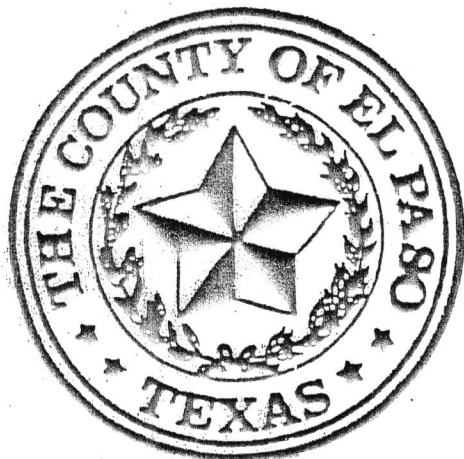


COUNTY OF EL PASO

SUBDIVISION



DESIGN

STANDARDS



JOSÉ R. RODRÍGUEZ
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EL PASO COUNTY, TEXAS
COUNTY COURTHOUSE
500 E. SAN ANTONIO, ROOM 203
EL PASO, TEXAS 79901

(915) 546-2050
FAX: (915) 546-2133

MEMORANDUM

TO: HECTOR ENRIQUEZ, JR., COUNTY CLERK

FROM: BRIAN QUINTERO, ASSISTANT COUNTY ATTORNEY

DATE: MARCH 10, 1997

RE: LANGUAGE TO GIVE NOTICE OF HOUSE BILL 1001 APPLICABILITY

Your real property department has requested that this office prepare a notice, that they feel should be included with purchased copies of the County's Subdivision Regulations and Design Standards, explaining House Bill 1001, the anti-colonias legislation that went into effect July 2, 1995. In the alternative, they have asked if we would re-write the Regulations and Design Standards to incorporate the State Law. Rather than do a full re-write, your office may wish to attach the below-written Special Notice to the front of the Regulations and Design Standards.

* * * * *

SPECIAL NOTICE

The subdivision and platting of land is also subject to any applicable laws or regulations of the Federal Government, State of Texas and the municipality in which the land is located in either the corporate limits or extraterritorial jurisdiction.

On July 2, 1995, Subchapter B, Chapter 232, Texas Local Government Code went into effect. This law greatly increases the requirements for subdividing land located outside of most municipal city limits in El Paso. This law supersedes the County's requirements where it is applicable. It is recommended that you check with the County Road and Bridge Department to see if land planned for a subdivision is located in an area affected by the law. If your land is any type of division of land into four or more lots. You should also get professional advice and assistance before selling any land in the affected area that you divided into four or more lots before the law became effective.

COUNTY OF EL PASO

SUBDIVISION IMPROVEMENT DESIGN STANDARDS

- SECTION I DRAINAGE & DRAINAGE STRUCTURES
- SECTION II STREETS & PAVING
- SECTION III SIDEWALKS & DRIVEWAYS
- SECTION IV GUARDRAILS & GUARDPOSTS

ALL plans and specifications submitted to the County Engineer for Subdivision Improvements must be signed by a professional Civil Engineer registered in the State of Texas and his seal must be affixed

For material specifications, "TEXAS HIGHWAY DEPARTMENT, 1982 Standard Specifications For Construction Of Highways, Streets And Bridges" shall govern

SECTION I

DRAINAGE & DRAINAGE STRUCTURES

TITLE	NO.
DRAINAGE PLANS.....	D-1
RETENTION BASIN DESIGN.. (PLAN).....	D-2
RETENTION BASIN DESIGN.. (SPECIFICATIONS).....	D-3 & D-4
DETENTION BASIN DESIGN.. (PLAN).....	D-5
DETENTION BASIN DESIGN.. (SPECIFICATIONS).....	D-6 & D-7
RAINFALL CURVES..... (CHART FOR WATERSHEDS OVER 200 ACRES).....	D-8
RUN-OFF COEFFICIENTS TABLE.....	D-9
SPILLWAY DESIGN CHART.....	D-10
ROUGHNESS COEFFICIENTS TABLE.....	D-11
OVERLAND FLOW TIME CHART.....	D-12
RAINFALL CURVES CHART (DURATION - INTENSITY).....	D-13
MANHOLE RING	D-14
MANHOLE COVER.....	D-15
STANDARD MANHOLE.. (CONICAL).....	D-16
STANDARD MANHOLE.. (PRECAST).....	D-17
STANDARD MANHOLE.. (SPECIFICATIONS).....	D-18
GRATE & FRAME FOR DROP INLETS.....	D-19
DROP INLET CURB & GRATE.....	D-20
TRENCH BEDDINGS FOR CIRCULAR PIPES.....	D-21
STORM DRAIN LATERAL PIPE CONNECTIONS.....	D-22
CONCRETE PIPE COLLAR.....	D-23
FLUME.....	D-24
FLUME DESIGN.....	D-25
FLUME AT SIDEWALK AREA.....	D-26
CONCRETE CHANNEL TYPE I.....	D-27
CONCRETE CHANNEL TYPE II.....	D-28
CHANNEL LINING AT PIPE DISCHARGE.....	D-29 & 30
MAINTENANCE STRUCTURES AT USBR DITCH CROSSINGS.....	D-31
DEBRIS TRAP AT USBR DITCH CROSSINGS.....	D-32
IRRIGATION STRUCTURES AT USBR DITCH CROSSINGS.....	D-33
WARNING SIGN PONDING AREAS.....	D-34
PERCOLATION TESTS.....	D-35



EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

D

DRAINAGE PLANS

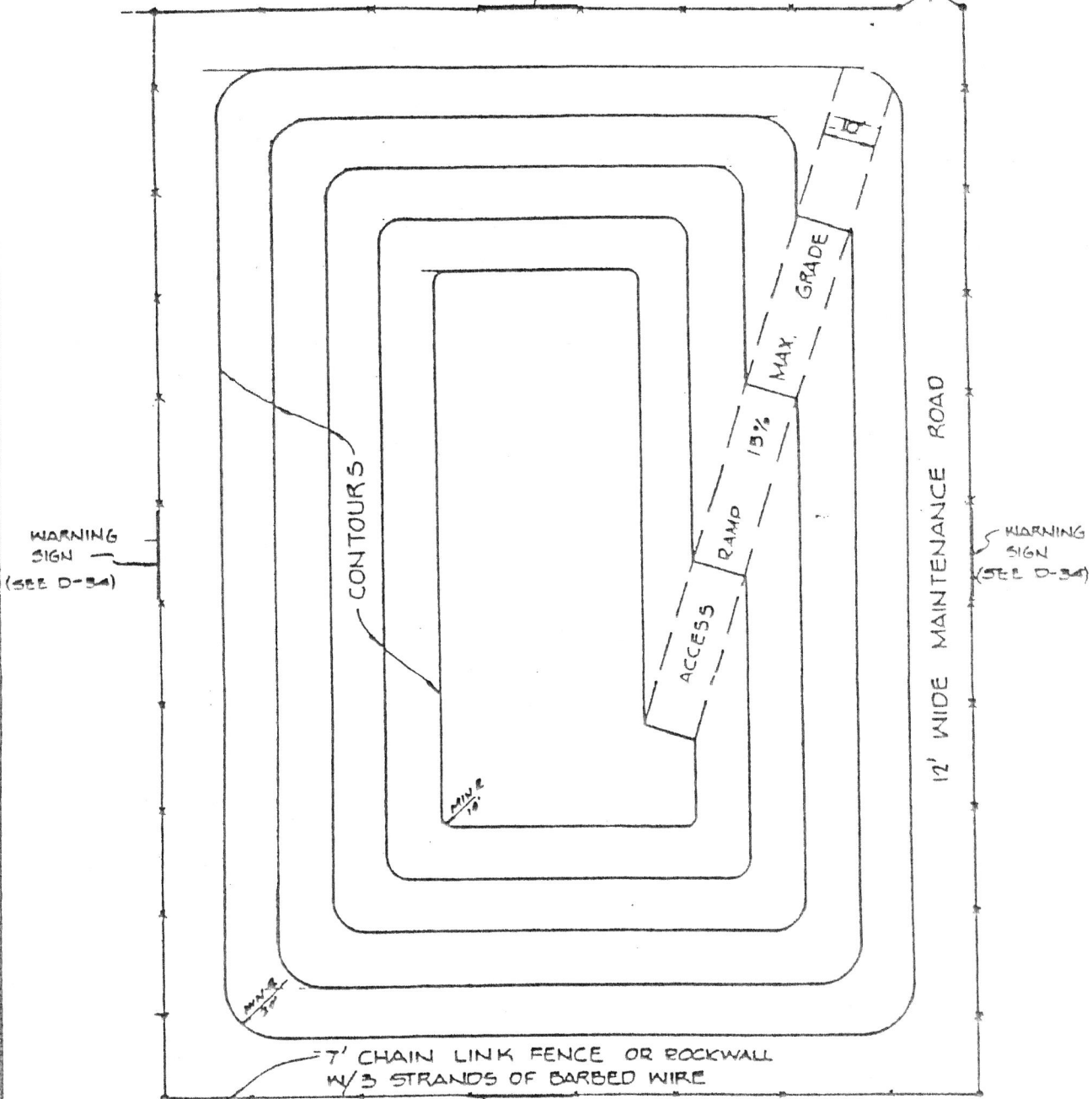
DRAINAGE PLANS SHALL BE SUBMITTED AS PART OF THE SUBDIVISION PLANS.

DRAINAGE PLANS SHALL CONSIST OF THE FOLLOWING:

- A. 1. A TOPOGRAPHIC MAP OF APPROPRIATE SCALE, SHOWING EXTERIOR DRAINAGE INTO THE SUBDIVISION AND THE DISPOSITION OF RUNOFF FROM THE SUBDIVISION.
2. A TOPOGRAPHIC MAP OF APPROPRIATE SCALE, SHOWING EXISTING AND PROPOSED SURFACE FLOWS WITHIN THE SUBDIVISION; EXISTING AND PROPOSED DRAINAGE CONDUITS AND STRUCTURES; RUNOFF DESIGN CRITERIA; AND THE AVERAGE ELEVATION OF THE WATER TABLE IF THE SUBDIVISION IS LOCATED IN VALLEY AREAS.
3. COMPLETE CONSTRUCTION PLANS AND DETAILS OF PROPOSED DRAINAGE CONDUITS AND STRUCTURES INCLUDING DRAINAGE STRUCTURES TO BE EXTENDED, ALTERED OR RECONSTRUCTED.
- B. A DRAINAGE REPORT CONSISTING OF THE DESIGN METHODS FOR ESTIMATING RUNOFFS AS INDICATED BY APPROVED POLICIES AND REQUIREMENTS OF THE C.O. ENGINEER; HYDRAULIC DATA FOR DRAINAGE CONDUITS AND STRUCTURES; REASONS FOR ANY DEVIATION FROM APPROVED POLICIES; AND ANY INFORMATION PERTINENT TO DRAINAGE IN THE SUBDIVISION.



WARNING 12' MIN. DOUBLE SWING
SIGN VEHICULAR GATE



WARNING SIGN
(SEE D-34)

WARNING SIGN
(SEE D-34)

7' CHAIN LINK FENCE OR ROCKWALL
W/3 STRANDS OF BARBED WIRE

WARNING SIGN SEE DETAIL D-34

NOTE:

CHAIN LINK FENCE, ROCK OR
MASONRY WALL REQUIRED AROUND
PERIMETER OF BASIN.

RETENTION

BASIN



EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

RETENTION BASIN

DEFINITION: A RETENTION BASIN IS A STORM WATER POND WHERE THE RESERVOIR HAS NO GRAVITY OUTLET AND HOLDS ALL RUNOFF FROM THE DESIGN STORM.

DESIGN CRITERIA: THE DESIGN STORM FOR PONDING SHALL BE A 4" RAINFALL IN 3 HOURS OVER AN AREA OF 200 ACRES OR LESS. (FOR AREAS LARGER THAN 200 ACRES, SEE NO. D-8).

TOTAL RUNOFF FORMULA: $Q_t = \frac{ARC}{12}$

Q_t = TOTAL RUNOFF IN ACRE FEET

A = TOTAL WATERSHED AREA IN ACRES (100%)

R = RAINFALL IN INCHES

C = RUNOFF FACTOR (SEE NO. D-9).

RESERVOIR SHALL HAVE A STORAGE CAPACITY EQUAL TO 100% OF THE TOTAL RUNOFF PLUS AN EMERGENCY CAPACITY EQUAL TO 25% OF THE TOTAL RUNOFF. ALSO, AN ADDITIONAL CAPACITY FOR A 10 YEAR VOLUME OF SILT IS NECESSARY. THE EMERGENCY CAPACITY CAN BE WITHIN THE POND, EXTEND INTO THE SURROUNDING AREA WITH THE HIGH WATER TO BACK OF THE LOWEST SIDEWALK, UNDERGROUND THROUGH PERCOLATION OR ANY COMBINATION THEREOF.

A TEN YEAR VOLUME OF SILT AND DEBRIS STORAGE SHALL BE ADDED TO THE RESERVOIR CAPACITY AS FOLLOWS:

<u>TYPE OF AREA</u>	<u>VOLUME/ACRES OF WATERSHED/10 YEARS</u>
MOUNTAINOUS	0.003 AC-FT/AC.
ALLUVIAL AND OUTWASH FANS	0.006 AC-FT/AC.
OTHER: SAND AND SILT	0.012 AC-FT/AC.

* SEE D-35 FOR PERCOLATION TESTS



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

D-3

RESERVOIR DESIGN:

MAXIMUM SIDE SLOPES OF THE RESERVOIR SHALL BE 2 TO 1. FOR STEEPER SLOPES THE DESIGNER SHALL PROVIDE A SOIL TEST REPORT PROVING THAT THE EXISTING SOIL WILL HOLD ITS DESIGNED SLOPE.

FOR SLOPES STEEPER THAN 8 1/3: 1, A 7 FOOT FENCE (CHAIN LINK OR ROCK OR COMBINATION THEREOF) WITH 3 STRANDS OF BARBED WIRE WILL BE REQUIRED AROUND THE RESERVOIR INCLUDING A 12 FOOT (MINIMUM) DOUBLE SWING VEHICULAR GATE APPROPRIATELY LOCATED FOR ACCESS INTO THE BASIN AREA.

FOR RESERVOIRS IN VALLEY AREAS, BORING TESTS SHALL BE REQUIRED TO OBTAIN THE DEPTH OF THE WATER TABLE AND THE PERCOLATION * PROPERTIES OF THE SOIL. THE BOTTOM OF THE RESERVOIR SHALL BE A MINIMUM OF 12 INCHES ABOVE THE HIGH WATER TABLE.

ACCESS INTO THE RESERVOIR SHALL BE PROVIDED FOR CLEANING AND MAINTENANCE PURPOSES.

D-33 FOR PERCOLATION TESTS



NOTE 1. 7' CHAINLINK FENCE OR 6' ROCKWALL W/3 STRANDS OF BARBED WIRE, CINDER BLOCK (C.M.U.) OR BRICK WALL ADJACENT TO SUBDIVISION, REQUIRED BY BUILDER.

NOTE 2. WHEN PONDING AREA IS ADJACENT TO CO. PROPERTY OR CO. R.O.W. CHAINLINK OR ROCKWALL MUST BE CONSTRUCTED BY DEVELOPER.

WARNING SIGN

WARNING SIGN IN BLACK AND WHITE LETTERING, SEE D-34 (TYPICAL)

WARNING SIGN

12' MAINTENANCE ROAD

CONTOURS

OUTLET STRUCTURE (DETAIL REQUIRED)

ACCESS RAMP 15% MAX. GRADE

WARNING SIGN

12' MIN DOUBLE SWING VEHICULAR GATE. MAKE RAMP OPPOSITE THE GATE.

DAM

WARNING SIGN

SPILLWAY AS REQUIRED

RETARDS AND RIPRAP

OUTLET CONDUIT AS REQUIRED W/ GATE VALVE

DETENTION BASIN



EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

DETENTION BASIN

DEFINITION: A DETENTION BASIN IS A STORM WATER POND WHERE THE RESERVOIR IS PROVIDED WITH A GRAVITY OUTLET CONDUIT AND AN OVERFLOW SPILLWAY.

DESIGN CRITERIA: THE DESIGN STORM FOR PONDING SHALL BE A 4" RAINFALL IN 3 HOURS OVER AN AREA OF 200 ACRES OR LESS. (FOR AREAS LARGER THAN 200 ACRES, SEE NO. D-8, EXAMPLE INCLUDED)

TOTAL RUNOFF FORMULA: $Q_t = \frac{ARC}{12}$

- Q_t = TOTAL RUNOFF IN ACRE FEET
- A = TOTAL WATERSHED AREA IN ACRES (100%)
- R = RAINFALL IN INCHES
- C = RUNOFF FACTOR (SEE NO. D-9)

THE RESERVOIR SHALL HAVE A STORAGE CAPACITY EQUAL TO 100% OF THE TOTAL RUNOFF, NOT INCLUDING ANY OUTLET FLOW, AND AN ADDITIONAL CAPACITY FOR A 10 YEAR VOLUME OF SILT.

A TEN YEAR VOLUME OF SILT AND DEBRIS STORAGE SHALL BE ADDED TO THE RESERVOIR CAPACITY AS FOLLOWS:

<u>TYPE OF AREA</u>	<u>VOLUME/ACRES OF WATERSHED/10 YEARS</u>
MOUNTAINOUS	0.003 AC/FT.
ALLUVIAL AND OUTWASH FANS	0.006 AC/FT.
OTHER: SAND AND SILT	0.012 AC/FT.



RESERVOIR DESIGN:

1. FREEBOARD: A MINIMUM FREEBOARD OF FIVE FEET SHALL BE REQUIRED.
2. SPILLWAY: AN EMERGENCY CONCRETE SPILLWAY SHALL BE REQUIRED WITH A CAPACITY EQUAL TO THE PEAK DISCHARGE OF THE DESIGNED STORM. (SEE NOTE D-10 & BELOW) DEPTH OF FLOW OVER CREST OF SPILLWAY SHALL BE 2 FEET MAXIMUM.
3. MAXIMUM SIDE SLOPES OF THE RESERVOIR SHALL BE 2 TO 1. FOR STEEPER SLOPES THE DESIGNER SHALL PROVIDE A SOIL TEST REPORT PROVING THAT THE EXISTING SOIL WILL HOLD ITS DESIGNED SLOPE.
4. FOR SLOPES STEEPER THAN 8 1/3: 1, A 7-FOOT FENCE (CHAIN LINK OR ROCK OR COMBINATION THEREOF) WITH 3 STRANDS OF BARBED WIRE WILL BE REQUIRED AROUND THE RESERVOIR INCLUDING A 12-FOOT (MINIMUM) DOUBLE SWING VEHICULAR GATE APPROPRIATELY LOCATED FOR ACCESS INTO THE BASIN AREA. THE FENCE SHALL BE PLACED AROUND THE OUTSIDE BOTTOM OF THE SPILLWAY SO THAT IN CASE OF OVERFLOW THE FENCE WILL NOT OBSTRUCT THE FLOW.
5. ACCESS INTO THE RESERVOIR SHALL BE PROVIDED FOR CLEANING AND MAINTENANCE PURPOSES.
6. AN OUTLET SHALL BE PROVIDED TO EMPTY THE RESERVOIR WITHIN 48 HOURS AFTER THE STORM. A NON-RISING STEM GATE VALVE SHALL BE PROVIDED FOR THE OUTLET.

DAM DESIGN: THE DESIGN OF EARTH DAMS SHALL BE BY ACCEPTED ENGINEERING PRACTICE WITH A MINIMUM OF LEAKAGE FROM THE RESERVOIR.

*EXAMPLE FOR USING CURVES ON D-10, FIND Q GIVEN A DURATION TIME OF 2 HOURS, AREA=2000 ACRES, C=0.2, I FROM TOP CHART=1.6"/HOUR, SINCE AREA=2000 ACRES MULTIPLE FACTOR BY 0.9 FROM BOTTOM CHART, USING RATIONAL FORMULA Q=AIC.
 $Q = 2000 \times 1.6 \times 0.2 \times 0.9 = 576 \text{ CFS}$



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

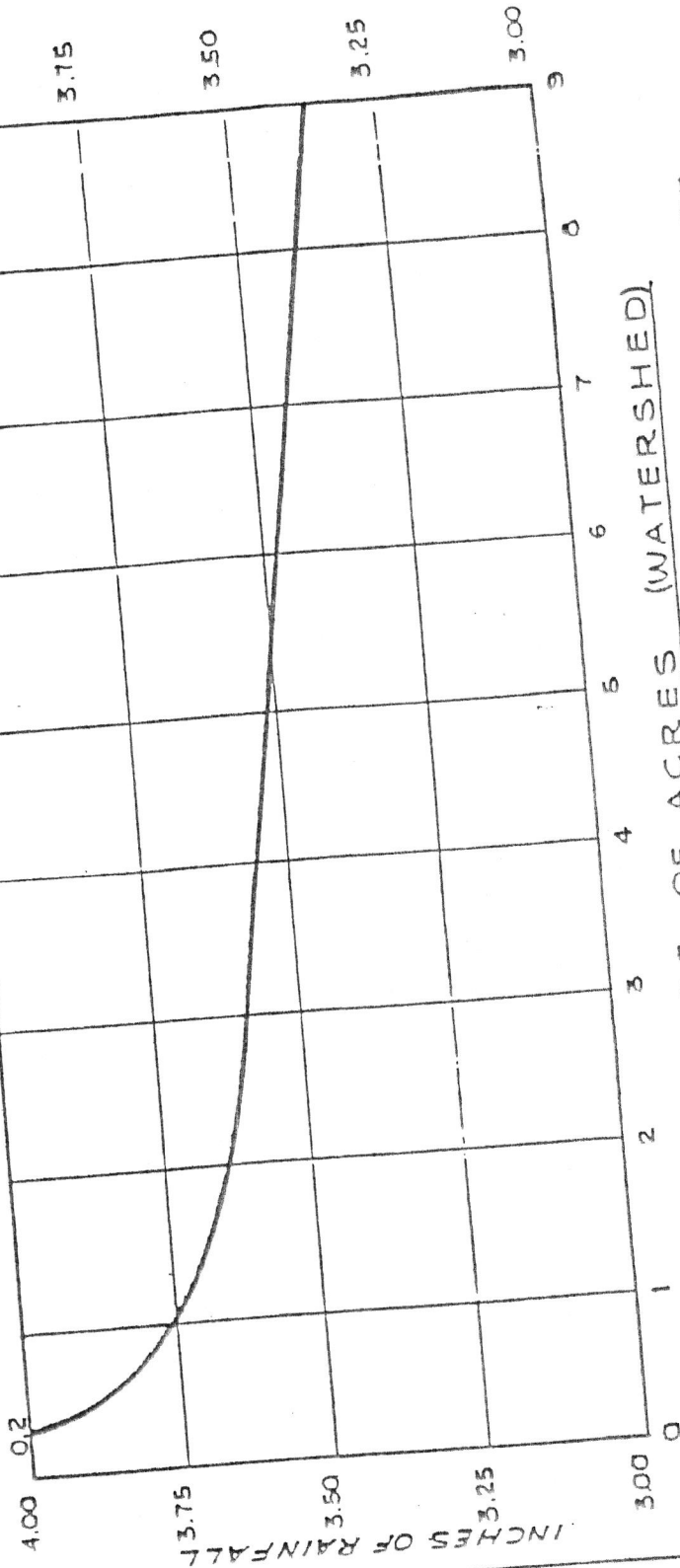


EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

D-8

VALUES OF 'R' (RAINFALL) IN FORMULA $Q_1 = \frac{ARC}{12}$

For Watersheds larger than 200 acres



LEGEND

- Q₁ = TOTAL RUNOFF IN ACRES FEET
- A = TOTAL WATERSHED AREA IN ACRES
- R = RAINFALL IN INCHES
- C = RUNOFF FACTOR (SEE NO. D-1)

EXAMPLE FOR USING THIS CURVE

FIND Q₁, GIVEN: A = 2000 ACRES, C = 0.1,
 SINCE THE AREA IS GREATER THAN 200 ACRES
 R = 3.55" (FROM GRAPH)
 $Q_1 = \frac{5000 \times 0.09 \times 0.1}{12} = 194 \text{ AC-FI}$

GUIDELINE OF C (COEFFICIENT) IN FORMULAS

$$Q_{TOTAL} = \frac{ARC}{L} \quad , \quad Q_{RATE} = AIC$$

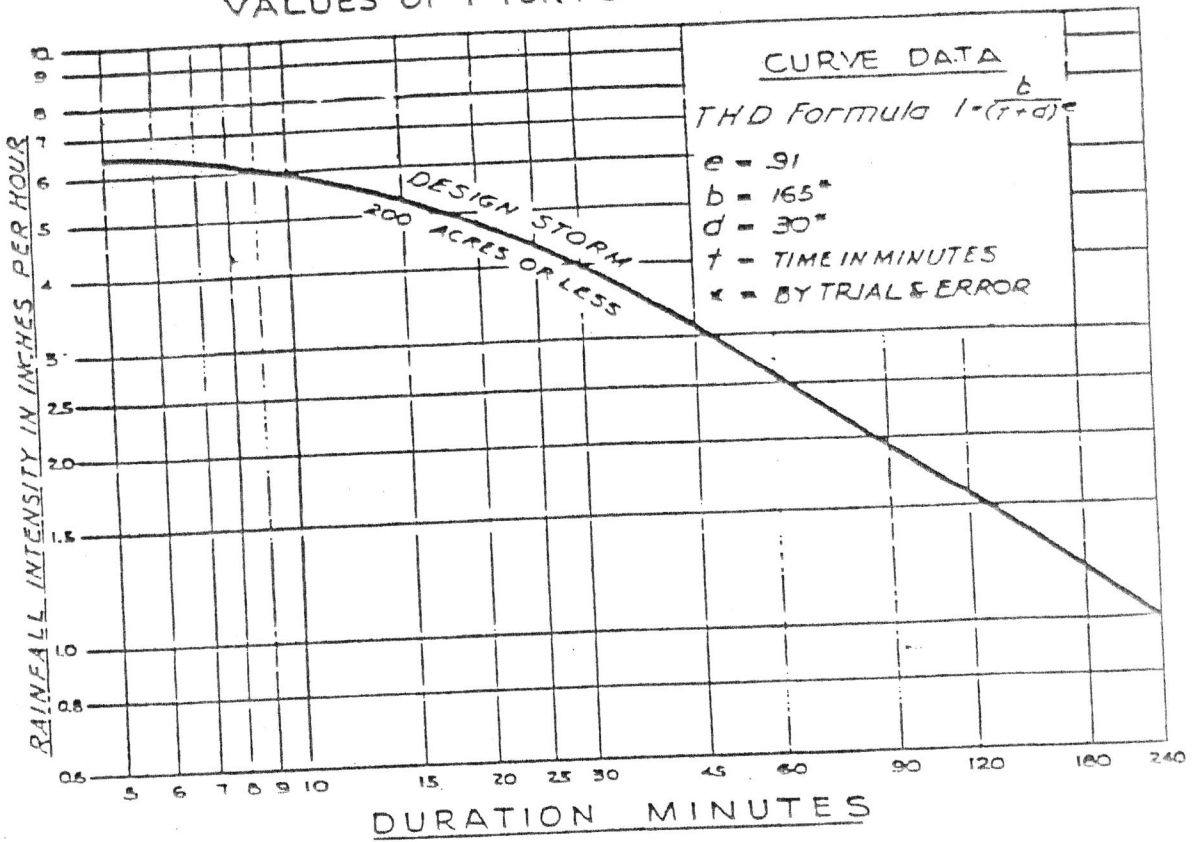
	<u>C</u>
<u>Developed Areas</u>	
Residential*	.50 min.
Commercial & Shopping Centers	.85
Pavement	.90
Parks	.40
Apartments	.75
<u>Undeveloped Areas</u>	
Mountainous	.85
Alluvial & Outwash Slopes	.67
Flat Mesas (Caliche)	.45
Sand Hills & Valleys	.55
Sandy Flat Mesas	.10

- *1. For mountainous, alluvial & outwash slopes with lots draining totally to street, lot grade equal to or less than 1% and street grades equal to or less than 5%.
2. For flat mesas, sandhills and valleys, only, drainage area may be determined by adding the area in acres of all street right-of-ways within the subdivision plus 60% of the remaining area, in acres, in the subdivision.

