design Manual.

5.09 Water Quality Control:
As required by Chapter 9.53 of the Merced County Code, the treatment of storm water runoff is an important consideration in the design of storm drainage systems. Components that may be included in a storm drainage system to provide for treatment of runoff may include:

A. Trash Rack: An in-line trash rack in a separate sump must be included in the design of every new storm drainage system. The sump for the trash rack shall be 5 feet in diameter and constructed from precast reinforced concrete sections. The trash rack shall extend the full height of the sump and shall be completely removable. The trash rack shall either be constructed from stainless steel or hot-dipped galvanized steel. The maximum diameter solid capable of passing through the trash rack shall be 2”. The sump shall be placed in a location accessible for clean-out by a vacuum truck.

B. Baffle Boxes: There are various types of baffle boxes on the market designed to accomplish treatment of storm water. See Drawing SD-17 for a typical design that has been approved for use. Whenever a Baffle Box is being used, the separate in-line trash rack may be eliminated.

C. Hydrodynamic Separators: Hydrodynamic separators may be specified to provide pretreatment of storm water. Hydrodynamic separators are approved on a case-by-case basis. Whenever a Hydrodynamic separator is being used, the separate in-line trash rack may be eliminated.
NOTES:

1. FOUR INCHES (4") OF CLASS 2 AGGREGATE BASE SHALL BE PLACED BENEATH THE CONCRETE COMPACTED TO 95% RELATIVE COMPACTION.

2. PURSUANT TO SECTION 73 OF THE CALTRANS STANDARD SPECIFICATIONS, CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER CUBIC YARD.

3. SEE SECTION 5.02 FOR EXPANSION JOINT, WEAKENED PLANE JOINT, AND OTHER MISCELLANEOUS REQUIREMENTS.

4. A NON–PIGMENTED CURING COMPOUND SHALL BE APPLIED TO FRESHLY FINISHED CONCRETE IN ACCORDANCE WITH SECTION 90–7 OF THE CALTRANS STANDARD SPECIFICATIONS.
NOTES:

1. THE SPECIAL VERTICAL CURB SHALL BE USED AT INTERSECTION RADIi AND AT CATCH BASIN LOCATIONS.

2. A THREE FOOT (3') TRANSITION LENGTH SHALL BE USED BETWEEN ROLLED CURB AREAS AND THE SPECIAL VERTICAL CURB.

3. SEE DRAWING SD-01B FOR TRANSITION STANDARD FROM 6" VERTICAL CURB TO ROLLED CURB.

4. FOUR INCHES (4") OF CLASS 2 AGGREGATE BASE SHALL BE PLACED BENEATH THE CONCRETE COMPACTED TO 95% RELATIVE COMPACTION.

5. PURSUANT TO SECTION 73 OF THE CALTRANS STANDARD SPECIFICATIONS, CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER CUBIC YARD.

6. SEE SECTION 5.02 FOR EXPANSION JOINT, WEAKENED PLANE JOINT, AND OTHER MISCELLANEOUS REQUIREMENTS.

7. A NON–PIGMENTED CURING COMPOUND SHALL BE APPLIED TO FRESHLY FINISHED CONCRETE IN ACCORDANCE WITH SECTION 90–7 OF THE CALTRANS STANDARD SPECIFICATIONS.

8. AT PEDESTRIAN RAMPS, THE CROSS SLOPE OF THE GUTTER PAN SHALL BE ADJUSTED TO BE 5% MAXIMUM.
CURB TRANSITION DETAIL (VERTICAL TO ROLLED)

STANDARD 6" VERTICAL CURB AND GUTTER.

1/2" EXPANSION JOINT

1/2" EXPANSION JOINT

STANDARD 4 1/2" ROLLED CURB.

4'-0" TRANSITION

6" 1"

6" 24"

12"

18"

4 1/2"
NOTES:
1. A FULL-DEPTH EXPANSION JOINT SHALL BE PLACED AT THE BEGIN AND END OF THE RADIUS USING 1/2" THICK FELT EXPANSION MATERIAL.
2. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER YARD.
3. THE ENTIRE AREA SHALL HAVE A TRANSVERSE HEAVY BROOM FINISH.
NOTES:

1. ALL STORM DRAIN CATCH BASINS SHALL HAVE A STORM DRAIN MARKER INSTALLED PRIOR TO PROJECT COMPLETION. THE MARKER SHALL BE CENTERED ON THE CURB BEHIND THE CATCH BASIN.

2. THE STORM DRAIN MARKERS SHALL BE DAS MANUFACTURING STORM DRAIN MARKERS OR APPROVED EQUIVALENT. THE MARKER SHALL BE ITEM #NDF, 3" X 5 ¾" ROUND CORNERED RECTANGLES, "DON'T POLLUTE NO CONTAMINE! FLOWS TO WATERWAYS" EMBOSSED ON THE MARKER. THE MARKER SHALL BE ADHERED BY ADHESIVE OR EQUIVALENT
SOUTH BAY FOUNDRY, INC. 26x26 TRAFFIC GRATE BP, C21, C28 OR EQUIVALENT

BOTTOM OF DETENTION BASIN

GROUT IN PLACE
3/4 INCH HOT DIPPED GALVANIZED BAR ACROSS OPENINGS

INLET FROM STREET

CONCRETE BASE

REINFORCING STEEL IN WALLS, No.4 BARS AT 18"
CENTERS PLACED 1 1/2" CLEAR TO INSIDE OF BOX, REQUIRED WHEN H=8' OR MORE

SEC. B-B

SEC. A-A

MERCED COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

STORM DRAIN OUTLET TYPE 1

DRAWING SD-08

G:\MASTERS\STANDARDS\2009 Update\Chapter 5 - Storm Drainage Standards\SD-08.dwg

APPROVED: 2/24/2009
NOTES:
1. ALL BARS WELDED AT POINT OF CONTACT.
2. ALL STEEL USED IN CONSTRUCTION OF GRATE SHALL BE HOT-DIPPED GALVANIZED.
CATCH BASIN WITH CURB AND GUTTER

STORM DRAIN OUTLET TYPE 1

Type 36RX CATCH BASIN
SEE SECTION 5.07 FOR PUMP EFFICIENCY REQUIREMENT
NOTES:
1. PURPOSE OF BAFFLE BOX IS TO SEPARATE IMPURITIES AND CONTAMINANTS (TRASH, OIL, SEDIMENTS) FROM STORM WATER.
2. BAFFLE BOX IS TO BE FROM BIO CLEAN ENVIRONMENTAL SERVICES OR EQUIVALENT BAFFLE BOX.
3. ACTUAL DIMENSIONS TO BE DETERMINED IN CONSULTATION WITH MANUFACTURER.
### Construction Notes:

1. This standard applies to concrete pipes, RCP or PVC pipes being connected to an existing reinforced concrete structure with a concrete collar.

2. If removal of an existing structure or pipe is specified, removal shall be by saw cutting with the Merced County Engineer on site during saw cutting.

3. Prepare surface of existing structures by wire brushing, water blasting, or sand blasting as required by the Merced County Engineer.

4. Vibrate concrete in place.

5. Provide water tight joint.

6. Concrete shall be 3000 PSI @ 28 days or better and conform to Merced County Department of Public Works Standards and Specifications Detail 5.03.B.5.

7. Concrete pipe: shall be cleaned and treated with an approved concrete bonding agent prior to concrete placement as required by Merced County Engineer.

   PVC pipe: shall be rubbed around the outside with PVC solvent cement and sanded to roughen surface prior to concrete placement.

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**Merced County Department of Public Works Improvement Standards**

**Reinforced Concrete Collar**

**Drawing SD-18**
CHAPTER 6
Services and Utilities

6.01 Domestic Water Systems:
The Department of Public Works does not approve the design or maintain domestic water systems within the County of Merced. The criteria set forth in this section have been established to protect public facilities where domestic water systems are being proposed. If the local controlling water district has more stringent standards than set forth in this manual, their standards shall take precedence.

A. Approvals: Whenever creation of or connection to a public water system is proposed as part of an improvement project, the following signature blocks shall appear on the Title Sheet of the Improvement Plans:

1. The Domestic Water System improvements proposed in these plans meets or exceeds the standards of the (name of local water district) Water District. There is adequate capacity to serve the anticipated domestic water needs of the proposed development.

   __________________________
   (Water District Engineer)

2. The domestic water system proposed in these plans is in conformance with our requirements to provide adequate flow for fire suppression. Prior to acceptance, actual water flows shall be tested for adequacy.

   __________________________
   Merced County Fire Marshal

3. If a subdivision will have 200 or more connections to a domestic water system, a signature block shall be provided for the State of California as follows:

   __________________________
   State of California  
   Department of Health Services

The office responsible for approval by the State of California is the Drinking Water Field Operations Branch – Merced District, located at 1040 E Herndon Avenue, Suite 205, Fresno, CA 93720. The phone number is (559) 447-3132.

4. The aforementioned signature blocks shall be signed by the appropriate representative of the responsible agency prior to approval of the improvement plans by the Department of Public Works.

B. Fire Hydrants: The plans of the proposed water distribution systems including size and location of mains, type and location of hydrants, and size and capacity of storage tanks shall be subject to the approval of the Fire Department.

1. See Drawing SU-01

2. Hydrants shall be Waterous Pacer, Mueller Super Centurion A-423, M & H Style 129, American-Darling B-84-B-5 or approved equal.

3. Hydrants shall be dry barrel compression type with break flange construction.

4. Hydrants shall have a 5” minimum internal valve opening.

5. Hydrants shall have two N.S.T. 2-1/2 inch diameter nozzles and one N.S.T. 4-1/2 inch diameter nozzle.

6. Nozzle and control nuts shall be 1” minimum to 1-3/4” maximum and shall be pentagon shaped.

7. Hydrants shall turn on in a counter clockwise direction.

8. All hydrants shall face the street unless otherwise determined by the Fire Department.

9. Spacing of fire hydrants shall be started at corners wherever possible. The spacing of hydrants shall be as follows:
a. Residential Zones: 500 feet maximum with 250 feet maximum to the ends of dead end roads and cul-de-sacs.

b. Commercial and Industrial Zones: Spaced at the discretion of the Fire Department.

10. A Blue Pavement Marker shall be placed in the road adjacent to fire hydrant locations as shown in Drawing SU-01A.

C. **Blow-off Valves:**

1. See Drawing SU-02 and SU-02A.

2. Blow-off valves shall not be placed within the pavement, curb, gutter or sidewalk.

D. **Water Valves:** Water valves shall be placed at the direction of the water district. See Drawing SU-13 for a typical detail.

E. **Traffic Valve Box:** Traffic valve boxes shall be Christy G-5, Brooks 4-TT, or approved equal with a cast iron face and the cover marked “WATER”.

F. **Water Service Connections:**

1. See Drawing SU-03.

G. **Thrust Blocking:** Thrust blocking shall be in conformance with the pipe manufacturer’s specifications as well as the local water district’s requirements. See Drawing SU-14 for typical thrust block placement details.

H. **Allowable Pipes within Right-of-Way:**

1. See Chapter 9 for trench excavation and backfill requirements.

2. The minimum allowable water main diameter within Merced County road right-of-way shall be 6”.

3. **Water Main Material:**

   a. AWWA C-900, Class 150 P.V.C. pipe or AWWA C-905, Class 235 P.V.C. pipe with a minimum cover of 42 inches when using a Type B-2 backfill or 36 inches when using a Type B-1 backfill.

   b. In areas where the minimum cover cannot be achieved or where separation from sewer mains is critical, AWWA C-900, Class 200 P.V.C. pipe should be used. The minimum cover over Class 200 P.V.C. pipe shall be 24 inches when using a Type A backfill.

   c. Other pipes will be considered for approval on a case by case basis with appropriate supporting evidence.

4. **Service Connection Materials:**

   a. Type K copper pipe.

   b. Class 160 Polyethylene (C.T.S.) pipe.

   c. Native materials may be used in Winton and Delhi as backfill material for water service laterals. Other community service districts may have more stringent requirements.

5. **Miscellaneous Standards:** Wherever standards and specifications have not been established within this manual, it shall be the responsibility of the developer to comply with the standards and specifications of the responsible water district providing service.

I. **Easement Widths:** The minimum pipeline easement width for pipelines located outside Merced County road right-of-ways shall be 10 feet. Easement width shall be located all on one property.

6.02 **Sanitary Sewer System:**

The Department of Public Works does not approve the design or maintain sanitary sewer systems within the County of Merced. The criteria set forth in this section have been established to protect public facilities where sanitary sewer systems are being proposed. If the local controlling sewer district has higher standards than set forth in this section, their standards shall take precedence.

A. **Approvals:** Whenever a sanitary sewer system is proposed as part of an improvement project, the following signature blocks shall appear on the Title Sheet of the Improvement Plans:
1. The sanitary sewer system improvements proposed in these plans meets or exceeds the requirements of the \(\text{name of local sewer district}\) Sanitary Sewer District. The existing collection system and the sewer treatment plant has adequate capacity to serve the additional services shown in these plans.

(Sanitary Sewer District Engineer)

2. The aforementioned signature block shall be signed by the appropriate representative of the responsible agency prior to approval of the Improvement Plans by the Department of Public Works.

B. **Sewer Manholes:**

1. See Drawing SU-04 for normal installation (Type I Manhole).
2. See Drawings SU-10 and SU-11 for alternative Type II Manhole.
4. Manhole lid frame and cover (See Drawing SU-06) shall be raised to finish grade after the street has been paved.
5. All straight pipe shall be laid through manholes with the top half removed and rough broken edges mortared smooth.
6. All miscellaneous concrete shall have a minimum cement content of 463 pounds per cubic yard or better.
7. Sewer pipe sizes and materials shall be in conformance with the Improvement Plans.
8. See Drawing SU-05 for sewer drop manhole modifications.
9. Manhole spacing shall not exceed 500’ maximum.

C. **Clean-outs:**

1. See Drawing SU-07.
2. Frame and cover shall be South Bay Foundry B-12 for a 6” clean-out or South Bay Foundry B-11 for an 8” clean-out or approved equals.
3. Locate outside driveways wherever possible.

