



**PUBLIC WORKS SPECIFICATIONS  
FOR  
THE CITY OF BANNING**

**January 1, 1983**



# CITY OF BANNING

161 West Ramsey Street • P. O. Box 998  
Banning, California 92220  
Telephone (714) 849-4511

March 10, 1983

SUBJECT: PUBLIC WORKS SPECIFICATIONS FOR THE CITY OF BANNING

The City Council on February 28, 1983, adopted by Resolution 1983-07 the "1983 PUBLIC WORKS SPECIFICATIONS FOR THE CITY OF BANNING," and as amended from time to time. Said Specifications were compiled and approved by the following departments:

1. Engineering
2. Wastewater
3. Water
4. Street
5. Building
6. Fire
7. Electric

In the same resolution, the 1982 Edition of the Standard Specifications for Public Works Construction popularly known as the "Green Book", authored by the Joint Cooperative Committee of the Southern California Chapters of the American Public Works Association and Associated General Contractors of California, as amended and as modified by each of the above departments, from time to time, was adopted by reference.

The "1983 Public Works Specifications for the City of Banning" are effective and will be enforced with each street work permit, design project and City Construction project on or after February 28, 1983.

Sincerely yours,

*Jerry Y. Jensen*

Jerry Y. Jensen  
City Engineer/Director of Public Works

JYJ/js

Enclosure: Resolution 1983-07

I N D E X

T O

STANDARD SPECIFICATIONS AND DRAWINGS

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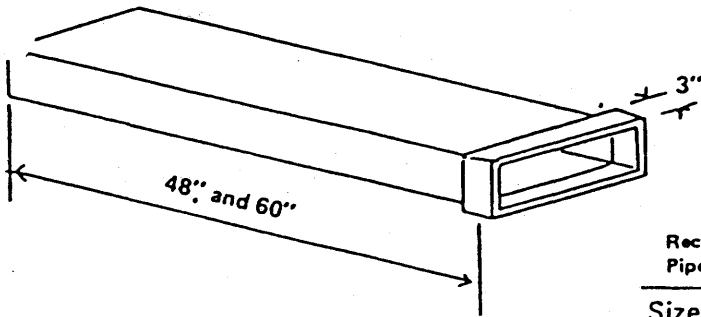
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# UNDER SIDEWALK

SALES • FABRICATORS • CONTRACTORS

# DRAIN PIPE TRANSITE



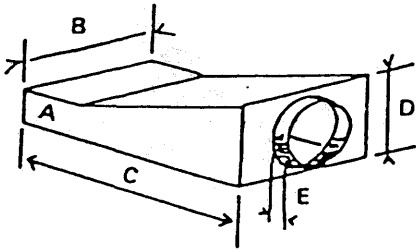
Rect. Pipe.	Round Pipe Eq.
Size 1	4"
2	6"
3	8"



## ASBESTOS-FREE GRADE!

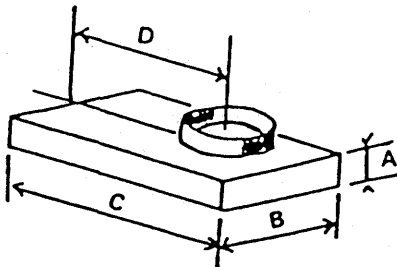
SIZE	Outside Dimension	Inside Dimension	Transverse Area Net	Weight	List Price 48" Length	Weight	List Price 60" Length
1	5-1/2 x 3-3/4	5 x 3	15.00 Sq. In.	20 lbs.		25 lbs.	16.90
2	8-1/2 x 4-1/4	8 x 3-1/2	28.00 "	28 "		36 "	17.60
3	16-7/8 x 4-1/2	15-1/8 x 3-1/2	52.94 "	65 "		78 "	19.40

### TYPE - L ROUND TO RECTANGULAR PIPE ADAPTOR



SIZE	A	B	C	D	E	Weight	List Price
1	3-3/4	5-1/2	8	6	2	5 lbs.	5.45
2	4-1/4	8-1/2	12	8	2	10-1/2	6.20
3	4-1/2	15-7/8	16-1/2	10	2-1/2	31 lbs.	14.50

### TYPE - T ADAPTOR



SIZE	A	B	C	D	Weight	List Price
1	3-3/4	5-1/2	8	5	4 lbs.	4.90
2	4-1/4	8-1/2	10	6	8-1/2	5.50
3	4-1/2	15-7/8	18	7	28	6.20

WESTERN SPECIALTY PRODUCTS  
1908 OAK STREET  
TORRANCE, CA 90501  
213-533-1586  
714-634-2228

3/15/88  
JK

RESOLUTION NO. 1983- 07

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BANNING, CALIFORNIA, RESCINDING RESOLUTION 1982-50 AND ADOPTING THE 1983 PUBLIC WORKS SPECIFICATIONS FOR THE CITY OF BANNING.

SECTION 1: That the City of Banning Resolution 1982-50 adopting the 1982 Edition of the "Standard Specifications for Public Works Construction" be rescinded.

SECTION 2: That the City Council of the City of Banning hereby adopt the 1983 Public Works Specifications for the City of Banning, and as amended from time to time.

One (1) copy of said specifications having been filed in the office of the Banning Engineering Department.

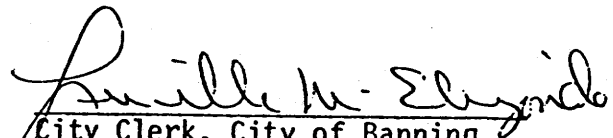
SECTION 3: That the 1982 Edition of the Standard Specifications for Public Works Construction popularly known as the "Green Book", authored by the Joint Cooperative Committee of the Southern California Chapters of the American Public Works Association and Associated General Contractors of California, and as amended from time to time, is hereby designated and adopted by reference as part of the 1983 Public Works Specifications described in Section 2 of this Resolution.

One (1) copy of said specifications having been filed in the office of the Banning Engineering Department.

CERTIFICATION

I, Lucille M. Elizondo, City Clerk of the City of Banning, California, do hereby certify that the foregoing resolution was regularly introduced and adopted at a regular meeting of said City Council duly called and held on the 28th day of February, 1983, and was duly passed and adopted by the following vote, to wit:

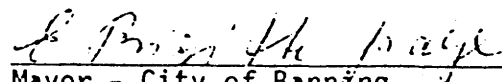
AYES        Councilmember Burgess, Williams, Mc Cabe, Crawford, Mayor Page  
NOES:        None  
ABSTAIN:    None  
ABSENT:     None

  
\_\_\_\_\_  
City Clerk, City of Banning  
California

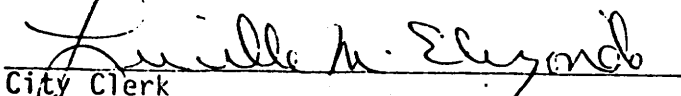
( S E A L )

SECTION 4: The City Clerk shall certify to the passage of this Resolution and shall cause the same to be published in the Record Gazette, a newspaper of general circulation, printed and published in the City of Banning, in the manner prescribed by law.

