

these Improvement Standards shall be approved by the Engineer before delivery is made. The developer shall give the Engineer sufficient notice of sources of material so that such tests and inspections as the Engineer deems necessary can be performed to determine that the materials comply to the specifications. If the source is not already approved the notice shall not be less than 10 working days prior to delivery of the material to the project. Only approved material shall be used in the work. If it is found that sources of supply which have previously been approved do not furnish a uniform product or if the product proves unacceptable at any time, the developer shall furnish acceptable material from another approved source. No material which after approval has in any way become unfit for use shall be used in the work.

All tests of materials and work to determine compliance with the approved specifications shall be in accordance with the methods and procedures in use by the Department of Transportation and defined in Section 6-3.01 of the Standard Specifications or as they may be amended in these Improvement Standards or by the Special Provisions. Should the work not be performed by contract, the test method shall be the test method in effect on the first day of the month preceeding the month in which work is first begun on the project. The developer shall furnish to the Engineer, without charge, samples of all materials to be used in the work. Samples of material from which tests are to be made shall be taken under the supervision of the Engineer, by a recognized laboratory or by the Design Engineer retained by the developer.

In lieu of prior sampling and testing of certain manufactured products such as reinforcing and structural steel, culvert pipe, paint, cement and asphalt products, the Engineer may permit or require certificates of compliance from the supplier of such products before such materials can be used in the work.

Preliminary sampling and testing of the improvement site or sources of materials that are to be made prior to construc-

tion may, at the option of the Engineer, be performed by the Laboratory of the Tulare County Road Department, by a recognized commercial laboratory or by the Design Engineer retained by the developer. Construction control testing of materials entering the work shall be performed by the Engineer or by a commercial laboratory retained by the County of Tulare. The cost of all preliminary testing not performed by the Laboratory of the Tulare County Road Department shall be paid by the developer. Costs of all preliminary testing performed by the County Laboratory under the direction of the Engineer and all construction control testing performed by the Engineer or laboratory retained by the County shall be paid by the County except as follows:

Whenever a specified percent relative compaction is required and the material or portion thereof so tested fails to meet or exceed the relative compaction specified, the first retest shall be performed at no expense to the contractor. Should the first retest also fail, a charge of \$30.00 for each additional retest performed by the County shall be charged the developer. Failure of the developer to comply with the approved plans and specifications and the procedures specified herein shall be deemed sufficient cause for the rejection by the County of all or any portion of the work. The Engineer may cause rejected work to be remedied, removed or replaced all at the expense of the developer.

B. STREETS AND HIGHWAYS

1. General

The construction of all streets, highways, drainage structures, and their auxiliary facilities shall comply with the requirements of the following portions of the Standard Specifications, except as such portions shall be amended by these Improvement Standards and/or the special provisions, excluding therefrom all reference to measurement and payment. Measurement and payment for improvement work performed under Division Seven or Twelve of the Streets and Highways Code of

the State of California shall be as specified in the Special Provisions. Measurement and payment for other work performed under these improvement standards shall be the responsibility of the developer.

Applicable Sections:

1. Definition and Terms
5. Control of Work
6. Control of Materials
10. Dust Control
15. Existing Highway Facilities
16. Clearing and Grubbing
17. Watering
18. Dust Palliative
19. Earth Work
20. Erosion Control and Landscaping
22. Finishing Roadway
24. Lime Treatment
25. Aggregate Subbase
26. Aggregate Bases
27. Road Mixed Cement Treated Bases
36. Penetration Treatment
37. Bituminous Seals
38. Road Mix Asphalt Surfacing
39. Asphalt Concrete
51. Concrete Structures
52. Reinforcement
53. Air-blown Mortar
60. Rubble Masonry
64. Asbestos Cement Pipe
65. Reinforced Concrete Pipe
66. Corrugated Metal Pipe
67. Structural Plate Pipe, Arches, and Pipe Arches
68. Sub-surface Drains
69. Over-side Drains
70. Miscellaneous Facilities
72. Slope Protection

- 73. Concrete Curb and Sidewalks
- 80. Fences
- 83. Railings and Barriers

Applicable Sub-Sections:

- 4-1.01 Intent of Plans and Specifications
- 4-1.02 Final Cleanup
- 4-1.04 Detours
- 4-1.05 Use of Materials Found on the Work
- 7-1.01 Laws to be Observed, excepting sub-sections 7-1.01A through 7-1.01L; In lieu of these excepted sub-sections, the Developer shall comply with all applicable local, State and Federal laws, and shall hold the County of Tulare harmless from any breach of said laws.
- 7-1.02 Weight Limitations
- 7-1.04 Permits and Licenses
- 7-1.05 Patents
- 7-1.06 Safety Provisions
- 7-1.07 Sanitary Provisions
- 7-1.08 Public Convenience
- 7-1.09 Public Safety
- 7-1.10 Use of Explosives
- 7-1.11 Preservation of Property
- 7-1.12 Responsibility for Damage
- 7-1.13 Disposal of Material Outside the Highway Right of Way
- 7-1.14 Cooperation
- 7-1.16 Contractors Responsibility for the Work and Materials
- 8-1.10 Utility and Non Highway Facilities

2. Earthwork

The earthwork shall conform to the requirements of Section 19 of the Standard Specifications and the following provisions.

All unsuitable or surplus material excavated shall become the property of the Contractor and shall be disposed of in accordance with the provisions in Section 7-1.13 of the Standard Specifications. Such material encountered in subdivision improvements may be used to regrade lots within the sub-

division with the approval of the developer and the Engineer provided such regrading is done in a manner which will not prohibit the proper drainage of lots or property within or adjacent to the subdivision.

Selected material for use in subdivision improvements may be obtained from material excavated from a location outside the right of way but within the subdivision when specified in the special provisions, shown on the plans, or designated by the Engineer.

The trench for pipe culverts shall be excavated a minimum depth of 3 inches below the bells or couplings for the full length of the trench under ordinary circumstances and if solid rock or other unyielding material is encountered the material shall be removed to a depth of one-fourth the nominal diameter of the pipe below the couplings or bells but not less than 4 inches. If the foundation is soft, spongy, or unstable, the trench shall be excavated to a stable soil or 1 foot below the bells or couplings, whichever is the least, and the excavation backfilled with structure backfill material of a quality and gradation specified herein.

Below an elevation of 12-inches above the top of the pipe backfill material shall have a sand equivalent of 30 and shall meet the following gradation requirements.

<u>Sieve Size</u>	<u>Percent Passing</u>
3"	100
No. 4	35-100

Backfill around the pipe and to an elevation of 12 inches above the pipe shall be placed carefully to provide uniform support for the pipe and in such a manner as not to injure or disturb the pipe.

Backfill material above an elevation of 12 inches above the pipe may be material from excavation, free from stones or lumps exceeding 3 inches in greatest dimension, vegetable matter, or other unsatisfactory material and shall be compacted to a relative compaction of not less than 90 percent. Backfill material placed below the roadway surfacing or other paved area

shall be compacted to a relative compaction of 95 percent to a depth of 1.5 feet below finished grade or to a depth of 0.5 foot below the lowest layer of surfacing, base or subbase whichever is the greatest.

Surfacing, base or subbase removed during the trenching operations shall be replaced with material equal or better than the material so removed. However, the surfacing replaced shall have a minimum depth of not less than 3 inches.

Jetting may be permitted under favorable conditions with prior approval of the Engineer. Mechanically operated tamping machines employing the impact principal will not be permitted at locations where, in the opinion of the Engineer, their use could cause damage to the pipe being backfilled.

Excavation for compaction of original ground as provided in Section 19-5.02 of the Standard Specifications shall not be required, but this provision will not preclude the necessity of compacting subgrade. The subgrade shall be prepared and compacted as provided in Section 19-1.03 of the Standard Specifications.

The relative compaction of each layer of embankment beneath the surfacing to a depth of 1.5 feet from finished grade or to a depth of 0.5 foot below the lowest layer of pavement, base or subbase, whichever is the greatest, shall not be less than 95 percent. The relative compaction of all other embankment material shall be not less than 90 percent.

3. Aggregate Subbase

Aggregate subbase shall conform to the requirements of Section 25 of the Standard Specifications and the following provisions.

Aggregate Subbase shall be Class 4 and the percentage composition by weight shall conform to the following grading when determined by Test Method No. Calif. 202.

<u>Sieve Sizes</u>	<u>Percentage Passing</u>
2 1/2 inches	100
No. 4	50-100
No. 200	0-25

Class 4 aggregate subbase shall also conform to the following minimum quality requirements:

<u>Tests</u>	<u>Test Method No.</u>	<u>Requirements</u>
Sand Equivalent	217	20
Resistance (R-Value)	301	50

The R-Value requirement will be waived provided the aggregate subbase conforms to the specified grading and has a Sand Equivalent of 25 or more.

Where the required thickness is 0.67 foot or less, the aggregate subbase may be spread and compacted in one layer. Where the required thickness is more than 0.67 foot, the aggregate subbase shall be spread and compacted in 2 or more layers of approximately equal thickness, and the maximum compacted thickness of any one layer shall not exceed 0.67 foot. Each layer shall be compacted in a similar manner.

4. Lime Treatment

Lime Treatment shall conform to the requirements in Section 24 of the Standard Specifications and these provisions.

Lime treated material may be used in place of aggregate subbase provided the minimum thickness of aggregate base and paving is provided.

Lime for use in lime treatment may be a granular quicklime which when sampled at the point of delivery shall conform to the following requirements.

1. Free lime, expressed as calcium hydroxide, $\text{Ca}(\text{OH})_2$, shall not be less than 95 percent as determined by Test Method No. Calif. 414-A.
2. Granular Quicklime shall meet the following dry mechanical grading analysis.

<u>Sieve Size</u>	<u>Percentage Passing</u>
No. 4	100
No. 100	10 maximum

3. Lime reactivity shall be not less than 25° C. Lime reactivity shall be expressed as the slaking rate of quicklime after 30 seconds in accordance with ASTM designation C110.

5. Aggregate Base

Aggregate base shall conform with the requirements of Section 26 of the Standard Specifications and the following provisions.

Aggregate base shall be Class 2, 3/4 inch maximum in the valley areas.

Aggregate base may be either Class 2, 3/4 inch maximum or Class 3 aggregate base in the mountain areas.

Class 3 aggregate base shall be free from vegetable matter and other deleterious substances and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base.

Aggregate for Class 3 aggregate base shall consist of any one or a mixture of broken or crushed stone, crushed gravel, or natural materials that will meet the specified quality requirements when combined within the specified limits of grading.

The percentage composition by weight of Class 3 aggregate base shall conform to one of the following gradings when determined by Test Method No. Calif. 202.

<u>Sieve Sizes</u>	<u>Percentage Passing</u>		
	<u>3/4" max.</u>	<u>1/2" max.</u>	<u>3/8" max.</u>
1"	100	-	-
3/4"	85-100	100	-
1/2"	-	90-100	100
3/8"	-	-	95-100
No. 4	35-65	50-75	-
No. 8	-	35-60	60-85
No. 30	10-30	15-35	25-45
No. 200	2-10	4-12	6-15

Class 3 aggregate base shall also conform to the following quality requirements:

<u>Tests</u>	<u>Test Method</u>	<u>Requirements</u>
	<u>No. Calif.</u>	
Resistance (R-Value)*	301	65 min.

Sand Equivalent

217

25 min.

* The R-Value requirement will be waived provided the aggregate base conforms to the specified grading and has a Sand Equivalent value of 35 or more.

In lieu of the requirements of Section 26-1.04B, aggregate base may be spread in accordance with the requirements of spreading aggregate subbase as specified in Section 25-1.04 of the Standard Specifications.

In mountain areas the finished aggregate base may vary up to 0.08 foot above or below the grade established by the Engineer.

6. Road-Mixed Asphalt Surfacing - Road-mixed asphalt surfacing shall conform with the following provisions.

Road-mixed asphalt surfacing shall only be used in mountain areas approved by the County Public Works Director.

The bituminous binder to be mixed with the aggregate shall be liquid asphalt conforming to the provisions in Section 93 of the Standard Specifications and shall be of a grade approved by the Engineer. The amount of liquid asphalt to be mixed with the aggregate shall be determined by the Engineer.

Aggregate may be imported material, selected material, local borrow material, or combination of such materials and shall consist of any one or a mixture of the following materials:

1. Broken or crushed stone, or crushed gravel.
2. Natural material having sufficient roughness to meet the specified stabilometer requirements when combined within the specified limits of grading.

The percentage composition by weight of the aggregate shall conform to one of the following gradings when determined by Test Method No. Calif. 202.

<u>Sieve Sizes</u>	<u>Percentage Passing</u>		
	<u>3/4" max.</u>	<u>1/2" max.</u>	<u>3/8" max.</u>
1"	100	-	-
3/4"	85-100	100	-

1/2"	-	90-100	100
3/8"	-	-	95-100
No. 4	35-65	50-75	-
No. 8	-	35-60	60-85
No. 30	10-30	15-35	25-45
No. 200	2-10	4-12	6-15

The combined aggregate shall also conform to the following quality requirements immediately prior to mixing with asphalt binder:

<u>Tests</u>	<u>Test Method</u>	
	<u>No. Calif.</u>	<u>Requirements</u>
Both K_C and K_F - Factors (obtained from C.K.E. Test)	303	1.8 Max.
Sand Equivalent	217	35 Min.

The combined aggregate shall also conform to the following quality requirements when mixed with the amount of asphalt determined to be optimum by Test Method No. Calif. 304 which in no case shall be less than 3.8 percent by weight of the dry aggregates:

<u>Tests</u>	<u>Test Method</u>	
	<u>No. Calif.</u>	<u>Requirements</u>
Stabilometer Value	304	30 Min.
Moisture Vapor Susceptibility (Stabilometer Value)	307	20 Min.
Swell	305	0.030 Max.

7. Asphalt Concrete

Asphalt Concrete shall comply with the requirements of Section 39 of the Standard Specifications and the following provisions.

In valley areas the asphalt binder to be mixed with the aggregate shall be a paving asphalt, the grade to be approved by the Engineer.

In mountain areas the asphalt binder to be mixed with the aggregate shall be a paving asphalt or a liquid asphalt of a grade approved by the Engineer.

Aggregate for asphalt concrete shall be Type B, the percentage composition by weight conforming to one of the

following gradings:

3/4" Maximum (Medium)

3/4" Maximum (Fine)

1/2" Maximum (Coarse)

A prime coat or paint binder meeting the requirements in Section 39-4.02 of the Standard Specifications shall be applied to all areas to be surfaced with asphalt concrete.

When specified by the Engineer, a Fog Seal complying with the requirements of Section 37 of the Standard Specifications shall be applied to the finished surface of the asphalt concrete. The combined mixture of asphaltic emulsion and water shall be applied at the rate of 0.10 gallon per square yard unless a lesser rate of application is required by the Engineer.

In lieu of the requirements in Sections 39-5.03A and 39-5.03B, the minimum rolling equipment specified may be reduced to one 2-axle tandem roller, weighing at least 8 tons, when asphalt concrete is placed at a rate of 100 tons, or less, per hour at any location provided it is demonstrated to the satisfaction of the Engineer that one roller can perform the work.

In mountainous areas, when approved by the Engineer, any course or layer of asphalt concrete may be spread with pneumatic tired motor graders meeting the requirements specified in Section 39-5.01 of the Standard Specifications provided segregation can be avoided and a uniform, smooth pavement obtained.

In mountainous areas the allowable surface tolerance may be increased to the maximum permissible for road-mixed asphalt surfacing as specified in Section 38-4.07 of the Standard Specifications.

8. Concrete Structures

Concrete structures shall be constructed in accordance with the requirements in Section 51 of the Standard Specifications and the following provisions.

When approved by the Engineer concrete may be designated

by 28 day comprehensive strength without reference to the class designation referred to in Section 90 of the Standard Specifications. If designated by compressive strength, the Contractor shall be responsible for furnishing concrete which contains not less than 5.5 sacks nor more than 8.5 sacks of cement per cubic yard of concrete which is workable, and which conforms to the strengths shown on the plans or specified by the Engineer. Unless approved by the Engineer the compressive strength specified shall be obtained without the use of admixtures. The weigh-batch proportions for concrete designated by compressive strength shall be determined by the Contractor.

Concrete may be mixed by hand where the batch size is less than 1/2 cubic yard and the concrete is mixed in accordance with the provisions in Section 90-6.05 of the Standard Specifications.

If approved by the Engineer in advance of mixing, where a truck mixer or agitator is used for transporting concrete, discharge of the concrete may be completed after more than 1½ hours or after 250 revolutions of the drum or blades following the introduction of the cement. The amount of additional time or number of revolutions permitted shall be determined by the Engineer.

The method used for curing concrete shall be determined by the Engineer and shall comply to the provisions in Section 90-7 of the Standard Specifications for the method selected.

A Class 1 surface finish may be waived for certain surfaces designated in Section 51-1.18B where shown on the plans or approved by the Engineer. However, an ordinary surface finish shall be required.

9. Reinforcement

Bar reinforcement, mesh reinforcement, and reinforcing wire shall conform to the requirements in Section 52 of the Standard Specifications and the following provisions.

Steel lists as specified in Section 52-1.03 shall not be required unless requested by the Engineer.

Samples of reinforcing steel to be used in the work may be

taken at the site of the work after delivery of the steel. The number and size of samples to be furnished the Engineer by the Contractor will be determined by the Engineer but shall not exceed two samples 2.5 feet in length from each size in each heat or melt.

10. Drainage and Irrigation Pipe

Pipe and pipe arch for use in drainage and irrigation facilities shall conform to the requirements in Sections 63, 64, 65, 66 and 67 of the Standard Specifications and the following provisions.

The type of pipe specified for work governed by these Improvement Standards may be selected by the developer or the design engineer provided the pipe is of sufficient strength to withstand the loading imposed, has a minimum service life of 50 years, and meets the quality requirements specified in the above named sections of the Standard Specifications. Soil tests may be required by the Engineer where the chemical composition of the soil may be detrimental to certain types of pipes proposed for use.

The strength of the pipe required within the road right of way shall be determined by the design procedure used by the State Department of Transportation.

Non-reinforced concrete pipe up to 18 inches in diameter and reinforced concrete pipe up to 24 inches in diameter that meet the D-load, minimum shell thickness, and minimum reinforcement shown in Plate A-24 of Section IV of these Improvement Standards may be used in lieu of pipe conforming to the quality requirements in said Section 65 provided the pipe can withstand the loading imposed.

Corrugated aluminum pipe and pipe arch shall conform to the provisions in Section 62-1.02C of the Standard Specifications.

Band couplers for corrugated pipe shall have the following minimum widths:

<u>Nominal Pipe Diameter</u>	<u>Minimum Band Width</u>
Under 15"	7"
15" thru 48"	12"
Over 48"	24"

Helically corrugated pipe shall be connected to annular corrugated pipe using a universal coupling band having a minimum width of 12 inches. The coupling of the two types of pipes at locations where a firm, positive connection is desired shall be avoided.

The hydrostatic test specified for siphon and pressure pipe in Sections 65-1.08 and 66-1.09D of the Standard Specifications may be waived by the Engineer under field conditions that he determines make the tests unnecessary or impractical to conduct.

11. Subsurface Drains

Subsurface drains shall conform to the requirements in Section 68 of the Standard Specifications and these provisions.

Permeable material may be either Class 1 or Class 2 material at the option of the Contractor unless otherwise specified on the plans or in the special provisions.

Trenches for underdrains shall be excavated to the width shown on the plans or directed by the Engineer. However, said width shall not be less than 2.0 feet. The trench shall also be excavated to a minimum depth of 6 inches below the grade established for the bottom of the drain line. The height to which the filter material is placed shall be as shown on the plans or as directed by the Engineer, which height shall generally be 6 inches below the natural ground outside the roadway or to the elevation of the grading plane within the roadway.

12. Overside Drains

Overside drains shall conform to the requirements in Section 69 of the Standard Specifications and these provisions.

Overside drains shall be limited to the tapered inlet and flume downdrain type of either ferrous metal or aluminum, except that asphalt concrete may be used where the slope is 4:1 or flatter and the length required is less than 10 feet.

Where soil conditions at the end of the downdrain are subject to erosion; rock, asphalt concrete or other material shall be placed to inhibit erosion.

When there is a question as to the ability of the down-drain to function properly, the Engineer may require water to be deposited on the finished roadway in such a manner that the operation of the downdrain may be tested. Inadequacies determined by such tests shall be corrected.

13. Miscellaneous Facilities

Miscellaneous facilities shall conform to the requirements in Section 70 of the Standard Specifications and these provisions.

The pressure tests specified in Sections 70-1.02B and 70-1.02K of the Standard Specifications may be waived by the Engineer under field conditions that he determines make the tests unnecessary or impractical to conduct.

Driveway culvert pipe placed within the right of way shall have a nominal diameter of not less than 12 inches.

14. Slope Protection

Slope protection shall conform to the requirements in Section 72 of the Standard Specifications and these provisions.

Unless shown on the plans or approved by the Engineer rock slope protection, grouted or ungrouted, shall be placed by Method A Placement. However, the local surface irregularities may vary up to two feet from the planned slope measured at right angles to the slope.

The slopes on which sacked concrete slope protection is to be placed may vary up to 0.5 foot of the planned slope measured at right angles to the slope.

15. Concrete Curbs and Sidewalks

Concrete curbs, sidewalks and gutter depressions shall conform to the requirements in Section 73 of the Standard

Specifications and the following provisions.

Either the 1" or 1 1/2" maximum aggregate grading specified in Section 90-3.04 of the Standard Specifications may be used.

16. Fences

Fences shall conform to the requirements in Section 80 of the Standard Specifications and these provisions.

Fences for ponding basins or lots shall be chain link fence, Type CL-6 constructed as shown on Plate No. B-6, Section IV of these Improvement Standards.

Fences adjacent to freeways or limited access expressways shall be of a type approved by the Engineer.

Property fences not adjacent to freeways or limited access expressways may be of any type and material selected by the developer that does not conflict with State and local ordinances or codes.

C. DRAINAGE

1. Pipelines

Pipe and pipe arch shall conform to item number 10 of Subsection B (Streets and Highways) of this section.

2. Earthwork

Trench compaction and backfill material shall conform to item number 2 of Subsection B (Streets and Highways) of this section.

3. Pumping Plant Equipment

a. General - The drainage pumping equipment and the pumping plant electrical equipment shall conform to the provisions in Section 74, "Pumping Plant Equipment", of the Standard Specifications and these special provisions.

The data required in Section 74-1.04, "Data to be Furnished", of the Standard Specifications shall be limited to 3 copies of the following material:

1. The name of manufacturer, catalog number, size, capacity and all pertinent power ratings of the pump.

2. Pump performance curves.

3. Assembly plans showing the pump, pipes and fittings and any bracing to be installed.

In addition to the above data any parts lists and service instructions packaged with or accompanying the drainage pumping equipment and pumping plant electrical equipment shall be delivered to the Engineer.

b. Drainage Pumping Equipment - The pumping unit shall be suitable for outdoor installation, consisting of a vertical-shaft, single propeller-type pump, direct connected to a vertical shaft induction motor. The unit shall be designed to operate safely in the reverse direction of rotation due to water returning through the pump. The weight of the revolving parts of the pump, including the unbalanced hydraulic thrust of the propeller, shall be carried by a thrust bearing in the motor. The pump shall be supported from a base plate and channels by means of a vertical column having a horizontal discharge located as specified.

The vertical pump supporting column and discharge elbow shall be made of welded plate steel with a minimum wall thickness of 10 gage from 8" through 14" columns and 1/4" for 16" columns and larger in lieu of the 3/8" minimum specified in Section 74-2.04 of the Standard Specifications. The discharge opening shall be plain end, fitted with a Dresser type coupling suitable for connection to the discharge pipe. The discharge elbow shall be as shown on the plans.

The suction bell and pump bowl shall be made of close-grained cast iron and shall be designed for easy removal of the propeller and bearings. The suction bell shall have a flared inlet designed to reduce entrance losses and a sufficient number of vanes to support the lower guide bearings as well as to sustain the weight of propeller and pump shaft when dismantling the pump.

The pump propellers shall be made of bronze or stainless steel and shall be fastened to the shaft in such a manner as to be removed readily. They shall be balanced statically and dynamically to reduce vibration and wear.

The shaft of the pumping unit shall be of ample size to operate without objectionable distortion or vibration at maximum speed in both the forward and reverse direction of rotation. The pump-bowl shaft shall be made of stainless steel and the line shaft shall be made of carbon or alloy steel. The shaft couplings shall be of the threaded type. Provision shall be made at the top of the motor shaft for adjusting the elevation of the propeller with reference to the bowls. If water lubricated lineshaft is supplied, it shall be furnished with a stainless steel shaft sleeve, mechanically replaceable in the field.

All oil-lubricated lineshaft bearings shall be protected from water and foreign matter by an enclosing tube. A shaft seal shall be provided immediately above the top propeller. By-pass ports to drain excess oil from the shaft enclosing tube shall be provided above the seal. All bearings shall be easily replaceable, and spaced not more than five feet apart. All water-lubricated lineshaft bearings shall be furnished of rubber, and installed in bearing retainers spaced at the minimum distance required by good practice in the field. All bearings shall be easily replaceable.

If oil-lubricated, the pump shall be equipped with a solenoid operated lubricating system which shall supply lubricant to each lineshaft bearing. The solenoid-operated oiler shall be designed for outdoor operation and shall have a lockable metal oil reservoir with a capacity of not less than one gallon. If water lubricated, the pump shall be furnished with a deep packing box designed to effectively reduce leakage. The packing box shall have not less than 6 packing rings and shall have a provision for grease lubrication of the packing.

The packing gland shall be of the split type.

The pump shall be controlled by a float type switch as shown on the plans.

The pump stand shall be constructed from information given on plans.

The motor shall be of the 3-phase, 60-cycle, drop-proof,

vertical, ball-bearing, squirrelcage, induction type for outdoor service. It shall be suitable for operation at (220) (440) (2300) volts, and shall be of the low starting current type suitable for across-the-line starting service. The thrust bearing shall be of proper design to carry the weight of the rotating parts of the pump, including the unbalanced thrust of the propeller. Motor conduit box shall be suitable for accommodating leads from solenoid-operated oiler. The unit shall meet applicable requirements of the latest National Electrical Manufacturer's Association standards. The horsepower rating shall be such that the motor will not be overloaded beyond the service factor under the maximum pumping load possible to develop under the range of pumping heads specified.

The maximum pumping capacity, total dynamic head and maximum relative speed shall be shown on the plans and be approved by the Engineer.

D. WATER SYSTEMS

1. Pipe and Fittings

a. Cast Iron - All cast iron pipe shall be cement lined and conform to A.W.W.A. Standard Specifications C 102, C 106 and C 108. Cement lining shall conform to A.W.W.A. Standard Specifications C 104.

The minimum pressure class allowable shall be Class 150. Where necessary, pipe of a higher pressure rating shall be used to give the proper factor of safety. Cast iron fittings shall be of the proper class for the intended use and in no case shall they be of a lower pressure rating than the pipe to which attached.

Cast iron pipe and fittings shall be joined by any of the methods generally accepted in water works practice, including bell and spigot joints, flanged joints, mechanical joints and sleeve type coupling joints. Any newly developed joints not generally accepted in the water works industry must have the approval of the Engineer prior to use.

Where caulked bell and spigot joints are used they shall be made up of the following materials:

(1) Caulking or packing material shall consist of (a) molded or tubular rubber rings, or (b) asbestos rope, or (c) treated paper rope.

(2) Lead shall be hot poured into the joint and shall contain not less than 99.73 percent pure lead. The producer's name or the mark of Lead Industries shall be clearly cast or stamped upon each piece of lead.

b. Asbestos-Cement - Asbestos-cement pipe shall conform to A.W.W.A. Standard Specifications C 400.

The minimum pressure class allowable shall be Class 150. Where necessary, pipe of a higher pressure rating shall be used to the proper factor of safety.

Fittings for asbestos-cement pipe shall be of cast iron and shall be of the proper pressure rating for the intended use and in no case shall they be of a lower pressure rating than the pipe to which attached.

Asbestos-cement pipe and cast iron fittings shall be joined by any of the methods generally accepted in water works practice, including continuous bell ring joints and lead caulking. Any newly developed joints not generally accepted in the water works industry must have the approval of the Engineer prior to use.

c. Copper Pipe - Copper pipe for service laterals shall conform to A.S.T.M. Designation B 88 for "Type K Copper Water Tube".

d. Other Types of Pipe and Fittings - Pipe and fittings of any material other than those herein set forth shall have the specific approval of the Engineer prior to their use.

e. Valves

(1) Gate Valves - All gate valves larger than four (4) inches shall conform to A.W.W.A. Standards C 500 when standard operating conditions are encountered. Where

other than Standard operating conditions are encountered, such as excessive waterhammer, operating in throttled position or under high operating pressure, gate valves of a design approved by the Engineer shall be used.

Gate valves four (4) inches and smaller shall be rated at 200 p.s.i. working pressure for non-shock, cold water service. all working parts of this class valve shall be bronze or bronze mounted and shall be standardized and interchangeable.

Gate valve ends shall be of any of the types commonly used in the water works industry, including screwed ends, hub ends, mechanical joint ends, flanged ends, spigot ends, universal ends and ends for direct connection to asbestos-cement pipe with rubber rings. Any ends other than those commonly used in the water works industry must have the approval of the Engineer prior to use.

(2) Plug Valves - The term "plug valve" shall, in these Standards, refer to regular duty plug valves, corporation stops and curb stops.

Regular Duty Plug Valves shall be designed for regular duty service and in sizes below twelve (12) inches, shall have a pressure rating not less than 175 p.s.i. water, oil or gas working pressure. Valves larger than 12 inches shall have a pressure rating approved by the Engineer.

Corporation stops shall have all bronze bodies, keys, stems, stem washers and stem nuts. Corporation stops shall have the proper type threads for the type of pipe or pipe clamp to which attached.

(3) Check Valves - Check valves for regular duty water works service shall employ non-corrosive materials in the construction of hinge pins, hinges, gate faces and seat faces.

Check valves up to twelve (12) inches in size for regular duty shall have a pressure rating of not less than 200 p.s.i. non-shock, cold water, oil or gas rating. Larger valves and valves for use in other than regular duty shall be of a pressure rating approved by the Engineer.

End connections on check valves may be any ends commonly used in water works practice, including hub ends, flange ends and universal ends. Types of ends other than those commonly used in the water works industry shall have the approval of the Engineer prior to use.

(4) Air and Vacuum Release Valves - Air and vacuum and air release valves shall have internal working parts made of corrosion resistant materials.

Air and vacuum and air release valves for regular service shall have a pressure rating of not less than 150 p.s.i., water, oil and gas, non-shock. Where other than regular service operation is required the valves shall have a pressure rating approved by the Engineer prior to their use.

(5) Miscellaneous Valves - Any type of valve not specifically covered in these specifications shall be considered in this category of "Miscellaneous Types of Valves".

Such valve types include: pressure relief valves, pressure regulating valves, altitude valves and globe valves, among other valve types.

Valves in this classification shall have the approval of the Engineer prior to use.

f. Fire Hydrants - When the required fire flow is 500 gpm, wet barrel or dry barrel fire hydrants may be installed. Wet barrel fire hydrants shall be installed when the required fire flow is 1500 gpm or greater.

Each fire hydrant shall have a minimum of one - $2\frac{1}{2}$ " outlet and one - $4\frac{1}{2}$ " outlet, except when the required fire flow in the system is 1500 gpm or greater then each hydrant shall have two - $2\frac{1}{2}$ " outlets and one - $4\frac{1}{2}$ " outlet. Outlets shall have National Standard Hose Threads.

Wet barrel fire hydrants shall meet the requirements of A.W.W.A. Standard C503. Dry barrel fire hydrants shall meet the requirements of A.W.W.A. Standard C502.

Each fire hydrant assembly shall be served with a minimum 6" diameter run of pipe, and shall be provided with a gate valve. Provisions shall be incorporated in the construction of

dry barrel hydrants to automatically shut off the flow of water in the event the hydrant is broken off.

Installation of fire hydrants shall be in accordance with Plate WS-9 in valley areas.

In mountainous areas only, the hydrant inlet may be reduced to 4 inches and installed in accordance with Plate WS-10.

g. Valve and Meter Boxes - Valve and meter boxes shall be constructed of materials capable of withstanding the loads imposed upon them.

Adequate access to all boxes shall be provided by means of readily removable covers.

Sizes of boxes shall be determined by sizes of valve or meter served.

Boxes shall be approved by the County Public Works Director prior to use.

2. Installation

a. General - All piping shall be supported and braced against movement as shown on the plans or as specified herein. When temporary supports are used they shall be sufficiently rigid to prevent any shifting or distortion of the pipe.

Where piping is installed on curves the maximum deflection of each joint shall be within the maximum deflection recommended by the pipe manufacturers.

Sufficient flexible couplings of Engineer approved design shall be provided in all piping adjacent to structures to permit differential settling of the foundation of said piping and structures without damage to the piping, or as may be required for ease of installation or removal of the pipe.

All dirt and scale shall be removed from the pipe prior to installing.

b. Earthwork - All trenching work shall conform to the requirements of the Item Number 2 of Subsection B (Streets and Highways) as found in these Standards.

c. Depth of Cover - Minimum cover from finished grade shall be as follows:

4" - 6" Pipe	- 36"	12" Pipe	- 48"
8" Pipe	- 36"	14" Pipe	- 48"
10" Pipe	- 36"	14"+Pipe	as required by County Public Works

d. Laying and Handling Pipe - Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe, convenient, and workmanlike prosecution of the work.

All pipe, fittings and valves shall be carefully lowered into the trench in such a manner as to prevent damage to pipe or pipe coating. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Before lowering and while suspended, the pipe shall be inspected for defects and cast iron pipe shall be rung with a light hammer to detect cracks. Any defective, damaged or unsound pipe shall be rejected and sound material furnished. Cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and skillful manner without damage to the pipe.

All pipe shall be laid and maintained in the required alignment, with fittings and valves at the required locations and with joints centered and spigots home, and with all valve stems plumb. When the pipe is bedded in a trench it shall be brought into true alignment and shall be secured there with proper backfill material, carefully tamped under and on each side of it as specified herein. Care shall be taken to prevent dirt from entering the joint space.

Each length of pipe shall have a swab drawn through it and shall be freed of any visible evidence of contamination, dirt and foreign material before it is lowered into its position in the trench, and it shall be kept clean during and after laying. At times when pipe laying is not in progress, the open ends of any pipe which has been laid shall be plugged. Trench water shall not be permitted to enter the pipe.

All installation shall be in full conformance with the manufacturer's recommendation.

e. Service Laterals - Copper service laterals shall be installed in a trench of such depth and direction that the service pipe (tubing) will be at least 24" below finished street grade, shall be laid in a plane perpendicular to the longitudinal axis of the main, shall be as far away from sewer laterals as possible and shall not interfere with other utility installations.

The copper tubing shall be bent in such a manner as to prevent kinking of the tubing.

For 3/4" and 1" services, the corporation stops shall be tapped into that side of the main to which the service is to be installed at a point approximately 60 degrees down from the top of the main with the shut-off valve of the corporation stop facing up.

Service laterals may be attached to mains by the use of saddles where recommended by the pipe manufacturer and shall conform to the manufacturer's recommendations.

The house end of the service lateral shall terminate with a curb stop corresponding to the size of the service, with the outlet in a horizontal position facing the lot to be served. If meters are required, a concrete meter box of proper size shall be levelled and longitudinally centered over the end of the service. The meter box shall be set square with the curb or property line in solid ground, with the top of the box at the elevation of the top of the curb or adjacent ground.

f. Thrust Backing and Harness - All tees, bends, plugs, fire hydrants and appurtenances as may be specified on the plans, shall be provided with thrust backing and/or harness in accordance with Standard Drawings.

Thrust backing shall be of Class "B" concrete conforming with requirements of Section 90 of the Standard Specifications cast in place between solid ground and the fittings to be anchored. The backing shall be so placed that the pipe and fitting joint will be accessible for repair.

g. Valves - A valve box or masonry pit shall be provided for every valve.

A valve box shall be provided for every valve which has no gearing or operating mechanism or in which the gearing or operating mechanism is fully protected with a cast iron grease case. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished pavement or such other level as may be directed.

A masonry valve pit shall be provided for every valve which has exposed gearing or operating mechanisms. The valve nut shall be readily accessible for operation through the opening in the manhole, which shall be set flush with the surface of the finished pavement or such other level as may be specified. Pits shall be so constructed as to permit minor valve repairs and afford protection to the valves and pipe from impact where they pass through the pit walls.

h. Fire Hydrants - All fire hydrants shall stand plumb and shall have their outlets parallel with or at right angles to the curb or road centerline with the steamer outlet facing the curb or road centerline, except that hydrants having two hose outlets 90 degrees apart shall be set with each outlet facing the curb or road centerline at an angle of 45 degrees. Hydrants shall be set to the established grade, with outlets a minimum of 18 inches and a maximum of 30 inches above the ground or as otherwise shown on the plans. In the SRA, hydrants shall be set 18 inches above the established grade.

