FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
KEN SCHULTZ

CHIEF ADMINISTRATIVE OFFICER
GENE ROMO

DEPUTY CAO PUBLIC SERVICES
FRANK MARTINEZ

DEPUTY CAO PLANNING/DEVELOPMENT
BILL MUELLER

May 18, 1988

Jeff Mortensen, P.E.
Tom Mann & Associates, Inc.
811 Dallas, NE
Albuquerque, New Mexico 87110

RE: DRAINAGE PLAN FOR PONDEROSA RESERVOIR (G-21/D28)
ENGINEER'S STAMP DATED MAY 3, 1988

Dear Mr. Mortensen:

Based on the information provided on your submittal of May 9, 1988, the above referenced plan is approved for Building Permit.

Please attach a copy of this plan to the construction sets prior to sign-off by Hydrology.

Also, we will need concurrence from the inspector in charge of this C.I.P. prior to Certificate of Occupancy release.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj

***

DRAINAGE INFORMATION SHEET

PROJECT TITLE: PONDEROSA RESERVOIR ZONE ATLAS/DRNG. FILE #: G-21/D28

LEGAL DESCRIPTION: CITY OF ALBUQUERQUE PROPERTY, PONDEROSA WELL SITE

CITY ADDRESS:

ENGINEERING FIRM: TOM MANN & ASSOCIATES CONTACT: PETER LUJAN

ADDRESS: 811 DALLAS NE PHONE: 265-5611

OWNER: CITY OF ALBUQUERQUE CONTACT: ART STEWART

ADDRESS: P.O. BOX 1293 PHONE: 768-2772

ARCHITECT: CH2M HILL CONTACT: PETER JACOBSON

ADDRESS: 6121 INDIAN SCH. RD. N.E. PHONE: 884-5600

SURVEYOR: KOOGLE & POULS ENGINEERING CONTACT: ENGINEER

ADDRESS: 8338 A COMANCHE, N.E. PHONE:

CONTRACTOR: UNKNOWN CONTACT:

ADDRESS: PHONE:

RECEIVED
MAY 09 1988
HYDROLOGY SECTION

PRE-DESIGN MEETING:

X YES

___ NO

X COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO.

EPC NO.

PROJ. NO. G-21/

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

X DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

X BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: May 3, 1988

BY: Peter M. Lujan

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

April 24, 1987

Ray Macy, P.E.
URS Corporation
5700 Harper Drive, NE #470
Albuquerque, New Mexico 87109

RE: DRAINAGE PLAN SUBMITTAL OF PONDEROSA RESERVOIR NO. 2 RECEIVED MARCH 26, 1987 FOR SITE DEVELOPMENT PLAN APPROVAL (G-21/D28)

Dear Ray:

The above referenced submittal dated March 24, 1987, is approved for Site Development Plan contingent upon there being an existing drainage easement to Karen Avenue for the proposed 36" RCP drain line, or an easement is obtainable.

With a copy of this memo, I am recommending to the Design Review Committee chairman that the City Work Order for these improvements not be released until evidence of an adequate drainage easement is provided.

If you have any questions, call me at 768-2650.

Cordially,

Roger A. Green, PE

Roger A. Green, P.E.
C.E./Hydrology Section

cc: Andre Houle, DRC

RAG/bsj

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Ponderosa Reservoir No. 2 ZONE ATLAS/DRNG. FILE #: G-21/D28

LEGAL DESCRIPTION: NE ¼, Section 4, T10N, R4E, N.M.P.M.

CITY ADDRESS: Montgomery Blvd, NE, between Morris & Tara

ENGINEERING FIRM: URS Corporation CONTACT: Ray Macy

ADDRESS: 5700 Harper Dr., NE, #470 PHONE: 822-1484

OWNER: City of Albuquerque CONTACT: Mike Mendoza

ADDRESS: P.O. Box 1293 PHONE: 768-2750

ARCHITECT: (Landscape) Morrow & Co., Ltd CONTACT: Liz Fish

ADDRESS: 210 La Veta, NE PHONE: 268-2266

SURVEYOR: Gordon Douglas & Associates CONTACT: Gordon Douglas

ADDRESS: 128 Washington, SE PHONE: 268-4429

CONTRACTOR: to be awarded CONTACT: _____

ADDRESS: _____ PHONE: _____

RECEIVED
MAR 26 1987
HYDROLOGY SECTION

PRE-DESIGN MEETING:

X YES

____ NO

____ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. _____

EPC NO. _____

PROJ. NO. _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

X DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

X SITE DEVELOPMENT PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ BUILDING PERMIT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ ROUGH GRADING PERMIT APPROVAL

____ GRADING/PAVING PERMIT APPROVAL

____ OTHER _____ (SPECIFY)

DATE SUBMITTED: March 25, 1987

BY: Raymond W. Macy

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION/DESIGN HYDROLOGY SECTION

CONFERENCE RECAP

DRAINAGE FILE/ZONE ATLAS PAGE NO.: G21 DATE: 12-17-87

PLANNING DIVISION NOS: EPC: _____ DRB: _____

SUBJECT: Pardoras Kayenne

STREET ADDRESS (IF KNOWN): _____

SUBDIVISION NAME: Pardoras Well site

APPROVAL REQUESTED:

____	PRELIMINARY PLAT	____	FINAL PLAT
____	SITE DEVELOPMENT PLAN	X	BUILDING PERMIT
____	OTHER	____	ROUGH GRADING

	WHO	REPRESENTING
ATTENDANCE:	Peter Lujan	
	Carlos A Montoya	

FINDINGS:

(1) Drainage plan per DPM

(2) Free drainage allowed to Mingonem

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED:	Carlos A Montoya	SIGNED:	Peter M. Lujan
TITLE:		TITLE:	
DATE:	12-17-87	DATE:	

NOTE PLEASE PROVIDE A COPY OF THIS RECAP WITH THE DRAINAGE SUBMITTAL

Send Thursday 08/11/88 04:47 pm

To:
Subject: PONDEROSA RESERVOIR NO. 2

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
KEN SCHULTZ

CHIEF ADMINISTRATIVE OFFICER
GENE TOMO

DEPUTY CAO DEVELOPMENT & ENTERPRISE SERVICES
LARRY WORKMAN

DEPUTY CAO PUBLIC SERVICES
DAN WEAKS

Per your request I have reviewed the subject submittal and forward the following comments on each alternative.

Alternative A proposes to construct a storm drain to Montgomery Boulevard from the well site. However, the storm drain in Montgomery Boulevard has minimal capacity, therefore, the existing storm drain in Montgomery Boulevard would need to be upgraded to handle the additional flows from the site. This alternative is not recommended.

Alternative B proposes to connect a storm drain system to Morris St. The storm drain system in Morris can convey the majority of the flows with the remaining flows being conveyed overland. This is the most attractive alternative given the capacity in Morris Street.

Alternative C is similar to Alternative B in that it proposes to connect to a sorm drain system, however, this connection would be in Cielito Lindo. The difference between the connection in Morris and Cielito Lindo is one of capacity, i.e., Morris has more capacity than Cielito Lindo. In either case, B or C, there exists sufficient capacity for dealing with the 111 cfs.

Alternative D is the least costly, however, this alternative, in my opinion, would overflow into the adjacent property given that this concept does not take into account vehicles that could be parked in the street which would reduce the flow capacity of the treet. Additionally, the proposal to use landscape berms to contain the runoff in the street is not a practical solution given the maintainability and/or lack of permanency of such a structure. A structure such as this would require constant monitoring and maintenance. I do not recommend this alternative.

Gene, if you would like to discuss my comments in more detail, please call me at 768-2650.

***

Speed Message

To Fred Aguirre

From Gene Leyendecker

Subject Ponderosa No. 2

Date 8/8/88 19

Pls find attached a drainage Report for the overflow from proposed Ponderosa Res. No. 2.

Please Review ASAP I was hoping to reply to us by 8/10

If you have any questions pls Call 873 6240

Thanx

Gene

Signed

RECEIVED
AUG 08 1988
HYDROLOGY SECTION

WilsonJones
GRAYLINE FORM 44-900 2-PART
©1983 • PRINTED IN U.S.A.

Existing 42" Storm Drain in Morris Can carry 90cfs

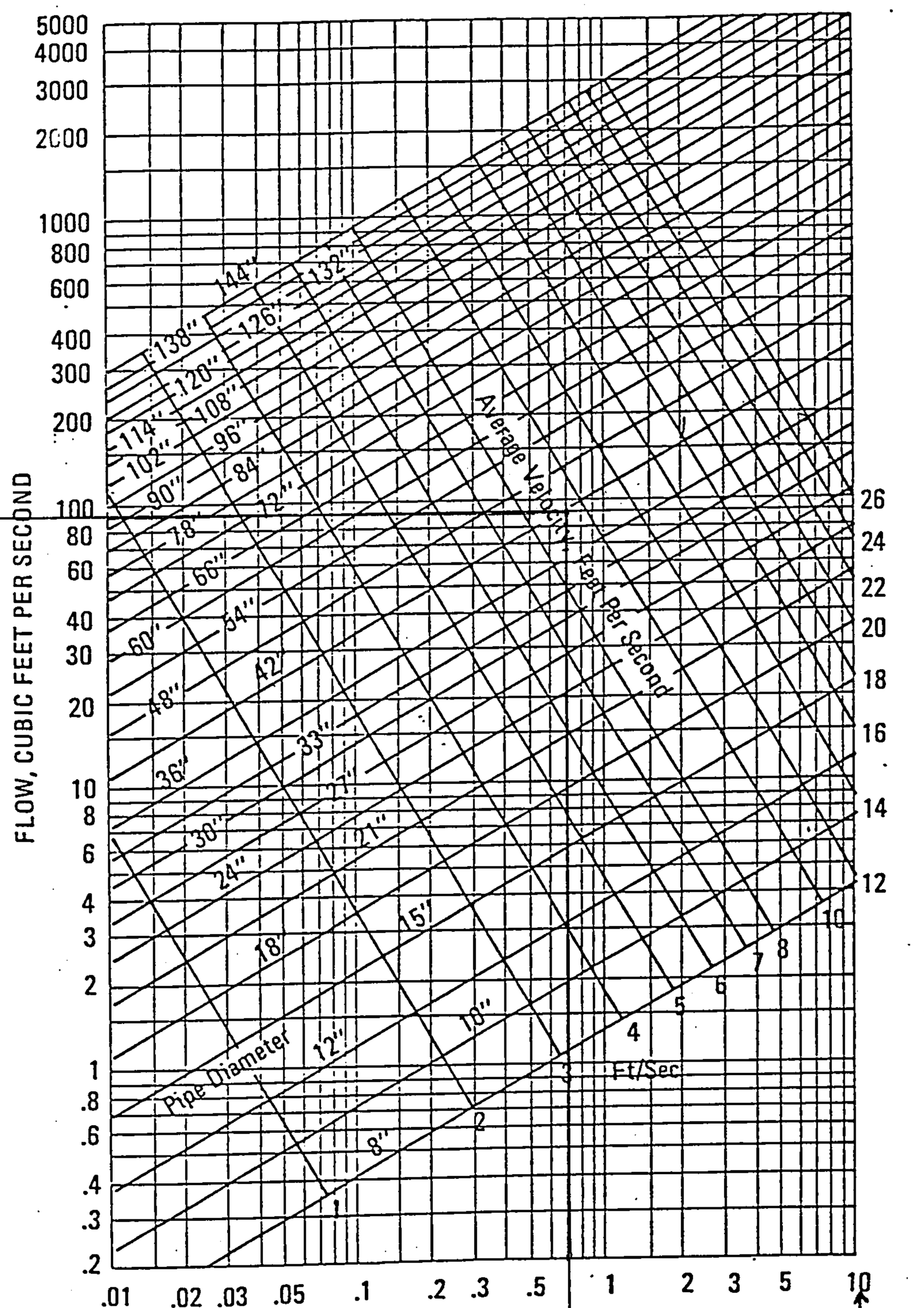


Figure 3.21. Flow for Circular Pipe Flowing Full Based on Manning's Equation, n = 0.012.

