COUNTY OF SUTTER
DEPARTMENT OF PUBLIC WORKS

IMPROVEMENT STANDARDS

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Revision 11/2010 Changes

REMOVE current	*INSERT 11/2010 version*
pages i. to iv.	pages i. to v.
Section 7 entirely Pages 7-1 to 7-19	Chapter 7 pages 7-1 to 7-17
Section 6 entirely Pages 6-1 to 6-8	Chapter 8 pages 8-1 to 8-10
Section 5 entirely Pages 5-1 to 5-30	Chapter 9 pages 9-1 to 9-27
	Standard Drawings Index Pages DI-1 to DI-2
Drawing S-1	Drawing S-1
Drawing S-1A	Drawing S-1A
Drawing S-1B	Drawing S-1B
Drawing S-2	Drawing S-2
Drawing S-3	Drawing S-3
Drawing S-4	Drawing S-4
Drawing S-5	Drawing S-5
Drawing S-6	Drawing S-6
Drawing S-6A	Drawing S-6A
Drawing S-7	Drawing S-7
Drawing S-9	Drawing S-9
Drawing W-1	Drawing W-1
Drawing W-2	Drawing W-2
Drawing W-3	Drawing W-3
Drawing W-4	Drawing W-4
Drawing W-5	Drawing W-5
Drawing W-7	Drawing W-7
Drawing W-8	Drawing W-8

COUNTY OF SUTTER
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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED) Page Revision

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

COUNTY OF SUTTER

DEPARTMENT OF PUBLIC WORKS

DESIGN STANDARDS

SECTION 1

PURPOSE AND DEFINITIONS

1-1 PURPOSE – It is the purpose of these Design Standards to provide standards to be applied to improvements and private works to be dedicated to the public and accepted by the County for maintenance or operations, as well as improvements to be installed within existing rights of way and easements. This is necessary in order to provide for coordinated development of required facilities to be used by and for the protection of the public. These Standards shall apply to regulate and guide the design and preparation of plans for construction of streets, highways, alleys, drainage, sewerage, street lighting, water supply facilities and related public improvements, and set guidelines for all private works which involve drainage, grading, trees, and related improvements.

1-2 DESIGN PRACTICE – It is recognized that it is not possible to anticipate all situations which may arise or to prescribe standards applicable to every situation. Therefore, any items or situations not included in these Design Standards shall be designed in accordance with generally accepted engineering practice, the State of California "Highway Design Manual" and "Traffic Manual," State of California Standard Specifications and as required by the Director of Public Works.

1-3 DEFINITIONS – Whenever the following terms or titles are used in these standards, or in any document or instrument where these standards govern, the intent and meaning shall be as specified in the Caltrans Standard Specifications, and as herein defined:

A. Developer – Shall mean any person or persons, firm, partnership, corporation, or combination thereof, financially responsible for the work involved.

B. Development – Shall mean the act or process of any construction on properties as well as subdivision improvement.

C. Director – Shall mean the Director of Public Works of Sutter County acting either directly or through the Assistant Director of the Department of Public Works or their authorized representatives. Director shall also mean the District Engineer where special districts are involved.

D. Laboratory – Shall mean any testing agency or testing firm which has been approved by the Department of Public Works.

E. Professional Engineer – Shall mean any person or persons, firm, partnerships, or corporation legally authorized to practice civil, mechanical or electrical engineering in the State of California who prepares or submits improvement plans and specifications to the Department of Public Works of Sutter County for approval.

F. Standard Drawings – Shall mean the standard drawings as set forth herein, approved by the Director by his signature thereon, and as modified, revised, or added.

G. Standard Specifications – Shall mean the latest standard specifications of the State of California, Department of Transportation (Caltrans), latest edition, governing the construction of roads, streets, sanitary sewers, storm drainage, concrete structures, water supply, traffic signals, street lighting and other facilities within the County of Sutter to provide for proper development.

H. State – As used in the Caltrans Standard Specifications shall mean Sutter County.

I. State Standard Plans – Shall mean the Standard Plans of the State of California, Department of Transportation (latest edition).

J. Urban Area – Shall mean the area within the boundary as defined by the Sphere of Influence of the City of Yuba City and the City of Live Oak.

SECTION 2

GENERAL REQUIREMENTS

2-1 PLANS BY AN APPROPRIATE ENGINEER – All plans and specifications for improvements, private and public, which are to be accepted for maintenance by the County and private, on-site drainage and grading shall be prepared by a Professional Engineer of the appropriate branch of engineering covering the work submitted.

2-2 APPROVED PLANS – Complete plans and specifications for all proposed streets, bikeways, grading, drainage facilities, sewerage, street lighting, water distribution systems, industrial developments, commercial developments, and subdivisions, including any necessary dedications, easements, and rights of entry, shall be submitted to the Department of Public Works for approval. The approval shall be substantiated by the signature of the Director prior to the beginning of construction of any such improvements. The Director will order any Contractor to cease work on any project if said Contractor does not have properly approved plans in his possession.

2-3 REFERENCE TO STANDARD SPECIFICATIONS AND DESIGN STANDARDS – The General Notes and Special Provisions of all plans shall include the following note:

All construction and materials shall be in accordance with the latest edition of the Caltrans Standard Specifications and Highway Design and Traffic Manuals and the County of Sutter Design Standards Manual.

2-4 WORK IN COUNTY RIGHTS OF WAY, EASEMENTS AND WATERWAYS – The following shall govern all work done within County rights-of-way, easements, and waterways:

A. Possession of a complete set of County-approved engineered plans and an encroachment permit will be required for a Contractor, duly licensed by the State of California, to perform work specified on the plans in County rights-of-way, easements and waterways. The Contractor shall be bonded as required by the Director.

B. In lieu of the plans required in "A" above, minor work within County rights-of-way, easements and waterways may be performed in accordance with the following:

1. Minor work within street rights-of-way and easements may be performed with an encroachment permit.

2. Minor work has a value of less than $5,000 and generally consists of such items as widening or constructing sidewalks adjacent to existing roadside curb and gutter, constructing driveways in existing curb and gutter, constructing asphalt concrete driveways, installing driveway culverts and utility related work which requires cutting the road surface.

3. The encroachment permit shall be issued in accordance with Division 2, Chapter 5.5 of the Streets and Highways Code of the State of California.

4. Work within street rights-of-way and easements consisting of street light installations or street light installations and minor work as described in No. 1 above shall be performed with an encroachment plan.

5. Encroachment plans shall be in accordance with all of the requirements of these standards except that Section 2-1, "Plans by an Appropriate Engineer," may be waived for the preparation of the encroachment plans.

2-5 IMPROVEMENT PLAN SUBMITTAL – The initial submittal of improvement plans to the Department of Public Works shall consist of the following:

A. A minimum of three sets of plans, complete and in accordance with these Design Standards and the Standard Specifications, along with any required specifications, computation, test data, preliminary construction cost estimate, and other material requested by the Director.

B. Two copies of the watershed map and drainage calculations in accordance with Section 5.

C. Two additional copies of the street lighting plan to be used for block numbering on street name signs.

D. One copy of the final "Conditions of Approval" and applicable exhibits for all rezones, subdivision approvals, variances, use permits, and any other discretionary planning actions for the subject development.

E. A portion of the plan check and inspection fee in accordance with Section 2-7.

F. The name, address and telephone number of the developer.

G. Utility letters in accordance with Section 2-16.

H. Copies of permits as required by other agencies.

Should there be required alterations or revisions to the plans as submitted, the Director will return one copy with the corrections marked or indicated thereon. If the plans submitted are not prepared in accordance with these Design Standards and the Standard Specifications or not in keeping with the standards of the profession, the Director may return them unmarked and unapproved.

2-6 IMPROVEMENT PLAN RESUBMITTAL – Plans being resubmitted shall consist of three complete sets of plans and revised studies as necessary. Additional sets may be required by the Director.

Plans being resubmitted containing revisions or alterations other than those required by the Director on previously corrected plans shall require the Professional Engineer to bring those revisions or alterations to the attention of the Director on another set of plans and color highlighting the revisions or alterations.

2-7 PLAN CHECK AND INSPECTION FEE – When improvement plans are initially submitted to the Department of Public Works for checking, a portion of the total plan check and inspection fee for the development will be required as a deposit to initiate checking of the plans.

Should the development not be carried to completion, any portion of the required deposit over and above the accumulated costs expended by the Department on the development will be refunded to the developer.

The Department of Public Works shall be notified of any change of billing address.

Required plan check and inspection fee payments shall be as set by Resolution of the Board of Supervisors.

2-8 PLAN APPROVAL – No plans will be approved nor construction authorized until such time as the Director signifies his approval by his signature on the set of plans and not unless such changes, corrections or additions are resubmitted to

the Director for approval as previously prescribed for the original plans. At such time as the Professional Engineer preparing the plans has made the necessary revisions and paid the remainder of the total plan check and inspection fee, the Director will sign the mylars in the space provided, after the Professional Engineer and all other approval agencies have signed them. The Director's approval is valid for a period of twelve months from the date of the Director's signature. Should work not commence within the twelve month period, the plans shall be resubmitted for reapproval prior to commencing construction.

Final asphalt concrete, aggregate base, and aggregate subbase quantities and calculations shall be submitted for all subdivision developments prior to approval.

2-9 FINAL PLANS REQUIRED – The Professional Engineer shall deliver the following number of sets of prints from the approved tracings to the Director:

A. Subdivisions – Eight complete sets of plans, three additional sets of the street light plans only, and one set of reproducible fixed line mylar plans.

B. Other Developments – Nine complete sets of plans.

C. Developments containing drainage pipeline systems shall submit a 1 inch = 100 foot scale map of these systems.

Additional copies of improvement plans may be requested by the Director at his discretion, and these shall be furnished to the County without cost.

Copies of the final utility letter required by Section 2-16 shall be included within the approved plans delivered to the Director.

2-10 IMPROVEMENT PLAN REVISIONS DURING CONSTRUCTION – Should changes become necessary during construction, the Professional Engineer shall first obtain the consent of the Director and shall then resubmit the title sheet and the plan sheets affected for approval. The changes on the plans shall be made in the following manner:

A. The original proposal shall not be eradicated from the plans but shall be lined out.

B. In the event that eradicating the original proposal is necessary to maintain clarity of the plans, approval must first be obtained from the Director.

C. The changes shall be clearly shown on the plans with the changes and approval noted on a revision signature block.

D. The changes shall be identified by the revision number in a triangle delineated on the plans adjacent to the change and on the revision signature block.

Minor changes, which do not affect the basic design or contract, may be made upon the authorization of the Director, but said changes must be shown on "record" plans when the contract is complete.

The Director may order changes in the plans in order to complete the necessary facilities. Changes in the plans ordered by the Director shall conform to all of the above.

2-11 RECORD (AS-BUILT) PLANS – The Professional Engineer shall keep an accurate record of all approved deviations from the plans and shall provide five copies of these records to the Director upon completion of the work. Before the Director will approve the subdivision improvements as complete, the Professional Engineer shall submit final mylar record plans to the Department.

Certification by the Professional Engineer of the finished pad elevations and geotech certification of compaction of subdivision lots shall also be required prior to the final approval of the subdivision improvements.

2-12 CONFLICTS, ERRORS AND OMISSIONS – Excepted from approval are any features of the plans that are contrary to, in conflict with, or do not conform to any California State Law, conditions of approval, or generally accepted good engineering practice, in keeping with the standards of the profession, even though such errors, omissions or conflicts may have been overlooked in the Department of Public Works' review of the plans.

2-13 CHANGE IN PROFESSIONAL ENGINEER – If the developer elects to have a registered civil engineer or licensed land surveyor other than the engineer who prepared the plans provide the construction staking, he shall provide the Director in writing the name of the individual or firm one week prior to the staking of the project for construction. The Developer shall then be responsible for proving all construction, the preparation of revised plans for construction changes, and the preparation of "as-built" plans upon completion of the construction.

In the Developer's notification of a change in the firm providing construction staking, he shall acknowledge that he accepts responsibility for design changes and "as-built" information as noted above.

2-14 SEWER ANNEXATION REQUIREMENTS – When sanitary sewer plans are submitted for an area that is not within a sanitation or sewer maintenance district, said plans will not be approved until a request for annexation to the appropriate special district has been completed, unless otherwise approved by the Director. Annexation request forms and information relative to annexation procedures are available from the special district.

2-15 TUNNEL SAFETY REQUIREMENTS – Any boring or jacking operation of 100 foot or greater length and involving an opening greater than 30 inches in diameter is subject to the State of California Division of Industrial Safety's tunnel safety requirements. The Professional Engineer shall submit to the Division of Industrial, Safety plans and specifications applicable to the tunnel operation, with a letter requesting tunnel classification. This procedure is also recommended to avoid project delay if there is the possibility of any personnel entering the tunnel, regardless of diameter and length. The letter should identify the Public Works agency responsible for the project, and the agency's mailing address. The plans shall identify underground utilities and tanks or areas for storing fuel and toxic gases in the vicinity of the tunnel site. The request for classification should be submitted allowing ample time for the Division of Industrial Safety review in order that any special requirements can be included in the project plans and specifications. The Professional Engineer shall also attend the required pre-construction meeting.

2-16 EXISTING UTILITIES – All existing utilities are to be shown on the plans. In addition, the Professional Engineer shall submit prints of the preliminary and approved plans to the utility companies involved. This is necessary for the utilities to properly plan their relocation projects and needed additional facilities. Copies of the transmittal letters to the utility companies shall be provided to the Director. The transmittal letters shall indicate all utility pole conflicts which require relocation. The conflict shall be referenced to stationing and distance from centerline. In addition, the following note shall appear on the first page of the plans: No pavement work will occur within the road right-of-way prior to completion of utility pole relocation.

2-17 PARTIAL PLANS – Where the improvement plans submitted cover only a portion of ultimate development, the plans submitted shall be accompanied by the approved tentative plan or a study plan if there is no approved tentative plan showing topographic features of the ultimate development at an adequate scale to clearly show the proposed improvements.

2-18 OTHER AGENCY NOTIFICATIONS – The Professional Engineer is responsible for obtaining the approval and necessary permits of governmental or municipal agencies when their facilities are involved. The Professional Engineer shall obtain the approval of other affected agencies prior to the Director approving the plans.

2-19 INSPECTION REQUIREMENTS – Any improvement which the County will assume maintenance responsibility, shall be inspected during construction by the Director. Each phase of construction shall be inspected and approved prior to proceeding to subsequent phases.

Private on-site grading and drainage related to subdivision improvements shall be inspected during construction by the Director. The Developer shall hire a geotechnical engineer, approved by the Director, to monitor onsite earthwork. The geotechnical engineer shall certify compliance with earthwork plans and specifications. The Professional Engineer shall certify finished pad elevations.

Any improvements constructed without inspection as provided above or constructed contrary to the order or instructions of the Director will be deemed as not complying with the Standard Specifications and will not be accepted by Sutter County for maintenance purposes.

The Professional Engineer shall notify the Director when the Contractor first calls for grades and staking and shall provide the Director with a copy of all cut sheets.

Within ten days after receiving the request for final inspection, the Director shall inspect the work. The Contractor, Professional Engineer, and Developer will be notified in writing as to any particular defects or deficiencies to be remedied. The Contractor shall proceed to correct any such defects or deficiencies at the earliest possible date. At such time as the work has been completed, a second inspection shall be made by the Director to determine if the previously mentioned defects have been repaired, altered, and completed in accordance with the plans. At such time as the Director approves the work and accepts the work for Sutter County, the Contractor, Professional Engineer and Developer will be notified in writing as to the date of final approval and acceptance.

On assessment districts and projects where Sutter County participates in the costs thereof, quantities will be measured in the presence of the Director, Professional Engineer, and Contractor, and witnessed accordingly.

2-20 SPECIAL NOTICES AND PERMITS – The Professional Engineer shall be responsible for advising the Contractors to have the following notices and have in his possession the following permits and plans:

A. Contractor shall be in receipt of official County approved plans prior to construction.

B. Contractor shall notify all utility companies involved in the development prior to beginning of work.

C. Contractor shall notify "Underground Service Alert" (phone 800-642-2444) two (2) working days in advance before any digging.

D. Contractor shall be responsible for the protection of all existing monuments and/or other survey monuments and shall notify Sutter County's Director of Public Works of any damaged or removed County, State or Bureau of Reclamation monuments.

E. Contractor shall notify Director upon application for permit and payment of required fees for sewer taps.

F. The Contractor shall verify all street names with County Surveyor before ordering street signs.

G. Unless specifically permitted on the plans, the Contractor shall be responsible for conducting his operation entirely outside of any floodplain boundaries. Floodplain boundaries shall be clearly delineated in the field prior to construction.

H. Contractor shall be responsible for conducting his operation entirely outside of any no-grading area. These areas shall be clearly delineated in the field prior to construction.

I. Where work is being done in an off-site easement, the Contractor shall notify the property owner 48 hours prior to commencing work.

SECTION 3

PLAN SHEET REQUIREMENTS

3-1 PAPER DETAILS – All improvement plans shall be prepared on plan and profile sheets 24" x 36" sheets, Plate "A" plan and profile paper, or special professional engineer's sheets which have been accepted by the County. Scales: Horizontal 1" = 20', 40', or 50'; Vertical 1" = 2', 4', or 5', but only the scale, horizontal or vertical, for which the sheet was intended shall be used.

3-2 DRAFTING STANDARDS – All plans approved by the County may be microfilmed. Therefore, certain drafting standards have become necessary to produce legible film and subsequent prints. All line work shall be clear, sharp and heavy. Letters and numerals shall be 1/8 inch minimum height, well formed and sharp. Numerals showing profile elevations shall not be bisected by station grid lines. Dimension lines shall be terminated by sharp solid arrowheads.

3-3 TITLE SHEET – On subdivision or improvement plans exceeding three sheets in a set, a title sheet shall be prepared showing the following:

A. The entire subdivision or parcel and project*
B. Assessment district limits
C. City limits
D. Street names and widths
E. Section lines, grant lines and corners
F. Adjacent subdivision, including names, lot lines and lot numbers
G. Property lines
H. Public easements
I. Location map*
J. Scale of drawings
K. Index of sheets*
L. Legend of symbols
M. Signature block situated at the lower right hand corner of the sheet*
N. AC, AB, ASB quantities
O. California Coordinate System grid numbers in the upper right hand corner

*Shall be shown on the front sheet of encroachment plans and plans consisting of three or less sheets.

Improvement plans consisting of three or less sheets and encroachment plans shall not be required to provide a title sheet but shall be required to show all of the above in the plans.

3-4 TITLE BLOCK – Each sheet within the set of drawings shall have an approved title block showing the sheet title, number, date, scale and the Professional Engineer's name, signature, license number and expiration date; the name of the County maintenance, water agency or sanitation district, when applicable; and the name of the subdivision or assessment district. Samples may be obtained from the Department of Public Works.

3-5 DRAINAGE, SEWER, WATER AND GRADING LAYOUT – On all subdivision plans, the storm drainage, sanitary sewer and domestic water systems shall be shown on an overall plan layout at 1" = 100' scale. In addition, the storm drainage and sanitary sewer and water systems shall be shown on the street plans. Separate grading plans with storm drainage system will be required for all subdivisions. On all other plans, an overall plan layout will not be required, but the above facilities shall be shown within the development and on the street plans.

All plans showing the domestic water systems shall include signature blocks and be approved by the responsible water and fire districts and for encroachment approval by the Director. The signature block shall be situated near the lower right hand corner of the first sheet of the water plans.

Where wells are included as a part of the water system, the layout of the well site shall be drawn to a scale no smaller than 1 inch equals 5 feet, with the layout covering an area at least 50 feet in all directions from the well location.

3-6 PLAN DETAILS – In addition to the other requirements of these Design Standards, the following details shall be shown on plans submitted for approval. This does not in any way exempt the Professional Engineer preparing plans from the responsibility of preparing neat, accurate and comprehensive plans in keeping with the standards of the profession.

A. Right-of-Way – Right-of-way lines, the boundaries of lots fronting on the street, drainage easements, utility easements, planting easements, section lines and corners, land grant lines and temporary construction easements, both existing and proposed, shall be shown on the plans. All right-of-way and easement lines shall be properly dimensioned.

B. Topography – All pertinent topographic features shall be shown, such as street lines, medians, driveways (on both sides of the street when within

40 feet of the median ending), curbs, sidewalks, shoulders, location and size of storm and sanitary sewer lines, high water and frequent inundation levels, water lines, gas lines, telephone conduits, other underground utilities, existing structures, houses, trees (9" and larger) and other foliage, traffic signals, street lights and pullboxes, underground electrical conduits, drainage ditches, utility poles, fire hydrants, retaining walls, masonry structures, and all other features of the area which may affect the design. When potential utility conflicts exist, "as-built" elevations of the utilities shall be verified by the Professional Engineer. For existing structural sections, the grade of the cross slope on the road and 20 feet into the property at driveways shall be shown.

C. Contours and Elevations – Existing contours or supporting elevations shall be shown on all plans submitted for subdivision, commercial improvements, or planned unit developments and shall extend a minimum of 100 feet outside the project boundary.

D. Profiles – The plans shall show the existing profile of all roadway centerline, edges of pavement, curb and gutter flow lines, drainage ditches, storm and sanitary sewers. All profiles of proposed improvements shall state centerline elevations at 50 foot intervals and rate of grades, vertical curves and other vertical alignment data. When curb and gutters are designed for reconstructed county roads, elevations shall be shown at the edge of the outside traveled way, or if the road has a full paved section, shall also be shown two feet from the proposed lip of gutter. Any warped surface and vertical curve shall set elevations at 25 foot intervals.

E. The plans shall show the existing ground profile for a minimum distance of 200 feet beyond temporary street endings to facilitate setting proper vertical alignment within the proposed improvements limits. The 200 foot minimum shall be increased when requested by the Director.

F. Stationing and Orientation – The stationing on plan and profile shall read from left to right. Stationing shall increase from south to north or from west to east. Plans shall be arranged with the north arrow pointing toward the top or upper 180 degrees, insofar as practical.

G. Bench Marks – The bench marks and datum shall be clearly delineated on the plans, both as to location description and elevations. The datum shall be 1983 North American Datum (U.S.G.S. or U.S.C&G.S.) Professional Engineers shall contact the County for location and elevation of the nearest official bench mark.

H. California Coordinates System – The Director may require that the proposed improvements be tied into the California Coordinates System if monumented coordinate points are available within a reasonable distance (200 feet or less) of said improvements as determined by the Director.

I. Typical Sections – A typical section for each type of facility within the improvement, setting out the structural features, shall be a part of the plans.

J. Cross Sections – Cross sections shall be included in the plans, where determined necessary by the Director. When in limited areas, unusual topographic features or special conditions occur which would affect the work, individual cross sections may be shown on the pertinent plan sheet.

K. Special Notes – Special notes shall be clearly indicated, and it shall be conspicuously noted on the plans for all construction work and installations shall conform to the Caltrans Standard Specifications and all work is subject to the approval of the Director. Notes shall contain a statement regarding obtaining encroachment permits from other agencies when applicable.

3-7 REQUIRED NOTES – A list of County required notes shall be obtained from the Department of Public Works and shall be included on the original mylars for all development plans submitted to the County for approval.

SECTION 4

STREETS

4-1 STREET TYPES AND DESIGN WIDTHS – The standard approved street types and design widths for Sutter County are as follows:

A. 40 Foot Street – A minor residential street with a right-of-way width of 40 feet, a back-to-back of curb width of 32 feet, and 4 foot sidewalks. See Standard Drawing H-4. A 6-foot planter may be added between the back of curb and sidewalk making the right of way 52 feet.

40 foot streets are normally used when serving 99 or fewer single family residential units. Some duplexes may be included when the street is less than 400 feet long.

B. 48 Foot Street – A standard residential street with a right-of-way width of 48 feet, a back-to-back of curb width of 40 feet, and 4 foot sidewalks. See Standard Drawing H-4. A 6-foot planter may be added between the back of curb and sidewalk making the right of way width 60 feet.

48 foot streets are normally used for serving more than 99 but fewer than 400 single family residential units and for serving duplex developments.

C. 60 Foot Street – A collector street with a right-of-way width of 60 feet, a back-to-back of curb width of 51 feet, and 4.5 foot sidewalks. See Standard Drawing H-5. A 6-foot planter may be added between the back of curb and sidewalk making the right of way 72 feet.

60 foot streets are required in all commercial, industrial, and multiple family developments and are normally used in the vicinity of parks, schools and other public facilities in residential areas when serving more than 400 residential units.

D. 86 Foot Street – A minor arterial street with a right-of-way width of 86 feet, a back-to-back of curb width of 77 feet, and 4.5 foot sidewalks. See Standard drawing H-6. Intersection widening may be required in accordance with Standard Drawings H-11. A 6-foot planter may be added between the back of curb and walk making the right-of-way 98 feet.

86 foot streets shall be required when shown on the Sutter County Major Street and Highway Plan.

E. 110 Foot Street – A major arterial street with a right-of-way width of 110 feet, a back-to-back of curb width of 101 feet, and 4.5 foot sidewalks. See Standard Drawing H-7. Intersection widening may be required in accordance with Standard Drawings H-11.

110 foot streets shall be required when shown on the Sutter County Major Street and Highway Plan.

F. Arterial Street Design – 110 foot major arterial streets have a solid non-traversable median between cross street intersections which shall be spaced at least 900 feet apart. Minor street intersections (with right turns only should be no closer than 450 feet from each other or from the cross street intersections. Major driveways which will serve significant traffic volume, as determined by the Director, shall be considered as intersecting streets with regard to spacing, and all other driveways will have right turns only. Driveways should be located as far apart as practical with a minimum of 150 feet between driveways or from driveways to intersections.

All streets 86 feet and wider shall be designed to the appropriate arterial standards regardless of whether they are apparent on the County Master Plan of Streets and Highways. Where streets are constructed with the arterial standard widths, it is intended that they meet all the standards specified herein.

G. Frontage Road – A street which provides service to abutting property and control of access alongside another street for which direct access is prohibited or undesirable. Frontage roads shall conform to the frontage road standard with a 26 foot paved surface with a barrier curb on one side and curb and gutter and a minimum 4 foot sidewalk on the other side. See Standard Drawing H-7 and Section 4-17(D).

H. Partial Street – A street for which the full right-of-way cannot be dedicated or the complete street cannot be constructed. Partial street shall be in accordance with Section 4-5.

4-2 STREET CLASS – The standard approved street classes of Sutter County are as follows:

A. Class "A" Streets – Class "A" street improvements shall be in accordance with Standard Drawings H-4 through H-7 and shall consist of the following:

1. "Asphalt" concrete pavement over an aggregate base, and aggregate subbase as required.

2. Concrete curb and gutter and sidewalks.

3. Side slopes not steeper than 2:1 in cuts or 2:1 in fills, or a reinforced concrete retaining wall beginning at the right-of-way line.

4. Street lights.

Street improvements for all single family residential lots and parcels having a net area of 14,500 square feet or less and a (lot) frontage of 100 feet or less shall be Class "A". The net area shall be considered to be that portion of the lot or parcel exclusive of street right-of-way, fenced easements and fenced parkways. Lot frontage in the case of a corner lot shall mean the side of the lot with the narrowest street frontage.

When considering subdivision improvements, the average lot area and average lot frontage shall be used to determine the street class. Lots in excess of 16,000 square feet shall not be considered in averaging lot areas. Lots having a lot frontage in excess of 125 feet shall not be considered in averaging lot frontage.

Property developments on land zoned or used for duplex, multiple residential business and professional, commercial, and industrial uses shall require Class "A" street improvements, regardless of the individual lot frontage or area.

Single family lots adjacent to 86 foot streets and 110 foot streets shall require Class "A" street improvements when within the limits of the urban area, regardless of the individual lot frontage.

B. Class "C" street improvements shall be required in zoning districts _____ _____. Class "C" street improvements shall be in accordance with Standard Drawings H-3.

The normal condition of using 40 foot streets to serve up to 99 single family residential units (Section 4-1(B)) shall also apply to AR-1 and AR-2 development.

4-3 STRUCTURAL SECTIONS – The following standards for the design of structural sections shall govern the preparation of plans for proposed improvements.

A. In all areas pavement shall be designed on the basis of the resistance R-value as determined in accordance with the State of California, Department of Transportation, or other approved method.

The thickness of the various structural components shall be determined by the tables, charts, formulas and procedures contained in the State Design Manual, or as directed by the Director.

Minimum traffic index shall be as specified in Table 4-1, or as determined by the Director.

TABLE 4-1

Street Classification	Minimum Traffic Index	Minimum Structural Section		
		AC	AB	ASB
Minor Residential	5.0	2″	6″	
Standard Residential	6.0	3″	6″	
Collector	7.0	3″	6″	
Industrial/Commercial	8.0	3″	6″	6″
Minor Arterial	9.0	4″	6″	6″
Major Arterial	10.0	4″	6″	6″

B. The minimum allowable thickness of roadbed section shall be as follows:

1. 6″ Portland cement concrete and 4″ aggregate base on 20 foot streets (alleys).

2. 2″ asphalt concrete and 6″ aggregate base on 40 foot streets serving single family residential and duplex developments.

3. 3″ asphalt concrete and 6″ aggregate base on 48 foot and 60 foot streets.

4. 4″ asphalt concrete, 6″ aggregate base, and 6″ aggregate subbase on 86 foot and 110 foot streets.

5. The minimum structural section for industrial and commercial streets shall be 3″ asphalt concrete, 6″ aggregate base, and 6″ aggregate subbase unless otherwise specified by the Director.

6. Developments shall use paving sections established by the Director for streets other than 40 and 48 foot streets where such special structural sections have been established.

7. In transition areas from one street width to another street width standard, the heavier structural section shall be used in the transition area.

8. As an alternative to the preceding structural sections, total asphalt concrete structural sections may be specified to the following minimum thicknesses:

   a. 5-1/2 inches of asphalt concrete equals 2 inches of asphalt concrete and 6 inches of aggregate base.

   b. 6 inches of asphalt concrete equals 3 inches of asphalt concrete and 6 inches of aggregate base.

   c. 9 inches of asphalt concrete equals 3 inches of asphalt concrete, 6 inches of aggregate base and 6 inches of aggregate subbase.

   Total asphalt concrete sections shall receive the specific approval of the Director.

C. Portland cement concrete streets may be constructed with the approval of the Director.

4-4 PROFILE STANDARDS – The following standards for the design of profiles shall govern the design of proposed improvements. See Section 3-6(D).

A. The minimum grade on new streets shall be 0.5 percent, including the curb and gutter grade around intersection corner roundings. Curb and gutter elevations on crest and sag vertical curves shall be adjusted to meet the 0.5 percent minimum grade.

B. The minimum grade of gutter sections constructed on existing streets shall be 0.20 percent.

C. Standard cross slope on new streets shall be 2.0 percent.

D. The minimum cross slope on widening shall be 1.5 percent and the maximum cross slope shall be 3.0 percent. The cross slope of the widening shall conform to the cross slope of the existing pavement whenever possible.

E. When two streets intersect, neither street shall have a grade greater than 3.0 percent for a minimum distance of 40 feet measured from the curb line of the intersecting street, except in unusually rough terrain, as determined by the Director. The centerline of the lesser intersecting street shall meet the cross slope at the projected lip of the gutter. Cross slope may be reduced to 1.0 percent within the intersection, if necessary.

F. The minimum vertical curve length allowable at the intersection of two grades shall be 50 feet. Vertical curves on residential and collector streets may be omitted where the algebraic difference in grades does not exceed 2.0 percent. The minimum vertical curve data to be computed and shown on the plans shall consist of the point of intersection elevation, the tangent gradients, the middle ordinate and the length of curve.

G. The design speed and minimum stopping sight distance over any segment of roadway shall be as follows unless a lesser design speed is specifically approved by the Director:

Street Type	Recommended Design Speed	Minimum Stopping Sight Distance
40 foot R/W	25 MPH	150 feet
48 foot R/W	30 MPH	200 feet
60 foot R/W	35 MPH	250 feet
86 foot R/W	55 MPH	500 feet
110 foot R/W	55 MPH	500 feet

Stopping sight distance is measured from the drivers' eyes, which are assumed to be 3.5 feet above the pavement surface, to an object 0.5-foot high on the road.

4-5 PARTIAL STREETS – Partial streets may be permitted by the Director along the boundary of a subdivision or property of the developer where the full right-of-way cannot be dedicated or where the complete street cannot be constructed, but will ultimately be constructed with adjacent development.

The minimum right-of-way width shall be 40 feet or one-half of the proposed right-of-way, whichever is greater.

Partial streets shall be constructed to a complete geometric and structural section for a minimum paving width specified by the following:

A. On 40 and 48 foot streets, the pavement width shall be 24 feet.

B. On 60 foot streets, the pavement shall extend five feet past centerline for a total of 28 feet.

The intersection pavement edges shall have a minimum radius of 13 feet on the uncompleted side. All other edge of pavement radii shall be 25 feet or greater.

When paving partial construction of an ultimate street development, the edges of the current pavement shall be protected by use of 2" x 6" approved headers, construction grade, or by pacing a minimum of one foot additional width of aggregate base material beyond the edge of pavement to the grade and depth of the adjacent structural section.

4-6 OFFSET INTERSECTION –

A. Streets intersecting any 40 foot, 48 foot, or 60 foot industrial or residential collector street from opposite sides shall have their centerlines meet, or the offset between centerline intersections shall be a minimum of 200 feet.

B. Streets intersecting any 86 foot street from opposite sides shall have their centerlines meet, or the offset between centerline intersections shall be a minimum of 300 feet.

C. See Section 4-1(F) for intersection spacing requirements for 86 foot and greater streets where there are median dividers.

4-7 CUL-DE-SAC – Cul-de-sac streets shall be terminated with a bulb which shall have right-of-way and back of curb radius dimensions conforming to Standard Drawing H-8 and the following:

Approach Street	R/W Radius	Back of Curb Radius
40 foot street	50 feet	46 feet
48 foot street	50 feet	46 feet
industrial street	56 feet	51.5 feet
60 foot street	56 feet	51.5 feet

No cul-de-sac shall exceed 600 feet in length as measured from the projected edge of gutter or edge of pavement to the center of the bulb.

A hammerhead bulb with a right-of-way and geometric dimensions conforming to Standard drawing H-9 may be approved by the Director in lieu of the standard cul-de-sac when there is no vehicular access from the development. Special turnaround designs may be approved by the Director under unusual topographic or other conditions.

4-8 ELBOW INTERSECTION – Elbows shall be required at right angle intersections in accordance with Standard Drawing H-10. Only under unavoidable or extreme conditions will an elbow other than 90° ± 5° be permitted by the Director. Elbow intersections are not allowed on 86 foot and 110 foot streets.

4-9 CENTERLINE RADII – The curve data (delta angle, length, tangent and radius) for all centerline curves shall be computed and shown on the plans. The minimum radius curve for 40 foot streets shall be 200 feet.

The minimum radius curve for 48 foot streets shall be 300 feet with the exception that 48 foot streets exceeding 1,000 feet in length and functioning as collectors serving over 99 lots and connecting to 86 foot or 110 foot streets shall have a minimum radius curve of 500 feet.

The minimum radius curve for 60 foot streets shall be 500 feet.

The minimum radius curve for 86 foot and 110 foot streets shall be 2,000 feet.

Special consideration will be given to unusually difficult alignment problems. Any exception to the above minimum radius requirements shall be approved by the Director.

Where a centerline radius on a major street is less than the above requirements is approved by the Director, superelevation may be required.

A minimum tangent length of 200 feet is required between reversing curves on 60 foot and larger streets.

4-10 SIGHT DISTANCE AT INTERSECTIONS – Streets shall not be designed with intersections on the inside of curves or at any location in general where sight distance will be inadequate for drivers to tell if they can safely enter the traffic flow or cross the street. The minimum distance from an intersection to a curve shall be the applicable minimum sight distance listed below. Exceptions may be made by the Director for especially difficult design circumstances only if visibility easements to provide adequate sight distances are established. In lieu of visibility easements, additional street right-of-way may be dedicated. Minimum intersection design sight distance standards shall be as follows:

Minimum Sight Distance

Type Street Being Entered	Recommended Design speed (MPH)	Minimum Sight Distance*
40′ R/W	25	280′
48′ R/W	30	330′
60′ R/W	35	390′
86′ R/W	55	500′
110′ R/W	55	550′

*Distance measured from an entering driver's eye position to the position of the closest approaching vehicle's far front corner.

The entering driver's eye position shall be assumed 3 feet to the right of the entering street's centerline, 3.5 feet above the pavement surface, and 11 feet clear of the nearest vehicle lane on the street being entered.

The position of the closest approaching vehicle's far front corner shall be assumed 3 feet from the edge of the nearest approaching vehicle lane and 4.25 feet above the pavement surface for each direction of travel.

Major driveways serving significant traffic volume, as determined by the Director, shall be considered as intersecting streets with regard to sight distance.

All streets and driveways shall conform to Standard Drawing H-14 for visibility requirements, as well as to the requirements herein.

Visibility easements shall describe an area to be maintained clear of any and all obstructions to a clear view from the adjacent streets. No sign, hedge, structure, natural growth, fence, or other obstruction of any kind whatsoever to a clear view, higher than 2'6" above the nearest pavement surface (or traveled area where no pavement exists) shall be installed or maintained or shall be permitted to be installed or maintained within the easement area.

Visibility easements shall be identified on subdivision maps.

All visibility easement areas (or additional street right-of-way provided in lieu of) between fences or walls and curbs or sidewalks shall be improved as follows:

C. Standard portland cement concrete sidewalk shall be placed in all areas having a width of 3 feet or less, and in all areas within intersection corner roundings.

D. All areas having a width greater than 3 feet and not within intersection corner roundings shall be surfaced with 2 inches of asphalt concrete or other impervious, non-raveling surfacing subject to the approval of the Director. Soil sterilization shall be applied in accordance with the manufacturer's instructions.

4-11 RIGHT-OF-WAY RADII – Minimum right-of-way radii for intersection corner roundings shall be in accordance with the Standard Drawings and the following:

Street Type	R/W Radius
40 foot	20 feet

48 foot	20 feet
48 foot*	25 feet
60 foot, 86 foot and 110 foot arterials	35 feet

*Intersections with a wider street.

When two streets of different widths intersect, the radius for the narrower street shall apply, except that when a 48 foot street intersects a wider street, the radius for the wider street shall apply.

4-12 RIGHT-OF-WAY WIDTHS – Right-of-way widths shall be in accordance with these standards for the type of street under consideration, and the Standard Drawings, or as required by the director. Right-of-way widths at 86 foot and 110 foot street intersections shall be in accordance with Standard Drawings H-6 and H-7 or as required by the Director.

In no instance, without specific approval of the Director, shall a street have a right-of-way width which is less than that of the street for which it is a continuation. Minimum transitions from a wider to a narrower right-of-way width at 86 foot and 110 foot street intersections shall be approved by the Director.

Right-of-way widths on 60 foot streets at intersections where the right-of-way width of the continuation of the street beyond the intersection increases and at intersections that have unusually high traffic volumes shall be widened as determined by the Director.

Building setbacks, landscaping requirements and parking requirements shall be based on the ultimate right-of-way width regardless of the location of existing public street improvements or right-of-way lines.

4-13 BUS STOPS – Bus stops with paved shelter pad areas shall be required on 86 foot streets and 110 foot streets, at all intersections with 48 foot or larger streets.

Bus stops shall be located on the far right hand side of the intersection, unless otherwise ordered by the Director, and shall be in accordance with Standard Drawing H-15.

Where intersections are too widely spaced to provide satisfactory bus stop intervals, as determined by the Director, mid-block bus stops and turnouts may be required.

Bus stop turnouts may be required at locations as determined by the Director.

Sidewalks shall be 6 feet wide at bus stops with an 11 foot wide section to accommodate bus shelters as shown on Standard Drawing H-15.

Type 2 curbs shall be required at all bus stops and turnouts in accordance with Standard Drawing H-15.

4-14 INTERSECTION WIDENING – Pavement widening at intersections shall be in accordance with the following:

A. Pavement widening shall be required at intersections of 86 foot and 110 foot streets in accordance with Standard Drawing H-11.

B. Pavement widths on 60 foot streets at intersections where the right-of-way width on the continuation of the street beyond the intersection increases and at intersections that have unusually high traffic volumes shall be widened as determined by the Director.

C. The Director may determine longer widening than the minimum standards shown on Standard Drawing H-11 is necessary at certain special case important intersections.

D. Private roads shall be required to accommodate "U" turns at all signals. A minimum outside clear 44 foot radius pavement path shall be required.

E. Where the projected curb lines do not line up and straight crosswalks cannot be accommodated, the Developer shall be required to install guidestrips. The design, materials, and location shall be determined by the Director.

4-15 PARTIAL PAVEMENT WIDENING – Partial pavement widening shall be terminated in accordance with the following:

A. Partial pavement widening shall be terminated with the end of the pavement perpendicular to the street unless otherwise specified below. A 2" x 6" redwood header board shall be required at the pavement ending.

B. Partial pavement widenings that terminate adjacent to an intersection or driveway shall be tapered 45 degrees to the street if right-of-way is available.

C. The end of a partial pavement widening that terminates a traveled lane in the direction of travel shall be tapered one foot per one foot of pavement

offset per 5 MPH increment of design speed. The design speed used in determining the taper shall be that given in the table in Section 4-4(G).

D. Pavement tapers for the termination of partial street widening different from the above may be required by the Director.

4-16 PAVEMENT CORNER RADII – The minimum edge of pavement radii for intersection corner roundings shall be in accordance with the Standard Drawings and the following:

Class "A" Streets

Street Type	E.P. Radius (C. & G. Lip)
40 foot	26.5 feet
48 foot	26.5 feet
48 foot*	31.5 feet
All others	31.5 feet

*Intersects with a wider street.

When two streets of different widths intersect, the radius for the narrower street shall apply, except that when a 48 foot street intersects a wider street, the radius for the wider street shall apply.

Partial Streets

All intersection pavement edges on partial streets shall have a minimum radius of 25 feet.

4-17 DEVELOPER'S PAVEMENT, SIGNAL, AND STREET LIGHT RESPONSIBILITY –

A. Development shall conform to the centerline established by the Director.

B. Where the existing pavement section does not generally meet the current standard and/or the centerline grade and alignment are not satisfactory to the Director, the Developer shall be responsible for the pavement section to the centerline on all streets within, adjacent, and contiguous to his project.

The Developer shall overlay any areas beyond the centerline where the design centerline grade deviates from the existing. The Developer shall also be responsible for overlaying any low areas where the new pavement meets the existing pavement to maintain a uniform cross slope.

C. When making a connection to an existing street end, the Developer shall be responsible for removing and reconstructing up to a maximum of twenty feet of the existing roadway to make a satisfactory connection as required by the Director.

D. The Developer shall be responsible for all of the structural section and pavement on all new streets within, adjacent, and contiguous to the project, including frontage roads.

E. All temporary approaches to existing roadways required as a result of the development shall be at the Developer's expense. The temporary approaches shall be paved with the structural section to be determined individually for each situation.

F. The Developer shall be responsible for relocating existing traffic signals and street lights, and installing new traffic signals and street lights as necessary for new street and driveway locations. The Developer shall also be responsible for relocating existing traffic signals and street lights as necessary for the installation of new curbs or new curbs and sidewalks at locations where there are no existing curbs or curbs and sidewalks.

The County will prepare the traffic signal relocation construction plans to be given to the Developer within 45 days after being requested.

G. The Developer shall be responsible for constructing or modifying curbed median islands where required by these standards, or when required for traffic control as a result of the development, as determined by the Director.

H. The Developer shall be responsible for bus stops, bus turnouts, and intersection widening as shown on Standard Drawings H-15 and H-11 and in accordance with Sections 4-13 and 4-15 of these Standards.

I. The Developer shall be responsible for all drainage facilities (bridges, pipes, culverts, and appurtenances) crossing new streets within, adjacent, and contiguous to the project.

J. The Developer shall be responsible for all on-site modifications to allow for access for the disabled, including but not limited to: guidestrips,

sidewalk ramps, etc. The Developer will not be responsible for remedial road work or delineation for the disabled outside of the limits of his project.

4-18 TRENCHING IN EXISTING PAVED ROADWAYS – Crossings other than perpendicular crossings of existing roadways and all trenching in high traffic locations shall provide for select backfill material and increased structural section depth over the standard for the particular roadway. Boring may be required on 86 foot and 110 foot streets where, in the opinion of the Director, high peak hour traffic volumes or other unusual conditions exist. No trenching will be permitted on any street which has either been constructed or overlaid within the last three years.

4-19 TESTING OF MATERIAL – Testing of materials to be utilized in work performed under the Caltrans Standard Specifications shall be performed in accordance with the methods of the Laboratory of the State of California, Department of transportation. Signed copies of the test results, as required, shall be submitted to the Director. Test results shall show clearly the name of the individual and firm performing the tests, as well as the name of the project, the date of sampling, and the date of testing. Tests performed by the County will be charged to the Developer as part of inspection billing.

The tests indicated in the Caltrans Standard Specifications will be the minimum required. In large developments or those developments presenting special problems, a more comprehensive and extensive testing program may be required. Such conditions will be evaluated and an appropriate testing program prescribed on an individual basis.

4-20 STREET NAMES – All roads and streets within an improvement shall be named by the Developer subject to the approval of the Director. No duplication of names already in use or previously proposed will be permitted. Sound-alike names or names with more than 13 spaces are not acceptable.

Street name signs shall be furnished and erected by the Developer. Street name signs shall conform to the requirement of the Standard Specifications and these Design Standards.

Street names and street name sign locations shall appear on plans submitted for approval. Sign details shall be as shown on Standard Drawing H-16.

Private roads paved with asphalt or portland cement concrete and serve five or more residences shall have street name signs installed in accordance with Section 4-21 below. Street name signs for private roads may be the same as for public

streets (Standard drawing H-16) except the words "Private Road" shall be added. Also, a separate additional sign shall be placed on the same post saying, "Not a County Road," which shall be 9 inches wide, 8 inches high, and have 1-3/4 inch high black letters on a white background.

4-21 STREET SIGN LOCATIONS – Street sign locations shall conform to the following:

A. Two street name sign installations (with four sign plates on each post) are required at each intersection where one or both of the intersecting streets has a right-of-way width of 60 feet or greater. At a four-way intersection, the installations shall be located on both far right-hand corners of the intersection relative to the street having the greater right-of-way or relative to the more important street if right-of-way widths are equal.

At a "Tee" intersection, the first installation shall be located on the far right-hand corner of the intersection, relative to the through street, and the second installation shall be located adjacent to the through street at a point in line with the centerline of the terminating street. One sign plate may be omitted from the standard four-plate installation at the "Tee" intersection sign locations where an approach street does not exist.

B. For highways with frontage roads, the street name sign installations shall be located in the divider strip between the frontage road and the main traveled lanes of the highway. All other requirements shall be as outlined above, except only one sign will be required (in the divider strip in line with the centerline of the minor street) when there is no opening in the divider strip for access to the main highway.

C. On streets having a right-of-way width of 60 feet or greater, the street name sign installations shall be located adjacent to the more important street, at the end of the curb return. On streets with right-of-way widths less than 60 feet, the street name sign installations shall be located at the midpoint of the curb return.

D. Street name signs shall be placed on street light poles wherever possible, in accordance with Standard Drawings H-17.

4-22 TRAFFIC SIGNS – All cul-de-sac and dead-end (stub) streets greater than 250 feet in length and all cul-de-sac and dead-end (stub) streets less than 250 feet in length where the curb at the centerline of the end of the street is not visible from the standard driver's eye position at the entering intersection shall be posted with a standard 24" x 24" code W53 (Not a Through Street) sign. The bottom of

the sign shall be a minimum of 7 feet above the sidewalk. The standard location for the W53 sign is on the right hand side at the tangent point of the corner rounding, 6 inches (minimum) from the back of the sidewalk.

All hammerhead street ends shall be posted with a standard 24" x 24" Code W-31 (end) sign, and a standard 18" x 18" red Type N marker. The red type N marker shall be mounted below the W31 sign, on the same post. The top of the red Type N marker shall be a minimum of 4 feet above the sidewalk. The standard location for the W31 - Red Type N installation is in the head of position, facing traffic, approximately 3 feet to the right of the prolongation of the street centerline, 6 inches (minimum) from the back of sidewalk.

The sign posts shall be 4" x 4" S4S treated douglas fir (State of California, Spec. No. 56-2.02B).

4-23 PERMANENT BARRICADES – Where improvements are temporarily terminated on a street proposed to be extended in the future, the improvements shall include a permanent type barricade at the end of the street extending completely across the right-of-way to prohibit access and to serve as a warning to the public. The barricade shall be constructed, erected, painted, and signed in accordance with Standard Drawing H-21. When necessary, barricades may be lengthened by making the 2" x 8" plank continuous with splicing at the posts.

Gates may be required where streets stub into public park areas or like areas.

Timber barricades with SW-44 signs and Type "L" markers in accordance with Standard Drawing H-22 will be required where partial street widening terminates at the far end of the widening in the direction of traffic. If the ground beyond the pavement constriction is free of fixed objects and relatively flat, the Director may approve the placement of delineators on 6 foot spacing in lieu of a timber barricade and signs.

Sidewalk barricades shall be constructed at the end of sidewalks where pedestrians cannot safely continue beyond the end of the sidewalks. Sidewalk barricades shall conform to Standard Drawing H-23.

4-24 STREET TREES – Permission to remove any tree in County rights-of-way or easements shall be obtained from the Director in advance (Tree Removal Permit or Encroachment Permit required).

All trees removed from within the ultimate right-of-way shall be replaced with trees approved by the Director.

Trees shall not be planted any closer than five feet from the back of sidewalks adjacent to County streets.

Where there are four foot minimum planters adjacent to the sidewalks, the planters shall be widened to accommodate the planting of trees.

Approved trees for planting in County rights-of-way and public easements are listed as follows (desired trees not listed may be planted with the approval of the Director):

Deciduous Street Trees

Botanical	Common Name
Alnus cordata	Italian Alder
Celtis australis	European Hackberry
Celtis sinensis	Chinese Hackberry
Fraxinus uhdei	Evergreen Ash
Liquidamber burgundy	Burgundy Sweet Gum
Nyssa sylvatica	Tupelo Sour Gum
Pistacia chinensis	Chinese pistache
Platanus acerifolia "Bloodgood"	London Plane Tree
Platanus acerifolia "Yarwood"	London Plane Tree
Pyrus calleryana "Bradford"	Bradford Pear
Quercus coccinea	Scarlet Oak
Quercus lobata	Valley Oak
Quercus rubra	Red Oak
Sapiium sebiferum	Chinese Tallow Tree

Evergreen Street Trees

Botanical	Common Name
Laurus nobilis	Grecian Laurel
Quercus agrifolia	Coast Live Oak
Quercus ilex	Holly Oak
Quercus suber	Cork Oak
Ulmus parvifolia	Chinese Elm

Umbellularia california	California Laurel

Confier Street Trees

Botanical	Common Name
Calocedrus decurrens	Incense Cedar
Ginkgo biloba	Maidenhair Tree
Pinus halenpensis	Allepo Pine
Pinus anea	Italian Stone Pine

4-25 DRIVEWAYS – Driveways shall be in accordance with Standard Drawings H-12, H-18, H-19, and H-14 as applicable, and the following:

A. Driveways entering Class "C" Streets shall meet the property line at such a grade and elevation as to permit conversion to a Class "A" street without regrading the driveway beyond the property line. The maximum driveway slope shall be 10 percent except in unusual terrain conditions and specifically approved by the Director.

B. No driveway will be allowed within 5 feet of a side property line on a commercial development. Exceptions may be approved by the Director for joint driveway or in unusual cases. Joint driveways may be required by the Director and a joint use driveway agreement will be required prior to approval of improvement plans.

C. The minimum width for a single family residential and duplex driveway shall be 16 feet. Residential and duplex driveways with plus grades shall have a rise of no more than 8 inches above the back-of-sidewalk grade at a point 7 feet from the back of sidewalk. Maximum residential and duplex driveway width shall be 35 feet.

D. All commercial and multiple family developments shall install commercial driveways as shown on Standard Drawing H-19, except as otherwise provided in this section. The design of major driveways which will serve significant traffic volume, as determined by the Director, shall be based on the width, cross section, and geometrics of a 60 foot public street. The standard multiple family and commercial driveway width shall be 45 feet on 86 foot and 110 foot streets and 35 feet on streets of 60 feet or less in width. Lesser widths may be approved by the Director. Driveways on 86 foot and 110 foot streets shall have a minimum clear spacing of 150 feet between driveways. Lesser spacing may be approved

by the Director when warranted by conditions at a particular site. Exceptions should be obtained as early as possible, prior to submissions of improvement plans or development plans.

A center median up to 10 feet wide may be approved by the Director for certain driveways. The normal driveway width shall be increased by the median width.

E. The standard driveway for industrial developments shall be commercial driveway, 45 feet wide, as shown on Standard drawings H-19.

F. When driveways are abandoned or relocated, the driveway sections shall be removed and replaced with standard curb and gutter, sidewalk and planters.

G. When street frontage improvements are existing with Type 1 curb and gutter, commercial driveways shall be installed for all accesses serving more than four single dwelling units.

H. Driveways entering levee roads and driveways entering commercial property on all roads shall have a slope not exceeding 5 percent for a minimum distance of 20 feet, measured from the edge of existing pavement. Driveways normally used by vehicle towing house or boat trailer shall have special requirements to be determined on an individual basis by the Director.

I. The nearest edge of driveways shall not be closer than 50 feet to the end of existing or future traffic medians. Medians shall be reconstructed and/or lengthened to conform to this section if necessary, as determined by the Director.

J. Visibility requirements for driveways shall be in accordance with Standard Drawing H-14 and Section 4-10. Increased visibility requirements may be required for driveways serving a significant amount of truck traffic.

K. Major commercial driveways which will serve significant traffic volume, as determined by the Director, shall be considered as intersecting streets and shall conform to the requirements of Section 4-6 regarding offsets.

L. Driveways near major intersections shall be no closer than 150 feet from the present or future intersection curb return. Exceptions may be granted by the Director. Exceptions should be obtained as early as possible, prior to submission of improvement plans or development plans.

M. Driveways and private roads accessing public streets with no curbs and gutters and sidewalks shall be paved with dust-free surfacing (either asphalt concrete or a double chip seal). Driveways and private roads accessing public roads with sidewalks and/or curbs and gutter shall be paved with concrete or asphalt concrete. See Standard Drawing H-13.

4-26 PEDESTRIAN LANES – Pedestrian lanes within a development shall be constructed with a minimum of 3-5/8 inches of portland cement concrete, Class "B", for the full width of the easement.

The maximum grade for pedestrian lanes shall be 8.33 percent.

Pedestrian lanes, where situated between lots, shall be fenced with chain link fencing from the street right-of-way to the back lot line. These fences shall be 6 feet high from the building setback line to the back lot line and 36 inches high from the building setback line to the street right-of-way line.

Cross fencing to control access shall be placed at the street ends of all pedestrian lanes.

All pedestrian lanes shall have lighting installed in accordance with Section 4-38.

4-27 HANDICAP RAMPS – Sidewalk ramps for handicapped pedestrians shall be constructed at all street intersections and at other locations where required by the Director, in accordance with Standard Drawings H-20, as applicable.

Intersections with Type 1 (rolled) curbs shall have fully depressed ramps in accordance with Standard Drawing H-20.

Intersections with Type 2 (vertical) curbs shall have sloped ramps in accordance with Standard Drawings H-20.

At "T" intersections, two ramps shall be constructed in the appropriate positions on the far side of the through street, opposite the ramps at the corner roundings of the intersecting street.

4-28 CURB AND GUTTER – Curb and gutter shall be installed adjacent to all developments in accordance with Standard Drawing H-1 and the following:

A. Type 1 Curb and Gutter: All developments and all locations not included in B through E below, or as required by the Director.

B. Type 2 Curb and Gutter: Industrial subdivisions.

C. Type 2 Curb and Gutter: Frontage roads; parks; unfenced schools; open space areas; public facilities; 60 foot streets with commercial and multi-family (not duplex) developments.

D. Type 2 Curb and Gutter: Within the curb return areas of all intersections of 86 foot and 110 foot streets, and at all bus stops. (See Standard Drawings H-15.

E. Type 2 Curb and Gutter: 86 foot and 110 foot streets.

4-29 CROSS GUTTERS – No cross or valley gutters will be allowed.

4-30 BARRIER CURBS – Barrier curbs shall be in accordance with these standards and Standard Drawing H-2. Barrier curbs shall be required at all locations where parking will be allowed in a front yard.

Barrier curbs shall be required at bus stops behind a sidewalk where the slope is toward the sidewalk (to prevent sheet flow across the sidewalk). Under sidewalk drains shall be used to remove drainage collected at the back of the barrier curb, as necessary to prevent any flow across the sidewalk. (See Standard Drawings H-24.

Barrier curbs shall be required adjacent to a sidewalk where the slope behind the sidewalk is greater than 4:1 and the slope is away from the sidewalk (for pedestrian safety). Where a retaining wall is allowed, creating a dropoff adjacent to the sidewalk, a minimum 36 inch high barrier fence is required in lieu of the barrier curb at the back of the sidewalk (see Section 4-32 below). Lot grading shall be done so as to not require fencing immediately adjacent to intersections and driveways in violation of the sight distance and visibility requirements.

4-31 SIDEWALKS – Sidewalks shall be in accordance with these standards and the Standard Drawings.

The standard width for all sidewalks shall be 4 or 4.5 feet except as specified below.

All school developments shall have eight foot sidewalks along all frontages except that six foot sidewalks may be used along fenced play areas where no access is provided, as determined by the Director.

Sidewalks may be 4 feet wide only for single family, duplex, or industrial development on streets with 48 foot or narrower rights-of-way.

All sidewalks adjacent to business or commercial developments shall be 4.5 feet wide, including those which are in an MP zone.

Sidewalks shall be 6 feet wide at bus stops as shown on Standard Drawings H-15.

Where utility poles and other obstructions are situated within street-side sidewalks, a minimum of four feet of clear uninterrupted sidewalk area shall be provided. Where it is necessary to widen the sidewalk beyond its standard width to attain the four foot clearance, the widened area shall extend a minimum of five feet beyond each side of the obstruction and a ten foot taper on each side of the widening shall be required.

In certain special case situations, with approval by the Director, sidewalks may be separated from the curb by lawn or approved landscaping. The distance between the back of the curb and the edge of the sidewalk may vary (meandering sidewalk), but shall not be less than 6 feet nor more than 25 feet, except at transitions. Type 2 curb and gutter shall be required at all locations where the sidewalk is separated from the curb.

Where sidewalks end in fill areas, the fill shall be extended beyond the end of the sidewalk for a minimum distance of six feet. As an alternate, a cut-off wall may be constructed at the end of the sidewalk.

Sidewalk barricades shall be required in accordance with Standard Drawing H-23 where satisfactory provision cannot be made for pedestrians to safely continue beyond the terminus of the sidewalk.

4-32 FENCES – Fences or walls shall not encroach upon visibility easements required by Section 4-10. All fences and walls are subject to the visibility requirements.

Fences and walls may require modification to accommodate street light poles and/or foundations.

When a barrier fence is required by the conditions described in Section 4-30, "Barrier Curbs," the barrier fence shall be three feet high, shall be chain link type (or another type approved by the Director), shall be placed at the back of sidewalk, and shall conform to the visibility requirements described herein.

4-33 PRIVATELY OWNED BRIDGES – Bridges intended for the sole use of the occupants of a multi-family type development or any bridge on a private road shall be designed to withstand an H-20 load. Other design features of the bridge, including but not limited to, widths, railings, clearances, and materials shall be in conformance with County and State Standards. A soils report prepared by a

qualified soils engineer will be required. Design calculations signed by the Consulting Engineer and including the registration number, expiration date, and stamp shall be required.

4-34 STREET TERMINATIONS – Vehicular access shall not be permitted from the end of a stubbed street. To obtain vehicular access, the street shall be extended through the property or properly terminated with a standard cul-de-sac bulb. In cases where no access is provided to the end of the street, a modified cul-de-sac bulb may be approved by the Director. (See Section 4-7 of these Standards.)

4-35 STREET LIGHTS REQUIRED – Street lights shall be required for all lots and parcels being developed or constructed upon unless excepted by Section 4-36. In addition, street lights may be required for lots and parcels containing existing structures which are being improved or altered, depending on the nature and extent of the work.

4-36 STREET LIGHTS NOT REQUIRED – Street lights shall not be required under the following circumstances:

A. Single family residential subdivision having an average lot street frontage of more than 125 feet but not more than 200 feet will not be required to install a street light system along the streets, but shall, as a minimum, be required to install street lights at all intersections, cul-de-sacs, and at other locations deemed essential for safety.

B. Street lights are not required for single family residential subdivisions with an average lot street frontage of more than 200 feet. In determining the average lot street frontage, lots not designed for single family residential use shall not be considered.

C. For planned developments, residential, commercial, or industrial developments where the internal streets are not offered for dedication, a street lighting system will not be required for the internal non-dedicated streets, but shall be provided by the developer on the external public street frontage.

4-37 LIGHTING PLAN DETAILS – The improvement plans shall show and identify all street lights to be installed, all existing lights in the immediate vicinity of the project, conduit and conductor runs, service points, trees, and all applicable provisions and details specified in these standards.

On subdivision plans, the street lights shall also be shown on a separate plan. The following shall be required on the street light only plan, even though

duplications may be involved. Subdivision street light plans shall include a vicinity map or equivalent, utility poles, public utility easements, names of adjacent subdivisions, intersecting property lines, a legend, north arrow, appropriate scale (1″ = 10′ to 1″ = 100′), all existing street lights on both sides of any street, and all trees within the vicinity of the conduit runs or proposed street lights.

4-38 LIGHTING DESIGN STANDARDS – Street lighting shall be designed in conformance with these specifications, the current edition of the Sutter County Standard Construction Specifications, and the "American National Standard Practice for Roadway Lighting" of the American Standards Institute, except that the average horizontal maintained footcandles for the various street classifications shall be as shown in Table 4-2. Data and calculations supporting the satisfaction of the above requirements shall be submitted for review, or the predetermined design standards included herein shall apply.

TABLE 4-2

Street Classification	St. Type & R/W Width	Type Street Light	Normal Mounting Height	Average Maintained Footcandle	Maintenance Factor
Major Arterial	110′	A	30′	.59	.65
Minor Arterial	86′	A	30′	.40	.65
Collector	60′	A	30′	.26	.65
Residential	40′/48′	B	20′	.12	.70
Pedestrian Lane	-	B	14′	.17	.70

1. Lumens used to calculate the Average Maintained Footcandle shall be 80% of initial lumen value rated by the lamp manufacturer.

4-39 STREET LIGHT DESIGN DETAILS – Design details for street lights are as follows:

A. Intersections – Intersections shall have at least one street light unless excepted by Section 4-36.

B. Cul-de-sacs – All cul-de-sacs exceeding 130 feet in length, measured from the street light location at the intersection to the right-of-way line at the end of the cul-de-sac, shall have street light within the bulb.

C. Pedestrian Lanes – Street lights shall be placed at both ends of pedestrian lanes.

D. Spacing – Maximum street light spacing, measured along the street centerline, shall conform to Table 4-3 except on 86-foot streets with a 1,000-foot radius horizontal curve or less, in which case the maximum spacing is 170 feet. Note that on Table 4-3 light spacing for 86-foot and 110 foot street is based on a one-side arrangement. Spacing on all other streets is based on a two-side arrangement. The one-side spacing arrangement is a system whereby the street light spacing relates to the distance between street lights all on the same side of the street. The two-side arrangement relates to the distance between street lights taking into consideration the street lights on both sides of the street.

E. Street Light Poles – All street light poles shall be of galvanized steel, aluminum or concrete, except as provided for by Item "F" below. All pole construction and materials shall conform to the standards outlined in the Standard Construction Specifications, and the Standard Drawings contained therein. Poles shall be identified on the plans or in the special provisions. Identification shall be by "pole series catalog numbering procedure" as shown in the Standard Construction Specifications for galvanized steel poles, or by construction material, by bolt circle diameter, by luminaire mounting height, by pole dimensions and by length of mast arm for other approved poles.

TABLE 4-3

Street Classification	Street Type and R/W Width	Type Street Light	Normal Mounting Height	High Pressure Sodium Lamp Wattage	Front On Lot	Back On Lot	Light Distribution Pattern Midblock Location
					Spacing (one side only)		
Major Arterial	110	A	30′	250	220	220	III
Minor Arterial	86	A	30′	150	220	250	III

Collector	60′	A*	30′	150	220′	II
Residential	48′	B	20′	100	200′	II
	40′	B	20′	100	240′	II

1. Lamp wattage shown is for high pressure sodium lamp only. Design criteria must be submitted for all other lamps.

2. Spacing may be adjusted ±10% to allow for driveways.

3. Back-on lot spacing may be adjusted to 330 feet if both sides of the street are lighted.

*Single family and duplex family zoning shall be type "B" street light (100 watt). 20′ mounting height.

The Director may approve special or unusual designs if the character of the surrounding neighborhood warrants unusual design. Where special or unusual design street light poles not specified in the Standard Construction Specifications are to be used, the developer shall supply to the County additional poles to be used for future pole replacement. The minimum number of replacement poles to be supplied to the County shall be 10% of the poles being installed with any fractional percent being rounded up to the next whole number.

F. Street Lights on Existing Utility-Owned Poles – Where there are permanent existing (or necessary planned) utility owned poles adjacent to the roadway, the street lights may be installed upon the utility pole in lieu of the poles required.

G. Luminaires – The type of street light and the appropriate wattage shall be specified on the plans. The luminaires shall be high-pressure sodium type with internal ballasts. All luminaires shall conform to the standards outlined in the Standard Construction Specifications.

The light pattern for each luminaire shall be specified on the plans. The light pattern for each luminaire shall be obtained from Table 4-3.

H. Service – All street light systems shall have underground service provided.

I. Photo Cell – A single photo cell receptacle shall be provided on the luminaire nearest to the service point for multiple service containing four

or more lights. All other light systems shall have a photocell in each luminaire.

CHAPTER 7

SANITARY SEWER SYSTEM

7-1 DESIGN CRITERIA – These criteria apply to all sanitary sewer / wastewater systems within Sutter County with a capacity up to an Average Dry Weather Flow (ADWF) of 15 million gallons per day (MGD).

7-2 TRIBUTARY AREA – Sewers shall be sized for the entire tributary area, even though the tributary area may extend beyond a specific development project's boundaries. The tributary area includes all existing development and future development that is anticipated in the Sutter County General Plan that will flow to the sewer being sized. The Director of Public Works (Director) may direct that other anticipated development be included in the tributary area.

7-3 AVERAGE DRY WEATHER FLOW – The ADWF at any location in the sewer system shall be the total of the ADWF for each land use listed below. The minimum population density used shall be equivalent to that of single family zoning. The area shall be examined for trends toward population concentration greater than present zoning allows and/or more than five lots per acre and, if found, an estimate should be made of the probable extent of such concentration. This estimate shall be used as the basis for determining flow.

A. Low and Medium Density Residential Units (less than 25 units per acre) – For low and medium density housing units, the ADWF shall be based on 310 gallons per residential unit per day, and the existing or proposed number of residential units.

B. High Density Residential Units (25 units per acre and above) – For high density housing units, the ADWF shall be based on 232 gallons per residential unit per day, and the existing or proposed number of residential units.

C. Schools – The ADWF shall be calculated by multiplying the gross acreage of the school by 1,860 gallons per acre per day.

D. Commercial and Industrial – For standard commercial and industrial development, the ADWF shall be calculated by multiplying the gross acreage by 1,860 gallons per acre per day. Non-standard commercial or industrial development (for example food processing) shall prepare customized ADWF calculations; and these customized ADWF calculations require approval by the Director. The Director may designate any commercial or industry development as non-standard.

E. Mixed Use (residential and commercial) – For mixed use development, the ADWF shall be calculated by multiplying the gross acreage by 3,020 gallon per acre per day.

F. Parks and Open Space - For parks and open space, the ADWF shall be calculated by multiplying the gross acreage by 150 gallon per acre per day. A park with sports facilities with public restrooms and that attracts large audiences may be designated by the Director as an Other Development Type (see below).

G. Other Development Types (ODT) – All land uses that are not one of those listed above are considered an ODT. All ODT shall prepare customized ADWF calculations; and these customized ADWF calculations require approval by the Director.

7-4 PEAK DRY WEATHER FLOW (PDWF) – The PDWF for low/medium/high density residential, schools, and standard commercial/industrial developments shall be calculated by multiplying the ADWF by the peaking factor from Drawing No S-7. Non-standard commercial or industrial development and ODT shall prepare customized PDWF calculations; and these customized PDWF calculations require approval by the Director.

7-5 INFILTRATION AND INFLOW (I&I) – I&I shall be calculated by multiplying the gross acreage by 1,400 gallons per day per acre. Some large, unsewered areas, such as golf courses (just the areas of play), habitat mitigation areas, or regional detention basins, may be removed from the I&I calculation with written approval by the Director. All areas of typical development, such as neighborhood parks, street, landscape areas, drainage ways, and local detention basins shall be included in the I&I calculation.

7-6 PEAK WET WEATHER FLOW (PWWF) - PWWF shall be calculated by adding the PDWF and the I&I. The PWWF is also called the "design flow."

7-7 SEWER SIZE, SLOPE, VELOCITY, CAPACITY, COVER AND MATERIAL – Design criteria for the sewer pipes are as follows:

A. Minimum Sewer Size – The minimum gravity sewer size shall be 8 inches in diameter (see below for service lateral sizing).

B. Slope, Velocity and Capacity – Manning's formula shall be used to determine the relation of slope, design flow, velocity, diameter, and "N" value. The "N" value shall be 0.013 for all pipe materials.

1. Sewers shall be designed to have a minimum velocity at the design flow of 2 feet per second and a maximum velocity of 8 feet per second. Velocities of less than 2 feet per second will be allowed in the upstream segments of 8-inch sewers (minimum allowed diameter).

2. Table 7-1 presents slopes and design flow capacities for various pipe diameters. Pipe slopes less than those listed in this table shall not be used without the approval of the Director. The slopes indicated are based on a velocity of two feet per second with the pipe flowing full.

3. The maximum ratio of depth of flow to pipe diameter (d/D) at the PWWF in any sewer 12 inches in diameter or less shall be 0.7. Sewers 15 inches in diameter or larger may be designed to flow full (d/D = 1.0). However, for sewers of any size with service lateral connections, d/D shall not exceed 0.7.

Table 7-1. Gravity Sewer Minimum Slopes and Resulting Capacities

Pipe Diameter (inches)	Minimum Slope (foot per foot)	Capacity at d/D = 0.7 (MGD)	Capacity when Flowing Full (MGD)
8	0.0034	0.38	0.46
10	0.0025	0.59	0.71
12	0.0020	0.86	1.03
15	0.0015	1.35	1.62
18	0.0012	1.97	2.35
21	0.0010	2.71	3.24
24	0.0010	3.87	4.62
27	0.0010	5.30	6.33
30	0.0010	7.02	8.38
33	0.0010	9.05	10.81
36	0.0010	11.41	13.63
42	0.0010	17.21	20.56
48	0.0010	24.58	29.36

C. Material – Pipe material shall be as approved by the Director and shall conform to the requirements of the Standard Construction Specifications. Pipe materials which will normally be considered are as follows:

1. Vitrified Clay Pipe – Vitrified clay pipe and fittings shall conform to and meet all of the requirements of ASTM Designation: C700, Standard Specifications for unglazed vitrified clay sewer pipe, extra strength, and shall conform to all materials data contained in the current Clay Pipe Engineering Manual published by the National Clay Pipe Institute. A

certification of compliance with these requirements shall be furnished by the pipe manufacturer.

Joints in vitrified clay pipe shall be of a factory applied resilient-type polyurethane compression type which conforms to ASTM Designation: C425.

2. Ductile Iron Pipe – Ductile Iron Pipe shall be used in high groundwater conditions when required by the Director. Ductile iron pipe (DIP) shall conform to ANSI A21.51 (AWWA C151) for a minimum working pressure of 150 psi unless otherwise specified. Ductile iron castings shall conform to and be tested in accordance with ASTM A536. Casting grade for pipe shall be 60-42-10. Laying length shall be the manufacturer's standard length, normally 18 feet. Shorter lengths may be used when required for closures and proper location of special sections.

   The interior surface of all (DIP) shall be lined. DIP pressure pipes designed to remain full shall be cement-mortar lined and seal coated in conformance with AWWA C104, except at air relief points/pipe high points. At air relief/high points, two pipe joints upstream and two pipe joints downstream shall be lined with 40 mils of ceramic epoxy (Protecto 401, or equal) to protect the pipes from corrosive gasses. All gravity flow pipes and pressure pipes that will periodically be drained shall be lined with 40 mils of ceramic epoxy (Protecto 401, or equal). The exterior surface shall have a bituminous coating of either coal tar or asphalt base, approximately 1 mil thick. At a minimum, buried DIP shall be encased in an 8-mil polyethylene wrap in accordance with AWWA C105. Additional external corrosion protection such as sacrificial anodes and/or impressed current cathodic protection may be required to suit site specific soil corrosivity, as required by the Director.

   Fittings shall be push-on, mechanical, or flanged-type ductile iron or cast iron and shall conform to ANSI 21.10 (AWWA C110) or ANSI 21.11 (AWWA C111) designed for a working pressure of 250 or 350 psi. Coating and lining requirements shall be the same as specified for pipe.

   Joints shall be push-on or mechanical type and shall conform to ANSI 21.11 (AWWA C111) with Nitrile (acrylonitrile butadiene) rubber gasket unless otherwise approved by the Director.

3. Polyvinyl Chloride Pipe (PVC) Sewer Force Main and Gravity Sewer –

a. Thickness – PVC pipe for force main and gravity service wall thickness shall be designed for a calculated deflection of 5% at constructed depth with AASHTO H-20 surface loading.

   i. PVC Force Main: 4-Inch through 12-Inch Diameter – Polyvinyl chloride pipe shall have a maximum dimension ratio (DR) of 18 (minimum Pressure Class 150), unless otherwise specified and shall conform to AWWA Standards C900 or C905. Outside diameter (OD) pipe dimension shall be manufactured to cast iron pipe (CIP) equivalent. Pipe shall be furnished in minimum standard lengths of 20 feet.

   ii. Gravity Piping: 8-Inch through 36-Inch Diameter Sizes – Polyvinyl chloride pipe shall have a maximum dimension ratio (DR) of 25, unless otherwise required by the Director and shall conform to ASTM D3034.

b. Outside diameter (OD) pipe dimension shall be manufactured to cast iron pipe (CIP) equivalent. Pipe shall be furnished in minimum standard lengths of 20 feet.

c. Joints – All PVC pipe joints shall be gasketed, bell-and-spigot, push-on type conforming to ASTM D3212 pipe shall have integral wall-thickened bell ends designed for joint assembly using elastomeric-gasket seals. The minimum wall thickness of the integral wall-thickened bell, at any point between the ring groove and the pipe barrel, shall conform with the DR requirements for the pipe barrel. The minimum wall thickness in the ring-groove and bell entry sections shall equal or exceed the minimum wall thickness of the pipe barrel. The elastomeric-gasket seals shall conform to ASTM F477.

   The pipe shall have a pipe stop indicated on the barrel that will accurately position the pipe end within the joint. The pipe in place shall permit thermal expansion and contraction of the pipe ends.

d. Fittings – Pressure Applications – Fittings for polyvinyl chloride pipe shall be those specified by the pipe manufacturer. All pressure pipe fittings for 12-inch diameter PVC and smaller shall be ductile iron compact fittings conforming to AWWA C153 Class 350. Fittings for PVC 14 inches in diameter and greater shall be standard mechanical joint connections conforming to AWWA Standard C110 or restrained to the satisfaction of the Engineer. Adapter "O" rings are not acceptable.

7-8 THRUST RESTRAINTS – All pressure sewer pipe shall have thrust restraints. Locating wire, consisting of 10 AWG with green colored PVC insulation, shall be installed on pressurized sewer mains.

7-9 SEWER LOCATIONS AND ALIGNMENT REQUIREMENTS – Location and alignment criteria are as follows:

A. General – All sanitary sewers shall be placed within rights-of-way dedicated for public streets unless the use of easements is specifically approved by the Director. Easements shall be a minimum of 25 feet wide for sewers up to 36 inches in diameter and as determined by the Director for larger diameter sewers. Temporary working easements of adequate dimensions shall be provided to allow the construction within the permanent easement to be completed in a safe and reasonable manner. Easements shall be granted to the appropriate district or the County of Sutter.

B. There shall be a minimum horizontal clearance of ten feet clear between the outside wall of parallel water and sanitary sewer lines; the water main shall be a minimum of 12 inches higher than the sewer. On crossings the water line shall be at least 12 inches above the sewer line. If a sanitary sewer force main must cross a water main, the requirements of Section 6-10 shall apply.

C. Location of New Subdivisions – In new residential subdivisions, sewers shall preferably be located six feet south or east of street centerlines within minor and primary streets. Sewers located in arterial streets shall be located as approved by the Director.

D. Location in Existing Streets – When sanitary sewers are to be installed in an existing street, factors such as curbs, gutters, sidewalks, traffic conditions, traffic lane conditions, pavement conditions, future street improvement plans, and existing utilities shall all be considered. The approval of the Director shall be obtained in every instance.

E. Water Well Clearance – No sanitary sewer interceptor, trunk line, lateral, or service shall be placed nearer than 50 feet to any water well, public or private, unless the well has been destroyed in accordance with the requirements of County Code and the County Environmental Health Division; or the location otherwise approved, in writing, by the appropriate health agencies. If a clearance of less than 50 feet is approved, all pipes within 50 feet distance from the well shall be of material approved by the Environmental Health Division.

F. Alignment – Alignment of all sewer pipe and structures shall be designed to provide a minimum six inch clearance from all other utilities and/or improvements, unless otherwise approved by the Director.

1. Horizontal alignment shall be parallel to the street centerline wherever possible. Minimum radius for sanitary sewers 6 inches through 12 inches in diameter shall be 200 feet. A larger radius shall be used wherever practicable or where necessary to avoid joint deflection in excess of the pipe manufacturers' recommended maximum.

2. Vertical alignment shall provide a constant slope between manholes. If a change in grade is necessary, construction of a manhole shall be required. Vertical curves shall not be used unless approved by the Director.

7-10 TRENCH LOADING CONDITIONS AND PIPE DESIGN – The loading condition and pipe design criteria for conduits are as follows:

A. Rigid Conduit Loading – On rigid conduits, Marston's formula shall be used to determine the load placed on the pipe by the backfill. The procedure for rigid pipe is described in the ASCE Manual and Report of Engineering Practice No. 60, the Clay Pipe Engineering Manual, and in similar handbooks. In the absence of specific soils data, as determined by a Geotechnical Engineer, a soil weight of 120 p.c.f. and a Ku factor of 0.110 shall be used.

B. Bedding and Initial Backfill – Bedding types and factors shall be as indicated on Standard Drawing No. S-8. Bedding and initial backfill type shall be as necessitated by height of cover over the pipe, trench width, pipe strength, and other factors used to determine safe pipe loading. Special attention shall be given to backfill requirements for pipe located in State rights-of-way and for pipe placed in areas where trench width is excessive, such as in the vicinity of bore pits. See Section 7-15 regarding this condition. Any special requirements shall be noted on the plans.

1. Bedding and initial backfill for VCP and DIP may be all types indicated. Bedding and initial backfill for PVC shall not be Type II.

2. The minimum trench width shall be pipe O.D. plus 12 inches.

C. Special Pipe Strength Requirements – Ductile iron or other high-strength pipe approved by the Director shall be used whenever cover is greater than 25 feet or where extra support strength is required. Ductile iron pipe, Class 200 or other high-strength pipe approved by the Director shall be used whenever cover is less than three feet, or insufficient clearance exists between the sewer pipe and rigid or load transmitting structures.

D. Design Guide – Tables which relate cover, pipe diameter, trench width, and bedding and initial backfill type for vitrified clay, according to the procedures contained in these Standards are provided on Standard Drawings No. D-25 and S-8.

7-11 MANHOLE CRITERIA – The design criteria for manholes are as follows:

A. General - Manholes shall be placed at the intersections of all sanitary sewer lines, at the end of any line terminating with a cul-de-sac, at the end of all permanent

lines, and at the end of any temporary line more than 50 feet in length. All manholes from which sewer line extensions are anticipated shall have a pipe stub installed at the grade and in the direction of the anticipated extension. Summit manholes connecting two sewers are acceptable.

B. Spacing – Maximum spacing of manholes shall be 400 feet for all straight lines of ten inch diameter or less. A line with a radius greater than 400 feet shall be considered as straight for purposes of this section. Manhole spacing on lines that are on a continuous curve of 200 foot radius (minimum allowable) shall be 200 feet. Manhole spacing on curved lines of radius between 200 and 400 feet, or where only a portion of the line is curved, shall be adjusted proportionately. Reverse curves require a manhole at the point of tangency between the curves. A manhole shall be required at any change in vertical alignment. A manhole shall also be placed at any change in horizontal alignment.

C. Elevation Criteria – When two lines of the same size enter a manhole and the flow of one must change direction by more than 20 degrees or if flow in a single line must change direction more than 20 degrees, the invert grade at the exit shall be at least 0.10 foot below that of the entrance pipe or, as a maximum, the crown of the exit pipe shall match the invert of the entrance pipe. If the pipes entering and exiting any manhole are not of the same size, the minimum invert elevation differential shall be when the pipes are matched crown to crown and the maximum invert elevation differential shall be based on the invert of the entering pipe matching the crown of the exit pipe. Drop connections are not governed by the above elevation requirements.

D. Construction Requirements – Manhole construction shall conform with the provisions of Standard Drawing No. S-3. Lock-type or pressure-type manhole covers shall be used on manholes located in areas subject to flooding. Where the manhole depth is less than four feet, an 18 inch high cone, as shown on Standard Drawing No. S-4 may be used. The plans shall note the frame on manholes located in unimproved areas shall be set 12 inches above existing ground level. Pipe material which does not provide adequate bonding between pipe and manhole may similarly require special designs. Manhole joints shall be sealed with bitumen impregnated sealant such as Ram-neck or equal.