MOVED, PASSED AND ADOPTED this 28th day of February, 1983.

  
\_\_\_\_\_  
Mayor - City of Banning

ATTEST:

  
\_\_\_\_\_  
City Clerk

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E. Brian Page  
Mayor - City of Banning

ATTEST:

Lucille M. Elzy  
City Clerk

CERTIFICATION

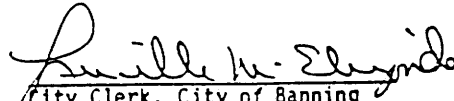
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AYES        Councilmember Burgess, Williams, Mc Cabe, Crawford, Mayor Page

NOES:       None

ABSTAIN:   None

ABSENT:    None

  
City Clerk, City of Banning  
California

( S E A L )

SECTION 1

SUPPLEMENTAL STANDARD PROVISIONS  
FOR USE IN CONJUNCTION WITH THE  
AGC/APWA STANDARD SPECIFICATIONS  
FOR PUBLIC WORKS CONSTRUCTION.

SUPPLEMENTAL STANDARD PROVISIONS  
FOR USE IN CONJUNCTION WITH THE  
AGC/APWA STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION  
IN THE CITY OF BANNING, CALIFORNIA

The numbering system used for these Supplemental Standard Provisions parallels that used in the AGC/APWA Standard Specifications for Public Works Construction, and numbers are preceded by the letters B. Any paragraph in these special provisions supersedes the paragraph of the same number in the Standard Specifications unless otherwise noted on drawings, project special provisions or contract documents. Any reference to the State Standard Specifications shall mean the latest (current) edition of the State of California, Department of Public Works, Division of Highways, Standard Specifications.

B- 2-1      AWARD AND EXECUTION OF THE CONTRACT

2-1.1      AWARD OF CONTRACT

The award of the contract, if it is awarded, will be to the lowest responsible bidder whose proposal complies with all requirements described. The award, if made, will be made within 35 days after the opening of the bids. All bids will be compared on the basis of the Engineer's estimate of quantities of work to be done.

2-1.2      EXECUTION OF CONTRACT

The contract shall be signed by the successful bidder and returned, together with the contract bonds, within 10 days, not including Sundays, after the bidder has received notice that the contract has been awarded. No proposal shall be considered binding upon the City until the execution of the contract by the City.

Failure to execute a contract and file acceptable bonds as provided herein within ten (10) days, not including Sundays, after the bidder has received notice that the contract has been awarded, shall be just cause for the annulment of the award and the forfeiture of the proposal guaranty.

The date of the contract shall be the date that the contract is executed by the City.

The bidder is required to examine carefully the site of, and the proposal plans, specifications, and contract forms for the work contemplated, and it will be assumed that the bidder has investigated and is satisfied as to the conditions to be encountered as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of the specifications, the Special Provisions, and the contract. It is mutually agreed that submission of a proposal shall be considered prima facie evidence that the bidder has made such examination.

For work to be accomplished under a State Improvement Act, the contract shall be executed by the successful bidder within the time limits set forth in the particular State Improvement Act stipulated in the Resolution of Intention.

B-7-5.1

BUSINESS LICENSE, PERMIT, CONSTRUCTION WATER

- a. Business License. Each prime contractor and subcontractor performing work under a City contract or permit issued by the City must have a Banning Business License. Each supplier delivering materials to the job site or other location in Banning must also have a business license. Detailed information concerning a business license may be obtained from the Finance Department, (714) 849-4511, City Hall.
- b. Permit for Public Works. Every individual, firm or government agency desiring to dig in or repair or perform any work in or on a street right of way must first obtain a street work permit from the Department of Public Works. (Exception: Persons or firms performing work under a contract with the City need not obtain a permit for the work on locations specified in the contract.) Prerequisites, costs and conditions of a permit may be obtained from the Department of Public Works, (714) 849-4511, City Hall.
- c. Permit for Building, Mechanical and Electrical. Every individual, firm or agency proposing to do work on any structure for the purpose of constructing, improving, removing or destroying shall obtain a permit for such work from the City of Banning, Department of Building and Safety. Cost of such permit shall be paid by such individual, firm or agency and prior approval of plans by the Building Official does not waive this requirement. Telephone (714) 849-4511.
- d. Construction Water. Every individual, firm or government agency desiring to obtain water from a City-owned fire hydrant for construction or any other purpose must first obtain a permit from the Department of Public Works (714) 849-4511, City Hall. Information concerning posts and conditions may be obtained from the department.

B-7-10.3.1 CONSTRUCTION SIGNING

All miscellaneous traffic devices and signs for handling traffic during construction shall be in accordance with the "Work Area Traffic Control Handbook" (WATCH) published by Building News Incorporated, and the Special Provisions of the specifications.

B-200\*

ALTERNATE ROCK PRODUCTS, ASPHALTIC CONCRETE, PORTLAND CEMENT CONCRETE AND UNTREATED BASE MATERIAL

\*Unless otherwise indicated by the Special Provisions, Alternate Rock Material - Type "S" is specified. Part 4, Section 400, of the Standard Specifications for Public Works Construction will be used.

B- 207-11 CORRUGATED METAL PIPE AND PIPE ARCHES (STEEL)

207.11.1 GENERAL

Add the following: Unless otherwise specified, the minimum gage for corrugated metal pipe shall conform to the following:

	<u>Gage</u>
8" to 24" inclusive	16
30" to 35" inclusive	14
42" to 48" inclusive	12
54" to 66" inclusive	10
72" to 96" inclusive	8

B- 302-5 ASPHALTIC CONCRETE PAVEMENT

302-5.1 GENERAL

Add the following: All testing of underground installation at any given point shall be completed before the surface course is placed at that point.