SL= 0.007

FIGURE 3

Reference: CONCRETE PIPE HANDBOOK, 1980

~~Ex~~isting 24" storm Drain in MONTGOMERY CAN ONLY CARRY 8 cfs

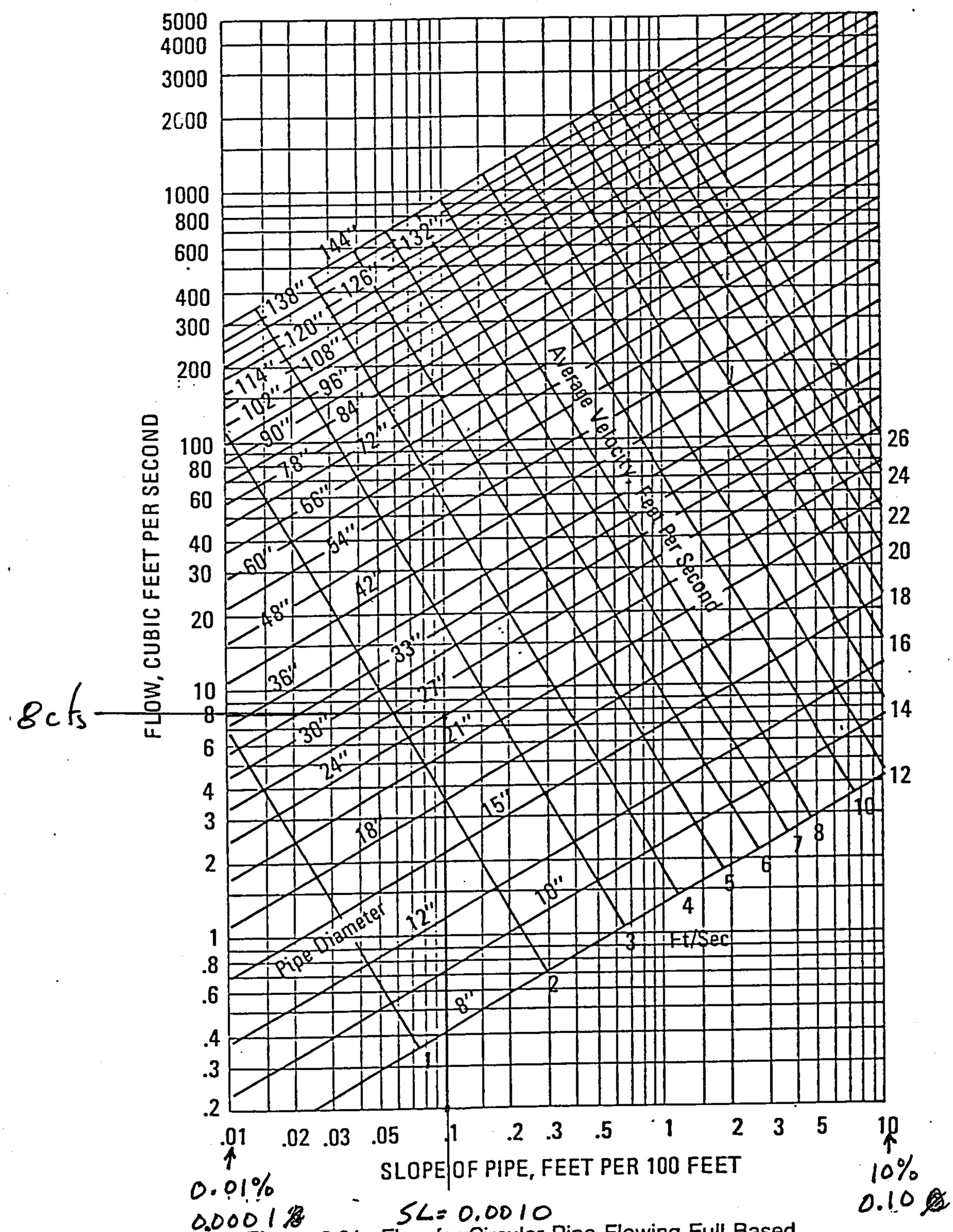


Figure 3.21. Flow for Circular Pipe Flowing Full Based on Manning's Equation, n = 0.012.

figure 1

Reference: CONCRETE PIPE HANDBOOK, 1980

— Existing 30" Storm Drain in Cielito Lindo
Can carry 60 cfs

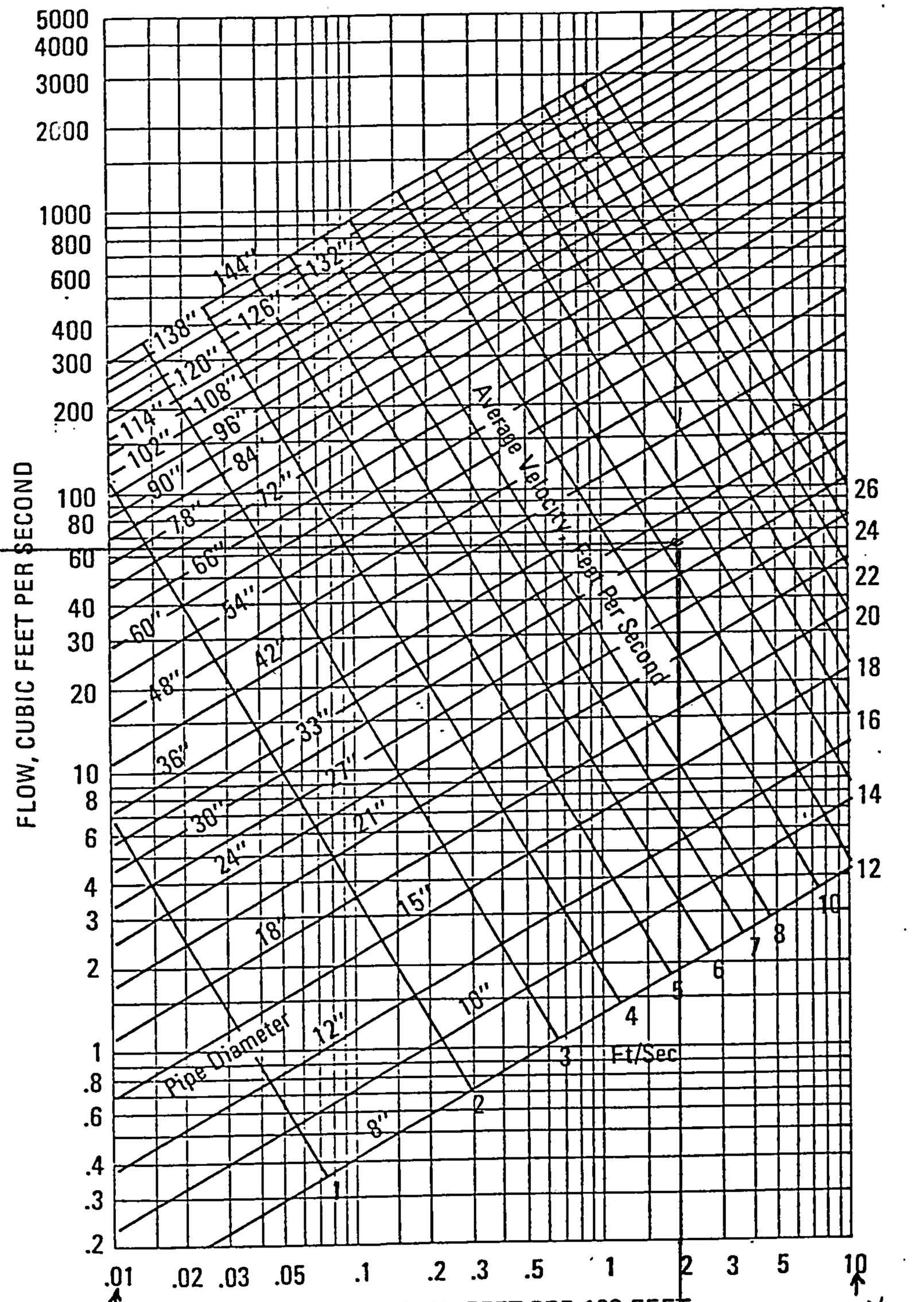
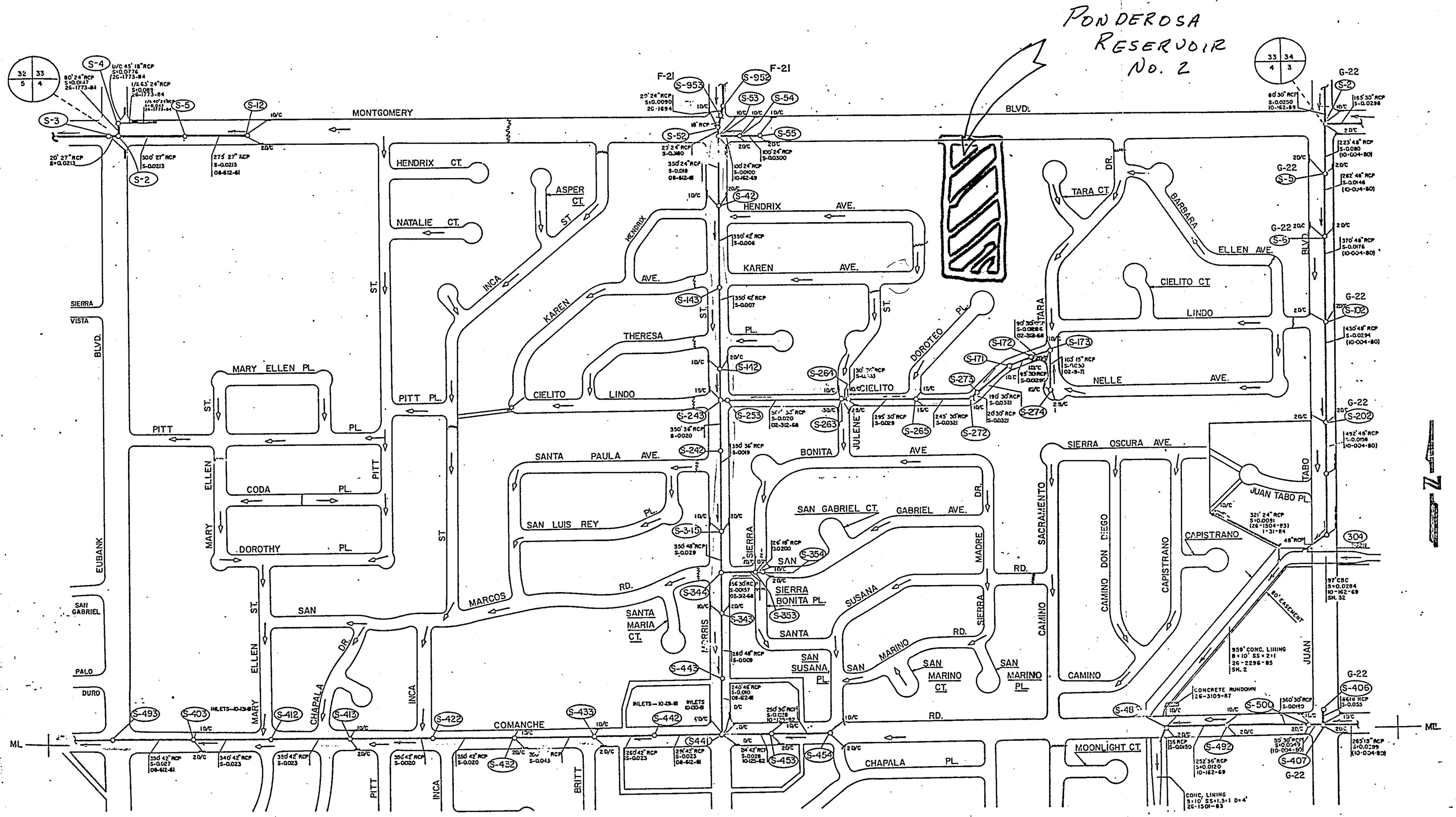


Figure 3.21. Flow for Circular Pipe Flowing Full Based on Manning's Equation, n = 0.012.

Figure 2

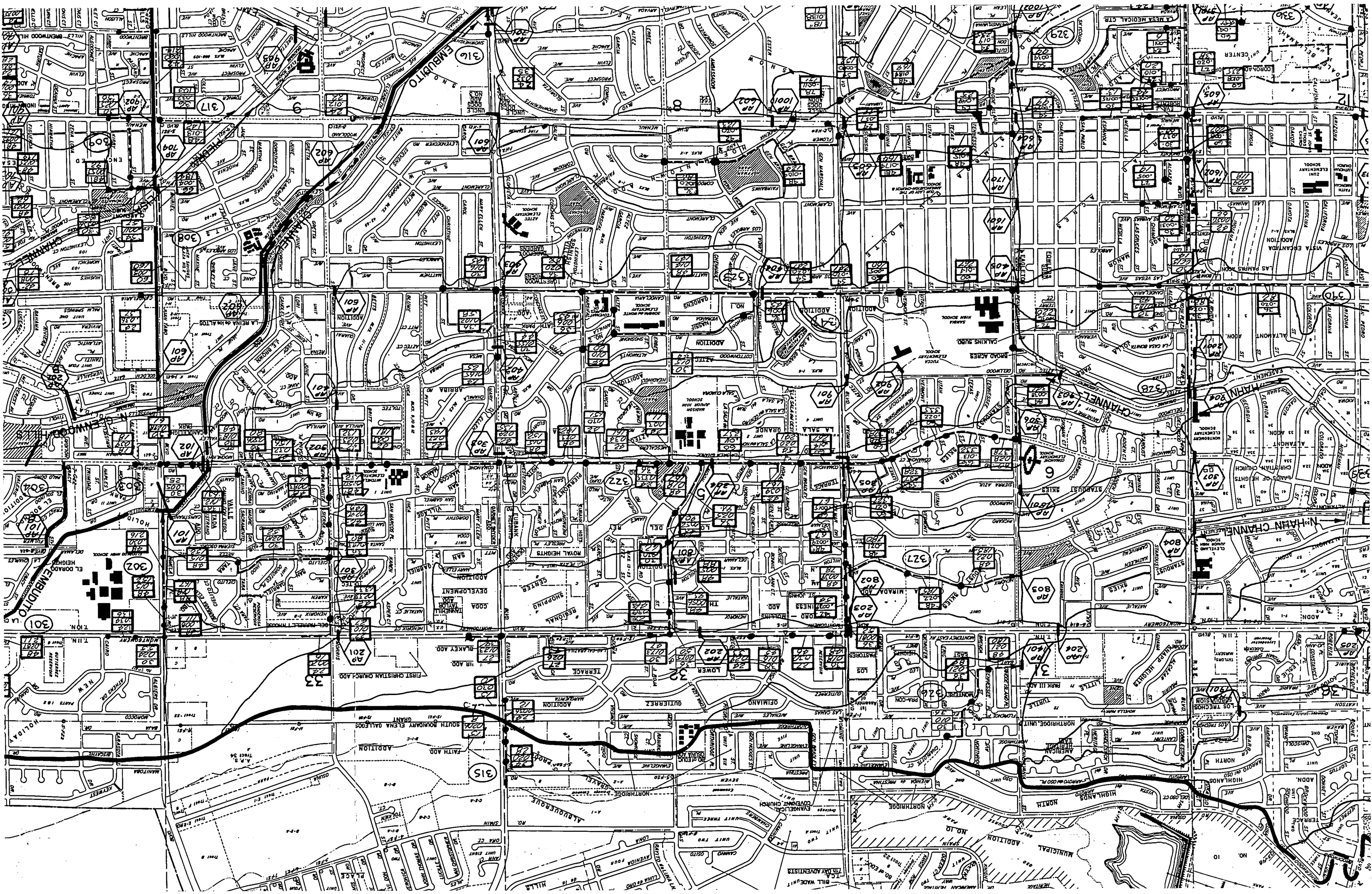
Reference: CONCRETE PIPE HANDBOOK, 1980

NEXT SHEET No. F-21S



DRAINAGE FACILITY MAP

LEGEND	NOTES	REVISIONS		MAP GRID
STORM SEWER LINE MANHOLE	1. MANHOLE IDENTIFICATION REQUIRES BOTH THE MAP GRID & MANHOLE No.	DATE 2-2-84	REMARKS SD ON MORRIS ICP4	