D. **Sewer Laterals:**

1. See Drawing SU-08.
2. Minimum residential sewer lateral pipe diameter shall be 4 inches.
3. In no case shall a lateral connect directly on top of the main or below the springline of the sewer main.
4. Sewer laterals shall have a minimum slope of 2% (1/4 inch per foot).
5. All joints for sewer lateral pipe shall be compression type.
6. A manhole shall be installed at the sewer main whenever a lateral exceeds 6” in diameter.
7. Laterals shall either be encased in concrete or class 50 ductile iron pipe shall be used whenever a 2 foot minimum cover cannot be achieved within the roadway right-of-way.
8. Sewer Laterals shall be placed at least 10 feet from water service connection laterals and other potable water sources.
9. Native materials compacted to 90% relative compaction may be used in Winton and Delhi as backfill material for sewer laterals. If Class II AB is used as trench backfill for sewer laterals, no compaction testing will be required. Other community service districts may have more stringent requirements.
E. Sewer Crossings:

1. Utility Crossing, Drawing SU-09. This detail shall be used whenever a new utility is installed or any construction occurs under an existing sewer main or lateral. Inside diameter of ductile iron or other approved pipe shall be the same as the pipe to which it connects.

2. Storm Drain Crossing, Drawing SU-09A. This detail should be used whenever a new storm drain crosses an existing sewer main or lateral.

3. Water Main Crossing, Drawing SU-09B. This detail should be used whenever a sewer crosses a water main.

F. Grease Interceptor, Sand and Oil Interceptor. See Drawings SU-15 and SU-16 for details of a typical Grease Interceptor and a Sand and Oil Interceptor. Installation of an interceptor may be required by the Sewer District or Division of Environmental Health. If required, the actual design of the interceptor must be approved by either the Sewer District and/or the Division of Environmental Health.

G. Allowable Pipes within Road Right-of-Way: Approved pipeline materials for sanitary sewers within County Road right-of-way are as follows:

1. ASTM D-3034, solid wall P.V.C. pipe with a maximum SDR of 35 and a minimum cover of 36 inches when using a Type A backfill. Class II AB may be used as a substitute for Class I Soils.

2. In areas where the minimum cover cannot be achieved or where separation from a water main is critical, AWWA C-900, Class 200 P.V.C. pipe shall be used. The minimum cover over Class 200 P.V.C. pipe shall be 24 inches when using a Type A backfill.

3. ASTM C-700, Extra Strength Vitrified Clay Pipe with a minimum cover based on Marston’s Formula and the manufacturer’s specifications.

4. AWWA C-151, Cement Mortar Lined Ductile Iron Pipe (D.I.P.) with a minimum cover based on Marston’s Formula and the manufacturer’s specifications.

5. Other pipes will be considered for approval on a case by case basis with appropriate supporting evidence.

Trench excavation and backfill for the above pipes shall be in conformance with Section 9 of this manual.

H. Easement Widths: The minimum easement width for pipelines located outside of County road right-of-way shall be 15 feet. Easement width shall be located all on one property.

6.03 Joint Utility Trenches and PUE’S:

Trenches for utilities such as gas, electricity, TV cable, telephone, streetlights, etc., shall be placed within the designated P.U.E.; All new P.U.E’s shall be 10 feet wide. A typical cross section showing the various utilities within the ditch shall be drawn on the As-Built plans. Locations of all newly installed utility lines shall be plotted on the As-Built plans.
6.04 Septic Systems & Wells:

A. Signature Blocks on Plans:

If a project includes either new on-site sewage disposal and wells or the destruction of existing wells and septic systems, the following signature blocks shall be included on the plans, as appropriate:

On Site Sewage & Well Approval

1. The on-site sewage disposal and domestic water well locations proposed on these plans meet the standards of the Merced County Health Department Division of Environmental Health.

2. Existing well and/or septic system destruction shown on Sheet(s) _____ is/are approved only through permit issuance from the Division of Environmental Health prior to destruction.

___________________________
Merced County Health Department
Division of Environmental Health

B. Septic System Monitoring:

In some locations, the formation of a County Service Area Zone of Benefit for monitoring septic systems is required. For more information on Zones of Benefit, refer to Section 8.02 of these Standards. If a Zone of Benefit is required for monitoring septic systems, similar documentation as described in Section 8.02 will be required.
TRAFFIC VALVE BOX
W/ CAST IRON FACE &
COVER MARKED "WATER."
CHRISTY G-5, BROOKS 4-TT
OR APPROVED EQUAL

PLUG DRAIN HOLE
8"Ø EXTENSION CHRISTY
C.I.P., SCHED. 40 P.V.C. OR
APPROVED EQUAL

6" BUTTERFLY
VALVE

CONCRETE
THRUST BLOCK

WATER
MAIN

12" SQUARE
FOOTING

4"

18"
18"

22"
22"

10"

6"

30"

3"

5" MIN.

18" 3"

5" MIN.

18"

STREET
CURB & GUTTER

SIDEWALK

PROPERTY LINE

CURB & GUTTER

SIDEWALK

DRIVEWAY

5"

3"

5" MIN.

TYPICAL LOCATIONS

MERCED COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

FIRE HYDRANT

DRAWING SU-01

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APPROVED: 2/24/2009
TWO LANE STREET

MULTI-LANE STREET

AN INTERSECTION

FOUR LANE STREET WITH TURN LANE
AT INTERSECTION

MULTI-LANE STREET
WITH TURN LANE

FREeways AND EXPRESSWAYS

= FIRE HYDRANT

= BLUE PAVEMENT MARKER

MERCEd COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

FIRE HYDRANT MARKER LOCATIONS

DRAWING SU-01A

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APPROVED: 2/24/2009
MARK CURB "W" AT LINE LOCATION

SIDEWALK

CHRISTY B-16 BOX WITH B-16C LID OR APPROVED EQUAL

2" GATE VALVE

3/4" CRUSHED ROCK

2" GALVANIZED IRON PIPE WITH 10 MIL WRAPPING TAPE

CAP TAPPED WITH 2" IRON PIPE THREADS

SET CONCRETE THRUST BLOCK AFTER WRAPPING ALL THREADS AND FITTINGS

30" MIN. COVER

12"

MERCE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

BLOW-OFF VALVE

DRAWING SU-02

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APPROVED: 2/24/2009
NOTES:
1. CONCRETE COLLAR REQUIRED REFER TO STD. SU-04 FOR INSTALLATION IN PAVED AREAS.
2. MANHOLE FRAME AND COVER SHALL BE SOUTH BAY FOUNDRY A-2 SERIES 24" DIA. MANHOLE ASSEMBLY OR APPROVED EQUAL.
RISER SHALL BE OF THE SAME SIZE MATERIAL AND SIZE AS THE MAIN.

RISER IS NOT TO BE EMBEDDED IN CONCRETE.

1/8 BEND WATER PIPE CLASS 250 CAST IRON FITTINGS OR V.C.P.X.

PROVIDE P.C.C. BEDDING MIN 6" UNDER 1/8 BEND AND UP TO SPRING LINE

NOTE: RISER IS NOT TO BE EMBEDDED IN CONCRETE.

4" MIN SAND BEDDING

3" MIN.

OAKUM

1 1/2 MIN.

PAVEMENT—TYP.
TYPICAL CROSSING OVER STORM SEWER

NOTE:
The above details are typical of main and sewer laterals when extra strength vitrified clay pipe materials are used.

TYPICAL CROSSING UNDER STORM SEWER

MERCED COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

SEWER CROSSING STORM DRAIN

DRAWING SU-09A

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APPROVED: 2/24/2009
NOTE:
Required whenever a Sanitary Sewer Main or Lateral crosses over a Water Main.

TYPICAL CROSSING OVER WATER MAIN

TYPICAL CROSSING UNDER WATER MAIN

MERCEDE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

SEWER CROSSING WATER MAIN

DRAWING SU-09B
Butyl rubber sealant shall be used between grade rings.

In unpaved areas (before backfilling) form and pour a 5 foot diameter Class "A" concrete collar concentric with concrete grade rings.

Butyl Rubber Sealant

Use Pre-fabricated Form Ring

Invert

No. 4 Rebar at 12" on center (both ways)

2 1/2" ±

Diameter of Base Block

Firm undisturbed soil

NOTES:

1. Install butyl rubber sealant between each joint of the cone and barrel sections to make a water tight joint. After joint is made, trim sealant smooth on the inside of manhole.
Butyl rubber sealant shall be used between grade rings.

In unpaved areas (before backfilling) form and pour a 5 foot diameter Class "A" concrete collar concentric with concrete grade rings.

Butyl Rubber Sealant

Remove top half of pipe through manhole

Channel as directed by District

45°

Direction of flow

Notes:
1. Install butyl rubber sealant between each joint of the cone and barrel sections to make a water tight joint. After joint is made, trim sealant smooth on the inside of manhole.

2. If distance from manhole rim to first step in pre-cast section is greater than 2'0", then standard step (shown dashed above) shall be installed by contractor in field. All other steps shall be installed in pre-cast sections by manufacturer and spaced 10"-15" apart.

3. Pre-cast sections shall be installed so that steps are aligned vertically and as shown in the plan section.

4. If distance from manhole rim to top of base block is less than 4'0", order pre-cast sections without steps.
NOTES:

1. Manhole Frame and Cover shall be as manufactured by Long Beach Iron Works X-144 or approved equal.

2. Cast Iron Frame and Cover shall be non-rocking.

3. Minor modifications in above dimensions and configurations are permissible subject to District approval.
Set to finish grade

6" Concrete Collar

Brick Footing

Loop to be provided in all risers

Gate Valve AWWA C509

P.V.C. Riser 6" dia min schedule 40 wall thickness min

#12 Tracer Wire must make conductive contact with all fittings

Strip tracer wire to bare wire at all metal fittings and make at least two turns

Traffic Valve Box Christy GS or Brooks 4-TT
NOTES:
1. Dimensions shown are for minimum size (800 gallon) interceptor.
2. Each unit shall be designed by a registered Civil Engineer and approved by the District Engineer if a larger size is required.
3. Concrete shall be minimum 3000 PSI at 28 days.
4. A sampling compartment will be required as directed by the District Engineer.
5. Covers shall be steel and shall be gas tight.
6. All waste shall enter interceptor through the inlet pipe only.
7. Reinforcement shall be adequate for traffic conditions in area where interceptor is located.
8. Provide 4" elevation drop between inlet and outlet pipes. Show pipe invert elevations at inlet and outlet on plan.
NOTES:

1. Dimensions shown are for minimum size (800 gallon) interceptor.

2. Each unit shall be designed by a registered Civil Engineer and approved by the District Engineer if a larger size is required.

3. Concrete shall be minimum 3000 PSI at 28 days.

4. A sampling compartment will be required as directed by the District Engineer.

5. Covers shall be steel and shall be gas tight.

6. All waste shall enter interceptor through the inlet pipe only.

7. Reinforcement shall be adequate for traffic conditions in area where interceptor is located.

8. Provide 4" elevation drop between inlet and outlet pipes. Show pipe invert elevations at inlet and outlet on plan.

CHAPTER 7
Driveways

7.01 Allowable Driveway Locations:

All new vehicular access points (driveways) onto a County maintained roadway must be approved by the Road Division of the Department of Public Works. The approval shall be either in the form of an encroachment permit or an approved set of Improvement Plans. In order to preserve the functional utility of roadways within the County of Merced, the following restrictions for new driveway placement shall be followed:

A. Driveways on Major Roadways: The placement of new driveways onto County roadways that functionally serve as collectors or arterials will be controlled as follows. These controls have been established to assist in maintaining the functional utility of roadways determined to be important in the overall circulation of traffic.

1. Minor Collector Roadways: The location and number of driveways that front on a minor collector roadway will be subject to the same requirements as a local roadway. However, the minimum width of driveways fronting on a minor collector shall be in conformance with Sections 7.02 and 7.03 of this manual.

2. Major Collector Roadways: The number of driveways that front on a major collector roadway shall not exceed one driveway per every 150 feet of roadway. Circular driveways will be allowed on a case-by-case basis.

3. Minor Arterial Roadways: The number of driveways that front on a minor arterial roadway shall not exceed one driveway per every 500 feet of roadway. Residential developments will not be allowed to front on minor arterial roadways.

4. Principal Arterial Roadways and Expressways: No private driveways will be allowed to front of principle arterial roadways and expressways.

B. Circular Driveways: The minimum distance between the interior edges of a circular driveway shall be 25 feet.

C. Driveways on Corner Lots:

1. A corner lot should only have access to the lowest order roadway on which it fronts. Thus, a corner lot that fronts on both a local roadway and a minor collector should only have access to the local roadway.

2. In order to decrease potential turning movement conflicts, driveways serving corner lots shall be placed as far as possible away from the County maintained roadway intersection. Thus, the minimum separation from the nearest edge of a driveway to the end of the intersection curb return shall be as follows:

   a. Driveways serving an R-1 5000 zoned parcel shall have a minimum separation of 5 feet.

   b. Driveways serving all other residential parcels shall have a minimum separation of 10 feet.

   c. The minimum separation for driveways serving commercial, manufacturing, or industrial zoned parcels shall be determined, with the same guidelines in mind, but on a case-by-case basis.

7.02 Driveways on Roadways with Vertical Curb and Gutter:

A. General Design Details:

1. See Drawings DW-01 and DW-01A for typical driveway plans.

2. Driveways shall be perpendicular to the roadway.

3. Sight distance shall be in conformance with the Visibility Ordinance.

4. Concrete shall have a minimum cement content of 463 pounds per cubic yard and shall be treated with a curing compound.
5. Driveways slab shall be 6 inches thick.

6. The driveway shall be placed over four inches (4”) of Class 2 Aggregate Base compacted to 95% relative compaction.

7. Expansion joints shall be one half inch (½”) thick felt and shall extend the full depth of the concrete.

B. Residential Driveways serving less than three (3) units:

1. The minimum width of a driveway fronting on a local roadway shall be 14 feet.

2. The minimum width of a driveway fronting on a collector or minor arterial roadway shall be 18 feet.

3. The maximum driveway width should be 30 feet.

4. The driveway slab shall be placed over four (4”) inches of Class 2 Aggregate Base.

C. Residential Driveways serving three (3) or more units:

1. The minimum width of a driveway fronting on a local roadway shall be 20 feet.

2. The minimum width of a driveway fronting on a collector or minor arterial roadway shall be 24 feet.

3. The maximum driveway width should be 30 feet.

4. The driveway shall have 6” x 6” 10/10 welded wire mesh suspended at the center of the slab. During the pour, the wire mesh shall be supported at three (3’) foot interval, on center.