B- 306-1.2 LAYING OF WATER, SEWER AND STORM PIPE

306-1.2.1 PIPE BEDDING

Bedding shall conform to the provision of Section 306-1.2.1 of the Standard Specifications and the City of Banning's Std. Dwg's. The cost of providing and installing said bedding material shall be included in the price bid for pipe and no additional allowance will be made therefor. In any case where rock bedding under the pipe is required by the Engineer for stabilizing unstable subgrade due to existing ground conditions (not attributable to contractors' operations or methods), such rock bedding material shall be paid for at the job site delivered price.

In the case of PVC pipe or ABS composite pipe bedding material through the haunch area and to the top of pipe shall be granular material having a minimum sand equivalent of 30 compacted to a relative compaction of 90%.

306.1.2.2 PIPE LAYING

Add the following: After completion of all work, except the street or trench resurfacing, an approved type sewer ball (not a free floating ball) equal to the diameter of the pipe shall be sent through sewers from the uppermost structure. The Contractor shall, at his own expense, furnish all materials including water for carrying out the operation and removing any obstructions that prevent the ball from traveling through the pipe.

All exposed piping shall be adequately supported with devices of appropriate design.

All joints shall be installed in strict accordance with manufacturer's recommendation and shall be provided with a protective coating at least equal to the protective coat on the pipe being joined.

B- 306-1.2.3 FIELD JOINTING OF CLAY PIPE

Add the following: Only Types "D" or "G" joints are acceptable for vitrified clay pipe. All other provisions of this section apply.

SECTION 1A

ADDENDUM TO STANDARD PROVISIONS FOR  
WATER SYSTEM CONSTRUCTION FOR USE WITH  
AGC/APWA STANDARD SPECIFICATIONS.

## INTRODUCTION

These Specifications shall apply to all Domestic Water System Improvements which are to be integrated into the City of Banning Water Department's Domestic Water System whether construction is to be accomplished by the Water Department or by a Contractor.

These Specifications are to be used as a specific guide for construction of work specified by Construction Drawings approved by the Water Department, Special Provisions issued by the Water Department or Directions given by the Water Department. Contractors and Engineers are cautioned that these Specifications are intended to augment Construction Drawings, Special Provisions or Directions for all Domestic Water System work and shall therefore not be used in any other manner.

Contractors and Engineers are advised to obtain prior approval of any work and to thereby obtain specific requirements of work. Work specified by Construction Drawings, Special Provisions or Directions shall be accomplished in accordance with these Specifications unless specified otherwise.

It is not the intent of these specifications to prevent the use of any material not specifically prescribed by these Specifications. However, the Water Department must determine that substitutes are equivalent to those materials specified and approve any substitution therefor. All materials shall be new and of the best quality for their intended use and shall be of one manufacture for any particular project. All materials shall be approved by the Water Department prior to purchase and only those materials approved by the Water Department shall be installed.

In the case of conflicts between these Addendum to Standard Provisions and the AGC/APWA Standard Specifications, these Addendum to Standard Provisions shall govern.

CITY OF BANNING WATER DEPARTMENT

BASIC PIPELINE SPECIFICATIONS

1. SCOPE: Contractor shall furnish all pipe and appurtenances together with all material, equipment, labor and perform all operations necessary to construct water mains and appurtenances as specified.
2. EXCAVATION:
  - A. Trenches: Excavation for pipeline and appurtenances shall be open trench to the depth and in the direction necessary for proper installation of same as shown on Construction Drawings or as otherwise directed by the Water Department. Excavation for trenches shall include removal of all material of any nature for installation of the pipe or appurtenance and shall include the construction of trench shoring and timbering and all necessary installations for dewatering.
  - B. Limit of Excavation: Trenches shall be excavated not more than 1,000 feet in advance of pipe laying, unless otherwise permitted in writing by the Water Department. Trenches shall be adequately shored and braced so that the earth will not slide or settle, and so that all existing improvements of any kind will be fully protected from damage. Any damage resulting from lack of adequate shoring and bracing shall be the responsibility of the Contractor. Contractor shall effect all necessary repairs or reconstruction at his own expense, as directed by the Water Department and shall bear all other expense resulting from such damage.
  - C. Width of Trench: Unless otherwise shown, all pipeline trenches shall, whenever possible, have vertical sides and a minimum width as shown on the Standard Drawings. Sloping of trench walls will be permitted under certain conditions.

The maximum allowable width of trench is shown on the Standard Drawings.
  - D. Excess Excavation: Should the excavation for the pipeline be carried below grade without instruction from the Water Department it shall be refilled to proper grade, at the Contractor's expense for all labor and material, with clean sand or sand and gravel tamped in place to 90% minimum compaction.
  - E. Excavation In Good Soil: The trench shall have a flat or semi-circular bottom conforming to the grade to which the pipe is to be laid. The bottom for all weld steel cylinder pipe shall be graded and prepared to provide firm and uniform bearing throughout the entire length of each joint of pipe. Welded steel cylinder pipe shall not be laid on earth mounds and bell holes shall be excavated in the sides and bottom of the

trench at pipe joints, of such size that the process of making joints and inspection can be carried on satisfactorily, and so that the pipe barrel will bear evenly on the bottom of the trench.

- F. Excavation In Poor Soil: All soft, spongy, or unstable material shall be removed from the bottom of the trench to a depth as determined in the field by the Water Department and shall be refilled to proper grade, at Contractor's expense to a depth of 2 feet below grade, with clean sand or sand and gravel or other suitable material as approved by the Water Department. Material shall be tamped to 90% minimum compaction, graded and prepared to provide a firm and uniform trench bottom.
- G. Excavation In Rock: Where rock is encountered it shall be removed below grade and the trench backfilled with suitable material to provide a compacted earth cushion with a thickness under the pipe of not less than 1 1/2" per inch of nominal diameter of pipe to be installed with a minimum allowable thickness of 6 inches.
- H. Disposal of Excavated Materials: All materials excavated from the trench shall be so placed as to offer a minimum of obstruction to traffic. Gutters shall be kept clean or other provisions shall be made for handling street or road drainage. Excess material and material that is not approved by the Water Department for use as backfill shall be disposed of elsewhere by Contractor entirely at his own expense and on his own responsibility.

If pipe or other material belonging to Water Department is uncovered or removed from the excavation, all pipe or other material which is salvable in the opinion of the Water Department shall be disposed of as directed by the Water Department. Material not considered to be salvable shall be disposed of with other excess excavated material.