EMBIDITO
N. HAIN CHANNEL
CHANNEL
BROAD ACRES
CALKINS SUBD.
SAHIA HIGH SCHOOL
LA CASA BONITA
LAS VEGAS AVE
LAS PALMAS ADDITION
VISTA ENCANTADA ADDITION
LA SALA
LA SALA ORANGE
MONTEREY
NORTHRIDGE
HIGHLANDS
NORTH
MUNICIPAL ADDITION
ALBUQUERQUE
EL DORADO HEIGHTS
NEW
HOLIDAY
SOUTH BOUNDARY ELENA GALLEGOS GRANT
FIRST CHRISTIAN CHURCH ADD.
FAITH ADD.
ADDITION
TERRACE
LOWER
GUTIERREZ
OTIMIANO
COOPER
DEVELOPMENT
SHOPPING
CENTER
ROYAL HEIGHTS
FUBANK HEIGHTS
VALLE
SAN GABRIEL
SAN MARCOS
SAN JOSE
SAN ANTONIO
SAN PEDRO
SAN JUAN
SAN MIGUEL
SAN LUIS
SAN ANDRES
SAN FRANCISCO
SAN DIEGO
SAN CARLOS
SAN BERNARDINO
SAN ANSELMO
SAN ALBERTO
SAN ALBERTO
SAN ALBERT

Rectangular Channel capacity
Agrees with URS

RECTANGULAR CHANNEL

Flow Rate	(cfs)	=	111
Depth	(ft)	=	1.244813
Velocity	(ft/s)	=	5.94467
Mannings n		=	.015
Slope	(ft/ft)	=	.0033
Side Slope	(H:V)	=	0
Bottom Width	(ft)	=	15
Top Width	(ft)	=	15
Area	(ft^2)	=	18.67219
Hydraulic Radius		=	1.067615
Freeboard	(ft)	=	2
Top Width	(w/ freebrd)	=	15
Froude Number		=	.9393994

STRIKE ANY KEY TO CONTINUE

URS
A PROFESSIONAL SERVICES ORGANIZATION

URS CONSULTANTS
5450 TECH CENTER DRIVE, SUITE 327
COLORADO SPRINGS, COLORADO 80919
TEL: (719) 590-7377

OFFICES
SAN FRANCISCO, SEATTLE, DENVER, SANTA BARBARA, COLORADO SPRINGS, SACRAMENTO, PORTLAND, ANCHORAGE, SAN BERNARDINO, LONG BEACH, PHOENIX, LAS VEGAS, NEW YORK, CLEVELAND, COLUMBUS, PARAMUS, AKRON, BUFFALO, NEW ORLEANS, ATLANTA, BOSTON, VIRGINIA BEACH, SAN ANTONIO, PITTSBURGH

August 3, 1988

RECEIVED
AUG 08 1988
HYDROLOGY SECTION

Mr. Gene Leyendecker
City of Albuquerque
Public Works Department
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage Analysis at Ponderosa Reservoir No. 2
URS Project No. 46801

Dear Mr. Leyendecker:

URS has completed an analysis considering feasibility of surface discharging the overflow water (111 cfs) from Ponderosa Reservoir No. 2.

The surface flow is identified as Alternate D on Exhibit A. Flow under this alternative eliminates extensive off-site storm sewer proposed in URS' original Alternates A, B and C. The construction cost for the surface discharge alternate is $64,000.00 versus $142,000.00 for the 36" Alternate B which is currently being implemented.

Discharge would surface flow through the 20 foot drainage easement, Karen Avenue and Julene Street. Flow would then be collected in proposed inlets at the intersections of Karen Avenue and Morris Street and at Julene Street and Cielito Lindo.

HISTORY OF PREVIOUS OVERFLOWS:

Previous overflows were discussed with Larry Jentgen of the City of Albuquerque Water Division.

The last overflow occurred two weeks ago. It was caused when the master system controller was out of service due to a new software error. The overflow occurred at 1:00 a.m., lasted one hour and was approximately 34 cfs (ultimate design overflow is 111 cfs). No damage occurred during this overflow.

The previous overflow occurred about three years ago. This overflow was caused by a loss of communication. No damage was caused.

IMPROVEMENTS PROPOSED FOR SURFACE FLOW:

Following is a list of improvements for the surface flow alternative. Off-site improvements are sketched in Exhibit A, on-site improvements are shown in Exhibit B. Improvements are listed from upstream to downstream.

1. The overflow pipes would discharge directly into the detention pond. During an overflow the pond will fill and discharge over the emergency spillway and through a 15 foot wide concrete channel to be constructed in the existing 20 foot wide drainage easement (see Exhibit B).

2. A small diameter pipe (18") is located at the south end of the detention pond. This pipe would have an orifice plate that would restrict the 100-year flood rate to historic levels (7.35 cfs). The invert of the orifice plate would be 0.5 feet above the detention pond floor and discharge 7.35 cfs when water pond is one foot above the orifice invert.

3. A 15 foot wide concrete spillway will discharge the 111 cfs overflow rate and require a head of two feet. The previous spillway only required 0.5 feet of head, therefore, additional berming will be required on-site.

4. A 15 foot wide concrete channel is proposed through the 20 foot drainage easement. Depth of flow is estimated at 1.5 feet. A 2.5 foot deep channel is recommended to include one foot of free board. A deflection structure should be provided at the downstream end of the concrete channel to direct water out into the center of Karen Avenue (see Exhibit C).

5. A portion of the flow leaving the deflection structure may encroach on the front yard of the home located directly east of the deflection structure. An initial re-landscaping cost has been included to provide a one foot berm on this property.

6. Karen Avenue will contain the 111 cfs flow at a depth of 0.66 feet, at a velocity of 9.2 feet per second. This is below the maximum allowable depth of 0.87 feet during a 100 year storm event. A profile of Karen Avenue is shown in Exhibit D.

7. At the intersection of Karen and Julene, a flow split will occur. It is assumed, based on the configuration and slopes at the intersection, that 20 to 40% of the total flow will be diverted down Julene Street. Julene has the capacity to carry 40% of the flow (44 cfs) below the 0.87 foot depth allowed for a 100 year storm event.

8. A portion of the flow will encroach on the yard of the home located at the southwest corner of the Karen and Julene Street intersection. An initial re-landscaping cost has been included to provide a one foot high berm on this property.

9. Inlets are proposed to collect the overflow water as follows:

Intersection	Number of Inlets Required
Karen and Morris	3 doubles and 1 single each side of the street
Julene and Cielito Lindo	1 single on west side and 2 singles on east side

CONCLUSIONS:

1. The estimated construction cost of the surface flow (Alternate D) versus the previously recommended Alternate B is as follows:

Alt. B (36" pipe)	$142,000
Alt. D (surface flow)	$ 65,000
(cost detail presented in Exhibit E)	

2. Disadvantages:

   a. Yards for two homes will require re-landscape work for protection.

   b. Only emergency vehicles can use Karen and Julene Streets during an overflow as flow is basically to top of curbs.

3. Advantages:

   a. Savings of the surface flow alternate is $77,000.

   b. Less disruption to the street/community during construction.

   c. Less water will surface flow down Morris Street, as 89 cfs versus 111 cfs will reach the Karen/Morris intersection. (The estimated capacity of the existing 42" storm drain in Morris is 70 cfs.)

RECOMMENDATION:

Based on construction cost savings and less disruption to the residential community, the surface flow alternate should be considered a viable option.

If you have any questions regarding this analysis, please call.