5. Slab shall be placed over four (4”) inches of Class 2 Aggregate Base.

D. Type 1 Commercial-Manufacturing-Industrial Driveways: This driveway may be used for projects that are projected to generate very small amounts of passenger vehicle traffic and no heavy truck traffic.

1. The minimum driveway width shall be 22 feet.

2. The maximum driveway width should be 35 feet.

3. The driveway shall have 6” x 6” 10/10 welded wire mesh suspended at the center of the slab. During the pour, the wire mesh shall be supported at three (3’) foot interval, on center.

4. Slab shall be placed over four (4”) inches of Class 2 Aggregate Base.

E. Type 2 Commercial-Manufacturing-Industrial Driveways: This driveway shall be used for projects that are projected to generate either moderate amounts of passenger vehicle traffic or any heavy truck traffic. This driveway shall be subject to the same requirements as the Type 1 Driveway, except the welded wire mesh shall be substituted with No. 4 rebar placed at twelve (12”) inches on center each way.

F. Type 3 Commercial-Manufacturing-Industrial Driveways: This driveway may be required or may be approved by the Department of Public Works for projects that are projected to generate large amounts of heavy loading traffic.

1. See Drawing SD-02 for a plan view of the Standard Valley Gutter. This standard shall be used for the Type 3 Driveway.

2. Pavement structural section shall be determined from Section 4.02.B of this manual.

G. Opening Driveways through Existing Curb and Gutter:

1. All newly installed driveways through existing curb and gutter shall be built in accordance with Drawing DW-01.

2. Existing curb, gutter and sidewalk shall be sawcut and removed as shown in Drawing DW-02.

3. If the new curb, driveway and sidewalk are to be poured as one unit, a score mark shall be placed at the back of the curb line and one half (½”) inch thick expansion joint shall be placed at the back edge of the sidewalk.

H. Closing an Existing Driveway:

1. The entire driveway section and gutter shall be removed and replaced.
2. New curb and gutter shall be installed in accordance with Section 5.02.

3. The sidewalk shall be replaced if it has been depressed as part of the driveway. If the curb, gutter and sidewalk are to be poured as one unit, a score mark shall be placed at the back of the curb line.

7.03 Driveways on Roadways with Rolled Curb and Gutter:

Driveways on roadways with rolled curb and gutter shall conform to the same width and spacing requirements as stated in Sections 7.02.A & B.

A. Driveway shall be placed immediately behind the sidewalk (It is assumed that sidewalk in rolled curb areas is located immediately adjacent to the rolled curb and the sidewalk is 6 inches thick). If sidewalk is less than 6 inches thick, the sidewalk through the driveway area shall be removed and replaced with a 6 inch thick concrete section.

B. Driveways serving 3 or more residential units or non-residential units shall be constructed pursuant to Section 7.02, as-if the vertical curb was in-place. Generally, rolled curb should not be used in non-residential areas or areas serving lots with multiple residential units.

7.04 Driveways on Roadways with Roadside Ditches:

A. General Design Details:

1. See Drawing DW-03, DW-04 and DW-04A.

2. Driveways shall be perpendicular to the roadway.

3. Sight distance at private driveways is sometimes very difficult to achieve. Sight distance at driveways is the responsibility of the individual property owner and must conform to the Merced County Visibility Ordinance (Section 13.24.030.C of the Merced County Code).

4. Storm drainage flow shall be maintained along the road frontage with either a twelve (12”) inch minimum diameter cross pipe or a swale in the driveway. The required pipe size may be greater than twelve (12”) inches to allow for adequate water flow capacity. If a cross pipe is utilized, the bottom of the cross pipe shall be set below the flowline of the ditch by 1/3 the pipe diameter.

5. The type of pipe used for a cross pipe shall be dictated by the type of traffic utilizing the driveway. In most cases, 16 gage corrugated steel pipe will be adequate. However, a driveway subject to very heavy traffic should utilize reinforced concrete pipe.

6. The required structural sections for new driveways shall be as follows:

a. New driveways accessing an existing native soil (dirt) roadway will require no special structural section.

b. New driveways accessing an existing gravel roadway shall be constructed with a minimum of four inches (4”) of Class 2 Aggregate Base.

c. New driveways serving an A-1 or A-2 zoned property accessing an existing paved roadway may be constructed with either concrete or A.C.

d. New driveways serving a residential zoned property accessing an existing paved roadway shall be constructed with concrete or A.C.

7. Structural Section Specifications: The required structural section shall be constructed, at a minimum, from the existing edge of pavement to the property line.

a. A.C. Driveways (See Drawing DW-04): Shall be constructed with 0.2 feet of A.C. over four inches (4”) of Class 2 aggregate base compacted to 95% relative compaction.

b. Concrete Driveways (See Drawing DW-04A): Shall be constructed with a minimum 6” thickness of concrete with a minimum cement content of 463 pounds per cubic yard. Concrete slab
shall be placed over four (4”) inches of Class 2 Aggregate Base compacted to 95% relative compaction. Residential driveways shall be reinforced with 6” x 6” 10/10 welded wire mesh. Agricultural driveways shall be reinforced with No. 4 rebar placed at twelve inch (12”) on-center each direction.

B. Residential Driveways:
1. The minimum width of a residential driveway fronting on a local roadway shall be 14 feet.
2. The minimum width of a residential driveway fronting on a collector roadway shall be 18 feet.
3. The maximum residential driveway width should be 30 feet.

C. Agricultural Driveways:
1. The minimum width of an agricultural driveway fronting on a local roadway shall be 20 feet.
2. The minimum width of an agriculture driveway fronting on a minor collector shall be 24 feet.
3. The maximum agricultural driveway width should be 35 feet.

7.05 Driveways for Storm Drainage Basins:
A driveway approach shall be provided for all new storm drainage basins. If the storm drainage basin includes a pump station, the driveway shall extend the entire length from the edge of the roadway to the pump station. If the driveway is fenced, the driveway shall extend the entire length from the edge of pavement to the gate.

A. The minimum driveway width shall be 12’ wide.
B. Driveways providing access to a pump station shall be constructed from concrete from the edge of the roadway to the pump station.

C. In areas with vertical curb and gutter, a standard curb cut and concrete driveway approach shall be provided.
D. In areas with rolled curb and gutter, a concrete driveway shall be provided.
E. In areas with no curb and gutter, a rural driveway approach shall be provided.

7.06 RRC Private Roadways (Joint Driveways):
In Rural Residential Centers, private roadways (joint driveways) may be approved for infill minor subdivision projects serving four (4) or fewer one-acre residential lots.

A. See Drawings DW-05, 05A, 05B, and 05C for details.
B. Storm drainage for projects developed with RRC Private Roadways shall remain on the project site and not be directed towards the County maintained roadway or an adjoining property.
C. The minimum pavement width for an RRC Private Roadway shall be 16 feet. A 2 foot wide AB shoulder shall be placed on both sides of the RRC Private Roadway.
D. A 10 foot wide Public Utility Easement shall be provided along at least one side of the RRC Private Roadway.
E. RRC Private Roadways will not be maintained by the County.
F. A County standard streetlight shall be placed at or near the intersection of the RRC Private Roadway and the County maintained roadway.
NOTES:

1. SIDEWALK SHALL BE DEPRESSED THROUGH DRIVEWAY AS SHOWN TO CONFORM TO ADA REQUIREMENTS.
2. CROSS SLOPE OF SIDEWALK SHALL BE 1.5% THROUGHOUT DRIVEWAY TRANSITION AND DRIVEWAY AREA.
3. SEE SECTION 7.02 FOR ADDITIONAL DRIVEWAY SPECIFICATIONS.
4. SEE SECTION 10.05 FOR ADDITIONAL SIDEWALK SPECIFICATIONS.
5. A 1" DEEP WEAKENED PLANE JOINT (CONTROL JOINT) SHALL BE PLACED ON EACH SIDE AND AT THE CENTER OF THE DRIVEWAY.
6. DRIVEWAY TO BE BORDERED AT SIDEWALK WITH A 12" WIDE BORDER OF 1/4" GROOVES SPACED APPROXIMATELY 3/4" ON CENTER. SEE BORDER GROOVING DETAIL.
NOTES:
1. SIDEWALK CROSS SLOPE SHALL BE MAINTAINED AT 1.5% THROUGH DRIVEWAY.
2. SEE DRAWING SD-01 FOR DRIVEWAY DETAILS THROUGH CURB.
NOTES:
1. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER CUBIC YARD.
2. CONCRETE SLAB TO BE FORMED WITH DRAINAGE SWALES AS SHOWN ON DRAWING DW-03.
3. RESIDENTIAL DRIVEWAY TO BE REINFORCED WITH 6" x 6" 10/10 WELDED WIRE MESH.
4. AGRICULTURAL DRIVEWAY TO BE REINFORCED WITH NO. 4 REBAR PLACED AT TWELVE (12") ON-CENTER EACH DIRECTION.
NOTES:

1. ALL UTILITIES SHALL BE PLACED UNDERGROUND IN PUBLIC UTILITIES EASEMENT (P.U.E.).

2. STORM DRAINAGE RUNOFF SHALL BE MANAGED (RETAINED) ON EACH SEPARATE PARCEL.

3. THIS STANDARD IS INTENDED TO BE USED FOR ACCESS TO FOUR OR FEWER PARCELS IN A RURAL RESIDENTIAL CENTER AS PERMITTED BY POLICY 12 OF THE CIRCULATION CHAPTER OF THE GENERAL PLAN.

4. SEE DW-05A AND DW-05B FOR TURNAROUND STANDARD.

5. STRUCTURAL SECTION:
   - SANDY SOIL AREAS
     0.2' AC OVER 0.35' AB
   - CLAY SOIL AREAS
     0.2' AC OVER 0.5' AB

6. PRIVATE ROADWAYS WILL NOT BE MAINTAINED BY COUNTY.
NOTES:
1. NAME TO BE DETERMINED BY DEVELOPER.
2. LN (LANE) DESIGNATION IS REQUIRED.
3. SEE MS–10 STREET NAME STANDARD FOR CONSTRUCTION DETAILS.
4. SIGNS WILL NOT BE INSTALLED OR MAINTAINED BY COUNTY.
8.01 General Specifications:
Continuous roadway lighting is required to be installed by developers along existing roadways and along all newly constructed roadways in residential, commercial, and industrial zoned areas. Due to advances in LED technology, the use of High Pressure Sodium (HPS) streetlight luminaires is no longer desired. All newly installed streetlights shall use LED luminaires.

The illumination to be provided along County roadways is intended to conform to recommendations included in the following publications:

The following tables summarize the recommended illumination levels:

### Arterial Roadways

<table>
<thead>
<tr>
<th>Area Type</th>
<th>Average Illuminance (footcandles)</th>
<th>Uniformity Ratio (Ave/Min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>1.7 fc</td>
<td>3 to 1</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1.3 fc</td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>0.9 fc</td>
<td></td>
</tr>
</tbody>
</table>

### Collector Roadways

<table>
<thead>
<tr>
<th>Area Type</th>
<th>Average Illuminance (footcandles)</th>
<th>Uniformity Ratio (Ave/Min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>1.2 fc</td>
<td>4 to 1</td>
</tr>
<tr>
<td>Intermediate</td>
<td>0.9 fc</td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>0.6 fc</td>
<td></td>
</tr>
</tbody>
</table>

### Local Roadways

<table>
<thead>
<tr>
<th>Area Type</th>
<th>Average Illuminance (footcandles)</th>
<th>Uniformity Ratio (Ave/Min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>0.9 fc</td>
<td>6 to 1</td>
</tr>
<tr>
<td>Intermediate</td>
<td>0.7 fc</td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>0.4 fc</td>
<td></td>
</tr>
</tbody>
</table>

8.02 Maintenance Zone of Benefit:
A. The Developer is required to provide all documentation and pay all fees associated with either the formation of a new streetlighting maintenance zone of benefit or the annexation of the project to an existing streetlighting maintenance zone of benefit.

B. Fees are calculated by the Department of Public Works.

C. Required documentation is as follows:
1. A legal description of the project boundaries prepared by a licensed Land Surveyor with original stamp and signature. This description shall extend to the centerline of abutting roadways and shall include the total acreage within the boundary.

2. An 8½” x 11” exhibit map of the project boundaries prepared by a licensed Land Surveyor with original stamp and signature. This map shall show the metes and bounds as described in the legal description, interior and exterior streets with names, lot numbers, street light locations and County assigned numbers.

3. A petition signed by all the current owners of the project property requesting either the formation or annexation of the lighting maintenance zone of benefit. The wording on the petition shall be as follows:
   a. **Formation of a Zone:**

   **Honorable Board of Supervisors:**

   We, as owners of the attached described property, hereby request the formation of Streetlighting Maintenance Zone of Benefit No. _____ to be part of County Service Area Number One.

   We understand that the purpose of the Maintenance Zone is to provide for the collection of user charges to operate and maintain Streetlighting improvements as part of the improvement requirements...
for the (Name and Type of Development and County Assigned Number).

Upon creation of a County Service Zone, we understand that we will be responsible for operation costs, on a prorate share, of the streetlighting system upon land that we own until such time as sufficient user fees are collected. Fees are to be divided on a land ownership basis.

______________________     ________
Signed       Date

b. Annexation to an Existing Zone:

Honorable Board of Supervisors:

We, as owners, hereby request the annexation of the attached described property to the existing Streetlighting Maintenance Zone of Benefit No. _____ which is a part of County Service Area Number One.

We understand that the purpose of the Maintenance Zone is to provide for the collection of user charges to operate and maintain streetlighting improvements as part of the improvement requirements for the (Name and Type of Development and county Assigned Number).

Upon annexation to a County Service Zone, we understand that we will be responsible for operation costs, on a prorate share, of the streetlighting system upon land that we own until such time as sufficient user fees are collected. Fees are to be divided on a land ownership basis.

