Detention Pond Volume Calculations

NOTE: Blue shaded cells require user input, all other cells should not be edited.
ASSUMPTIONS:
1. Area less than 40 acres (simplified hydrograph method).
2. 100-year, 6-hour storm event

Peak Flow per Acre - DPM Section 22.2 Table A-9

Zone	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.7
3	1.87	2.6	3.45	5.02
4	2.2	2.92	3.73	5.25

Basin Name : [illegible]
Choose Zone (1 - 4) 1
Basin Area = (acres) 38.01

Exist Conditions				Proposed Conditions			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A	97.0%	36.87	47.56	A	0.0%	0.00	0.00
B	0.0%	0.00	0.00	B	32.5%	12.35	25.08
C	3.0%	1.14	3.27	C	32.5%	12.35	35.45
D	0.0%	0.00	0.00	D	35.0%	13.30	58.14
		Q Peak - exist.=	**51.10**			Peak Q Developed=	**146.33**

includes 19cfs from open space

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ?? 1
If No, what is the maximum allowable discharge ?

Excess Precipitation - DPM Section 22.2 Table A-8

Zone	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.8	1.08	1.46	2.64

Determine Developed E (avg excess precipitation for the developed basin)

%A x E = 0.00
%B x E = 0.22
%C x E = 0.32
%D x E = 0.69
Avg E(in) = 1.23

Determine Tb (hours)

Tb = 0.585

Determine Tc (Note: Tc is assumed to be 0.2 hours, this should be checked using DPM 22.2.B.2)

Tc = 0.2

Determine Tp and Duration of Peak (hours)

Tp = 0.244167
Peak Duration = 0.0875

Compute the required retention volume using the simple hydrograph, Figure A-3 in DPM Section 22.2

Time to Control Q (hrs) = 0.085
Time to end of Control Q (hrs)= 0.496623
Duration of Control Q (hrs)= 0.411

Required Detention Volume (CF) = 85511.1 1.9630642 acre-ft

E

Carrillo, Abiel X.

From:	Carrillo, Abiel X.
Sent:	Thursday, September 01, 2016 10:41 AM
To:	'Kent@edi-arch.com'
Cc:	'jhartenb@gmail.com'; Ortiz, Monica; Sandoval, Darlene M.; Biazar, Shahab
Subject:	4504 Atherton Way - Construction Changes
Attachments:	SKM_C554e16090110360.pdf

Mr. Breierle,

See attached in reference to a recent site visit by our Staff.

If you or the Contractor have any question feel free to contact me.

Abiel Carrillo, PE, CFM
Principal Engineer - Hydrology
Planning Department
Development Review Services Division
City of Albuquerque
505-924-3986
acarrillo@cabq.gov
600 2nd Street NW
Albuquerque, NM 87102

4504 Atherston Way

Carrillo, Abiel X.

From:	Ortiz, Monica
Sent:	Tuesday, August 30, 2016 11:12 AM
To:	Carrillo, Abiel X.
Subject:	FW: Pohl-Helms Residence hydrology calculations
Attachments:	2016-08-29_HYDROLOGY-existing.pdf; 2016-08-29_HYDROLOGY-proposed.pdf

Here are the calculations sent from Kent Beierle the architect for the Pohl-Helms residence.

Monica Ortiz
Planning Department – Transportation & Hydrology
Development & Building Services Division
600 2nd St. NW, Suite 201
Albuquerque, NM 87102
t 505-924-3981
f 505-924-3864

From: Kent Beierle [mailto:Kent@edi-arch.com]
Sent: Tuesday, August 30, 2016 10:24 AM
To: Ortiz, Monica
Cc: jhartenb@gmail.com
Subject: Pohl-Helms Residence hydrology calculations

Hi Monica,

Here are the calculations I prepared. I included an pre-development (Existing) as well as a post-development (Proposed) calculation as a comparison to historical flows.

This particular site was a compacted level pad before we started design. The only pre-existing drainage management appears to be "weeps" through the terrace walls.

Our design strategy was to absorb as much storm water on site as possible through planting areas and the remainder of concentrated flows off of roofs would be captured in cisterns and percolation areas. I assumed the weeps through the terrace walls would continue to function in their current capacity, just be less volume.

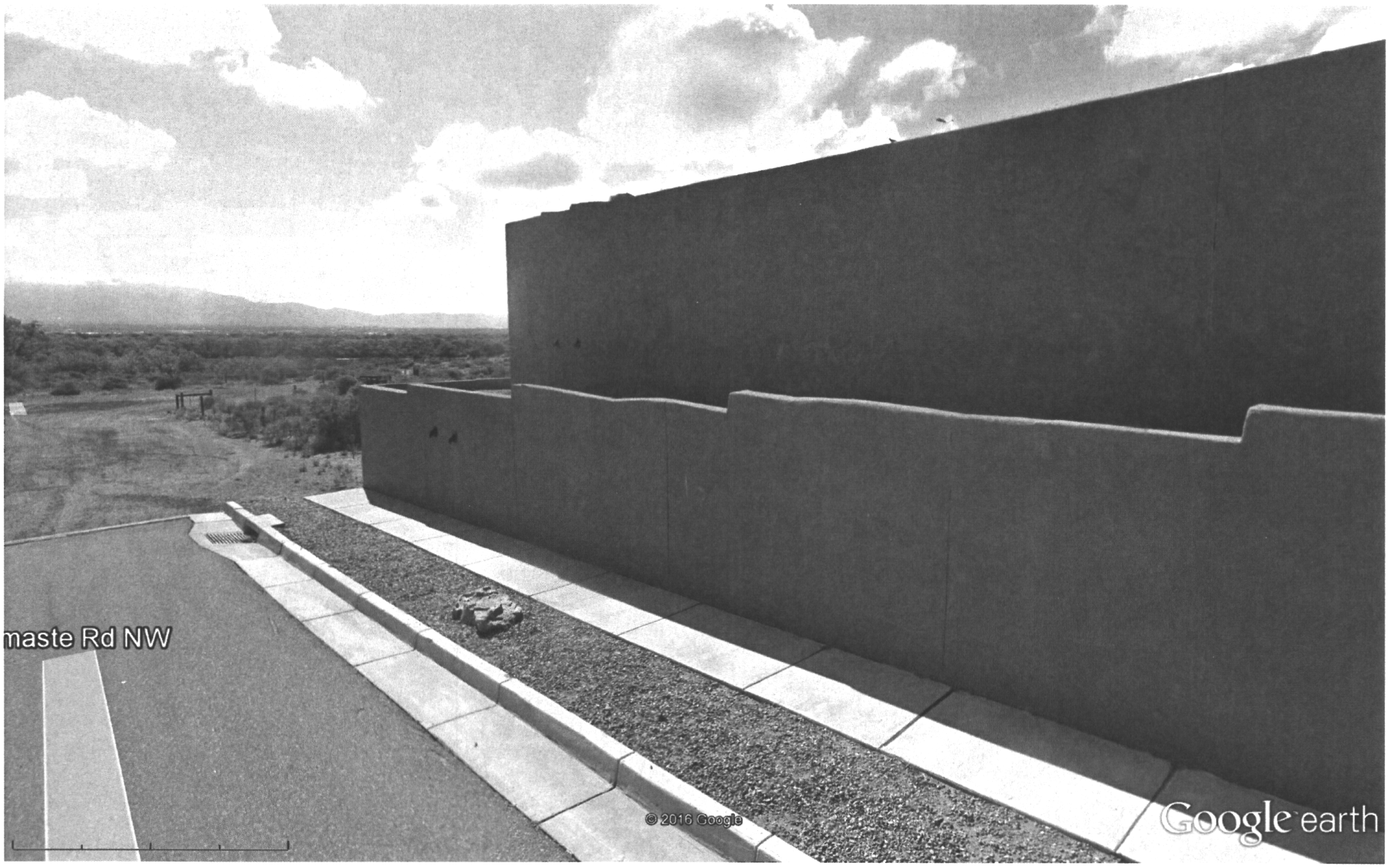
Please let me know if you need anything further or have any questions.

Thank you,

Kent Beierle, Principal
Architect
CO#402108
NM#005188

Environmental Dynamics, Incorporated
142 Truman Street NE, Suite A-1
Albuquerque, NM 87108
USA

Tel: 505.242.2851
Email: kent@edi-arch.com
Web: www.edi-arch.com



Google Earth Pro

feet 9
meters 2

14013 - POHL-HELMS RESIDENCE

DRAINAGE CALCULATIONS EXISTING

PRECIPITATION ZONE (1-4): PER TABLE A-1 $\boxed{1}$

DESIGN STORM (IN): TABLE A-2

1HR	6HR	24HR	4DAY	10DAY
1.87	2.2	2.66	3.12	3.67

EXISTING CONDITIONS - ENTIRE SITE:

LAND TREATMENT TABLE A-4	AREA (SQ FT)	ACRE	SITE AREA (ACRES)	AREA (%)	EXCESS PRECIP "E" FOR 6HR STORM @ 100YR TABLE A-8	PEAK DISCHARGE "Q" (CFS/ACRE) @ 100YR TABLE A-9	Q ACTUAL (CFS)	VOLUME 6 HR (CF)	VOLUME 24 HR (CF)	VOLUME 4 DAY (CF)	VOLUME 10 DAY (CF)
A	0	43560	0	0.0%	0.44	1.29	0.5676	0.00	0.00	0.00	0.00
B	0	43560	0	0.0%	0.53	1.56	0.8268	0.00	0.00	0.00	0.00
C	24646	43560	0.565806	100.0%	0.66	1.87	1.2342	1355.56	2300.34	3245.12	4374.75
D	0	43560	0	0.0%	0.8	2.2	1.76	0.00	0.00	0.00	0.00
SUBTOTAL	24646	43560	0.565806	100.0%			4.39	1355.56	2300.34	3245.12	4374.75

14013 - POHL-HELMS RESIDENCE

DRAINAGE CALCULATIONS PROPOSED

PRECIPITATION ZONE
(1-4): PER 1
TABLE A-1

DESIGN STORM (IN):

TABLE A-2	1HR	6HR	24HR	4DAY	10DAY
	1.87	2.2	2.66	3.12	3.67

EXISTING CONDITIONS - ENTIRE SITE:

LAND TREATMENT TABLE A-4	AREA (SQ FT)	ACRE	SITE AREA (ACRES)	AREA (%)	EXCESS PRECIP "E" FOR 6HR STORM @ 100YR TABLE A-8	PEAK DISCHARGE "Q" (CFS/ACRE) @ 100YR TABLE A-9	Q ACTUAL (CFS)	VOLUME 6 HR (CF)	VOLUME 24 HR (CF)	VOLUME 4 DAY (CF)	VOLUME 10 DAY (CF)
A	13976	43560	0.320856	56.7%	0.44	1.29	0.5676	512.47	1048.24	1584.00	2224.59
B	1555	43560	0.035698	6.3%	0.53	1.56	0.8268	68.68	128.29	187.90	259.17
C	437	43560	0.010032	1.8%	0.66	1.87	1.2342	24.04	40.79	57.54	77.57
D	8678	43560	0.199219	35.2%	0.8	2.2	1.76	578.53	911.19	1243.85	1641.59
D CAPTURED	3624	43560	0.083196	14.7%	0.8	2.2	1.76	241.60	380.52	519.44	685.54
SUBTOTAL	24646	43560	0.565806	100.0%			4.39	1183.72	2128.50	3073.28	4202.91

less than historical site flow

(2) cisterns: 168 cu ft, 140 cu ft
(1) pond/fountain: 80+ cu ft
(2) infiltration beds: 150 cu ft each
Total proposed catchment: 688 cu ft

CITY OF ALBUQUERQUE

August 31, 2016

Richard J. Berry, Mayor

Kent D. Beierle, R.A.
EDI
142 Truman St NE
Albuquerque, NM, 87108

RE: Pohl-Rehms Residence
4504 Atherton Way, Oxbow North
Construction Issues
Subdivision Hydrology File: F11D011

Dear Mr. Beierle:

Based on a site visit to the above-referenced site, there are several issues that will need to be resolved prior to approval for a Certificate of Occupancy. This is an advance notification of those requirements in an effort to minimize impacts to the closeout schedule of the project.