E. Vacuum Testing Manholes – All sewer manholes shall be vacuum tested in accordance with ASTM C1244 and the Standard Construction Specifications.

7-12 DROP CONNECTION CRITERIA – A drop connection shall be required whenever a pipe enters a manhole higher than 3 feet above the exiting pipe. If an elevation difference of at least three feet is not available, the slope of the incoming line shall be increased to eliminate the need for the drop. Drop connections shall conform to Standard Drawing No. S-9. The inside drop connection shall be used for all service laterals and sewer connections up to eight inches in diameter. The outside drop connection shall be used for pipes larger than eight inches in diameter and require written approval by the Director.

7-13 FLUSHING BRANCH CRITERIA – A temporary flushing branch may be used in lieu of a manhole at the upstream end of a sewer if all of the following apply: 1) The cleanout is less than 50 feet upstream of a manhole, 2) the sewer is planned future extension, 3) there are no service lateral connections between the clean out and the man hole. Flushing branches shall conform to Standard Drawing No. S- 1A.

7-14 SERVICE LATERAL DESIGN – The design criteria for service laterals are as follows:

A. General – Service laterals shall be constructed of VCP or PVC as previously specified or solid wall acrylonitril-butadiene-styrene (ABS) conforming to ASTM D2751 minimum wall thickness SDR 35. Service laterals shall conform to Standard Drawing No. S-2 and S-5 and shall be constructed perpendicular to the sewer main unless otherwise approved by the Director. The service laterals shall extend from the sewer to the edge of public right-of-way or edge of easement unless a water main is to be installed at back of sidewalk as part of the subdivision improvements. In such cases, service shall be extended to seven feet back of sidewalk. The cleanout to grade shall remain within two feet of back of sidewalk. See Note A of Standard Drawing No. S-5 for cover requirements. Service laterals shall extend one foot beyond edge of pavement of any private road and easements of adequate width to accommodate the services shall be obtained. A plan and profile of any service laterals shall be supplied to the Director upon request.

B. Cleanout – The cleanout to grade required at the termination of service laterals shall be constructed by the building plumber at the time the building sewer connection is made. Unless otherwise noted on the plans, construction of the cleanout to grade is the responsibility of the plumbing contractor for the building improvements. At the time of construction of the service lateral and until the building connection is made a 4” x 4” green painted post shall be maintained at the end of the service lateral, extending from the pipe invert to not less than 12 inches above ground surface. Deferral of cleanout will not be allowed where a water main will be installed at the back of sidewalk.

C. Division of Responsibility - Each property owner is responsible for the installation of a service lateral across his/her property frontage and connecting to the sewer system. This responsibility can be complied with by paying the appropriate fees for the County (or sanitation or sewer district) to install the service lateral. After initial installation, the section of the service lateral within

the private property is the responsibility of the private property owner. The section of the service lateral within a public right-of-way is the responsibility of the County (or sanitation or sewer district).

D. Service Lateral Cover – Service laterals shall have a minimum slope of 1/4 inch per foot. The minimum cover shall be 12 inches at any buildable location within the properties to be served. At the right-of-way line, a minimum of 4 feet of cover is required. If a water main is installed at the back of sidewalk, a minimum of 5 feet of cover is required at the right-of-way line. The invert elevation of the service lateral at the property line shall be shown on the improvement plans.

E. Sizing – Minimum residential service lateral diameter is four inches. Service laterals serving two or more residential units, schools and other developments expected to contribute high sewage flows shall be six inch or larger. In addition, service laterals shall be sized according to requirements of the California Plumbing Code, and determinations by the Consulting Engineer. If the service lateral and collector sewer are of the same size, a manhole shall be constructed; if the collector sewer is larger than the service laterals, a factory fitting at the connection is satisfactory. Connection to trunk lines will be permitted only at manholes.

F. Connection Limitations – Service laterals shall not directly connect to sewers more than 14 feet deep without the approval of the Director.

G. Location – When sewers are constructed as part of new subdivision improvements, service laterals shall be constructed to each lot. In new subdivisions or development areas, service laterals shall be placed on the low side of any subdivision lot with two percent or greater slope across the front. The service lateral shall be placed in the center of lots of slopes less than 2 percent. Consideration shall be given to trees, improvements, etc., so as to minimize interference when the service lateral is extended to service the house.

If the property is located with service lateral available both to a sewer located in an easement and also in right-of-way, service laterals shall be in the right of way location unless otherwise approved by the Director. No service laterals shall be located where future on-site construction will result in the sewer being in close proximity to a water well or water main. No service lateral may cause applicable health standards to be violated.

The curb adjacent to the cleanout shall be marked with an “S” on face of curb, using arial or other similar block letter font letters a minimum of 2.5 inches high and ¼” deep into the concrete.

H. Joint Trench – If a joint trench is being utilized for other utilities, the plans shall indicate that a joint trench will exist and shall adjust service elevations as necessary.

I. Special Requirements in Developed Areas – In developed areas, a service lateral shall be provided to each parcel participating in the project which contains a source of sewage less than 200 feet from a sewer. A property owner's request for service lateral location where existing buildings to be serviced exist, shall be honored whenever practicable. Parcels which have two or more existing dwelling units shall have independent service laterals for each dwelling unit.

7-15 CREEK CROSSING DESIGN – Advance approval of the Director and of other appropriate agencies is necessary prior to initiating design. The criteria for creek crossing design is as follows:

A. General – In all cases the proposed future creek bed elevation shall be used for design purposes. Crossing details of pipe, piers, anchorage, transition couplings, etc. shall be shown upon a detail sheet of the plans in large scale.

B. Construction and Material – For sewer sizes ten inches and smaller, ductile iron pipe or other pipe material as approved by the Director shall be used under the full creek width, plus ten feet each side, unless the pipe is four feet or more below the creek bed elevation. For sewer sizes twelve inches and larger, pipe used shall be as directed by the Director. Special care shall be taken to provide a firm base for the pipe bedding. The plans shall specify all soft or organic material within the creek banks shall be replaced with select imported backfill. In addition, a layer of four inch to eight inch cobbles shall be placed and compacted on the top surface of the trench area for the full width of the creek. Unless otherwise directed, a clay plug will be required at the downstream side of the crossing. The plug shall be a minimum of four feet in length, shall extend the full width of the trench, and shall extend twelve inches above and below the pipe.

If the pipe must cross above the creek bed, ductile iron or welded steel pipe shall be used. Steel pipe may be fusion epoxy lined and coated, or glass lined; the Director shall approve the type of coating and lining specified and the gauge, class, or thickness of the pipe. The Director may specify the pipe material to be used.

Reinforced concrete piers of adequate depth shall be located as necessary for adequate support of the pipe. The pipe shall be held in cylindrical cradles, formed in the pier tops, with galvanized steel straps, with galvanized anchor bolts of adequate size. Open cell neoprene 1/8 inch thick cushion material shall be placed between the pipe, clamps, and support. The pipe must be sloped so that there is a continuous downward slope, even when the maximum deflection occurs.

C. Design – Calculations shall be submitted which clearly indicate the design of the pipe and supports regarding impact, horizontal and vertical forces, overturning, pier and anchorage reactions, etc.

7-16 BORING AND JACKING REQUIREMENTS – Where use of conductor casing is specified, the casing shall be corrugated steel pipe, reinforced concrete pipe, or welded steel pipe. The casing shall be of sufficient diameter to allow dry sand to be blown into the void between the carrier and the conductor and to allow adjustment of the carrier pipe to grade. Normally, an inside diameter six inches greater than the outside diameter of the couplings of the carrier pipe is sufficient. Welded steel conductor pipe shall have a minimum wall thickness of 1/4 inch for sizes up to and including 24 inches in diameter and 5/16 inch for sizes 27 inches to 36 inches in diameter. Corrugated steel pipe conductor shall not be less than 0.138 inches thick for sizes up to 36 inches, and 0.168 inches thick for diameters to 60 inches. Reinforced concrete pipe conductor shall be designed for the loading condition and, if jacked, the additional loading imposed by the jacking operation.

Direct dry boring of reinforced concrete pipe and the portion of sewers and service sewers which pass beneath curbs and gutter, sidewalks, and other obstructions, up to a maximum length of 15 feet, is permissible. Six inch and smaller pipelines may be installed by wet boring where approved by the Director. Pipe material used in the small size dry and wet bores shall be ductile iron pipe. Installation and other material specifications shall conform to the requirements of the Standard Construction Specifications.

Backfill in bore pits shall be given special attention with respect to preventing structural failure of the pipe entering or exiting the conductor, and adequate bedding and initial backfill shall be specified.

7-17 PUMP STATION AND FORCE MAIN REQUIREMENTS – Every phase of pump station design, including force mains, shall be closely coordinated with and shall be under the direction of Sutter County. The plans shall show the testing required prior to acceptance of the pump station.

The firm capacity of the pump station must convey the design PWWF flow. Sewer pump stations shall include the following facilities: a back up pump, piping and valving to allow bypass pumping, flow meter, pressure gage, on-site pump controls (start, stop, alternate), controls that allow for remote monitoring of pump status and power supply status, ample vehicle accessibility, connection for standby power, and security fencing around the entire site. The director may also require an on-site standby generator and odor control facilities.

Unless otherwise approved by the Director, “fee title” shall be granted to the County or to the appropriate district for the pump station site and any access road thereto.

7-18 WASTEWATER STORAGE FACILITIES - Wastewater storage facilities normally will not be allowed. However, the Director may allow (in writing) wastewater storage facilities if there is no other feasible alternative. The Director may require an engineering study to verify that no other feasible options exist. If allowed, the storage facility shall be sized, planned, designed, and constructed as required by the Director.

7-19 SEWER IMPROVEMENT PLAN REQUIREMENTS – Plans for the construction of sanitary sewers whether in conjunction with other improvements or for a sewer project only, shall conform to the following standards, as well as other standards contained in the General and Plan Sheet Requirements of these Improvement Standards.

A. Study Map – A study map may be required prior to review of the sewer design if there is a possibility upstream or adjacent areas might require service through the subject property. The map should show the entire service area including upstream tributary and adjacent areas, and all other data necessary to determine anticipated sewage flows. The method of sewering the entire service area, including pipe sizes and slopes, shall be shown to the extent necessary to determine the requirements within the subject property.

B. General Requirements – Plans for sewer improvement projects should include a layout sheet, plan and profile of each sewer line, and any necessary detail drawings. The plans shall be clearly legible and conform to accepted practice with respect to drafting standards. All information which in the opinion of the Director is necessary for the satisfactory design, review, construction and maintenance of a project shall be provided and, where applicable, shall be shown on the plans.

C. Layout Sheet – All sewer improvement plans shall include an overall map which shows the project boundaries, sewer lines, manholes, flushing branches, and other important items of the work. Where pavement will be cut in several locations, the pavement replacement requirements shall be shown on the layout sheet.

A parcel or area which benefits from and financially participates in a sewer construction project, but is not included within the project boundaries, shall have a note to effect placed on the layout map and on the plan and profile sheet if the parcel appears thereon. Parcels which make use of those facilities may be subject to additional fees at the time of connection, if the participation has not been so noted.

D. Plan and Profile Sheets – Sewers which will be maintained by a district shall be shown in both plan and profile views on approved plan and profile sheets. The following standards, with respect to drafting and the information to be included

on the plan and profile sheets, generally apply to projects in developed areas. In new subdivision, only the requirements which are applicable shall apply.

1. Sewer lines to be constructed shall be indicated on the profile by parallel lines spaced the pipe diameter at the pipe invert for ten inch diameter and smaller lines only. Manholes shall also be indicated by parallel lines spaced according to scale. Slope shall be printed 1/8 inch above and preferably parallel to the pipe line, or between the parallel lines. The length, size, and type of pipe material between each manhole shall be printed parallel to the horizontal grid lines and approximately halfway between the ground surface and pipe line. All pipe inverts at manholes and other structures shall be indicated on the profile. The invert elevations shall be printed parallel to the horizontal grid lines and shall be under scored by a line which then runs at a 45 degree angle to the corresponding pipe invert. When manholes, manholes with drop connections, flushing branches, or other appurtenances will be constructed, the profile shall be so noted. Existing facilities shown on the profile shall be cross-hatched. Manhole identification on the plan view may be oblique. Stationing shall appear at the lower edge of the profile grid directly under the manhole.

2. In approved areas, the location of each service sewer proposed to be constructed shall be indicated on the plans by stationing or by reference to a permanent, well-defined structure, if available. In new subdivisions the service sewers shall be located by stationing unless the situation exists, such as at the end of a cul-de-sac, where stationing is not an adequate description of location. In such cases, a dimension to a lot line may be used. The invert elevation of the service sewer at its upstream end shall be shown on the plans whenever the standard depth is inadequate to serve the property. Standard depth shall conform to the conditions set forth on Standard Drawing No. S-2.

   Improvements or lots shown on a plan sheet but served to a line shown on another plan sheet shall have the direction of service shown by a small triangle and letter ”S”. “As-built” plans shall also show the service sewer location measured from the nearest downstream manhole. Both permanent and working easements shall be shown to scale on the plans. Easement dimensions shall be given and each easement shall be tied to both the property line and the sewer line. Each permanent easement shown on the plans shall be identified by a box or table, on the same plan sheet, which gives the property owner’s name and the book and page number in which the easement is recorded. The Consulting Engineer shall provide the book and page number.

3. Indicate the limiting maximum trench width as measured at the top of the pipe on the plans between well-defined points of application; the pipe material and class, if more than one class is available; and the bedding-

backfill type. Type I bedding when used and unlimited trench width when allowed need not be shown on the plans. If more than one combination of pipe material or class, maximum limiting trench width, or bedding type is available, a practical range of such combinations shall be shown on the plans.

4. Proposed sewer lines shall be adequately dimensioned from street centerline. If the sewer is to be located in an easement, sufficient dimensions and bearings from physical features to locate the line in the field shall be shown on the plans.

5. Gas, water, storm sewers, and all other main utility lines above or below ground shall be determined and shown on the plans with accuracy as great as practicable. The location of any utility line which is parallel to and within five feet of the sewer line or which crosses the sewer line at an angle of 30 degrees or less shall be determined with an accuracy of + 1.0 foot and the clearance shown on the plans. Service lines such as water and gas normally shall not be shown.

6. Trees and other objects within 10 feet of construction centerline shall have their correct location shown on the plans and the clearance from construction centerline shown. The diameter of tree trunks and interfering heavy tree branches shall be noted. Removal of a tree or object, or other special handling shall be noted on the plans. The Consulting Engineer shall assume full responsibility for such notes as it is assumed he has made all necessary arrangements with the owner of the object to be handled. Written documentation of any special arrangements regarding preservation of property made between property owners and the Consulting Engineer shall be supplied to the Director if no easement document is involved. If an easement is negotiated, all special arrangements shall be included in the easement document. Tree removal within public rights-of-way or easements shall be approved by the Director.

7. Culverts shall be shown on both plan and profile when crossed by the construction or when parallel and within 20 feet of the construction line. The size and type of all such culverts shall be indicated and when the culvert crosses or is perpendicular or nearly so and within 20 feet of the construction line, the invert of the culvert end nearest the construction line shall be shown.

8. Address of buildings shall be shown on the plan view, within the outline of the building. Only the front line and indication of side lines of buildings need be shown.

E. Detail Drawings – Items of a special nature shall be shown with detail drawings, either on the plan sheet or on a separate detail sheet.

F. Connection to existing facilities where bypassing or stoppage of existing flow will be required – When improvement plans require connection to an existing facility which will require bypassing or stoppage of existing flows, a note shall be placed on the plans which provides an estimate of the existing flow to be bypassed (in gpm), or the times between which the flow may be stopped. Coordination with Sutter County is required in developing these numbers. The note shall also require the contractor to contact the Department of Public Works at least two working days prior to initiating the bypass/stoppage operation so the temporary facilities and equipment can be evaluated for adequacy. Where the bypassing/stoppage operation will be accomplished on a major trunk line, submittal of a work plan for review will be required prior to initiation of the operation.

7-20 MULTIPLE-OWNERSHIP RESIDENTIAL DEVELOPMENTS – The "on-site" portion of the sanitary sewer collection system connected to a public treatment works serving more than one residential unit in a multiple ownership residential development that is not within a public sewer easement or a public right-of-way, and is therefore privately-owned, shall meet the following requirements.

A. Multiple Residential Structures – Residential developments where separate lots and structures are sold and adjacent land is owned in common and maintenance is performed by a homeowner's association.

1. General – Sanitary sewers shall meet all requirements for public sewers contained in these Improvement Standards, except as specified herein.

2. Manhole Spacing – Maximum spacing of manholes on laterals shall be 300 feet for all straight runs of pipe.

3. Laterals. Sewer laterals serving each structure shall be constructed under separate building permit conforming to building code requirements. Only "Wyes", not Tees shone on Drawing S-5, shall be used for connecting on-site laterals to the on-site collection mains

4. Minimum Depth on Streets – All lines located within vehicular traffic areas shall have a minimum cover of three feet to finish grade. If the cover over a section of pipe must be less than two feet due to utility conflicts, ductile iron pipe shall be used for that section.

5. Plan and Profile Sheets. On-site improvement plans may be prepared without the sanitary sewer profile otherwise required in these Standards, unless specifically required by the Director. Final on-site grades and

drainage facilities shall be shown on the plans on the same sheet as the plan view of the sanitary sewers.

6. Location – Wherever possible, sewer collection mains shall be located in streets.

7. Review and Approval – Plans shall be reviewed and approved by Public Works Department.

Small sewer systems utilizing dispersal system or on-site treatment works shall be designed and constructed in accordance with the requirements of building code, and the County Environmental Health Division.

B. Single Structure Condominiums or Cooperative Developments. Multiple dwelling unit structures where dwelling units within the total development are sold. On-site sanitary sewers shall be constructed under separate building permit conforming to building code requirements.

7-21 MULTI-PARCEL COMMERCIAL AND INDUSTRIAL DEVELOPMENTS – The "on-site" portion of the sanitary sewer collection system serving more than one commercial or industrial that is not within a public sewer easement or a public right-of-way, and is therefore privately-owned, shall meet the requirements of Multiple Residential Structures in the preceding section. Otherwise, each separate parcel within a multi-parcel commercial or industrial development shall have its own separate connection to the public sewer system.

7-22 SEWER LINE TESTING - All sanitary sewers shall be tested.

A. Leakage Testing shall be performed in accordance with ASTM C828 and the Standard construction Specifications.

B. Obstruction Testing and Pipeline Inspection shall be conducted by closed circuit television in accordance with the Standard Construction Specifications.

C. PVC and ABS Pipe shall also be tested for deflection by a Go-No Go mandrel in accordance with the Standard Construction Specifications.

CHAPTER 8

WATER SUPPLY SYSTEM

8-1 INTRODUCTION – These improvement standards shall govern the engineering design of all domestic water systems intended for operation and maintenance by the County of Sutter or other agencies, such as Community Services Districts, where the Board of Supervisors is the agency board.

8-2 INTENT OF CRITERIA – The intent of these criteria is to provide a water system which will dependably and safely convey the required amount of high quality water throughout the distribution system at the least cost. In establishing the required amount of water, periods of peak domestic demand occurring in conjunction with an emergency fire flow demand shall be considered.

8-3 CURRENT STANDARDS – Pertinent and current requirements of the following agencies or standards shall be complied with:

A. Environmental Protection Agency Drinking Water Regulations
B. Laws and Standards of the State of California, Department of Public Health Services relating to Domestic Water Supply
C. General Order No. 103 of the California Public Utilities Commission
D. Sutter County Code regulating the installation, operation, construction, reconstruction and repair of wells and pumps
E. State of California, Water Well Standards (Bulletin 74-81)
F. Title 17, Chapter V, Sections 7583-7622, California Administrative Code, regarding cross-connections and backflow prevention
G. Uniform Fire Code
H. Uniform Plumbing Code
I. Latest edition of the American Water Works Association (AWWA) Standards

8-4 CONNECTION PERMITS AND FEES – A permit shall be obtained for each connection to the water system.

8-5 WATER SUPPLY QUALITY – The quality of the water shall conform to the Environmental Protection Agency Drinking Water Act and the State Department of Public Health Drinking Water Standards.

8-6 WATER SUPPLY PRESSURE – Normal operating pressures of not less than 40 psi nor more than 80 psi shall be maintained at service connections to the distribution system, except during periods of peak domestic and fire demand the pressure shall not be less than 20 psi. Excessive water pressure greater than 80 psi must be regulated.

8-7 DESIGN CRITERIA – For design of the distribution system, the following criteria shall be used in designing and constructing the water systems. Water system design criteria and construction practices shall conform to the following criteria.

OPERATING CONDITIONS

WATER SUPPLY PRESSURE

	Pressure		Velocity
	Maximum	**Minimum**	**Maximum**
Maximum day	80 psi	40 psi	7 fps
Maximum day and Fire	80 psi	20 psi	10 fps
Peak hour	80 psi	40 psi	7 fps

RATE OF DOMESTIC WATER USE

Land Use	**Average Day Demand (gpd/ac)**	**Fire Flow[1] [2] (gpm)**	**Fire Flow Duration (hr)**
Low Density Residential	3,270	1,500	2
Medium Density Residential	3,720	1,500	2
High Density Residential	4,160	2,500	3
Commercial/Office	2,670	3,000	3
Light Industrial	2,670	3,000	3
Schools	3,270	4,000	4
Parks	3,640		
Environmental Corridor	530		
Open Space	530		
Maximum Day Demand	1.85 x Average Day		
Peak Hour Demand	1.9 x Maximum Day		

[1] Assumes all new residential construction over 6,200 ft² and all commercial, public and industrial land use will require fire sprinklers.

[2] Unique projects or projects with alternative materials may require higher fire flows and will be reviewed by the Fire Marshall on a case by case basis (e.g. proposed commercial/industrial areas and schools).

STORAGE AND PUMPING PLANT DESIGN

Minimum Storage Volume shall be the total of the following storage volumes

Operational Storage =	1/4 Maximum Day Demand
Fire Storage =	Highest fire flow demand in service area multiplied by required duration
Emergency =	Average Day Demand

8-8 WATER SUPPLY– All developments shall meet all applicable water supply reliability requirements of federal and state laws.

8-9 WELL AND PUMPING PLANT DESIGN – All phases of well and pumping plant design shall be coordinated with, and shall be under the direction of Sutter County. Particular attention shall be given, both in design and construction, to conformance with Bulletin 74-81, "Water Well Standards: State of California" of the State Department of Water Resources. Well production shall be based on the test wells drilled in the vicinity of the proposed well site and as approved by the Director of Public Works (Director). In general, all developments shall have a minimum of two (2) sources of water. Pump stations shall contain a minimum of two pumps and have the ability to meet all operating conditions efficiently and with largest pump out of service. Standby power may be required at the option of the Director. Standby power must be provided to be considered a reliable supply. Emergency storage for well supply systems may be waived if standby power is supplied for each well and the number of wells exceeds the minimum number by at least 20%.

Well site selection shall be approved by Sutter County and meet the requirements of the Environmental Health Division of the County Environmental Management Department, and the State Department of Public Health.

8-10 TRANSMISSION SYSTEM DESIGN (larger than 12 inch diameter) – Sizing and layout of transmission mains shall conform to Master Water Supply Plans for the proposed water system.

Technical specifications for water transmission mains shall be included in the proposed improvement plans.

Fire hydrants and water services shall not be directly connected to a transmission main over 12" in diameter, unless otherwise specified by the Director.

8-11 TRANSMISSION SYSTEM LAYOUT PLAN REQUIREMENT

A. The transmission mains shall be shown in full on the plan and profile drawings, including valves, air relief devices, and blow off devices.

B. Elevations shall be shown at all grade changes.

C. Transmission mains shall maintain a minimum vertical clearance from all other utilities of 1'-0" or as approved by the Director.

D. Transmission Main Location – All transmission mains shall be installed within public rights-of-way and easements.

E. In general, the location shall be three (3) feet from the curb and gutter. The transmission main may be located in a landscape frontage if approved by the Director.

F. The minimum horizontal separation between water mains and sanitary sewers shall be 10 feet.

G. Minimum cover shall be 36" in all locations.

8-12 DISTRIBUTION SYSTEM DESIGN (12 inch diameter and smaller) – Sizing of mains shall be such that the stated normal pressures and the minimum requirements for main spacing and sizing are maintained.

The Hazen-Williams formula shall be used in the hydraulic study of the system, using a "C" value of 130 for cement-lined pipe, PVC C900, and ductile iron pipe. A hydraulic analysis of any proposed distribution system shall be submitted to the Director with the improvement plans. In design of the system, the maximum delivery from any hydrant shall be assumed to be limited to 1,500 gallons per minute. Hydraulic Model electronic files shall be provided to the Director.

8-13 DISTRIBUTION SYSTEM LAYOUT REQUIREMENTS – The water system layout requirements are as follows:

A. Improvement Plan Criteria

1. The distribution main shall be shown on plan and profile (top of pipe only). A water plan at 1" = 100' scale shall be included as part of the improvement plans, showing locations of valves, fire hydrants, and water services.

2. Details of water mains crossing other utilities or unusual alignments shall be provided if deemed necessary by the Director.

B. Main Location.

1. General – All water mains shall be placed within rights-of-way dedicated for public streets unless the use of easements is specifically approved by the Director. Easements shall be a minimum of 25 feet wide for mains up to 24 inches in diameter and as determined by the Director for larger diameter sewers. Temporary working easements of adequate dimensions shall be provided to allow the construction within the permanent easement

to be completed in a safe and reasonable manner. Easements shall be granted to the appropriate district or the County of Sutter.

2. The water main location shall be three (3) feet from the curb and gutter on the northerly or westerly side of the street. If it should be necessary because of existing improvements or possible conflict with other utilities, and with the approval of the Director, the mains shall be installed within an easement immediately adjacent to and behind the property line fronting on the public right-of-way.

3. The minimum horizontal distance between parallel water and sanitary sewer lines shall be 10 feet, and the water main shall be higher than the sewer. On crossings, the water line shall be at least 1 foot above the sewer line or as approved by the Director.

4. When crossing a sanitary sewer force main, the water line shall be a minimum of 3 feet above the sewer line. The water line shall be ductile iron.

5. In every instance where a water main is to be installed in public right-of-way or easement, the Director shall approve the specific location.

C. Main Layout and Sizing – The distribution system, whenever possible, shall be in grid form so pressures throughout the system tend to become equalized under varying rates and locations of maximum demand. The required minimum pressures and flows shall govern design of the system. The following conditions are to be considered for the distribution system design:

1. In general, the minimum pipe size shall be 8 inches inside diameter for looped systems and for dead end runs more than 50 feet long that have a hydrant at the end. Dead end runs less than 50 feet and dead end runs without a hydrant may be 6 inches in inside diameter.

2. Where water mains are installed in a major thoroughfare (86 feet right-of-way or greater), dual mains (one pipeline on each side of the street) may be required.

3. Mains shall maintain a minimum cover of 30” (36” in rights-of-way 54’ and greater) and a maximum depth of 60”, both measured from gutter flow-line, unless otherwise specified by the Director.

4. Mains shall maintain a minimum 1’-0” vertical clearance from all utilities.

5. Mains shall be installed in a roadway right-of-way or within a water easement.

6. In privately owned, multiple ownership developments, water mains that are to be maintained by County/District forces shall be contained in a public water system easement.

D. Valves, Hydrants and Blow-Offs – The distribution system shall be equipped with a sufficient number of valves (clock-wise turn to close) so no single shut-down will result in shutting down a transmission main. Valves will also be spaced no greater than 500 feet in school, commercial, industrial, or multiple-family dwelling areas. In other residential areas, valves shall be spaced so no single shutdown will result in shutting down more than 15 services or 800 feet. In no case shall more than two fire hydrants be removed from service. The valves shall be located so any section of main can be shut down without going to more than two locations to close valves. Valves at intersections shall be located within the curb returns, and set as close to minimum pipe depth (30" to 36") as possible. Four valves shall be placed where mains cross and three valves where mains tee. If it is necessary to install valves between street intersections, they shall be located on property lines between lots.

Fire hydrants of a type conforming to current County Fire Department Specifications and blow-off assemblies shall be located as follows:

1. Fire hydrants shall be placed at street intersections wherever possible, and located to minimize the hazard of damage by traffic. They shall have a maximum normal spacing of 500 feet in single family residential areas and 300 feet in duplex and multi-family areas, commercial areas, or industrial areas, measured along the street frontage. Hydrants located at intersections shall be installed at the curb return. All others shall be located on property lines between lots.

2. Not more than two hydrants shall be placed on a six inch main between intersecting lines. The minimum size main serving a fire hydrant shall be six inches in diameter. The pipeline connecting the hydrant and the main shall be a minimum of six inches, with a gate valve flange connected to the main. On long runs a second valve may be required near the hydrant location by the fire protection district having jurisdiction. The pipe reducer shall be placed at the fire hydrant.

3. A fire hydrant assembly shall be installed on all permanent dead end runs. Blow-off valves may be used with the approval of the Director if dead end runs are temporary and less than standard spacing will result if a fire hydrant is used. Wherever possible the blow-off shall be installed in the street right-of-way three feet from the curb and gutter. In no case shall the location be such that there is a possibility of back-siphonage into the distribution system.

E. Service Lines – Service lines from the water main to the property line or edge of easement shall normally be installed at the time the main is constructed. Services from mains installed in private roads shall extend one foot beyond the edge of the pavement. Service line criteria shall be as follows:

1. In all new subdivisions the service line shall preferably be located within 9 inches to 30 inches from the side property line.

2. Normal residential size of a service line shall be one inch. Schools, commercial, industrial, or multiple-family units with higher demand shall be provided with larger service lines, subject to approval of the Director. All services shall be installed with a corporation stop at the main and an angle meter stop or gate valve at the property line. The gate valve shall be used only when the service is 1-1/2 inches or larger. Installation of a concrete meter box is required for all services.

3. Water service taps into existing mains shall only be accomplished by licensed contractors upon application for a permit and payment of the required fees. A note to this effect shall be placed on the plan sheet which details the area requiring such tapping. Application should be made to the Public Works Department and the required fees paid at least five (5) working days in advance of the time the tap is desired. All excavation and backfill, and the installation of the remainder of the water service shall be done by the Contractor.

F. Water Meters – Water meters shall be installed on all residential, commercial, industrial, multi-family, and irrigation services. All water services shall be metered with Sensus (formerly Rockwell) SRII Touch Read, pit lid meters, reading in 100 cubic feet increments installed within a meter box.

G. Water Pipe – Pipe used in the construction of water distribution systems shall be either ductile iron or polyvinyl chloride pipe. The pipe and the method of placement shall conform to the Standard Specifications.

H. Detector-Check Valves – A detector-check valve and bypass meter is required on each fire service line into a building or fire line. See Standard Drawing W-8 for specifications and typical installation details.

I. Backflow Devices – Backflow devices are required in accordance with Title 17, Chapter V, Sections 7583-7622 of the California Administrative Code.

J. Locating Wire - Locating wire, consisting of 10 AWG with blue colored PVC insulation, shall be installed on all water mains in accordance with Drawing W-4.

8-14 WATER MAIN MATERIALS

A. Material – Pipe material shall be as approved by the Director and shall conform to the requirements of the Standard Specifications. Pipe materials which will normally be considered are as follows:

1. Ductile Iron Pipe (DIP) – Ductile iron pipe shall conform to ANSI A21.51 (AWWA C151) for a minimum working pressure of 150 psi unless otherwise specified. Ductile iron castings shall conform to and be tested in accordance with ASTM A536. Casting grade for pipe shall be 60-42-10. Laying length shall be the manufacturer's standard length, normally 18 feet. Shorter lengths may be used when required for closures and proper location of special sections.

   The interior surface of all ductile iron pipe shall be cement-mortar lined and seal coated in conformance with AWWA C104, and the exterior surface shall have a bituminous coating of either coal tar or asphalt base, approximately 1 mil thick. At a minimum, buried DIP shall be encased in an 8-mil polyethylene wrap in accordance with AWWA C105. Additional external corrosion protection such as sacrificial anodes and/or impressed current cathodic protection may be required to suit site specific soil corrosivity, as required by the Director.

   Fittings shall be push-on, mechanical, or flanged-type ductile iron or cast iron and shall conform to ANSI 21.10 (AWWA C110) or ANSI 21.11 (AWWA C111) designed for a working pressure of 250 or 350 psi. Coating and lining requirements shall be the same as specified for pipe.

   Joints shall be push-on or mechanical type and shall conform to ANSI 21.11 (AWWA C111) with rubber gasket unless otherwise specified.

2. Polyvinyl Chloride Pipe (PVC)

   a) Polyvinyl chloride pipe shall have a maximum dimension ratio (DR) of 18 (minimum Pressure Class 150), unless otherwise specified, and shall conform to AWWA Standards C900. Outside diameter (OD) pipe dimension shall be manufactured to cast iron pipe (CIP) equivalent. Pipe shall be furnished in minimum standard lengths of 20 feet. Pipe 6- to 12-inch diameter shall conform to AWWA Standard C900 and pipe 14- to 48-inch diameter shall conform to AWWA Standard C905.
   b) Joints – Polyvinyl chloride pipe shall have integral wall-thickened bell ends designed for joint assembly using elastomeric-gasket seals. The minimum wall thickness of the integral wall-thickened bell, at any point between the ring groove and the pipe barrel, shall conform with the DR requirements for the pipe barrel. The minimum wall thickness in the ring-groove and bell entry sections shall equal or exceed the

minimum wall thickness of the pipe barrel. The elastomeric-gasket seals shall conform to ASTM F477.

The pipe shall have a pipe stop indicated on the barrel that will accurately position the pipe end within the joint. The pipe in place shall permit thermal expansion and contraction of the pipe ends.

c) Fittings –Fittings for polyvinyl chloride water main pipe shall be those specified by the pipe manufacturer. All pressure pipe fittings for 12-inch diameter PVC and smaller shall be ductile iron compact fittings conforming to AWWA C153 Class 350. Fittings for PVC 14 inches in diameter and greater shall be standard mechanical joint connections conforming to AWWA Standard C110 or restrained to the satisfaction of the Engineer. Adapter "O" rings are not acceptable.

8-15 TRENCH LOADING CONDITIONS AND PIPE DESIGN – The loading condition and pipe design criteria for conduits are as follows:

A. Marston's formula shall be used to determine the load placed on the pipe by the backfill. In the absence of specific soils data, as determined by a Soils Engineer, a soil weight of 120 p.c.f. and a Ku factor of 0.110 shall be used.

B. Bedding and Initial Backfill – Bedding types and factors shall be as per Standard Drawing No. S-8. Bedding and initial backfill type shall be as necessitated by height of cover over the pipe, trench width, pipe strength, and other factors used to determine safe pipe loading. Unless otherwise noted on the plans, bedding and initial backfill for ductile iron pipe shall be Type II; bedding and initial backfill for PVC pipe shall be Type II Alternate. The minimum trench width shall be pipe O.D. plus 12 inches.

8-16 PRESSURE TESTING WATER MAINS

A. After disinfection of the system, and prior to making connections, the entire new installation shall be pressure tested in accordance with the Standard Construction Specifications. Water mains shall be tested and must successfully pass all tests prior to acceptance.

B. In the case of pipelines that fail to pass the prescribed leakage test, Contractor shall determine the cause of the leakage, take corrective measures acceptable to the Director to repair the leaks, and again test the pipelines. Corrective measures shall be subject to the approval of the Director.

C. Contractor shall keep records of each piping test including: description and identification of piping tested, description of test procedure, date of test, witnessing by Contractor and Engineer, test evaluation, remarks on leaks, and remarks on leak repairs.

8-17 DISINFECTING PIPELINES

A. All potable water pipelines shall be disinfected as hereafter described and in accordance with AWWA C651. Handling of disinfection solution before and after the test shall be the responsibility of the contractor/developer. Discharge to storm drains is prohibited. Discharge to sanitary sewer is subject to the approval of the Director.

B. Chlorination

1. A chlorine-water mixture shall be uniformly applied by means of a solution-feed chlorinating device. The chlorine solution shall be applied at one end of the pipeline through a tap in such a manner that as the pipeline is filled with water, the dosage applied to the water entering the pipe shall be approximately 50 mg/1.

2. Disinfection of Mains 12 inches or less in diameter may be accomplished using the Tablet Method as described in the Standard Construction Specifications.

3. Care shall be taken to prevent the strong chlorine solution from flowing back into the line supplying the water. A reduced pressure backflow preventer or an air gap shall be used for this purpose.

C. Retention Period

1. Chlorinated water shall be retained in the pipeline long enough to destroy all non-spore-forming bacteria. This period shall be at least 24 hours.

2. During the retention period, the free chlorine residual at the pipeline extremities and at other representative points shall be maintained at a value of at least 25 mg/1.

D. During the process of chlorinating the pipeline, all valves and other appurtenances shall be operated while the pipeline is filled with the heavily-chlorinated water.

E. Final Flushing and Bacteriological Testing. Final Flushing and Bacteriological Testing shall be performed as required in the Standard Construction Specifications.

F. Connections to Existing System. Where connections are to be made to an existing potable water system, the interior surfaces of all pipe and fittings used to make the connections shall be swabbed or sprayed with a one percent

hypochlorite solution before they are installed. Thorough flushing shall be performed as soon as the connection is completed.

CHAPTER 9

STORM DRAINAGE

9-1 COUNTY POLICY AND REQUIREMENTS

A. Using methods acceptable under County ordinances and Federal guidelines, the storm drainage system design shall be based on a drainage study that describes the improvements necessary to mitigate any adverse impacts of changed runoff caused by the project including changes to flow rate, quality, total volume and duration. The design of a new storm drain system shall include consideration of the downstream creek, conveyance channel or storm drain. The Design Engineer shall show that the existing storm water system can convey the proposed drainage without adverse flooding, erosion, sedimentation or other water quality impacts to upstream, downstream or adjacent facilities or areas; or that such facilities or areas are being improved or protected to the point where the drainage can be conveyed without adverse impacts.

B. All submitted studies, plans, and calculations shall be signed and stamped by a Registered Civil Engineer prior to approval and all work shall be in accordance with these design standards and good engineering practice.

C. All new structures shall be protected from the 100-year (1 %) flood event. All lowest floor elevations shall be set at least one foot (1.0) above all sources of 100-year flooding. If the elevation of the 100-year (1%) flood event is not available, it must be calculated by a Registered Civil Engineer. For arterial roadways, one lane of travel in each direction must be protected from the 100-year (1%) flood event and all public roads must be protected from the 10-year (10%) flood event by maintaining the hydraulic grade line a minimum of one-half foot (0.5') below the elevation of inlet grates and manhole rims.

D. Private storm drain systems shall be clearly noted on the plans and maintenance responsibilities recorded in the covenants, conditions, and restrictions for each parcel.

E. For areas that drain into existing storm drain facilities that were sized using previous standards, the Director may approve the use of alternative runoff rates or other modifications to the design standards.

9-2 STORMWATER UTILITY - The County maintains public drainage facilities within the Utility service areas and Sutter County Water Agency – Drainage Zones. New development in areas outside the existing Sutter County Utility service areas may be required to form a benefit assessment district or annex to a maintenance district for storm drain maintenance as required by the Director.

9-3 DRAINAGE FEES AND CREDITS – Developments may be required to participate in a zone of benefit drainage district or other public entity for financing the construction of a storm drainage capital-improvement system. Developments in an existing or future zone of benefit drainage district are subject to payment of a drainage impact fee, assessment, or other financing mechanism to facilitate the constriction of a storm drainage system. Developments may be reimbursed for the construction of storm drainage facilities that benefit other properties. Reimbursement agreements shall be signed by the developer, and notarized, before approval of improvement plans. An approved zone of benefit study will define the drainage facilities eligible for reimbursement, the cost of those facilities, and the fair share cost for each property within the zone. Developers may be required to prepare the zone of benefit study.

9-4 FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) NATIONAL FLOOD INSURANCE PROGRAM

A. Sutter County is a participant in the National Flood Insurance Program and all development in the County shall comply with the regulations of the Federal Emergency Management Agency (FEMA) and the County's Floodplain Management ordinance. Petitions for a Conditional Letter of Map Amendment (CLOMA) or Conditional Letter of Map Revision (CLOMR) shall be submitted to Public Works and FEMA and approved by both entities before improvement plan approval.

B. Petitions for a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR) shall be submitted and approved by Public Works and FEMA before building permit issuance.

C. Fill for the removal of land from the FEMA 100-year floodplain of a watercourse, where building pads will be created, must comply with the FEMA standards and must be compacted to 90 percent (90%) of the maximum density obtainable with the modified proctor test method (ASTM Standard D-1557) or an equivalent test method acceptable to the Director.

D. These standards do not preclude the County from applying additional requirements under County Code or FEMA regulations. Required Federal fees shall be paid directly to FEMA by the applicant.

9-5 NOT USED

9-6 IMPACTS TO EXISTING DRAINAGE – All drainage must enter and leave the project area at its existing line and grade, unless otherwise approved by the Director. No net increase of peak flow is allowed. No net adverse impact for volume, quality or duration is allowed. No additional runoff may be directed towards County facilities or adjacent parcels. All impacts must be mitigated in the project area or lands acquired for mitigation by the project. Impacts must be evaluated using the 2-year, 10-year, and 100-year storms.

9-7 LOCATION OF FACILITIES AND LAND DEDICATIONS

A. All drainage and storm drain facilities must be in the public road right-of-way or within land dedicated to the County in fee unless otherwise approved by the Director. Such parcels must be a minimum of 25 feet wide, sufficiently wide to accommodate normal construction equipment, and shall be easily accessible to such equipment as necessary to construct, operate, maintain and reconstruct the facility. Any area designated for public drainage facilities, including overland flow conveyance routes, and service roads, not confined to existing public right-of-ways shall be dedicated as a fee title parcel to the County. In rural areas, with approval of the Director, a drainage easement may be acceptable in lieu of land dedication. The County will not accept any conservation or other conditional easement on drainage courses to be conveyed to the County.

B. Acquisition and maintenance of temporary construction easements outside of the limits of the subdivision shall be the developer's responsibility.

C. Location and land dedication requirements specific to underground mains and open channels are further described below in this Chapter.

9-8 NOT USED

9-9 DESIGN SUBMITTALS

A. As part of the design of a drainage system, a comprehensive drainage study must be prepared for review and acceptance by the Director. The comprehensive drainage study shall include but is not limited to: a detailed pre- and post-project hydrologic and hydraulic analysis of the project and project impacts; definition of the local controlling 100-year frequency water levels pre- and post-project; and the proposed method of flow conveyance with adequate supporting calculations. The study shall include any proposed improvements to mitigate the impacts of increased runoff from the project and any change in runoff including quality, peak flow, volume, and duration. The study shall be consistent with the ultimate upstream development in the General Plan and any specific, area, or master plans; and shall conform to these Design Standards. It shall demonstrate that the proposed methods of flow conveyance mitigate the potential project impacts. Study must be completed and stamped by a Professional Engineer, and determined by the County to be comprehensive, accurate, and adequate.

B. The drainage study submitted shall include, as a minimum, the following information and computations:

- Topographic map showing existing and proposed ground elevations.
- A shed map including on-site and off-site watershed boundaries draining onto the site. It shall also include land uses, total and sub-shed areas in acres.
- Quantity of flow (cfs) to each drainage inlet structure with corresponding area and land uses that generates the quantity.
- Quantity of flow (cfs) in each pipe.
- Flow line elevation of each manhole or junction structure.
- Top of structure rim or inlet grate elevation.
- Location of downstream outlet and hydraulic grade line at this location.
- Hydraulic grade line of the systems.
- The starting elevation for all hydraulic grade line calculations must be clearly noted on all plans and calculations. The source of this elevation must also be indicated (Master Plan, FEMA, etc.). If it is not readily available it must be calculated. If it is assumed, the basis of the assumption must be noted.
- Pipe size, material type, length and slope.
- Channel dimensions, flow and water surface profile computations.
- Overland Release hydraulic computations for street and non-street releases (including fence/wall openings and outlet).
- Analysis of permits required including type, processing time, and expected restrictions.

C. Improvement Plans must contain the additional features:

- Pipelines plans and profiles
- Open channel plans and profiles
- Phasing plans if all improvement are not constructed in the same time
- An overflow release map showing surface elevations and flow paths
- Notes concerning agreements and dedications

D. The applicant shall obtain applicable California Department of Fish and Game, U.S. Army Corps of Engineers, and other required state, federal, and local permits. The conditions of such permits must be reviewed and conditions considered acceptable by the County, before the permit is issued.

9-10 DESIGN RUNOFF. Computation of runoff shall be performed in the appropriate manner prescribed below.

A. Runoff shall be computed using on of the following methods:

- For calculations requiring development of a hydrograph(s), the Sacramento Method as described in Volume 2 of the Sacramento City/County Drainage Manual, HEC-1 or HEC-HMS may be used. Other appropriate methods may be used with approval by the Director.
- For calculations requiring only peak flows, the Sacramento Method Drainage Charts or Rational Method, or the hydrograph methods listed above may be used. Other methods may be used if approved by the Director.

B. For Sacramento Method calculations, the following apply:

- SacCalc is a Windows based software, available for free download that simplifies the preparation of HEC-1 models based on the Sacramento Method.
- The Nolte Method option presented in the SacCalc program may not be used.
- Sutter County is considered to be in Rainfall Zone 2.
- The runoff used in storm drain pipe design for drainage areas 160 acres and smaller may be computed from the Sacramento Method Drainage Charts included in these standards as drawings D-1 to D-4.
- Use Tables 9-1 and 9-2 to determine percentage of impervious cover, infiltration rates, and Basin ‘n’ values to be used in runoff calculations using the Sacramento Method and for use with the design flow curves in the standard drawings.

9-11 NOT USED

TABLE 9-1. IMPERVIOUS COVER PERCENTAGES AND INFILTRATION RATES BASED ON LAND USE AND SOIL GROUP

Cover/Land Use from Volume 2 Hydrology Standards	Equivalent Sutter County General Plan Land Use Designation[1]	% Impervious Cover	Infiltration by Soil Group (in/hr)		
			B	C	D
Highways, Parking		95	0.14	0.07	0.04
Commercial, Offices	Commercial	90	0.16	0.08	0.05
Intensive Industrial	Industrial	85	0.162	0.082	0.052
Apartments, HDR	High Density Residential	80	0.165	0.085	0.055
Mobile Home Park		75	0.167	0.087	0.057
Condominiums, MDR	Medium Density Residential	70	0.17	0.09	0.06
Residential: 8-10 du/acre, Ext Industrial	Medium Density Residential	60	0.18	0.10	0.07
Residential: 6-8 du/acre, LDR, School	Low Density Residential	50	0.18	0.10	0.07
Residential: 4-6 du/acre	Low Density Residential	40	0.18	0.10	0.07
Residential: 3-4 du/acre	Low Density Residential	30	0.18	0.10	0.07
Residential: 2-3 du/acre	Estate Residential	25	0.18	0.10	0.07
Residential: 1-2 du/acre	Estate Residential	20	0.18	0.10	0.07
Residential: 0.5-1 du/acre	Estate Residential	15	0.18	0.10	0.07
Residential: 0.2-0.5 du/acre, Ag Res	Agriculture Rural Community, Agricultural Preserve (residential)	10	0.18	0.10	0.07
Residential: <0.2 du/ac, Recreation	Parks & Recreation	5	0.18	0.10	0.07
Open Space, Grassland, Ag	Open Space, Agriculture	2	0.18	0.10	0.07
Open Space, Woodland, Natural	Open Space	1	0.19	0.11	0.08
Dense Oak, Shrubs, Vines	Open Space	1	0.25	0.16	0.12

1. In some cases, the General Plan designation encompasses more than one cover/land use type from the hydrology standards. The equivalent cover/land use type should be selected based on the actual proposed densities when known; otherwise an average value should be used.

TABLE 9-2. BASIN 'N' VALUES BASED ON LAND USE

Cover/Land Use from Volume 2 Hydrology Standards	Equivalent Sutter County General Plan Land Use Designation[1]	% Impervious Cover	Channelization Description	
			Developed Pipe/Channel	Undeveloped Natural
Highways, Parking		95	0.030	n/a
Commercial, Offices	Commercial	90	0.031	n/a
Intensive Industrial	Industrial	85	0.032	n/a
Apartments, HDR	High Density Residential	80	0.033	n/a
Mobile Home Park		75	0.034	n/a
Condominiums, MDR	Medium Density Residential	70	0.035	n/a
Residential: 8-10 du/acre, Ext Industrial	Medium Density Residential	60	0.037	n/a
Residential: 6-8 du/acre, LDR, School	Low Density Residential	50	0.040	n/a
Residential: 4-6 du/acre	Low Density Residential	40	0.042	n/a
Residential: 3-4 du/acre	Low Density Residential	30	0.046	n/a
Residential: 2-3 du/acre	Estate Residential	25	0.050	n/a
Residential: 1-2 du/acre	Estate Residential	20	0.053	n/a
Residential: 0.5-1 du/acre	Estate Residential	15	0.056	0.096
Residential: 0.2-0.5 du/acre, Ag Res	Agriculture Rural Community, Agricultural Preserve (residential)	10	0.060	0.100
Residential: <0.2 du/ac, Recreation	Parks & Recreation	5	0.065	0.110
Open Space, Grassland, Ag	Open Space, Agriculture	2	0.070	0.115
Open Space, Woodland, Natural	Open Space	1	0.075	0.120
Dense Oak, Shrubs, Vines	Open Space	1	0.080	0.150

1. In some cases, the General Plan designation encompasses more than one cover/land use type from the hydrology standards. The equivalent cover/land use type should be selected based on the actual proposed densities when known; otherwise an average value should be used.

9-12 CLOSED CONDUITS

A. Capacity and Hydraulic Grade Line

1. Pipe storm drain systems shall be designed to convey the peak flow rate from the 10-year storm.

2. Manning's formula shall be used to determine the pipe design parameters such as capacity, slope, hydraulic grade line, and velocity. Computations shall be based on the following Manning's roughness coefficients.

Precast Concrete Pipe	0.015
High Density Polyethylene Pipe	0.015
Polyvinylchloride Pipe	0.015
Concrete Box Culvert (within a closed conduit system)	0.016
Ribbed Metal Pipe	0.015
Concrete Cast-In-Place Pipe	0.015
Corrugated Metal Pipe 2-2/3" x ½" Corrugations	0.024
Corrugated Metal Pipe 3" x 1" or 5" x 1" Corrugations	0.028

3. Hydraulic grade line calculations for pipe storm drain systems shall begin at the worst case 10-year channel or basin water surface elevation. For the design flow, the hydraulic grade line shall be a minimum one-half foot (0.5') below the elevation of all inlet grates.

4. A note shall be made on the plans indicating stationing where the hydraulic grade line is below the soffit of the pipe.

5. The minimum inside diameter for pipes used in the public right of way shall be no less than twelve inches (12"). No storm drain conduit shall have a diameter less than that of the conduit immediately upstream of it.

6. In adjacent unimproved areas with no current development plans, the future gutter flow line is assumed one and one-half feet (1.5') lower than the natural ground elevation, for purposes of pipe hydraulics calculations. This also applies to in-fill development, where the elevation of the hydraulic grade line is not known.

B. Material. The specific type of pipe or alternate pipe to be used in the development shall be shown on the profile sheets. Publicly maintained drainage systems shall be constructed of the following materials and installed consistent with the latest edition of the Standard Construction Specifications:

1. Reinforced Concrete Pipe. Class of pipe shall be based upon depth as detailed in the Standard Drawings. Pipe shall conform to ASTM C76, latest revision. The consultant shall specify on the plans that the assembly

of joints shall be in accordance with the pipe manufacturer's recommendations and the requirements of ASTM C443.

2. Concrete Cast-In-Place-Pipe. Use of Concrete Cast-In-Place-Pipe is not permitted for use in storm systems to be owned, operated, and maintained by Sutter County.

3. Polyvinyl Chloride Pipe. Polyvinyl Chloride (PVC) Pipe may be used conforming to the Standard Specifications. Use of polyvinyl chloride downstream of the last manhole or junction structure to outfalls to channels or detention basins is not allowed.

4. High Density Polyethylene Pipe

   a. HDPE shall not be used in existing or future roadways or for driveway culverts. It may only be used for trunk lines outside roadways.
   b. Use of High Density Polyethylene Pipe downstream of the last manhole or junction structure to open channels, detention facilities or to a daylight condition is not allowed.

5. Metal Pipe

   a. Metal pipe shall be corrugated steel, corrugated aluminum, corrugated aluminized steel Type II, ribbed steel, ribbed aluminized steel Type II or ribbed aluminum.
   b. Metal pipe shall be designed for a minimum maintenance free service lift of fifty (50) years in accordance with the methods specified in Section 854.3 and 854.4 of the California Department of Transportation Highway Design Manual. To assure that the service life is achieved, alternative metal pipe may require added thickness and/or protective coatings. The Design Engineer shall provide certified copies of the laboratory report giving the results of pH and resistivity tests. The report shall also include a map showing the location of each site and depth where samples were taken.
   c. Unless otherwise specified by the Director, a minimum of two soil samples shall be taken for the first 1,000 lineal feet of pipe or fraction thereof on a project with a minimum of one additional sample being required for each additional 1,000 lineal feet of pipe or fraction thereof. The samples shall be taken along the approximate alignment and at the approximate depth of the pipe to be installed. Priority in sampling shall be given to trunk facilities.

C. Cover Requirements. At locations where the minimum cover requirements cannot feasibly be obtained, the conduit shall be provided with a concrete cover or other methods of pipe protection as approved by the Director. Cover shall be

measured from the top of a rigid Portland cement concrete pavement or the bottom of a flexible asphalt concrete pavement structural section.

1. Minimum Cover - The minimum cover requirements shall be per Table 9-3 and measured from the top of pipe exterior to top of subgrade (bottom of A.B.).

2. Maximum Cover - Maximum height of cover shall be per Tables 9-4A and 9-4B.

TABLE 9-3. MINIMUM PIPE COVER REQUIREMENTS

Pipe Material Type and Location	Minimum Cover Requirement
High Density Polyethylene (HDPE) – non traffic areas	Twenty-four (24”) – top of pipe to top of grade
Corrugated Metal	Span/8 but not less than twelve inches (12”)
Spiral Rib – Steel	Span/3 but not less than twelve inches (12”)
Spiral Rib – Aluminum with spans less than or equal to 72”	Span/2 but not less than twelve inches (12”)
Spiral Rib – Aluminum with spans greater than 72”	Span/3 but not less than thirty inches (30”)
Reinforced Concrete in unpaved areas	1/8 the diameter or rise (the greater of) but not less than twelve inches (12”)
Reinforced Concrete under flexible pavements (Class IV and V)	1/8 the diameter or rise (the greater of) but not less than twelve inches (12”)
Reinforced Concrete under flexible pavements (Class I, II, and III)	1/8 the diameter or rise (the greater of) but not less than twenty-four inches (24”)
Reinforced Concrete under rigid pavements	A nine-inch (9”) space between top of pipe and bottom of slab consisting of compacted granular fill shall be maintained at a minimum.
Cast-in-Place-Concrete-Pipes in paved areas	The structural section (AC & AB) plus twenty-four inches (24”)
Cast-in-Place-Concrete-Pipes in unpaved areas	Twenty-four inches (24”)
Polyvinyl Chloride – C900 and C905	Twelve inches (12”)
Polyvinyl Chloride – D2241 and D3034	Twenty-four inches (24”)

Notes: 1. All depths shown are for a minimum trench width equal to the outside diameter of the pipe plus sixteen inches (16”) measured at the top of the pipe.

2. Top of pipe means the top of pipe exterior.

TABLE 9-4A. MAXIMUM PIPE COVER REQUIREMENTS – CONCRETE / PLASTIC PIPE

Measured to bottom of trench in feet

DIA	RCP Class					Cast In Place	PVC	HDPE
	I	II	III	IV	V			
12	Not Permitted	8	12	30	No Limit	No Limit	14	49
15		10	15	35			14	45
18		11	16	38			14	43
21		12	17	39			14	
24		12	18	39			14	43
27		13	19	39			14	
30		14	19	38			Not Permitted	34
33		14	20	38				
36		13	17	27	69			45
42		14	18	29	62	38		46
48		15	19	30	60	30		41
54		16	20	31	58	26		
60	14	16	21	31	57	24		48
66	15	17	22	32	56	21		
72	15	18	23	33	56	21		

Note: All depths shown are for a minimum trench width equal to the outside diameter of the pipe plus sixteen inches (16") measured at the top of the pipe.

TABLE 9-4B. MAXIMUM PIPE COVER REQUIREMENTS - METAL PIPES

Measured to bottom of trench in feet

DIA	CMP ** Thickness - inches					Ribbed Steel Pipe Thickness - inches			Ribbed Aluminum Pipe Thickness - inches			
	0.064	0.079	0.109	0.138	0.168	0.064	0.079	0.109	0.060	0.075	0.105	0.135
12	99	No Limits										
15	99											
18	99											
21	99	99										
24	93	99				36	50	67	21	29	49	64
30	74	93	99			30	40	56	17	24	40	51
36	62	78	99	99		26	35	48	14	21	34	44
42	53	66	93	99		21	31	41	13	18	30	37
48	46	58	81	99	99	20	28	38	12	17	26	34
54	47	52	72	93	99	19	26	34		15	25	31
60	43	53	65	84	99		25	32		14	23	28
66	39	48	68	76	93		22	30			21	26
72	35	42	62	70	85		22	28			20	25

Note: 1. All depths shown are for a minimum trench width equal to the outside diameter of the pipe plus sixteen inches (16") measured at the top of the pipe.

2. ** Normal pipe corrugation profile is 2 2/3" x ½". The corrugation of the pipes within the shaded box area shall have profile of 3" x 1" or 5" x 1".

3. When flow velocity exceeds five (5) feet per second, the next thicker gauge shall be used for CMP pipe.

D. Temporary Construction Vehicle Loading

1. A note shall be made on the plans stating the minimum cover requirements during construction for temporary heavy construction vehicle loading, such as scraper or truck haul routes.

2. For flexible pipes, place at least four feet (4') of cover over the top of the pipe.

3. For rigid pipes, place at least three feet (3') of cover over the top of the pipe.

E. Trench Requirements

1. Trenches shall be excavated with full depth and vertical sides whenever possible.
2. The minimum trench width shall not be less than the outside diameter of the pipe barrel plus sixteen inches (16”), measured at the top of the pipe. Where conditions require side sloping of trenches, the minimum vertical trench shall be from the bottom of the trench to one foot (1’) over the top of the pipe

3. In fill areas, or in areas with poor soil conditions where it is anticipated that a good, firm, vertical-walled trench cannot be constructed, the Design Engineer shall design the pipe structural requirements in accordance with good engineering practice. A note shall be placed on the plans directing the contractor to place the proper strength pipe if trench conditions encountered differ from those stated in the design trench plans.

F. Parallel Pipe Spacing Requirements. When multiple adjacent pipe lines are used, they shall be spaced so that the sides of the pipes shall be no closer than two feet (2’), or for parallel pipes larger than forty-eight inch (48”) the spacing shall be no closer than one half (1/2) the nominal diameter of the largest pipe. This is to permit adequate compaction of backfill material. Special bedding and backfill considerations shall be taken when depths of parallel pipes vary.

G. Alignment Requirements

1. The location of storm drainage pipes in new streets shall be typically six feet (6’) north or west of and parallel to the centerline of the street. In special situations, pipelines may be placed in alternative locations, including under curb and gutter, as approved by the Director.

2. All new storm drain mains shall be placed a minimum of fifty feet (50’) from existing and proposed water wells. Encroachments less than fifty feet (50’) require approval of County Planning and the water purveyor prior to plan approval.

Avoid unnecessary meandering and angular changes of pipelines. Angular changes, when necessary, shall not exceed 90 degrees unless approved by the Director. No angular changes in direction are allowed for concrete cast-in-place-pipe other than on a radius.

4. Pipeline Radius Criteria: All pipe placed on curves shall meet manufacturer's recommendations for curved alignment. All curves, radii, length of pipe joints, and types of pipe shall be shown on the plans. The minimum radius of curvature for concrete cast-in-place-pipe shall be determined by the formula $R = 30D$ where R = radius of curvature, and D = nominal internal pipe diameter, with R and D expressed in the same units.

5. Pipelines shall be laid straight in both horizontal and vertical planes between manholes unless otherwise approved by the Director.

H. Velocity. The minimum full flow velocity shall be no less than two (2) feet per second. The maximum velocity, at maximum pipe system capacity, shall not exceed 10 feet per second.

I. Pipe Inlets and Outlets

1. Headwalls, flared end sections and other structures at inlets shall be designed to increase hydraulic efficiency, prevent erosion adjacent to the conduit and provide a counterweight to prevent flotation. Headwalls or flared end sections shall be used at both intake and discharge ends of culverts and pipes.

2. At pipe outfalls into open channels, standard headwalls shall be installed per the Standard Drawings.

3. The vertical face of the headwall shall be set back a sufficient distance from the channel side slope to accommodate flap-gates (when needed) in a fully opened position without encroachment of the flap past the channel side slope face.

4. All pipe and culvert entrance and outlet locations must be provided a concrete apron with a minimum length of five (5) pipe diameters for erosion control and maintenance purposes.

5. Pipe inlets greater than 24 inches will normally have a trash rack installed. Pipe outlets greater than 36 inches, not in an area enclosed with a fence, will normally have a trash rack installed for access control.

6. Energy dissipaters must be utilized at outlets at the end of the concrete apron. All energy dissipation shall be designed considering outlet velocities and hydraulic jumps. Rip-rap shall not be placed on the outlet apron.

J. Bored and Jacked Pipe. All casing pipes shall be sealed at both ends in such a manner as to provide water resistant seal.

K. Backfill Seepage. A concrete filled cutoff barrier shall be utilized at inlets and outlets where there is a high probability that water will periodically penetrate pipe backfill material.

L. Water and Soil Tight System

1. All storm drain pipes, manholes, and fitting connections, including drain inlet laterals shall be water and soil tight and tested in conformance with the Standard Specifications.

2. A note shall be placed on the improvement plans stating these requirements and that the contractor is responsible for providing equipment and labor for performing tests and making measurements when directed to do so by the County's inspector.

M. Land Dedication. Drainage parcels, right-of-ways, or easements (if authorized) for closed conduits, shall meet the following criteria:

1. Minimum width of the parcel/right-of-way shall be equal to the greater of twenty-five feet (25') or the required trench width according to the standard detail for pipe bedding and initial backfill (Standard Drawing D-5) plus two feet (2') of additional width for every foot of depth as measured from the bottom of the pipe to finished grade

2. A minimum distance from the conduit to the edge of the parcel/right-of-way of ten feet (10') must be provided.

9-13 MANHOLES AND JUNCTION BOXES – Requirements for manholes are as follows:

A. Standard pre-cast concrete or saddle type manholes shall be used except where special manholes or junction boxes are required. The design of special manholes and junction boxes must be submitted to the Director for approval. Cast-in-place manholes shall conform to the Standard Drawings.

B. All manholes shall be a minimum 48 inches inside diameter unless approved on an exception basis by the Director. In no case will junction boxes or manholes be allowed which are smaller than twenty-four inches (24") inside dimension.

C. Manholes shall be sized to provide a minimum of nine inches (9") wall spacing between annular cutout edges of pipe openings.

D. Manholes shall be located at junction points, angle points greater than 15 degrees, and changes in pipe size or materials. On curved pipes with radii of 200-feet to 400-feet, manholes shall be placed at the beginning and end of curve and on 300-

feet maximum intervals along the curve. On curves with radii exceeding 400-feet, manholes shall be placed at the beginning and end of curves and on 400 feet maximum intervals along the curve for pipes twenty-four inches (24”) and less in diameter and 500-feet maximum intervals along the curve for pipes greater than twenty-four inches (24”) in diameter. Manhole spacing on curves with radii less than 200-feet will be determined on an individual basis. Exceptions to these calculated manhole placement shall be allowed if the resulting manholes are within 100 feet of existing or proposed manhole.

E. Spacing of manhole, junction boxes (or inlets of such size as to be accessible for maintenance) shall not exceed 400-feet for drains fifteen inches (15”) and smaller in diameter, 500-feet for drains between eighteen inches (18”) and thirty-six inches (36”) in diameter, and 600-feet for pipes greater than forty-two inches (42”) in diameter.

F. All manholes and junction boxes other than inlets shall have standard manhole frames and covers as shown in the Standard Drawings. Manhole and junction box covers shall be marked "STORM DRAIN" in raised lettering. Manholes will not be allowed in the gutter or sidewalk.

G. A reinforced concrete forty-eight inch (48”) diameter (no cone) flat top, as shown in the Standard Drawings, shall be required when any pipe would enter the manhole above any portion of the base of a manhole cone.

H. Use grated manhole covers (Standard Drawing D-11) to pick up minor drainage in non-traffic areas only if debris clogging is not a concern.

I. Improvement plans shall include a special detail for all manholes at junction points where there is a change in pipe direction for pipe diameters exceeding forty-eight inches (48”).

J. Resilient connectors, in conformance with Standard Drawing D-6 and the Standard Construction Specifications, are required between pre-cast manhole/box and pipe, and between pre-cast drop inlet and pipe. Water stops are required for pipe to cast-in-place manhole/drop inlet connections. Use non-shrinking/non-expansive grout for making connections of pipe and water stop to structure walls.

K. Stations of manholes/boxes shown on project drawings apply at center line of shaft. Manhole/box lids shall be bolted to frame where lids are prone to surcharging when the storm drain system is at maximum capacity. A pressure manhole design may be required by the Director.

M. Storm drain manholes/boxes shall be tested in conformance with the Standard Construction Specifications.

N. There shall be no sumps in manholes outside of the public right-of-way. Manholes and junction boxes located outside of paved areas shall have rim set 0.5 feet above ground surface.

O. Drop inlets shall not be used as junction boxes, unless approved by the Director.

P. Junction boxes shall be constructed of pre-cast or cast in place reinforced concrete with minimum wall thickness of six inches (6”). The Design Engineer shall submit calculations indicating the junction box is designed to withstand HS-20 loading

Q. The inside vertical dimension of junction boxes shall be such as to provide a minimum of three-inch (3") clearance on the outside diameter of the largest pipe in each face. Junction boxes shall have a minimum horizontal inside dimension of forty-eight inches (48”). All junction boxes shall be rectangular unless otherwise approved by the Director.

R. Pipes adjacent to junctions shall have tight, impermeable joints subject to testing requirements of the Standard Construction Specifications.

S. Junction boxes larger than ten feet (10’) in any internal dimension shall have two manhole access points.

T. Storm drain manholes/boxes shall be tested in conformance with the Standard Construction Specifications. All storm drain manholes shall be vacuum tested in accordance with ASTM C1244 and the Standard Construction Specifications.

9-14 INLETS

A. All inlet design curves in these Design Standards assume clean inlets. The Design Engineer shall assume a 50% clogging factor when determining the number and location of inlets.

B. Additional inlets may be required at sump locations. At sag points where the approaching gutter profile slope exceeds 2%, the inlets shall be sized to account for upstream bypass flows of at least 0.7 cfs/acre.

C. Type B inlets are typically used for streets with concrete curbs and gutters. The maximum area allowed to drain to any one drain inlet is 2 acres.

D. Always use grated inlets when the longitudinal slope of the street exceeds 4% where due to the high velocities it is difficult to direct the flows into the curb opening.

E. Type F inlets may be used in roadside ditches, swales, unimproved medians, and outside of the road right-of-way. Figure 9-1 provides the design capacity for one two-foot wide window of a Type F inlet, clear of debris.

F. Temporary pipe stubs shall be as deep as possible to provide for future extension, and raised to grade using a type F, type H, or type I inlet or other appropriate

catchments. Type H Inlets shall be sized two (2) sizes larger than the connecting pipe or pipe stub.

G. Curb opening inlets (D-15) may be used in locations where additional inlet capacity, beyond a single Type B inlet, is needed, or as where directed by the Director. The inlet width may vary from seven feet (7') to twenty-eight feet (28'). The H dimension is the gutter depression depth and shall be a standard two inches (2"). When more than one grate is required, use Drawing D-16 for support assembly. Assure that the lateral is sized to serve the increased inlet capacity. Flow capacity for the curb opening inlets is calculated using the methods found in the Federal Highway Administration (FHWA) Urban Drainage Design Manual Hydraulic Engineering Circular No. 22.

H. Inlets in Class "A" and "B" streets (as defined in Section 4-2) shall be placed at lot lines in residential subdivisions and at the curb return of intersections. Inlets shall be placed so that the length of flow does not exceed 500 feet, unless otherwise approved by the Director. Inlets at curb returns shall be constructed so that they are not in conflict with the Americans with Disabilities Act requirements for ramps. No face plates are allowed on inlets at the curb returns.

I. Type F inlets shall be designed based on Figures 9-1 and 9-2. The chart assumes clean openings, so some clogging shall be accounted for by adding a grated lid or increasing the window opening(s).

TYPE F INLET FLOWS

FIGURE 9-1

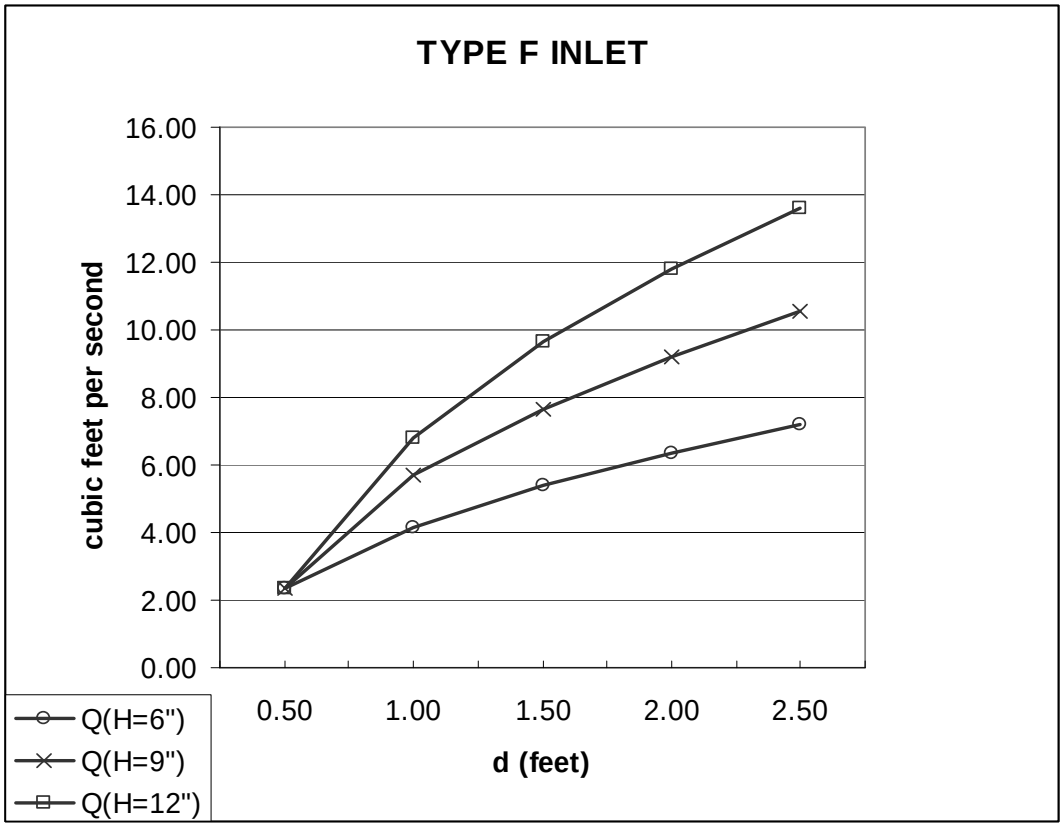
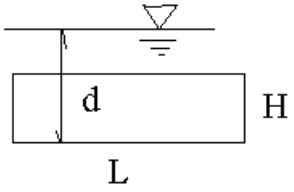


FIGURE 9-2



$$Q_{weir} = 3.33 L d^{1.5} \qquad (d<H)$$

$$Q_{weir} = 0.60(2gd)^{0.50} \qquad (d>H)$$

9-15 OVERLAND RELEASE – Piped storm drain systems are not designed to convey peak flow from infrequent high intensity storm events. When the pipes and inlets are overwhelmed, surface runoff will pond in low areas and flow overland along designed overland release routes. The improvement plans shall include overland release routing and the Design Engineer shall provide supporting calculations. Risk of flood damage shall be reduced by insuring that the 100-year storm runoff ponds and flows through the proposed development with appropriate freeboard protecting existing and proposed structures, pursuant to Section 9-1 of these Standards. Hydraulic and erosion control calculations for overland release flows must be provided with the design.

A. For purposes of overland flow design, the designer may assume the storm drain pipes are flowing full into 100-year downstream water surface condition, or may actually calculate the flow conditions using the 100-year storm event with a 10-year HGL as the starting water elevation for the downstream channel.

B. Arterial streets and selected collector streets, as determined by the Director, will be designed with at least one traffic lane in each direction completely above the 100-year HGL elevation.

C. Where the overland release path leaves the paved right-of-way, concrete improvements shall be constructed as a mow strip, gutter or other permanent flow line. Decorative use of stamped concrete is encouraged. The use of grouted paving stones or cobbles is acceptable as long as they are placed on top of a two (2) inch minimum concrete base, are solid grouted, and do not protrude into the invert elevation/flow line. The outlet of the overland release flows must be similarly armored with a concrete apron. Additionally, energy dissipation features must be placed at the end of the apron and/or formed within the apron concrete.

D. Streets, publicly-owned parking lots, pedestrian areas, pedestrian walkways, utility routes and other open space areas may be considered compatible uses for the overland release routing. Appropriate barricades for traffic safety and signage as required by the County shall be placed as needed for release paths exiting the right-of-way.

9-16 NOT USED

9-17 HEADWALLS AND RACKS – The requirements for headwalls, wing-walls, end walls, trash racks, access control racks and railings are as follows:

A. All headwalls, wing-walls and end walls shall be considered individually and in general shall be designed in accordance with these Standards and the State Standard Plans and State Standard Specifications.

B. Erosion control is of high importance where storm drain pipes discharge to natural channels. Energy dissipating structures shall be detailed on the improvement plans. Pipe and culvert entrance and outlet locations shall be provided a concrete apron with minimum lengths as required in Sections 9-12, H and 9-14, F for erosion control and maintenance purposes.

C. Trash racks will be provided on inlets to pipes entering an underground conduit system. Pipe inlets greater than 24 inches will normally have a rack installed.

D. Racks shall be required on pipe outlets forty-two inches (42”) or larger, unless access is restricted by fencing and omission is approved by the Director. The Director may require racks at smaller pipe outlets in locations that are deemed to warrant supplemental access control. Racks will not normally be installed on open-ended culverts.

E. Racks shall be designed such that the ratio of rack open area to drain opening is at a minimum four to one (4H:1V).

F. Public safety may require metal beam guardrail or chain link fencing at the top of culverts, headwalls, box culverts, and steep side slopes. Installation shall be in accordance with the Standard Construction Specifications and the Standard Drawings.

G. Slopes around headwalls, wing walls, end walls, trash racks and other concrete structures shall be protected from erosion appropriately.

9-18 DRAINAGE PUMPS – Drainage pumping stations shall be designed in accordance with the latest edition of the Hydraulic Institute Standards and as specified by the Director. A pump station will include the following minimum features:

A. A standby backup pump.

B. A trash rack with an automated debris removal system at the inlet.

C. A diesel powered generator with automated start and stop and a 24 hour supply of fuel.

D. A low flow pump.

E. Automated control systems linked to a SCADA system.

F. In most cases the pump station shall include a building to house the electrical equipment, backup generator, and to provide a storage area.

The County will provide a list of additional required features based on the size, location and purpose of each station.

9-19 DETENTION SYSTEMS – Detention basins can be used for peak flow attenuation, detention, and retention and/or storm water treatment. Flood control detention system designs must be performed for all detention/retention basins, temporary or permanent.

A. Flood control detention basin volume requirements shall be determined based on a 100-year storm. Detention systems shall be evaluated for storm durations of 24-

hours and 10-days and the worst case duration shall govern the design. Flood control detention basins shall be designed with a minimum of 1 foot of freeboard. For detention basins with levees, a minimum freeboard of 3 feet shall be provided. The total volume required for the basin shall be based on hydrologic routing computations. Basin routing curves shall be included in the submitted design calculations.

B. Side slopes of the basin and any berm shall be no steeper than 3H:1V. Shape should be irregular and slopes should vary around the basin to give it a more natural appearance, up to approximately 10H:1V slopes. Bottom of the basin must slope towards outlet at a minimum 2% slope if vegetated or 0.5% if paved.

C. The bottom of the basin shall be a minimum of 2 feet above the highest seasonal ground water elevation and be based on the recommendation of a licensed engineering geologist or soils engineer. A clay or concrete liner may be required to prevent groundwater intrusion into the basin.

D. If a water quality structure is included in the basin design, the volume of the water quality portion of the basin will be in addition to the volume required for detention. The water quality element of the basin must be designed according to the above referenced design standards and the Stormwater Quality Design Manual for the Sacramento and South Placer Region.

E. Approved detention basins shall require submittal of a "User Manual" for each detention basin. This manual shall include an 11"x17" sheet showing details of the detention basin including: inlets, outlets, ramps, elevation, and a vicinity map showing the access route from the arterial and the 10- and 100-year elevations.

F. Fencing shall normally be required around detention basins. The specific design and materials used are subject to the approval of the Director. The minimum requirements for fencing are as follows:

- Fencing shall be six foot (6') chain link or "decorative" style, located six inches (6") inside of right of way or easement.
- Pedestrian gates shall be four feet (4') wide.
- Vehicle gates shall be two eight foot (8') gates with a total opening of sixteen feet (16') wide. They shall be set a minimum of twenty feet (20') back from the edge of pavement to allow for a safe parking area off of the traveled way while opening and closing the gates. Gates must swing away from road right-of-way. A concrete driveway shall be provided at vertical curb locations. Asphalt concrete paving shall be provided between the traveled way and drive gate.
- Signs may be required as considered appropriate by the Director. As a minimum, the vehicle gate access shall be marked "Sutter County Drainage Facility – No Motorized Vehicles - No Parking". Signage statements, sizes, layout, and colors shall be approved by the Director.
- Fencing and gates components shall be composed of unpainted galvanized steel. Other materials such as aluminum, or other approved durable and corrosion-

resistant materials may be used if decorative fencing is required for the area. Weld joints shall be cleaned and covered with a zinc-based coating.

G. Access Roads are required around detention basins for maintenance, normally located at or above the 100-year flood elevation. An area with a minimum width of 25 feet shall be set aside for access.

- A twenty foot (20') service road shall be provided having a sixteen foot (16') improved surface and two foot (2') shoulders on each side. Curve radii shall be a minimum of forty-two feet (42'). Turnouts shall be placed as dictated by horizontal sight distance and shall be no greater than one-thousand feet (1,000').
- For roads with no outlet, a turn-around shall be constructed with a minimum 40 foot outer radius at the end of the road.
- Improved surfaces of the service road shall be a minimum six inches of AB. Existing sub grade shall be compacted to 95% and AB will be compacted to 90%.

H. Access ramps are required to the bottom of detention basins that are more than 4 feet below the access road to allow access for emergency and maintenance equipment.

- The minimum width shall be twelve feet (12') at a maximum slope of ten percent (10%). See Drawing D-24.
- Ramps will be constructed of concrete; minimum 4 inches thick with appropriate base (may be colored to blend with the surroundings). Attention to both aesthetics and serviceability is required. Materials with characteristics similar to concrete may be substituted on an exception basis if authorized by the Director.
- Details of the ramps shall be shown on the improvement plans.

9-20 OPEN CHANNELS – All runoff for new development must normally be conveyed in closed conduits. Open channels may be authorized by the Director whenever one or more of the following applies:

- The design flow rate exceeds the capacity of a seventy-two inch (72") pipe.
- The outfall is at an elevation such that minimum cover cannot be obtained over the pipe.
- County, State or Federal Government policies require that the channel remain natural. A parallel facility for runoff conveyance may be considered. If an agreement is needed between a State and Federal Agency, such agreement must be approved by the Director prior to its submittal to other agencies.

Open channels are to be designed pursuant to the drainage study provided by the design engineer and to the satisfaction of the Director. Each project has unique hydraulic constraints and storm water quality requirements; therefore, the following should be deemed guidelines.

A. Open channels may consist of vegetated earth channels. Concrete lining may also be used.

B. Criteria for open channels shall be as follows:

1. Open channel design shall include a water surface profile analysis using the Army Corps of Engineers HEC-RAS computer program or other steady or unsteady state hydraulic program, approved by the Director.

2. Open channels shall be designed to convey the 100-year flood event with a minimum one foot (1') of freeboard. Greater freeboard may be required depending on the sensitivity of the model, obstructions, and surrounding property.

3. For open channel systems, the hydraulic grade line shall be shown for the 10-year and 100-year design flows. Prior to acceptance of all channels, bridges or culverts the 10- and 100-year hydraulic grade line elevations must be permanently marked on the structure.

4. The minimum 'n' values to be used in the Manning's formula for open channel design calculations shall conform to the following:

Open Channel Fully Lined with Concrete	0.018
Open Channel with Concrete Lined Bottom, Clean Sides	0.035
Earth Channel - Uniform shape with vegetated bottom and sides	0.060
Earth Channel with natural bottom and sides	0.080 or higher

5. The minimum velocity for open channels is 2.0 ft/s. The maximum velocity shall be as shown in Table 9-5:

TABLE 9-5. PERMISSIBLE VELOCITIES FOR UNLINED CHANNELS (ft/sec)

Type of Material in Excavation Section	Permissible Velocity (ft/s)	
	Intermittent Flow	Sustained Flow
Fine Sand (Noncolloidal)	2.5	2.5
Sandy Loam (Noncolloidal)	2.5	2.5
Silt Loam (Noncolloidal)	3.0	3.0
Fine Loam	3.5	3.5
Volcanic Ash	4.0	3.5
Fine Gravel	4.0	3.5
Stiff Clay (Colloidal)	5.0	4.0
Graded Material (Noncolloidal)		
Loam to Gravel	6.5	5.0
Silt to Gravel	7.0	5.5
Gravel	7.5	6.0
Coarse Gravel	8.0	6.5
Gravel to Cobbles (Under 6 in)	9.0	7.0
Gravel and Cobbles (Over 8 in)	10.0	8.0

6. Super elevating the outside bank on bends may be required to maintain specified freeboard.

7. The centerline curve radius of an open channel shall be equal to the greater of twice the bottom width or thirty-five feet (35').