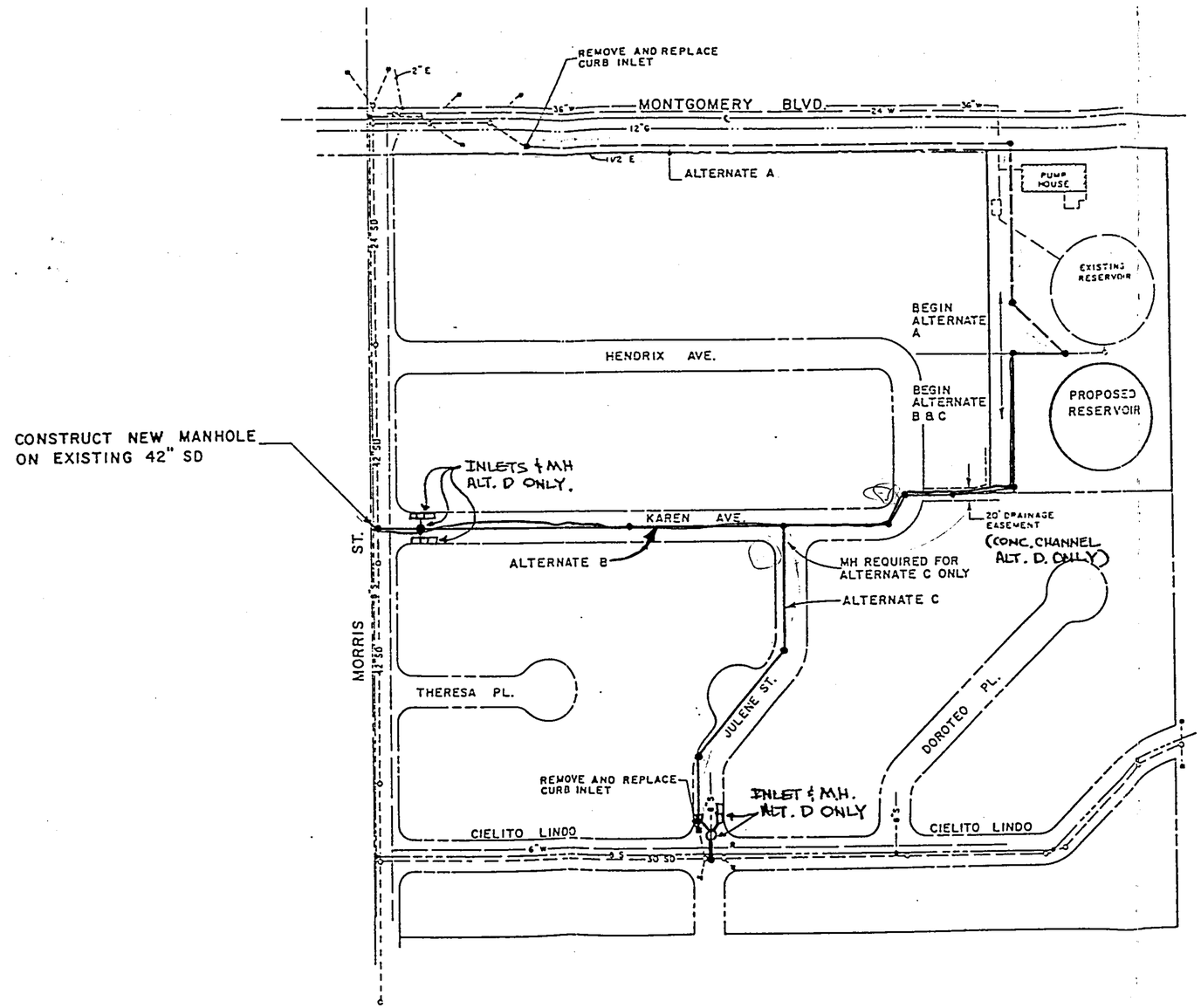
Sincerely,

Arne P. Sandvik

Arne P. Sandvik, P.E.
Project Engineer

APS/psm

URS
CONSULTANTS
MAKING TECHNOLOGY WORK

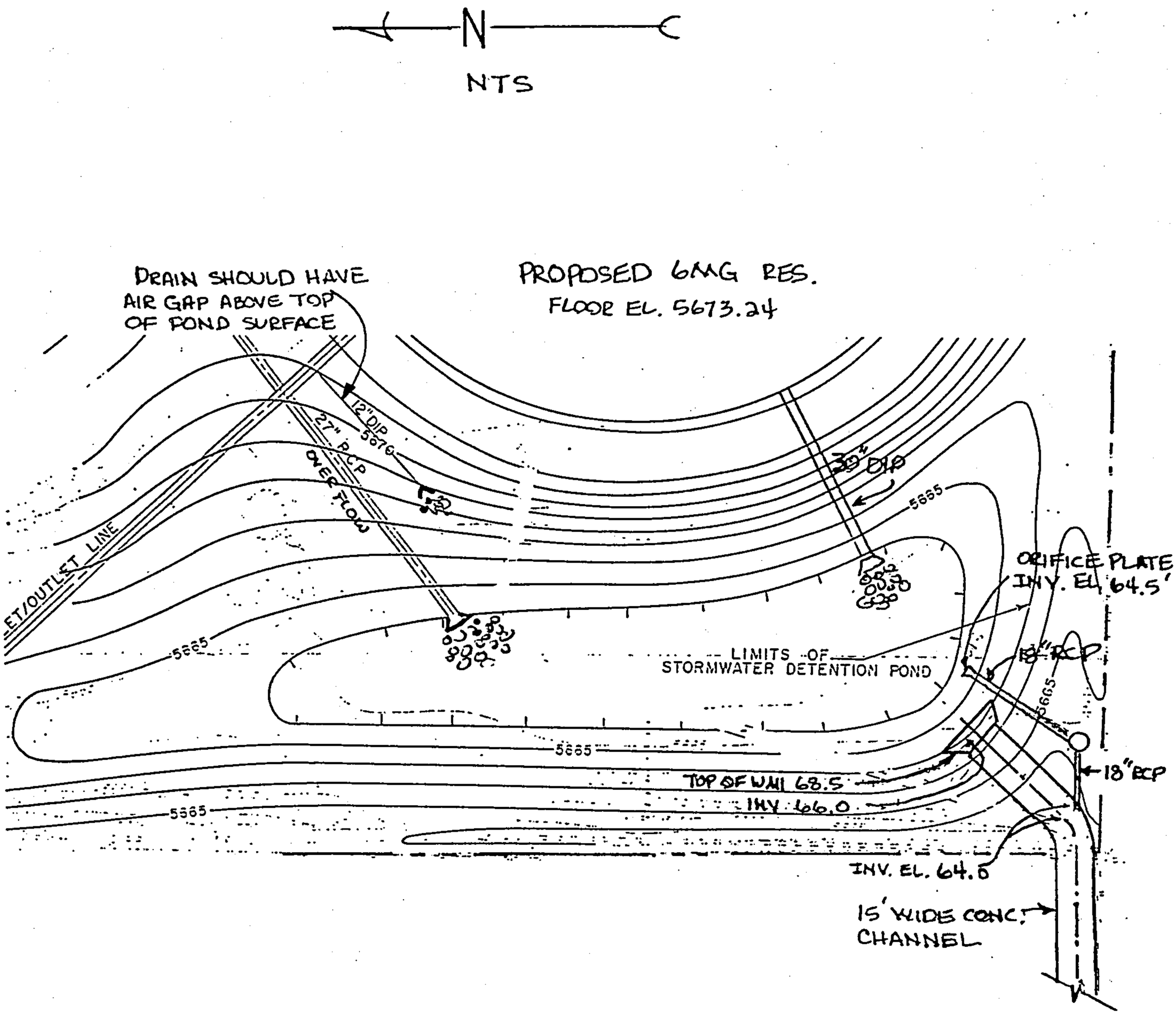


PONDEROSA RESERVOIR

ALTERNATE DRAIN LINES

EXHIBIT A

URS CONSULTANTS
MAKING TECHNOLOGY WORK



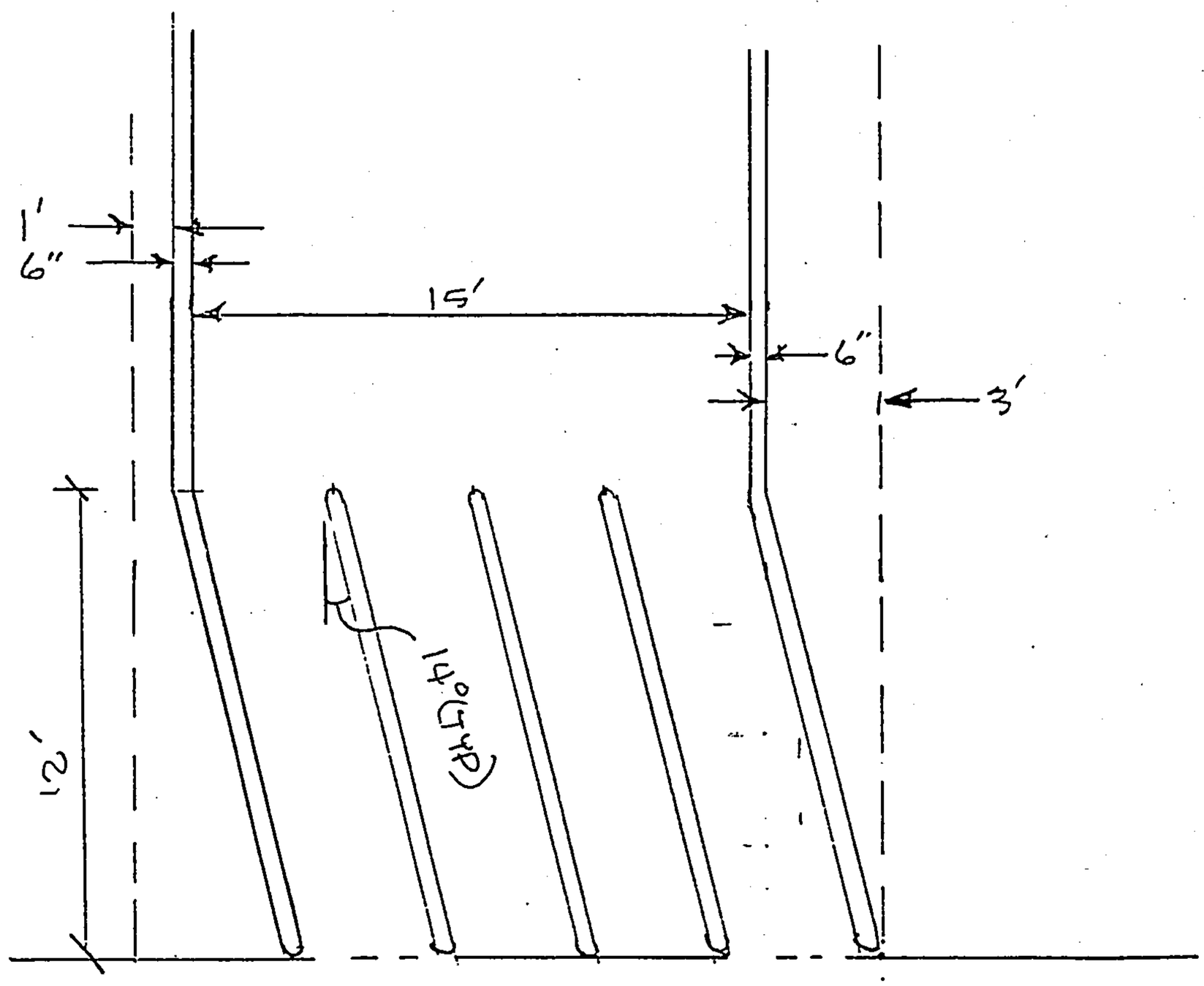
NOTE: PROPOSED CONTOURS SHOWN ARE FOR GENERAL INFO ONLY. ACTUAL BERM ON SOUTH AND WEST SIDE MUST BE 2.5' HIGHER THAN SHOWN.

EXHIBIT B

PONDEROSA RESERVOIR NO. 2
ON-SITE PIPING FOR
SURFACE DISCHARGE
OF OVERFLOW

URS
CONSULTANTS, INC.
MAKING TECHNOLOGY WORK™

URS JOB NO. 46801 PAGE 1 OF 1
DATE 8-3-88 BY Dpl CHECKED BY _____ (date)
CLIENT COA
PROJECT PONDEROSA RESERVOIR NO. 2
SUBJECT



PLAN VIEW
NTS

EXHIBIT C
DEFLECTION STRUCTURE
AT DOWN STREAM END
OF CONC. CHANNEL

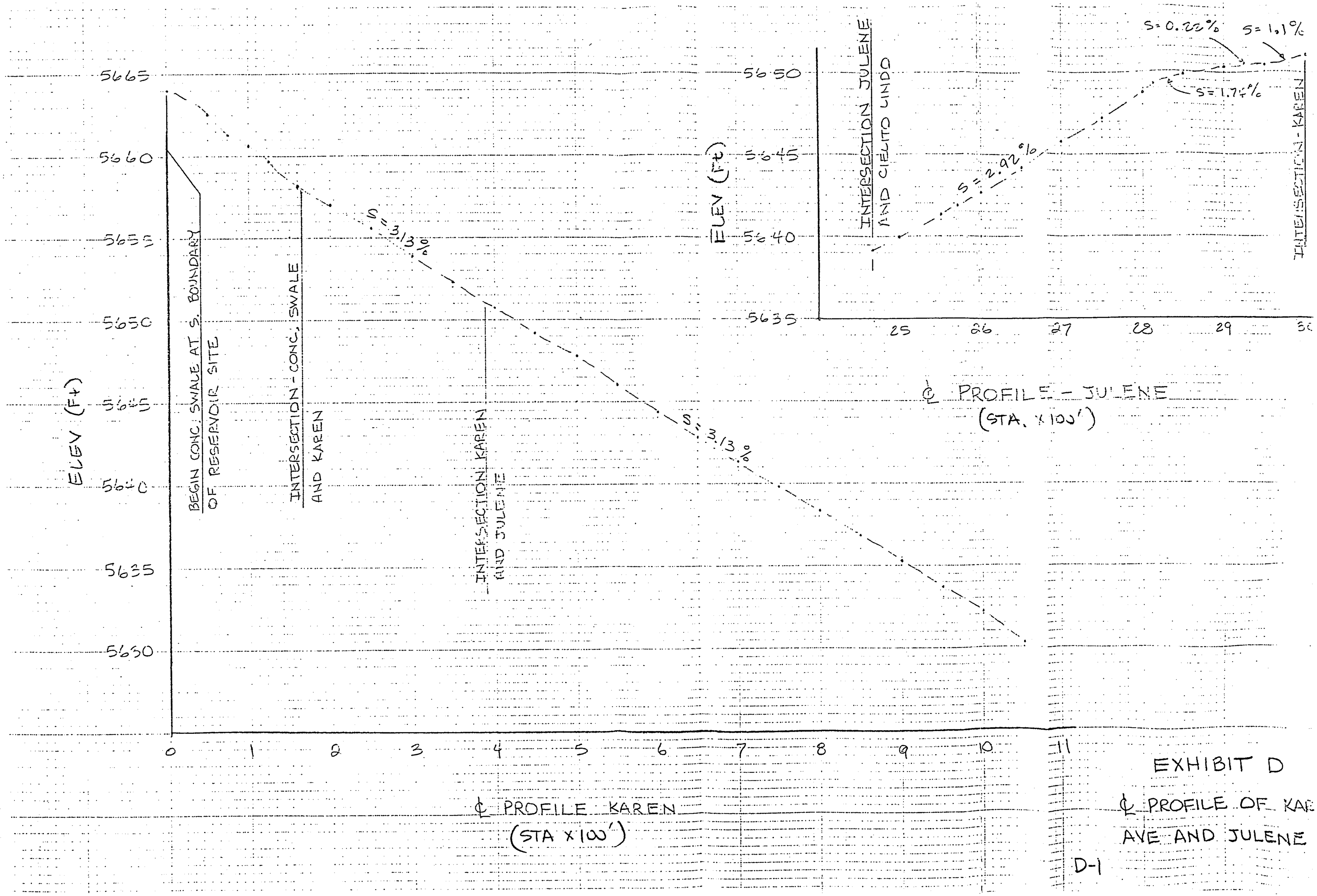


EXHIBIT D

℄ PROFILE OF KAR
AVE AND JULENE

EXHIBIT E
PONDEROSA RESERVOIR NO. 2
CONSTRUCTION COST ESTIMATE
ALTERNATIVE D
SURFACE DISCHARGE OF OVERFLOW

Item	Quantity	Unit		Unit Cost	Total
A. Improvements to Morris and Karen					
Double Inlets	6	ea	X	$3,000	$18,000
Single Inlets (A's)	2	ea	X	$2,500	5,000
6' Dia Manholes	2	ea	X	$1,400	3,000
42-inch	100	l.f.	X	$ 50	5,000
					$31,000
B. Improvements to Julene					
Single Inlets	3	ea	X	$2,500	$ 8,000
6' Dia Manholes	2	ea	X	$1,400	3,000
30-inch	100	l.f.	X	$ 32	3,000
					$14,000
C. Pond Outlet On-Site					
18-inch	50	l.f.	X	$ 20	$ 1,000
4' Dia Manholes	1	ea	X	$1,000	1,000
Concrete Channel	54	c.y.	X	$ 250	14,000
					$16,000
D. Increase Landscaping and Flood Proofing					
Residential	2	ea	X	$2,000	$ 4,000
TOTAL					$65,000

