MARIPOSA COUNTY RESOLUTION NO. 88 - 418

A RESOLUTION ADOPTING THE MARIPOSA COUNTY IMPROVEMENT STANDARDS

WHEREAS, the Board of Supervisors wishes to adopt technical road standards for the County of Mariposa; and

WHEREAS, the Ad Hoc Advisory Committee appointed by the Board of Supervisors for the purpose of reviewing such standards, has prepared revised Improvement Standards;

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of Mariposa County, a political subdivision of the State of California, that the Mariposa County Improvement Standards, attached hereto as Exhibit A, are approved and adopted.

PASSED AND ADOPTED this 9th day of August, 1988, by the Board of Supervisors of Mariposa County by the following vote:

AYES: BAGGETT, ERICKSON, RADANOVICH, TABER

NOES: DALTON

ABSENT: NONE

ABSTAINED: NONE

ERIC J. ERICKSON, Chairman
Mariposa County Board of Supervisors

ATTEST:

MARGIE WILLIAMS, Clerk of the Board

APPROVED AS TO FORM AND LEGAL SUFFICIENCY:

JEFFREY E. GREEN, County Counsel
MARIPOSA COUNTY

IMPROVEMENT STANDARDS

* * * * *

Adopted by

BOARD OF SUPERVISORS

MARIPOSA COUNTY

August 9, 1988

Resolution No. 88 - 418

BOARD OF SUPERVISORS

District 1 - Arthur Baggett
District 2 - Eugene Dalton
District 3 - Eric Erickson
District 4 - Leroy Radanovich
District 5 - Gertrude Taber

Approved: Wm. C. Lincoln
Director, Public Works
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SECTION 1 - GENERAL

1.1 Introduction & Purpose

(A) The following standards shall govern, guide and control all engineering involved in planning, constructing, modifying or extending any:

(1) Sanitary sewage system

(2) Storm water drainage system

(3) Domestic water distribution system which eventually will be granted, or dedicated to, accepted by, and operated and maintained under any applicable jurisdiction of Mariposa County.

(4) Concrete Structures

(5) Road or street

(6) Erosion Control

(B) The owner, developer, or his agent, and/or contractors, shall keep himself fully informed of all current state, national, county laws, ordinances, resolutions, or regulations which in any manner affect the development or work contemplated. Strict compliance with these standards is required, in order to insure the orderly expansion of roads and utilities to the highest practical standards with a maximum efficiency for the greatest public benefit.

1.2 Definitions

(A) The following terms, when used, herein, shall have these stated respective meanings:

(1) "County" shall mean Mariposa County.

(2) "Board" shall mean the Board of Supervisors of Mariposa County.

(3) "State" shall mean the State of California.

(4) "State Standard Plans" shall mean the Standard Plans of the State of California, Department of Transportation, current editions.
(5) "State Specifications" shall mean the Standard Specifications of the State of California, Department of Transportation, current editions.

(6) "Engineer" shall mean County Engineer of Mariposa County.

(7) "Consulting Engineer" - Any person, firm, or corporation legally authorized to practice civil engineering in the State of California who prepares or submits improvement plans and specifications (usually for an owner or developer) to the County Engineer for approval.

(8) "Contractor" - Any person, firm, or corporation holding a current valid license issued by the Contractors State License Board, Department of Consumer Affairs, State of California, covering the category of work being performed.

(9) "Standard Drawings" shall mean the current standard drawings of Mariposa County.

(10) Whenever in these standards, or in any documents or plans where these standards govern, the following abbreviations or definitions appear, they shall be interpreted as follows. All specifications shall be latest edition.

Abbreviations:

AASHTO - American Association of State Highway & Transportation Officials.
ASCE - American Association of Civil Engineers.
ACI - American Concrete Institute.
CRSI - Concrete Reinforcing Steel Institute.
AISC - American Institute of Steel Construction.
AITC - American Institute of Timber Construction.
ANSI - American National Standard Institute
ASA - American Standards Association.
AWWA - American Water Works Association.
WPCF - Water Pollution Control Federation.
AWS - American Welding Society.
Federal Specs - Federal Specifications
State Specifications - Same as (e) above latest edition.
psi - Pounds per square inch.

Pipe Types
ACP - Asbestos Cement Pipe
PVC - Poly Vinyl Chloride
CIP - Cast Iron Pipe
CL & CP - Concrete Lined and Coated Cylinder Pipe
CMP - Corrugated Metal Pipe
PMP - Perforated Metal Pipe
RCP - Reinforced Concrete Pipe
VCP - Vitrified Clay Pipe
S.P. - Steel Pipe

1.3 Engineering and Construction Policy

(A) The engineering policy of the County requires strict compliance with the Professional Engineers Act of the State of California. All plans, specifications, reports, and documents required by the County shall be signed and stamped with the seal of a Registered Civil Engineer, currently licensed to practice in the State of California, if said engineering is so required by the County.

(B) All engineered facilities covered by these standards shall be constructed by:

(1) Contractors holding a currently valid license issued by the Contractors State License Board, Department of Consumer Affairs, State of California.

(2) The contractor must be licensed in one of the following classifications:

(a) General Engineering Class A

(b) Specialty license covering specialty work being performed.

(C) Safety

(A) Compliance with California State Division of Industrial Safety - Labor Code and Construction Safety Orders.
SECTION 2 - PLANS & SPECIFICATIONS

2.1 General Requirement

(A) Complete plans and specifications, when required, for all proposed streets, or roads, drainage facilities, sewerage and water distributions systems including necessary dedications and easements shall be submitted to the Engineer for approval. Approval must be substantiated by the signature of the Engineer prior to the beginning of construction of any proposed development. Plans will not be approved until all of the requirements of these standards are met as well as:

(1) All requirements of the of Mariposa County Code are met.

(2) All required fees, bonds, agreements, etc. have been paid and/or posted, as per Board Resolution.

2.2 Procedure

(A) Plans, and specifications complete and in accordance with these standards shall be submitted in duplicate, including computations, test data and any other pertinent supporting information as required. No plans will be approved or construction authorized until all requirements are met. Non-conforming submittals will be returned to the Consulting Engineer for corrections and resubmittal. This procedure will continue until the plans have final approval by the Engineer.

(B) Any major changes which may become necessary during construction must be approved by the Engineer and noted on the plans. Minor changes which do not affect the basic design may be approved by the county inspector, but must be shown on the final "As Built Plans" when the project is completed.

2.3 Ultimate Development

(A) Where the improvement plans submitted cover only a portion of the ultimate area to be developed, the plans submitted must be accompanied by the approved tentative map or a site plan, if there is no approved tentative map, showing topographic features and area of the ultimate development to an adequate scale clearly showing the proposed improvements. Facilities proposed for partial development must be adequate for the future ultimate development where applicable.
2.4 Plan Details

(A) Title Sheet

(1) Title sheet dimensions shall be 24" X 36".

(2) Vicinity Map. Scale - 1" = 1000' or larger.

(3) Name of Project.

(4) Name and address of Owner or Developer.

(5) Name, address and signature of the Civil Engineer responsible for field work and preparation of plans.

(6) Approval of the plans does not release the developer of responsibility or correction of mistakes, errors or omissions contained therein. If during the course of construction of the improvements, public interest requires modification of or a departure from County specifications, or these improvement plans the Engineer shall have the authority to require modification or departure and to specify the manner in which the same is made.

(B) Plan and Profile

(1) Plans

(a) All improvement plans shall be prepared on plan and profile sheets the dimensions of which shall be 24" x 36", drawn to a scale of 1" - 50' or larger. Storm drainage, sanitary sewer and water distribution systems may be shown on the street or road plans or separately.

(b) A complete set of plans shall consist of the following:

(1) Title sheet with vicinity map. Scale 1" = 1000' or larger.

(2) Overall layout sheets showing complete storm drainage system, sanitary sewer system, and water distribution system, to a scale of 1" = 100' or larger. The layout sheet shall show all the lines sizes, structures, valves, blow offs, loops, crossovers, tanks, wells, drop inlets, rodding inlets, etc.
Each system shall be shown on separate sheets.

(c) Construction plans shall show all pertinent construction data such as:

(1) Elevation datum and bench marks.

(2) Horizontal alignment, right-of-way lines, easements, boundary line and the number of lots fronting on streets, road widths, sewer lines, water lines, culverts, and all appurtenant structures.

(3) All horizontal curve information.

(4) Typical structural sections for each type of road within improvement.

(5) Roadway centerline stationing at fifty foot intervals.

(2) Profile

(a) Profile shall show:

(1) Finish roadway centerline elevations at fifty foot intervals, rate of grade, and vertical curve information. Vertical scale shall be 1" = 10'. (Maximum)

(2) Flow line and slope of ditches, curb and gutters, where applicable, invert elevation of all culvert inlets and outlets.

(3) Invert elevation of all sewer manholes, rodding inlets and sewer line slopes.

(4) Depth of all water lines.

(3) Stationing and Orientation

(a) Stationing on plans shall read (increase) from left to right.

(b) Plans shall be so arranged that the north arrow points toward the top of the sheet or away from the viewer insofar as possible.
SECTION 3 - INSPECTION, COMPLIANCE AND ACCEPTANCE

3.1 Inspection

(A) Any improvement constructed to County standards must be inspected during construction by a representative of the Engineer.

(B) The County will hold the owner, developer or his agent responsible for compliance with the County requirements for the whole project until final acceptance by the County.

3.2 Compliance

(A) All material and workmanship that is to become a permanent part of any improvement covered by these standards, shall conform to the requirements for the particular material or workmanship as set forth in these standards. The contractors or developers shall supply any and all certificates of compliance, certified test results, or shall perform tests as required to assure the County that the material being incorporated into the work has met the requirements as specified.

3.3 Acceptance

(A) Prior to final acceptance by the County of any improvements constructed in compliance with these standards, the following requirements shall be completed:

(1) The contractor shall by letter request a final inspection by the Engineer or his representative.

(2) Any deficiencies noted during the final inspection shall be corrected.

(3) The consulting engineer shall prepare a complete and accurate reproducible (Polyester Film or Linen) set of "As Built" plans, when so required by the Engineer. These plans shall be signed by both the Consulting Engineer and the Engineer. These "As Built" plans are to be filed in the office of the Engineer as a permanent County record.

(4) When all of the above requirements have been executed, the Engineer by letter will inform the contractor and the developer that the improvements are ready for acceptance by the County as complete.
SECTION 4 - EARTH WORK-UNDERGROUND UTILITIES

4.1 Description

(A) Earthwork shall consist of performing all operations necessary to excavate all material, of whatever nature, required for the construction of sewer lines, storm drainage lines, culverts, water lines, and any other appurtenant structure as required; to place bedding and backfill material, under, around and over sewer lines, storm drainage lines, culverts, water lines and other appurtenant structures; to remove unsuitable material and replace with suitable material as required.

4.2 Trench Excavation, Tunnels, Bore and/or Jacked Pipes

(A) Excavation

(1) Excavation shall be made only after the material to be used in the work is delivered to the jobsite. In public street areas, excavation and pipe laying shall be coordinated so that a minimum of interference with public traffic will occur. Encroachment permit is required for work to be done on any county road.

(2) If for any reason work is suspended for a period of over two days, the exposed ends of any pipe line under construction shall be plugged to keep out foreign material and the trench shall be barricaded or fenced. Where excavation occurs in paved areas, the pavement shall be scored or sawed ahead of the trenching operations. The proper tools or equipment shall be used so that the pavement will be cut accurately and trimmed to neat lines parallel to the trench at the required width. Any pavement damaged outside the trench limits shall be neatly and accurately cut and trimmed and pavement replaced by the contractor.

(B) Trench Width and Shoring

(1) Safety is the contractor's responsibility. Attention is called to the "Trench Construction Safety Orders" of the California State Division of Industrial Safety which the contractor is required by law to obey. The contractor shall furnish, install and maintain all sheet piling, lagging, timbering or bracing as may be required.
(2) All lagging, sheet piling or any other timbering or bracing used in the trench construction shall be removed prior to or during backfilling operations in such a manner as not to create any excessive load on, or movement of the pipe.

(3) In the absence of detailed information on the plans the minimum trench width shall be eight (8) inches wider than the greatest external diameter of the pipe and the maximum trench width shall not be more than sixteen (16) inches wider that the greatest external diameter of the pipe.

(4) Trenches shall be excavated with full depth; vertical sides whenever possible.

(5) Where conditions require side sloping of trenches, the minimum vertical trench shall be from the bottom of the trench to one (1) foot over the top of the pipe.

(C) Unsuitable Material

(1) In advance of placing any underground pipeline, conduit or appurtenant structures, existing material which in the opinion of the Engineer is unsuitable as a foundation, including but not limited to vegetal matter, garbage and junk piles either on the surface or buried shall be removed and disposed of and the over excavation backfilled and compacted to the required grade.