### 3. BACKFILLING:

- A. Basic Requirements: Backfilling shall be as specified by the Water Department.
- B. Backfilling Adjacent to Pipe:
  - 1. Steel Cylinder Pipe: Initial backfill shall be done as soon as possible after the pipe has been laid. Selected backfill material consisting of loose earth or sand free from stones, clods or other deleterious material larger than 3" in diameter shall be placed in the trench simultaneously on each side of the pipe for the full width of the trench in layers not exceeding 6" in depth. Backfill shall then be thoroughly compacted by tamping or where the material is sufficiently granular in nature as determined by the Water Department, by water settlement until the pipe has been covered by at least 12" of well compacted material. Care shall be exercised in backfilling to avoid any damage to the pipe coating. Whenever pipe is supplied with internal bracing, it shall be left in place

SECTION 1C

ADDENDUM TO STANDARD PROVISIONS FOR  
ELECTRICAL SYSTEM WORK CONSTRUCTION  
FOR USE WITH AGC/APWA STANDARD SPECIF-  
ICATIONS

until the pipe is installed and backfill operations are completed.

- C. Backfilling Above the Pipe: From the top of the selected backfill to ground surface, the material for backfill shall be free from stones or lumps of material exceeding 3" in greatest dimension, in quantity not exceeding 40% of the volume when said coarse materials are well distributed throughout the finer material and the specified compaction can be obtained. All backfill material shall be compacted to a density of 90% or more as determined by field compaction tests. Compaction shall be obtained by means of water settlement or tamping, depending on the nature of the material. Sandy, granular soils, may be compacted by means of water settlement. Trench to be backfilled by water settlement shall be diked at suitable intervals not to exceed 300 feet. Impounded water shall be of sufficient depth so that earth pushed or shoveled into trench will, at all times, be falling into water and will be completely saturated. Soils not having a sandy or granular nature shall be backfilled and compacted by either of the following methods:

1. All material shall be placed in layers not exceeding 8" in thickness, loose measurement, and each layer compacted to a density of 90% or more, as specified above, by means of hand or pneumatic tampers.
2. All material shall be placed in layers not exceeding 3 feet in thickness, loose measurement, and each layer compacted to a density of 90% or more as specified above, by the use of a "Hydra-Hammer" tamper, or similar equipment.

On steep slopes and other locations where compaction by flooding is not practicable, the backfill shall be compacted by means of either of the above tamping methods.

In open terrain or wherever, in the opinion of the Water Department, settlement is not important, tamping or water settling may be omitted in the backfilling above the pipe. After filling to the top of the trench with material excavated from the trench the backfill shall be rolled three times with the dual-wheels of a truck loaded to 5 tons or with other equivalent equipment. Surplus backfill material shall be mounded over the trench in sufficient quantity to allow settlement and as directed by the Water Department.

- D. Imported Backfill Material: Imported material shall be select earth, sand, or gravel, free from clods, lumps, or stones over 3" in diameter and shall not contain over 10% by volume of clay or adobe.

#### 4. PIPE MATERIALS:

- A. Steel Cylinder Pipe (Cement Mortar Lined and Either Outside Wrapped or Cement Mortar Coated)

1. Nominal Steel cylinder pipe thickness shall be as shown by Standard Drawings.

All pipe furnished shall be manufactured by an organization which has had not less than 10 years successful experience in the manufacture of the type of pipe specified.

2. Data to be submitted by Contractor: Whenever specified by Construction Drawings or by the Water Department all proportioning and detailing for the pipeline, including specials, manways and connections to the pipe, shall be done by Contractor. Contractor shall prepare detailed shop fabrication drawings of the pipe, lining and coating, joints, details of reinforcement, fittings, appurtenance, and station and elevation for each outlet and fitting and each pipe joint where a change in pipe class, alignment or slope occur, and shall submit these to the Water Department for approval in all cases at a time sufficiently early to allow review and approval as hereinafter specified and to accommodate the rate of construction. These shop fabrication drawings shall be submitted in duplicate. The Water Department will, within 15 days, return one copy to Contractor, marked either "Returned for Revision", "Approved", or "Approved as Revised". In the last case, all revisions will be clearly shown on the returned copy which shall be considered as approved drawing, and only drawing or prints so corrected shall be used for manufacture.

Revisions shown on the shop drawing shall be considered as changes necessary to meet the requirements of specifications and shall not be taken as the basis of claims for extra charges. Contractor shall accept such revision or submit other for approval. When delay is caused by the resubmission of details, Contractor shall not be entitled to any damages or extension of time on account of such delay. The corrections on prints marked "Approved as Revised" shall be made on the tracing as soon as practicable, and new prints submitted. The Water Department approval shall be considered as applying only to the general arrangement and such approval or the criticism of detail shall not relieve Contractor from entire responsibility for correctness of details and dimensions. Contractor shall correct any misfits due to any errors in the drawings. Any fabrication or other work performed in advance of the receipt of approved drawings shall be done entirely at Contractor's risk.

Contractor shall furnish the Water Department 2 copies of all approved drawings.

3. Curves, Angles, Closures and Short Sections: Laying of pipe on curved alignment by means of unsymmetrical closure of spigot into bell rings will be permitted. The amount of the pull permitted from normal closure on one side of the joint will be up to 1/2" for 8" pipe or smaller, up to 3/4" for 10" through 21" pipe, and up to 1" for pipe 24" and larger, provided that the maximum deflection shall not exceed 3 degrees. Where smaller radius of curvature is required, sections of pipe with beveled ends may be

laid on curved alignment, unless fabricated bends are shown on the Construction Drawings, or ordered by the Water Department. The spigot end of the angle or beveled pipe may have a maximum bevel of 5 degrees measured from a plane perpendicular to the pipe's axis. The center of the short side of the bevel shall be marked on the joint bands. For the purpose of reducing the angular deflections at pipe joint, and for closure sections, Contractor shall be permitted to install pipe sections of less than standard length.

Closing courses and short sections of pipe shall be fabricated and installed by Contractor as found necessary in the field. Where closing pieces are required, Contractor shall make all necessary measurements and shall be responsible for the correctness.

Where it is necessary to cut the pipe in the field to make a bend or to fabricate a joint, it will be done in such a manner and location that it will be possible to butter the joint by hand to ensure a continuous cement lining.

4. Fittings: All fittings shall be fabricated from machine cement mortar lined and machined outside coated pipe. Individual parts of fittings shall be cut from the pipe, welded together, and the lining and coating of joints shall be hand applied to provide a finished cement mortar lined and finished outside coated joint comparable to mechanically applied lining and coating detailed herein.

Fittings may be field fabricated or fabricated by pipe material supply contractor, as approved by the Water Department.

All fittings shall be in accordance with AWWA C-208, latest.