URS CONSULTANTS, INC.
MAKING TECHNOLOGY WORK™

URS JOB NO. 46301 PAGE 1 OF 3
DATE 8-3-88 BY [illegible] CHECKED BY _____ (date)
CLIENT COA
PROJECT PONDEROSA RES. NO. 2
SUBJECT EXHIBIT F MISC. CALCULATION

1. HEAD REQ'ED ON SPILLWAY

GIVEN: Width = 15'
Q = 111 cfs
C = 2.68 $\qquad Q = CLH^{2/3}$

CALC.

$$H^{2/3} = Q/CL$$

$$1.5 \log H = \log Q/CL$$

$$\log H = \frac{\log(Q/CL)}{1.5} = \frac{\log[111/2.68(15)]}{1.5} = 2.0'$$

$$H = 2.0'$$

2. DEPTH OF FLOW IN CONC. CHANNEL (RECTANGULAR)

GIVEN: WIDTH = 15' $\qquad n = 0.015$
$S = 0.0033 \qquad WP = 15' + 2d$
$Q = 111.0$ cfs $\qquad A = 15'(d)$
$V = \frac{1.49}{n} R^{2/3} S^{1/2} \qquad R = \frac{15' + 2d}{15d}$

BY TRIAL & ERROR:

$$V = 4.92'$$

CALC. DEPTH

$$A = Q/V = 111/4.92 = 22.6$$

$$d = A/15'$$

$$d = 1.5'$$

3. FLOW SPLIT ASSUMPTIONS:

20 to 40 % of the 111 cfs will flow down Julene Street. This leaves the following flows in Karen and Julene

	Min	MAX	USE FOR DESIGN OF INLETS
Karen	67	89	89
Julen	22	44	44

4. SIZING OF INLETS

a. Karen Street

Given: $S = 3.13\%$
$Q = 89$ cfs
depth $= 0.6'$

∴ Capacity of single = 11.5 cfs
Capacity of double = 13.5 cfs

USE 3 doubles and 1 single each side

$2 \times 11.5 + 6 \times 13.5 =$ 104 cfs capacity (provided)

b. Julene Street

Given: S = 2.92 %
Q = 44 cfs
depth = 0.73'

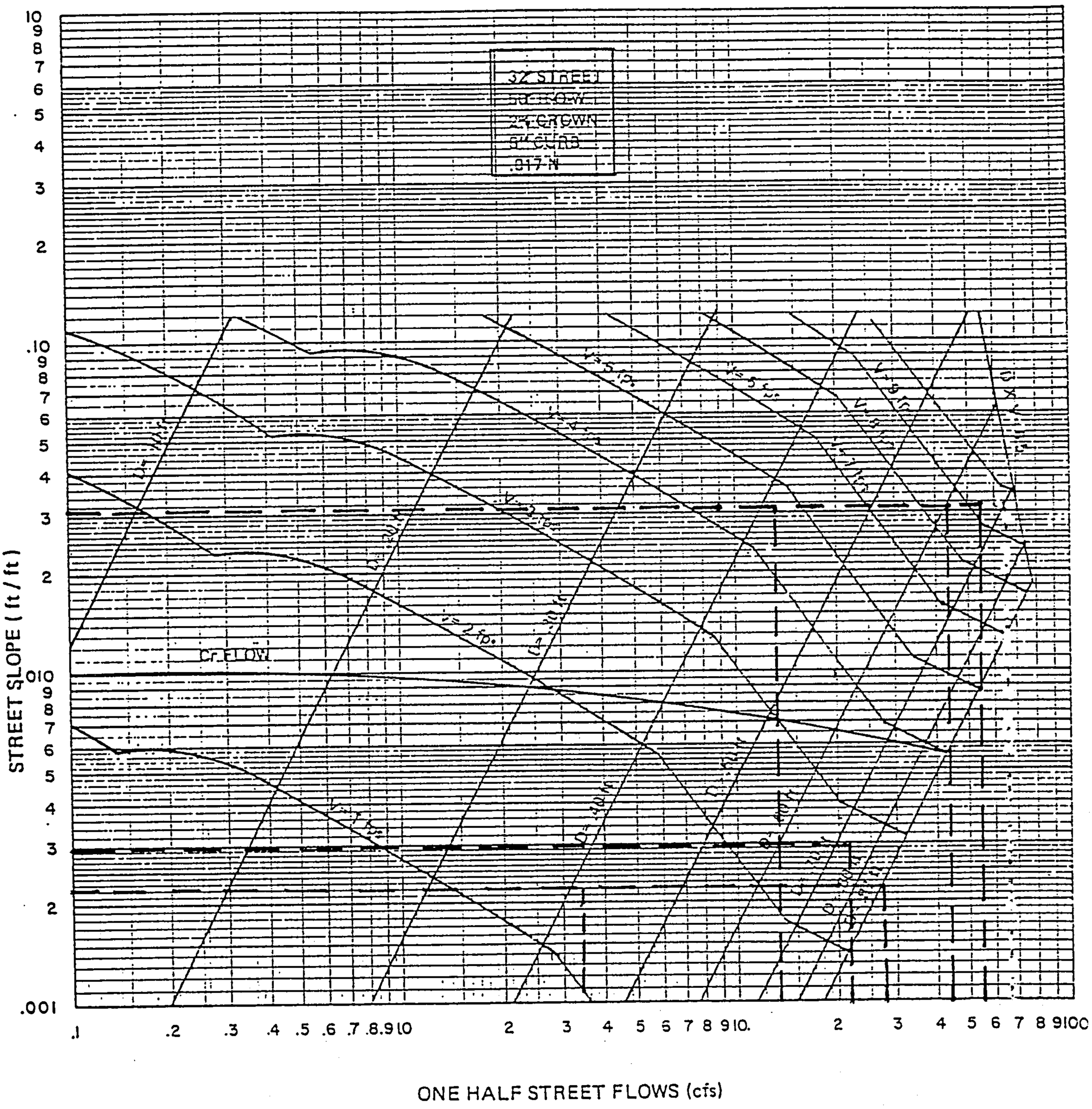
∴ Capacity of single = 14.5 cfs
Capacity of double = 16.5 cfs

One single inlet exists on the west side

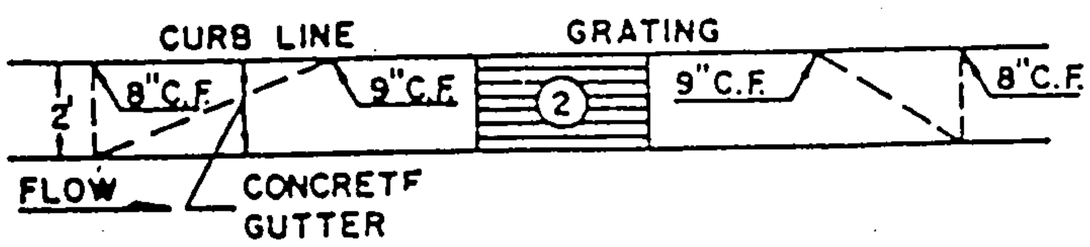
14.5 + 3 x 14.5 = 58 cfs
(existing)

On west side use existing plus 1 single
On East side add two singles

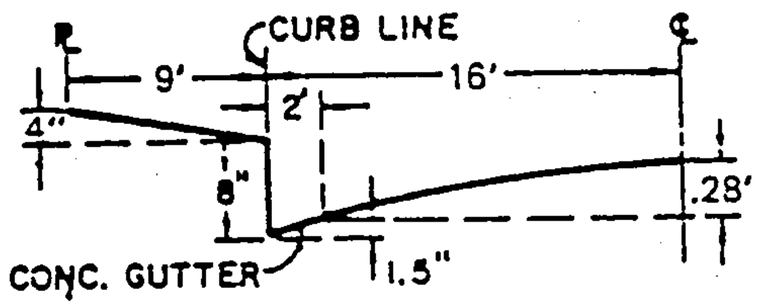
STREET CAPACITY



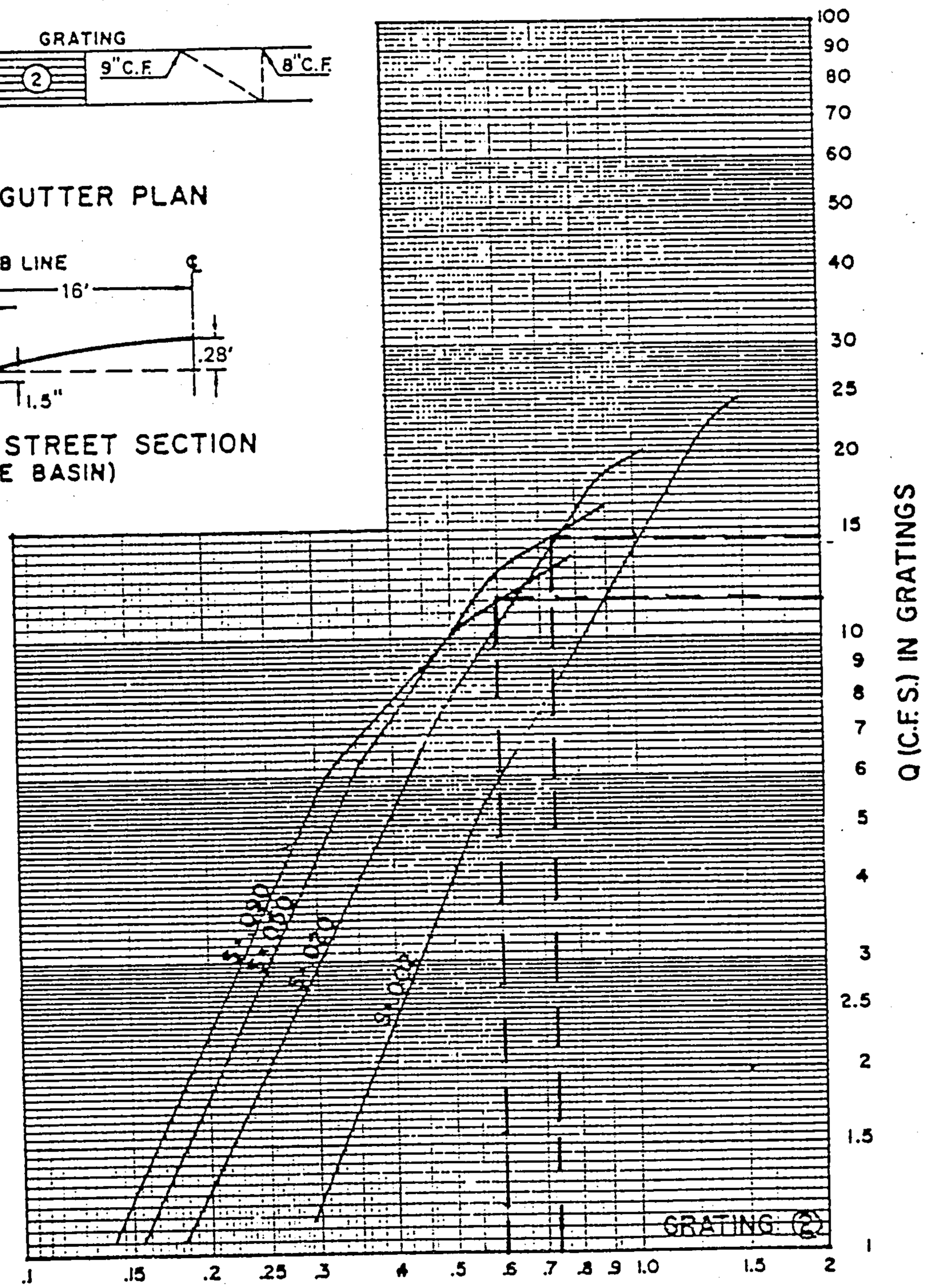
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



GRATING & GUTTER PLAN



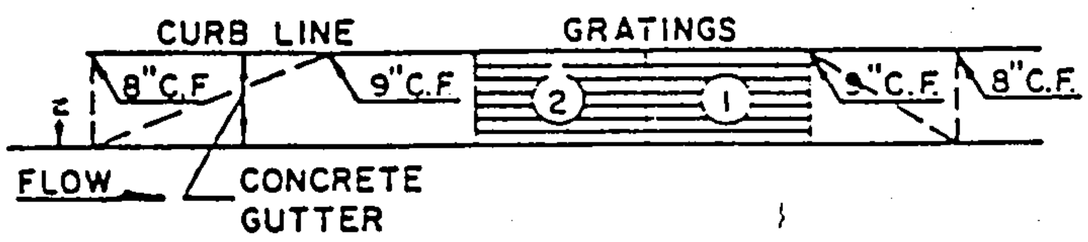
TYPICAL HALF STREET SECTION
(ABOVE BASIN)



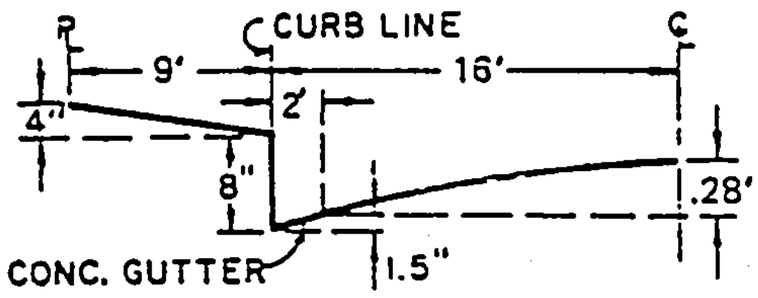
D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