Our concerns are related to the modifications made to the existing retaining wall:

1. Closeout correspondence from the original subdivision (~2004) references outfall pipes that were installed through "Walls 7 and 7A" (the change was then certified by a Structural Engineer). These drains spill onto Namaste in the vicinity of an inlet at the end of the road. The Contractor for this current project has created new openings that discharge directly to Open Space property, which is not allowed by the City.
    a. In a related matter, we need to have an assurance that the pool will not be planned so as to be able to be drained to the Open Space property.
2. The eastern, upper retaining wall has been cut to provide access to the terrace of the lower retaining wall. It is not clear that the wall was designed for the added saturation caused by landscaping irrigation, surface discharge through the new gate, and the concentration of loadings due to the features that are planned on the terrace.

The following will need to be completed.

- The Development will need to coordinate with the Parks and Recreation Department to resolve Item 1.
- A wall certification by a qualified Structural Engineer/Firm will be needed to address Item 2.

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

CITY OF ALBUQUERQUE

Richard J. Berry, Mayor

- A statement from you will suffice for the question in Item 1.a.

If you have any questions, you can contact me at 924-3986, or acarrillo@cabq.gov.

Sincerely,

Abiel Carrillo, P.E.
Principal Engineer, Planning Dept.
Development Review Services

PO Box 1293

Orig: Drainage file

Albuquerque

New Mexico 87103

www.cabq.gov

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS
1706 * 2006
ALBUQUERQUE
Making History

November 12, 2004

Mr. Kevin Patton, PE
BOHANNAN-HUSTON, INC.
7500 Jefferson St. NE
Albuquerque, NM 87109

RE: OXBOW NORTH SUBDIVISION, UNITS 1, 2, 3 (F-11/D11)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 10/21/2004
Engineers Certification dated 11/11/2004

Dear Kevin:

Based upon the information provided in your Engineer's Certification Submittal dated 11/12/2004, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, you can contact me at 924-3982

Sincerely,

Arlene V. Portillo

Arlene V. Portillo
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 699583-Unit 1
COA #699584-Unit 3
COA #699585-Unit 2

File

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

Smith Engineering Company

A Full Service Engineering Company

October 25, 2004

Mr. Howard Stone, P.E.
Chief Operations Officer
Bohannan Huston Inc.
7500 Jefferson St. NE
Albuquerque, New Mexico 87109

Re: CERTIFICATION OF WALL RETROFIT – OXBOW NORTH (7 & 7A WALLS)

Dear Mr. Stone:

Smith Engineering Company (SEC) is certifying that Salls Brothers Construction retrofitted 7 & 7A Walls per the plans & specifications set fourth by Bohannan Huston Inc. (BHI).

Although there are a few items that still need to be addressed, they are not seen as structual components.

- The over-flow drain spouts in Wall O-2 was not blocked out.
- Shotcrete over-spray on stucco and wrought iron view fences.
- Wall X still needs to be stuccoed.

Please accept this certification, knowing these issues are outstanding. Please don't hesitate to call me with any questions regarding this certification at 350-9453.

Jim Spinello, VP 10-25-04
Jim Spinello
Vice President
Construction Services Manager
Date

VP 10/26/04
Patrick J. Conley, P.E.
Vice President
Date

PATRICK J. CONLEY
NEW MEXICO
10141
LICENSED PROFESSIONAL

Cc: Steve Hernandez (Oxbow Dev.)
Kevin Patton (BHI)

RECEIVED
NOV 12 2004
HYDROLOGY SECTION

6400 Uptown Boulevard. N.E. Suite 500E Albuquerque, NM 87110 abq@secnm.com Telephone 505/884-0700 Fax 505/884-2376

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

December 13, 2002

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Oxbow North Subdivision Amended Grading Plan
Engineer Stamp dated 10-21-02 (F11/D11)

Dear Mr. Patton,

Based upon the information provided in your submittal dated 11-12-02, the above referenced amended plan is approved for Final Plat and Work Order. This is now the plan that must be certified for release of Financial Guarantees.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept
Development and Building Services

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

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

October 10, 2002

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Oxbow North Subdivision Drainage Report
Engineer Stamp dated 9-24-02 (F11/D11)

Dear Mr. Patton,

Based upon the information provided in your submittal dated 9-24-02, the above referenced report is approved for Preliminary Plat, Site Plan for Subdivision and Site Plan for Building Permit action by the DRB.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept
Development and Building Services

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE REPORT
FOR
OXBOW NORTH SUBDIVISION
(A REPLAT OF TRACT B-1, ARCHDIOCESE OF SANTA FE)

AUGUST 30, 2002

PREPARED BY:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109

PREPARED FOR:

OXBOW NORTH VENTURES
4407 LOMAS BLVD NE
ALBUQUERQUE, NM 87110

RECEIVED
AUG 30 2002
HYDROLOGY SECTION

PREPARED BY:

Yolanda Padilla 8/30/02

Yolanda Padilla, E.I. Date

UNDER THE SUPERVISION OF:

Kevin Patton 8-30-02

Kevin Patton, P.E. Date

KEVIN G. PATTON
NEW MEXICO
13685
REGISTERED PROFESSIONAL ENGINEER

9-24-02

Bohannan Huston Inc.

I. PURPOSE

The purpose of this report is to present historic and proposed drainage conditions for the area pertaining to this site, and to obtain work order, preliminary and final plat approvals.

II. METHODOLOGIES

Site conditions will be analyzed for a 10-year and 100-year, 6-hour storm event in accordance with the City of Albuquerque Drainage Ordinance and the Development Process Manual (DPM) Volume 2, Design Criteria, Section 22.2, Hydrology, for the City of Albuquerque, January 1993.

The site, as described in the 'Site Location and Characteristics' section below, is approximately 38.01 acres. Therefore, Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres was used.

This report will reference the following City of Albuquerque approved studies prepared for Altura West LTD: 1) *Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties* dated October, 1997.

The *Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties* dated October, 1997 (hereafter referred to as the Master Plan), which was prepared for Altura West LTD. and Archdiocese of Santa Fe and approved by the City of Albuquerque. That report was prepared to support future drainage plans submitted for the development of individual land parcels within the Oxbow Subdivisions, and to provide design guidance for the installation of major drainage infrastructure to be constructed in advance of, or simultaneously with individual parcel development. In addition, it provides fully developed flow rates for basins within the Altura West and Archdiocese of Santa Fe Properties.

III. SITE LOCATION AND CHARACTERISTICS

Please refer to the proposed Bulk Land Plat enclosed with this report and the A.G.I.S. vicinity map page G-11.

The Site, Oxbow North Subdivision, Tract B-1, Archdiocese of Santa Fe, is bounded by St. Pius High School and Oxbow Bluff to the south, Coors Boulevard to the west, the City of Albuquerque's Open Space Tract to the east, and Namaste Road to the north. The 38.01-acre site proposes to be developed into three units and two phases. Unit 1 consists of 78 lots and Unit 2 consists of 45 lots for a total of 123 lots for the upper development and Unit 3 consist of 46 lots on the lower development. Units 1 and 2 are separated from Unit 3 by a private open space parcel. All are single, family dwelling units.

Vegetation on the site consists primarily of Mesa Dropseed, Indian Ricegrass, Black Gramma and Sand Sagebrush. The soil at the site has been given the SCS soil classification of BKD (Bluepoint-Kokan association, hilly) and MWA (Madurez-Wink Association, gently sloping). The BKD soils are in the hydrologic soil Group A, which have the highest rate of rainfall absorption. The MWA soils are in the hydrologic soil Group B, which also absorb more water than typical.

IV. EXISTING HYDRAULIC AND HYDROLOGIC CONDITIONS

The existing drainage basins and patterns are shown graphically on the Existing Drainage Conditions located in the Exhibit section of this report. Please note that the Existing Drainage Basin Map was taken from the approved Master Drainage Plan for Altura West and is labeled as the "Altura West & Archdiocese of Santa Fe Existing Drainage Conditions". This map adequately depicts the existing condition of this site.

The existing site consists of Basin L, which flows east to the Rio Grande. The runoff from the on-site basins is approximately 51.8cfs in the 100-year, 6-hour storm event.

AMAFCA currently constructed a small detention pond with a 48" CMP outfall pipe into the Oxbow at the end of Namaste Road. The detention pond is located in an existing Drainage Easement. The outfall pipe has provided the necessary erosion control.

For additional information regarding the existing drainage conditions, please refer to the approved Master Plan (October 1997).

V. PROPOSED HYDRAULIC AND HYDROLOGIC CONDITIONS

For additional assistance throughout this section, please refer to the Grading and Drainage Plan, Interim Drainage Conditions Map and/or the Ultimate Drainage Conditions Map enclosed within the Exhibit section of this report. The site consists of three Units. Unit 1 and 3 are going to be developed simultaneously, where Unit 2 will be developed at a later date, however the whole site will be graded at the same time including retaining walls. The three Units will mostly flow north and east into a storm drain system in Namaste Road and into a permanent detention pond at the east end of the bluff where a controlled amount of flow will be allow to be discharged to the Rio Grande via an ring dissipater. For any information concerning the pond and ring dissipater, see the sections below labeled Detention Pond and Ring Dissipater.

A. On-Site Basins, Unit 1 and Unit 2

The entire site (except Basin C-4, which drains to Namaste Road) drains to the northeast corner of the site to the north end of Willow View Lane to a storm drain system which drains to Namaste Road Storm Drain and to a permanent detention pond at the east end of the bluff where a controlled amount of flow will be release to the Rio Grande via a ring dissipater. However, in the interim, detention ponds at the end of Street Deer Meadow Trail and Old Adobe Trail will capture the flow and release it into storm drain stub outs. In the ultimate conditions, these stub outs will tie to storm drain and inlets, which will capture this flow in the roadway.

The proposed site is broken into six (6) basins and sub-basins for analysis reasons. Basin A encompasses the entire length of Beresford Lane and Deer Meadow Trail as well as the lots fronting them. Basin A-1 (1.10ac, Q100=3.78cfs) is located on the southwest corner of the site and south of the highpoint at lots 15/116 southern property line. This flow will flow south on Beresford Trail to Old Adobe Trail and be collected by inlets at the east end of the street. Basin A-2 (2.6ac, Q100=8.94cfs) encompasses the west side of Beresford Trail and north side of Deer Meadow Trail to the entrance road. Basin A-3 (1.31, Q100=4.51cfs) encompasses the west side of Beresford Trail. Basin A-4 (0.21ac, Q100=0.88cfs) encompasses the south end of Deer Meadow to the entrance road. Basin A-5 (0.87ac, Q100=2.99cfs) is located on the north side of Deer Meadow Trail east of the entrance. Basin A-6 (0.54ac, Q100=1.85cfs) is located on the south side of Deer Meadow Trail east of the intersection. These basins will all flow to the east end of Beresford Trail where a series of inlets will collect flow and then ultimately at the north end of Willow View Lane. However in the interim, this flow will be collected by a series of inlet and any residual flow will continue to a temporary detention pond which encompasses the undeveloped portion of Deer Meadow Trail a be collected by an inlet. The flow whether ultimate or interim will then flow to a storm drain system in Namaste Rd to a permanent detention pond.