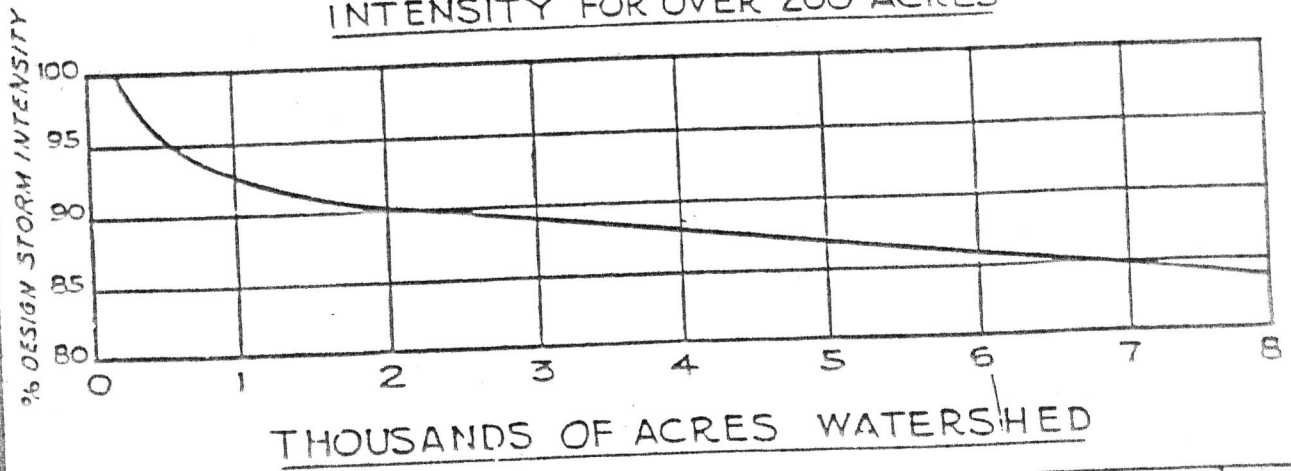
Note:
This table to be used only as a guide line for Runoff Coefficients



VALUES OF "T" FOR PEAK DISCHARGE Q₁AIC



INTENSITY FOR OVER 200 ACRES



**EL PASO COUNTY
 SUBDIVISION DESIGN STANDARDS**

VALUES OF n (Coefficient of Roughness) IN MANNINGS FORMULA

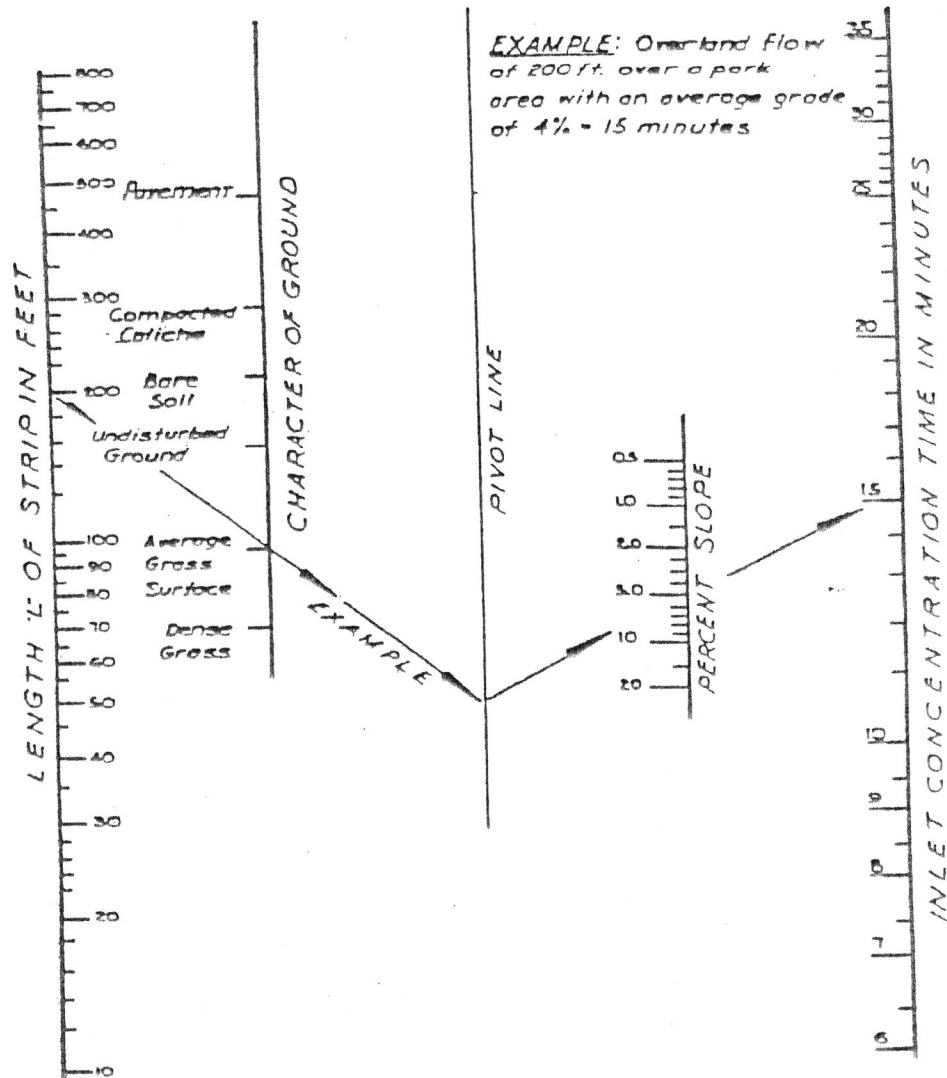
$$Q = A \times \frac{1.49}{n} \times R^{2/3} \times S^{1/2}$$

SURFACE

	<u>n</u>
Concrete Pipe	0.012*
Corrugated Metal Pipe	0.021*
Cast Iron Pipe	0.012*
Vitrified Clay Pipe	0.013*
Concrete Culvert	0.013
Concrete Riprap	0.013
Grouted Rock Riprap	0.018
Ungrouted Rock Riprap	0.020
Concrete Gutter	0.015
Asphalt Pavement	0.016
Earth Channel, Straight & Uniform	0.017 to 0.0225
Earth Channel, Weeds & Grass	0.020 to 0.033
Arroyo, Some Weeds & Stones	0.025 to 0.050
Arroyo, Winding/Weed/Stones	0.040 to 0.125

** Good Alignment and Smooth Joints*





This chart to be used on upper extremity of watershed where the flow is unconcentrated for distances not greater than 800 feet. For concentrated flows such as gutters or channels velocities should be determined by Manning's Formula.

FOR NATURAL ARROYOS NOT WELL DEFINED USE THE FOLLOWING VELOCITIES

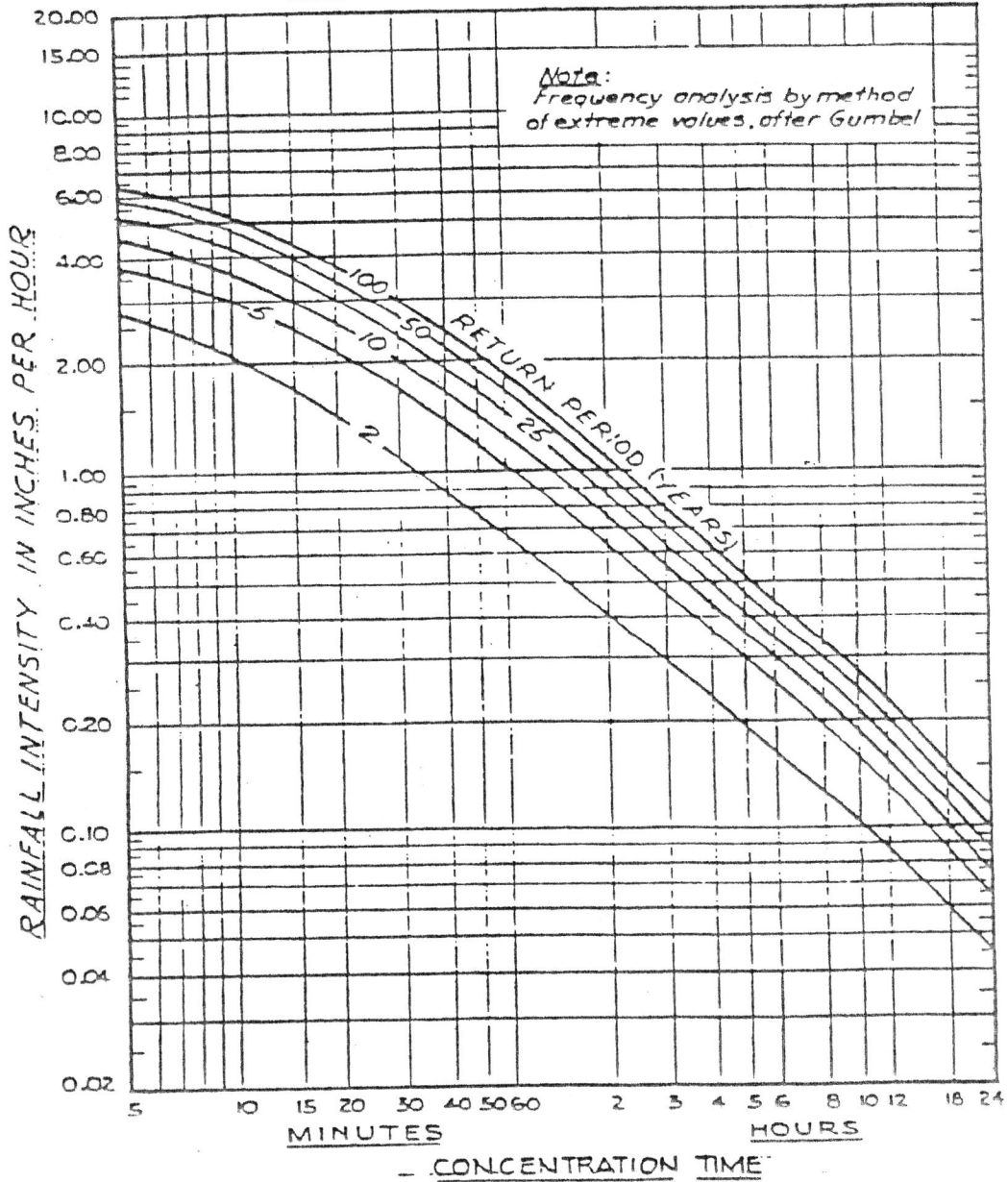
Watershed Area	0%-3% slope	3%-7% slope	7%-11% slope	11%-15% slope	over 15%
0-5 acres	1 ft/sec	3 ft/sec	5 ft/sec	8 ft/sec	12 ft/sec
5-20 acres	2 ft/sec	4 ft/sec	7 ft/sec	10 ft/sec	15 ft/sec

Over 20 acres determine values by Manning's Formula

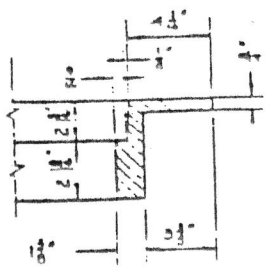
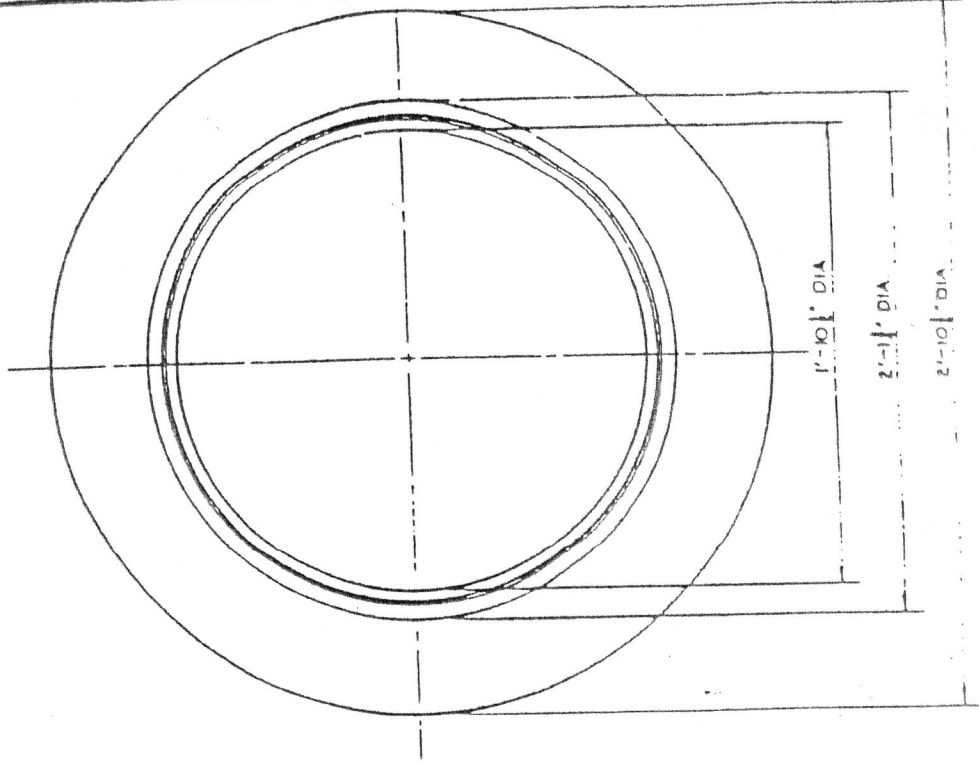


EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

EL PASO, TEXAS 1906-1948



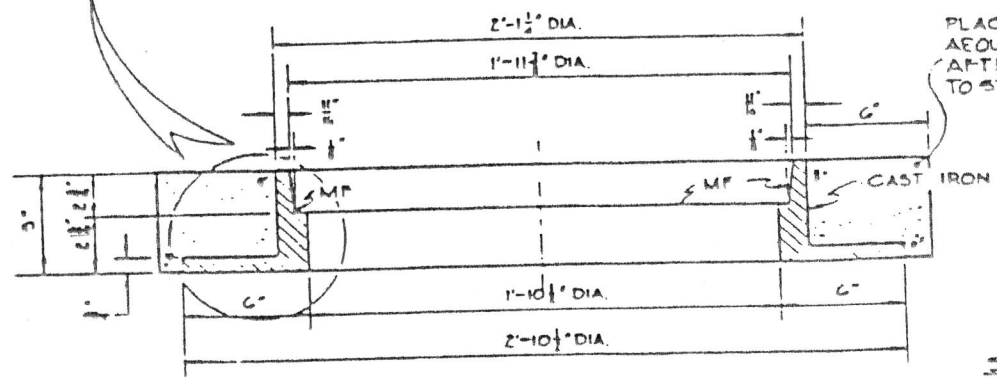
EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS



DETAIL OF INVERTED
MANHOLE RING.

NOTE:

1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH & VOID OF AIR HOLES.

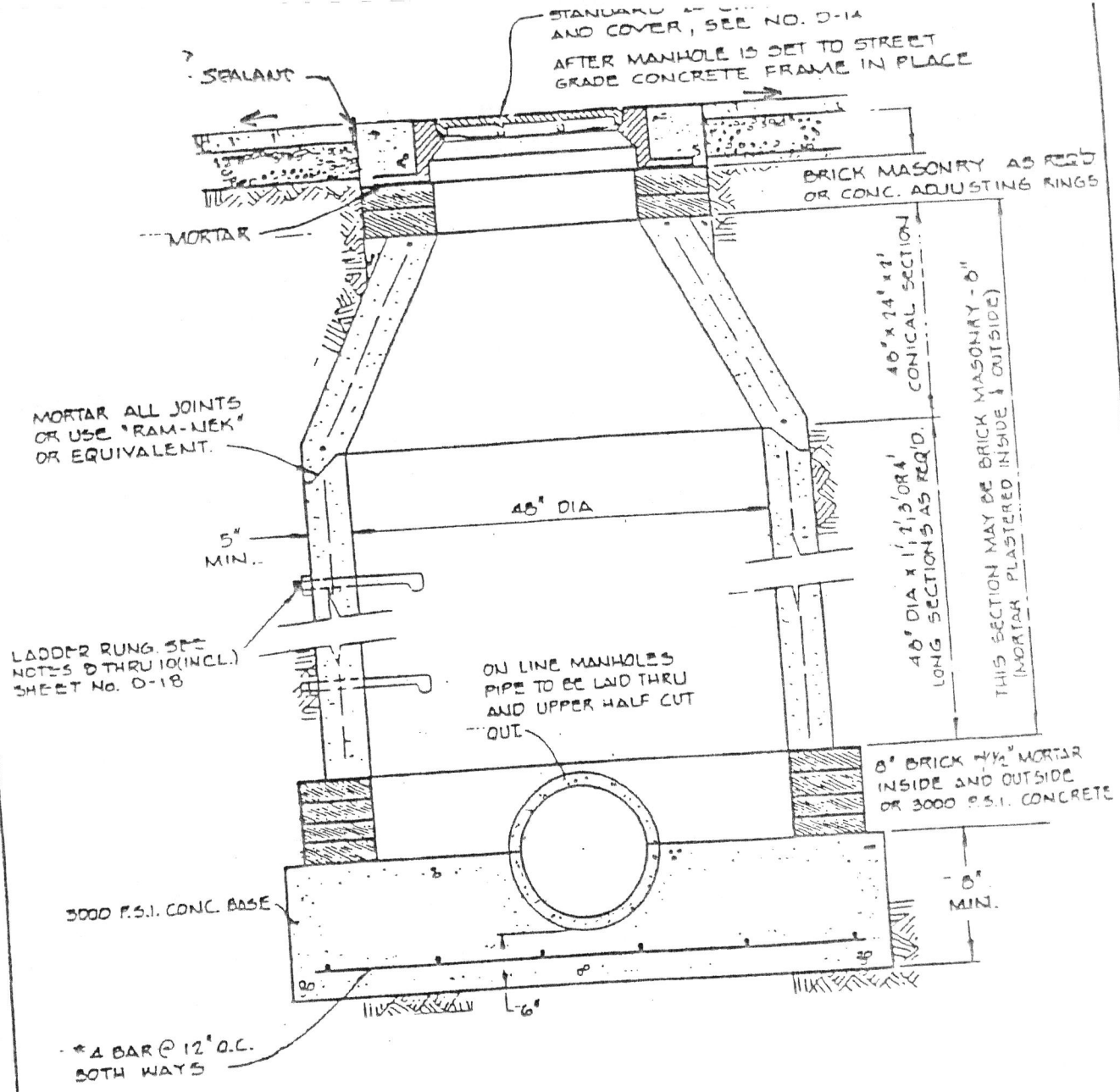


PLACE CONCRETE AROUND MANHOLE AFTER FRAME IS SET TO STREET GRADE.