5. Ends Of Pipe Sections:

- A. Flanged Joints: All steel welding flanges shall conform to AWWA C-207, latest. Class D is the minimum class acceptable.
- B. Plain End for Mechanical Joint: Ends for sleeve type couplings shall have the weld bead ground flush. Mortar coating or wrapping shall terminate 12" back on the outside and a coating of bitumastic tank solution applied to the steel. After joint is coupled all exterior surfaces shall be coated with a coating specified for the balance of the pipeline.
- C. Swedged Lap Welded Joints: The bell end shall be formed integrally with steel cylinder and shall be swedged out by machine to be circular in shape and so designed and fabricated to withstand design pressure of the class of pipe called for and to permit the (plain end) spigot end to enter the belled end approximately 1", with a clearance of approximately 1/32".
- D. Banded Lap Welded Joints: Where lap welded joints are required

and swaged lap welded joints cannot be fabricated, a banded bell end shall be formed by welding a band of steel to the outside circumference of the plain end of a pipe, resulting in a circular shape, and so designed and fabricated to withstand design pressures stated herein and to permit the (plain end) spigot end to enter the belled end approximately 1", with a clearance of approximately 1/32".

- E. Cut To Fit Joints: Where cut to fit joints are required, they shall be in accordance with the Standard Drawings, and with notes on Construction Drawings, and so designed and fabricated to withstand design pressures of the class of pipe specified. Pipe coatings at cut to fit joints shall be held back as required to permit construction of joint, and thereafter added in the field.
6. Installation: All pipe shall be laid true to line and grade and at the locations as shown on Construction Drawings or as specified. All pipe shall be carefully beeded to provide continuous bearing and prevent uneven settlement.

Circumferential field joints shall be made in a workmanlike manner using approved materials for the type of joint specified. Special care shall be taken to avoid damaging the lining and coating during the lowering of the pipe into the trench and making of the field joints. Where rubber gasket joints are called for all pipe to be jointed shall be positioned so that the spigot end of one is in line, and facing the bell end of the other. The exterior of the spigot and the interior of the bell shall be thoroughly cleaned. A liquid soap, approved by the Water Department, shall be applied to the rubber gasket. Paste type soaps shall not be used unless approved by the Water Department, and thinned to water consistency. The lubricant shall be water soluble, nontoxic, shall impart no objectionable taste or odor to the water, shall have no deteriorating effects on the rubber gaskets and shall not support growth of bacteria. The gasket shall then be snapped into place in the groove on the spigot. The joining ends of the pipe shall be "battered" with cement mortar composed of plastic cement and silica sand and in sufficient quantity to completely fill the space between the respective mortar linings. The joint shall be completed by forcing the spigot into the bell or the bell into the spigot. The joint shall be checked with a "feeler" gage to insure that the gasket has been properly seated. The pipe interior shall then be swabbed to remove all excess mortar by drawing an approved pipe cleaning tool through the pipe.

Pipe joints which are 20" in diameter and larger shall be hand "battered" from inside the pipe.

Pipe having flanged joints, welded joints, or cut to fit joints shall be "battered" by a method approved by the Water Department.

The exterior of rubber gasket joints shall be dispersed and filled with a material compatible with the exterior pipe coating. Couplings, lap welded joints, flanges and cut to fit joints shall be coated with material compatible with the exterior pipe coating and as directed by the Water Department.

5. VALVES:

- A. Gate Valves: All gate valves to be furnished and installed by Contractor shall be designed and manufactured in accordance with AWWA C-500, latest, except as specified herein or as shown on the Standard Drawings. Valves shall be Mueller, Eddy-Iowa, Kennedy, or approved equal.

Generally valves shall be cast iron body, bronze mounted, double disc and parallel seat with ASA Class 125 cast iron flanges. Valves stems shall be nonrising with 2" square operating nut turning counterclockwise to open. Valves which are 12" diameter and smaller shall have "O" ring seals, nonshock cold water working pressure of 200 psi and hydrostatic test pressure of 350 psi. Valves which are greater than 12" in diameter shall have "O" ring seal or conventional packing as approved by the Water Department appropriate sized bypass, non-shock cold water working pressure of 150 psi and hydrostatic test pressure of 300 psi.

- B. Butterfly Valves: All butterfly valves to be furnished and installed by Contractor shall be designed and manufactured in accordance with AWWA C-504, latest, except as specified herein or as shown on the Standard Drawings. Valves shall be Crane, Dresser, Pratt, or approved equal.

Valves shall be cast iron body, short laying length pattern with ASA Class 125 cast iron flanges. Valve shafts shall be of the one piece design and manufactured of type 304 stainless steel.

6. SERVICES:

- A. Location and Size: All services shall be located and sized as approved by the Water Department. Services will not be permitted in driveway areas.

- B. Service Taps: Any and all service taps shall be on line with the meter box and perpendicular to the main.

Service and other taps shall not be made closer than 2' to a bell, coupling, joint, fitting or other service.

Service taps will be permitted only where complete services are to be installed.

1. Service Taps on Steel Mains: Service taps shall be made with a coupling welded to the pipe at the time of pipe fabrication or in the field as shown on the Standard Drawings.

Where connections are made in the field, care shall be exercised to minimize damage to linings and coatings.

- C. Services from Steel Mains: Each service shall include a corporation stop, sufficient service pipe, a stop, a plastic meter box, and all other materials required by the Standard Drawings.
- D. Meter Boxes: Meter boxes shall be plastic and interchangeable with those shown on the Standard Drawings, and shall be installed as shown on the Standard Drawings. They shall be set true to line and grade and shall be flush with the sidewalk or concrete curb.

Meter boxes shall be installed by the Water Department following application for service, in accordance with the Water Department's Regulations Governing Domestic Water Service, and any amendments thereto.

## 7. FIELD HYDROSTATIC TEST AND LEAKAGE TEST:

### A. General:

1. The required test pressures shall be applied by a pump connected to the pipe in a manner satisfactory to the Water Department. Contractor shall provide calibrated meters for measurement of the leakage, necessary bulkheads, piping, gages, pumps, power and labor and do and furnish everything necessary for making all tests required, at his own expense and shall furnish to the Water Department copies of all tests performed.
2. Contractor, at his own expense, shall do all excavation necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed, and shall replace such excavated material and shall make all repairs necessary for the required water tightness, after which the required tests shall be repeated until the pipe and fittings meet the requirements set forth herein.
3. After the pipe and fittings have successfully met the test requirements, to the satisfaction of the Water Department, the entire test section shall be filled with water and so maintained until completion of the work, unless otherwise ordered by the Water Department.