3. Water Storage

Storage facilities shall be provided where necessary to meet the demands of the water system.

Steel storage tanks shall conform to A.W.W.A. D 100 specifications and shall be painted in accordance with A.W.W.A. D 102 specifications.

Other tanks such as wood tanks, hydropneumatic tanks, reinforced concrete tanks and ground storage reservoirs may be acceptable, subject to the approval of the Engineer. Request for approval of any of these facilities shall be accompanied by

complete specifications and design calculations.

4. Pressure Testing

a. Hydrostatic Test - After the pipe has been laid and backfilled, said pipe shall be subjected to a hydrostatic pressure no less than the full rated (Maximum recommended) pressure class of the pipe plus an additional 50 p.s.i.

The duration of each test shall be 30 minutes unless otherwise directed by the Engineer.

Each section of pipeline shall be slowly filled with water, and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection, and all necessary apparatus, shall be furnished by the Contractor.

During the filling of the pipe and before applying the specified test pressure, all air shall be expelled from the pipeline. To accomplish this, taps shall be made, if necessary, at points of highest elevation, and after completion of the test the taps shall be tightly plugged unless otherwise specified.

During the test, all exposed pipes, fittings, valves, hydrants and joints shall be carefully examined. Any part found to be cracked or defective shall not be accepted and shall be removed and replaced by the Contractor with new, sound material. The test shall then be repeated until satisfactory to the Engineer.

b. Leakage Test - Leakage tests shall be conducted after completion of the hydrostatic test and shall be made at not less than the normal working pressure of the system as determined by the Engineer.

No pipe installation will be accepted until or unless the leakage for the section of line tested is less than the rate specified in the following table.

LEAKAGE ALLOWANCE

Gallons per 1300 feet per hour*

Pipe Diam. (inches)	Test Pressure (psi)						
	50	75	100	125	150	200	225
4	1.54	1.87	2.16	2.42	2.65	3.07	3.25
6	2.30	2.80	3.25	3.63	3.98	4.50	4.88
8	3.07	3.73	4.33	4.83	5.30	6.13	6.50
10	3.83	4.66	5.41	6.04	6.63	7.66	8.12
12	4.60	5.59	6.50	7.25	7.95	9.20	9.75
14	5.37	6.52	7.58	8.46	9.28	10.73	11.38
16	6.13	7.45	8.66	9.66	10.60	12.27	13.00

Measurement of allowable leakage need not be made until after the pipe has been filled with water for a period of 24 hours.

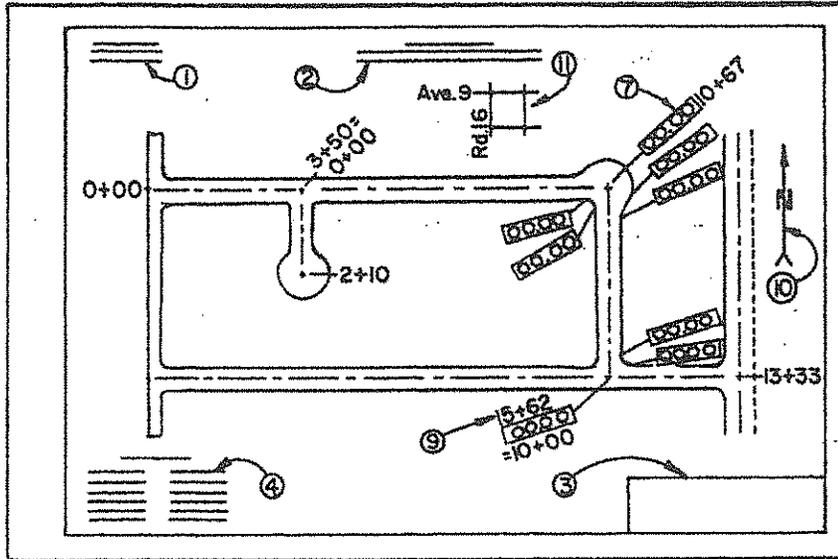
5. Disinfection

Disinfection of water mains shall be in accordance with A.W.W.A. Standard C 601. Special attention shall be given during pipe laying to keeping the pipe clean as outlined in Sections 1 through 4 of said standards.

Disinfection of storage tanks shall be in accordance with provisions of A.W.W.A. Standard D 102.

Following disinfection, samples will be taken and tests made by the Tulare County Department of Health Services for adequate disinfection. The Contractor shall request such tests and shall also provide the Engineer with evidence of Health Department acceptance.

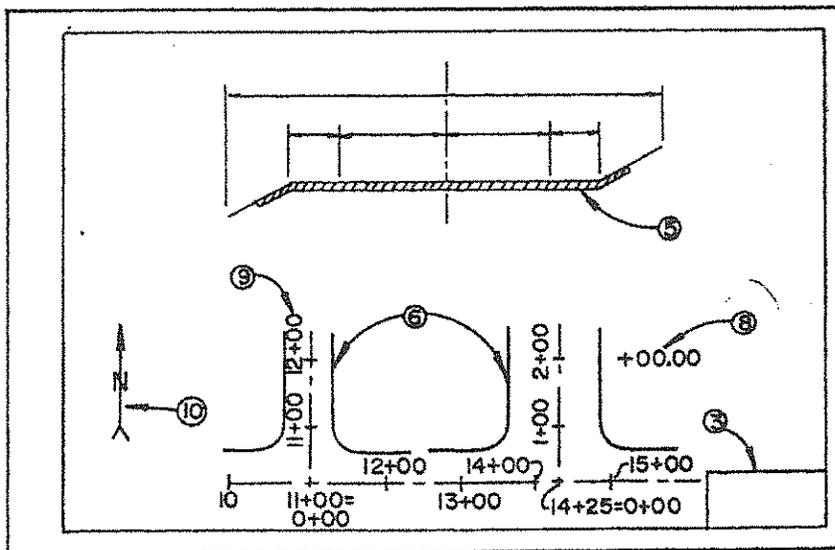
* A.C. pipe/13 ft. joints. Leakage allowances for water pipelines constructed with other materials shall be determined by the Engineer.



Sheet No.1 Drainage layout showing all grade breaks, curb grades, catch-basins, storm drains, drainage channels, natural drainageways and other drainage works in sufficient detail; and showing lot line and location of fire hydrants, both proposed and existing; showing key map to show the relationship of subdivision to surrounding streets (scale 1" = 1000')

Standard sheet size-24"x36"
or 22"x 35"

- ① Index of sheets
- ② Project title
- ③ Title Block
- ④ Conventional symbols or legend
- ⑤ Typical cross section
- ⑥ Road approaches
- ⑦ 00.00 Proposed elevation
- ⑧ 00.00 Existing Elevation
- ⑨ 0+00 Show Stationing
- ⑩ North Arrow
- ⑪ Key Map



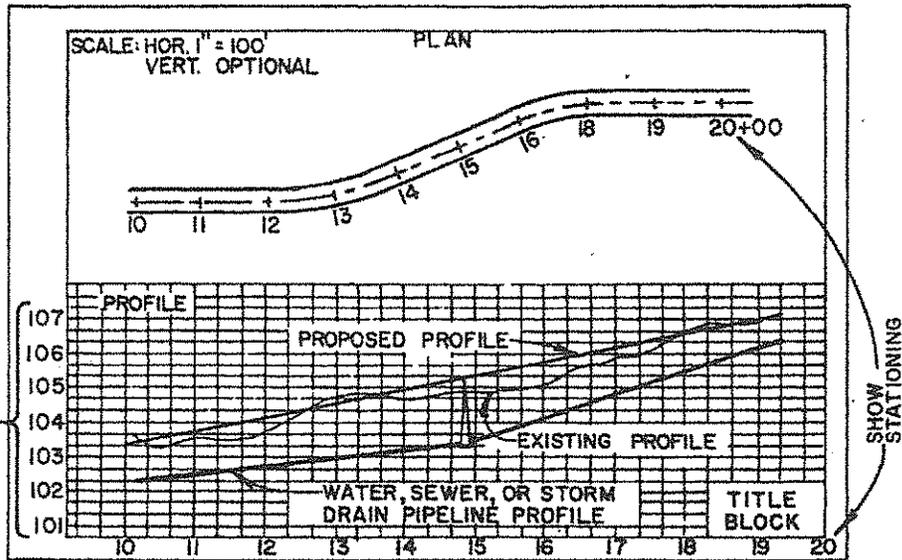
Sheet No. 2 Typical cross sections and road approaches

PUBLIC ROAD STANDARDS

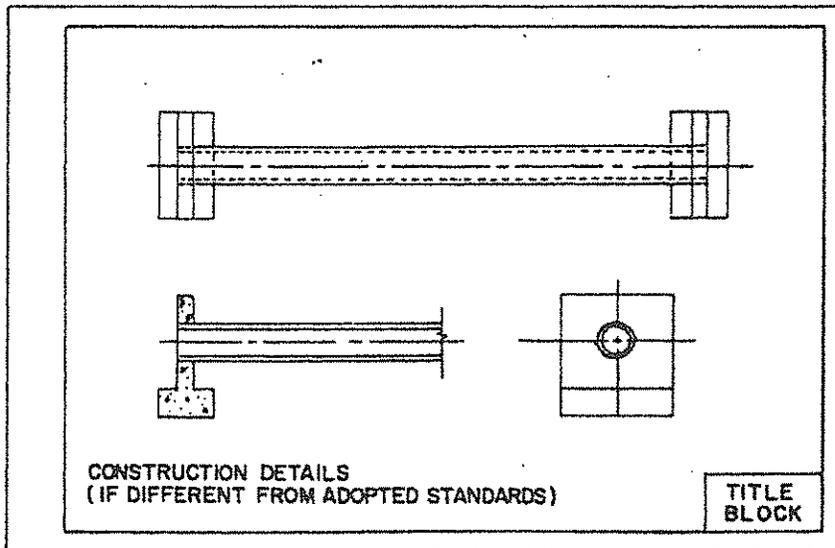
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

TYPICAL IMPROVEMENT
PLAN LAYOUT

PLATE NO. 1



Sheet no. 3 to be used for utility plan and profiles, road grades with vertical curves and superelevation. Show elevations of all changes of grade in streets, pipelines, etc.



Remaining sheets following plan and profile to be used for construction details.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

TYPICAL IMPROVEMENT
PLAN LAYOUT

PLATE NO. 2

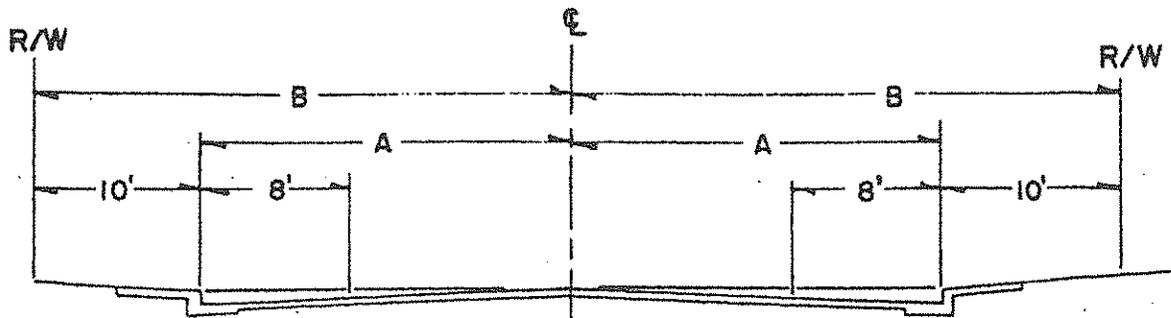
SUBDIVISION IMPROVEMENT PLANS COUNTY OF TULARE		SCALE
(NAME OF ENGINEERING FIRM)		DRAWN BY
(TRACT IDENTIFICATION)		REVISED
(TITLE OF SHEET)		
DESIGN ENGINEER _____		SHEET
DATE _____	C.E. LICENSE NO. _____	_____ OF
REVISED		SHEETS
APPROVAL		
APPROVED _____	C.E. LICENSE NO. _____	
COUNTY OF TULARE	DATE _____	
REVISED		
APPROVAL		

PUBLIC ROAD STANDARDS

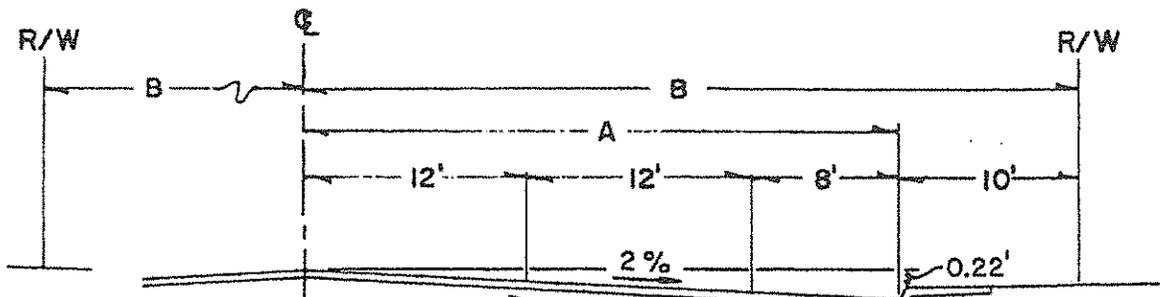
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

APPROVAL AND
TITLE BLOCK

PLATE NO. 3



CLASS 1,2, & 3 TWO LANE ROADS
 Top of curb elevation = centerline elevation



Top of curb elevation is 0.22' lower than C elevation
CLASS 3 & SELECT SYSTEM FOUR LANE UNDIVIDED ROADS

*Note: The distance between face of curb and right of way and distance B may be reduced to 8 feet and 40 feet respectively on existing 80 foot right of ways. The chart below applies to urban areas with speed control zones, and select system

ROAD CLASS	NO. OF LANES	DESIGN VELOCITY	A MIN.	B MIN.	MAX. GRADE	MAX. SUPER
1	2	25 MPH	18	28	10%	6%
2	2	30 MPH	20	30	10%	
3	2	35 MPH	20	30	10%	6%
3	4	40 MPH	32	42'	8%	
SELECT	2	40 MPH	20	30	8%	6%
SELECT	4	50 MPH	32	42'	8%	

roads outside such areas shall be designed to 60 m.p.h. minimum using a maximum super of 10%.

PUBLIC ROAD STANDARDS

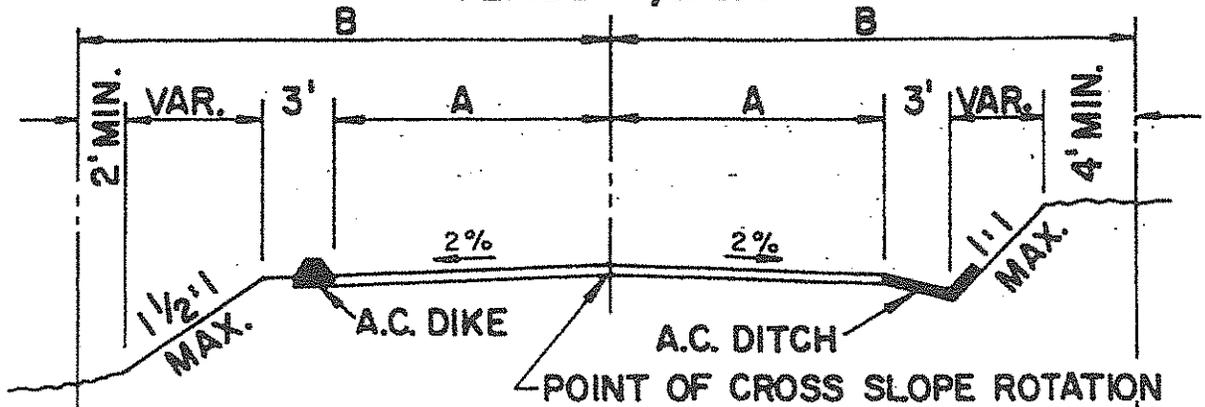
VALLEY AREA

TULARE COUNTY
 ORDINANCE CODE
 SECTION No. 7080

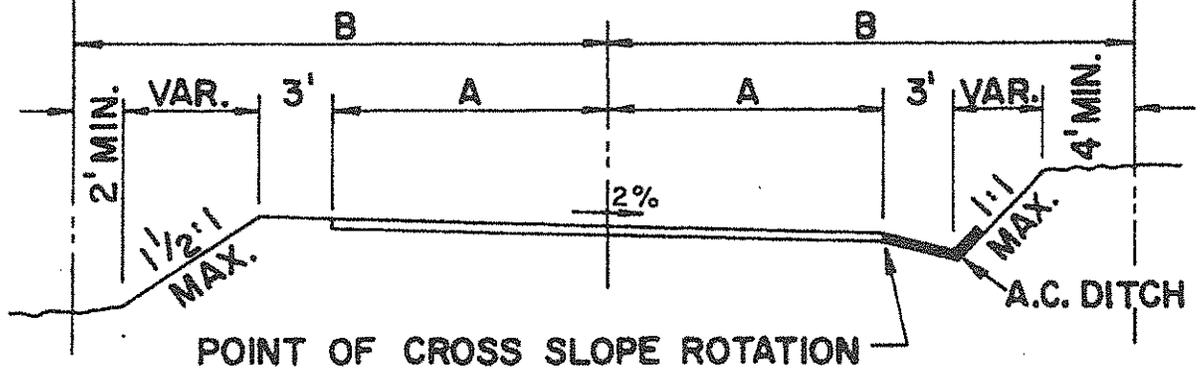
GEOMETRIC
 SECTIONS

PLATE NO. A-1

FOR LOT AREAS 20,000 SQ. FT. OR MORE
CLASS 1, 2 & 3



CLASS 1 & 2 ALTERNATE

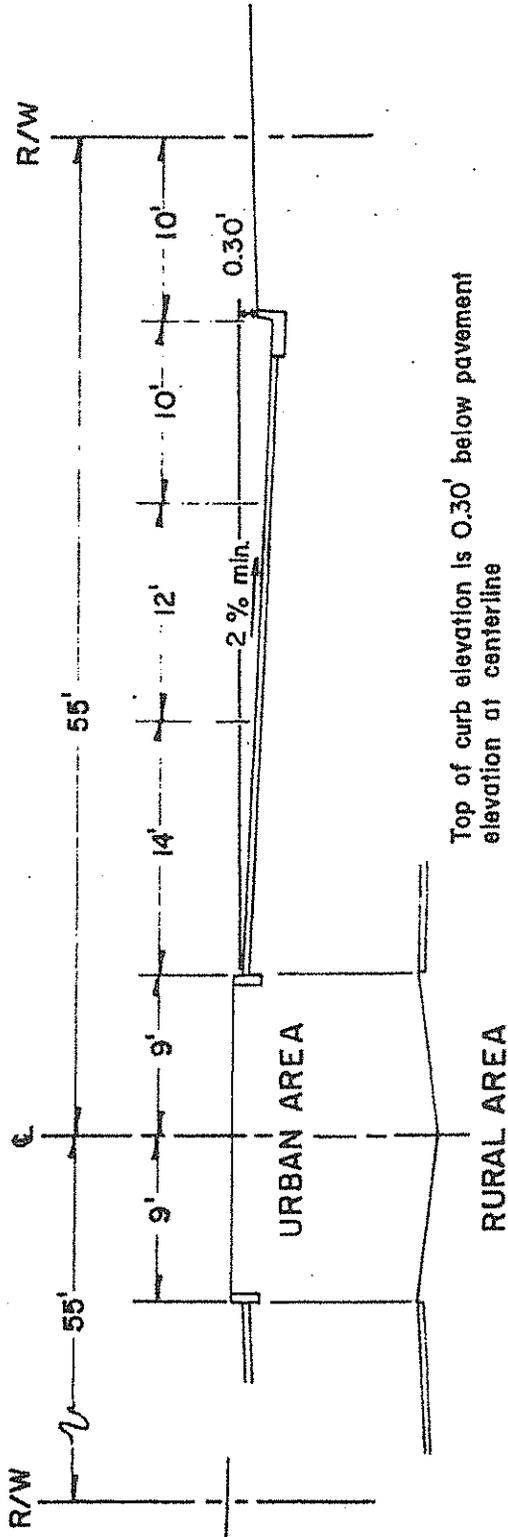


ROAD CLASS	LOCATION	DESIGN VELOCITY	A MIN.	B MIN.	MAX. GRADE
1	WINTER TRAFFIC ABOVE ELEV. 3000'	20 MPH	12'	25'	10 %*
2		20 MPH	13'	25'	10 %
3		30 MPH	14'	30'	10 %
1	BELOW ELEV. 3000'	20 MPH	12'	25'	15 %
2		20 MPH	13'	25'	12 %
3		30 MPH	14'	30'	10 %

* In very difficult terrain, grade up to 12% will be permitted for short distances at locations approved by the Road Department.

PUBLIC ROAD STANDARDS
MOUNTAINOUS AREA

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080
GEOMETRIC SECTION
FOR LOT AREAS
20,000sq.ft. OR MORE
PLATE No. A-1M



**SELECT SYSTEM FOUR LANE
DIVIDED HIGHWAYS**

ROAD LOCATION	MIN. DESIGN VELOCITY	MAX. GRADE	MAX. SUPER
Rural Areas	60 m.p.h.	6%	10%
Urban Areas	50 m.p.h.	6%	6%

PUBLIC ROAD STANDARDS

VALLEY AREA

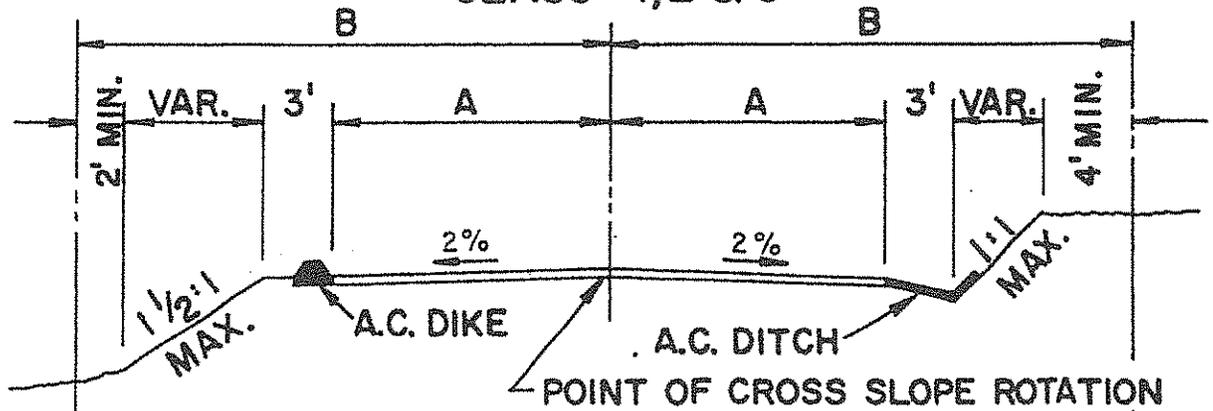
TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

SELECT SYSTEM
GEOMETRICS

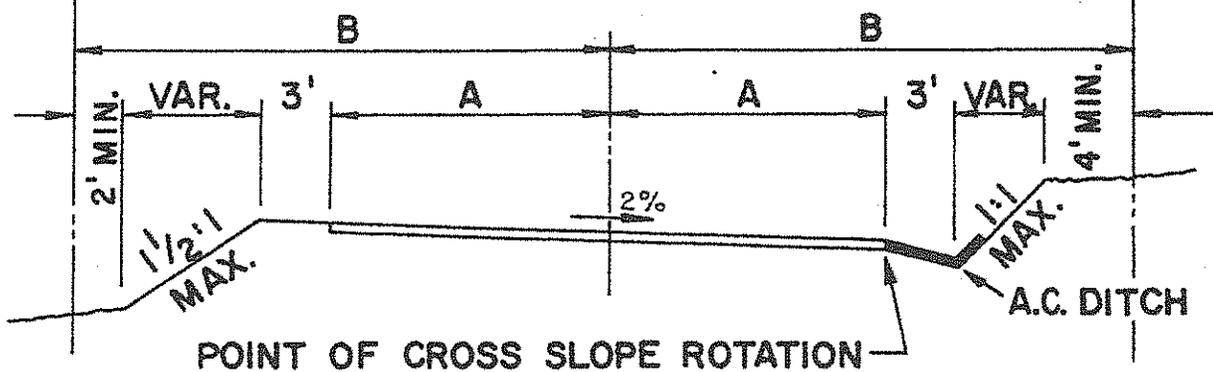
PLATE NO. A-2

FOR LOT AREAS LESS THAN 20,000 SQ. FT.

CLASS 1, 2 & 3



CLASS 1 & 2 ALTERNATE

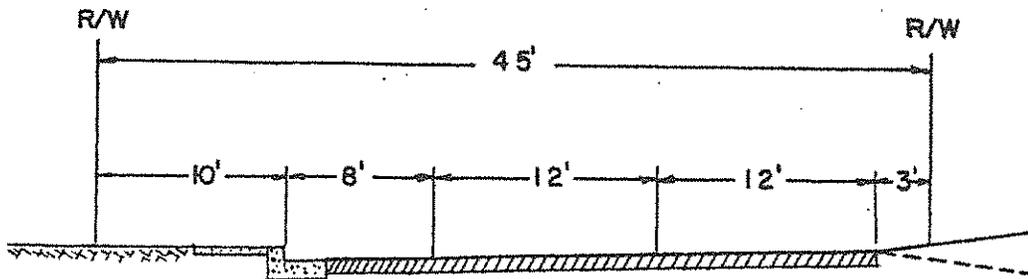


ROAD CLASS	LOCATION	DESIGN VELOCITY	A MIN.	B MIN.	MAX. GRADE
1	WINTER TRAFFIC ABOVE ELEV. 3000'	20 MPH	16'	30'	10 %*
2		20 MPH	17'	30'	10 %
3		30 MPH	18'	30'	10 %
1	BELOW ELEV. 3000'	20 MPH	16'	30'	15 %
2		20 MPH	17'	30'	12 %
3		30 MPH	18'	30'	10 %

* In very difficult terrain, grade up to 12% will be permitted for short distances at locations approved by the Road Department.

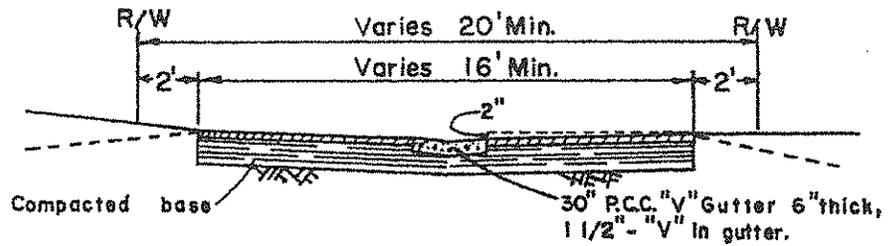
**PUBLIC ROAD STANDARDS
MOUNTAINOUS AREA**

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080
GEOMETRIC SECTIONS
FOR LOT AREAS LESS
THAN 20,000 sq. ft.
PLATE No. A-2M



FRONTAGE ROAD SECTION

Note: Grade and alignment shall be the same as the parallel contiguous highway. Frontage roads shall enter four lane streets through Bulb Type Intersections.



ALLEY SECTION

PUBLIC ROAD STANDARDS

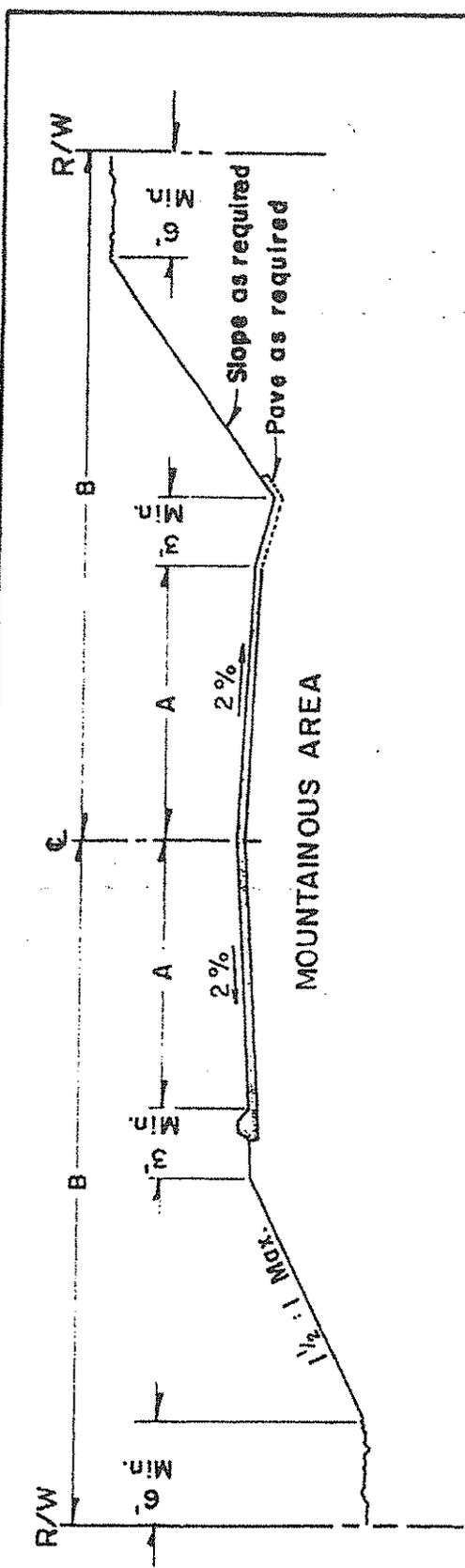
TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

FRONTAGE ROAD
AND ALLEYS

PLATE No. A-3

PUBLIC ROAD STANDARDS

MOUNTAINOUS AREAS



ROAD CLASS	LOT SIZE	DESIGN VELOCITY	A MIN #	B MIN	MAX. GRADE.
Collector	20,000 sq.ft.	35 m.p.h.	14' or 16'	30'	10%
Arterial	or more	40 m.p.h.	16'	40'	8%
Collector	Less than	35 m.p.h.	18' or 20'	30'	10%
Arterial	20,000 sq.ft.	40 m.p.h.	20'	40'	8%

*Paved width dependent upon traffic volume.

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

TWO-LANE SELECT
SYSTEM ROAD

PLATE NO. A-3M

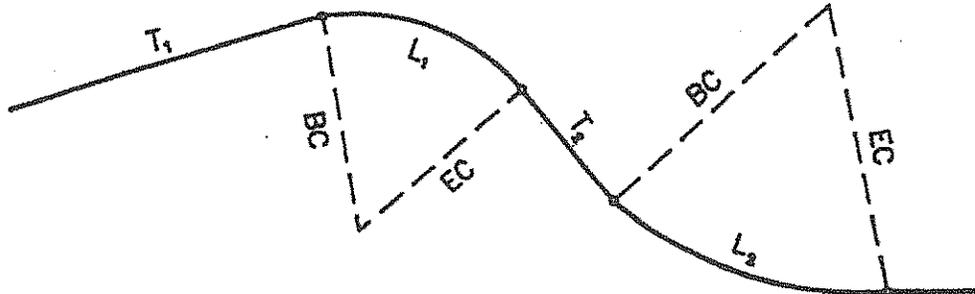


TABLE OF MINIMUM CURVE RADII (R)								
S \ V	20	25	30	35	40	50	60	70
	NONE*	125	235	375	585	820	1385	2180
.02	105	190	300	455	630	1040	1600	2330
.04	95	175	275	410	560	925	1410	2040
.06	90	160	250	375	510	835	1260	1815
.08						760	1140	1635
.10						695	1040	1485

* Design based on S = -0.02

TABLE OF MINIMUM TANGENT LENGTHS (T)								
S ₁ +S ₂ \ V	20	25	30	35	40	50	60	70
	.02	←		NONE		→	300	↑
.04	←		NONE		→	325	375	↑
.06	20	25	30	35	40	350	↓	425
.08	40	50	60	70	80	375	↓	↓
.10	60	75	90	105	120	400	400	↓
.12	80	100	120	140	160	425	425	↓
.14						450	450	450
.16						475	475	475
.18						500	500	500
.20						525	525	525

V	F
20	.24
25	.20
30	.18
35	.16
40	.15
50	.14
60	.13
70	.12

$$R = \frac{V^2}{15(F+S)}$$

WHERE

- R = Radius in feet
- V = Velocity in M.P.H.
- S = Superelevation in ft./ft.
- F = Friction factor

NOTES:

1. See Plate A-5 for other applicable formulii
2. In the State Responsibility Area, add 4 feet additional surface width for R < 100 feet and 2 feet for 100 < R < 200 feet

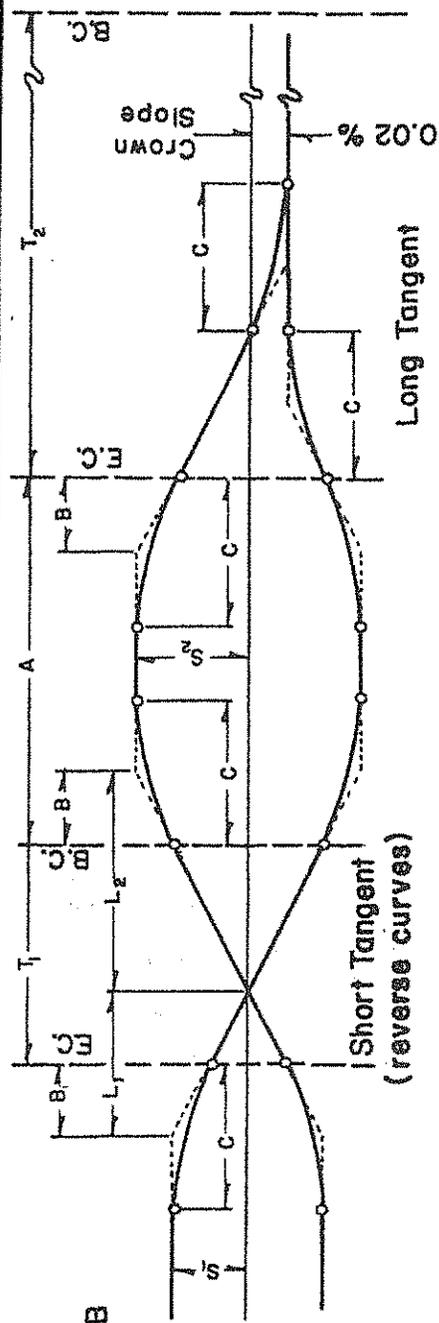
TABLE OF MINIMUM ARC LENGTHS (L) FOR VARIOUS DESIGN VELOCITIES								
V	20	25	30	35	40	50	60	70
L	80	100	120	140	160	300	360	420

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

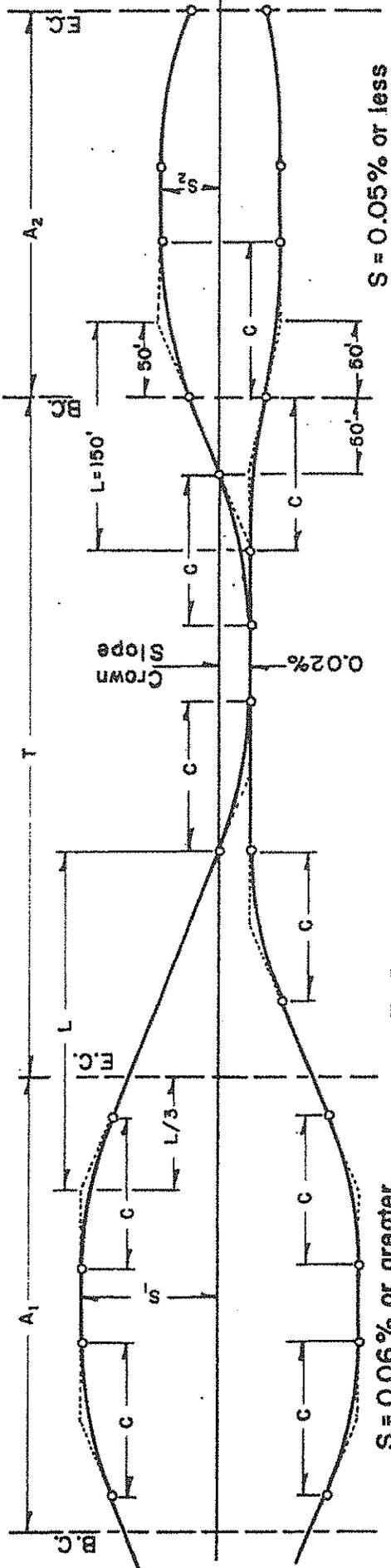
CURVE DESIGN
RADII & TANGENTS

PLATE NO. A-4



$L = 50VS$
 $T_{min.} = 50V(S_1 + S_2 \cdot 0.04) = L_1 + L_2 - 2B$
 $A_{min.} = 4V$
 $B = V$
 $C = 2V$
 $V =$ Design Velocity in M.P.H.
 $S =$ Superelevation, ft./ft.
 (max. = 0.06 ft./ft.)