SCALE: 2" = 1'-0"
WT - 165"



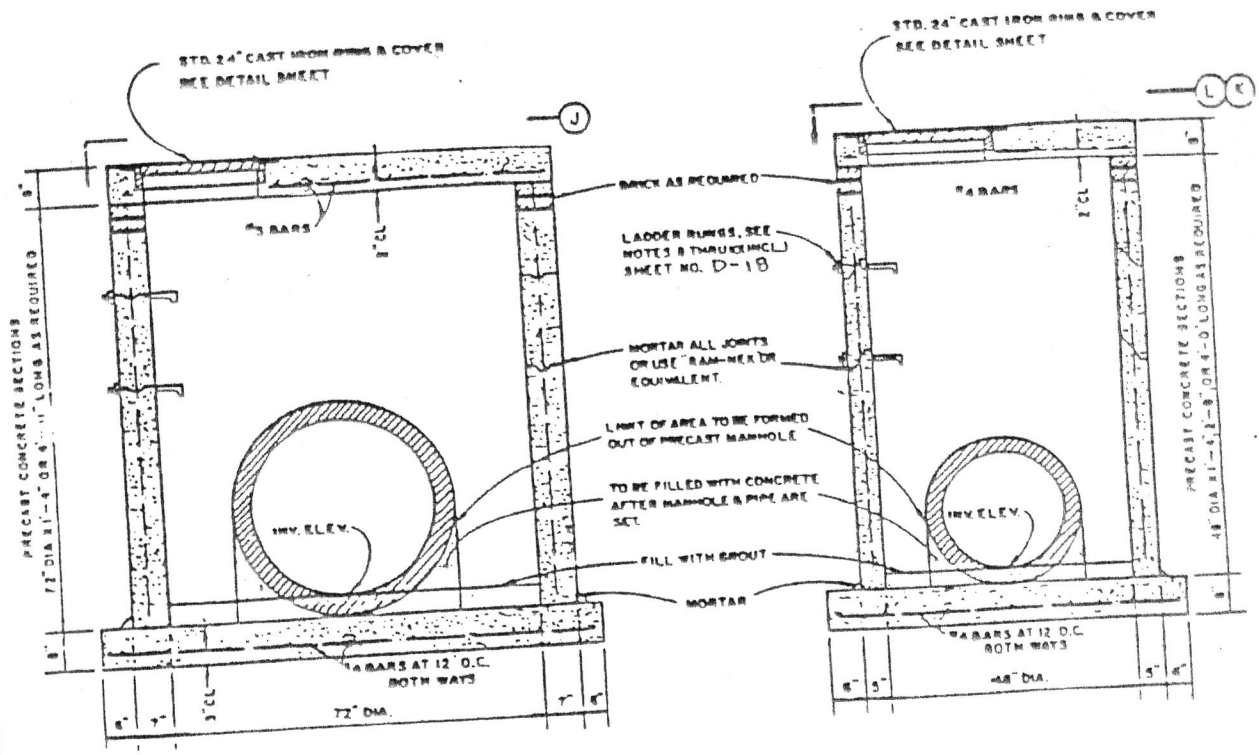
**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



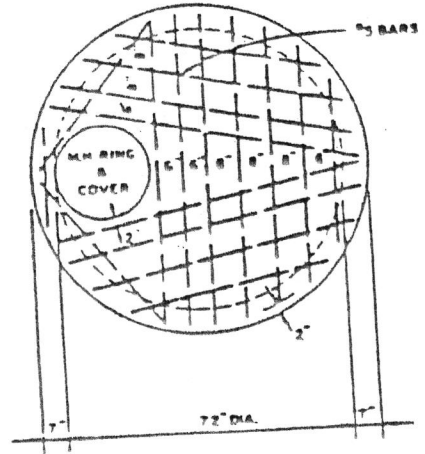
TYPICAL MANHOLE SECTION



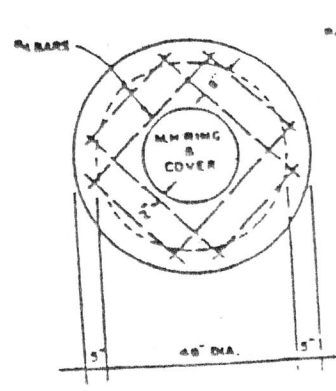
**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



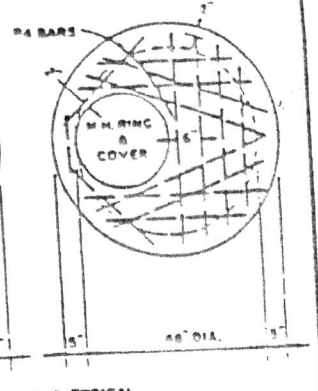
TYPICAL PRECAST MANHOLE SECTIONS



SECTION — J



SECTION — L



SECTION — K

DIMENSIONS TYPICAL

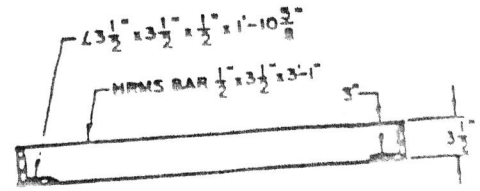
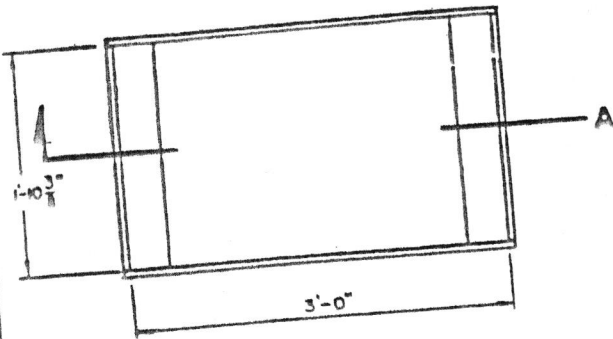
No Scale



STANDARD MANHOLE

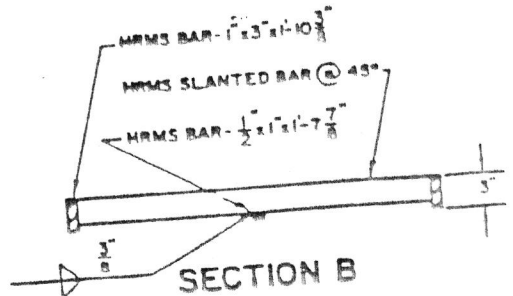
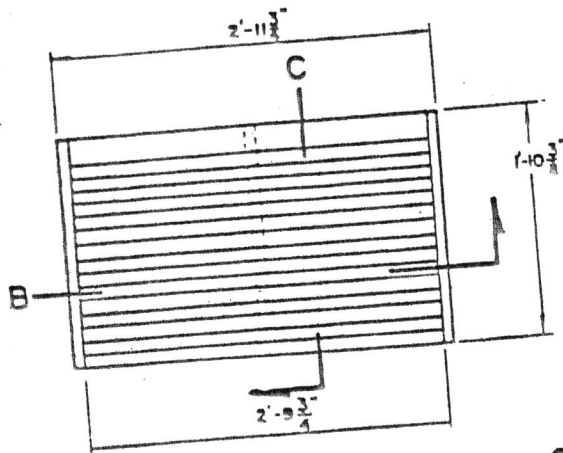
1. THE PRE-CAST MANHOLE RISER AND CONICAL SECTIONS SHALL BE 48" DIAMETER OR 72" DIAMETER OF REINFORCED CONCRETE AND SHALL CONFORM TO ASTM SPECIFICATIONS C-478.
2. THE CONICAL SECTIONS CAN BE CONCENTRIC OR ECCENTRIC AND SHALL BE ADAPTED TO THE 48" RING AT ONE END AND TO THE COUNTY OF EL PASO STANDARD CAST IRON FRAME AT THE OTHER. ECCENTRIC WHEREVER STEPS ARE REQUIRED.
3. THE FLAT SLABS OPENING SHALL BE CONCENTRIC WHERE NO LADDER RUNGS ARE REQUIRED, AND SHALL BE ADAPTED TO THE 48" OR 72" RING AT ONE END, AND TO THE CO. OF EL PASO STANDARD CAST IRON FRAME AT THE OTHER.
4. THE PRE-CAST CONCRETE SHALL HAVE A MINIMUM ALLOWABLE COMPRESSIVE STRENGTH AT 28 DAYS OF 4000 POUNDS PER SQUARE INCH FOR THE RISER SECTIONS AND FOR THE CONICAL SECTIONS.
5. THE RISER SECTIONS SHALL BE REINFORCED WITH STEEL WIRE MESH 6X6X10X10 AND THE CONICAL SECTION SHALL HAVE 6X6X10X10 STEEL WIRE MESH REINFORCEMENT AND 3/8 ROD AT TOP AND BOTTOM. (SEE ASTM STANDARDS PART 16 - C - 478)
6. THE BASE SHALL BE 3000 P.S.I. CONCRETE POURED ON UNDISTURBED OR THOROUGHLY COMPACTED SUB-BASE.
7. MASONRY TO BE COMMON BRICK LAID UP WITH 1:3 MORTAR.
8. LADDER RUNGS WILL BE REQUIRED IF DEPTH OF MANHOLE EXCEEDS 4 FEET.
9. LADDER RUNGS TO BE OF NON-CORROSIVE MATERIAL CONFORMING TO O.S.E.A. REGULATIONS.
10. THE DISTANCE BETWEEN RUNGS SHALL NOT EXCEED 12" INCHES AND SHALL BE UNIFORM THROUGHOUT THE LENGTH OF LADDER.





SECTION A

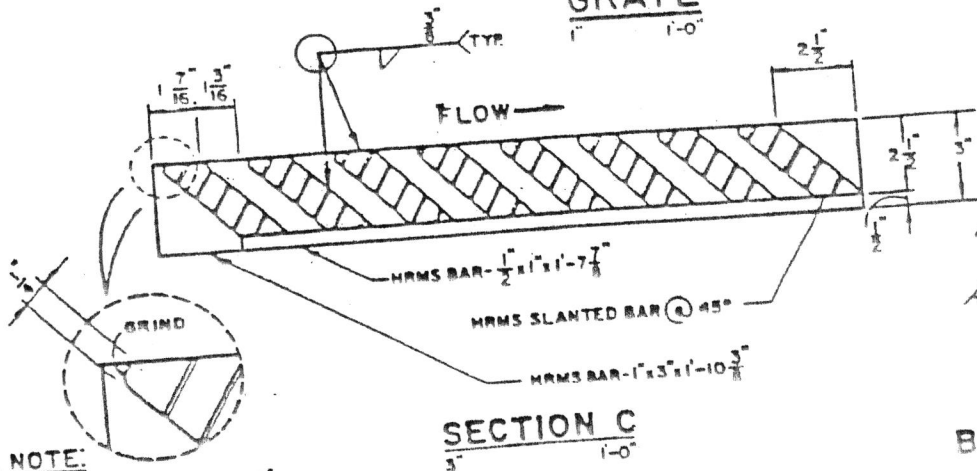
FRAME
1'-0"



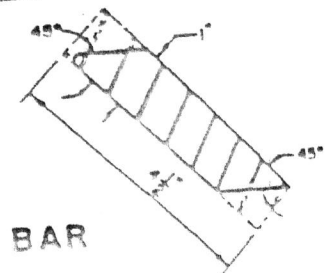
SECTION B

GRATE
1'-0"

ALL WELDED CONSTRUCTION



SECTION C
3"



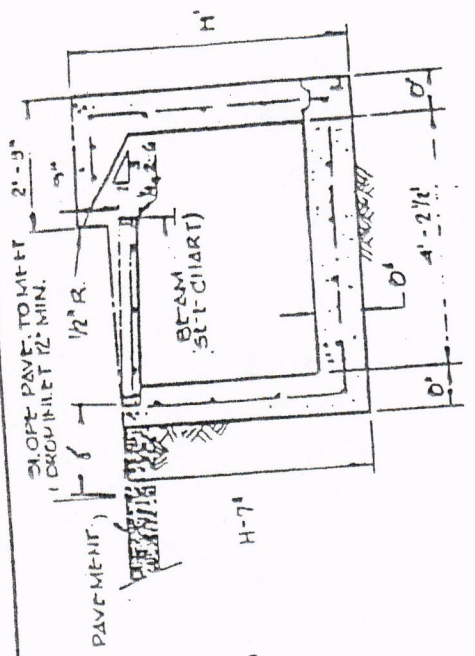
BAR

NOTE:
Round off corners of each slanted bar as shown.



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

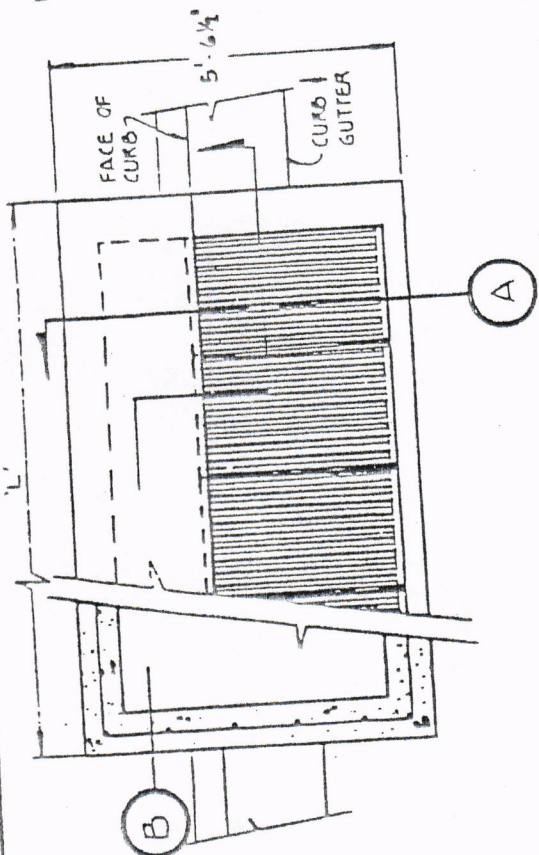
D.



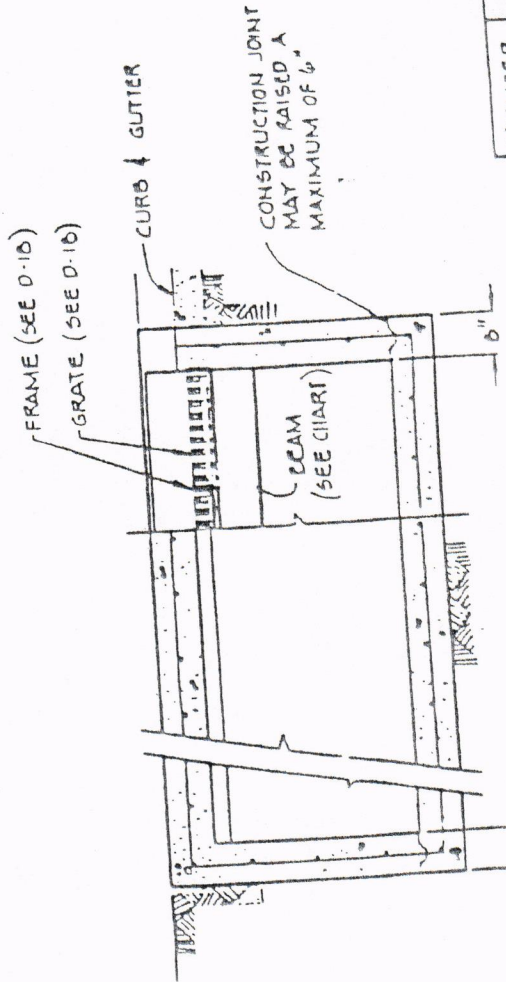
SECTION - A

NOTES:

1. H = 20' MAXIMUM
2. CONCRETE TO BE CLASS C (5000 P.S.I.)
3. USE ANCHOR BOLTS ON FRAME AS REQUIRED
4. GRATE TO BE 1 TO TRAFFIC



SECTION - B

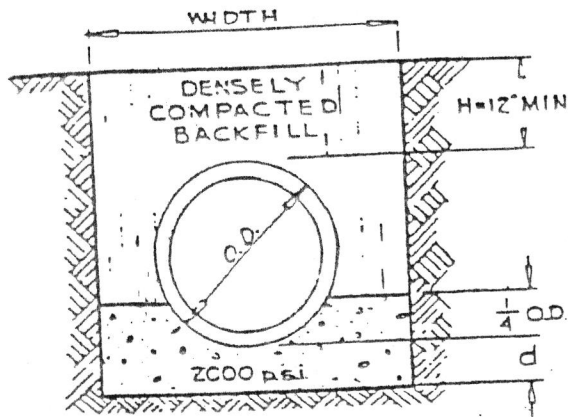


NUMBER OF GRATES	L'	BEAM	
		LENGTH	MINIMUM SIZE'S
1	3'-2 1/8"	2' 0"	W6 x 0.5, S4 x 9.5, C6 x 0.2
2	5'-2 1/4"	4'-0 1/4"	W6 x 12, S5 x 14.75, C7 x 19.0
3	7'-1 1/8"	6'-7 1/8"	W8 x 13, S6 x 17.25, C8 x 13.75
4	9'-1 1/4"	8'-1 1/4"	W8 x 15, S7 x 20, C10 x 15.0
5	11'-1 1/8"	10'-1 1/8"	W12 x 17, S8 x 24.4, C12 x 20



CLASS A

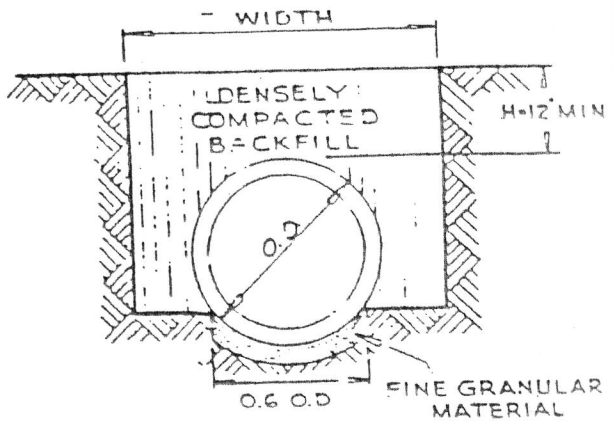
$L_f = 2.8$



CONCRETE CRADLE

CLASS B

$L_f = 1.9$



SHAPED SUBGRADE WITH GRANULAR FOUNDATION

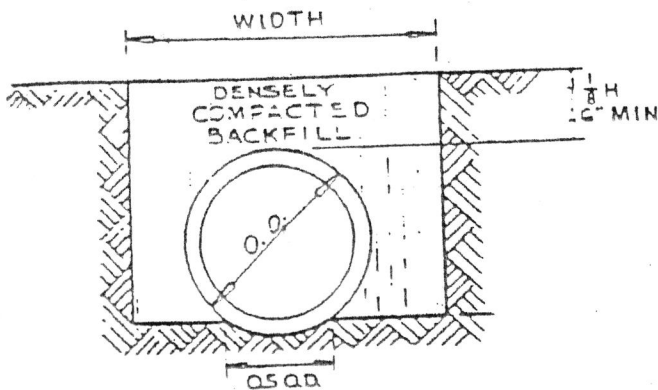
NOTE

For rock or other incompressible materials the trench should be over excavated a minimum of 6" and refilled with granular material. Compact to 95% Density, modified AASHTO method, under proposed or existing roadways.

NO SCALE

CLASS C

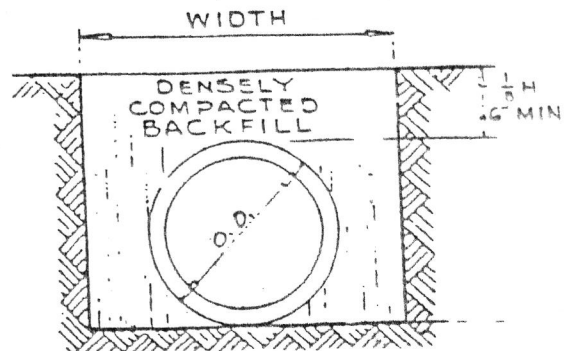
$L_f = 1.5$



SHAPED SUBGRADE

CLASS D

$L_f = 1.1$



FLAT SUBGRADE

Legend

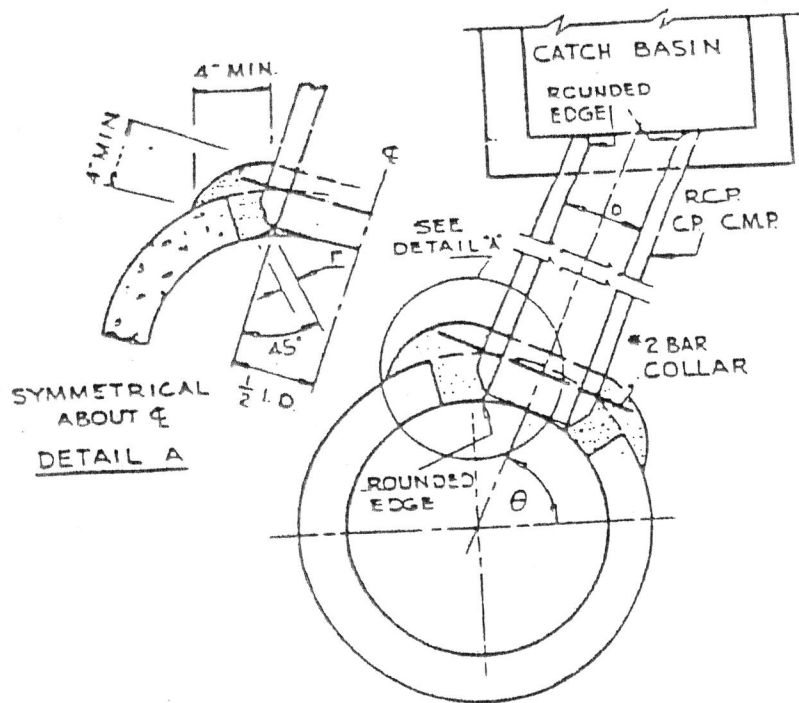
- d = Depth of bedding material below pipe
- O = Inside diameter of pipe
- H = Backfill cover above top of pipe
- O.D. = Outside diameter of pipe

Trench Widths
 For Pipes 42" Dia. or less
 Width = O.D. + 2ft.
 For Pipes over 42" Dia.
 Width = O.D. + 4ft.

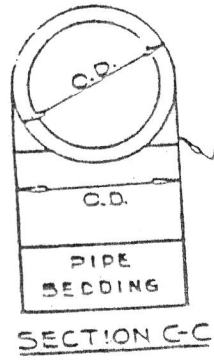
Depth of Bedding Material Below Pipe	
27" & smaller	3"
30" to 60"	4"
66" & larger	6"



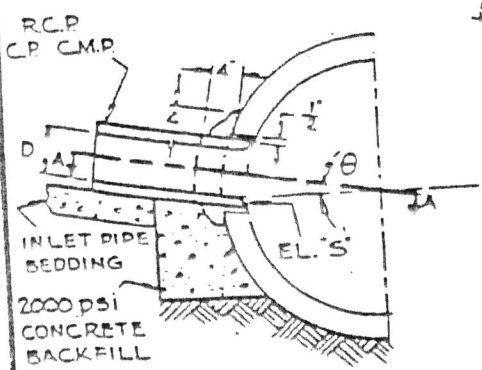
**EL PASO COUNTY
 SUBDIVISION DESIGN STANDARDS**



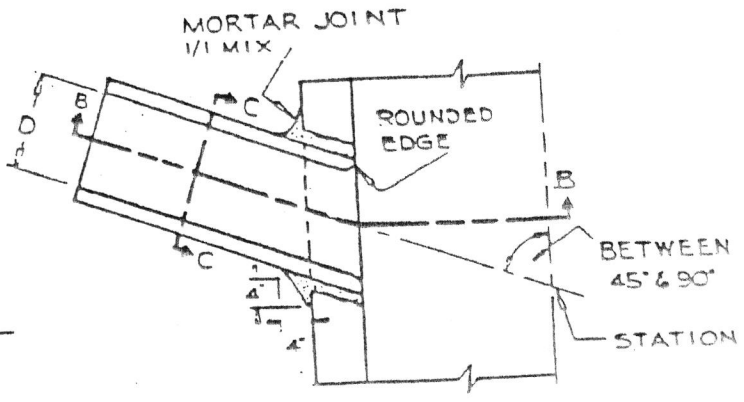
**CATCH BASIN ABOVE
STORM DRAIN
TYPE II**



SECTION C-C



SECTION B-B



**SECTION A-A
SIDE INLET
TYPE I**

NO SCALE

NOTES

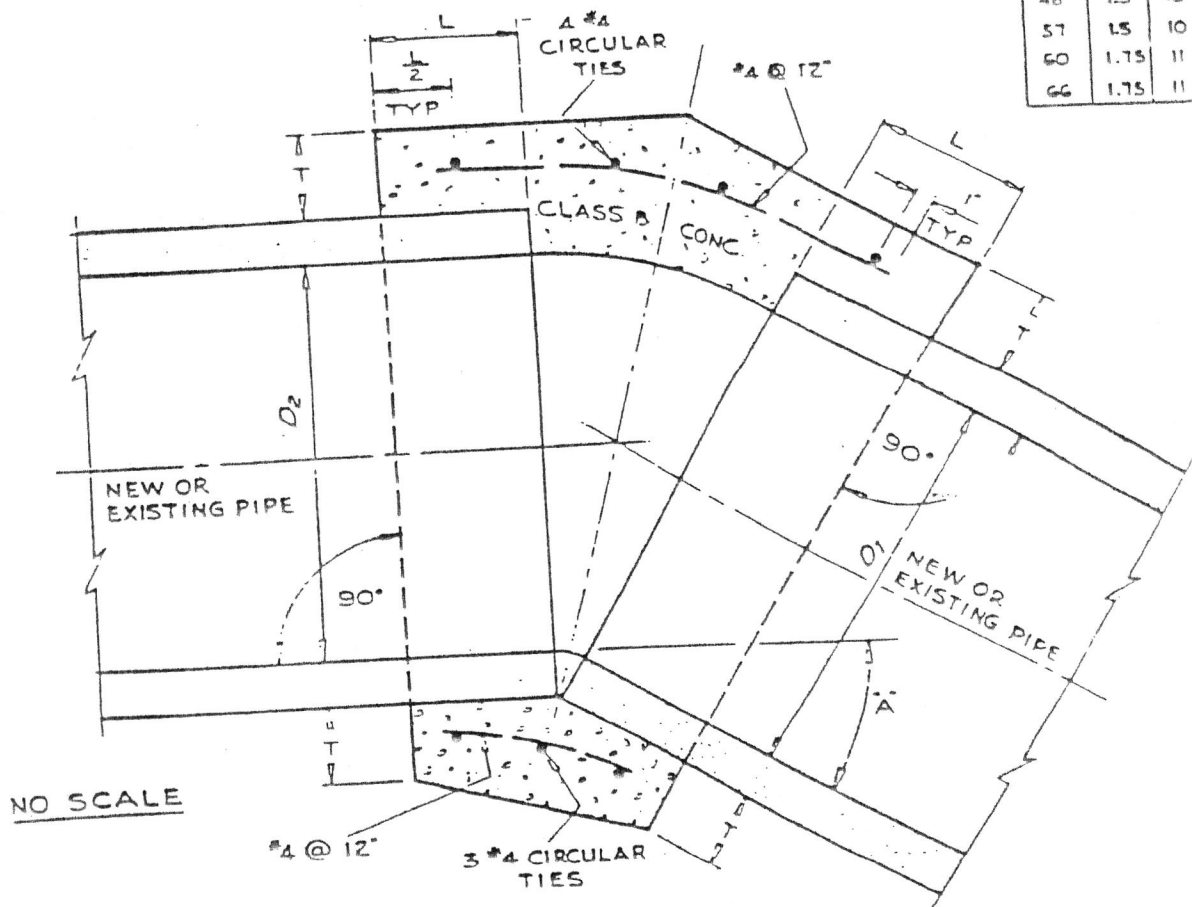
1. 'D' shall be 24" or less. For larger value of 'D' use Man-hole or Junction Structure.
2. In no case shall the outside diameter of the inlet pipe exceed one half the inside of the main storm drain.
3. C of inlet shall be on radius of main storm drain except when elevation 'S' is shown on plans.
4. The minimum opening into the storm drain shall be the outside diameter of the connecting pipe plus 1 inch.
5. If θ is 45° or less use Type I. If θ is greater than 45°, use Type II.
6. Provide for prefabricated Asphaltic or mastic compound and watertight pipe joints.