(2) In rock, or a mixture of rock and soil excavations, such material shall be excavated six (6) inches below the bottom of the pipe and the over excavation shall be filled to proper grade with properly compacted imported material.

(D) Line and Grade Stakes

(1) Line and grade stakes conforming with the plans and profile will be set under the direction of the Consulting Engineer on an offset line parallel to the centerline of pipeline or structure to be constructed. These stakes shall be carefully maintained by the contractor in place until that portion of the work for which the line and stakes were set has been completed, inspected and accepted.

(E) Tunnels, Bores and/or Jacked Pipes
(1) Tunnels

(a) Where tunnels without conductor pipes are permitted, they may be drilled with approved equipment which will cut to true line and grade, or they may be excavated by standard tunneling methods using shoring.

(2) Bores and Jacked Pipe

(a) Where designated on the plans, or permit, approved metal conductor pipes shall be placed in bored holes or jacked under the area to be crossed. The minimum interior diameter of the conductor pipe shall be eight (8) inches greater than the maximum outside diameter of the carrier pipe which is to be placed therein. All conductor or casing pipes shall be sealed at both ends in such a manner so as to provide a water proof seal.

(b) When metal or concrete pipes are jacked with or without a carrier pipe, guide rails shall be accurately set to line and grade so that the pipe will be guided true to line and grade. Jacks and bearing plates of sufficient size, number and strength to jack the pipe true to line and grade shall be used.
SECTION 5 - INSTALLATION, BEDDING & BACKFILL

5.1 Pipe Laying and Appurtenant Structures

(A) Installation

(1) All pipes, conduits, culverts, etc. and appurtenant structures shall be laid or constructed to the prescribed line and grade as shown on the plans. A grade line shall be established before any pipe is laid in the trench. Each length of pipe shall be checked for grade. Unless approved by the Engineer, all pipes shall be laid without break, up grade from the point of connection to an existing line or between structures with the bell end upgrade.

(2) Unsuitable foundation material shall be excavated and replaced with compacted bedding material to the required grade, as required by the Engineer.

(3) All pipes, conduits, culverts, etc. shall be bedded with a minimum of four (4) inches of compacted bedding material to provide full bearing of the pipe, conduit, etc. and adequate bell hold excavations shall be made. In an area of rock excavation, all pipes, conduits, etc. shall be bedded with a minimum of six (6) inches of compacted material to provide full bearing of the pipe, conduit, etc. and adequate bell hold excavations shall be made as required.

(4) All pipes, conduits, culverts, etc. and any connections made to existing lines shall be inspected and approved prior to any backfilling.

(5) All lines which are to be installed in conductor pipes or casing shall be laid on approved treated redwood skids, shaped so as to give full support to the pipe. The pipe shall be laid or jointed on the approved skids set to grade, then jacked or slid into place.

5.2 Bedding, Backfill, Compaction

(A) Type I
(1) Whenever ground water conditions are encountered, all pipe, conduits, etc. and appurtenant structures shall be constructed on a minimum of six (6) inches of Type I bedding. All pipe laying and concrete work for appurtenant structure foundation is to be "in the dry", the contractor at all times shall control the ground water level so as to enable all work to be executed "in the dry".

(2) Type I bedding material shall meet all of the quality requirements of Sec. 26 for class 2 aggregate base of the State Specs.

The grading of Type I bedding shall be as follows:

<table>
<thead>
<tr>
<th>U.S. Standard Sieve</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4&quot;</td>
<td>100%</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>5%</td>
</tr>
</tbody>
</table>

No material shall be used as Type I bedding unless it has been approved by the Engineer.

(B) Type II Bedding

(1) Type II bedding shall consist of all material returned to the trench from four (4) inches below the pipe, culvert, conduit, etc. to one (1) foot over the top of pipe, culvert, conduit, etc. These dimensions shall be after compaction and not loose depths.

(2) Type II bedding material shall meet the following requirements:

<table>
<thead>
<tr>
<th>U.S. Standard Sieve</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>100%</td>
</tr>
</tbody>
</table>

No. 200     Not more than
10%

Sand equivalent of at least 35, as per Test Method No. Calif. 217, Department of Transportation. No material shall be used for Type II bedding unless it has been approved by the Engineer. Where required, Type I bedding shall be used in conjunction with Type II bedding.
(C) Backfill

(1) Backfill shall include all material placed in the trench as backfill from the top of the Type II bedding up to the top of the roadway or up to original ground when construction takes place outside the roadway. Material for backfill may consist of trench excavation or imported backfill, at the contractor's option. Material for backfill shall consist of no rocks greater than six (6) inches maximum dimensions and enough fines to adequately fill all voids.

(2) Backfill placed within a roadway shall be compacted to a relative density of ninety (90) percent, up to within two (2) feet of the roadway base material. The top two (2) feet shall be compacted to a final density of ninety-five (95) percent of maximum density at optimum moisture content as determined by Test Method No. Calif. 216 or 231 as per State Specs.

(a) Backfill placed within the roadway section, shall be compacted by mechanical means only.

(b) Backfill placed outside the roadway section, shall be compacted to a relative density of eighty (80) percent at optimum moisture content as determined by Test Method No. Calif. 216, or 231 as per State Specs. Outside the roadway section backfill may be compacted by mechanical means, by jetting or by a combination of both, as long as the required results are obtained.

(D) Compaction

(1) All Type I and Type II bedding material shall be mechanically compacted to a final density of ninety (90) percent of maximum density at optimum moisture content as determined by Test Method No. Calif. 216 or 231 as per State Specs.
SECTION 6 - MATERIALS (GENERAL)

6.1 Portland Cement Concrete, Mortar and Grout

(A) All Portland cement shall be Type II conforming to ASTM Designation: C 150.

(B) Portland Cement Concrete

(1) All grading of aggregate, proportioning, mixing, placing, finishing and curing of Portland cement concrete shall comply with Section 90 of State Specs. Classification as to class of concrete shall comply with State Specs.

(2) Combined aggregate grading limits shall be the one and one half (1 1/2) inch maximum, or the three quarter (3/4) inch maximum as listed in Section 90 of the State Specs.

(3) No admixture of any nature shall be used in the mixing of Portland cement concrete without the expressed approval of the Engineer.

(C) Mortar and Grout

(1) Mortar shall be composed of one (1) part Portland cement and two (2) parts sand by volume.

(2) Grout shall be composed of one (1) part Portland cement and one and one-half (1 1/2) parts sand by volume.

(3) All mortar and/or grout shall be proportioned and mixed so as to comply with Section 650 of the State Specs. No admixtures of any nature shall be used in the mixing of the mortar and/or grout without the expressed approval of the Engineer.

6.2 Reinforcing Steel and Wire Mesh

(A) Steel reinforcement and/or mesh reinforcement shall be of a size shown and be placed in concrete structures in accordance with the details as shown on the plans or Standard Drawings, or as directed by the Engineer.
(B) Bar reinforcement shall conform to ACI 318, latest edition. Tie wire shall be No. 14 or No. 16 steel wire.

(C) Mesh reinforcement shall be a standard type of electrically welded wire fabric as specified in ASTM Designation: A 185.

(D) All reinforcement steel and/or wire mesh shall be designed, fabricated, placed and supported in the forms, all in accordance with ACI 318 and ACI 315.

6.3 Gray Iron Castings

(A) Cast iron used in the manufacture of manhole frames and covers, rodding and flushing inlets, curb inlets, grates, etc., shall comply with ASTM Designation A 48 Class 30. All cast iron castings shall be coated in accordance with Paragraph 9 ASTM Designation: A 74. Covers and frame seats shall be machined to provide a true even fit, provide firm support and prevent rattling.

6.4 Miscellaneous Iron and Steel

(A) All steel used in the manufacture of grates, frames, plates, anchors, etc. shall conform to ASTM Designation: A 36. All metal castings and fabrications shall be constructed in accordance with the details on the plans or Standard Drawings. Finished members shall be true to line and free from twists, bends and open joints.

(B) All welding shall be done in accordance with the requirements of the American Welding Society.

6.5 Galvanizing

(A) Metal work which is to be galvanized shall be galvanized by the hot zinc dipped process after complete fabrication. Welding of members after galvanizing will not be permitted. All galvanizing shall be in accordance to ASTM Designation: 153.
SECTION 7 - STRUCTURES

7.1 Reinforced Concrete Structures

(A) All reinforced concrete structures shall be constructed to line, grade and detail, as shown on the plans or the Standard Drawings.

(B) Forms, Ties and Joints

(1) All forms shall conform to the shape, lines, and dimensions of the members as called for on the plans. Forms shall be adequately braced, tied, and supported to support all of the imposed loads due to the placing of concrete.

(2) All concrete structures shall be formed on both sides, whenever practical. All reinforcing steel or embedded steel anchors or castings shall be firmly and accurately placed and supported in place with metal hangers, chairs or other satisfactory metal supports.

(3) Expansion and construction joints shall be located where shown on the plans or approved by the Engineer. Expansion joint filler material shall be performed, nonextruding bituminous fiber conforming to ASTM Designation: D 1751.

(4) All concrete shall be consolidated to the maximum density so that it is free from pockets of coarse aggregate and voids around embedded materials and form corners.

(5) Forms shall be removed in such a manner as to insure the complete safety of the structure and cause a minimum of damage to the finish. All transition channels, inverters or any area over which water is to flow shall be smooth finished so as to cause a minimum of resistance to flow.

(6) All repair of concrete structures such as rock pockets, voids or deformations shall be completed within twenty-four (24) hours after form removal. All material and methods of concrete repairs shall be in accordance with the procedures of the American Concrete Institute.
SECTION 8 - SANITARY SEWERAGE

8.1 General

(A) Sanitary sewer lines and appurtenances within County jurisdiction shall be constructed in accordance with the details shown on plans and specifications approved by the Engineer. Where such sewer system is to be operated and/or maintained by any District, the plans, specifications and construction must be approved by that District.

8.2 Design Standards

(A) Sanitary Sewers

(1) The following guide lines shall be followed in computing contributing sewage:

(a) The average family unit shall be four (4) persons per residential unit.

(b) The average daily discharge of domestic sewage shall be one hundred (100) gallons per day per person. Design discharge shall be one and one-half (1 1/2) times this or one hundred and fifty (150) gallons per day per person for peak discharge.

(c) Infiltration allowances will be (600) gallons/acre served/day, or between two hundred fifty (250) and five hundred (500) gallons/day/inch diameter/mile of sewer.

(d) Main sewers up to fifteen (15) inches inside diameter shall be designed to flow five-tenths (0.5) full. Trunk or main sewers over fifteen (15) inches inside diameter may be designed to flow seven tenths (0.7) full.

(e) Under no condition is a gravity sewer ever to be designed to flow under a head.

(2) Sewer Velocity and Quantities

(a) Minimum design velocity for any sanitary sewer shall be two (2) feet per second, for pipes flowing full or half full.
(b) Velocities in sanitary sewers shall be computed using Manning's formula with a constant "n" value depending on type of pipe used.

(3) Maximum Discharge

(a) Since sanitary sewers are to be designed with no head on the inlet, the maximum design discharge shall not exceed the flow at critical slope and velocity, due to the unstable flow conditions at critical slope and critical velocity. Sanitary sewers should not be designed for these conditions, but maximum design discharge should not exceed flow under these conditions regardless of greater slope.

(B) Manholes

(1) Manholes shall be placed at the intersections of all main sewer lines.

(2) Manholes shall be placed at all changes of alignment either vertical or horizontal.

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

(4) A one-tenth (0.1) foot energy drop shall be allowed for flow through manholes.

(5) Invert elevations of varying size pipes leading into and out of manholes shall be set by matching the total energy gradients of the pipes.

(C) Drop Manholes

(1) Whenever the vertical distance between the inverts of lines connection of a manhole exceeds eighteen (18) inches, a standard drop manhole shall be constructed.

(D) Rodding and Flushing Inlets

(2) Rodding and flushing inlets shall be constructed at the end of all sewer mains.
8.3 Sewer Line Location, Alignment, Cover, and Size

(A) Location

(1) All sanitary sewers and appurtenant structures shall be located as close to the roadway center line as practicable. In no case shall a sanitary sewer line be located closer than two (2) feet from an existing or proposed gutter lip. Sanitary sewer lines shall be laid out on the opposite side of the roadway centerline from the water lines. The entire sanitary system shall be located as mentioned above and shall be designed to clear all other existing or proposed utilities by six (6) inches.

(2) Location of sewer lines in easements shall be kept to a minimum. Whenever possible, sewers shall be placed in the public roadway. Where sewer lines are located in easements, the easements shall be:

(a) Granted with Subdivision Map, or

(b) Be dedicated to and accepted by the County.

(c) The minimum width of any easement for sanitary sewer purpose shall be twenty (20) feet wide. In special cases of terrain, depth of sewer line, etc. the required easement width may be varied. All easements shall include right of ingress and egress over adjoining property for maintenance, replacement and operation.