Basin B encompasses the entire length of Hodgin Lane and the lots that front it. Basin B-3 (0.68ac, Q100=2.36cfs) is located from the highpoint south to the intersection of Old Adobe Trail. This basin flows into Old Adobe Trail and flow collected by inlets at the east end of the street; any residual flow will travel north on Willow View Lane and be collect by inlets at the north end of the street in ultimate conditions. However in interim conditions, this flow will travel east to a temporary detention pond, which encompasses the undeveloped portion of Old Adobe Trail and Willow View Lane. The flow will be collected by a storm drain stub, which will connect to inlets in the future to collect this flow. Basin B-1 (1.35ac, Q100=4.65cfs) is located on the west side of Hodgin Lane. Basin B-2(1.33ac, Q100=4.59cfs) is located on the east side of Hodgin Lane. These basins will travel north and combine with Basin A and be collected as Basin A is. See previous paragraph for this information.

Basin C encompasses the entire length of Summer Hill Lane and the lots that front it. Basin C-3 (0.38ac, Q100=1.30cfs) is located from the southern highpoint south to the intersection of Old Adobe Trail. This basin flows into Old Adobe Trail and flow collected by inlets at the east end of the street; any residual flow will travel north on Willow View Lane and be collect by inlets at the north end of the street in ultimate conditions. However in interim conditions, this flow will travel east to a temporary detention pond, which encompasses the undeveloped portion of Old Adobe Trail and Willow View Lane. The flow will be collected by a storm drain stub, which will connect to inlets in the future to collect this flow. Basin C-1 (1.52ac, Q100=5.24cfs) is located on the west side of Summer Hill Lane. Basin C-2 (1.51ac, Q100=5.21cfs) is located on the east side of Summer Hill Lane. These basins will travel north and combine with Basin A & B and be collected as they are. See previous paragraphs for this information. Basin C-4 (0.12ac, Q100=0.50cfs) is located from the northern highpoint north to Namaste Road. This flow will travel east on Namaste Road and be intercepted by inlets within the road.

Basin D (0.91ac, Q_{100}=3.13cfs) encompasses the entire length of New Berry Way and the lots that front it. This flow will travel east and into Willow View Lane where inlets at the north end of the street will collect the flow.

Basin E (1.16ac, Q_{100}=3.99cfs) encompasses the entire length of Middle Berry Way and the lots that front it. This flow will travel east and into Willow View Lane where inlets at the north end of the street will collect the flow.

Basin F encompasses the entire length of Willow view Lane and the lots that front it. Basin F-1 (1.25ac, Q100=4.30cfs) is located on the west side of Willow View Lane. Basin F-2 (2.90ac, Q100=9.98cfs) is located on the east side of Willow View Lane. These basins will travel north and be collected by inlets at the north end of the street, where it will then travel to a storm drain system in Namaste Road and to the permanent detention pond on the east side of the project site.

Basin G encompasses the entire length of Old Adobe Trail. Basin G-1 (1.03ac, Q100=3.53cfs) is located on the north side of Old Adobe Trail. Basin G-2 (2.42ac, Q100=8.34cfs) is located on the south side of Old Adobe Trail. This basin will be collected by inlets at the east end of the street; any residual flow will travel north on Willow View Lane and be collect by inlets at the north end of the street in ultimate conditions. However in interim conditions, this flow will travel east to a temporary detention pond, which encompasses the undeveloped portion of Old Adobe Trail and Willow View Trail. The flow will be collected by a storm drain stub, which will connect to inlets in the future to collect this flow.

B. Unit 3

The entire site (except Basin I-1, which drains to Namaste Road) drains to the lowpoint located in Atherton Way north of Lot 40 where it will be collected by inlet. The flow will travel via a storm drain to Namaste Road where it will flow east to the permanent detention pond.

Basin I encompasses the entire length of Oxbow North Trail and the lots that front it. Basin I-1 (1.70ac, Q100=5.35cfs) is located on Oxbow North Trail from the highpoint to Namaste Road. This flow will travel north to Namaste Road where it will be collected by inlets and to the permanent detention pond. Basin I-2 (0.29ac, Q100=1.20cfs) is the west side of Oxbow North Trail from the highpoint south. Basin I-3 (1.67ac,Q100=5.26cfs) is located on the east side of Oxbow North Trail from the high point south. These basins will travel southeast into Atherton Way and be collected by inlets at the low point.

Basin J (1.97ac, 6.20cfs) encompasses the entire length of Wild Plum Way and the lots that front it. This basin will flow northeast into Oxbow North Trail, southeast to Atherton Way, where inlets at the low point will collect the flow.

Basin K (1.83ac, 5.76cfs) encompasses the entire length of Coyote Hill Way and the lots that front it. This basin will flow northeast into Oxbow North Trail, southeast to Atherton Way, where inlets at the low point will collect the flow.

Basin L encompasses the entire length of Atherton Way and the lots that front it. Basin L-1 (1.26ac, Q100=3.96cfs) is located on the west side of Atherton Way south of Oxbow North Trail. This flow will travel north, where inlets at the low point will collect the flow. Basin L-2 (1.97ac, Q100=6.20cfs) is located on the east side of Atherton Way south of the low point. Basin L-3 (0.17ac, Q100=0.73cfs) is located on the west side of the street south of the low point, north of Oxbow North Trail. These basins will travel north to the low point where the flow will be collected by inlets. Basin L-4 (1.39ac, Q100=4.37cfs) is located on the west of Atherton Way north of the low point. Basin L-5 (1.78ac, Q100=5.60cfs) is located on the east side of Atherton Way north of the low point. These basins will travel south where inlets at the low point will collect the flow.

C. Offsite

There are four offsite basins. Two are on Coors and two on Namaste Road. Basin Coors-South (0.70ac,Q100=2.90cfs) is located on the east side of Coors Boulevard from the highpoint just south of Namaste Road to the centerline of Namaste Road. Basin Coors-North (0.06ac, 0.25cfs) is located on the west side of Coors Blvd from the centerline of Namaste Rd to the projected north flowline of Namaste Road. These basins will travel north into Namaste Road where it will be flow east, be collected by inlets and be discharged into the permanent detention pond. Basin Namaste-North (0.56ac, Q100=2.32cfs) is located on the north side of Namaste Road. Basin Namaste-South (1.21ac, Q100=5.00cfs) is located on the south side of Namaste Road. These basins will travel east and be collected by inlets and into the permanent detention pond any residual will continue downstream.

D. Detention Pond & Ring Dissipater

A permanent detention pond is going to be place inside the existing AMAFCA easement located on the Open Space Tract just east of the Oxbow North Site. The required pond volume is 2.0 acre-ft. This volume has the capacity to take in flow from Unit 1 & 2 (Q100= 80.1cfs), Unit 2 (Q100=44.6cfs) and the Open Space Tract (Q100=19cfs). The allowable discharge will be the historic flow of approximately 51cfs. See Existing Conditions Basin Map in the Exhibit section of this report for more information. There is currently and existing storm drain pipe and erosion control in the AMAFCA easement. The pond will be located accordingly so the outlet pipe is the existing pipe. A ring dissipater will be connected to this existing pipe before it gets released into the Rio Grande. The existing erosion control will be utilized.

VI. CONCLUSION

This report has provided hydrologic and hydraulic considerations of the proposed development of Altura West Tract E, the Oxbow Village Subdivision. This information provides adequate supporting documentation and guidance for approval of this report and to guide future development and phasing of the properties previously mentioned. It is recommended that this plan be approved as requested.

Oxbow North										
BASIN I.D.	AREA (AC)	UNITS #		A	% LAND TREATMENT B	C	D^2		DISCHARGE (CFS) 10 YR	100YR
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING CALCULATED)										
Parcel I	23.20			97.0%	0.0%	0.0%	3.0%		7.7	31.6
Parcel II	14.81			97.0%	0.0%	0.0%	3.0%		4.9	20.2
TOTAL	38.01								12.6	51.8
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING)[1]										
Parcel I & II	38.01									51.1
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED)										
ONSITE										
UNIT 1 & 2										
A-1	1.10	6		0.0%	24.1%	24.1%	51.7%		2.2	3.78
A-2	2.60	15		0.0%	24.1%	24.1%	51.7%		5.3	8.94
A-3	1.31	8		0.0%	24.1%	24.1%	51.7%		2.7	4.51
A-4	0.21	0		0.0%	10.0%	0.0%	90.0%		0.6	0.88
A-5	0.87	4		0.0%	24.1%	24.1%	51.7%		1.8	2.99
A-6	0.54	2		0.0%	24.1%	24.1%	51.7%		1.1	1.85
B-1	1.35	8		0.0%	24.1%	24.1%	51.7%		2.7	4.65
B-2	1.33	8		0.0%	24.1%	24.1%	51.7%		2.7	4.59
B-3	0.68	4		0.0%	24.1%	24.1%	51.7%		1.4	2.36
C-1	1.52	9		0.0%	24.1%	24.1%	51.7%		3.1	5.24
C-2	1.51	9		0.0%	24.1%	24.1%	51.7%		3.1	5.21
C-3	0.38	2		0.0%	24.1%	24.1%	51.7%		0.8	1.30
C-4	0.12	0		0.0%	10.0%	0.0%	90.0%		0.3	0.50
D	0.91	4		0.0%	24.1%	24.1%	51.7%		1.8	3.13
E	1.16	6		0.0%	24.1%	24.1%	51.7%		2.4	3.99
F-1	1.25	6		0.0%	24.1%	24.1%	51.7%		2.5	4.30
F-2	2.90	14		0.0%	24.1%	24.1%	51.7%		5.9	9.98
G-1	1.03	4		0.0%	24.1%	24.1%	51.7%		2.1	3.53
G-2	2.42	14		0.0%	24.1%	24.1%	51.7%		4.9	8.34
SUBTOTAL	**23.20**	**123**							**47.4**	**80.1**
H	**1.90**	**0**		0.0%	0.0%	100.0%	0.0%		**2.8**	**5.45**
UNIT 3										
I-1	1.70	5		0.0%	31.8%	31.8%	36.5%		3.0	5.35
I-2	0.29	0		0.0%	10.0%	0.0%	90.0%		0.8	1.20
I-3	1.67	6		0.0%	31.8%	31.8%	36.5%		2.9	5.26
J	1.97	7		0.0%	31.8%	31.8%	36.5%		3.5	6.20
K	1.83	7		0.0%	31.8%	31.8%	36.5%		3.2	5.76
L-1	1.26	3		0.0%	31.8%	31.8%	36.5%		2.2	3.96
L-2	1.97	8		0.0%	31.8%	31.8%	36.5%		3.5	6.20
L-3	0.17	0		0.0%	10.0%	5.0%	90.0%		0.5	0.73
L-4	1.39	5		0.0%	31.8%	31.8%	36.5%		2.4	4.37
L-5	1.78	5		0.0%	31.8%	31.8%	36.5%		3.1	5.60
SUBTOTAL	**14.03**	**46**							**25.1**	**44.6**
TOTAL	**39.13**	**169**							**75.3**	**130.1**
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED)										
OFFSITE										
Coors-North	0.06	0		0.0%	10.0%	0.0%	90.0%		0.2	0.25
Coors-South	0.70	0		0.0%	10.0%	0.0%	90.0%		1.9	2.90
Namaste-North	0.56	0		0.0%	10.0%	0.0%	90.0%		1.5	2.32
Namaste-South	1.21	0		0.0%	10.0%	0.0%	90.0%		3.2	5.00
SUBTOTAL	**2.53**	**0**							**6.8**	**10.5**
TOTAL	**41.66**	**169**							**82.1**	**140.6**

NOTES:

1) In the "Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties Near St. Pius High School" is shows that Oxbow North is Parcel I & II.
The existing 100yr discharge was also taken from this report.
See Exhibit 3.