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

TABLE

D	L	T
12"	1.0'	4"
16	1.0	5
24	1.0	6
36	1.5	8
48	1.5	10
57	1.5	10
60	1.75	11
66	1.75	11

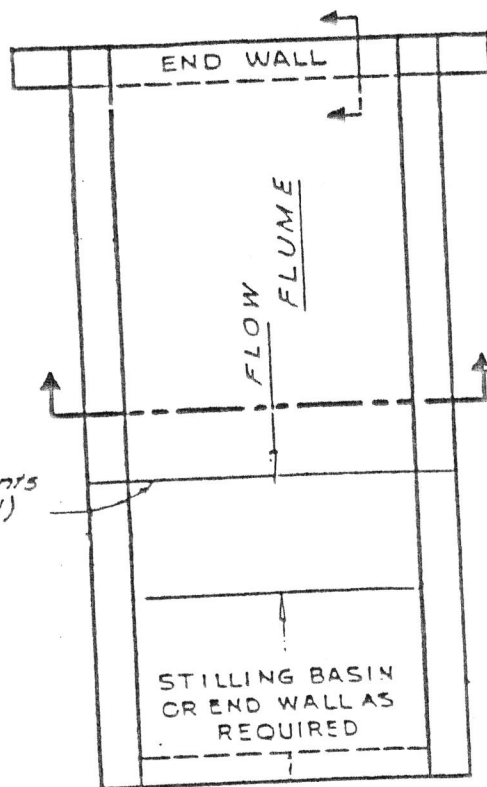


NO SCALE

1. A concrete collar is required where pipes of different diameters or materials are joined, or where the change in alignment or grade exceeds that allowed for an ordinary joint
2. Where pipes of different diameters are joined with a concrete collar, L & T should be those of the larger pipe, D₁ or D₂ whichever is greater
3. For pipe sizes not listed use next size larger
4. Omit reinforcing on pipes 24" or less in diameter
5. Where reinforcing is required the diameter of the circular ties shall be $D + (2 \times \text{wall thickness}) + 8"$
6. Field closures of pipe of the same diameter and without change in grade or alignment shall be made with a concrete collar

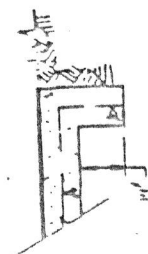


**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

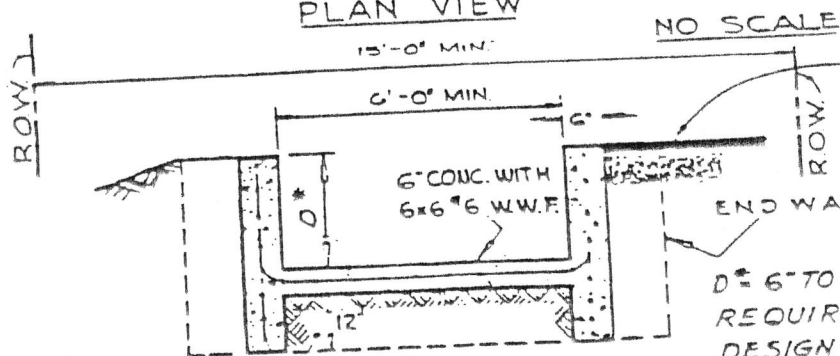


Provide for expansion joints with Dowels. (Show Detail)

PLAN VIEW



END WALL DETAIL



All areas between R.O.W. lines must be paved with 2" H.M.A.C. or 3" Conc. or Masonry

D = 6" TO 18" OVER 18" REQUIRES STRUCTURAL DESIGN

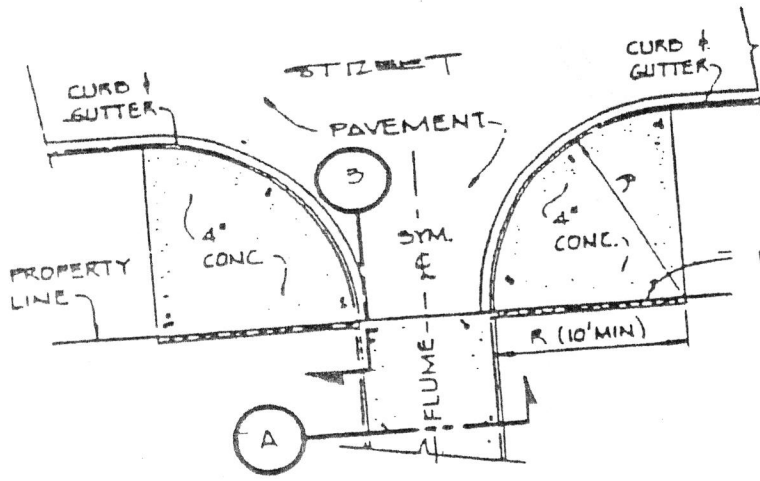
95% COMPACTION MODIF. AASHTO

SECTIONAL VIEW

(3000 PSI) CONCRETE



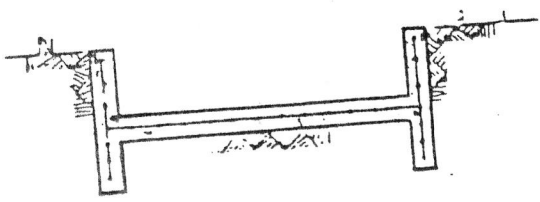
**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



PLAN

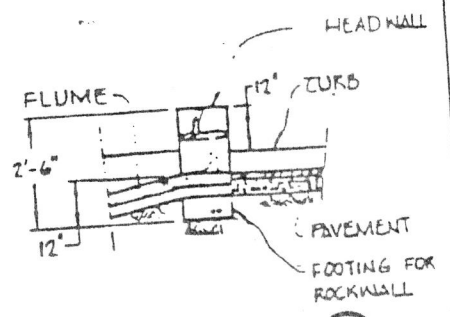
HEAD WALL

1. 12" ROCK WALL W/FOOTING
2. 8" CONC. BLOCK W/FOOTING
3. 6" REINFORCED CONC. #1/6x6 = 6 W.W.F.



SUGGESTED FLUME DESIGN

SECTIONS - (A)



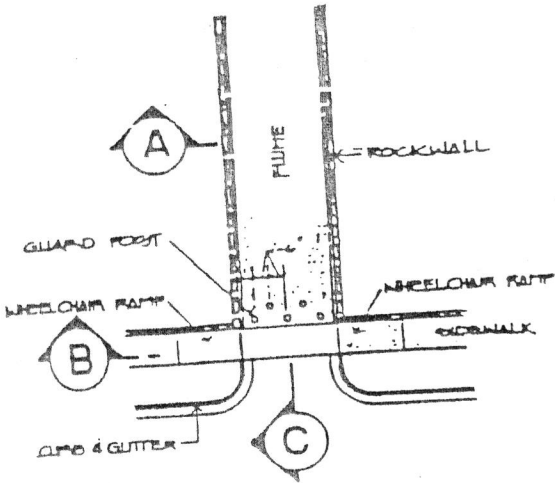
SECTION - (B)

NOTE:

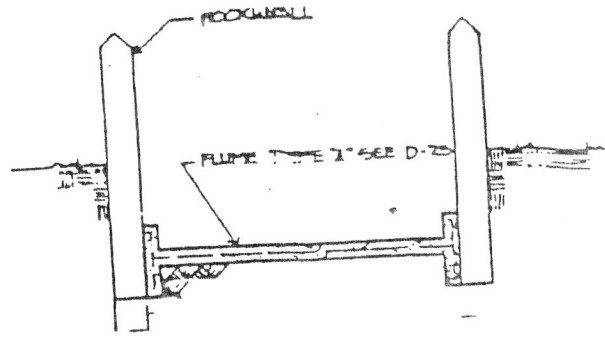
HEAD WALL REQUIRED ON UNDEVELOPED SITES WHERE NO ROCK WALL EXISTS. CUTOFF WALL CAN BE REMOVED OR BUILT UPON WHENEVER ROCK WALLS ARE INSTALLED.



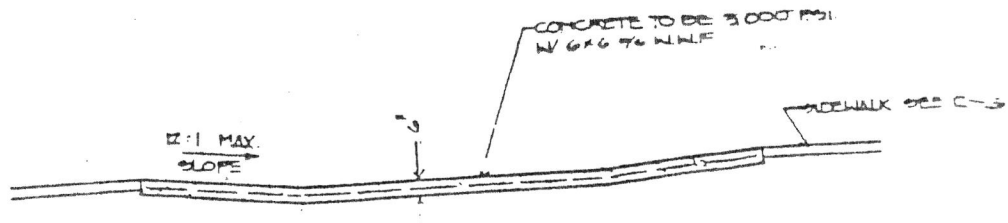
**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



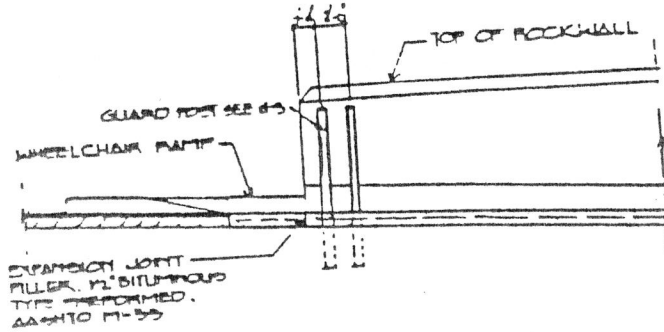
PLAN



(A) SECTION



(B) SECTION

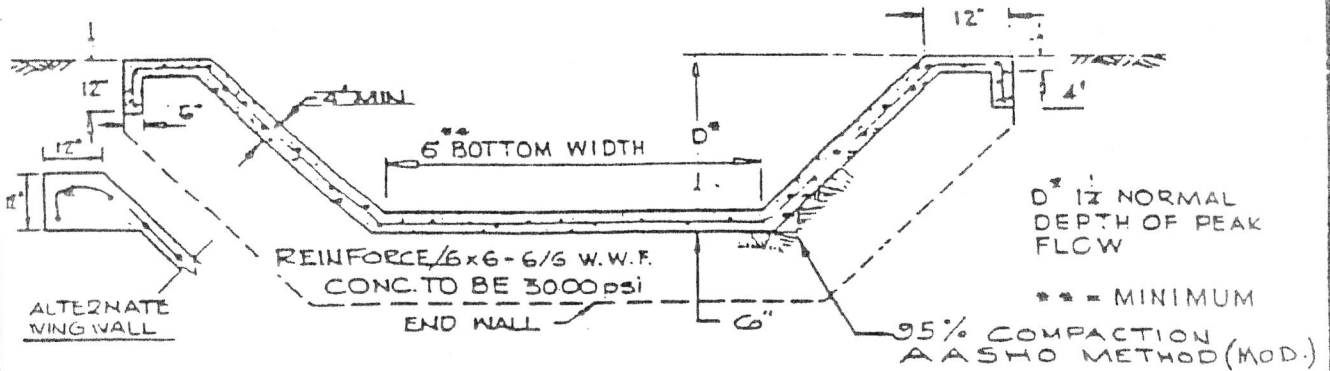


(C) SECTION



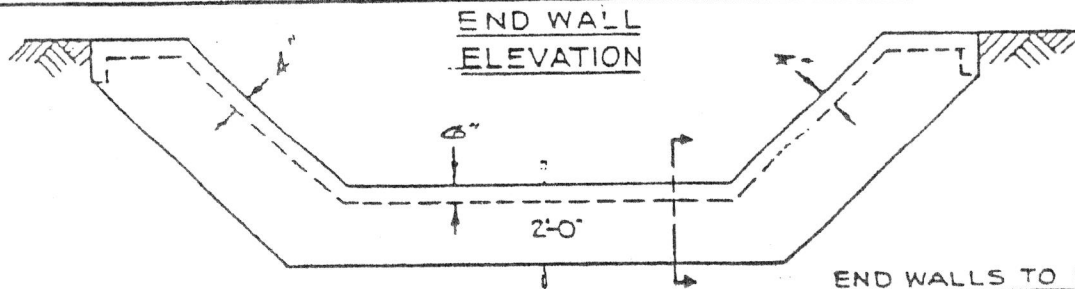
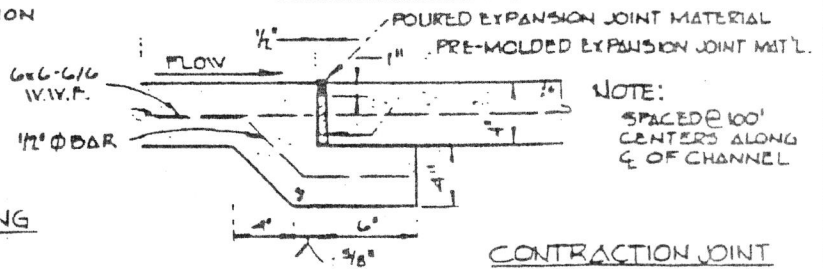
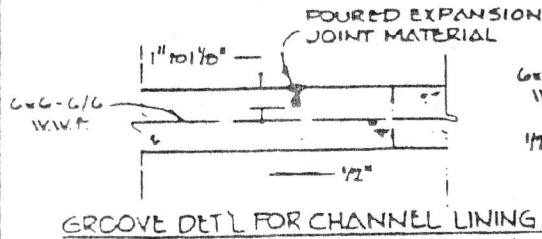
**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

ALL CHANNELS MUST BE DESIGNED FOR A 50 YEAR RETURN STORM

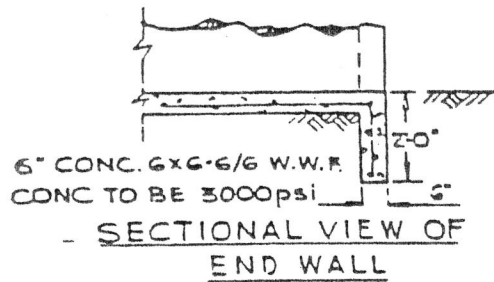


NOTE:
TRANSVERSE CONTRACTION GROOVES SHALL BE @ 25'-0"
CENTERS ON TANGENTS. TRANSVERSE CONTRACTION
GROOVES AROUND CURVES SHALL BE ON RADIAL LINES
@ 25'-0" CENTERS, SPACED ALONG THE CHANNEL C.

TYPE I SPECIFIED WHEN TOP
C OF CHANNEL IS EVEN WITH
BERM



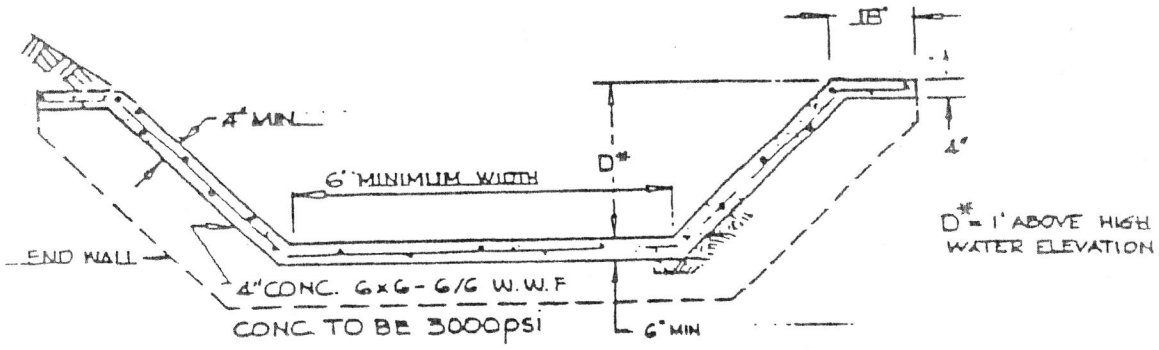
END WALLS TO BE PLACED
AT BEGINNING AND END OF
CONCRETE CHANNELS



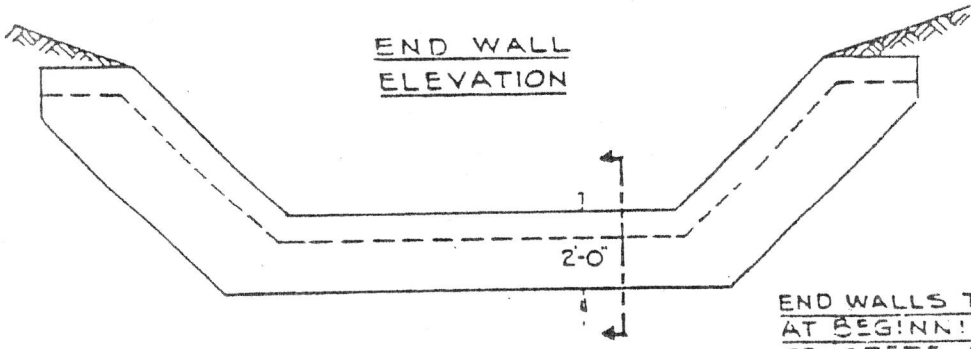
NO SCALE



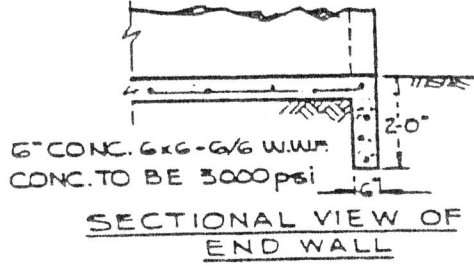
EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS



TYPE II SPECIFIED WHEN TOP OF CHANNEL IS BELOW THE BERM



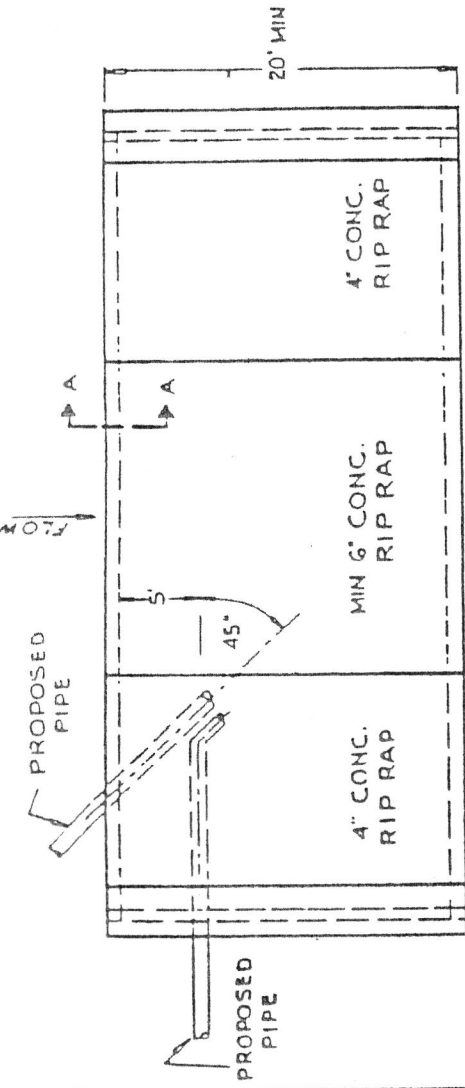
END WALLS TO BE PLACED AT BEGINNING AND END OF CONCRETE CHANNELS



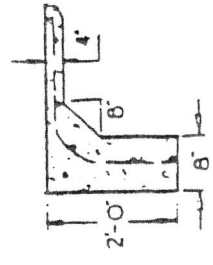
NO SCALE



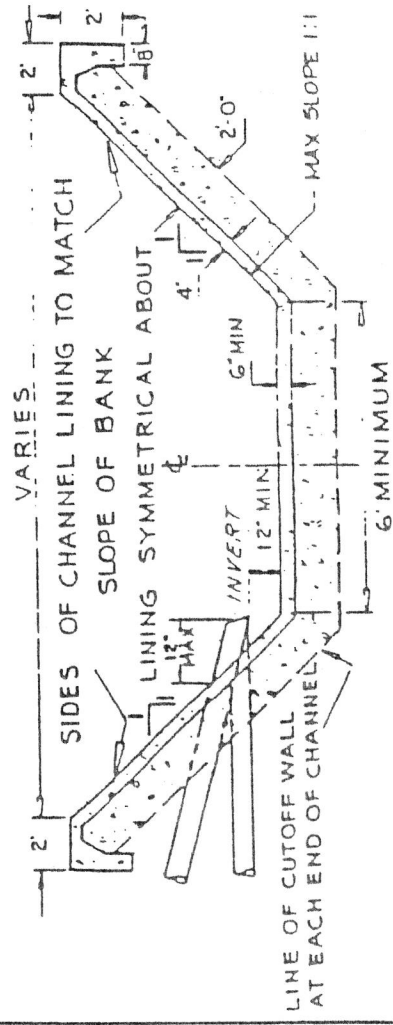
**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



PLAN VIEW



SECTION A-A



CROSS SECTION

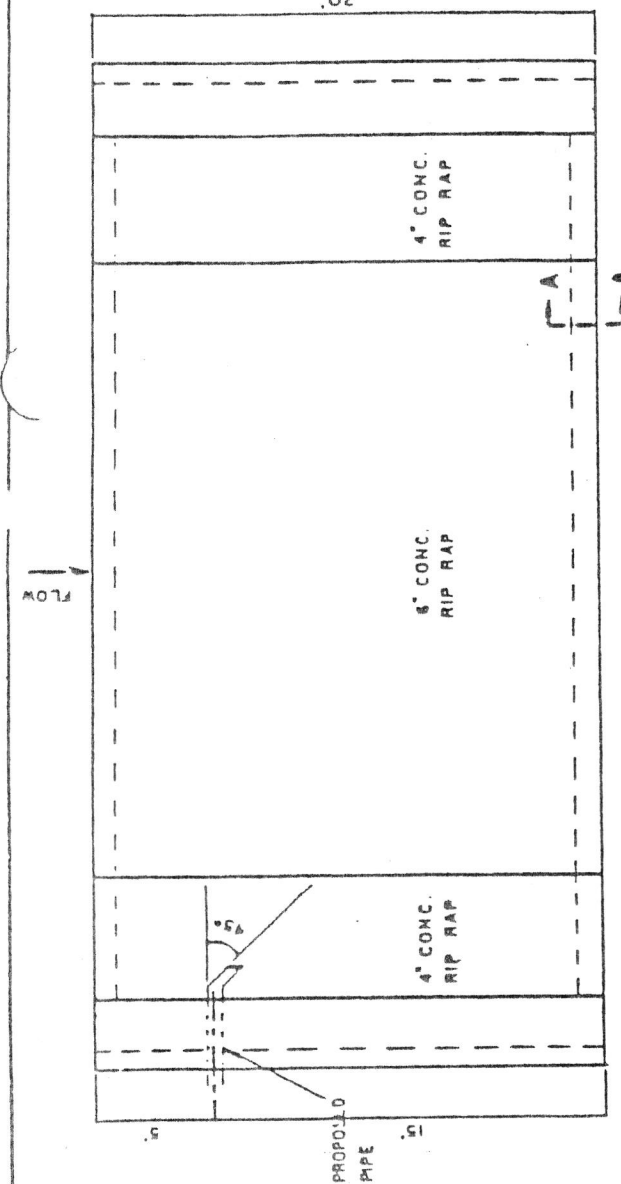
NOTES

1. Bottom of liner conforms to maintenance grade and width of subject drains.
2. RipRap shall be placed 5' upstream and 15' downstream of $\frac{1}{4}$ of discharge
3. All slopes conform to subject drain to flow line and to be directed downstream
4. All concrete to be 3000 P.S.I.
5. Discharge to be 45° with respect to flow line and to be directed downstream
6. Place 6x6-6/6 W.W.F. throughout
7. Where erosive condition exists this type of standard must be utilized.
8. Discharge pipe shall not extend more than 12" beyond face of lining.

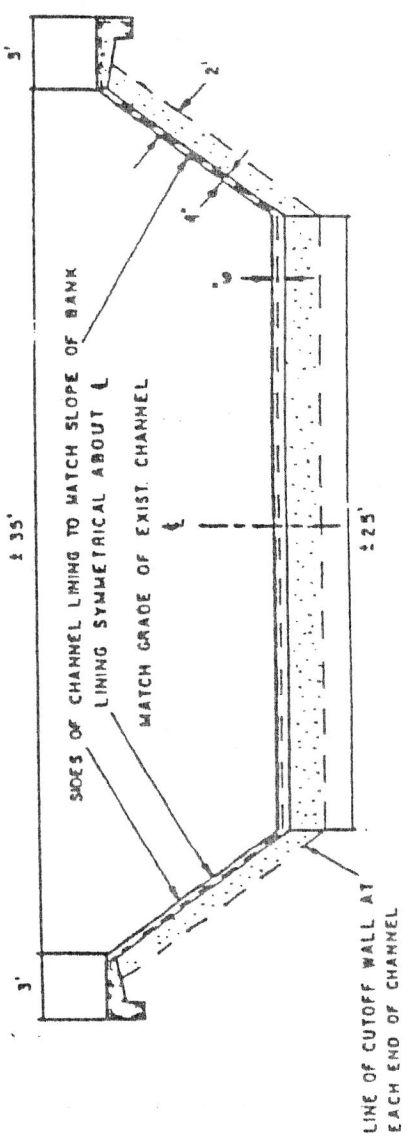
NO SCALE



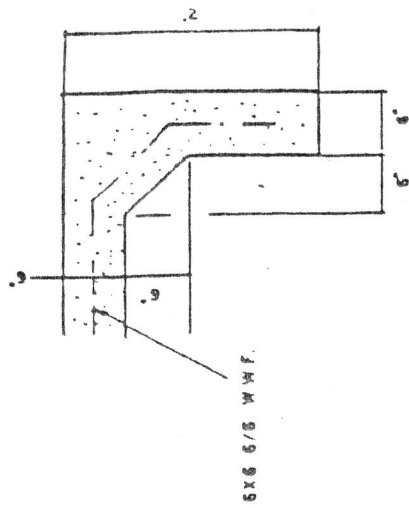
EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS



PLAN VIEW
Scale 1" = 5'



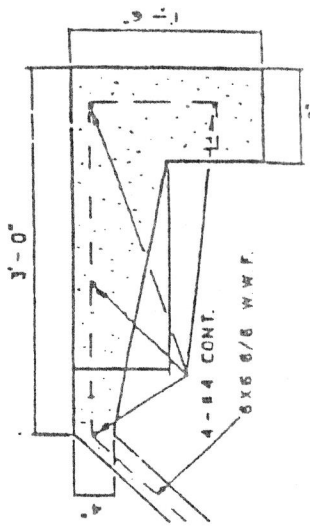
CROSS SECTION
Scale 1" = 5'



SECTION A-A
Scale 1" = 1'

NOTES

1. Bottom of liner conforms to maintenance grade and width of subject drains.
2. Rip Rap shall be placed 5' upstream and 15' downstream of L of discharge.
3. All slopes conform to subject draw.
4. All concrete to be 3000 P.S.I.
5. Discharge to be 45° with respect to flow line and to be directed downstream.
6. Piece 6 x 6 - 6/8 W.W.F. throughout.
7. Where adverse condition exists this type of standard must be utilized.