FOR DESIGN VELOCITIES 40 M.P.H. OR LESS



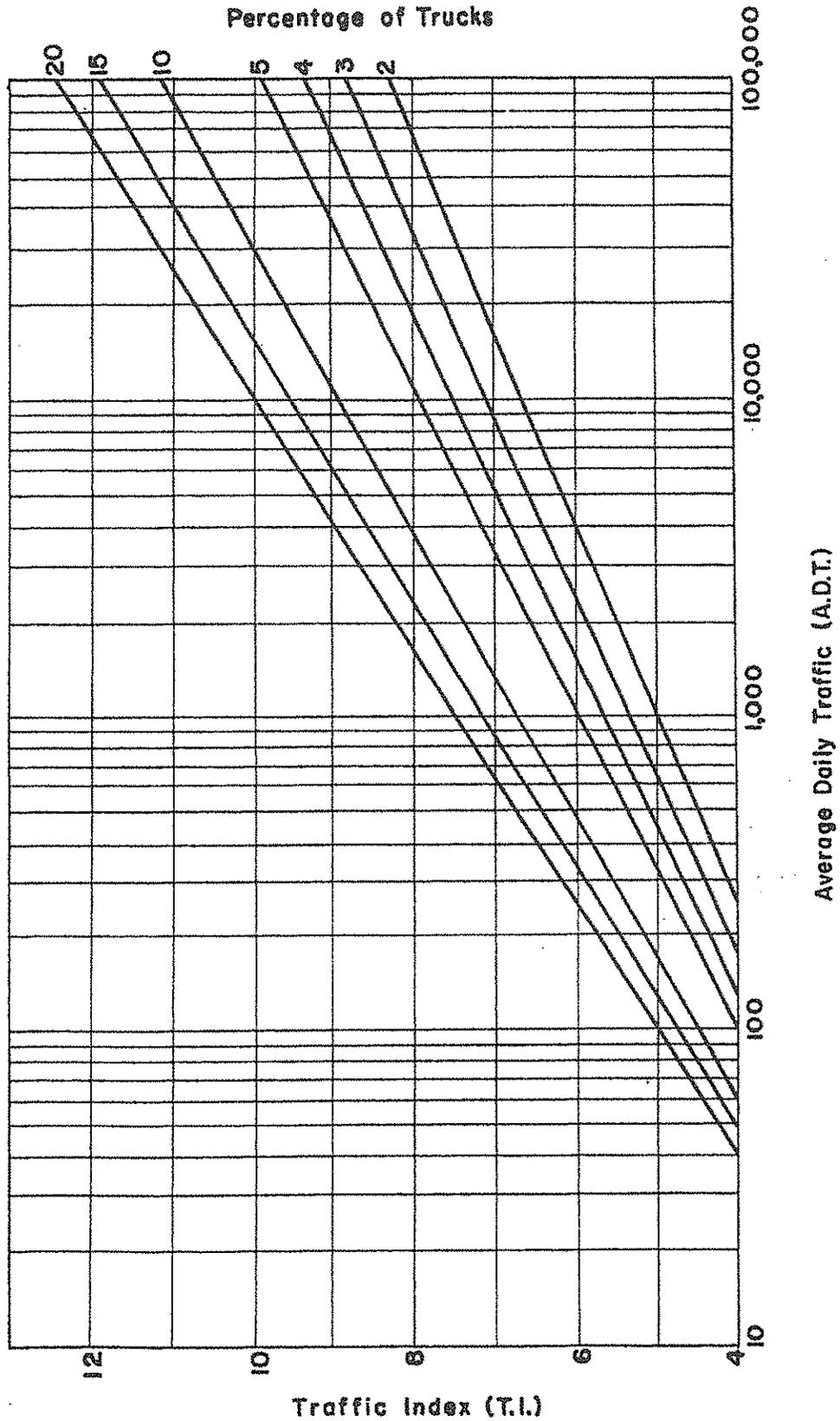
FOR DESIGN VELOCITIES OVER 40 M.P.H.

$S = 0.06\%$ or greater
 $L = 2500 \times S, 150'$ min.
 T min., See Plate A-4
 $A_{min.} = 6V$
 $C = 100'$
 $V =$ Design Velocity in M.P.H.
 $S =$ Superelevation, ft./ft. (0.10 max.)
 See Plate A-3 for table of min. values

PUBLIC ROAD STANDARDS

TULARE COUNTY
 ORDINANCE CODE
 SECTION No. 7080
 CURVE DESIGN
 SUPERELEVATION
 PLATE NO. A-5

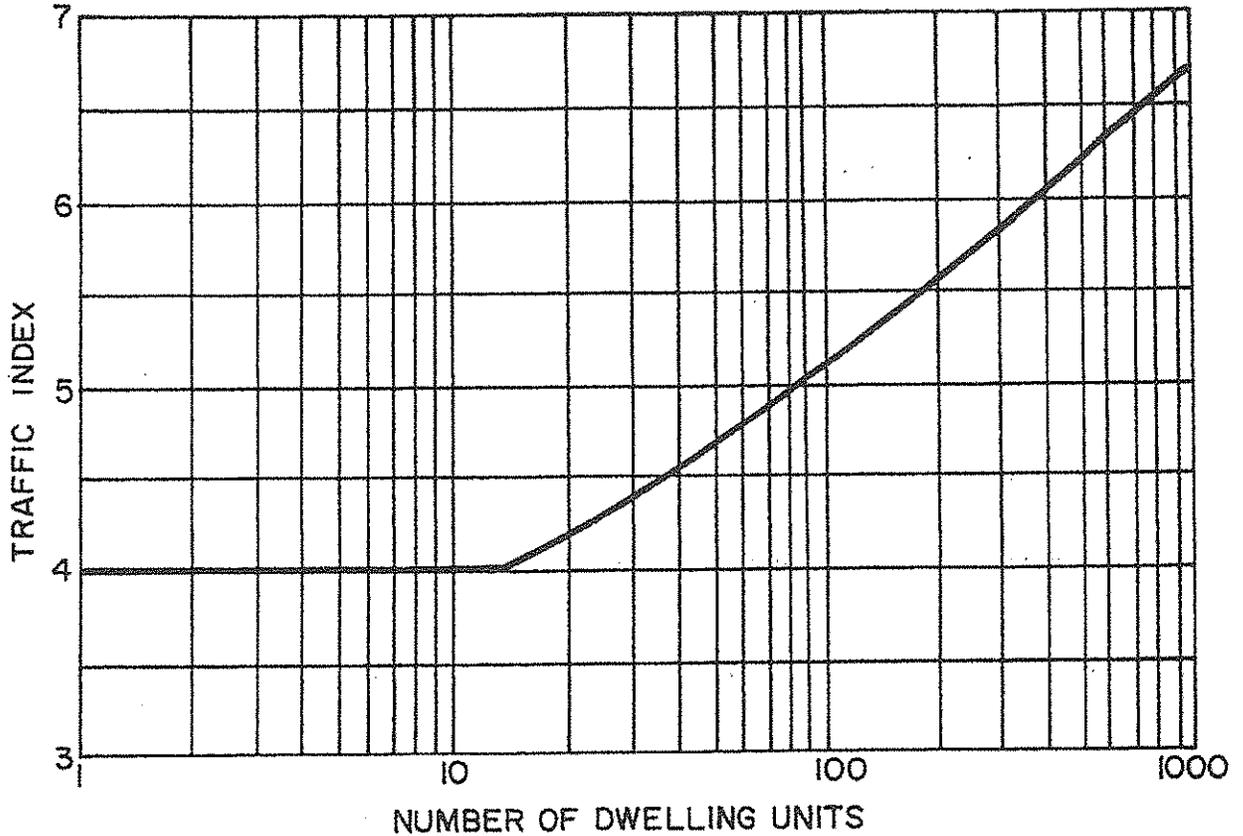
CONVERSION CHART
 AVERAGE DAILY TRAFFIC TO TRAFFIC INDEX



PUBLIC ROAD STANDARDS

TULARE COUNTY
 ORDINANCE CODE
 SECTION No. 7080
 TRAFFIC INDEX
 TO A. D. T.
 PLATE NO. A-6

CHART FOR ESTIMATION OF TRAFFIC INDEX FROM NUMBER OF DWELLING UNITS



Notes: For use only within subdivisions for residential and residential collector streets.

Chart is based on a 10 year design life.

Where the number of dwelling units cannot be accurately determined, the following traffic indexes shall be used:

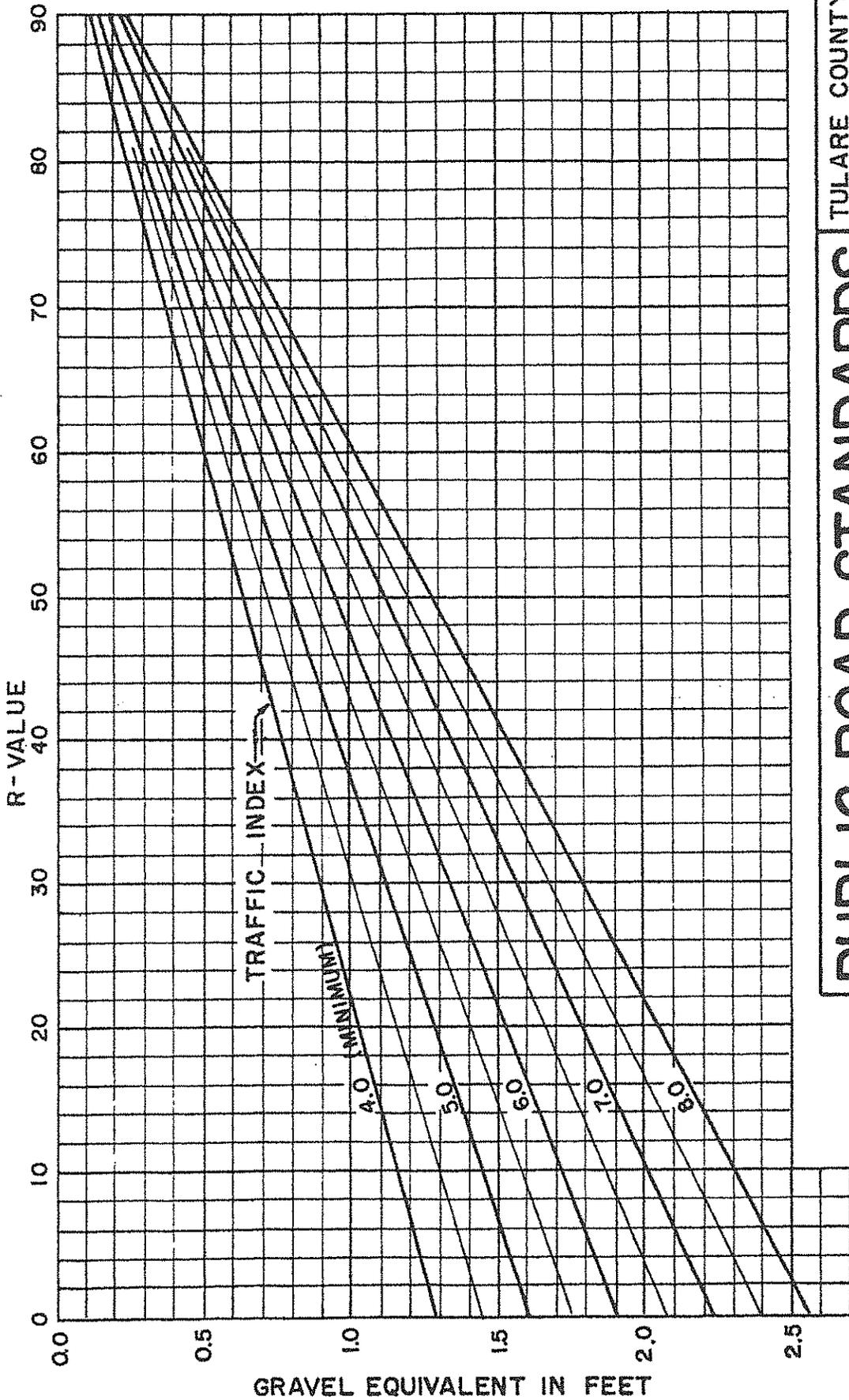
<u>Class of road</u>	<u>T. I.</u>
1	4.5
2	5.0
3	5.5

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

TRAFFIC INDEX TO
DWELLING UNITS

PLATE NO. A-7



TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

STRUCTURAL DESIGN
CHART FOR FLEXIBLE
PAVEMENT

PLATE NO. A - 8

PUBLIC ROAD STANDARDS

$GE = 0.0032 (TI)(100-R)$

ACTUAL THICKNESS IN FEET	GRAVEL EQUIVALENT IN FEET													
	ASPHALT CONCRETE				ROAD-MIXED ASPH SURFACING				AB	CL "B" CTB,	CL "C" CTB, BTB, LTB	CL "D" CTB & ASB		
	T. I. FACTOR Gf	5 & BELOW	5.5 6.0	6.5 7.0	7.5 8.0	5 & BELOW	5.5 6.0	6.5 7.0					7.5 8.0	
0.13 MIN.		0.32												
0.15		0.38	0.35											
0.20		0.50	0.46	0.43		0.30								
0.25		0.63	0.58	0.54	0.50	0.38								
0.30		0.75	0.70	0.64	0.60	0.45								
0.35		0.86	0.81	0.75	0.70	0.53	0.49	0.45					0.35	
0.40		1.00	0.93	0.86	0.80	0.60	0.56	0.52	0.48				0.40	
0.45			1.04	0.96	0.90	0.68	0.63	0.59	0.54	0.66	0.54		0.45	
0.50			1.16	1.07	1.01	0.75	0.70	0.65	0.60	0.55	0.60	0.66	0.50	
0.55				1.18	1.11			0.72	0.66	0.61	0.66	0.66	0.55	
0.60					1.21			0.78	0.72	0.66	0.72	0.72	0.60	
0.65					1.31				0.78	0.72	0.78	0.78	0.65	
0.70										0.77	0.77	0.77	0.70	
0.75											1.05	1.05	0.84	0.70
0.80											1.13	1.13	0.90	0.75
											1.20	1.20	0.96	0.80

A. Solid line indicates minimum thickness allowed.

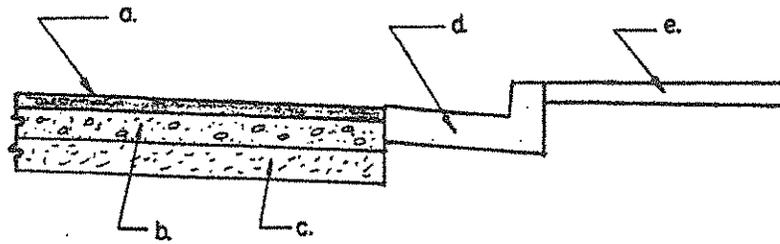
B. T. I. values shall be rounded to the nearest one half.

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

GRAVEL EQUIVALENTS
AND MIN. THICKNESS

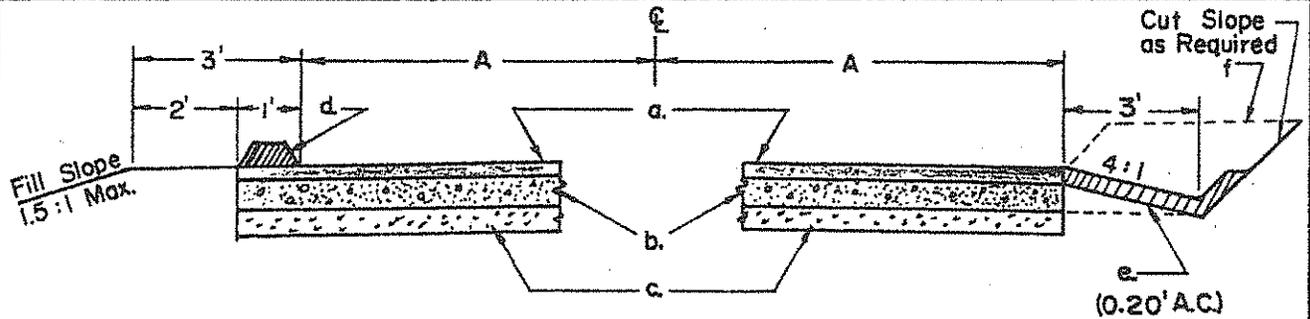
PLATE NO. A-9

PUBLIC ROAD STANDARDS



APPLICABLE TO VALLEY IMPROVEMENT STANDARDS

- a. Type "B" Asphalt Concrete pavement.
- b. Class "2" Aggregate Base.
- c. Class "4" Aggregate Subbase if required by design.
- d. Standard Type Curb.
- e. Sidewalks where required.



APPLICABLE TO MOUNTAIN IMPROVEMENT STANDARDS

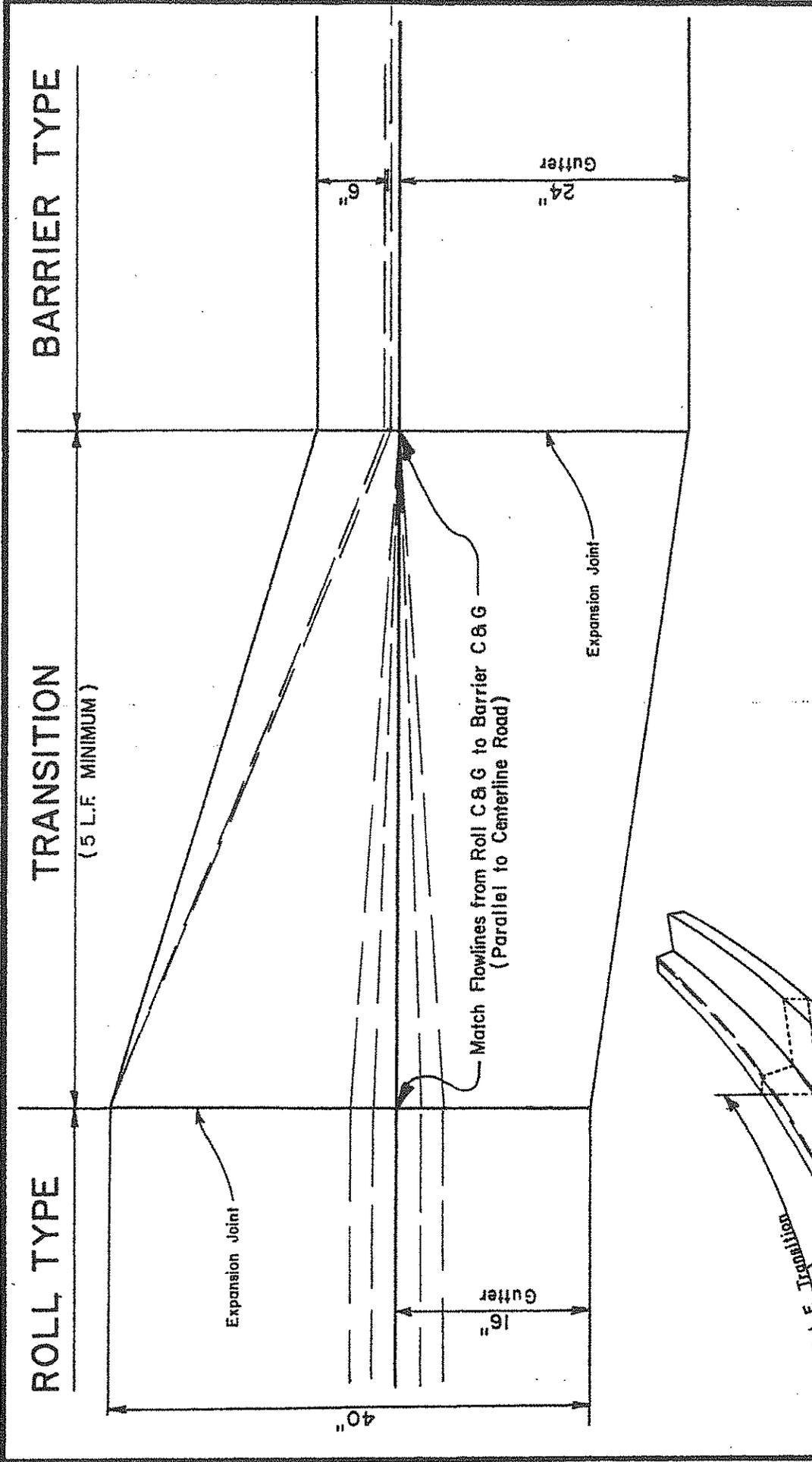
- a. Type "B" Asphalt Concrete or Road Mixed Asphalt Surfacing.
- b. Class "2" or Class "3" Aggregate Base.
- c. Class "4" Aggregate Subbase if required by design.
- d. Standard Asphalt Concrete Dike. May be eliminated where fill slope are flatter than 6:1 and erosion is not anticipated.
- e. Paved Roadside Ditch. Pavement may be eliminated on grades flatter than 4% if erosion is not probable.
- f. The roadside ditch (e) may be eliminated where paved width 'A' is 17' or greater and ditch is not needed to carry calculated gutter flow.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

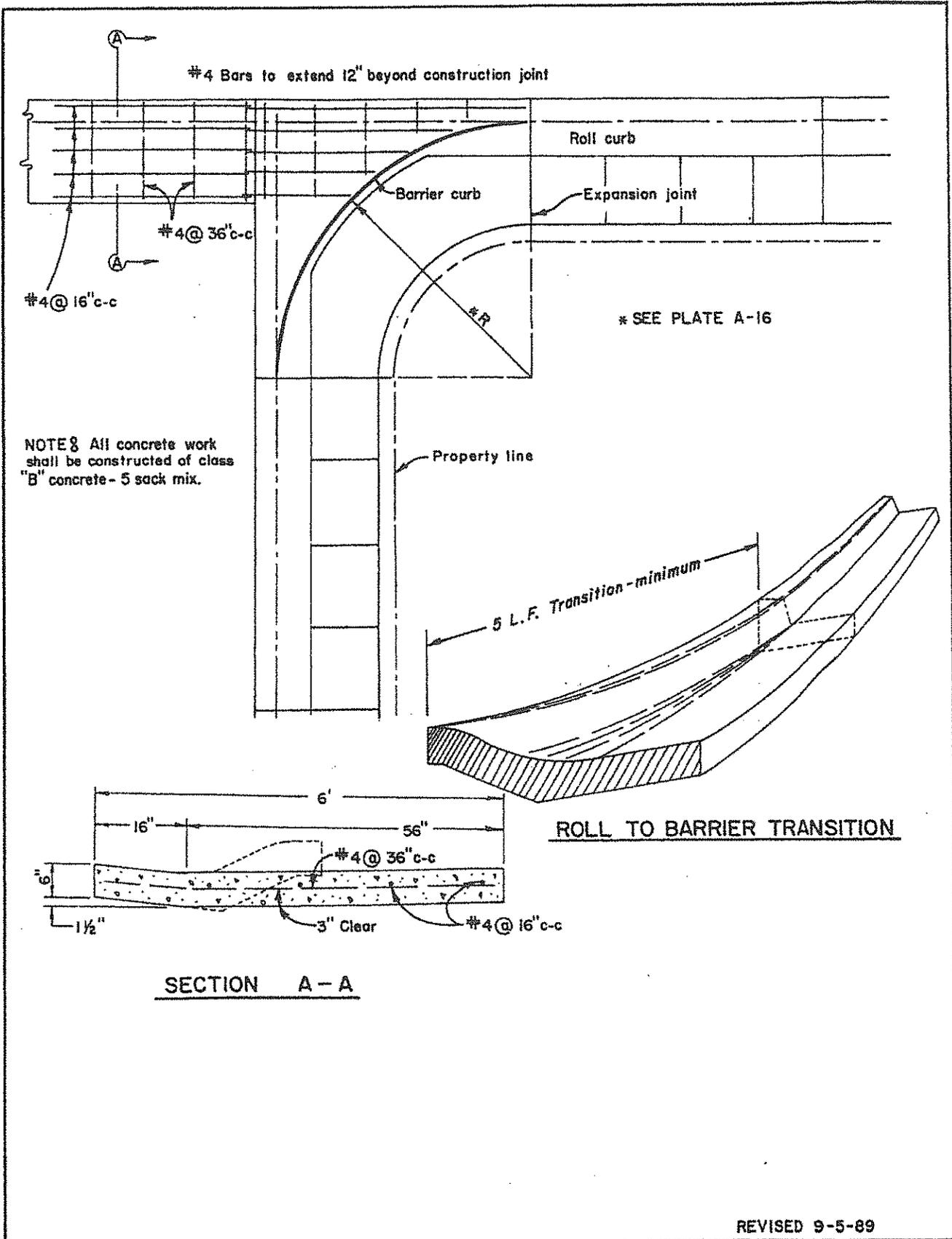
STRUCTURAL
ROAD DETAILS

PLATE NO. A-10



TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080
CURB AND GUTTER
TRANSITION
ROLL TO BARRIER
PLATE NO. A-13

PUBLIC ROAD STANDARDS

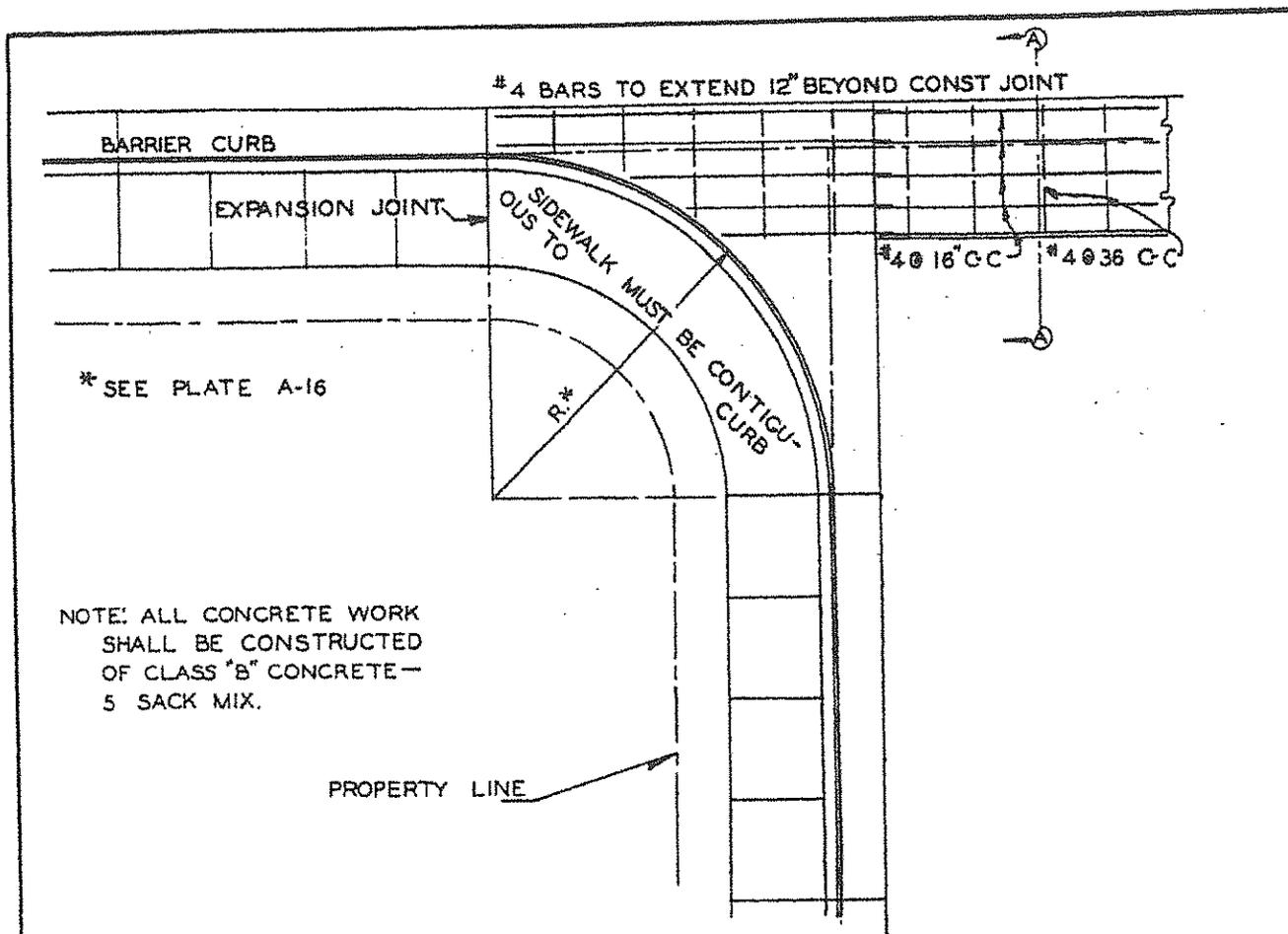


REVISED 9-5-89

PUBLIC ROAD STANDARDS

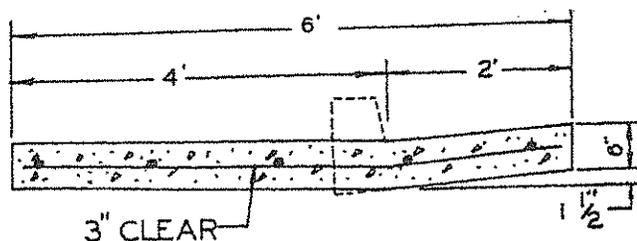
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080
CONTINUOUS GUTTER
TRANSITION

PLATE NO. A-14



* SEE PLATE A-16

NOTE: ALL CONCRETE WORK SHALL BE CONSTRUCTED OF CLASS "B" CONCRETE - 5 SACK MIX.



APPLICABLE USE WITH BARRIER TYPE CURB

SECTION A-A

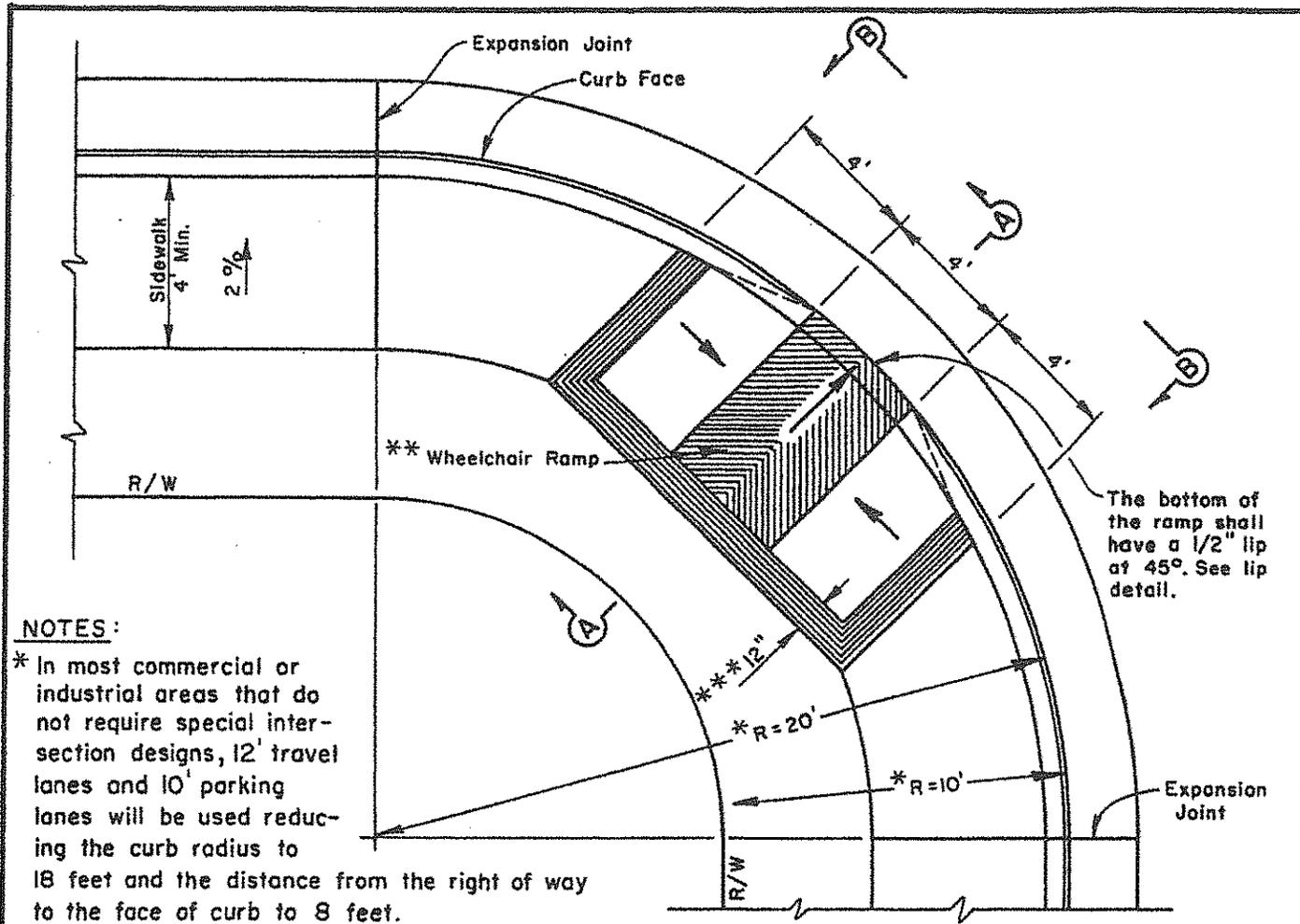
REVISED 9-5-89

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

CONTINUOUS GUTTER
CURB RETURN

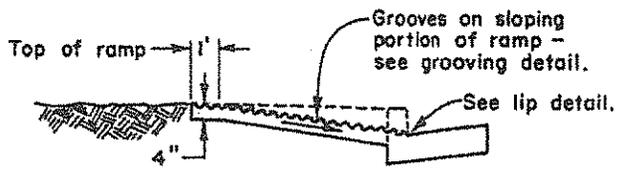
PLATE NO. A-15



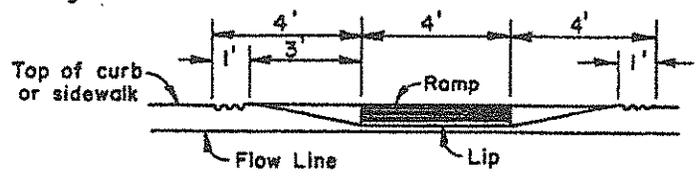
NOTES:

- * In most commercial or industrial areas that do not require special intersection designs, 12' travel lanes and 10' parking lanes will be used reducing the curb radius to 18 feet and the distance from the right of way to the face of curb to 8 feet.
- ** Wheelchair ramps shall be located in the center of curb return. It shall be grooved in a herringbone pattern with 1/4" grooves approximately 1 1/2" o.c. See grooving detail. Grooves should be aligned parallel to crosswalk stripes to direct blind pedestrians into the correct crosswalk.
- *** The ramp shall have a 12" wide border with 1/4" grooves approximately 3/4" o.c. See grooving detail.

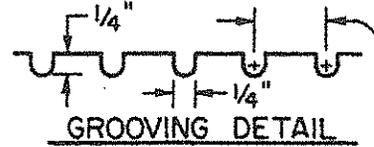
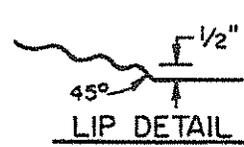
The bottom of the ramp shall have a 1/2" lip at 45°. See lip detail.



SECTION A-A



SECTION B-B



Approximately 3/4" at border and 1 1/2" on sloping portion of ramp.

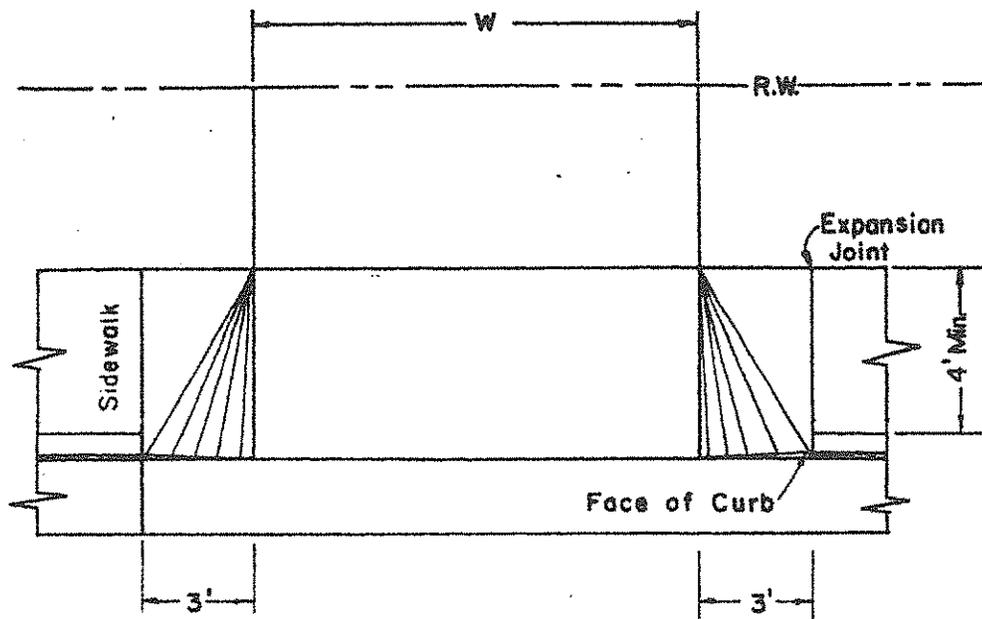
REVISED 9-89

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION No. 7080
CURB RETURN DETAIL
PLATE A-16

NOTE: Driveway approaches need only to extend to the back of sidewalk location where approved by the engineer and A.C. pavement continues.