8. Earth channels and the side slopes of bottom lined channels shall be vegetated with native grasses or other permanent vegetative cover. All vegetation shall be approved by the Director. Hydro-seeding conducted during the wet season (October 1 – April 30) shall include additional appropriate soil stabilization materials to prevent erosion. A note shall be added to improvement plans stating "Vegetated open channels shall not be accepted by the County until 70% of the vegetation is established." No trees shall be planted below the 10-year hydraulic grade line. Trees shall only be allowed below the 100-year hydraulic grade line when the channel is designed to preserve adequate conveyance capacity with trees present. Selection and location of trees must be approved by the Director.

9. Channels, deeper than two feet (2'), shall be constructed to a typical cross section with 3H:1V or flatter side slopes. Channels immediately adjacent to a road shall be designed with a side slope of 4H:1V or flatter. Exceptions require a soils report and the approval of the Director.

10. All channels deeper than 2 feet shall have a minimum bottom width of six feet (6').

11. Permanent erosion protection shall be placed at the top of the cut or bank to prevent erosion (see Standard Drawings). At locations where overland flows enter the channel, appropriate erosion control and energy dissipation methods shall be incorporated into the design.

12. For all channels, either improved or natural, the following items shall be shown on improvement plans in addition to information heretofore required:

    a. Typical sections and cross-sections.
    b. Profile of the existing channel and top of bank profile including enough of the existing channel each side of the development to establish an average profile grade through the development.
    c. Ten and one-hundred year water surface elevations.
    d. Road crossings with road profile indicating overland release.

13. In developed areas, fencing shall normally be required along both sides of open channels. The specific design and materials used are subject to the approval of the Director. The minimum requirements for fencing are as follows:

    a. Fencing shall be six foot (6’) chain link or “decorative” style, located within right of way or easement.
    b. Pedestrian gates shall be four feet (4’) wide.
    c. Vehicle gates shall be two eight foot (8') gates with a total opening of sixteen feet (16’) wide. They shall be set a minimum of twenty feet (20’) back from the edge of pavement to allow for a safe parking area off of the traveled way while opening and closing the gates. Gates must swing away from road right-of-way. A concrete driveway shall be provided at vertical curb locations. Asphalt concrete paving shall be provided between the traveled way and drive gate.
    d. Signs may be required as considered appropriate by the Director. As a minimum, the vehicle gate access shall be marked “Sutter County Drainage Facility – No Motorized Vehicles - No Parking”. Signage statements, sizes, layout, and colors shall be approved by the Director.
    e. Fencing and gates components shall be composed of unpainted galvanized steel. Other materials such as aluminum, or other approved durable and corrosion-resistant materials may be used if decorative fencing is required for the area. Weld joints shall be cleaned and covered with a zinc-based coating.

14. Access Roads are required on both sides of open channels for maintenance, normally located at or above the 100-year flood elevation. An area with a minimum width of 25 feet shall be set aside for access.

    a. A twenty foot (20’) service road shall be provided having a sixteen foot (16’) improved surface and two foot (2’) shoulders on each side. Curve radii shall be a minimum of forty-two feet (42’). Turnouts shall be placed as dictated by horizontal sight distance and shall be no greater than one-thousand feet (1000’).
    b. For roads with no outlet, a turn-around shall be constructed with a minimum 40 foot outer radius at the end of the road.
    c. Improved surfaces of the service road shall be a minimum six inches of AB. Existing sub grade shall be compacted to 95% and AB will be compacted to 90%.

15. Access ramps are required to the bottom of open channels that are more than 4 feet below the access road to allow access for emergency and maintenance equipment. Each segment of a channel shall be accessible. Ramps shall be located in pairs where possible to allow entrance and exit of equipment.

    a. The minimum width shall be twelve feet (12') at a maximum slope of ten percent (10%). See Drawing D-24.
    b. Ramps will be constructed of concrete; minimum 4 inches thick with appropriate base (may be colored to blend with the surroundings). Attention to both aesthetics and serviceability is required. Materials with characteristics similar to concrete may be substituted on an exception basis if authorized by the Director.
    c. Details of the ramps shall be shown on the improvement plans.

9-21 OUTFALL PLANS – Requirements for outfall plans are as follows:

A. All permanent and temporary drainage outfalls shall be shown in both plan and profile on the improvement plans for a distance until a definite "daylight" condition is established.

B. The profiles shall include ditch flow-line and left and right top of bank elevations.

C. When improvements have more than one unit or phase, the drainage outfall shall be shown as extending to the property boundary and beyond, if required, although it may not be constructed with the current unit development.

9-22 NOT USED

9-23 CROSS CULVERT CRITERIA – The following standards apply when the 100-year water surface elevation is not freely spanned by a bridge:

A. Cross culverts for minor sheds shall be designed in accordance with procedures outlined in the U.S. Department of Transportation "Hydraulic Design of Highway Culverts," Hydraulic Design Series No. 5, September, 1985. For shed areas greater than 160 acres, use HEC-RAS or other software approved by the Director.

B. Cross culverts shall be checked against 100-year runoff to assure that no adverse effect will occur upstream or downstream.

C. Cross culvert profile will be determined by an examination of the overall profile of the channel for a minimum distance of 500-feet on each side of the installation, assuring that freeboard requirements are met, and inlet or outlet control shall be determined.

D. Where no overland release is possible, cross culverts shall be oversized by at least twenty five percent (25%).

E. Where roads are not to be overtopped, for public safety or physical constraints, the box culvert soffit shall have one-foot (1') of freeboard over the 100-year water surface elevation.

F. Culverts shall include a headwall or flared end section at both the upstream and downstream end. A concrete apron shall be provided at the inlet and outlet of a culvert, with the minimum length of the lesser of 20 (twenty) feet or five (5) pipe diameters.

9-24 DRAINAGE IN RURAL AREAS – Drainage ditches may be used for runoff collection and conveyance along public right of ways in rural residential areas zoned for agricultural/residential lots at least 2 acres in size. Non-roadside ditches shall use the criteria for open channels and may require private easements to be recorded for cross lot drainage.

When appropriate, open roadside ditches shall use the criteria for design of Class "C" streets and the following requirements:

A. Roadside ditches shall be sized to convey design runoff. Analysis of 100-year flows shall be considered per Section 9-1. Analysis shall include culverts. The 10-year and 100-year hydraulic grade lines shall be shown on the profile. A minimum grade of 0.3% or a minimum velocity of 2 ft/second shall be required.

B. Roadside ditches shall use 4H:1V or flatter side slopes. Roadside ditches, including slopes, shall be located within the right-of way, where feasible. A drainage easement shall be dedicated for that portion of a ditch that extends beyond the standard right-of-way width..

C. Driveway culverts shall be designed to pass the greater of the 10-year design runoff, the roadside ditch capacity, or a 12 inch minimum diameter. Culverts shall be constructed out of CMP or RCP pipe. Culverts shall be installed with either a six inch (6") thick concrete collar and headwall; or shall extend at least 1 foot beyond the driveway slope and include a flared end section at the upstream and downstream ends.

9-25 STORMDRAIN SYSTEMS IN PRIVATE STREETS – Private storm drain systems that connect to County maintained drainage facilities shall have a manhole on private property immediately upstream of the connection within the public easement or right-of-way.

A. It shall be made clear on the plans which facilities are privately owned.

B. Private storm drain pipes serving more than two parcels shall be built per these Design Standards.

9-26 NOT USED

9-27 NOT USED

APPENDIX A
HYDROLOGIC SOIL GROUPS (HSGs)

APPENDIX A
Hydrologic Soil Groups (HSGs)

Soils are classified into hydrologic soil groups (HSGs) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSGs are A, B, C and D.

The four groups are defined by Soil Conservation Service (SCS) soil scientists as follows:

Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission (greater than 0.30 in/hr).

Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15-0.30 in/hr).

Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/hr).

Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0-0.05 in/hr).

Table 2-2a.—Runoff curve numbers for urban areas[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1]Average runoff condition, and $I_a = 0.2S$.

[2]The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3]CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4]Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5]Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4, based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b.—Runoff curve numbers for cultivated agricultural lands[1]

Cover description			Curve numbers for hydrologic soil group—			
Cover type	Treatment[2]	Hydrologic condition[3]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T + CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T + CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1]Average runoff condition, and $I_a = 0.2S$.

[2]*Crop residue cover* applies only if residue is on at least 5% of the surface throughout the year.

[3]Hydrologic condition is based on combination of factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes in rotations, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c.—Runoff curve numbers for other agricultural lands[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing.[2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element.[3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	[4]30	48	65	73
Woods—grass combination (orchard or tree farm).[5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods.[6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	[4]30	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

[1]Average runoff condition, and $I_a = 0.2S$.

[2]*Poor:* <50% ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: >75% ground cover and lightly or only occasionally grazed.

[3]*Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

[4]Actual curve number is less than 30; use CN = 30 for runoff computations.

[5]CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

[6]*Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d.—Runoff curve numbers for arid and semiarid rangelands[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

[1]Average runoff condition, and $I_a = 0.2S$. For range in humid regions, use table 2-2c.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

[3]Curve numbers for group A have been developed only for desert shrub.

APPENDIX B

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) GUIDANCE INFORMATION

SUTTER COUNTY
GUIDANCE INFORMATION
For
COMPLIANCE WITH
NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM
(NPDES Phase II)

For construction activities which disturb 1 acre or more of land, a Notice of Intent (NOI) to comply with the terms of the State General Permit to Discharge Storm Water Associated with Construction Activity (WQ Order No. 99-08-DWQ) must be submitted to the State Water Quality Control Board.

NOI to be mailed to:

State Water Resources Control Board
Division of Water Quality
Attn; Storm Water Permit Unit
P.O. Box 1977
Sacramento, CA 95812-1977

Additional information and forms may be obtained from the state web pages:

http://www.swrcb.ca.gov/stormwtr/construction.html
http://www.swrcb.ca.gov/stormwtr/gen_const.html

It is the responsibility of the owner/applicant to comply with all regulations and permits for storm water regulations through the California State Water Quality Control Board (SWQCB). Evidence of compliance shall be provided to the County at time of construction permit issuance by submission of a State WDID No. (The WDID No. is the number assigned by the State to each discharger covered under the General Permit). A copy of the Storm Water Pollution Prevention Plan (SWPPP) shall also be given to the County.

Following are the NOI forms and State fee schedule.

TO: CONSTRUCTION STORM WATER DISCHARGER

SUBJECT: CHECKLIST FOR SUBMITTING A NOTICE OF INTENT

In order for the State Water Resources Control Board to expeditiously process your Notice of Intent (NOI), the following items must be submitted to either of the addresses indicated below:

1._____ NOI (please keep a copy for your files) with all applicable sections completed and original signature of the landowner or signatory agent;

2._____ Check made out to the "State Water Resources Control Board" Fee is ($200 + $20/acre) plus 18.5% surcharge. See reverse for listing of fees by acre.

3. _____ Site Map of the facility (see NOI instructions). DO NOT SEND BLUEPRINTS

U.S. Postal Service Address

State Water Resources Control Board
Division of Water Quality
Attn: Storm Water Section
P.O. Box 1977
Sacramento, CA 95812-1977

Overnight Mailing Address

State Water Resources Control Board
Division of Water Quality
Attn: Storm Water, 15th Floor
1001 I Street
Sacramento, CA 95814

NOIs are processed in the order they are received. A NOI receipt letter will be mailed to the land owner within approximately two weeks. Incomplete NOI submittals will be returned to the landowner's address within the same timeframe and will specify the reason(s) for return. If you need a receipt letter by a specific date (for example, to provide to a local agency), we advise that you submit your NOI thirty (30) days prior to the date the receipt letter is needed.

Please do not call us to verify your NOI status. A copy of your NOI receipt letter will be available on our web page within twenty-four (24) hours of processing. Go to: http://esmr.swrcb.ca.gov:7778/dwq/ConReceiptLetter.asp to retrieve an electronic copy of your NOI receipt letter. If you have any questions regarding this matter, please contact us at (916) 341-5537.

Acres	Fee	18.5% Surcharge	Total Fee	Acres	Fee	18.5% Surcharge	Total Fee
0	$200.00	$37	$237	51	$1,220.00	$226	$1,446
1	$220.00	$41	$261	52	$1,240.00	$229	$1,469
2	$240.00	$44	$284	53	$1,260.00	$233	$1,493
3	$260.00	$48	$308	54	$1,280.00	$237	$1,517
4	$280.00	$52	$332	55	$1,300.00	$241	$1,541
5	$300.00	$56	$356	56	$1,320.00	$244	$1,564
6	$320.00	$59	$379	57	$1,340.00	$248	$1,588
7	$340.00	$63	$403	58	$1,360.00	$252	$1,612
8	$360.00	$67	$427	59	$1,380.00	$255	$1,635
9	$380.00	$70	$450	60	$1,400.00	$259	$1,659
10	$400.00	$74	$474	61	$1,420.00	$263	$1,683
11	$420.00	$78	$498	62	$1,440.00	$266	$1,706
12	$440.00	$81	$521	63	$1,460.00	$270	$1,730
13	$460.00	$85	$545	64	$1,480.00	$274	$1,754
14	$480.00	$89	$569	65	$1,500.00	$278	$1,778
15	$500.00	$93	$593	66	$1,520.00	$281	$1,801
16	$520.00	$96	$616	67	$1,540.00	$285	$1,825
17	$540.00	$100	$640	68	$1,560.00	$289	$1,849
18	$560.00	$104	$664	69	$1,580.00	$292	$1,872
19	$580.00	$107	$687	70	$1,600.00	$296	$1,896
20	$600.00	$111	$711	71	$1,620.00	$300	$1,920
21	$620.00	$115	$735	72	$1,640.00	$303	$1,943
22	$640.00	$118	$758	73	$1,660.00	$307	$1,967
23	$660.00	$122	$782	74	$1,680.00	$311	$1,991
24	$680.00	$126	$806	75	$1,700.00	$315	$2,015
25	$700.00	$130	$830	76	$1,720.00	$318	$2,038
26	$720.00	$133	$853	77	$1,740.00	$322	$2,062
27	$740.00	$137	$877	78	$1,760.00	$326	$2,086
28	$760.00	$141	$901	79	$1,780.00	$329	$2,109
29	$780.00	$144	$924	80	$1,800.00	$333	$2,133
30	$800.00	$148	$948	81	$1,820.00	$337	$2,157
31	$820.00	$152	$972	82	$1,840.00	$340	$2,180
32	$840.00	$155	$995	83	$1,860.00	$344	$2,204
33	$860.00	$159	$1,019	84	$1,880.00	$348	$2,228
34	$880.00	$163	$1,043	85	$1,900.00	$352	$2,252
35	$900.00	$167	$1,067	86	$1,920.00	$355	$2,275
36	$920.00	$170	$1,090	87	$1,940.00	$359	$2,299
37	$940.00	$174	$1,114	88	$1,960.00	$363	$2,323
38	$960.00	$178	$1,138	89	$1,980.00	$366	$2,346
39	$980.00	$181	$1,161	90	$2,000.00	$370	$2,370
40	$1,000.00	$185	$1,185	91	$2,020.00	$374	$2,394
41	$1,020.00	$189	$1,209	92	$2,040.00	$377	$2,417
42	$1,040.00	$192	$1,232	93	$2,060.00	$381	$2,441
43	$1,060.00	$196	$1,256	94	$2,080.00	$385	$2,465
44	$1,080.00	$200	$1,280	95	$2,100.00	$389	$2,489
45	$1,100.00	$204	$1,304	96	$2,120.00	$392	$2,512
46	$1,120.00	$207	$1,327	97	$2,140.00	$396	$2,536
47	$1,140.00	$211	$1,351	98	$2,160.00	$400	$2,560
48	$1,160.00	$215	$1,375	99	$2,180.00	$403	$2,583
49	$1,180.00	$218	$1,398	>100	$2,200.00	$407	$2,607
50	$1,200.00	$222	$1,422				

STORM WATER POLLUTION PREVENTION PLAN

1. Objectives

A Storm Water Pollution Prevention Plan (SWPPP) shall be developed and implemented to address the specific circumstances for each construction site covered by this General Permit. The SWPPP shall be certified in accordance with the signatory requirements of section C, Standard Provision for Construction Activities (9). The SWPPP shall be developed and amended or revised, when necessary, to meet the following objectives:

a. Identify all pollutant sources including sources of sediment that may affect the quality of storm water discharges associated with construction activity (storm water discharges) from the construction site, and

b. Identify non-storm water discharges, and

c. Identify, construct, implement in accordance with a time schedule, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in storm water discharges and authorized nonstorm water discharges from the construction site during construction, and

d. Develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs).

e. Identify a sampling and analysis strategy and sampling schedule for discharges from construction activity which discharge directly into water bodies listed on Attachment 3. (Clean Water Act Section 303(d) [303(d)] Water Bodies listed for Sedimentation).

f. For all construction activity, identify a sampling and analysis strategy and sampling schedule for discharges that have been discovered through visual monitoring to be potentially contaminated by pollutants not visually detectable in the runoff.

2. Implementation Schedule

a. For construction activity commencing on or after adoption of this General Permit, the SWPPP shall be developed prior to the start of soil-disturbing activity in accordance with this Section and shall be implemented concurrently with commencement of soil-disturbing activities.

b. Existing permittees engaging in construction activities covered under the terms of the previous General Construction Permit SWPPP (WQ Order No.92-08-DWQ) shall continue to implement their existing SWPPP and shall implement any necessary revisions to their SWPPP in accordance with this Section of the General

Permit in a timely manner, but in no case more than 90-calender days from the date of adoption of this General Permit.

c. For ongoing construction activity involving a change of ownership of property, the new owner shall review the existing SWPPP and amend if necessary, or develop a new SWPPP within 45-calender days.

d. Existing permittees shall revise their SWPPP in accordance with the sampling and analysis modifications prior to August 1, 2001. For ongoing construction activity involving a change of ownership the new owner shall review the existing SWPPP and amend the sampling and analysis strategy, if required, within 45 days. For construction activity commencing after the date of adoption, the SWPPP shall be developed in accordance with the modification language adopted.

3. Availability

The SWPPP shall remain on the construction site while the site is under construction during working hours, commencing with the initial construction activity and ending with termination of coverage under the General Permit.

4. Required Changes

a. The discharger shall amend the SWPPP whenever there is a change in construction or operations which may affect the discharge of pollutants to surface waters, ground waters, or a municipal separate storm sewer system (MS4). The SWPPP shall also be amended if the discharger violates any condition of this General Permit or has not achieved the general objective of reducing or eliminating pollutants in storm water discharges. If the RWQCB determines that the discharger is in violation of this General Permit, the SWPPP shall be amended and implemented in a timely manner, but in no case more than 14-calendar days after notification by the RWQCB. All amendments should be dated and directly attached to the SWPPP.

b. The RWQCB or local agency with the concurrence of the RWQCB may require the discharger to amend the SWPPP.

5. Source Identification

The SWPPP shall include: (a) project information and (b) pollutant source identification combined with an itemization of those BMPs specifically chosen to control the pollutants listed.

a. Project Information

(1) The SWPPP shall include a vicinity map locating the project site with respect to easily identifiable major roadways, geographic features, or landmarks. At a minimum, the map must show the construction site

perimeter, the geographic features surrounding the site, and the general topography.

(2) The SWPPP shall include a site map(s) which shows the construction project in detail, including the existing and planned paved areas and buildings.

(a) At a minimum, the map must show the construction site perimeter; existing and proposed buildings, lots, roadways, storm water collection and discharge points; general topography both before and after construction; and the anticipated discharge location(s) where the storm water from the construction site discharges to a municipal storm sewer system or other water body.

(b) The drainage patterns across the project area must clearly be shown on the map, and the map must extend as far outside the site perimeter as necessary to illustrate the relevant drainage areas. Where relevant drainage areas are too large to depict on the map, map notes or inserts illustrating the upstream drainage areas are sufficient.

(c) Temporary on-site drainages to carry concentrated flow shall be selected to comply with local ordinances, to control erosion, to return flows to their natural drainage courses, and to prevent damage to downstream properties.

3. Information presented in the SWPPP may be represented either by narrative or by graphics. Where possible, narrative descriptions should be plan notes. Narrative descriptions which do not lend themselves to plan notes can be contained in a separate document which must be referenced on the plan.

b. Pollutant Source and BMP Identification

The SWPPP shall include a description of potential sources which are likely to add pollutants to storm water discharges or which may result in nonstorm water discharges from the construction site. Discharges originating from off-site which flow across or through areas disturbed by construction that may contain pollutants should be reported to the RWQCB.

The SWPPP shall:

(1) Show drainage patterns and slopes anticipated after major grading activities are completed. Runoff from off-site areas should be prevented from flowing through areas that have been disturbed by construction unless appropriate conveyance systems are in place. The amount of

anticipated storm water run-on must be considered to determine the appropriateness of the BMPs chosen. Show all calculations for anticipated storm water run-on, and describe all BMPs implemented to divert off-site drainage described in section A. 5 a. (2) (c) around or through the construction project.

(2) Show the drainage patterns into each on-site storm water inlet point or receiving water. Show or describe the BMPs that will protect operational storm water inlets or receiving waters from contaminated discharges other than sediment discharges, such as, but not limited to: storm water with elevated pH levels from contact with soil amendments such as lime or gypsum; slurry from sawcutting of concrete or asphalt ;washing of exposed aggregate concrete; concrete rinse water; building washing operations; equipment washing operations; minor street washing associated with street delineation; and/or sealing and paving activities occurring during rains.

(3) Show existing site features that, as a result of known past usage, may contribute pollutants to storm water, (e.g., toxic materials that are known to have been treated, stored, disposed, spilled, or leaked onto the construction site). Show or describe the BMPs implemented to minimize the exposure of storm water to contaminated soil or toxic materials.

(4) Show areas designated for the (a) storage of soil or waste, (b) vehicle storage and service areas, (c) construction material loading, unloading, and access areas, (d) equipment storage, cleaning, and maintenance areas.

(5) Describe the BMPs for control of discharges from waste handling and disposal areas and methods of on-site storage and disposal of construction materials and construction waste. Describe the BMPs designed to minimize or eliminate the exposure of storm water to construction materials, equipment, vehicles, waste storage areas, or service areas. The BMPs described shall be in compliance with Federal, State, and local laws, regulations, and ordinances.

(6) Describe all post-construction BMPs for the project, and show the location of each BMP on the map. (Post-construction BMPs consist of permanent features designed to minimize pollutant discharges, including sediment, from the site after construction has been completed.) Also, describe the agency or parties to be the responsible party for long-term maintenance of these BMPs.

(7) Show the locations of direct discharge from the construction site into a Section 303(d) list water body. Show the designated sampling locations in the receiving waters, which represent the prevailing conditions of the

water bodies upstream of the construction site discharge and immediately downstream from the last point of discharge.

(8) Show the locations designated for sampling the discharge from areas identified in Section A. 5. b. (2), (3), and (4) and Section A. 5. c. (1) and (2). Samples shall be taken should visual monitoring indicate that there has been a breach, malfunction, leakage, or spill from a BMP which could result in the discharge in storm water of pollutants that would not be visually detectable, or if storm water comes into contact with soil amendments or other exposed materials or contamination and is allowed to be discharged. Describe the sampling procedure, location, and rationale for obtaining the uncontaminated sample of storm water.

c. Additional Information

(1) The SWPPP shall include a narrative description of pollutant sources and BMPs that cannot be adequately communicated or identified on the site map. In addition, a narrative description of preconstruction control practices (if any) to reduce sediment and other pollutants in storm water discharges shall be included.

(2) The SWPPP shall include an inventory of all materials used and activities performed during construction that have the potential to contribute to the discharge of pollutants other than sediment in storm water. Describe the BMPs selected and the basis for their selection to eliminate or reduce these pollutants in the storm water discharges.

(3) The SWPPP shall include the following information regarding the construction site surface area: the size (in acres or square feet), the runoff coefficient before and after construction, and the percentage that is impervious (e.g., paved, roofed, etc.) before and after construction.

(4) The SWPPP shall include a copy of the NOI, and the Waste Discharge Identification (WDID) number. Should a WDID number not be received from the SWRCB at the time construction commences, the discharger shall include proof of mailing of the NOI, e.g., certified mail receipt, copy of check, express mail receipt, etc.

(5) The SWPPP shall include a construction activity schedule which describes all major activities such as mass grading, paving, lot or parcel improvements at the site and the proposed time frame to conduct those activities.

(6) The SWPPP shall list the name and telephone number of the qualified person(s) who have been assigned responsibility for prestorm, poststorm,

and storm event BMP inspections; and the qualified person(s) assigned responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

6. Erosion Control

Erosion control, also referred to as "soil stabilization" is the most effective way to retain soil and sediment on the construction site. The most efficient way to address erosion control is to preserve existing vegetation where feasible, to limit disturbance, and to stabilize and revegetate disturbed areas as soon as possible after grading or construction. Particular attention must be paid to large mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great. Mass graded construction sites may be exposed for several years while the project is being built out. Thus, there is potential for significant sediment discharge from the site to surface waters.

At a minimum, the discharger/operator must implement an effective combination of erosion and sediment control on all disturbed areas during the rainy season. These disturbed areas include rough graded roadways, slopes, and building pads. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single-most important factor in reducing erosion at construction sites. The discharger shall consider measures such as: covering with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, permanent seeding, and a variety of other measures.

The SWPPP shall include a description of the erosion control practices, including a time schedule, to be implemented during construction to minimize erosion on disturbed areas of a construction site. The discharger must consider the full range of erosion control BMPs. The discharger must consider any additional site-specific and seasonal conditions when selecting and implementing appropriate BMPs. The above listed erosion control measures are examples of what should be considered and are not exclusive of new or innovative approaches currently available or being developed.

a. The SWPPP shall include:

(1) An outline of the areas of vegetative soil cover or native vegetation onsite which will remain undisturbed during the construction project.

(2) An outline of all areas of soil disturbance including cut or fill areas which will be stabilized during the rainy season by temporary or permanent erosion control measures, such as seeding, mulch, or blankets, etc.

(3) An outline of the areas of soil disturbance, cut, or fill which will be left exposed during any part of the rainy season, representing areas of potential

soil erosion where sediment control BMPs are required to be used during construction.

(4) A proposed schedule for the implementation of erosion control measures.

b. The SWPPP shall include a description of the BMPs and control practices to be used for both temporary and permanent erosion control measures.

c. The SWPPP shall include a description of the BMPs to reduce wind erosion at all times, with particular attention paid to stock-piled materials.

7. Stabilization

(1) All disturbed areas of the construction site must be stabilized. Final stabilization for the purposes of submitting a NOT is satisfied when:

-All soil disturbing activities are completed AND EITHER OF THE TWO FOLLOWING CRITERIA ARE MET:

-A uniform vegetative cover with 70 percent coverage has been established OR:

-equivalent stabilization measures have been employed. These measures include the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.

(2) Where background native vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: If the native vegetation covers 50 percent of the ground surface, 70 percent of 50 percent (.70 X .50=.35) would require 35 percent total uniform surface coverage.

8. <u>Sediment Control</u>

The SWPPP shall include a description or illustration of BMPs which will be implemented to prevent a net increase of sediment load in storm water discharge relative to preconstruction levels. Sediment control BMPs are required at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during the rainy season. Sediment control practices may include filtration devices and barriers (such as fiber rolls, silt fence, straw bale barriers, and gravel inlet filters) and/or settling devices (such as sediment traps or basins). Effective filtration devices, barriers, and settling devices shall be selected, installed and maintained properly. A proposed schedule for deployment of sediment control BMPs shall be included in the SWPPP. These are the most basic measures to prevent sediment from leaving the project site and moving into receiving waters. Limited exemptions may be authorized by the

RWQCB when work on active areas precludes the use of sediment control BMPs temporarily. Under these conditions, the SWPPP must describe a plan to establish perimeter controls prior to the onset of rain.

During the nonrainy season, the discharger is responsible for ensuring that adequate sediment control materials are available to control sediment discharges at the downgrade perimeter and operational inlets in the event of a predicted storm. The discharger shall consider a full range of sediment controls, in addition to the controls listed above, such as straw bale dikes, earth dikes, brush barriers, drainage swales, check dams, subsurface drain, sandbag dikes, fiber rolls, or other controls. At a minimum, the discharger/operator must implement an effective combination of erosion and sediment control on all disturbed areas during the rainy season.

If the discharger chooses to rely on sediment basins for treatment purposes, sediment basins shall, at a minimum, be designed and maintained as follows:

Option 1: Pursuant to local ordinance for sediment basin design and maintenance, provided that the design efficiency is as protective or more protective of water quality than Option 3.

OR

Option 2: Sediment basin(s), as measured from the bottom of the basin to the principal outlet, shall have at least a capacity equivalent to 3,600 cubic feet of storage per acre draining into the sediment basin. The length of the basin shall be more than twice the width of the basin. The length is determined by measuring the distance between the inlet and the outlet; and the depth must not be less than three feet nor greater than five feet for safety reasons and for maximum efficiency.

OR

Option 3: Sediment basin(s) shall be designed using the standard equation:

$$As=1.2Q/Vs$$

Where: As is the minimum surface area for trapping soil particles of a certain size; Vs is the settling velocity of the design particle size chosen; and Q=C x I x A where Q is the discharge rate measured in cubic feet per second; C is the runoff coefficient; I is the precipitation intensity for the 10-year, 6-hour rain event and A is the area draining into the sediment basin in acres. The design particle size shall be the smallest soil grain size determined by wet sieve analysis, or the fine silt sized (0.01mm) particle, and the Vs used shall be 100 percent of the calculated settling velocity.

The length is determined by measuring the distance between the inlet and the outlet; the length shall be more than twice the dimension as the width; the depth shall not be less than three feet nor greater than five feet for

safety reasons and for maximum efficiency (two feet of storage, two feet of capacity). The basin(s) shall be located on the site where it can be maintained on a year-round basis and shall be maintained on a schedule to retain the two feet of capacity;

OR

Option 4: The use of an equivalent surface area design or equation, provided that the design efficiency is as protective or more protective of water quality than Option 3.

A sediment basin shall have a means for dewatering within 7-calendar days following a storm event. Sediment basins may be fenced if safety (worker or public) is a concern.

The outflow from a sediment basin that discharges into a natural drainage shall be provided with outlet protection to prevent erosion and scour of the embankment and channel.

The discharger must consider any additional site-specific and seasonal conditions when selecting and designing sediment control BMPs. The above listed sediment control measures are examples of what should be considered and are not exclusive of new or innovative approaches currently available or being developed.

The SWPPP shall include a description of the BMPs to reduce the tracking of sediment onto public or private roads at all times. These public and private roads shall be inspected and cleaned as necessary. Road cleaning BMPs shall be discussed in the SWPPP and will not rely on the washing of accumulated sediment or silt into the storm drain system.

9. Non-Storm Water Management

Describe all non-storm water discharges to receiving waters that are proposed for the construction project. Non-storm water discharges should be eliminated or reduced to the extent feasible. Include the locations of such discharges and descriptions of all BMPs designed for the control of pollutants in such discharges. Onetime discharges shall be monitored during the time that such discharges are occurring. A qualified person should be assigned the responsibility for ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems (consistent with BAT/BCT), and the name and contact number of that person should be included in the SWPPP document.

Discharging sediment-laden water which will cause or contribute to an exceedance of the applicable RWQCB's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain without filtration or equivalent treatment is prohibited.

10. Post-Construction Storm Water Management

The SWPPP shall include descriptions of the BMPs to reduce pollutants in storm water discharges after all construction phases have been completed at the site (Post-Construction BMPs). Post-Construction BMPs include the minimization of land disturbance, the minimization of impervious surfaces, treatment of storm water runoff using infiltration, detention/retention, biofilter BMPs, use of efficient irrigation systems, ensuring that interior drains are not connected to a storm sewer system, and appropriately designed and constructed energy dissipation devices. These must be consistent with all local post-construction storm water management requirements, policies, and guidelines. The discharger must consider site-specific and seasonal conditions when designing the control practices. Operation and maintenance of control practices after construction is completed shall be addressed, including short-and long-term funding sources and the responsible party.

11. Maintenance, Inspection, and Repair

The SWPPP shall include a discussion of the program to inspect and maintain all BMPs as identified in the site plan or other narrative documents throughout the entire duration of the project. A qualified person will be assigned the responsibility to conduct inspections. The name and telephone number of that person shall be listed in the SWPPP document. Inspections will be performed before and after storm events and once each 24-hour period during extended storm events to identify BMP effectiveness and implement repairs or design changes as soon as feasible depending upon field conditions. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible after the conclusion of each storm depending upon worker safety.

For each inspection required above, the discharger shall complete an inspection checklist. At a minimum, an inspection checklist shall include:

a. Inspection date.

b. Weather information: best estimate of beginning of storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall (inches).

c. A description of any inadequate BMPs.

d. If it is possible to safely access during inclement weather, list observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list result of visual inspection at relevant outfall, discharge point, or downstream location and projected required maintenance activities.

e. Corrective actions required, including any changes to SWPPP necessary and implementation dates.

f. Inspectors name, title, and signature.

The dischargers shall prepare their inspection checklists using the inspection checklist form provided by the SWRCB or RWQCB or on forms that contain the equivalent information.

12. Training

Individuals responsible for SWPPP preparation, implementation, and permit compliance shall be appropriately trained, and the SWPPP shall document all training. This includes those personnel responsible for installation, inspection, maintenance, and repair of BMPs. Those responsible for overseeing, revising, and amending the SWPPP shall also document their training. Training should be both formal and informal, occur on an ongoing basis when it is appropriate and convenient, and should include training/workshops offered by the SWRCB, RWQCB, or other locally recognized agencies or professional organizations.

13. List of Contractors/Subcontractors

The SWPPP shall include a list of names of all contractors, (or subcontractors) and individuals responsible for implementation of the SWPPP. This list should include telephone numbers and addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers should also be included.

14. Other Plans

This SWPPP may incorporate by reference the appropriate elements of other plans required by local, State, or Federal agencies. A copy of any requirements incorporated by reference shall be kept at the construction site.

15. Public Access

The SWPPP shall be provided, upon request, to the RWQCB. The SWPPP is considered a report that shall be available to the public by the RWQCB under section 308(b) of the Clean Water Act.

16. Preparer Certification

The SWPPP and each amendment shall be signed by the landowner (discharger) or his representative and include the date of initial preparation and the date of each amendment.

NOTICE OF INTENT (NOI) TO COMPLY WITH THE TERMS
OF THE GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL INSTRUCTIONS

Who Must Submit

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Activities Storm Water Permit (General Permit). Construction activity which is a part of a larger common area of development or sale must also be permitted. (For example, if 4 acres of a 20-acre subdivision is disturbed by construction activities, and the remaining 16 acres is to be developed at a future date, the property owner must obtain a General Storm Water Permit for the 4-acre project). Construction activity includes, but is not limited to: clearing, grading, demolition, excavation, construction of new structures, and reconstruction of existing facilities involving removal and replacement that results in soil disturbance. This includes construction access roads, staging areas, storage areas, stockpiles, and any off-site areas which receive run-off from the construction project such as discharge points into a receiving water. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

The owner of the land where the construction activity is occurring is responsible for obtaining a permit. Owners may obtain coverage under the General Permit by filing a NOI in accordance with the following instructions. Coverage for construction activity conducted on easements (e.g., pipeline construction) or on nearby properties by agreement or permission, or by an owner or lessee of a mineral estate (oil, gas, geothermal, aggregate, precious metals, and/or industrial minerals) entitled to conduct the activities, shall be obtained by the entity responsible for the construction activity. Linear construction projects which will have construction activity occurring in one or more than one Region should contact the State Water Resources Control Board at the number listed below prior to submitting an NOI application for specific information related to the use of the NOI form.

Construction Activity Not Covered By This General Permit

Storm water discharges in the Lake Tahoe Hydrologic Unit will be regulated by a separate permit(s) adopted by the California Regional Water Quality Control Board, Lahontan Region, and will not be covered under the State Water Resources Control Board's (SWRCB) General Permit. Storm water discharges on Indian Lands will be regulated by the U.S. Environmental Protection Agency.

Where to Apply

The NOI form, vicinity map, and appropriate fee must be mailed to the SWRCB at the following address:

State Water Resources Control Board
Division of Water Quality
Attn: Storm Water Permit Unit
P.O. Box 1977
Sacramento, CA 95812-1977

When to Apply

Property owners proposing to conduct construction activities subject to this General Permit must file a Notice of Intent prior to the commencement of construction activity.

Fees

The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI. Checks should be made payable to: SWRCB.

Completing the Notice of Intent (NOI)

The submittal to obtain coverage under the General Permit must include a completed NOI Form (Notice of Intent, attached), a vicinity map, and the appropriate annual fee. The NOI must be completely and accurately filled out; the vicinity map and annual fee must be included with the NOI or the submittal is considered incomplete and will be rejected. A construction site is considered to be covered by the General Permit upon filing a complete NOI submittal, and implementation of a defensible Storm Water Pollution Prevention Plan (SWPPP). Upon receipt of a complete NOI submittal, each discharger will be sent a receipt letter containing the waste discharger's identification (WDID) number.

Questions?

If you have any questions on completing the NOI please call the SWRCB at (916) 341-5537.

NOI-LINE-BY-LINE INSTRUCTIONS

Please type or print when completing the NOI Form and vicinity map.

SECTION I--NOI STATUS

Mark one of the two boxes at the top portion of the NOI. Check box 1 if the NOI is being completed for new construction. Check box 2 if the NOI is being submitted to report changes for a construction site already covered by the General Permit. An example of a change that warrants a resubmittal of the NOI is a change of total area of the construction site. The permit is non-transferable, a change of ownership requires a Notice of Termination (NOT) submittal and a new NOI. Complete only those portions of the NOI that apply to the changes (the NOI must always be signed). If box 2 is checked, the WDID number must be included.

SECTION II--PROPERTY OWNER

Enter the construction site owner's official or legal name and address; contact person (if other than owner), title, and telephone number.

SECTION III--DEVELOPER / CONTRACTOR INFORMATION

Enter the name of the developer's (or general contractor's) official or legal name, address, contact person, title, and telephone number. The contact person should be someone who is familiar with the construction site and is responsible for compliance and oversight of the general permit.

SECTION IV-CONSTRUCTION PROJECT INFORMATION

Enter the project name, site address, county, city, (or nearest city if construction is occurring in an unincorporated area), zip code, and telephone number (if any) of the construction site. Include an emergency contact telephone or pager number. Construction site information should include latitude and longitude designations, tract numbers, and/or mile post markers, if applicable. The site contact person should be someone who is familiar with the project, site plans, SWPPP, and monitoring program. All NOIs must be accompanied by a vicinity map.

Part A: Enter the total size in acres of all areas associated with construction activity, including all access roads.

Part B: Enter the total size in acres of the area to be disturbed by construction activity and the percentage of the area listed in Part A above that this represents.

Part C: Enter the percentage of the site that is impervious (areas where water cannot soak into the ground, such as concrete, asphalt, rooftops, etc.) before and after construction.

Part D: Include tract numbers, if available.

Part E: Enter the mile post marker number at the project site location.

Part F: Indicate whether the construction site is part of a larger common plan of development or sale. For example, if the construction activity is occurring on a two-acre site which is within a development that is one acre or greater, answer yes.

Part G: Enter the name of the development (e.g. "Quail Ridge Subdivision", "Orange Valley Estates", etc.).

Part H: Indicate when construction will begin (month, day, year). When a NOI is being submitted due to a change in ownership, the commencement date should be the date the new ownership took effect.

Part I: Indicate the percentage of the total project area to be mass graded.

Part J: Enter the estimated completion dates for the mass grading activities and for the project completion.

Part K: Indicate the type(s) of construction taking place. For example, “Transportation” should be checked for the construction of roads; “Utility” should be checked for installation of sewer, electric, or telephone systems. Include a description of the major construction activities, (e.g., 20 single family homes, a supermarket, an office building, a factory, etc.)

SECTION V--BILLING ADDRESS

To continue coverage under the General Permit, the annual fee must be paid. Indicate where the annual fee invoice should be mailed by checking one of the following boxes:

Owner: sent to the owners address as it appears in Section II.

Developer/Contractor: sent to the developer's address as it appears in Section III.

Other: sent to a different address and enter that address in the spaces provided.

SECTION VI--REGULATORY STATUS

Indicate whether or not the site is subject to local erosion/sediment control ordinances. Indicate whether the erosion/sediment control plan designed to comply with the ordinance addresses the construction of infrastructure and structures in addition to grading. Identify the name and telephone number of the local agency, if applicable.

SECTION VII--RECEIVING WATER INFORMATION

Part A: Indicate whether the storm water runoff from the construction site discharges indirectly to waters of the United States, directly to waters of the United States, or to a separate storm drain system.

Indirect discharges include discharges that may flow overland across adjacent properties or rights-of-way prior to discharging into waters of the United States.

Enter the name of the owner/operator of the relevant storm drain system, if applicable. Storm water discharges directly to waters of the United States will typically have an outfall structure directly from the facility to a river, lake, creek, stream, bay, ocean, etc. Discharges to separate storm sewer systems are those that discharge to a collection system operated by municipalities, flood control districts, utilities, or similar entities.

Part B: Enter the name of the receiving water. Regardless of point of discharge, the owner must determine the receiving water for the construction site's storm water discharge. Enter the name of the receiving water.

SECTION VIII--IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

Part A: Indicate the status of the SWPPP, date prepared, or availability for review. Also indicate if a tentative construction schedule has been included in the SWPPP (the inclusion of a construction activity schedule is a mandatory SWPPP requirement).

Part B: Provide information concerning the status of the development of a monitoring program, a component of the SWPPP which outlines an inspection and maintenance schedule for the proposed Best Management Practices (BMPs). Provide name and phone number of program preparer.

Part C: Provide the name and phone numbers of the responsible party or parties designated to insure compliance with all elements of the General Permit and SWPPP.

SECTION IX--VICINITY MAP AND FEE

Provide a “to scale” or "to approximate scale" drawing of the construction site and the immediate surrounding area. Whenever possible, limit the map to an 8.5” x 11’ or 11" x 17" sheet of paper. At a minimum, the map must show the site perimeter, the geographic features surrounding the site, and general topography, and a north arrow. The map must also include the location of the construction project in relation to named streets, roads, intersections, or landmarks. A NOI containing a map which does not clearly indicate the location of the construction project will be rejected. Do not submit blueprints unless they meet the above referenced size limits.

SECTION X--CERTIFICATIONS

This section must be completed by the owner or signatory agent of the construction site*. The certification provides assurances that the NOI and vicinity map were completed in an accurate and complete fashion and with the knowledge that penalties exist for providing false information. Certification also requires the owner to comply with the provisions in the General Permit.

* For a corporation: a responsible corporate officer (or authorized individual). For a partnership or sole proprietorship: a general partner or the proprietor, respectively. For a municipality, State, Federal, or other public agency: either a principal executive officer, ranking elected official, or duly authorized representative.

Attachment 2

State Water Resources Control Board

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ ORDER No. 99-08-DWQ)

I. NOI STATUS (SEE INSTRUCTIONS)

MARK ONLY ONE ITEM 1. ☐ New Construction 2. ☐ Change of Information for WDID#

II. PROPERTY OWNER

Name	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone ( ) --

III. DEVELOPER/CONTRACTOR INFORMATION

Developer/Contractor	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone ( ) --

IV. CONSTRUCTION PROJECT INFORMATION

Site/Project Name	Site Contact Person		
Physical Address/Location	Latitude _____°	Longitude _____°	County
City (or nearest City)	Zip	Site Phone Number ( ) --	Emergency Phone Number ( ) --

A. Total size of construction site area: _____ Acres B. Total area to be disturbed: _____ Acres (% of total _____)	C. Percent of site imperviousness (including rooftops): Before Construction: _____% After Construction: _____%	D. Tract Number(s): _____, _____ E. Mile Post Marker: _____

F. Is the construction site part of a larger common plan of development or sale? ☐ YES ☐ NO	G. Name of plan or development:
H. Construction commencement date: _____/_____/_____ I. % of site to be mass graded: _____	J. Projected construction dates: Complete grading: _____/_____/_____ Complete project: _____/_____/_____

K. Type of Construction (Check all that apply):

1. ☐ Residential 2. ☐ Commercial 3. ☐ Industrial 4. ☐ Reconstruction 5. ☐ Transportation
6. ☐ Utility Description: _____ 7. ☐ Other (Please List): _____

V. BILLING INFORMATION

SEND BILL TO:	Name	Contact Person	
☐ OWNER (as in II. above)			
☐ DEVELOPER (as in III. above)	Mailing Address	Phone/Fax	
☐ OTHER (enter information at right)	City	State	Zip

VI. REGULATORY STATUS

A. Has a local agency approved a required erosion/sediment control plan?..... ☐ YES ☐ NO

Does the erosion/sediment control plan address construction activities such as infrastructure and structures?..... ☐ YES ☐ NO

Name of local agency: _____ Phone: ( ) --

B. Is this project or any part thereof, subject to conditions imposed under a CWA Section 404 permit of 401 Water Quality Certification?..... ☐ YES ☐ NO

If yes, provide details: _____

VII. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):

1. ☐ **Indirectly to waters of the U.S.**

2. ☐ **Storm drain system - Enter owner's name:**_____

3. ☐ **Directly to waters of U.S. (e.g. , river, lake, creek, stream, bay, ocean, etc.)**

B. Name of receiving water: (river, lake, creek, stream, bay, ocean): _____

VIII. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (check one)

☐ A SWPPP has been prepared for this facility and is available for review: Date Prepared: ____/____/____ Date Amended: ____/____/____

☐ A SWPPP will be prepared and ready for review by (enter date): ____/____/____

☐ A tentative schedule has been included in the SWPPP for activities such as grading, street construction, home construction, etc.

B. MONITORING PROGRAM

☐ A monitoring and maintenance schedule has been developed that includes inspection of the construction BMPs before anticipated storm events and after actual storm events and is available for review.

If checked above: A qualified person has been assigned responsibility for pre-storm and post-storm BMP inspections to identify effectiveness and necessary repairs or design changes..... ☐ YES ☐ NO

Name: _____ Phone: ( ) --

C. PERMIT COMPLIANCE RESPONSIBILITY

A qualified person has been assigned responsibility to ensure full compliance with the Permit, and to implement all elements of the Storm Water Pollution Prevention Plan including:

1. Preparing an annual compliance evaluation..... ☐ YES ☐ NO

Name: _____ Phone: ( ) --

2. Eliminating all unauthorized discharges..... ☐ YES ☐ NO

IX. VICINITY MAP AND FEE (must show site location in relation to nearest named streets, intersections, etc.)

Have you included a vicinity map with this submittal? ..... ☐ YES ☐ NO

Have you included payment of the annual fee with this submittal?..... ☐ YES ☐ NO

X. CERTIFICATIONS

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan will be complied with."

Printed Name: _____

Signature: _____ **Date:** _____

Title: _____

ATTACHMENT 3

303d Listed Water Bodies for Sedimentation

REGION	*WATER BODY NAME*	CODE	POLLUTANT
1	MATTOLE RIVER	1100	Sedimentation/Siltation
1	TRINITY RIVER, SOUTH FORK	1100	Sedimentation/Siltation
1	REDWOOD CREEK	1100	Sedimentation/Siltation
1	MAD RIVER	1100	Sedimentation/Siltation
1	ELK RIVER	1100	Sedimentation/Siltation
1	EEL RIVER, SOUTH FORK	1100	Sedimentation/Siltation
1	EEL RIVER, NORTH FORK	1100	Sedimentation/Siltation
1	TRINITY RIVER	1100	Sedimentation/Siltation
1	EEL RIVER, MIDDLE FORK	1100	Sedimentation/Siltation
1	MAD RIVER	2500	Turbidity
1	TEN MILE RIVER	1100	Sedimentation/Siltation
1	NOYO RIVER	1100	Sedimentation/Siltation
1	BIG RIVER	1100	Sedimentation/Siltation
1	ALBION RIVER	1100	Sedimentation/Siltation
1	NAVARRO RIVER	1100	Sedimentation/Siltation
1	GARCIA RIVER	1100	Sedimentation/Siltation
1	GUALALA RIVER	1100	Sedimentation/Siltation
1	RUSSIAN RIVER	1100	Sedimentation/Siltation
1	TOMKI CREEK	1100	Sedimentation/Siltation
1	VAN DUZEN RIVER	1100	Sedimentation/Siltation
1	EEL RIVER DELTA	1100	Sedimentation/Siltation
1	EEL RIVER, MIDDLE MAIN FORK	1100	Sedimentation/Siltation
1	ESTERO AMERICANO	1100	Sedimentation/Siltation
1	NAVARRO RIVER DELTA	1100	Sedimentation/Siltation
1	EEL RIVER, UPPER MAIN FORK	1100	Sedimentation/Siltation
1	FRESHWATER CREEK	1100	Sedimentation/Siltation
1	SCOTT RIVER	1100	Sedimentation/Siltation
2	TOMALES BAY	1100	Sedimentation/Siltation
2	NAPA RIVER	1100	Sedimentation/Siltation
2	SONOMA CREEK	1100	Sedimentation/Siltation
2	PETALUMA RIVER	1100	Sedimentation/Siltation
2	LAGUNITAS CREEK	1100	Sedimentation/Siltation
2	WALKER CREEK	1100	Sedimentation/Siltation

2	SAN GREGORIO CREEK	1100	Sedimentation/Siltation
2	SAN FRANCISQUITO CREEK	1100	Sedimentation/Siltation
2	PESCADERO CREEK (REG 2)	1100	Sedimentation/Siltation
2	BUTANO CREEK	1100	Sedimentation/Siltation
3	MORRO BAY	1100	Sedimentation/Siltation
3	SAN LORENZO RIVER ESTUARY	1100	Sedimentation/Siltation
3	SHINGLE MILL CREEK	1100	Sedimentation/Siltation
3	MOSS LANDING HARBOR	1100	Sedimentation/Siltation
3	WATSONVILLE SLOUGH	1100	Sedimentation/Siltation
3	SAN LORENZO RIVER	1100	Sedimentation/Siltation
3	ELKHORN SLOUGH	1100	Sedimentation/Siltation
3	SALINAS RIVER LAGOON (NORTH)	1100	Sedimentation/Siltation
3	GOLETA SLOUGH/ESTUARY	1100	Sedimentation/Siltation
3	CARPINTERIA MARSH (EL ESTERO MARSH)	1100	Sedimentation/Siltation
3	LOMPICO CREEK	1100	Sedimentation/Siltation
3	MORO COJO SLOUGH	1100	Sedimentation/Siltation
3	VALENCIA CREEK	1100	Sedimentation/Siltation
3	PAJARO RIVER	1100	Sedimentation/Siltation
3	RIDER GULCH CREEK	1100	Sedimentation/Siltation
3	LLAGAS CREEK	1100	Sedimentation/Siltation
3	SAN BENITO RIVER	1100	Sedimentation/Siltation
3	SALINAS RIVER	1100	Sedimentation/Siltation
3	CHORRO CREEK	1100	Sedimentation/Siltation
3	LOS OSOS CREEK	1100	Sedimentation/Siltation
3	SANTA YNEZ RIVER	1100	Sedimentation/Siltation
3	SAN ANTONIO CREEK (SANTA BARBARA COUNTY)	1100	Sedimentation/Siltation
3	CARBONERA CREEK	1100	Sedimentation/Siltation
3	SOQUEL LAGOON	1100	Sedimentation/Siltation
3	APTOS CREEK	1100	Sedimentation/Siltation
4	MUGU LAGOON	1100	Sedimentation/Siltation
5	HUMBUG CREEK	1100	Sedimentation/Siltation
5	PANOCHE CREEK	1100	Sedimentation/Siltation
5	FALL RIVER (PIT)	1100	Sedimentation/Siltation
6	BEAR CREEK (R6)	1100	Sedimentation/Siltation
6	MILL CREEK (3)	1100	Sedimentation/Siltation
6	HORSESHOE LAKE (2)	1100	Sedimentation/Siltation
6	BRIDGEPORT RES	1100	Sedimentation/Siltation
6	TOPAZ LAKE	1100	Sedimentation/Siltation

6	LAKE TAHOE	1100	Sedimentation/Siltation
6	PINE CREEK (2)	1100	Sedimentation/Siltation
6	TRUCKEE RIVER	1100	Sedimentation/Siltation
6	CLEARWATER CREEK	1100	Sedimentation/Siltation
6	GRAY CREEK (R6)	1100	Sedimentation/Siltation
6	WARD CREEK	1100	Sedimentation/Siltation
6	BLACKWOOD CREEK	1100	Sedimentation/Siltation
6	GOODALE CREEK	1100	Sedimentation/Siltation
6	EAST WALKER RIVER	1100	Sedimentation/Siltation
6	HEAVENLY VALLEY CREEK	1100	Sedimentation/Siltation
6	WOLF CREEK (1)	1100	Sedimentation/Siltation
6	WEST WALKER RIVER	1100	Sedimentation/Siltation
6	HOT SPRINGS CANYON CREEK	1100	Sedimentation/Siltation
6	BRONCO CREEK	1100	Sedimentation/Siltation
6	SQUAW CREEK	1100	Sedimentation/Siltation
7	IMPERIAL VALLEY DRAINS	1100	Sedimentation/Siltation
7	NEW RIVER (R7)	1100	Sedimentation/Siltation
7	ALAMO RIVER	1100	Sedimentation/Siltation
8	SAN DIEGO CREEK, REACH 1	1100	Sedimentation/Siltation
8	RATHBONE (RATHBUN) CREEK	1100	Sedimentation/Siltation
8	SAN DIEGO CREEK, REACH 2	1100	Sedimentation/Siltation
8	UPPER NEWPORT BAY ECOLOGICAL RESERVE	1100	Sedimentation/Siltation
8	BIG BEAR LAKE	1100	Sedimentation/Siltation
8	ELSINORE, LAKE	1100	Sedimentation/Siltation
9	SAN ELIJO LAGOON	1100	Sedimentation/Siltation
9	LOS PENASQUITOS LAGOON	1100	Sedimentation/Siltation
9	AGUA HEDIONDA LAGOON	1100	Sedimentation/Siltation
9	BUENA VISTA LAGOON	1100	Sedimentation/Siltation

NEW OWNER INFORMATION AND
CHANGE OF INFORMATION (COI) FORM FOR THE
GENERAL CONSTRUCTION PERMIT NO. CAS000002

Owners Name: _____ Date: _____
WDID No.: _____ Date of Last NOI Change: _____
Prepared By: _____ Signature of Preparer: _____

	Area Transferred (acres)[1] column 1	Area Remaining (acres)[2] column 2	Lot/Tract Numbers Transferred	Contact Person and Company Name of NewOwner(s)	Address(es) of the New Owner(s)	Phone # of New Owner	Is Const/Post Construction Complete? Yes/No	Date of Ownership Transfer
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

[1]Use approximate area (in acres) if no exact figure is available.
[2]Calculate running total in this column as follows:
Enter in column 2, line 1, the area from NOI minus the area in column 1.
Enter in column 2, line 2, the area in column 2, line 1, minus the area in line 2, column 1.
Enter in column 2, line 3, the area in column 2, line 2, minus the area in line 3, column 1, and so forth.

State Water Resources Control Board

Division of Water Quality
1001 I Street • Sacramento, California 95814 • (916) 341-5537
Mailing Address: P.O. Box 1977 • Sacramento, California • 95812-1977
FAX (916) 341-5543 • Internet Address: http://www.swrcb.ca.gov

Terry Tamminen
Secretary for Environmental Protection

To: Storm Water Permit Holder

RE: NOTICE OF TERMINATION OF COVERAGE UNDER THE GENERAL **CONSTRUCTION** STORM WATER PERMIT (GENERAL PERMIT)

In order for us to terminate your coverage under the General Permit, please complete and submit the enclosed Notice of Termination (NOT) your local Regional Water Quality Control Board (RWQCB). Refer to the last page of the NOT packet for RWQCB locations.

Please note that you are subject to the annual fee until you file a NOT and the RWQCB approves your NOT.

Should you have any questions regarding this matter, please contact your local RWQCB at the number listed on the back page of the NOT package, or the Storm Water Unit at (916) 341-5537.

Sincerely,

Storm Water Unit
Division of Water Quality

Enclosure

State of California
State Water Resources Control Board

NOTICE OF TERMINATION

OF COVERAGE UNDER THE NPDES GENERAL PERMIT NO. CAS000002
FOR DISCHARGES OF STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY

Submission of this Notice of Termination constitutes notice that the owner (and his/her agent) of the site identified on this form is no longer authorized to discharge storm water associated with construction activity by NPDES General Permit No. CAS000002.

I. WDID NO.

II. OWNER

COMPANY NAME CONTACT PERSON

STREET ADDRESS TITLE

CITY STATE ZIP PHONE

III. CONSTRUCTION SITE INFORMATION

A. DEVELOPER NAME CONTACT PERSON

STREET ADDRESS TITLE

CITY CA ZIP PHONE

B. SITE ADDRESS COUNTY

CITY CA ZIP PHONE

IV. BASIS OF TERMINATION

_____ 1. The construction project is complete and the following conditions have been met.

- All elements of the Storm Water Pollution Prevention Plan have been completed.
- Construction materials and waste have been disposed of properly.
- The site is in compliance with all local storm water management requirements.
- A post-construction storm water operation and management plan is in place.

Date of project completion _____/_____/_____

_____ 2. Construction activities have been suspended, either temporarily _____ or indefinitely _____ and the following conditions have been met.

- All elements of the Storm Water Pollution Prevention Plan have been completed.
- Construction materials and waste have been disposed of properly.
- All denuded areas and other areas of potential erosion are stabilized.
- An operation and maintenance plan for erosion and sediment control is in place.
- The site is in compliance with all local storm water management requirements.

Date of suspension _____/_____/_____ Expected start up date _____/_____/_____

_____ 3. Site can not discharge storm water to waters of the United States (check one).

_____ All storm water is retained on site.

_____ All storm water is discharged to evaporation or percolation ponds offsite.

_____ 4. Discharge of storm water from the site is now subject to another NPDES general permit or an individual NPDES permit.

NPDES Permit No._____ Date coverage began _____/_____/_____

_____ 5. There is a new owner of the identified site. Date of owner transfer _____/_____/_____

Was the new owner notified of the General Permit requirements? YES ____ NO ____

NEW OWNER INFORMATION

COMPANY NAME CONTACT PERSON

STREET ADDRESS TITLE

CITY STATE ZIP PHONE

V. EXPLANATION OF BASIS OF TERMINATION (Attach site photographs - see instructions).

VI. CERTIFICATION:

I certify under penalty of law that all storm water discharges associated with construction activity from the identified site that are authorized by NPDES General Permit No. CAS000002 have been eliminated or that I am no longer the owner of the site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under the general permit, and that discharging pollutants in storm water associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an owner from liability for any violations of the general permit or the Clean Water Act.

PRINTED NAME TITLE

SIGNATURE: DATE _____/_____/_____

REGIONAL WATER BOARD USE ONLY

This Notice of Termination has been reviewed, and I recommend termination of coverage under the subject NPDES general permit.

Printed Name _____ Region No. _____

Signature _____ Date _____/_____/_____

State of California
State Water Resources Control Board

INSTRUCTIONS FOR COMPLETING NOTICE OF TERMINATION FOR CONSTRUCTION ACTIVITY

Who May File

Dischargers who are presently covered under NPDES General Permit No. CAS000002 for discharge of storm water associated with construction activity may submit a Notice of Termination when they meet one of the following criteria.

1. The construction project has been completed and the following conditions have been met: all elements of the Stormwater Pollution Prevention Plan have been completed; construction materials and equipment maintenance waste have been disposed of properly; the site is in compliance with all local storm water management requirements including erosion/sediment control requirements and the appropriate use permits have been obtained; and a post-construction storm water operation and management plan is in place.

2. Construction activities have been suspended, either temporarily or indefinitely and the following conditions have been: all elements of the Stormwater Pollution Prevention Plan have been completed; construction materials and equipment maintenance waste have been disposed of properly; all denuded areas and other areas of potential erosion are stabilized; an operation and maintenance plan for erosion and sediment control is in place; and the site is in compliance with all local storm water management requirements including erosion/sediment control requirements.
   The date construction activities were suspended, and the expected date construction activities will start up again should be provided.

3. Construction site can not discharge storm water to waters of the United States. Please indicate if all storm water is retained on site or if storm water is collected offsite.

4. Discharge of construction storm water from the site is now subject to another NPDES general permit or an individual NPDES permit. The general permit or individual permit NPDES number and date coverage began should be provided.

5. There is a new owner of the identified site. If ownership or operation of the facility has been transferred then the previous owner must submit a Notice of Termination and the new owner must submit a Notice of Intent for coverage under the general permit. The date of transfer and information on the new owner should be provided. Note that the previous owner may be liable for discharge from the site until the new owner files a Notice of Intent for coverage under the general permit.

Where to File

The Notice of Termination should be submitted to the Executive Officer of the Regional Water Board responsible for the area in which the facility is located. See attached. If the Executive Officer, or his designated staff, agrees with the basis of termination, the Notice of Termination will be transmitted to the State Water Board for processing. If the Executive Officer, or his designated staff, does not agree with the basis of termination, the Notice of Termination will be returned. The Regional Water Board may also inspect your site prior to accepting the basis of termination.

LINE-BY-LINE INSTRUCTIONS

All necessary information must be provided on the form. Type or print in the appropriate areas only. Submit additional information, if necessary, on a separate sheet of paper.

SECTION I--WDID NO.

The WDID No. is a number assigned to each discharger covered under the General Permit. If you do not know your WDID No., please call the State Water Board or Regional Water Board and request it prior to submittal of the Notice of Termination.

SECTION II--OWNER

Enter the owner of the construction site's official or legal name (This should correspond with the name on the Notice of Intent submitted for the site), address of the owner, contact person, and contact person's title and telephone number.

SECTION III--CONSTRUCTION SITE INFORMATION

In Part A, enter the name of the developer (or general contractor), address, contact person, and contact person's title and telephone number. The contact person should be the construction site manager completely familiar with the construction site and charged with compliance and oversight of the general permit. This information should correspond with information on the Notice of Intent submitted for the site.

In Part B, enter the address, county, and telephone number (if any) of the construction site. Construction sites that do not have a street address must attach a legal description of the site.

SECTION IV--BASIS OF TERMINATION

Check the category which best defines the basis of your termination request. See the discussion of the criteria in the Who May File section of these instructions. Provide dates and other information requested. Use the space under Explanation of Basis of Termination heading.

SECTION V--EXPLANATION OF BASIS OF TERMINATION

Please explain the basis or reasons why you believe your construction site is not required to comply with the General Permit. To support your explanation, provide a site map and photograph of your site.

SECTION VI--CERTIFICATION

This section must be completed by the owner of the site.

The Notice of Termination must be signed by:

For a Corporation: a responsible corporate officer

For a Partnership or Sole Proprietorship: a general partner or the proprietor, respectively.

For a Municipality, State, or other Non-Federal Public Agency: either a principal executive officer or ranking elected official.

For a Federal Agency: either the chief or senior executive officer of the agency.

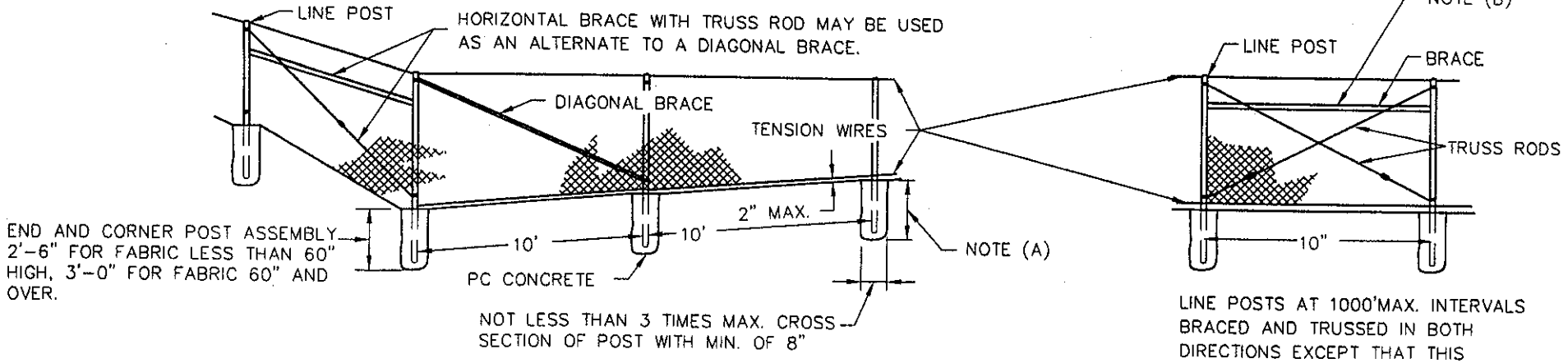
Contact List is located at
www.swrcb.ca.gov/stormwtr/contact.html
under *Contacts*

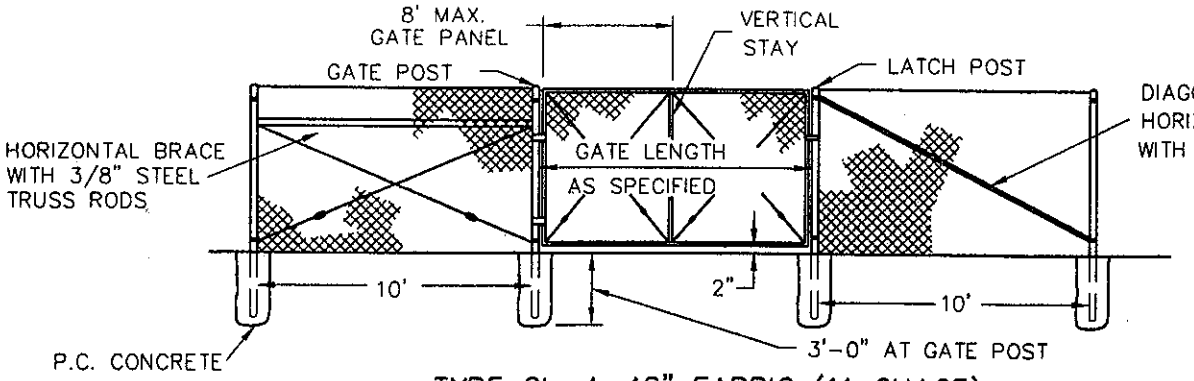
STANDARD DRAWINGS

COUNTY OF SUTTER
STANDARD DRAWINGS INDEX

DRAWING	TITLE	Date
D-1	CHAIN LINK FENCE, DETAIL ONE	06/18/02
D-1A	CHAIN LINK FENCE, DETAIL TWO	03/14/06
D-2	PIPE CONNECTIONS DETAIL	06/18/02
D-3	UTILITY STREAM CROSSING DETAIL	06/18/02
D-4	FIELD DROP INLET	03/14/06
D-5	CATCH BASIN	03/14/06
D-6	DROP INLET TYPE "F"	06/18/02
D-7	DRAINAGE INLET	03/14/06
D-8	MODIFIED JUNCTION BOX	06/18/02
D-9	DROP INLET DRAINAGE GRATE ASSEMBLY	06/18/02
D-10	STANDARD PRECAST STORM MANHOLE	03/14/06
D-11	TYPE A&B SADDLE MANHOLE	03/14/06
D-12	30" DIAMETER PIPE OR GREATER JUNCTION BOX	03/14/06
D-13	STANDARD 24" MANHOLE FRAME & COVER	06/18/02
D-14	GRATE TYPE MANHOLE COVER	03/14/06
D-15	PIPE INLET STRUCTURE	06/18/02
D-16	PIPE INLET STRUCTURE & TRASH RACK (30" PIPE & SMALLER)	06/18/02
D-17	TRASH RACK (33" PIPE & LARGER)	03/14/06
D-18	PIPE OUTFALL - ACCESS CONTROL RACK	03/14/06
D-19	EROSION CONTROL PIPE DISCHARGE	03/14/06
D-20	EROSION CONTROL DITCH DISCHARGE	06/18/02
D-21	CULVERT OUTFALL	03/14/06
D-22	ROCK LINED CHANNEL SECTION	03/14/06
D-23	LINED CHANNEL SECTION	06/18/02
D-24	ACCESS RAMP DETAIL	06/18/02
D-25	PIPE COVER REQUIREMENTS RCP, VCP & CAST-IN-PLACE	06/18/02
D-26	NO DUMPING PUBLIC NOTICE DETAIL	03/14/06
D-27	SAND AND OIL TRAP MANHOLE WITH FLAT SLAB TOP	03/14/06
D-28	HEADWALL	03/14/06
D-29	SANDBAG	03/14/06
H-1	CURB & GUTTER	06/18/02
H-2	BARRIER CURB	03/14/06
H-3	RURAL ROAD SECTIONS	03/14/06
H-4	TYPICAL SECTIONS - URBAN RESIDENTIAL STREETS	03/14/06
H-5	TYPICAL SECTION 60' COLLECTOR STREET	03/14/06
H-6	TYPICAL SECTION 86' MINOR ARTERIAL	03/14/06
H-7	TYPICAL SECTION 110' MAJOR ARTERIAL	03/14/06
H-8	STANDARD CUL DE SAC	03/14/06
H-9	HAMMERHEAD CUL DE SAC	03/14/06
H-10	90' INTERSECTION ELBOW	03/14/06
H-11	WIDENING DETAILS AT MAJOR STREET INTERSECTIONS	03/14/06
H-12	DRIVEWAY CONNECTION	03/14/06

DRAWING	TITLE	Date
H-13	PRIVATE ROAD CONNECTION	06/18/02
H-14	VISIBILITY REQUIREMENTS – RESIDENTIAL STREETS	03/14/06
H-15	BUS STOP	06/18/02
H-16	STANDARD STREET NAME SIGN TYPE "A"	03/14/06
H-16A	STANDARD STREET NAME SIGN TYPE "B"	03/14/06
H-17	STREET NAME SIGN INSTALLATION PLACEMENT ON STREET LIGHT POLE	06/18/02
H-18	RESIDENTIAL DRIVEWAY	03/14/06
H-19	COMMERCIAL DRIVEWAY	03/14/06
H-20	WHEELCHAIR RAMP	06/18/02
H-21	STANDARD TIMBER BARRICADE	03/14/06
H-22	BARRICADE PAVEMENT WIDENING	06/18/02
H-23	SIDEWALK BARRICADE	06/18/02
H-24	SIDEWALK DRAIN	06/18/02
H-25	OBJECT MARKER	03/14/06
H-26	JOINT UTILITY TRENCH	03/14/06
H-27	STANDARD SIDEWALK	03/14/06
H-28	TYPE I TRENCH RESTORATION	03/14/06
H-28A	TYPE II TRENCH RESTORATION	03/14/06
H-29	UTILITY CROSSING	03/14/06
H-30	MONUMENT WELL	03/14/06
H-31	STANDARD STOP SIGN	03/14/06
S-1	SEWER CLEANOUT	11/2010
S-1A	FLUSHING BRANCH	11/2010
S-1B	FLUSHER BRANCH FRAME & COVER	11/2010
S-2	SEWER SERVICE	11/2010
S-3	STANDARD SEWER MANHOLE	11/2010
S-4	SPECIAL SEWER MANHOLE	11/2010
S-5	SEWER ACCESS CONTROL	11/2010
S-6	ESTIMATED AVERAGE SEWER FLOWS	11/2010
S-6A	ESTIMATED AVERAGE SEWER FLOWS (including commercial & industrial)	11/2010
S-7	SANITARY SEWER PEAKING FACTORS	11/2010
S-8	PIPE BEDDING & INITIAL BACKFILL	03/14/06
S-9	SEWER DROP CONNECTIONS	11/2010
W-1	FIRE HYDRANT	11/2010
W-2	THRUST BLOCK DETAILS	11/2010
W-3	WATER VALVE BOX	11/2010
W-4	WATER MAIN LOCATING WIRE	11/2010
W-5	SINGLE WATER SERVICE	11/2010
W-6	AIR VACUUM VALUE	06/18/02
W-7	DEAD END WATER MAIN	11/2010
W-8	FIRE SERVICE CHECK VALVE	11/2010
W-9	TESTING BLOCK AND BYPASS	06/18/02
W-10	THRUST BLOCK FOR FLANGE CROSS	06/18/02
W-11	ONSITE FIRE PROTECTION AND BACKFLOW ASSEMBLY	06/18/02





TYPE CL-4=48" FABRIC (11 GUAGE)
TYPE CL-6=72" FABRIC (9 GUAGE)

NOTES:

(A) 2'-6" FOR FABRIC LESS THAN 60" HIGH
3'-0" FOR FABRIC 60" AND OVER

(B) BRACE TO BE REMOVED AFTER ALL OTHER FENCE CONSTRUCTION IS COMPLETED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

NOTES:

1. THE ABOVE TABLE SHOWS EXAMPLES OF POST AND BRACE SECTIONS WHICH MAY COMPLY WITH THE SPECIFICATIONS.
2. SECTIONS SHOWN IN THE TABLES MUST ALSO COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS.
3. OTHER SECTIONS WHICH COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS MAY BE USED ON APPROVAL OF THE DIRECTOR
4. OPTIONS EXERCISED SHALL BE UNIFORM ON ANY ONE PROJECT.
5. DIMENSIONS SHOWN ARE NOMINAL.
6. TYPICAL MEMBER DIMENSIONS AND GATE POST TABLES DETAIL (D-1A).

DATE	REVISIONS	BY

COUNTY OF SUTTER

CHAIN LINK FENCE
DETAIL ONE

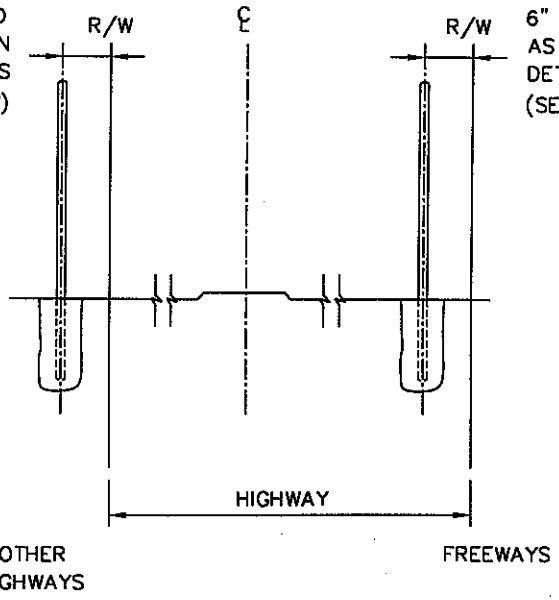
Kirk Bacon — APPROVED — 6/18/02 — DATE

SCALE : NONE
DRN : PSO

DWG NO. D-1

TYPICAL MEMBER DIMENSIONS

FENCH HEIGHT	LINE POSTS			END,LATCH & CORNER POSTS			BRACES			
	ROUND (I.D.)	H	ROLL FORMED	ROUND (I.D.)	ROLL FORMED		ROUND (I.D.)	H	ROLL FORMED	
LESS THEN 6'	1 1/2"	7/8"x1 5/8"	1 3/4"x1 3/4"	2"	3 1/2"x3 1/2"	2"x1 3/4"	1 1/4"	1 1/2"x1 5/16"	1 5/8"x1 1/4"	1 3/4"x1 1/4"
OVER 6'	2"	2 1/4"x2"	2"x1 3/4"	2"x2 1/2"	3 1/2"x3 1/2"	2"x1 3/4"	1 1/4"	1 1/2"x1 5/16"	1 5/8"x1 1/4"	1 3/4"x1 1/4"



GATE POST

FENCE HEIGHT	GATE WIDTHS	NOMINAL I.D.	WEIGHT PER FOOT
6'-0" AND LESS	UP THRU 6'	2-1/2"	4.95
	OVER 6' THRU 12'	4"	10.79
	OVER 12' THRU 18'	5"	14.62
	OVER 18' TO 24' MAX.	6"	18.97
OVER 6'	UP THRU 6'	3"	7.58
	OVER 6' THRU 12'	5"	14.62
	OVER 12' THRU 18'	6"	18.97
	OVER 18' TO 24' MAX.	8"	28.55

NOTE: ABOVE POST DIMENSIONS AND WEIGHTS ARE MINIMUMS LARGER SIZES MAY BE USED ON APPROVAL OF ENGINEER.

NOTE: OFFSET TO BE 2'-0" AT MONUMENT LOCATIONS, MEASURED AT RT. ANGLE TO R/W LINES. TAPER TO ACHIEVE OFFSET TO BE AT LEAST 20' LONG.

DATE	REVISIONS	BY
11/10/05		K.X.

COUNTY OF SUTTER

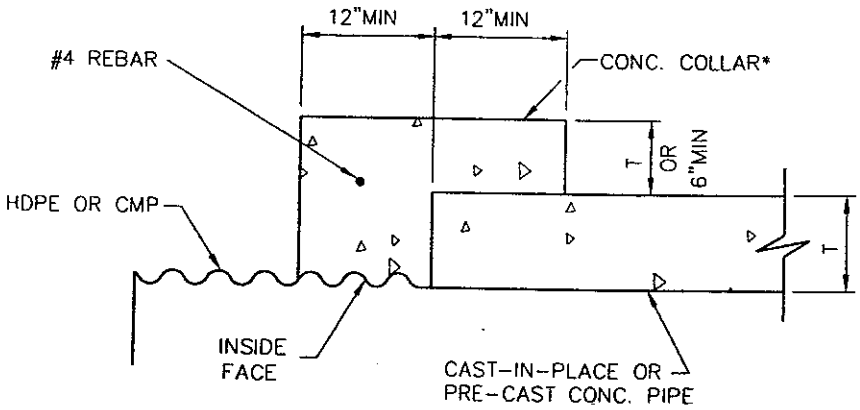
CHAIN LINK FENCE DETAIL TWO

APPROVED 3/14/06 DATE

SCALE : NONE

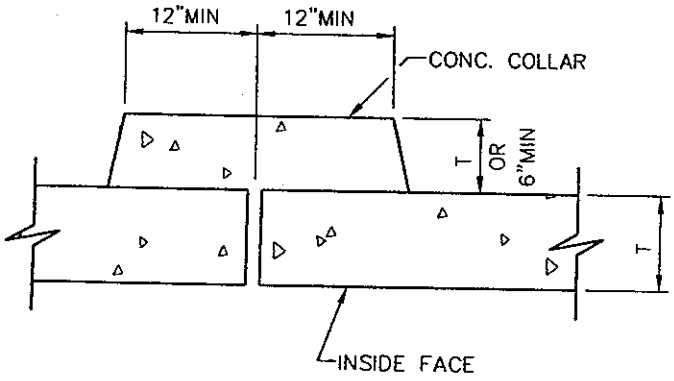
DRN: PSO

DWG NO. D-1A

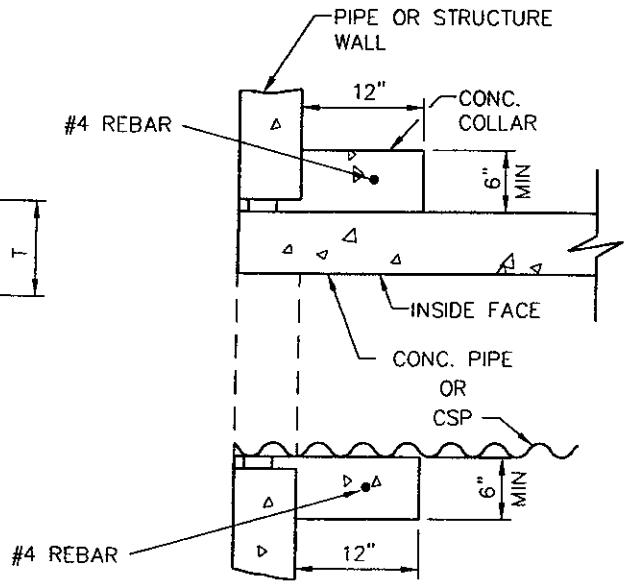


CAST-IN-PLACE OR PRE-CAST CONCRETE PIPE TO HDPE OR CMP

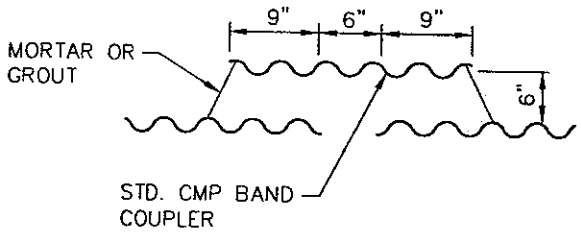
*TRANSITION OF PIPE MATERIAL AT MANHOLES IS PERFERRED



CONCRETE PIPE TO CONCRETE PIPE WITHOUT STANDARD JOINT



CONCRETE PIPE, HDPE OR CMP INTO EXISTING PIPE OR STRUCTURE



PIPES OF DISSIMILAR METALS

DATE	REVISIONS	BY

COUNTY OF SUTTER

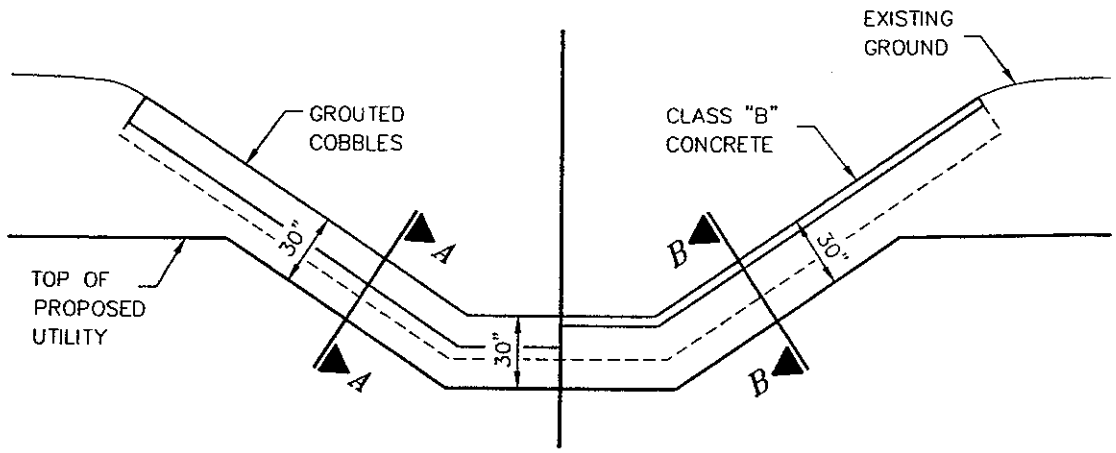
PIPE CONNECTIONS DETAIL

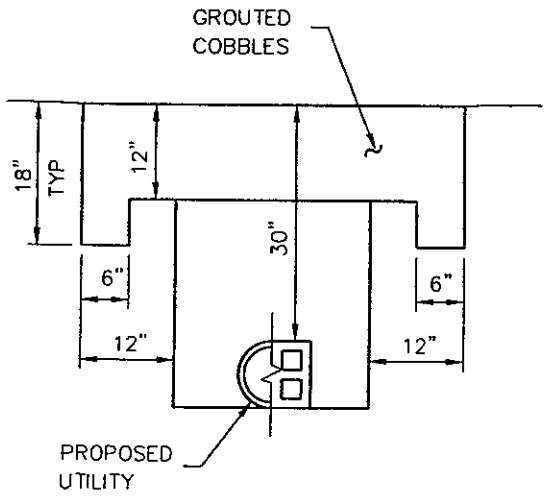
APPROVED _____ DATE 6/8/02

SCALE : NONE

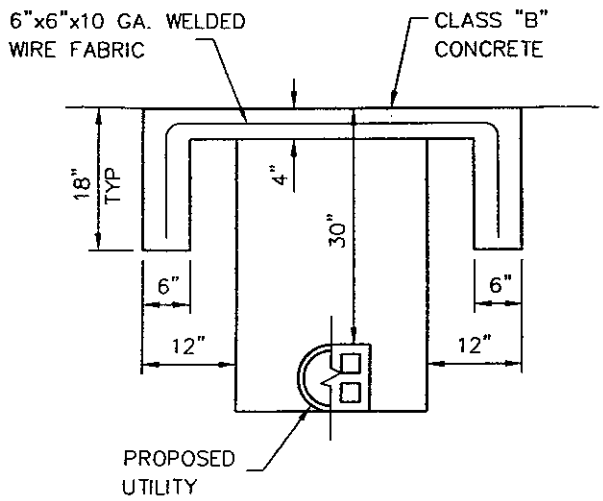
DRN : PSO

DWG NO. D-2





SECTION A–A



SECTION B–B

NOTES:

1. ALL UTILITY CROSSINGS OF EXISTING STREAMS SHALL BE AT LEAST 30" BELOW EXISTING CHANNEL SIDES AND BOTTOMS. DEEPER PLACEMENT MAY BE REQUIRED IF FUTURE CHANNEL IMPROVEMENTS ARE ANTICIPATED.
2. THE CUT SHALL BE SEALED AS SHOWN WITH GROUTED COBBLES, CLASS "B" CONCRETE OR OTHER APPROVED MATERIAL TO A WIDTH 12" EACH SIDE OF THE UTILITY TRENCH. ALL NATURAL STREAMS, AS SHOWN ON THE NATURAL STREAMS PLAN, SHALL UTILIZE GROUTED COBBLES.