SECTION B-B
Scale 1" = 1'



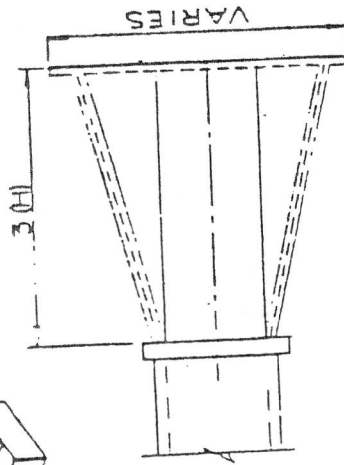
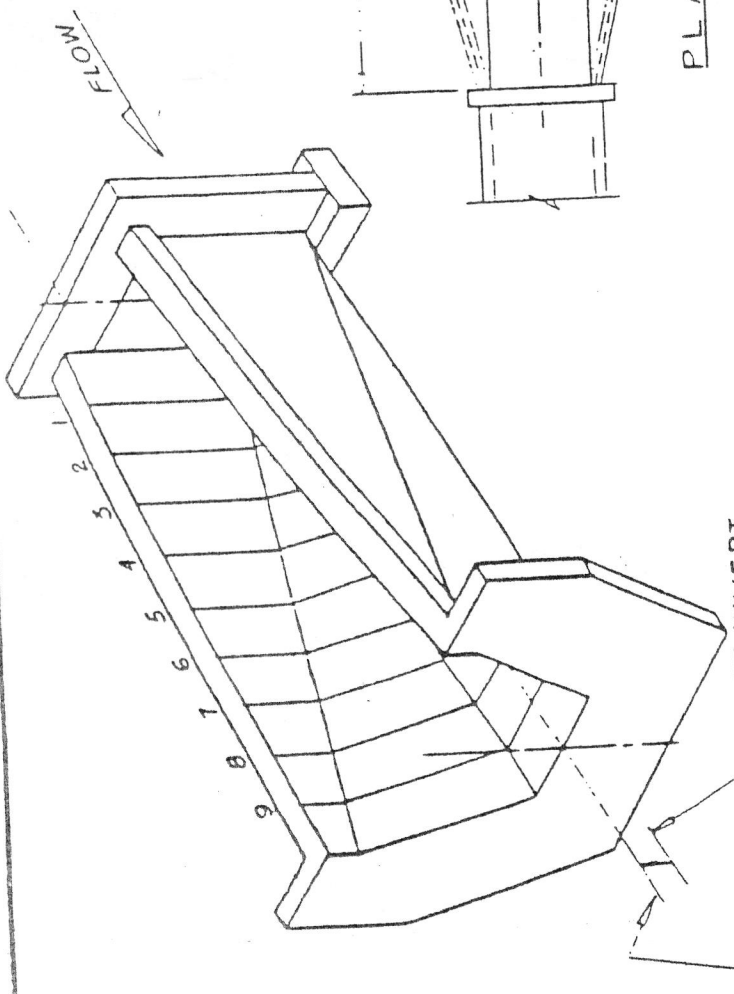


EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

D-31

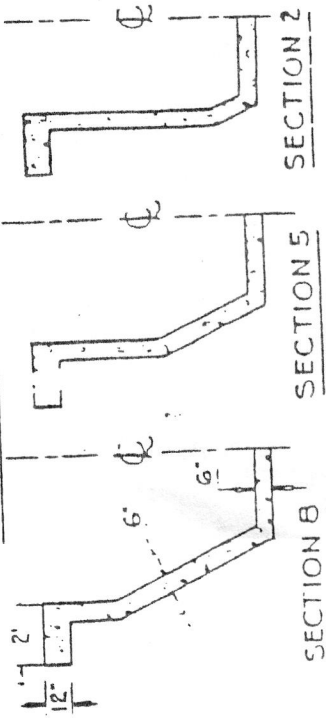
NOTES

1. THE MINIMUM SECTIONAL AREA FOR ANY CULVERT WILL BE 55 SQ. FT. INCLUDING FREEBOARD.
2. 6#6 - 6/6 MNIF THROUGHOUT BOTH CHANNELS.
3. BUREAU OF RECLAMATION REQUIREMENTS ONLY!
4. ALL CONCRETE TO BE 3000 P.S.I.

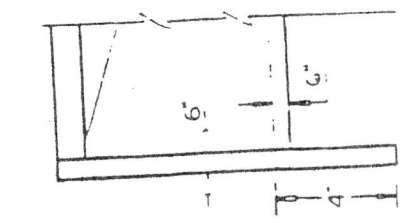


PLAN

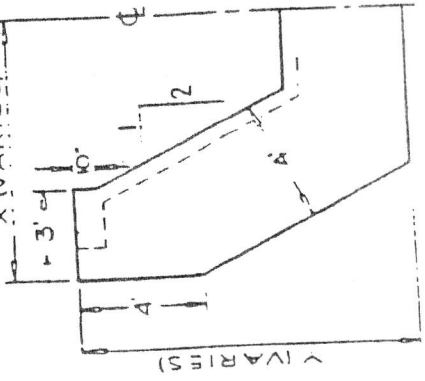
SYMMETRICAL ABOUT CENTERLINE



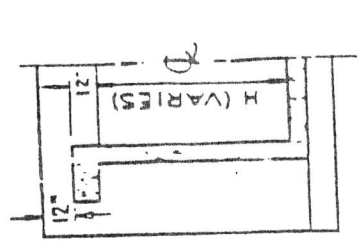
NO SCALE



**SIDE ELEVATION
AT END WALL**

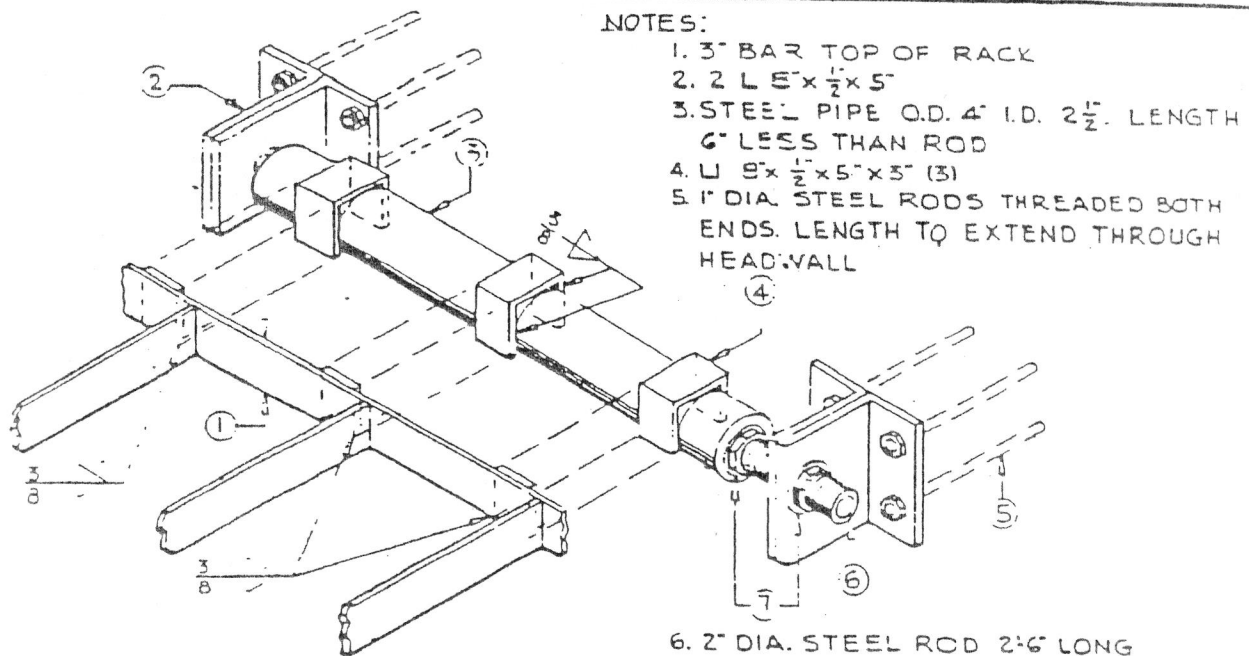


**ELEVATION AT
END WALL**



**SECTION AT
HEAD WALL**

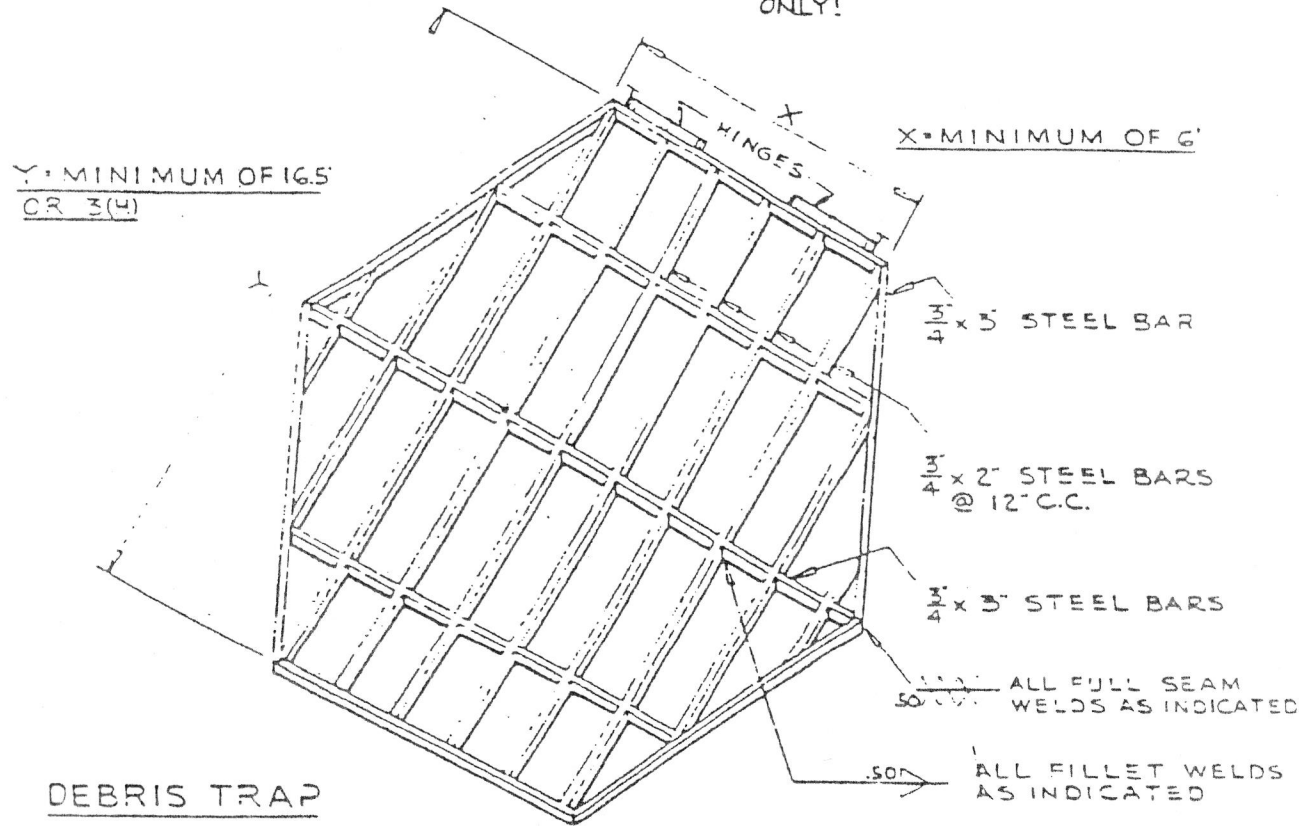
H = MINIMUM 5'-6"
INS. INCLUDING
6" FREE BOARD



NOTES:

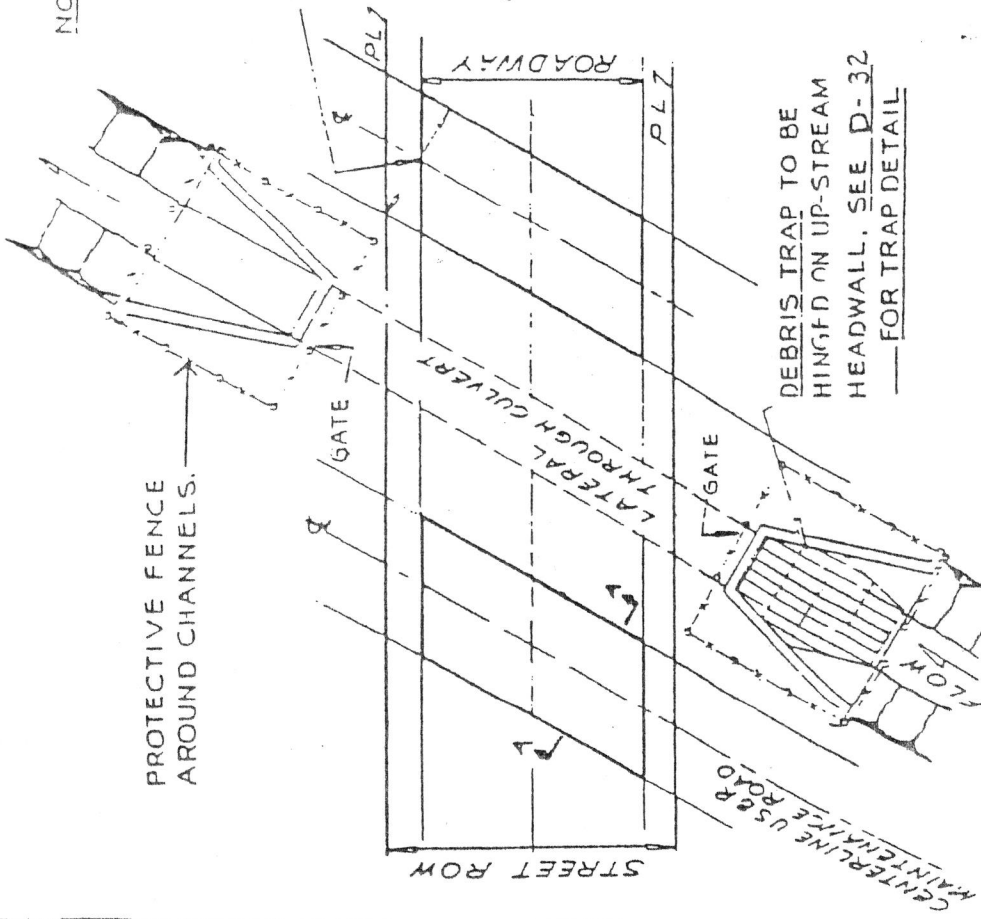
1. 3" BAR TOP OF RACK
2. 2 L $E \times \frac{1}{2} \times 5"$
3. STEEL PIPE O.D. 4" I.D. $2\frac{1}{2}"$ LENGTH 6" LESS THAN ROD
4. U $9 \times \frac{1}{2} \times 5 \times 3"$ (3)
5. 1" DIA. STEEL RODS THREADED BOTH ENDS. LENGTH TO EXTEND THROUGH HEADWALL
6. 2" DIA. STEEL ROD 2'-6" LONG THREAD BOTH ENDS 4"
7. 2" HEX NUTS AND WASHERS @ BUREAU OF RECLAMATION REQUIREMENTS ONLY!

HINGE

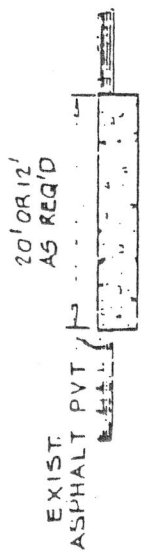


DEBRIS TRAP





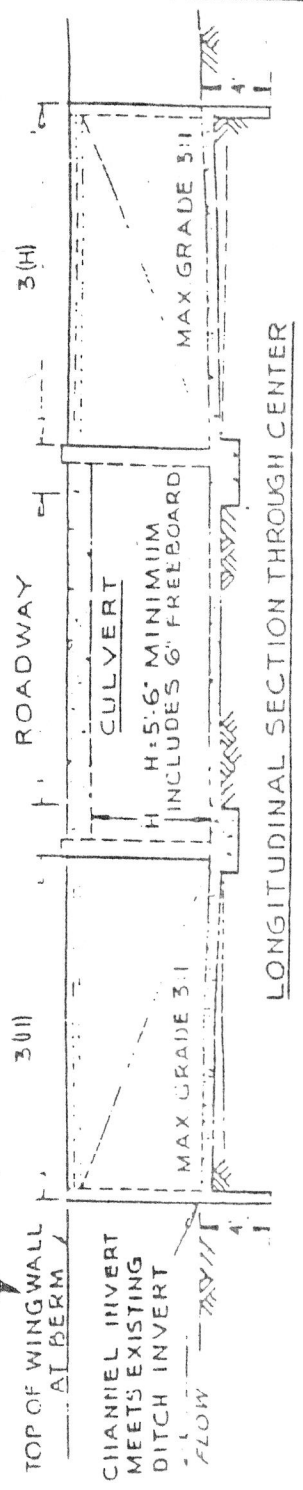
NOTE
 CONCRETE A STRIP 20' WIDE ON EACH SIDE OF DRAIN CULVERTS, 12' WIDE ON EACH SIDE OF CANALS AND LATERALS, AS REQUIRED BY U.S.B.R.
 CONCRETE SLABS ARE TO BE CENTERED IN LINE WITH U.S.B.R. MAINTENANCE ROADS.



6" CONCRETE SLAB 3000 PSI WITH 6x6-6/8 W.W.F. GALV.

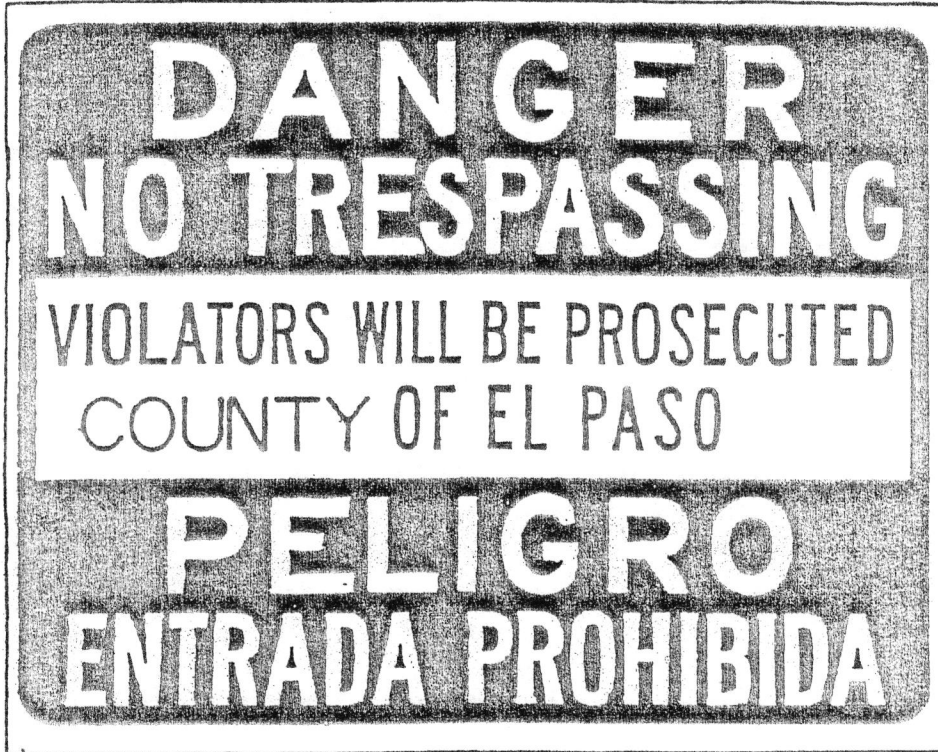
SECTION A-A

NO SCALE



**EL PASO COUNTY
 SUBDIVISION DESIGN STANDARDS**

D-33



NOTE:

1 Sign to be approximately 2'-0" x 2'-6" and painted on 16 gauge galvanized sheet metal. (RED BACKGROUND/WHITE LETTERS)



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

D-34

PERCOLATION TESTS

I. GENERAL

A. SUBDIVISION

- (1) AT LEAST ONE REPRESENTATIVE TEST SHOULD BE MADE FOR EACH SIGNIFICANT SOIL VARIATION ENCOUNTERED OR EXPECTED.
- (2) EACH TEST HOLE SHOULD BE LOCATED BY A KEY NUMBER ON A TOPOGRAPHIC MAP OF THE TRACT.
- (3) SOIL BORING SHOULD BE MADE (ONE EVERY 5 ACRES, OR IF SUBSOIL CONDITIONS INDICATE, A GREATER NUMBER WILL BE REQUIRED) TO SHOW CLEARLY THE TYPE OF SOIL OR SOIL MATERIAL EXISTING BENEATH THE ABSORPTION AREA. BORINGS SHALL EXTEND TO A POINT AT LEAST 6 FEET BELOW THE FINISH GRADE OF PROPOSED ABSORPTION TRENCHES.
- (4) IF A SOIL OR SITE IS DETERMINED TO BE POORLY DRAINED WITH AN ACCOMPANYING HIGH WATER TABLE, IT IS UNSUITABLE REGARDLESS OF PERCOLATION TEST DATA.

B. INDIVIDUAL LOTS

IN UNIFORM SOILS ONE PERCOLATION TEST SHOULD BE MADE FOR EACH ABSORPTION FIELD SITE. IF SIGNIFICANT SOIL VARIATIONS ARE ENCOUNTERED OR EXPECTED, ADDITIONAL TESTS SHOULD BE MADE FOR EACH VARIATION.

II. TEST PROCEDURE

ALL PERCOLATION TESTS REQUIRE SHOULD BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING:

- A. DIG OR BORE THE HOLES WITH HORIZONTAL DIMENSIONS OF FROM 4 TO 12 INCHES AND VERTICAL SIDES TO THE DEPTH OF THE BOTTOM OF THE PROPOSED ABSORPTION DEVICE. HOLES CAN BE BORED WITH 4 INCH DIAMETER POST-HOLE TYPE AUGER.
- B. ROUGHEN OR SCRATCH THE BOTTOM AND SIDES OF THE HOLES TO PROVIDE A NATURAL SURFACE. REMOVE ALL LOOSE MATERIALS FROM THE HOLE. PLACE ABOUT 2 INCHES OF COARSE SAND OR FINE GRAVEL IN THE HOLE TO PREVENT BOTTOM SCOURING.
- C. FILL THE HOLE WITH CLEAR WATER TO A MINIMUM DEPTH OF 12 INCHES OVER THE GRAVEL. BY REFILLING, OR BY SUPPLYING A SURPLUS RESERVOIR OF WATER (AUTOMATIC SIPHON), KEEP WATER IN HOLE FOR AT LEAST FOUR HOURS, AND PREFERABLY OVERNIGHT. IN GRANULAR SOILS, I.E., GW, GP, SW, OR SP CLASSIFIED ACCORDING TO THE UNIFIED SOILS CLASSIFICATION SYSTEM, THE TEST CAN BE MADE AFTER THE WATER FROM ONE FILLING HAS SEEPED AWAY.
- D. PERCOLATION RATE MEASUREMENTS SHOULD BE MADE ON THE DAY FOLLOWING THE SATURATION PROCESS, EXCEPT IN SANDY SOILS.
- E. IF WATER REMAINS IN THE TEST HOLE ON OVERNIGHT SATURATION, ADJUST THE DEPTH OF 6 INCHES OVER THE GRAVEL. FROM A FIXED REFERENCE POINT, MEASURE THE DROP IN WATER LEVEL AT APPROXIMATELY 30-MINUTE INTERVALS OVER A 4-HOUR PERIOD. THE DROP WHICH OCCURS DURING THE FINAL 30-MINUTE PERIOD IS USED TO CALCULATE THE PERCOLATION RATE.
- F. IF NO WATER REMAINS IN THE HOLE AFTER OVERNIGHT SATURATION, ADD CLEAR WATER TO A DEPTH OF ABOUT 6 INCHES OVER THE GRAVEL. FROM A FIXED REFERENCE POINT, MEASURE THE HEIGHT OF THE WATER SURFACE AT APPROXIMATELY 30-MINUTE INTERVALS OVER A 4-HOUR PERIOD, REFILLING THE HOLE TO A DEPTH OF 6 INCHES WHEN THE PERCOLATION RATE INDICATES THE HOLE WILL RUN DRY BEFORE THE NEXT READING IS MADE. THE DROP WHICH OCCURS DURING THE FINAL 30-MINUTE PERIOD IS USED TO CALCULATE THE PERCOLATION RATE.