NOTE: See sheet A-18 for further details of concrete driveway.

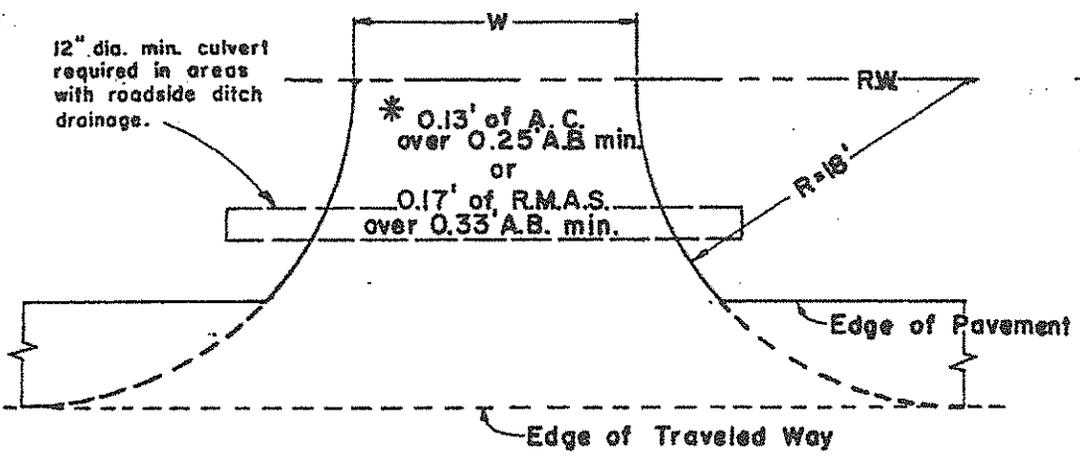


Vary slope from edge of sidewalk to existing ground at or near right of way. Max. slope=20%

URBAN DRIVEWAY

* NOTE:

If County maintained road is surfaced with A.C. then A.C. approach is required. If County maintained road is R.M.A.S. surfacing then R.M.A.S. or A.C. approach is required.



Vary slope to meet ground, Max. slope=20%
Minimum height of drive crown above gutter 0.40'

RURAL DRIVEWAY

TYPE	W-MIN.	W-MAX.
Residential	9'	24'
Commercial	15'	35'

NOTES:

- All commercial drives shall be of urban type except in mountain areas where approved by Engineer.
- Where drives are constructed on diked roads, the A.C. dike shall be extended down the drive to R.W.

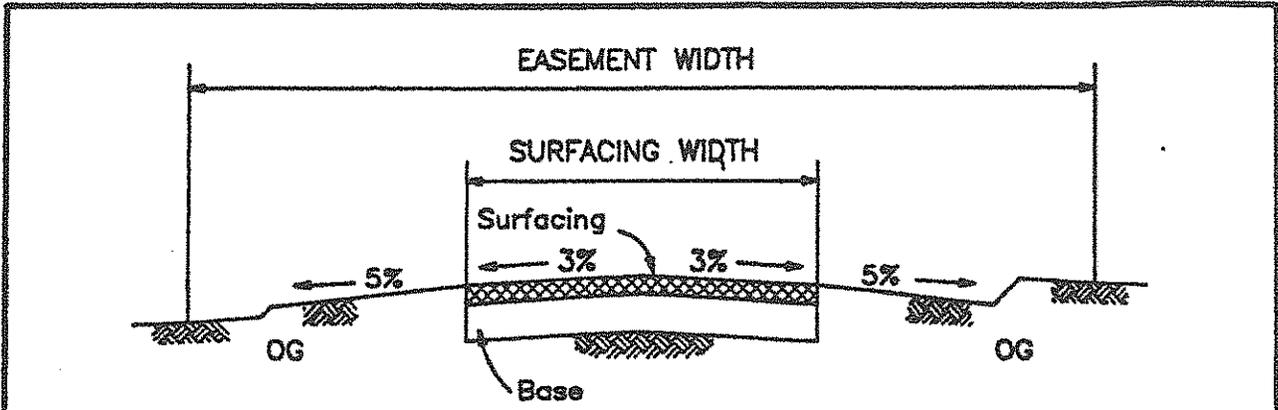
REVISED 7-10-79 G.R.M.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

DRIVEWAY DETAILS

PLATE NO. A-17



EASEMENT AND SURFACING WIDTHS ***			STRUCTURAL SECTION (minimum) ***		
NO. OF PARCELS TO BE SERVED *	EASEMENT WIDTH (ft.)	PAVEMENT WIDTH (ft.)	NO. OF PARCELS TO BE SERVED *	BASE	SURFACING
1	18	10	1-2	3" AB(3)	OIL PENETRATION **
2	18	16	3	3" AB(3)	1.5" RMAS or AC
3	20	18	4	AB(3)	RMAS or AC
4	26	20		Use TI = 4.0 for thickness	

- NOTES:**
1. A 37' paved radius turnaround bulb shall be constructed within a 45' easement radius at the end of access easements serving 2,3, and 4 parcels. In the SRA, turnarounds will also be required for access easements serving one parcel with more than two buildings or four or more dwelling units. Turnaround bulbs shall be paved to a 40' radius within a 48' easement radius.
 2. Private Vehicular Access connections to County roads shall be constructed in accordance with Plate No. A-17.
 3. When more than four parcels are served, County Road Standards for right-of-way, surfacing widths, and structural section shall apply.
 4. When RMAS is used, the oil quantity and the quality of aggregate will be tested using test method No. Calif. 304 and other tests as required in Section III-B6 of these standards.
 5. Compaction of OG and AB shall be to a minimum of 90% relative compaction. Compliance tests will be taken as directed by the Public Works Director.
 6. Improvement Standards for public roads shall be applicable for those standards not specifically stated in these Private Vehicular Access Easement Standards.

ABBREVIATIONS

- | | |
|-----------------------------------|---------------------------------|
| RMAS = ROAD MIX ASPHALT SURFACING | AC = ASPHALTIC CONCRETE |
| AB(3) = CLASS III AGGREGATE BASE | SRA = STATE RESPONSIBILITY AREA |
| OG = ORIGINAL GROUND | TI = TRAFFIC INDEX |

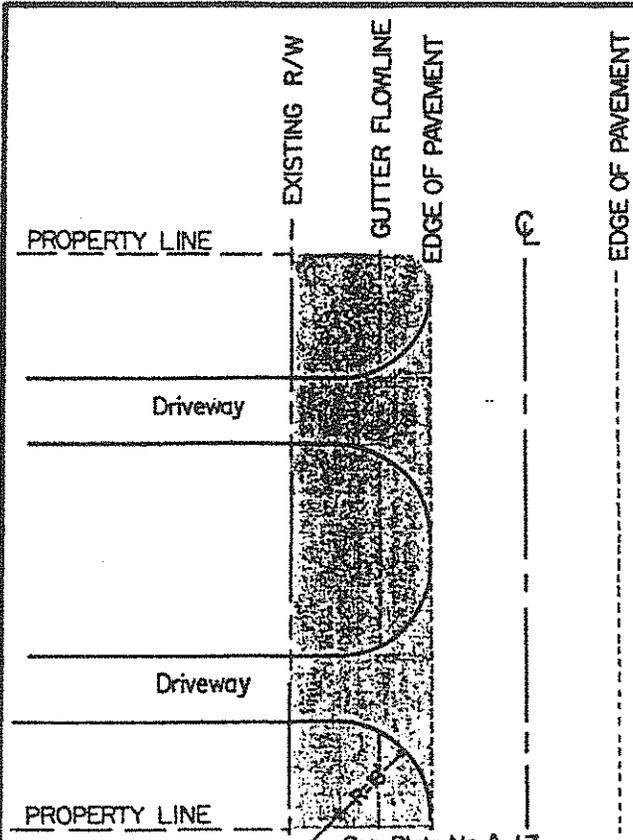
- * Parcels served which do not have public road frontage
- ** Penetrating oil shall be SC 800 grade
- *** In the SRA, surfacing widths and structural section requirements for PVAEs serving three parcels, two parcels, or one parcel with more than two buildings or four or more dwelling units shall be improved to the following standards. Structural section requirements shall consist of AB(3) surfaced with AC or RMAS designed using a TI of 3.0. Pavement width shall be 18 feet, within an easement width of 20 feet. Grades shall not exceed 16 percent.

PRIVATE VEHICULAR ACCESS EASEMENT STANDARDS

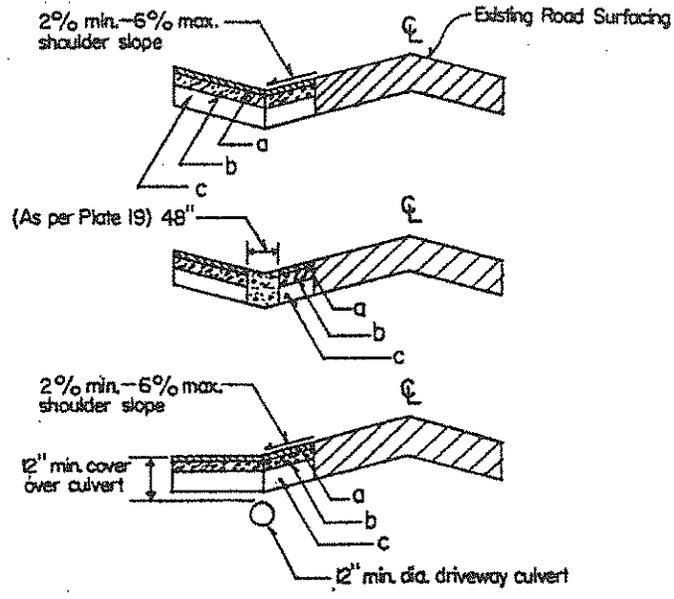
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

VEHICULAR
ACCESS
EASEMENTS

PLATE NO. A-17-B



- a) 0.13' Asphalt Concrete
- b) 0.25' Min. Aggregate Base—
95% Compacted
- c) 0.50' Original Ground—
95% Compacted



NOTES:

Roadside drainage to be provided by use of asphalt gutter (0.5% min. slope), or concrete Vee gutter (0.4% min. slope), or 12" min. dia. culvert.

1. The granting of permission to perform frontage paving is not intended to allow driveway approach widths, at the existing R/W line, that exceed the standards. Approach widths and locations shall be defined by means approved by the Road Commissioner.
2. The diameter and length of driveway culvert shall be determined by the Road Commissioner based upon the hydraulic capacity needed and other field conditions. Driveway culverts shall be standard culverts designed to withstand traffic loads and soil conditions.
3. Vee gutter shall be placed at normal curb and gutter location and with a minimum flowline slope of 0.4% as per plate A-19.

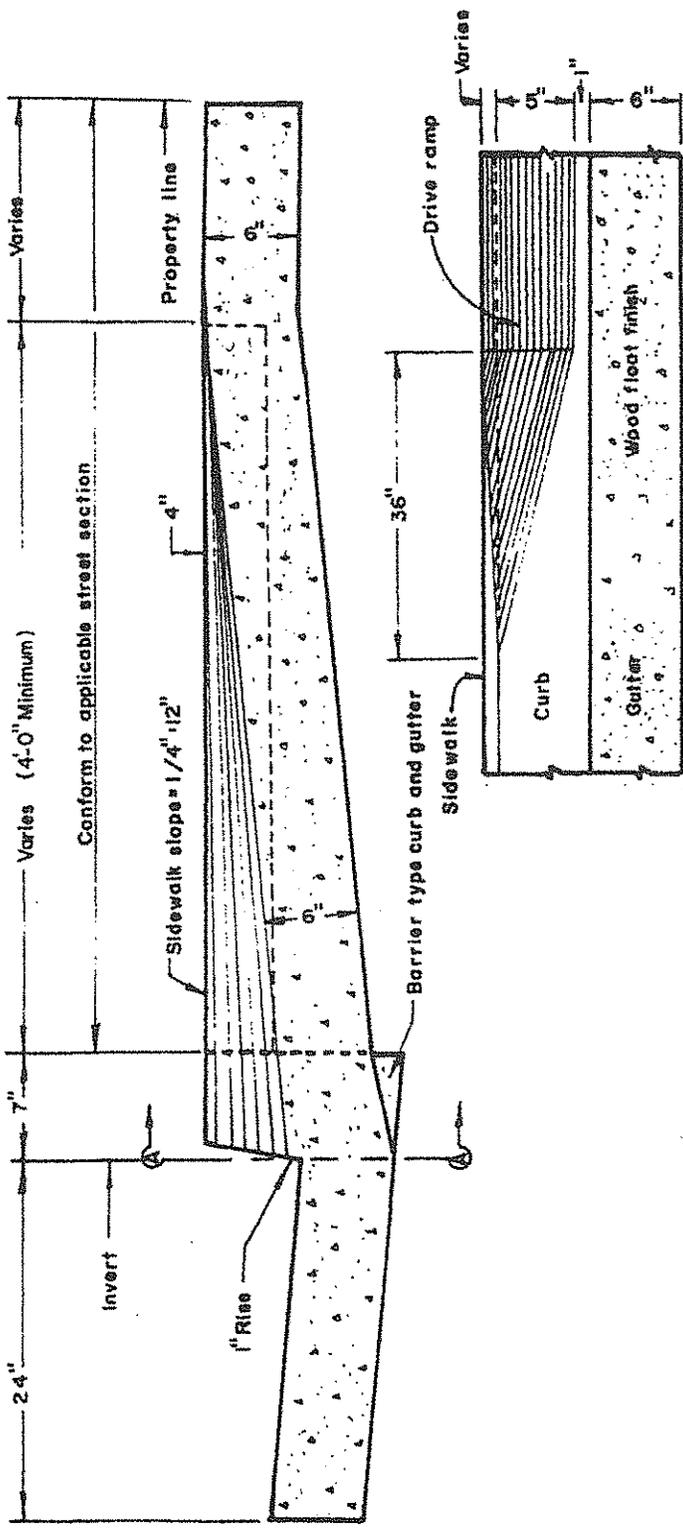
REVISED 9-5-89

PUBLIC ROAD STANDARDS
(DOES NOT APPLY INSIDE URBAN IMPROVEMENT AREA BOUNDARY)

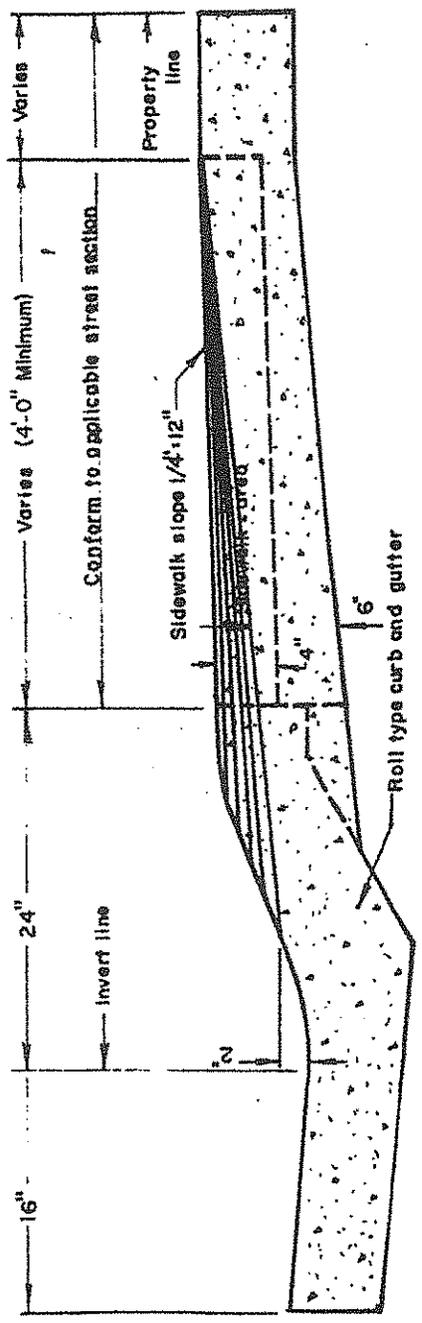
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

RURAL FRONTAGE
PAVING DETAILS

PLATE NO. A-17C



SECTION A-A

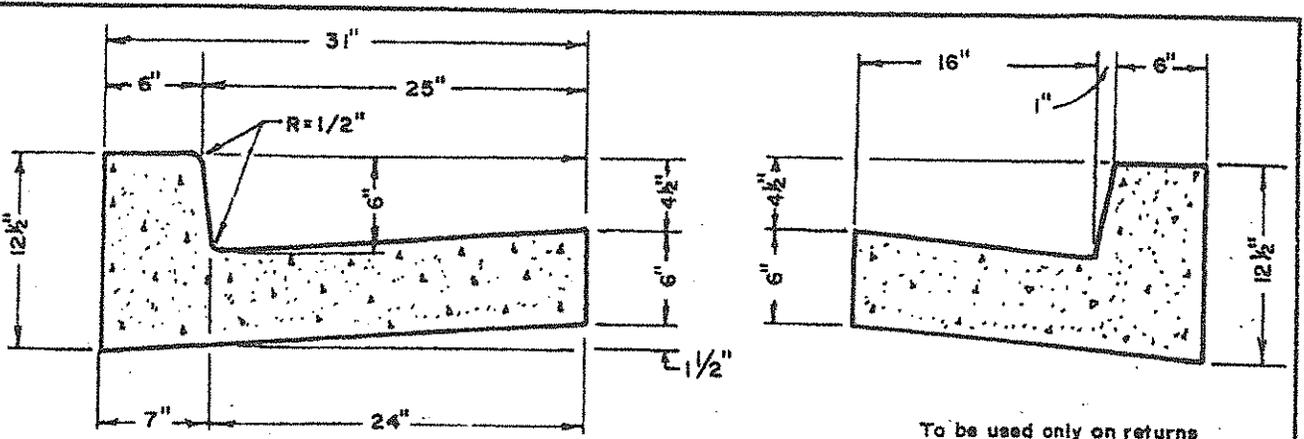


PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

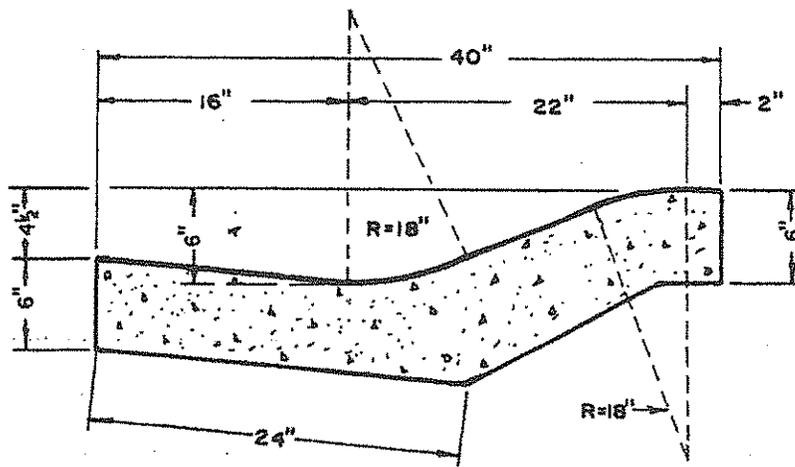
DRIVEWAY
APPROACH

PLATE NO. A-18



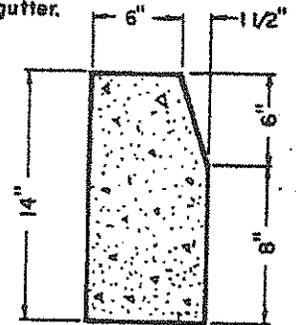
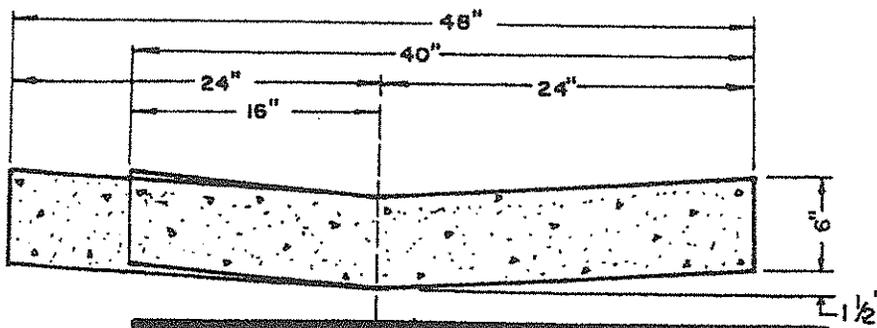
To be used only on returns where Roll-Barrier transition is required.

CURB and GUTTER BARRIER TYPE



CURB and GUTTER ROLL TYPE

Notes: Barrier type curb and gutter shall have a minimum gradient of 0.15 feet per 100 feet.
 Roll type curb and gutter shall have a minimum gradient of 0.40 feet per 100 feet.
 All concrete shall be of class "B" concrete- 5 sack mix
 Area between back of curb and and property line shall be back filled and sloped to drain to gutter.



CURB

Shall not be used as continuous gutter at intersection.
 Vee gutter shall have a minimum gradient of 0.40 feet per 100 feet.

VEE GUTTER

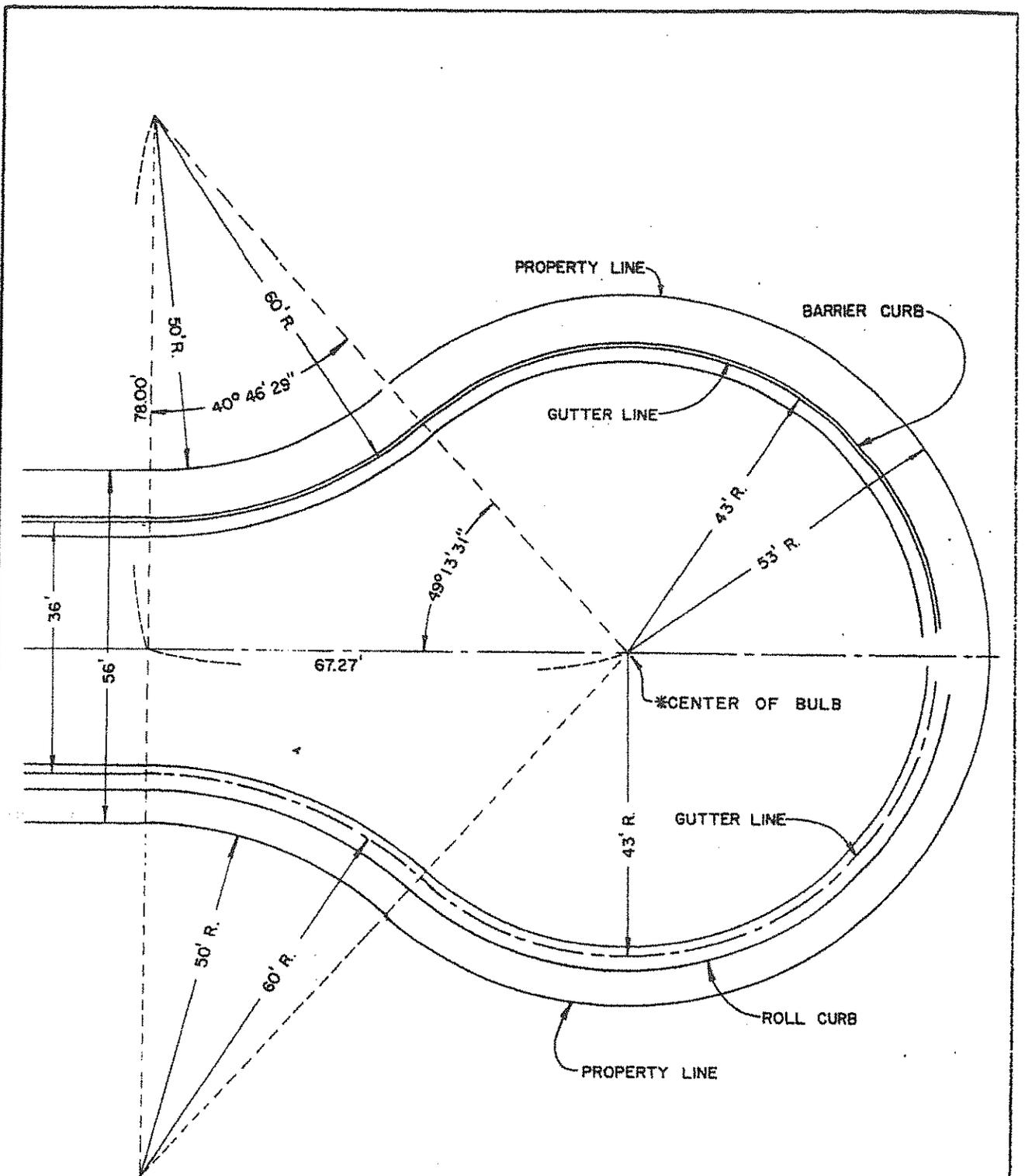
REVISED 9-5-89

PUBLIC ROAD STANDARDS

TULARE COUNTY
 ORDINANCE CODE
 SECTION NO. 7080

CURB and GUTTER

PLATE NO. A-19



* Elevation of pavement surface at center of bulb shall be designed to allow pavement slope to gutter of 2% minimum.

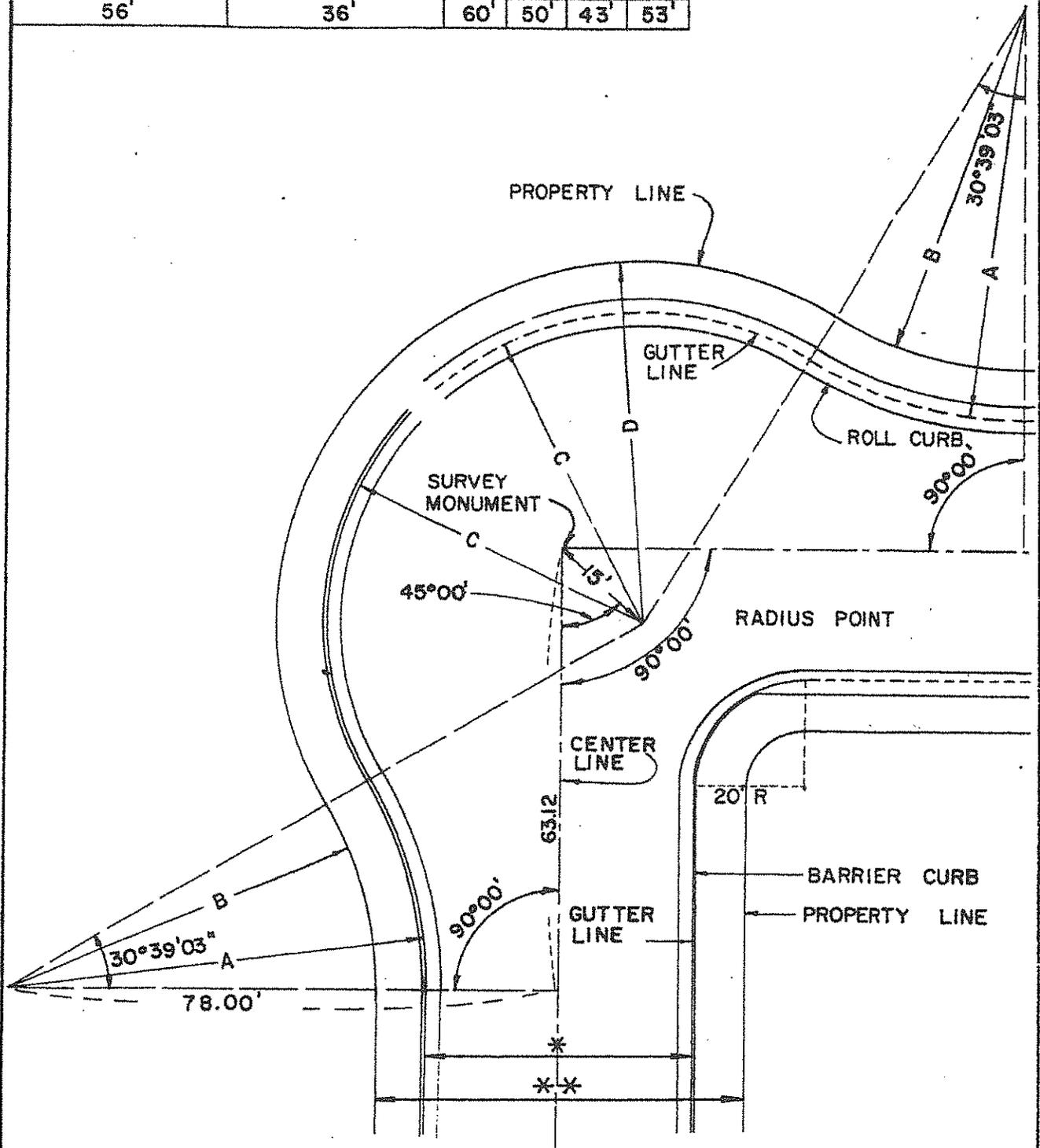
PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

CUL-DE-SAC

PLATE NO. A-20

** WIDTH OF RIGHT OF WAY	* CURB TO CURB ROAD WIDTH	LENGTH OF RADIUS			
		A	B	C	D
60'	40'	58'	48'	45'	55'
56'	36'	60'	50'	43'	53'

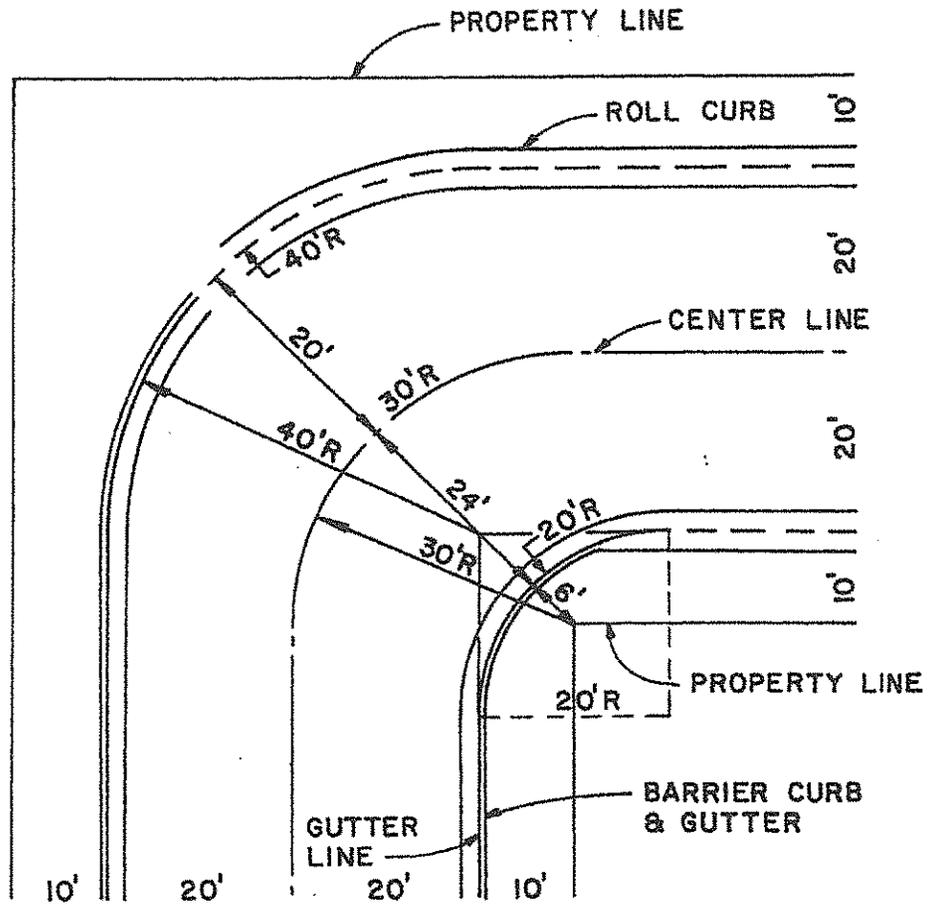


PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

STREET BULB
CONNECTION

PLATE NO. A-21



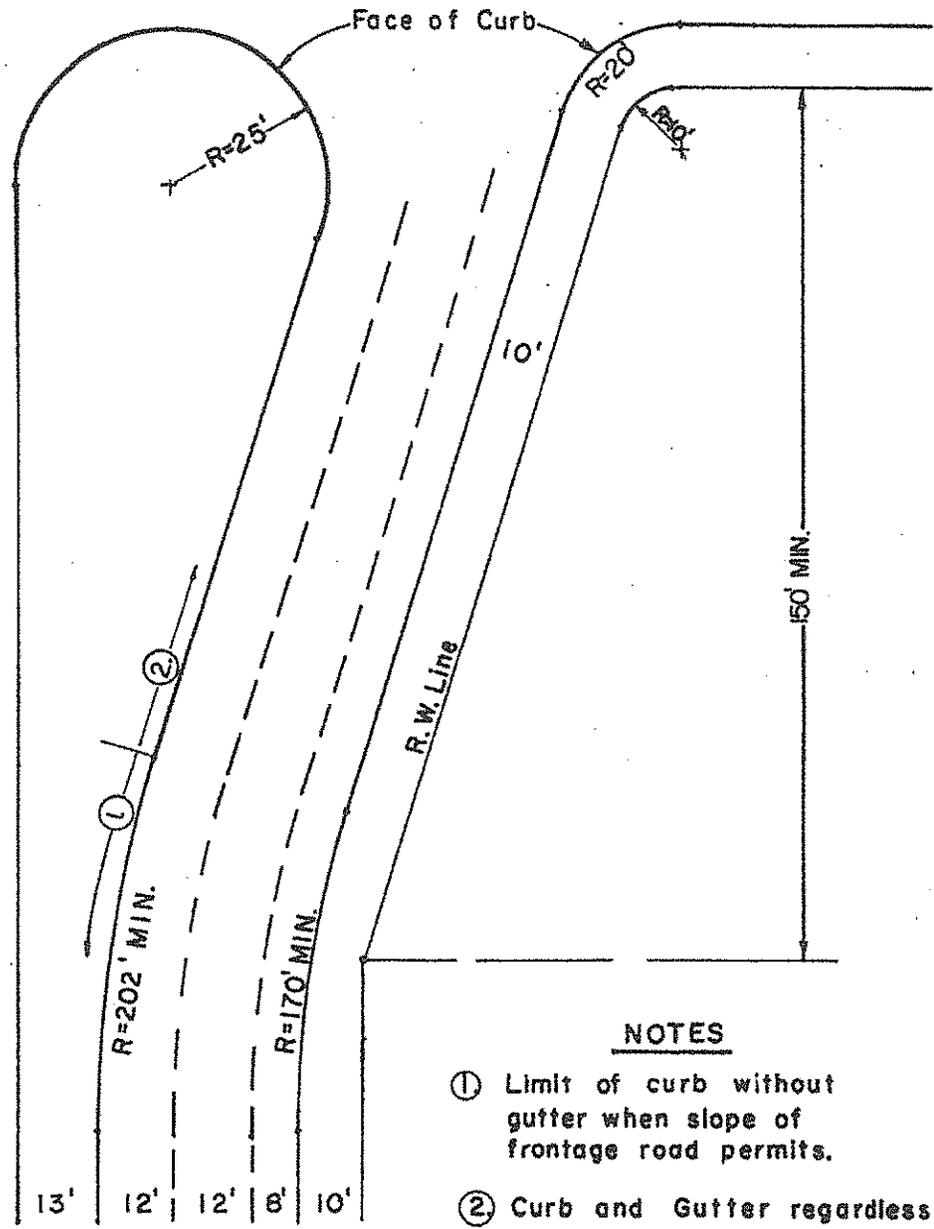
PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

STREET CONNECTION
WITHOUT BULB

PLATE NO. A-21-a

LIMITED ACCESS ROAD



NOTES

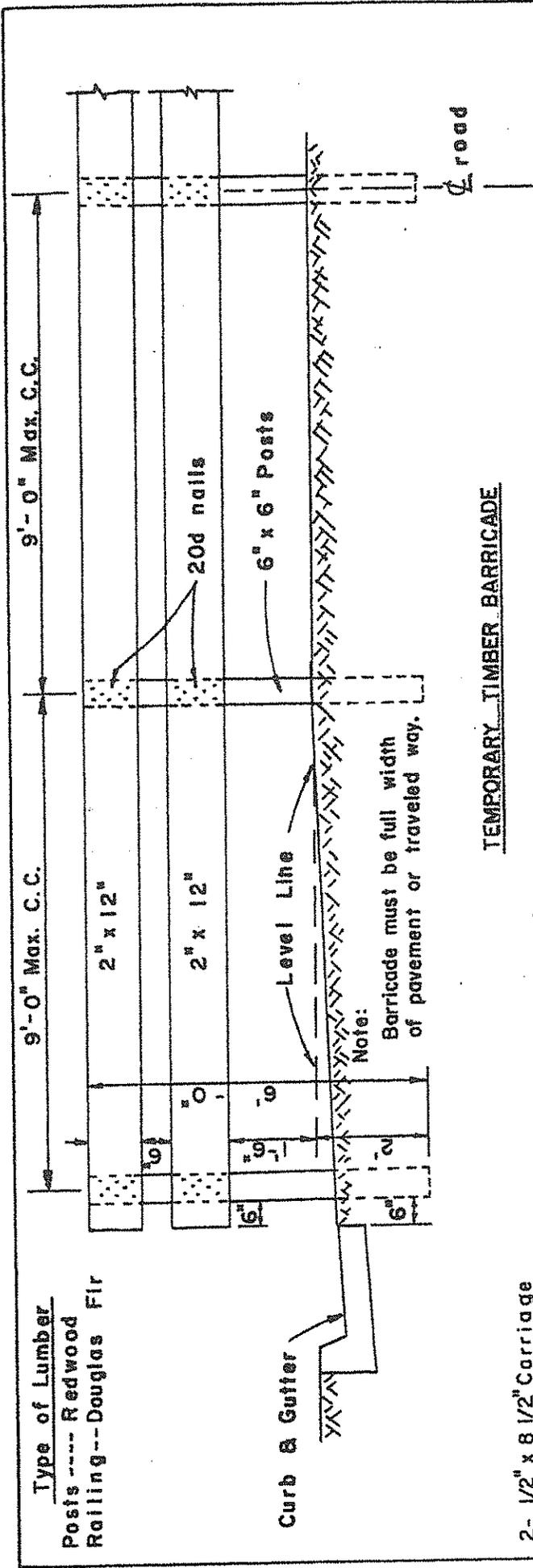
- ① Limit of curb without gutter when slope of frontage road permits.
- ② Curb and Gutter regardless of slope of frontage road.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO.7080

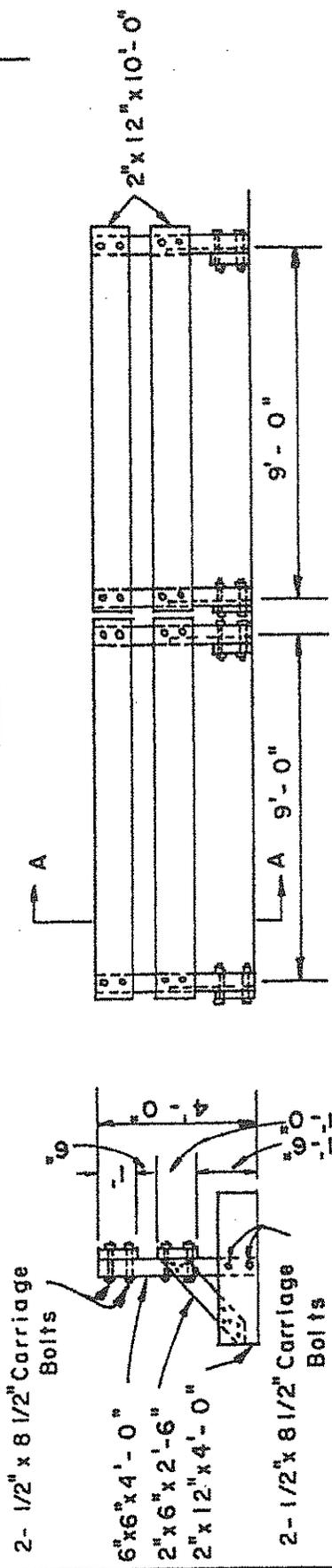
FRONTAGE ROAD
BULB LAYOUT

PLATE NO.A-22



Note:
Barricade must be full width
of pavement or traveled way.