2) Impervious percentages for developed flows were calculated from the DPM equation a-4. The remaini percentages were distributed evenly between land treatment types B and C, except for Basin D which taken from Table A-5 and the rest placed in land treatment type B.

Unit 1 & 2

N=UNITS/ACRES = 5.3

%D= 7*SQRT((N*N)+(5*N)) = 51.7%

Unit 3

N=UNITS/ACRES = 3.3

%D= 7*SQRT((N*N)+(5*N)) = 36.5%

STD

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

32ff/50rw-std-full S=2.27%

MANNING'S N= .017 SLOPE= .0227

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	1.09	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.73	3.25	0.05	0.15
0.15	0.15	0.39	0.8	6.79	1.95	6.55	0.06	0.21
0.20	0.20	0.84	1.9	11.84	2.25	11.52	0.08	0.28
0.25	0.25	1.54	4.1	16.89	2.67	16.49	0.11	0.36
0.30	0.30	2.49	7.7	21.94	3.08	21.47	0.15	0.45
0.35	0.35	3.69	12.9	27.00	3.49	26.44	0.19	0.54
0.40	0.40	5.13	19.9	32.05	3.88	31.41	0.23	0.63
0.45	0.45	6.74	30.8	32.94	4.57	32.23	0.32	0.77
0.50	0.50	8.35	44.0	33.05	5.26	32.25	0.43	0.93
0.55	0.55	9.96	58.9	33.15	5.91	32.28	0.54	1.09
0.60	0.60	11.58	75.5	33.25	6.52	32.30	0.66	1.26
0.65	0.65	13.20	93.6	33.35	7.10	32.33	0.78	1.43
0.70	0.70	14.88	106.6	37.11	7.16	36.05	0.80	1.50
0.75	0.75	16.80	120.6	41.76	7.18	40.70	0.80	1.55
0.80	0.80	18.95	137.4	46.41	7.25	45.35	0.82	1.62
0.85	0.85	21.34	157.0	51.06	7.36	50.00	0.84	1.69

After STE

after STG

Q_T = 20.14 (previous page) + 6.42 (648F-2)

Q_{100} = 26.56

V = 4.30

d = .43 < .85 EH = .72 < .85 ✓

Noetnend.

Q_T ST D . = 3.13 (D) + 4.30 (F-1) + 3.99 (E) + 2.98 (QR-STG) + 9.98 (F-2)

Q = 24.38

$Q_{\frac{1}{2}}$ = 12.19

d = .34

See Nomograph

@ 2% Qi = 4.6

@ 5% Qi = 6.0

@ 2.27% Q = 4.73 cfs

Q_R = 14.92

Q_{total} = 14.92 (Q_R StD) + 9.67 cfs

= 24.59 cfs

2x100 = 49.18

STD

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

32ff/50rw-std-half S=2.27%

MANNING'S N= .017 SLOPE= .0227

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	4	9.00	0.00	7	0.00	0.00
2	8.37	0.67	5	11.00	0.13	8	0.00	0.00
3	8.83	0.67	6	25.00	0.41	9	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.02	0.0	0.85	1.09	0.81	0.02	0.07
0.10	0.10	0.08	0.1	1.71	1.73	1.63	0.05	0.15
0.15	0.15	0.19	0.4	3.40	1.95	3.27	0.06	0.21
0.20	0.20	0.42	0.9	5.92	2.25	5.76	0.08	0.28
0.25	0.25	0.77	2.1	8.45	2.67	8.25	0.11	0.36
0.30	0.30	1.24	3.8	10.97	3.08	10.73	0.15	0.45
0.35	0.35	1.84	6.4	13.50	3.49	13.22	0.19	0.54
0.40	0.40	2.57	10.0	16.02	3.88	15.71	0.23	0.63
0.45	0.45	3.37	15.4	16.47	4.57	16.11	0.32	0.77
0.50	0.50	4.18	22.0	16.52	5.26	16.13	0.43	0.93
0.55	0.55	4.98	29.4	16.57	5.91	16.14	0.54	1.09
0.60	0.60	5.79	37.7	16.63	6.52	16.15	0.66	1.26
0.65	0.65	6.60	46.8	16.68	7.10	16.16	0.78	1.43
0.70	0.70	7.44	53.3	18.55	7.16	18.03	0.80	1.50
0.75	0.75	8.40	60.3	20.88	7.18	20.35	0.80	1.55
0.80	0.80	9.48	68.7	23.20	7.25	22.68	0.82	1.62
0.85	0.85	10.67	78.5	25.53	7.36	25.00	0.84	1.69

After STE
West

$Q_T = 3.13(D) + 2.58(60\% F\text{-}1) + 399(E) + 10.44(Q_R - STG)$

$Q_{100} = 20.14$
$d = .49$
$V = 5.06$
overcenterline

After ST G Westside
$Q_{100} = Q_R$ St G
$Q = 10.44$
$d = .40$
See Nomograph
@ 2% Qi = 6 cfs
@ 5% Qi = 8.2 cfs
@ 2.27 Qi = 6.20 cfs

STG

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

32ff/50rw-std-full S=0.60%

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.56	1.63	0.00	0.05
0.10	0.10	0.16	0.1	3.41	0.89	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.79	1.00	6.55	0.02	0.17
0.20	0.20	0.84	1.0	11.84	1.16	11.52	0.02	0.22
0.25	0.25	1.54	2.1	16.89	1.37	16.49	0.03	0.28
0.30	0.30	2.49	3.9	21.94	1.59	21.47	0.04	0.34
0.35	0.35	3.69	6.6	27.00	1.80	26.44	0.05	0.40
0.40	0.40	5.13	10.2	32.05	2.00	31.41	0.06	0.46
0.45	0.45	6.74	15.8	32.94	2.35	32.23	0.09	0.54
0.50	0.50	8.35	22.6	33.05	2.71	32.25	0.11	0.61
0.55	0.55	9.96	30.3	33.15	3.04	32.28	0.14	0.69
0.60	0.60	11.58	38.8	33.25	3.35	32.30	0.17	0.77
0.65	0.65	13.20	48.1	33.35	3.65	32.33	0.21	0.86
0.70	0.70	14.88	54.8	37.11	3.68	36.05	0.21	0.91
0.75	0.75	16.80	62.0	41.76	3.69	40.70	0.21	0.96
0.80	0.80	18.95	70.6	46.41	3.73	45.35	0.22	1.02
0.85	0.85	21.34	80.7	51.06	3.78	50.00	0.22	1.07

$Q_T = 10.97 + 8.34$

$Q_{100} = 19.31$

$V = 2.54$

$d = .48 < .85$ ✓

$E = .56 < .85$ ✓

STG

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

32ff/50rw-std-half S=0.60%

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	4	9.00	0.00	7	0.00	0.00
2	8.37	0.67	5	11.00	0.13	8	0.00	0.00
3	8.83	0.67	6	25.00	0.41	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.02	0.0	0.85	0.56	0.81	0.00	0.05
0.10	0.10	0.08	0.1	1.71	0.89	1.63	0.01	0.11
0.15	0.15	0.19	0.2	3.40	1.00	3.27	0.02	0.17
0.20	0.20	0.42	0.5	5.92	1.16	5.76	0.02	0.22
0.25	0.25	0.77	1.1	8.45	1.37	8.25	0.03	0.28
0.30	0.30	1.24	2.0	10.97	1.59	10.73	0.04	0.34
0.35	0.35	1.84	3.3	13.50	1.80	13.22	0.05	0.40
0.40	0.40	2.57	5.1	16.02	2.00	15.71	0.06	0.46
0.45	0.45	3.37	7.9	16.47	2.35	16.11	0.09	0.54
0.50	0.50	4.18	11.3	16.52	2.71	16.13	0.11	0.61
0.55	0.55	4.98	15.1	16.57	3.04	16.14	0.14	0.69
0.60	0.60	5.79	19.4	16.63	3.35	16.15	0.17	0.77
0.65	0.65	6.60	24.1	16.68	3.65	16.16	0.21	0.86
0.70	0.70	7.44	27.4	18.55	3.68	18.03	0.21	0.91
0.75	0.75	8.40	31.0	20.88	3.69	20.35	0.21	0.96
0.80	0.80	9.48	35.3	23.20	3.73	22.68	0.22	1.02
0.85	0.85	10.67	40.4	25.53	3.78	25.00	0.22	1.07

North

Q_T 3.78(A-1) + 2.36(B-3) + 1.30(C-3) + 3.53(G-1)

Q_{100} = 10.97

V = 2.68

d = .50 < .87

over centerline

See Nomograph

d = .50

@ .2% Qi = 4.7

@ 2.0% Qi = 9.8

@ 0.6% Qi = 5.83

South

Q_{100} = 8.34 (G-2)

V = 2.40

d = .46 < .87

over centerline

d = .46

@ .2% Qi = 3.7

@ 2.0% Qi = 6.4

@ 0.6% Qi = 4.3

STG

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll full S=0.60%

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	5	23.00	0.30	9	46.00	0.50
2	8.38	0.33	6	35.00	0.06	10	0.00	0.00
3	9.00	0.00	7	37.00	0.00	11	0.00	0.00
4	11.00	0.06	8	37.63	0.33	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.08	0.0	3.42	0.58	3.39	0.01	0.06
0.10	0.10	0.36	0.3	8.22	0.85	8.17	0.01	0.11
0.15	0.15	0.90	1.0	13.49	1.12	13.41	0.02	0.17
0.20	0.20	1.71	2.3	18.76	1.37	18.65	0.03	0.23
0.25	0.25	2.77	4.4	24.02	1.60	23.89	0.04	0.29
0.30	0.30	4.10	7.5	29.29	1.82	29.14	0.05	0.35
0.35	0.35	5.58	11.9	31.39	2.14	31.22	0.07	0.42
0.40	0.40	7.26	16.8	36.32	2.31	36.15	0.08	0.48
0.45	0.45	9.19	22.9	41.25	2.49	41.07	0.10	0.55
0.50	0.50	11.37	30.2	46.17	2.66	46.00	0.11	0.61

$Q_T = 3.78(A-1) + 2.36(B-3) + 3.57(43\%\ G-2)$

$Q_{100} = 9.71$

$V = 1.98$

$d = .33 < .50$ ✓

STG

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll half S=0.60%

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	3	9.00	0.00	5	23.00	0.30
2	8.38	0.33	4	11.00	0.06	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.58	1.69	0.01	0.06
0.10	0.10	0.18	0.2	4.11	0.85	4.08	0.01	0.11
0.15	0.15	0.45	0.5	6.74	1.12	6.71	0.02	0.17
0.20	0.20	0.85	1.2	9.38	1.37	9.33	0.03	0.23
0.25	0.25	1.38	2.2	12.01	1.60	11.95	0.04	0.29
0.30	0.30	2.05	3.7	14.65	1.82	14.57	0.05	0.35
0.35	0.35	2.79	6.0	15.70	2.14	15.61	0.07	0.42
0.40	0.40	3.63	8.4	18.16	2.31	18.07	0.08	0.48
0.45	0.45	4.60	11.4	20.62	2.49	20.54	0.10	0.55
0.50	0.50	5.68	15.1	23.09	2.66	23.00	0.11	0.61