NOTE: IF A HOLE MUST BE REFILLED TO OBTAIN A FINAL 30-MINUTE READING, DETERMINE FROM THE PREVIOUS READING THE WATER LEVEL DROP DURING THAT INTERVAL. ADD WATER UNTIL THE LEVEL ABOVE THE BOTTOM EQUALS THIS FIGURE PLUS ONE-HALF INCH. CONTINUE THE TEST, MEASURING THE DROP DURING THE FINAL 30-MINUTE PERIOD.

- G. IN SANDY SOILS, OR OTHER SOILS IN WHICH THE FIRST SIX INCHES OF WATER SEEPS AWAY IN LESS THAN 30-MINUTES, AFTER THE OVERNIGHT SATURATION PERIOD, THE TIME INTERVAL BETWEEN MEASUREMENTS CAN BE TAKEN AT 10-MINUTES AND THE TEST RUN OVER A PERIOD OF ONE HOUR. THE DROP WHICH OCCURS IN THE FINAL 10-MINUTE PERIOD IS USED TO CALCULATE THE PERCOLATION RATE.



EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

SECTION II
STREETS & PAVING

TITLE	NO.
STREET SPECS.....	S-1
LEFT TURN LANE W/24' MEDIAN.....	S-2
CURB AND GUTTER DESIGN.....	S-3
CONCRETE READERS.....	S-4
VALLEY GUTTER REQUIREMENTS.....	S-5
INTERSECTION WITH VALLEY GUTTER.....	S-6
CUL-DE-SAC.....	S-7
ALLEY PAVEMENT.....	S-8
STREET DESIGN.....	S-9
TRENCH BACKFILL AND PAVEMENT REPLACEMENT.....	S-10
OFF-STREET STORM INLET DETAIL.....	S-11
ROLLED CURB WITH SIDEWALK SECTION.....	S-12



SPECIFICATIONS FOR ROAD CONSTRUCTION
FOR EL PASO COUNTY

1. The right-of-way shall be cleared of stumps, brush, rubbish, trees and shrubs. All cleared and grubbed material shall be disposed of in a manner satisfactory to the County Road Engineer.
2. All roadway excavation and corresponding embankment construction shall be performed to conform to the established alignment, grades and cross sections. All suitable excavated materials shall be utilized, insofar as practicable, in constructing the required roadway sections. Unsuitable roadway excavation and excavation in excess of that needed for construction shall be known as "waste" and shall become the property of the Contractor to be disposed of by him outside the limits of the right of way.
3. After grubbing and excavation has been completed, the roadway bed and shoulders shall conform to the established alignment, grades, and cross sections. The roadway bed shall be bladed, rolled, watered and worked until sub-grade has reached 95% compaction of optimum compaction as determined by field densities as prescribed by the County Road Engineer. The compacted roadbed shall be maintained by the Contractor until subsequent base and paving have been completed, and should the roadbed fail due to any reason or cause, lose the



required stability, density and finish before the subsequent base and surfacing have been completed, it shall be recompact and refinished at the sole expense of the Contractor.

4. The Contractor shall install a Type A flexible base to meet Texas Highway Department standards on prepared sub-base and compact to not less than 100% density before placement of HMAC. The flexible base shall conform to the established alignment, grades and cross sections.
5. The Contractor shall place curb & gutter or header curb as directed by the County Road Engineer upon results of drainage study. Curbing shall be placed to conform the established alignment, grades and cross sections and shall be of 3000 PSI concrete.
6. A prime coat consisting of an application for CRS-1 asphaltic material on the completed roadway base shall be applied as directed by the County Road Engineer.

Prime coat shall not be applied when the air temperature is below 60 F and falling. The air temperature shall be taken in the shade and away from artificial heat. Asphaltic material shall not be placed when general weather conditions are not suitable.

The prime coat shall be applied by a self-propelled pressure distributor at a rate of .20 gals/sq. yd. or as directed by County Road Engineer.

7. The Contractor shall place a Type C HMAC to meet Texas Highway Department



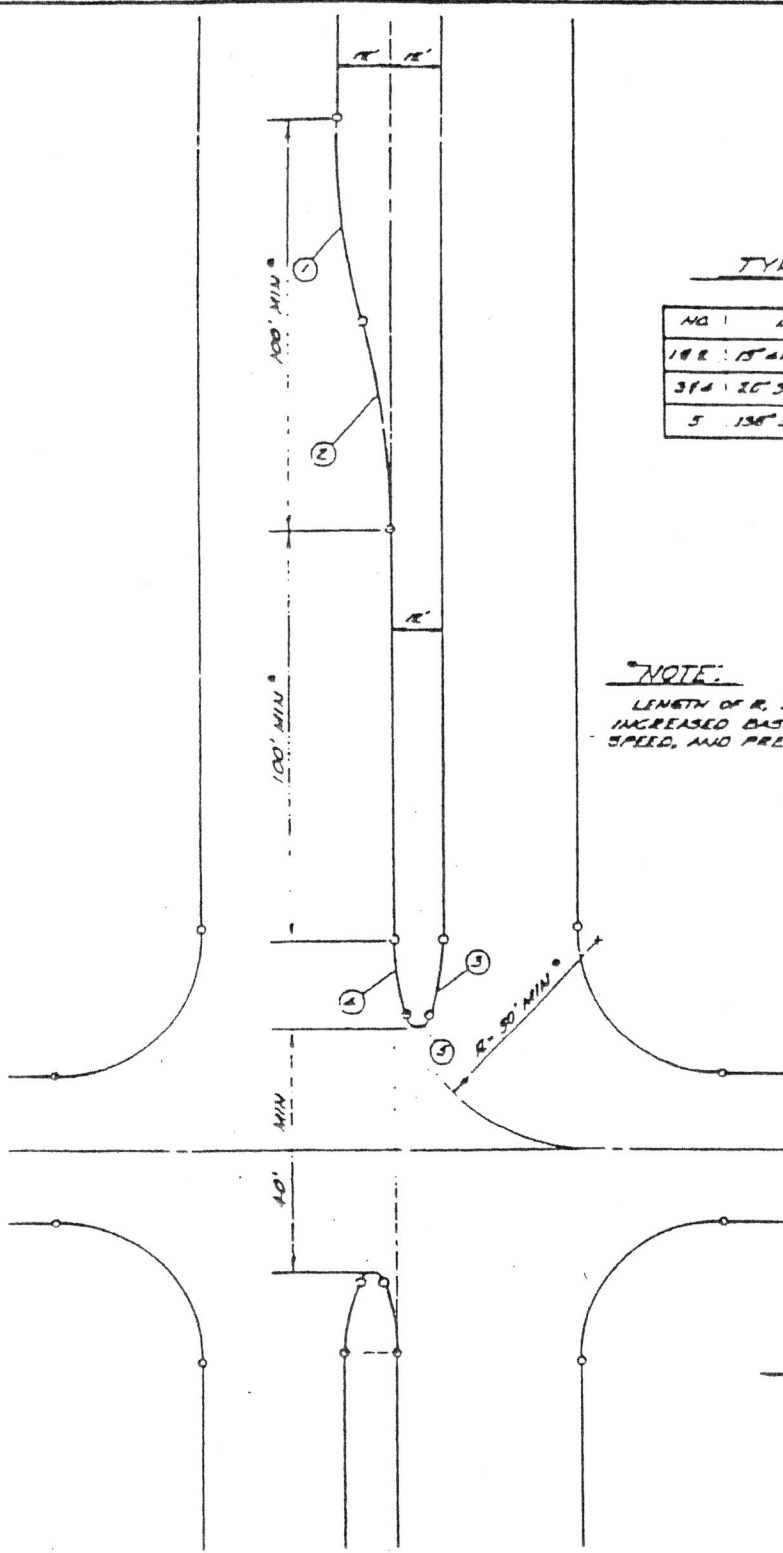
Standards on the prepared base. The HMAC shall be spread on the tacked surface with an approved spreading and finishing machine in such a manner that when properly compacted the finished surface will be smooth and of uniform density. Asphaltic mixture will be placed to a compacted thickness of not less than 1 1/2".

Asphaltic mixture shall not be placed when temperature is below 50 degree and falling but may be placed when temperature is 45 degree and rising.

8. The Contractor shall be responsible for the maintenance of constructed road for one year after date of final acceptance by County Road Engineer. The Contractor shall notify the County Road Engineer prior to the end of first year to make inspection of condition of road way. The County Road Engineer shall notify the Contractor in writing stating condition of road and recommending of any repairs needed, if any. After repairs have been done, the Contractor shall notify the County Road Engineer and the County Road Engineer will give the Contractor a certificate of acceptance and County maintenance of roads will begin.



EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS



TYPICAL CURVE DATA

NO.	Δ	R	L	T	SW
10 R	15° 41' 08"	211.34'	50.40'	25.36'	50.56'
3 P A	20° 34' 50"	50'	17.96'	9.08'	17.06'
5	136° 50' 48"	5'	7.27'	7.99'	5.62'

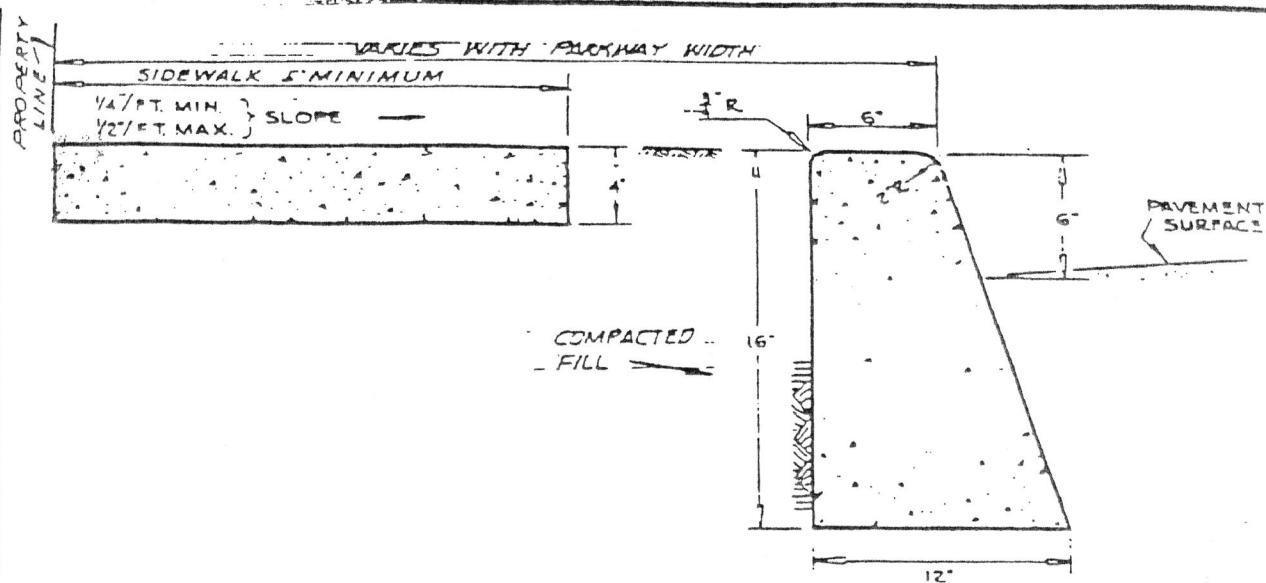
NOTE:

LENGTH OF R, STORAGE, AND TRANSITION TO BE INCREASED BASED UPON TRAFFIC DENSITY, ROAD DESIGN SPEED, AND PRESENCE OR ABSENCE OF TRAFFIC SIGNALS.

PLAN
SCALE: 1" = 50'



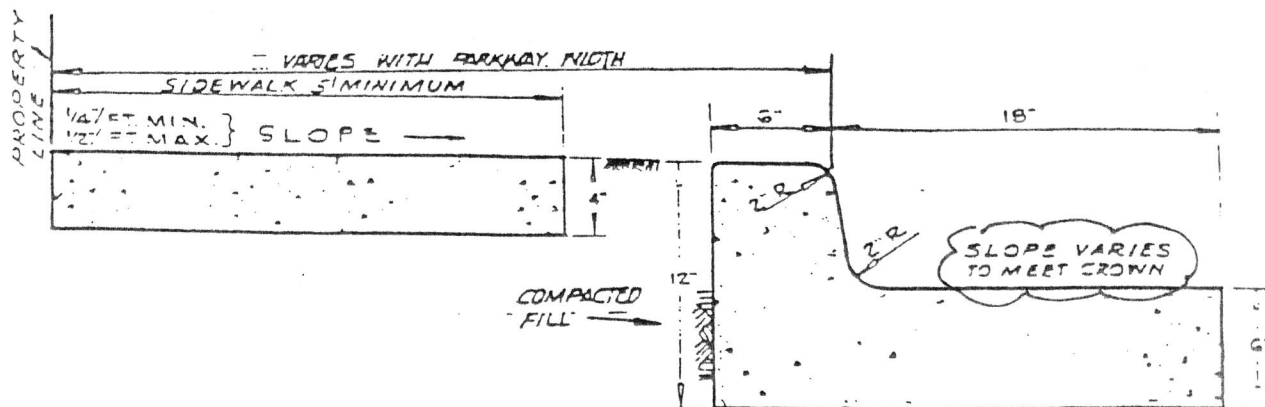
**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



STANDARD CURB & SIDEWALK SECTION

NOTES:

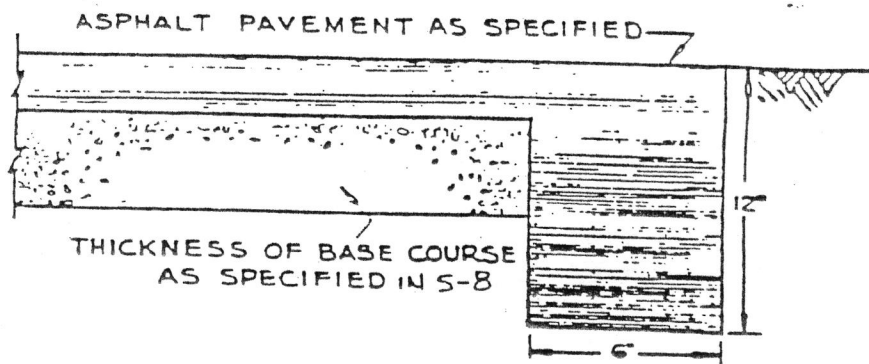
1. CONCRETE FOR CURBS, GUTTERS, & RETURNS... SHALL BE 3000 P.S.I. MINIMUM.
2. DUMMY JOINT REQUIRED AT 10' O.C.
3. EXPANSION JOINTS REQUIRED AT CURB RETURNS. JOINTS TO BE PACKED WITH 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL OR EQUAL.



CURB & GUTTER WITH SIDEWALK SECTION

NO SCALE





NO SCALE

NOTE

THICKENED EDGE SHALL BE CONSTRUCTED IN COURSES NOT OVER 4" IN THICKNESS, EACH COURSE THOROUGHLY COMPACTED BEFORE PLACING NEXT COURSE. FINAL COURSE TO BE PLACED MONOLITHIC WITH PAVEMENT AT END OF STREET ONLY!



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

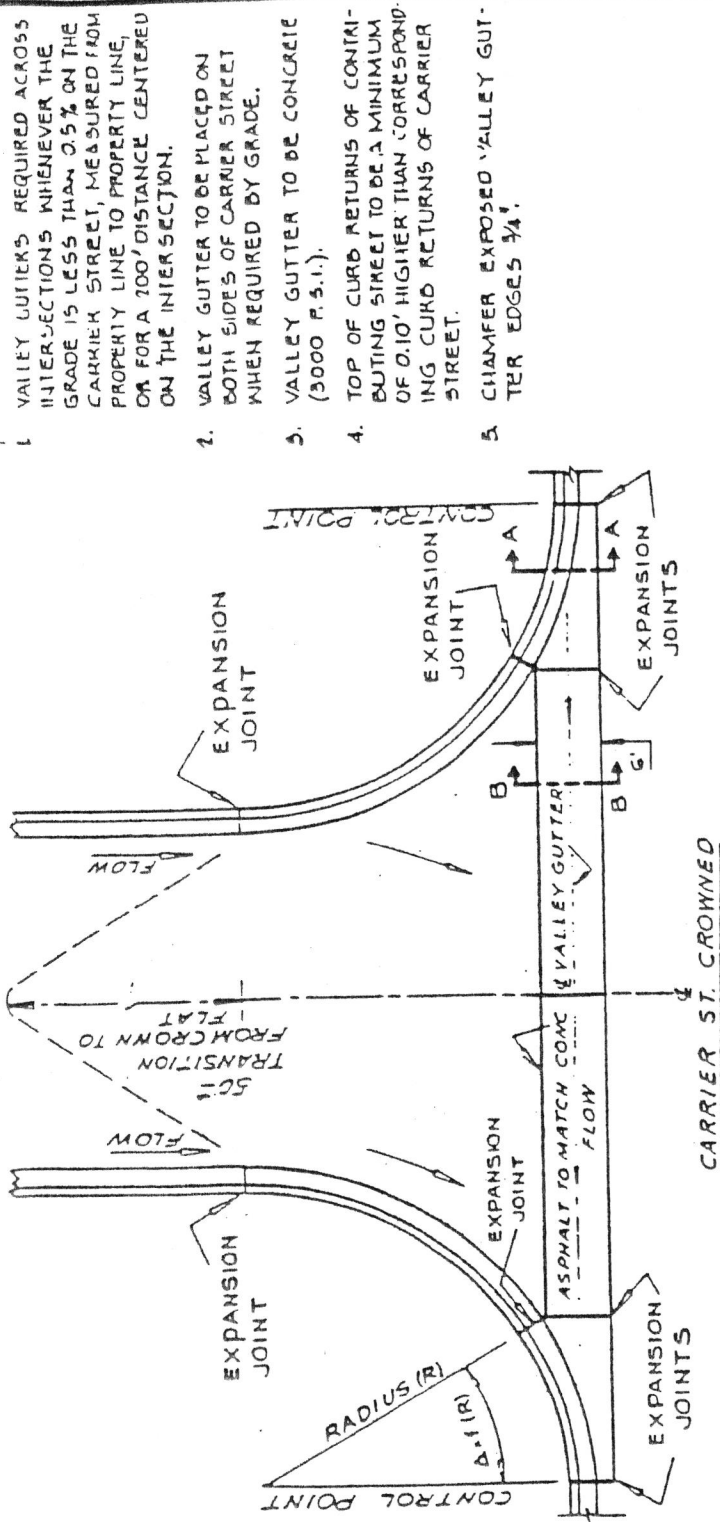
S-4



EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

S-5

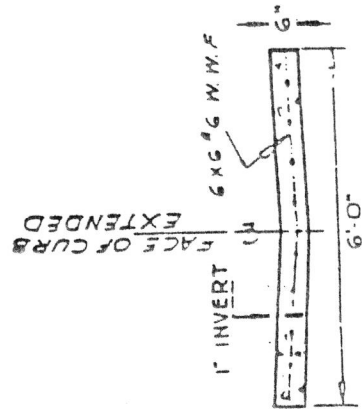
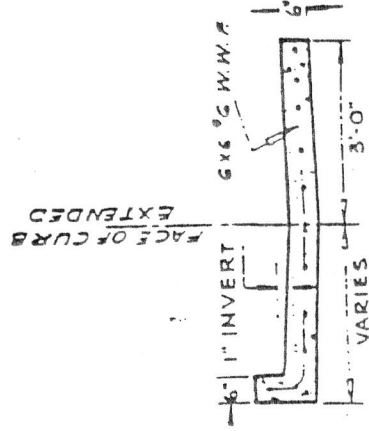
CONTRIBUTING STREET
CROWNED

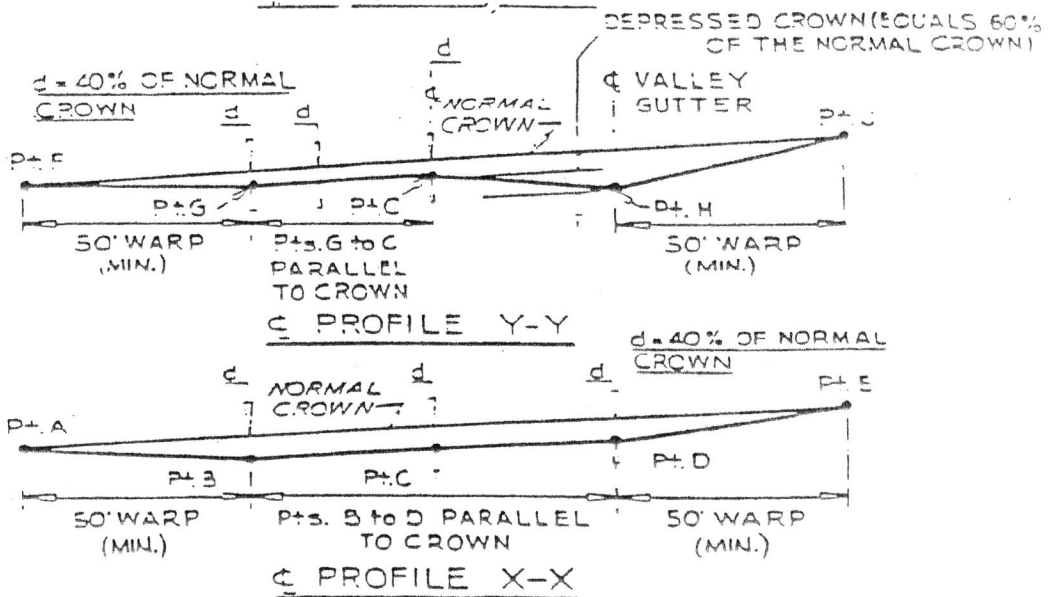
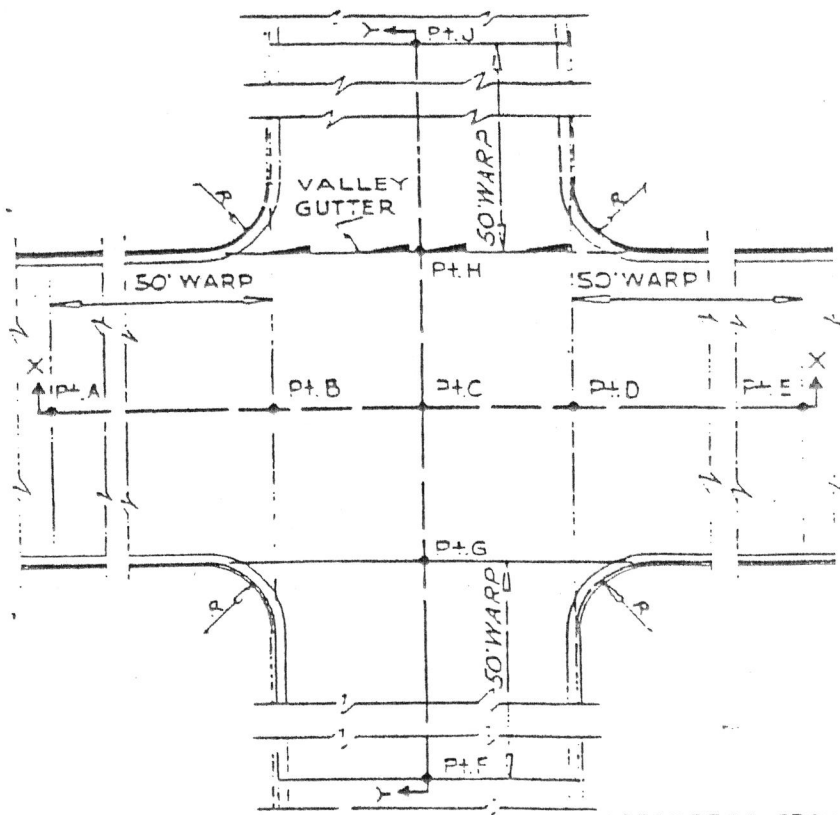


NOTES

1. VALLEY GUTTERS REQUIRED ACROSS INTERSECTIONS WHENEVER THE GRADE IS LESS THAN 0.5% ON THE CARRIER STREET, MEASURED FROM PROPERTY LINE TO PROPERTY LINE, OR FOR A 100' DISTANCE CENTERED ON THE INTERSECTION.
2. VALLEY GUTTER TO BE PLACED ON BOTH SIDES OF CARRIER STREET WHEN REQUIRED BY GRADE.
3. VALLEY GUTTER TO BE CONCRETE (3000 P.S.I.).
4. TOP OF CURB RETURNS OF CONTAINING STREET TO BE A MINIMUM OF 0.10' HIGHER THAN CORRESPONDING CURB RETURNS OF CARRIER STREET.
5. CHAMFER EXPOSED VALLEY GUTTER EDGES $\frac{3}{4}$ ".