______________________     ________
Signed       Date

4. Locations of all streetlights and County Assigned streetlight numbers shall be shown on the Improvement Plans.

8.03 Design Geometries:

The required luminaire wattages, mounting heights and luminaire spacing determined to be necessary to provide recommended illumination are as follows:

A. General:

1. See Drawing SL-01 for typical streetlighting installations.

2. A Streetlight will be required at all intersections and within cul-de-sac bulbs with the maximum spacings as shown in Drawing SL-02.

B. Local Roadways in AR, R1, R2, R3, and R4 Zoned Areas:

1. LED luminaire conforming to the following nominal specifications (or equivalent LED luminaire):

   a. Minimum Light Output: 4,430 initial delivered lumens.

   b. Light Distribution: Type II, Cutoff

   c. Color Temperature: 4000 ± 275K

   d. Drive Current: 525 mA

   e. Voltage: 120 VAC or 240 VAC in conformance with the requirements of the local utility.

   f. Power Factor: 0.90

   g. Number of LEDs: 30

   h. PE Cell Receptacle: 3-prong twist-lock able to rotate so that PE window can be positioned to face North. A photocell shall be provided with each luminaire.

   i. Housing: Primarily constructed of metal, powder coated silver/gray in color, rust resistant with stainless steel hardware.

   j. Lumen Depreciation: LED modules shall deliver at least 70% of initial lumens when installed for a minimum of 50,000 hours.

   k. Warranty: Five (5) year minimum full replacement.

2. 30 foot mounting height.

3. 225 foot optimum staggered spacing as shown in Drawing SL-02. The actual design spacing may vary from the optimum by a maximum of plus or minus 25 feet.
4. 8 foot arm length if the sidewalk is adjacent to curb and gutter, 4 foot arm length if the sidewalk is separate from the curb and gutter, and 10 foot minimum arm length in AR zoned areas with no curb and gutter. See Drawing SL-01.

C. Collector Roadways in AR, R1, R2, R3, and R4 Zoned Areas:

1. LED luminaire conforming to the following nominal specifications (or equivalent LED luminaire):
   a. Minimum Light Output: 5,920 initial delivered lumens.
   b. Light Distribution: Type II, Cutoff
   c. Color Temperature: 4000 ± 275K
   d. Drive Current: 525 mA
   e. Voltage: 120 VAC or 240 VAC in conformance with the requirements of the local utility.
   f. Power Factor: 0.90
   g. Number of LEDs: 40 minimum
   h. PE Cell Receptacle: 3-prong twist-lock able to rotate so that PE window can be positioned to face North. A photocell shall be provided with each luminaire.
   i. Housing: Primarily constructed of metal, powder coated silver/gray in color, rust resistant with stainless steel hardware.
   j. Lumen Depreciation: LED modules shall deliver at least 70% of initial lumens when installed for a minimum of 50,000 hours.
   k. Warranty: Five (5) year minimum full replacement.

2. 30 foot mounting height.

3. 225 foot optimum staggered spacing as shown in Drawing SL-02. The actual design spacing may vary from the optimum by a maximum of plus or minus 25 feet.

4. 8 foot arm length if the sidewalk is adjacent to curb and gutter, 4 foot arm length if the sidewalk is separate from the curb and gutter. See Drawing SL-01.

D. Local Roadways in Commercial Zoned Areas:

1. LED luminaire conforming to the following nominal specifications (or equivalent LED luminaire):
   a. Minimum Light Output: 8,760 initial delivered lumens.
   b. Light Distribution: Type II, Cutoff
   c. Color Temperature: 4000 ± 275K
   d. Drive Current: 525 mA
   e. Voltage: 120 VAC or 240 VAC in conformance with the requirements of the local utility.
   f. Power Factor: 0.90
   g. Number of LEDs: 60 minimum
   h. PE Cell Receptacle: 3-prong twist-lock able to rotate so that PE window can be positioned to face North. A photocell shall be provided with each luminaire.
   i. Housing: Primarily constructed of metal, powder coated silver/gray in color, rust resistant with stainless steel hardware.
   j. Lumen Depreciation: LED modules shall deliver at least 70% of initial lumens when installed for a minimum of 50,000 hours.
   k. Warranty: Five (5) year minimum full replacement.

2. 30 foot mounting height.

3. 195 foot optimum staggered spacing as shown in Drawing SL-02. The actual design spacing may vary from the optimum by a maximum of plus or minus 25 feet.

4. 8 foot arm length if the sidewalk is adjacent to curb and gutter, 4 foot arm length if the sidewalk is separate from the curb and gutter. See Drawing SL-01.
E. **Other Roadway Classifications with Various Zoning:**

The design engineer shall submit proposed design to conform to the illumination levels recommended in Section 8.01 of this Chapter.

8.04 **Luminaire Accepted Manufacturers:**

Due to the rapidly changing marketplace for LED luminaires, the following list is likely to change. Alternative manufacturers will be considered on a case-by-case basis. Please contact the Department of Public Works for updates.

Luminaire may be manufactured by any one of the following:

1. American Electric Lighting Autobahn Series:
   a. Model ATB0
   b. Model ATB1
2. Cree LEDway:
   a. Model STR-LWY, IP66 Series

8.05 **Pole Specifications:**

A. Pole and arm shall be either Aluminum or Hot Dipped Galvanized Steel. Minimum wind design load shall be 25 psf.

B. A 3” x 5” minimum hand hole will cover shall be provided.

C. A full base cover shall be provided.

D. Light poles shall be set a minimum of 3 feet from property corner markers.

E. Poles shall be marked with the County assigned number by the Developer’s Contractor.
   1. See Drawing SL-03.
   2. The Improvement Plans shall include a block by each streetlight location for insertion of the County assigned number.
   3. County assigned number shall be placed on the street side of the streetlight pole, 9 feet above the base. Numbers shall be 2-1/2 inches in height and shall be black enamel transfers or stenciled figures.

8.06 **Foundation Specifications:**

A. Foundations for poles shall be in accordance with Drawing SL-03. Caution should be exercised when placing poles near underground pipelines. The minimum clearance between a pole foundation and any underground pipeline shall be one foot.

B. The minimum foundation depth shall be 5 feet.

C. The minimum foundation width or diameter shall be 2 feet. If the arm length is greater than 8 feet, the minimum foundation width shall be increased to 2-1/2 feet.

D. Anchor bolts shall be 1” Diameter High Strength Steel and shall be 36” long with a 4” tail. If the pole height is greater than 30’, the anchor bolt diameter shall be increased to 1-1/4” minimum.

8.07 **Wiring Specifications:**

A. Electric service shall be 120 or 240 volt, to be consistent with the appropriate lighting maintenance zone of benefit and the requirements of the local utility.

B. All circuits shall be underground using either No. 6 Aluminum or No. 8 copper THN-TW conductors in 1 inch minimum, schedule 40 P.V.C., to secondary splice box.

C. Electrical connections shall be made in accordance with the requirements stated in either the T.I.D. SL-1 schedule or the PG&E. LS-2A schedule, whichever is appropriate.

D. Fuses shall be waterproof in-line and shall be accessible from the required handhole.

E. Minimum cover for all conduit shall be 36 inches.

F. Contractor shall furnish the County with a marked-up drawing showing proposed conduit runs and pull box locations at the time of the prejob conference. Final locations shall be included by the Design Engineer in the As-Built Drawings.
8.08 Pull Box Specifications:

A. Pull boxes for streetlighting shall conform to the Traffic Rated Pull Box with galvanized frame and steel plate cover as shown in Caltrans Standard Plans, regardless of their location.

B. Cover shall be marked as indicated in the Caltrans Standard Plans.

C. Non-traffic rated pull boxes are not allowed in any circumstance due to issues with theft of copper wire and the ease of gaining entry to non-traffic rated pull boxes.

D. After installation, the County will replace the standard hold-down bolts with proprietary-keyed bolts.
# Optimum Luminaire Spacings

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Optimum Staggered Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR, R1, R2, R3, R4 Zones Local Roadway</td>
<td>A: 30', B: 225' ± 25', C: 125' ± 25'</td>
</tr>
<tr>
<td>AR, R1, R2, R3, R4 Zones Collector Roadway</td>
<td></td>
</tr>
<tr>
<td>Commercial Zones Local Roadway</td>
<td></td>
</tr>
</tbody>
</table>
NOTES:

1. WIDTH (OR DIAMETER) OF FOUNDATION TO BE 2' IF ARM LENGTH IS 8 FEET OR LESS. WIDTH (OR DIAMETER) TO BE 2 1/2" MINIMUM OF ARM LENGTH IS GREATER THAN 8 FEET.

2. ANCHOR BOLT TO BE 1" DIAMETER HIGH STRENGTH STEEL, 36" LONG WITH 4" TAIL. DIAMETER TO BE INCREASED TO 1-1/4" IF POLE HEIGHT IS GREATER THAN 30'.


CHAPTER 9
Earthwork

9.01 General Requirements:
A. Earthwork: Refer to Section 19 of the Caltrans Standard Specifications for information on earthwork not covered in this chapter.
B. Pipe Placement:
   1. See Chapter 5 for additional requirements for storm drainage pipe.
   2. See Chapter 6 for additional requirements for sewer and water pipe.
   3. All pipes shall be bedded true to the line and grade as shown in the approved improvement plans.
   4. Blocking shall not be used to bring pipe up to grade.
   5. Pipe shall not bear on bells or joints. The trench shall be excavated to provide at least 1½ inches of bedding material below the bell.
   6. The pipe bedding and backfill as specified in these standards shall be followed for all pipes placed within the Merced County Road right of way as well as for all pipes that are to be relinquished to the public for maintenance.

9.02 Backfill Types:
See Drawing EW-01 for a typical backfill cross-section. Under stable trench conditions (see Section 9.03.F), the following backfill types shall be used within the embedment zone as required by the general specifications of the pipe type selected for use. See Table EW-1, “Embedment Materials”, for a description of the soil classes referenced below. The description Class I soils has been significantly modified; the use of clean manufactured angular material is no longer permitted due to “piping” problems that may occur in the embedment zone leading to failure of the intermediate and final backfill.

A. Type A Backfill:
   Type A backfill shall consist of Class I soils throughout the entire embedment zone.
B. Type B-1 Backfill:
   Type B-1 backfill shall consist of:
   1. Class I soils within the bedding and haunching zones.
   2. Class III or better soils within the initial backfill zone.
C. Type B-2 Backfill:
   Type B-2 backfill shall consist of Class III or better soils within the entire embedment zone.
D. Type C Backfill:
   Type C backfill shall consist of:
   1. Class I soils within the bedding and haunching zones.
   2. Class IV or better soils within the initial backfill zone.
E. Type D Backfill:
   Type D backfill shall consist of native soils through the entire embedment zone.

9.03 Trench Construction:
A. The Developer and his contractor shall be responsible for expediting all trench and pipe work performed on County roads. Trenches within existing County road right of way will not be allowed to remain open over night. Work shall be scheduled so that trenching does not exceed the expected work for the day. If work is not completed at the end of the day, the trench shall be backfilled and re-dug the following scheduled workday. Immediately after the pipes have been place and inspected by the acquiring agency, the trench shall be backfilled in accordance with this standard.
B. The extracts from the Construction Safety Orders issued by the California Division of
Occupational Safety & Health dealing with “Excavation and Trenches” shall be strictly adhered to (Section 6705, Labor Code).

C. When the project requires the construction of a trench or other excavation, which will be 5 feet or more in depth, a special permit required by the California Labor Code, Section 6500 must be obtained from the Division of Occupational Safety and Health prior to commencing work. A copy of this permit and a shoring detail shall be submitted prior to any required pre-job conference or prior to approval of an encroachment permit.

D. Over Excavation. During the course of construction, should the trench be inadvertently over-excavated from 6 to 12 inches below the bottom of the pipe, that area shall be filled with the same class of bedding material required for the pipe installation and compacted to a minimum of 90 percent relative density. Any area over-excavated more than 12 inches below the bottom of the pipe shall be filled with Class I soils and compacted to a minimum of 90 percent relative density.

E. Control of Water. When water is encountered, either ground water or surface runoff, the Contractor shall furnish, install, maintain and operate all necessary machinery and equipment to keep the excavation free from water until the placing of bedding material, laying and joining of pipe, and initial backfill has been completed and inspected and until all danger of flotation and other damage is removed.

F. Stable Trench. A trench is considered to be stable if the results of penetration resistance test (ASTM D-1586-99) in the bedding zone are equal to or less than 8 blows per foot.

1. Foundation. A foundation of Class I soils shall be placed under a pipe within an unstable trench area to a thickness as recommended in writing by a soils engineer.

2. Embedment Material. Class I embedment material shall be placed throughout the entire embedment zone of the pipe when in an unstable trench area.

3. PVC or HDPE pipe shall not be used in unstable trench areas.

H. Backfill material shall be placed in uniform, horizontal layers that shall not exceed 0.67 feet in thickness before compaction.

I. Ponding or jetting will be allowed for use as a compaction technique only within the intermediate backfill and only when the native soil is Class III or better. Ponding or jetting will not be allowed for use under any circumstances within the embedment zone or the final backfill.

J. Whenever the trench is within the Merced County road bed, final and intermediate backfill must be clean native or other approved soils. Final backfill shall be compacted to 95% relative compaction and intermediate backfill shall be compacted to 90% relative compaction.

K. Final and intermediate backfill in trenches outside of the Merced County roadbed shall be compacted to 85% relative compaction.

9.04 Inspection and Testing

The developer is responsible for retaining a soils testing firm to conduct compaction tests on all trench work. The number and location of compaction tests shall be determined by Merced County.