(B) Cover

(1) Minimum cover for any sewer line shall be three (3) feet. Any deviation from this cover shall require special design and approval by the Engineer.

(C) Size

(1) Minimum line size for any sewer main shall be six (6) inches inside diameter.

(D) Laterals and/or Side Sewers, Cleanouts, Backflow Preventers
(1) Minimum size of any sanitary lateral or side sewer to serve individual residences, commercial structures, etc. shall be four (4) inches. Actual size of laterals larger than four (4) inches shall be determined by fixture unit requirements as per the current edition of the Uniform Plumbing Code.

(2) Each sanitary sewer lateral shall have a cleanout at the property line, or roadway or sewer main easement, as per Standard Drawings.

(3) Each structure with installed plumbing at an elevation such that there could be a backflow of sewage from the main, in case of a main stoppage, shall be equipped with a backflow preventer or an overflow device installed in the lateral behind the property line.

(E) Special Designs

(1) Special structures, such as pump stations, pressure lines and sags, etc shall require special considerations and approval by the Engineer.

(F) Sewage treatment

(1) Sewage treatment shall have approval of governing agencies.

8.4 Materials and Installation

(A) General

(1) All material that is to become a permanent part of any sanitary sewer or appurtenant structure shall conform to the requirements for the particular material as set forth in these Specifications. The Contractor shall supply any and all certificates of compliance, certified test results or shall perform tests as required to assure the Engineer that the material being incorporated into the work has met the requirements as specified. Request to use materials not listed in these Standards shall require special consideration and approval of the Engineer.
(B) Pipe and Pipe Joining Material

(1) All pipe or conduits shall be of the size, material and strength as shown on the plans. All pipe fittings shall be marked or stamped with the trade brand name of the manufacturer, and strength or class of pipe. All pipe shall be designed to withstand all internal or external loads applied.

(2) Supporting strength of conduits as installed to safely carry imposed gravity loads and superimposed loads (including a suitable factor of safety) shall be determined by use of Marston's formula as per Chapter IX (Structural Requirements) ASCE Manual of Engineering Practice No. 37. All pipe or conduits shall be of the same material between structures.

(a) Asbestos Cement Pipe and fittings shall conform to Federal Specifications SS-P-331 B Asbestos-Cement, Sewer Non-pressure or ASTM Designation: C 428, Non-Pressure. Asbestos cement pressure pipe shall conform to ASTM Designation: C 296. Rubber rings used for joining asbestos-cement pipe couplings shall be as recommended by the manufacturer and conform to ASTM Designation: D 1869.

(1) All asbestos-cement pipe shall have a minimum crushing strength of 1500 pounds per foot.

(2) Pipe Lengths

(a) Lateral sewers - Maximum length, for lateral sewers within public right-of-way shall be half-lengths or six and one-half (6 1/2) feet.

(bb) Maximum lengths of pipe whose crushing strength exceeds 1500 pounds shall be thirteen (13) feet.

(cc) Maximum length of pipe which is rigidly connected to a structure shall not be over six and one-half (6 1/2) feet or a half-length.
(2) **Cast Iron Pipe and Fittings**

(a) All cast iron pipe and fittings for main sewers shall be at least Class 150 and conform to AWWA Standards C 106-75. Joints shall be approved type mechanical joints. No lead joints will be allowed.

(b) Cast iron pipe and fittings for laterals within the public right of way shall be new, first quality and conform to AWWA Standards C 106-75, Cast Iron Soil Pipe and Fittings.

(c) Concrete Lined and Ductile Iron Pipe CL and DI shall be cement mortar lined in accordance with AWWA Standards C 104-74.

(3) **Polyvinyl Chloride Pipe and Fittings**

(a) PVC pipe and fittings shall conform to ASTM Designations: D 3034, D 2564, D 2665, D 2729, and F 679, and to SDR 35.

(C) **Manholes**

(1) All manholes shall be water tight structures and shall have steps from top to bottom. Manholes shall be constructed to grade as shown on the Standard Drawings. Precast reinforced concrete manhole risers and tops shall conform to ASTM Designations: C 478. Precast tops shall be the eccentric cone type. All cement used in the construction of concrete manholes shall be Type II and conform to ASTM Designation: C 150.

8.5 **Final Acceptance**

(A) **Cleaning**

(1) Prior to acceptance of any sewer line by the County, the Contractor shall clean all lines with a Wayne-type sewer cleaning ball under hydrostatic pressure. Any stoppage, dirt or foreign matter shall be removed from the lines. All cleaning and testing of sewer lines shall take place after all construction work is completed, up to but not including the final paving. The system will be inspected after final paving is completed and any damage to the system during final paving and cleanup will be corrected before acceptance.
(B) Testing

(1) Prior to final acceptance all sewer lines shall be tested for leakage by use of the low pressure air test. The test shall be performed using the following procedures and under the observation of an Engineer's representative. Prior to testing, all pipe shall be flushed clean or other approved cleaning methods used to assure pipe contains no debris or any nature (see (A) above).

(2) After a manhole-to-manhole reach of pipe has been backfilled and cleaned, the pneumatic plugs shall be placed in the line at each manhole and inflated to 25 psig. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 psig. At least two minutes shall be allowed for the air to stabilize.

(3) After the stabilization period (3.5 psig minimum pressure in the pipe), the air hose from the control panel to the air supply shall be disconnected. The portion of the line being tested shall be termed acceptable if the time required in minutes for the pressure to decrease from 3.5 to 2.5 psig shall not be less than the time shown for the given diameters in the following table.

<table>
<thead>
<tr>
<th>Pipe Diameter* (Inches)</th>
<th>Minimum Time (Min&amp;sec)</th>
<th>Length for Min. Time* (feet)</th>
<th>Time for Longer lengths (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2:50</td>
<td>0-398</td>
<td>0.427 X Length</td>
</tr>
<tr>
<td>8</td>
<td>3:47</td>
<td>0-298</td>
<td>0.760 X Length</td>
</tr>
<tr>
<td>10</td>
<td>4:43</td>
<td>0-239</td>
<td>1.187 X Length</td>
</tr>
<tr>
<td>12</td>
<td>5:40</td>
<td>0-199</td>
<td>1.709 X Length</td>
</tr>
</tbody>
</table>

* Main line pipe diameter and main line length (manhole-to-manhole). Main line sections of pipe being tested shall also include all house service laterals for each section, but no additional length or time will be allowed for the house service lines.

(4) All testing and cleaning equipment shall be supplied by the Contractor.
SECTION 9

DOMESTIC WATER SUPPLY AND DISTRIBUTION SYSTEM

9.1 General

(A) Water systems and appurtenances within County jurisdiction shall be constructed in accordance with the details shown on plans and specifications approved by the Engineer. Where such water system is to be operated and/or maintained by any District, the plans, specifications and construction must be approved by that District.

9.2 Distribution System

(A) Flow Requirements

(1) For design purposes the daily per capita use shall be one hundred and fifty (150) gallons per day, and the average family or residential unit shall be four (4) persons per unit.

(2) Fire flow shall be determined by appropriate fire authority.

(3) Commercial establishments, schools, etc. shall be studied on an individual basis.

(B) System Layout

(1) The distribution system layout shall be laid out in a grid form wherever possible, so as to attempt to equalize the pressures within the system under use. Sizes and depth of lines shall be in accordance with AWWA Standards.

(a) Layout and Location

Mains shall be laid out in the dedicated roadway wherever possible so as to keep easement requirements to a minimum. Mains shall be laid out on the opposite side of the roadway centerline from the sanitary sewer lines - preferably within five (5) feet of the roadway centerline. Mains shall be laid out a minimum of ten (10) feet from sewer lines which run parallel.

9.3 Design Standards
(A) Line Size

(1) Minimum size of any main supplying both domestic and fire demand shall be six (6) inches inside diameter.

(B) Depth

(1) Minimum cover for water mains shall be thirty-six (36) inches. Minimum cover for services shall be twenty-four (24) inches. Any variations from these minimums shall have special approval of the Engineer. Wherever a water main crosses a sewer line the water main shall be at least one (1) foot above the sewer line.

(C) Valves, Hydrants, Blow-offs, etc.

(1) Shut off valves

(a) At least three (3) valves shall be placed at crosses. At least two (2) valves shall be placed at tees.

(b) The systems shall be designed and valves placed so that not more than eight hundred (800) feet of line will have to be removed from service for repairs, maintenance, etc.

(2) Pressure Reducing Valves

(a) Whenever pressure reducing valves are installed within the system they shall be located within a concrete vault and be installed between shut off valves with flexible connections for quick removal for repair, as per Standard Drawings.

(3) Fire Hydrants and Blow Offs

(a) Fire hydrants shall be located at street intersections wherever possible and shall be spaced along the street frontage at maximum intervals of five hundred (500) feet. The minimum size main serving a fire hydrant shall be six (6) inches. Fire hydrants shall be installed as per Standard Drawings. Blow offs or fire hydrants shall be installed on all permanent dead ends. Blow offs and fire hydrants shall be installed as per Standard Drawings.
(4) Service Lines

(a) Service lines from the water main to the property line shall normally be installed when the distribution system is constructed. Services shall be installed with a corporation stop at the main and a curb stop at the property line. Services shall be installed as per Standard Drawings.

(5) Location Devices

(a) All non-metallic water mains shall have a bare single strand No. 10 soft copper wire laid over the water main during construction. The copper wire shall be spliced and brought up into the valve boxes. The copper detector wire shall be taped to top of pipe and installed as per Standard Drawings.

(b) Location type shall be required as specified by the Engineer.

9.4 Materials and Installation

(A) General

(1) All material that is to be come a permanent part of any water system or appurtenant structure shall conform to the requirements for the particular material as set forth in these Specifications. The Contractor shall supply any and all certificates of compliance, certified test results or shall perform tests as required to assure the Engineer that the material being incorporated into the work has met the requirements as specified. Request to use materials not listed in these Standards shall require special consideration and approval of the Engineer.

(B) Pipe and Conduits

(1) All pipe or conduits shall be of the size, material and strength as shown on the plans. All pipe fittings shall be marked or stamped with the trade brand name of the manufacturer, and strength or class of pipe. All pipe shall be designed to withstand all internal or external loads applied.
(2) Supporting strength of conduits as installed to safely carry imposed gravity loads and superimposed loads (including a suitable factor of safety) shall be determined by use of Marston's formula as per Chapter IX (Structural Requirements) ASCE Manual of Engineering Practice No. 37. All pipe or conduits shall be of the same material between structures.

(C) Pipe and conduits within the distribution system shall be designed to withstand all possible increased stresses due to "Water Hammer", etc.

(1) Asbestos-Cement Pipe (pressure) shall conform to AWWA Standards C 400-71 or C 407-75.

(a) Rubber rings used for joining asbestos-cement pipe couplings shall be as recommended by manufacturer and conform to ASTM Designation: D 1869.

(2) Ductile Iron Pipe and Fittings shall be at least class 150 and conform to AWWA standards C 151-76. Joints shall be approved type mechanical joints. No lead joints will be allowed.

(3) Concrete Lines and Coated Steel Cylinder Pipe CL and CP shall conform to California Administrative Code Title 22 Specifications. Gaskets shall be designated in the above Specifications.

(4) Polyvinyl Chloride Pipe and Fittings shall meet AWWA C 900 and all the requirements of ASTM Designations: D 1784, D 2241, D 2152, D 1598, D 1599, D 790 and Commercial Standard CS 256-63.

(5) Services

(a) Minimum size service lines from main up to water meter shall be one (1) inch PVC SCH 80.

(b) All service lines shall be installed as per Standard Drawings.

(6) Gate Valves

(a) Gate valves shall be AWWA C 500 Iron body, non-rising stem, resilient seat type.
(D) Earthwork Installation and Backfill

(1) Earthwork, installation and backfill involved in the construction and installation of any water supply and distribution system shall adhere to Section 4 and Section 5 of these standards.

9.5 Final Acceptance

(A) Prior to the final acceptance the complete system shall be:

(1) Flushed and cleaned of all foreign material.

(2) Complete system shall be subjected to a hydrostatic pressure test for leakage at a minimum pressure of fifty (50) psi above maximum design operating pressure, with a minimum test pressure of one hundred seventy-five (175) psi.

(3) The complete system shall be disinfected and tested as per AWWA Standards. The contractor shall supply all equipment, labor, material, and perform all tests as required prior to final acceptance.
SECTION 10

STORM WATER DRAINAGE SYSTEM

10.1 General

(A) These standards shall govern the design and construction of any storm water drainage system to be dedicated or granted to Mariposa County for maintenance and operation.