DATE	REVISIONS	BY

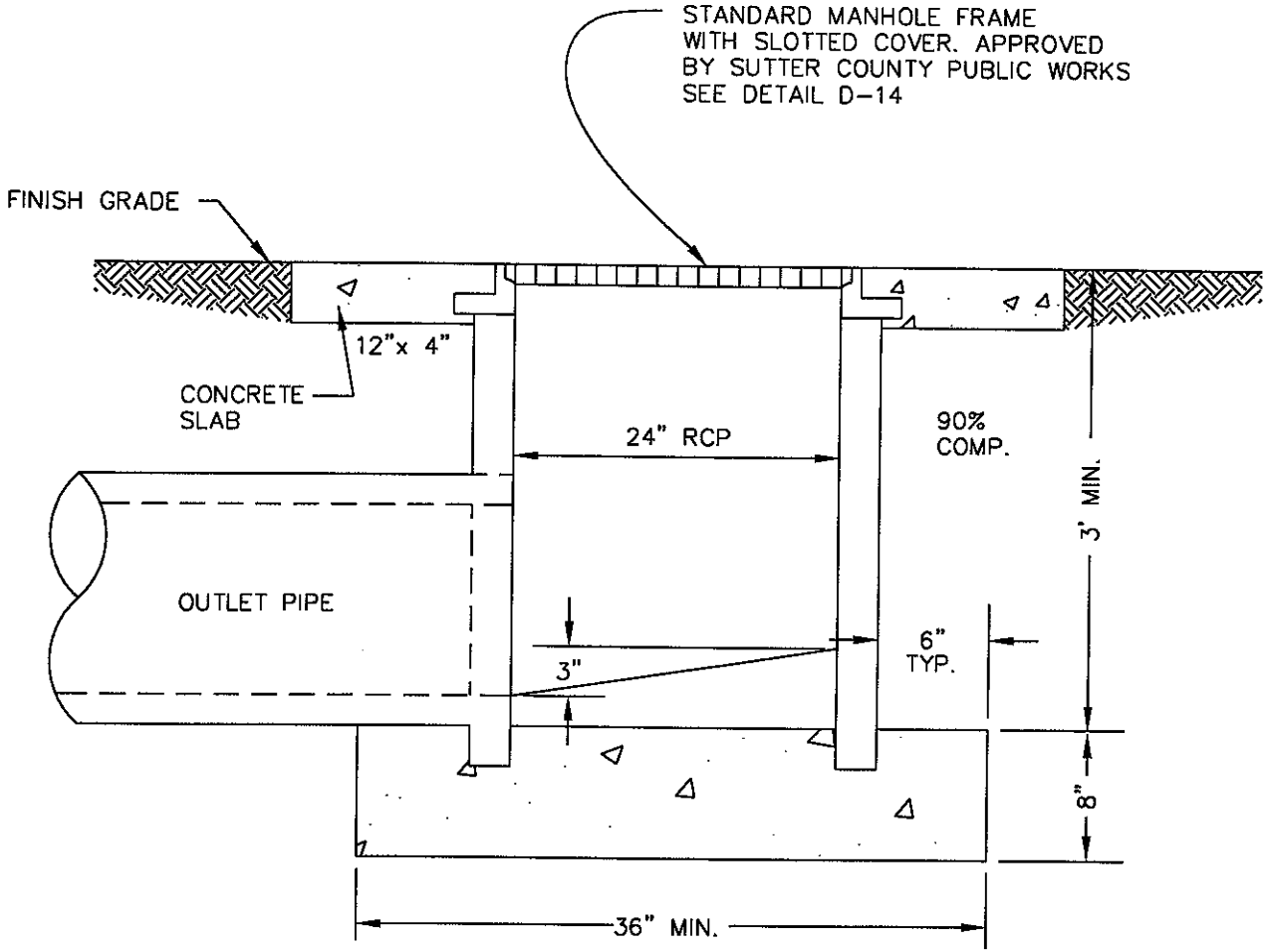
COUNTY OF SUTTER

UTILITY STREAM CROSSING DETAIL

APPROVED — DATE 1/8/02

SCALE : NONE
DRN : PSO

DWG NO. D-3



NOTE:

THIS DI FOR INSTALLATION IN ROAD SIDE DITCH.
NOT FOR USE WITH CURB & GUTTER.

6/10/04		K.X.
DATE	REVISIONS	BY

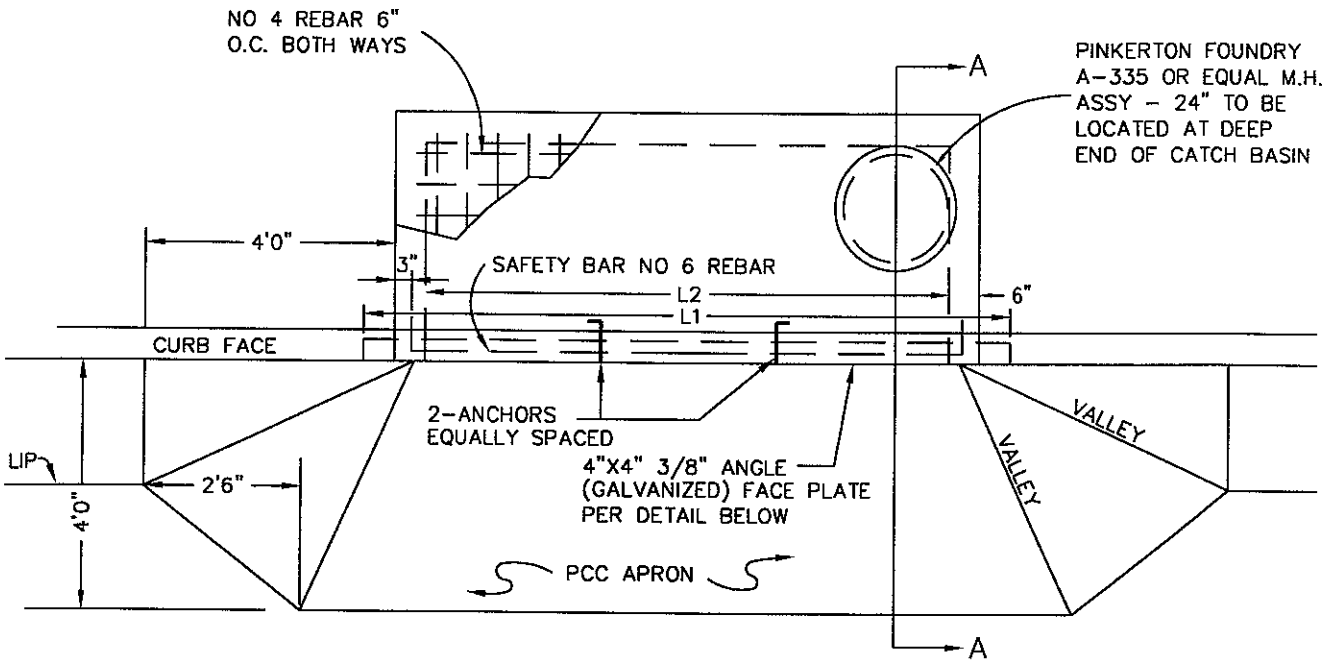
COUNTY OF SUTTER

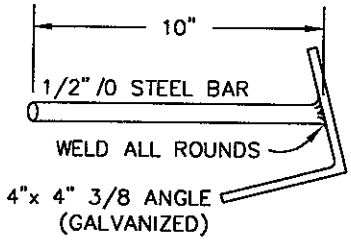
FIELD DROP INLET

APPROVED 3/14/06 DATE

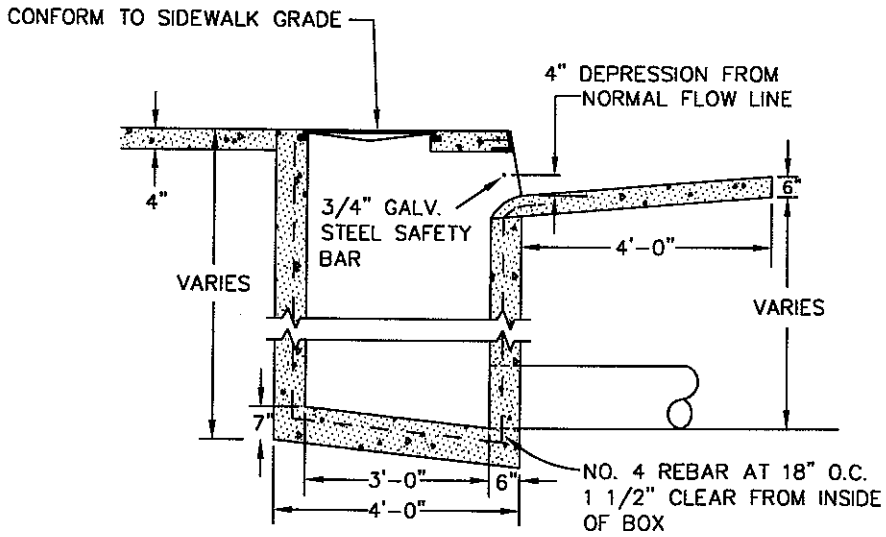
SCALE : NONE
DRN : PSO

DWG NO. D-4





FACE PLATE DETAIL



SECT. A-A

SCHEDULE		
STYLE	L_1	L_2
TYPE "A"	9'-6"	7'
TYPE "B"	7'-6"	5'

NOTE:

A PRECAST UNIT MEETING THESE MINIMUM STANDARDS MAY BE SUBSTITUTED UPON PRIOR APPROVAL OF THE DIRECTOR.

DATE	REVISIONS	BY
6/10/04		K.X.

COUNTY OF SUTTER

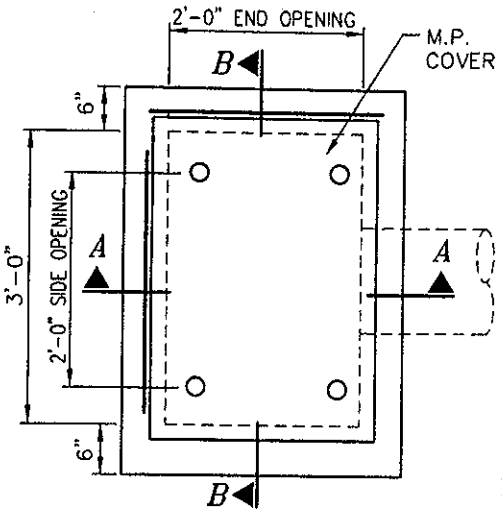
CATCH BASIN

APPROVED 3/14/06 DATE

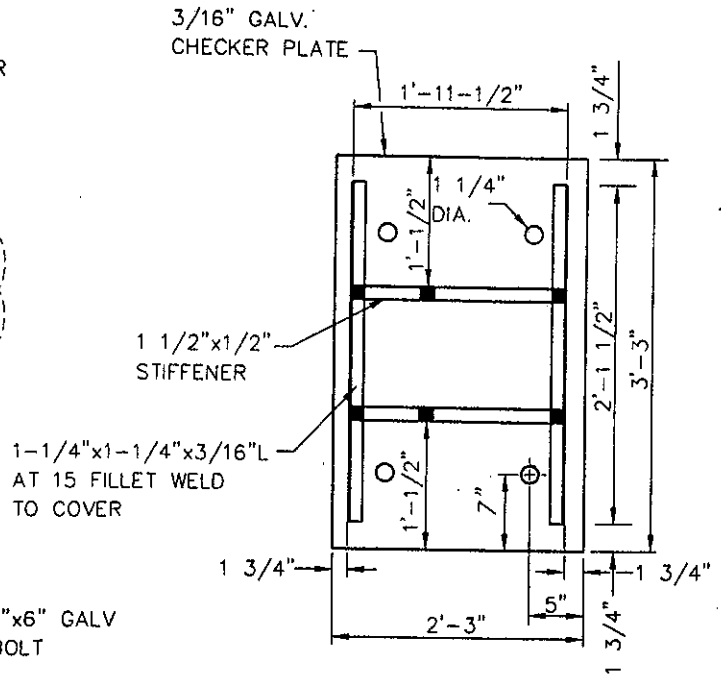
SCALE : NONE
DRN : PSO

DWG NO. D-5

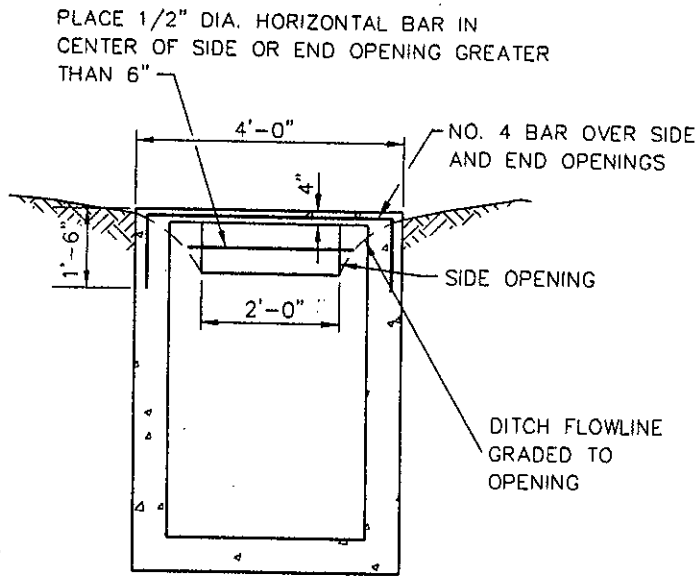
Apr. 19, 1999 7:56 DWG Name: R:\develop\SUT0202\Std-Det\Sutter\D-05.dwg Updated By: GYustat



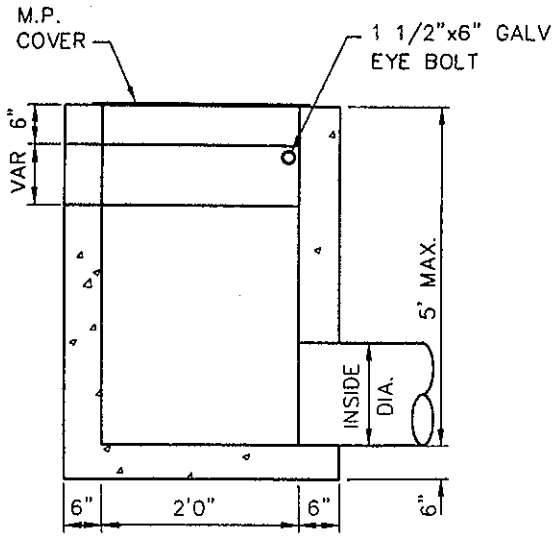
PLAN



METAL COVER
(UNDERSIDE)



SECTION B-B



SECTION A-A

NOTES:

1. TOP OF WALLS TO BE FINISHED TO A FLAT PLANE TO PROVIDE EVEN BEARING FOR PLATE COVER.
2. PROVIDE 1/4" x 18" GALV. CHAIN WELD TO COVER AND EYE BOLT.
3. PROVIDE END OR SIDE OPENINGS AS SHOWN ON PLAN OR CROSS SECTION AND EYE BOLT.
4. METAL PLATE COVER TO BE GALVANIZED.

DATE	REVISIONS	BY

COUNTY OF SUTTER

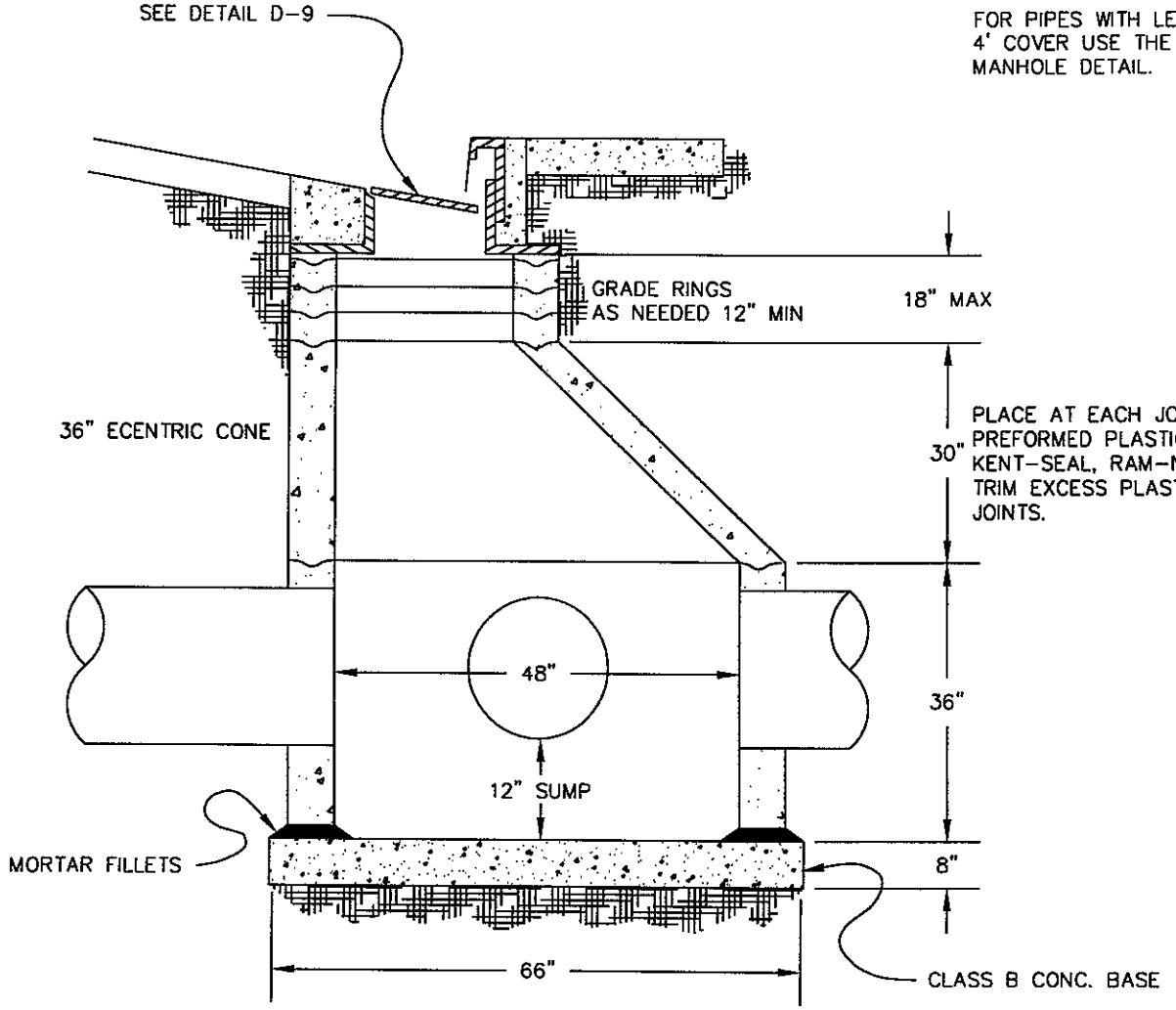
DROP INLET TYPE "F"

APPROVED — DATE 4/15/02

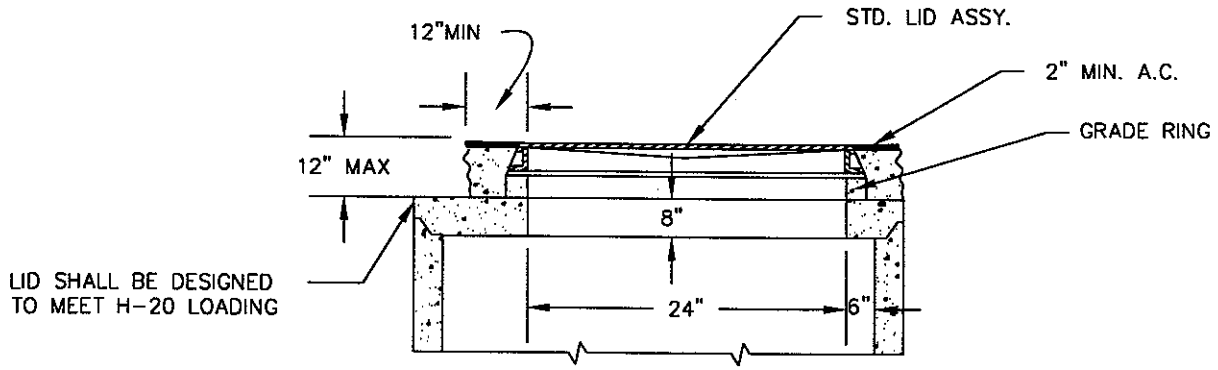
SCALE : NONE
DRN : PSO

DWG NO. D-6

NOTE:
FOR PIPES WITH LESS THAN 4' COVER USE THE SHALLOW MANHOLE DETAIL.



JUNCTION D.I. DETAIL



SHALLOW MANHOLE DETAIL (FOR PIPES W/LESS THAN 4' COVER)

DATE	REVISIONS	BY
6/11/04		K.X.

COUNTY OF SUTTER

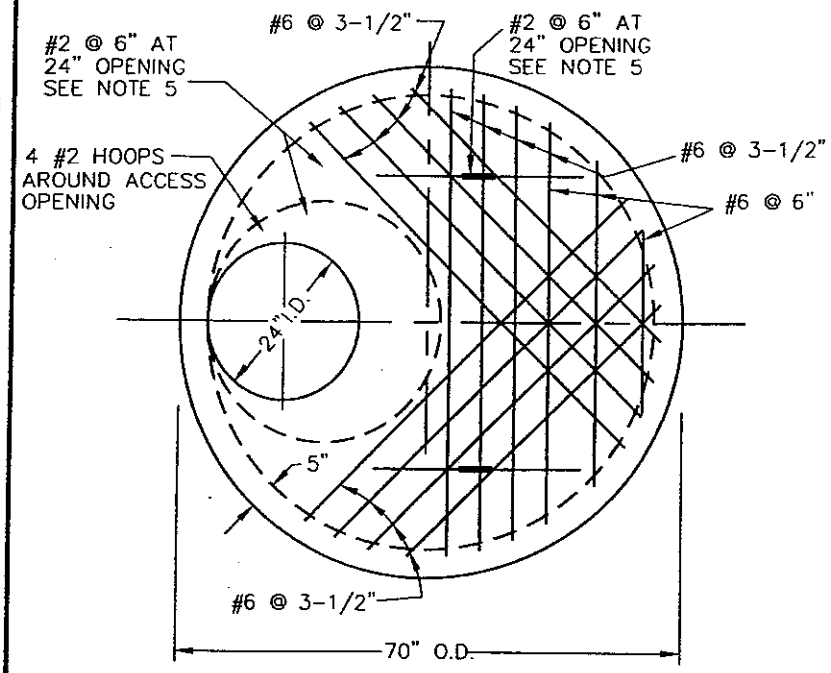
DRAINAGE INLET

APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. D-7

H-20 LOADING

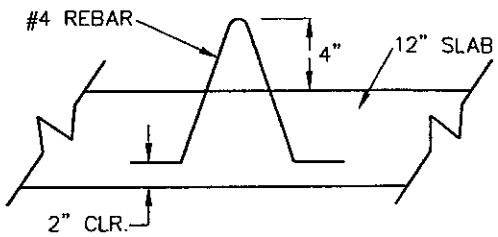


SLAB WEIGHT = 3600 lbs.

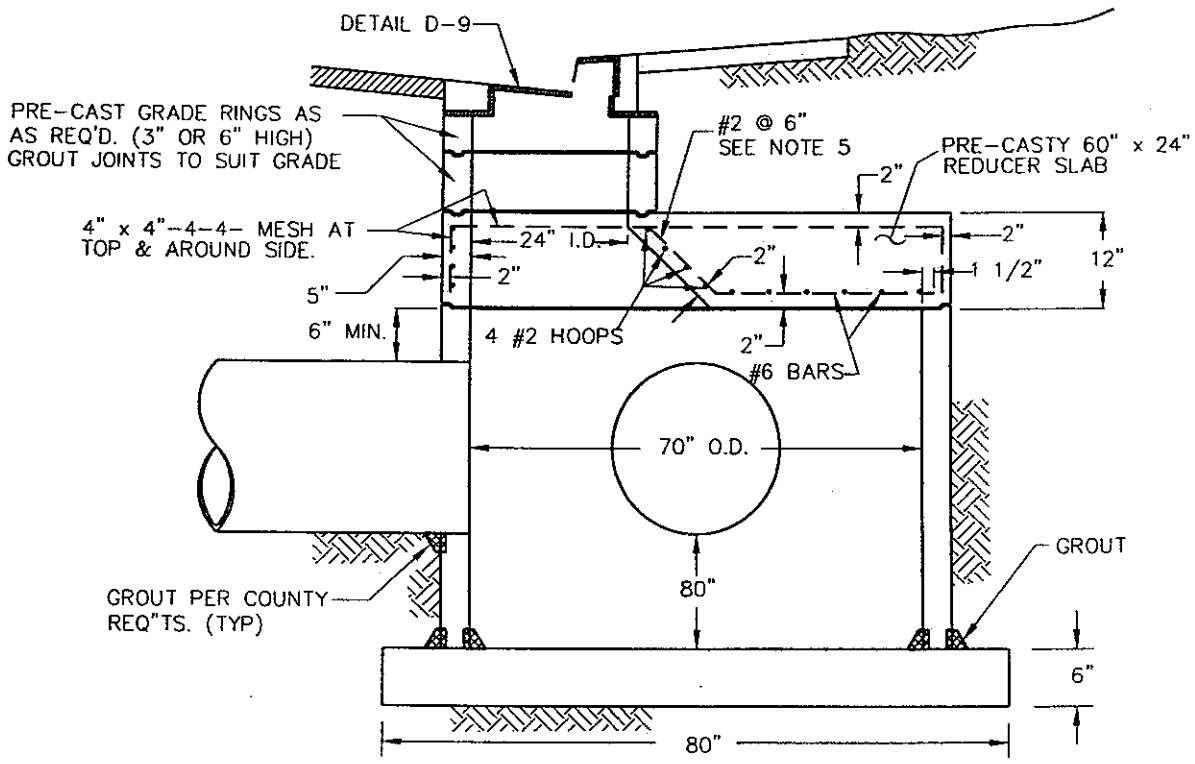
SLAB PLAN

NOTES:

1. MANHOLES & SLABS ARE MANUFACTURED TO ASTM SPECIFICATION C478.
2. CONCRETE SHALL TEST 3000 psi AT 28 DAYS.
3. GALVANIZED STEEL STEPS. 3/4" O , SPACED 12"O.C. MAY BE SPECIFIED. STEPS ARE SPACED AT 6" FROM JOINTS.
4. 1:3 GROUT MIX OR RAM-NEK JOINT COMPOUND TO BE USED IN ALL JOINTS.
5. #2 BARS BENT UP & SPACED 6"O.C. AROUND 24" OPENING. HORIZONTAL LEG TO FAN OUT AT EQUAL SPACE TO 2" CLR. AT EDGE OF SLAB.
6. WEIGHT OF REDUCER SLAB= 3600 LBS.



LIFTING EYE DETAIL



DATE	REVISIONS	BY

COUNTY OF SUTTER

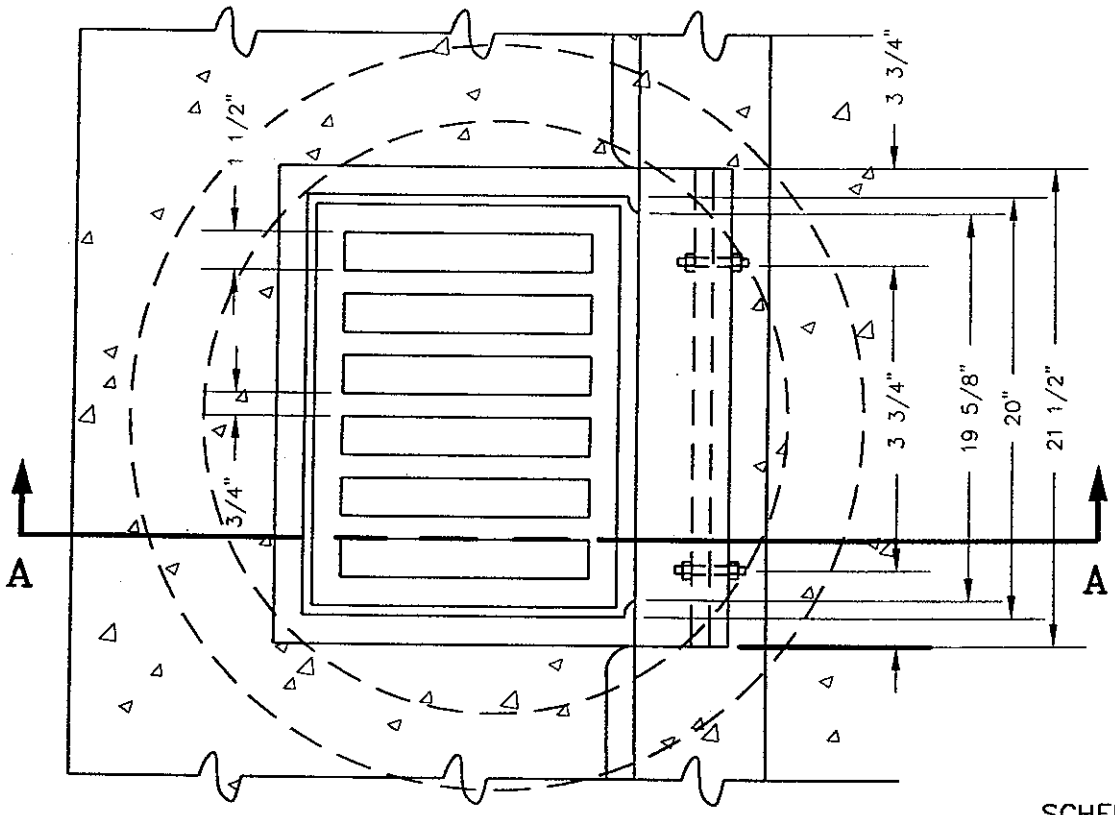
MODIFIED JUNCTION BOX

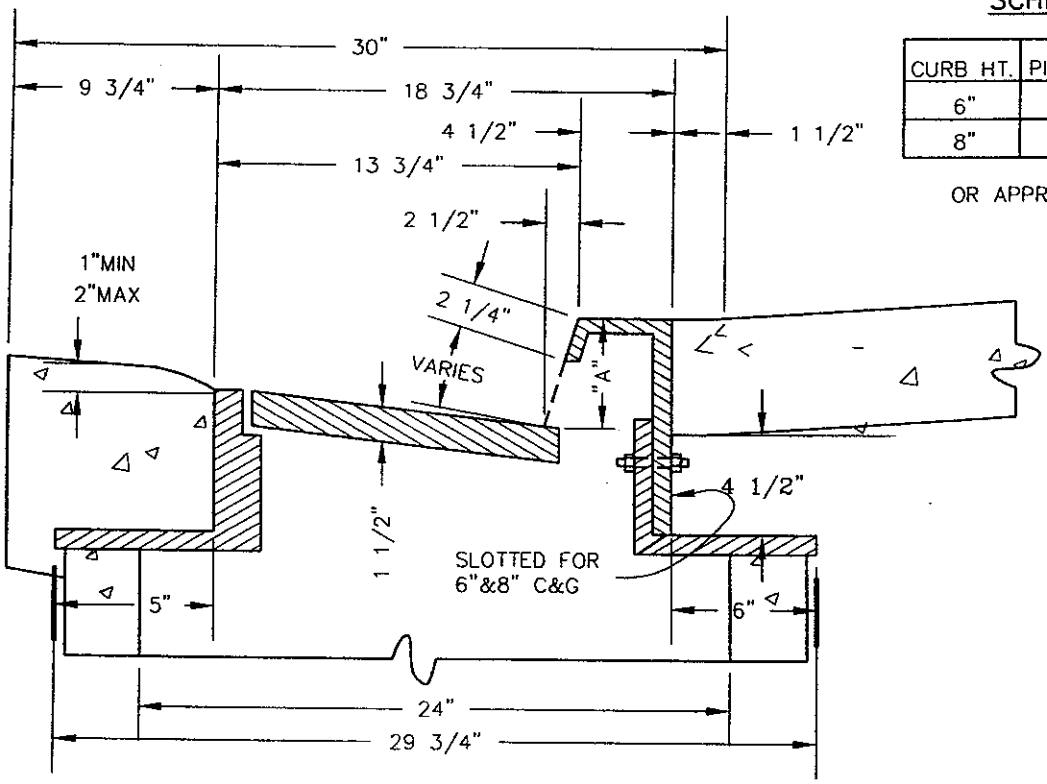
APPROVED _____ DATE _____

SCALE : NONE

DRN : PSO

DWG NO. D-8





SCHEDULE A

CURB HT.	PINKERTON NO.	"A"
6"	A-420B-M	6"
8"	A-420B-M	8"

OR APPROVED EQUAL

DATE	REVISIONS	BY

COUNTY OF SUTTER

DROP INLET DRAINAGE GRATE ASSEMBLY

APPROVED _____ DATE _____

SCALE : NONE
DRN : PSO

DWG NO. D-9

Apr. 19, 1999 - DWG Name: R:\develop\SUT0202\Std-Det\Sutter\D-09.dwg Updated By: GYustat

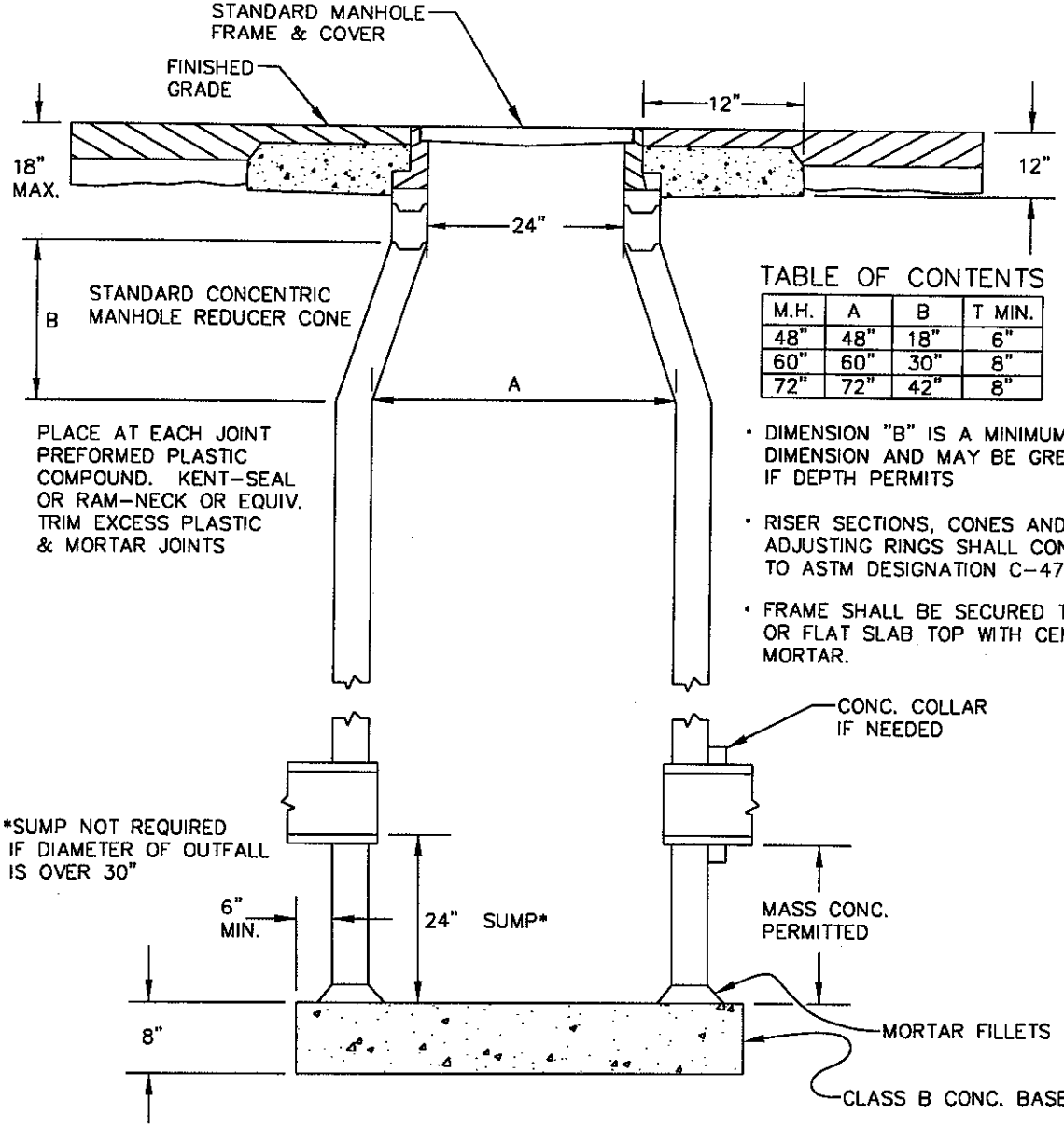
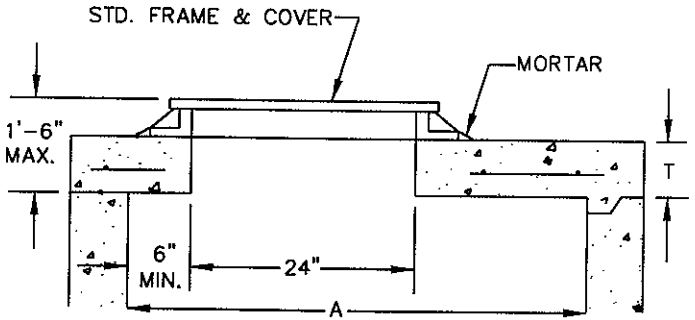


TABLE OF CONTENTS

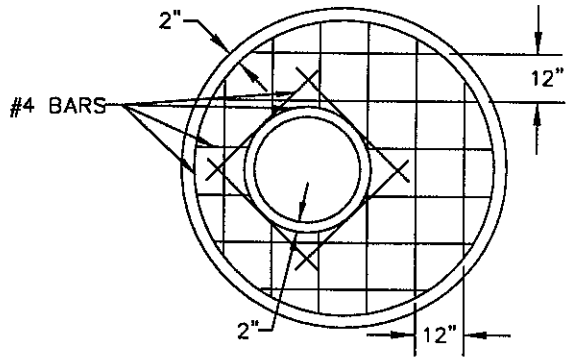
M.H.	A	B	T MIN.
48"	48"	18"	6"
60"	60"	30"	8"
72"	72"	42"	8"

- DIMENSION "B" IS A MINIMUM DIMENSION AND MAY BE GREATER IF DEPTH PERMITS
- RISER SECTIONS, CONES AND ADJUSTING RINGS SHALL CONFORM TO ASTM DESIGNATION C-478.
- FRAME SHALL BE SECURED TO RISER OR FLAT SLAB TOP WITH CEMENT MORTAR.



FLAT SLAB SHALL BE USED WHEN DEPTH DOES NOT PERMIT USE OF TAPER UNIT.

ECCENTRIC CONES SHALL BE USED WHERE SPECIFIED ON THE PLANS. JOINTS MAY BE EITHER KEYED OR TONGUE AND GROOVE.



FLAT SLAB TOP

DATE	REVISIONS	BY
6/11/04		K.X.

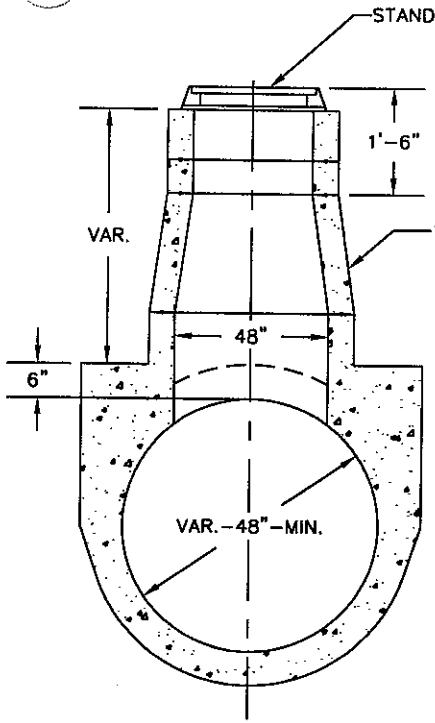
COUNTY OF SUTTER

STANDARD PRECAST STORM MANHOLE

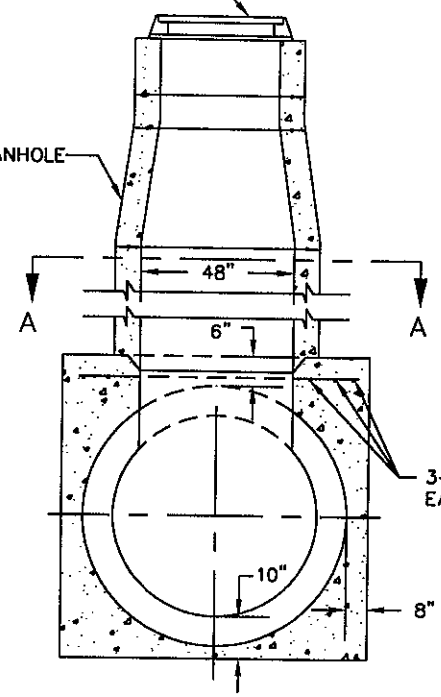
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

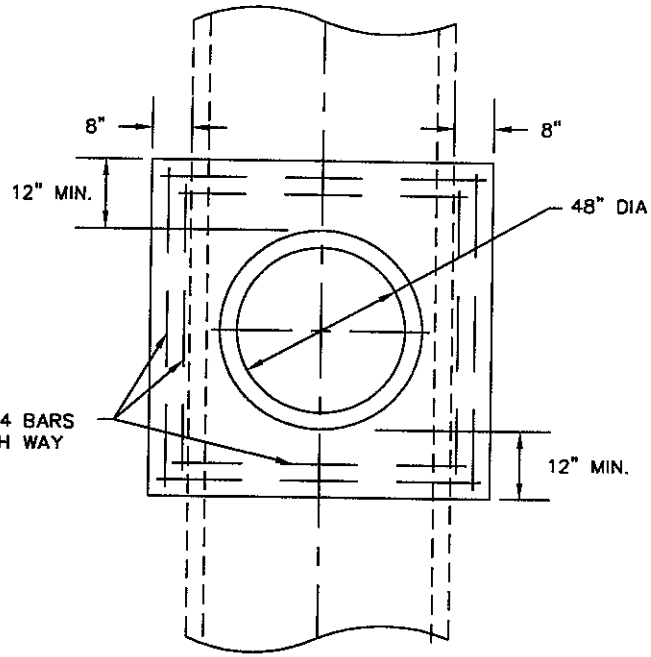
DWG NO. D-10



TYPE A
(CAST-IN-PLACE PIPE ONLY)



TYPE B



SECTION A-A

NOTES:

1. REMOVE CONCRETE IN MANHOLE OPENING AND CONSTRUCT RISER BASE WHILE CONCRETE IS STILL FRESH.
2. PLACE RISER SECTION AFTER CONCRETE HAS SET.

NOTES:

1. ALL PIPE OTHER THAN CAST-IN-PLACE PIPE.
2. CAST-IN-PLACE PIPE LESS THAN 48" DIA.

DATE	REVISIONS	BY
6/11/04		K.X.

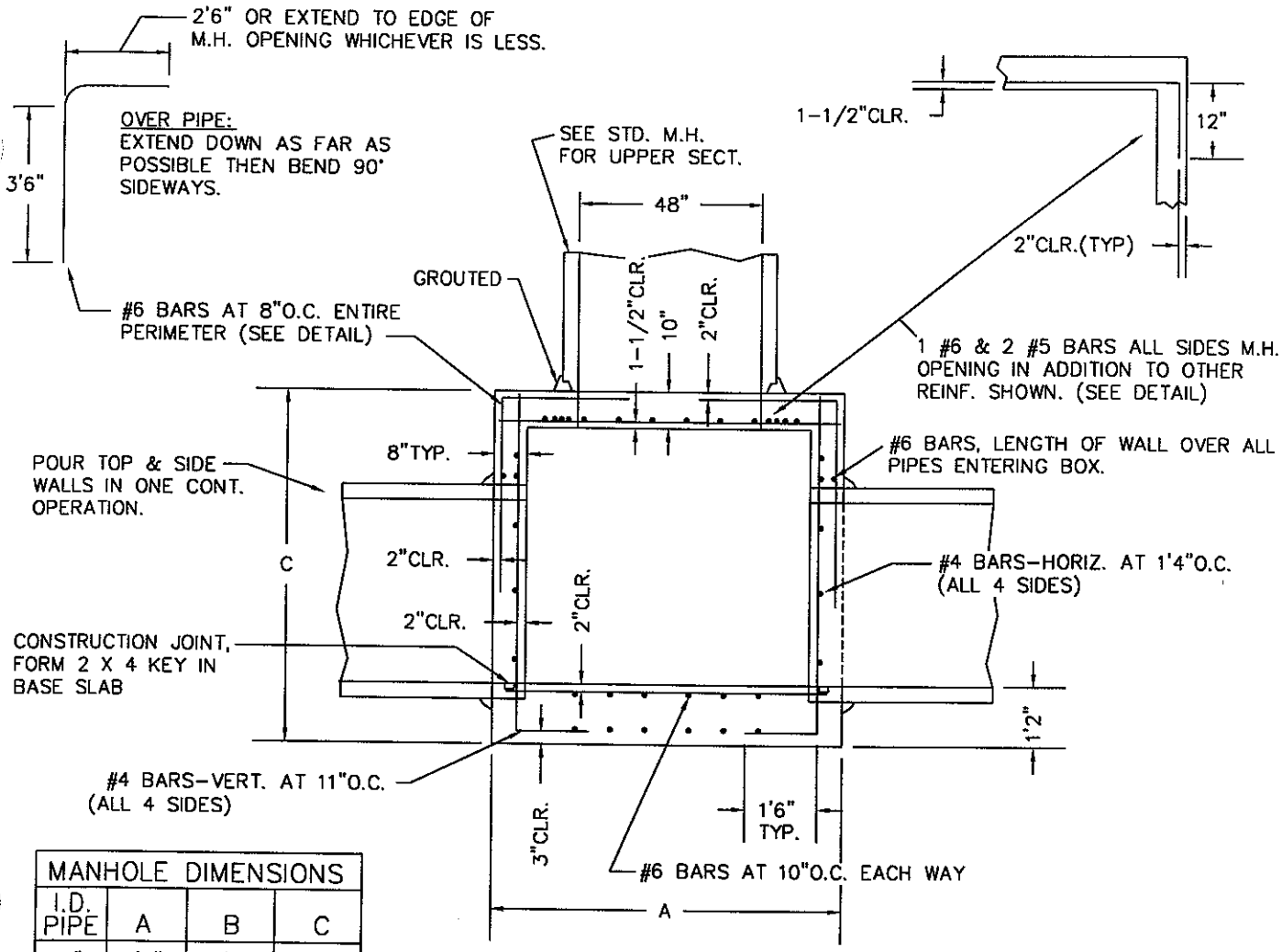
COUNTY OF SUTTER

TYPE A & B SADDLE MANHOLE

APPROVED 3/14/06 DATE

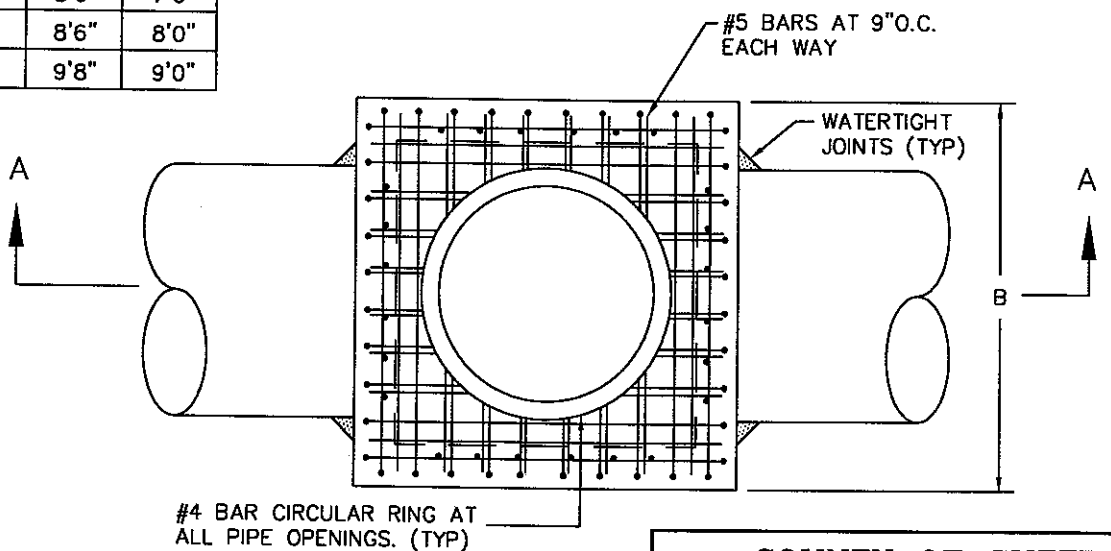
SCALE : NONE
DRN : PSO

DWG NO. D-11



SECTION A-A

MANHOLE DIMENSIONS			
I.D. PIPE	A	B	C
30"	5'6"	4'6"	5'4"
36"	6'0"	5'6"	5'10"
42"	6'6"	6'6"	6'4"
48"	7'0"	7'0"	7'0"
54"	7'10"	8'0"	7'6"
60"	8'0"	8'6"	8'0"
72"	9'0"	9'8"	9'0"



DATE	REVISIONS	BY
6/14/04		K.X.

COUNTY OF SUTTER

30" DIAM. PIPE OR GREATER JUNCTION BOX

APPROVED 3/14/06 DATE

SCALE : NONE

DRN : PSO

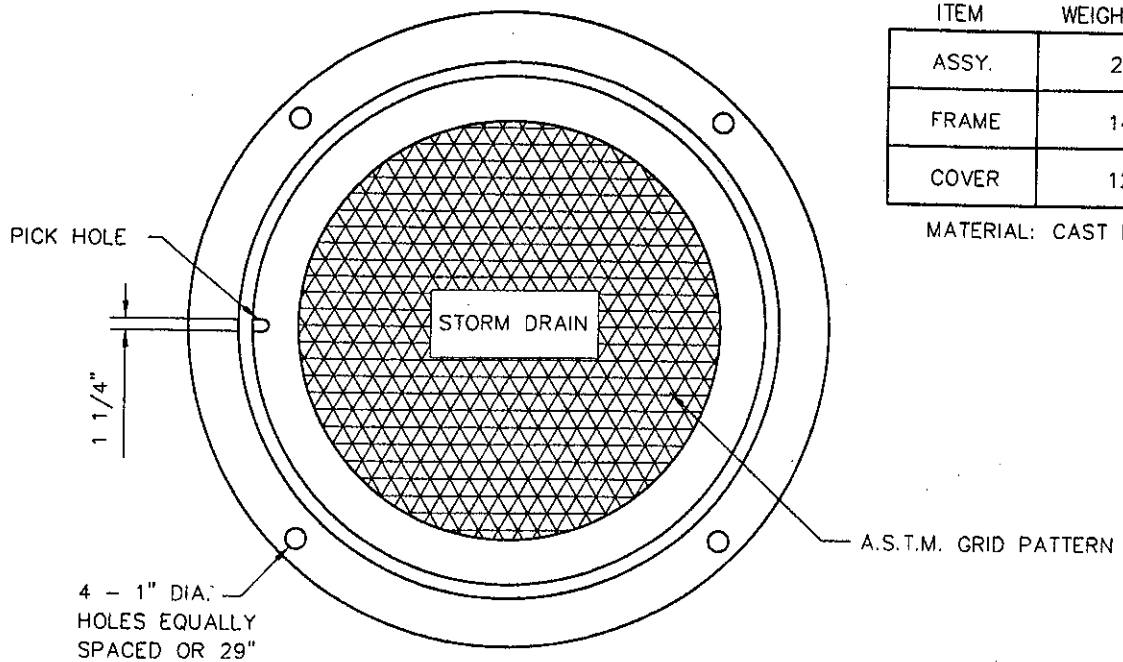
DWG NO. D-12

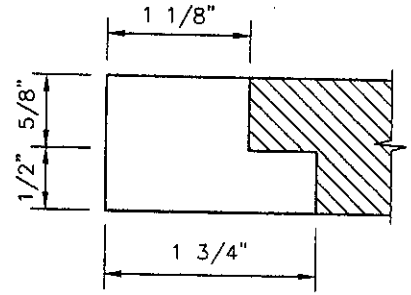
Apr. 20, 1999 - 07:

DWG Name: R:\develop\SUT02202\Std-Det\Sutter\D-12.dwg Updated By: GYustat

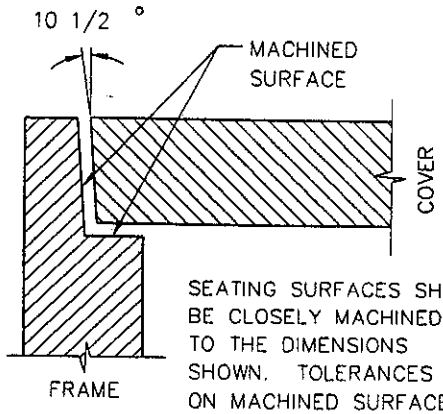
ITEM	APPROXIMATE WEIGHT (LBS.)
ASSY.	270
FRAME	142
COVER	128

MATERIAL: CAST IRON



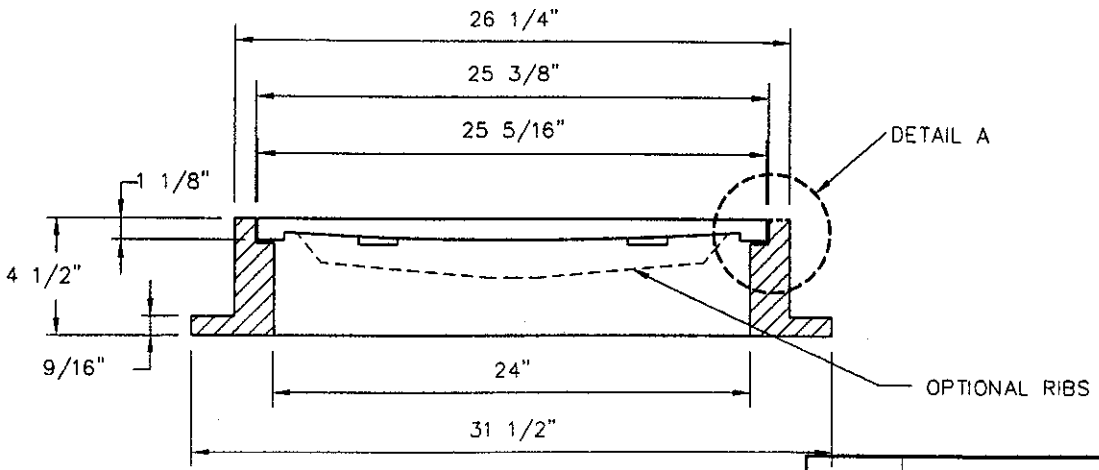


SECTION THROUGH CENTER OF PICK HOLE



SEATING SURFACES SHALL BE CLOSELY MACHINED TO THE DIMENSIONS SHOWN. TOLERANCES ON MACHINED SURFACES SHALL NOT EXCEED 1/64"

DETAIL A



NOTE:

ALL MATERIALS TO BE MADE IN U.S.A.

DATE	REVISIONS	BY

COUNTY OF SUTTER

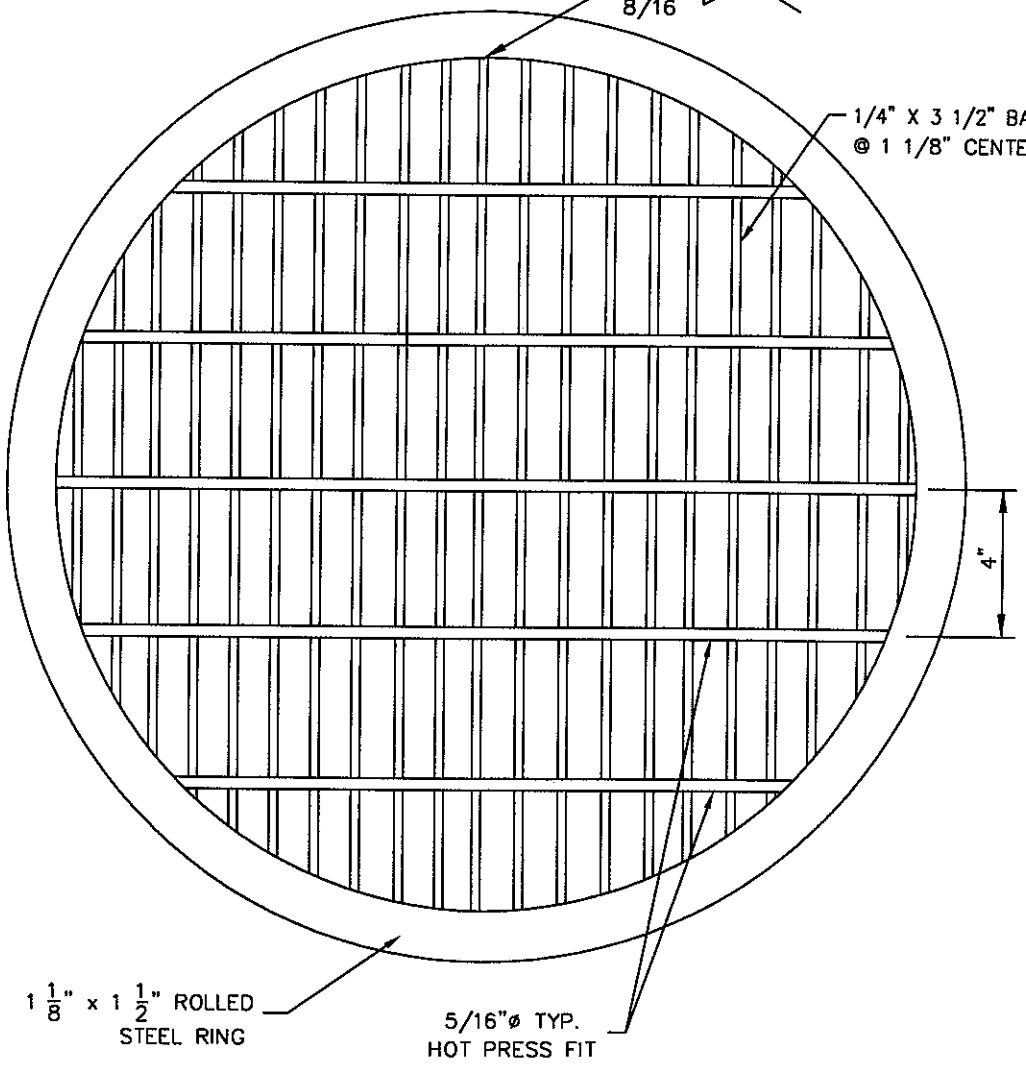
STANDARD 24" MANHOLE FRAME & COVER

APPROVED DATE 6/10/02

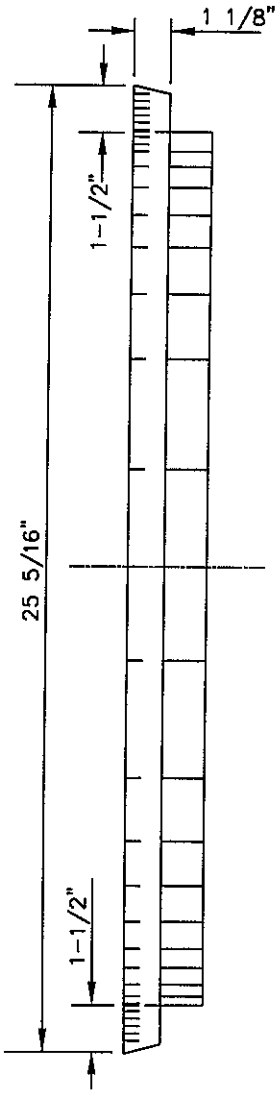
SCALE : NONE

DRN : PSO

DWG NO. D-13



TOP



SIDE

NOTES:

1. MANHOLE COVER SHALL FIT FRAME SHOWN ON DRAWING D-13.
2. SEATING SURFACES SHALL BE MACHINED AS SHOWN IN DETAIL ON DRAWING D-13.
3. THIS COVER MAY BE USED ONLY WITH APPROVAL OF ENGINEER
4. GALVANIZE AFTER FABRICATION.

DATE	REVISIONS	BY
6/14/04		K.X.

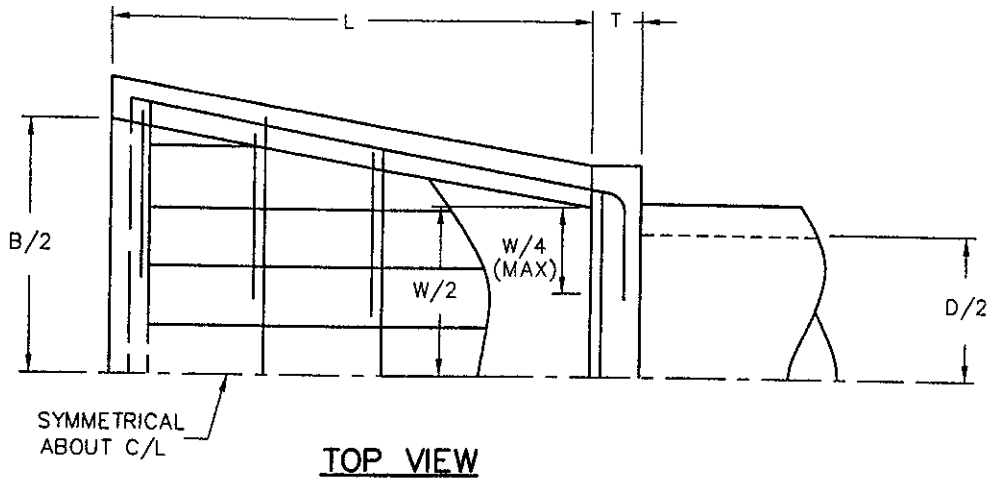
COUNTY OF SUTTER

GRATE TYPE MANHOLE COVER

APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

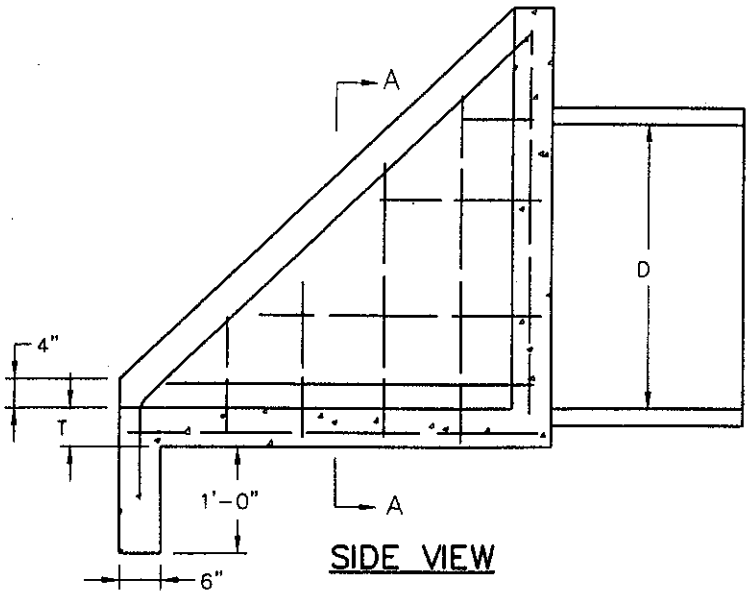
DWG NO. D-14



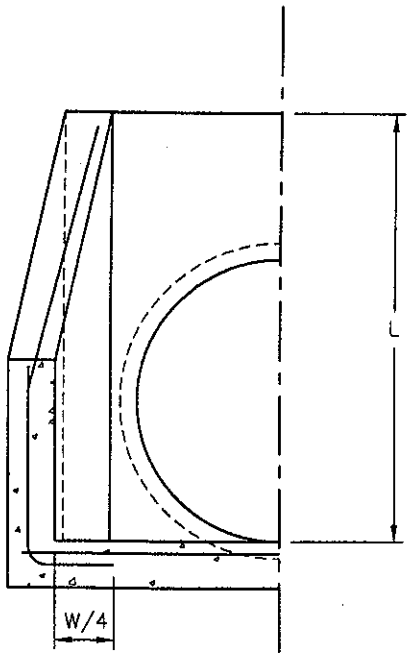
TOP VIEW

DIMENSIONS AND REINFORCING

D	W	B	L	T	ALL REINFORCING
33"	3'-3"	5'-3"	4'-0"	6"	#3 @ 12"
36"	3'-8"	5'-8"	4'-2"	6"	#3 @ 12"
42"	4'-4"	6'-4"	4'-8"	6"	#3 @ 12"
48"	4'-10"	7'-2"	5'-2"	8"	#6 @ 12"
54"	5'-4"	8'-0"	6'-0"	8"	#6 @ 12"
60"	6'-0"	8'-10"	6'-6"	8"	#6 @ 12"



SIDE VIEW



HALF SECTION A-A

NOTES:

1. "B" MAY BE REDUCED IF REQUIRED BY CHANNEL DIMENSIONS.
2. REINFORCING BAR SPACING SHOWN IS MAXIMUM SPACING.
3. USE CLASS 'B' CONCRETE.

DATE	REVISIONS	BY

COUNTY OF SUTTER

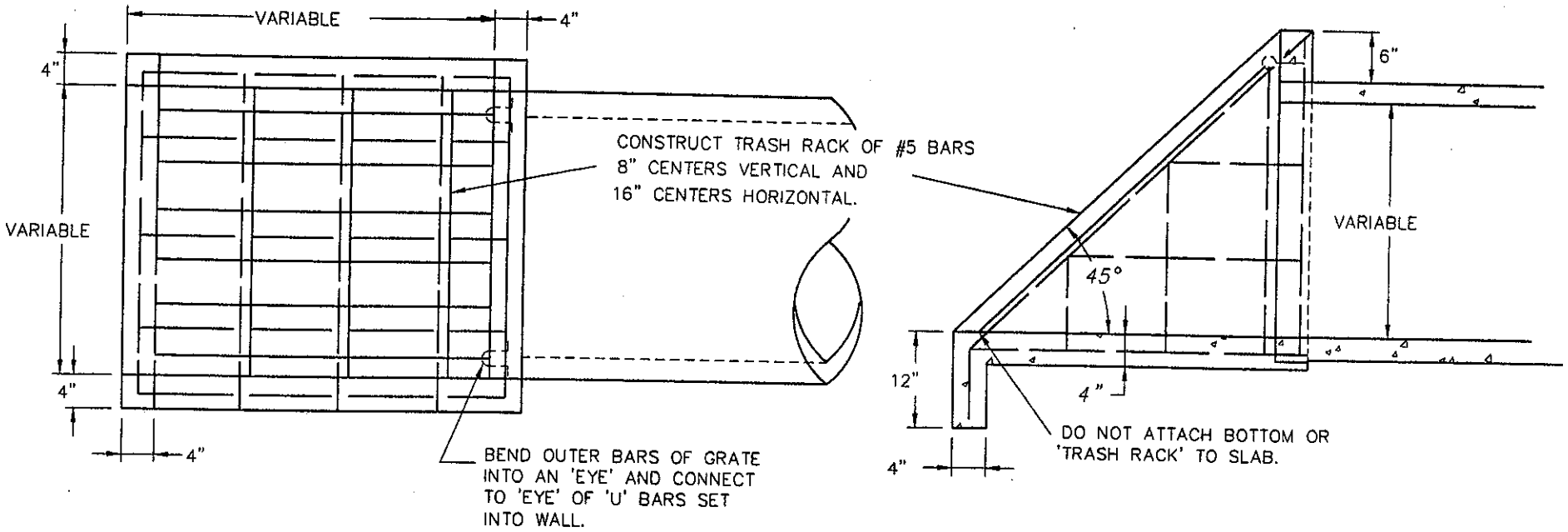
PIPE INLET STRUCTURE

APPROVED DATE 6/04/02

SCALE : NONE
DRN : PSO

DWG NO. D-15

Apr. 20, 1999 - 07:
DWG Name: R:\develop\SUT0202\Std-Det\Sutter\d-16.dwg Updated By: GYuslat



TOP VIEW

SIDE VIEW

NOTE:

ALL REINFORCING TO BE #4 @ 12"
USE CLASS 'B' CONCRETE

DATE	REVISIONS	BY

COUNTY OF SUTTER

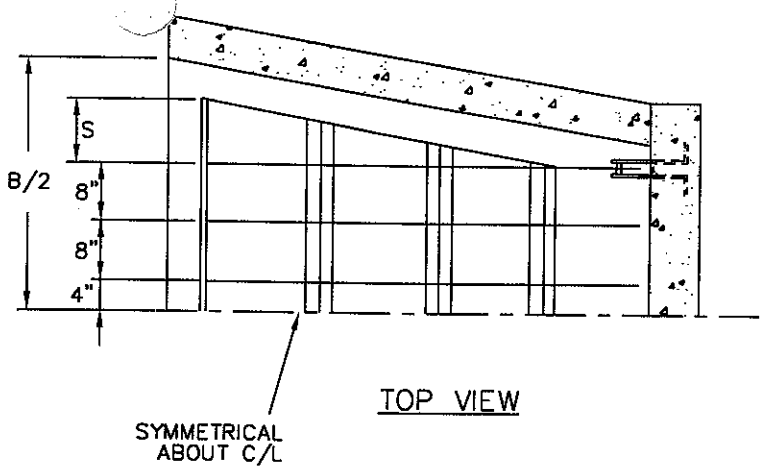
PIPE INLET STRUCTURE AND TRASH RACK (30" PIPE & SMALLER)

APPROVED DATE

SCALE : NONE
DRN : PSO

DWG NO. D-16

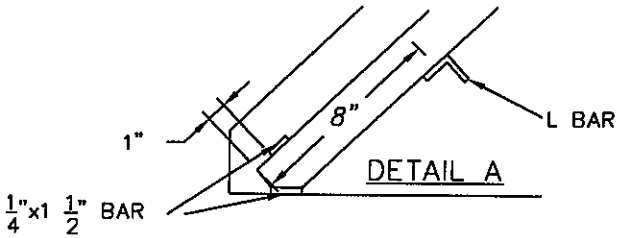
Apr. 20, 1999 - 07:32:48 DWG Name: R:\develop\SU10202\Std-Det\Sutter\d-17.dwg Updated By: GYustat



TOP VIEW

TRASH RACK DIMENSIONS

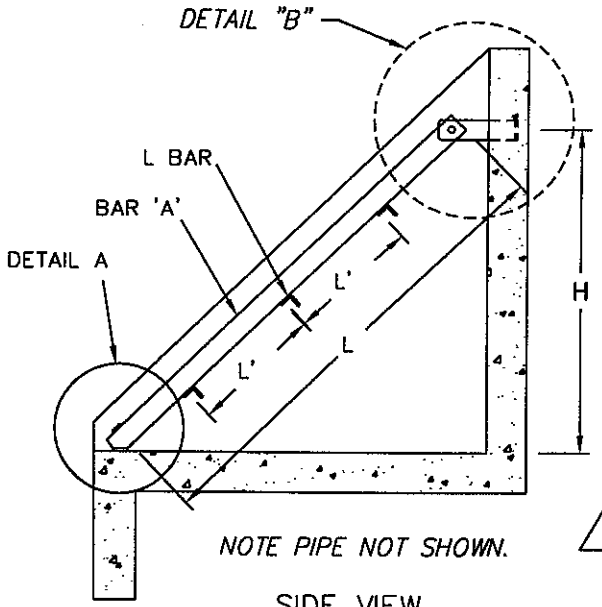
DIA.	NUMBER & SIZE		L	L'	S	H
	BAR 'A'	L BAR				
33"	8-3/8" x 2-1/2"	3-2 x 2 x 1/4	5'-1"	1'-10"	8"	3'-8"
36"	8-3/8" x 2-1/2"	3-2 x 2 x 1/4	5'-4"	1'-11"	8"	3'-10"
42"	9-3/8" x 2-1/2"	3-2 x 2 x 1/4	5'-11"	2'-3"	9"	4'-4"
48"	9-3/8" x 2-1/2"	4-2 x 2 x 1/4	6'-7"	1'-9"	10"	4'-10"
54"	10-3/8" x 3"	4-3 x 3 x 1/4	7'-9"	2'-1.5"	10.5"	5'-8"
60"	11-3/8" x 3-1/2"	4-3 x 3 x 1/4	8'-5"	2'-4"	11"	6'-2"



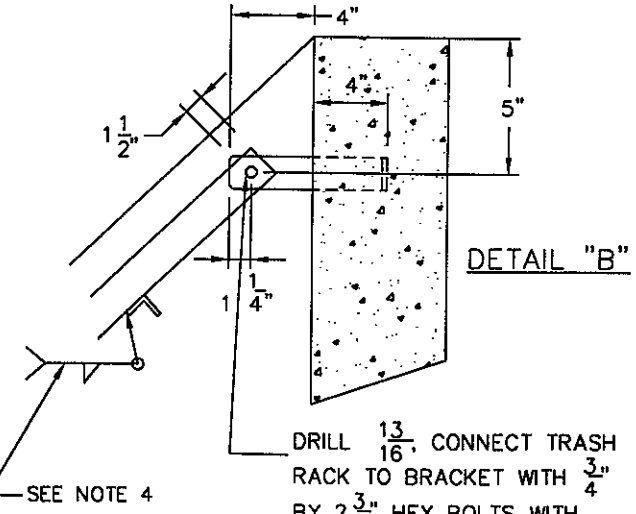
DETAIL A

NOTES:

1. THIS TRASH RACK TO BE USED WITH PIPE INLET STRUCTURES.
2. MATERIAL TO CONFORM TO ASTM DESIGNATION A-36.
3. 'S' MAY VARY WITH 'B' SEE PLATE.
4. ALL FILLET WELDS TO BE 3/16"
5. 2 HINGES REQUIRED FOR 33,36 & 42 INCH PIPES. 3 HINGES REQUIRED FOR 48, 54 & 60 INCH PIPES.



SIDE VIEW



DETAIL "B"

DRILL $\frac{13}{16}$, CONNECT TRASH RACK TO BRACKET WITH $\frac{3}{4}$" BY $2\frac{3}{4}$" HEX BOLTS WITH TWO HEX NUTS EACH.

DATE	REVISIONS	BY
11/3/05		K.K.

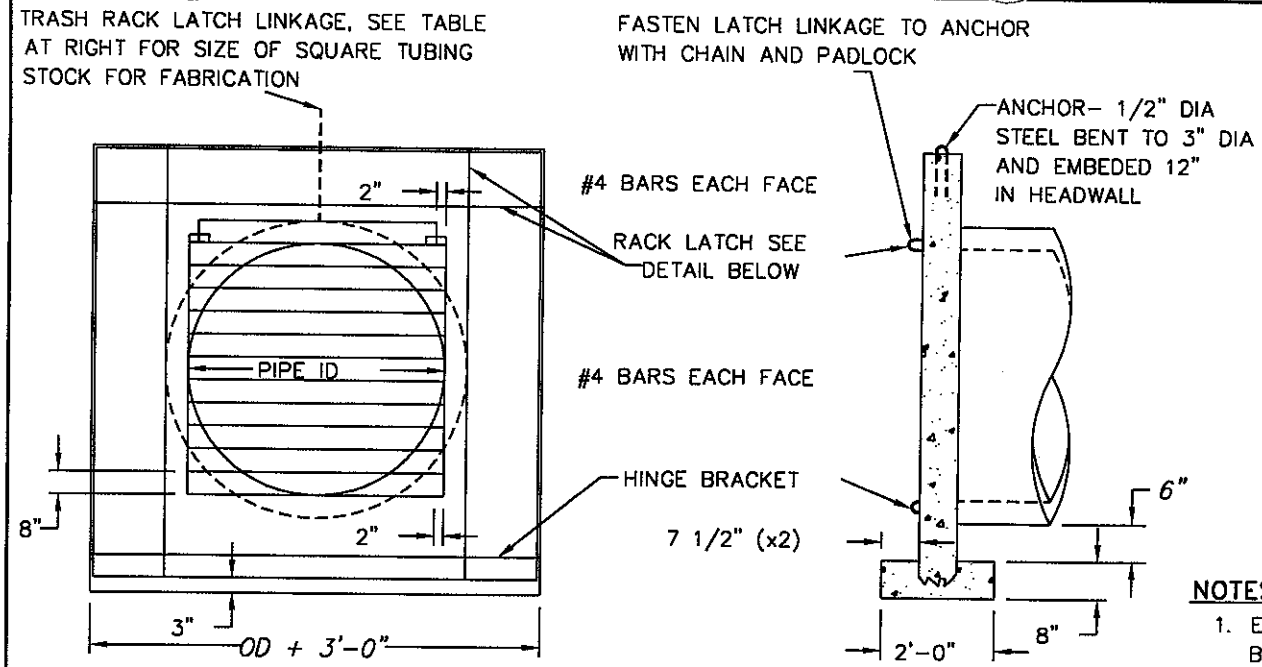
COUNTY OF SUTTER

TRASH RACK (33" PIPE OR LARGER)

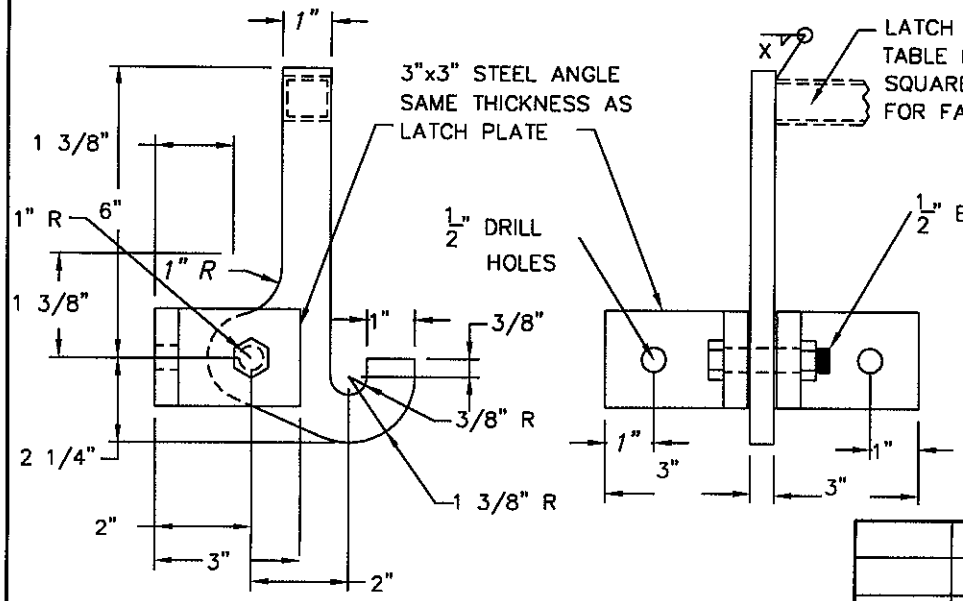
APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

DWG NO. D-17



PIPE SIZE	RACK BAR SIZE	LATCH PLATE THICKNESS	LATCH PLATE SIZE
21"	#4	1/4"	1",.095" THICK
24"	*	*	*
27"	#5	*	*
30"	*	3/8"	*
33"	#6	*	*
34"	*	*	1",.133" THICK
42"	#7	*	*
48"	*	1/2"	*
54"	*	*	*
60"	#8	*	*
66"	*	*	*
72"	*	*	*
84"	*	*	*



NOTES:

1. ENTIRE RACK TO BE WELDED REINFORCING STEEL OR ROUND BARS OF EQUAL DIA WITH HORIZONTAL BARS BEING 8" CENTER TO CENTER
2. USE CLASS "B" CONCRETE.
3. ROOM SHALL BE PROVIDED DOWNSTREAM TO LAY RACK FLAT.
4. FASTEN LATCH BRACKET, TO HEADWALL WITH 1/2"x6" BOLTS
5. WHEN RACK BAR SHALL BE TIGHT AGAINST THE TOP OF THE HINGE BRACKET SO THAT THE RACK CANNOT BE LIFTED OFF THE LATCH.
6. FABRICATE HINGE BRACKET FROM #4 RE-BAR.
7. ALL REINFORCING STEEL SHALL HAVE 2" EMBEDMENT EXCEPT AS NOTES

DATE	REVISIONS	BY
6/14/04		K.X.