Any excavation and backfill constructed without testing by a soils testing firm and inspection by Merced County staff shall be uncovered for examination and properly restored at the developer’s expense.
### Table EW-1
Embedment Materials

<table>
<thead>
<tr>
<th>Soil Class</th>
<th>Soil Type</th>
<th>Description of Material Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I Soils**</td>
<td>-</td>
<td>Class 2 Aggregate Base (AB) conforming to Caltrans Specifications.</td>
</tr>
<tr>
<td>Class II Soils**</td>
<td>GW</td>
<td>Well-graded gravels and gravel-sand mixtures, little or no fines. 50% or more retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.</td>
</tr>
<tr>
<td>Class II Soils**</td>
<td>GP</td>
<td>Poorly graded gravels and gravel-sand mixtures, little or no fines. 50% or more retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.</td>
</tr>
<tr>
<td>Class II Soils**</td>
<td>SW</td>
<td>Well-graded sands and gravelly sands, little or no fines. More than 50% passes No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.</td>
</tr>
<tr>
<td>Class II Soils**</td>
<td>SP</td>
<td>Poorly graded sands and gravelly sands, little or no fines. More than 50% passes No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.</td>
</tr>
<tr>
<td>Class III Soils***</td>
<td>GM</td>
<td>Silty gravels, gravel-sand-silt mixtures. 50% or more retained on No. 4 sieve. More than 50% retained on No. 200 sieve.</td>
</tr>
<tr>
<td>Class III Soils***</td>
<td>GC</td>
<td>Clayey gravels, gravel-sand-clay mixtures. 50% or more retained on No. 4 sieve. More than 50% retained on No. 200 sieve.</td>
</tr>
<tr>
<td>Class III Soils***</td>
<td>SM</td>
<td>Silty sands, sand-silt mixtures. More than 50% passes No. 4 sieve. More than 50% retained on No. 200 sieve.</td>
</tr>
<tr>
<td>Class III Soils***</td>
<td>SC</td>
<td>Clayey sands, sand-clay mixtures. More than 50% passes No. 4 sieve. More than 50% retained on No. 200 sieve.</td>
</tr>
<tr>
<td>Class IV Soils</td>
<td>ML</td>
<td>Inorganic silts, very fine sands, rock flour, silty or clayey fine sands. Liquid limit 50% or less. 50% or more passes No. 200 sieve.</td>
</tr>
<tr>
<td>Class IV Soils</td>
<td>CL</td>
<td>Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. Liquid limit 50% or less. 50% or more passes No. 200 sieve.</td>
</tr>
<tr>
<td>Class IV Soils</td>
<td>MH</td>
<td>Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts. Liquid Limit greater than 50%. 50% or more passes No. 200 sieve.</td>
</tr>
<tr>
<td>Class IV Soils</td>
<td>CH</td>
<td>Inorganic clays of high plasticity, fat clays. Liquid Limit greater than 50%. 50% or more passes No. 200 sieve.</td>
</tr>
<tr>
<td>Class V Soils</td>
<td>OL</td>
<td>Organic silts and organic silty clays of low plasticity. Liquid limit 50% or less. 50% or more passes No. 200 sieve.</td>
</tr>
<tr>
<td>Class V Soils</td>
<td>OH</td>
<td>Organic clays of medium to high plasticity. Liquid limit greater than 50%. 50% or more passes No. 200 sieve.</td>
</tr>
<tr>
<td>Class V Soils</td>
<td>PT</td>
<td>Peat, muck and other highly organic soils.</td>
</tr>
</tbody>
</table>

* Soils are defined in ASTM D2487; except for Class I material which is defined in ASTM D2321. ** In accordance with ASTM D2487, less than 5% pass No. 200 sieve. *** In accordance with ASTM D2487, more than 12% pass No. 200 sieve. Soils with 5% to 12% pass No. 200 sieve fall in borderline classification, e.g., GP-GC.
9.05 Lot Grading:

Residential lot grading shall, at a minimum, conform to the requirements of the International Building Code. A typical lot grading detail is shown in Drawing EW-02.

The following requirements are intended to supplement the minimum requirements of the International Building Code.

- Lot grading on a new residential subdivision development project occurs in two phases. The developer of the subdivision is required to rough grade the lots. The home builder is generally required to finish grade the lots. In either phase, where fills, or cut and fills are used to create building pads having a total depth greater than 12”, special inspection is required for existing site conditions, and continuous special inspection is required for fill placement and compaction in accordance with Section 1704.7 of the 2007 CA Building Code.

- Prior to construction, a final soils report may be required for each lot. Soils reports on parcels that include building sites shall comply with all applicable parts of CA Building Code Sections 1802.2 through 1802.2.7.

A. Definitions:

1. Residential Subdivision: Any new development project that requires the filing of a final map or parcel map. Any residential zoning shall apply including, but not limited to: AR, R1, R2, R3, R4, and/or PUD.

2. Transition Slope: Frequently, a grading plan for a new project results in abutting lots having adjacent elevations that do not match. A transition slope is the slope that is required between the non-matching elevations.

B. Rough Grading:

Lots shall be rough graded to provide for a minimum ½ percent slope from the back of the lot to the abutting roadway. (This may include a situation where one back corner is graded to drain towards another back corner before it is graded to drain towards the front of the lot. In addition, some corner lots on a hill may require that a lot be graded to drain from the uphill side towards the back of the lot before the drainage is directed towards the front of a lot.) When designing the grading for a new subdivision, the following requirements shall be satisfied:

1. Maximum Cut and Fill Slopes (horizontal:vertical):
   a. Interior Property Lines: Whenever an elevation difference exists between abutting lots that are interior to a project, the maximum transition slope between the lots shall be 3:1. Steeper slopes may be considered if supported by a geotechnical report, but in no case shall transition slopes be steeper than 2:1.

b. Adjacent property lines of abutting property that is not a part of the project: Whenever an elevation difference exists between the perimeter of a project and abutting property, the maximum transition slope shall be 3:1. Steeper slopes may be considered if supported by a geotechnical report, but in no case shall transition slopes be steeper than 2:1. The slope shall not encroach on abutting property unless a recorded slope easement is obtained from the owner of the abutting property.

c. Road right-of-way: Whenever an elevation difference exists along the edge of the road right-of-way, the maximum transition slope shall be 3:1.

2. The maximum height of a continuous transition slope shall not exceed thirty (30) feet. The stability of all grading shall be addressed in the standard soils report that is required for subdivisions. Whenever the maximum height of a continuous transition slope exceeds eight (8) feet, a geotechnical
report shall be submitted that supports the stability of the proposed transition slope.

3. Setback Requirements: Transition slopes shall be located entirely on one property as opposed to splitting a property line. The minimum setback requirements for transition slopes shall be as follows:
   a. Setback from road right-of-way: 2 feet
   b. Setback of top toe of slope from an interior or adjacent property line: For transition slope heights of five (5) feet or less, the minimum setback shall be one (1) foot. For transition slope heights greater than five (5) feet, the minimum setback shall be equivalent to one-fifth of the height of the slope.

4. Ground Preparation for Fill Placement: Ground preparation for placement of fills shall conform to the recommendations of a soils or geotechnical report that has been prepared for the project. At a minimum, the natural ground must be prepared for receiving fill by removing vegetation, top soil, unstable material and existing non-complying fill.

5. Fill Placement and Compaction: Fill shall be placed in accordance with the recommendations of a soils or geotechnical report that has been prepared for the project. At a minimum, fills shall be constructed in layers (maximum loose thickness of 8") of earthen material with no detrimental organic matter and no rocks larger than 12". All fills must be compacted to a minimum of 90%, except for the top 6 inches. This compaction requirement may be reduced by the Director of Public Works for minor fills not intended to support structures. Where fills, or cut and fills are used to create building pads having a total depth greater than 12", special inspection is required for existing site conditions, and continuous special inspection is required for fill placement and compaction in accordance with Section 1704.7 of the 2007 CA Building Code.

6. Geotechnical Report: Whenever a geotechnical report is required, it shall be prepared under the direction of a licensed professional recognized by the State of California.

7. Retaining Walls (concrete masonry units or reinforced concrete): Whenever retaining walls are proposed, design calculations prepared by a Civil Engineer shall be submitted. In addition, the improvement plans must include construction details of the retaining wall. Building permits will be required for all retaining walls that have a height of four (4) feet or more as measured from the bottom of the footing to the top of the wall.

8. Retaining Walls around Utility Transformers: Occasionally, a transition slope that extends into the Public Utility Easement may conflict with the placement of an above ground electric utility transformer. Whenever this occurs, a masonry or concrete retaining wall may need to be constructed. The minimum setback from the retaining wall to the transformer shall be determined by the effected utility.

9. Wood Retaining Fences: Retaining fences may be place on lot lines of interior or adjacent lots in lieu of a transition slope. The maximum height difference that may be held by a wood retaining fence shall be eighteen (18) inches. Wood retaining fences shall be constructed pursuant to the Merced County Wood Retaining Fence Standard (See Drawing EW-03A and Drawing EW-03B).

10. Drainage: Drainage must be designed to protect cut and fill slopes and structures from erosion and water damage. Grading shall direct runoff flows to the nearest roadway or storm drainage system. In general, surface runoff shall not be designed to discharge onto adjoining or abutting property. Minor runoff amounts may discharge onto adjoining or abutting properties when it is clear that such runoff will not cause erosion or sedimentation or
endanger any cuts, fills or structures on the adjoining or abutting property; In addition, a recorded storm drainage easement must be obtained from any adjoining or abutting property owners that receive any runoff.

11. Erosion Control Plan: An erosion control plan prepared by a certified erosion control specialist or a licensed landscape architect shall be prepared whenever the transition slope is steeper than 3:1 and the height of the transition slope is greater than 10 feet.

12. Usable Lot Area: Residential lots may need to be increased in size over the minimum zoning code requirement to ensure that sufficient usable lot area remains after taking into account the impacts of transition slopes. The Planning and Community Development Department shall make a determination concerning sufficient usable lot area.

13. Backyard Building Setback: A ten (10) foot minimum setback is required from the bottom toe of the transition slope and the back of residential structure.

C. Finish Grading

Finish grading includes the addition of side swales and grading away from the residential structure. See Drawing EW-02 for a sample plan showing typical finish grading required for a residential lot.

Improper finish grading may result in poor lot drainage. It is the home builder’s responsibility to ensure that finish grading is completed properly. Ultimately, it is the homeowner’s responsibility to maintain proper finish grading. Many times, revisions to landscaping compromise the finish grade of a residential lot. A final soils report may be required prior to construction for each lot. Soils reports on parcels that include building sites shall comply with all applicable parts of CA Building Code Sections 1802.2 through 1802.2.7.
NOTES

1. SAWCUT SHALL RESULT IN A SMOOTH VERTICAL JOINT.

2. APPLY A TACK COAT TO ALL AC FACES PRIOR TO PLACING GEOTEXTILE FABRIC AND PRIOR TO PLACING ADDITIONAL AC LIFTS.

3. THICKNESS OF AC TRENCH REPAIR SHALL, AT A MINIMUM, MATCH THE THICKNESS OF THE EXISTING AC. IN NO CASE SHALL THE AC THICKNESS BE LESS THAN 2 INCHES.

4. AB THICKNESS SHALL, AT A MINIMUM, MATCH THE EXISTING AB THICKNESS. IN NO CASE SHALL THE AB THICKNESS BE LESS THAN 10 INCHES.

5. BEDDING SHALL HAVE A 4 INCH MINIMUM THICKNESS.

6. A TRENCH FOUNDATION WILL BE REQUIRED IF RECOMMENDED BY THE PROJECT'S SOILS/GEOTECHNICAL REPORT.

7. TRENCHES LESS THAN 6 INCHES IN WIDTH SHALL BE BACKFILLED WITH SLURRY CEMENT.


9. ALL MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO CALTRANS STANDARD SPECIFICATIONS.

MERCEDES COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

TRENCH EXCAVATION & BACKFILL

DRAWING EW-01
NOTES:

1. FINISHED FLOOR TO BE 12" MIN. ABOVE TOP OF CURB OR WHERE CURB NOT PRESENT, 12" ABOVE CROWN OF ROAD.

2. PROVIDE 2% SLOPE FOR MINIMUM OF FIVE FEET AWAY FROM BUILDING PER UBC.

3. WHERE APPLICABLE, FINISH FLOOR ELEVATION SHALL BE AT OR ABOVE THE LATEST FEMA MAP FLOOD ZONE ELEVATION.

4. MINIMUM SLOPE FROM REAR LOT LINE TO FRONT LINE SHALL BE 0.5%. HOWEVER, FHA FUNDED HOMES REQUIRE OVERALL SLOPES OF 1% MIN.

5. IMPROVEMENT PLANS SHALL INDICATE DESIGN FINISH GRADES FOR EACH LOT CORNER AND THE MINIMUM BUILDING PAD ELEVATION; IF PARCEL IS WITHIN A FLOOD ZONE, IMPROVEMENT PLANS SHALL INDICATE MINIMUM FINISH FLOOR ELEVATION.
NOTES:
1. WOOD POSTS WILL NOT BE CONSIDERED FOR APPROVAL.
2. STEEL POSTS SHALL BE GALVANIZED.
3. THE DESIGN INDICATED IN THIS STANDARD IS BASED ON POOR SOIL CONDITIONS IN A SATURATED CONDITION. ENGINEER MAY SUBMIT ALTERNATIVE FOOTING DESIGN BASED ON ACTUAL SOIL CONDITIONS FOR CONSIDERATION BY COUNTY.
4. H = HEIGHT OF SOIL TO BE RETAINED.
5. D = REQUIRED FOOTING DEPTH.
CHAPTER 10
Miscellaneous

10.01 Alleys:
A. See Drawing MS-01.
B. The following traffic indices shall be used in determining the required structural section:
   3. Heavy Commercial or Industrial: use T.I. = 8.0.
C. The minimum structural section shall be 0.20 feet of A.C. over 0.35 feet of A.B.
D. The valley gutter shall be constructed from concrete with a minimum cement content of 463 pounds per cubic yard.
E. The minimum valley gutter flowline slope shall be 0.0020. The maximum capacity of a valley gutter shall be 0.5 times the capacities shown on Exhibit 4 of the Storm Drainage Design Manual.
F. Alley approach for Residential and Light Commercial areas shall be built in conformance with the Type 2 Commercial Driveway Standard found in Section 7.02.E of this manual.
G. Alley approach for Heavy Commercial and Industrial areas shall be built in conformance with the Type 3 Commercial Driveway Standard found in Section 7.02.F of this manual.