(B) The drainage study and basis of design for any proposed development shall include not only the areas to be developed, but shall include all tributary areas draining to or through the proposed development. Drainage facilities shall be of adequate size to accommodate the whole tributary area as well as that portion of the drainage basin being developed. Data used in the design of storm water drainage facilities including rainfall intensity and duration, concentration periods and coefficients of runoff, hydrographs, etc. shall be submitted to the Engineer for approval along with development and construction plans.

(C) Changes or diversion of the natural drainage pattern will only be allowed within the development. Natural drainage channels above and below the development must be maintained in their original alignment both horizontally and vertically, unless special agreement, approved by the Engineer, has been executed with adjoining property owners.

10.2 Location, Capacity, Easements

(A) Location

(1) Drainage lines, structures, conduits and channels shall be located:

(a) In the public right-of-way whenever possible.

(b) In drainage easements dedicated by a map.

(c) In drainage easements dedicated to and accepted by Mariposa County.
(B) Capacity

(1) Inlet, outlet and flow line elevation and capacity of the proposed drainage system shall be designed so that the system may be extended, in the future to serve the entire drainage basin at the time of ultimate development.

(C) Easements

(1) Widths

(a) Minimum width of any drainage easement shall be ten (10) feet. Dedication of any easement shall include right of ingress and egress for operation, maintenance and replacement.

(b) For larger diameter and deeper conduits easements widths shall be increased as required.

(c) Easements for open channels, lined or unlined, shall be of adequate width to contain the channel, including side slopes and a minimum fifteen (15) foot maintenance road.

10.3 Design Standards

(A) Runoff Frequency Study Method

(1) Can be used when peak flow records exist for a given stream and near the location of the proposed structure.

(2) Data is usually obtained from the Department of Water Resources, State of California.

(3) Records usually only exist for a short period of years.

(4) Record data must be projected over a 100 year period using the methods of probability.

(5) All data and computations must be submitted to the Engineer for approval.

(B) Rational or Cal Trans Method
(1) Shall be used when no peak flow records exist for a given stream, near the location of the proposed structure.

(2) Computations shall include a minimum of the following:

(a) Drainage area in acres with a copy of the map(s) used to obtain same.

(b) Rainfall intensity in inches per hour (Minimum for Mariposa County will be one (1) inch per hour.)

(c) Runoff coefficients which generally will range from 30 to 70 percent for most regions of Mariposa County.

(3) All data and computations must be submitted to the Engineer for approval.

(C) Manning's formula can be used to compute capacities, etc. of all conduits open or closed.

(D) The "n" values to be used are:

(1) Precast reinforced concrete pipe (RCP) 0.013

(2) Cast in place (No Joint). 0.015

(3) Corrugated steel pipe (CSP) no paving or lining. 0.021

(4) Corrugated steel pipe (CSP) fully lined. 0.013

(5) Gunite or concrete lined open channels. 0.016

(6) If unlined earth, channels minimum 0.035

(E) Other Methods

(1) The Engineer will consider other methods for design runoff, but they must have the Engineers approval prior to their use.

(2) It will be the responsibility of the applicant to provide any data and/or computations to support the use of any other method.
(F) Minimum velocity allowed in any conduit shall be two (2) feet per second.

(G) Maximum Velocity

(1) Maximum velocity allowed in any unlined earth channel shall be five (5) feet per second.

(2) Maximum velocity in any conduit open or closed shall not exceed ten (10) feet per second without special design and approval.

(H) All open channels shall be designed with a minimum of one (1) foot of free board.

(I) Energy Gradient

(1) The total-energy line shall be at least one half (1/2) foot below the elevation of any inlet grate, gutter lip or any inlet structure or manhole cover.

(J) Maximum length

(1) Unlined roadside ditches in erodible soil shall be two hundred and fifty (250) feet.

(K) Conduit Size

(1) Minimum; size of any drainage conduit shall be eighteen (18) inches inside diameter.

(2) The only exception shall be for access roadway culverts, or by the expressed approval of the Engineer.

(L) Full Flow Conditions

(1) All structures shall be designed to handle the flow rates obtained from the methods in this section.

(2) All structures shall be so designed and installed to be structurally stable under the flow and traffic condition imposed on it.

(3) The Engineer may, at his discretion, require that any structure or part thereof, be designed by a Registered Professional Engineer.
(M) Overtopping Flow Structures

1. All structures shall be designed to handle a minimum of fifty (50) percent of the flow obtained from the methods in this section.

2. All structures shall be so designed and installed to be structurally stable under the flow and traffic conditions imposed on it. Special attention shall be paid to the portion of the structure that will handle the flow under overtopping conditions. The design shall insure that the structure and/or roadway will not be damaged or require maintenance after overtopping occurs.

3. All proposed overtopping structures of this type will require Planning Commission approval prior to the Engineer taking any action regarding their design or installation.

4. The Engineer may, at his discretion, require that the structure or parts thereof, be designed by a Registered Professional Engineer.

(N) Manholes or Junction Boxes

1. Manholes or Junction boxes shall be constructed at all:

   a. Changes of horizontal or vertical alignment.

   b. Change in conduit sizes.

   c. Junction points.

   d. Manholes shall be located at the B.C. and E.C., and at a minimum spacing of four hundred (400) feet along curves. All curve information for drainage conduits shall be shown on the plans. The minimum radius of curvature and joint deflections for curved conduits shall be as recommended by the manufacturer and approved by the Engineer.

(O) Miscellaneous Structures
(1) All of the following miscellaneous drainage structures shall conform in design and material to the State Standard Plans, State Standard Specifications and County Improvement Standards. Any special design problem such as storm water pumping stations, sags, etc. shall be designed and approved on an individual basis.

(a) Catch basins.
(b) Drop inlets.
(c) Grates.
(d) Box culverts.
(e) Wing walls.
(f) Head walls.
(g) Flared inlet and outlet sections.
(h) Overside drains.
(i) Underdrains.
(j) Arch culverts, concrete or metal.
(k) Trash racks.
(l) Fencing, including gates.

10.4 Materials

(A) General

(1) Same as Section 6 of these standards.

(B) Closed Conduits

(1) Reinforced Concrete Pipe

(a) Reinforced concrete pipe shall meet all of the requirements of ASTM Designation: C 76.

(2) Cast in Place Concrete Pipe

(a) Cast in place monolithic concrete pipe shall conform to applicable portions of Section 63 State Specs.

(3) Corrugated Metal and Structural Plate Pipes and Arches

(a) Corrugated metal and structural plate pipes and arches shall conform to the applicable portions of Sections 66 and 67 of the State Standard Specs.

(4) Asbestos-Cement Pipe
(a) Asbestos-cement pipe used for storm drains shall comply with the applicable portion of Section 64 of the State Specs.

(C) Lined Channels

(1) All lined channels shall be of adequate size and designed to withstand all imposed loads and stresses.

(2) Lining shall consist of air blown mortar (gunite) or portland cement concrete adequately reinforced with steel wire mesh or reinforcing steel.

10.5 Earthwork, Installation, Bedding, and Backfill

(A) All earthwork installation, bedding and backfill shall conform to Sections 4 and 5 of these standards.

10.6 Final Acceptance

(A) Prior to final acceptance, all drainage conduits and structures shall be cleaned of all foreign material and undergo a final field inspection.
SECTION 11
ROAD STANDARDS

11.1 General

(A) These standards govern the construction of County roads and any road to be offered to the County for dedication. These standards may also be applied to projects as required by the Planning Commission and the Board of Supervisors. The standards to be used will be based on estimated future traffic and the classification of the road, as delineated in the Mariposa County Road Improvement and Circulation Policy, the Mariposa County Subdivision Ordinance (Title 16) and the Subdivision Map Act.

(B) The standards also apply to shoulder improvements such as sidewalks, driveways or other encroachments, and signage. Also included in the specifications are requirements for bikeways, paths and trails.

11.2 Definitions

(A) The following define terms used in this section: (some of these are repeated from Section 1)

(1) "Design Manual" shall mean the Design Manual of the State of California Department of Transportation, current editions.

(2) "CALTRANS" shall mean State of California, Department of Transportation.

(3) "State Standard Plans" shall mean the Standard Plans of the State of California, Department of Transportation, current editions.

(4) "Standard Specifications" shall mean the Standard Specifications of the State of California, Department of Transportation.

(B) Other definitions are as per Section 1.

11.3 Plans, Test Procedures & Inspections

(A) Plans

(1) A subdivision map will not be accepted for filing until all conditions of the Road Standards are met, and all other requirements satisfied, unless improvements are otherwise deferred.
(2) Road work will not commence on any subdivision until an approved tentative map and if required, approved construction plans are presented and approved by the Engineer.

(3) Roadways, requiring engineered construction plans, must be slope staked prior to construction and inspected by the Engineer, using State of California, Department of Transportation Standard Practice.

(4) All subdivisions having 200 residential lots or more, will submit traffic flow data giving estimate of daily traffic volumes and truck volumes, over a twenty year period for each road.

(5) For commercial projects, traffic flow data giving estimate of daily traffic volumes and truck volumes, over a twenty (20) year period for each road will be submitted.

(6) Subdivision roads shall be monumented in accordance with the Subdivision Map Act, County Code, and the requirements of the County Surveyor.

(7) Engineered construction plans for subdivisions will show plan, profile and typical section of the proposed improvement, along with all drainage and utilities, necessary details, on site and adjoining easements. The plan shall show the size and location of all engineered structures. Drainage from culverts and overside drains crossing lots or between lots must be shown as drainage easements on the final or parcel map to be filed with the Mariposa County Recorder. Super-elevation diagrams for all curves will be required on profile.

(8) Computations when required, for drainage structures shall be submitted to the Engineer to facilitate processing of Final or Parcel Maps.

(B) Test Procedures

(1) Test procedures - State of California, unless otherwise approved by the Engineer.
(C) Inspections

(1) It is required that the contractor obtain inspections by the Engineer for each of the following steps of road construction.

(a) Preparation of existing ground.

(b) Preparation of subgrade and placing of base material.

(c) Curb and gutter forms before pouring where required.

(d) Curb and gutter pouring and finishing where required.

(e) Surface material before delivery to project, where required.

(f) Paving.

(g) Finishing roadway.

(2) Engineer is to be notified twenty four (24) hours in advance of each inspection to be made.

11.4 Road Design

(A) When required, the design and construction shall be based on the State Specifications, Design Manual and these Standards.

(1) Geometrics

(a) Alignment

(1) All horizontal and vertical alignment shall be governed by design speed.

(b) Curves

(1) The minimum curve radius shall be governed by adequate sight distance for the design speed required as per the Design Manual.
(2) On inside turns where sight distance is not a factor, the minimum radius will be determined by using a maximum super-elevation of eight (8) percent and determining the radius from the Design Manual.

(3) Super-elevation rate table is provided as a guide for residential areas. All curves must conform to the proper super-elevation as determined by the Design Manual.

(4) Broken back and reverse curves will not be acceptable unless approved by the Engineer.

(5) A tangent section should be placed between all curves.

(6) Curves with small deltas may require signing.

(7) On vertical curves minimum stopping sight distance must be obtained for sags and crests. The minimum design speeds are shown on the Standard Drawings and must have the approval of the Engineer.

(8) Abrupt changes within a newly constructed section of road should be avoided, especially at the end of long tangents. Where it is necessary to change design speed, the maximum change shall not exceed ten (10) MPH.

(3) Grades

(a) The MAXIMUM grade below 3000 foot elevation will be twelve (12) percent and above 3000 foot elevation will be ten (10) percent. The MAXIMUM grade may be increased to fifteen (15) percent below 3000 feet or twelve (12) percent above 3000 feet where it can be found that twelve (12) percent or ten (10) percent is impractical due to topography. The approval to exceed twelve (12) percent and ten (10) percent is conditioned upon the concurrence of the Engineer and may require paving. Grades on previous divisions or easements will be considered on a case-by-case basis.
(b) The MINIMUM tangent will be 0.5% on all roads. The developer's attention is directed to the problem of the effects of super-elevation on minimum grades. The minimum grade of 0.5% will be required on all ditches. Cross slope should equal two (2) percent on standard sections.

(c) The MAXIMUM grade next to all stop intersections shall be five (5) percent. The maximum required length at this slope shall be twenty-five (25) feet.

(4) Road Extensions

(a) Roads which are extensions of existing roads or streets shall continue along the centerline of existing road or street as far as practical, either in the same direction or by adjusting curves.

(5) Intersections

(a) Intersections of roads will be designed using good design practice. Intersections will be as close to ninety (90) degrees as possible. An intersection with an angle of approach of less than sixty (60) degrees will have to have approval of the Engineer. Intersections must have fifty (50) feet of tangent on both sides of the intersection and it must be shown that the intersection is safe with adequate sight distance. Channelized intersections shall be designed in accordance with the requirements of the Design Manual.

(6) Right-of-Way

(a) Road improvements shall be constructed in such a manner as to result in the centerline of full road improvement width and the road easement centerlines to be one and the same unless varied by the Engineer.
(b) Right-of-ways shown on cross-sections are minimum. More space may be required to fit "Alternate cross-sections" or to accommodate large cuts and fills.