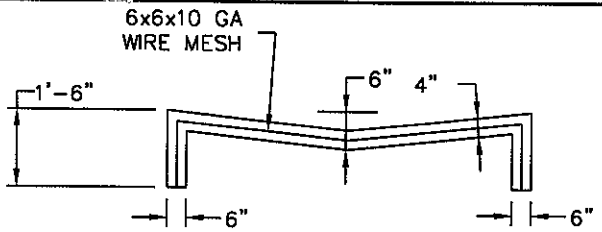
COUNTY OF SUTTER

PIPE OUTFALL-ACCESS CONTROL RACK

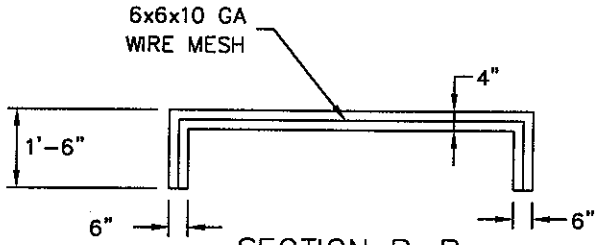
APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

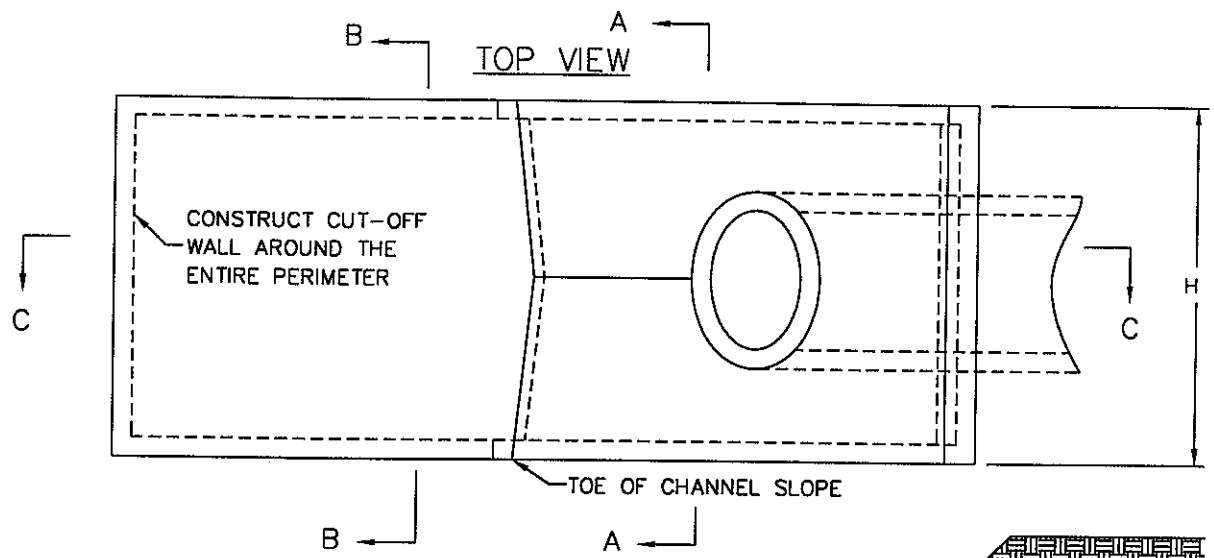
DWG NO. D-18

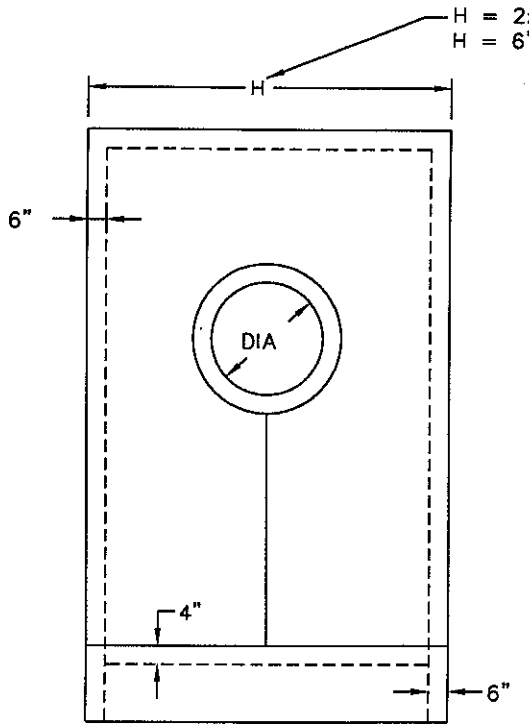


SECTION A-A



SECTION B-B

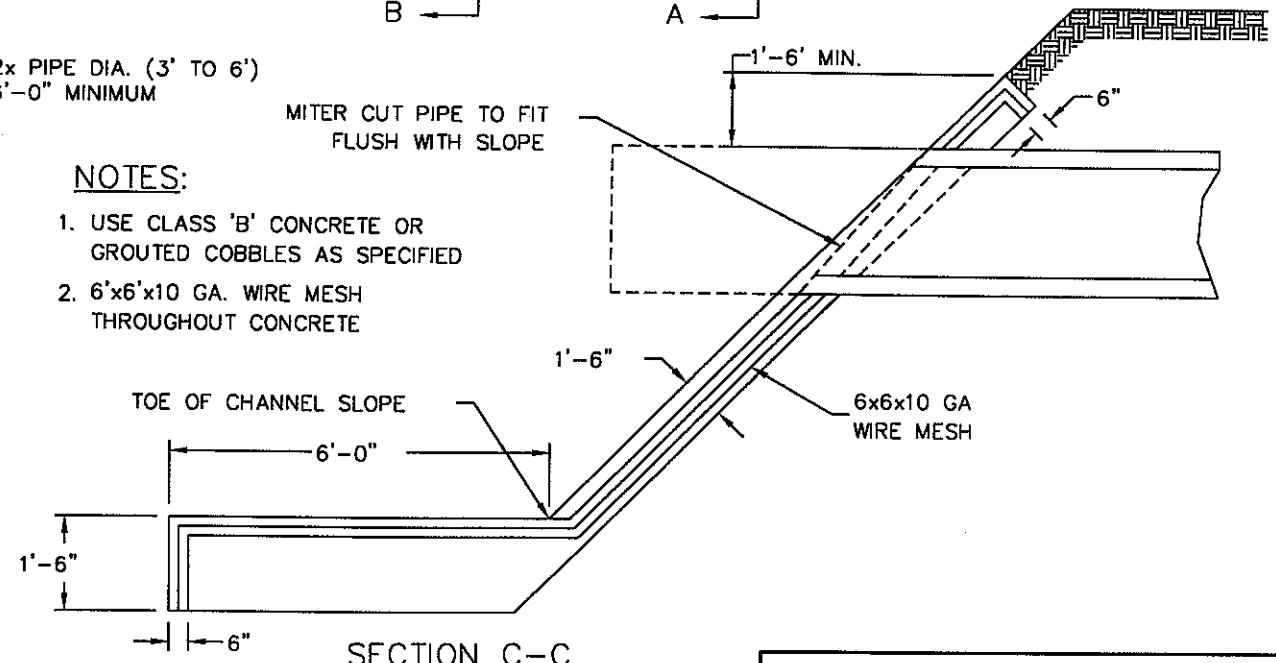




FRONT VIEW

NOTES:

1. USE CLASS 'B' CONCRETE OR GROUTED COBBLES AS SPECIFIED
2. 6'x6'x10 GA. WIRE MESH THROUGHOUT CONCRETE



SECTION C-C

6/23/04		K.X.
DATE	REVISIONS	BY

COUNTY OF SUTTER

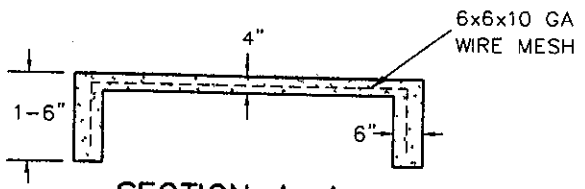
EROSION CONTROL
PIPE DISCHARGE

APPROVED 3/14/06 DATE

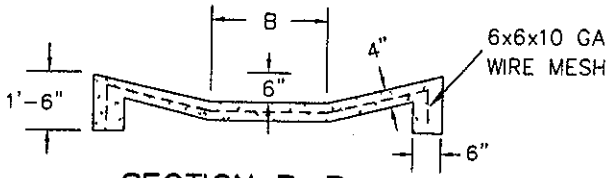
SCALE : NONE
DRN : PSO

DWG NO. D-19

Apr. 20, 1999 - DWG Name: R:\develop\SUT0202\Std-Det\Sutter\D-20.dwg Updated By: GYustat

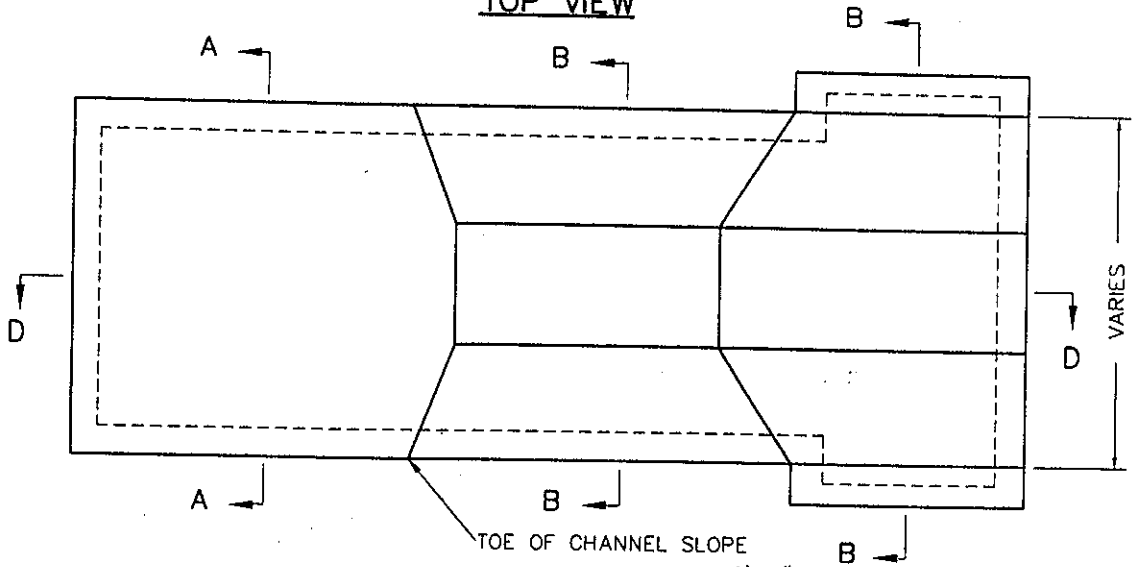


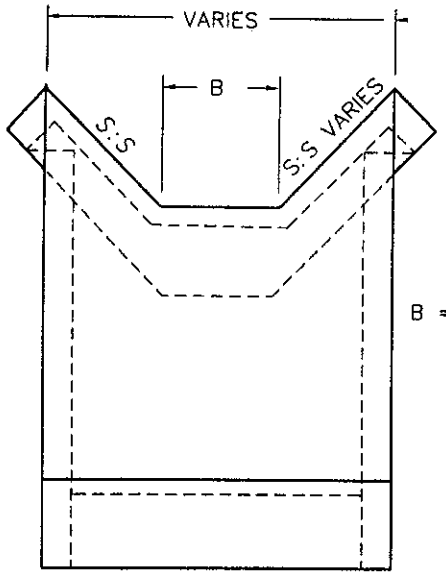
SECTION A-A



SECTION B-B

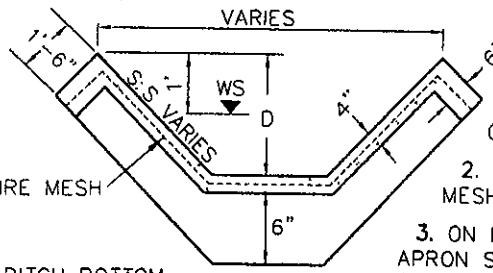
TOP VIEW





FRONT VIEW

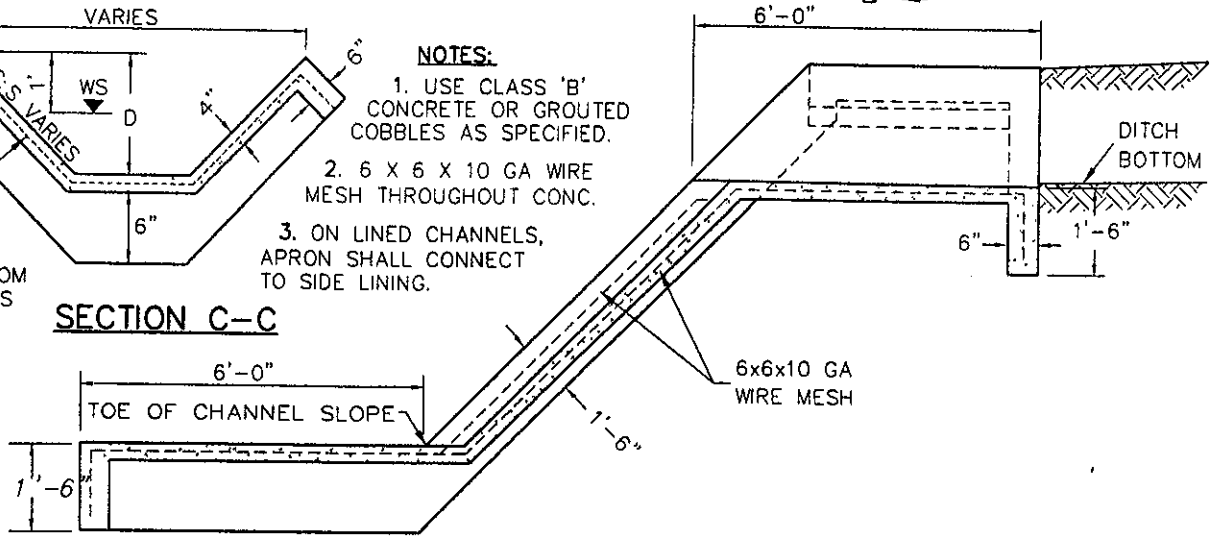
B = DITCH BOTTOM WIDTH OR AS SHOWN ON PLANS



SECTION C-C

NOTES:

1. USE CLASS 'B' CONCRETE OR GROUTED COBBLES AS SPECIFIED.
2. 6 X 6 X 10 GA WIRE MESH THROUGHOUT CONC.
3. ON LINED CHANNELS, APRON SHALL CONNECT TO SIDE LINING.



SECTION D-D

DATE	REVISIONS	BY

COUNTY OF SUTTER

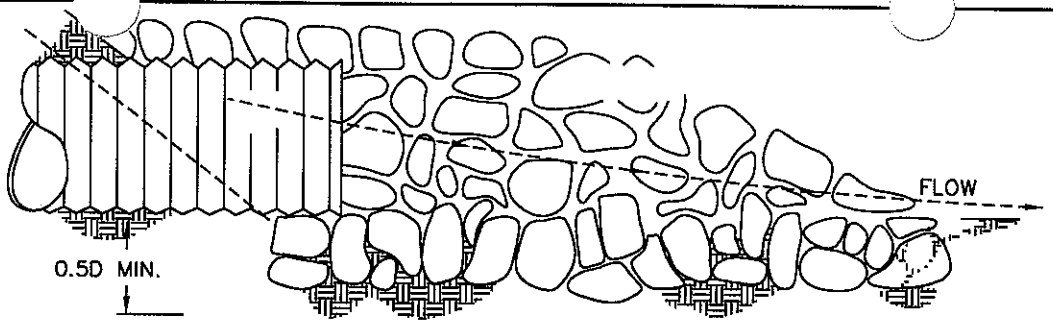
EROSION CONTROL
DITCH DISCHARGE

APPROVED 4/8/02 DATE

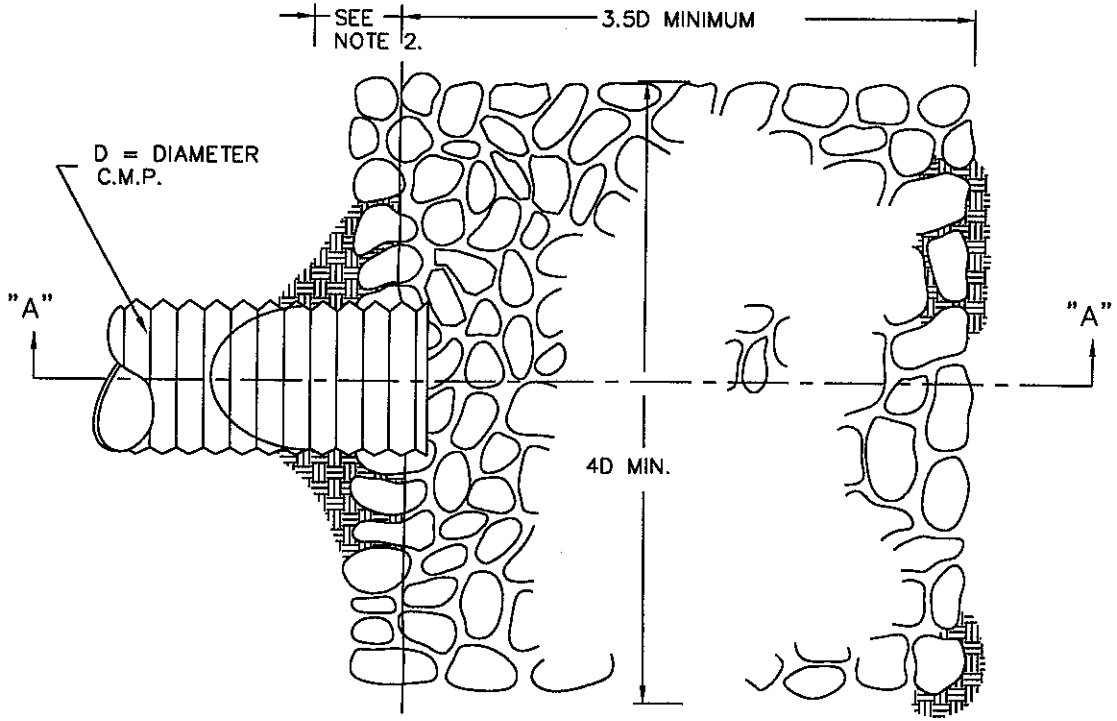
SCALE : NONE
DRN : PSO

DWG NO. D-20

Apr. 20, 1999 - 07:30:56 DWG Name: R:\develop\SUT0202\Std-Det\Sutter\d-21.dwg Updated By: GYustat



SECTION A-A



PLAN

NOTE:

1. STONE LINING SHALL BE COBBLES CONFORMING TO THE REQUIREMENTS SECTION 72 OF THE STANDARD SPECIFICATIONS OR SHOT ROCK AS DIRECTED BY THE ENGINEER.
2. 0.5D OR 1' WHICH EVER IS GREATER.

DATE	REVISIONS	BY
11/3/05		K.X.

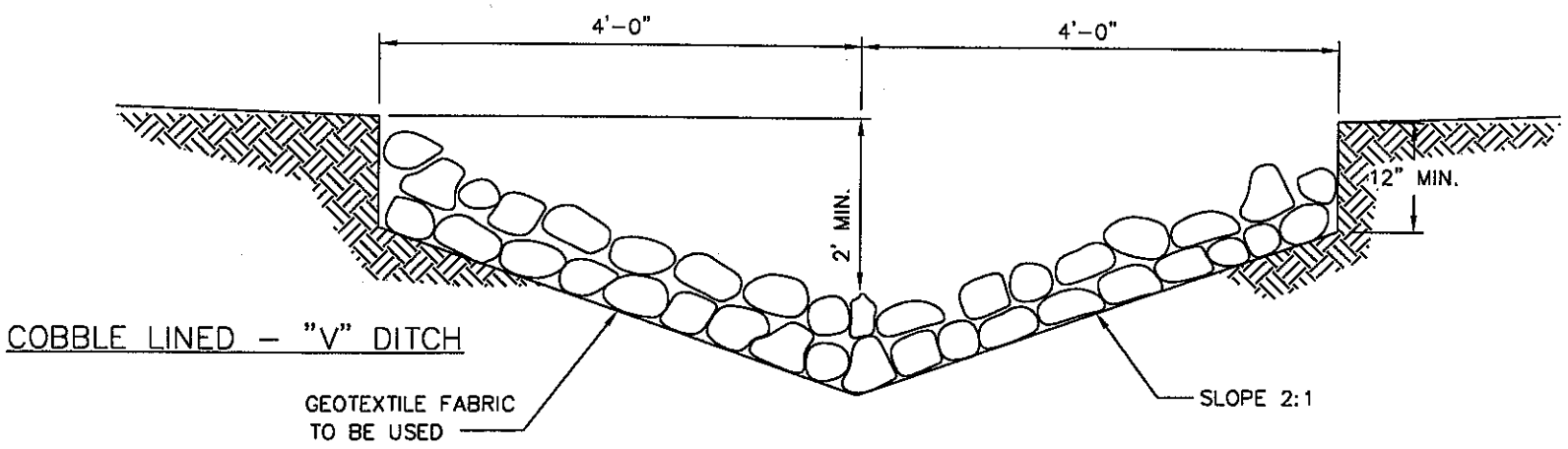
COUNTY OF SUTTER

CULVERT OUTFALL

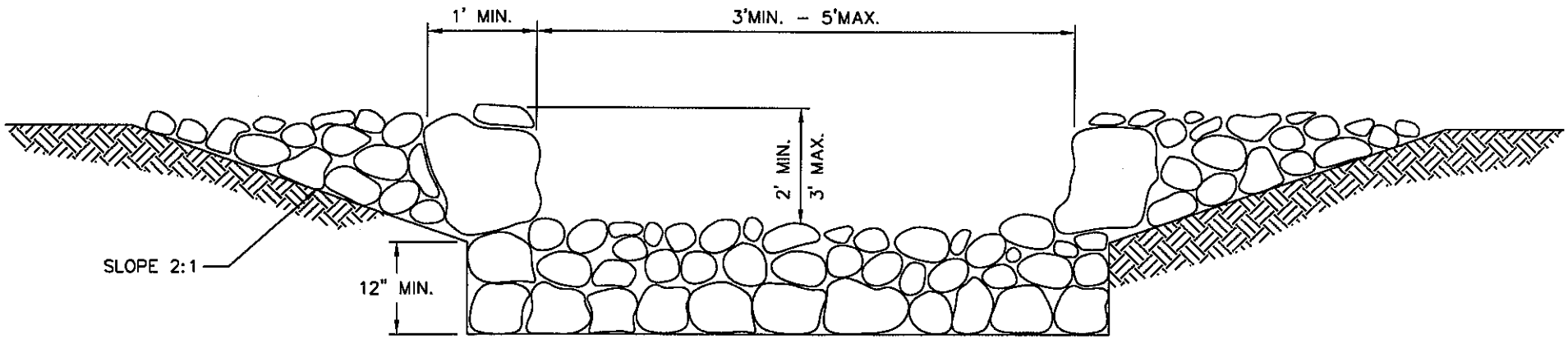
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. D-21



COBBLE LINED – "V" DITCH



NOTE:

6" TO 36" COBBLE

DATE	REVISIONS	BY
6/14/04		K.X.

COUNTY OF SUTTER

ROCK LINED CHANNEL SECTION

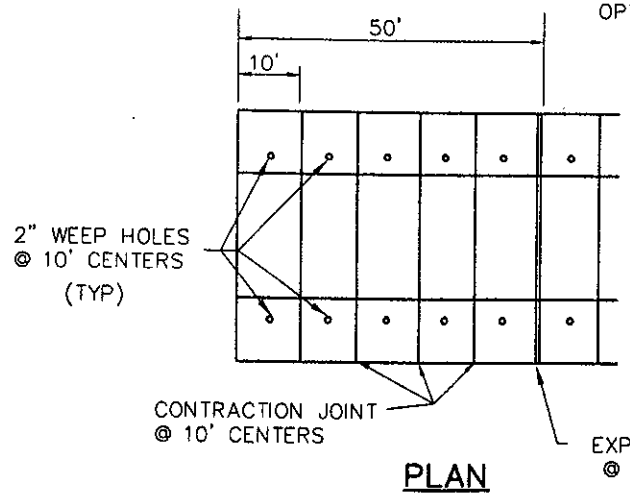
APPROVED 3/14/06 DATE

SCALE : NONE

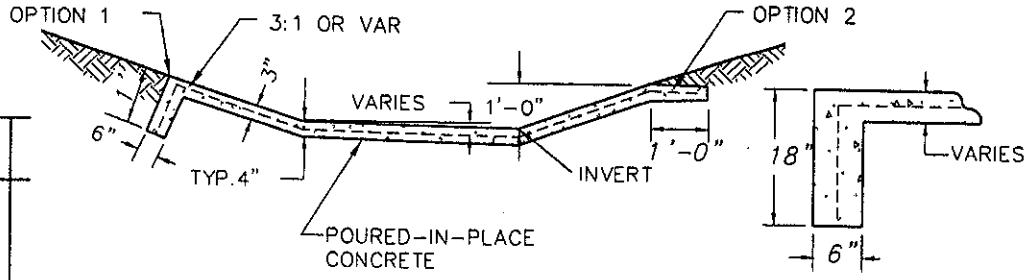
DRN : PSO

DWG NO. D-22

Apr. 20, 1999 - DWG Name: R:\develop\SUT0202\Std-Det\Sutter\d-23.dwg Updated By: GYustat

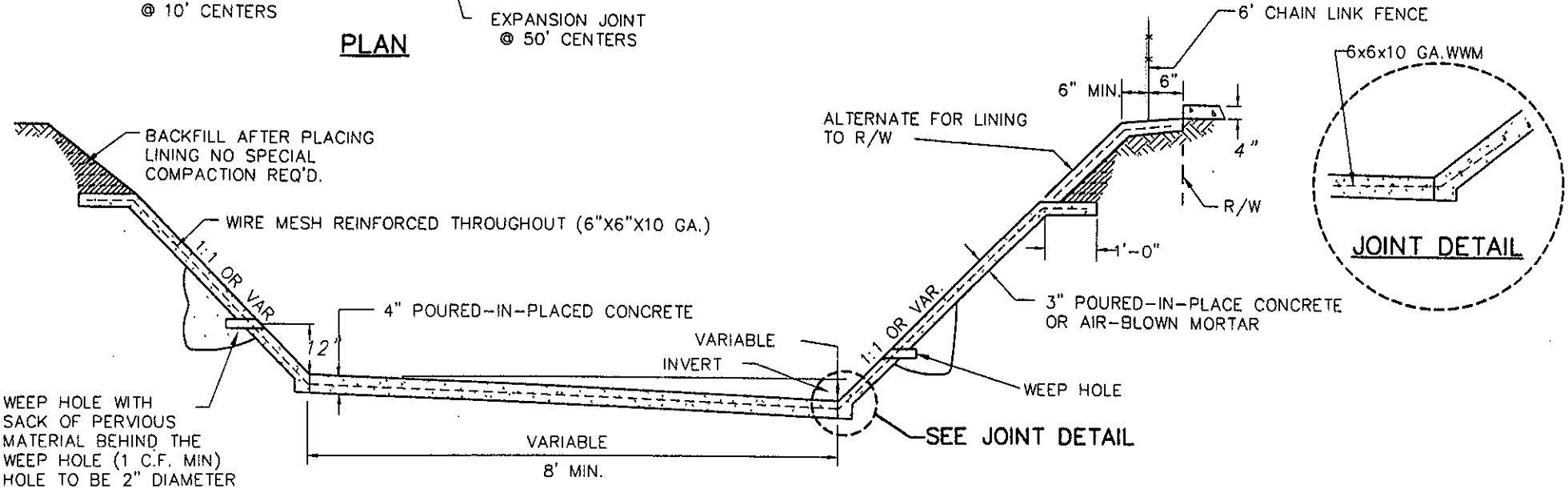


PLAN



CUTOFF WALL

TO BE PLACED ALONG ENTIRE END OF LINED SECTION AT BEGINNING AND AT END OF LINING



SECTION

DATE	REVISIONS	BY

COUNTY OF SUTTER

LINED CHANNEL SECTION

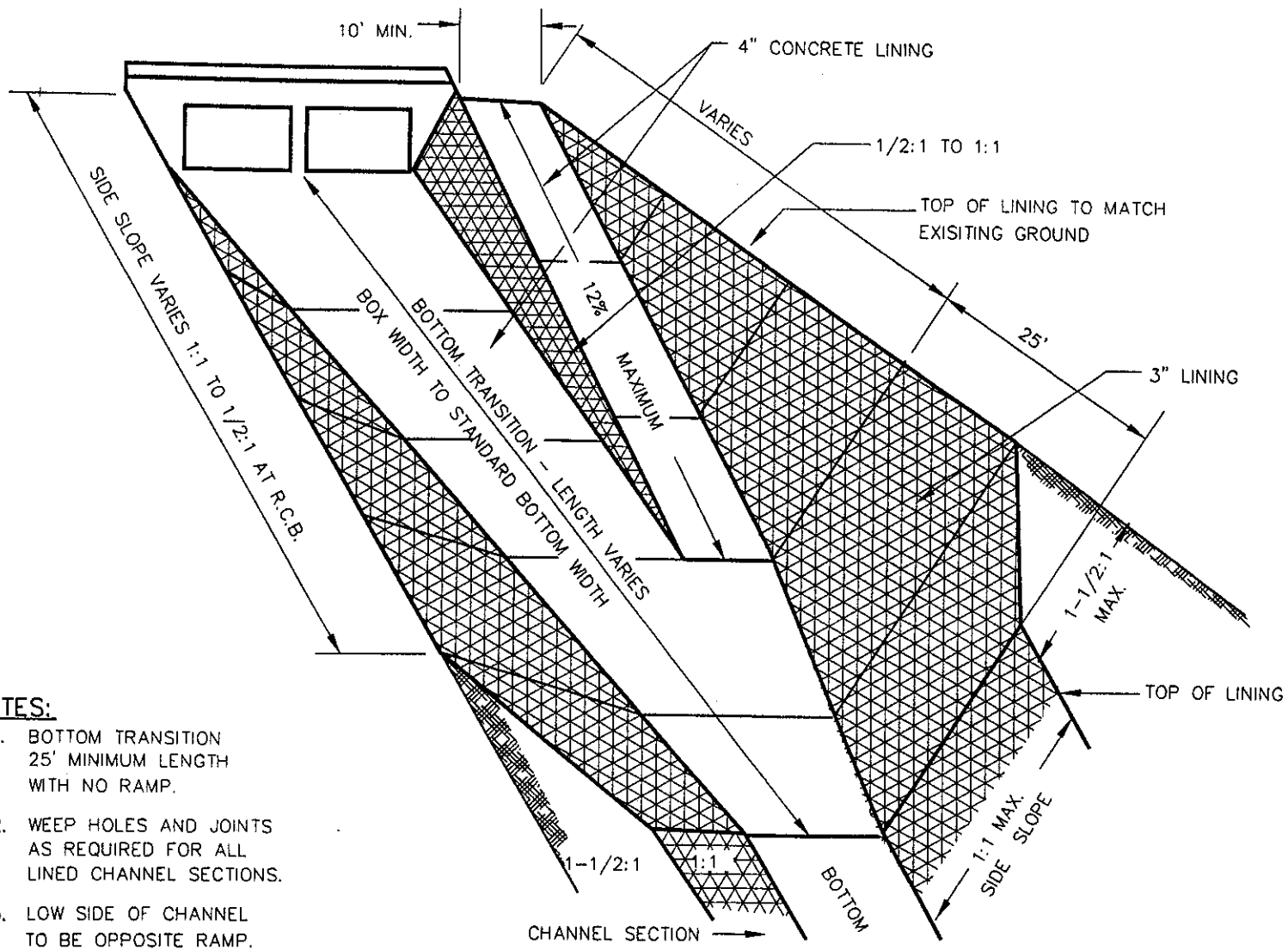
APPROVED DATE

SCALE : NONE

DRN : PSO

DWG NO. D-23

Apr. 20, 1999 - DWG Name: R:\develop\SUT0202\Std-Det\Sutter\d-24.dwg Updated By: GYustat



NOTES:

1. BOTTOM TRANSITION 25' MINIMUM LENGTH WITH NO RAMP.
2. WEEP HOLES AND JOINTS AS REQUIRED FOR ALL LINED CHANNEL SECTIONS.
3. LOW SIDE OF CHANNEL TO BE OPPOSITE RAMP.
4. SIDE SLOPE LINING MAY BE DELETED ON CHANNELS WITH BOTTOM LINING ONLY

DATE	REVISIONS	BY

COUNTY OF SUTTER

ACCESS RAMP DETAIL

APPROVED — DATE

SCALE : NONE
DRN : PSO

DWG NO. D-24

MAXIMUM TRENCH DEPTH
MEASURED SURFACE TO BOTTOM OF TRENCH IN FEET

DIAMETER	C-14 CONC. PIPE -CLASS-			REINFORCED CONCRETE PIPE -CLASS-					VCP E.S.	CAST IN PLACE
	1	2	3	I	II	III	IV	V		
10	12	17	29	NOT PERMITTED	8	12	30	NO LIMIT	NO LIMIT	NO LIMIT
12	12	17	21		10	15	35			
15	12	17	20		11	16	38			
18	11	17	19		12	17	39			
21	11	17	19		12	18	39			
24	11	16	19		13	19	39			
27	11	16	18		14	19	38			
30	11	15	17		14	20	38			
33	11	15	16		13	17	27	69	25	
36	10	13	14		14	18	29	62	APPROVED ON DESIGN BASIS	
42	NOT PERMITTED				15	19	30	60		
48					16	20	31	58		
54										
60				14	16	21	31	57		45
66				15	17	22	32	56		35
72				15	18	23	33	56		30

MINIMUM TRENCH DEPTH
MEASURED SURFACE TO TOP OF PIPE IN INCHES

TYPE	CLASS	MIN. COVER	
		STREET	OFF ST.
C-14 CONC. PIPE	1	30	12
	2	27	12
	3	24	12
REIN. CONCRETE	I	27	12
	II	24	12
	III	18	12
	IV	12	12
	V	12	12
VCP	ES.	24	12
CAST IN PLACE CONCRETE PIPE	—	12	12

NOTES:

1. ALL DEPTHS SHOWN FOR FLEXIBLE PAVEMENT AND TRENCH WIDTH EQUAL TO O.D. OF PIPE PLUS 16" FOR PIPE 33" AND SMALLER IN INSIDE DIAMETER. TRENCH WIDTH EQUALS O.D. OF PIPE PLUS 24" FOR PIPE 36" AND LARGER IN INSIDE DIAMETER. TRENCH WIDTH MEASURED AT TOP OF PIPE.
2. THIS DETAIL SHALL BE A GUIDE ONLY. THE COUNTY REQUIRES THAT A NCPI LOAD CALCULATION BE RUN ON ALL PIPES FOR TRENCH LOAD DESIGN.

DATE	REVISIONS	BY

COUNTY OF SUTTER

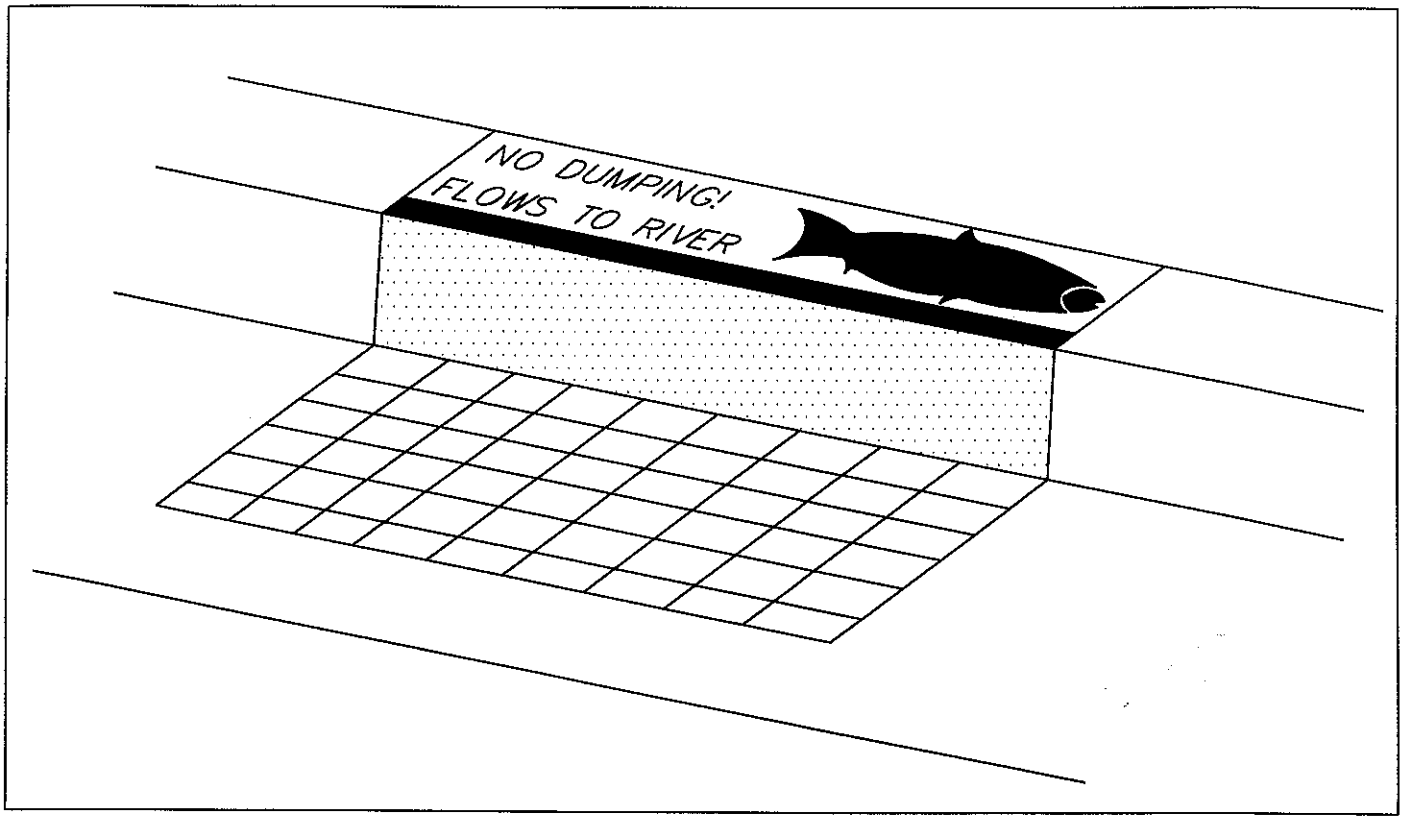
PIPE COVER REQUIREMENTS
RCP, VCP & CAST-IN-PLACE

APPROVED _____ DATE 6/15/02

SCALE : NONE
DRN : PSO

DWG NO. D-25

A PUBLIC NOTICE SHALL BE PLACED ADJACENT TO ALL DRAIN INLETS
IN ACCORDANCE WITH THE DETAIL BELOW.



NOTES:

1. MESSAGE AND SYMBOL SHALL BE PERMANENTLY PLACED WITH THE USE OF BOMACRON OR ANOTHER METHOD APPROVED BY THE COUNTY PRIOR TO THE CONSTRUCTION OF THE CURB AND GUTTER.

2. LETTERS SHALL BE 1-1/2" IN HEIGHT. OUTSIDE DIMENSION OF PUBLIC NOTICE BACKGROUND SHALL BE 12" x MINIMUM OF 30" (FIT TO BACK OF INLET).

3. COLORS SHALL BE BLACK LETTERING AND GRAPHIC WITH GREY BACKGROUND.

4. PAINTING OF MESSAGE WILL NOT BE ALLOWED.

5. FOR AREA DRAIN INLETS, NOTICE WILL BE PLACED ADJACENT AND PARALLEL TO THE LONG AXIS OF THE DRAIN.

DATE	REVISIONS	BY
6/25/04		K.X.

COUNTY OF SUTTER

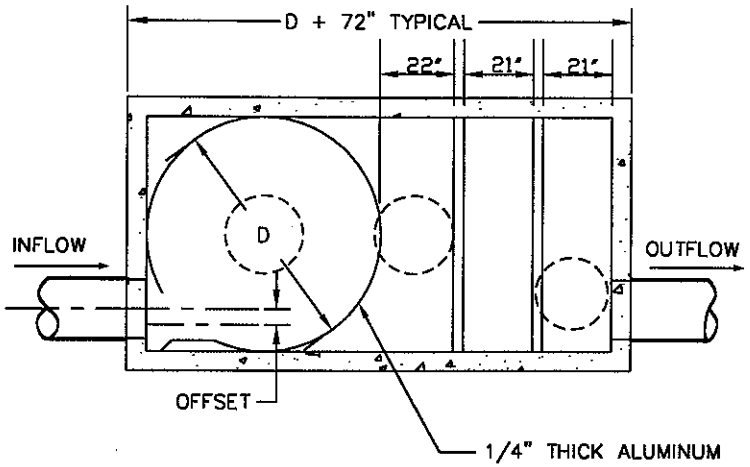
NO DUMPING
PUBLIC NOTICE DETAIL

APPROVED 3/14/06 DATE

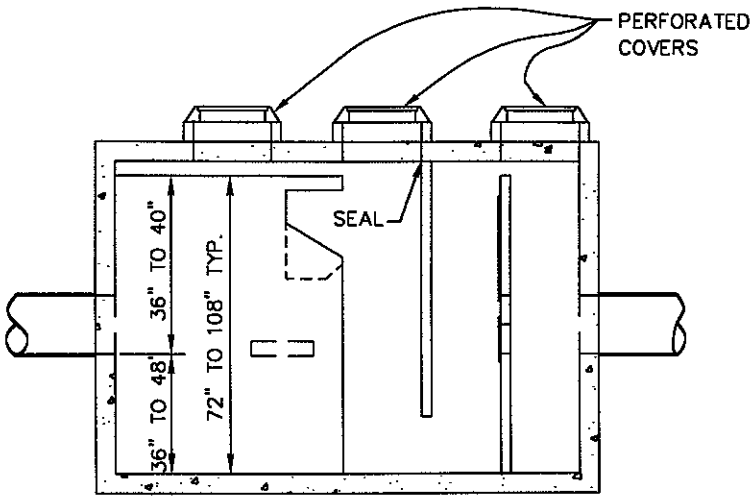
SCALE : NONE
DRN : PSO

DWG NO. D-26

Apr. 20, 1999 - 32 DWG Name: R:\develop\SU10202\Std-Del\Sutter\d-26.dwg Updated By: GYustol



PLAN VIEW



ELEVATION VIEW

THE VORTECHS™ STORMWATER TREATMENT SYSTEM

VORTECHS™ MODEL	GRIT CHAMBER DIAM./AREA FT/FT²	PEAK DESIGN FLOW[A] CFS	SEDIMENT STORAGE[B] CYS	APPROX. SIZE[C] L x W FT
1000	3/7	1.6	0.75	9x3
2000	4/13	2.8	1.25	10x4
3000	5/20	4.5	1.75	11x5
4000	6/28	6.0	2.5	12x6
5000	7/38	8.5	3.25	13x7
7000	8/50	11.0	4.0	14x8
9000	9/64	14.0	4.75	15x9
11000	10/79	17.5	5.5	16x10
16000	12/113	25.0	7.0	18x12

ENGINEERING NOTES:

A) FOR IN-LINE SYSTEMS WITHOUT A BYPASS, SIZING CRITERIA IS BASED ON PROVIDING ONE SQUARE FOOT OF GRIT CHAMBER SURFACE AREA FOR EACH 100 GPM OF PEAK DESIGN STORM FLOW RATE (E.G. 10-YEAR STORM). FOR MORE DETAILS ABOUT VORTECHNICS SIZING CRITERIA REFER TO VORTECHNICS TECHNICAL BULLETIN 3.

B) SEDIMENT STORAGE VOLUME ASSUME A 3 FOOT SUMP.

C) CONSTRUCTION DETAILS MAY VARY DEPENDING ON THE SPECIFIC APPLICATION. ANY ALTERATIONS TO THE SIZING CHART SPECIFICATIONS WILL APPEAR ON VORTECHNICS DIMENSIONAL AND SHOP DRAWINGS. PLEASE CALL VORTECHNICS FOR THE WEIGHT OF SPECIFIC VORTECHS SYSTEMS IF NEEDED.

SPECIAL NOTE:

OIL STORAGE CAPACITY, WHEN IT IS NEEDED TO MEET A SPECIFIC REQUIREMENT FOR SPILL CONTAINMENT, CAN BE SIZED TO MEET THE STORAGE REQUIREMENT WITH THE SELECTED MODEL. VORTECHNICS TECHNICAL STAFF WILL OPTIMIZE SYSTEM GEOMETRY TO MEET CONTAINMENT REQUIREMENTS WITHIN A CORRECTLY SIZED VORTECHS SYSTEM. (207) 885-9830.

DATE	REVISIONS	BY

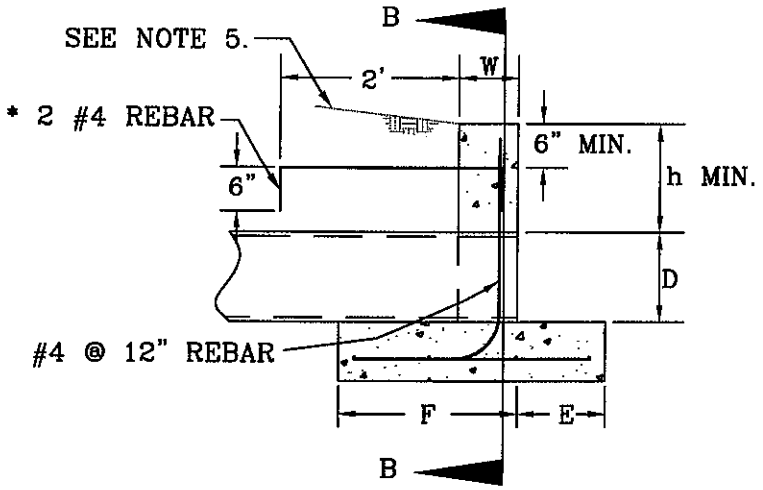
COUNTY OF SUTTER

SAND AND OIL TRAP MANHOLE WITH FLAT SLAB TOP

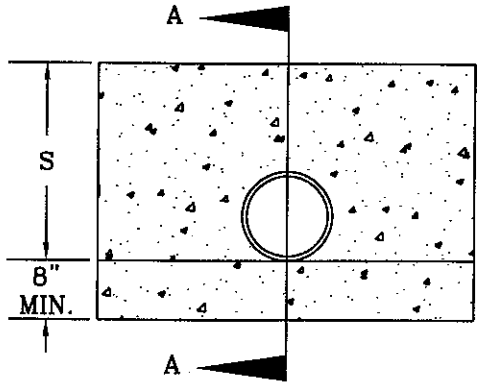
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : K. XIONG

DWG NO. D-27

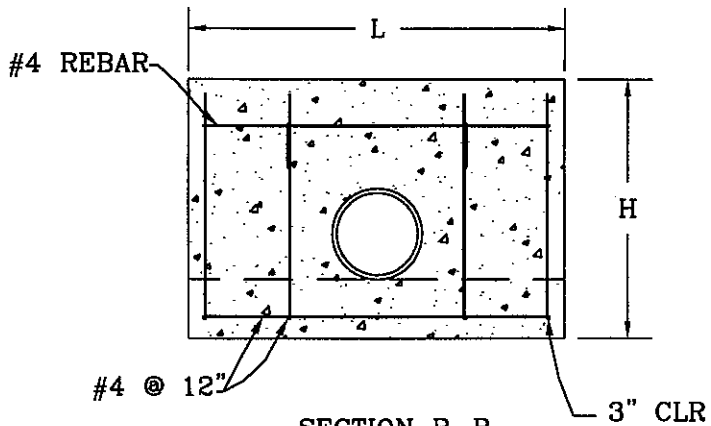


SECTION A–A
NTS



NOTES:

1. "L" MAY BE REDUCED IF REQUIRED BY CHANNEL DIMENSIONS.
2. REINFORCING BAR (REBAR) SPACING SHOWN IS MAXIMUM SPACING.
3. ALL REBAR CLEARANCE SHALL NOT LESS THAN 2" UNLESS SPECIFIED.
4. "*" THESE REBARS ARE REQUIRED IF THE WALL HAS NO FOOTING OR FOOTING LESS THAN THE REQUIREMENT.
5. SLOPE AND TOE OF SLOPE INTERSECTION MAY BE ADJUSTED IF REQUIRED BY SITE CONDITIONS AND AS DIRECTED BY INSPECTOR.
6. USE CLASS "B" CONCRETE



SECTION B–B
NTS

PIPE D	WALL L	WALL H	WALL S	WALL W	FOOTING F	FOOTING E	PIPE COVER h
12"	4'	2'-8"	2'	6"	2'	1'	1'
15"	6'	3'-2"	2'-6"	8"	2'	1'	1'-3"
18"	7'	3'-8"	3'	8"	2'	1'	1'-6"
24"	9'	4'-2"	3'-6"	8"	2'	1'	1'-6"
30"	11'	4'-8"	4'	8"	2'-3"	1'	1'-6"

DATE	REVISIONS	BY

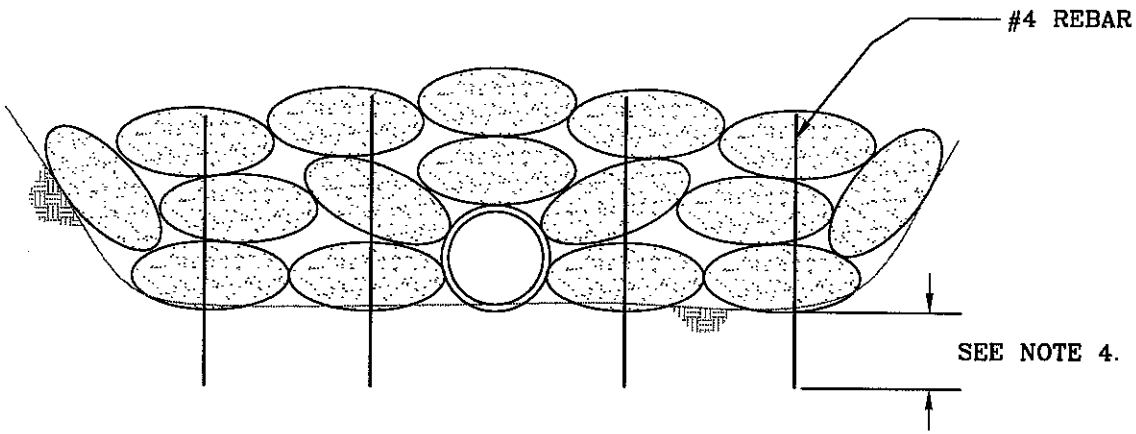
COUNTY OF SUTTER

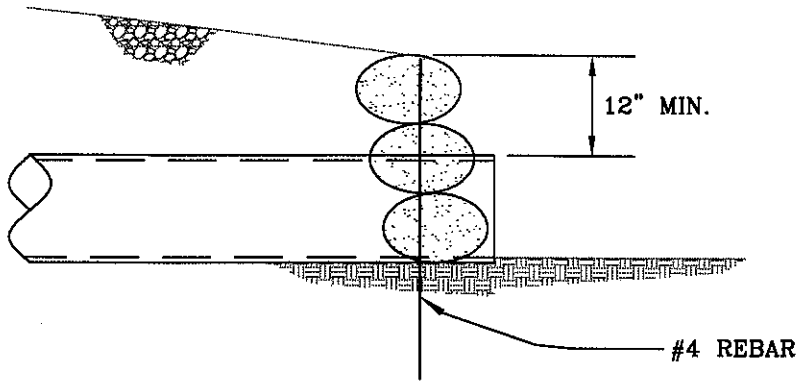
HEADWALL

APPROVED — DATE 3/14/06

SCALE : NONE
DRN : K.XIONG

DWG NO. D-28





SIDE VIEW

NOTES:

1. PIPE SHALL BE PLACED SLIGHTLY BELOW EXISTING GRADE.
2. BACKFILL REQUIREMENT FOR PRIVATE ROAD AND DRIVEWAY CONNECTION, SEE DWG NOS. H-12 AND H-13.
3. REBAR SHALL CUT OFF A MINIMUM ONE INCH BELOW THE SURFACE.
4. REBAR SHALL PENETRATE INTO THE GROUND AS REQUIRED TO SECURE THE SAND BAGS IN PLACE OR AS DIRECTED BY INSPECTOR.

DATE	REVISIONS	BY

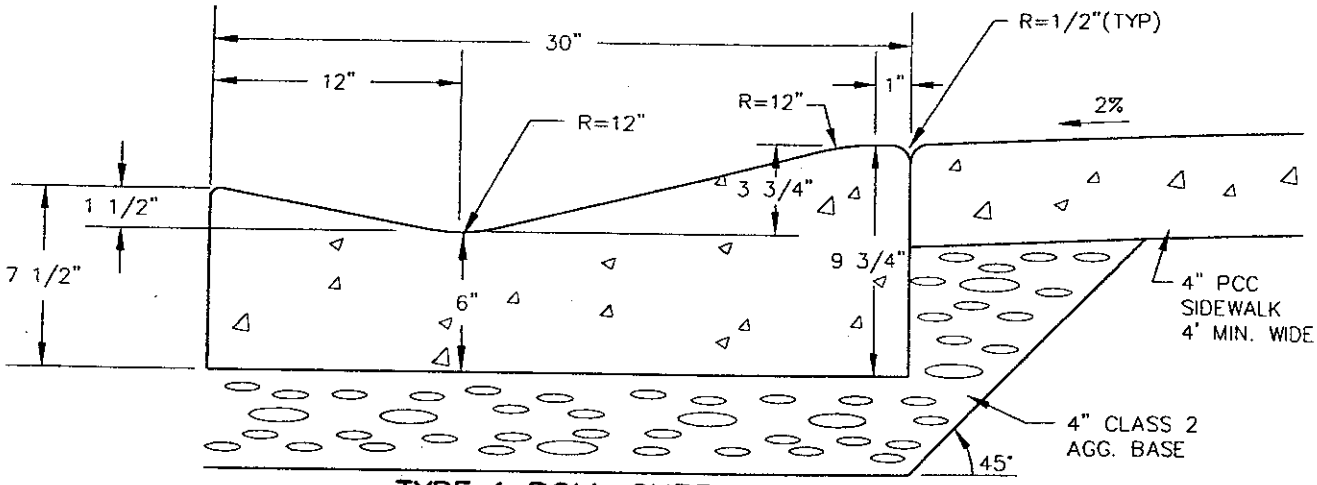
COUNTY OF SUTTER

SANDBAG

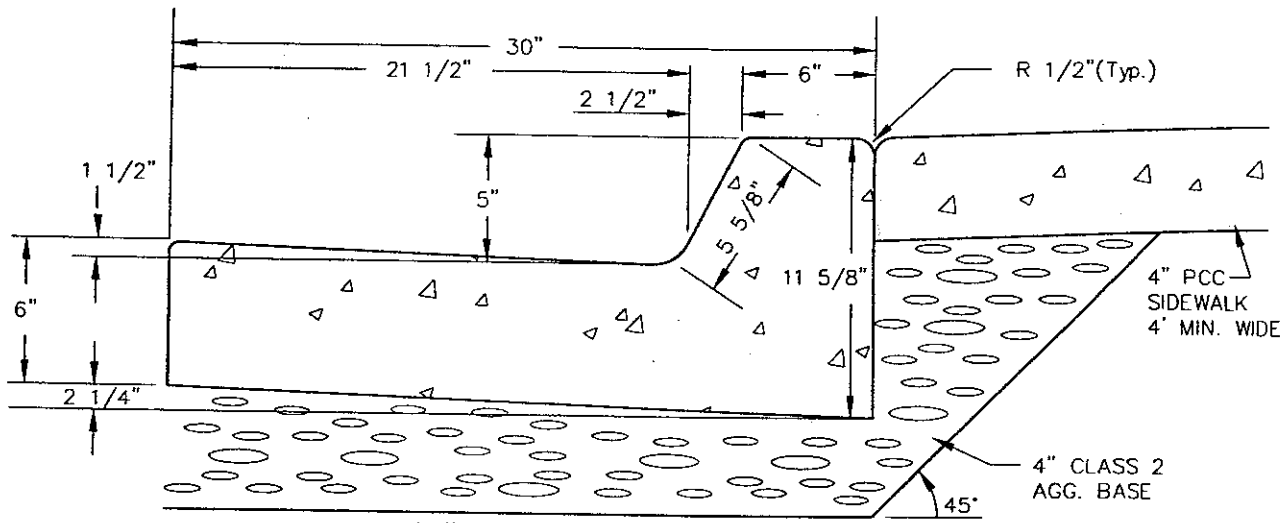
APPROVED — DATE: 3/14/06

SCALE : NONE
DRN : K.XIONG

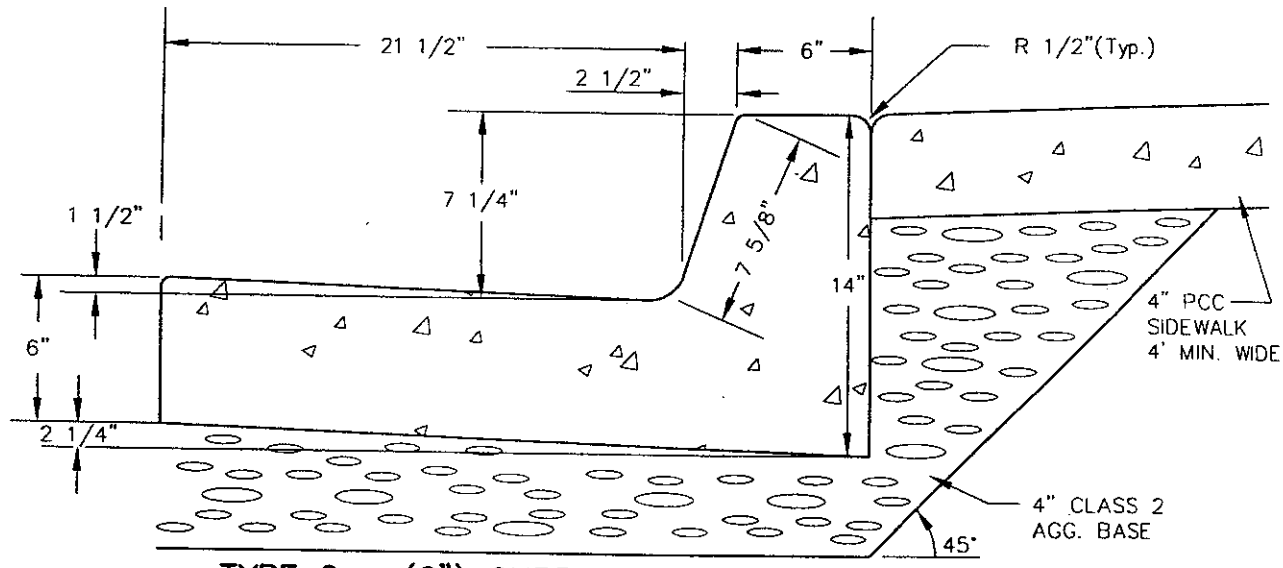
DWG NO. D-29



TYPE 1 ROLL CURB



TYPE 2 – (6") CURB & GUTTER



TYPE 2 – (8") CURB & GUTTER

DATE	REVISIONS	BY

COUNTY OF SUTTER

CURB & GUTTER

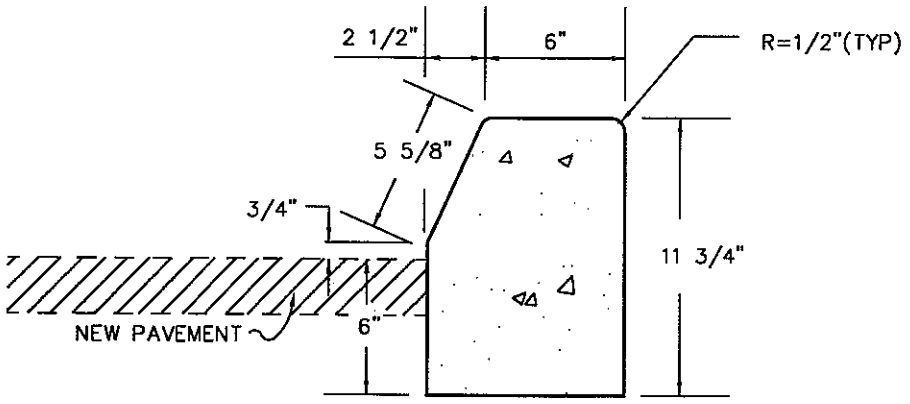
APPROVED _____ DATE 6/14/02

SCALE : NONE
DRN : PSO

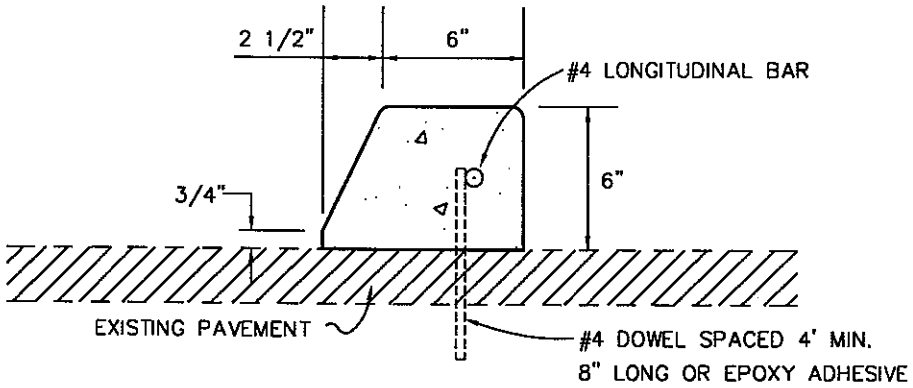
DWG NO. H-1

DWG Name: R:\develop\SUT0202\Std-Del\Sutter\H-1.dwg Updated By: Rlehutsky

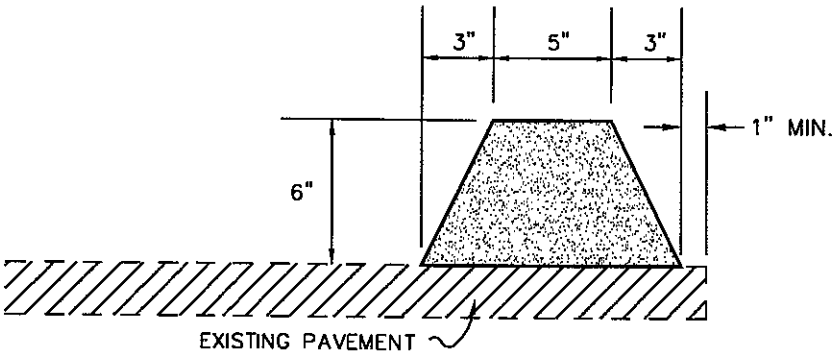
Apr. 09, 1999 -



6" P.C.C. CURB (TYPE A)



6" P.C.C. CURB (TYPE B)



6" A.C. DIKE

11/8/05		K.X.
DATE	REVISIONS	BY

COUNTY OF SUTTER

BARRIER CURB

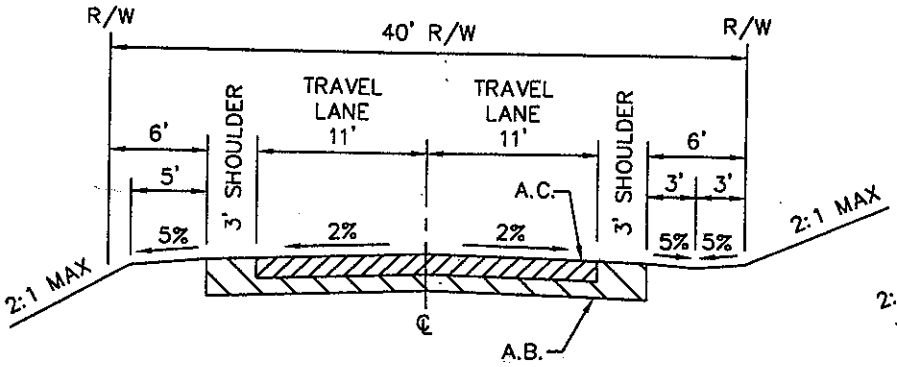
APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

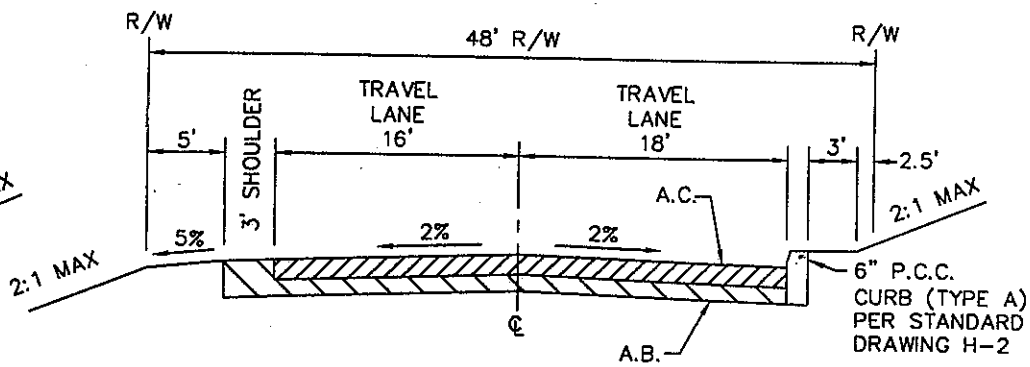
DWG NO. H-2

DWG Name: R:\develop\SUT02021\Std-Det\Sutter\H-2.dwg Updated By: Rtehutsky

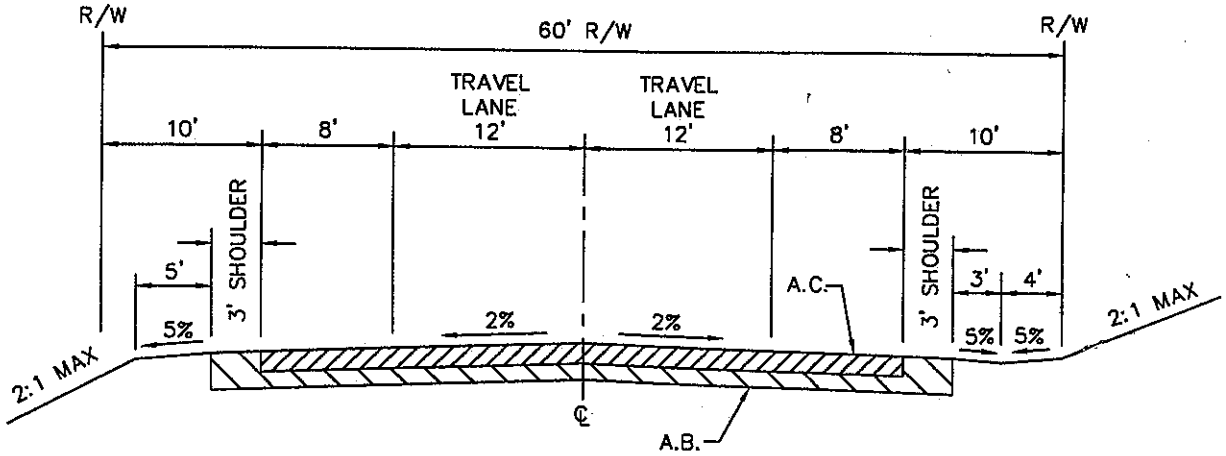
Apr. 09, 1999 - 14:



RURAL LOCAL



RURAL COLLECTOR



RURAL ARTERIAL

NOTES:
SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTIONS.

DATE	REVISIONS	BY
11/8/05		K.X.

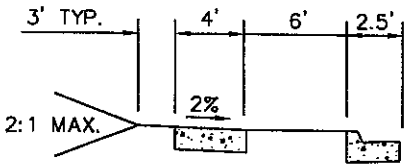
COUNTY OF SUTTER

RURAL ROAD SECTIONS

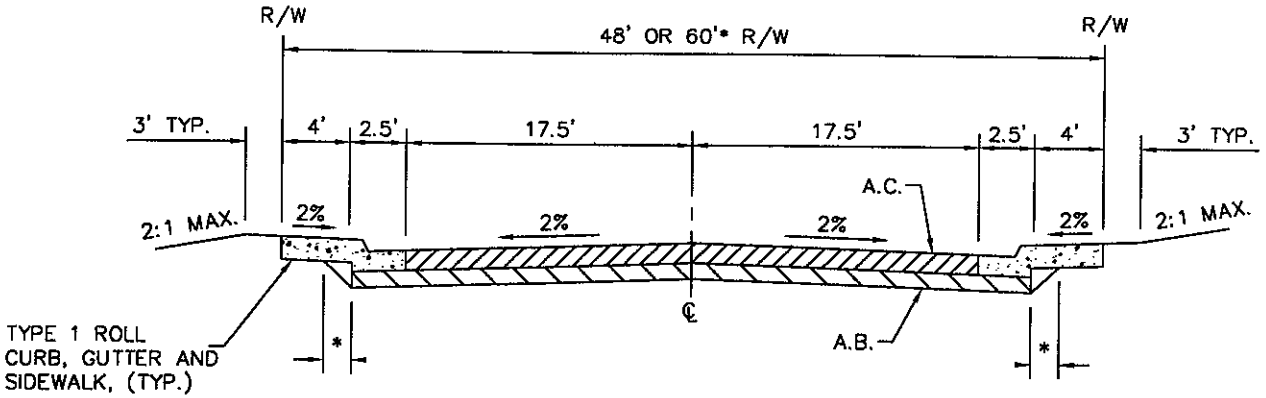
APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

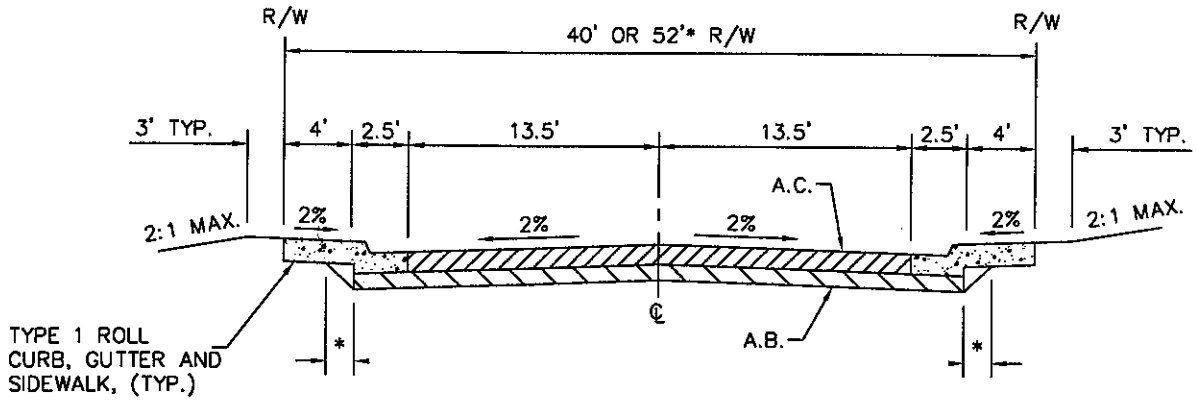
DWG. H-3



* 6' OPTIONAL PLANTER STRIP BETWEEN BACK OF CURB AND SIDEWALK



STANDARD RESIDENTIAL



MINOR RESIDENTIAL

NOTES:

SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTION.

DATE	REVISIONS	BY
11/8/05		K.X.

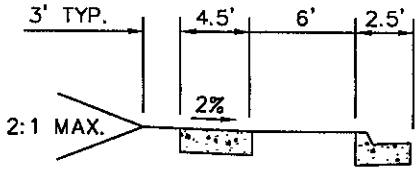
COUNTY OF SUTTER

TYPICAL SECTIONS
URBAN RESIDENTIAL STREETS

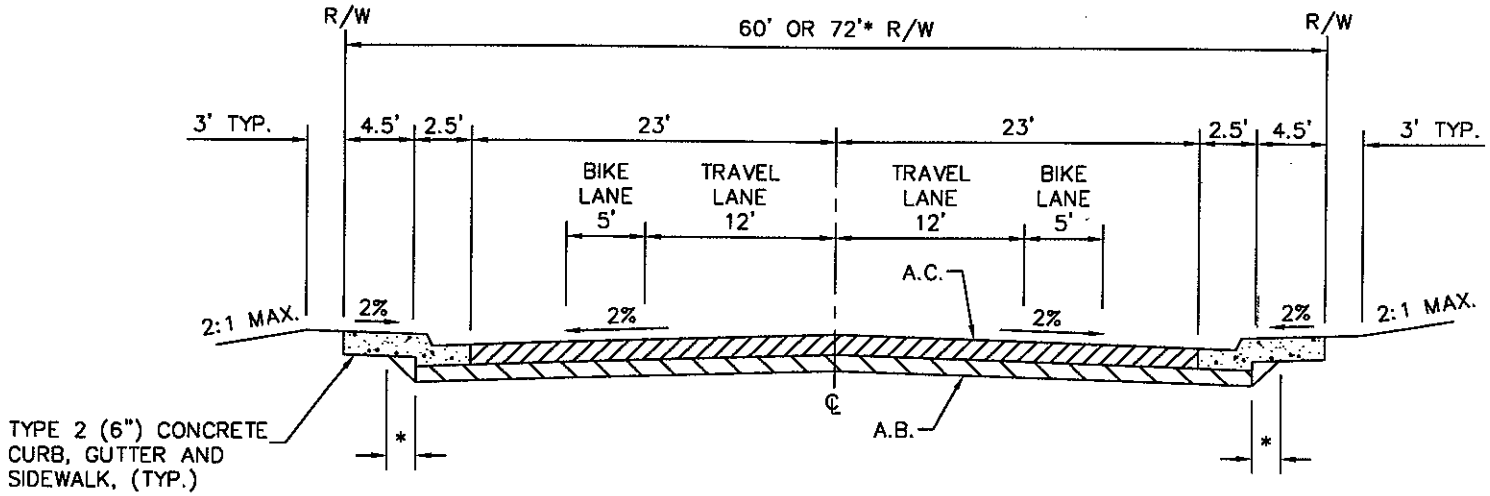
APPROVED 7/14/06 DATE

SCALE : NONE
DRN : PSO

DWG NO. H-4



*6' OPTIONAL PLANTER STRIP BETWEEN BACK OF CURB AND SIDEWALK



COLLECTOR

NOTES:
SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTION.

DATE	REVISIONS	BY
6/15/04		K.X.

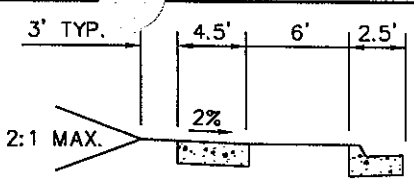
COUNTY OF SUTTER

TYPICAL SECTION
60' COLLECTOR STREET

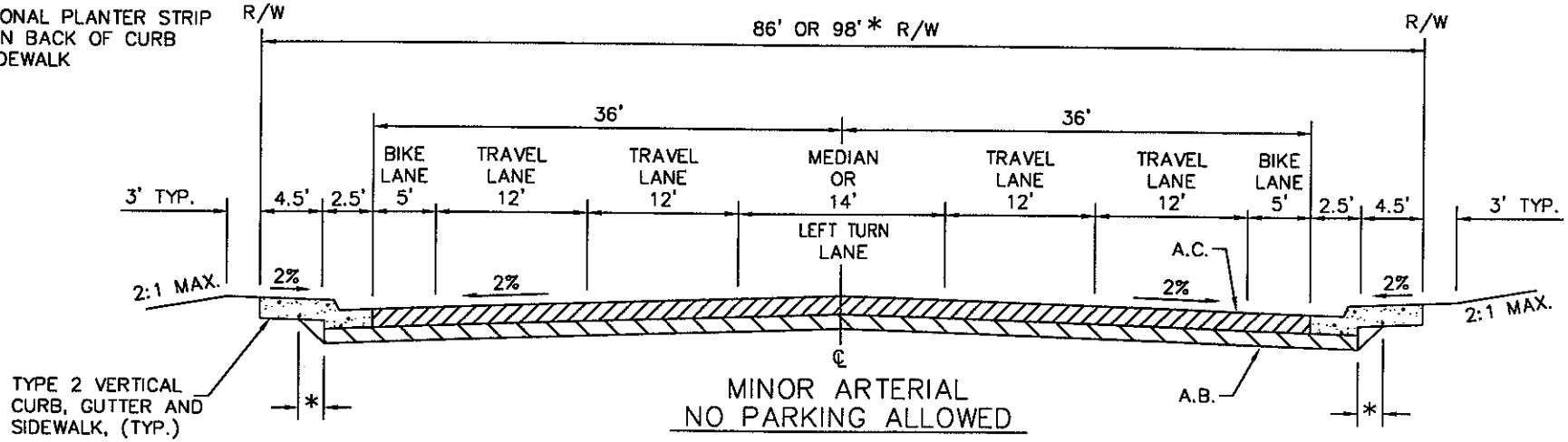
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

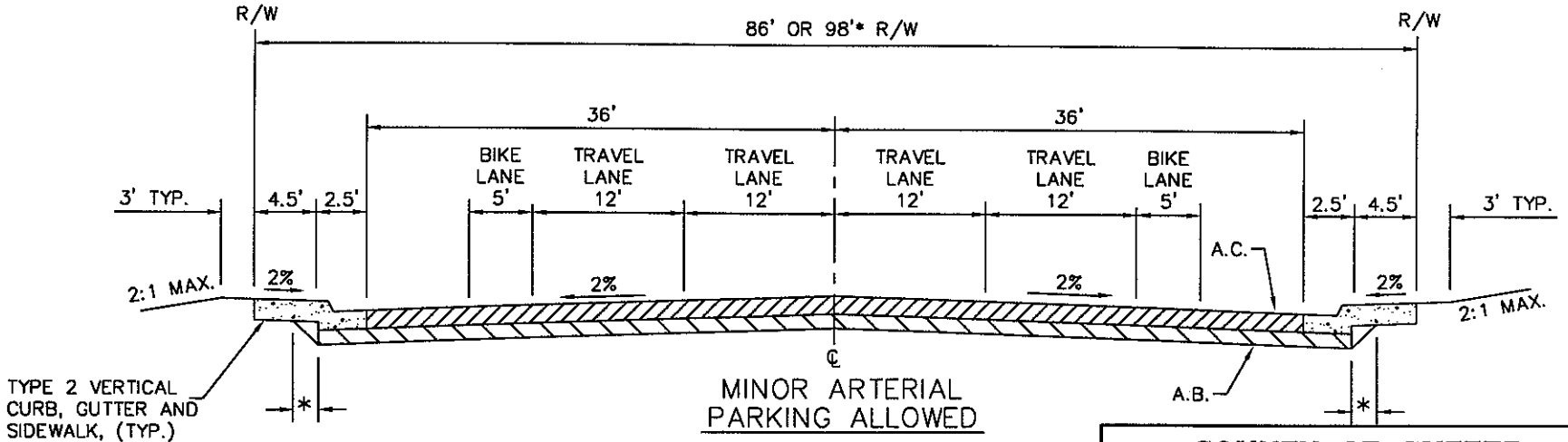
DWG NO. H-5



*6' OPTIONAL PLANTER STRIP BETWEEN BACK OF CURB AND SIDEWALK



MINOR ARTERIAL
NO PARKING ALLOWED



MINOR ARTERIAL
PARKING ALLOWED

NOTES:
SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTION.

DATE	REVISIONS	BY
11/8/05		K.X.