NO SCALE



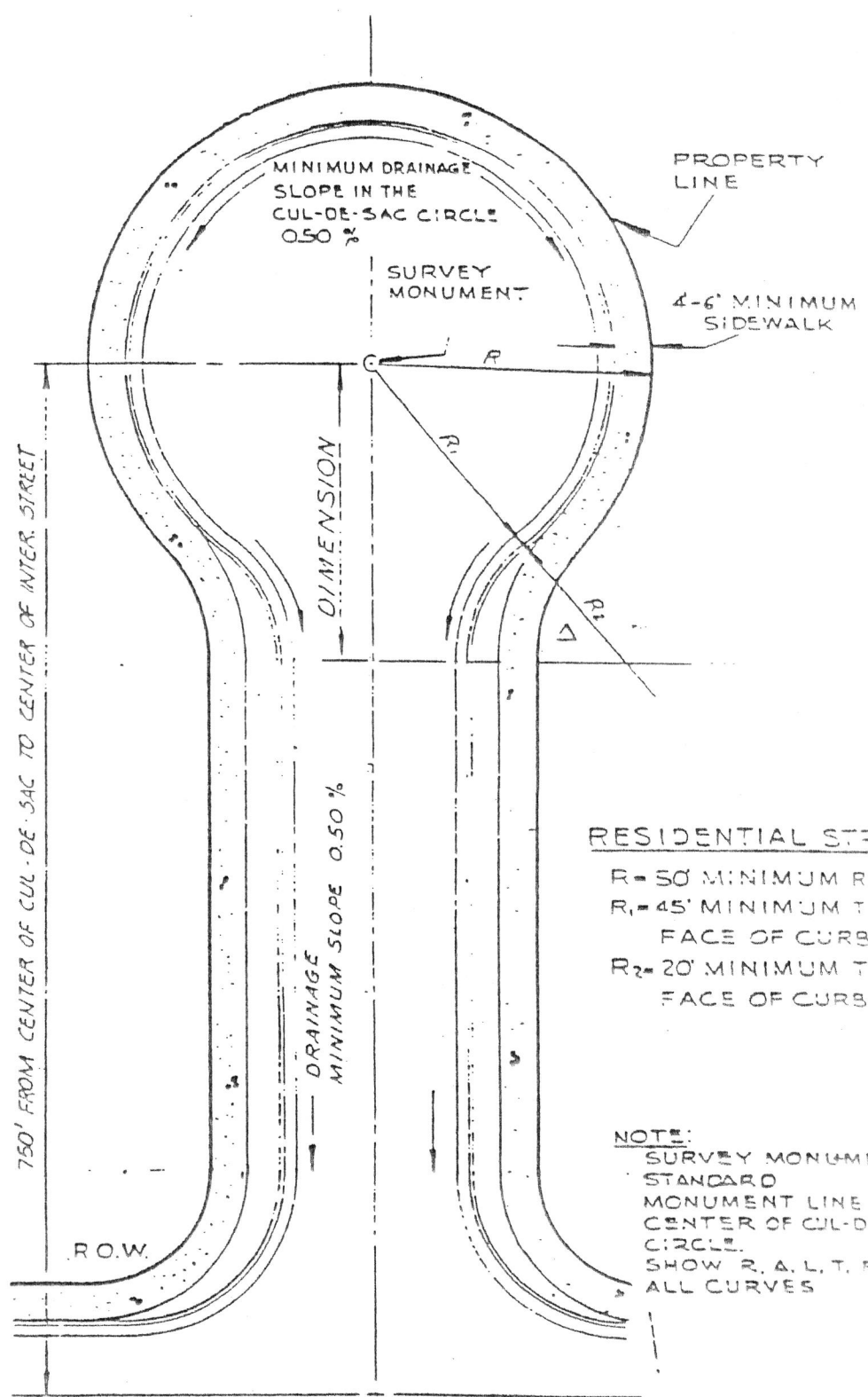


NOTES

Crown on center-line of intersection (P+G to P+H) shall be depressed 40% of the Normal Crown and pavement shall be warped linearly parallel to the Valley Gutter 50' from P+G & P+H.

Show center-line profile of matching streets perpendicular to the Valley Gutter on respective Plan-Profile sheets.





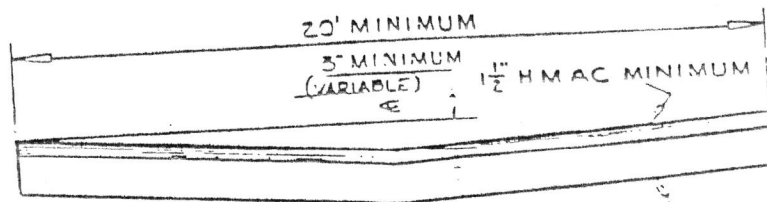
RESIDENTIAL STREETS

- R = 50' MINIMUM RADIUS
- R₁ = 45' MINIMUM TO FACE OF CURB
- R₂ = 20' MINIMUM TO FACE OF CURB

NOTE:
 SURVEY MONUMENT STANDARD ON MONUMENT LINE AND CENTER OF CUL-DE-SAC CIRCLE.
 SHOW R, A, L, T, FOR ALL CURVES



**EL PASO COUNTY
 SUBDIVISION DESIGN STANDARDS**



SUB-BASE
COMPACTED TO 95%
MODIFIED AASHO DENSITY

THICKNESS OF PAVING
BASE 4 1/2" MINIMUM
COMPACTED TO 100% MODIFIED
AASHO DENSITY

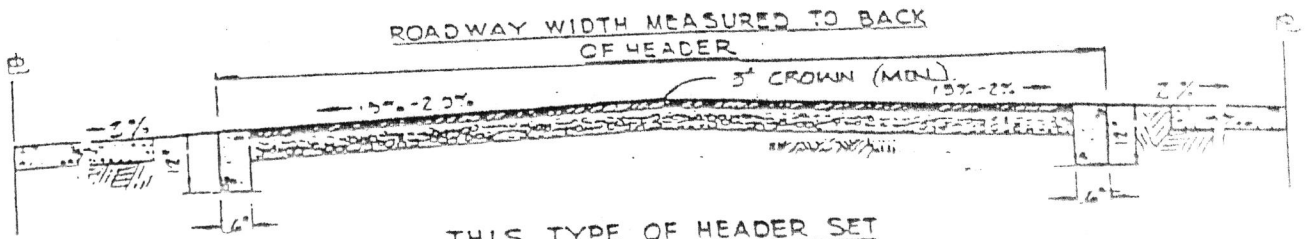
NO SCALE

NOTE:

GRADE LINE TO BE CARRIED ON THE INVERT.
SIDE ELEVATIONS CAN VARY TO MEET
EXISTING CONDITIONS.

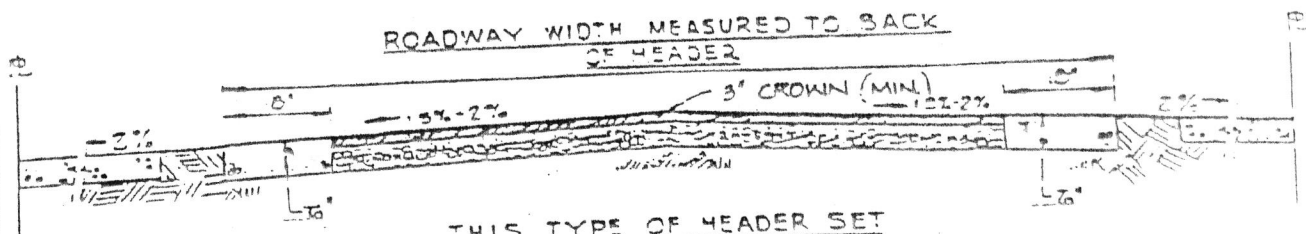


**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



THIS TYPE OF HEADER SET
IN SOIL

2% SLOPE ON PARKWAY
TOWARDS R₂ FOR SUBDIVISIONS.
WITH ON-SITE PONDING



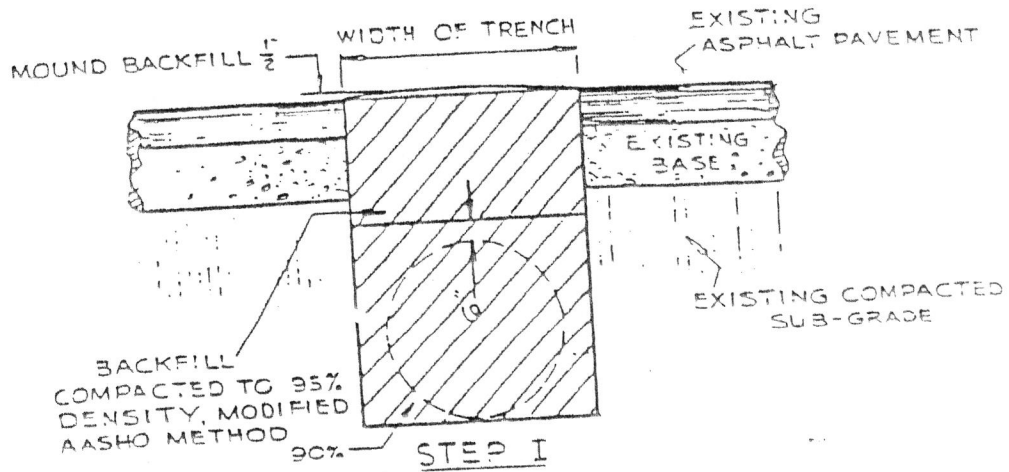
THIS TYPE OF HEADER SET
IN ROCK & CONGLOMERATE

NOTE
CONCRETE CLASS A (3000 psi)

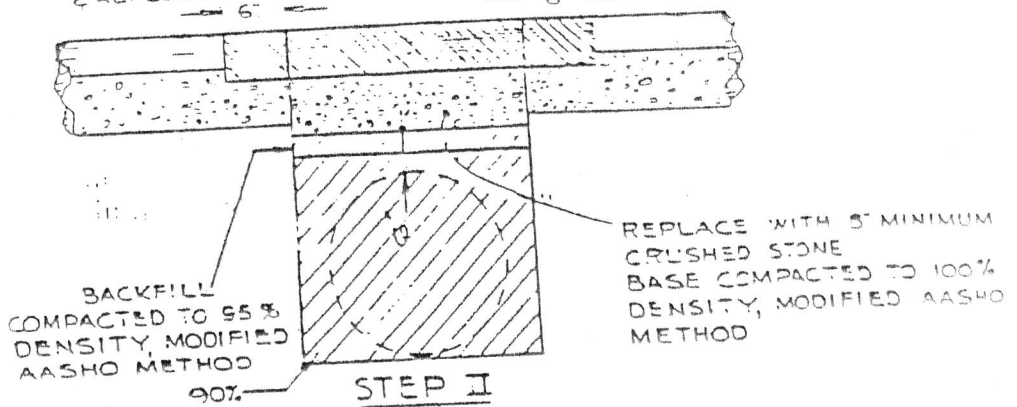
NO SCALE



EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS



SAWCUT BACK EXISTING ASPHALT 6" ON BOTH SIDES OF TRENCH. PRIME EDGE OF CUT & BASE COURSE WITH CS-1 & REPLACE WITH 2" MIN. H.M.A.C. 6"



NOTES

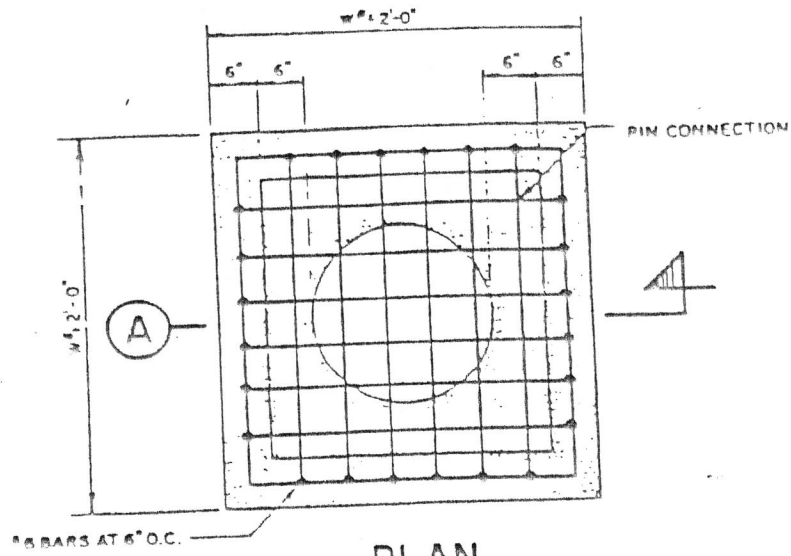
1. Backfill trench in accordance with Texas Hwy. Dept. 1972 Standard Specifications for Construction of Highways Streets and Bridges; Item 401.2(8)
2. Step I & II required if not resurfaced immediately after backfill.
Step II only required if resurfaced immediately after backfill

NO SCALE

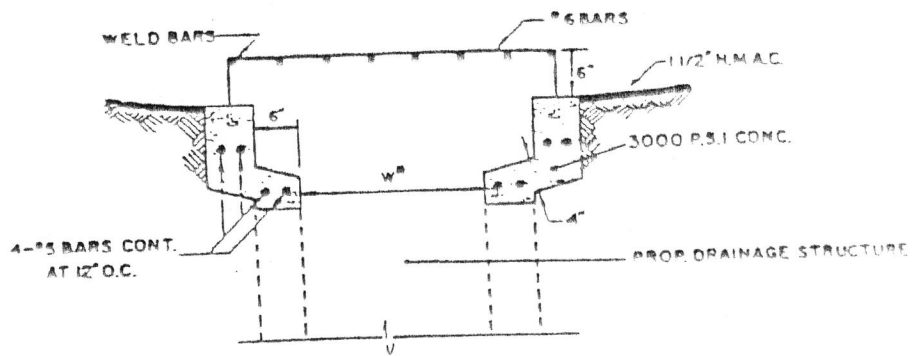


EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS

S-10



PLAN



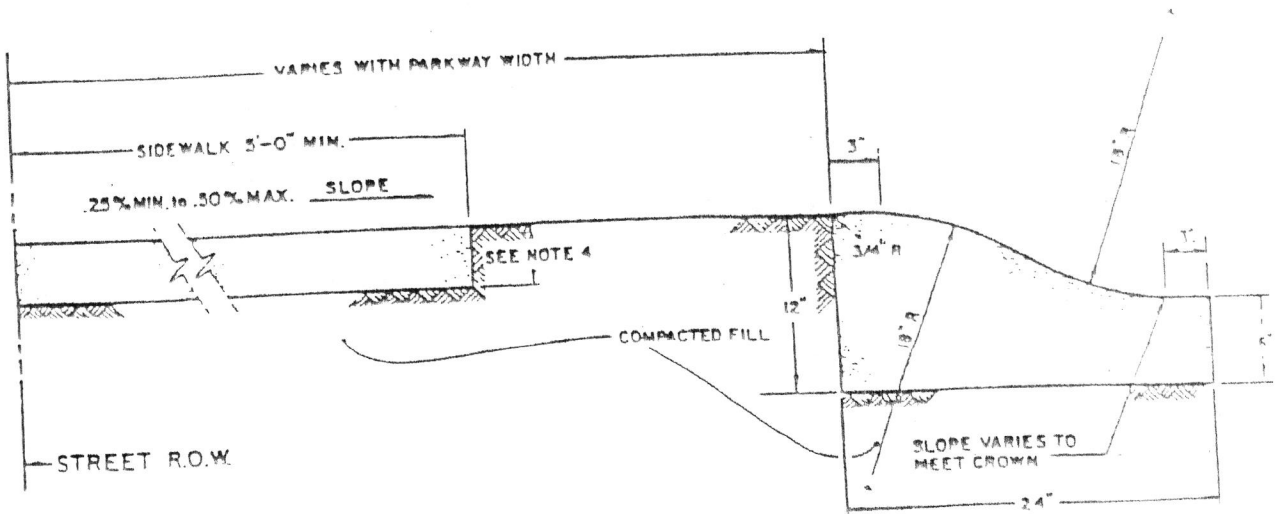
SECTION A

*WIDTH VARIES DEPENDING ON DRAINAGE STRUCTURE.

NO SCALE



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**



ROLLED CURB WITH SIDEWALK SECTION
 FOR MOBILE HOME USE ONLY

NOTES:

1. CONCRETE FOR CURBS AND SIDEWALKS SHALL BE 3000 P.S.I. (MIN.)
2. DUMMY JOINT AT 10' C./C., MINIMUM 1/2" PRE-MOLDED ASPHALT IMPREGNATED EXPANSION JOINT AT 30' C./C. (SIDEWALK ONLY).
3. CURB EXPANSION JOINTS AT CURVE POINTS OR ABUTTING CURB.
4. SIDEWALK TO BE EITHER 4" CONCRETE WITH W.W.F. 6x6 #6 OR 6" CONCRETE WITH NO REINFORCEMENT.

NO SCALE



SECTION III
SIDEWALKS & DRIVEWAYS

TITLE	NO.
RESIDENTIAL DRIVEWAYS.....	C-1
COMMERCIAL DRIVEWAYS.....	C-2
DRIVEWAY - RETURN TYPE.....	C-3
DRIVEWAY - WING TYPE.....	C-4
MAXIMUM DRIVEWAY AND ALLEY ENTRANCE SLOPES.....	C-5
SIDEWALKS.....	C-6
WHEEL CHAIR RAMP.....	C-7
SIDEWALK FOR ON-SITE PONDING.....	C-8



SECTION III
SIDEWALKS & DRIVEWAYS

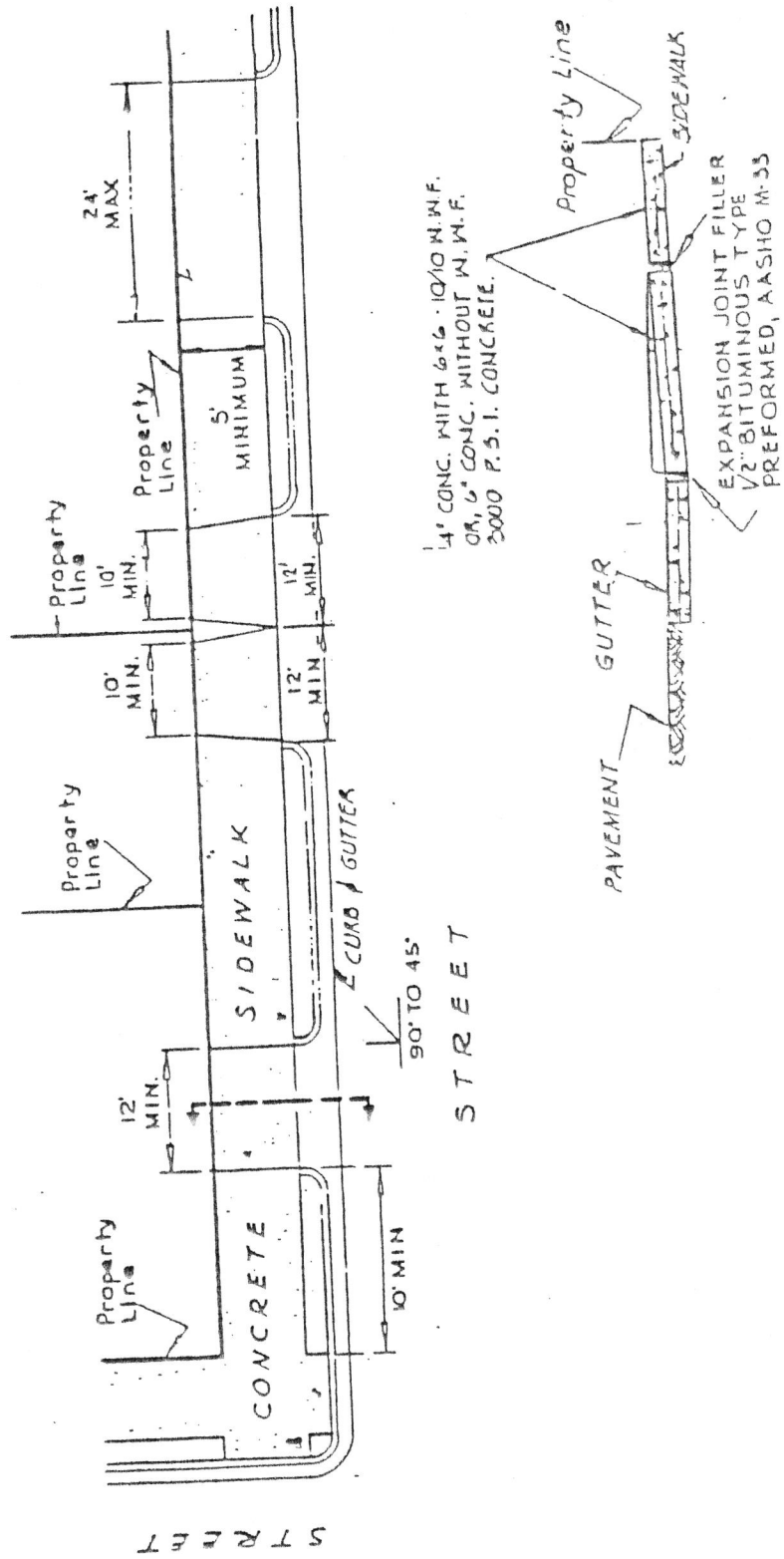
TITLE	NO.
RESIDENTIAL DRIVEWAYS.....	C-1
COMMERCIAL DRIVEWAYS.....	C-2
DRIVEWAY - RETURN TYPE.....	C-3
DRIVEWAY - WING TYPE.....	C-4
MAXIMUM DRIVEWAY AND ALLEY ENTRANCE SLOPES.....	C-5
SIDEWALKS.....	C-6
WHEEL CHAIR RAMP.....	C-7
SIDEWALK FOR ON-SITE PONDING.....	C-8





EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

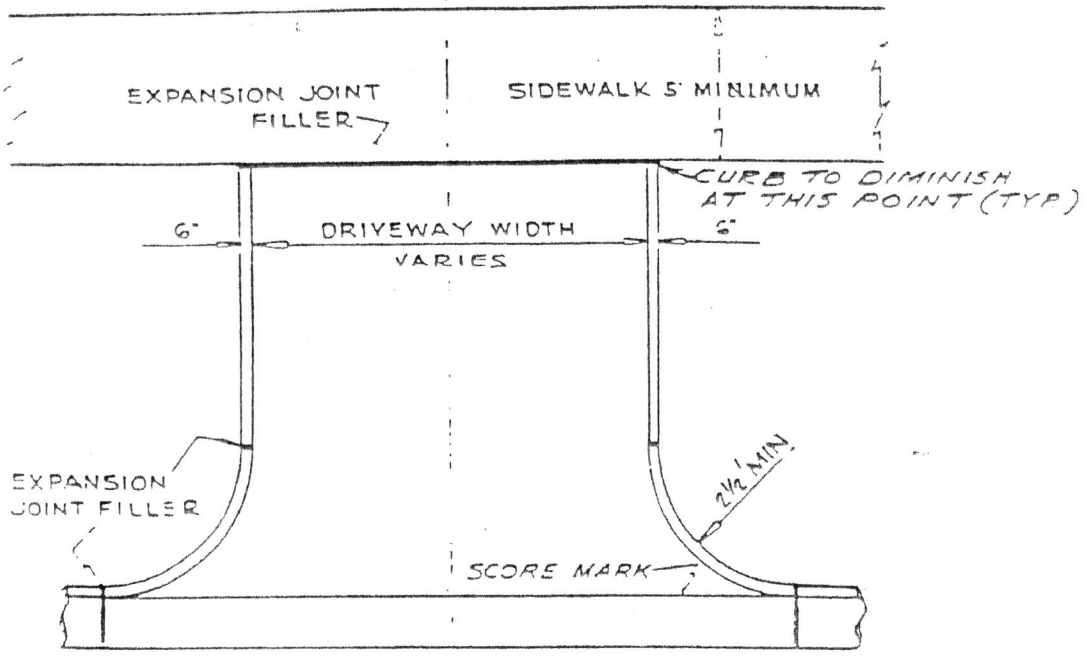
C-1



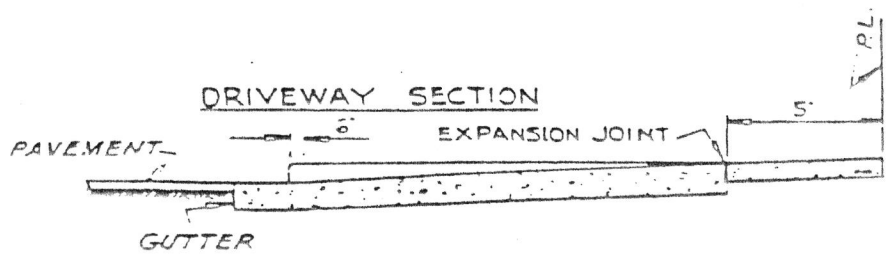
DRIVEWAY SECTION

NO SCALE

RESIDENTIAL DRIVEWAYS



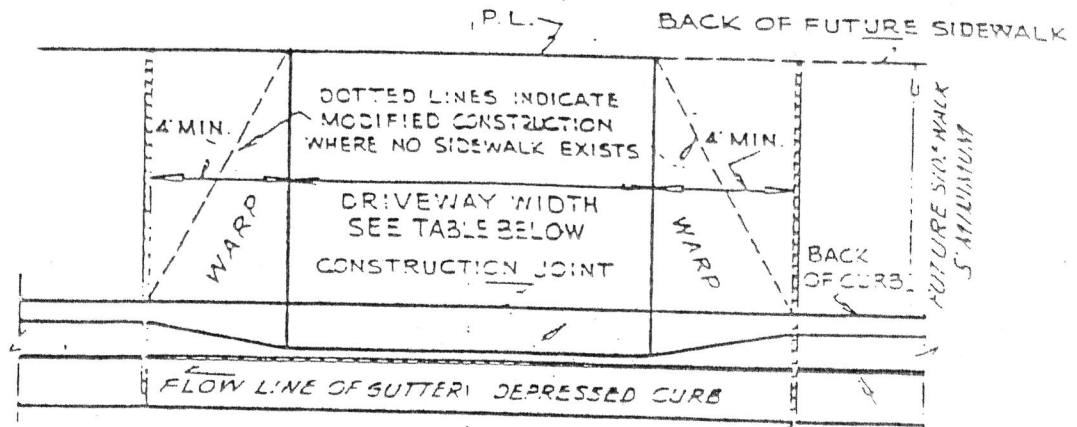
EXPANSION JOINT FILLER
 1/2" BITUMINOUS TYPE
 PREFORMED, AASHO M-35