(B) Structural

(1) Road Width

(a) Road width shall be as shown in the cross-sections for each classification.

(2) Soil testing

(a) Soil testing using current State of California, Department of Transportation methods will be required to determine the structural section of each road, where paving is required.

(b) "R" values by expansion as well as extrusion, must be considered.

(c) A minimum traffic index of 4.0 will be used. See "R" Value design chart.

(d) Larger values will be required on a case by case basis for commercial areas and larger subdivisions as determined by the Engineer.

(e) Traffic studies on large subdivisions may require a higher traffic index based on the Design Manual.

(3) Earthwork

(a) All earthwork and clearing must conform to Standard Specifications. Erosion control shall be provided as required by the Engineer. (See Section 12 of these standards.)

(1) Cut Slopes

Cut slopes in earth or decomposed rock shall not be steeper than one to one (1:1). The cut slope ratio may be modified in the field depending upon the nature of the material encountered; however, no cut slope shall exceed one to one (1:1) unless approved by the Engineer.
(2) Fill Slopes

(a) Unless approved by the Engineer, fill slopes shall not be steeper than one and one-half to one (1.5:1). Flatter fill slopes may be required when soil conditions warrant.

(b) Fills constructed of material of granitic origin, will provide an additional two (2) foot shoulder.

(c) Right-of-way lines will be set back from the top of cut slopes and toe of fill slopes, a minimum of five (5) feet.

(d) Guardrails may be required on some fills, as designated by the Engineer.

(4) Drainage

(a) All drainage structures, estimated to be greater than thirty (30) inches, shall be designed by a licensed Civil Engineer using a method approved by the Engineer, as per Standard Specifications, (use Standard Culvert Practice).

(b) Overside drains must be approved for each location.

(c) Wet areas are to be drained.

(d) Drop inlets, minimum size thirty (30) inches in diameter, are required in cut bank installations.

(e) Headwalls or inlet/outlet protection on culverts may be required.

(f) Berms may be required.

(g) Other requirements per applicable sections of these improvement standards.
(h) Culvert pipe placed for cross-road drainage shall be a minimum of eighteen (18) inches and location(s) to be approved by the Engineer. Culvert pipe placed for driveway drainage shall be a minimum of twelve (12) inches.

(5) Road Surface—Paving not required

(a) Roads not requiring paving shall have the approval of the Engineer prior to the placement of any surface course. The type of surface must be to a thickness noted on the Standard Drawings and be of a type not to exceed three-quarter (3/4) inch maximum. The Engineer will consider alternatives, but prior approval must be obtained.

(b) No road surfacing material containing asbestos shall be used. Lab analysis of representative samples will be required prior to placement of suspect materials. The County Air Pollution Control Officer may be contacted for information on how this testing is to be conducted.

(c) Dust control requirements must be approved by the Engineer prior to application with respect to material and application rates.

(d) Any oil surface to be applied will be SC 250 at a rate of 0.25 gallon per square yard or as determined by the Engineer, prior to application.

(e) Because of the hazardous nature of the substance, no waste oil or used oil (such as crankcase oil) is to be applied to any road surface.

(6) Road Surface—Paving required

(a) The subbase will be staked prior to laying of base course to insure proper road shape and base thickness, as approved by the Engineer.

(b) Aggregate subbase will conform to Standard Specifications.

(c) Aggregate base shall conform to Standard Specifications.
(d) Asphaltic Concrete Surfacing shall conform to Standard Specifications.

(7) Bridges

(a) Bridges shall be designed in accordance with the requirements of State Specifications and A.A.S.H.T.O.. The Engineer shall be consulted regarding requirements prior to starting any design. Bridges and other structures shall be designed for the one-hundred (100) year flood.

(8) Modified Cross-sections

(a) Reasonable alternatives to the standard cross-section(s) may be considered. Each proposal shall be reviewed on a case-by-case basis by the Engineer.

(1) Split level roads shall have geometrics of design, improvements and capacity provided in a normal street of the same classification, with each direction of roadway constructed at different elevations and separated by a median. Surfaced width of roadbed shall be equal to the improved width for a standard street of the same classification.

(9) Cul-de-sacs

(a) When engineering is required, the minimum radius of a cul-de-sac will be forty-five (45) feet. Islands in cul-de-sacs will not be accepted, unless prior arrangement is made with the Engineer.

(10) Alternative Turnarounds

(a) Alternative turnarounds shall be approved on a case-by-case basis.

11.5 Shoulder Improvements

(A) Driveways
(1) In new subdivisions, as required by the Engineer, or commercial projects, all lots will have driveways constructed to the lot property line. Driveways shall be constructed prior to placing aggregate base on the roadways. Adequate sight distance must be provided for all driveways. Sight distance must be governed by design speed. See also Standard Drawings for spacing of driveways.

(B) Curbs and Gutters

(1) Standard Drawings shall apply where curb and gutter are required.

(2) Rolled curbs may be used along local residential roads where grades permit and at the discretion of the Engineer. See "Rolled Curb and Gutter" Detail.

(3) Curb returns shall have a twenty-five (25) foot minimum radius.

(a) Handicap ramps are required at all intersections, and other locations as required for continuity with other pedestrian ways. Where existing conditions do not warrant pedestrian crossing, appropriate pavement and curb construction joints shall be provided to allow future ramp installation.

(b) The handicap ramps shown in Standard Drawings are the approved standard designs as set forth by the State Building Code (Title 24 of California Administrative Code) for handicap access onto sidewalks.

(c) Grooving: Where the ramp is located in the center of a curb return, it shall be grooved in a herringbone pattern. Also the level edge at the top of the ramp required a groove detail as shown. Grooving shall be done with a pre-made tool meeting the groove specification. Ramps not located in a curb return do not require grooving on the ramp itself. In such cases, the surface of the ramp shall have a traverse broomed surface texture rougher than the surrounding sidewalk.
(C) Sidewalks - see Standard Drawings

(1) Minimum unobstructed sidewalk width shall be four (4) feet.

(D) Signage and Pavement Markings

(1) Roads shall be properly signed. Signing shall meet the requirements of the approved improvement plans and the following:

(a) Road Name Signs shall be placed at each intersection in a visible location. See Standard Drawings.

(b) Traffic Control Signs of approved design shall be placed as delineated in the improvement plans, or as required by the Engineer. The need for such signs shall be determined on an individual basis in accordance with the latest edition of the State Department of Transportation Traffic Manual, or as determined by the Engineer.

(c) THIS ROAD IS NOT COUNTY MAINTAINED signs shall be metal, twenty-four (24) inches high by eighteen (18) inches wide, yellow background with three and one-half (3 1/2) inch black letters and a black border, mounted on a ten (10) foot long four-by-four (4X4) redwood post which has been placed three (3) to four (4) feet in the ground, on all roads not maintained by the County.

(E) Parking

(1) Any on-site parking, on other than local residential streets, that may affect the safe operation of a public road, may be subject to review by the Engineer.

(2) All on-site parking shall have a controlled exit and entry.

(3) On-site parking, excepting single-family residential along residential local roads, shall not encourage vehicles to back out into any public right-of-way or pedestrian walk.

(4) Existing unsafe conditions are to be corrected at the design stage, whenever possible.
11.6 Bikeways

(A) The developer shall adhere to the requirements in "CALTRANS Planning and Design Criteria for Bikeways." All bikeways shall be striped and/or signed as required by the Engineer.

11.7 Paths and Trails

(A) Right-of-Ways

(1) Minimum pedestrian path right-of-way shall be ten (10) feet wide.

(2) Minimum equestrian trail right-of-way shall be twenty (20) feet wide.

(3) Lesser right-of-way shall be allowed in limited instances where it can be shown that safety will not be impaired, and that maintenance can still be performed.

(4) Right-of-ways shall be located, as much as possible, to allow reasonable construction of trails or paths.

(B) Construction

(1) Trails shall be constructed in accordance with established trail construction guides or as approved by the Engineer.

(2) Grade of paths shall be maintained under five (5) percent where handicapped use is likely.
SECTION 12 - EROSION CONTROL

12.1 Application

(A) These standards shall apply to any project where, as determined by the Engineer, any of the following conditions exist:

(1) Erosion controls and/or vegetation are required by another County department.

(2) Erosion may cause undue environmental damage.

(B) These standards shall only be used to supplement and/or clarify any requirements enacted by Mariposa County.

12.2 Requirements

(A) A plan shall be submitted to the Engineer for approval containing the following:

(1) Protective measures to be taken during construction to prevent erosion by surface or groundwater of cut and fill slope faces and any other surface area involved.

(2) Permanent methods of erosion control to be used following completion of the proposed grading or improvements. The methods shall consider, but are not limited to, the use of the following:

(a) Revegetation

(b) Straw or Hydro Mulching

(c) Berms (temporary or permanent)

(d) Interceptor ditches

(e) Subsurface drains

(f) Terraces

(g) Sediment traps

(3) Approximate sequence and timing of grading and improvement increments, and/or subsequent revegetation and landscaping work.
(B) The Engineer may require that any or all of the above requirements be designed and/or supervised by qualified individuals.

(1) Qualified individuals shall be determined by the Engineer.

12.3 Standards

(A) Permanent revegetation or landscaping, if required, is to be commenced on the construction site as soon as practical and in no case exceeding three (3) months after achieving final grades and utility implacements, unless so approved by the Engineer. Whenever practical, land is to be developed in increments of workable size which can be completed during a single construction season; erosion control measures are to be coordinated with the sequence of grading or improvements.

(B) Grading equipment is to be confined to areas immediately adjacent to areas of disturbance as indicated by the plan approved by the Engineer.

(C) All surfaces disturbed by vegetation removal, grading, haul roads, or other activity of construction which alters the natural vegetative cover, are to be prepared for expedient revegetation or otherwise maintained to control erosion, unless covered with impervious or other improved surfaces pursuant to approved plans within thirty (30) days following the completion of grading (or removal of vegetation, if no grading was involved). Erosion control described in USDA Soil Conservation Information Bulletin 347 may be used as a guide.

(D) Topsoil removed from the surface in preparation for grading and construction is to be stored whenever possible on or near the site and protected from erosion while grading operations are underway, provided that such storage may not be located where it would cause suffocation of root systems of trees intended to be preserved. After completion of such grading, topsoil is to be restored to exposed cut and fill embankments or building pads so as to provide a suitable base for seeding and planting.
(E) Acceptable methods of revegetation include straw-mulching, hydro-mulching, and planting of rye grass, barley or other fast germinating seed. Where lawn or turf grass is to be established, lawn grass seed or other appropriate landscape cover is to be sown at not less than four (4) pounds to each one thousand (1,000) square feet of land area. Other methods of revegetation may be approved by the Engineer where equivalent protection is provided.

(F) All revegetation and landscaping is to be conducted within suitable growing periods. Native plant materials are specifically encouraged in order to reduce irrigation demands.

(G) See "EXHIBIT A" for types and planting rates suggested for our area. Contact Soil Conservation Service for details.

(H) For all grading or improvements to be conducted during the rainy season, a sedimentation control plan is to be submitted including, where necessary, temporary sedimentation basins. Sedimentation control facilities, are to be installed in conjunction with initial grading operations and maintained throughout the construction period to remove sediments from runoff waters during development.