$Q_{T(North)} = 3.78(A-1) + 2.36(B-3)$

$Q_{100} = 6.14$

V =

d = .35 over centerline

Stc

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll full S=0.70%

MANNING'S N= .017 SLOPE= .007

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	5	23.00	0.30	9	46.00	0.50
2	8.38	0.33	6	35.00	0.06	10	0.00	0.00
~~3~~	~~9.00~~	~~0.00~~	~~7~~	~~37.00~~	~~0.00~~	~~11~~	~~0.00~~	~~0.00~~
4	11.00	0.06	8	37.63	0.33	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.08	0.1	3.42	0.62	3.39	0.01	0.06
0.10	0.10	0.36	0.3	8.22	0.92	8.17	0.01	0.11
0.15	0.15	0.90	1.1	13.49	1.21	13.41	0.02	0.17
0.20	0.20	1.71	2.5	18.76	1.48	18.65	0.03	0.23
0.25	0.25	2.77	4.8	24.02	1.73	23.89	0.05	0.30
0.30	0.30	4.10	8.1	29.29	1.97	29.14	0.06	0.36
0.35	0.35	5.58	12.9	31.39	2.31	31.22	0.08	0.43
0.40	0.40	7.26	18.2	36.32	2.50	36.15	0.10	0.50
0.45	0.45	9.19	24.7	41.25	2.69	41.07	0.11	0.56
0.50	0.50	11.37	32.7	46.17	2.87	46.00	0.13	0.63

$Q_T = 4.65(B\text{-}1) + 4.59(B\text{-}2)$

$Q_{100} = 9.24$

$d = .31 < .50$ ✓

$V = 2.05$

$E = .39 < .50$ ✓

STC

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll half S=0.70%

MANNING'S N= .017 SLOPE= .007

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	3	9.00	0.00	5	23.00	0.30
2	8.38	0.33	4	11.00	0.06	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.62	1.69	0.01	0.06
0.10	0.10	0.18	0.2	4.11	0.92	4.08	0.01	0.11
0.15	0.15	0.45	0.5	6.74	1.21	6.71	0.02	0.17
0.20	0.20	0.85	1.3	9.38	1.48	9.33	0.03	0.23
0.25	0.25	1.38	2.4	12.01	1.73	11.95	0.05	0.30
0.30	0.30	2.05	4.0	14.65	1.97	14.57	0.06	0.36
0.35	0.35	2.79	6.4	15.70	2.31	15.61	0.08	0.43
0.40	0.40	3.63	9.1	18.16	2.50	18.07	0.10	0.50
0.45	0.45	4.60	12.4	20.62	2.69	20.54	0.11	0.56
0.50	0.50	5.68	16.3	23.09	2.87	23.00	0.13	0.63

Basin B-1

Q_{100} = 4.65

V = 2.06

d = .32

overcenterline

Basin B-2

Q_{100} = 4.59

V = 2.05

d = .31

overcenterline

Basin B-3

Q_{100} = 2.36

V = 1.72

d = .24 < .50 ✓

St. B1H

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

32ff/50rw-std-full S=4.88%

MANNING'S N= .017 SLOPE= .0488

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

☐ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.1	1.71	1.60	1.63	0.04	0.09
0.10	0.10	0.16	0.4	3.41	2.54	3.25	0.10	0.20
0.15	0.15	0.39	1.1	6.79	2.86	6.55	0.13	0.28
0.20	0.20	0.84	2.8	11.84	3.30	11.52	0.17	0.37
0.25	0.25	1.54	6.0	16.89	3.91	16.49	0.24	0.49
0.30	0.30	2.49	11.3	21.94	4.52	21.47	0.32	0.62
0.35	0.35	3.69	18.9	27.00	5.12	26.44	0.41	0.76
0.40	0.40	5.13	29.2	32.05	5.69	31.41	0.50	0.90
0.45	0.45	6.74	45.2	32.94	6.70	32.23	0.70	1.15
0.50	0.50	8.35	64.5	33.05	7.72	32.25	0.93	1.43
0.55	0.55	9.96	86.3	33.15	8.67	32.28	1.17	1.72
0.60	0.60	11.58	110.7	33.25	9.56	32.30	1.42	2.02
0.65	0.65	13.20	137.3	33.35	10.41	32.33	1.68	2.33
0.70	0.70	14.88	156.3	37.11	10.50	36.05	1.71	2.41
0.75	0.75	16.80	176.8	41.76	10.52	40.70	1.72	2.47
0.80	0.80	18.95	201.4	46.41	10.63	45.35	1.75	2.55
0.85	0.85	21.34	230.3	51.06	10.79	50.00	1.81	2.66

$Q_T = 8.94(A-2) + 4.51(A-3) + .88(A-4) + 2.99(A-5) + 1.85(A-6)$
$+ 4.65(B-1) + 4.59(B-2) + 5.24(C-1) + 5.21(C-2)$

$Q_{100} = 38.86$

V= 6.30

d= .43

EH = 1.05 > .87 fails.

To reach .87 Q cannot exceed 29.2 cfs

Q North - 8.94 cf
d= .28
See Nomograph
@ 2.0% Qi = 2.8
@ 50% Qi = 4.2
@ 4.88% Qi = 4.14

Q = 7.79 cfs
d= .27

Qi = 4.14 cfs.

Q south = 5.39 + 3.99 = 18.62
d= .35
See Nomograph
@ 2.0% Qi = 4.5
@ 50% Qi = 6.4
@ 4.88% Qi = 6.32

Q = 10.16 cfs
d= .29
Qi = 4.14 cfs

B-9

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw std full 0.72%

MANNING'S N= .017 SLOPE= .0072

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.61	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	0.97	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.82	1.10	6.58	0.02	0.17
0.20	0.20	0.84	1.1	11.92	1.27	11.60	0.02	0.22
0.25	0.25	1.55	2.3	17.03	1.50	16.63	0.03	0.28
0.30	0.30	2.50	4.3	22.13	1.74	21.65	0.05	0.35
0.35	0.35	3.71	7.3	27.23	1.96	26.68	0.06	0.41
0.40	0.40	5.11	12.0	28.84	2.34	28.20	0.09	0.49
0.45	0.45	6.52	17.9	28.94	2.75	28.23	0.12	0.57
0.50	0.50	7.93	24.8	29.04	3.12	28.25	0.15	0.65
0.55	0.55	9.35	32.5	29.15	3.47	28.28	0.19	0.74
0.60	0.60	10.76	41.0	29.25	3.81	28.30	0.23	0.83
0.65	0.65	12.18	50.2	29.35	4.13	28.33	0.26	0.91
0.70	0.70	13.66	56.2	33.11	4.11	32.05	0.26	0.96
0.75	0.75	15.38	62.7	37.76	4.08	36.70	0.26	1.01
0.80	0.80	17.33	70.8	42.41	4.09	41.35	0.26	1.06
0.85	0.85	19.52	80.5	47.06	4.12	46.00	0.26	1.11

$Q_T = 8.94(A\text{-}2) + 4.51(A\text{-}3) + 0.88(A\text{-}4)$

$\therefore Q_{100} = 14.33$

$V = 2.50$

$d = .42 < .85$ ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll full S=0.72%

MANNING'S N= .017 SLOPE= .0072

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	5	23.00	0.30	9	46.00	0.50
2	8.38	0.33	6	35.00	0.06	10	0.00	0.00
~~3~~	~~9.00~~	~~0.00~~	~~7~~	~~37.00~~	~~0.00~~	~~11~~	~~0.00~~	~~0.00~~
4	11.00	0.06	8	37.63	0.33	12	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.08	0.1	3.42	0.63	3.39	0.01	0.06
0.10	0.10	0.36	0.3	8.22	0.93	8.17	0.01	0.11
0.15	0.15	0.90	1.1	13.49	1.22	13.41	0.02	0.17
0.20	0.20	1.71	2.6	18.76	1.50	18.65	0.03	0.23
0.25	0.25	2.77	4.9	24.02	1.76	23.89	0.05	0.30
0.30	0.30	4.10	8.2	29.29	2.00	29.14	0.06	0.36
0.35	0.35	5.58	13.1	31.39	2.34	31.22	0.09	0.44
0.40	0.40	7.26	18.4	36.32	2.54	36.15	0.10	0.50
0.45	0.45	9.19	25.1	41.25	2.73	41.07	0.12	0.57
0.50	0.50	11.37	33.1	46.17	2.91	46.00	0.13	0.63

$Q_T = 4.51(A\text{-}3) + 5.36(60\%\ A\text{-}2)$

$Q_{100} = 9.87$ cfs

$V = 2.17$

$d = .38 < .5$ ✓

Before intersection

$Q_T = 4.51(A\text{-}3) + 8.94(A\text{-}2) + .88(A\text{-}4) + 4.65(B\text{-}1) + 4.59(B\text{-}2)$

$Q_{100} = 23.57$

$d = .25$

$V = 1.74$

$EH = .29 < .50$ ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll half S=0.72%

MANNING'S N= .017 SLOPE= .0072

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	3	9.00	0.00	5	23.00	0.30
2	8.38	0.33	4	11.00	0.06	6	0.00	0.00

~~WSEL~~ (FT)	~~DEPTH INC~~ (FT)	~~FLOW AREA~~ SQ.FT.	~~FLOW RATE~~ (CFS)	~~WETTED PER~~ (FT)	~~FLOW VEL~~ (FPS)	~~TOPWID~~ (FT)	~~VEL~~ HEAD (FT)	~~ENERGY~~ HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.63	1.69	0.01	0.06
0.10	0.10	0.18	0.2	4.11	0.93	4.08	0.01	0.11
0.15	0.15	0.45	0.6	6.74	1.22	6.71	0.02	0.17
0.20	0.20	0.85	1.3	9.38	1.50	9.33	0.03	0.23
0.25	0.25	1.38	2.4	12.01	1.76	11.95	0.05	0.30
0.30	0.30	2.05	4.1	14.65	2.00	14.57	0.06	0.36
0.35	0.35	2.79	6.5	15.70	2.34	15.61	0.09	0.44
0.40	0.40	3.63	9.2	18.16	2.54	18.07	0.10	0.50
0.45	0.45	4.60	12.5	20.62	2.73	20.54	0.12	0.57
0.50	0.50	5.68	16.6	23.09	2.91	23.00	0.13	0.63

Basin A-2 Q_{100} = 8.94

@ Lot 7 = .60 (A-2)

Q .60 (8.94) = 5.36

V = 2.18

d = .33

over centerline

Basin A-3 Q_{100} = 4.51 cfs

V = 2.06

d = .31 ~~.3~~.30

over centerline

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335
www.bhinc.com
voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll half S=1.0%

MANNING'S N= .017 SLOPE= .01

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	3	9.00	0.00	5	23.00	0.30
2	8.38	0.33	4	11.00	0.06	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.74	1.69	0.01	0.06
0.10	0.10	0.18	0.2	4.11	1.10	4.08	0.02	0.12
0.15	0.15	0.45	0.7	6.74	1.44	6.71	0.03	0.18
0.20	0.20	0.85	1.5	9.38	1.77	9.33	0.05	0.25
0.25	0.25	1.38	2.9	12.01	2.07	11.95	0.07	0.32
0.30	0.30	2.05	4.8	14.65	2.35	14.57	0.09	0.39
0.35	0.35	2.79	7.7	15.70	2.76	15.61	0.12	0.47
0.40	0.40	3.63	10.8	18.16	2.99	18.07	0.14	0.54
0.45	0.45	4.60	14.8	20.62	3.21	20.54	0.16	0.61
0.50	0.50	5.68	19.5	23.09	3.43	23.00	0.18	0.68

Basin A-1

$Q_{100} = 3.78$ cfs

$V = 2.39$

$d = .27 < .50$ ✓

St F

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll half S=1.40%

MANNING'S N= .017 SLOPE= .014

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	3	9.00	0.00	5	23.00	0.30
2	8.38	0.33	4	11.00	0.06	6	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.88	1.69	0.01	0.06
0.10	0.10	0.18	0.2	4.11	1.30	4.08	0.03	0.13
0.15	0.15	0.45	0.8	6.74	1.71	6.71	0.05	0.20
0.20	0.20	0.85	1.8	9.38	2.09	9.33	0.07	0.27
0.25	0.25	1.38	3.4	12.01	2.45	11.95	0.09	0.34
0.30	0.30	2.05	5.7	14.65	2.79	14.57	0.12	0.42
0.35	0.35	2.79	9.1	15.70	3.27	15.61	0.17	0.52
0.40	0.40	3.63	12.8	18.16	3.54	18.07	0.19	0.59
0.45	0.45	4.60	17.5	20.62	3.80	20.54	0.22	0.67
0.50	0.50	5.68	23.1	23.09	4.06	23.00	0.26	0.76