NO SCALE



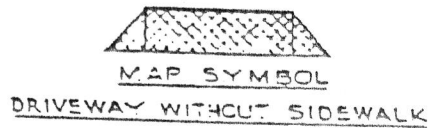
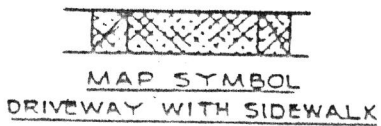
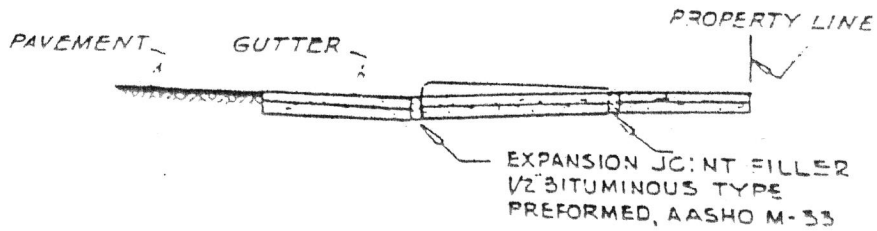
**EL PASO COUNTY
 SUBDIVISION DESIGN STANDARDS**



DRIVEWAY WIDTH	MIN	MAX
	15'	35'

EXPANSION JOINT FILLER
 1/2" BITUMINOUS TYPE
 PREFORMED, AASHO M-33

NO SCALE



EL PASO COUNTY SUBDIVISION DESIGN STANDARDS



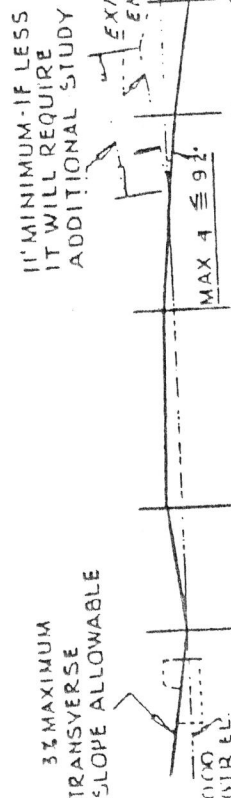
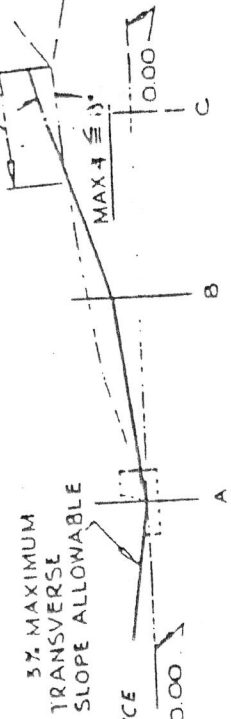
EL PASO COUNTY SUBDIVISION DESIGN STANDARDS

NOTE

All controls are interchangeable and must be considered in all cases. Dimensions, slopes, and relative elevations are the maximum which may be used in the construction of driveway and alley entrances to prevent conflicts with vehicular traffic. They are based on measurements of the representative standard vehicle under full design load condition taken from the Automobile Manufacturers Assoc., Engineering Notes for 1968.

MAXIMUM DRIVEWAY & ALLEY SLOPES (POSITIVE)			MAX. SLOPE ALLOWABLE		ELEV. B		ELEV. C	
POINT	ELEV. A	MAX. SLOPE ALLOWABLE FROM A - B	FROM A - B	0.11	0.11	0.22	0.22	0.22
STATION	0.00							
DET. 12	0.00	0.121	0.42	1.42	0.420	1.450	1.450	1.450
DET. 12	0.00	0.113	0.32	1.32	0.275	1.435	1.435	1.435
DET. 10	0.00	0.129	0.50	1.50	0.289	1.468	1.468	1.468

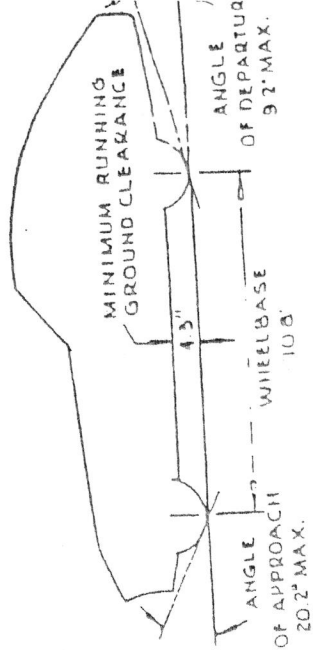
IF MINIMUM-IF LESS IT WILL REQUIRE ADDITIONAL STUDY



STATION	A	B	SLOPE FROM B - C	C	SLOPE FROM C - D	D	SLOPE FROM D - E	E
DET. 12	0.00	0.055	-0.0328	0.11	-0.11	-0.54	0.309	0.22
DET. 12	0.00	0.58	-0.0475	-0.24	-0.185	-0.78	-0.324	-2.24
DET. 12		0.42	-0.062	0.08	-0.20	1.02	0.338	-2.88
DET. 12		0.34	-0.076	-0.08	0.214	-1.26	-0.355	-3.20
DET. 12		0.26	-0.091	-0.24	-0.229	-1.50	-0.367	-3.52
DET. 12		0.18	0.105	0.40	0.244	-1.74	0.382	-3.84
DET. 12	0.00	0.10	-0.120	-0.56	0.265	-2.01	-0.396	-4.19

ALL FIGURES IN THIS CHART ARE BASED ON CURB AND GUTTER WITH 5 FT. SIDEWALK.

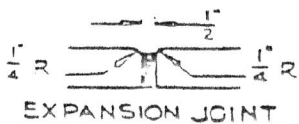
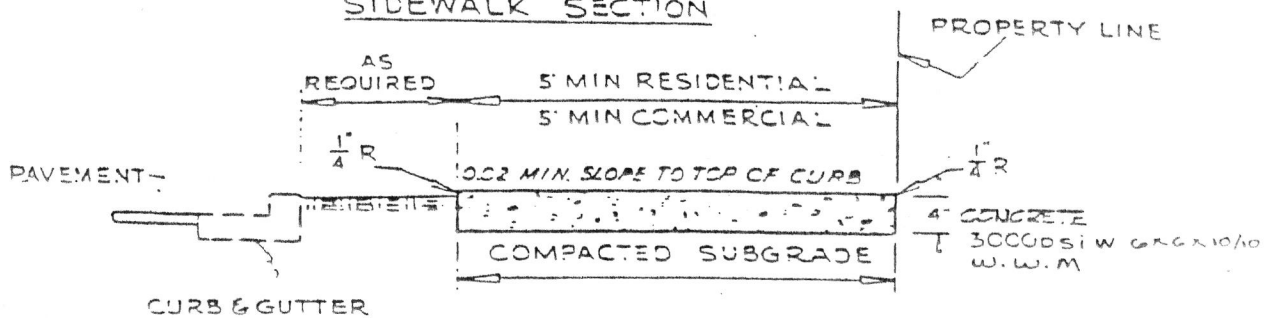
NOTE: Existing driveway cannot be connected if it makes a positive angle of more than 92°. Angle will control and slope will be less than maximum.



A - GUTTER ELEVATION - 0.00 DET. 12 - 0.00
 B - RELATIVE DISTANCE DRIVEWAY ENTRANCE IS ABOVE THE GUTTER REFLECTING THE DEPRESSION OF THE DRIVEWAY ENTRANCE IN INTERVALS OF 0.00
 C, D & E - MAXIMUM VERTICAL DISTANCE ABOVE OR BELOW DATUM AT THESE POINTS.

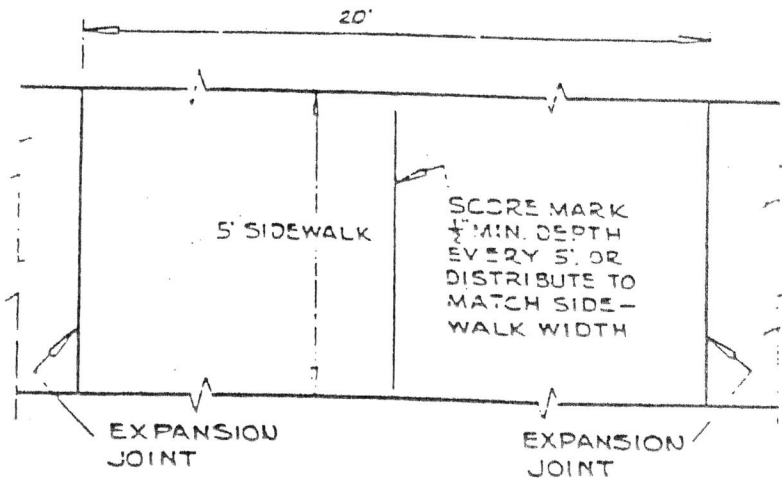


SIDEWALK SECTION



NOTES

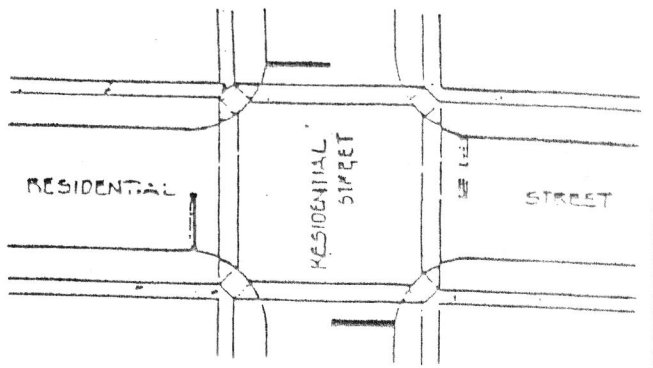
1. EXPANSION JOINT FILLER SHALL BE BITUMINOUS TYPE PREFORMED JOINT FILLER, AASHTO M-33
2. WHEREVER SIDEWALK ABUTS ROCK OR MASONRY STRUCTURES SUCH AS CURBS OR BUILDINGS, EXPANSION JOINT FILLER SHALL BE PLACED IN ACCORDANCE WITH STANDARD SPECIFICATIONS



NO SCALE

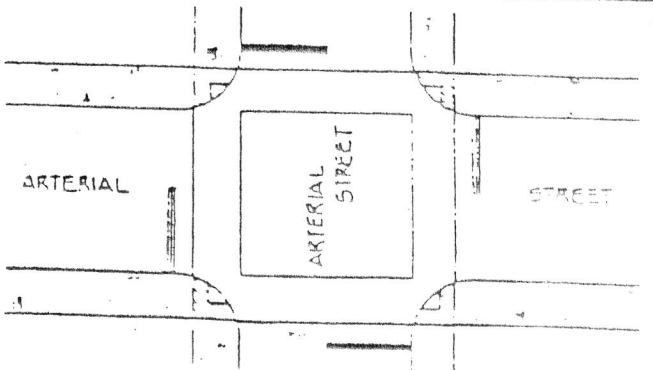


EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS

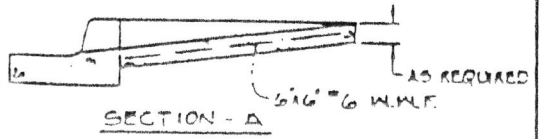
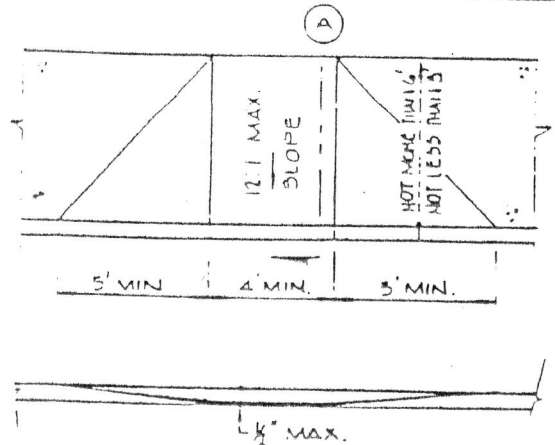


RAMPS ON RESIDENTIAL AREA

Note: ALL CONCRETE TO BE 3000 P.S.I. (MIN). BROOM FINISHED.



RAMPS AT SIGNALIZED ARTERIAL INTERSECTION



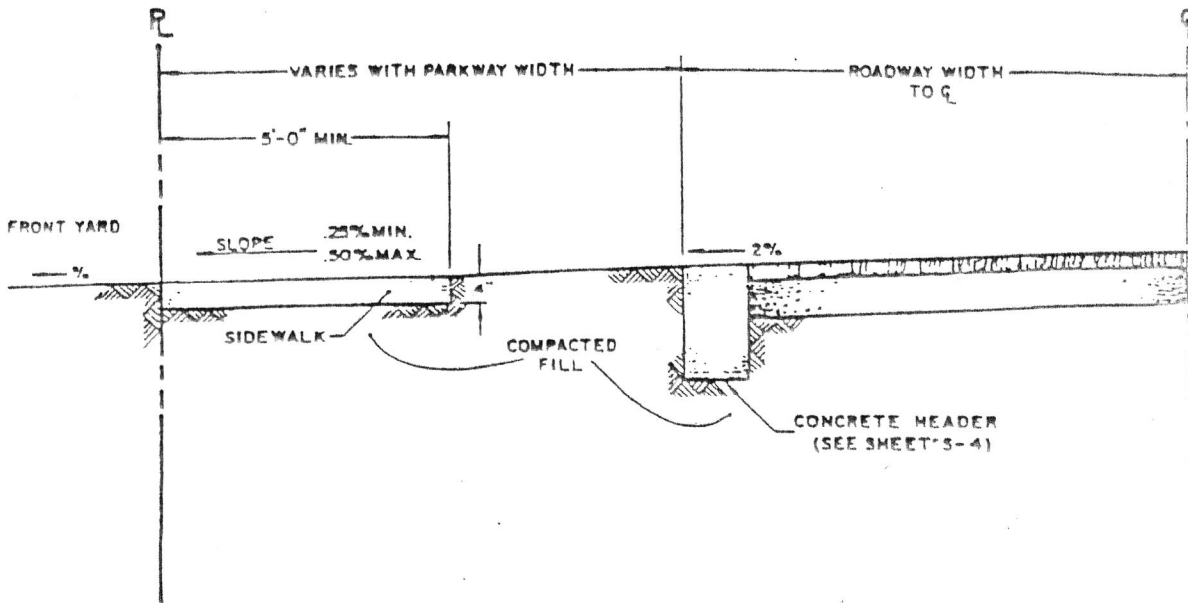
DETAILS

LEGEND

- SIDEWALK
- RAMP
- CROSSWALK
- STOP LINE



EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS



SIDEWALK FOR ON-SITE PONDING

NOTES:

1. CONCRETE FOR HEADERS AND SIDEWALKS SHALL BE 3000 P.S.I. (MIN).
2. DUMMY JOINT AT 10' O.C., MINIMUM 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION JOINT AT 30' O.C. (SIDEWALK ONLY).
3. EXPANSION JOINTS FOR HEADER AT ALL CURVE POINTS.

NO SCALE



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**

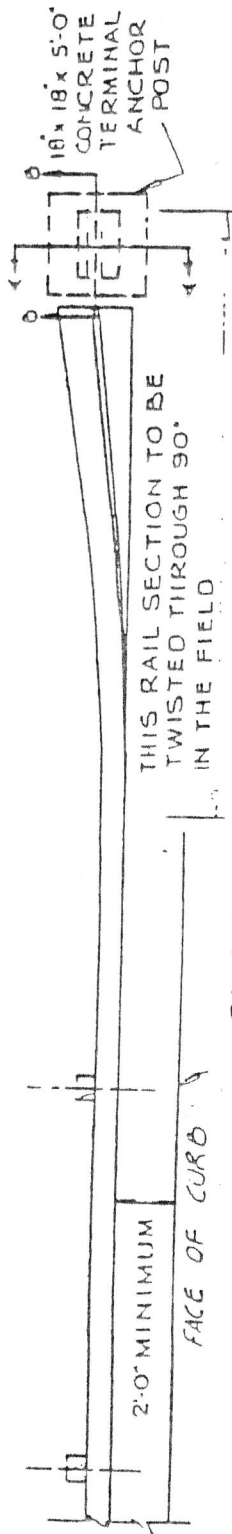
C-8

SECTION IV
GUARD RAILS & GUARD POSTS

TITLE	NO.
GUARD RAIL.....	G-1
METAL BEAM GUARD FENCE.....	G-2
GUARD POST.....	G-3

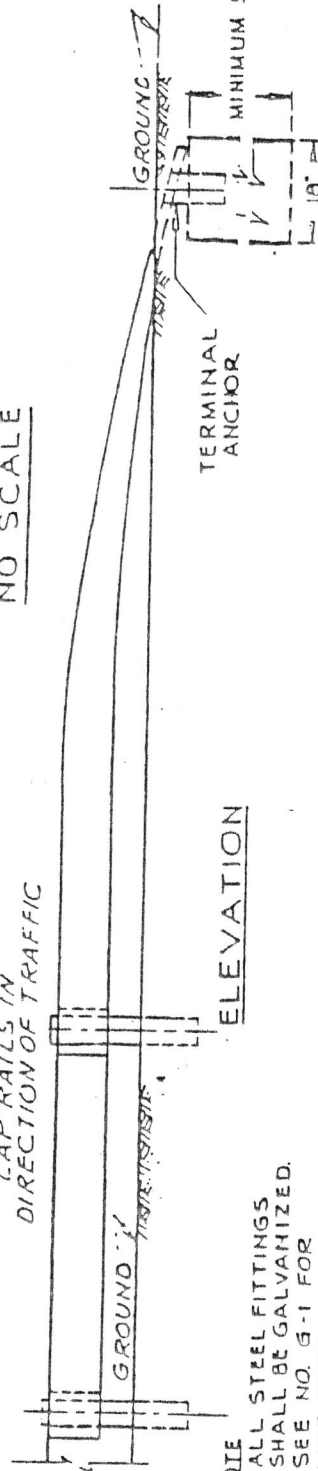


NOTE: TO BE USED ON MAJOR ARTERIALS



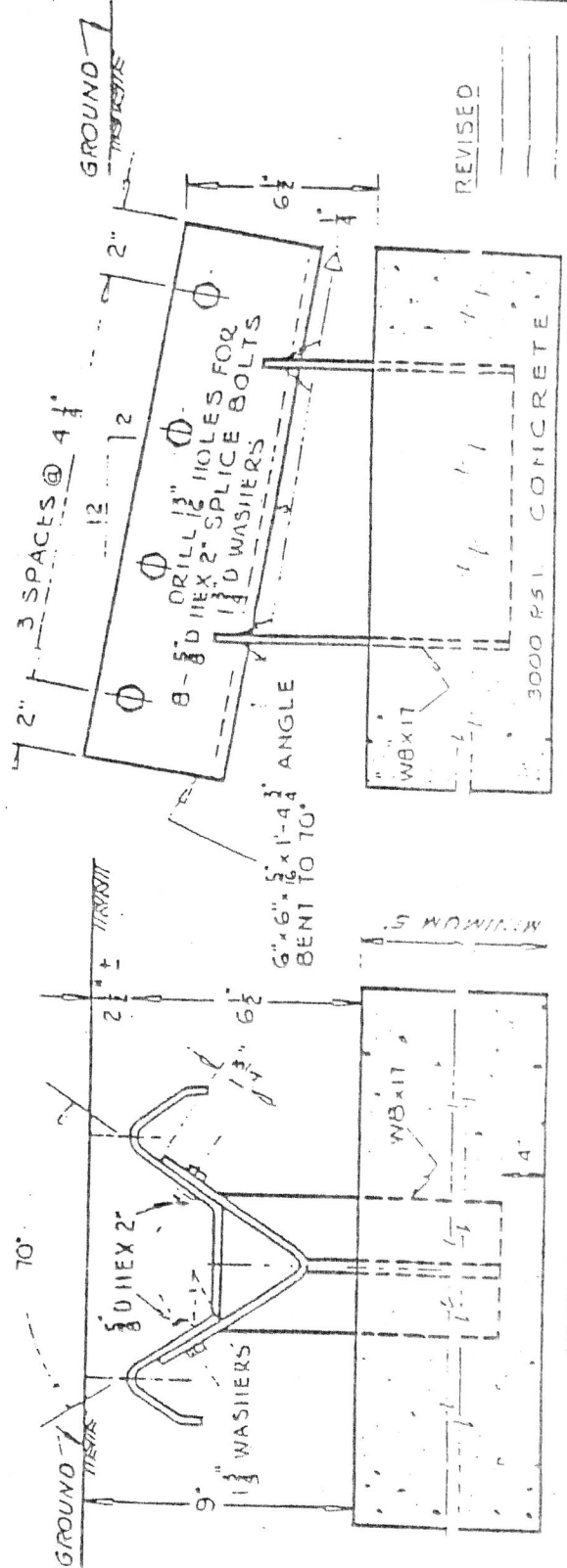
NO SCALE

LAP RAILS IN DIRECTION OF TRAFFIC

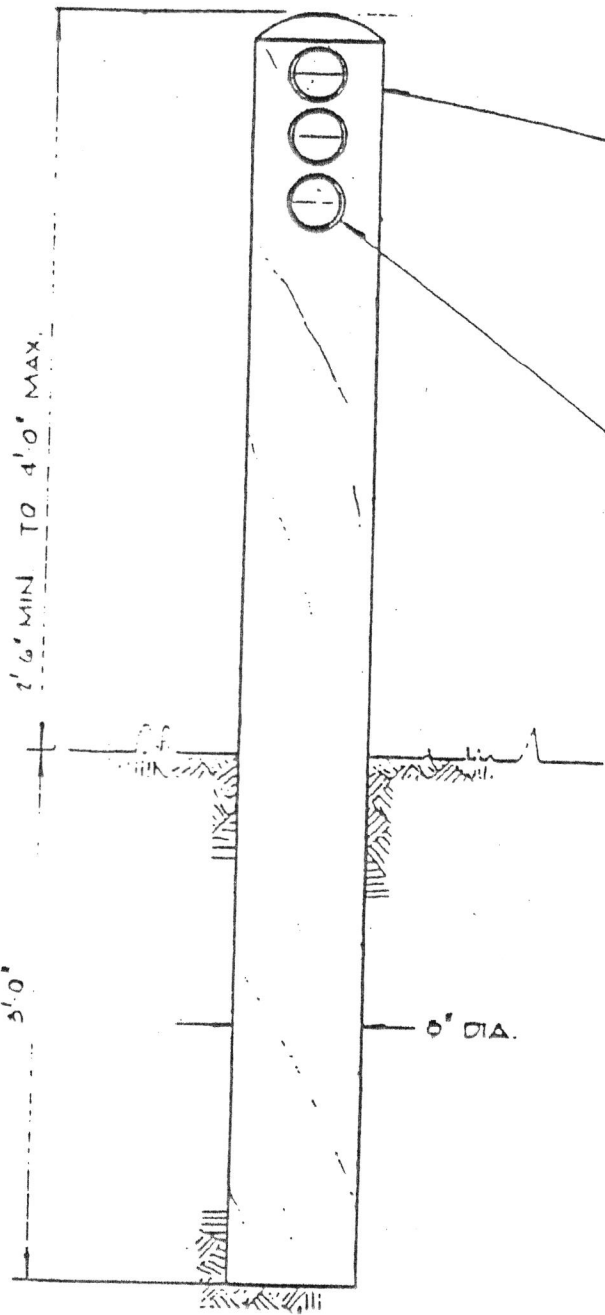


NOTE

1. ALL STEEL FITTINGS SHALL BE GALVANIZED.
2. SEE NO. G-1 FOR LINE POST DETAIL



EL PASO COUNTY SUBDIVISION DESIGN STANDARDS



TIMBER POST SHALL BE SOUTHERN YELLOW PINE, OR EQUAL, A MINIMUM OF 7 INCHES IN DIAMETER. POST SHALL BE TREATED WITH 0.4 LBS./CU. FT. DRY PENTACHLOROPHENOL. AFTER ERECTION POST SHALL BE PAINTED WITH 2 COATS OF ALUMINUM PAINT OR OTHER TYPE AS APPROVED BY THE CO. ENGINEER.

3 RED INDEPENDENTLY HOUSED ACRYLIC PLASTIC PRISMATIC REFLECTORS (3" DIA.)

2' 6" MIN TO 4' 0" MAX.

5' 0"

8" DIA.



**EL PASO COUNTY
SUBDIVISION DESIGN STANDARDS**