(I) Permanent sediment catchment basins or other types of sediment retention facilities are required wherever necessary to prevent discharge of sediment to stream channels. Accumulated sediment is to be inspected and removed for disposal according to a regular maintenance schedule, by the appropriate entity.
### Vegetative Guide

**Conservation Practice:** CRITICAL AREA PLANTING

#### Cuts, Fills, and Other Disturbed Areas

<table>
<thead>
<tr>
<th>Vegetative Soil Group</th>
<th>IRRIGATED</th>
<th>Planting Rate</th>
<th>Vegetative Soil Group</th>
<th>Nonirrigated</th>
<th>Planting Rate</th>
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<tbody>
<tr>
<td><strong>I. HERBACEOUS GROUND COVER</strong></td>
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<td>A. Creeping Herbaceous Perennials</td>
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<td>ABCDE 1. Hypericum (St. Johnswort, Aaron's beard)</td>
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<td>ABCDE 2. Common periwinkle</td>
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<td>ABCDEG 3. Snow-in-summer</td>
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<td>ABCDEG 4. English Ivy</td>
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<td>ABCDG 5. Japanese honeysuckle</td>
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<td>B. Grasses and Legumes</td>
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<td>ABCDEFG 1. Hybrid bermudagrass</td>
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<td>'Santa Ana'</td>
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<td>'Tifgreen'</td>
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<td>a. Sprigs (2 bu/1,000 ft²) 1/ft²</td>
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<td>b. Plugs 1/ft²</td>
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<td>c. Sod (rolls) Solid</td>
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<td>Lbs/Ac³</td>
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<td>ABCDEG 2. Creeping red fescue</td>
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<tr>
<td>ABCDEG 3. 'Alta' or 'Fawn' tall fescue</td>
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<td>ABCD 4. Perennial ryegrass</td>
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<td>ABCDEG 5. 'Blando' brome</td>
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<td>ABCDEGH 6. 'Zorro' annual fescue</td>
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<td>ABCDEG 7. 'Wimmera-62' ryegrass</td>
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<td>ABCD 8. 'Lana' woollypod vetch</td>
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<td>ABCD 9. Rose clover</td>
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<td>ABCDG 10. Birdsfoot or Narrowleaf trefoil</td>
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<td>ABCD 11. Strawberry clover</td>
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<td>ABCD 12. New Zealand White or Ladino clover</td>
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<td>ABCDEG 13. Clover mix</td>
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<td>Sub Rose Crimson</td>
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**Subarea (4 ET's) d, e Lbs/Br³**

| ABCDEG 1. 'Zorro' annual fescue | 4 6 |
| Rose clover 5/ | 6 9 |
| ABCDEG 2. 'Blando' brome | 8 12 |
| Rose clover 5/ | 6 9 |
| ABCDEG 3. 'Blando' brome | 8 12 |
| 'Zorro' annual fescue | 2 4 |
| Rose clover 5/ | 6 9 |
| California poppy (optional) | 1 1 |
| ABCDEG 4. 'Blando' brome | 8 12 |
| 'Lana' woollypod vetch | 10 15 |
| ABCDEG 5. 'Blando' brome | 8 12 |
| 'Wimmera-62' or annual ryegrass | 6 9 |
| ABCDEG 6. Barley 6/ | 60 90 |
| 'Blando' brome | 8 12 |
| 'Lana' woollypod vetch | 10 15 |
| ABCDEG 7. Australian saltbush | 10 15 |
| 'Zorro' annual fescue | 2 4 |
| ABCDEFG 8. 'Blando' brome | 8 12 |
| 'Zorro' annual fescue | 2 4 |
| ABCDEG 9. 'Blando' brome | 8 12 |
| 'Wimmera-62' ryegrass | 6 9 |
| 'Lana' woollypod vetch | 10 15 |
| ABCDEG 10. 'Zorro' annual fescue | 4 6 |
| 'Wimmera-62' or annual ryegrass | 6 9 |
| ABCDEG 11. Annual ryegrass 6/ | 15 24 |
| ABCDEG 12. Barley 6/ | 90 180 |

### Notes:
1/ Serpentine soils and unusual critical areas such as mine spoils need onsite review determining planting requirements.
2/ Invasive after establishment and may compete with natives.
3/ Dr - Drilled, Br - Broadcast
4/ Check w/Agr. Commissioner before planting.
5/ Use locally adapted varieties as recommended by Farm Advisors.
6/ Rapid cover plus reseeding capability.
SECTION 13

PUMP TEST FOR MAXIMUM YIELD

13.1 Introduction

(A) This shall apply to systems to be accepted and maintained by the County.

(B) Water wells shall be progressively tested for yield versus drawdown and the maximum allowable yield shall be established, all in accordance with these Specifications and Sections A1-7, "Testing for Yield and Drawdown", of the AWWA A100-66 Standard for Deep Wells.

(C) The water wells shall be tested for water quality in accordance with these Specifications.

(D) All test wells shall be constructed in accordance with State of California Department of Water Resources Bulletin No. 74 entitled "Water Well Standards" as applied by the Engineer.

13.2 Determining Maximum Allowable Yield

(A) After a well has been completely constructed, developed and cleaned, including a bailer test to estimate the test pump capacity, the tentative maximum allowable yield for the well shall be determined by one or more specific pumping tests performed on predetermined dates. The exact dates shall be recommended by the Consulting Engineer and shall be subject to approval by the Engineer prior to beginning any tests. The specific pumping tests shall conform to the requirements of Section 13.3 and Section 13.4 of these specifications and shall be planned and performed under the direct supervision of the Engineer, or his representative.

(B) After the specific pumping tests have been completed, the Consulting Engineer shall assemble and analyze the relevant data and submit, to the appropriate public agency, a report including said analysis and a recommendation for the maximum allowable yield for each well. The report shall include, but not be limited to, the following items:

(1) Recommended maximum allowable yield.

(2) Certified well driller's "Report of Completion".
(3) Well test "Stepped Time-Drawdown Curve" for initial pumping test.

(4) Well test "Time-Drawdown Curve" for final pumping test.

(5) Well test "Specific Capacity Curve".

(6) Information concerning the testing and performance of wells in the vicinity of the subject well.

(7) Analysis of precipitation coincidental to the test period in relation to the historical pattern of precipitation.

(8) Geological study of the well site and adjacent areas which contribute to the ground water supply.

13.3 Specific Water Well Pumping Test

(A) A specific water well pumping test shall be performed for each water well in order to determine a maximum allowable yield for the well. The specific test shall consist of two (2) phases; the initial pumping test and the final pumping test. The purpose of the initial test is to establish an ultimate yield for the well. The purpose of the final test is to establish a maximum allowable yield for the well.

(1) Initial Pumping Test

(a) The initial pumping test shall be conducted as follows: After measuring the static water level in the well, the initial pumping shall be started at a rate equal to approximately thirty-three (33) percent of the anticipated ultimate yield of the well and shall be maintained until the water level in the well has stabilized. The water level and respective time increments shall be recorded as required by the following:

0-  5 minutes-measurements recorded every 1/2 minute.
5-  60 minutes-measurements recorded every 5 minutes.
60-170 minutes-measurements recorded every 20 minutes.
(b) If observation of adjoining wells are available, the measurements shall be recorded as follows:

0-60 minutes—measurements recorded every 2 minutes.
60-120 minutes—measurements recorded every 5 minutes.
120-240 minutes—measurements recorded every 10 minutes.
240-end minutes—measurements recorded every 20 minutes.

(c) The readings shall be continued until the water surface elevation has stabilized for sixty (60) minutes.

(d) In order to measure the pumping rate, the following methods are acceptable:

(1) time to fill a 55 gallon barrel.

(2) a commercial type meter.

(3) circular orifice weir (NOTE: good for turbine or centrifugal pumps, but not acceptable for a piston pump.)

(4) orifice bucket (maximum limit of one hundred fifty (150) gallons.)

(e) Measurement of the water level shall be made by one the following procedures:

(1) electric sounder method,

(2) wetted tape method, or

(3) air line method.

(f) The readings should be made to the nearest .10 of a foot.

(g) Alternate methods of measuring must be submitted to the Engineer for approval.

(h) Thereafter, the pumping rate shall be increased by steps approximately equal to the initial rate, achieving stabilization of the pumping level for each step before proceeding to the next step, until the rate is reached for which stabilization cannot be achieved. From this step the rate of pumping shall be gradually decreased until a certain maximum yield, having a stabilized pumping level, can be maintained for a
period of not less than four (4) hours.

(i) Said maximum yield, after being successfully pumped, shall be considered the ultimate yield of the well. The water surface elevation should not be allowed to drawdown to a depth less than five (5) feet above the casing perforations not ten (10) feet above the test pump bowls. At the end of the pumping period, the pump shall be shut down and the well shall be allowed to recover until the original static water level, or a lesser stabilized level, has been established, at which time the initial pumping test shall be considered complete. The water surface elevation with respect to time measurement during the recovery period shall be measured every five (5) minutes during this period.

(j) A well test "Stepped Time-Drawdown Curve" and a "Specific Capacity Curve" shall be constructed, in accordance with Exhibits A and B, as included herein, for the initial pumping test.

(2) Final Pump Test

(a) The final pumping test shall be conducted as follows: Within two (2) hours of the stabilized water surface elevation recovery after the initial pump test, the final pumping shall be started and maintained, at a rate equal to the yield previously established, for a period of not less than ten (10) days commencing when the pumping rate and water surface elevation have stabilized at the ultimate yield rate.

(b) Measurements shall be as required in the initial pump test except that once the stabilized water surface is reached, the measurements shall be made every thirty (30) minutes for a duration of ten (10) days. Said rate, after being successfully pumped, shall be considered the maximum allowable yield of the well. At the end of the pumping period, the pump shall be shut down and the well shall be allowed to recover until the original static water level, or a lesser stabilized level, has been established,
at which time the final pumping test shall be considered complete and a maximum allowable yield, equal to the final pumping rate, will have been achieved. Measurements during the recovery period shall be as stated in the initial pump test.

(c) A well test "Time-Drawdown Curve" shall be constructed, in accordance with Exhibit C, as included herein, for the final pumping test.

(d) After the specific water well pumping tests have been completed, the Contractor shall reclean the wells and shall remove any sand, stones, rock, or any other deleterious materials that may have accumulated in the wells.

(e) In order to accomplish a valid specific water well pumping test, the continuity of the entire testing procedure shall not be interrupted or altered. If, for any reason whatsoever, the sequence of the varied rates of pumping is not strictly followed or if the pumping is improperly terminated prior to completing said test, the test shall be regarded as void, shall be discontinued, and shall be initiated once again from the starting point unless, in the judgement of the Engineer, modifications to the testing procedure can be made which will accomplish a proper and acceptable test.

13.4 Equipment For Pumping Test

(A) The Contractor shall make the necessary arrangements for conducting the pumping tests and shall furnish and install the necessary equipment for pumping the maximum anticipated rate from the lowest anticipated water level of the well to the required point of discharge at ground level, but with satisfactory throttling devices so that the rate may be varied to suit the requirements of the test. The pumping equipment shall be complete with a motor having adequate power and controls, and shall be capable of being operated without interruption for the maximum anticipated period of continuous pumping.

(B) The required point of discharge shall be located where the water will not damage surrounding property or structures, will not trespass over, along, or into unauthorized routes or territories, and will not recirculate into the well.
(C) The Contractor shall furnish devices for recording time, devices such as orifice weirs, orifice buckets, or meters for measuring the rate of water flow, and devices such as electric sounders, wetted tapes, or air lines for measuring the varying elevations of water level. Said devices shall be accurate and reliable for the uses contemplated, and the use of any device shall be approved by the Engineer prior to beginning the test.

13.5 Sampling And Quality Of Well Water

(A) The water from wells coming under the jurisdiction of these standards shall be sampled and analyzed for bacterial, chemical, physical, and radiological quality in accordance with the procedures established by the local County Health Department and the California Department of Public Health, and shall meet the requirements for bacterial, chemical, physical, and radiological quality established by the County Health Department, the California Department of Public Health and the United States Public Health Service Drinking Water Standards.

(1) Bacterial Sampling

(a) Sampling of community water supply wells is covered by requirements of the State Board of Health and the local County Health Department. For individual domestic wells, technical assistance or advice regarding the collection of bacteriological samples may be obtained from the local County Health Department or from the laboratory that will examine the sample.

(b) If no technical assistance is available, the following procedure will suffice: A sterile sample bottle, preferably one provided by the laboratory that will make the determination, must be used. It is extremely important that nothing except the water to be analyzed come in contact with the inside of the bottle or the cap; the water must not be allowed to flow over an object or over the hands while the bottle is being filled. Do not rinse the sample bottle. The sample should be delivered to the laboratory as soon as possible and in no case more than twenty-four (24) hours after its collection. During delivery, the sample
should be kept as cool as possible (but not frozen).

(2) Chemical (Mineral) Sampling

(a) Generally, a routine material analysis (determination of the concentrations of the common minerals) will suffice, particularly where there is no prior knowledge of the chemical quality of the water in the area where the well is located. Where quality conditions in the surrounding area are known, a more selective analysis may be made. For certain uses it may also be desirable to make analysis for concentrations of the heavy metals (such as iron and manganese in the case of domestic water) or other constituents not routinely determined. Information or advice on chemical quality conditions may be obtained from the local agencies such as the County Farm Advisor's Office, County Health Department and Water Service Agency (irrigation or water district, for example).

(b) The sample should be collected after the well has been pumped long enough to remove standing water and development and disinfectant chemicals, and to insure that water from the producing formation(s) has entered the well. The water sample should be obtained in a chemically clean container preferably one obtained from the laboratory which has been selected to perform the analysis. The container should be rinsed several times with the water to be sampled prior to collecting the sample. The laboratory performing the analysis should issue instructions regarding the quantity of sample required. However, one-half (1/2) gallon is usually sufficient for a routine mineral analysis; one (1) gallon when analysis for heavy metals is also required.