- B. Hydrostatic Test: Upon completion of the laying, joining, and backfilling and at least 7 days after the last concrete thrust device has been placed, the pipe and appurtenances involved in the construction shall be filled with water for a minimum of 24 hours. Care shall be taken to see that all air vents are open during the filling, and after the section has been completely filled, it shall be allowed to stand under a slight pressure for a sufficient length of time to allow the escape of air from any air pockets. During this period, all fittings, specials, armholes and connections shall be

examined for leaks. If any are found, they shall be stopped. A test pressure of 250 psi will be applied to the pipe and fittings as directed by the Water Department and maintained for a 4 hour period.

- C. Leakage Test: After the pressure test is satisfactorily completed, the piping shall be tested for leakage at a pressure equal to the pressure class of the pipe and fittings involved in each test section. Contractor shall test the pipe in sections as designated by the Water Department and the required pressure shall be maintained for a 2 hour period during which time the leakage shall be accurately measured.

The measured leakage shall not exceed the limits set by the following formula unless other wise specified by Construction Drawings.  $L = \frac{ND\sqrt{P}}{5000}$  in which L is allowable leakage in gallons per hour; N is the number of joints, including specials and connections in the length of pipeline tested; D is the nominal diameter of the pipeline tested, in inches; and P is the weighted average test pressure during the leakage test, in psi gage.

#### 8. DISINFECTION OF PIPELINES AND APPURTENANCES:

Contractor shall furnish all equipment, labor and materials for the proper disinfection of the pipeline and appurtenances. Disinfection shall be accomplished by flushing and chlorination after the lines have been tested for leakage but before they have been connected to the existing system.

The method of disinfection shall be as approved by the Water Department and shall conform to the provisions of AWWA C 601, latest. The chlorinating agent shall be applied as prescribed by the Water Department and at locations selected by or designated by the Water Department. The concentration of the dosage applied to the water within the pipeline shall be at least 50 ppm. The tablet method of application shall not be used unless special permission is granted by the Water Department prior to construction.

Chlorinated water must be retained in the pipeline long enough to destroy all non-spore forming bacteria. This period shall be at least 24 hours. After the chlorine treated water has been retained for the required time, the chloring residual at the pipe extremities and at other representative points must be at least 25 ppm.

Following chlorination, Contractor shall flush all pipelines and appurtenances in the manner and with the procedure prescribed by the Water Department. Flushing shall continue until all chlorine, debris, and foreign materials have been removed from pipelines and appurtenances. If so, directed by the Water Department, Contractor shall remove portions of certain appurtenances, such as blowoff installations and service installations, in order to accomplish complete flushing and replace same without adversely affecting disinfected pipelines and

appurtenances. Should the initial treatment fail to produce satisfactory disinfection of the pipeline, as evidenced by the chlorine residual, the chlorination procedure shall be repeated until acceptable results are obtained.

Chlorine residual tests shall be arranged and paid for by Contractor and it shall be his responsibility to deliver an Affidavit of Compliance, in triplicate, to the Water Department showing compliance with the requirements of this disinfection specification. The person or agency performing said tests shall not be engaged by Contractor until approval of said person or agency is given by the Water Department. All tests will be witnessed by the Water Department and Contractor shall obtain the Water Department's prior approval of the time, place, location and number of test points.

9. MISCELLANEOUS REQUIREMENTS:

- A. Connections to Existing Watermains: All connections to existing water mains will be hot tapped and under the supervision of the Water Department.
- B. Field Welding of Pipe: Whenever field welded joints or other field welding of steel pipe is required, Contractor shall not tack weld welders ground to pipe. Ground shall be attached to pipe with "C" clamps or in a manner approved by the Water Department so that no damage to pipe will result unless specified otherwise. All pipe joints within 120' of any special or standard fitting shall be tack welded. Each joint shall receive evenly spaced tack welds 3" in length for each 12" of pipe circumference, with three evenly spaced tack welds per joint minimum.
- C. Field Location of Valves: The Contractor will be responsible to see that all valves are located and marked, as shown on the Standard Drawings.
- D. Use of Water During Construction: All uses of water during construction will require an approved backflow device unless specified differently by the Water Department (Air Gap. - RP-DC).

Abbreviations: Whenever used in these specifications the following abbreviations shall refer to the agency shown:

- a. AASHO American Association of State Highway Officials
- b. ACI American Concrete Institute
- c. AISI American Iron and Steel Institute
- d. API American Petroleum Institute
- e. ASTM American Society for Testing Materials
- f. ASA American Standards Association
- g. AWWA American Water Works Association
- h. AWS American Welding Society
- i. NEMA National Electrical Manufacturing Association
- j. SSPC Steel Structure Painting Council

All references to specifications of any of the above agencies shall mean the latest editions thereof.

SECTION 1B

ADDENDUM TO STANDARD PROVISIONS FOR  
STORM DRAIN WORK.

SUMMARY  
STORM DRAIN WORK

All design and construction work shall be performed per requirements of the Riverside County Flood Control and Water Conservation District. Referenced documents include the following:

- (1) Riverside County Flood Control and Water Conservation District  
"Hydrology Manual", latest addition with all supplements.
- (2) Riverside County Flood Control and Water Conservation District  
"Design Manual Drawings".

The most commonly used Standard Drawings for the above are shown in the Standard Drawings Section of these Public Works Specifications.

In the case of conflicts between these addendum to Standard Provisions on Storm Work and the AGC/APWA Standard Specifications, these Addendum to Standard provisions shall govern.

SUMMARY

ELECTRICAL SYSTEM WORK

Installation of all underground electric service for real estate subdivisions, tracts, apartments, condominiums, mobile homes etc. shall be designed and constructed per requirements of the City of Banning Electric Department. Said requirements are described in separate sets of bounded specifications entitled "City of Banning Underground Specifications for Electrical Services" which may be purchased from the City of Banning Electric Department. These specifications include both the written construction methods and standard drawings. The "City of Banning Underground Specifications for Electrical Services" complete with the enclosed Standard Drawings shall apply to all electrical work integrated into the City of Banning Electrical system whether construction is accomplished by the Electric Department or by an outside contractor.

In the case of conflicts between these Addendum to Standard Provisions on Electrical Work and the AGC/APWA Standard Specifications, these Addendum Standard Provisions shall govern.

SECTION ID

ADDENDUM TO STANDARD PROVISIONS FOR SITE  
GRADING WORK.