Basin E

$Q_{100} = 3.99$

$V = 2.54$

$d = .26$

$E = .36 < .50$ ✓

St E

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw roll half S=4.00%

MANNING'S N= .017 SLOPE= .04

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	3	9.00	0.00	5	23.00	0.30
2	8.38	0.33	4	11.00	0.06	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.1	1.71	1.49	1.69	0.03	0.08
0.10	0.10	0.18	0.4	4.11	2.19	4.08	0.07	0.17
0.15	0.15	0.45	1.3	6.74	2.89	6.71	0.13	0.28
0.20	0.20	0.85	3.0	9.38	3.54	9.33	0.19	0.39
0.25	0.25	1.38	5.7	12.01	4.14	11.95	0.27	0.52
0.30	0.30	2.05	9.6	14.65	4.71	14.57	0.34	0.64
0.35	0.35	2.79	15.4	15.70	5.52	15.61	0.47	0.82
0.40	0.40	3.63	21.7	18.16	5.98	18.07	0.55	0.95
0.45	0.45	4.60	29.5	20.62	6.43	20.54	0.64	1.09
0.50	0.50	5.68	39.0	23.09	6.87	23.00	0.73	1.23

Basin D

$Q_{100} = 3.13$

$V = 3.57$

$d = .20 < .5$

ST A

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

32ff/50rw roll half S=0.60%

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	3	9.00	0.00	5	25.00	0.34
2	8.38	0.33	4	11.00	0.06	6	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.58	1.69	0.01	0.06
0.10	0.10	0.18	0.2	4.11	0.85	4.08	0.01	0.11
0.15	0.15	0.45	0.5	6.74	1.12	6.70	0.02	0.17
0.20	0.20	0.85	1.2	9.37	1.37	9.32	0.03	0.23
0.25	0.25	1.38	2.2	12.00	1.60	11.93	0.04	0.29
0.30	0.30	2.05	3.7	14.63	1.82	14.55	0.05	0.35
0.35	0.35	2.85	5.7	17.70	2.00	17.61	0.06	0.41
0.40	0.40	3.79	8.4	20.16	2.22	20.07	0.08	0.48
0.45	0.45	4.85	11.8	22.62	2.43	22.54	0.09	0.54
0.50	0.50	6.04	15.8	25.09	2.62	25.00	0.11	0.61

Basin C-1

Q100= 5.24

V= 1.96

d= .34 ✓

E=.41 < .50 ✓

Basin C-2

Q100= 5.21

V= 1.96

d= .34 ✓

Basin C-3

Q100= 1.30

V= 1.39

d= .21

STA

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw std half 0.60%

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	4	9.00	0.00	7	0.00	0.00
2	8.37	0.67	5	11.00	0.13	8	0.00	0.00
3	8.83	0.67	6	23.00	0.37	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.02	0.0	0.85	0.56	0.81	0.00	0.05
0.10	0.10	0.08	0.1	1.71	0.89	1.63	0.01	0.11
0.15	0.15	0.19	0.2	3.41	1.00	3.29	0.02	0.17
0.20	0.20	0.42	0.5	5.96	1.16	5.80	0.02	0.22
0.25	0.25	0.77	1.1	8.51	1.37	8.31	0.03	0.28
0.30	0.30	1.25	2.0	11.07	1.58	10.83	0.04	0.34
0.35	0.35	1.86	3.3	13.62	1.79	13.34	0.05	0.40
0.40	0.40	2.56	5.5	14.42	2.14	14.10	0.07	0.47
0.45	0.45	3.26	8.2	14.47	2.51	14.11	0.10	0.55
0.50	0.50	3.97	11.3	14.52	2.85	14.13	0.13	0.63
0.55	0.55	4.67	14.8	14.57	3.17	14.14	0.16	0.71
0.60	0.60	5.38	18.7	14.63	3.48	14.15	0.19	0.79
0.65	0.65	6.09	22.9	14.68	3.77	14.16	0.22	0.87
0.70	0.70	6.83	25.6	16.55	3.75	16.03	0.22	0.92
0.75	0.75	7.69	28.6	18.88	3.72	18.35	0.22	0.97
0.80	0.80	8.67	32.3	21.20	3.73	20.68	0.22	1.02
0.85	0.85	9.76	36.7	23.53	3.77	23.00	0.22	1.07

Basin C-1
$Q_{100} = 5.24$
V
d .39

Basin C-2
$Q_{100} = 5.21$
V=
d= .39

See Nomograph
d=.39
@ .2% Qi = 2.5
@ 20% Qi = 5.8
@ 0.6% Qi = 3,23

STK

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw std half 3.6%

MANNING'S N= .017 SLOPE= .036

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	4	9.00	0.00	7	0.00	0.00
2	8.37	0.67	5	11.00	0.13	8	0.00	0.00
3	8.83	0.67	6	23.00	0.37	9	0.00	0.00

□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.02	0.0	0.85	1.37	0.81	0.03	0.08
0.10	0.10	0.08	0.2	1.71	2.18	1.63	0.07	0.17
0.15	0.15	0.19	0.5	3.41	2.45	3.29	0.09	0.24
0.20	0.20	0.42	1.2	5.96	2.83	5.80	0.12	0.32
0.25	0.25	0.77	2.6	8.51	3.35	8.31	0.17	0.42
0.30	0.30	1.25	4.9	11.07	3.88	10.83	0.23	0.53
0.35	0.35	1.86	8.2	13.62	4.39	13.34	0.30	0.65
0.40	0.40	2.56	13.4	14.42	5.23	14.10	0.43	0.83
0.45	0.45	3.26	20.0	14.47	6.14	14.11	0.59	1.04
0.50	0.50	3.97	27.7	14.52	6.98	14.13	0.76	1.26
0.55	0.55	4.67	36.3	14.57	7.77	14.14	0.94	1.49
0.60	0.60	5.38	45.8	14.63	8.52	14.15	1.13	1.73
0.65	0.65	6.09	56.2	14.68	9.23	14.16	1.32	1.97
0.70	0.70	6.83	62.8	16.55	9.19	16.03	1.31	2.01
0.75	0.75	7.69	70.1	18.88	9.11	18.35	1.29	2.04
0.80	0.80	8.67	79.2	21.20	9.13	20.68	1.30	2.10
0.85	0.85	9.76	90.0	23.53	9.22	23.00	1.32	2.17

Basin K

$Q_{100} = 5.76$

$Q_{\frac{1}{2}} = 288$

$V = 3.41$

$d = .24$

$EH = .43 < .87$ ✓

ST J

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw std half 4.25%

MANNING'S N= .017 SLOPE= .0425

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	4	9.00	0.00	7	0.00	0.00
2	8.37	0.67	5	11.00	0.13	8	0.00	0.00
3	8.83	0.67	6	23.00	0.37	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.02	0.0	0.85	1.49	0.81	0.03	0.08
0.10	0.10	0.08	0.2	1.71	2.37	1.63	0.09	0.19
0.15	0.15	0.19	0.5	3.41	2.66	3.29	0.11	0.26
0.20	0.20	0.42	1.3	5.96	3.08	5.80	0.15	0.35
0.25	0.25	0.77	2.8	8.51	3.64	8.31	0.21	0.46
0.30	0.30	1.25	5.3	11.07	4.22	10.83	0.28	0.58
0.35	0.35	1.86	8.9	13.62	4.77	13.34	0.35	0.70
0.40	0.40	2.56	14.5	14.42	5.69	14.10	0.50	0.90
0.45	0.45	3.26	21.8	14.47	6.67	14.11	0.69	1.14
0.50	0.50	3.97	30.1	14.52	7.59	14.13	0.89	1.39
0.55	0.55	4.67	39.5	14.57	8.44	14.14	1.11	1.66
0.60	0.60	5.38	49.8	14.63	9.25	14.15	1.33	1.93
0.65	0.65	6.09	61.0	14.68	10.02	14.16	1.56	2.21
0.70	0.70	6.83	68.2	16.55	9.99	16.03	1.55	2.25
0.75	0.75	7.69	76.2	18.88	9.90	18.35	1.52	2.27
0.80	0.80	8.67	86.0	21.20	9.92	20.68	1.53	2.33
0.85	0.85	9.76	97.8	23.53	10.02	23.00	1.56	2.41

Basin J

$Q_{100} = 6.20$ cfs

$Q_{\frac{1}{2}} = 3.10$ cfs

$V = 3.71$

$d = .26$

$EH = .47 < .85$ ✓

ST I

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw std half 2.4%

MANNING'S N= .017 SLOPE= .024

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	4	9.00	0.00	7	0.00	0.00
2	8.37	0.67	5	11.00	0.13	8	0.00	0.00
3	8.83	0.67	6	23.00	0.37	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.02	0.0	0.85	1.12	0.81	0.02	0.07
0.10	0.10	0.08	0.1	1.71	1.78	1.63	0.05	0.15
0.15	0.15	0.19	0.4	3.41	2.00	3.29	0.06	0.21
0.20	0.20	0.42	1.0	5.96	2.31	5.80	0.08	0.28
0.25	0.25	0.77	2.1	8.51	2.74	8.31	0.12	0.37
0.30	0.30	1.25	4.0	11.07	3.17	10.83	0.16	0.46
0.35	0.35	1.86	6.7	13.62	3.59	13.34	0.20	0.55
0.40	0.40	2.56	10.9	14.42	4.27	14.10	0.28	0.68
0.45	0.45	3.26	16.4	14.47	5.01	14.11	0.39	0.84
0.50	0.50	3.97	22.6	14.52	5.70	14.13	0.50	1.00
0.55	0.55	4.67	29.6	14.57	6.34	14.14	0.62	1.17
0.60	0.60	5.38	37.4	14.63	6.95	14.15	0.75	1.35
0.65	0.65	6.09	45.9	14.68	7.53	14.16	0.88	1.53
0.70	0.70	6.83	51.3	16.55	7.51	16.03	0.88	1.58
0.75	0.75	7.69	57.2	18.88	7.44	18.35	0.86	1.61
0.80	0.80	8.67	64.6	21.20	7.46	20.68	0.86	1.66
0.85	0.85	9.76	73.5	23.53	7.53	23.00	0.88	1.73

Basin I

East

I-3 (5.26

$Q_{100} = 5.26$

V = 3.37

d = .32

EH = .50 < .87 ✓

cross over centerline

See Nomograph

Q = 3.7 cfs

0.50 Q = 5.3 cfs

3.45

West

I-2 (1.20) + J (6.20) + K (5.76)

$Q_{100} = 13.16$

d = .42

V = 4.57

EH = .75 < .87 ✓

cross over centerline

Q = 6.5

Q = 9.00

= 7.01

ST I

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

28ff/46rw std full 2.4%

MANNING'S N= .017 SLOPE= .024

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

☐ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	1.12	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.78	3.25	0.05	0.15
0.15	0.15	0.39	0.8	6.82	2.00	6.58	0.06	0.21
0.20	0.20	0.84	1.9	11.92	2.31	11.60	0.08	0.28
0.25	0.25	1.55	4.2	17.03	2.74	16.63	0.12	0.37
0.30	0.30	2.50	7.9	22.13	3.17	21.65	0.16	0.46
0.35	0.35	3.71	13.3	27.23	3.59	26.68	0.20	0.55
0.40	0.40	5.11	21.8	28.84	4.27	28.20	0.28	0.68
0.45	0.45	6.52	32.7	28.94	5.01	28.23	0.39	0.84
0.50	0.50	7.93	45.2	29.04	5.70	28.25	0.50	1.00
0.55	0.55	9.35	59.3	29.15	6.34	28.28	0.62	1.17
0.60	0.60	10.76	74.8	29.25	6.95	28.30	0.75	1.35
0.65	0.65	12.18	91.7	29.35	7.53	28.33	0.88	1.53
0.70	0.70	13.66	102.6	33.11	7.51	32.05	0.88	1.58
0.75	0.75	15.38	114.5	37.76	7.44	36.70	0.86	1.61
0.80	0.80	17.33	129.3	42.41	7.46	41.35	0.86	1.66
0.85	0.85	19.52	147.0	47.06	7.53	46.00	0.88	1.73