10.02 Barricades and Temporary Turn-Arounds:
A. Barricades:
   1. See Drawing MS-02.
   2. A barricade shall be installed at all temporary dead-end roadways except where a temporary turnaround is required.
   3. All required signs shall be in conformance with the California Manual on Uniform Traffic Control Devices (MUTCD).
   4. Posts shall be 6” x 6” clear redwood or pressure treated Douglas fir rails shall be 2” x 6” Douglas fir.
   5. Barricade shall extend the full width of the pavement or traveled way.
   6. Barricades shall be painted with two coats of white exterior prime paint.
   7. A 2” x 6” redwood header shall be placed at the end of the roadway structural section.
B. Temporary Turn-around:
   1. See Drawings MS-03 and MS-04.
   2. A temporary turnaround shall be installed when a proposed temporary dead-end roadway is greater than 1½ lots in depth.
   3. The structural section of the portions of the temporary turn-around which will eventually be removed shall be 0.2 feet of A.C. over 0.33 feet of A.B.

10.03 Surveying:
A. Horizontal Control: Horizontal control surveys shall be done in accordance with Title 17 of the Merced County Code and the requirements of the County Surveyor.
   1. Street Centerline Monuments:
      a. Street centerline monuments and encasements shall be installed at intersections and centerline control points such as beginnings and ends of curves and points of compound and reverse curvature.
      b. See Drawings MS-05A and MS-05B for typical survey encasements.
         i. Centerline monuments within encasements shall be set within 3” of finish grade prior to acceptance of the improvements.
ii. Frame and cover shall be cast iron, California Concrete Pipe A-581 ASSY., KP-2501 or equivalent.

iii. Frame shall be set in 7 sack concrete.

c. The project Surveyor shall verify in writing that all required monuments are in place prior to acceptance of improvements.

B. Vertical Control:

1. Construction Benchmarks: A minimum of two temporary construction benchmarks shall be established within the project boundary or within 500 feet of the project by a Surveyor and shall be referenced on the Improvement Plans.

   The temporary construction benchmark shall be a permanent or semi-permanent physical mark of known elevation consisting of either a railroad spike in a utility pole or a square chiseled on a fixed concrete object.

   If the project is within a special flood hazard zone, the elevation of the temporary construction benchmarks shall be based on the North American Vertical Datum of 1988 (NAVD 88). The leveling precision used to establish the temporary construction benchmarks shall be third order and shall either loop back to the same or a second established benchmark. If a project area is more than two (2) miles from a benchmark, looping of levels back to the starting benchmark may be waived provided that the forward leveling utilizes two levels and third order precision is maintained. Double rodding is unacceptable.

   If the project is within a special flood hazard zone, the Surveyor shall submit a copy of the level notes prior to the approval of the Improvement Plans. Improvement plans will not be approved if an improper vertical control was used to establish the temporary construction benchmarks.

2. Permanent Benchmarks: All projects in a special flood hazard zone which also require installation of streetlights shall set vertical control benchmarks as shown in Drawing MS-06. After the vertical control benchmarks have been set, the developer’s surveyor shall run a level loop between the new benchmark and a benchmark with an established elevation on the North American Vertical Datum of 1988 (NAVD 88). The number of these benchmarks that will be required will be determined on a case-by-case basis: generally, only one permanent benchmark will be required per project.

3. Grade Verification: Prior to any building permits being issued, the project Surveyor shall submit a letter to the Department of Public Works stating that all lot and street grading has been completed in accordance with the Improvement Plans. This letter shall be accompanied with a copy of the grading sheets from the Improvement Plans showing actual elevations that have been surveyed.

   If the project is within a special flood hazard zone as identified by the Federal Emergency Management Agency (FEMA), a Surveyor or Civil Engineer shall submit a stamped certification to the Department of Public Works stating that building pads meet or exceed the required elevations prior to the foundation being poured.

C. Construction Staking: The Developer shall be responsible for all necessary survey to layout and control the work to the elevations, lines and dimensions shown on the Improvement Plans. Any deviations must receive prior written approval of the Director of Public Works. All surveys affecting the line or elevations of underground drainage, sewers, or utilities and any other work within public right-of-way or easements shall be performed under the direction of a Surveyor.
A Surveyor shall provide grade stakes at 50 foot intervals on both sides of roadways being constructed.

Staking shall be field checked by the Department of Public Works prior to proceeding with subsequent layers of material such as sub-base, aggregate base, A.C., etc.

Prior to placing concrete for curb and gutter, a Surveyor shall verify that the forms or guidelines have been set in accordance with the grades shown on the Improvement Plans.

10.04 Fencing:

A. See Drawing MS-07.

B. A fence is required around all pump stations.

C. A retention basin is required to be fenced when either the design depth for a 10-year, 24-hour storm exceeds 1½ feet or if the side slopes of the basin are greater than 8:1.

D. Chain link fabric shall be No. 9 gage woven in a 3½” x 5” mesh or No. 9 gage woven in a 2” x 2” mesh.

E. Pickets shall be standard grade stained redwood 3/8” x 2½” or similar width colored plastic slats inserted vertically in chain link fabric.

F. Typical Post Sizes:
   1. Gate posts: 2-7/8” O.D. standard pipe.

G. Posts shall be spaced at 10’ centers in 36” deep x 8” diameter hole filled with concrete with a minimum cement content of 463 pounds per cubic yard.

H. Bottom tension wire shall be No. 7 gauge coil spring.

I. All material shall be galvanized.

J. Gate shall be rolling type and shall have a minimum width of twelve (12’) feet.

K. A 4” deep x 12” wide concrete strip shall be provided for wheel path of rolling gate.

10.05 Sidewalks and Wheelchair Ramps:

A. General Specifications:
   1. Concrete shall have a minimum cement content of 463 pounds per cubic yard.
   2. A non-pigmented curing compound shall be applied to freshly finished concrete in accordance with Section 90-7 of the Caltrans Standard Specifications.
   3. Four inches of Class II Aggregate Base (A.B.) with 1½” maximum aggregate compacted to 95% relative compaction shall be placed under sidewalks and wheelchair ramps in heavy soil areas (Class IV or Class V soils as specified in Table EW-1).
   4. Four inches of Class III Aggregate Subbase (A.S.) compacted to 95% relative compaction shall be placed under sidewalk and wheelchair ramps in silty soil areas (Class III soils as specified in Table EW-1).

B. Sidewalk:
   1. See Drawing MS-08A and MS-08B.
   2. The required sidewalk thickness for areas with rolled curb and gutter is six (6) inches.
   3. One half-inch thick (1/2”) expansion joints shall be placed at 60 foot intervals and at both ends of driveways and wheelchair ramps. Expansion joints shall be full depth and extend through the entire thickness of concrete. When curb is adjacent to sidewalk, the expansion joint locations shall match. Expansion joints shall be braced by steel backing during pour.
   4. Weakened plane joints shall be placed at ten (10’) foot intervals between expansion joints. Weakened plane joints shall be constructed to minimum depth of one inch (1”) by scoring with a tool, which will leave the corners rounded and insure a free movement of the concrete at the joint.
5. No joint of any kind shall be placed within the driveway approach.

6. Sidewalk shall be scored one quarter (\(\frac{1}{4}\)”) inch deep at five (5’) foot intervals.

7. No signs, streetlights, fire hydrants, manholes, valve covers, or any other obstruction shall be placed within the sidewalk.

C. Curb Ramps:

1. See Drawings MS-09A through MS-09E.

2. If a curb ramp is to be installed in a location where the existing curb height is greater than six (6") inches, the maximum slopes shall be as follows:
   a. The main ramp slope shall not exceed 7.5%.
   b. Ramp side slope shall vary uniformly from a maximum of 9.5% at curb face to conform with longitudinal sidewalk slope adjacent to top of the ramp.

10.06 Signs:

A. Street Name Signs:

1. See Drawings MS-10A through MS-10D.

2. The preferred method for mounting street name signs is on a streetlight post as shown in Drawing MS-10D. Whenever possible, streetlights shall be strategically placed to allow this method of street name mounting.

3. As an alternative to mounting on streetlight posts, street name signs may be mounted on their own posts. (Street name signs shall never be installed on the same post as a STOP sign.) Post shall be 2” square x 10’ long, 14 gage thick steel tubing. Tubing shall be hot-dipped, galvanized steel material. Post may be TELESPAR 20F12 or equivalent.

4. Post shall be anchored as shown in Drawing MS-10B. Anchor shall be 2¼” square x 36”, 12 gage, hot-dipped galvanized steel tubing. Anchor may be TELESPAR 22F12 or equivalent. Sleeve shall be 2½” square x 18”, 12 gage, hot-dipped galvanized steel tubing. Sleeve may be TELESPAR 24F12 or equivalent.

5. Sign plates shall be .080” thick aluminum, fully alodine 1200, grade 606IT6.

6. Plates shall be riveted onto the post as shown in Drawing MS-10A.

7. Lettering on street name signs are to be four (4”) inches high; Supplementary lettering to indicate type of street shall be 2” high. The bottom of the supplementary letters shall align with the bottom of the street name lettering.

8. Street name signs shall be reflectorized and shall have white lettering, a one half (½”) inch white border on a green background.

B. Stop Signs:

1. See Drawing MS-11.

2. Stop sign code is R1-1. Size shall be 36” x 36”.

3. All signs shall be on 0.080 thick aluminum, fully alodine 1200 engineer grade sheeting, grade 606IT6 or 5052H38.

4. Face of sign shall be of one of the following materials: Adecolite, Nikkalite, or 3-M Scotchlite and shall conform to current State of California DOT-OMB-MO specifications.

5. All stop signs shall be high intensity and covered with a protective reflective sheeting comparable to 3-M Scotchlite #7050, F-Cal EF-40801 or approved equal.

6. Stop signs shall be die stamped on the back with the wording, “MERCED COUNTY PROPERTY”.

7. Metal Post Mount:
   a. Stop signs are required to be installed on a metal post in all residential, commercial, and industrial areas.
b. Stop sign shall be positioned 3’ from the back of curb in areas with separate or no sidewalk, 5’ from the back of curb in areas with adjacent sidewalk, or 4’ from the edge of the shoulder in areas with no curb and gutter.

c. Metal post shall be 2” square x 11’ long, hot dipped galvanized steel square tubing.

d. Post shall be anchored in an 8” diameter x 2” deep hole filled with concrete. Post shall have a 2” x 2” x 6” x ¼” section of angle iron welded to it 6” from the bottom of the post to assist anchoring the post in the concrete.

e. Pipe mounting set shall consist of two sets of the “U” – brackets shown on Drawing MS-11. Sign mounting bolts shall be 5/16” – 18 x ½” with a neoprene washer.

8. Wood Post Mounts are no longer allowed.

9. Pavement Markings. A 12” wide limit line and “STOP” word pavement markings shall be placed at each STOP sign installation. Pavement markings shall conform to Caltrans Standard Specifications and Caltrans Standard Plans. Paint shall be applied in two coats with reflectorized glass beads.

10.07 Mail Boxes:

A. All mailboxes shall comply with the AASHTO publication entitled, “A Guide For Erecting Mailboxes on Highways.” See Table 1 and Figure 4 of same.

B. Mailboxes that are to be within the roadway right-of-way are subject to the approval of the Merced County Department of Public Works as well as the U.S. Postal Service.

C. Curb and Gutter Areas:

1. When sidewalk is adjacent to the curb, mailboxes shall be located behind the sidewalk. Mailboxes should be located so that when open, the door will not overhang into the sidewalk.

2. When sidewalk is separate from the curb, mailboxes may be located in the planting strip area. Mailboxes should be located so that when open, the door will not overhang past the back of curb.

3. Mailboxes will not be allowed to be placed within the sidewalk.

4. The Department of Public Works encourages the installation of group mailboxes.

D. Earth Ditch Areas:

1. Mailboxes shall be a minimum of 4 feet behind the edge of pavement.

2. Mail boxes should be placed on a 4” x 4” redwood post. Mail boxe s constructed such that they are a fixed object that may be considered a traffic hazard will not be allowed within the roadway right-of-way. Special mailbox mounting designs must be reviewed by the Department of Public Works.

10.08 Speed Humps:

A. See Drawings MS-12A and MS-12B for speed hump installation details.

10.09 Rumble Strips:

A. See Drawing MS-13 for Rumble Strip installation details.

10.10 Access Gates:

A. See Drawing MS-14 or Access Gate construction details.

B. A 24” Type N marker sign shall be installed on the access gate. The Type N Marker shall use reflectorized yellow sheeting mounted on an aluminum sign plate.

10.11 Masonry Walls:

Whenever a masonry wall (or pre-cast) is required to be constructed as part of a project, the engineer will be required to submit plans and calculations for the design and construction of the wall. If the wall is over four (4) feet in height, the wall is considered a structure subject to the building code and a building permit will be required.
Occasionally, the Planning and Community Development Department will want to review the design of the wall for aesthetic considerations.

Whenever a wall is part of the project, the following notes shall be included on the improvement plans:

1. CMU and pilaster block shall be _______ [color/texture] or match the materials used for ______________ located along ____________________.

2. The contractor shall obtain a building permit from the Department of Public Works – Buildings Division prior to start of work. The contractor shall submit 4 sets of plans and 2 sets of engineering calculations wet stamped and signed to the Buildings Division. Building inspection requests shall be made by phone at (209) 385-7477 prior to 4:00 PM for inspection the following day.

3. The contractor shall contact the Department of Public Works – Professional Services Division at (209) 385-7601 at least 48 hours prior to start of work. The Department of Public Works will verify the contractor has obtained a building permit prior to start of work, approve CMU materials as to color and texture, verify wall location, and perform final cleanup inspection of the site.

For walls over 7 feet in height, the following additional notes shall be placed on the plans:

4. The contractor shall submit a letter of certification from the manufacturer of the masonry units delivered to the job site to assure the units comply with the compressive strength requirements.

5. The contractor shall submit compressive strength tests at seven-days and 28-days for grout used in the work.

6. A masonry prism test may be submitted.
PLACE NO. 4 BARS AT 36" O.C. AND 3 NO. 4 BARS LONGITUDINALLY. CONCRETE SHALL BE 5 SACK.
NOTES:
1. FRAMES AND COVER SHALL BE CAST IRON. APPROVED MODELS INCLUDE: CALIFORNIA CONCRETE PIPE A–581 ASSY., KP–2501 OR EQUIVALENT.
2. FRAME TO BE SET IN 7 SACK CONCRETE.