F-5

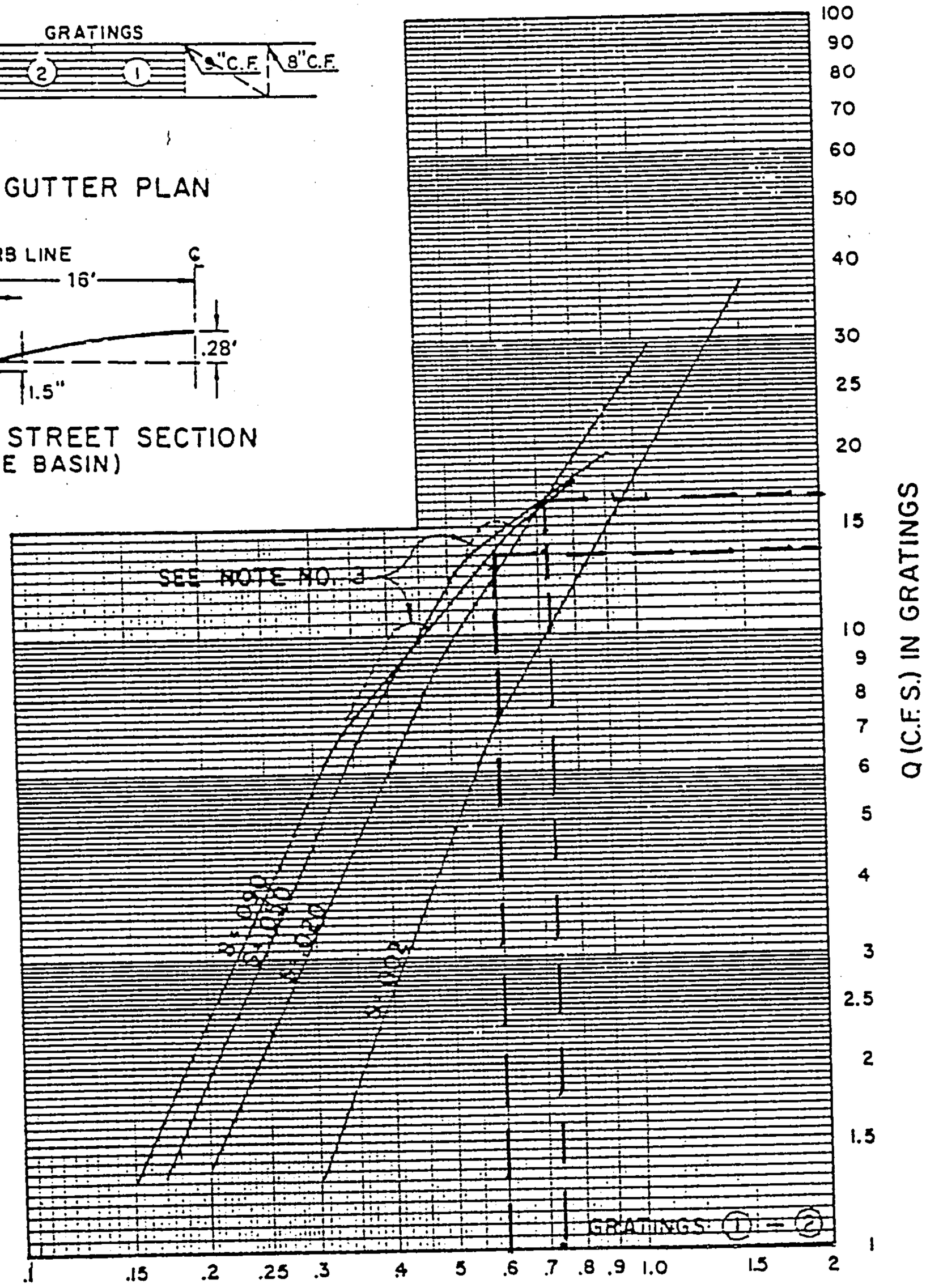
GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



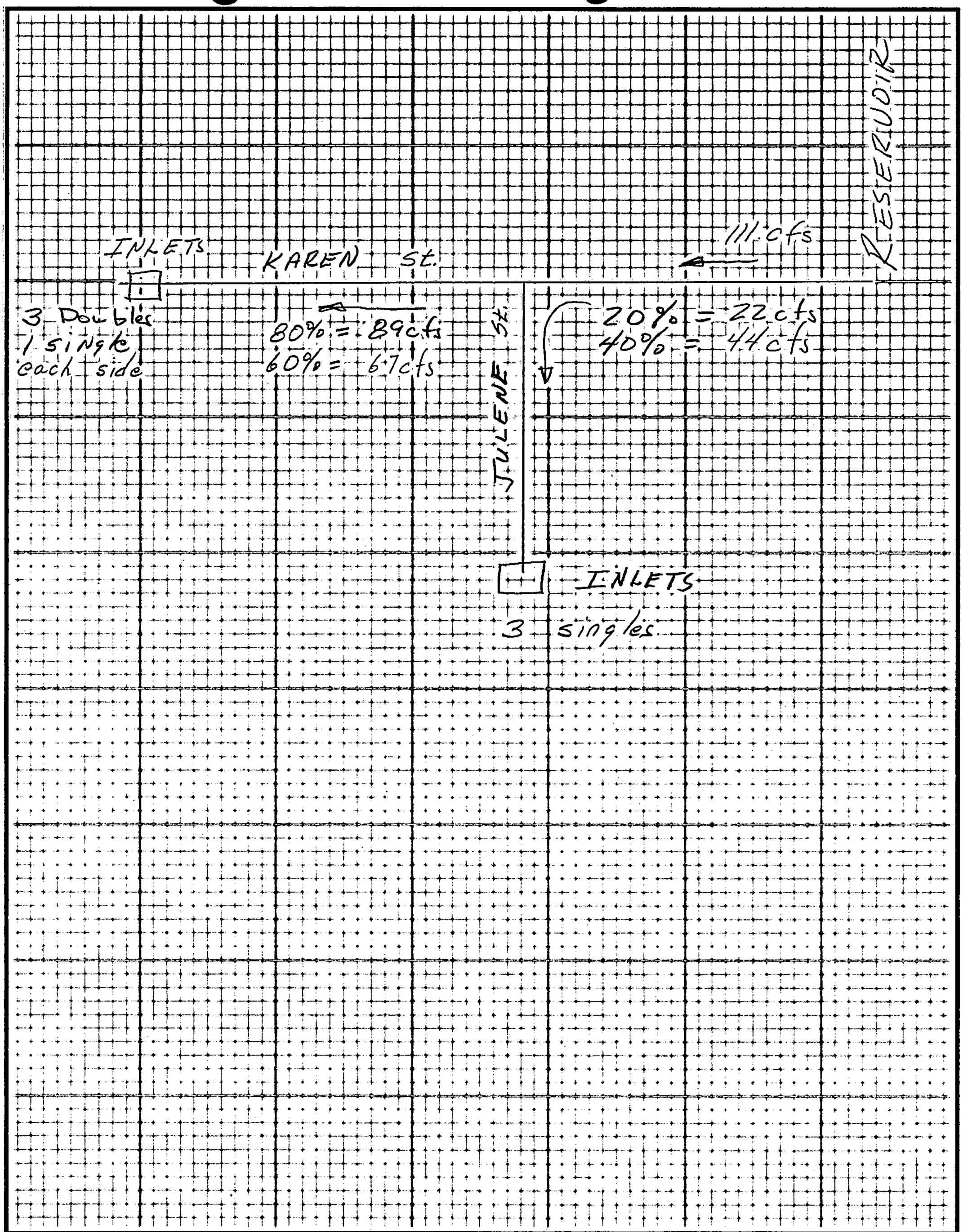
GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D= DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE



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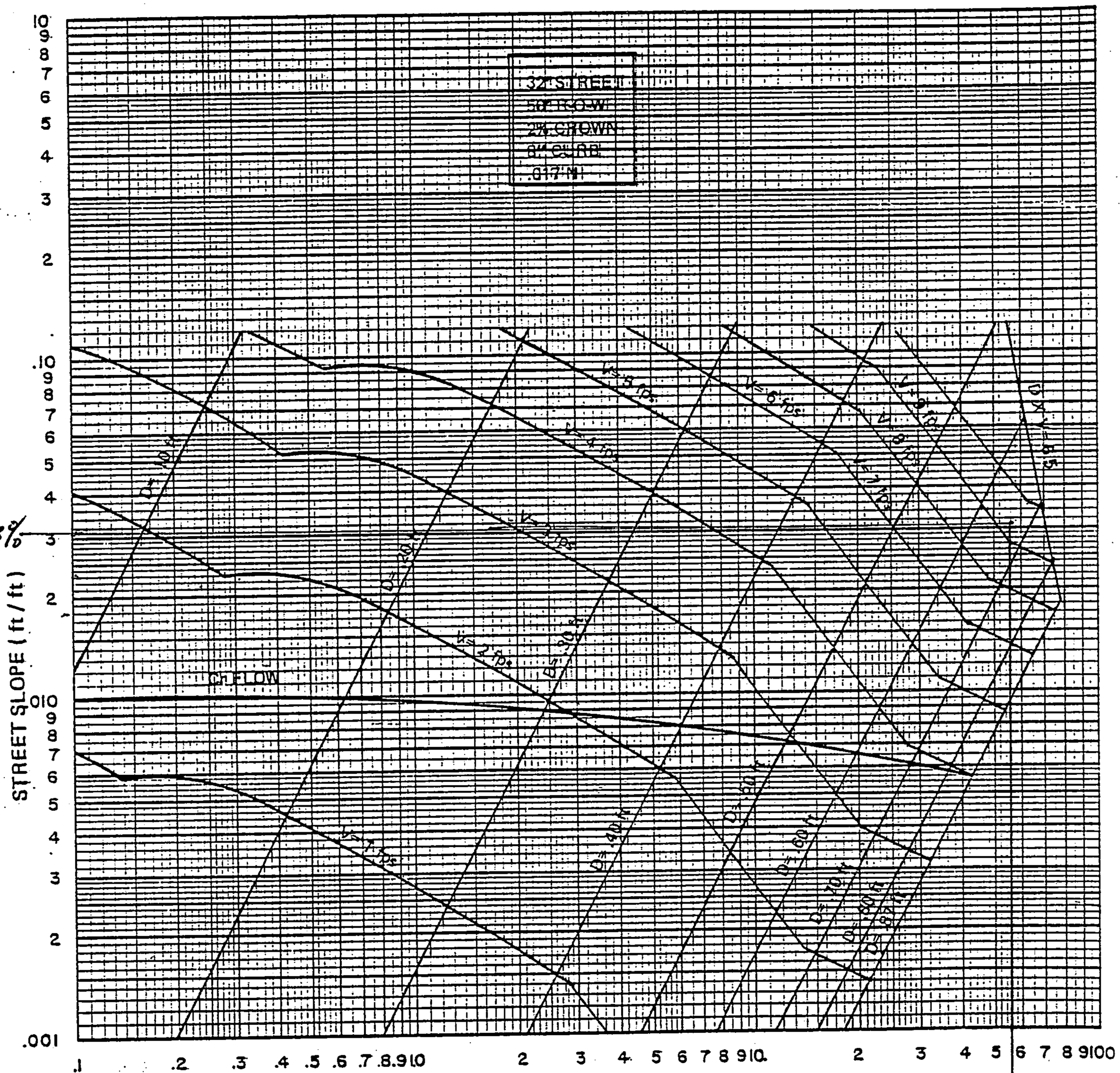
STREET FLOWS ON KAREN SLOPE = 3.13%
FROM CHART Depth = 0.66 ft. VEL = 9.3 ft/sec