$Q_T = 5.26(I-3) + I-2(1.20) + J(6.20) + K(5.76)$

$Q_{100} = 18.42$

$V = 4.00$

$d = .38$

$EH = .63 < .87$ ✓

*****   PC PROGRAM STREAM   SEPTEMBER 1994   *****

28ff/46rw 2% cross-slope 2.8%

MANNING'S N= .017 SLOPE= .028

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	1.33	4	11.00	0.37	7	37.63	0.67
2	8.38	1.16	5	35.00	0.13	8	46.00	0.84
3	9.00	0.49	6	37.00	0.00	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.02	0.0	0.87	1.23	0.85	0.02	0.07
0.10	0.10	0.08	0.2	1.74	1.95	1.69	0.06	0.16
0.15	0.15	0.22	0.4	4.71	1.88	4.64	0.05	0.20
0.20	0.20	0.57	1.3	9.78	2.21	9.69	0.08	0.28
0.25	0.25	1.19	3.2	14.85	2.71	14.73	0.11	0.36
0.30	0.30	2.05	6.6	19.92	3.21	19.78	0.16	0.46
0.35	0.35	3.16	11.7	24.98	3.69	24.83	0.21	0.56
0.40	0.40	4.48	19.7	27.11	4.40	26.93	0.30	0.70
0.45	0.45	5.85	30.1	27.98	5.15	27.78	0.41	0.86
0.50	0.50	7.26	42.4	28.71	5.85	28.48	0.53	1.03
0.55	0.55	8.68	57.0	28.84	6.57	28.57	0.67	1.22
0.60	0.60	10.11	73.3	28.98	7.25	28.66	0.82	1.42
0.65	0.65	11.55	91.2	29.12	7.90	28.76	0.97	1.62
0.70	0.70	13.01	107.4	30.69	8.25	30.30	1.06	1.76
0.75	0.75	14.59	123.3	33.22	8.45	32.81	1.11	1.86
0.80	0.80	16.29	141.1	35.75	8.66	35.32	1.16	1.96
0.85	0.85	18.12	162.3	37.79	8.96	37.34	1.25	2.10
0.90	0.90	19.99	190.9	37.86	9.55	37.38	1.42	2.32
0.95	0.95	21.86	221.4	37.93	10.13	37.43	1.59	2.54
1.00	1.00	23.73	253.6	38.00	10.69	37.48	1.77	2.77
1.05	1.05	25.60	287.5	38.07	11.23	37.52	1.96	3.01
1.10	1.10	27.48	323.1	38.14	11.76	37.57	2.15	3.25
1.15	1.15	29.36	360.3	38.20	12.27	37.62	2.34	3.49
1.20	1.20	31.28	387.2	40.19	12.38	39.60	2.38	3.58
1.25	1.25	33.32	413.4	42.65	12.41	42.06	2.39	3.64
1.30	1.30	35.49	442.3	45.12	12.46	44.52	2.41	3.71
1.33	1.33	36.85	460.8	46.59	12.51	46.00	2.43	3.76