SECTION A–A
NOTES:
1. FRAME SHALL CONSIST OF CHRISTY G5 TRAFFIC VALVE BOX 10 3/8 ID X 12".
2. COVER SHALL BE CAST IRON CHRISTY G5C LID OR EQUIVALENT.
3. FRAME TO BE SET IN 7 SACK CONCRETE.

CENTERLINE MONUMENT ENCASMENT (ALTERNATE)
1. FENCING SHALL BE No. 9 GAGE WOVEN WIRE MESH IN A 3-1/2" x 9" OR 2" x 2" GRID WITH PICKETS OF STANDARD GRADE STAINED REDWOOD OR PLASTIC SLATS INSTALLED VERTICALLY.
NOTES:

1. SIDEWALK ABUTTING VERTICAL CURB: IF Poured Separately, the thickness of the sideWALK shall be 4". If poured monolithically with CURB AND GUTTER, THE THICKNESS OF THE SIDEWALK SHALL BE 6".

2. SIDEWALK IN ROLLED CURB AREAS SHALL BE 6" THICK. SIDEWALK AND ROLLED CURB MAY BE PLACED MONOLITHICALLY.

3. IF THE R-VALUE OF THE NATIVE SOIL IS LESS THAN 50, 4" OF CLASS 2 AGGREGATE BASE SHALL BE PLACED BENEATH THE SIDEWALK. IF THE R-VALUE OF THE NATIVE SOIL IS GREATER THAN 50, THEN NATIVE MATERIAL MAY BE PLACED BENEATH THE SIDEWALK. BASE BENEATH SIDEWALK SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.

4. PURSUANT TO SECTION 73 OF THE STATE STANDARD SPECIFICATIONS, CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER CUBIC YARD.

5. SEE SECTION 10.05 OF THE SPECIFICATIONS FOR EXPANSION JOINT, WEAKENED PLANE JOINT, AND OTHER MISCELLANEOUS REQUIREMENTS.
1. IF THE R-VALUE OF THE NATIVE SOIL IS LESS THAN 50, 4" OF CLASS 2 AGGREGATE BASE SHALL BE PLACED BENEATH THE CONCRETE. IF THE R-VALUE OF THE NATIVE SOIL IS GREATER THAN 50, THEN NATIVE MATERIAL MAY BE PLACED BENEATH THE CONCRETE. BASE BENEATH SIDEWALK SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.

2. PURSUANT TO SECTION 73 OF THE STATE STANDARD SPECIFICATIONS, CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER CUBIC YARD.

3. SEE SECTION 10.05 OF THE SPECIFICATIONS FOR EXPANSION JOINT, WEAKENED PLANE JOINT, AND OTHER MISCELLANEOUS REQUIREMENTS.
NOTES:
1. THE GROOVE BORDER SHALL FORM A ONE FOOT BORDER ON THREE SIDES OF THE CURB RAMP. THE GROOVES SHALL BE 1/4" DEEP AND SHALL BE APPROXIMATELY 3/4" ON CENTER. BORDER SHALL NOT BE CONSIDERED AS PART OF THE RAMP.
2. A FULL-DEPTH EXPANSION JOINT SHALL BE PLACED AT THE BEGINNING AND END OF THE RADIUS USING 1/2" THICK FELT EXPANSION MATERIAL.
3. THE TYPICAL CROSS SECTION PASSES THROUGH THE CENTER OF THE CURB RAMP.
4. THE MAXIMUM RAMP SLOPE SHALL BE 7.5%.
5. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH OF THE RAMP. DETECTABLE WARNING SURFACE SHALL BE EITHER CAST IRON, SOLID COMPOSITE POLYMER, OR HIGH-STRENGTH REINFORCED CONCRETE PANELS AND CONFORM WITH NEENAH FOUNDRY COMPANY DETECTABLE WARNING PLATES (POWDER-COATED YELLOW), MACO CASTINTACT DETECTABLE WARNING PANELS (YELLOW), ARMORCAST DETECTABLE WARNING PANELS (YELLOW) OR APPROVED EQUIVALENT.
6. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE GUTTER FLOW LINE.
7. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER CUBIC YARD.
8. THE ENTIRE AREA SHALL BE A TRANSVERSE HEAVY BROOM FINISH.
9. IF THE R-VALUE OF THE NATIVE SOIL IS LESS THAN 50, 4" OF CLASS 2 AGGREGATE BASE SHALL BE PLACED BENEATH THE CONCRETE. IF THE R-VALUE OF THE NATIVE SOIL IS GREATER THAN 50, THEN NATIVE MATERIAL MAY BE PLACED BENEATH THE CONCRETE. BASE BENEATH SIDEWALK SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.
10. INTERSECTION RAMP TO BE CONSTRUCTED MONOLITHIC.
11. GUTTER PAN SLOPE SHALL NOT EXCEED 5% AT RAMP.

MERCED COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

TYPE A INTERSECTION RAMP FOR VERTICAL CURB AREAS  DRAWING MS-09A
NOTES:

1. The groove border shall form a one foot border on three sides of the curb ramp. The grooves shall be 1/4" deep and shall be approximately 3/4" on center. Border shall not be considered as part of the ramp.

2. A full-depth expansion joint shall be placed at the beginning and end of the radius using 1/2" thick felt and expansion material.

3. The typical cross section passes through the center of the curb ramp.

4. The maximum ramp slope shall be 7.5%.

5. Curb ramps shall have a detectable warning surface that extends the full width of the ramp. Detectable warning surface shall be either cast iron, solid composite polymer, or high strength reinforced concrete panels and conform with Neenah Foundry Company detectable warning plates (powder-coated yellow), Maco Castintact detectable warning panels (yellow), Armocast detectable warning panels (yellow), or approved equivalent.

6. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flow line.

7. Concrete shall have a minimum cement content of 463 pounds per yard.

8. The entire area shall be a transverse heavy broom finish.

9. If the R-value of the native soil is less than 50, 4" of Class 2 aggregate base shall be placed beneath the concrete. If the R-value of the native soil is greater than 50, then native material may be placed beneath the concrete. The base beneath sidewalk shall be compacted to 95% relative compaction.

10. Intersection ramp to be constructed monolithic.

11. Gutter pan slope shall not exceed 5% at ramp.

MERCEDE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

TYPE A INTERSECTION RAMP FOR ROLLED CURB AREAS

DRAWING MS-09B

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UPDATED: 12/18/2013
NOTES:

1. THE MAXIMUM RAMP SLOPE SHALL BE 7.5%.
2. THE GROOVE BORDER SHALL BE ONE FOOT WIDE AND SHALL BE PLACED ON BOTH SIDES OF THE CURB RAMP. THE GROOVES SHALL BE 1/4" DEEP AND SHALL BE APPROXIMATELY 3/4" ON CENTER. BORDER SHALL NOT BE CONSIDERED AS PART OF THE RAMP.
3. A FULL-DEPTH EXPANSION JOINT SHALL BE PLACED AT THE BEGIN AND END OF THE RADIUS USING 1/2" THICK FELT EXPANSION MATERIAL.
5. CURB RAMPS SHALL HAVE A 3' X 5' DETECTABLE WARNING SURFACE. DETECTABLE WARNING SURFACE SHALL BE EITHER CAST IRON, SOLID COMPOSITE POLYMER, OR HIGH STRENGTH REINFORCED CONCRETE PANELS AND CONFORM WITH NEOHAN FOUNDRY COMPANY DETECTABLE WARNING PLATES (POWDER-COATED YELLOW), MASCO CASTINTACT DETECTABLE WARNING PANELS (YELLOW), ARMORCAST DETECTABLE WARNING PANELS (YELLOW) OR APPROVED EQUIVALENT.
6. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE GUTTER FLOWLINE.
7. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER YARD.
8. THE ENTIRE AREA SHALL BE A TRANSVERSE HEAVY BROOM FINISH.
9. IF THE R-VALUE OF THE NATIVE SOIL IS LESS THAN 50, 4" OF CLASS 2 AGGREGATE BASE SHALL BE PLACED BENEATH THE CONCRETE. IF THE R-VALUE OF THE NATIVE SOIL IS GREATER THAN 50, THEN NATIVE MATERIAL MAY BE PLACED BENEATH THE CONCRETE BASE BENEATH THE SIDEWALK SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.
10. INTERSECTION RAMP TO BE CONSTRUCTED MONOLITHIC.
11. GUTTER PAN SLOPE SHALL NOT EXCEED 5%.

MERCEDE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

TYPE B INTERSECTION RAMP FOR VERTICAL CURB AREAS

DRAWING MS-09C
1. The maximum ramp slope shall be 7.5%.
2. The groove border shall be one foot wide and shall be placed on both sides of the curb ramp. The grooves shall be 1/4" deep and shall be approximately 3/4" on center. Border shall not be considered as part of the ramp.
3. A full-depth expansion joint shall be placed at the begin and end of the radius using 1/2" thick felt expansion material.
4. A retaining curb shall be placed behind the ramp area. The top of the retaining curb shall be flush with the sidewalk at the top of the 7.5% sidewalk slope.
5. Curb ramps shall have a 3'x5' detectable warning surface. Detectable warning surface shall be either cast iron, solid composite polymer, or high strength reinforced concrete panels and conform with Neenah Foundry Company Detectable Warning Plates (powder-coated yellow), Masco Castintact Detectable Warning Panels (yellow), Armorcast Detectable Warning Panels (yellow) or approved equivalent.
6. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.
7. Concrete shall have a minimum cement content of 465 pounds per yard.
8. The entire area shall be a transverse heavy broom finish.
9. If the R-value of the native soil is less than 50, 4" of class 2 aggregate base shall be placed beneath the concrete. If the R-value of the native soil is greater than 50, then native material may be placed beneath the concrete. Base beneath sidewalk shall be compacted to 95% relative compaction.
10. Intersection ramp to be constructed monolithic.
11. Gutter pan slope shall not exceed 5% at ramp.

MERCEDES COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

TYPE B INTERSECTION RAMP FOR ROLLED CURB AREAS

DRAWING MS-09D
NOTES:

1. THE MAXIMUM RAMP SLOPE SHALL BE 7.5%.

2. THE GROOVE BORDER SHALL BE ONE FOOT WIDE AND SHALL BE PLACED ON BOTH SIDES OF THE CURB RAMP. THE GROOVES SHALL BE 1/4" DEEP AND SHALL BE APPROXIMATELY 3/4" ON CENTER. BORDER SHALL NOT BE CONSIDERED AS PART OF THE RAMP.

3. A FULL-DEPTH EXPANSION JOINT SHALL BE PLACED AT THE BEGIN AND END OF THE CURB RAMP USING 1/2" THICK FELT EXPANSION MATERIAL.


5. CURB RAMPS SHALL HAVE A 3'x5' DETECTABLE WARNING SURFACE. DETECTABLE WARNING SURFACE SHALL BE EITHER CAST IRON, SOLID COMPOSITE POLYMER, OR HIGH STRENGTH REINFORCED CONCRETE PANELS AND CONFORM WITH NEENAH FOUNDRY COMPANY DETECTABLE WARNING PLATES (POWDER-COATED YELLOW), MASCO CASTINTACT DETECTABLE WARNING PANELS (YELLOW), ARMORCAST DETECTABLE WARNING PANELS (YELLOW) OR APPROVED EQUIVALENT.

6. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE GUTTER FLOWLINE.

7. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 463 POUNDS PER YARD.

8. THE ENTIRE AREA SHALL BE A TRANSVERSE HEAVY BROOM FINISH.

9. IF THE R-VALUE OF THE NATIVE SOIL IS LESS THAN 50, 4" OF CLASS 2 AGGREGATE BASE SHALL BE PLACED BENEATH THE CONCRETE. IF THE R-VALUE OF THE NATIVE SOIL IS GREATER THAN 50, THEN NATIVE MATERIAL MAY BE PLACED BENEATH THE CONCRETE. BASE BENEATH SIDEWALK SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.

10. CURB RAMP TO BE CONSTRUCTED MONOLITHIC.

11. GUTTER FAN SLOPE SHALL NOT EXCEED 5% AT RAMP.
TOP CAP

3/8" STEEL RIVETS

2x6" SQUARE ALUMINUM TUBING .225-1/8"

1" RADIUS

10-16x3/4" SELF DRILLING ZINC PLATED
5/16" HEX HEAD SCREWS

SEE WS-1CB SGN FOUNDATION DETAIL

MERCE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

STREET NAME SIGN

DRAWING MS-10A

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MODIFIED: 5/15/2015
NOTES:
1. POST SHALL BE 2" X 2" SQUARE, 14 GAGE, HOT-DIPPED GALVANIZED STEEL TUBING. POST MAY BE UNISTRUT TELESPAR 20F12 OR EQUIVALENT.
2. ANCHOR SHALL BE 2-3/4" SQ. X 36", 12 GAGE, HOT-DIPPED GALVANIZED STEEL TUBING. ANCHOR MAY BE UNISTRUT TELESPAR 22F12 OR EQUIVALENT.
3. SLEEVE SHALL BE 2-1/2" SQ. X 24", 12 GAGE, HOT-DIPPED GALVANIZED STEEL TUBING. SLEEVE MAY BE UNISTRUT TELESPAR 24F12 OR EQUIVALENT.
4. POST SHALL BE MOUNTED TO FOUNDATION WITH TWO 3/8" x 3/8" DRIVE RIVETS. RIVETS SHALL BE STAGGERED AS SHOWN ON DETAIL.
5. ANCHOR AND SLEEVE SHALL BE DRIVEN INTO THE GROUND. NO CONCRETE SHALL BE PLACED AROUND ANCHOR OR SLEEVE.
NOTES:

1. LETTERING ON STREET NAME SIGNS ARE TO BE 6" HIGH; SUPPLEMENTAL LETTERING TO INDICATE TYPE OF STREET TO BE 3" HIGH. THE BOTTOM OF THE SUPPLEMENTARY LETTERS SHALL ALIGN WITH THE BOTTOM OF THE STREET NAME LETTERING.