TEMPORARY TIMBER BARRICADE



PORTABLE TIMBER BARRICADE

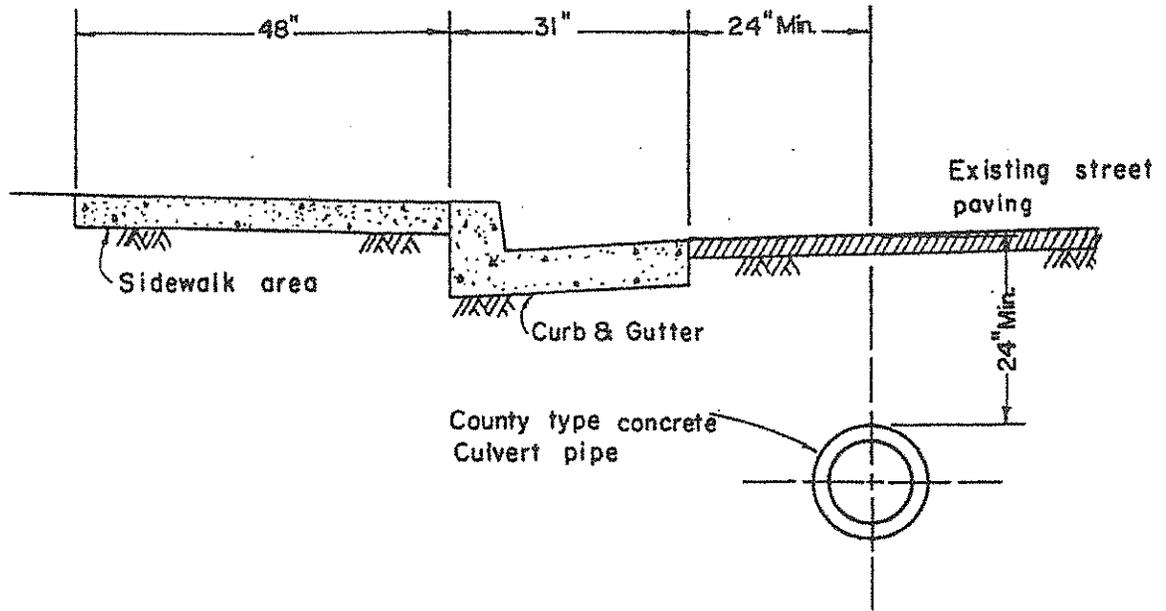
Note:
Appropriate signs to be designated
by the Road Commissioner. All signs
to be in accordance with the State
of California
Standards.
Two coats of white paint shall be
applied to the surface of all lumber.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

BARRICADES

PLATE NO. A-23



STRENGTH REQUIREMENTS:

Design and Test Requirements of County type Concrete Culvert pipe are given in the following table:

INSIDE DIAMETER INCHES	MIN. SHELL THICKNESS INCHES	MINIMUM CIRCULAR REINF.(a.)	ULTIMATE LOAD REQUIREMENTS	
			THREE-EDGE BEARING LB. PER LIN. FT.	METHOD D-LOAD
12	2	NONE	3000	3000
15	2	NONE	2750	2200
18	2 1/4	NONE	2700	1800
21	2 1/2	.086	3000	1700
24	2 5/8	.086	3000	1500

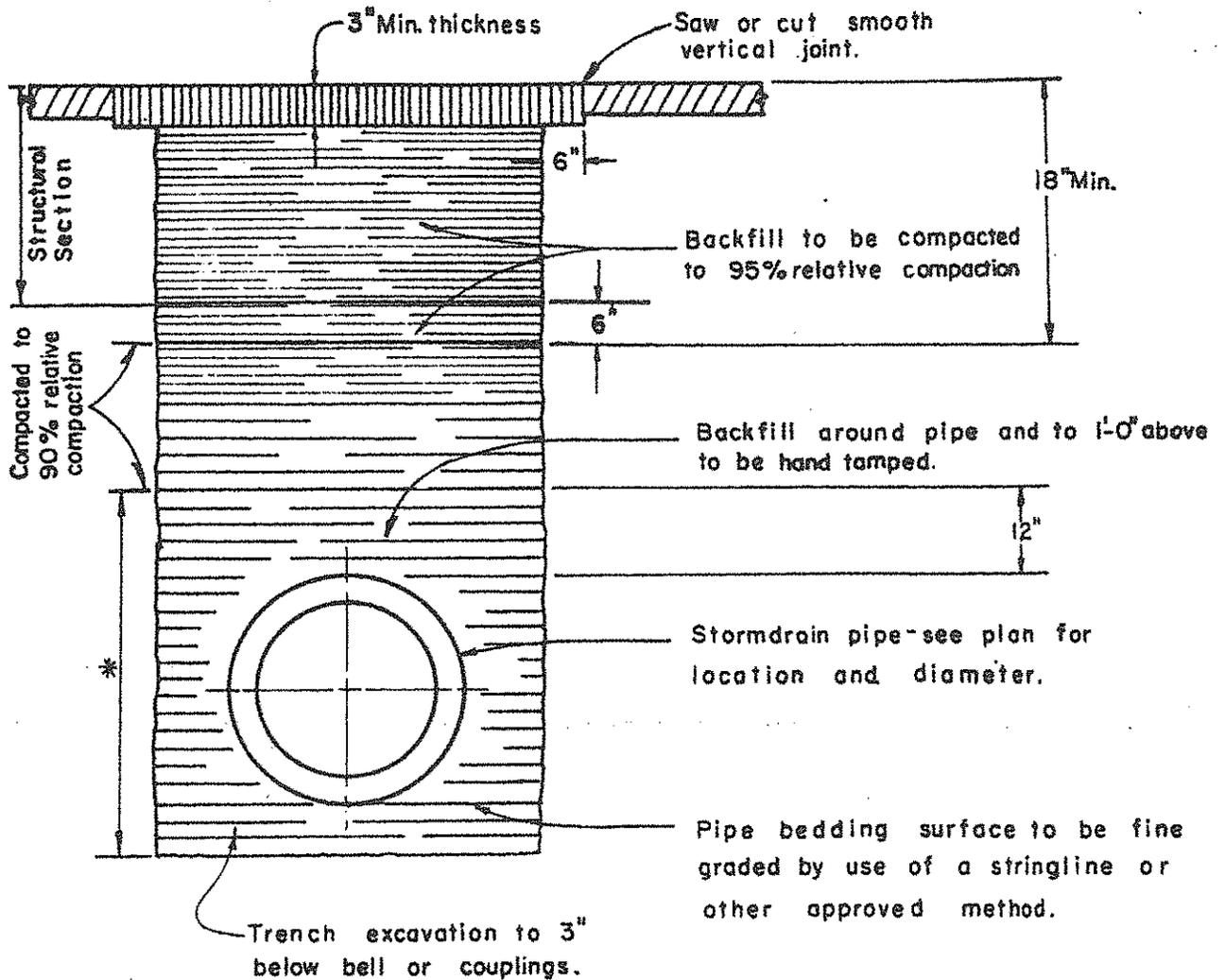
(a) In square inches per linear foot of pipe barrel.
One line of reinforcement of the specified area or greater shall be placed in the barrel of the pipe equally distant from its inner and outer surfaces.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

PIPE LOCATION AND
STRENGTH REQUIREMENT

PLATE NO. A-24



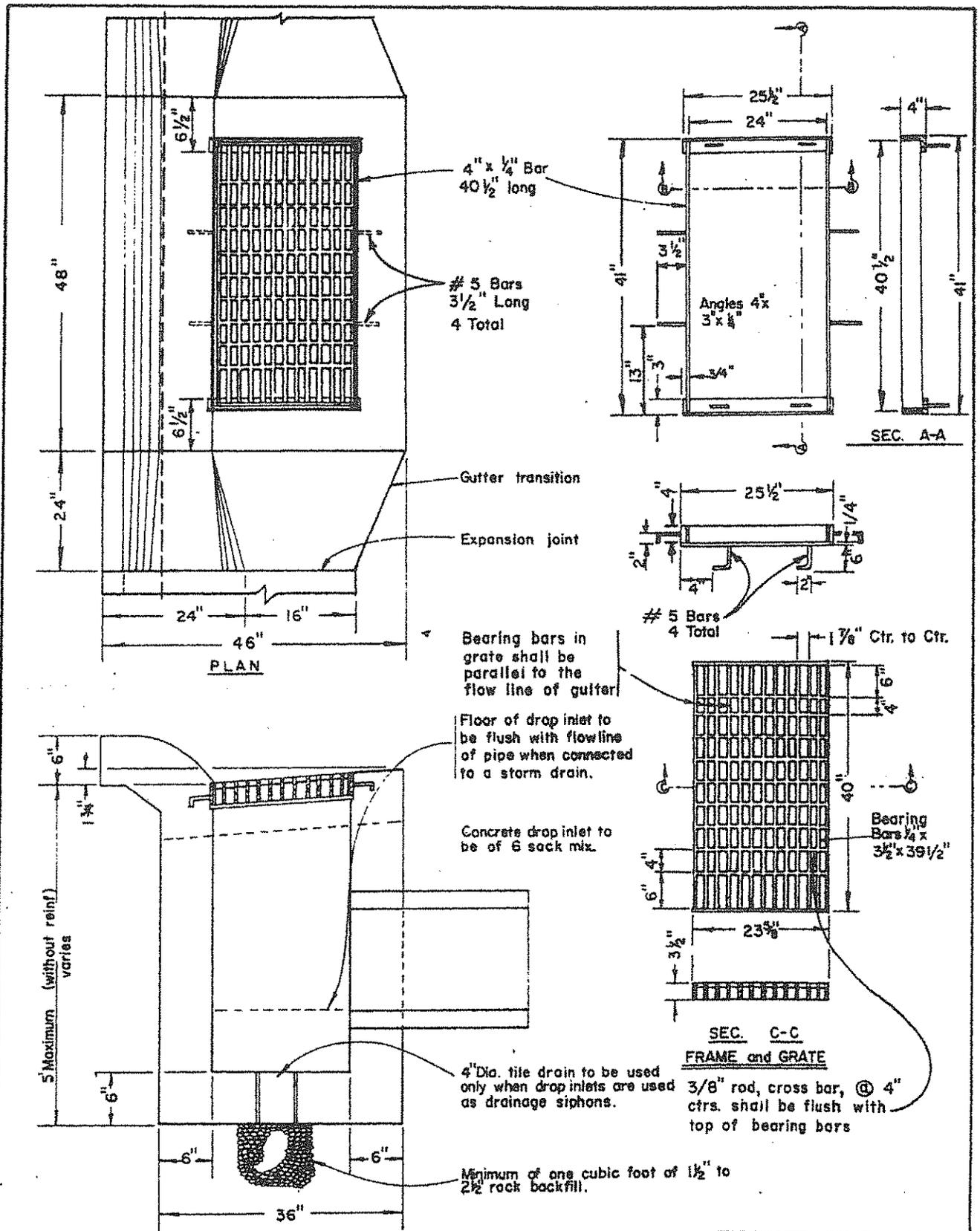
*Backfill around pipe and to 1'-0" above top of pipe may be material from the excavation only if it has a sand equivalent of 30 minimum. For plastic pipe backfill around pipe and to 1'-0" above top of pipe may be material from the excavation only if it is coarse sand or decomposed granite free of rocks larger than 1 1/2" diameter.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

BACKFILL AND
STREET EXCAVATION

PLATE NO. A-25



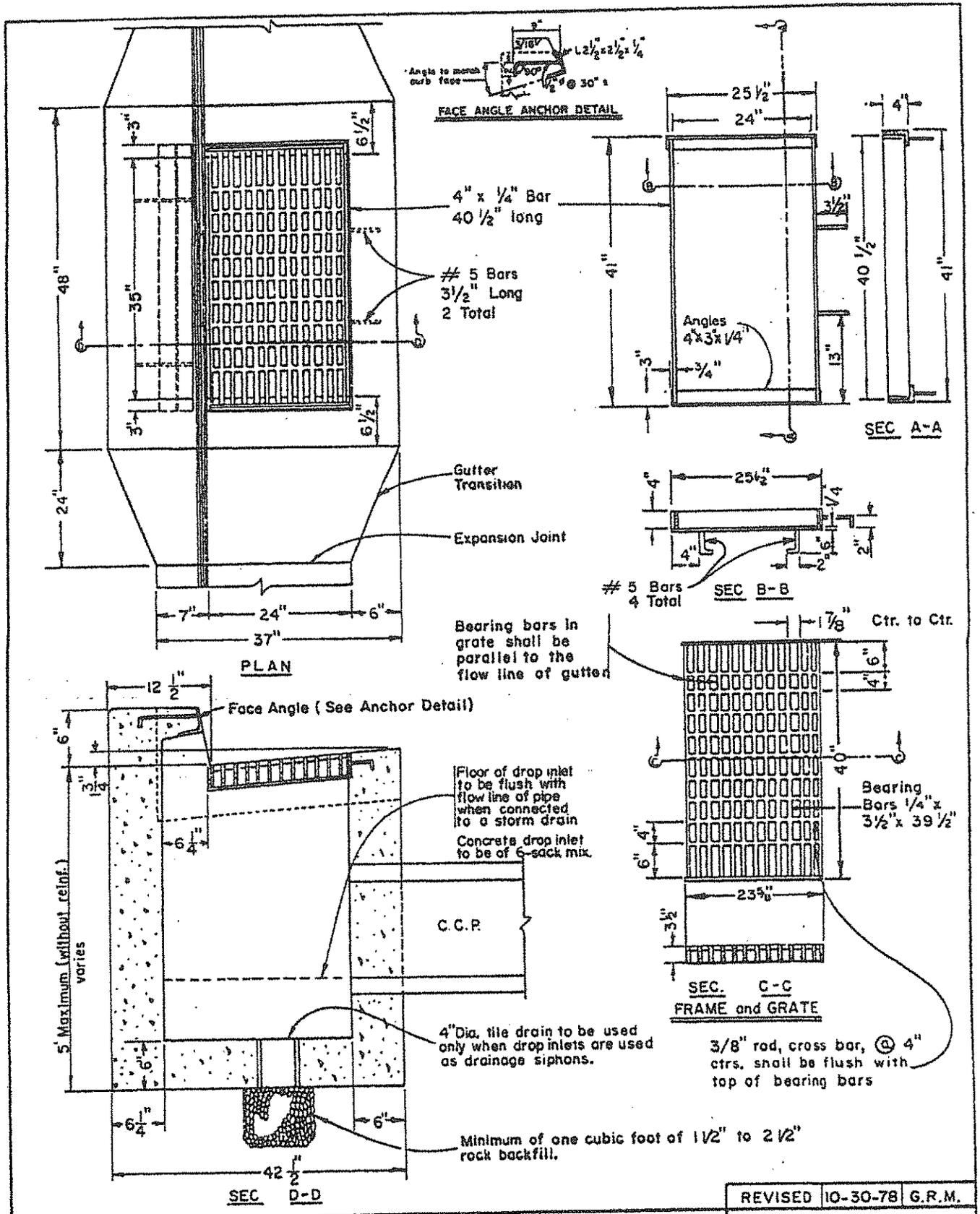
PUBLIC ROAD STANDARDS

REVISED 7-7-72 G.R.M.

TULARE COUNTY
 ORDINANCE CODE
 SECTION NO. 7080

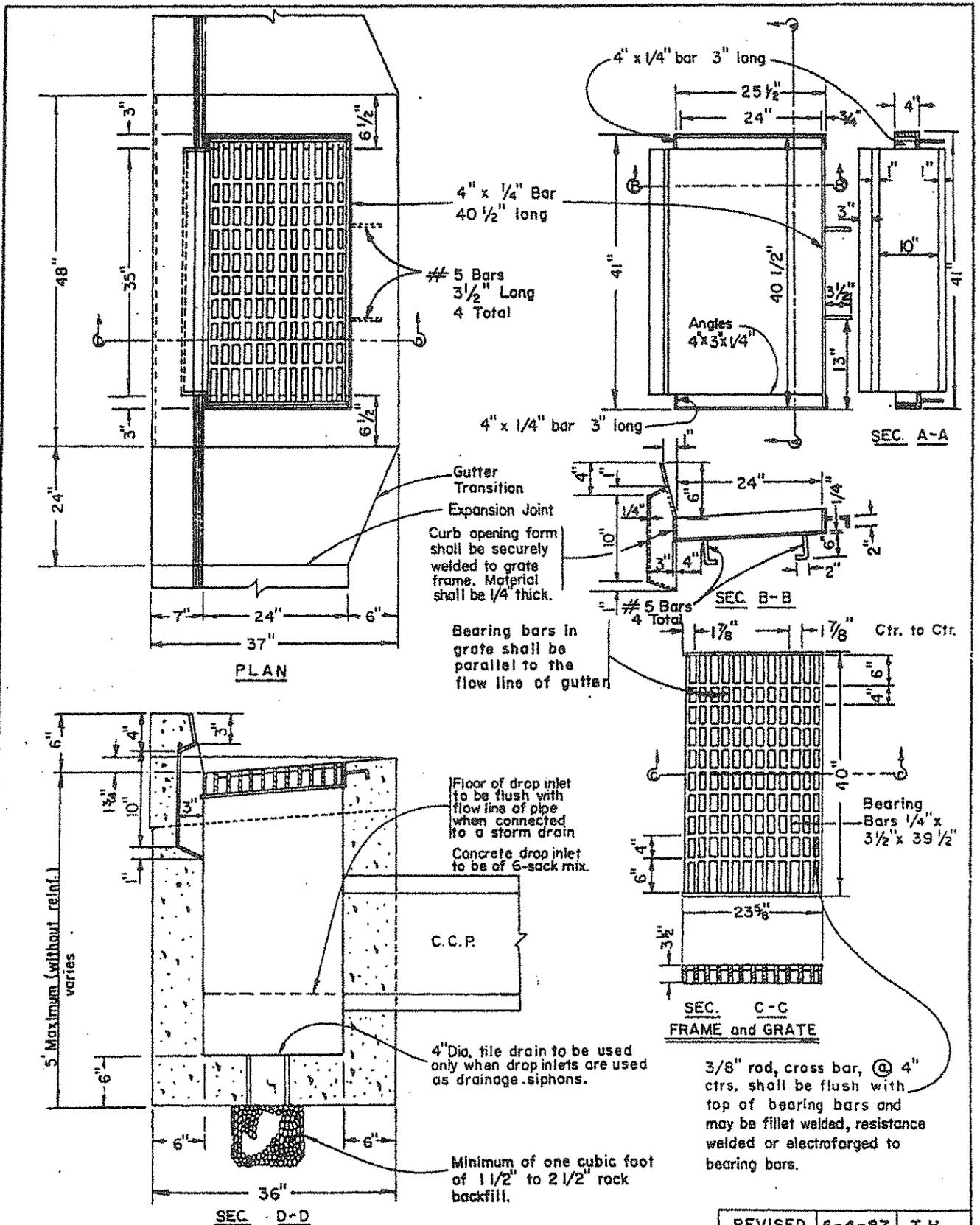
ROLL CURB
 DROP INLET

PLATE NO. A-26.



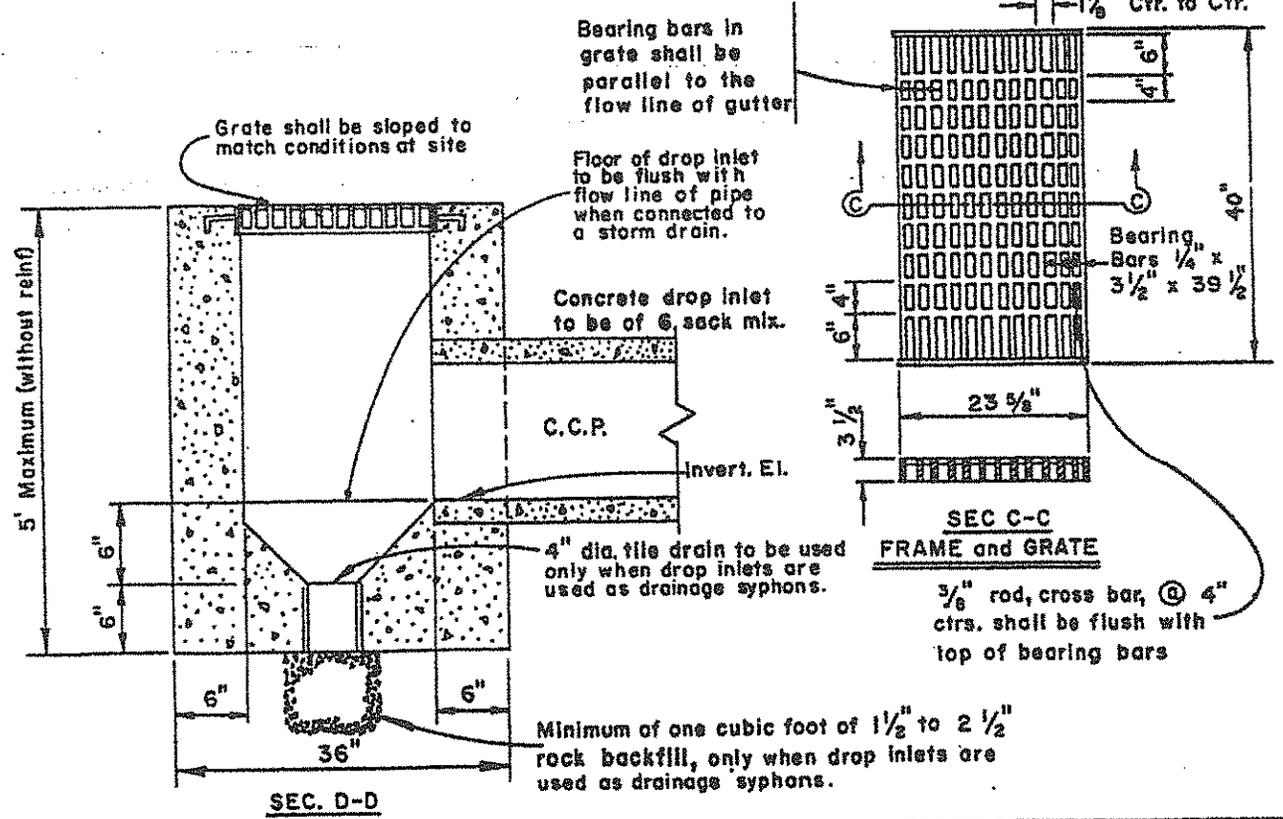
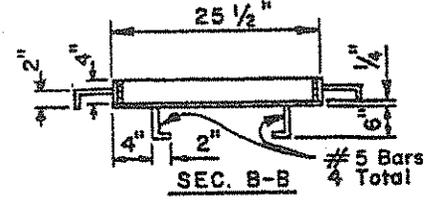
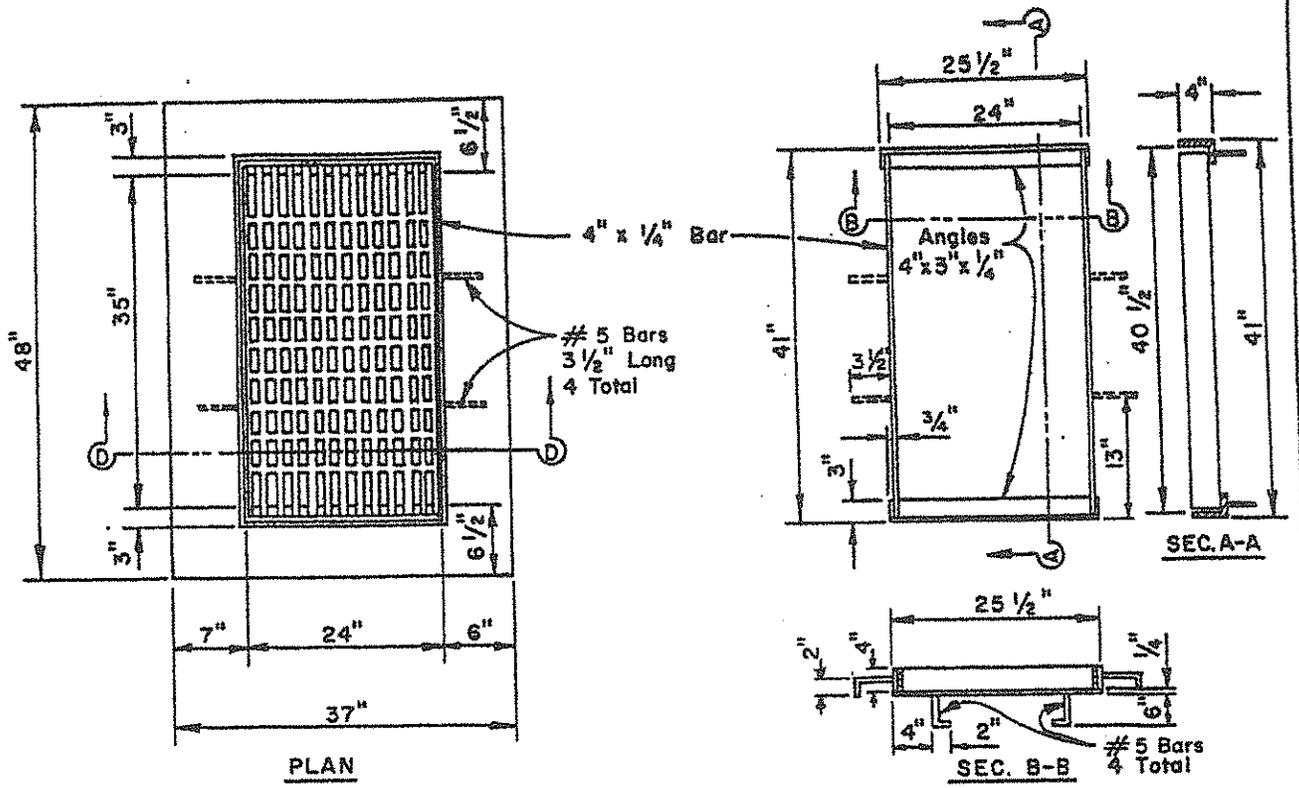
PUBLIC ROAD STANDARDS

REVISED	10-30-78	G.R.M.
TULARE COUNTY ORDINANCE CODE SECTION NO. 7080		
BARRIER CURB SIDE OPENING DROP INLET		
PLATE NO.	A-27a	



PUBLIC ROAD STANDARDS

REVISED	6-4-87	T.H.
TULARE COUNTY ORDINANCE CODE SECTION NO. 7080		
BARRIER CURB SIDE OPENING DROP INLET		
PLATE NO. A-27 b		