(B) Any analysis shall be performed by a laboratory certified by the California Department of Public Health, and a copy of said analysis shall be forwarded to the County Health Department and, if required, to the California Department of Public Health.
Data Sheet – Time Drawdown Curve "Example"

Mariposa County Engineering Department

Water Well Testing

Datum Elevation (Pump Discharge Base of Surface Plate)

Original Water Elevation

10 Days Continuous Pumping Required

Exhibit "C"
# Pavement Design Chart

## For Subdivision Streets

<table>
<thead>
<tr>
<th>Traffic Index</th>
<th>Houses*</th>
<th>Layer</th>
<th>Thickness of Asphalt Concrete, Base, and Subbase (Feet)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 - 15</td>
</tr>
<tr>
<td>4.0</td>
<td>1-14</td>
<td>AC</td>
<td>0.167</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AB</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASB</td>
<td>0.30</td>
</tr>
<tr>
<td>5.0</td>
<td>15-100</td>
<td>AC</td>
<td>0.167</td>
</tr>
<tr>
<td></td>
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<td>0.50</td>
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<tr>
<td>5.5</td>
<td>101-500</td>
<td>AC</td>
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<tr>
<td></td>
<td></td>
<td>AB</td>
<td>0.50</td>
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<td></td>
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<td>501-1000</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>ASB</td>
<td>0.90</td>
</tr>
</tbody>
</table>

* Total of present and future houses contributing traffic to the street. If over 1000 houses, a special design will be made for the street in question. Traffic index for a particular street may be higher than that given by straight house count if the street is subjected to unusual traffic.
### A.A.S.H.T.O.

**Superelevation Rates**

\[ E = 8\% \text{ max.} \]

<table>
<thead>
<tr>
<th>Radius (ft)</th>
<th>25 MPH</th>
<th>30 MPH</th>
<th>35 MPH</th>
<th>40 MPH</th>
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<tbody>
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</tr>
<tr>
<td>200</td>
<td>7.7</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>250</td>
<td>7.4</td>
<td>8.0</td>
<td>---</td>
<td>---</td>
</tr>
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<td>300</td>
<td>7.1</td>
<td>7.7</td>
<td>---</td>
<td>---</td>
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<td>350</td>
<td>6.8</td>
<td>7.4</td>
<td>8.0</td>
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</tr>
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<td>400</td>
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<td>7.2</td>
<td>7.7</td>
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<tr>
<td>450</td>
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</table>

**Minimum Curve Radius 150 Feet**
# Thrust Block Minimum Bearing Area Chart

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>90° Elbow</th>
<th>45° Elbow</th>
<th>Valve, Tees, Dead Ends</th>
<th>1 1/4&quot; or 22 1/2° Bend</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/2&quot;</td>
<td>300</td>
<td>200</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>2&quot;</td>
<td>500</td>
<td>300</td>
<td>400</td>
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<td>3&quot;</td>
<td>1000</td>
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<tr>
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<td>12&quot;</td>
<td>16000</td>
<td>9100</td>
<td>11800</td>
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</table>

## Estimated Soil Bearing Load

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>1bs./sq. ft.</th>
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</thead>
<tbody>
<tr>
<td>Muck, Peat, Etc</td>
<td>0</td>
</tr>
<tr>
<td>Soft Clay</td>
<td>500</td>
</tr>
<tr>
<td>Sand</td>
<td>1000</td>
</tr>
<tr>
<td>Sand &amp; Gravel</td>
<td>1500</td>
</tr>
<tr>
<td>Sand &amp; Gravel w/Clay</td>
<td>2000</td>
</tr>
<tr>
<td>Sand &amp; Gravel Cemented w/Clay</td>
<td>4000</td>
</tr>
<tr>
<td>Hard Pan</td>
<td>5000</td>
</tr>
</tbody>
</table>

**Note:** Values are estimated for horizontal thrusts at depths of burial which exceed 2 feet.

## General Notes

1. All concrete to be 2000# - 28 day

2. All concrete to be poured against firm, undisturbed earth.

3. Do not encase joints in concrete.
NEAT CUT

EXIST A.C.

CLASS 2 AGGREGATE
BASE (6" MIN.)

EXISTING AGG. BASE

BACKFILL MATERIAL
95% COMPACTION
TOP 2 FEET

90% COMPACTION

COMPACT TO 12" MIN.
OVER PIPE

BEDDING - 4" MIN.

TYPE 1 BEDDING - WHEN
REQUIRED

BEDDING - 90% COMPACTION
(6" MIN.)

O.D. + 16" MAX.

O.D. + 8" MIN.

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN: GJF
CHECKED: JLM
DATE: 3-1-88

SHEET 1 OF 3

SCALE: NONE

TYPICAL TRENCH SECTION IN PAVED AREAS

APPROVED BY
ENGINEER

DWG. NO. 5-1
NEAT CUT

2" A.C. MIN.
EXISTING A.C.

NEAT CUT

4" MIN.

CLASS 2 AGGREGATE
BASE (6" MIN.)

EXISTING A.GG. BASE

BACKFILL MATERIAL
95% COMPACTION
TOP 2 FEET.

ENCASE PIPE
WITH CLASS "C"
CONCRETE FULL
WIDTH OF TRENCH

CLASS "C" CONCRETE

O.D. + 16" MAX.

O.D. + 8" MIN.
PROVIDE 8'-12' MOUND FOR SETTLEMENT

EXISTING GROUND

COMPACTED TO 12" MIN. OVER TOP OF PIPE

BEDDING 4" MIN.

TYPE I BEDDING WHEN REQUIRED (6" MIN.)
90% COMPACTION

O.D. + 16" MAX.

O.D. + 8" MIN.

TYPE II BEDDING & BACKFILL 90% COMPACTION

BACKFILL MATERIAL 80% COMPACTION

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN: ____________________  CHECKED: J.L.M.  DATE: 3-1-88
SHEET 3 OF 3  SCALE: NONE
TYPICAL TRENCH SECTION OFF ROAD R/W
APPROVED BY:__________________________  DWG. NO.: S-3
ENGINEER:__________________________
3'-0" MIN.
(SEE BELOW WHERE NO CURB & GUTTER)

PLUG IF LATERAL IS NOT CONNECTED

MARIPOSA COUNTY ENGINEERING DEPARTMENT
DRAWN GJF
CHECKED JLM
DATE 3-1-88
SCALE NONE
LATERAL CLEANOUT INSTALLATION
APPROVED BY ENGINEER
DWG.NO. S-4
NOTE: All joints shall be sealed and finished inside and out as approved by the engineer.

* Manholes shall come with steps installed by manufacturer.

** Standard steps

Eccentric cone

Install concrete collar when required

4 1/8"

Grooved & mortar

Install seal ring (neoprene or rubber type)

#4 bar at 12" o.c. both ways

Note: Precast manhole bottoms will be considered on an individual basis.

Note: See sheet 1 of 3 for detail of step & plan view.

MariPOsa County Engineering Department

Drawn GUF  Sheet 1 of 3  Standard Precast Manhole Installation

Checked JLM  Scale: None  Approved by Engineer

Date 3-1-86  DwG. No. S-6
INSTALL CONCRETE COLLAR WHEN REQUIRED

INSTALL SEAL RING (NEOPRENE OR RUBBER) TYP.

HEAT FLUSH FIT

SEAL

TRACER WIRE (WHEN REQUIRED)

SLOPE

45° WYE

45° ELBOW

STANDARD STEPS

#4 BARS AT 12" OC BOTH WAYS

8" MIN.

NOTE: PRECAST BOTTOMS WILL BE CONSIDERED ON AN INDIVIDUAL BASIS

CAST IN PLACE ON UNDISTURBED SOIL.
BASE IS TO BE CONTINUOUS POUR. (NO COLD JOINTS)
NOTE: IF SURFACE NOT PAVED, INLET SHOULD BE ABOVE GROUND LEVEL.

3'-0" DIA.

1'-0"

2'-0"

2" A.C.

NOT REQUIRED IN PAVED ROADWAY

45°

CLASS "C" CONCRETE

CONC. FULL WIDTH OF TRENCH

NOT REQUIRED IN PAVED ROADWAY

EXTRA CARE MUST BE TAKEN FOR PROPER REPLACEMENT & COMPACTION OF ALL DISTURBED OR EXCAVATED EARTH IN THIS AREA

PLUG END OF WYE

3" MNL

6"

VERTICAL SECTION OF RISER PIPE

MARIPosa COUNTY ENGINEERING DEPARTMENT

DRAWN G.JF CHECKED J.L.M. DATE 3-1-88

SHEET 1 OF 2 SCALE NONE

STANDARD RODDING INLET INSTALLATION 6" OR 8" MAIN

APPROVED BY ENGINEER

DWG. NO. S-9
PLAN

SECTION A-A

PHOENIX # P-7104
OR APPROVED EQUAL

NOTE:
The cast iron frame & cover for 8" line is the same except for dimensions.

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN GEF
CHECKED JLM
DATE 3-1-88
SCALE 1:1

6" CLEANOUT INLET RISER FRAME & COVER
(RODDING & FLUSHING INLET)

APPROVED BY ENGINEER

DWG. NO. S-10
NOTE:
- Water meters 11" & over shall be compound.
- Meter must be located 8 x the pipe diameter from any elbows & valves on delivery side.
- If meter box located outside of traveled way, may be fiberglass constructed meter box.

1" x 3/4" angle meter stop, "Ford" FV-7 with "Ford" CBG-77 straight coupling "Jones" or approved equal.

Neptune T-10 or T-8 meter or equal

3/4" SCW'd gate valve by customer

Pressure regulator by customer

Check valve by customer
FIRE HYDRANT:
DRESSER "500" TRAFFIC MODEL
DRY BARREL
TWO - 2 1/2" HOSE, ONE - 4 1/2" PUMPER NOZZLES
NATIONAL STANDARD THREADS

NOTE: ADEQUATE HYDRANT PROTECTION
SHALL BE APPROVED BY THE ENGINEER

VALVE BOX:
BROOKS 1-RT SERIES OR APPROVED EQUAL
(V ALVE BOX & CAST IRON COVER MARKED WATER)

RISER:
6" MIN. DIA.
(CLAY, CONCRETE OR A.C.)

BARE COPPER WIRE
ALONG TOP OF PIPE & EXTEND INTO VALVE BOX

TYPICAL 6" WATERLINE INSTALLATION-
SCH 250 DUCTILE

WATER MAIN
MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN G.I.F.  SHEET OF  TYPICAL THRUST BLOCK LOCATION
CHECKED: JEM  SCALE: NONE  APPROVED BY
DATE 3-1-88  ENGINEER

2-#4 REBAR TIEDOWN

TEE

12" MIN. TRENCH WIDTH

2-#4 REBAR TIEDOWN

VALVE

CROSS

90° ELBOW

45° ELBOW

OR

11¼° OR 22 ½°
NOTE:
GATE VALVES AND LINE TO BE ANCHORED TO WITHSTAND LINE PRESSURE WHEN PRESSURE REDUCING VALVE IS REMOVED FOR SERVICE.

TRAFFIC COVER: CAST IRON OR CHECKERED GALVANIZED STEEL PLATE TO WITHSTAND H-20-44 TRAFFIC LOADS. (TIE DOWN WITH BRASS SCREWS)

CAST IN PLACE VAULT SHALL BE A MIN. OF SIX INCH REINFORCED CONCRETE (MIN. REINFORCEMENT: #4 BARS @ 12" LENGTH & WIDTH)

PRECAST VAULT & COVERS TO WITHSTAND H-20-44 TRAFFIC LOADS

GATE VALVE
REDUCING VALVE
FLEXIBLE FLANGED COUPLER (FOR QUICK REMOVAL)

SEE NOTE ABOVE
CONCRETE SUPPORT
6" MIN. CLEARANCE
6" MIN. CLEAN CRUSHED ROCK (3/4" MESH)
BROOKS - NO 37-T
CONCRETE BOX & CAST IRON TRAFFIC COVER
(OR APPROVED EQUAL)

MALE ADAPTER FOR 1 1/2" NST HOSE

2" BRASS GATE VALVE

INSULATION REQUIRED IN BOX IN AREAS SUBJECT TO FREEZING.

20"
(X 12" WIDTH)

WATER MAIN

2" GALVANIZED PIPE

STANDARD TAPPED END CAP

90° GALVANIZED ELBOW

THRUST BLOCK MIN. OF 3 SQUARE FEET OF CONCRETE BEARING

FIRM UNDISTURBED EARTH

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN SF
CHECKED JLM
DATE 3-1-88

SCALE NONE

PERMANENT BLOW-OFF VALVE INSTALLATION

APPROVED BY ENGINEER

DWG. NO. W-5
### CLASS I

**NOTE:** All slopes to be rounded off at top of slope.

<table>
<thead>
<tr>
<th>Class</th>
<th>Design Speed</th>
<th>Class II Aggregate Base Width &quot;W&quot;</th>
<th>Thickness &quot;T&quot;</th>
<th>Surface Type &quot;S&quot;</th>
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<tbody>
<tr>
<td>A</td>
<td>None</td>
<td>6'</td>
<td>2&quot;</td>
<td>-</td>
</tr>
<tr>
<td>B</td>
<td>None</td>
<td>6'</td>
<td>3&quot;</td>
<td>-</td>
</tr>
<tr>
<td>C</td>
<td>None</td>
<td>6'</td>
<td>2&quot;</td>
<td>Oil</td>
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NOTE: ALL SLOPES ARE TO BE ROUNDED OFF AT TOP OF SLOPE

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<tr>
<th>CLASS</th>
<th>DESIGN SPEED</th>
<th>CLASS II AGGREGATE BASE WIDTH &quot;W&quot;</th>
<th>CLASS II AGGREGATE BASE THICKNESS &quot;T&quot;</th>
<th>SURFACE TYPE &quot;S&quot;</th>
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<tr>
<td>C</td>
<td>NONE</td>
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<td>2&quot;</td>
<td>OIL</td>
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</table>
CLASS IV MINOR

MINIMUM REQUIREMENTS:
2" CLASS "B" ASPHALT CONCRETE
C" CLASS II AGGREGATE BASE

DESIGN SPEED: 25 M.P.H. (MIN.)