2. LETTERING SHALL BE UPPERCASE AND SHALL CONFORM TO CALTRANS SERIES D LETTERING.

3. SIGN LETTERING SHALL BE OFFSET A MINIMUM OF 2" FROM THE EDGE OF THE SIGN PLATE.

4. SIGN PLATES SHALL BE 0.080" THICK ALUMINUM, FULLY ALODINE 1200 GRADE 6061-T6.

5. STREET NAME SIGNS SHALL BE REFLECTORIZED AND SHALL HAVE WHITE LETTERING AND A 1/2" WHITE BORDER ON A GREEN BACKGROUND.

6. ASSEMBLY SCREW LOCATIONS ARE SHOWN ON THE DRAWING.
NOTES:
1. CANTILEVER ARM BRACKETS TO BE MOUNTED TO STREETLIGHT POST WITH TWO 3/4" X 0.032" HEAVY DUTY STAINLESS STEEL STRAPS WITH HEAVY DUTY STAINLESS STEEL BUCKLE. HAWKINS HAWKINS CO. PART NO. M2G-34S(HD), AND M2G-34B(HD).
2. SIGNS TO BE MOUNTED ON ZUMAR 556 SIGN BRACKET. 1" SQUARE ALUMINUM TUBING SHALL BE ATTACHED BETWEEN EACH END OF THE SIGN PLATE PAIRS.
3. SIGN PLATES SHALL BE ATTACHED TO THE CANTILEVER BRACKET USING STAINLESS STEEL SET SCREWS.
NOTES

1. SIGNS SUBSTRATE SHALL BE ALUMINUM COMPOSITE.
   APPROVED BRANDS ARE:
   A. ALCAN COMPOSITES "DIBOND MATERIAL, 2MM"
   B. MITSUBISHI CHEMICAL AMERICA, ALPOLIC 350

2. SIGNS SHALL BE MOUNTED TO THE POST WITH 1/4" x 3/16" DRIVE RIVETS.

3. FACE OF SIGN SHALL BE TYPE III HIGH INTENSITY SHEETING AND
   SHALL CONFORM TO CURRENT STATE OF CALIFORNIA SPECIFICATIONS.
   APPROVED BRANDS ARE:
   A. AVERY DENNISON, T-5500 SERIES
   B. NIPPON CARBIDE, NIKKALITE BRAND ULTRALITE GRADE II
   C. 3M SERIES 3870

4. POST SHALL BE 2" X 2" X 10', 14 GAGE, HOT-DIPPED
   GALVANIZED STEEL TUBING. POST MAY BE UNISTRUT TELESFAR 20F12
   OR EQUIVALENT.

5. STOP SIGN SHALL BE POSITIONED 3' FROM THE BACK OF CURB IN
   AREAS WITH SEPARATE OR NO SIDEWALK, 5' FROM THE BACK OF CURB
   IN AREAS WITH ADJACENT SIDEWALK, OR 4' FROM THE EDGE OF THE
   SHOULDER IN AREAS WITH NO CURB AND GUTTER.

SEE MS-103 FOR FOUNDATION DETAILS

MERCESD COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

STOP SIGN (R1) DRAWING MS-11

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NOTE: EXACT SIGN LOCATIONS TO BE DETERMINED BY PUBLIC WORKS STAFF.

WARNING SIGN: W17-1
30" X 30" (PER CA MUTCD)

WARNING SIGN: W13-1P
18" X 18" (PER CA MUTCD)

ALL SIGN POSTS SHALL BE IN ACCORDANCE WITH COUNTY STANDARD MS-108 FOR MATERIAL AND INSTALLATION.

EXISTING GROUND
NOTES:
1. DO NOT PLACE WITHIN 5 FEET OF ANY UTILITY STRUCTURE.
2. OUTSIDE EDGE OF HUMPS SHOULD BE 10' MINIMUM FROM DRIVEWAYS.
3. PLACE HUMPS AT PROPERTY LINES AND STREET LIGHTS WHERE POSSIBLE.
4. HOT MIX ASPHALT SHALL BE TYPE "B" WITH 3/8" AGGREGATE PER SECTION 39 OF THE CALTRANS STANDARD SPECIFICATIONS.
5. SPACING BETWEEN SERIES OF SPEED HUMPS SHOULD BE APPROXIMATELY 250' APART.
6. SPEED HUMPS SHOULD NOT BE CLOSER THAN 175' TO AN INTERSECTION.
7. FINAL LOCATION TO BE DETERMINED BY THE DEPARTMENT OF PUBLIC WORKS.

MERCEDE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

SPEED HUMP MARKING DETAILS

DRAWING MS-12B
ACCESS GATE

NO SCALE

1 1/4" INSIDE DIAMETER x 2" LONG SLEEVE PIPE WELDED TO GATE AND GUARD POST

1" STEEL ROD

GROUND SURFACE (VARIES)

15" DIA. CONCRETE PIER

INSTALL 6" DIA. STEEL PIPE AS SHOWN

6" DIA. STEEL PIPE FILLED WITH CONCRETE. PRIME AND PAINT.

MERCE COUNTY DEPARTMENT OF PUBLIC WORKS IMPROVEMENT STANDARDS

ACCESS GATE

DRAWING MS-14

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APPROVED: 2/24/2009
APPENDIX A
Utilities Occupying County Roadways

1.01 Purpose:
The purpose of this Appendix to the Merced County Department of Public Works Improvement Standard and Specifications is to expand on the specifications contained in Chapter 6 “Services and Utilities”.

This appendix establishes procedures and policies for the issuance of encroachment permits for the initial placement, and adjustment, relocation and maintenance of utilities occupying or adjacent to County roadways and are intended to protect the traveling public from exposure to hazards and also to protect the longevity and maintenance characteristics of the roadway.

1.02 Definitions:
Director - The Merced County Director of Public Works or his authorized representative.
Utility - A public or private company, district, and/or corporation providing any one or more of the following products of services: Electricity, Natural Gas or other Petroleum Products, Telephone, Telecommunications, Cable T.V., Domestic Water, Sewer Companies, and Irrigation Districts.
Road Right-of-Way – The Property currently owned in fee or easement for road purposes by the County of Merced.
Travel Lane - A 12’ wide section of road providing a single direction of travel lying parallel and adjacent to the center-line of that roadway.
Recovery Zone – The area between the outer edge of travel lane and the roadside face of object. In Urban areas that distances is 10 feet and in the Rural areas that distance is 15 feet.
Urban Area – Those unincorporated areas of the County which are designated as Community Plan Areas in the current addition of the Merced County General Plan.

1.03 Conditions of Occupancy:
The streets and Highways Code provides permit authority which conditions utility owners in the use of public road right-of-way with the approval of the Department for transmitting and distributing products and services. All utility encroachments in County road right-of-way shall be designed, installed and maintained so that traffic disruption and hazards to highway users are minimized. The design and location shall be in compliance with these requirements.

1.04 Types of Permits:
The Department will issue three types of utility encroachment permits. One is intended for new installations. Another authorizes routine and/or emergency maintenance activities on an annual basis and the third authorizes replacement of existing overhead lines when the scope of work exceeds routine maintenance.

Possession of Permit Required – The permit or a copy thereof shall be kept at the site of the work and must be shown to any representative of the Department or any law enforcement officer or demand. WORK SHALL BE SUSPENDED IF PERMIT IS NOT AT JOB SITE AS PROVIDED.

Notice Required – Before starting work, the permittee shall notify the Department’s representative. In emergencies, the Department’s representative shall be notified as soon as possible.

Standard of Work – All work shall conform to recognized standards of utility construction and the Department’s current Standard Specifications.

A. Annual Maintenance Permit: Any utility company occupying County road right-of-way must obtain an annual maintenance encroachment permit which authorizes the following activities.
1. Tree Trimming – The permittee may perform tree trimming functions when those trees interfere with the utility’s facilities.

2. Emergency Repairs – The permittee may make emergency repairs, altering traffic flow, excavating through improved surfaces, only when breaks in the conduit, cable or pipeline over or under the pavement present a definite public hazard or serious interruption of essential service. In such cases, the Department’s representative shall be notified as soon as possible.

3. Open Excavations – No excavation shall be left open after daylight hours, unless specifically authorized and adequate protection for traffic is provided in accordance with the Provisions in the current Manual of Traffic Controls published by Caltrans. Backfill and pavement replacement shall be performed in accordance with the applicable Provisions in this manual.

4. Service Connection – These provisions do not authorize installation of new underground conduit, cable, gas pipe or water pipe or services within the County road right-of-way, regardless of the location of any existing main, conduit, pipe or cable. All new installations of underground conduit, pipe, cable or the removal of abandoned service facilities must be covered by a Specific Project Permit. Overhead service connections within the road right-of-way are authorized installations including those which will result in the installation of new poles, provided any new poles are inset no closer to the existing travel lane than the existing distribution poles.

5. Manholes – The permittee may open existing manholes to repair underground cables. Where the manholes lies within the improved surface of the highway, the permittee will provide adequate protection for traffic in accordance with the Provisions in the current Manual of Traffic Controls published by Caltrans.

6. Excavations – For routine inspection and repair of pipeline and cables shall:
   a. Not be made in improved surfaces, landscaped areas or closer than 10’ to the edge of the pavement without a special permit; and
   b. Not uncover more than 50’ of line at any one time.

7. Pole Lines – Permittee is authorized to:
   a. Stub, or resent existing pole, provided no change in location of pole or anchor is made. Stubs and anchors must not be placed between existing pole and traveled way.
   b. Replace poles, guy poles, and cross arms in same location limited to no more than 50% of the poles in any one mile long section of line in any 12 month period of time provided there is increase in the voltage on lines above 50,000 volts. No additional poles or guys poles are authorized under this routine maintenance provision. In emergency conditions where longer sections of lines have been damaged causing serious interruption of essential service those line repairs or replacements can be performed under authority granted in the annual permit.
   c. Replace broken pins and insulators, repair broken wires, pull slack wires, and replace or pull broken or slack guys.
   d. Repair and complete transfer work on existing aerial cables.
   e. Install new and replace existing transformers on existing poles.
   f. Replace aerial wires and cross arms on existing poles. Unless otherwise specifically required by the Department, protected cable, tree wire or plastic tree wire guard used for communication lines may be used through trees where necessary, provided the appearance of the tree or the tree itself will not be damaged.
g. Clear grass from around base of poles and excavate around poles for inspection, including tamping and straightening. The use of herbicides or other chemicals is not authorized by this permit. A separate encroachment permit must be applied for and issued for that purpose.

h. Install a new pole for a new service connection when placing that pole between two existing poles. Said new pole shall not be any closer to the edge of travel lane than the poles supporting the existing line.

i. Extend an existing distribution line for no more than 3500 feet when providing service to a new facility or new customer. All poles necessary for said extension shall be placed in the outside three feet of right-of-way and be at least as far from the edge of travel lane as the existing poles in the line being extended.

B. Specific Maintenance Permit: Authorizes the replacement of existing utility poles when the scope of work exceeds that authorized in the Annual Maintenance Permit and the project line voltage is lower than 50,000 volts or does not increase the existing voltage on lines above 50,000 volts.

1. The replacement of existing Utility Poles in both rural and urban areas shall be set clear of the Recovery Zone defined in this Appendix when there is sufficient road right-of-way to accommodate the relocation and the length of sufficient right-of-way is at least 1300 lineal feet.

2. If there is insufficient road right-of-way to implement said clear recovery area standard the replacement poles may be repositioned longitudinally to reduce the number of poles, guy poles, or guy wires, or to improve design provided that replacement poles shall be placed in the last three feet of existing right-of-way and be no closer to the travel lane than the poles being replaced. Utility shall make a good faith effort to reduce the overall number of poles based upon prudent design practices and economic considerations. In no case under the Specific Maintenance Permit shall the overall number of poles increase.

3. Should the accident history on any section of line being replaced warrant, that replacement project will be jointly evaluated by the permittee and the Director shall determine if the requirements set forth in this document for Specific Project Permits shall be implemented on the evaluated project.

C. Specific Project Permit – Authorizes all new construction projects not authorized in the Annual Maintenance Permit or the Specific Maintenance Permit described above. Utilities to be located within existing road right-of-way, or the clear recovery zone described below, shall require a permit and be constructed in accordance with the approved improvement plans and/or permit specifications and in compliance with these standards.

1. Aesthetics shall be a consideration and as a matter of policy undergrounding of utilities in residential areas will be strongly encouraged.

2. Underground utility projects shall be designed in accordance and conform to the requirements of Section VI of this document.

3. Above ground utility projects shall be designed and constructed in accordance with the following policies and requirements.

   a. In urban areas where curb-gutter and sidewalk are existing utility facilities shall be located in back of the sidewalk or if the sidewalk is separated from the curb and facility may be placed between the curb and sidewalk. But must be at least 1 ½ feet behind the back of curb.

   b. In urban areas where no curb and gutter exists utility installations should be placed at their ultimate location
behind the planned sidewalk. However, should there be insufficient road right-of-way to accomplish this placement the planned utility may be moved closer to the edge of travel lane but must maintain a clear recovery area of at least 10 feet.

c. In rural areas all above ground utility installations shall be located at least 15 feet from the outer edge of travel lane regardless of the existing right-of-way width.

d. All new above ground utilities must conform to the requirements in Chapter 13.24 “Sight Distance at Public Intersections and Private Driveways” of the Merced County Code.

e. Deviations from the above described criteria may be allowed by an approved variance when justified by suitable study considering traffic safety construction cost and impacts to adjacent property. The variance must also be requested by the utility and approved by the Director of Public Works before any of the above criteria can be waived.

f. Specific Project Permits and Specific Maintenance Permits shall be issued promptly by the County upon receipt of a complete application providing all information necessary to issue said permits. The County shall notify the applicant if the application is complete within three working days from receipt of said application and issue the permit with conditions within 10 working days (excluding weekends and holidays) of said notification. If the County fails to issue a permit within the 10 day time frame above, the utility may proceed with the work without a permit; provided, however, that such work must conform to the provision of this appendix.

1.05 Prior Rights:

Nothing in this appendix nor in Ordinance 13.30 is intended to prevent a utility from exercising any right granted by the State of California or a locally issued Franchise Agreement.