STREET CAPACITY



$\frac{111 cfs}{2} = 56 cfs$

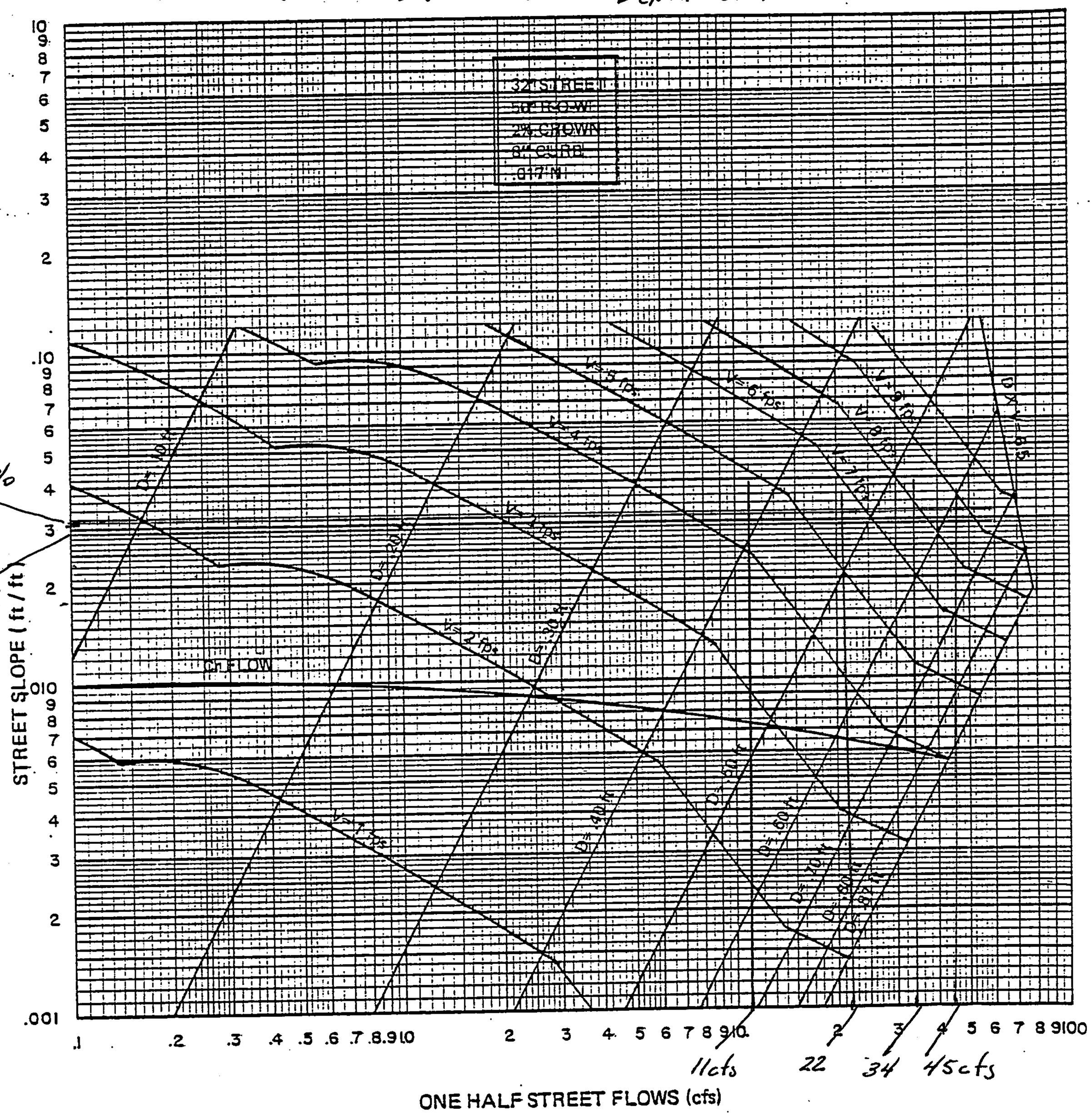
REV. 3-83

PLATE 22.3 D-1

STREET CAPACITIES & DEPTHS AT INLETS

① KAREN SL = 3.13% — 89 cfs ⇒ ½Q = 45 cfs, Depth = 0.61'; 67 cfs ⇒ ½Q = 34 cfs, Depth = 0.55'

② JULENE SL = 2.92% — 44 cfs ⇒ ½Q = 22 cfs, Depth = 0.47'; 22 cfs ⇒ ½Q = 11 cfs, Depth = 0.39'

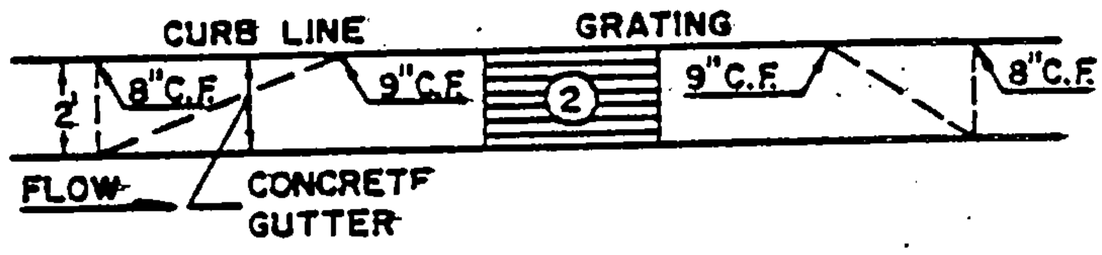


REV. 3-83

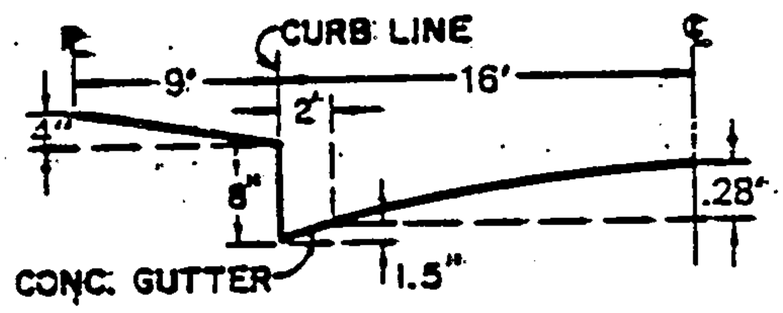
PLATE 22.3 D-1

CAPACITY OF INLETS ON JULENE
PROPOSE 3 singles
3 X 7.6 = 22.8 Cfs

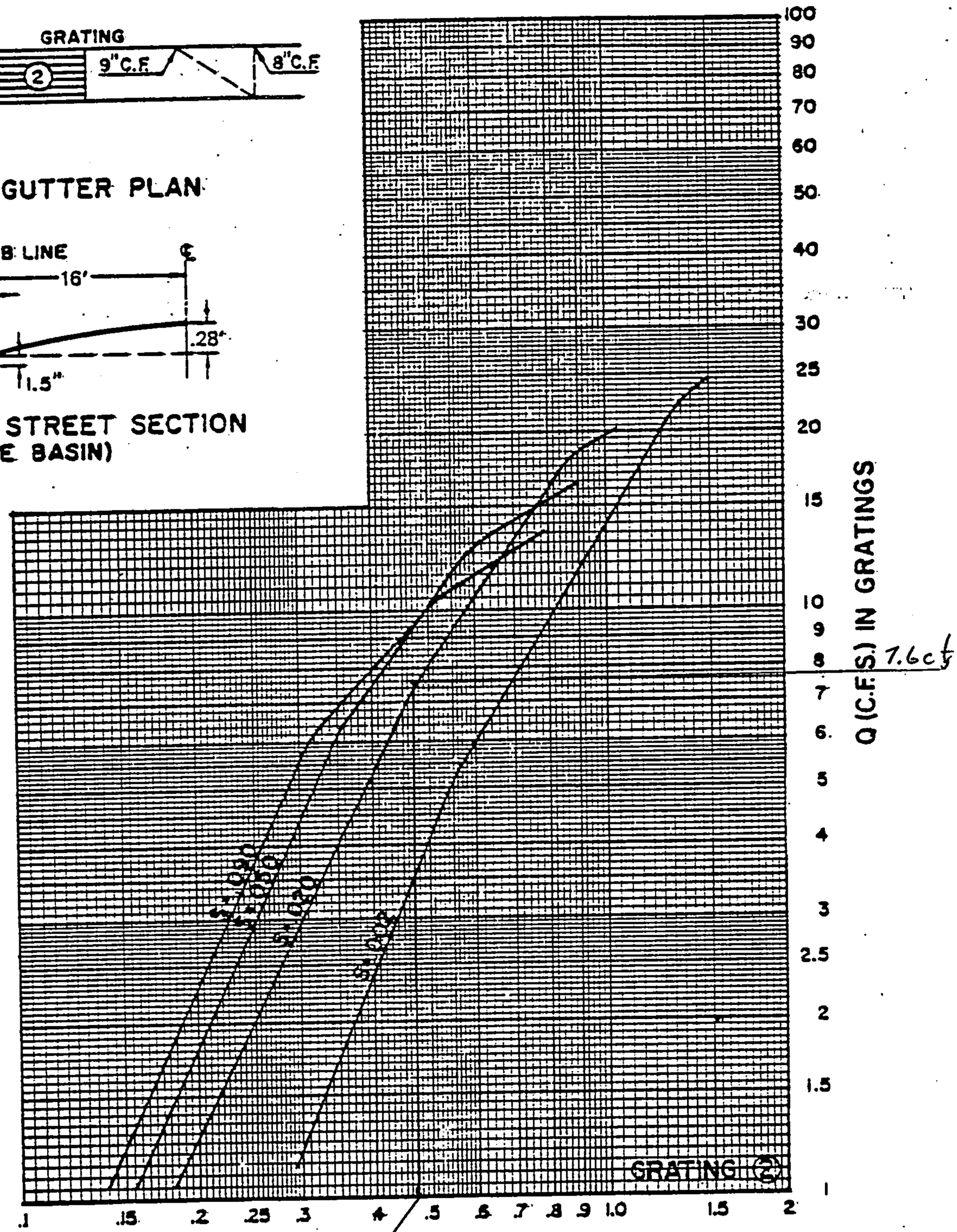
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



GRATING & GUTTER PLAN



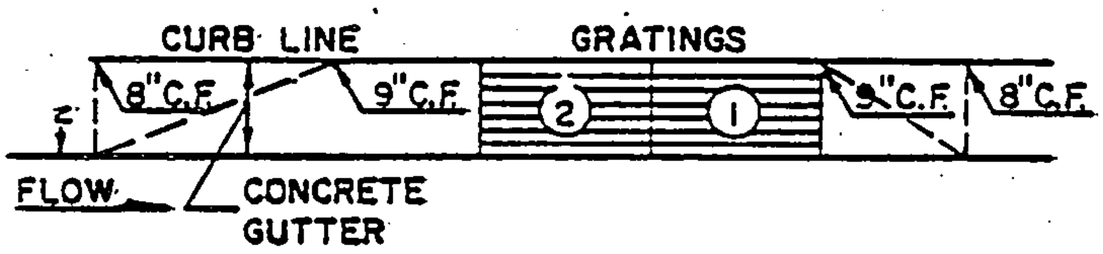
TYPICAL HALF STREET SECTION
(ABOVE BASIN)



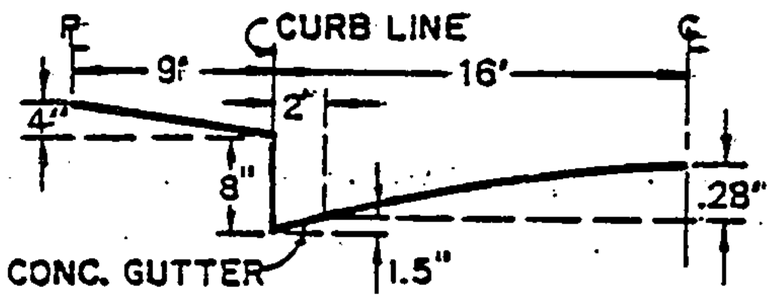
JULENE
INLETS

CAPACITY INLETS ON KAREN
PROPOSE 6 DOUBLES
6 x 13 cfs = 78 cfs

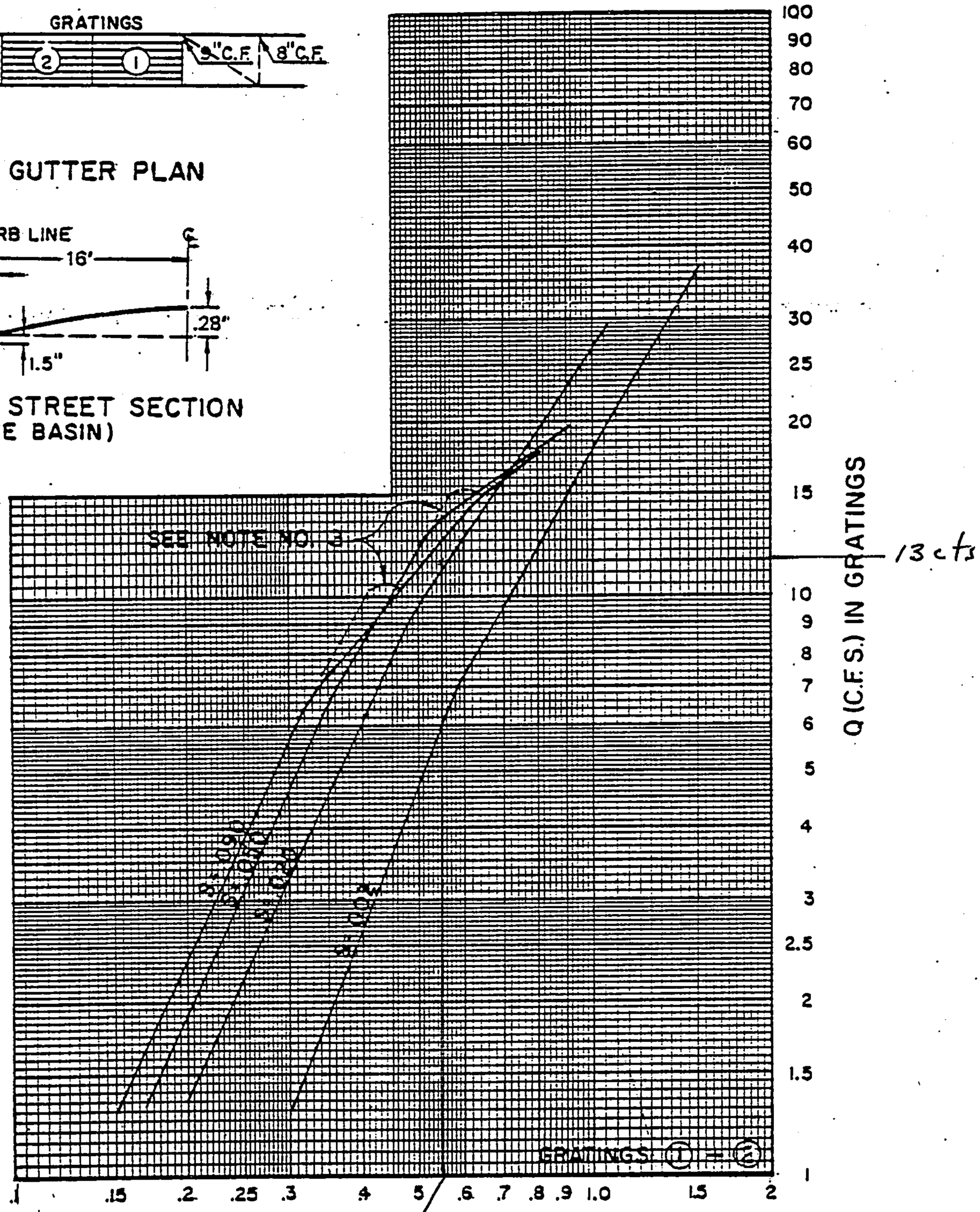
GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