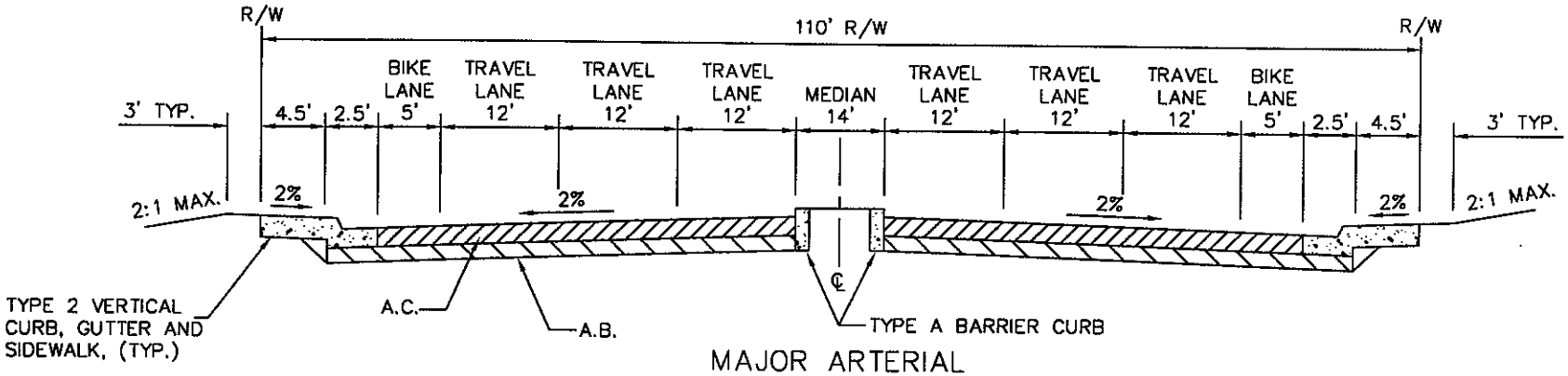
COUNTY OF SUTTER

TYPICAL SECTION
86' MINOR ARTERIAL

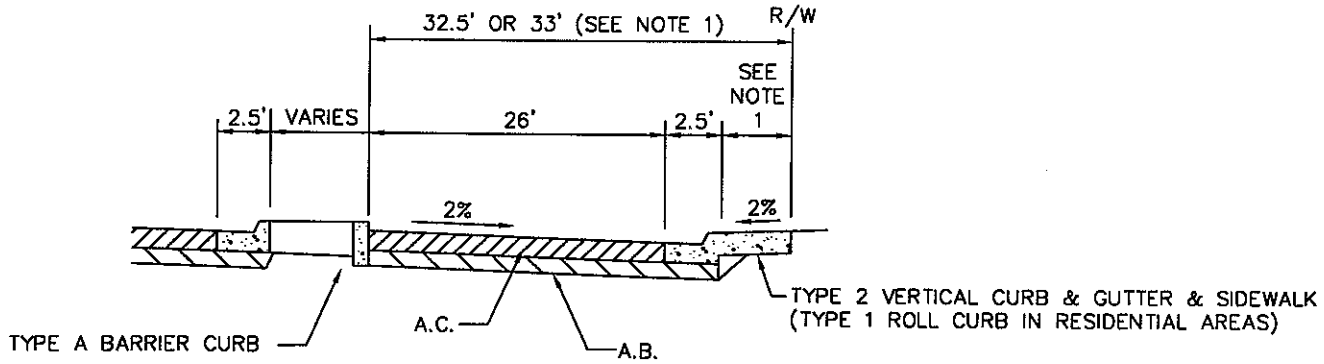
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-6



MAJOR ARTERIAL
NO PARKING ALLOWED



FRONTAGE ROAD

NOTE:

1. SIDEWALK SHALL BE 4' WIDE IN SINGLE FAMILY & DUPLEX RESIDENTIAL AREAS AND 4.5' IN ALL OTHER AREAS.
2. SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTION.

DATE	REVISIONS	BY
11/8/05		K.X.

COUNTY OF SUTTER

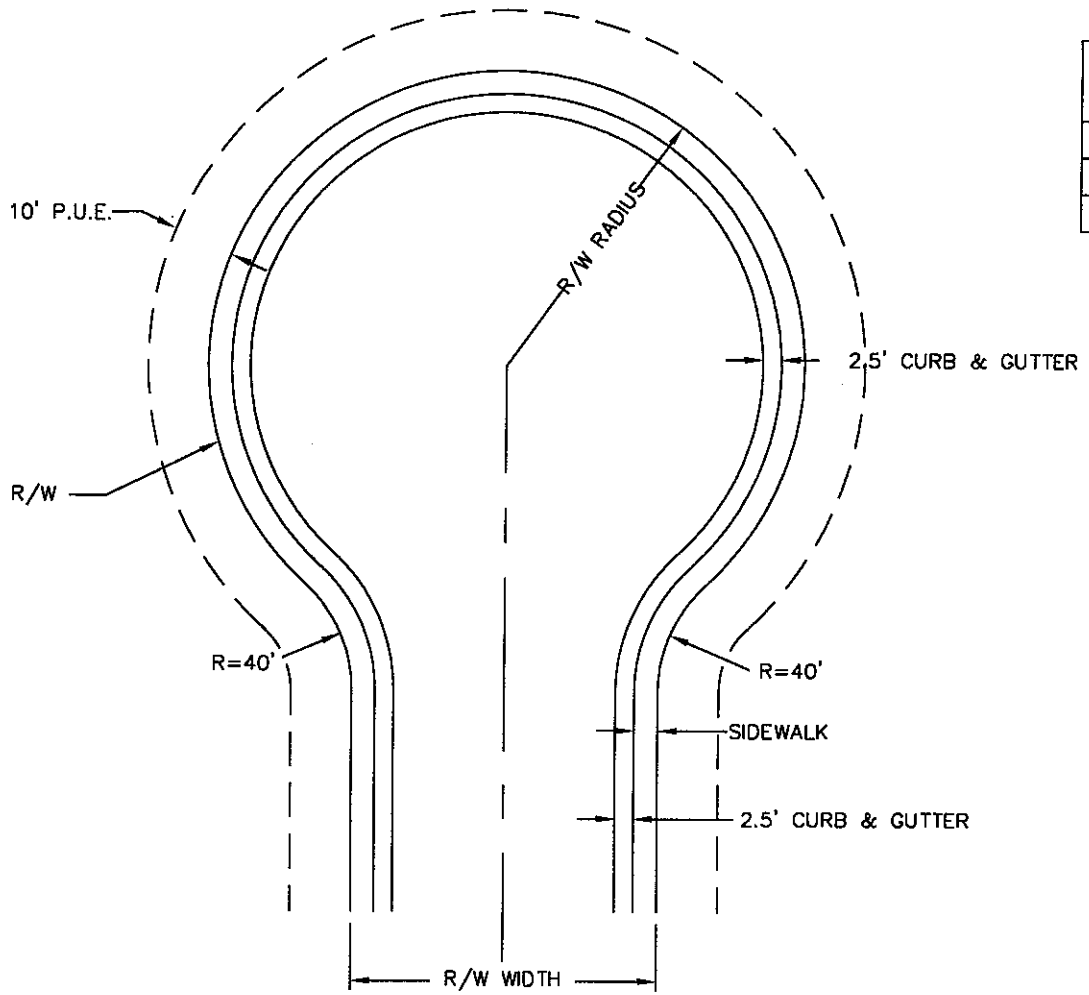
TYPICAL SECTION
110' MAJOR ARTERIAL

APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

DWG NO. H-7

STREET R/W WIDTH	STREET R/W RADIUS
40'	50'
48'	50'
60'	56'



NOTE:

1. A STANDARD CODE W53 (NOT A THROUGH STREET) SIGN IS TO BE POSTED AT THE ENTRANCE TO ALL CUL-DE-SACS GREATER THAN 250 FEET IN LENGTH.
2. SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTION.

DATE	REVISIONS	BY
11/8/05		K.X.

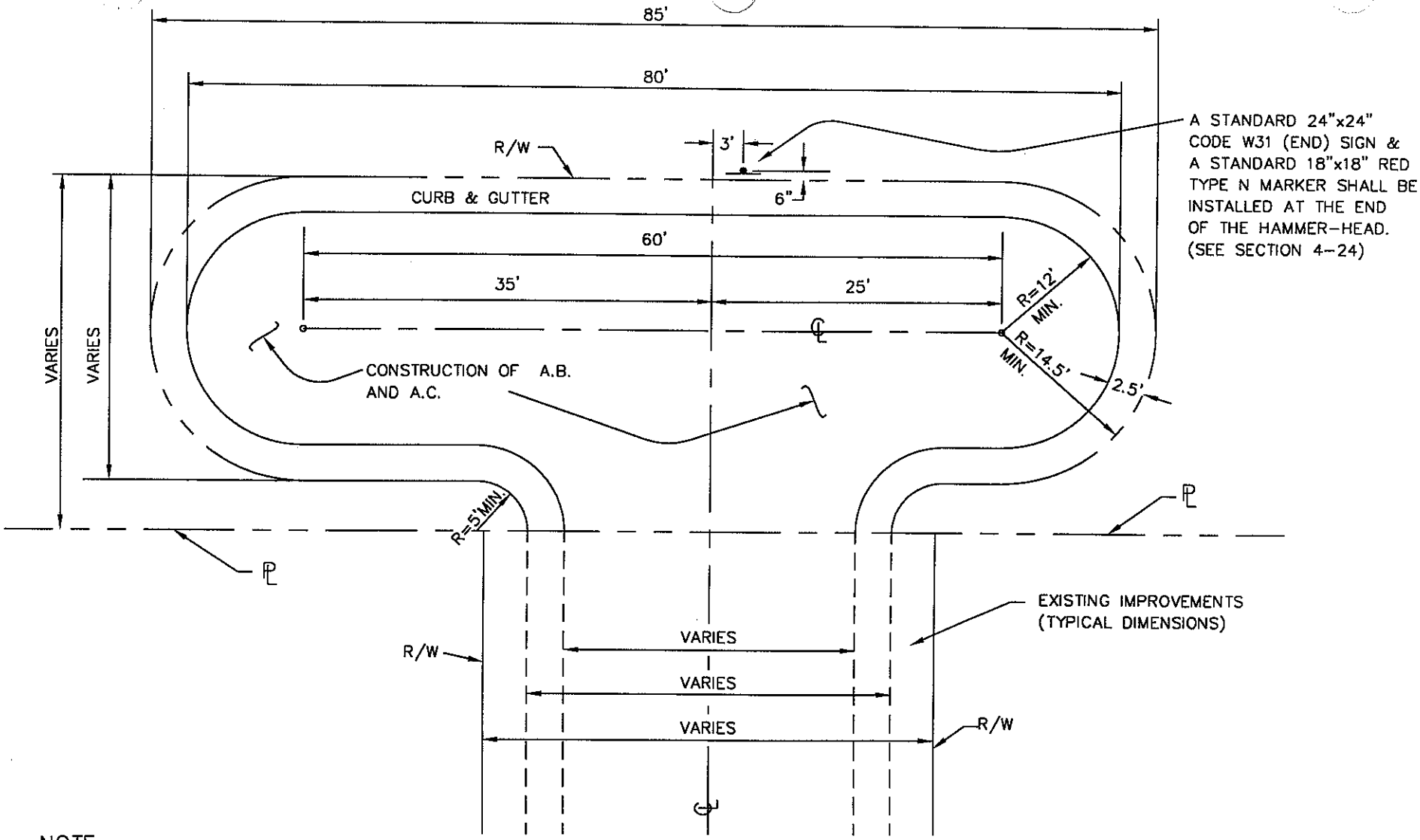
COUNTY OF SUTTER

STANDARD CUL DE SAC

APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

DWG NO. H-8



NOTE:

1. HAMMER-HEAD DESIGN MAY BE USED WHERE TEMPORARY CUL-DE-SAC CAN NOT BE CONSTRUCTED.
2. SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTION.

DATE	REVISIONS	BY
11/8/05		K.X.

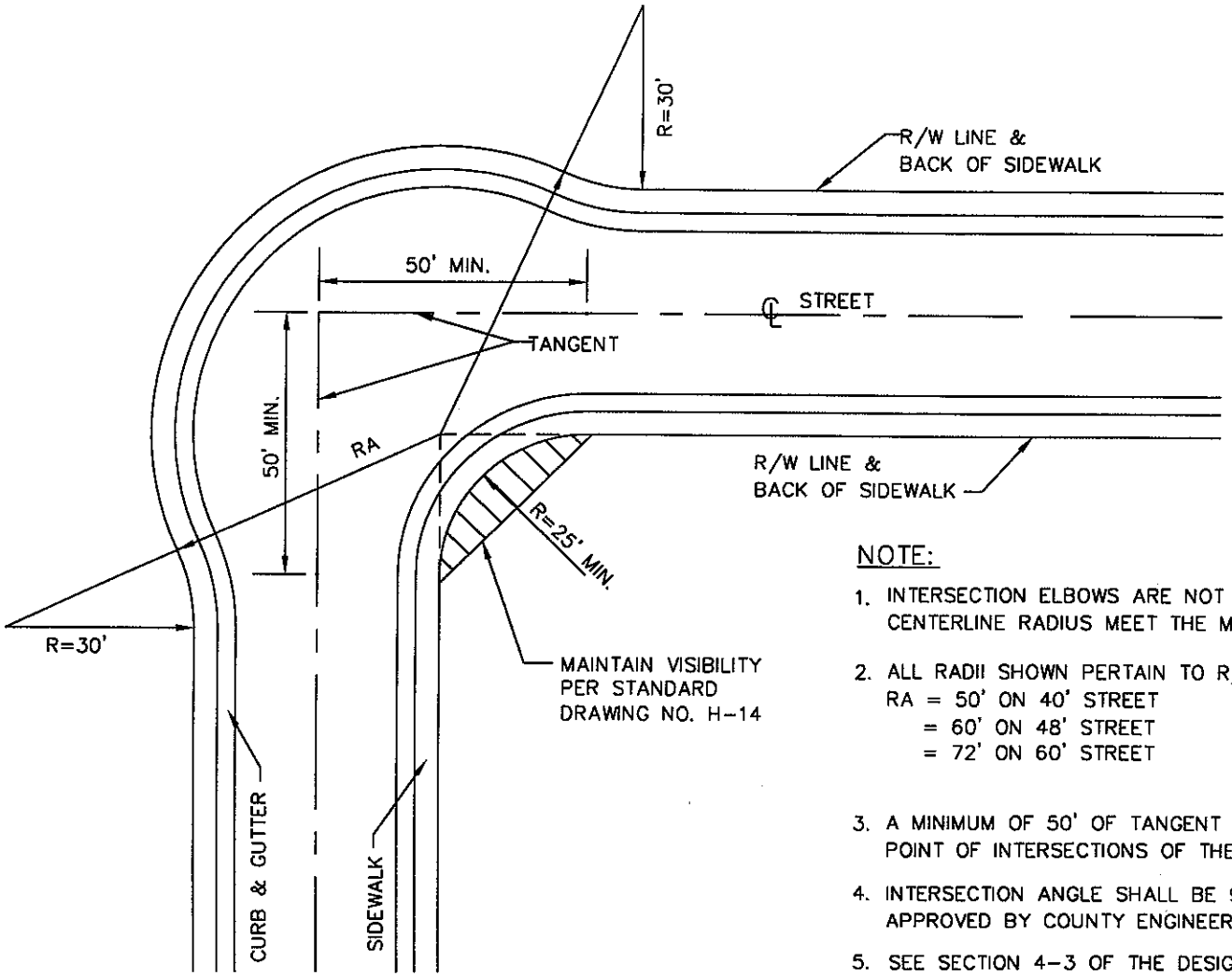
COUNTY OF SUTTER

HAMERHEAD CUL DE SAC

APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-9



NOTE:

1. INTERSECTION ELBOWS ARE NOT REQUIRED WHERE THE CENTERLINE RADIUS MEET THE MINIMUM REQUIREMENTS
2. ALL RADII SHOWN PERTAIN TO R/W LINES.
   RA = 50' ON 40' STREET
   = 60' ON 48' STREET
   = 72' ON 60' STREET
3. A MINIMUM OF 50' OF TANGENT IS REQUIRED FROM THE POINT OF INTERSECTIONS OF THE CENTERLINES.
4. INTERSECTION ANGLE SHALL BE 90° ± 5° EXCEPT AS APPROVED BY COUNTY ENGINEER.
5. SEE SECTION 4-3 OF THE DESIGN STANDARD FOR MINIMUM STRUCTURAL SECTION.

DATE	REVISIONS	BY
11/8/05		K.X.

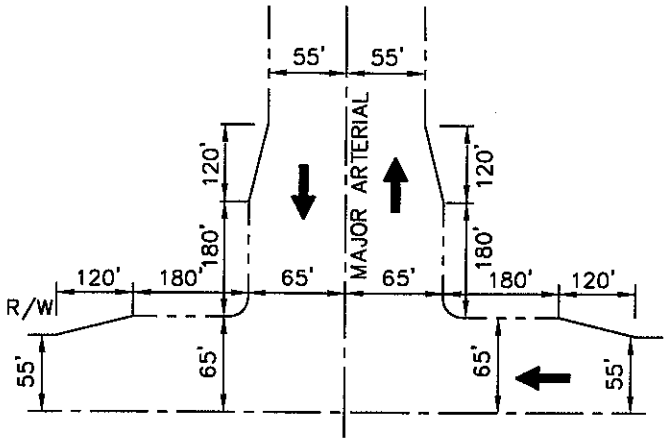
COUNTY OF SUTTER

90° INTERSECTION ELBOW

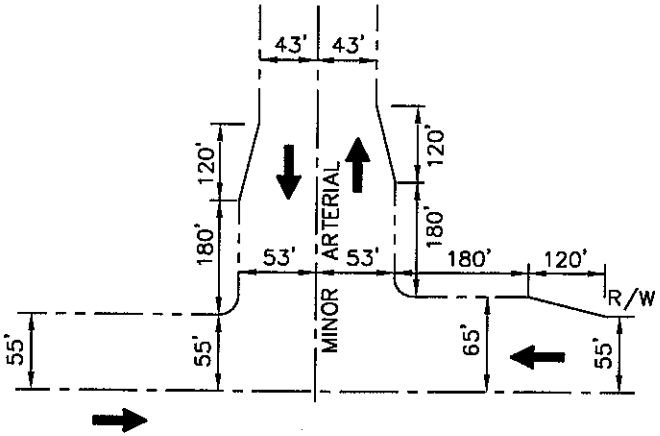
APPROVED — DATE 3/14/06

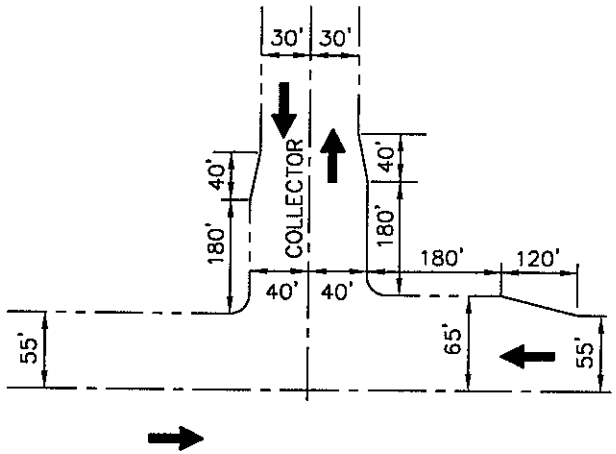
SCALE : NONE
DRN : PSO

DWG NO. H-10

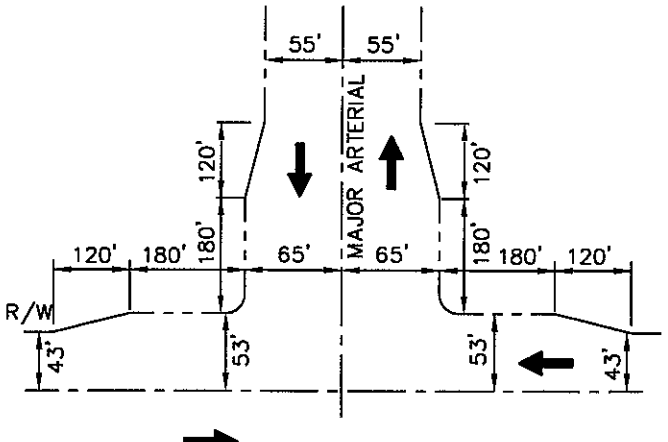


DIRECTION OF TRAVEL

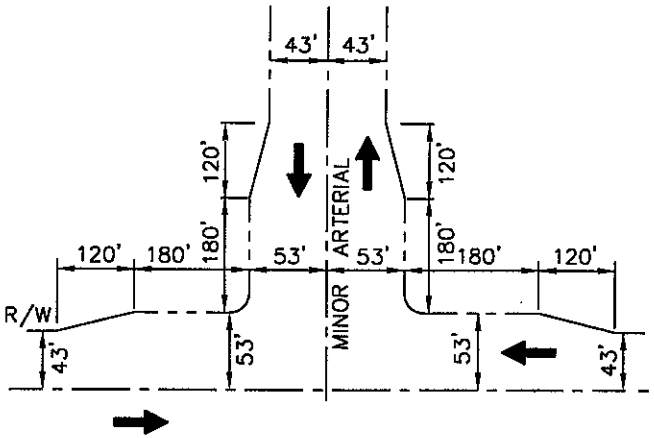


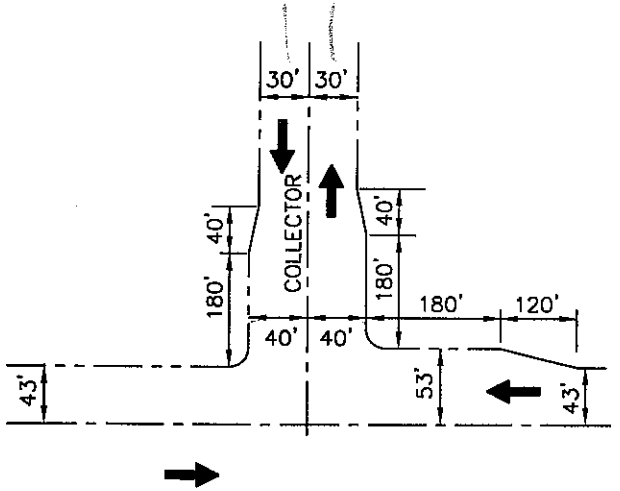


MAJOR ARTERIAL 110' (OR MORE) STREET



DIRECTION OF TRAVEL





MINOR ARTERIAL (86')

NOTE:

1. WIDENING NOT USUALLY REQUIRED AT COLLECTOR/ COLLECTOR AND SMALLER INTERSECTIONS.
2. ANY MODIFICATIONS TO THESE STANDARDS MUST BE APPROVED BY THE DIRECTOR.

DATE	REVISIONS	BY
6/16/04		K.X.

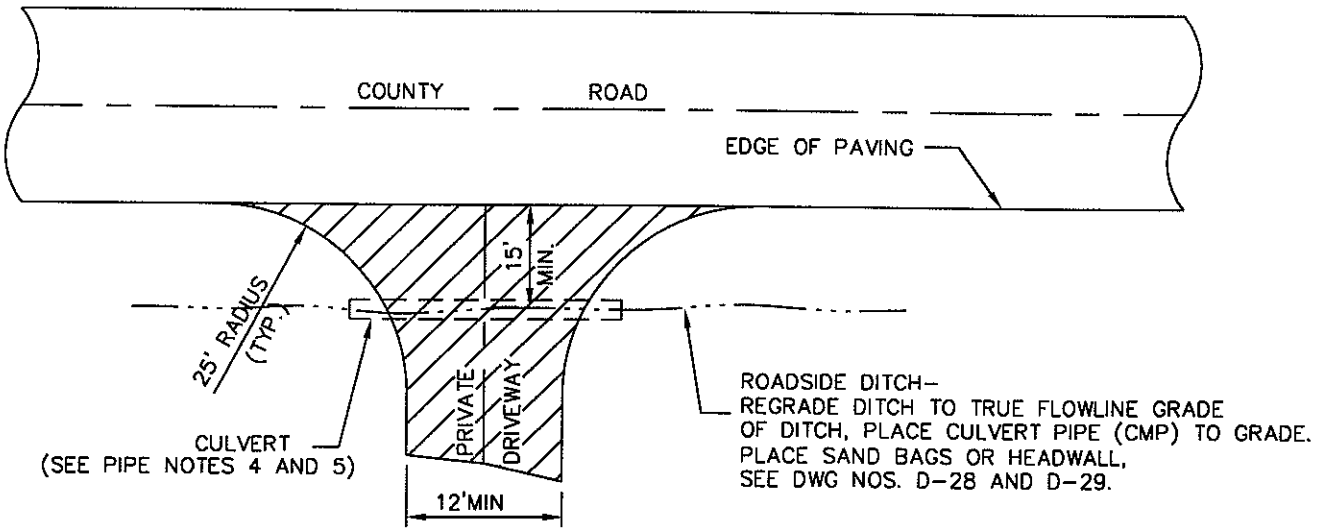
COUNTY OF SUTTER

WIDENING DETAILS AT MAJOR STREET INTERSECTIONS

APPROVED — DATE: 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-11

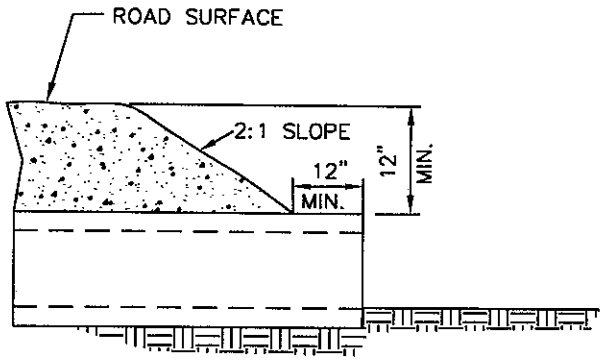


NOTE:

1. Pipe shall be placed slightly below existing grade or at a grade specified by the County Road Department.
2. Pipe sections shall be joined together securely to prevent infiltration.
3. Used pipe is unacceptable.
4. Pipe diameter shall be 12" minimum.
5. Pipe placement shall be 100' maximum in length. Any pipe placement more than 100' in length shall install a DI or leave 5' gap between.

NOTES:

1. Prior to new paving, edge of existing paving at County road is to have a neat, straight, vertical sawcut to tie into.
2. Prior to placing asphalt concrete the sawcut edge is to have a SS-1 tack coat applied.
3. The driveway approach section shall be a minimum of 2 1/2" asphalt concrete on 4" Class II aggregate base rock for residential approaches and 4" asphalt concrete on 6" Class II aggregate base rock for commercial drive approaches. Asphalt concrete shall consist of AR4000, 1/2" maximum aggregate asphalt concrete. Base rock shall be compacted to 95%.
4. Asphalt concrete placement at County road is to be a flush butt joint. Placed to sawcut edge of road and sloped away from road.
5. Finish grade is to slope away from County road at a minimum 2% fall, 5% maximum fall.
6. Paving surface at butt joints shall be sealed with SS-1 emulsion 4" each side of joint after final compaction of asphalt concrete. Sealant shall be sanded as necessary to prevent traffic pick up.
7. All work shall conform to the Standard Specifications of the State of California, Department of Transportation, current edition.
8. Public Works shall be notified 24 hours after permit issue and prior to any work performed. Phone Number 822-7450
9. No additional drainage water direct to County right of way.
10. Appropriate agencies shall be contracted/notified of work prior to any work start for necessary utility permits and USA notification (1-800-227-2600) and markings by permittee/owner.



CULVERT DETAIL

DATE	REVISIONS	BY
11/3/05		K.X.

COUNTY OF SUTTER

DRIVEWAY CONNECTION

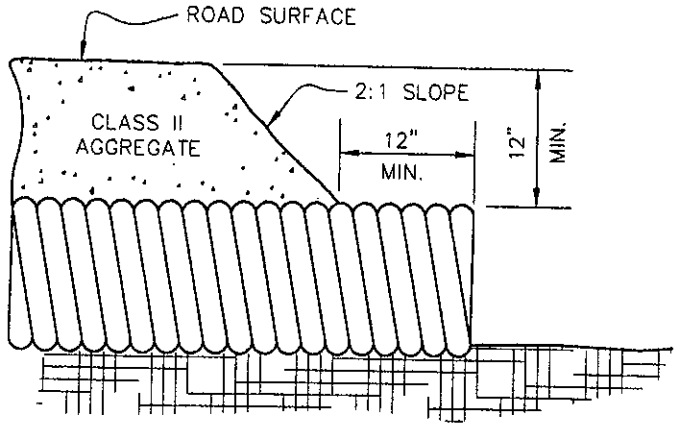
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-12

LENGTH OF TAPER FOR
COUNTY ROADS WITH
LESS THAN 8' SHOULDERS

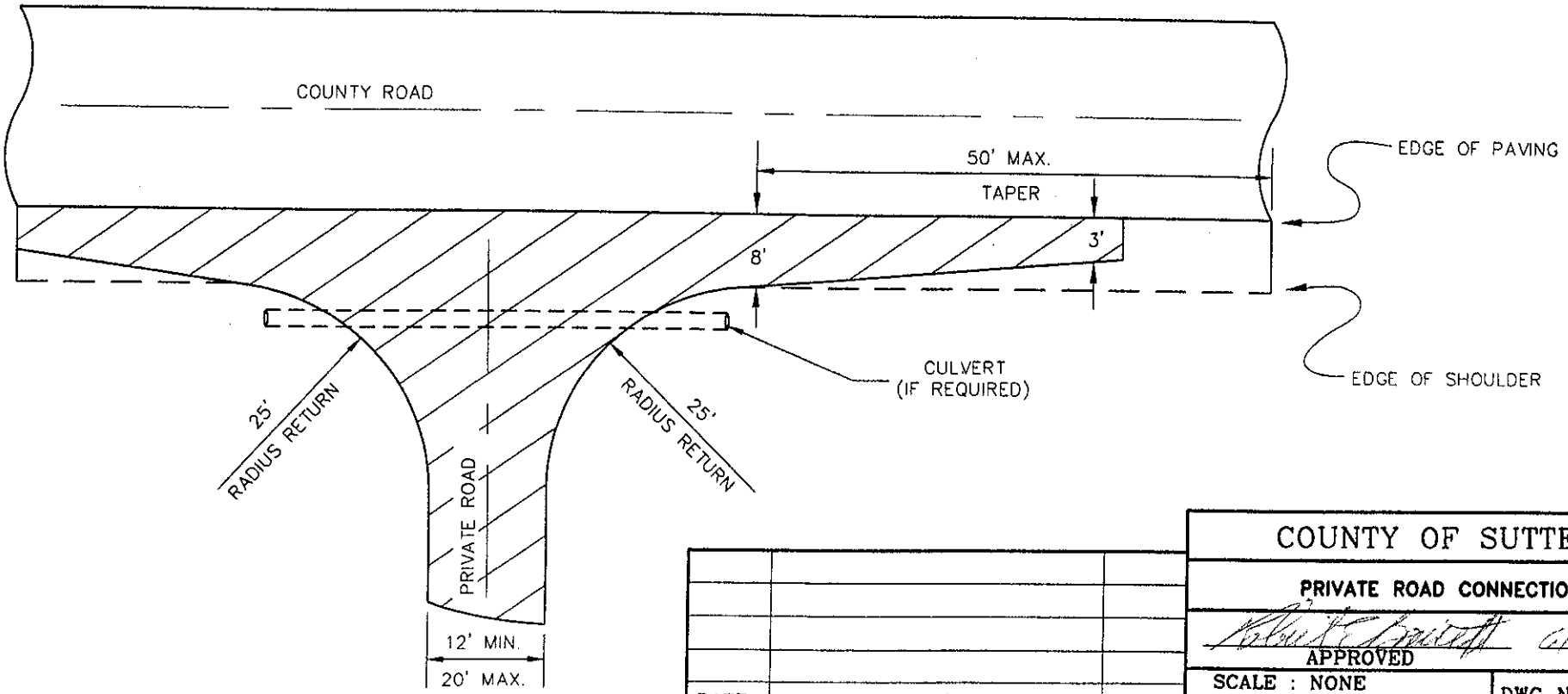
SHOULDER WIDTH	8'	6'	4'	2'	0'
LENGTH OF TAPER	50'	38'	25'	13'	0'



NOTES:

1. PIPE SHALL BE PLACED SLIGHTLY BELOW EXISTING GRADE OR AT A GRADE SPECIFIED BY THE COUNTY ROAD DEPARTMENT
2. PIPE SECTIONS SHALL BE JOINED TOGETHER SECURELY, SO THAT NO INFILTRATION OCCURS.
3. USED PIPE IS UNACCEPTABLE

CULVERT DETAIL



DATE	REVISIONS	BY

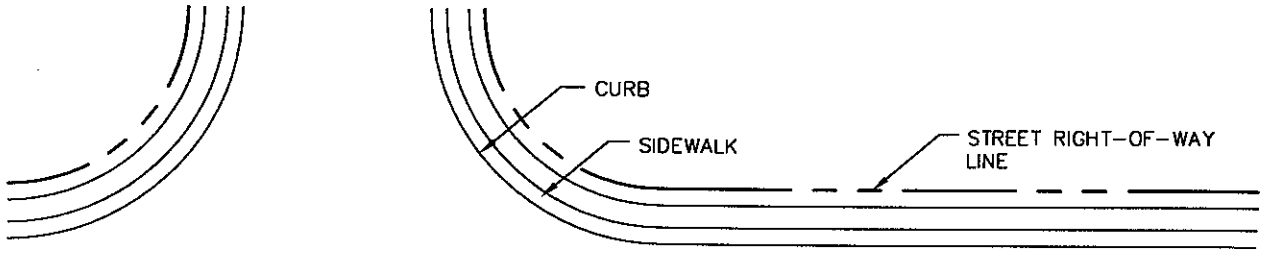
COUNTY OF SUTTER

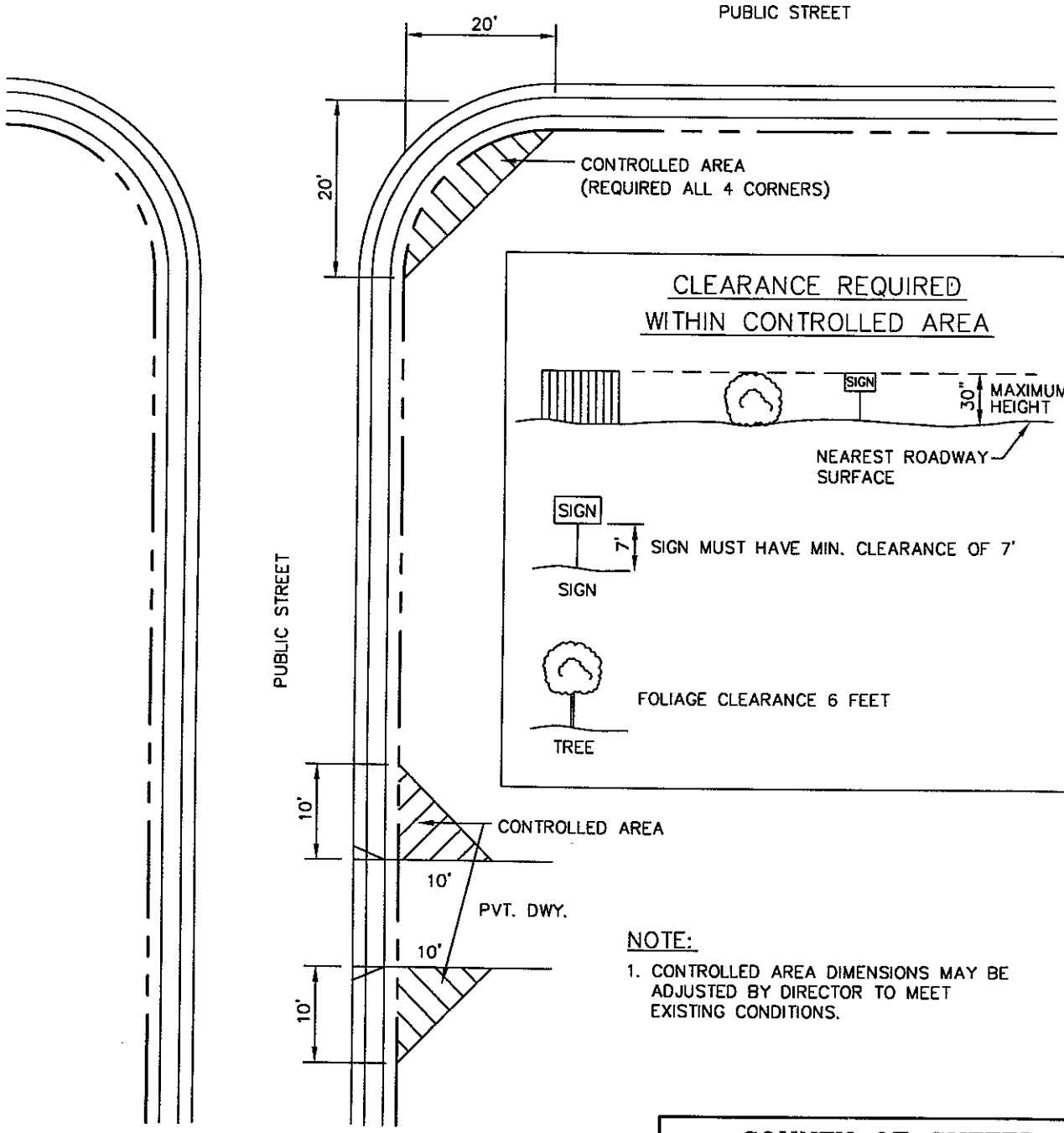
PRIVATE ROAD CONNECTION

APPROVED DATE

SCALE : NONE
DRN : PSO

DWG NO. H-13





CLEARANCE REQUIRED WITHIN CONTROLLED AREA

SIGN MUST HAVE MIN. CLEARANCE OF 7'

FOLIAGE CLEARANCE 6 FEET

NOTE:

1. CONTROLLED AREA DIMENSIONS MAY BE ADJUSTED BY DIRECTOR TO MEET EXISTING CONDITIONS.

DATE	REVISIONS	BY
11/8/05		K.X.

COUNTY OF SUTTER

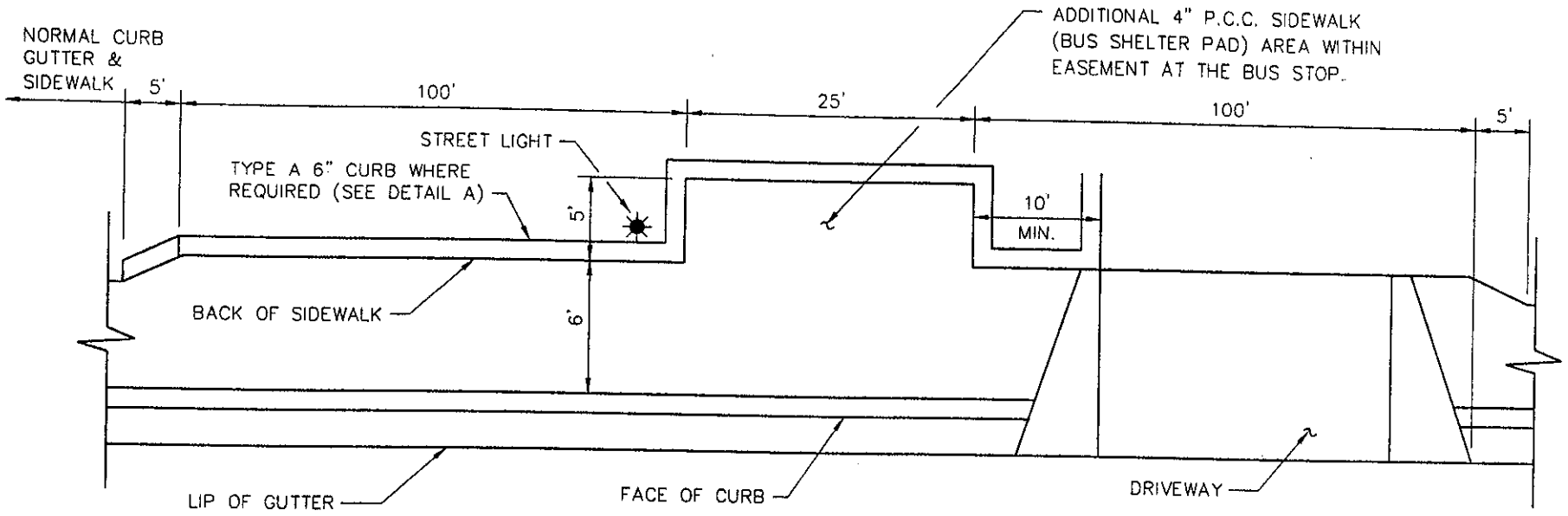
VISIBILITY REQUIREMENTS
RESIDENTIAL STREETS

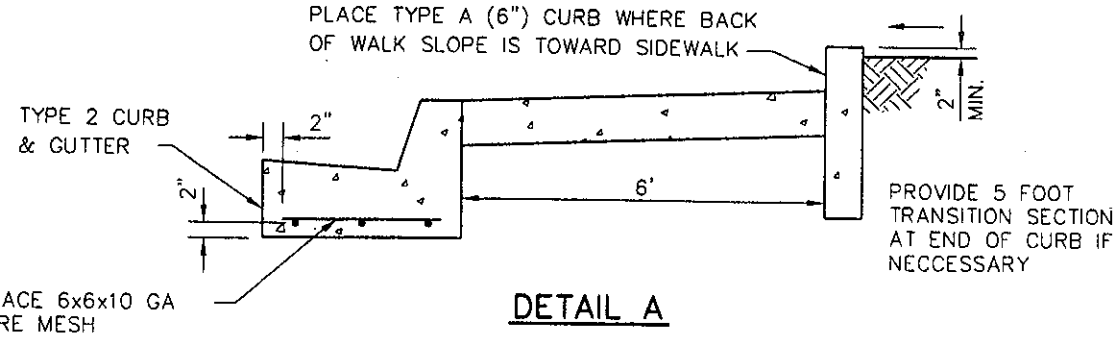
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-14

Mar. 25, 199 8:45 DWG Name: R:\develop\SUT0202\Std-Det\Sutter\yt-14.dwg Updated By: JMillard





DETAIL A

NOTES:

1. DETAIL 'A' SECTION SHALL BE USED FOR 100 FEET EACH SIDE OF BUS STOPS WITHOUT TURNOUTS. THE WIRE MESH REINFORCING STEEL SHALL BE CONTINUED ACROSS ANY DRIVEWAYS WITHIN THE 100 FOOT DISTANCE FROM THE BUS STOP.
2. PLACE UNDER-SIDEWALK DRAINS AT ALL BEHIND-SIDEWALK DRAINAGE CATCH POINTS.

DATE	REVISIONS	BY

COUNTY OF SUTTER

BUS STOP

APPROVED DATE 6/15/02

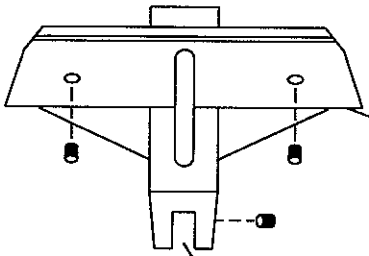
SCALE : NONE
DRN : PSO

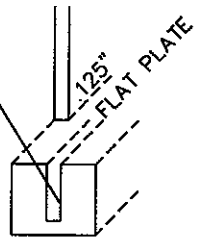
DWG NO. H-15

NOTE:

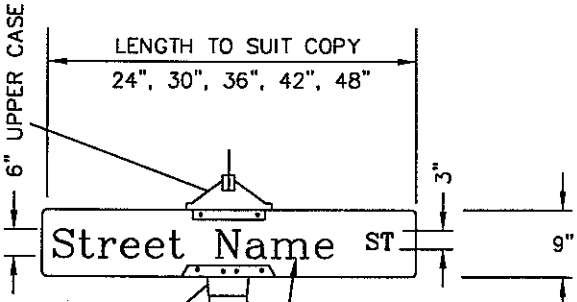
Use heavy duty slotted high tensile aluminum alloy die castings for caps & cross pieces Hawkins & Hawkins (part #'s given) or equal.

90° CROSSPIECE NO. V14(HD)SL-105-90



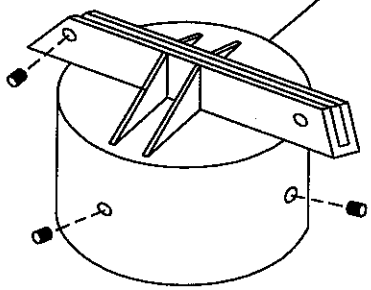


INDICATOR S68



4 1/2" LOWERCASE

Cap & Crosspiece set screws 5/16"-18x1/4 steel plated socket hd. No. v14(hd) IIOS.

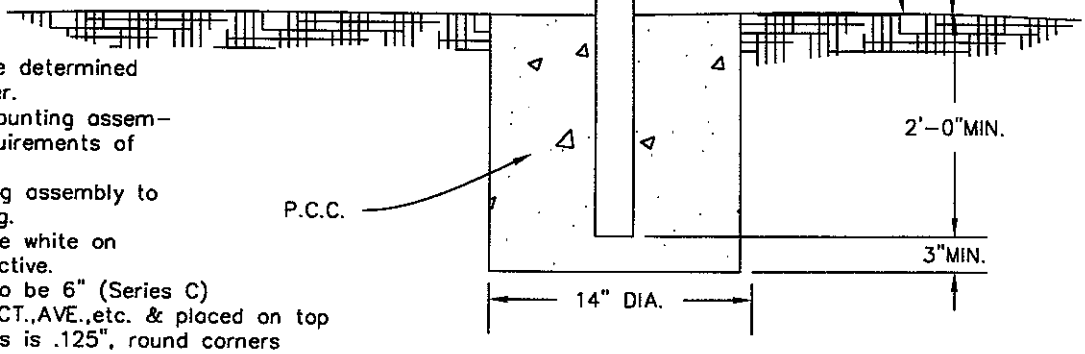


Cap for 2" I.D. Pipe NO. V14 (hd)SL-107.2C

8'-0"MIN. TO 9'-0" MAX.

FINISH GRADE

2" DIA. GALVANIZED PIPE



NOTES:

1.) Sign location to be determined by the County Engineer.
2.) Name plates & mounting assemblies to meet the requirements of the County Engineer.
3.) Spot weld mounting assembly to pipe to prevent turning.
4.) Plate color shall be white on green & shall be reflective.
5.) Reflective letters to be 6" (Series C) for name, and 3" ST.,CT.,AVE.,etc. & placed on top
6.) Flat Plate thickness is .125", round corners

DATE	REVISIONS	BY
6/22/04		K.X.

COUNTY OF SUTTER

STANDARD STREET NAME SIGN TYPE "A"

APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

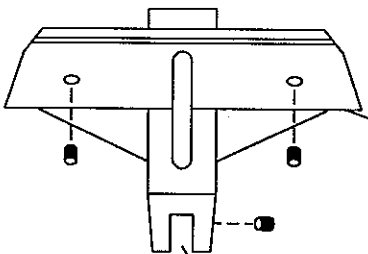
DWG NO. H-16

DWG Name: R:\Develop\SUT0202\Std-Det\Sutter\Std Dwgs\H-16.dwg Updated By: RLehutsky
Jan. 08, 2003 - 1:

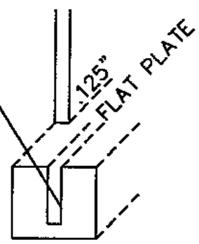
NOTE:

Use heavy duty slotted high tensile aluminum alloy die castings for caps & cross pieces Hawkins & Hawkins (part #'s given) or equal.

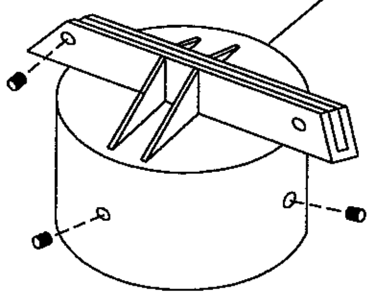
90° CROSSPIECE NO. V14(HD)SL-105-90



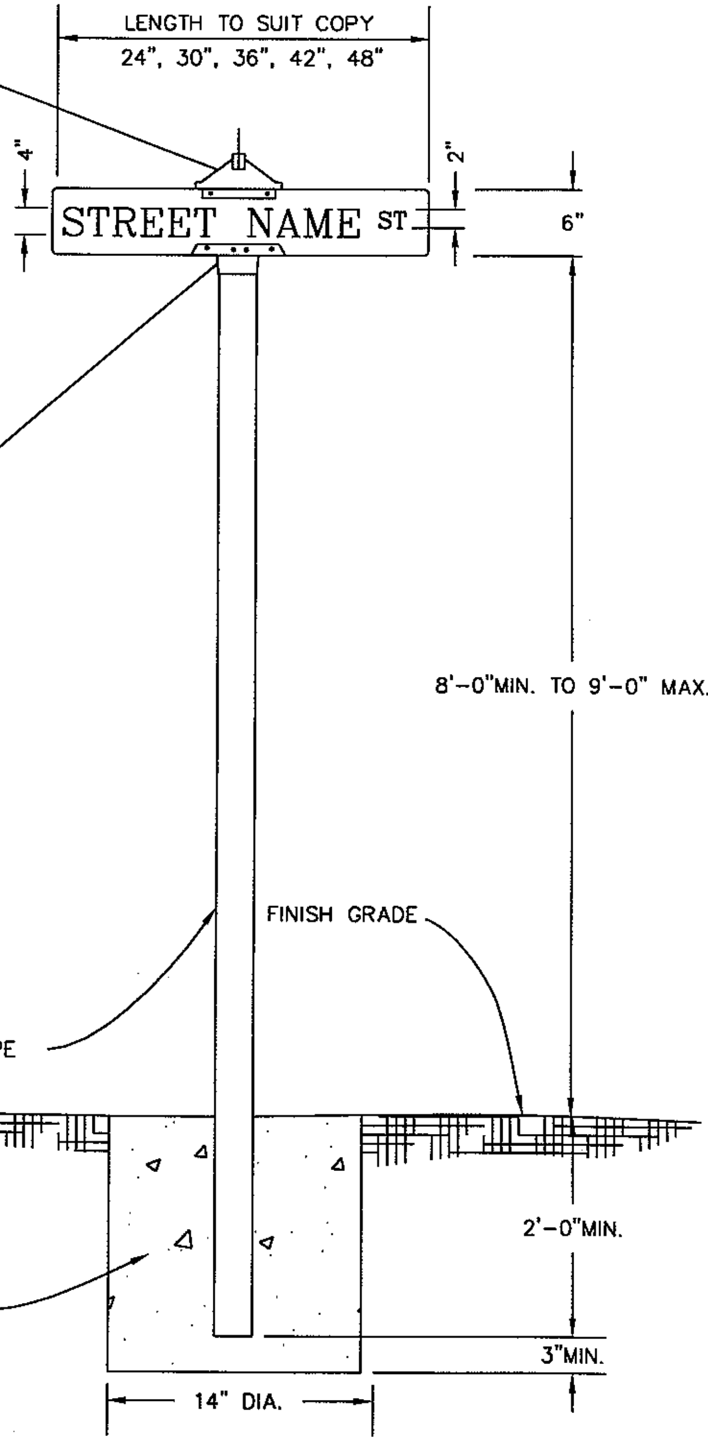
INDICATOR S68



Cap & Crosspiece set screws 5/16"-18x1/4 steel plated socket hd. No. v14(hd) IIOS.



Cap for 2" I.D. Pipe NO. V14 (hd)SL-107.2C



NOTES:

1.) Sign location to be determined by the County Engineer.
2.) Name plates & mounting assemblies to meet the requirements of the County Engineer.
3.) Spot weld mounting assembly to pipe to prevent turning.
4.) Plate color shall be white on green & shall be reflective.
5.) Reflective letters to be 4" (Series C) for name, and 2" ST.,CT.,AVE.,etc. & placed on top
6.) Flat Plate thickness is .125", round corners

6/22/04		K.X.
DATE	REVISIONS	BY

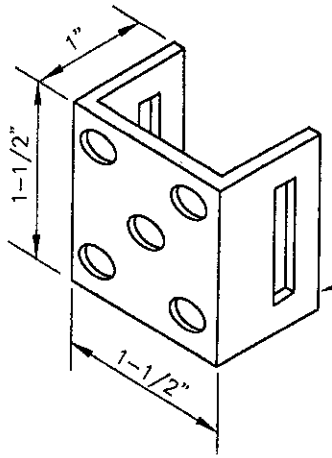
COUNTY OF SUTTER

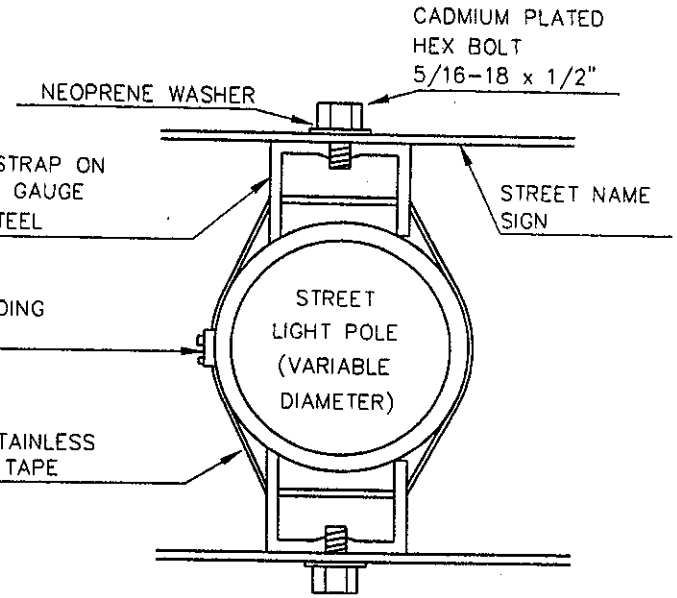
STANDARD STREET NAME SIGN TYPE "B"

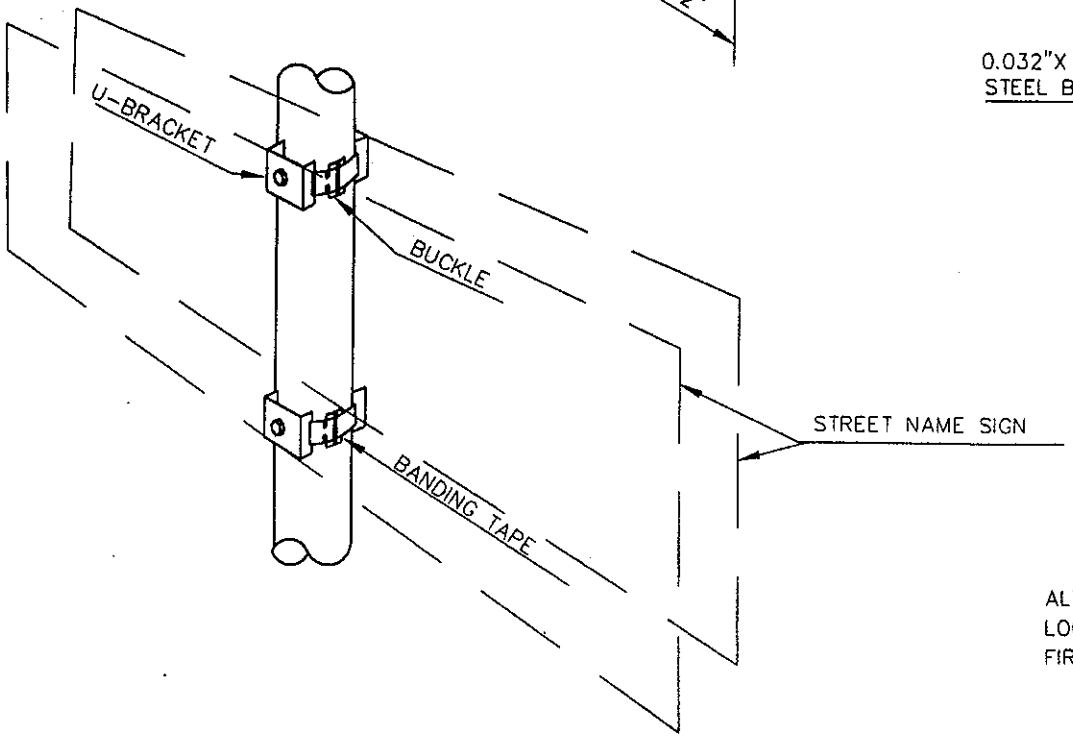
APPROVED 3/14/06 DATE

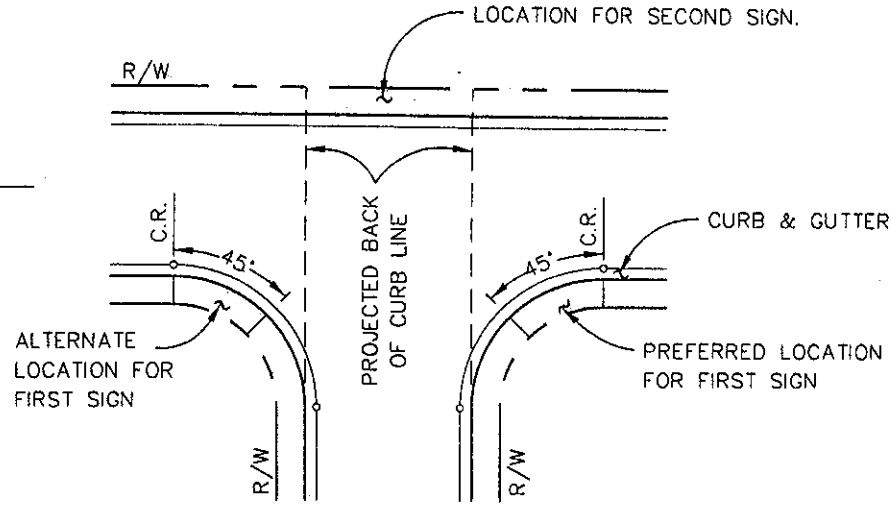
SCALE : NONE
DRN : PSO

DWG NO. H-16A









NOTES:

1. DETAIL SHOWN IS FOR TWO SIGN INSTALLATION. FOUR SIGN INSTALLATION MAY BE MADE, WHERE APPLICABLE, BY FASTENING A SECOND PAIR OF SIGNS IN THE SAME MANNER.
2. STANDARD CLEARANCE TO BOTTOM OF LOWEST SIGN IS 7 FEET.
3. STREET NAME SIGNS MAY BE INSTALLED ON STREET LIGHT POLES WHEN THEY ARE LOCATED WITHIN THE LIMITS DEFINED ON THIS DETAIL.

DATE	REVISIONS	BY

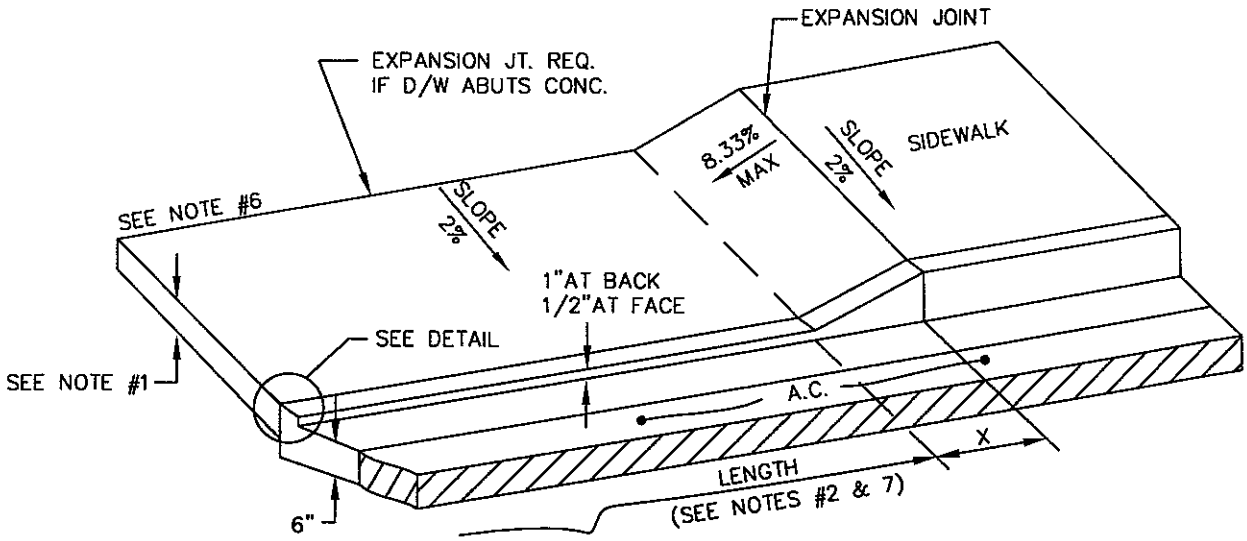
COUNTY OF SUTTER

STREET NAME SIGN INSTALLATION
PLACEMENT ON STREET LIGHT POLE

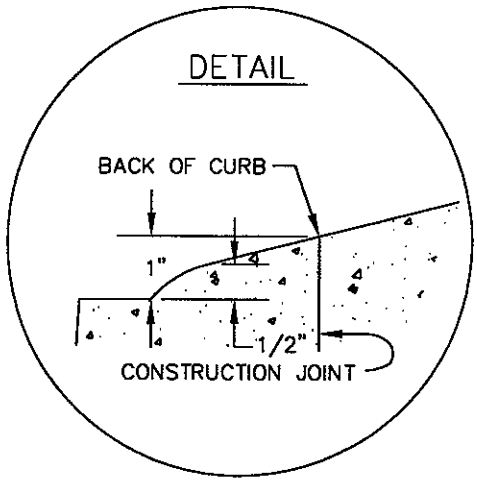
APPROVED — DATE 6/18/02

SCALE : NONE
DRN : PSO

DWG NO. H-17



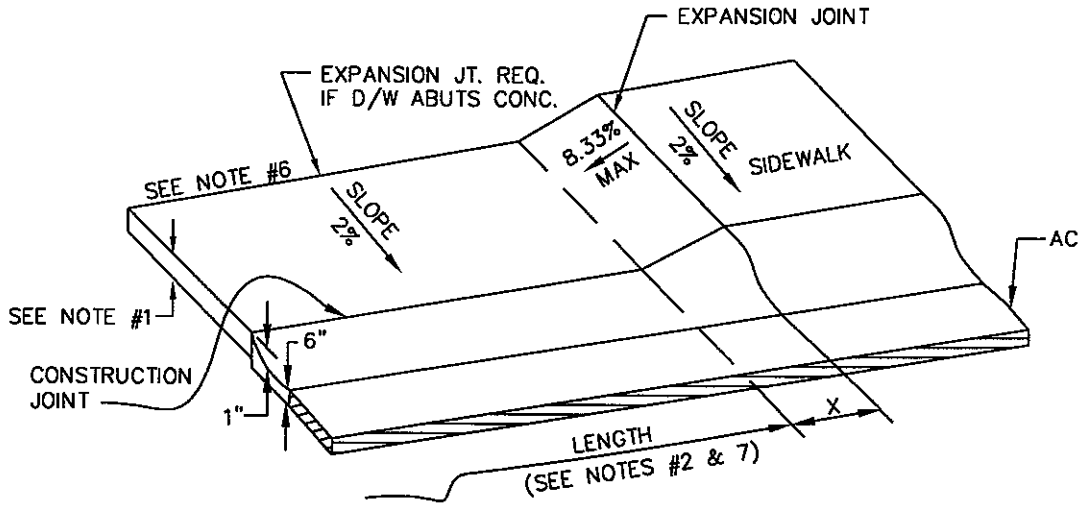
TYPE 2 CURB & GUTTER



"X" LENGTH		
ROLL	6"CURB	8"CURB
3'	5'	7'

NOTES:

1.) Min. D/W slab thickness in single family residential areas shall be 4".
2.) Min. width of residential D/W shall be 12', & max of 24'.
3.) All concrete removals shall be to neat saw cut lines.
5.) D/W approach shall be poured separately from curb unless otherwise approved by the engineer.
6.) On site grading may be required to eliminate excessive grade change and to maintain suitable drainage.
7.) Maximum curb opening may be increased due to special conditions on approval of county engineer.



TYPE 1 ROLL CURB

11/9/05		K.K.
DATE	REVISIONS	BY

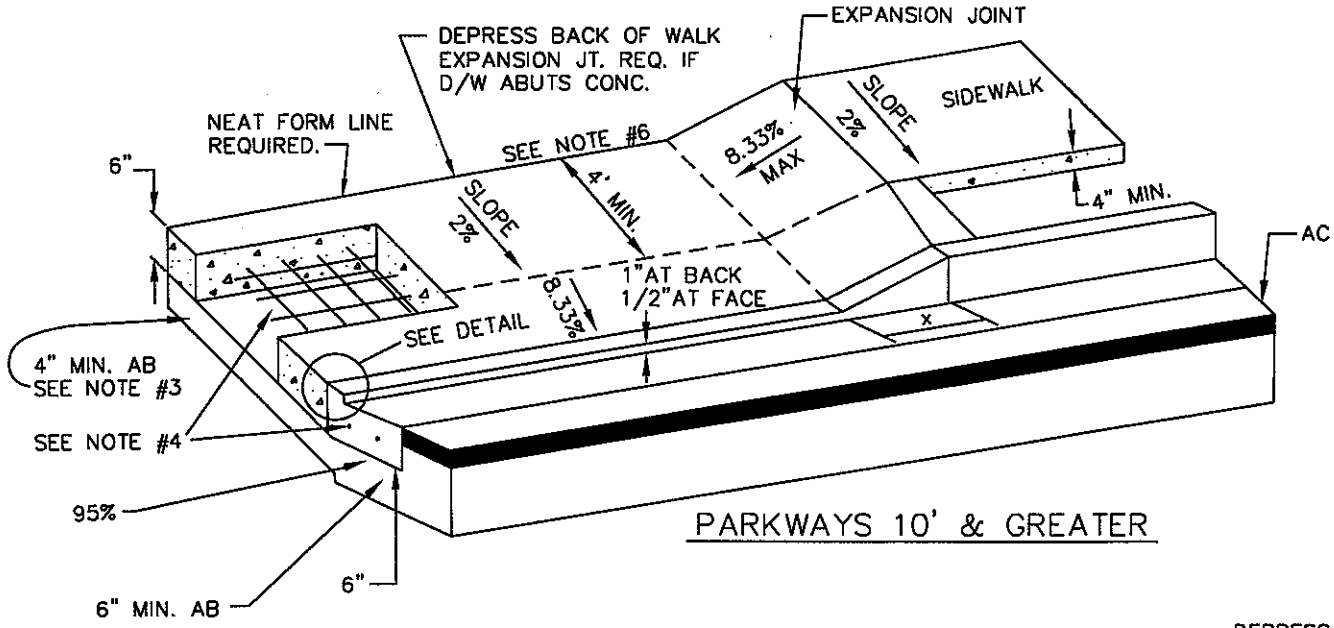
COUNTY OF SUTTER

RESIDENTIAL DRIVEWAY

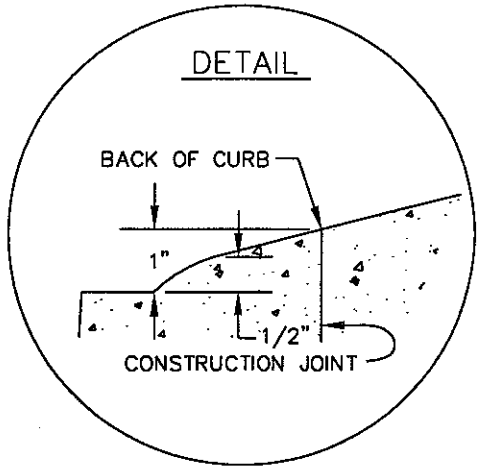
APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-18

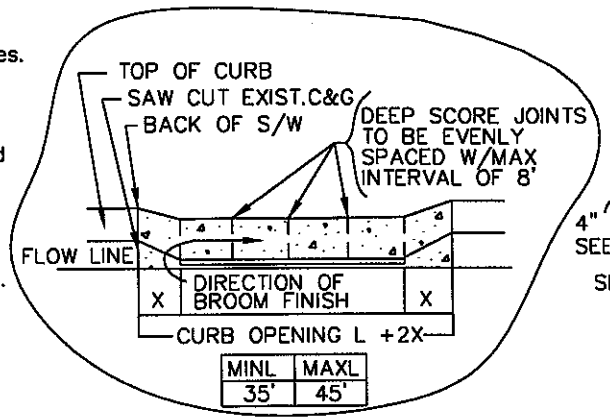


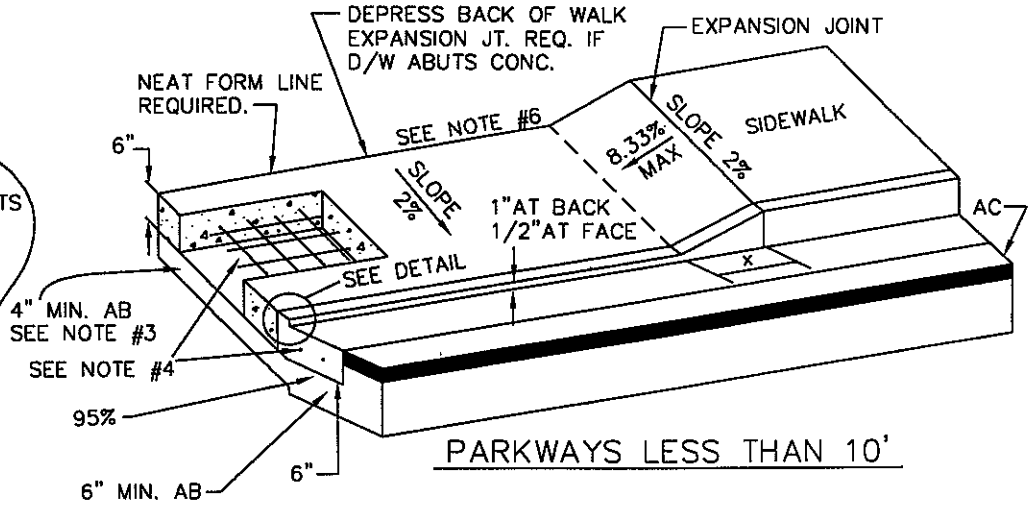
PARKWAYS 10' & GREATER



NOTES:

1.) All concrete removal shall be to neat saw cut lines.
2.) 95% relative compaction required on subgrade.
3.) 1" additional concrete thickness may be substituted for the required 4" of class 2 A.B.
4.) All driveways shall have 2 No. 4 rebar 12" O.C. in the gutter and 6"x6"x10 G.A. wire mesh throughout the approach.
5.) D/W approach shall be poured separately with curb unless otherwise approved by the engineer.
6.) On site grading may be required to eliminate excessive grade change and to maintain suitable drainage.
7.) Maximum curb opening may be increased due to special conditions on approval of county engineer.





PARKWAYS LESS THAN 10'

X LENGTH		
PARKWAY WIDTH	6" CURB	8" CURB
≥ 10'	3'	5'
< 10'	5'	7'

DATE	REVISIONS	BY
6/22/04		K.X.

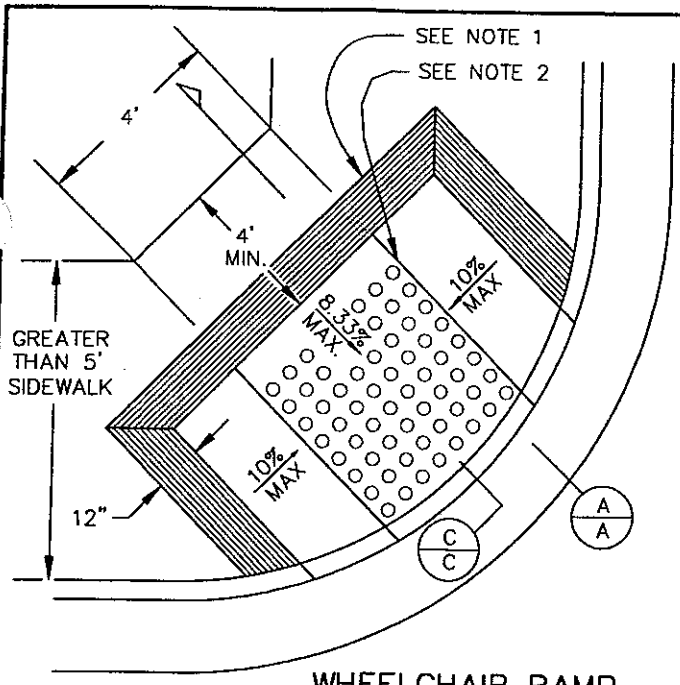
COUNTY OF SUTTER

COMMERCIAL DRIVEWAY

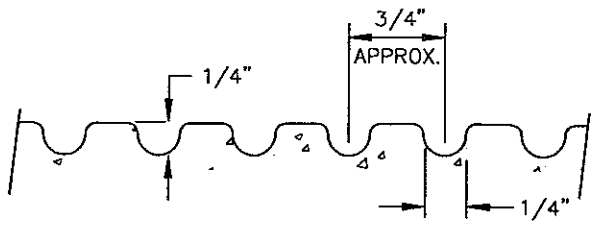
APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

DWG NO. H-19



WHEELCHAIR RAMP
FOR SIDEWALKS GREATER THAN 5'

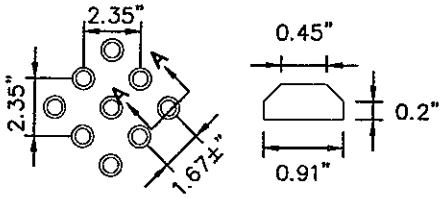


GROOVE DETAIL (2)
N.T.S.

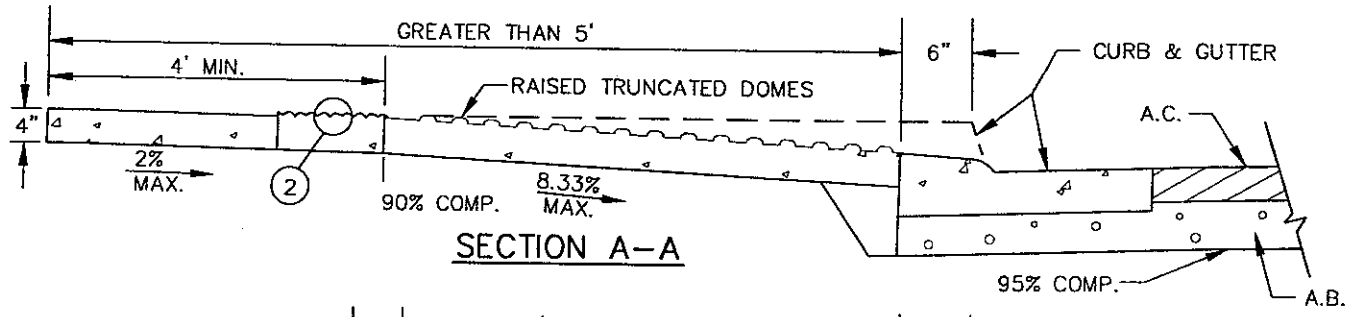
NOTES:

1.) The ramp shall have a 12" wide border w/1/4" grooves approx. 3/4" O.C. (see groove detail). The surface of the ramp shall have a transverse broomed surface texture rougher than the surrounding sidewalk.

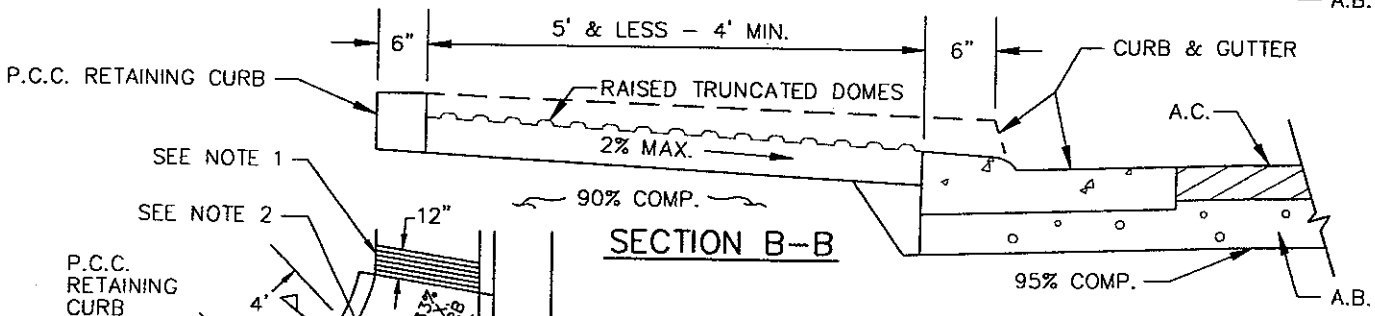
2.) Domes may be omitted when ramp slope exceeds 6.67%. Truncated domes per Caltrans Std. Pln. a88-1. See section 71-4 c.2. and 71-5 of the Caltrans Const. Specs. for required product or approved equal information.



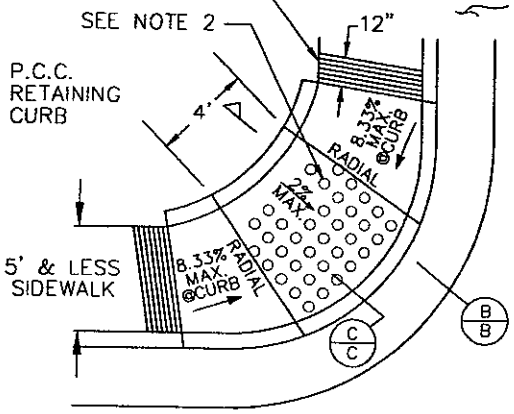
TRUNCATED DOME DETAIL



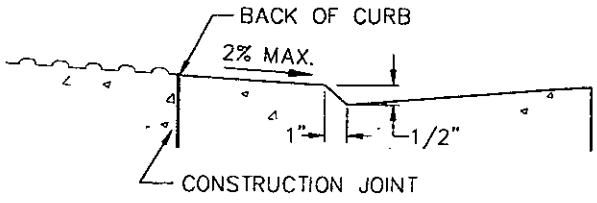
SECTION A-A



SECTION B-B



WHEELCHAIR RAMP
FOR SIDEWALKS 5' AND LESS



SECTION C-C

DATE	REVISIONS	BY

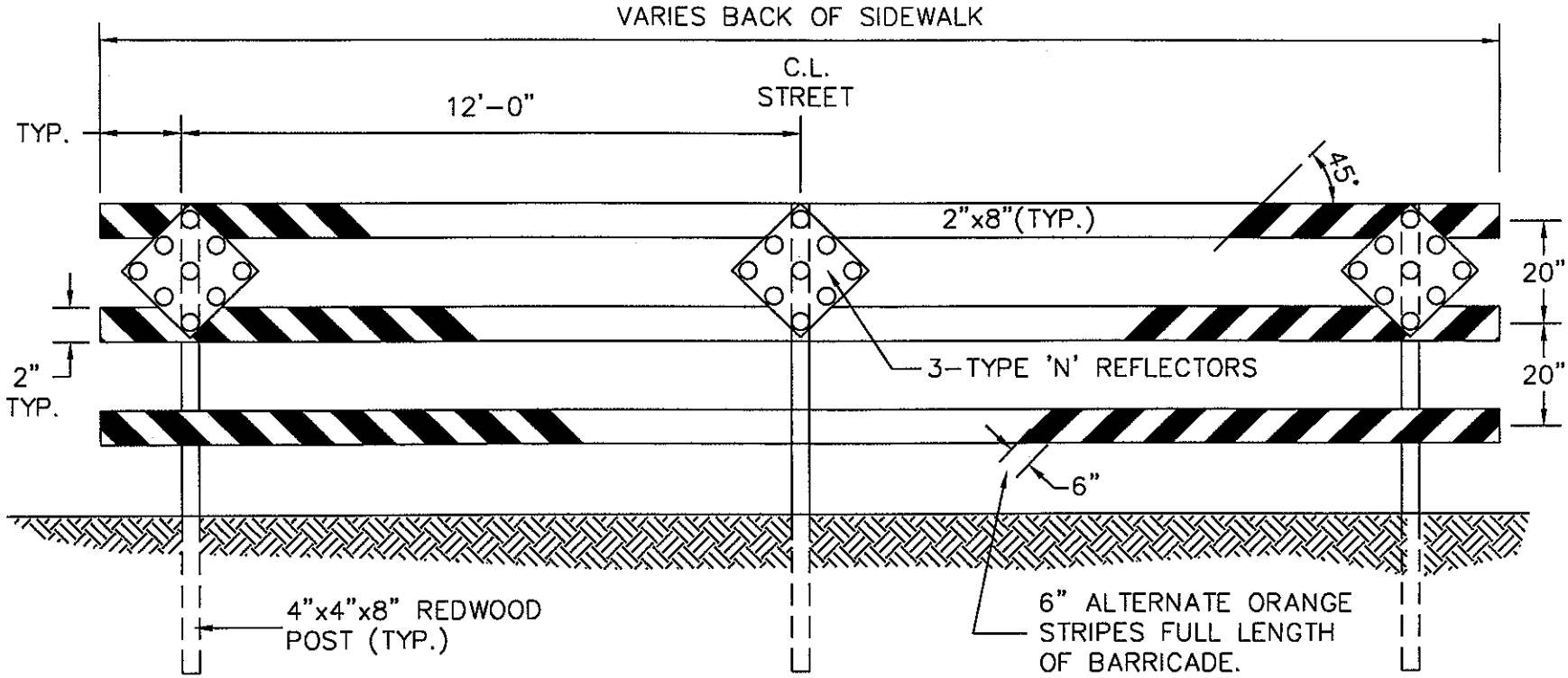
COUNTY OF SUTTER

WHEELCHAIR RAMP

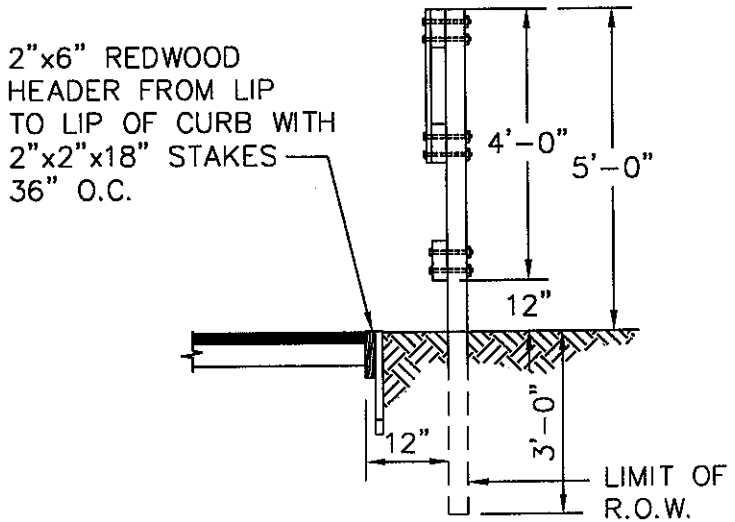
APPROVED _____ DATE 6/18/02

SCALE : NONE
DRN : PSO

DWG NO. H-20



FRONT



SIDE

NOTE:
ALL EXPOSED SURFACES TO BE PAINTED WITH 2 COATS OF WHITE AND ONE COAT OF ORANGE FOR STRIPES. BOTH PAINTS TO CONFORM TO SECT. 91-3.02 OF THE CA. DIV. OF HOGHWAYS STANDARD SPECS. ALL POSTS SHALL BE FOUNDATION GRADE REDWWOD. 2"x8" CROSS MEMBERS SHALL BE CONSTRUCTION GRADE DOUGLAS FIR. BARRICADE(S) SHALL EXTEND TO BACK OF WALK.