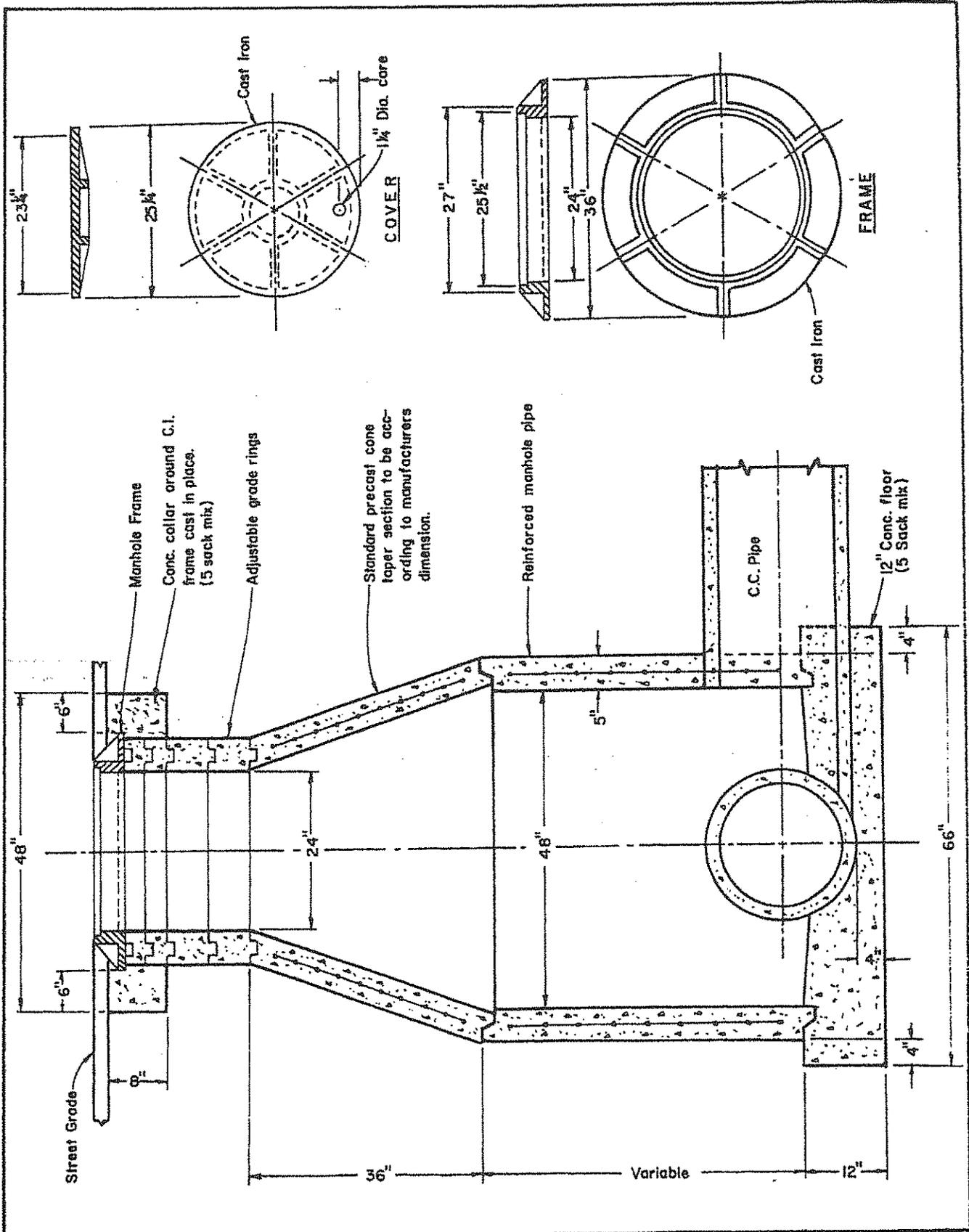


TYPE "A" DROP INLET PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

TYPE A DROP INLET
WITHOUT CURB & GUTTER

PLATE NO. A-27c

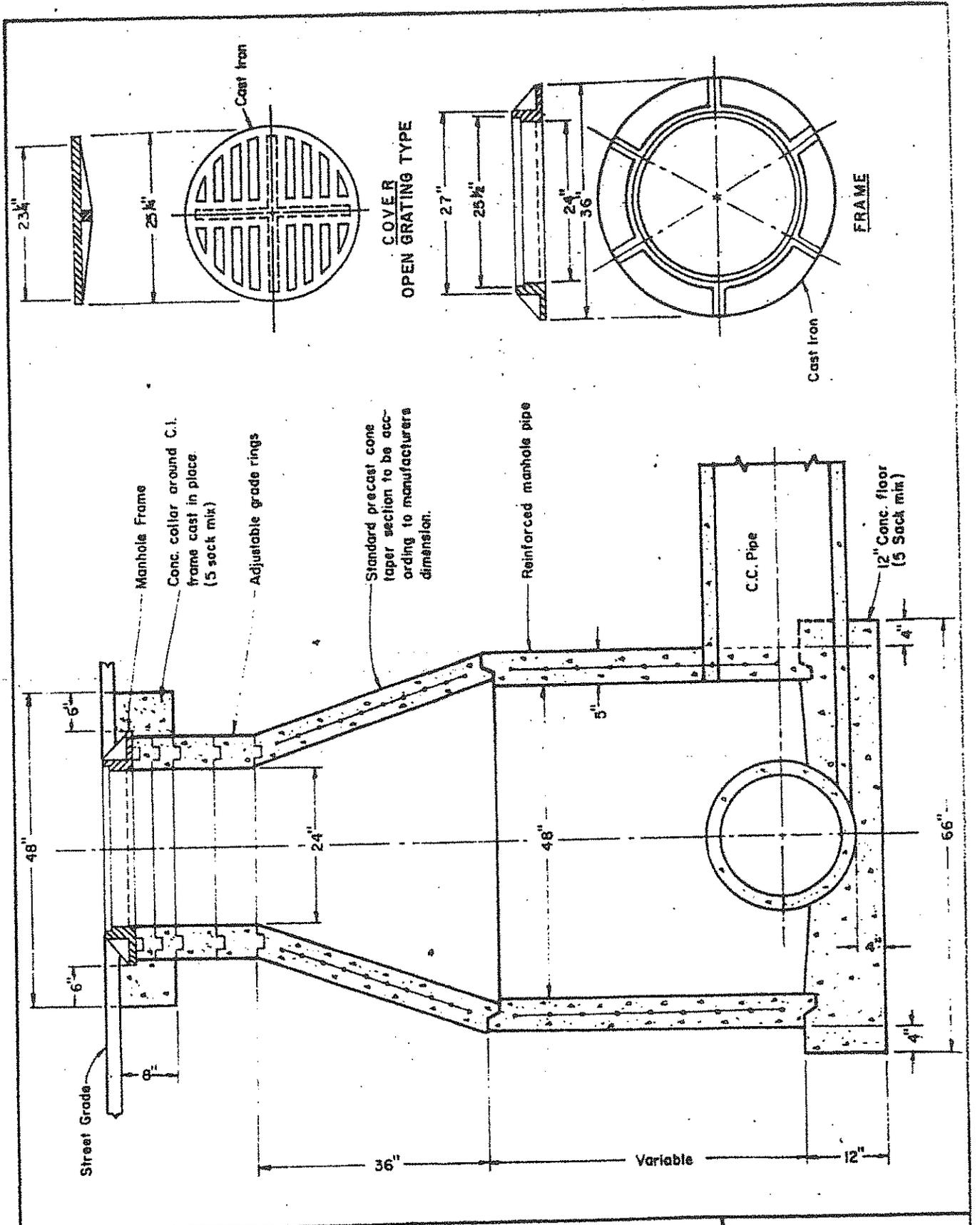


DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

MANHOLE FRAME
AND COVER

PLATE NO. A-28

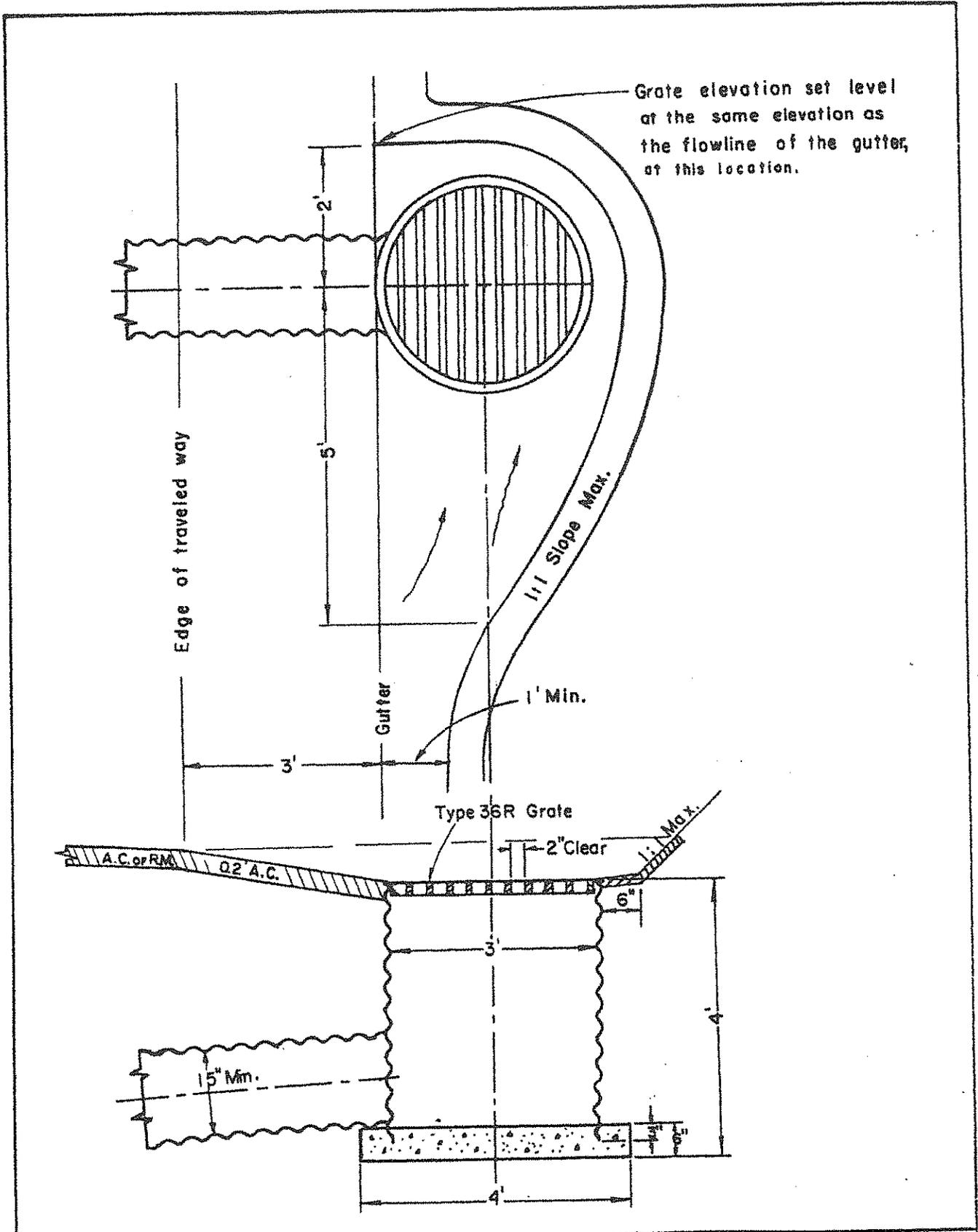


DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

MANHOLE WITH OPEN
GRATING COVER

PLATE NO. A-286



PUBLIC ROAD STANDARDS
MOUNTAINOUS AREAS

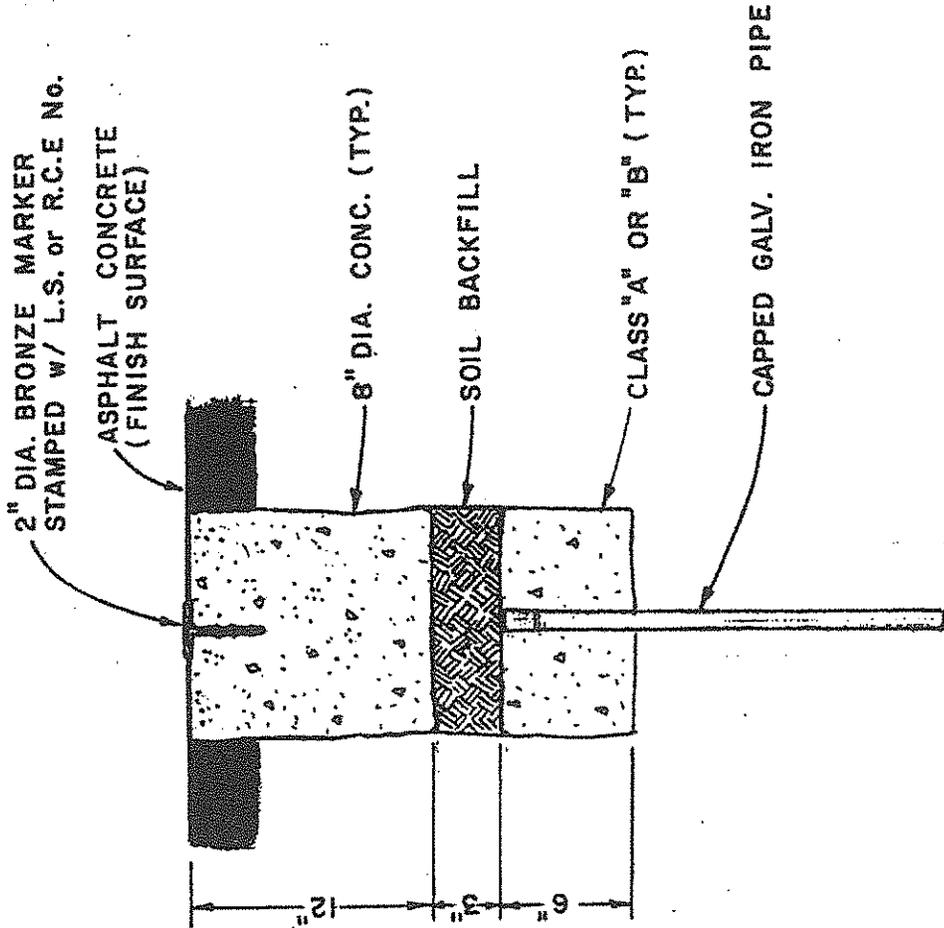
TULARE COUNTY
 ORDINANCE CODE
 SECTION NO. 7080

CROSS DRAIN
 INLET DETAIL

PLATE NO. A-29M

NOTES:

1. ALL MONUMENTS AND REFERENCES SHALL BE PERMANENTLY TAGGED OR MARKED WITH L.S. or R.C.E. No. (Bus. & Prof. Code Sec. 8772)
2. STREET MONUMENTS FOR GOV'T. CORNERS AND TRACT BOUNDARY CORNERS SHALL BE 2" x 24" MINIMUM. (Gov't. Code Sec. 27580, Ord. Code Sec. 7074)
3. OTHER STREET MONUMENTS FOR CENTERLINE INTERSECTIONS, ETC., SHALL BE 1/2" x 18" MINIMUM. (Ord. Code Sec. 7074)

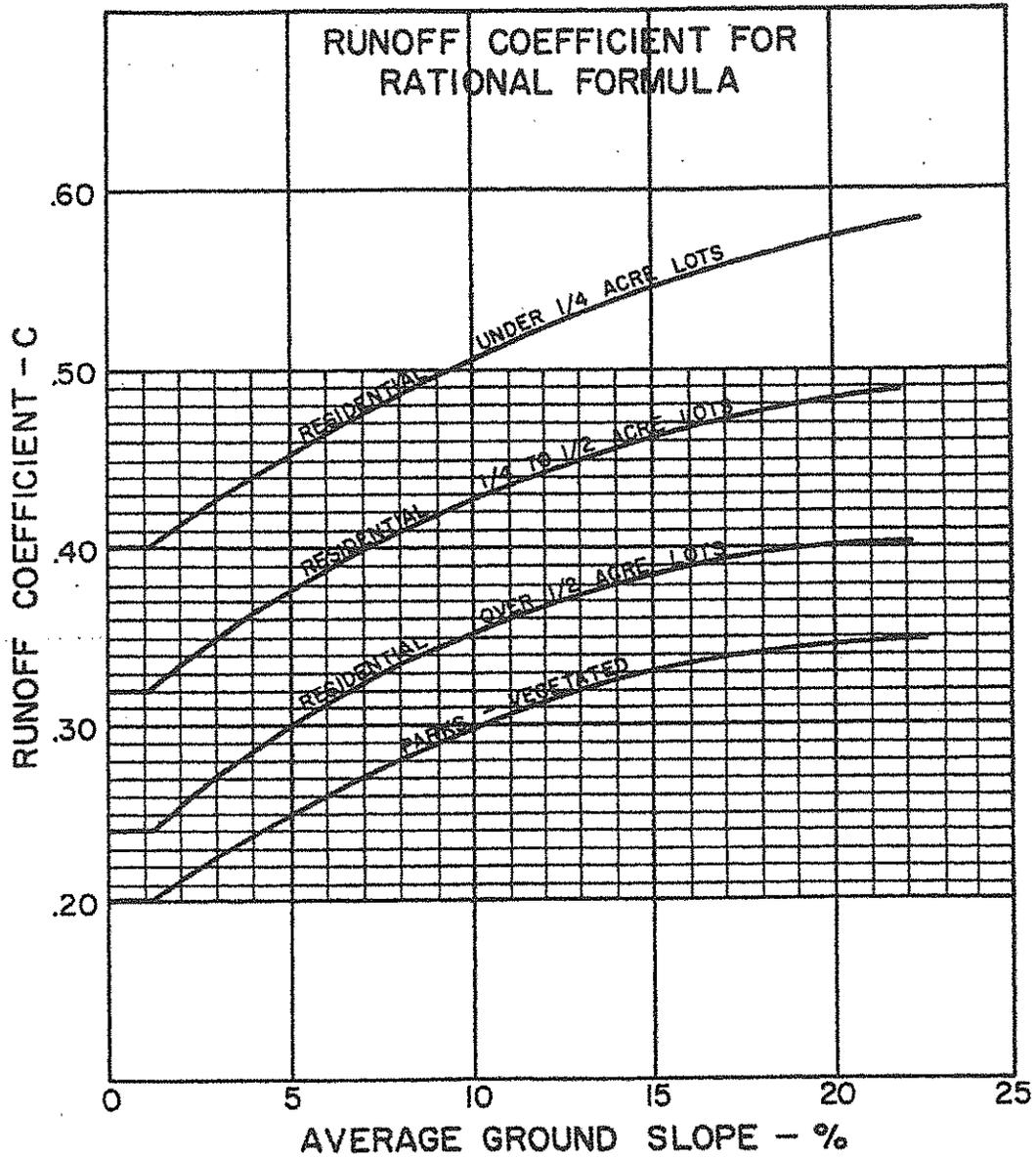


PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

STREET MONUMENT

PLATE NO. A-31



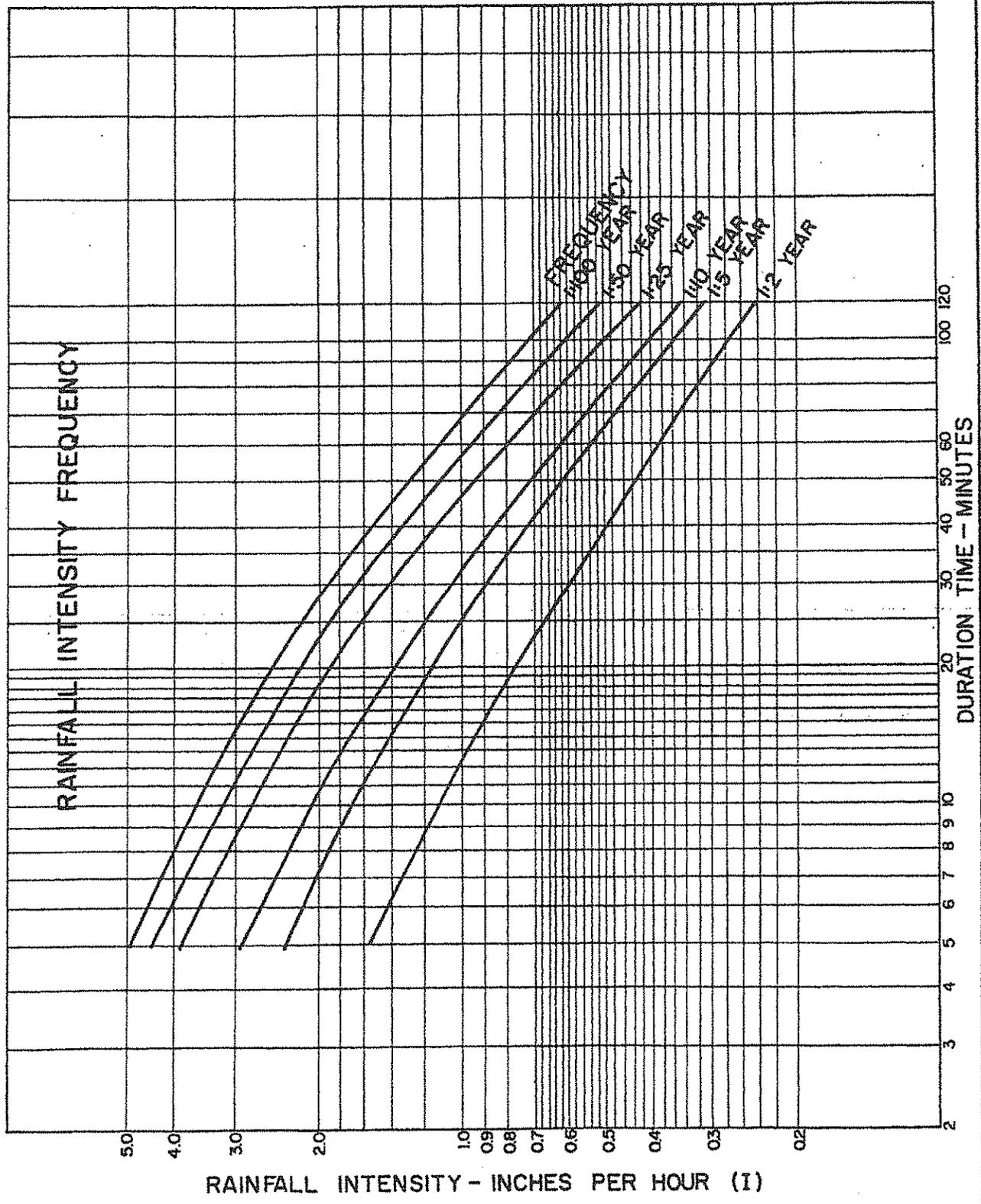
NOTE: USE C=0.85 FOR COMMERCIAL, INDUSTRIAL AND MULTIPLE RESIDENTIAL AREAS

DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

RUNOFF
COEFFICIENT

PLATE NO. B-1



DRAINAGE STANDARDS

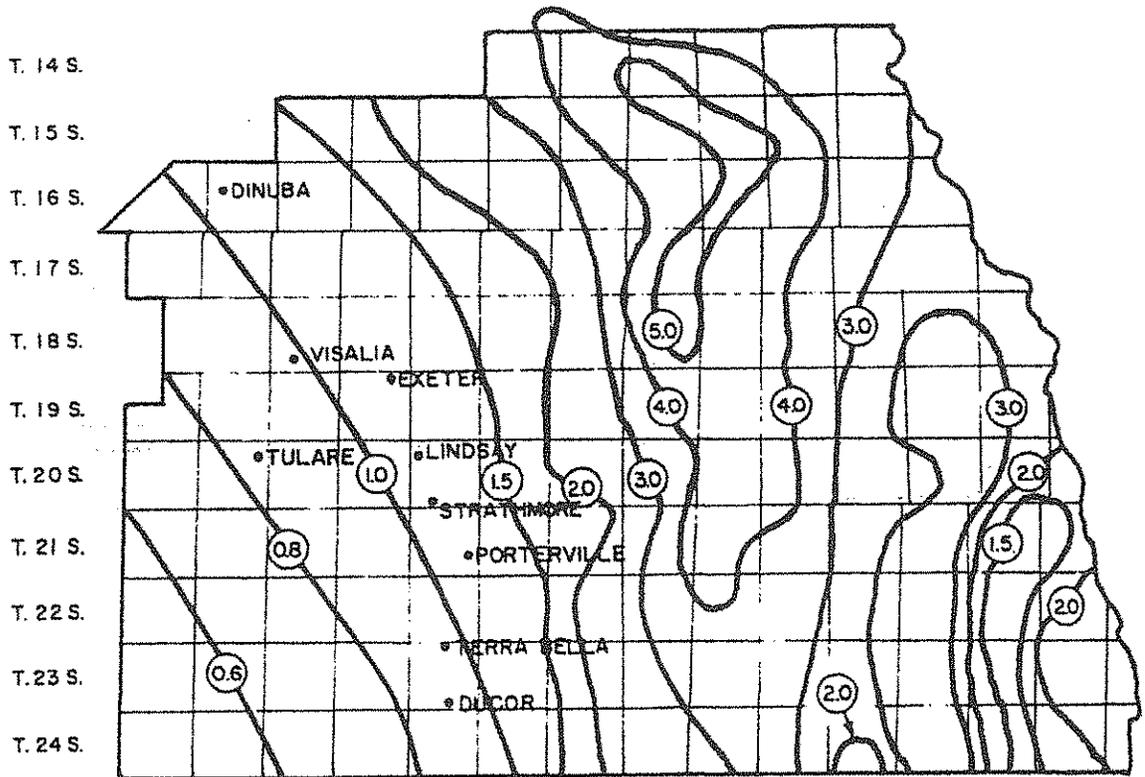
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

INTENSITY
DURATION CURVES

PLATE NO. B-2

TULARE COUNTY

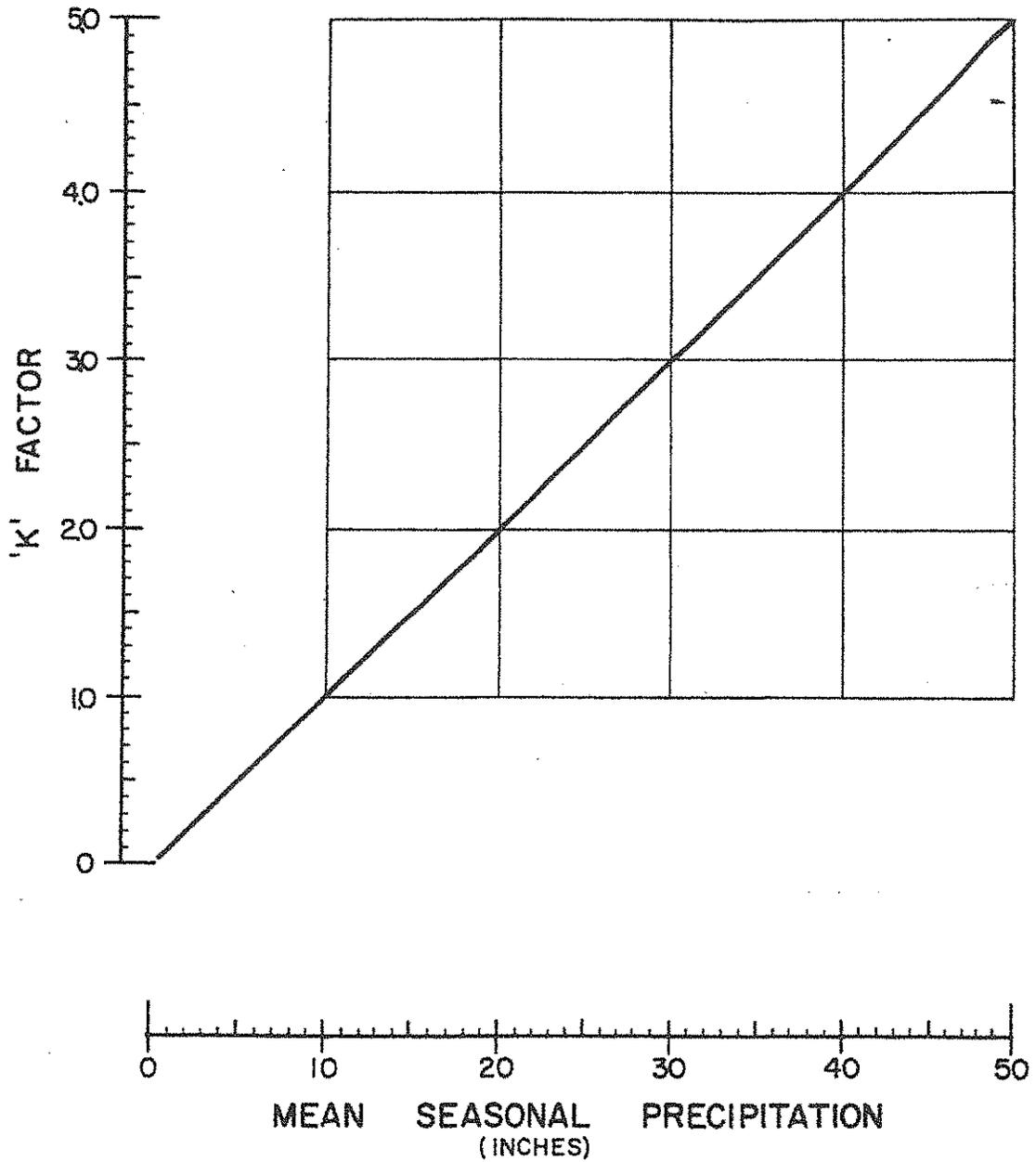
R. 23 E. R. 24 E. R. 25 E. R. 26 E. R. 27 E. R. 28 E. R. 29 E. R. 30 E. R. 31 E. R. 32 E. R. 33 E. R. 34 E. R. 35 E. R. 36 E. R. 37 E.



(1.0) INDICATES 'K' FACTOR TO BE USED WITH
THE MODIFIED RATIONAL FORMULA ($Q = KCIA$)

DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080
RATIONAL FORMULA
'K' FACTOR
PLATE NO. B-3



DRAINAGE STANDARDS

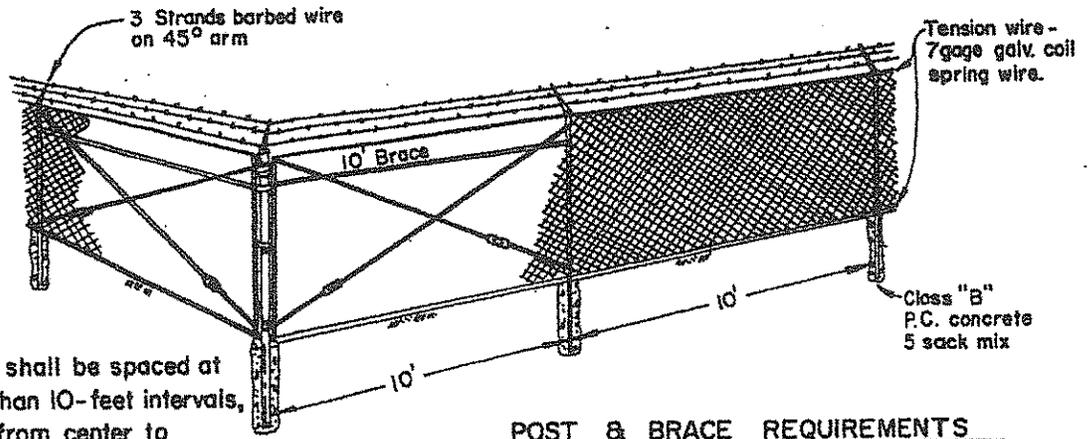
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

'K' FACTOR TO
PRECIPITATION

PLATE NO. B-4

Post taps, extension arms, stretcher bars and other required fittings and hardware shall be steel or malleable iron or wrought iron and shall be galvanized.

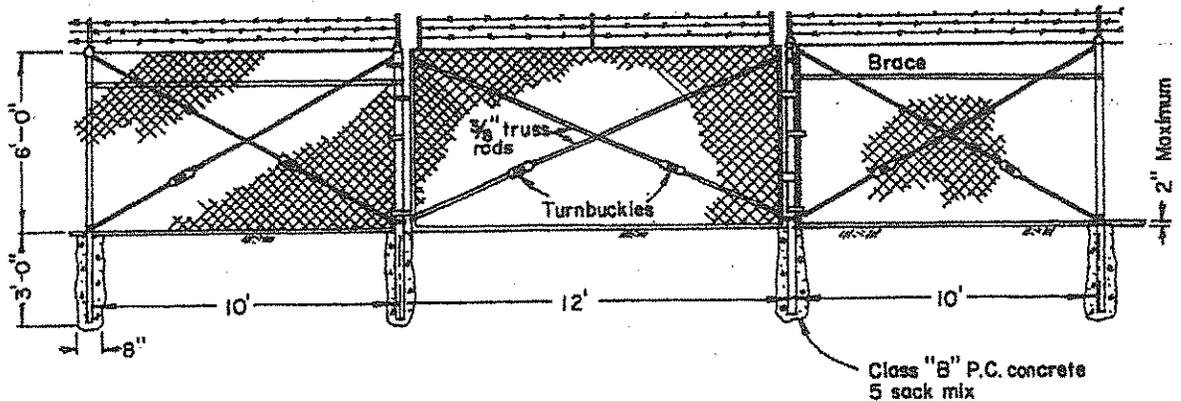
Wire used in the manufacture of the fabric shall be 11-gage for all fence 84" or less in height, and shall be woven into approximately 2-inch mesh.



Line posts shall be spaced at not more than 10-foot intervals, measured from center to center of posts.

End, corner, and gate posts shall be braced to the nearest line post with galvanized diagonal or horizontal braces used as compression members and galvanized $\frac{3}{8}$ " steel truss rods with turnbuckles used as tension members.

POST & BRACE REQUIREMENTS			
LOCATION	TYPE	MIN SIZE	MIN WT.(LB./FT.)
End and corner posts	Pipe	2.351 O.D.	3.10
Line posts	Pipe	1.869 O.D.	2.31
Braces	Pipe	1.630 O.D.	1.93
Gate posts	Pipe	3.960 O.D.	8.65



Gate frame shall be constructed of not less than $1\frac{1}{2}$ " galvanized pipe and shall be cross trussed with $\frac{3}{8}$ " adjustable truss rods. The corner of gate frames shall be fastened together with a malleable iron fitting.

The gate shall be hung by at least two (2) steel or malleable iron hinges not less than three inches (3") in width, and a malleable catch and locking attachment.

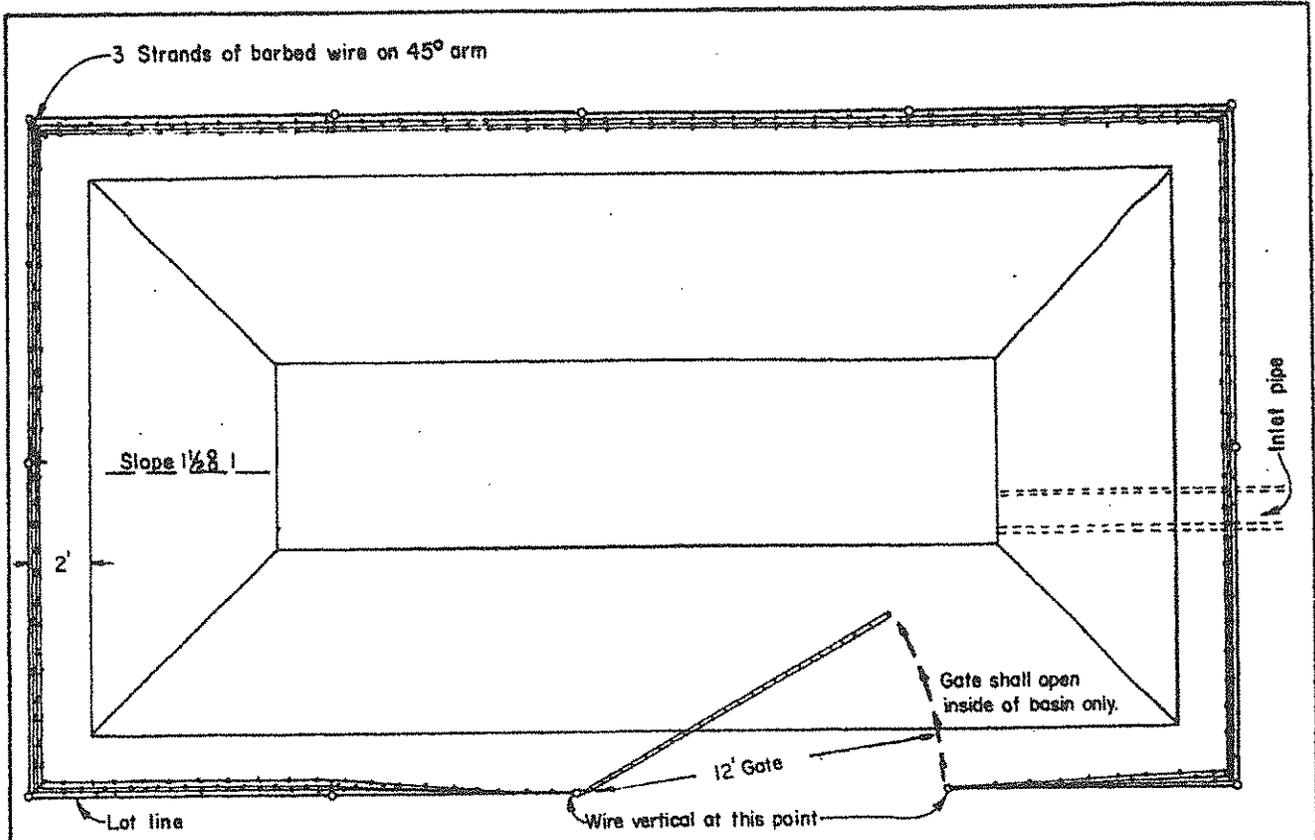
All posts shall be a minimum of 9' long.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

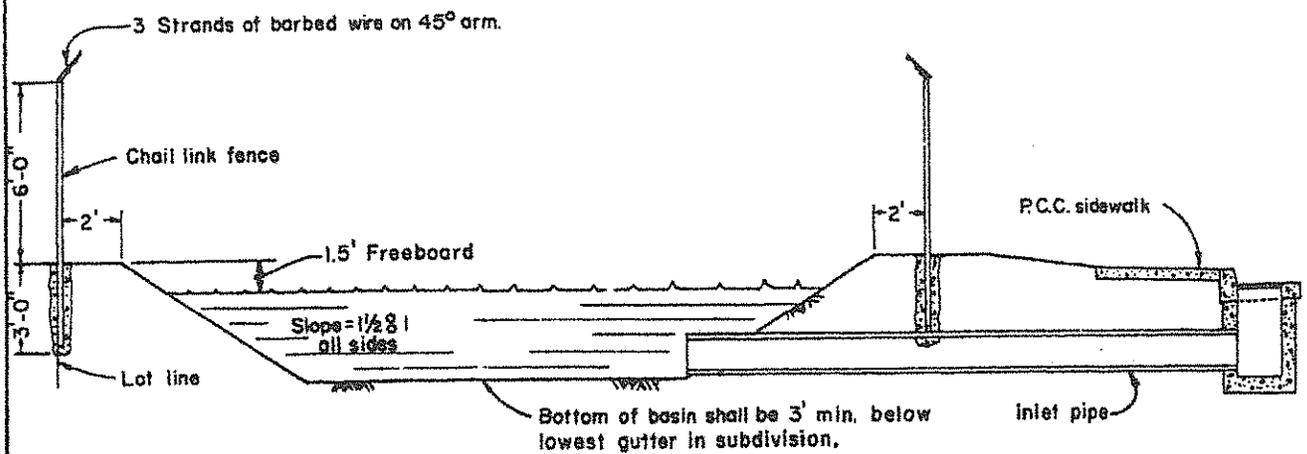
CHAIN LINK
FENCING

PLATE NO. B-5



GENERAL NOTES

- Fence to be placed on lot line.
- Maximum depth of water in ponding basin - 3'-0".
- Fence post to be placed in class "B" P.C. Concrete.
- Access gate 12'-0" minimum, open inside of basin only.
- Entire area of ponding lot to be treated with soil sterilant to one foot outside of fence or to back of concrete curb or sidewalk.
- The soil sterilant to be used and rate of application must be approved by the Public Works Director before being applied.
- Where ponding basin is on corner lot, fence shall follow curve of lot line.