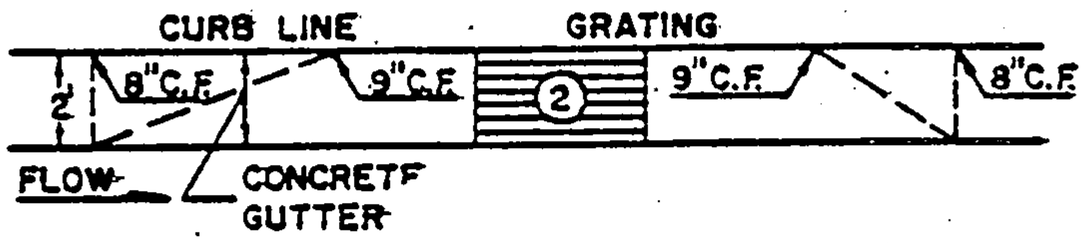
KAREN
INLETS

CAPACITY INLETS ON KAREN

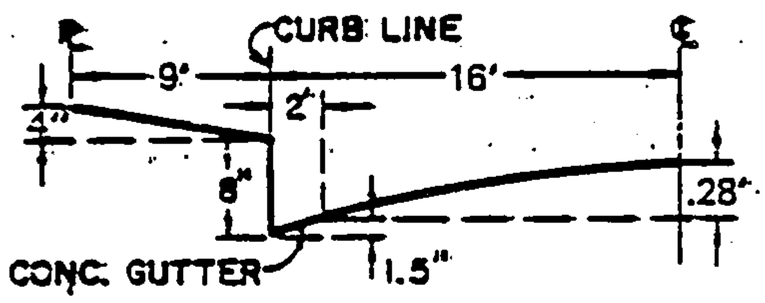
PROPOSE 2 SINGLES

2 x 9.6 cfs = 19.2 cfs

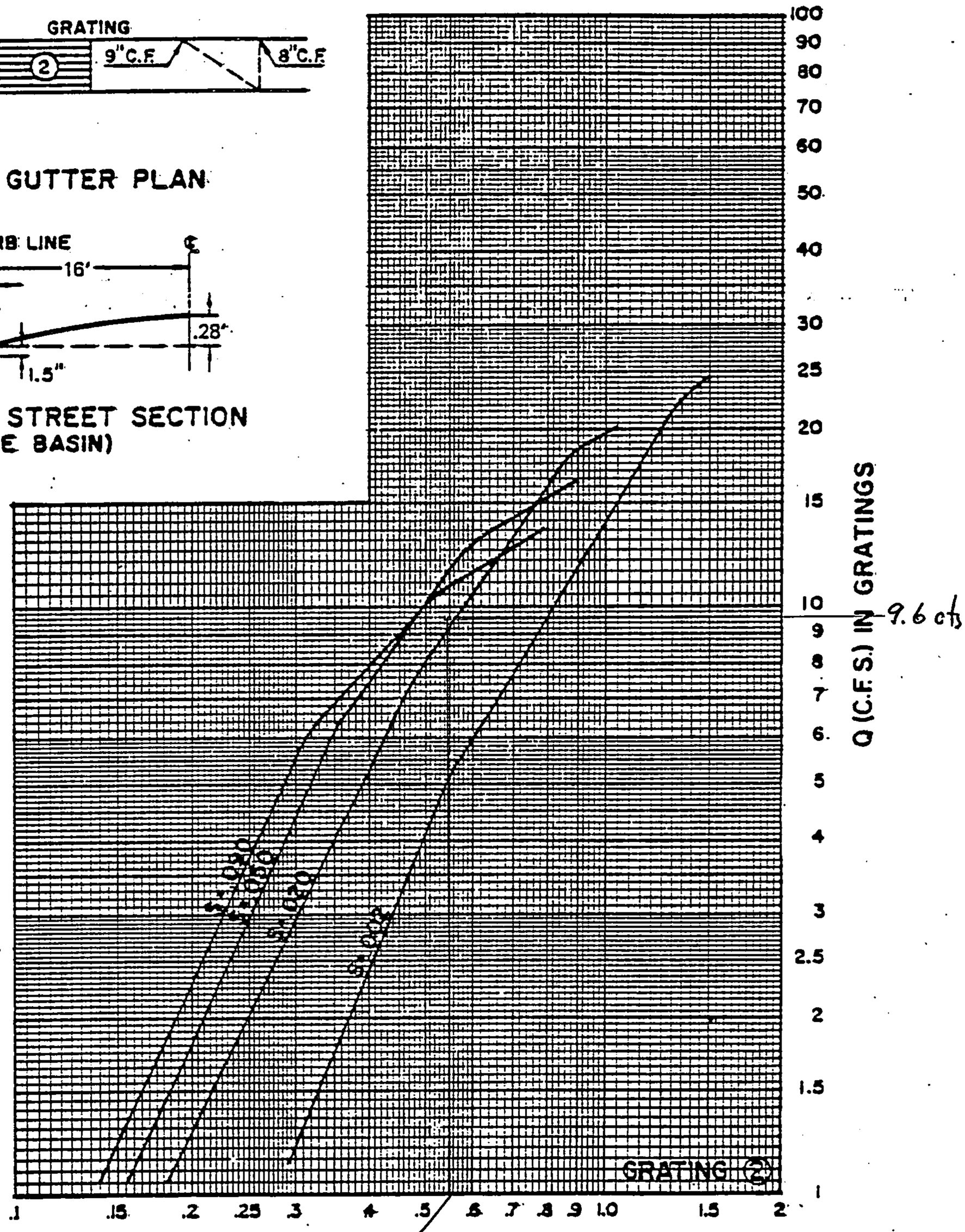
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



KAREN
INLETS

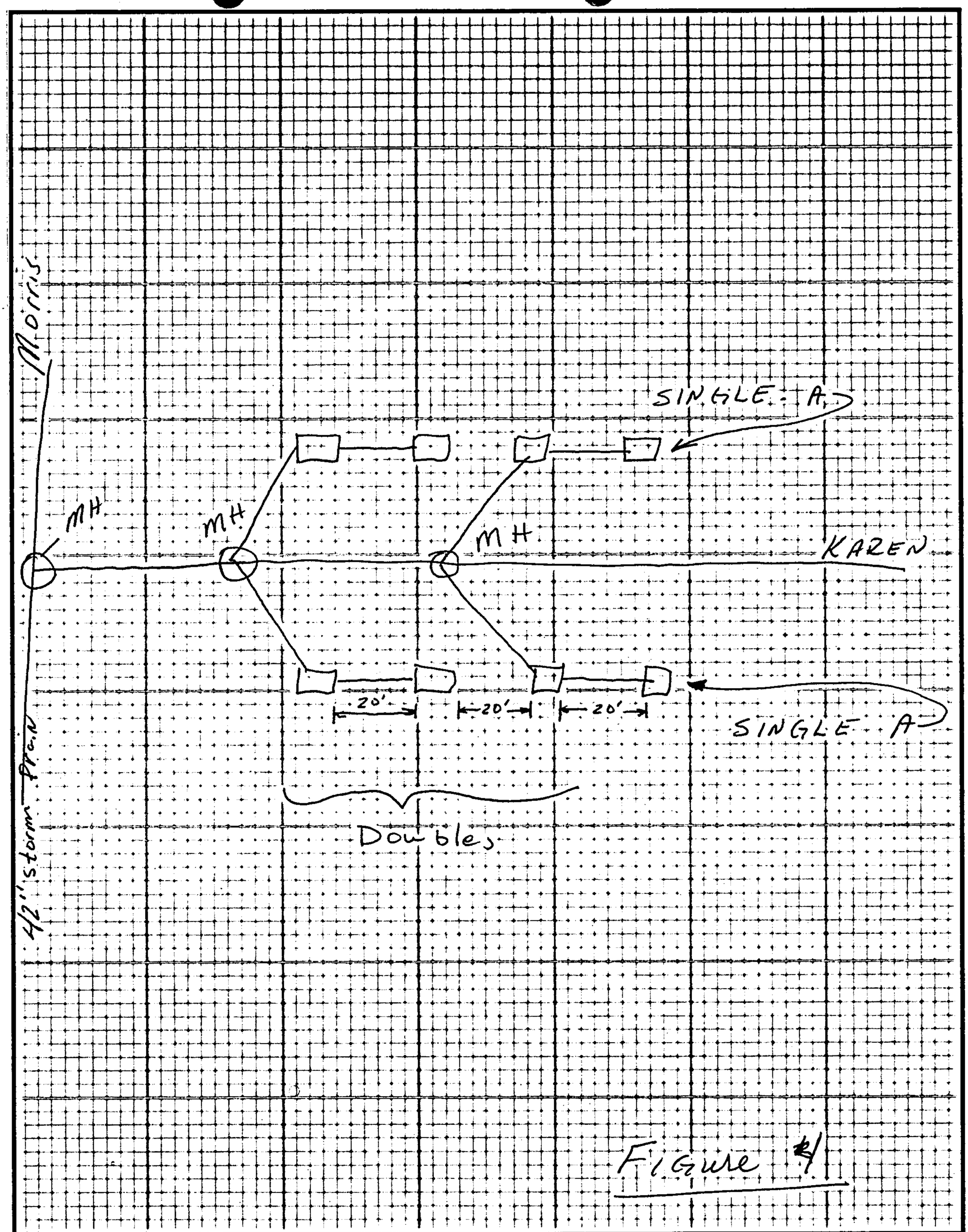


Figure #1

FOR _____ DESCRIPTION _____

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Prefabricated wye confluences are preferred, with field fabricated wyes a second choice. Special confluence structures incorporating access points may be acceptable when circumstances and economics clearly dictate.

Inlets:

Inlets should generally be positioned to intercept street flow before it is allowed to cross intersections or flow transversely across streets.

Type "A" standard inlets are preferred for single installations and are generally required as the first upstream interception in any multiple or battery installation of inlets. Type "B" inlets are preferred as the second and third units of multiple inlet installations on minor streets. Type "B" should not be used on arterial streets. Type "C" are preferred as the second and third inlets on arterial streets. Normally, multiple installations should not exceed 3 units per battery. Units in multiple installations must generally be spaced a minimum of 20 feet apart, measured between the near edges of adjacent inlets. If multiple batteries of multiple inlets are required to intercept exceptional flows, such batteries must be spaced such that the upstream most inlet in each battery can intercept the maximum amount of flow consistent with street flow requirements and constraints. Generally, the spacing between batteries of multiple inlets shall be such that the near edges of the grates of the terminal inlets of adjacent batteries will be no closer than 50 feet.

Inlet connecting pipes if less than 30' in length to main conduits preferably are to be joined by means of prefabricated 45° wyes. Field fabricated wyes are an allowable second choice. Connecting pipes normally should enter the main conduit radial to the cross section. If connecting pipes from inlets to main are longer than 30', a manhole or access point will be required at the point of connection to the main; 45° intersection is still desired with such manhole connection. Manhole/access points may be prefabricated vertical tees placed immediately downstream of the connection point, within the next joint of pipe.

Slopes of inlet connecting lines when connected directly to main lines by either wyes or manholes should preferably be a minimum of 2%. Inlet positioning at major intersections should generally be designed to eliminate nuisance flow across any leg of the intersection. When only one storm drain main is flowing through the intersection, the preferred connection scheme for inlets is to connect inlets directly to each other by parallel connecting on either side of the main and then connect downstream of the intersection by means of 45° connecting pipes to the main; a manhole or access point will be required at such connection point.

If a confluence of major and minor storm drains occurs in an intersection such that a manhole is required in the intersection, inlet connectors may be connected to such manhole if room is available, however, connecting lines which flow in a direction opposite to the main flow must be connected so that flow from the connector will drop into

the main flow rather than oppose it. For battery installation, it is preferred that multiple inlets be connected in series of not more than 3 units by means of connectors paralleling the street and that these parallel connectors then be joined to the main by 45° connectors with an access point or manhole.

In all instances involving arterial streets, every reasonable effort should be made to design for the interception of side street flows on the side streets before such flows reach the arterial.

Summary: The preceding guidelines are not intended to discourage innovative or economical design of systems, but rather to establish desired features considered necessary to achieve hydraulically efficient and easily maintained systems with reasonable economy. Designers will be expected to at least investigate the suitability of the guide lines in each case and to demonstrate the greater desirability of any alternates proposed.

CDS/fs