SUMMARY

SITE GRADING WORK

All site grading and related design and construction work shall comply with Section 6 and other applicable Sections of the Municipal Code of the City of Banning. Per Section 6-1 of the above, the most recent edition of the Uniform Building Code as adopted and in effect immediately after the date of state promulgation of said code, is adopted and made part of the City of Banning Municipal Code by reference. Also see Standard Drawings Section of these Public Works Specifications for specific procedures to follow in designing and performing site grading work.

In the case of conflicts between these Addendum to Standard Provisions on grading work and the AGC/APWA Standard Specifications, these Addendum to Standard Provisions shall govern.

## STREET - DESIGN CRITERIA

### WIDTHS

- A. All street classification shall conform to the latest adopted Circulation Element of the General Plan.
- B. Street widths shall be in accordance with Table A. (Pg. 31).
- C. Intersection of arterials, depending on estimated traffic volumes, may require special design. The use of left turn pocket, free right turn lanes, raised medians, etc., shall be investigated.
- D. Where feasible, when streets are improved for only one-half widths, the unimproved half shall drain away from the paved section and shall be provided with a paved ditch.

### GRADES

- A. Minimum grade should be 0.4% for local streets.
- B. Grade of more than 10% may be cause for disapproval.
- C. Vertical curves are required when grade breaks exceed 0.8%.
- D. Normal crown slope on A.C. pavement shall be 2.0%.

### ALIGNMENT

- A. Streets shall normally intersect at right angles.
- B. Cul-de-sacs shall not exceed 500 feet in length, nor less than 52 feet wide without special approval and shall have a 50 foot minimum curb line radius at the turn-around.
- C. Minimum length of tangent between reversing curves shall be 100 feet. A lesser length may be used for local streets with the approval of the City Engineer.
- D. All corner cutoffs for local and residential collector streets shall have a minimum 20-foot property line radius; collector streets shall have a minimum property line radius of 25 feet.

### STRUCTURAL SECTION

- A. Design shall be based on results of soil tests made before plans are prepared. The "R" value shall be verified after rough-grading and prior to paving. The structural section shall then be modified if necessary. In no case shall the structural section be less than 3" A.C. over 4" of A.B. C1. II

### CURBS

Use 6" curb face with 24" gutter unless 8" is required to handle drainage. Usually, 6" curb face will be used on residential streets and 8" curb face will be used on commercial-industrial streets.

STREET - DESIGN CRITERIA (Cont'd)

SIDEWALKS

- A. Sidewalks shall be installed along both sides of all streets and shall be located contiguous with the curb unless an alternate location is approved by the City Engineer.
- B. Minimum widths:
  - 1. Residential-----5'
  - 2. Industrial-----5'
  - 3. Commercial-----8'
- C. When sidewalk is to be adjacent to the curb, the top 6" width of the curb may be considered as part of the required sidewalk width.
- D. Minimum thickness:
  - 1. At driveway approaches - 6".
  - 2. All other locations -4".

SIGHT DISTANCE

- A. All sight distances shall be in accordance with Division of Highways Design Manual.
- B. For local streets, maintain triangular area at intersection, measure 30' back of B.C.R.'s, free of any obstructions in excess of 30" in height measured from top of curb. Any variations will require the specific approval of the City Engineer and Building Official.
- C. For intersections involving collector or arterial streets provide clear sight distance as recommended in AASHO "A Policy on Geometric Design of Rural Highways".

STREET LIGHTS

- A. Street lights shall be furnished and installed by the developer at his expense.
- B. Street lights shall normally be located on the outside of curves. Lights shall be located 2-feet behind face of curb measured from center of post.

MONUMENTATION

Standard centerline monuments shall be installed at the BC and EC of all curves and at the PI of all intersecting streets.

SIGNS

Street name signs and traffic signs shall be fabricated and installed by the developer at his expense. It shall be the developer's responsibility to notify the City prior to installation of sign poles.

## STREET-DESIGN CRITERIA (Cont'd)

### STREET TREES

Street trees of the variety listed on the current street tree list on file with the Parks Department, shall be placed in the front yard of each lot.

### FENCES

A fence at least three and one-half feet (3 1/2') in height shall be constructed at the top of any vertical cut or retaining wall exceeding four (4') in height, for safety purposes.

### DRIVEWAYS

	<u>Maximum*</u>	<u>Minimum*</u>	<u>Type</u>
Commercial	35 feet	10 feet	6" PCC
Residential	20 feet	10 feet	6" PCC

#### Maximum Frontage:

Residential, commercial & manufacturing - 50%  
Garages & service stations - 50%

- A. Minimum clear distance between driveways on same property - 20 feet.
- B. Minimum clear distance from property line - 2 1/2 feet.
- C. Minimum clear distance from curb return - 5 feet.
- D. Minimum clear distance from fire hydrant - 5 feet.
- E. No driveways will be permitted in curb returns.

All dimensions are to top of "X" unless otherwise noted.

\* Clear width measured at bottom of "X".

Any deviations from the above dimensions must be approved by the City Engineer.

TABLE A

CITY OF BANNING ENGINEERING DEPARTMENT SUMMARY  
OF MINIMUM STREET DESIGN STANDARDS

Design Criteria	Description				
	Major Highway	Secondary Highway	General Local Streets	Restricted Local Streets	Alley
1. Estimated ultimate 24 hr. traffic (volume)	10,000+	10,000+	75 Dwelling Units	Max. 75 Dwellings	-
2. Design Speed (MPH)	60	50	30	25	25
Spacing of intersections	2,600	1,200	500	250	-
3. Right-of-Way (Ft.)	100	80	60	52	20
4. Curb to curb (Ft.)	80	64	40	40	-
	16' median				
5. Traffic Index	9.5	8 min.	5.5	4.5	-
	Min. Thickness of*				
	Pavement(inches)				
6. Stopping sight dist.(summits) (feet)	4AC/6AB	3AC/4AB	3AC/4AB	3AC/4AB	2 1/2AC/3AB
	475	350	200	160	-
7. Head light dist. (sags) (feet)	475	350	200	160	-
8. Min.Ctr.Line Hori.Radius (feet)	1,200	1,000	500	200	-
9. Max. Grade (%) AC	6	6	10	15	-
10. Min. Grade (%)	0.4	0.4	0.4	0.4	0.4
11. Curb return radius (feet)	30	25	20	20	

STREETS

\*NOTE: Aggregate base is Class II.