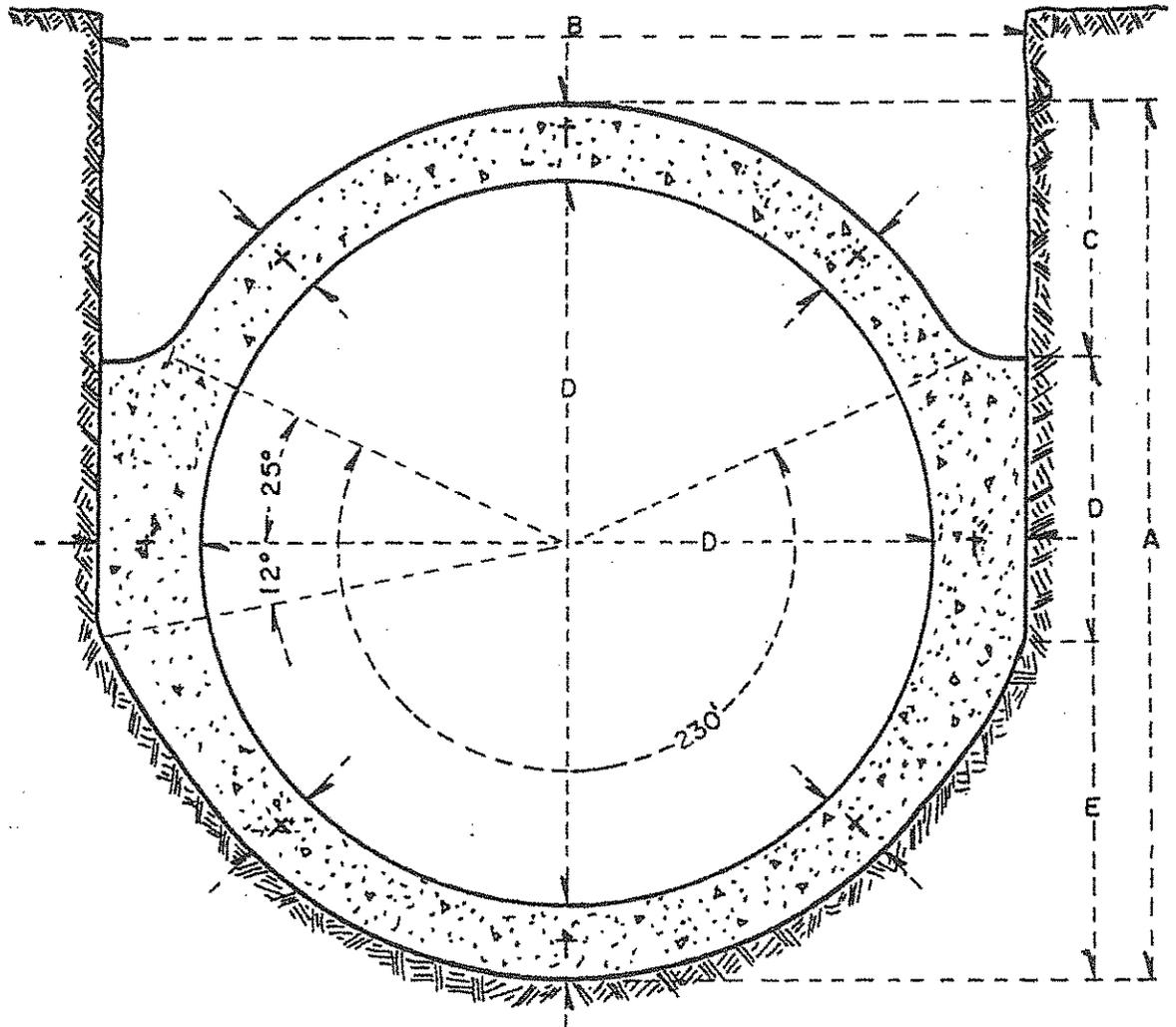


DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

PONDING
BASIN DETAILS

PLATE NO. B-6



D	t	t'	B	C	D	E	A
24	3	3 3/4	31 1/2	8 1/2	10	11 1/2	30
30	3	3 3/4	37 1/2	10	12	14	36
36	3 1/2	4 1/4	44 1/2	12 1/2	14	16 1/2	43
42	4	4 3/4	51 1/2	14 1/2	16	19 1/2	50
48	5	6 1/2	61	16 1/2	19	22 1/2	58
54	5 1/2	7 1/2	69	18 1/2	21	25 1/2	65
60	6	8	76	21	23	28	72
72	7	8 1/2	89	25	27 1/2	33 1/2	86

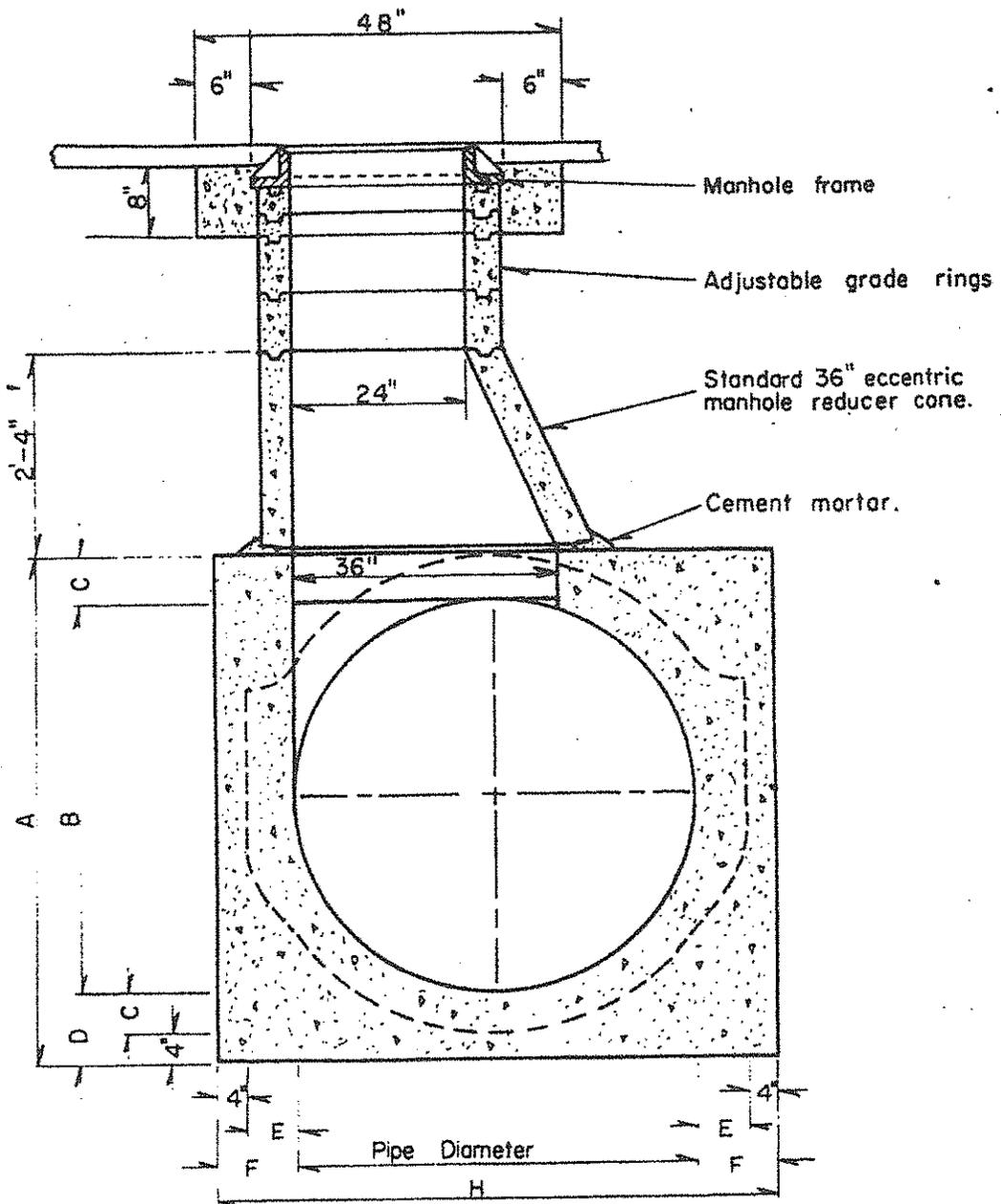
All dimensions in inches.

DRAINAGE

STANDARDS

TULARE COUNTY
 ORDINANCE CODE
 SECTION NO. 7080
 CAST-IN-PLACE
 CONCRETE PIPE
 SECTION

Plate No. B-7



*H equals width parallel to pipe flowline also.

Pipe Dia.	A	B	C	D	E	F	H*
36	49 1/2	36	3 1/2	7 1/2	4 1/2	8 1/2	53
42	56	42	4	8	5	9	60
48	63	48	5	9	6	10	68
54	69 1/2	54	5 1/2	9 1/2	6 1/2	10 1/2	75
60	76	60	6	10	7	11	82
66	83	66	6 1/2	10 1/2	7 1/2	11 1/2	89
72	90	72	7	11	8	12	96

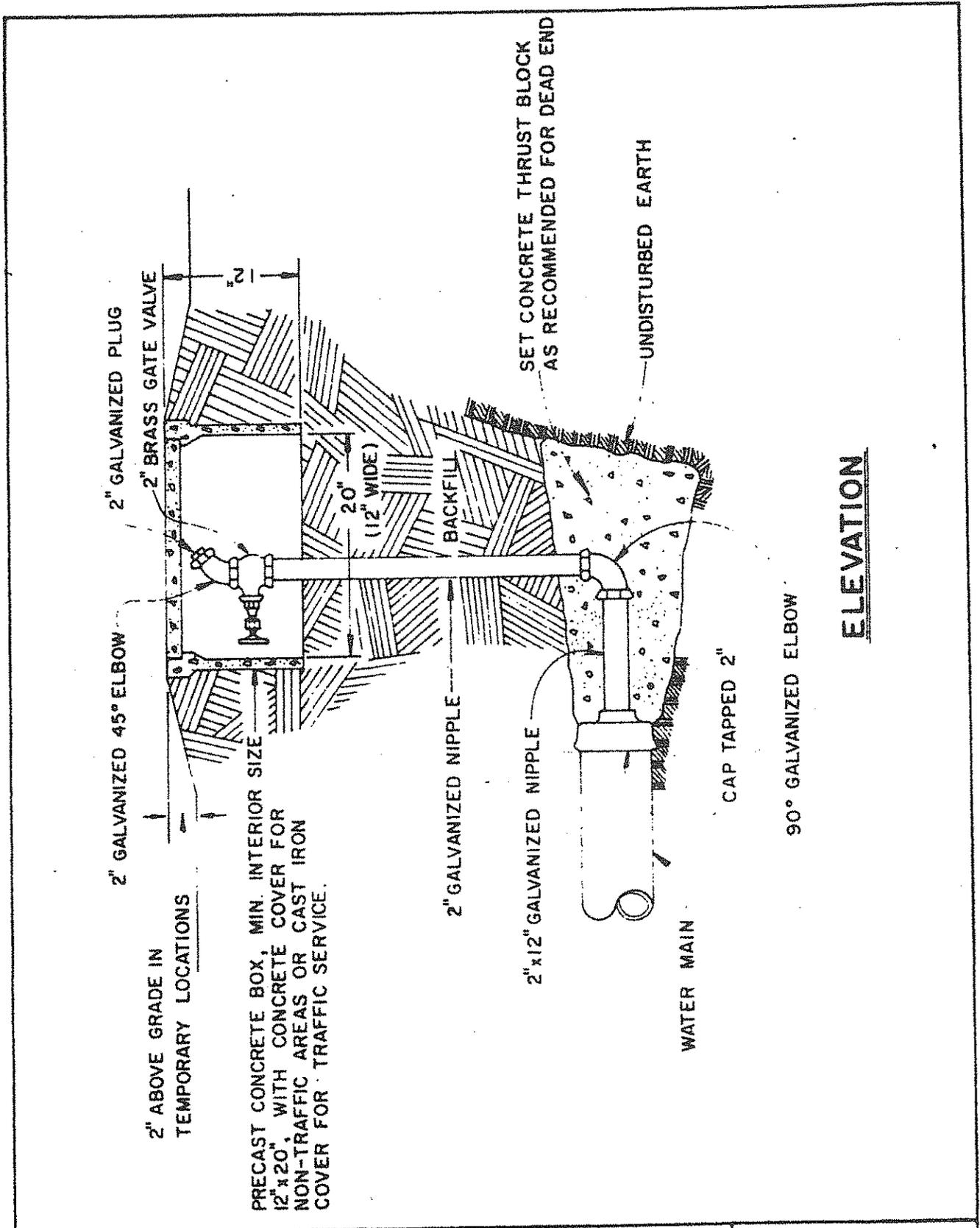
All dimensions in inches.

DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

CAST - IN - PLACE
MANHOLE

PLATE NO. B-8

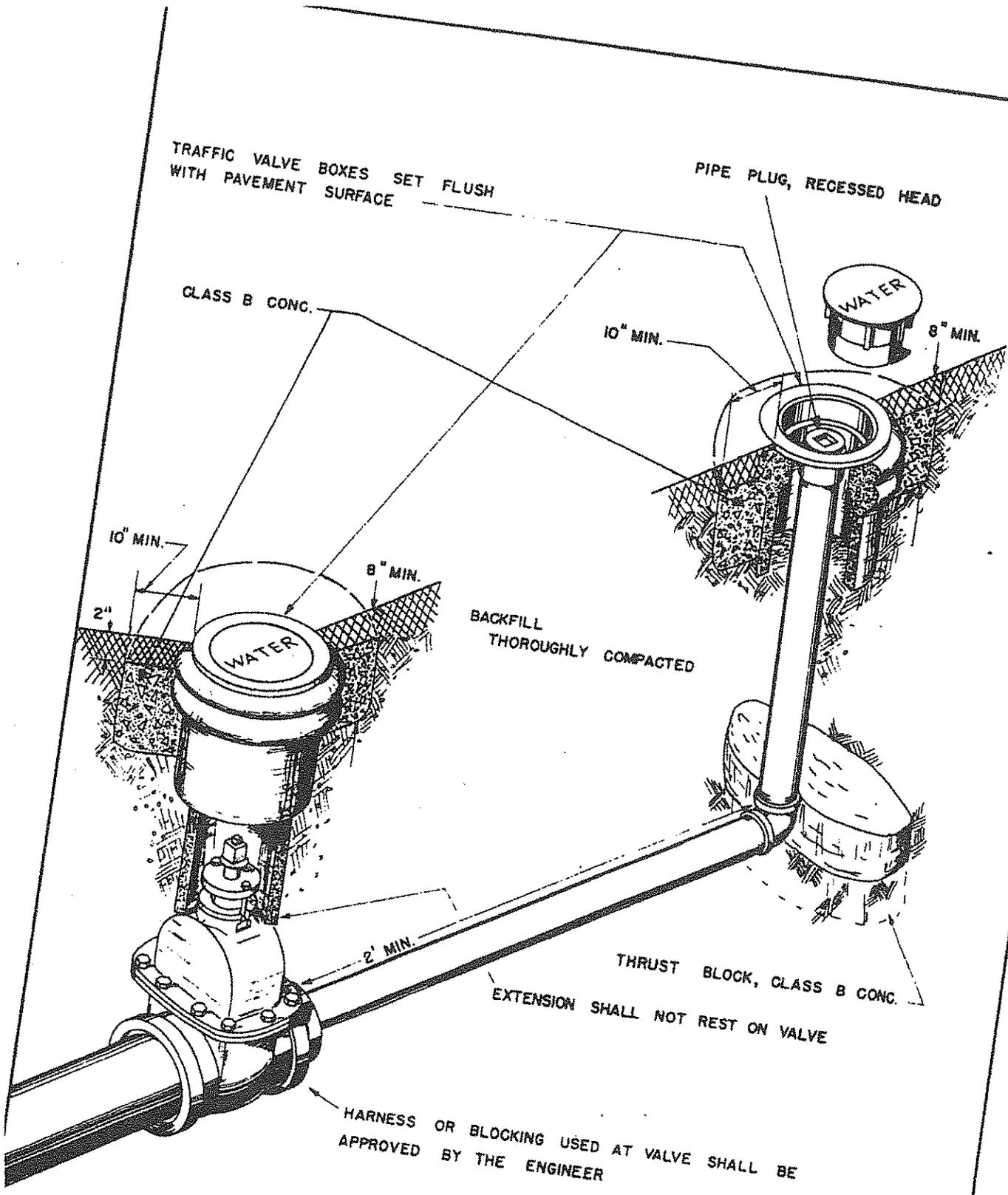


WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

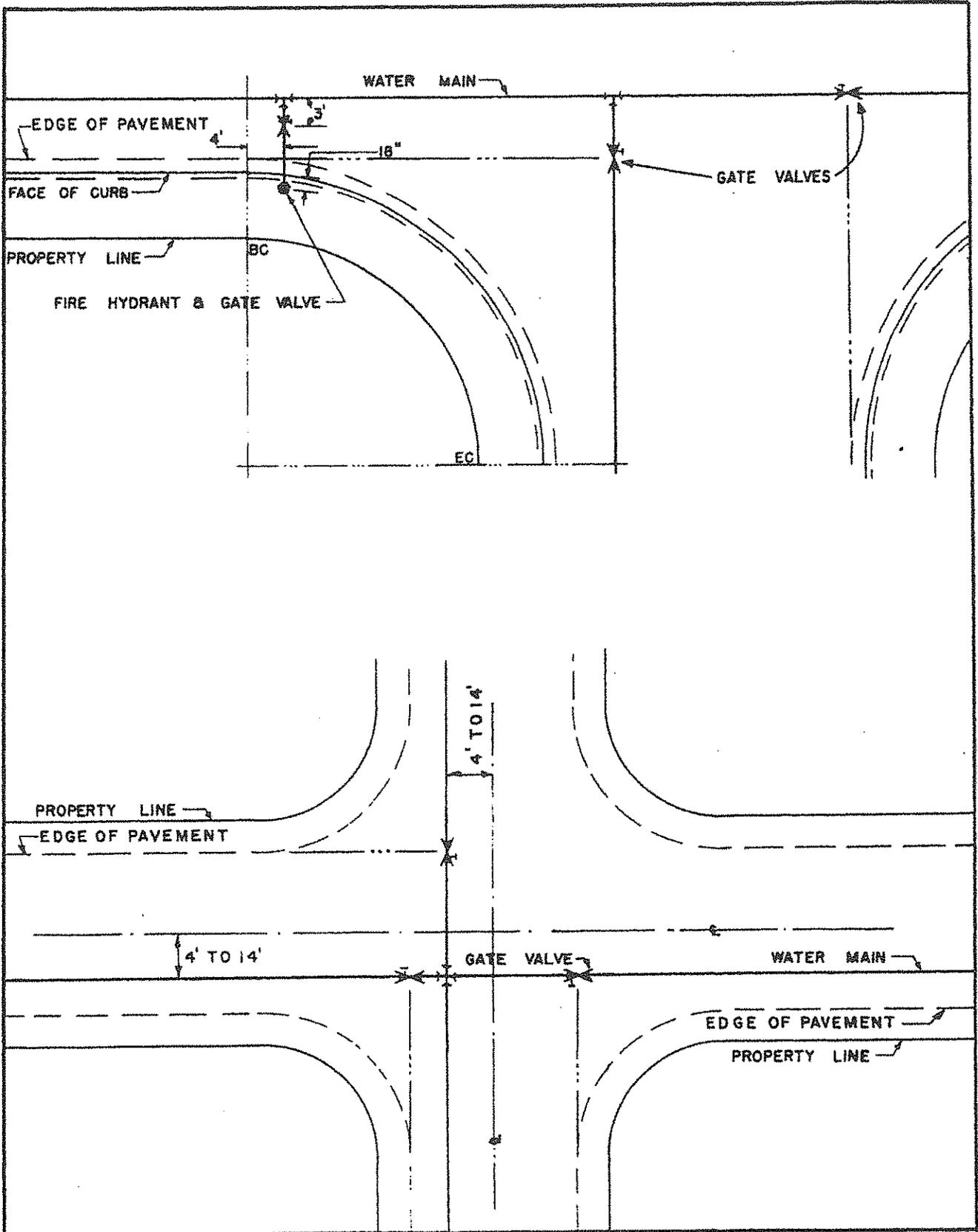
BLOW-OFF WITH
2" VALVE

PLATE No. WS-1



WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080
BLOW-OFF WITH
6" VALVE
PLATE ..

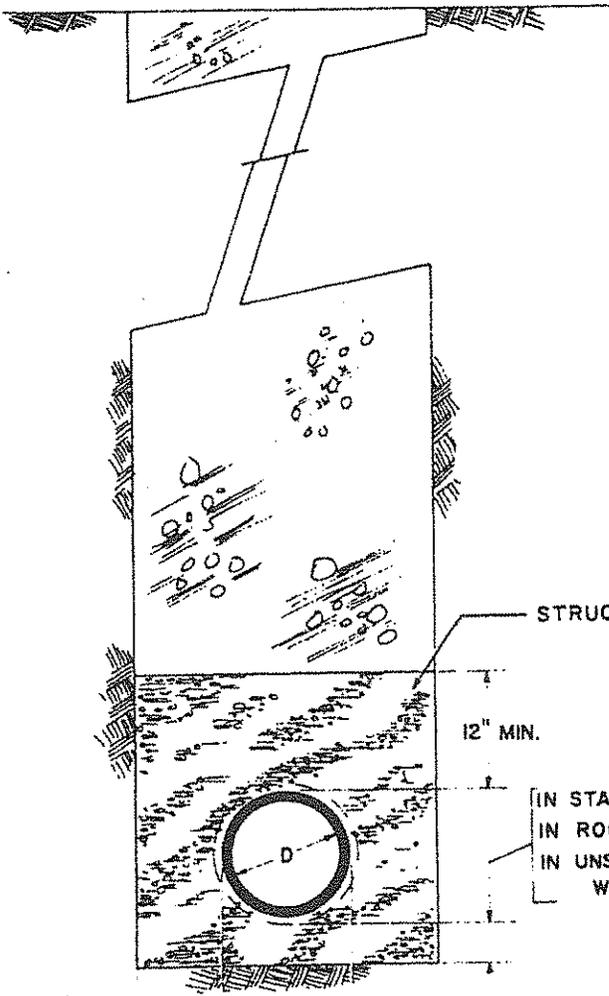


WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

LOCATION OF VALVES
& HYDRANTS AT
INTERSECTIONS

PLATE No. WS-3



STRUCTURE BACKFILL

12" MIN.

IN STABLE SOIL 3" MINIMUM
 IN ROCK, $\frac{D}{4}$ BUT NO LESS THAN 4"
 IN UNSTABLE SOIL, 12" OR TO STABLE SOIL,
 WHICHEVER IS LESS

← 6" → MIN. ← 6" →

STRUCTURE BACKFILL	
SIEVE SIZE	PERCENT PASSING
3"	100
No. 4	35 - 100

ANY OVEREXCAVATION SHALL BE BACKFILLED WITH APPROVED BEDDING MATERIAL

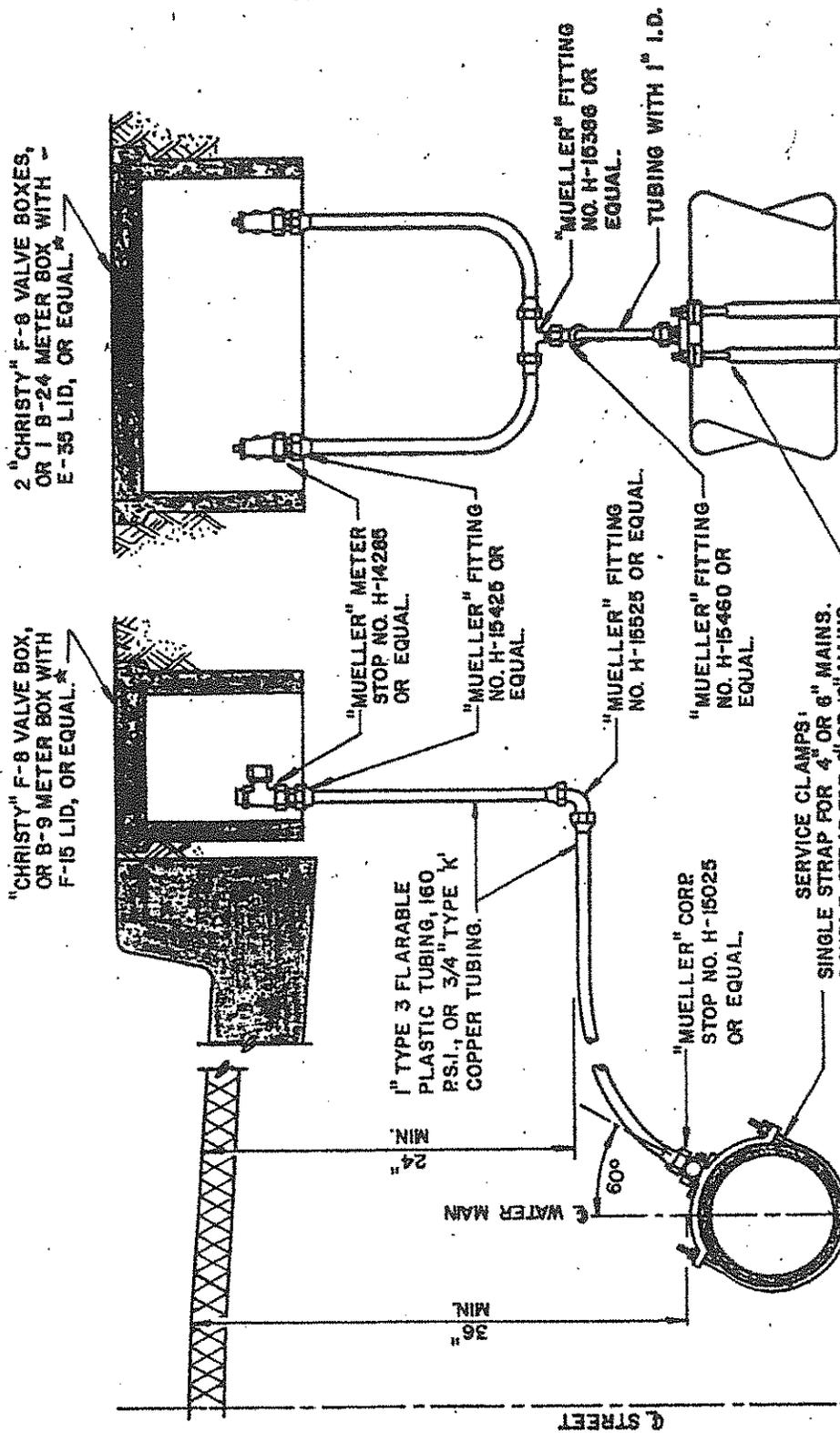
WATER SYSTEM STANDARDS

TULARE COUNTY
 ORDINANCE CODE
 SECTION No. 7080

PIPE BEDDING

PLATE No. WS-4

**TYPICAL WATER SERVICE INSTALLATION
FOR SINGLE SERVICE FOR DOUBLE SERVICE**



* NOTE: METER BOX OR CURB VALVE BOX IS TO BE LOCATED ADJACENT TO CURB WHERE CURBS ARE INSTALLED AND ADJACENT TO THE PROPERTY LINE WHERE NO CURBS ARE INSTALLED. SPLIT SERVICES ARE TO BE CENTERED ON THE PROJECTED LOT LINE.

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

DOMESTIC
WATER
SERVICES

PLATE NO. WS-5

REQUIRED BEARING AREA - TOTAL SQUARE FEET

TYPE OF FITTING	90° BEND	45° BEND	11 1/4° OR 22 1/2° BEND	TEE OR DEAD END	TEE w/PLUG	CROSS w/PLUG
TYPICAL INSTALLATION						
4" PIPE	2	1	1	2	2	2
6" PIPE	4	2	1	3	4	4
8" PIPE	7	4	2	5	7	7
10" PIPE	12	6	3	8	12	12
12" PIPE	16	10	5	12	16	16

- NOTES: (1) THRUST BLOCKS TO BE CONSTRUCTED OF CLASS "B" CONCRETE
 (2) AREAS GIVEN ARE FOR CLASS 150 PIPE AT PRESSURE OF 150 P.S.I. IN SOIL WITH 2000 P.S.F. BEARING CAPACITY. INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES, AND/OR SOIL TYPES SHOULD ADJUST AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF ENGINEER.
 (3) BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
 (4) JOINTS AND FACE OF PLUG TO BE KEPT CLEAR OF CONCRETE.
 (5) MINIMUM THICKNESS OF THRUST BLOCKS TO BE 6 INCHES.

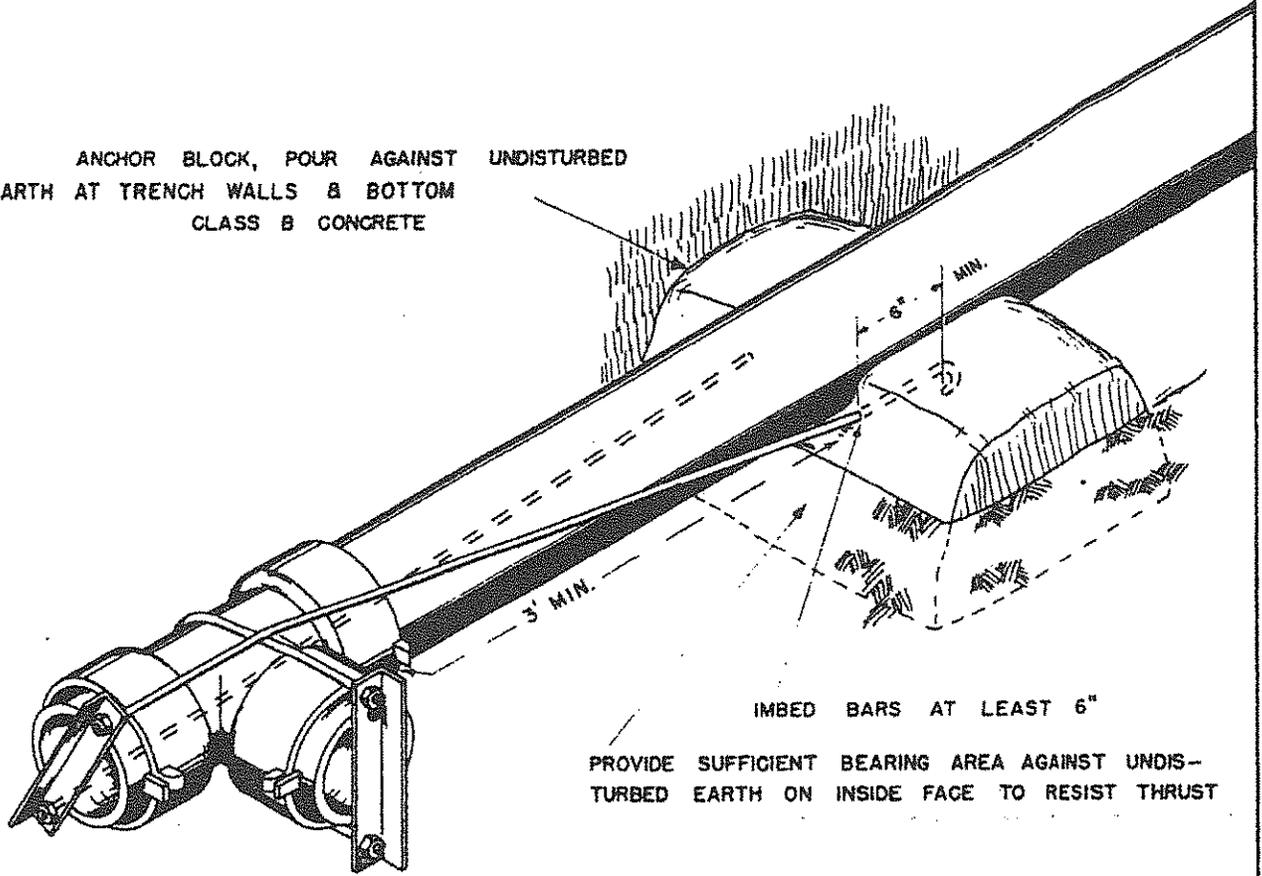
WATER SYSTEM STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

THRUST BLOCK BEARING AREA REQUIREMENTS

PLATE NO. WS - 6

ANCHOR BLOCK, POUR AGAINST UNDISTURBED
EARTH AT TRENCH WALLS & BOTTOM
CLASS B CONCRETE



IMBED BARS AT LEAST 6"

PROVIDE SUFFICIENT BEARING AREA AGAINST UNDIS-
TURBED EARTH ON INSIDE FACE TO RESIST THRUST

HARNESS & ANCHOR BLOCK SHALL BE DESIGNED TO
WITHSTAND THRUSTS DEVELOPED BY THE TEST
PRESSURE

BARE STEEL TO BE ASPHALT COATED

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

PIPE HARNESS

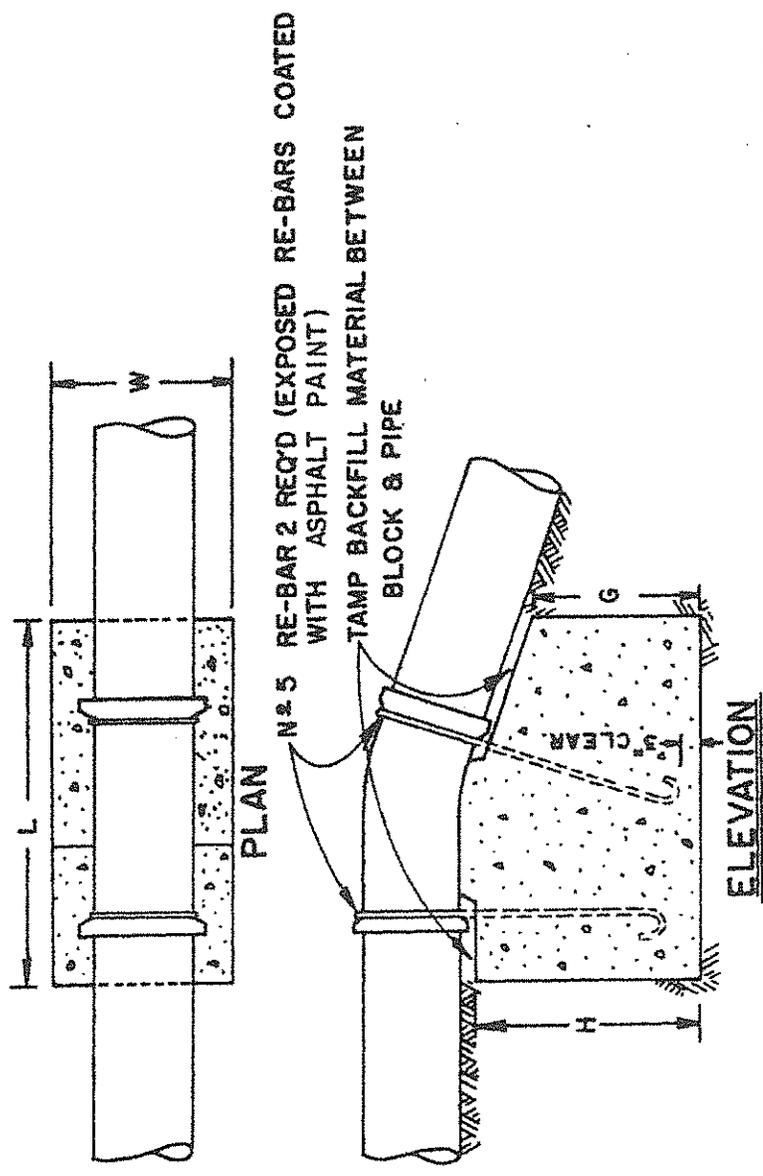
PLATE No. WS-7

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

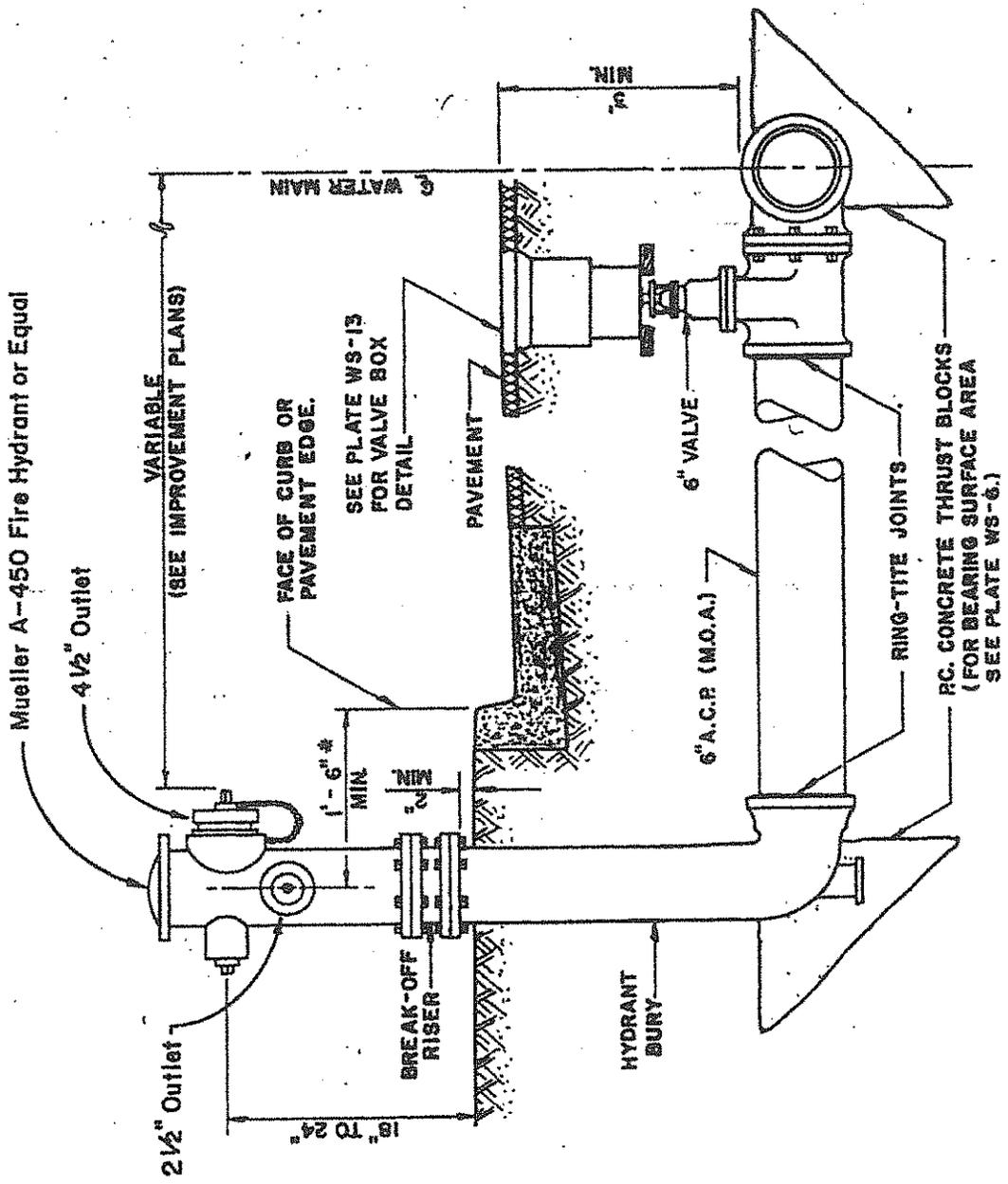
THRUST BLOCKING
AT VERTICAL BENDS

PLATE No. WS-8



THRUST BLOCK DIMENSIONS - UPWARD THRUST

PIPE SIZE	1 1/4" BEND			2 1/2" BEND			45° BEND			
	L	W	H	L	W	H	L	W	H	
4" 86"	2'-0"	2'-0"	1'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
8"	2'-0"	2'-0"	1'-0"	3'-0"	2'-0"	2'-0"	3'-0"	2'-0"	2'-0"	3'-0"
10"	3'-0"	2'-0"	2'-0"	4'-0"	2'-0"	2'-0"	6'-0"	2'-0"	2'-0"	3'-8"
12"	3'-0"	2'-0"	2'-0"	6'-0"	2'-0"	2'-0"	7'-0"	2'-6"	2'-6"	4'-0"



WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

FIRE HYDRANT
INSTALLATION
(WET BARREL)

PLATE NO. WS-9

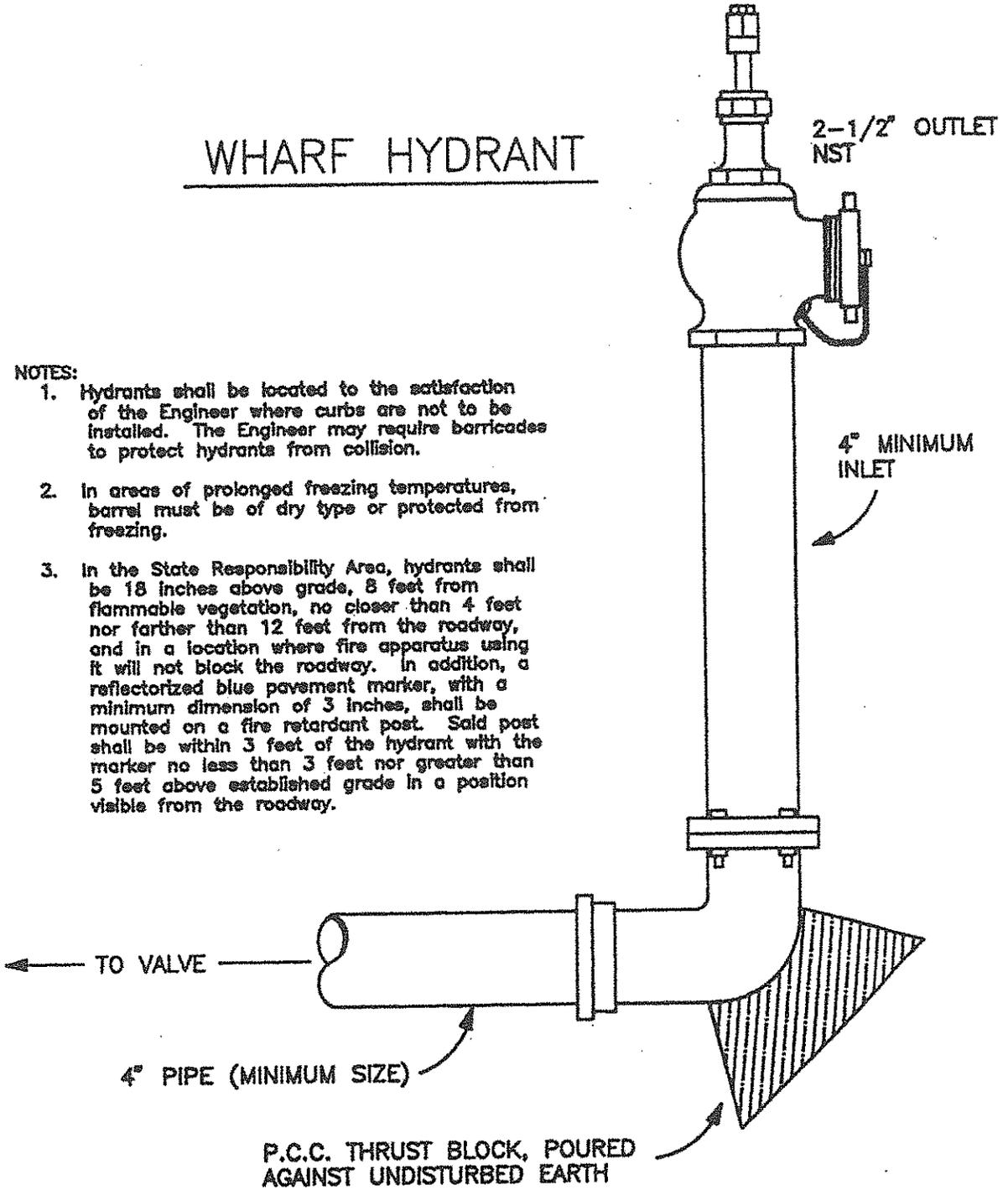
* When sidewalk is constructed, or if within Urban Improvement Area, distance shall be 5'-0" min.