NOTE: ALL SLOPES TO BE ROUNDED OFF AT TOP OF SLOPE

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN: GNF  SHEET 4 OF 11  RURAL CLASS IV MINOR
CHECKED: JLM  SCALE: NONE
DATE: 3-1-88  APPROVED BY: ENGINEER

DWG. NO.: R-4
NOTE: ALL SLOPES TO BE ROUNDED OFF AT TOP OF SLOPE.

CLASS I MAJOR

MINIMUM REQUIREMENTS:
2" CLASS "B" ASPHALT CONCRETE
6" CLASS II AGGREGATE BASE

DESIGN SPEED: 35-45 M.P.H. (MIN.)
MINIMUM 12" DIAMETER CROSS PIPE, LOCATION TO BE DETERMINED IN FIELD. WHEN REQUIRED. (SEE NOTE G)

MIN. 12" DIAMETER PIPE TO BE SET IN LINE WITH ANY EXISTING DITCHES AT ELEV. NOT TO DISRUPT SIDE DRAINAGE.

RURAL DRIVEWAY

<table>
<thead>
<tr>
<th>TYPE</th>
<th>W (MIN.)</th>
<th>W (MAX.)</th>
<th>A.B. (MIN.)</th>
<th>A.C. (MIN.)</th>
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<tbody>
<tr>
<td>RESIDENTIAL</td>
<td>12'</td>
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<tr>
<td>COMMERCIAL</td>
<td>15'</td>
<td>35'</td>
<td>6&quot;</td>
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NOTES:

(1) AT AN INTERSECTION NO DRIVEWAY SHALL BE PLACED WITHIN 5' OF B.C.
(2) DRIVEWAYS SHALL BE AT RIGHT ANGLE TO THE STREET.
(3) ONE DRIVEWAY FOR EVERY 100' OF FRONTAGE.
(4) CIRCLE DRIVEWAYS TO BE NO CLOSER THAN 75' BETWEEN CENTERS (RESIDENTIAL) OR 30' BETWEEN CENTERS (COMMERCIAL).
(5) WHEN CROSS PIPE IS USED IT SHALL EXTEND A MINIMUM 0.5' PAST TOP OF FILL OF DRIVEWAY; ALL FILL TO BE COMPACTED TO 95% RELATIVE COMPACTION.
(6) PIPES WILL BE CORRUGATED METAL.
**TOWN CLASS II**

Minimum Requirements:
- 2" CLASS "B" ASPHALT CONCRETE
- 6" CLASS II AGGREGATE BASE
- NO DESIGN SPEED

* per planning commission requirements

(Note: All slopes to be rounded off at top of slope.)
TOWN CLASS III

MINIMUM REQUIREMENTS:

2" CLASS "B" ASPHALT CONCRETE

6" CLASS II AGGREGATE BASE

DESIGN SPEED: 25 MPH. (MIN.)

* per planning commission requirements

NOTE: ALL SLOPES TO BE ROUNDED OFF AT TOP OF SLOPE.
Town CLASS IV

Major Collector

Minimum Requirements:
- 2" Class "B" Asphalt Concrete
- 6" Class II Aggregate Base
- Design Speed: 35 - 45 MPH (Min.)

* per Planning Commission requirements

Note: All slopes to be rounded off at top of slope.
TYPICAL TURN LANE INSTALLATION

* per Planning Commission requirements
GRADE TO BE LEVEL UNLESS OTHERWISE APPROVED BY COUNTY ENGINEER.

ROAD WIDTHS, SIDEWALK PLACEMENT, CURB & GUTTER PER CROSS-SECTIONS
NOTES:
1. REINFORCING STEEL IN WALLS SHALL BE #4 BARS @ 18" CENTERS PLACED 1 1/2" CLEAR TO INSIDE OF BOX.
2. ALL MATING SURFACES BETWEEN GRATE & FRAME TO BE MACHINED.
3. GRATE & FRAME MAY BE APPROVED EQUAL.
4. CATCH BASIN TO BE USED WITH 18" PIPES (INCREASE DIMENSIONS FOR PIPES >18")
5. FINAL GRATE CONFIGURATION TO BE DETERMINED BY COUNTY ENGINEER.

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN GJF  SHEET OF  CATCH BASIN TYPE "A"
CHECKED JLM  SCALE: NONE  APPROVED BY
DATE 3-1-88  ENGINEER

DWG NO. R-15
NOTES

1) 1/4" FELT EXPANSION JOINTS TO BE BRACED BY STEEL BACKING DURING POUR.

2) SAND TO BE PLACED WHEN DIRECTED BY ENGINEER AND COMPACTED TO 95% RELATIVE COMPACTION.

3) EXPANSION JOINTS TO BE PLACED AT 20' INTERVALS AND ONE AT EACH END OF PRIVATE DRIVEWAYS AND AT ENDS OF CURB RETURNS AND EDGES OF HANDICAPPED RAMPS.

* CURB & GUTTER INSTALLED SEPARATELY FROM SIDEWALK IN UNSTABLE SOIL, AND ALL COMMERCIAL DRIVEWAYS SHALL HAVE #4 STEEL BAR PLACED AS SHOWN.
1. DESIGNED FOR RESIDENTIAL AREAS ONLY.

2. REFER TO DETAIL R-16 FOR OTHER NOTES.
1) CONCRETE SHALL BE CLASS "B"  
2) 1/4" FELT EXPANSION JOINTS SHALL BE AT 30' INTERVALS AND AT EDGE OF EACH DRIVEWAY.  
3) WHERE HANDICAPPED RAMPS ARE NOT IMMEDIATELY REQUIRED, PLACE FELT EXPANSION JOINTS AT STREET CORNERS.  
4) WHEN SIDEWALK IS ADJACENT TO CURB, EXPANSION JOINTS SHALL MATCH THOSE IN CURB.  
5) SIDEWALK SCORED, 1/4" DEEP AT 5' INTERVALS  
6) SAND TO BE COMPACTED TO 95% RELATIVE COMPACTION.
TYPICAL SEPARATED SIDEWALK OR PATH SECTION

NOTE: PROVIDE LATERAL SUPPORT AS NECESSARY. PER COUNTY ENGINEERS' REQUIREMENTS.

DIKE OR SHOULDER AS REQUIRED.

R.O.W. WIDTH

WIDTH

4' OR G 2' VARES

R.O.W. WIDTH

R.O.W. Width

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN G.I.F. SHEET 3 OF 4
CHECKED J.L.M. DATE 3-1-85
SCALE NONE TYPICAL SEPARATED SIDEWALK OR PATH SECTION
APPROVED BY ENGINEER

DWG.NO R-19
RAMP AT CORNERS (PLAN)

RAMP AT MIDBLOCK (ISOMETRIC)

TRaverse ROUGH BROOM FINISH - BOTH SIDES

Grooves in ramp area are to be placed parallel to crosswalk markings for use of the blind.

12" MIN.

RAMP UP - 3/8" TO 1/2" HEIGHT

3/4" ON LANDING 1 1/2" ON RAMP

1/4"

1/4"

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN G.J.F.
CHECKED J.L.M.
DATE 3-1-88
SCALE NONE
HANDICAPPED RAMP
APPROVED BY ENGINEER
DWG.NO. R-20
NOT MORE THAN 60% OF LOT(S) FRONAGE IN ANY ONE DRIVEWAY OR COMBINATION OF DRIVEWAYS

SEPARATE DRIVEWAYS ON ADJACENT PARCELS BY 2' MIN. FULL-HEIGHT CURB. MAY WAIVE THIS REQUIREMENT WHEN JOINT DRIVEWAYS ARE USED.

DRIVEWAYS SHALL BE AT RIGHT ANGLE TO THE STREET.
NOTES:
1) LETTERING ON ROAD NAME SIGNS ARE TO BE 4" HIGH; SUPPLEMENTARY LETTERING TO INDICATE STREET TYPE 2" HIGH.

2) STREET NAME SIGNS ARE TO BE REFLECTORIZED, AND SHALL HAVE A WHITE MESSAGE AND BORDER ON A GREEN BACKGROUND.

3) CROSS PIECE AND BOTTOM CAP FIXTURE - HEAVY-DUTY ALUMINUM WITH THEFT-PROOF ALLENHEAD SET SCREWS.

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**Road Name Sign**

**Cross Piece**

**Bottom Cap Fixture** for 2" I.D. Pipe

**Theft-Proof Allenhead Set Screws**

**Steel Galvanized Pipe:** 2" I.D. x 10'-0"

**Aluminum Plates:** Min. thickness 0.08"

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**Anchor Detail**

**2" x 2" x 6" x ¼" Angle Iron Welded to the Pipe.**

**P.C.C. Base**

**8" Diameter**

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**Sign Placement**

**Sidewalk Separated from Curb**

**Sidewalk Adjacent to Curb**

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**Mariopa County Engineering Department**

**Drawn:** G.I.F  **Checked:** J.L.M  **Date:** 3-1-88  **Approved By:** Engineer

**Sheet 1 of 2**  **Standard Road Sign**  **Scale:** None  **Dwg. No:** R-23
NOTES:
(1) LETTERING ON ROAD NAME SIGNS ARE TO BE 4" HIGH; SUPPLEMENTARY LETTERING TO INDICATE STREET TYPE: 2" HIGH.

(2) STREET NAME SIGNS ARE TO BE REFLECTORIZED AND SHALL HAVE A BROWN MESSAGE AND BORDER ON AN IVORY BACKGROUND.

(3) CROSS PIECE, BOTTOM CAP FIXTURE AND FINIAL: HEAVY DUTY ALUMINUM WITH THEFT-PROOF ALLENHEAD SET SCREWS.

(4) SEE "STANDARD ROAD SIGN" FOR ANCHOR DETAIL & SIGN PLACEMENT.

(5) WHERE EXISTING BUILDINGS FRONT DIRECTLY ON THE R.O.W. LINE, SIGNS MAY BE SUSPENDED FROM BUILDING. SUBMIT INSTALLATION PLANS TO COUNTY ENGINEER FOR APPROVAL.

SIGN HARDWARE

STEEL GALVANIZED PIPE: 2" I.D. X 10'-0"

ORNAMENTAL TOP FINIAL
ALUMINUM PLATES: MIN. THICKNESS 0.08"

CROSS PIECE

BOTTOM CAP FIXTURE FOR 2" I.D. PIPE

THEFT-PROOF ALLENHEAD SET SCREWS.

STREET NAME IS ON BOTH SIDES OF EACH PLATE.

E MAIN ST

ROAD NAME SIGN

VARIED

E

BROWN BORDER

1 1/2"

RADIUS

MARIPOSA COUNTY ENGINEERING DEPARTMENT

DRAWN: G.J.F. CHECKED: J.L.M.
DATE: 3-1-88 SCALE: NONE

SHEET 2 OF 2 ROAD SIGN - HISTORIC DISTRICTS

APPROVED BY ENGINEER

DWG. NO. R-24
NOTE: TYPICAL INSTALLATION WHEN REQUIRED BY ADOPTED SPECIFIC PLANS.

PLAN

COMMON OR PAVING BRICK COVER - REQUIRED ONLY WHERE SIDEWALK EXISTS (MAINTAIN 4'-MIN. SIDEWALK WIDTH)

24" (MIN.)

32 1/2"

PRUNE TREE ABOVE STAKELINE

1 x 2 x 12 REDWOOD CROSS TIES

2-2 x 2 x 96 REDWOOD STAKES (SET 18"-24" INTO GROUND)

CONG SIDEWALK

UNGROUTED BRICK SURFACE

INSTALL WATERING SYSTEM FOR EACH PLANTER

2" SAND BED

96" DEEP (MIN.) TREE HOLE

REPLANTING MIX: ADD ONE PART PEAT MOSS OR MULCH TO THREE PARTS WITHDRAWN SOIL. INCLUDE ONE PART SAND TO HEAVY SOILS.