SEWER - DESIGN CRITERIA

1. MAINS

A. General

1. Minimum size shall be 8".
2. Material shall be extra strength vitrified clay pipe
3. Joints shall be plastic compression joint unless otherwise specified.
4. Submit design calculations to verify line size and bedding design. Normally a Manning  $n = 0.013$  will be satisfactory.

B. Locations

1. Alley: mains shall be offset 3' min. from centerline to clear alley gutter.
2. Street: main locations shall be in accordance with appropriate Std. Dwg. and State of California, Department of Health requirements.
3. Streets with more than 80' of R/W require special design.
4. Extend and cap all dead ends beyond pavement.
5. Sewers shall normally be placed at least 7' below finished grade.

C. Minimum Slopes - Maintain minimum velocity of 2 FPS min. Special attention should be given to maintaining adequate velocities at low flows.

	<u>Minimum</u>	<u>Desirable Minimum</u>
1. 8"	0.32%	0.40%
2. 10"	0.26%	0.32%
3. 12"	0.20%	0.32%

D. Demands

1. Domestic Demands

- a. In residential areas, assume 100 gallons per capita per day and 2.5 persons per unit for average day.
- b. Maximum flows should be based on ratio of peak to average flows as listed on page 34.
- c. Industrial and commercial demands require special design.

SEWER - DESIGN CRITERIA (Cont'd)

2. MANHOLES

- A. At all changes of slope.
- B. At all changes of direction unless a special design is required by field conditions.
- C. At intersections of mains - match center lines.
- D. Desirable spacing = 300 feet; maximum spacing = 400 feet.
- E. At ends of line unless a cleanout is provided.
- F. All manholes shall be numbered on the plans.

3. CLEANOUT LOCATION

Permanent ends of line, not in excess of 200' beyond last manhole.

4. LATERALS

A. Size

- 1. Single family - minimum 4".
- 2. All others - minimum 6".

B. Locations

- 1. Right angle or radial to street R/W.
- 2. Center of lot to 5' above downstream lot line (shown on as-built plans).
- 3. When future lot widths are not known, a service shall be installed every 60 feet in residential areas.
- 4. Service shall not be located in driveway without prior approval of City Engineer.

C. Depth - 30" min. below bottom of gutter.

D. Taps - All taps shall be made by an approved method of equal.

I N D E X

T O

STANDARD SPECIFICATIONS AND DRAWINGS

<u>PAGE</u>	<u>TITLE</u>	<u>STANDARD NUMBER</u>
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19	1B: ADDENDUM TO STANDARD PROVISIONS FOR STORM DRAIN WORK.	-
21	1C: ADDENDUM TO STANDARD PROVISIONS FOR ELECTRIC WORK CONSTRUCTION.	-
23	1D: ADDENDUM TO STANDARD PROVISIONS FOR SITE GRADING WORK	-
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	3A: STREET SECTIONS	
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54	CURB & GUTTER JOINTS	C-205
55	CURB TRANSITION ON TANGENT	C-206
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PEAK TO AVERAGE SEWAGE FLOW FOR SOUTHERN CALIFORNIA COMMUNITIES

<u>Population</u>	<u>Ratio of Peak to Average Flow</u>	<u>Population</u>	<u>Ratio to Peak to Average Flow</u>
1,000	2.49	5,200	1.99
1,050	2.48	5,350	1.98
1,100	2.47	5,500	1.97
1,150	2.46	5,750	1.96
1,200	2.45	6,000	1.95
1,250	2.44	6,200	1.94
1,300	2.43	6,400	1.93
1,350	2.42	6,650	1.92
1,375	2.41	6,900	1.91
1,400	2.40	7,300	1.90
1,450	2.39	7,500	1.89
1,500	2.38	7,750	1.88
1,550	2.37	8,100	1.87
1,600	2.36	8,400	1.86
1,625	2.35	8,750	1.85
1,650	2.34	9,100	1.84
1,700	2.33	9,600	1.83
1,750	2.32	10,000	1.82
1,800	2.31	10,800	1.81
1,850	2.30	11,500	1.80
1,900	2.29	12,300	1.79
1,950	2.28	13,000	1.78
2,000	2.27	13,800	1.77
2,075	2.26	14,500	1.76
2,150	2.25	15,000	1.75
2,225	2.24	16,000	1.74
2,300	2.23	16,700	1.73
2,375	2.22	17,400	1.72
2,425	2.21	18,000	1.71
2,500	2.20	18,900	1.70
2,600	2.19	19,800	1.69
2,675	2.18	21,500	1.68
2,775	2.17	22,600	1.67
2,850	2.16	23,800	1.66
2,925	2.15	25,000	1.65
3,000	2.14	26,500	1.64
3,100	2.13	28,000	1.63
3,200	2.12	29,800	1.62
3,350	2.11	32,000	1.61
3,500	2.10	34,000	1.60
3,600	2.09	36,000	1.59
3,700	2.08	38,000	1.58
3,800	2.07	42,000	1.57
3,900	2.06	45,000	1.56
4,000	2.05	49,000	1.55
4,200	2.04	54,000	1.54
4,400	2.03	60,000	1.53
4,600	2.02	70,000	1.52
4,800	2.01	90,000	1.51
5,000	2.00	100,000+	1.50

## DRAINAGE - DESIGN CRITERIA

### 1. GENERAL

- A. All drainage design and requirements shall be in accordance with the latest Master Drainage Plan for the City of Banning.
- B. Design calculations and flow maps for all contributory areas shall be submitted with plans.
- C. The use of underground storm drain systems, in addition to standard curb and gutter, shall be required:
  - 1. When flooding or street overflow will cause serious damage.
  - 2. When future up-stream development will cause drainage problems.
  - 3. When existing drainage facilities are adjacent to proposed development.
  - 4. When more than one travel lane of arterial and collector streets would be obstructed by storm water based on "10-year storm".
- D. The use of underground storm drain systems shall be investigated:
  - 1. When the water level in streets at the design storm is within 2 inches of top of curb.
  - 2. When velocity of water in streets exceeds 8 F.P.S.
  - 3. When the water travels more than 1000 feet overland.
- E. Permanent open drainage ditches will not be permitted in public right-of-way.
- F. The type of drainage facility shall be selected on the basis of physical and cultural adaptability to the proposed land use. Open channels may be considered in lieu of underground systems when the peak flow exceeds the capacity of a 48-inch diameter R.C.P.
- G. Permanent drainage facilities and right-of-way shall be provided from development to point of satisfactory disposal.
- H. The use of cross-gutters on collectors and arterials requires special approval.
- I. Where the development density is one lot per acre or greater, all drainage channels shall be improved.