GREENBERG TYPE
No. 123 OR EQUAL

WHARF HYDRANT

NOTES:

1. Hydrants shall be located to the satisfaction of the Engineer where curbs are not to be installed. The Engineer may require barricades to protect hydrants from collision.
2. In areas of prolonged freezing temperatures, barrel must be of dry type or protected from freezing.
3. In the State Responsibility Area, hydrants shall be 18 inches above grade, 8 feet from flammable vegetation, no closer than 4 feet nor farther than 12 feet from the roadway, and in a location where fire apparatus using it will not block the roadway. In addition, a reflectorized blue pavement marker, with a minimum dimension of 3 inches, shall be mounted on a fire retardant post. Said post shall be within 3 feet of the hydrant with the marker no less than 3 feet nor greater than 5 feet above established grade in a position visible from the roadway.

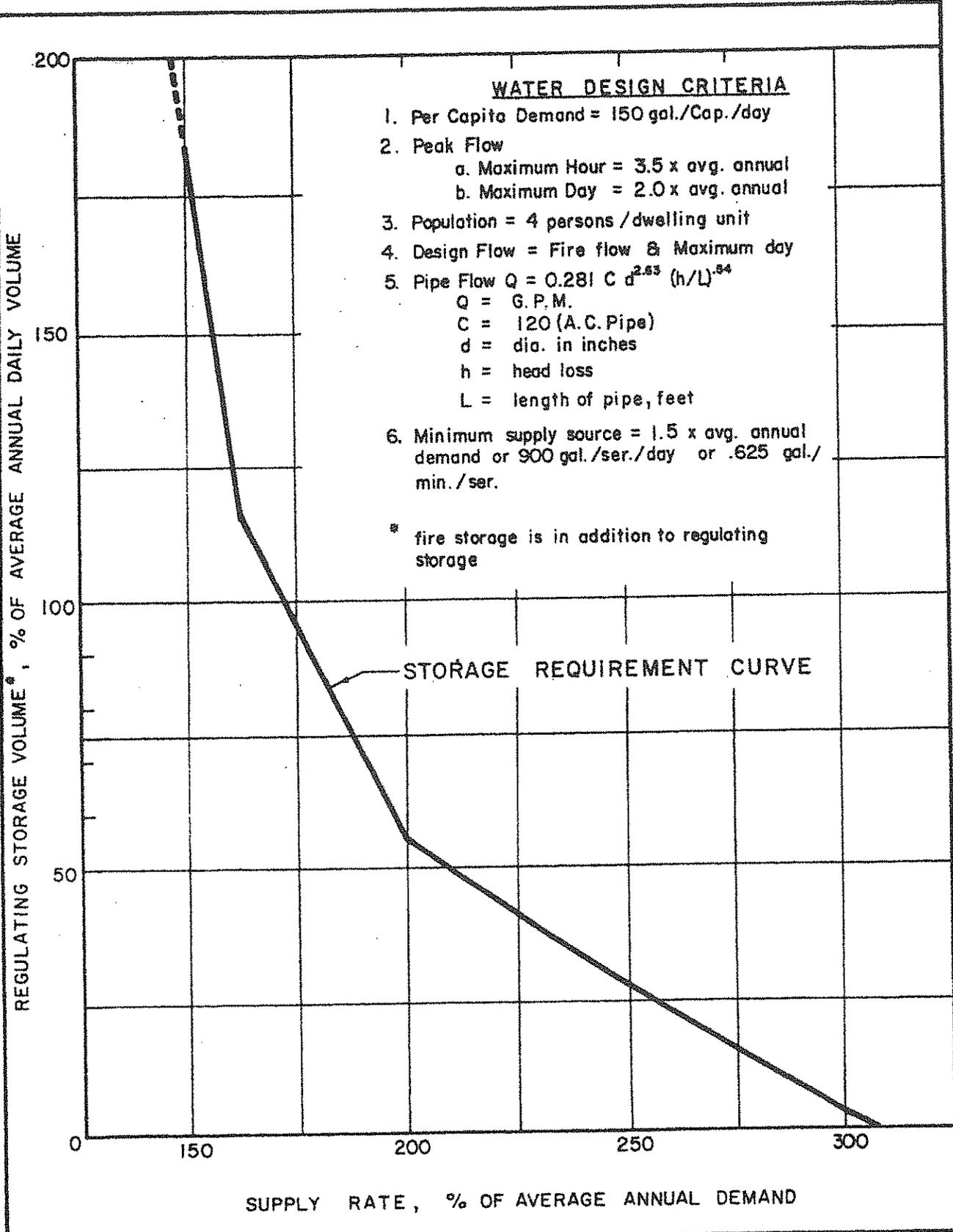


WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

FIRE HYDRANT
INSTALLATION
MOUNTAINOUS AREAS

PLATE NO. WS-10

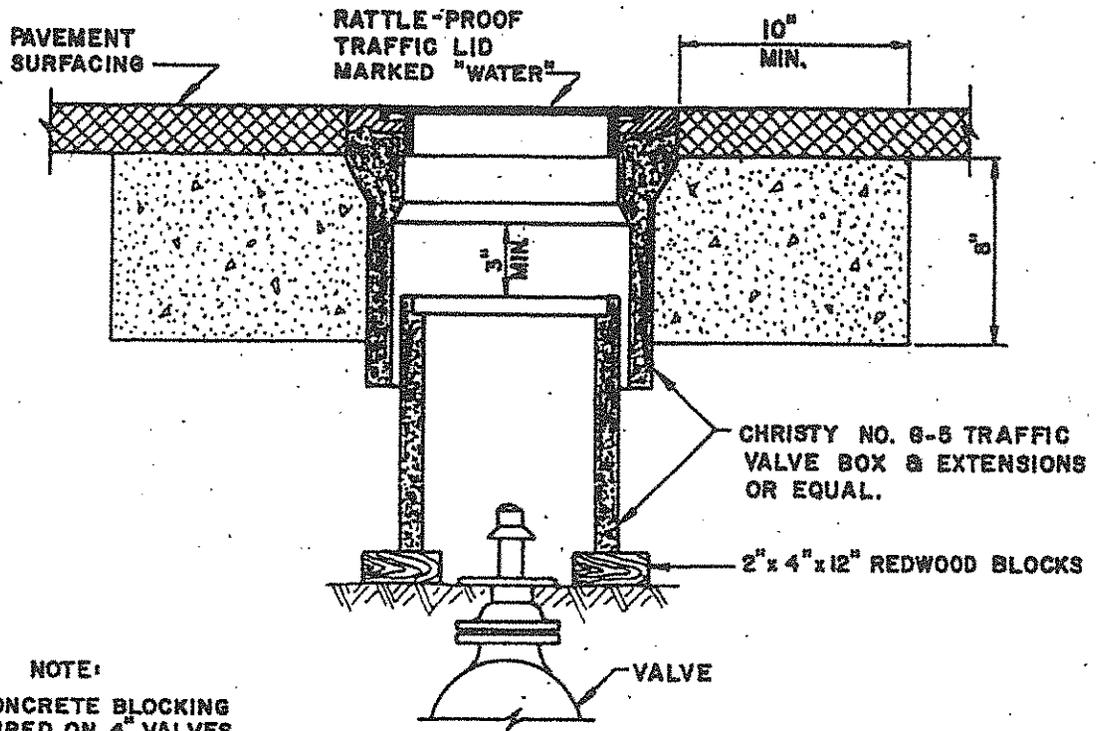


PUBLIC WATER SYSTEMS

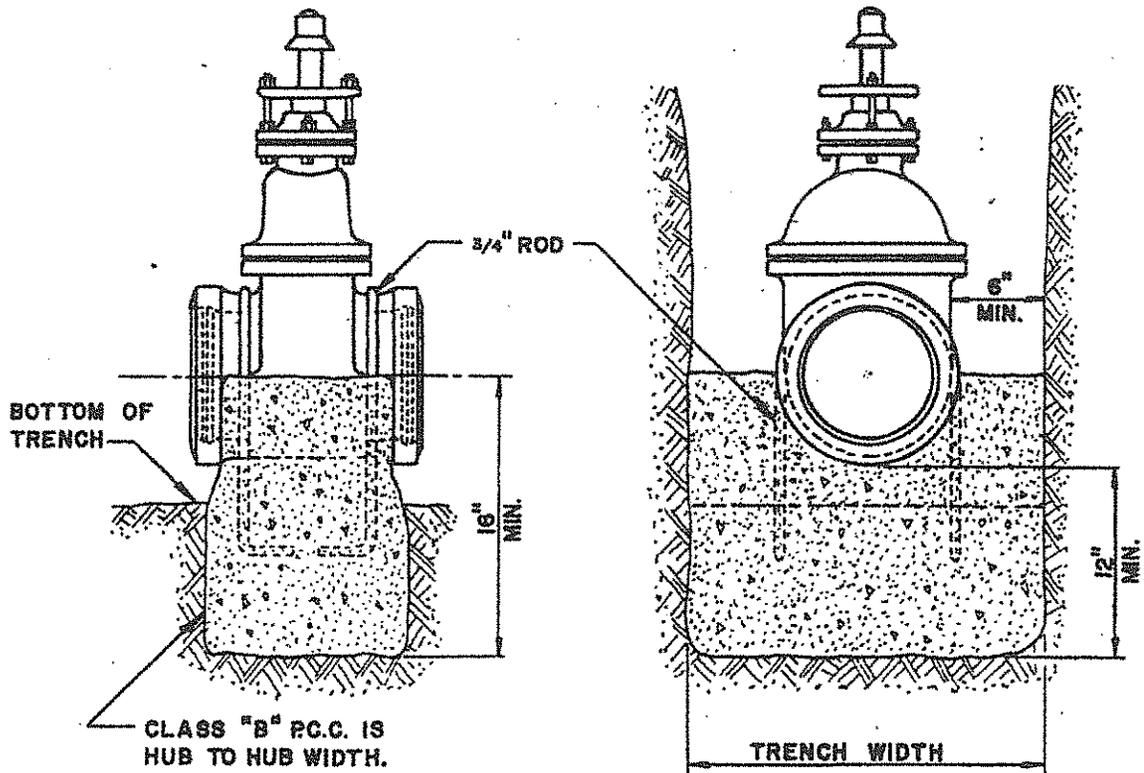
TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

FLOW DESIGN
AND STORAGE
REQUIREMENTS

PLATE No. WS-11



NOTE:
 NO CONCRETE BLOCKING
 REQUIRED ON 4" VALVES
 OR 6" FIRE HYDRANT
 VALVES.

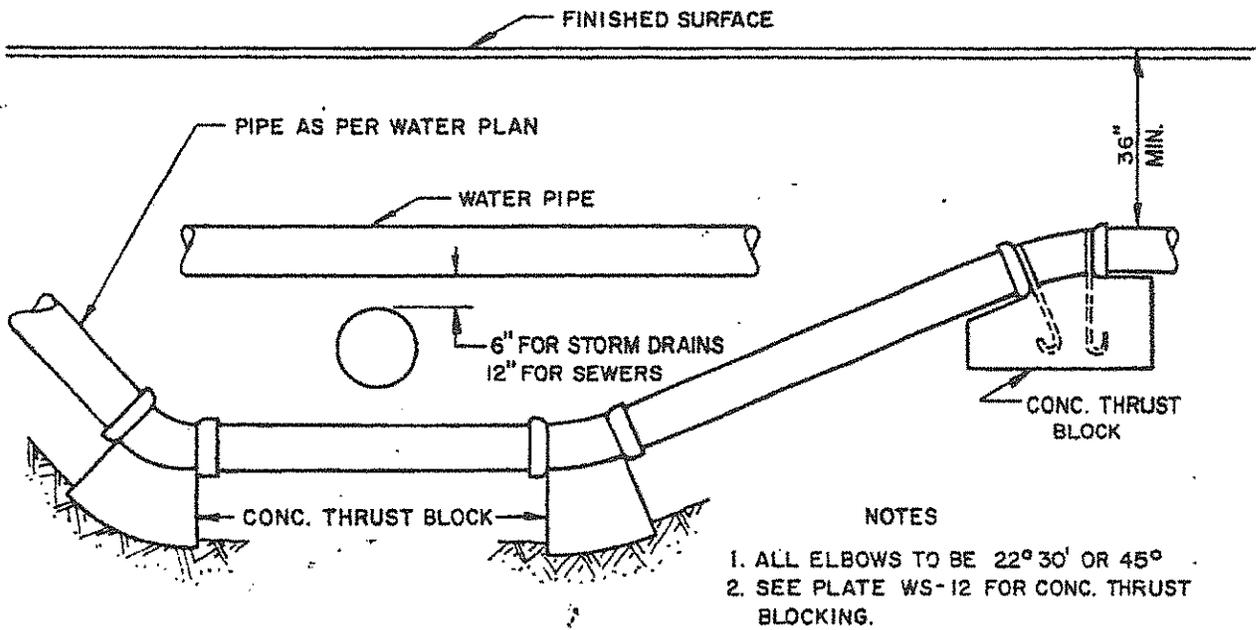


WATER SYSTEM STANDARDS

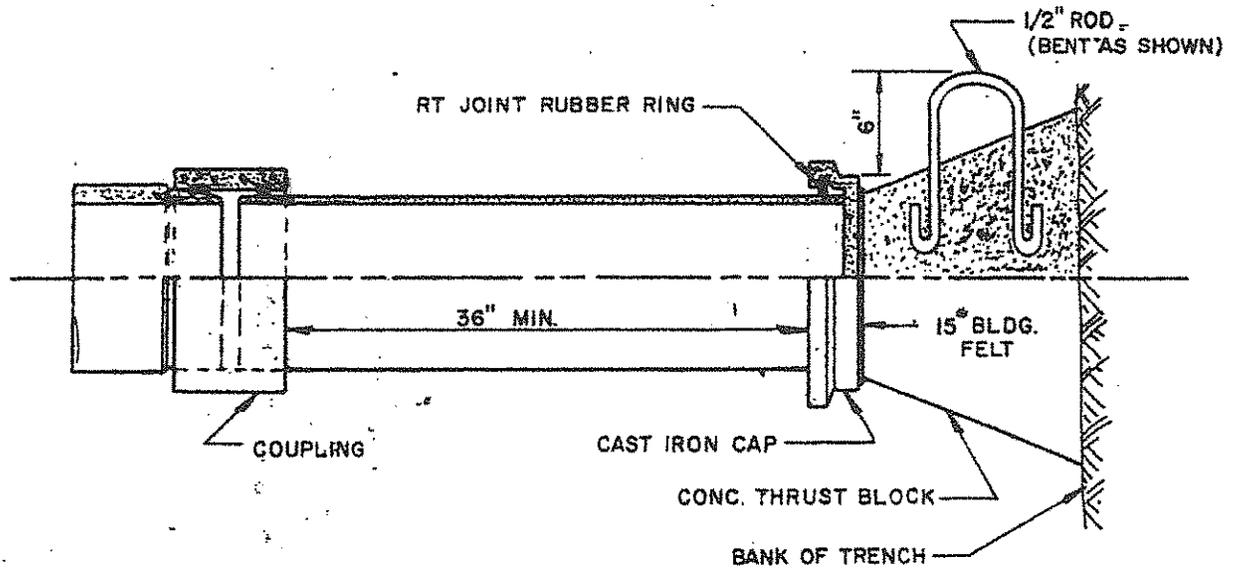
TULARE COUNTY
 ORDINANCE CODE
 SECTION NO. 7080

GATE VALVE
 BLOCKING
 & COVERS

PLATE NO. WS - 13



UNDER & OVER CROSSING-DETAIL



BULL PLUG ASSEMBLY DETAIL

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

UTILITY CROSSINGS
AND
BULL PLUG ASSEMBLY

PLATE NO. WS - 14

6. Three Rivers CSD LAFCo Inventory Overview.

DISTRICT: Three Rivers Community Services District

ADDRESS: PO Box 423, 40915 Sierra Dr, Three Rivers CA 93271

PHONE: (559) 561-3480 **FAX:** (559) 561-3480

CONTACT: Randy Pares, General Manager

E-MAIL: info@3riverscsd.com **WEB:** <http://www.3riverscsd.com/>

FUNCTIONS PERFORMED: Preparation of project report for sewage system, trash pick-up, oversight of existing individual septic systems, provision of domestic water within Improvement District No. 1

METHOD OF FINANCING: Ad valorem taxes

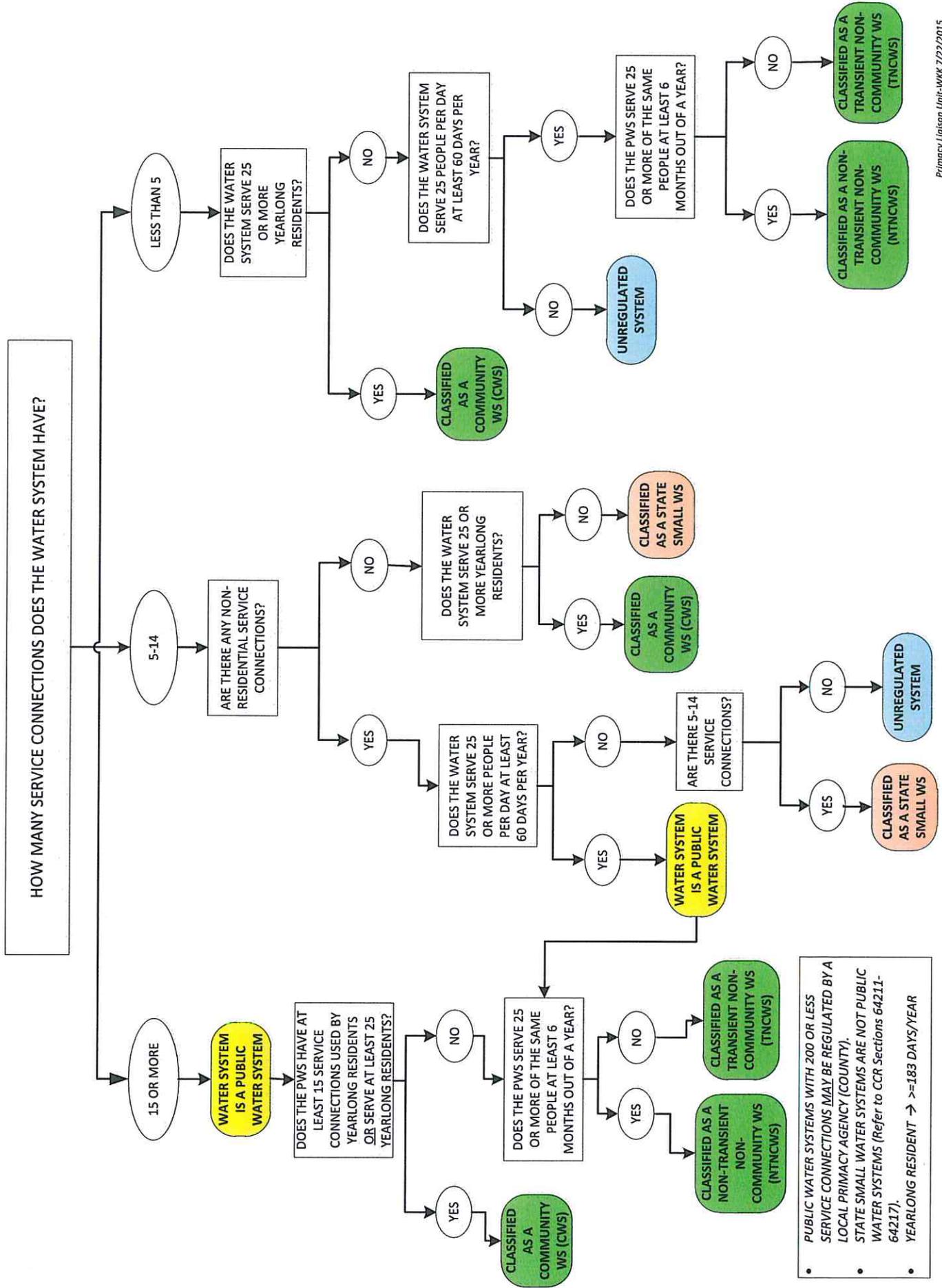
BOARD OF DIRECTORS	TERM OF OFFICE
Michael L. Cannarozzi	12/2/05 – 12/4/09
Rex H. Black	12/2/05 – 12/4/09
Dennis Mills	12/5/03 – 12/7/07
Tom Sparks	12/5/03 – 12/7/07
Vincent D. Andrus	12/5/03 – 12/7/07

MEETING TIME:
1 st Wednesday of the month @7PM
MEETING LOCATION:
District office

PRINCIPAL COUNTY	TULARE	POPULATION:	2,248 (Census ... 4/1/00)
DISTRICT AREA	5,397AC (8.4MI ²)	SOI AREA	NO SOI
FORMED	October 1973	LAFCO RESO.	73-036, Case 459
LAST SOI AMEND.	n/a	LAFCO RESO.	n/a

7. State Department of Water Resources
Classification of Water Systems.

DECISION TREE FOR CLASSIFICATION OF WATER SYSTEMS



- PUBLIC WATER SYSTEMS WITH 200 OR LESS SERVICE CONNECTIONS MAY BE REGULATED BY A LOCAL PRIMARY AGENCY (COUNTY).
- STATE SMALL WATER SYSTEMS ARE NOT PUBLIC WATER SYSTEMS (Refer to CCR Sections 64211-64217).
- YEARLONG RESIDENT → ≥183 DAYS/YEAR

3. Discussion of Special Topics.

(b) Noise.

1. Draft Three Rivers Community Plan Update Policies Noise.
2. General Plan Policies: Noise.
3. General Plan Table 10.1 Land Use Compatibility for Community Noise Environments.

1. Draft Three Rivers Community Plan Update
Policies Noise.

2015 DRAFT
THREE RIVERS COMMUNITY PLAN UPDATE
NOISE POLICIES

4-13-15

1.1.3 Limit commercial or recreational uses that generate negative impacts, such as noise, lighting, traffic, odors and emissions in residential and rural residential neighborhoods.

(a) The height, size, mass, scale, and design of new development shall be consistent in size, and compatible with the character of the surrounding natural or built environment. Structures shall be designed to follow natural contours of the landscape and clustered in the most accessible, least visually prominent and most geologically stable portion or portions of a site. Structures will be sited so as not to obstruct significant views.

(b) Implement a development height standard, based on the existing building code, with maximum building height not to exceed 35' as identified in the FGMP page 41).

The following general provisions are recommended:

- (a). Distance: to be determined based on the following factors:
- (b). Stabilization of edge condition,
- (c). Types of operation,
- (d). Types of land uses (i.e. schools, etc.)
- (e). Building orientation,
- (f). Planting of trees for screening,
- (g). Location of existing and future rights-of-way,
- (h). Types of uses allowed inside the project area,
- (i). Unique site conditions,
- (j). Responsibility for maintenance,
- (k). Scale of development.

1.1.4 Encourage compatible commercial establishments necessary to serve residents and tourists that are commensurate with the scale and intensity of the

community, preserve the environment, and which do not have to the extent feasible, significant traffic, light, noise or visual impacts to the community.

1.1.6 Protect land uses adjacent to State Highway 198 from noise impacts by requiring adequate landscape screening and buffering.

1.1.9 LU-1.3 Prevent Incompatible Uses

The County shall discourage the intrusion into existing residential and rural residential areas of new incompatible land uses that produce significant noise, odors, or fumes.

1.2.2 Encourage visitor serving uses which are low intensity, and which do not have negative traffic, noise or visual impacts to the community.

1.3.3 Apply the noise standards found in the Tulare County Health and Safety Element (Part 1 Section 10.8). Utilize recommendations included in the community plan EIR to address and develop feasible noise standards to the extent feasible reflective of a foothill canyon environment.

198 protects scenic resources and provides access to vistas of working and natural landscapes by:

- a. Limiting the construction of sound walls that block views of the County's landscapes (incorporate setbacks to sensitive land uses to avoid noise impacts whenever feasible),
- b. Using regionally-appropriate trees and landscaping and incorporating existing landmark trees,
- c. Preserving historic and cultural places and vistas,
- d. Avoiding excessive cut and fill for roadways along State scenic highways and County scenic routes, and along areas exposed to a large viewing area, and
- e. Promote highway safety by identifying appropriate areas for traffic pull-outs and rest areas.

1.4.8 HS-8.8 Adjacent Uses

The County shall not permit development of new industrial, commercial, or other noise-generating land uses if resulting noise levels will exceed 60 dB Ldn (or CNEL) at the boundary of areas designated and zoned for residential or other noise-sensitive uses, unless it is determined to be necessary to promote the public health, safety and welfare of the County.

4.1.1 Maintain a serene and attractive natural environment by prohibiting land use activities that create excessive and unwanted noise and/or light in the community.

2. General Plan Policies: Noise.

COMMUNITY NOISE

TULARE COUNTY GENERAL PLAN 2030 UPDATE POLICIES

LAND USE ELEMENT

LU-1.3 Prevent Incompatible Uses

The County shall discourage the intrusion into existing urban areas of new incompatible land uses that produce significant noise, odors, or fumes.

LU-3.6 Project Design

The County shall require residential project design to consider natural features, noise exposure of residents, visibility of structures, circulation, access, and the relationship of the project to surrounding uses. Residential densities and lot patterns will be determined by these and other factors. As a result, the maximum density specified by General Plan designations or zoning for a given parcel of land may not be attained.

SCENIC LANDSCAPES ELEMENT

SL-4.1 Design of Highways

The County shall work with Caltrans and Tulare County Association of Governments (TCAG) to ensure that the design of State Highway 99 and other State Highways protects scenic resources and provides access to vistas of working and natural landscapes by:

1. Limiting the construction of sound walls that block views of the County's landscapes (incorporate setbacks to sensitive land uses to avoid noise impacts whenever feasible),
2. Using regionally-appropriate trees and landscaping and incorporating existing landmark trees,
3. Preserving historic and cultural places and vistas,
4. Avoiding excessive cut and fill for roadways along State scenic highways and County scenic routes, and along areas exposed to a large viewing area, and
5. Promote highway safety by identifying appropriate areas for traffic pull-outs and rest areas.

HEALTH AND SAFETY ELEMENT

HS-8.1 Economic Base Protection

The County shall protect its economic base by preventing the encroachment of incompatible land uses on known noise-producing industries, railroads, airports, and other sources.

HS-8.2 Noise Impacted Areas

The County shall designate areas as noise-impacted if exposed to existing or projected noise levels that exceed 60 dB Ldn (or Community Noise Equivalent Level (CNEL)) at the exterior of buildings.

HS-8.3 Noise Sensitive Land Uses

The County shall not approve new noise sensitive uses unless effective mitigation measures are incorporated into the design of such projects to reduce noise levels to 60 dB Ldn (or CNEL) or less within outdoor activity areas and 45 dB Ldn (or CNEL) or less within interior living spaces.

HS-8.4 Airport Noise Contours

The County shall ensure new noise sensitive land uses are located outside the 60 CNEL contour of all public use airports.

HS-8.5 State Noise Standards

The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code (UBC). Title 24 requires that interior noise levels not exceed 45 dB Ldn (or CNEL) with the windows and doors closed within new developments of multi-family dwellings, condominiums, hotels, or motels. Where it is not possible to reduce exterior noise levels within an acceptable range the County shall require the application of noise reduction technology to reduce interior noise levels to an acceptable level.

HS-8.6 Noise Level Criteria

The County shall ensure noise level criteria applied to land uses other than residential or other noise-sensitive uses are consistent with the recommendations of the California Office of Noise Control (CONC).

HS-8.7 Inside Noise

The County shall ensure that in instances where the windows and doors must remain closed to achieve the required inside acoustical isolation, mechanical ventilation or air conditioning is provided.

HS-8.8 Adjacent Uses

The County shall not permit development of new industrial, commercial, or other noise-generating land uses if resulting noise levels will exceed 60 dB Ldn (or CNEL) at the boundary of areas designated and zoned for residential or other noise-sensitive uses, unless it is determined to be necessary to promote the public health, safety and welfare of the County.

HS-8.9 County Equipment

The County shall strive to purchase equipment that complies with noise level performance standards set forth in the Health and Safety Element.

HS-8.10 Automobile Noise Enforcement

The County shall encourage the CHP, Sheriff's office, and local police departments to actively enforce existing sections of the California Vehicle Code relating to adequate vehicle mufflers, modified exhaust systems, and other amplified noise.

HS-8.11 Peak Noise Generators

The County shall limit noise generating activities, such as construction, to hours of normal business operation (7 a.m. to 7 p.m.). No peak noise generating activities shall be allowed to occur outside of normal business hours without County approval.

HS-8.12 Foothill and Mountain Noise

For areas designated by Tulare County as being within Foothill and Mountain Planning Areas and outside Foothill Development Corridors, the hourly Leq resulting from the development or new noise-sensitive land uses or new noise-generating sources shall not exceed 50 dB during the day (7:00 a.m.-10:00 p.m.) or 40 dB during the night (10:00 p.m.-7:00 a.m.) when measured at the boundary of areas containing or planned and zoned for residential or other noise-sensitive land uses. For these same areas and under the same circumstances, the maximum A-weighted noise level (Lmax) shall not exceed 70 dB during the day or 60 dB during the night.

HS-8.13 Noise Analysis

The County shall require a detailed noise impact analysis in areas where current or future exterior noise levels from transportation or stationary sources have the potential to exceed the adopted noise policies of the Health and Safety Element, where there is development of new noise sensitive land uses or the development of potential noise generating land uses near existing sensitive land uses. The noise analysis shall be the responsibility of the project applicant and be prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California, etc.). The analysis shall include recommendations and evidence to establish mitigation that will reduce noise exposure to acceptable levels (such as those referenced in Table 10-1 of the Health and Safety Element).

HS-8.14 Sound Attenuation Features

The County shall require sound attenuation features such as walls, berming, heavy landscaping, between commercial, industrial, and residential uses to reduce noise and vibration impacts.

HS-8.15 Noise Buffering

The County shall require noise buffering or insulation in new development along major streets, highways, and railroad tracks.

HS-8.16 State Noise Insulation

The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code.

HS-8.17 Coordinate with Caltrans

The County shall work with Caltrans to mitigate noise impacts on sensitive receptors near State roadways, by requiring noise buffering or insulation in new construction.

HS-8.18 Construction Noise

The County shall seek to limit the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7pm, Monday through Saturday when construction activities are located near sensitive receptors. No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.

HS-8.19 Construction Noise Control

The County shall ensure that construction contractors implement best practices guidelines (i.e. berms, screens, etc.) as appropriate and feasible to reduce construction-related noise-impacts on surrounding land uses.

HOUSING ELEMENT

Housing Policy 3.17 Discourage developments of residential housing units in areas with high noise levels, as determined by State Noise Standards, or require mitigation measures to diminish the effects.

3. General Plan Table 10.1 Land Use
Compatibility for Community Noise
Environments.

Table 10.1 Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure- L_{dn} or CNEL (dB)						
	50	55	60	65	70	75	80
Residential - Low Density Single Family, Duplex, Mobile Homes	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Residential - Multi-Family	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Transient Lodging - Motels, Hotels	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Auditoriums, Concerts Halls, Amphitheaters	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Sports Arenas, Outdoor Spectator Sports	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Playgrounds, Neighborhood Parks	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Office Buildings, Business Commercial and Professional	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
Industrial, Manufacturing, Utilities, Agriculture	Normally Acceptable		Conditionally Acceptable			Normally Unacceptable	
	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.					
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
	Normally Unacceptable	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.					
	Clearly Unacceptable	New construction or development generally should not be undertaken.					

[Source: Figure Noise-1. State Land Use Compatibility Standards for Community Noise Environment: California Governor's Office of Planning and Research, October 2003]