DATE	REVISIONS	BY
6/16/04		K.X.

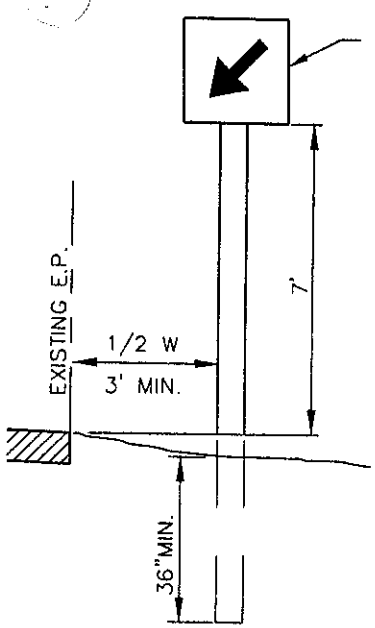
COUNTY OF SUTTER

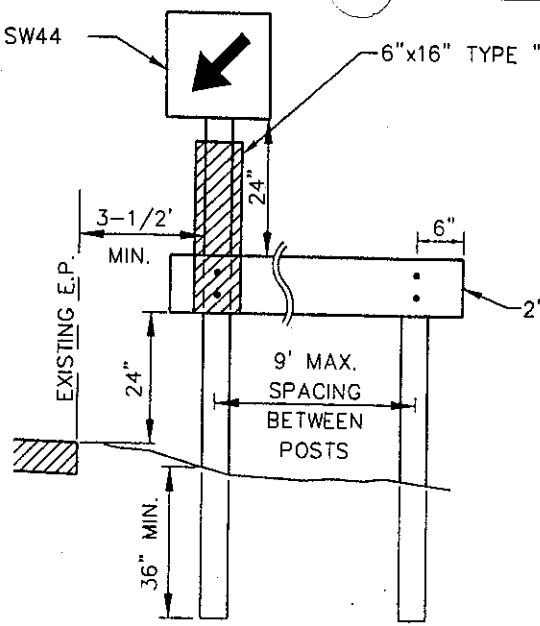
STANDARD TIMBER BARRICADE

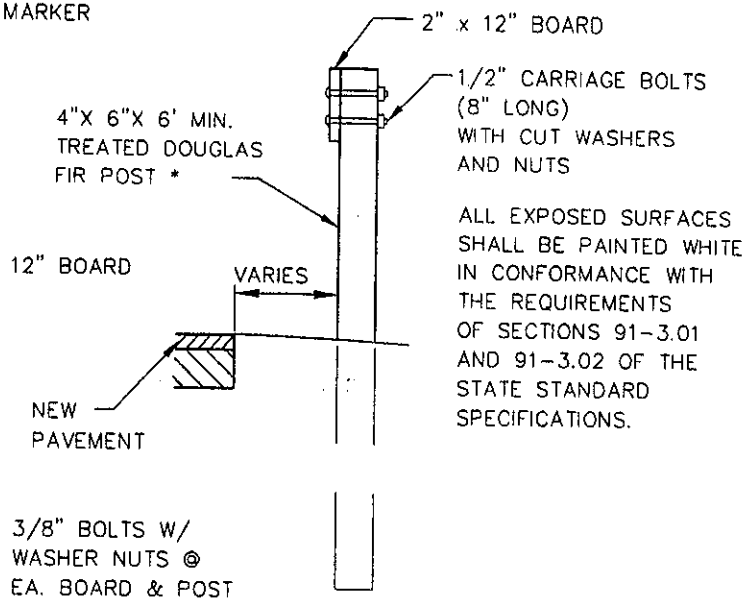
APPROVED 3/14/06 DATE

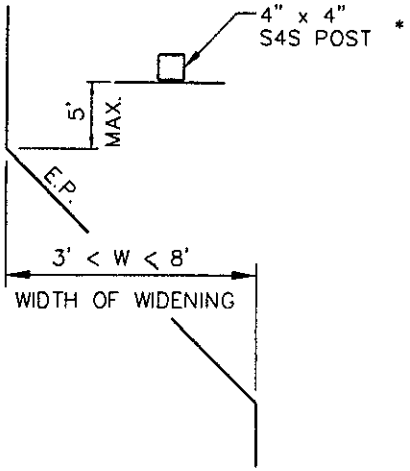
SCALE : NONE
DRN : PSO

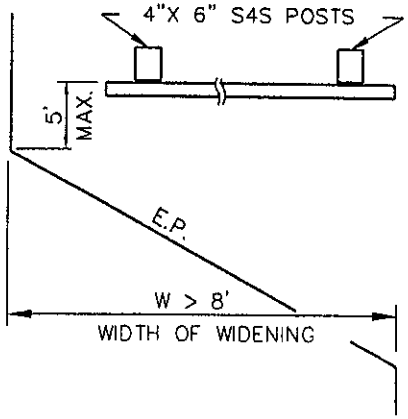
DWG NO. H-21

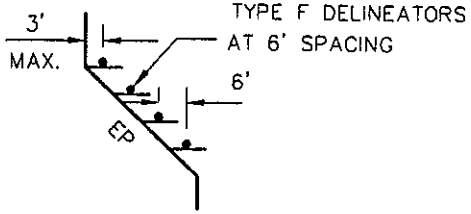












SPECIAL APPLICATION AT DIRECTION OF ENGINEER

**W4-2 IN LIEU OF TYPE F DELINEATOR
AT DIRECTION OF ENGINEER

* STATE OF CALIFORNIA SPECIFICATIONS 56-2.02B

DATE	REVISIONS	BY

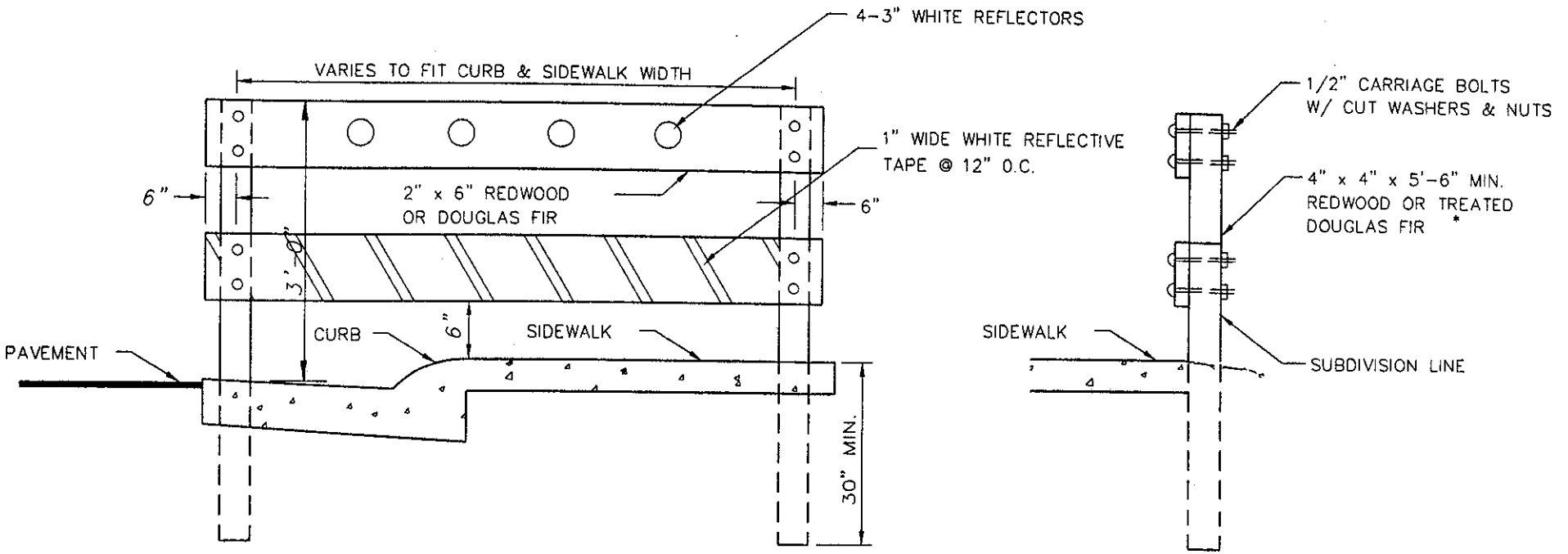
COUNTY OF SUTTER

BARRICADE PAVEMENT WIDENING

APPROVED DATE

SCALE : NONE
DRN : PSO

DWG NO. H-22



NOTE:

1. SIDEWALK BARRICADES TO BE ERECTED AT EACH LOCATION WHERE SATISFACTORY PROVISION CAN NOT BE MADE FOR PEDESTRIANS TO CONTINUE BEYOND THE TERMINUS OF A SIDEWALK.
2. ALL EXPOSED SURFACES TO BE PAINTED WITH TWO (2) COATS OF WHITE PAINT CONFORMING TO SECTION 91-3.02 OF STATE SPECIFICATIONS.

* STATE OF CALIF. SPECIFICATION #58-1.02

DATE	REVISIONS	BY

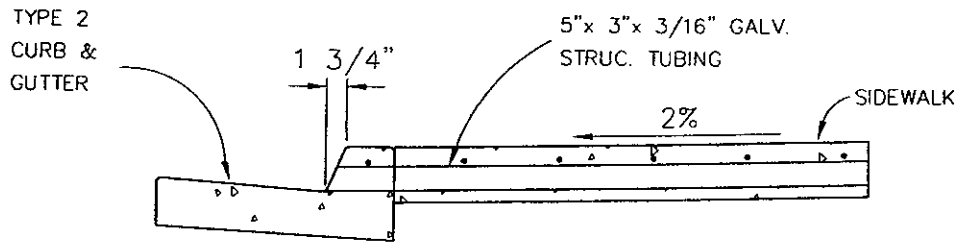
COUNTY OF SUTTER

SIDEWALK BARRICADE

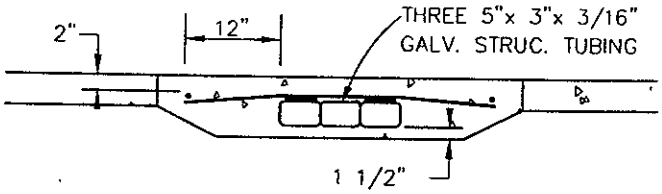
APPROVED _____ DATE _____

SCALE : NONE
DRN : PSO

DWG NO. H-23



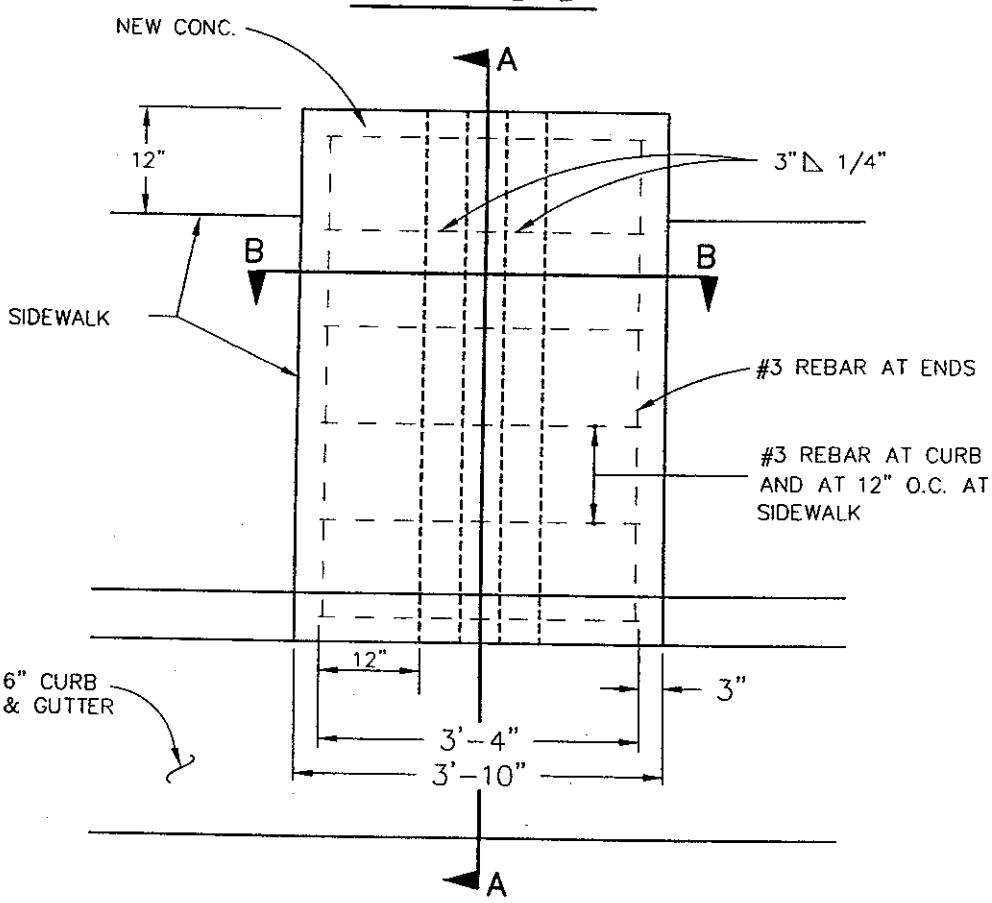
SECTION A–A



NOTE:

1. DRAIN ASSEMBLY SHALL BE FABRICATED AND HOT DIP GALVANIZED.
2. STRUCT. TUBING TO BE CUT TO FIT CURB ANGLE. COAT ENDS W/MIN. 2 COATS SHERWIN WILLIAMS "GALVITE" OR EQUAL.

SECTION B–B



PLAN VIEW

DATE	REVISIONS	BY

COUNTY OF SUTTER

SIDEWALK DRAIN

Robert Bassett 6/18/02
APPROVED DATE

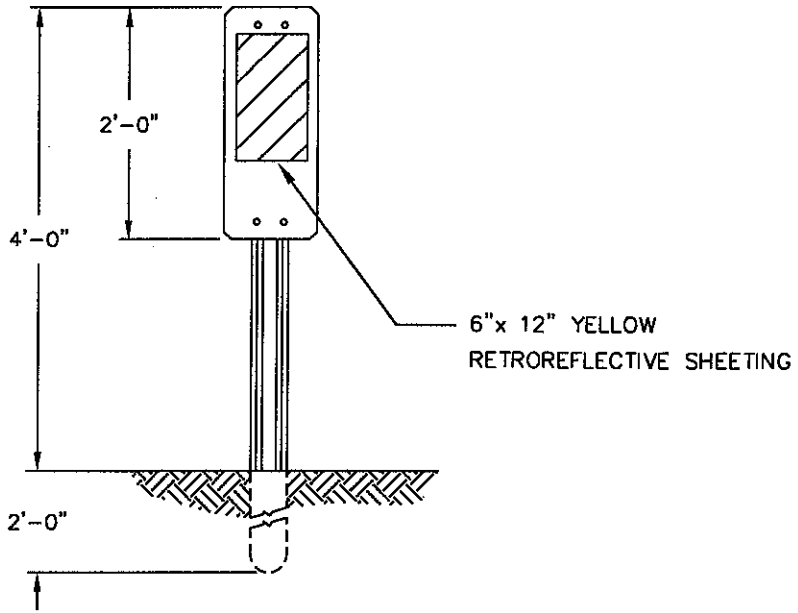
SCALE : NONE
DRN : PSO

DWG NO. H-24

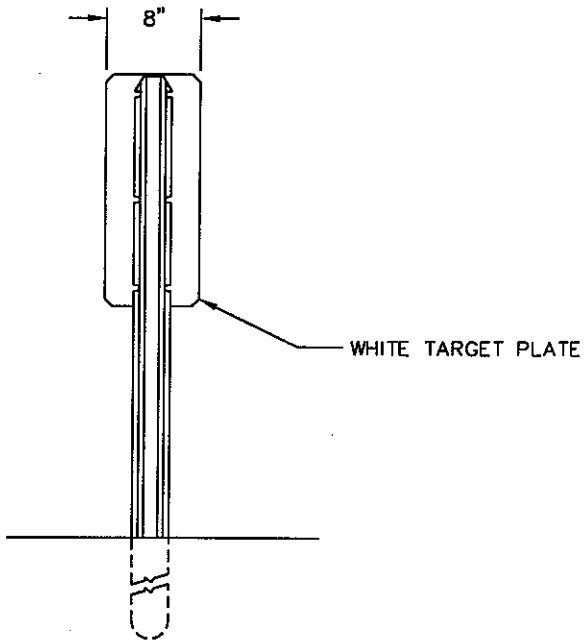
Mar. 25, 1999 - 14:30:16 DWG Name: R:\develop\SUT0202\Std-Det\Sutter\H-24.dwg Updated By: RLehutsky

NOTES:

1. CONSTRUCTION AND MATERIALS SHALL CONFORM TO CALTRANS STD. PLAN SHEET A73A.
2. PLACE 6" BEYOND EGDE OF PAVEMENT. SPACE AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.



FRONT



REAR

DATE	REVISIONS	BY

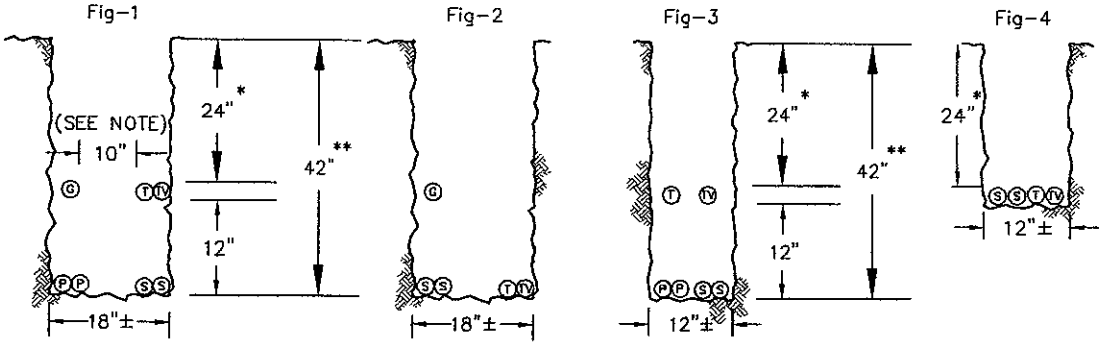
COUNTY OF SUTTER

OBJECT MARKER

APPROVED 3/14/06 DATE

SCALE : NONE
DRN : K. XIONG

DWG NO. H-25



LEGEND:

- (G) — GAS
- (P) — ELECT. PRIMARIES
- (S) — ELECT. SECONDARIES
- (T) — TELEPHONE
- (TV) — TELEVISION

NOTE:

* — INCREASE TO 30" IN STREET AREA
** — INCREASE TO 48" IN STREET AREA

SEPARATION MAY BE REDUCED TO NOT LESS THAN 6' WHEN NECESSARY, INSTEAD OF INCREASING TRENCH WIDTH.

TYPICAL SIDEWALK & STREET JOINT TRENCH CONFIGURATIONS

Sect.	(G)	(P)	(S)	(T)	(TV)	Fig.
A	X	X	12" Trench Width			1
B	X	X	X	12" Trench Width		1
C	X	X	X	X		1
D	X	X		X		1
E	X		X	12" Trench Width		1
F	X		X	X		2
G	X	X			X	1
H	X		X		X	2
I	X			X		1

Sect.	(G)	(P)	(S)	(T)	(TV)	Fig.
J	X			X	X	1
K	X				X	1
L		X	X	36" Min. Cover		3
M		X	X	X		3
N		X		X		3
P		X		X	X	3
Q		X	X		X	3
R		X			X	3
S			X	X		4

Sect.	(G)	(P)	(S)	(T)	(TV)	Fig.
T			X		X	4
U				X	X	4
V	X	X	X	X	X	1
W	X		X	X	X	2
X		X	X	X	X	3
Y			X	X	X	4

JOINT TRENCH OCCUPANCY GUIDE

DATE	REVISIONS	BY

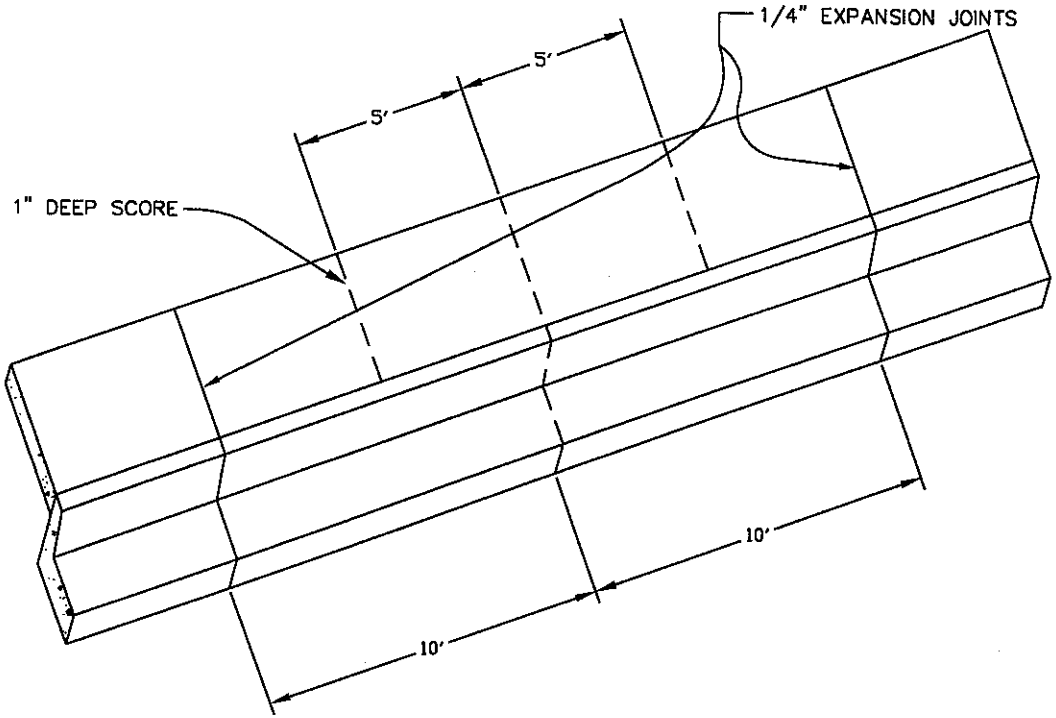
COUNTY OF SUTTER

JOINT UTILITY TRENCH

APPROVED — DATE 2/14/06

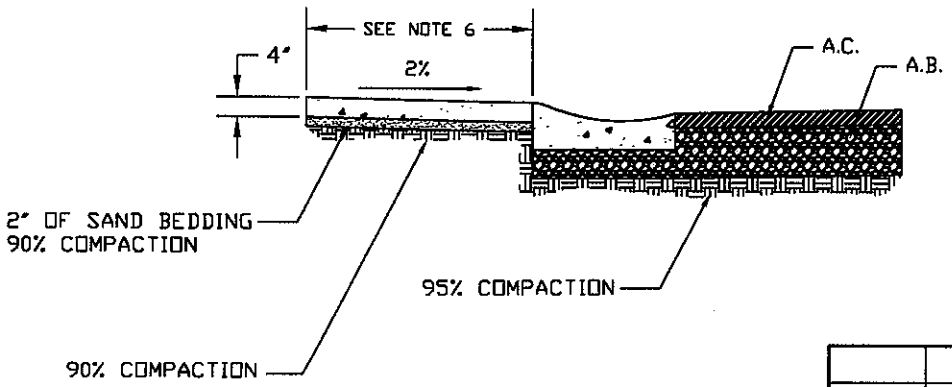
SCALE : NONE
DRN : PSO

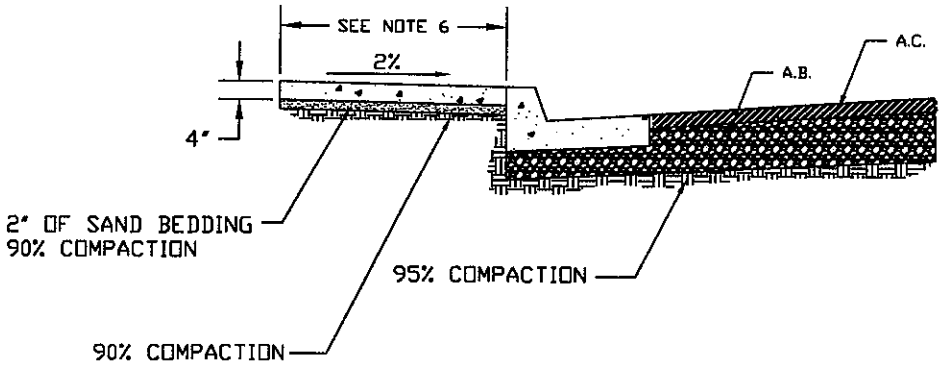
DWG NO. H-26



NOTES:

1. DISTANCE BETWEEN SCORE LINES TO BE 5' IN SIDEWALK.
2. 1/4" TRANSVERSE EXPANSION JOINTS AT 20' INTERVALS FOR SIDEWALK.
3. 1/4" TRANSVERSE EXPANSION JOINTS AT 60' INTERVALS FOR CURB AND GUTTER.
4. SIDEWALK EXPANSION JOINTS TO COINCIDE WITH THOSE IN CURB AND GUTTER.
5. CURB AND GUTTER TO HAVE 1" DEEP SCORE AT 10' INTERVALS.
6. SIDEWALK WIDTH, SEE STANDARD DRAWING NOS. H-4, H-5, H-6, H-7.





DATE	REVISIONS	BY

COUNTY OF SUTTER

STANDARD SIDEWALK

APPROVED — DATE: 3/14/06

SCALE : NONE
DRN : K.X.

DWG NO. H-27

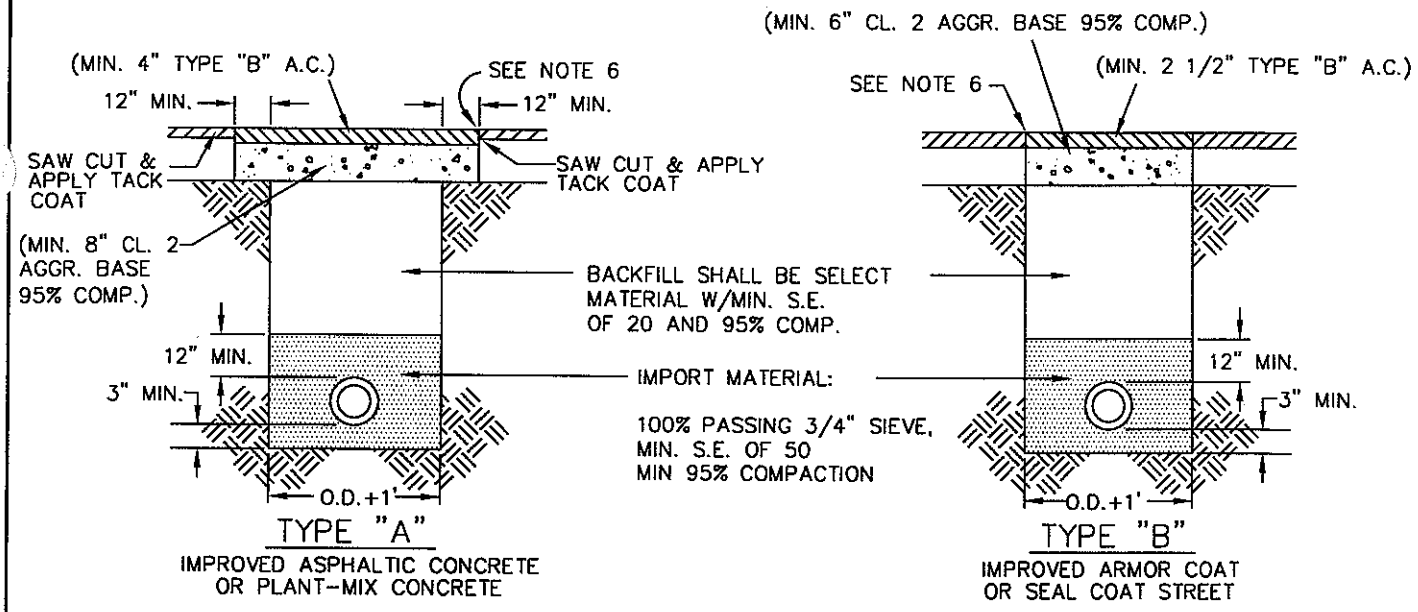
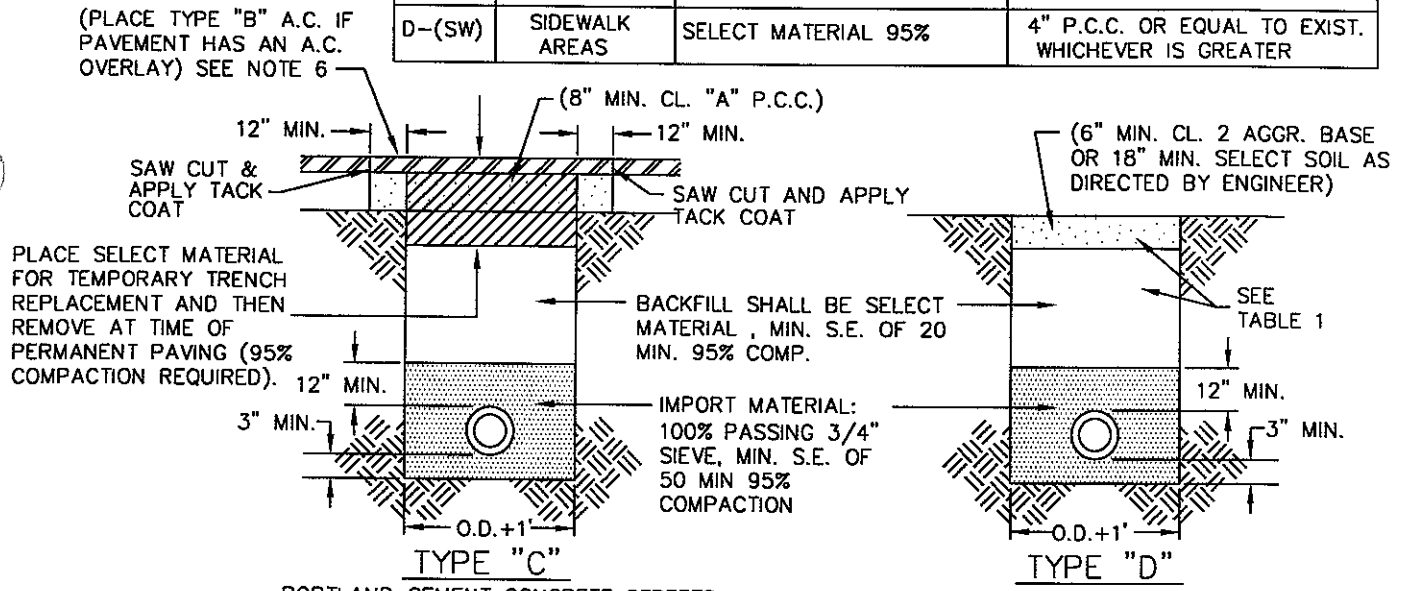


TABLE 1

TYPE	LOCATION	BACKFILL & COMP.	RESTORATION TYPE
D-1	WITHIN 5' OF E.P.	SELECT MATERIAL 95%	6" CL. 2" A.B.
D-2	GREATER THAN 5' TO E.P.	SELECT MATERIAL 90%	18" MIN. SELECT SOIL
D-(SW)	SIDEWALK AREAS	SELECT MATERIAL 95%	4" P.C.C. OR EQUAL TO EXIST. WHICHEVER IS GREATER



NOTES:

1. Type "A". "B" & "C" trenches require (2) two cuts: first cut initial trench width then 30 days after work has been completed it shall be saw cut 12" wider both sides.
2. Type "A", "B" & "C" trenches require placement and maintenance of temporary pavement (sc-800 cold mix) for a minimum of 30 days prior to permanent paving.
3. Structural thickness shown is minimum allowable. Other thickness of structural sections may be required by director if existing structural section exceeds these minimums.
4. All trench work 5' and deeper shall have approved trench sloping or shoring plan.
5. Paving surface at trench joints shall be sealed with asphalt emulsion 4" each side of joint after final compaction of asphalt concrete. Sealant shall be sanded as necessary to prevent traffic pickup.
6. Contact Sutter County Public Works (822-7450) 24 hrs. prior to trenching.
7. Contractor shall provide S.E. (Sand Equivalent) test Results for backfill and bedding material from geotech lab.
8. All trenches in the public R/W shall be either properly backfilled or sealed w/steel plates at the end of each working day.

DATE	REVISIONS	BY
6/22/04		K.X.

COUNTY OF SUTTER

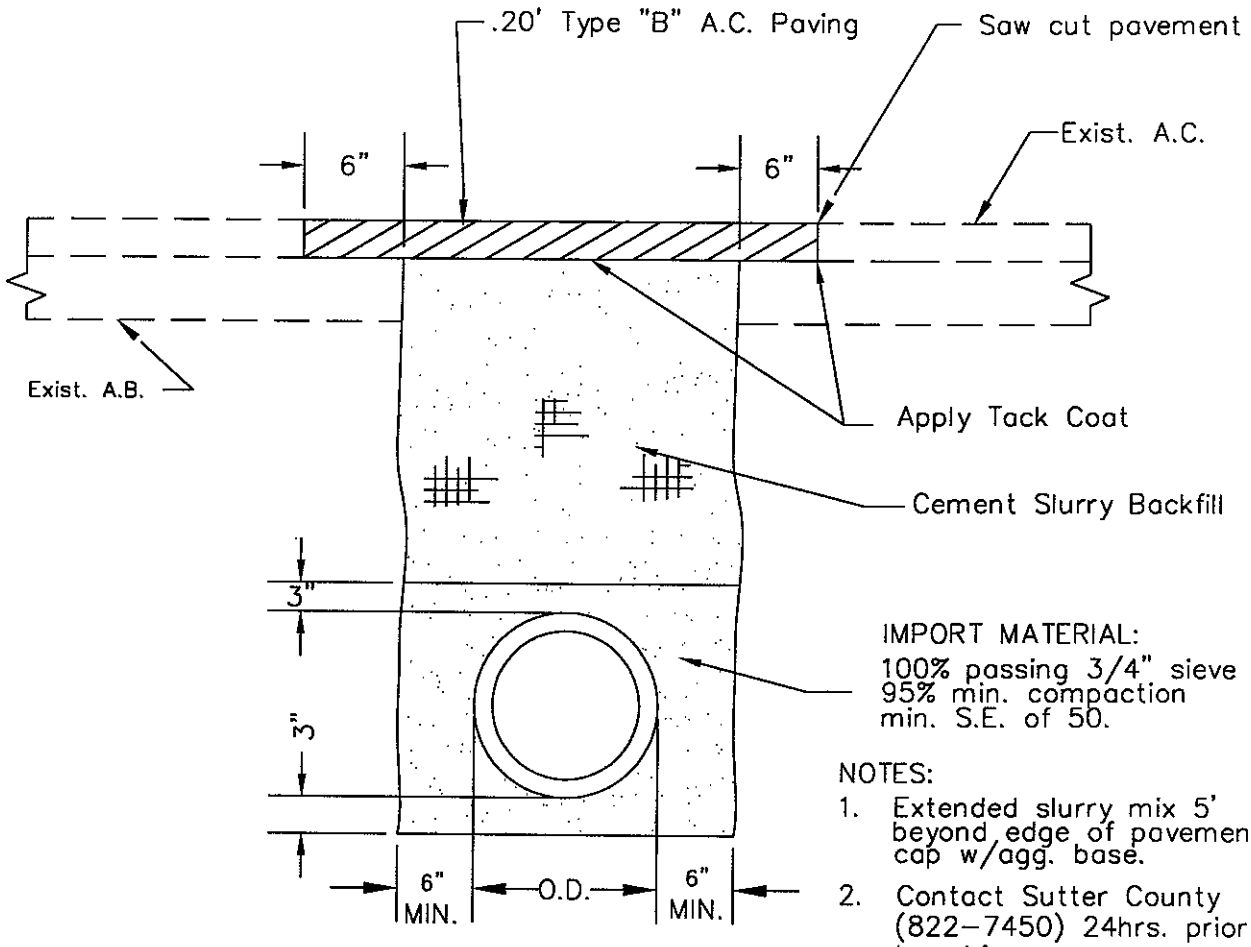
TYPE I TRENCH RESTORATION

APPROVED — DATE 2/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-28

DWG Name: R:\Location\SUT0202\Std-Det\Sutter\Std Dwgs\H-28.dwg Updated By: Rlehulsky
Nov. 25, 2002 - 08:



IMPORT MATERIAL:
100% passing 3/4" sieve
95% min. compaction
min. S.E. of 50.

TYPE II TRENCH RESTORATION

NOTES:

1. Extended slurry mix 5' beyond edge of pavement & cap w/agg. base.
2. Contact Sutter County (822–7450) 24hrs. prior to trenching.
3. Paving surface at trench joints shall be sealed with asphalt emulsion 4" each side of joint after final compaction of asphalt concrete. Sealant shall be sanded as needed to prevent traffic pickup.
4. All trenches in the public r/w shall be either properly back– filled or sealed w/steel plates at the end of each working day.

CEMENT SPECIFICATIONS

2 Sack Portland Cement (188 lbs.)
52 Gallons Water
814 lbs. 3/8" rock SSD Weight
2310 lbs. Sand

TOTAL BATCH WT. 3,750 LBS. PER CUBIC YARD ±10% TO BE SHOWN ON DELIVERY TICKET.

Backfill Slurry mix to top of exist. a.b. and bridge w/metal plate until slurry mix can support vehicular traffic.
Asphalt concrete patch to match existing thickness, 0.2' min.
Do not move slurry once placed in ditch.
2% max. (by cement wt.) calcium chloride may be added to slurry mix.

DATE	REVISIONS	BY
6/22/04		K.X.

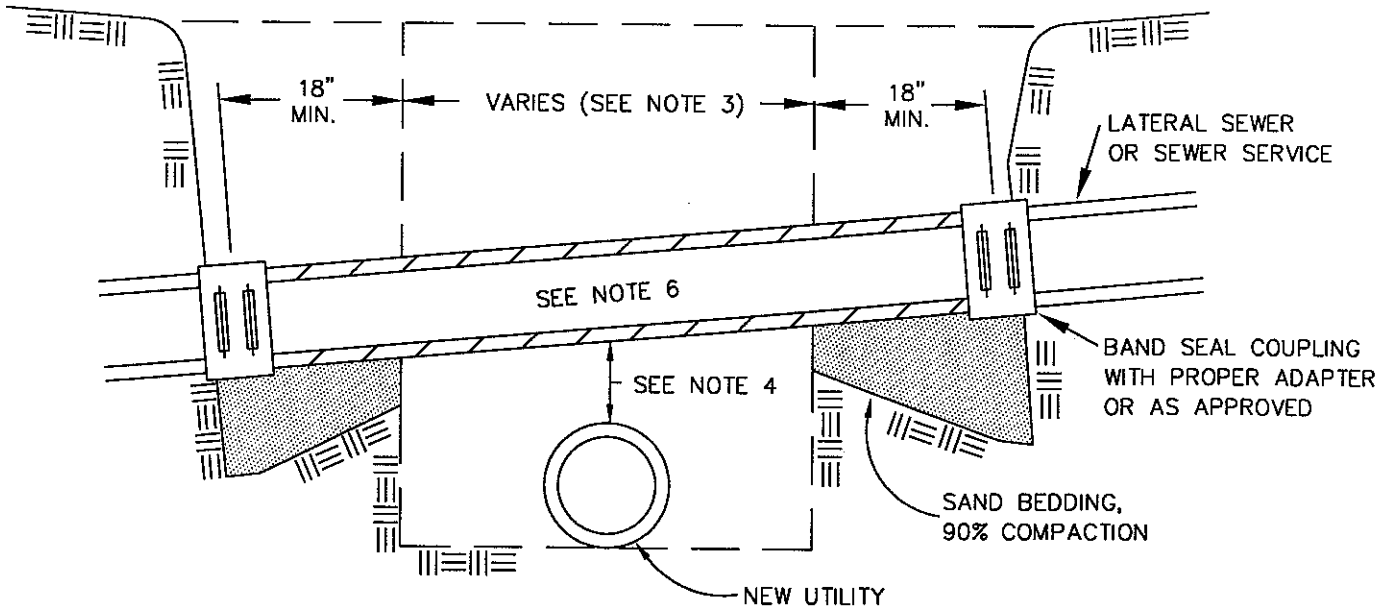
COUNTY OF SUTTER

TYPE II TRENCH RESTORATION

APPROVED — DATE 3/14/06

SCALE : NONE
DRN : PSO

DWG NO. H-28A



NOTES:

1. INSIDE DIAMETER OF PIPE TO BE THE SAME AS THE PIPE TO WHITCH IT CONNECTS.
2. ALTERATIONS OF SEWER GRADES WILL BE PERMITTED ONLY AFTER PERMISSION HAS BEEN RECEIVED FROM THE COUNTY OR SPECIAL DISTRICT.
3. WHENEVER THE SPAN OF THE PIPE EXCEEDS 5'-0" REPLACEMENT PROCEDURE AND MATERIAL SHALL BE AS DIRECTED BY THE COUNTY OR SPECIAL DISTRICT.
4. MINIMUM CLEARANCE BETWEEN PIPES SHALL BE 3".
5. TRIM THE END OF THE SIDE SEWER PIPE TO A CLEAN CUT UNDAMAGED END WITH MECHANICAL PIPE CUTTER.
6. EXTRA STRENGTH VITRIFIED CLAY PIPE OR DUCTILE IRON PIPE FOR SANITARY SEWER LINES; FOR STORM DRAIN LINES, CONCRETE PIPE OF THE SAME TYPE REMOVED.
7. BAND SEAL COUPLING SHALL HAVE STAINLESS STEEL SHEAR RING.

DATE	REVISIONS	BY

COUNTY OF SUTTER

UTILITY CROSSING

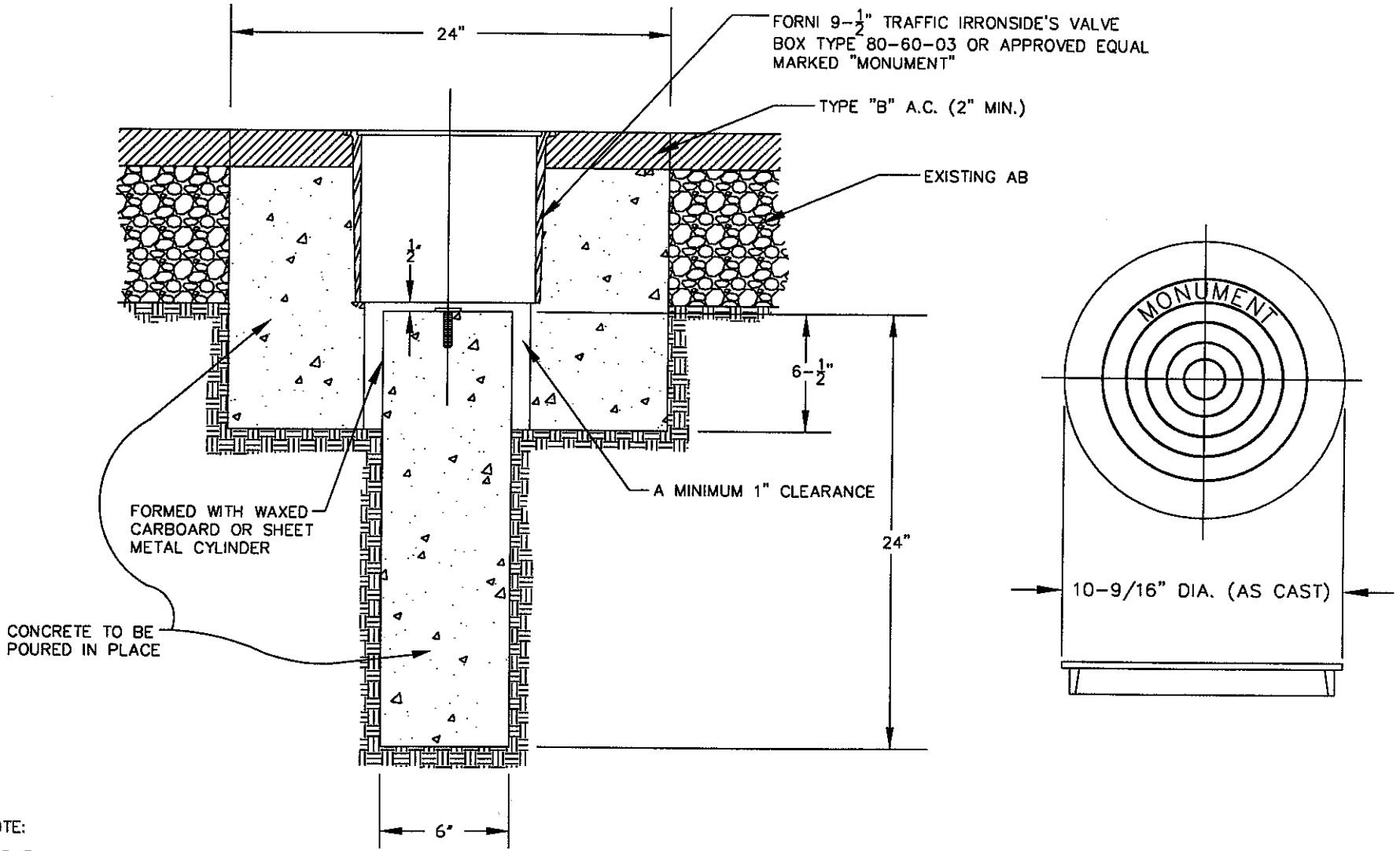
APPROVED 3/14/06 DATE

SCALE : NONE
DRN : PSO

DWG NO. H-29

DWG Name: R:\develop\SUT0202\Std-Det\Sutter\H-27.dwg Updated By: RLebulsky

Mar. 26, 1999 - 1



NOTE:

SURVEY MONUMENT MARKER SOLID BRASS, 1-3/8" DIA. TOP AND 7/16"X2" SHANK

6/2/04		K.X.
DATE	REVISIONS	BY

COUNTY OF SUTTER

MONUMENT WELL

APPROVED 3/14/06 DATE

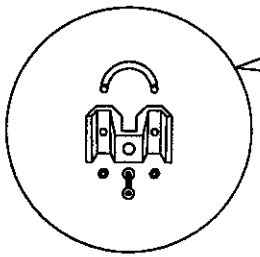
SCALE : NONE

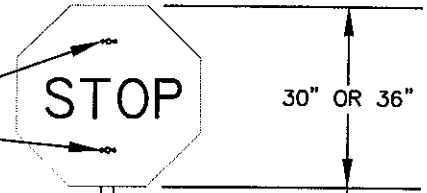
DRN : M. MILLER 6/15/92

DWG NO. H-30

Note:

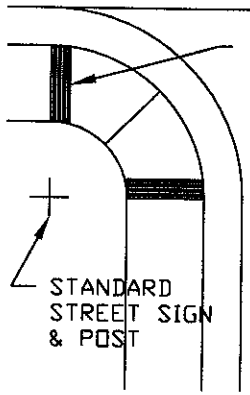
Bracket Set-Shall be Hawkins M26-C2VB or equivalent

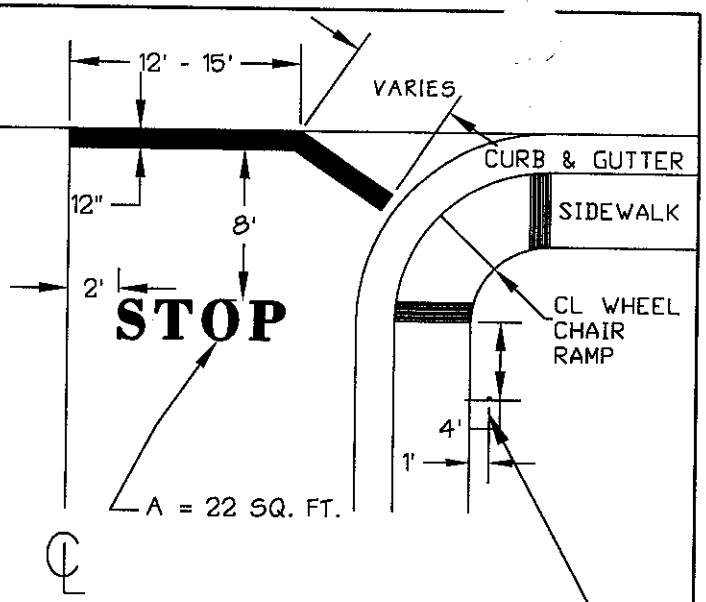




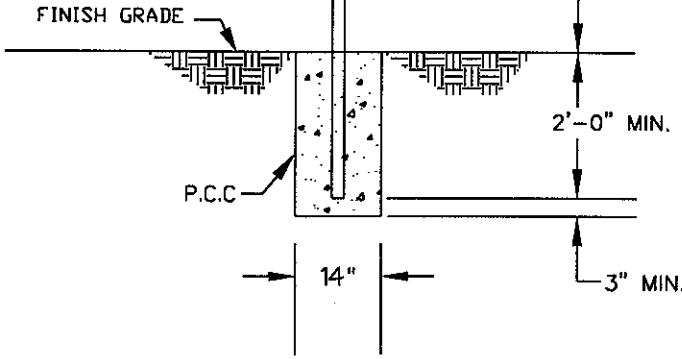
2" DIA. GALVANIZED PIPE

7' TO 8'

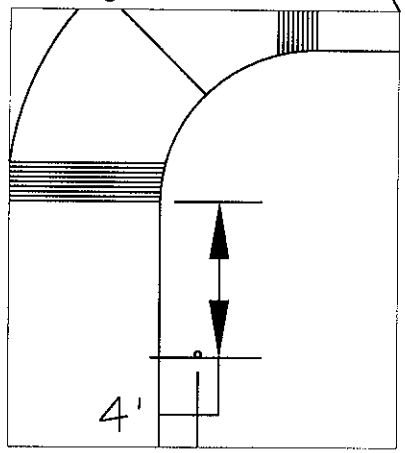




NOTE:
1.) Sign location & Size to be determined by county engineer
2.) Stop sign thickness is 0.80 & shall be standard engineering grade aluminum.
3.) Pavement marking & limit line shall conform to 2002 standard specification and section 84-2.02



Standard Stop Sign and Post



DATE	REVISIONS	BY

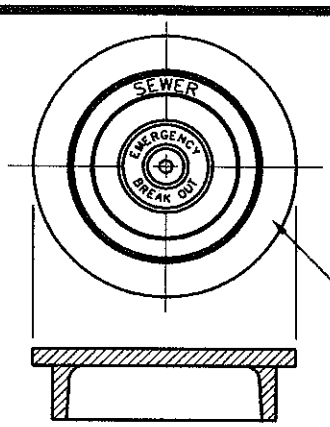
COUNTY OF SUTTER

STANDARD STOP SIGN

APPROVED — DATE 2/14/06

SCALE : NONE
DRN : B. MOODY

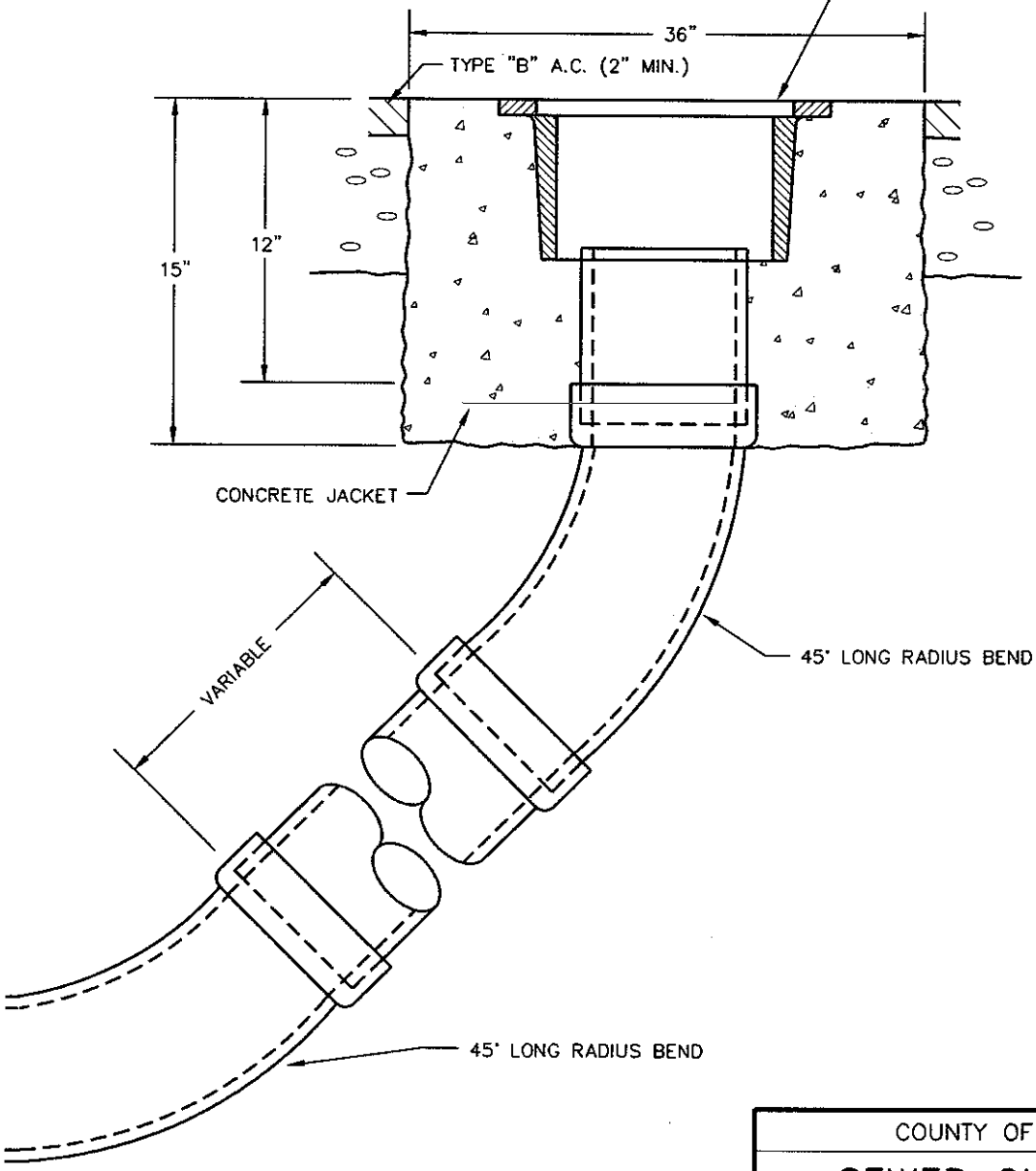
DWG NO. H-31



COVER DETAIL

(1) FOR 6" SEWER MAIN USE D & L SUPPLY 9 1/2" TRAFFIC VALVE BOX TYPE H8030 OR APPROVED EQUAL MARKED "SEWER".

(2) FOR 8" 10" AND 12" SEWER MAINS USE D & L CLEAN-OUT ASSEMBLY H-8026 OR EQUAL MARKED "SEWER".



COUNTY OF SUTTER

SEWER CLEANOUT

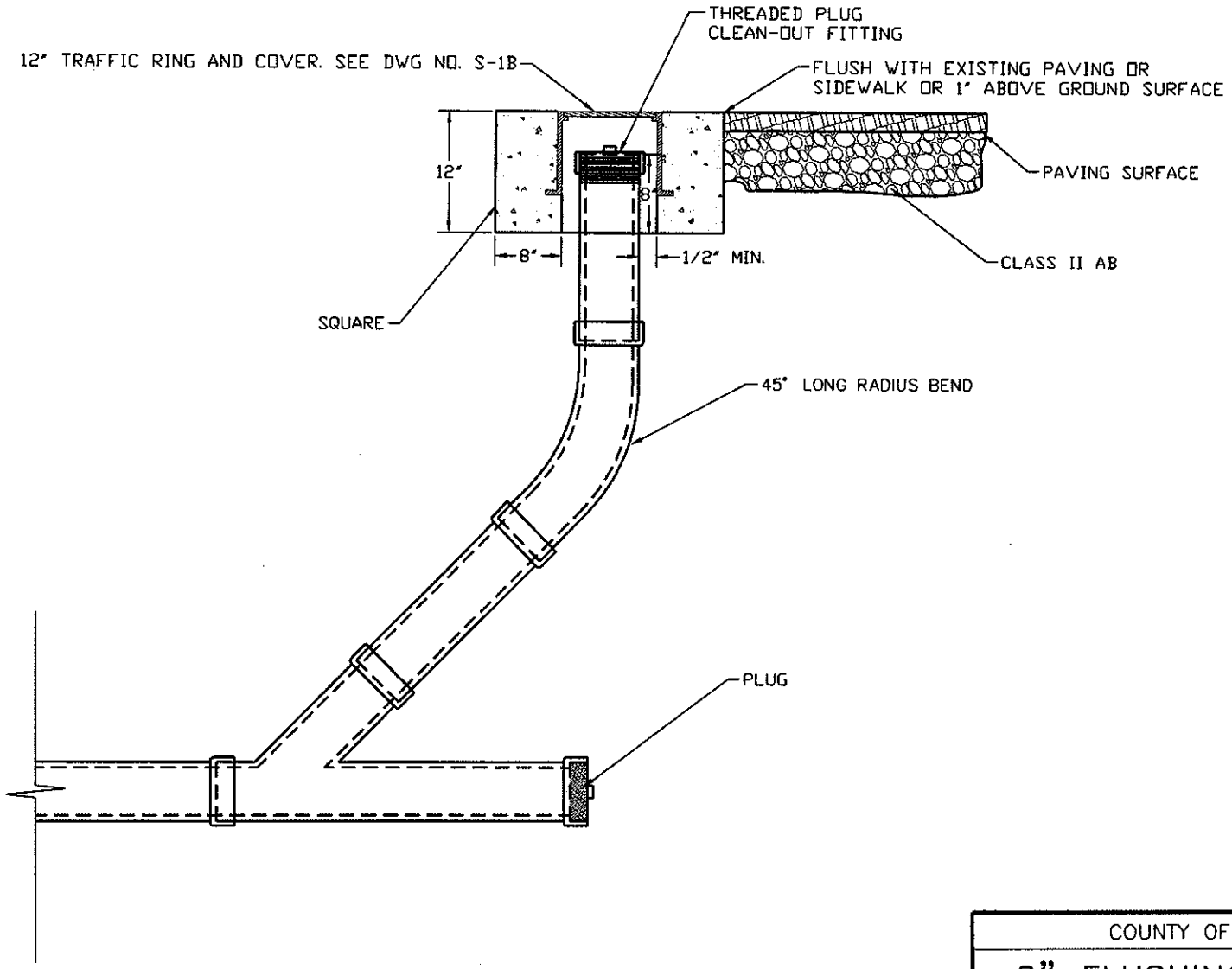
Douglas N Hault

DIRECTOR OF PUBLIC WORKS

SCALE: NONE

DRN: PSO DATE: 11/2010

DWG NO. S-1



COUNTY OF SUTTER

8" FLUSHING BRANCH

Douglas R Hault

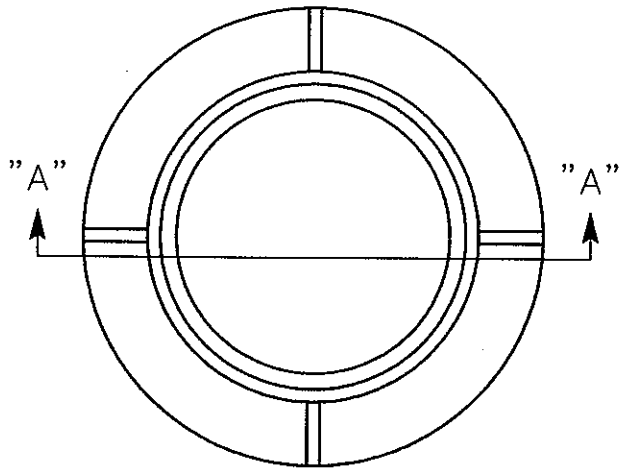
DIRECTOR OF PUBLIC WORKS

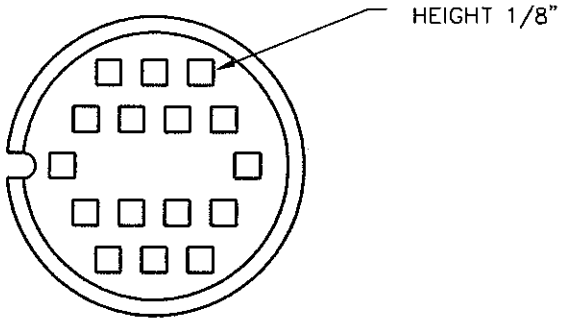
SCALE: NONE

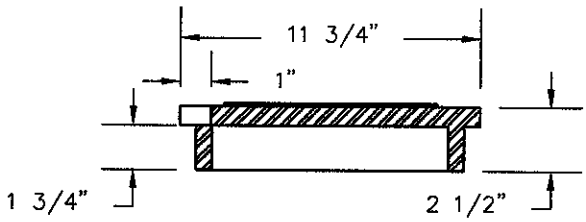
DRN: K.XIONG DATE: 11/2010

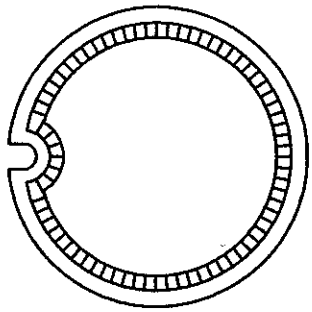
DWG NO. S-1A

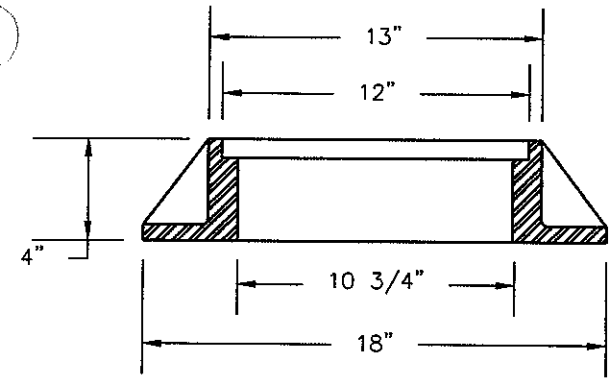
PLAN











SECTION A–A

NOTES:

1. USE D&L SUPPLY H–8024 OR APPROVED EQUAL. MARKED "FLUSHING".
2. ALL MATERIALS USED IN MANUFACTURING SHALL CONFORM TO ASTM 48, CLASS 35B.
3. CASTING SHALL BE DIPPED IN BLACK, BITUMINOUS PAINT.
4. FRAME AND COVER MEETS H–20 WHEEL LOADING.

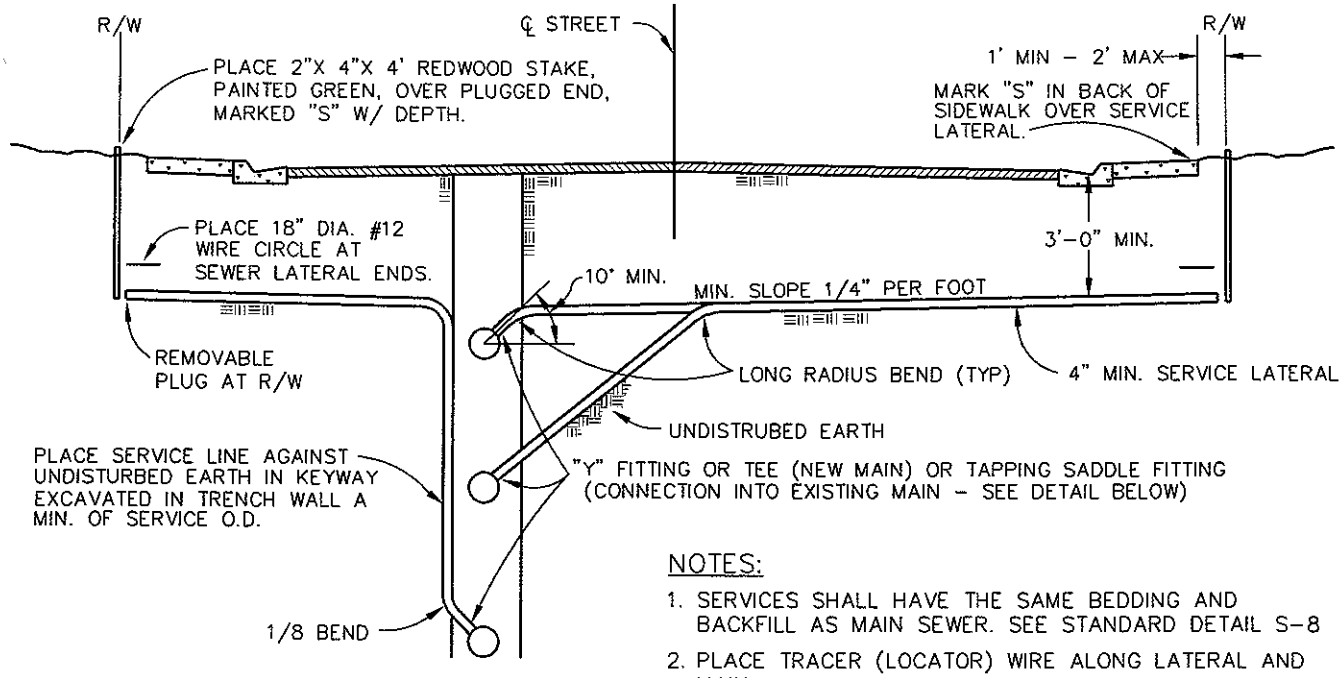
COUNTY OF SUTTER

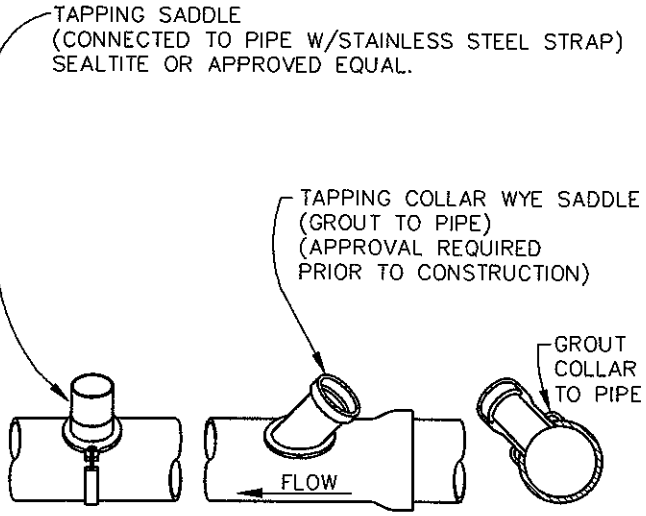
FRAME AND COVER

Douglas N. Hault
DIRECTOR OF PUBLIC WORKS

SCALE: NONE
DRN: K.XIONG DATE: 11/2010

DWG NO. S–1B





NOTES:

1. SERVICES SHALL HAVE THE SAME BEDDING AND BACKFILL AS MAIN SEWER. SEE STANDARD DETAIL S–8
2. PLACE TRACER (LOCATOR) WIRE ALONG LATERAL AND MAIN.
3. ANY REPAIRS TO SERVICES AND MAINS SHALL HAVE COMPRESSION COUPLINGS WITH STAINLESS STEEL SHEAR RINGS.
4. COLLAR WYE SADDLE OR CUT IN WYE SHALL BE USED FOR 4–INCH AND 6–INCH LATERAL. 8–INCH LATERALS OR LARGER REQUIRE A STANDARD MANHOLE.
5. "HAMMER TAP" CONNECTIONS ARE NOT ACCEPTABLE. THE HOLE FOR THE COLLAR OR WYE FITTING FOR A SEWER SADDLE SHALL BE MADE WITH AT TAPPING MACHINE. THE HOLE SHALL BE CLEANLY MACHINED AND IF NECESSARY WORKED BY HAND WITH A RASP OR SANDED TO ACCOMPLISH A TRUE AND NEAT OPENING FOR THE COLLAR WYE.
6. TAP TO BE MADE AT APPROXIMATELY CENTER OF JOINT.
7. THE SADDLE CONNECTION SHALL BE ENCASED TO THE LIMITS SHOWN WITH CONTROLLED LOW STRENGTH CONCRETE (100 PSI, MAX) AFTER THE CONNECTION IS APPROVED BY THE INSPECTOR. THE BELL IN THE LATERAL SHALL NOT BE ENCASED.
8. ALL CHIPS, DIRT, MORTAR, AND CONCRETE SHALL BE KEPT OUT OF THE SADDLE. CLEANING AND BALLING OF THE SADDLED REACH SHALL BE PERFORMED IF DIRECTED BY THE INSPECTOR.
9. ANY DAMAGED PIPE SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE INSPECTOR.
10. MAIN LINE SHALL CUT FOR SADDLE ONLY IN THE PRESENCE OF THE INSPECTOR.

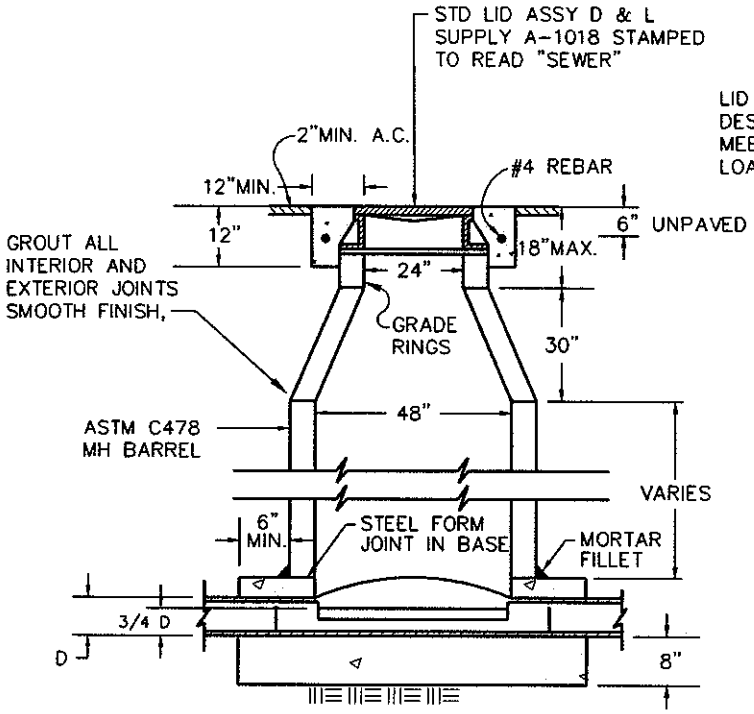
COUNTY OF SUTTER

SEWER SERVICE CONNECTION

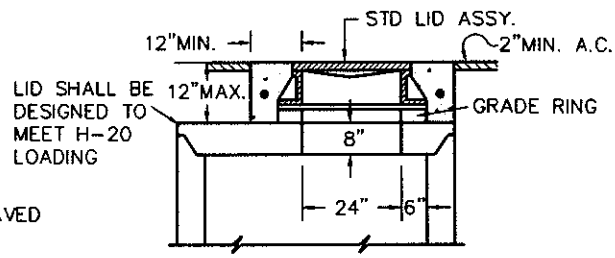
Douglas R Gault

DIRECTOR OF PUBLIC WORKS

SCALE: NONE
DRN: PSO DATE: 11/2010 DWG NO. S–2



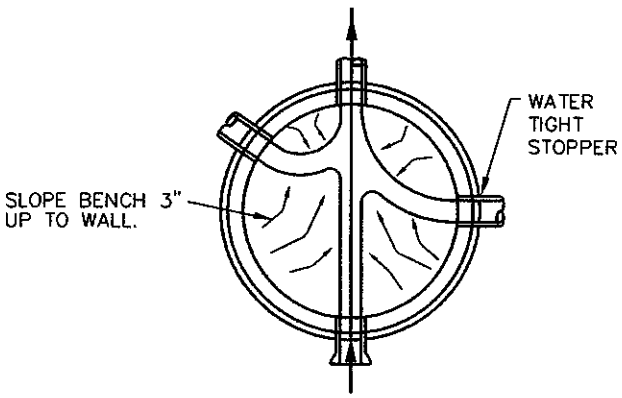
SANITARY SEWER



SHALLOW MANHOLE DETAIL
(FOR PIPES WITH LESS THAN 4' COVER)

NOTES:

1. FOR PIPES WITH LESS THAN 4' COVER USE THE SHALLOW MANHOLE DETAIL.
2. ALL MANHOLE BASES TO BE CAST IN PLACE UNLESS OTHERWISE APPROVED.
3. MANHOLE BASE TO HAVE 0.1' FALL FROM INLET FLOWLINE TO OUTLET FLOWLINE.
4. ALL CONCRETE TO BE CLASS A, 3000 PSI MIN.
5. 60" MANHOLE REQUIRED FOR 24" AND LARGER PIPE.
6. ALL MANHOLE JOINTS TO BE TOUNGE AND GROOVE WITH "RAMNECK" OR APPROVED EQUAL WATER STOP.
7. PROVIDE 2 GRADE RINGS MIN, 4 GRADE RINGS MAX.
8. SEE DETAIL S-9 FOR DROP CONNECTION REQUIREMENTS.



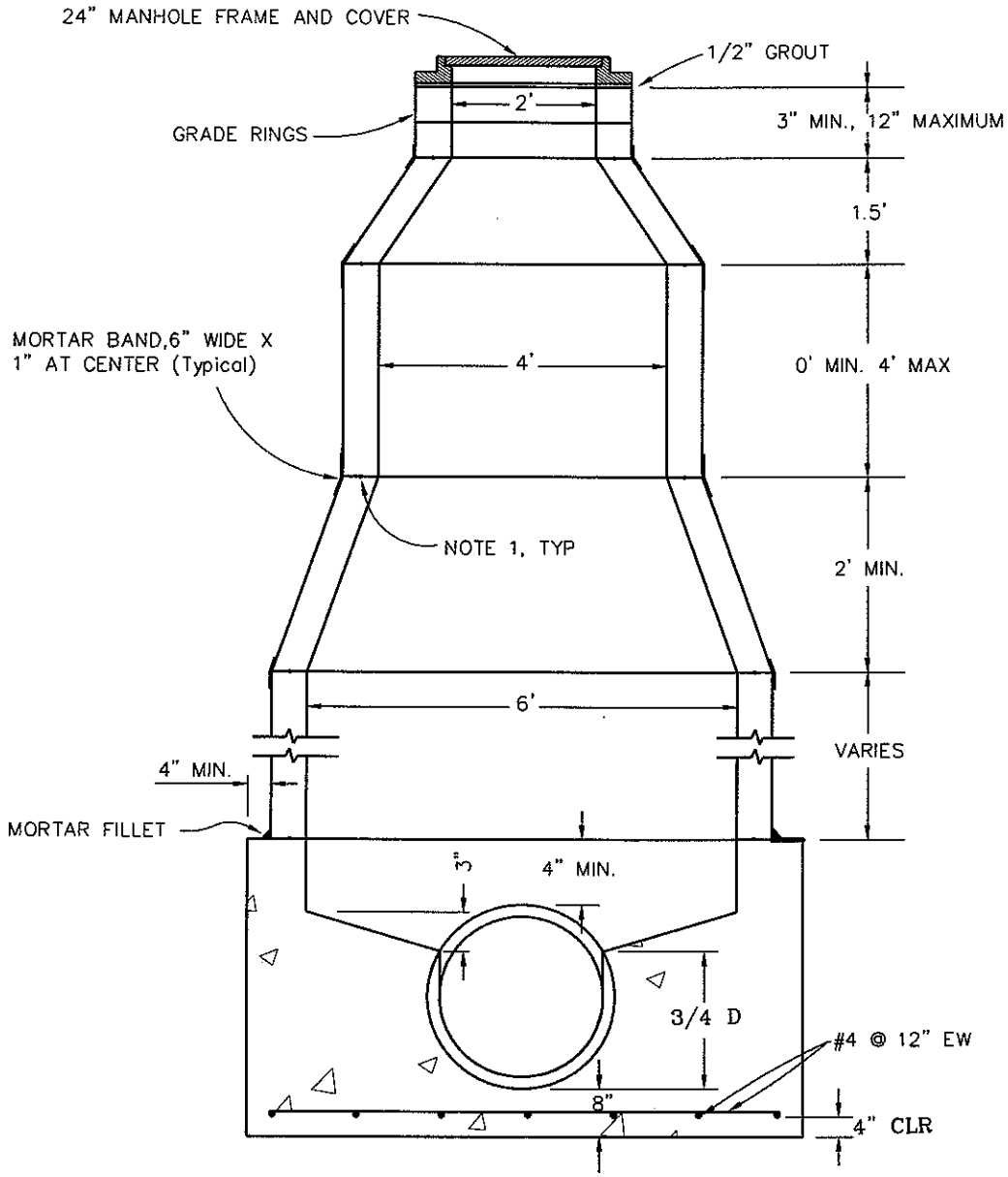
CHANNELIZATION FOR SANITARY SEWER MANHOLES

COUNTY OF SUTTER

STANDARD SEWER MANHOLE

Douglas N Gault
DIRECTOR OF PUBLIC WORKS

SCALE: NONE
DRN: PSO
DATE: 11/2010
DWG NO. S-3



NOTES:

1. SEAL ALL JOINTS WITH RAM-NEK. GROUT JOINTS INSIDE AND OUTSIDE, TYP.
2. REMOVE TOP OF PIPE INSIDE MANHOLE.

SANITARY SEWER SPECIAL MANHOLE

COUNTY OF SUTTER

SPECIAL SEWER MANHOLE

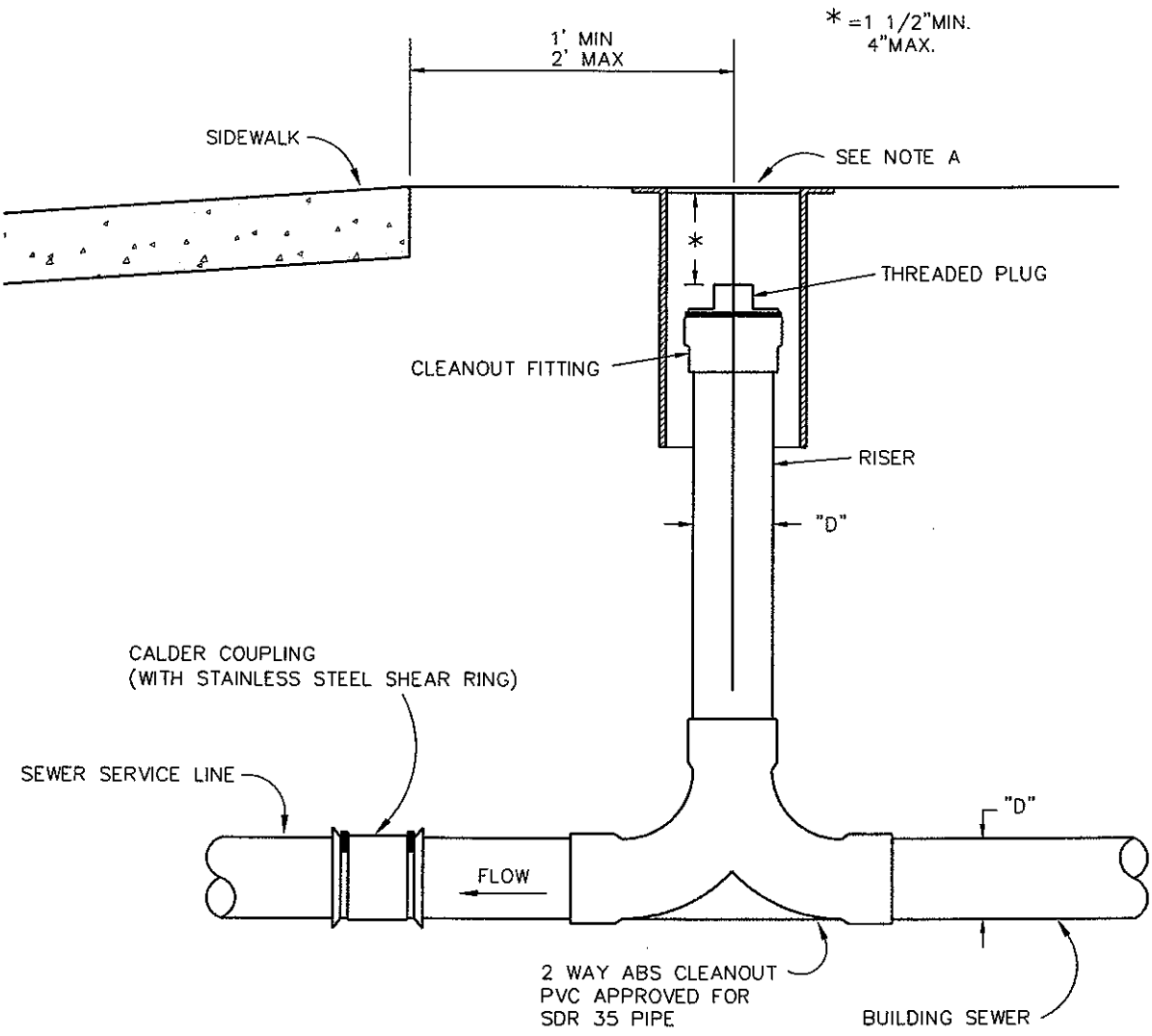
Douglas N Hault

DIRECTOR OF PUBLIC WORKS

SCALE: NONE

DRN: PSO DATE: 11/2010

DWG NO. S-4

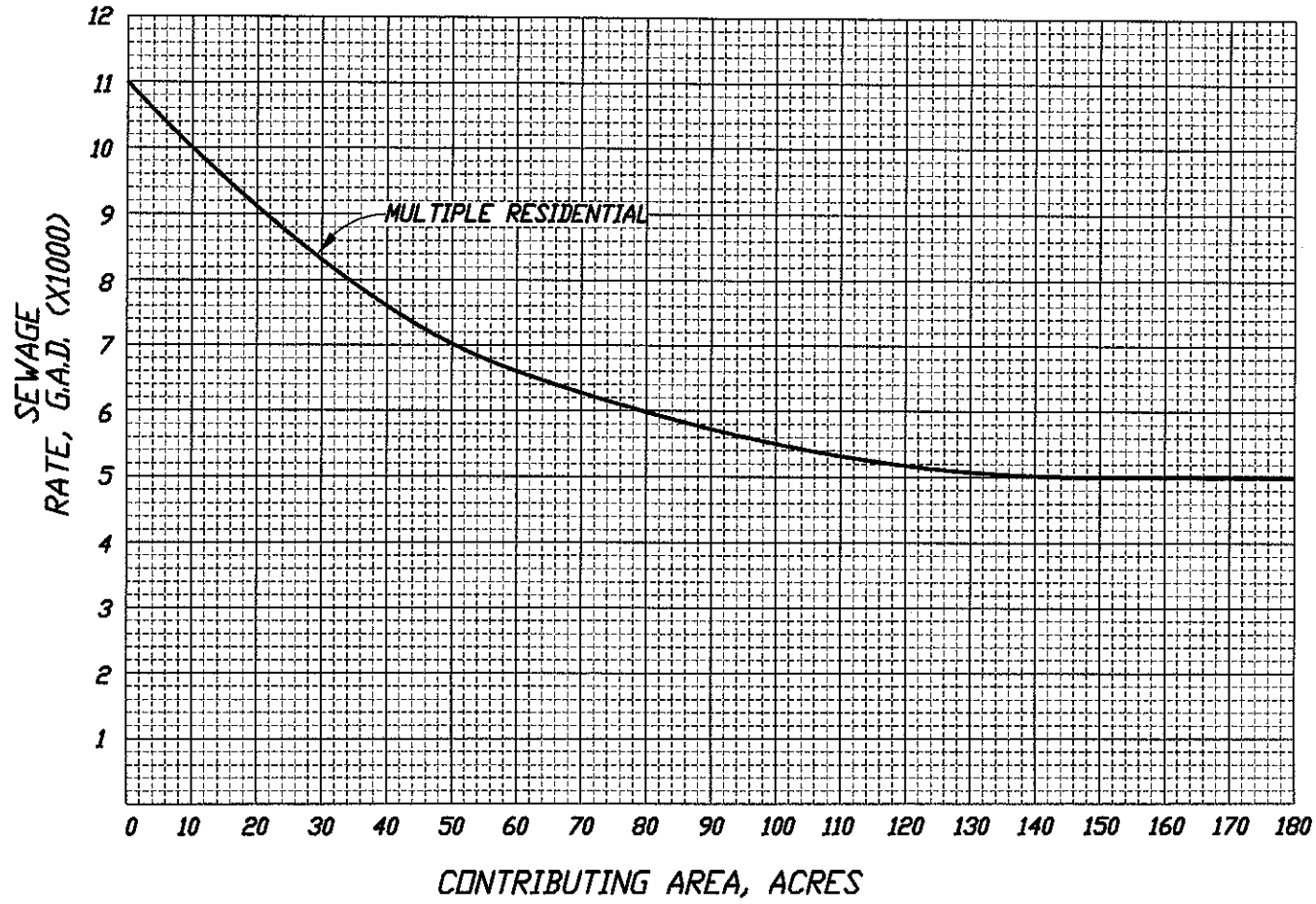


NOTE A:

WHEN INSTALLED IN DRIVEWAY USE BROOKS 3RT SERIES VALVE BOX, MARKED "SEWER"– WHEN INSTALLED IN LAWN OR PLANTER USE BROOKS 1–SP SERIES VALVE BOX MARKED "SEWER".

SANITARY SEWER ACCESS CONTROL

COUNTY OF SUTTER	
SEWER ACCESS CONTROL	
Douglas N Hault DIRECTOR OF PUBLIC WORKS	
SCALE: NONE DRN: PSO DATE: 11/2010	DWG NO. S–5



COUNTY OF SUTTER

AVERAGE SEWER FLOWS

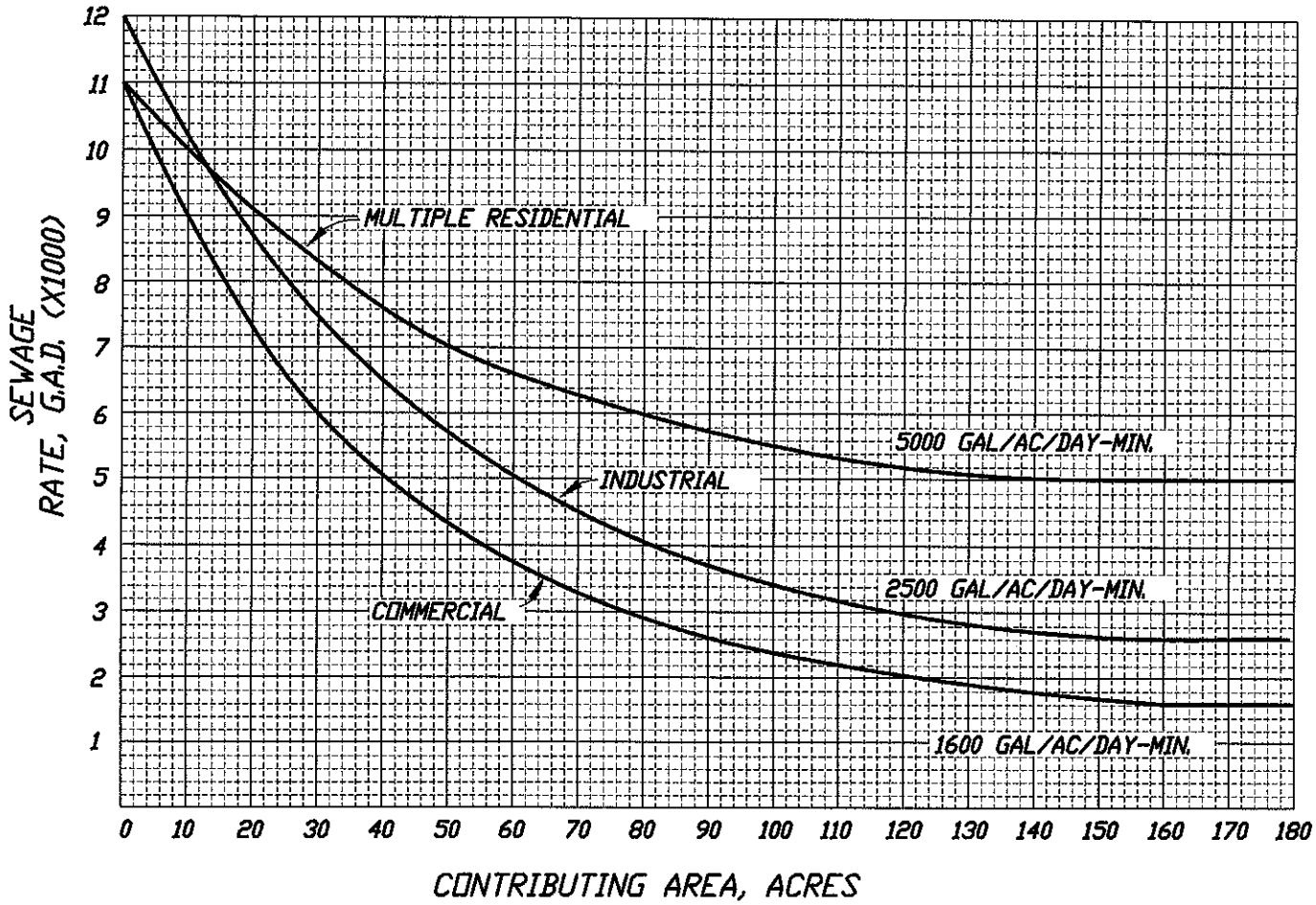
Douglas N Hault

DIRECTOR OF PUBLIC WORKS

SCALE: NONE

DRN: PSO DATE: 11/2010

DWG NO. S-6



COUNTY OF SUTTER

AVERAGE SEWER FLOWS

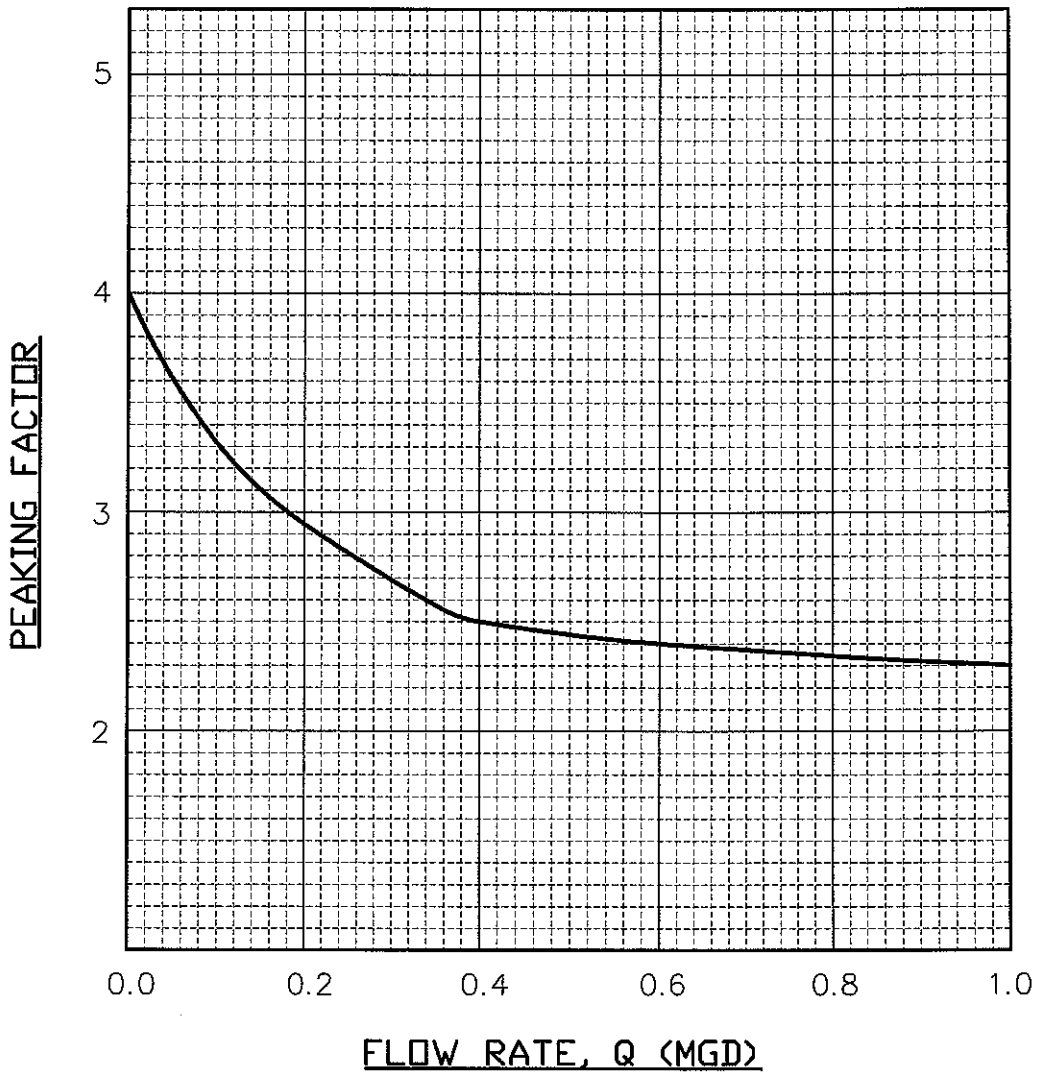
Douglas N Hart

DIRECTOR OF PUBLIC WORKS

SCALE: NONE

DRN: PSO DATE: 11/2010

DWG NO. S-6A



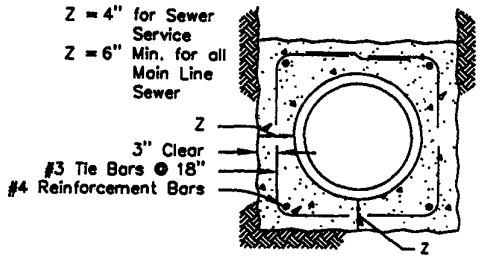
COUNTY OF SUTTER

SEWER PEAKING FACTORS

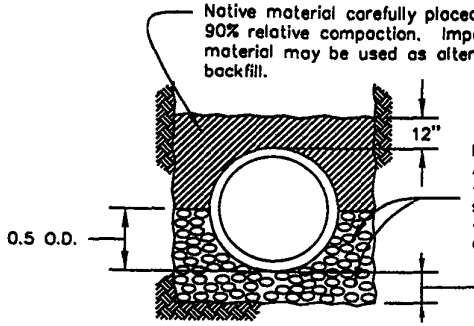
Douglas N Hault
DIRECTOR OF PUBLIC WORKS

SCALE: NONE
DRN: PSO DATE: 11/2010

DWG NO. S-7

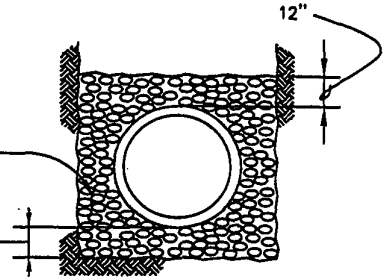


CONCRETE ENCASEMENT



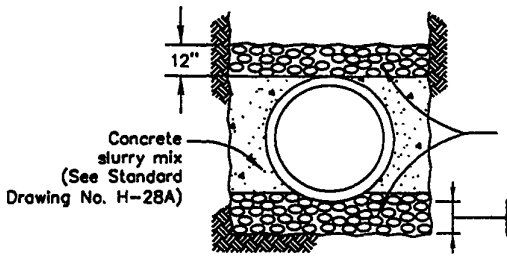
Bedding Factor = 1.9

TYPE II
(See Note 5)



Bedding Factor = 2.2 for 36" or less; for greater than 36" dia. field condition only (see note 2).

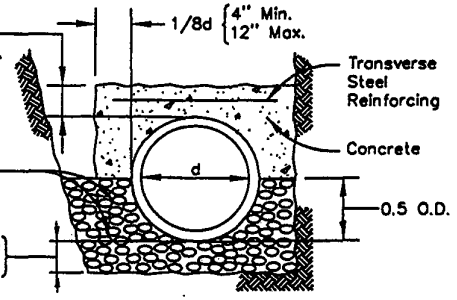
TYPE II ALTERNATE



Bedding Factor = 2.7

TYPE III
(See Note 3)

(Concrete must extend from pipe to the trench walls. TYPE III not allowed where soils are expansive)



Bedding Factor = 3.4
P = 0.4%

TYPE IV
(See Notes 3 & 4)

GENERAL NOTES:

1. Minimum depth of bedding and material under pipe bells shall be 3 inches.
2. For pipe greater than 36" in diameter Type II Alternate shall be allowed only when field encountered construction conditions have resulted in the allowable trench width for Type II being exceeded and calculations must be submitted for the Engineer's approval to determine the appropriate bedding factor for the situation. Design method No. 38 as published by the American Concrete Pipe Association shall be the basis for the calculations. Maximum allowable Bedding Factor is 2.2.
3. Type III and IV may be used only when construction conditions encountered in the field have resulted in the allowable trench width for Type II and Type II Alternate being exceeded. Written approval of the Engineer is necessary.
4. For reinforced concrete, P is the percentage of the area of transverse steel to the area of concrete above the top of the pipe barrel. Use wire mesh or uniformly distributed small diameter rebar.
5. For all flexible (non-rigid) pipe, imported material must be used for bedding and initial backfill to 12 inches over pipe bell.

DATE	REVISIONS	BY
11/3/05		K.X.

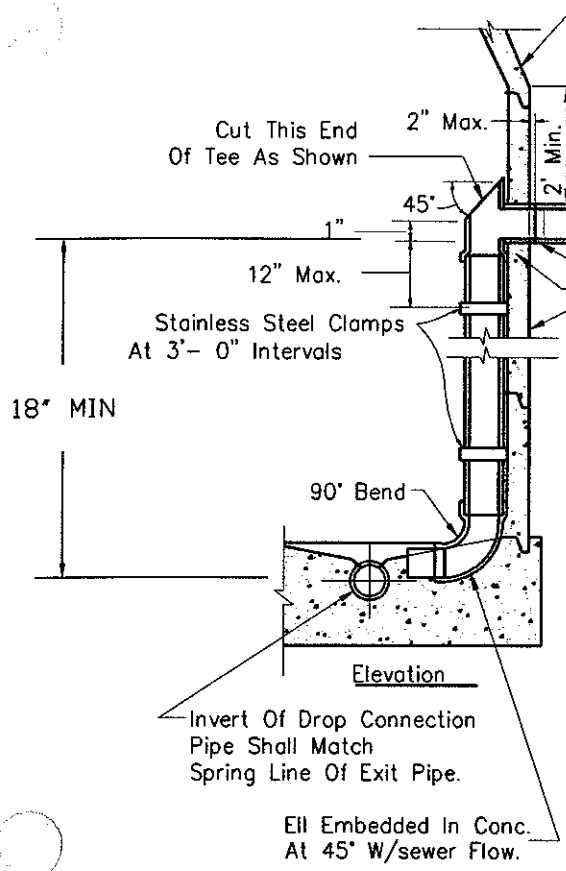
COUNTY OF SUTTER

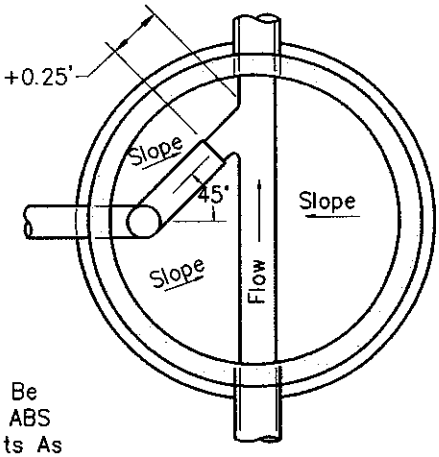
PIPE BEDDING & INITIAL BACKFILL

APPROVED — DATE 3/4/06

SCALE : NONE
DRN: PSO

DWG NO. S-8





PLAN

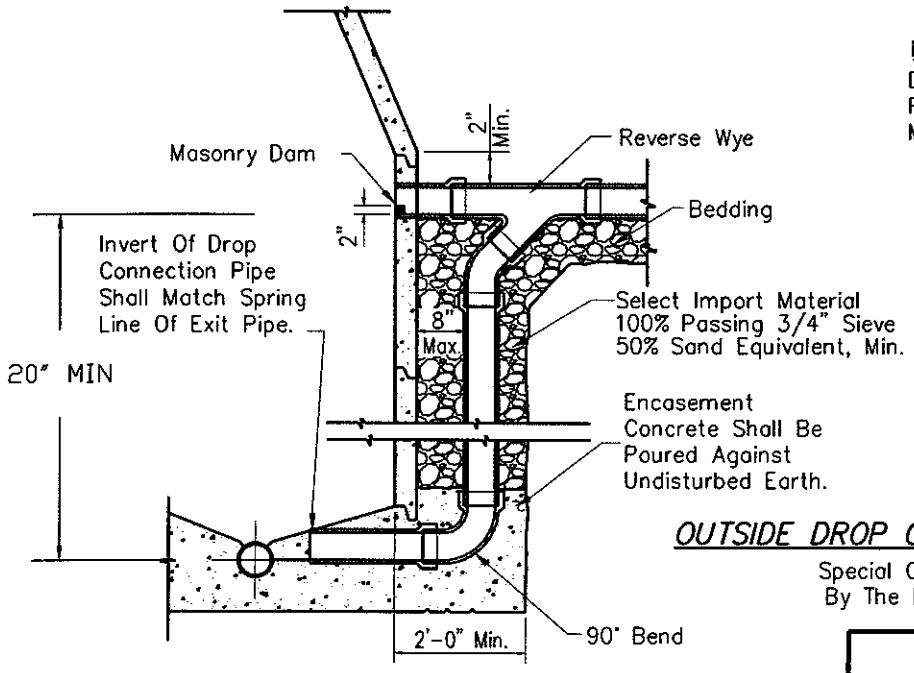
Notes:

1. All Inside Drop Piping Shall Be PVC Pipe, Schedule 40 Or ABS
2. Prime And Cement All Joints As Recommended By The Manufacturer.
3. Drop Connection Pipe & Fittings To Be Size As Entering Pipe.
4. Clamps Shall Be 1-1/2"x 12 Gage Stainless Steel, Anchored To M.H. Wall With 2-1/2" Stainless Steel Bolts.
5. Minimum 48-inch Diameter Manhole. See Detail S-3 for M.H.

use 60 " Manhole If:

1. Depth Exceeds 12' (measured From Rim Elevation To Deepest Invert Elevation), Or
2. Size Of Inside Drop Is 10" Or Greater, Or
3. Two (2) Or More Inside Drop Connections Of Any Size Are Placed Within Manhole.

INSIDE DROP CONNECTION UP TO 8" IN SIZE



Note:

Drop Connection Pipe And Fittings To Be Same Size & Material As Lateral.

OUTSIDE DROP CONNECTION OVER 8" IN SIZE

Special Case (use Only As Directed By The Director Of Public Works)

COUNTY OF SUTTER

SEWER DROP CONNECTION

Douglas N Hoult

DIRECTOR OF PUBLIC WORKS

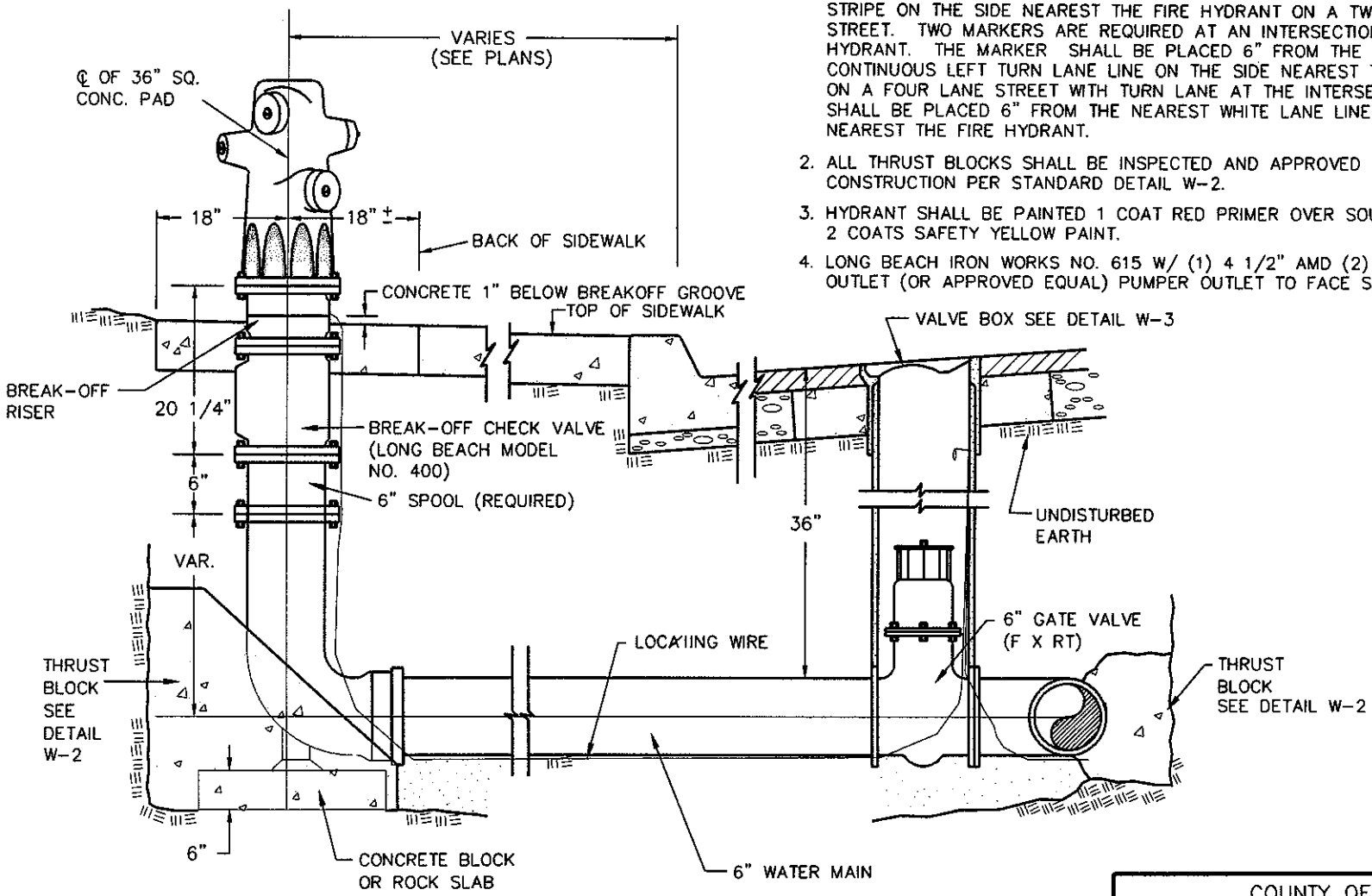
SCALE: NONE

DRN: PSO DATE: 11/2010

DWG NO. S-9

NOTES:

1. BLUE REFLECTIVE PAVEMENT MARKERS SHALL BE PLACED 6" FROM CENTERLINE STRIPE ON THE SIDE NEAREST THE FIRE HYDRANT ON A TWO OR MULTI-LANE STREET. TWO MARKERS ARE REQUIRED AT AN INTERSECTION HAVING A FIRE HYDRANT. THE MARKER SHALL BE PLACED 6" FROM THE EDGE OF THE CONTINUOUS LEFT TURN LANE LINE ON THE SIDE NEAREST THE FIRE HYDRANT. ON A FOUR LANE STREET WITH TURN LANE AT THE INTERSECTION, THE MARKER SHALL BE PLACED 6" FROM THE NEAREST WHITE LANE LINE ON THE SIDE NEAREST THE FIRE HYDRANT.
2. ALL THRUST BLOCKS SHALL BE INSPECTED AND APPROVED AT THE TIME OF CONSTRUCTION PER STANDARD DETAIL W-2.
3. HYDRANT SHALL BE PAINTED 1 COAT RED PRIMER OVER SOUND METAL & 2 COATS SAFETY YELLOW PAINT.
4. LONG BEACH IRON WORKS NO. 615 W/ (1) 4 1/2" AMD (2) 2 1/2" HOSE OUTLET (OR APPROVED EQUAL) PUMPER OUTLET TO FACE STREET.



COUNTY OF SUTTER

FIRE HYDRANT

Douglas N. Hamilt

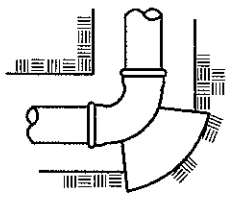
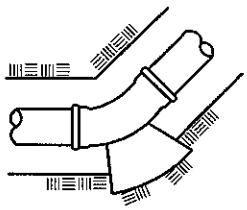
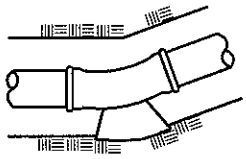
DIRECTOR OF PUBLIC WORKS

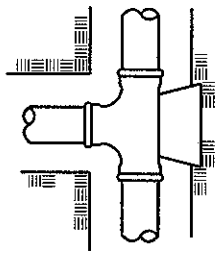
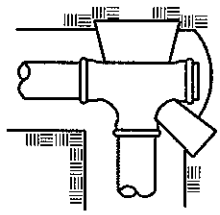
SCALE: NONE

DRN: PSO DATE: 11/2010

DWG NO. W-1

REQUIRED BEARING AREA – TOTAL SQUARE FEET

TYPE OF FITTING		90° BEND	45° BEND	11 1/2° OR 22 1/2° BEND
TYPICAL INSTALLATION				
SIZE OF PIPE	4"	2	1	1
	6"	4	2	1
	8"	7	4	2
	10"	12	6	3
	12"	16	10	5

TYPE OF FITTING		TEE OR DEAD END	TEE WITH PLUG
TYPICAL INSTALLATION			
SIZE OF PIPE	4"	2	2
	6"	3	4
	8"	5	7
	10"	8	12
	12"	12	16

NOTES:

1. THRUST BLOCKS TO BE CONSTRUCTED OF CLASS "B" CONCRETE.
2. AREAS GIVEN ARE FOR CLASS 150 PIPE AT TEST PRESSURE OF 150 P.S.I. IN SOIL WITH 2,000 P.S.F. BEARING CAPACITY. INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES, AND/OR SOIL TYPES SHOULD BE ADJUST AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF ENGINEER.
3. BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
4. JOINTS TO BE KEPT CLEAR OF CONCRETE.
5. BLOCKS TO BE IN PLACE 7 (SEVEN) DAYS BEFORE TESTING.
6. ALL PLUGS SHALL BE SECURED WITH THRUST BLOCKS.
7. SEE STANDARD DETAIL W-10 FOR CROSS THRUST BLOCK.

COUNTY OF SUTTER

THRUST BLOCK DETAILS

Douglas N Hault

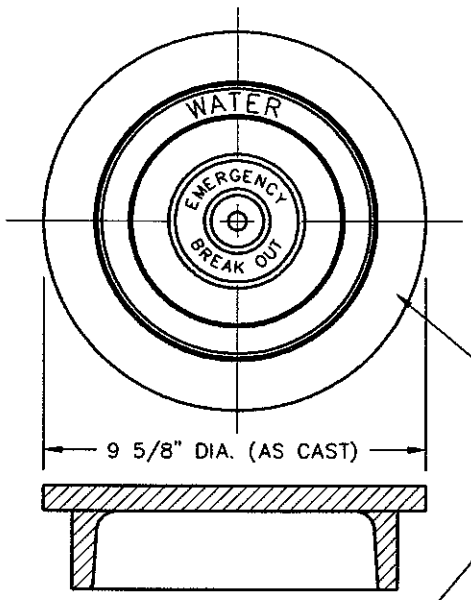
DIRECTOR OF PUBLIC WORKS

SCALE: NONE
DRN: PSO DATE: 11/2010

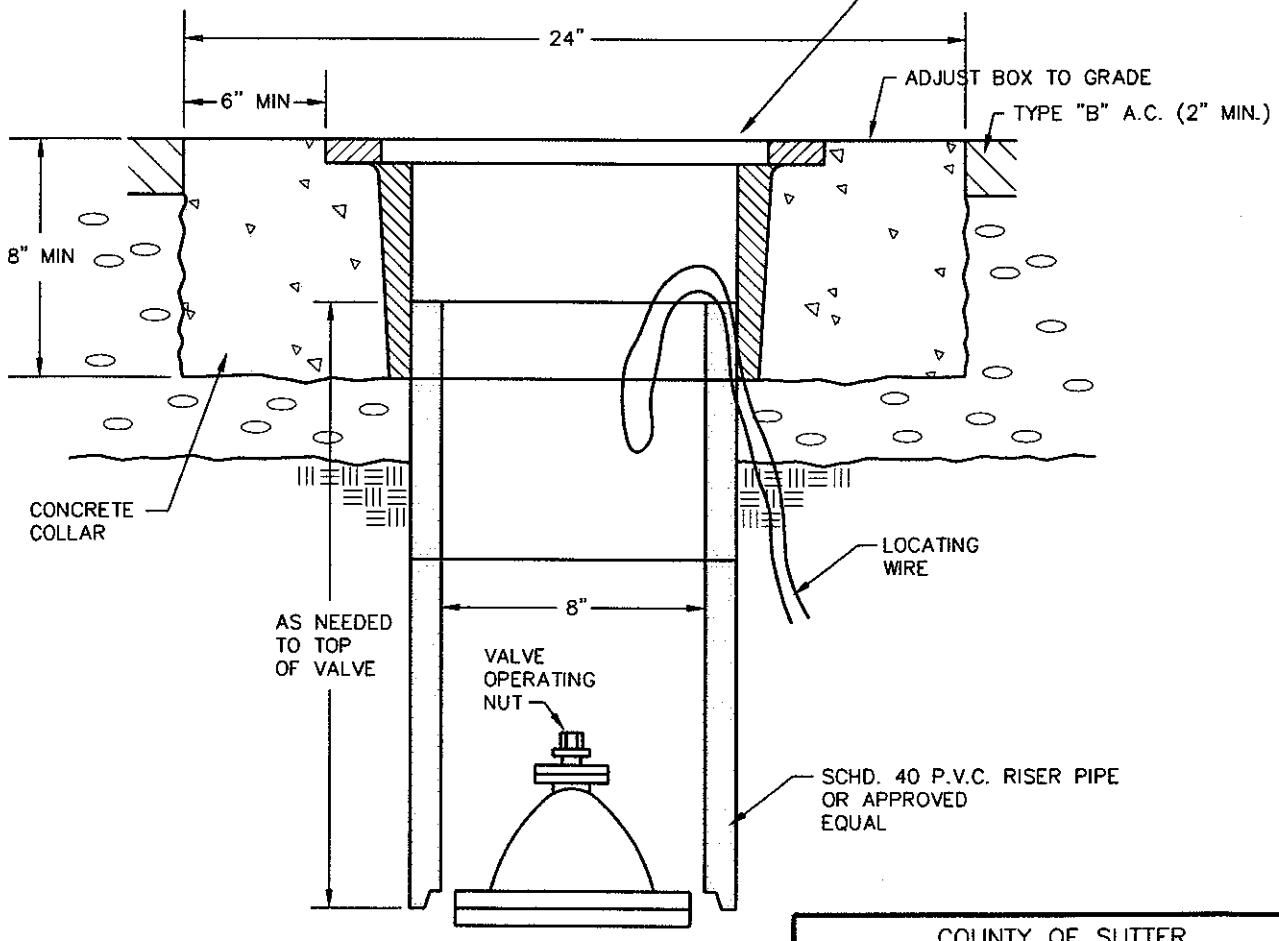
DWG NO. W-2

NOTES:

1. RESILIENT SEAT GATE VALVES SHALL COMPLY WITH AWWA C-509. BUTTERFLY VALVES SHALL COMPLY WITH AWWA C-504.
2. VALVE BOX RISER TO BE ONE CONTINUOUS PIECE AND CENTERED ON VALVE.
3. VALVE OPERATING NUT EXTENSION SHALL BE REQUIRED WHERE VALVE NUT IS IN EXCESS OF 5' BELOW FINISHED GRADE.



COVER DETAIL

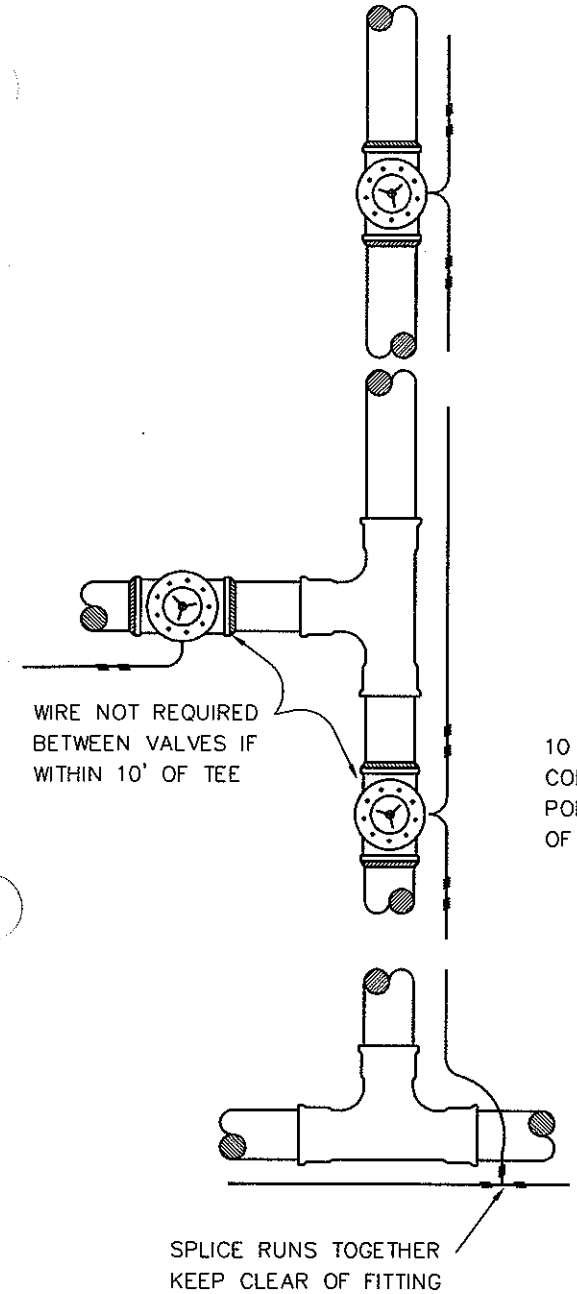


COUNTY OF SUTTER

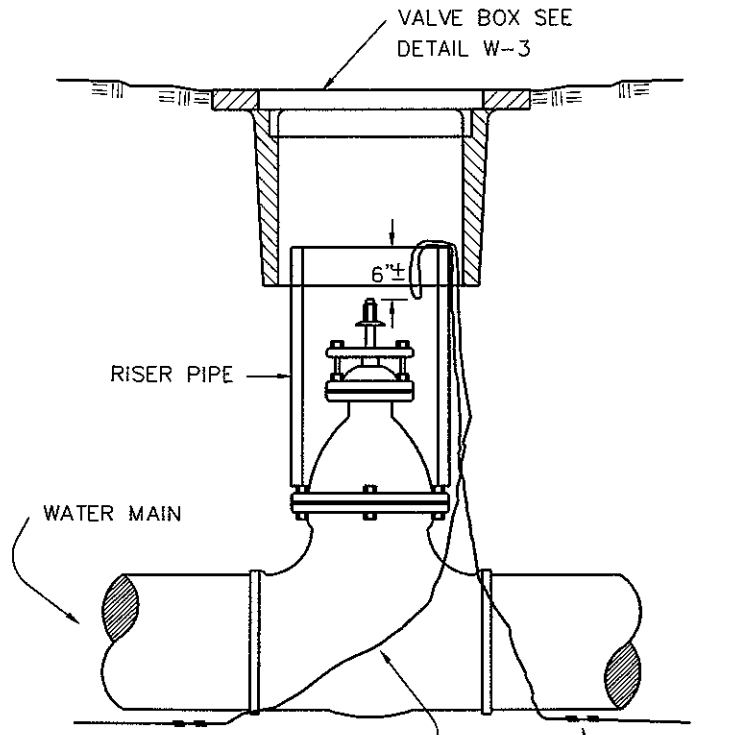
WATER VALVE BOX

Douglas N Hault
DIRECTOR OF PUBLIC WORKS

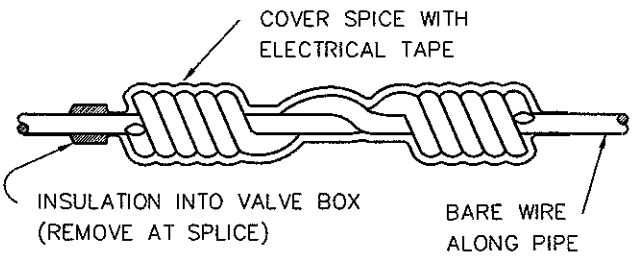
SCALE: NONE
DRN: PSO DATE: 11/2010
DWG NO. W-3



TYPICAL LAYOUT



VALVE DETAIL



SPLICE DETAIL

NOTES:

1. WIRE TO BE CONTINUOUS BETWEEN VALVE BOXES, EXCEPT AS NOTED.
2. BARE WIRE NOT TO TOUCH METAL VALVES OR FITTINGS.
3. LOCATING WIRE TO BE LAID AT BOTTOM OF TRENCH, NEXT TO PIPE.
4. LOCATING WIRE MUST BE TESTED & BE IN WORKING ORDER AFTER ALL UNDERGOUND WORK IS DONE, AND PRIOR TO STREET PAVING.

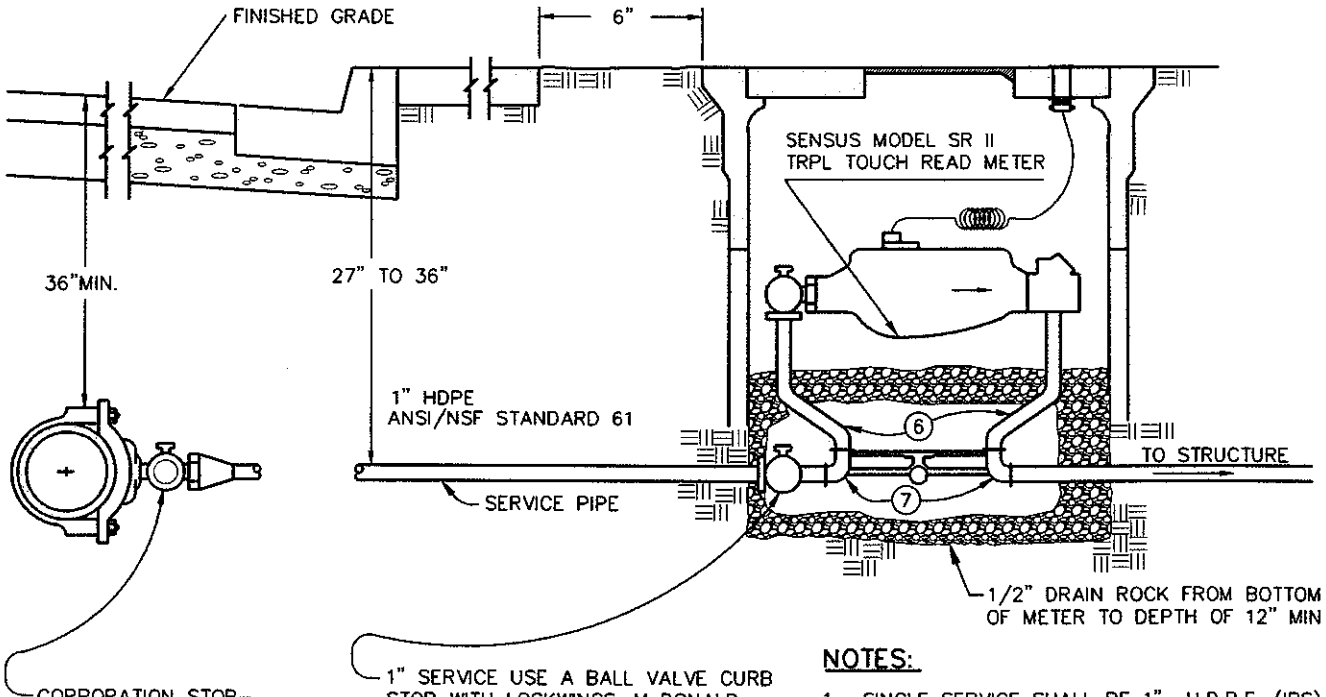
COUNTY OF SUTTER

WATER MAIN LOCATING WIRE

Douglas N Gault
DIRECTOR OF PUBLIC WORKS

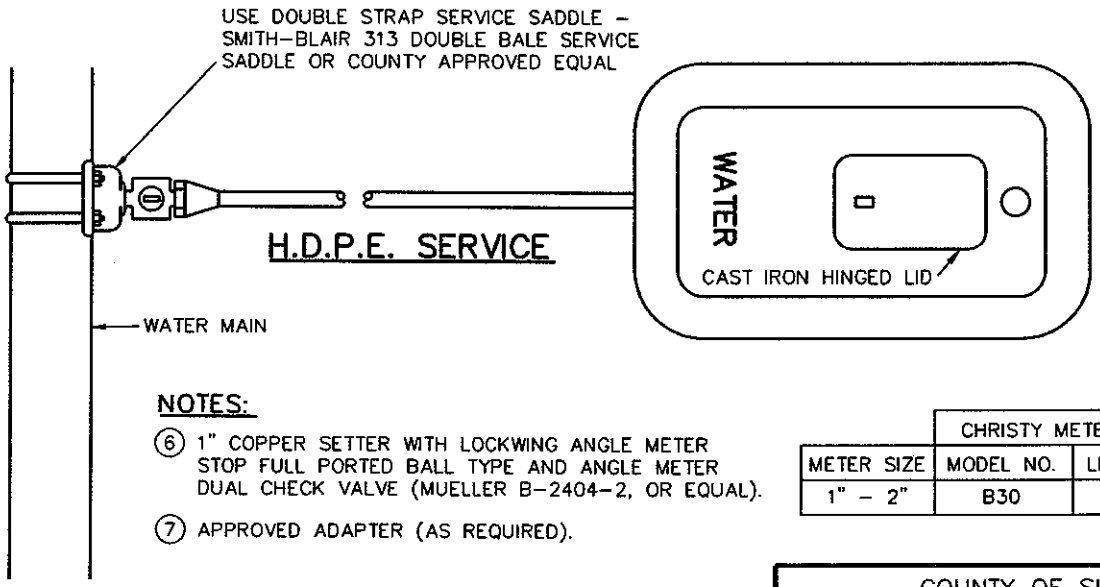
SCALE: NONE
DRN: PSO DATE: 11/2010

DWG NO. W-4



NOTES:

1. SINGLE SERVICE SHALL BE 1" H.D.P.E. (IPS).
2. SPLICES IN THE SERVICE LINE ARE TO BE AVOIDED; BUT IF ALLOWED, THEY SHALL BE MADE USING CTS GRIP-TYPE COMPRESSION COUPLINGS
3. PIPE MUST BE LABELED WITH A LABORATORY SEAL OR MARK ATTESTING TO SUITABILITY.
4. ALL SERVICE LATERALS MUST HAVE TRACE WIRE INSTALLED.
5. METER BOX SHALL NOT BE LOCATED IN DRIVEWAY.



NOTES:

(6) 1" COPPER SETTER WITH LOCKWING ANGLE METER STOP FULL PORTED BALL TYPE AND ANGLE METER DUAL CHECK VALVE (MUELLER B-2404-2, OR EQUAL).

(7) APPROVED ADAPTER (AS REQUIRED).

	CHRISTY METER BOX	
METER SIZE	MODEL NO.	LID TYPE*
1" - 2"	B30	B30GP

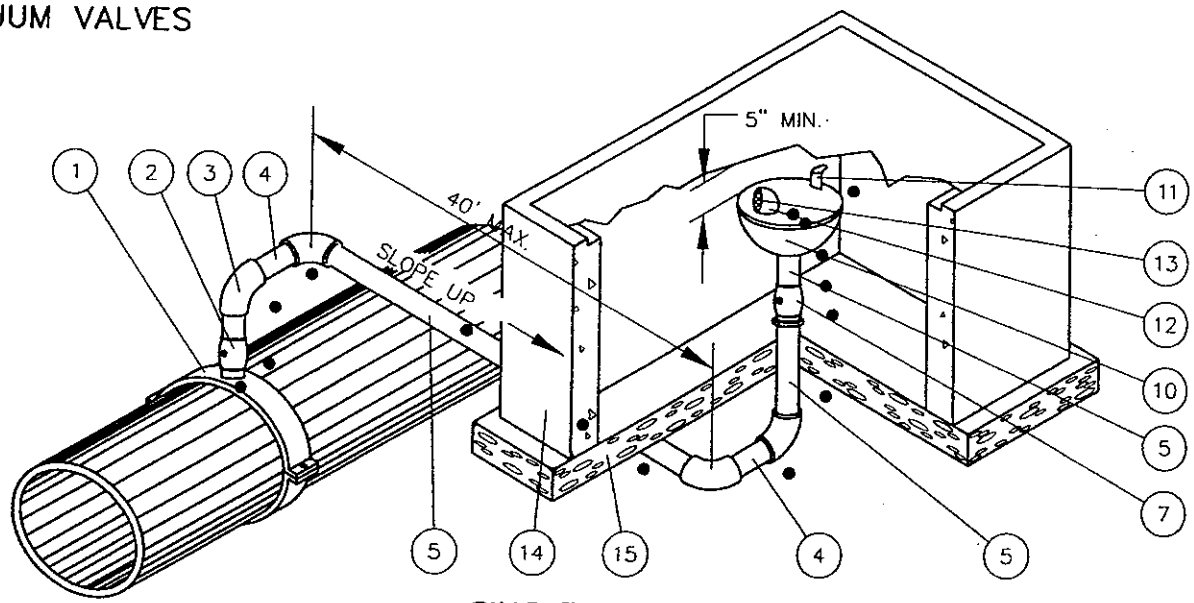
COUNTY OF SUTTER

SINGLE WATER SERVICE

Douglas N Gault
DIRECTOR OF PUBLIC WORKS

SCALE: NONE
DRN: KSX DATE: 11/2010
DWG NO. W-5

AIR–VACUUM VALVES

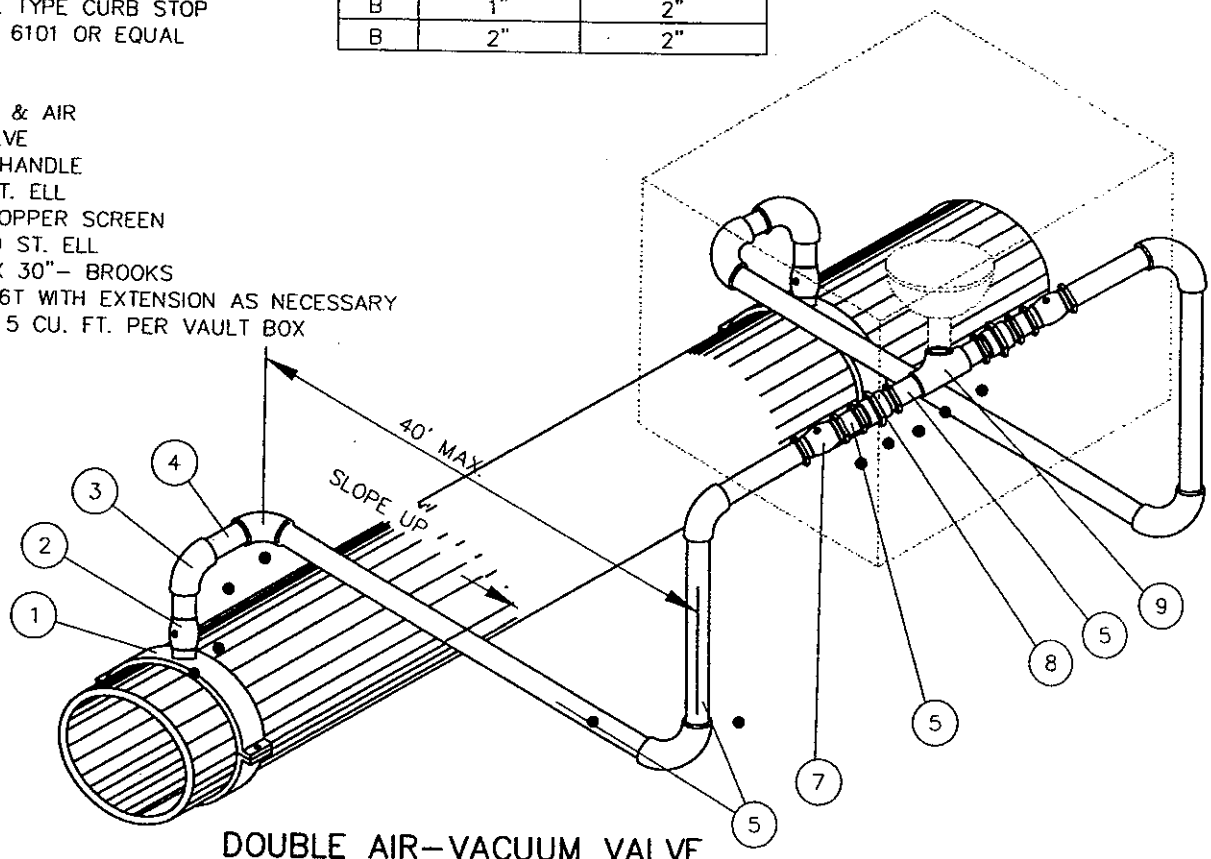


1. SERVICE SADDLE–SMITH BLAIR #313 OR APPR. EQUAL (DBL STRAP FOR D.I. FULL BODY FOR PVC)
2. CORP. STOP–FORD FB 1700
3. 90° ELL
4. NIPPLE
5. GALV. PIPE–RIGID

7. TEFLON BALL TYPE CURB STOP McDONALD # 6101 OR EQUAL
8. UNION
9. TEE
10. AIR–VACUUM & AIR RELEASE VALVE
11. BIBB W/TEE HANDLE
12. 90° BRASS ST. ELL
13. FINE MESH COPPER SCREEN WIRE AROUND ST. ELL
14. VAULT: 17" X 30"– BROOKS MODEL NO. 66T WITH EXTENSION AS NECESSARY
15. DRAIN ROCK, 5 CU. FT. PER VAULT BOX

SINGLE AIR–VACUUM VALVE
TYPE "B"

TYPE	AIR–VALVE SIZE	SIZE OF PIPE FITTINGS
A	1"	1"
A	2"	2"
B	1"	2"
B	2"	2"



DOUBLE AIR–VACUUM VALVE
TYPE "A"

DATE	REVISIONS	BY

COUNTY OF SUTTER

AIR VACUUM VALVE

APPROVED _____ DATE _____

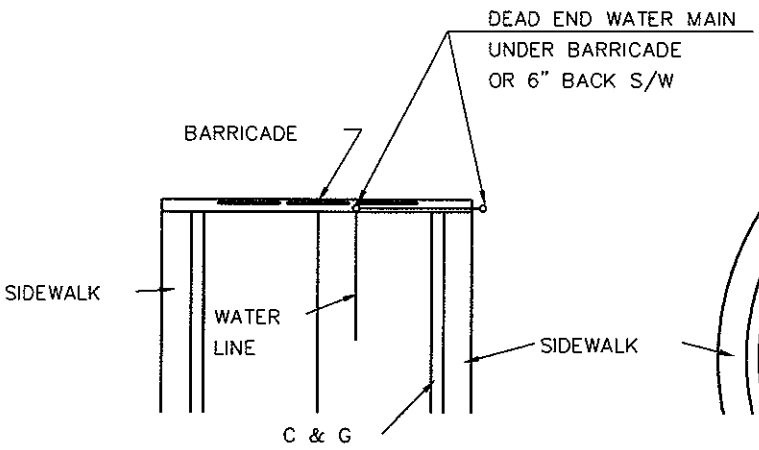
SCALE : NONE

DRN : PSO

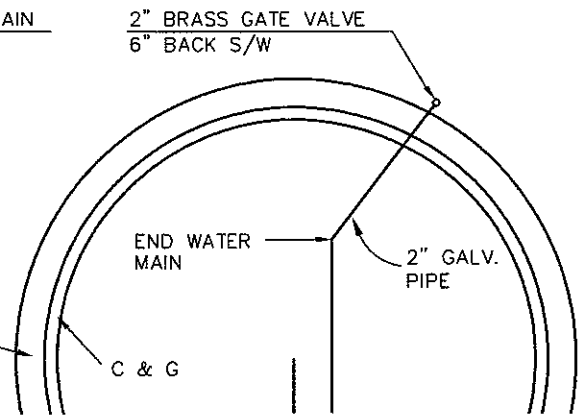
DWG NO. W-6

DWG Name: R:\Develop\SUT0202\Std-Det\Sutter\W-6.dwg Updated By: JWillard

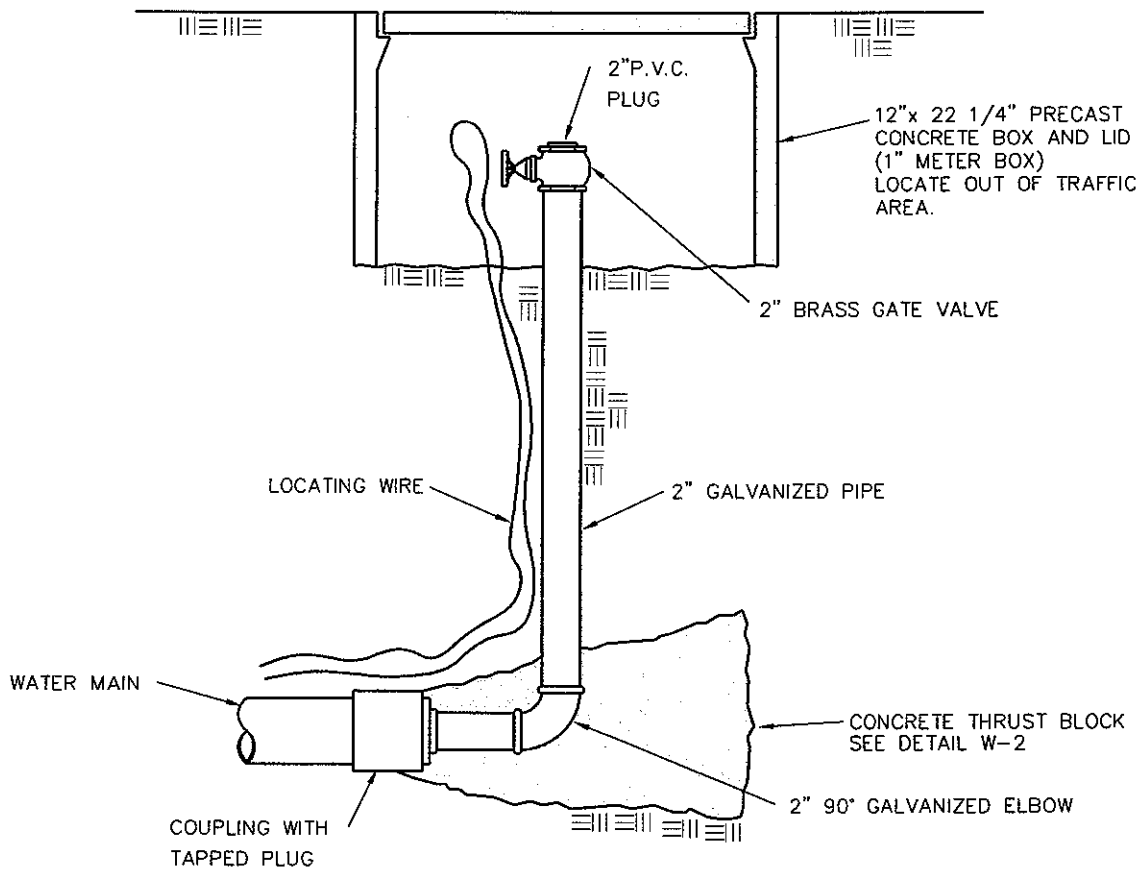
Mar. 24, 1999 - 10



DEAD END STREET
NTS



CUL-DE-SAC
NTS



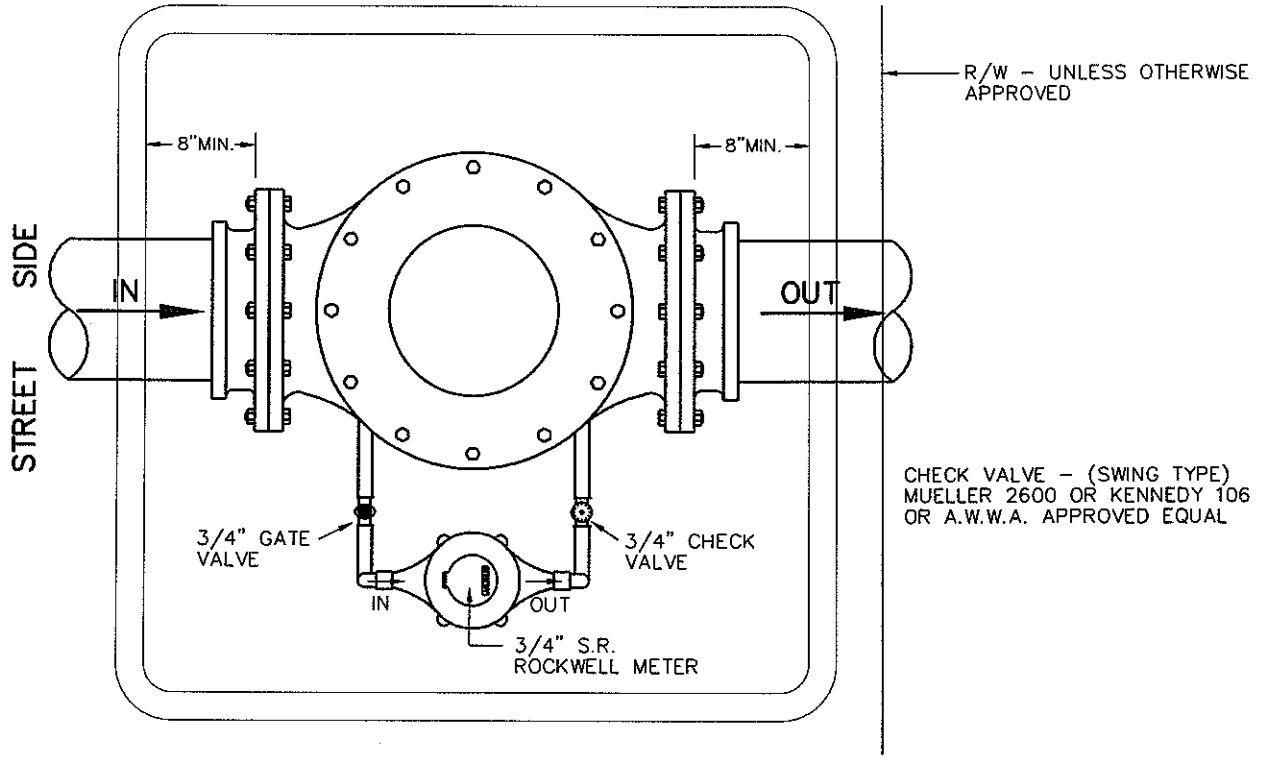
COUNTY OF SUTTER

BLOW OFF

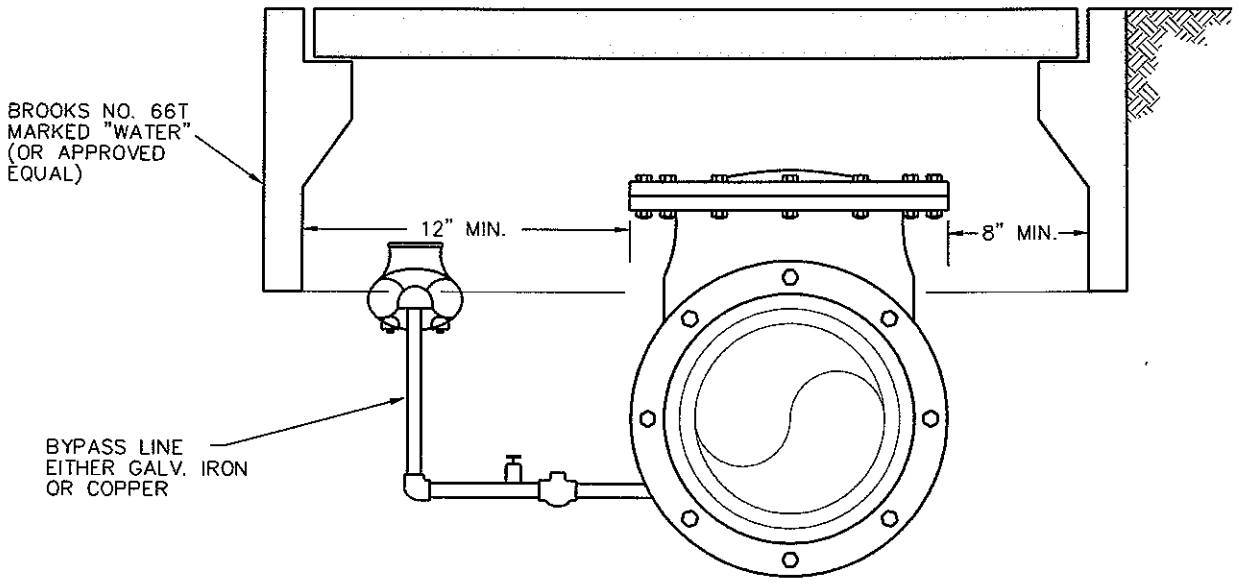
Douglas N Hault
DIRECTOR OF PUBLIC WORKS

SCALE: NONE
DRN: PSO DATE: 11/2010

DWG NO. W-7



PLAN VIEW



END VIEW

COUNTY OF SUTTER

FIRE SERVICE CHECK VALVE

Douglas N Hault

DIRECTOR OF PUBLIC WORKS

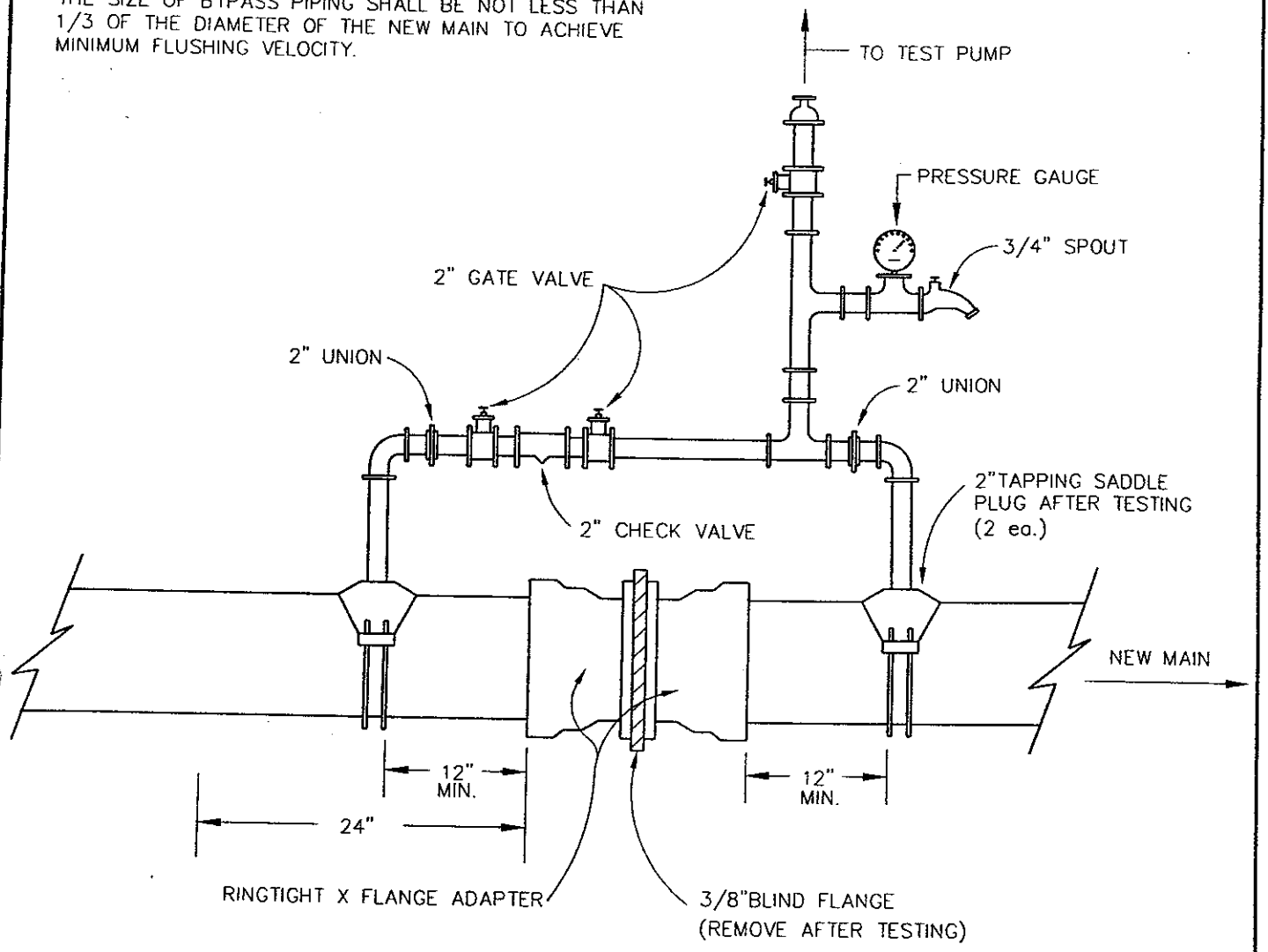
SCALE: NONE

DRN: PSO DATE: 11/2010

DWG NO. W-8

NOTE:

THE SIZE OF BYPASS PIPING SHOWN IS FOR A 6" MAIN THE SIZE OF BYPASS PIPING SHALL BE NOT LESS THAN 1/3 OF THE DIAMETER OF THE NEW MAIN TO ACHIEVE MINIMUM FLUSHING VELOCITY.



NOTE: ALL MATERIAL INSTALLATION AND RECONNECTION TO BE FURNISHED BY CONTRACTOR

FOR NEW WATER MAIN CONSTRUCTION

DATE	REVISIONS	BY

COUNTY OF SUTTER

TESTING BLOCK AND BYPASS

APPROVED _____ DATE _____

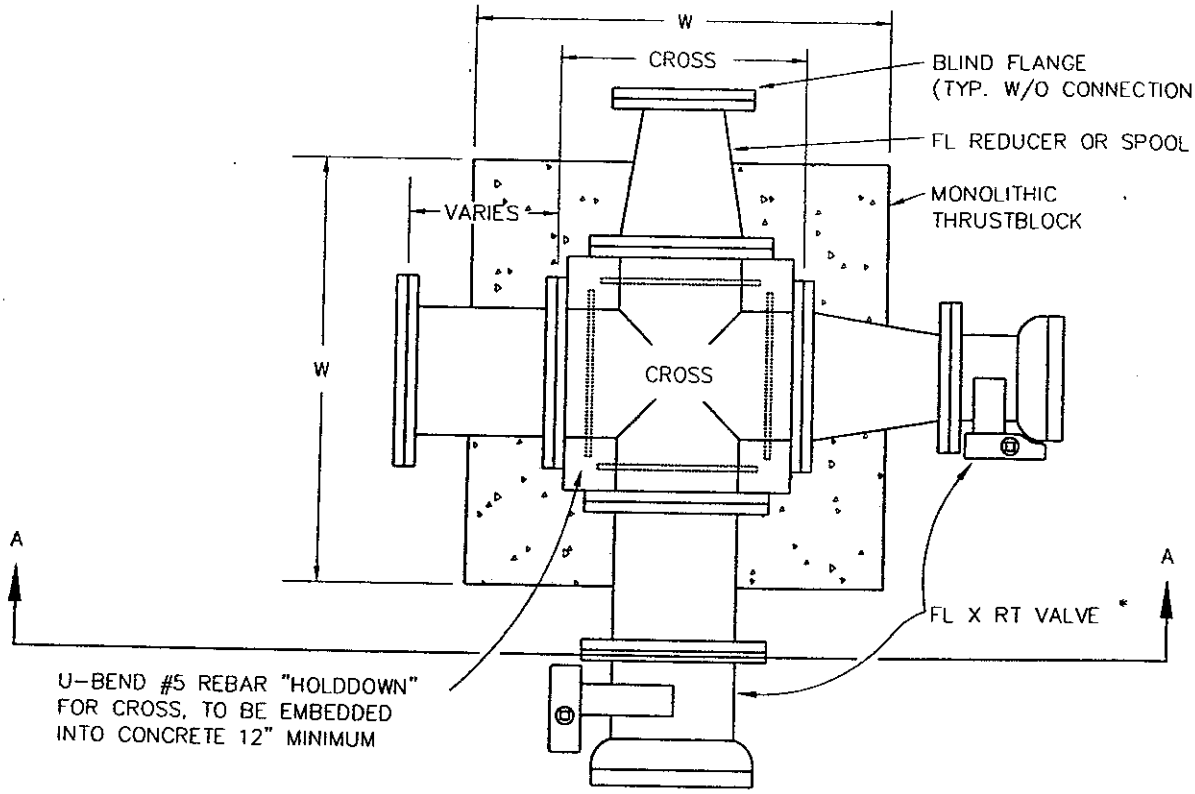
SCALE : NONE

DRN : PSO

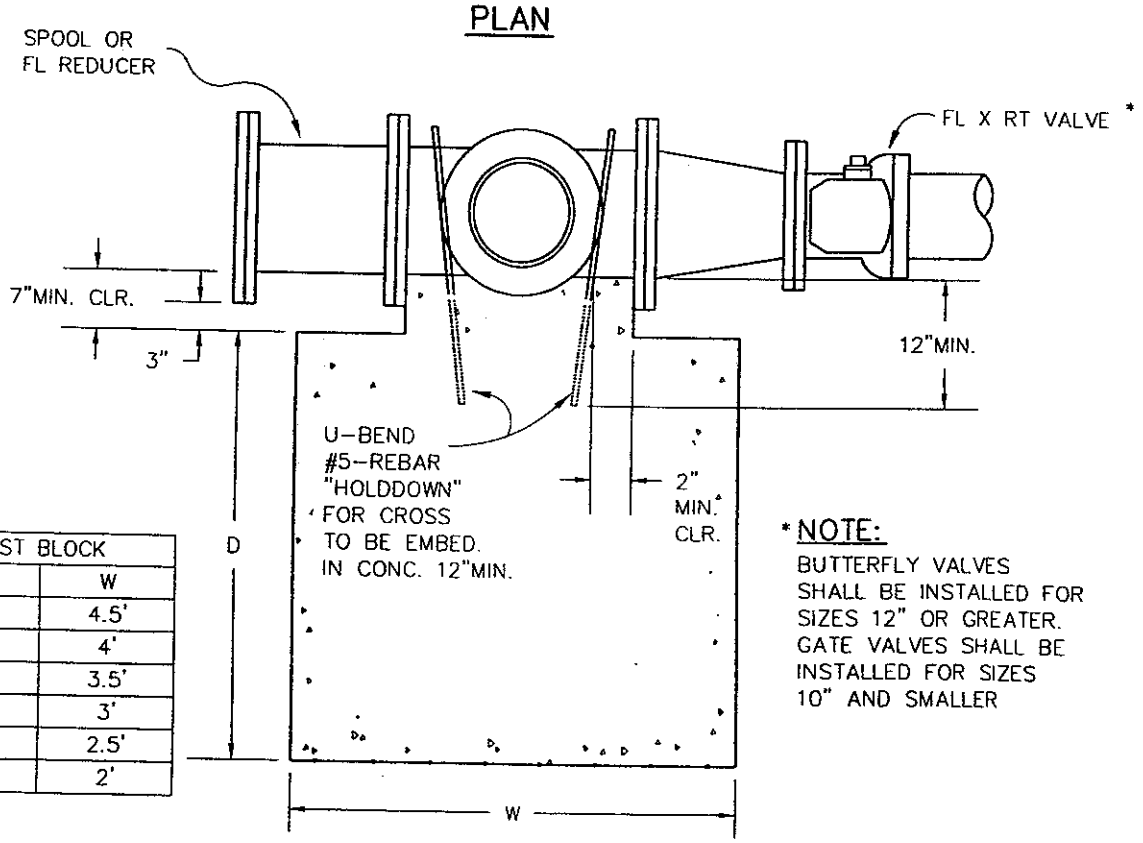
DWG NO. W-9

DWG Name: R:\develop\SU10202\Std-Det\Sutter\W-9.dwg Updated By: JWillard

Mar. 24, 1999 - 1



PLAN



SECTION A-A

SIZE OF THRUST BLOCK		
SIZE OF CROSS	D	W
16"	4.5'	4.5'
14"	4'	4'
12"	3.5'	3.5'
10"	3'	3'
8"	2'	2.5'
6"	1.5'	2'

*NOTE:
BUTTERFLY VALVES SHALL BE INSTALLED FOR SIZES 12" OR GREATER. GATE VALVES SHALL BE INSTALLED FOR SIZES 10" AND SMALLER

DATE	REVISIONS	BY

COUNTY OF SUTTER

THRUST BLOCK FOR FLANGE CROSS

APPROVED _____ DATE _____

SCALE : NONE
DRN : PSO

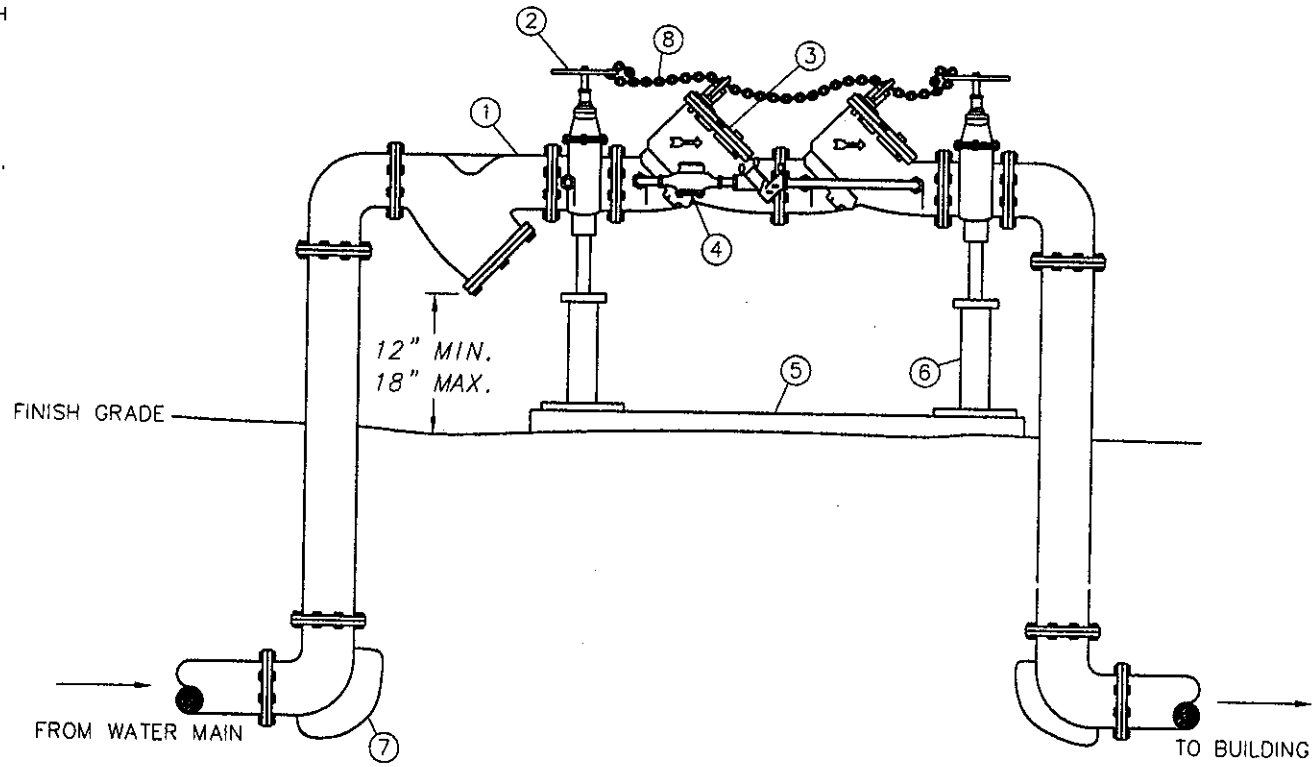
DWG NO. W-10

DWG Name: R:\develop\SUT0202\Sld-Det\Sutter\W-10.dwg Updated By: JWillard

Mar. 24, 1999 - 1

NOTES:

1. NO WATER SHALL BE DRAWN THROUGH THE BACKFLOW DEVICE UNTILL IT HAS BEEN TESTED BY THE COUNTY.
2. THE BACKFLOW DEVICE SHALL BE INSULATED WITH AN APPROVED FREEZE PROTECTION BAG.
3. FITTINGS SHALL BE FLANGE BY FLANGE OR RESTRAINED.
4. BURIED NUTS AND BOLTS SHALL HAVE SAP CAPS.
5. BURIED PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.
6. PIPE AND FITTINGS SHALL BE DUCTILE IRON.



MATERIALS:

(1) FLANGED "Y" TYPE STRAINER

(2) OS & Y GATE VALVE (TYP.)

(3) DOUBLE DETECTOR CHECK-ALL DEVICES TO BE APPROVED BY COUNY

(4) DETECTOR METER

(5) 4" THICK REINFORCED CONCRETE SLAB (CLASS "B" CONCRETE)

(6) SUPPORTS 2-TYP. SHALL BE BOLTED DOWN WITH A MINIMUM OF TWO BOLTS EACH

(7) THRUST BLOCK (TYP.) DETAIL W-2

(8) 1/4" NON CASE HARDENED CHAIN WITH LOCK BETWEEN VALVES

DATE	REVISIONS	BY

COUNTY OF SUTTER

ONSITE FIRE PROTECTION AND BACKFLOW ASSEMBLY

APPROVED _____ DATE _____

SCALE : NONE
DRN : PSO

DWG NO. W-11