$Q_T = Q_R(\text{Street I}) + L\text{-}1 + L\text{-}2 + L\text{-}3$

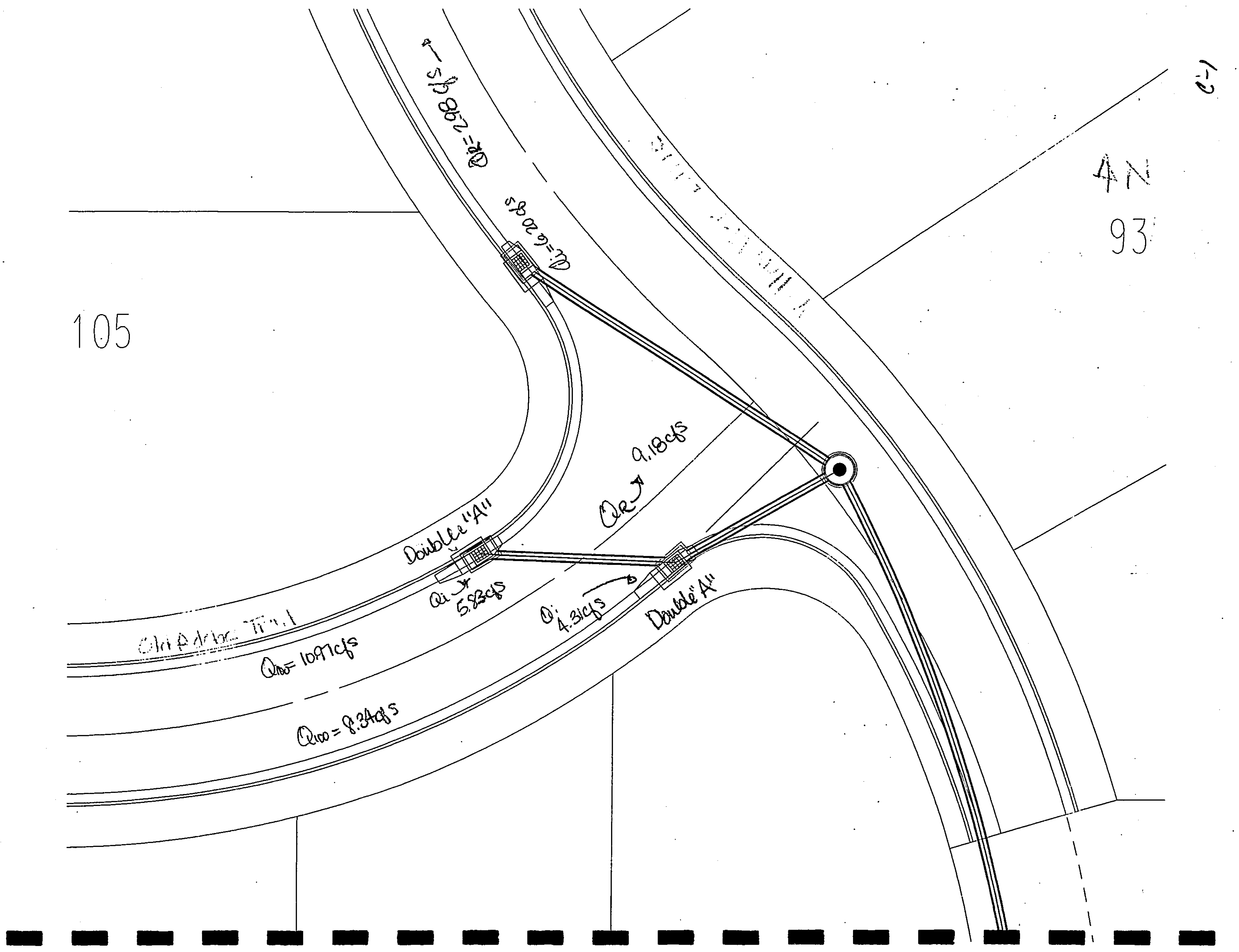
$18.42 + 3.96 + 6.20 + .73$

$Q_{100} = 29.31$

$V = 5.09$

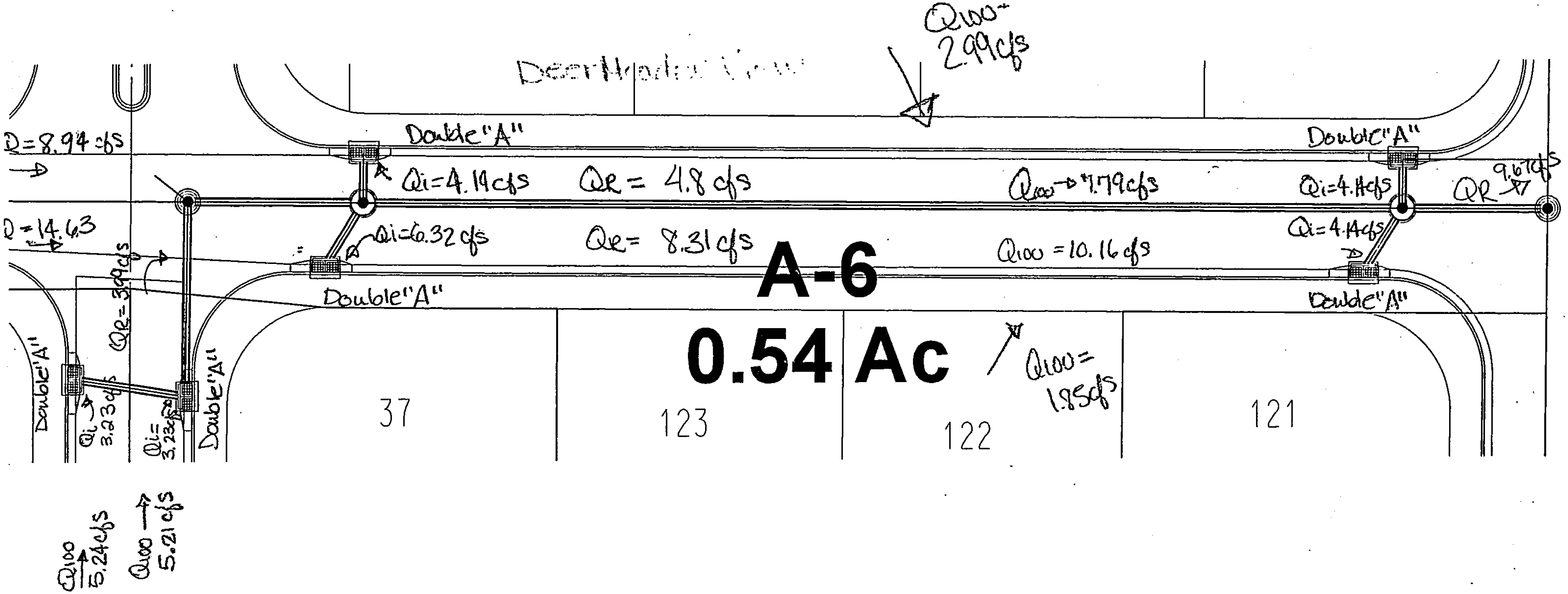
$d = .45$

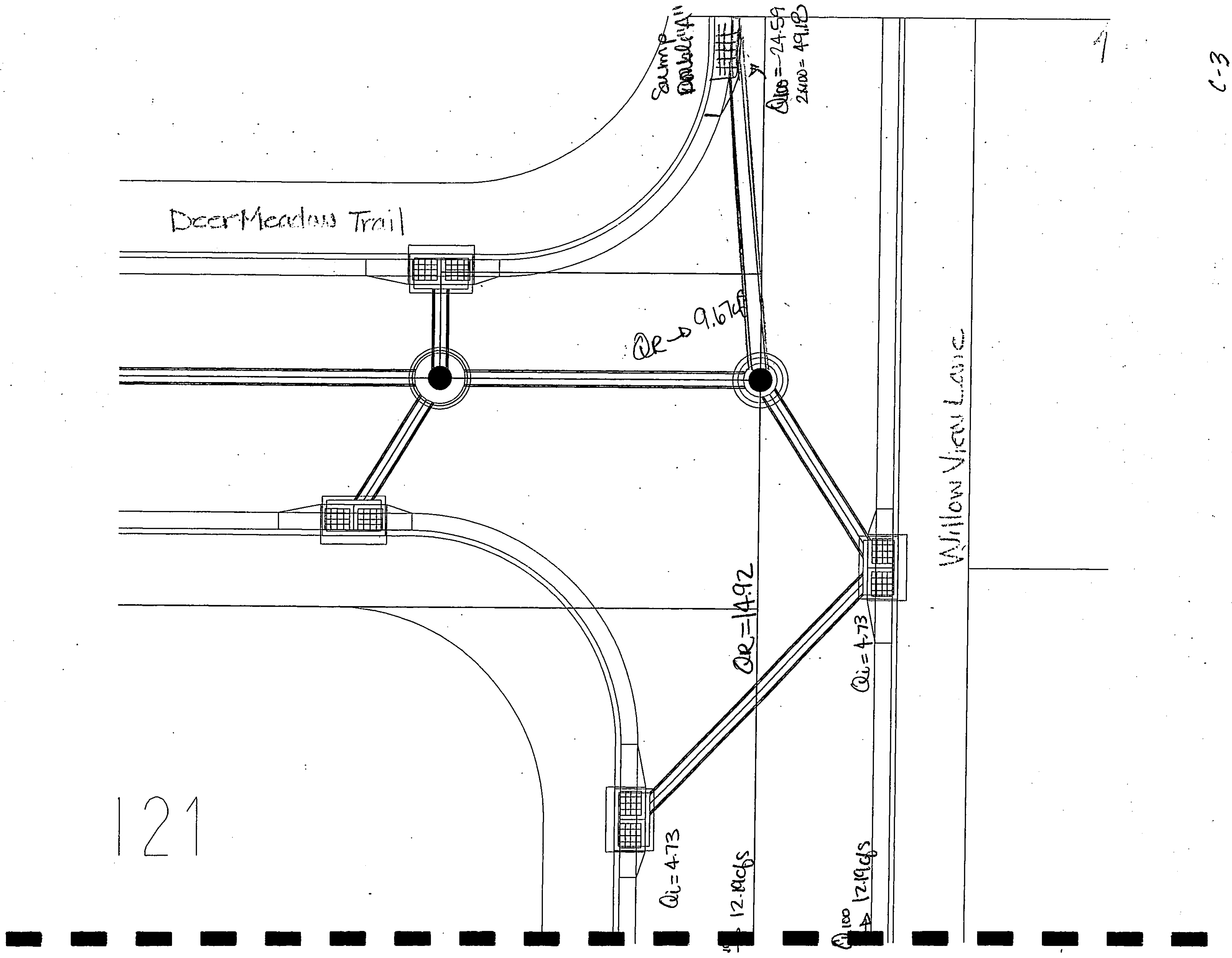
$EH = .85 < .87$ ✓

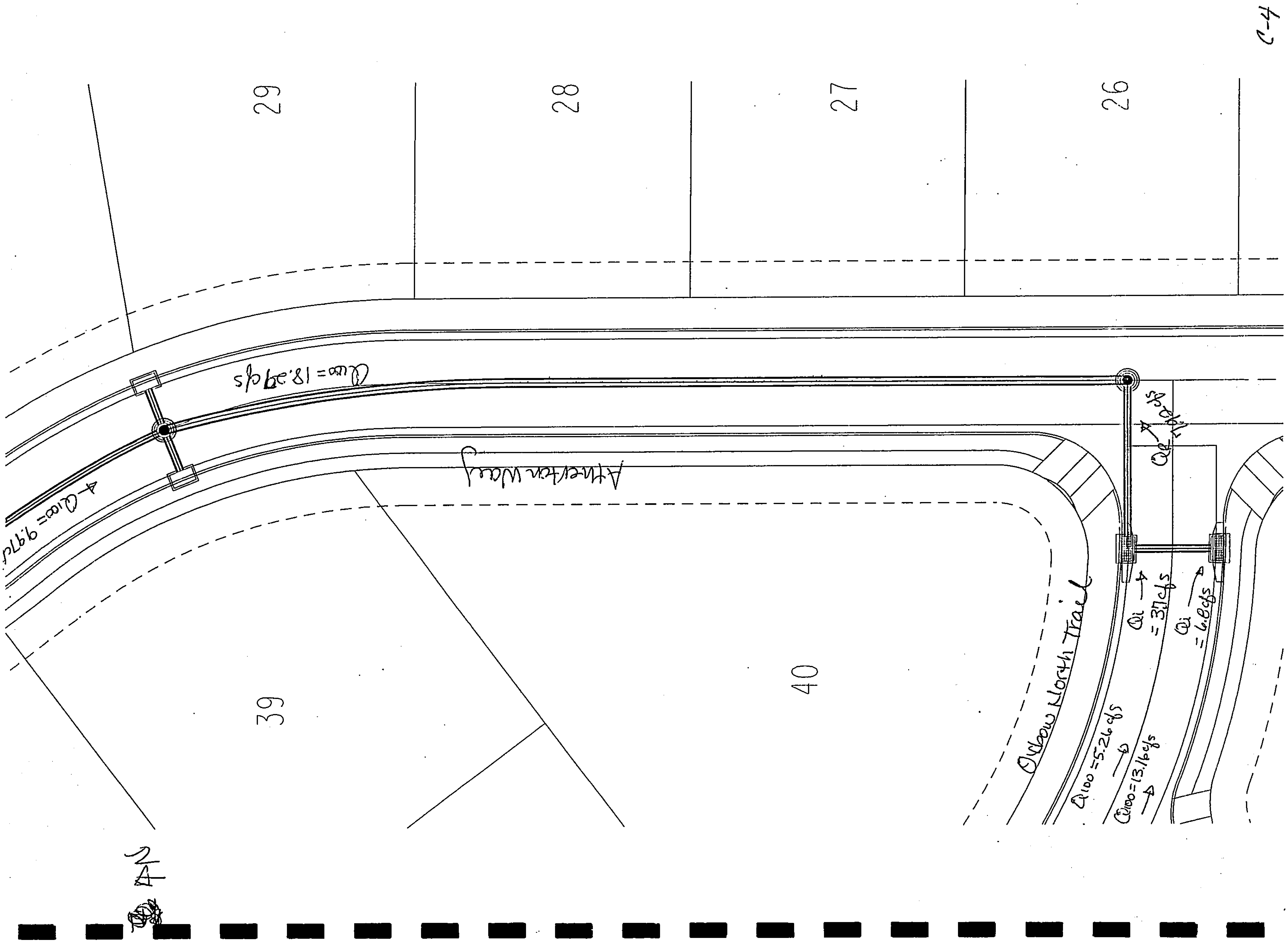


105
93
Qi=6.20cfs
QR=2.98cfs
9.18cfs
QR
Double "A"
Qi
5.83cfs
Qi
4.31cfs
Double "A"
Q100=10.97cfs
Q100=8.34cfs

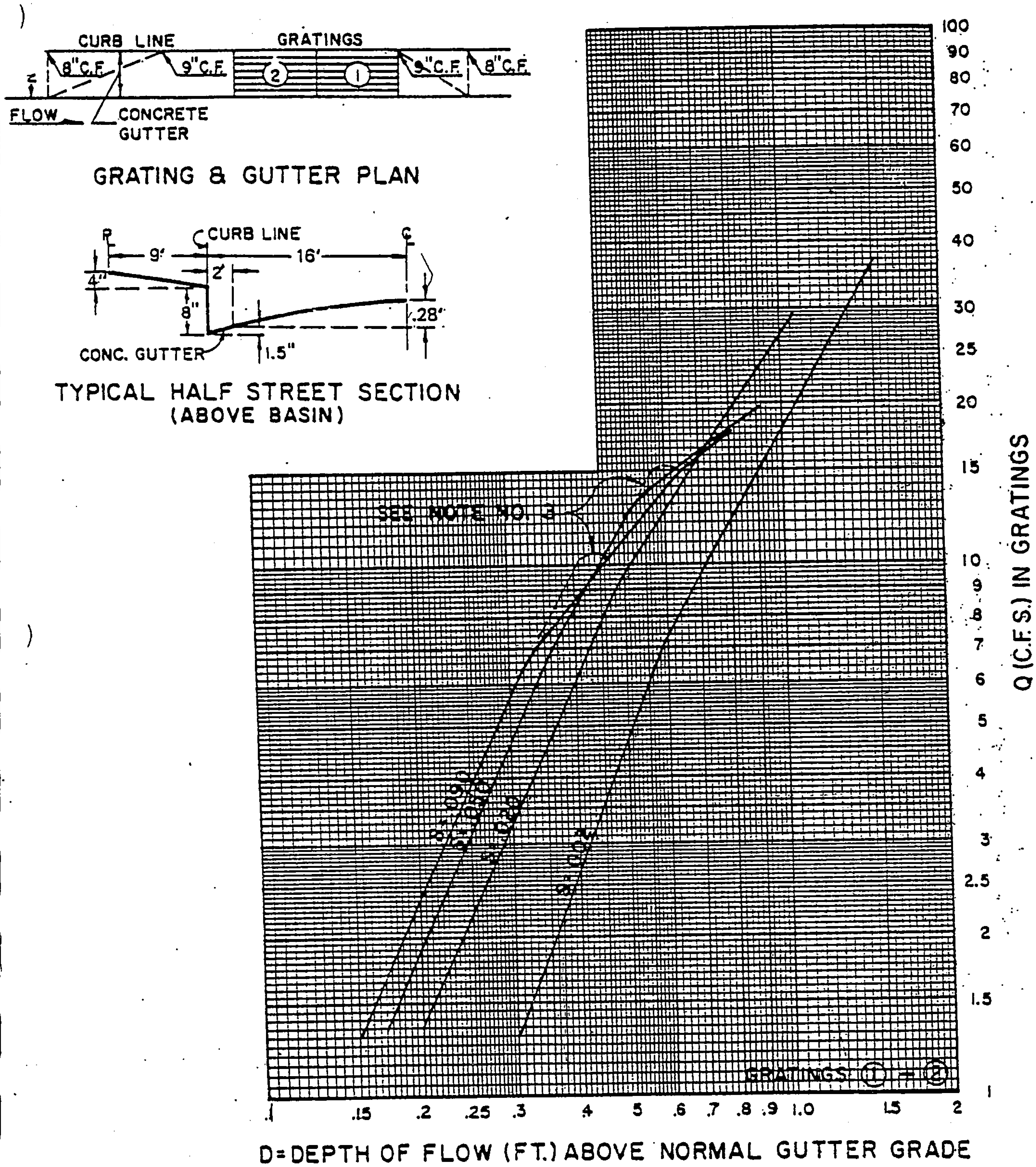
C-2


Q100=
2.99cfs
Q=8.94 cfs
Double"A"
Qi=4.14cfs
QR = 4.8 cfs
Q100 7.79cfs
Double"A"
Qi=4.14cfs
QR 9.67cfs
Q=14.63
Qi=6.32 cfs
QR= 8.31 cfs
Q100 =10.16 cfs
Qi=4.14cfs
QR=3.99cfs
Double"A"
Double"A"
A-6
0.54 Ac
Q100=
1.85cfs
Double"A"
Qi 3.23cfs
Qi= 3.23cfs
Double"A"
37
123
122
121
Q100 5.24cfs
Q100 5.21cfs


C-3
Sump
Q_{100} = 24.59
2×100 = 49.18
DeerMeadow Trail
Q_R → 9.674
Willow View Lane
Q_R = 14.92
Q_i = 4.73
Q_i = 4.73
12.19cfs
Q_{100} → 12.19cfs
121

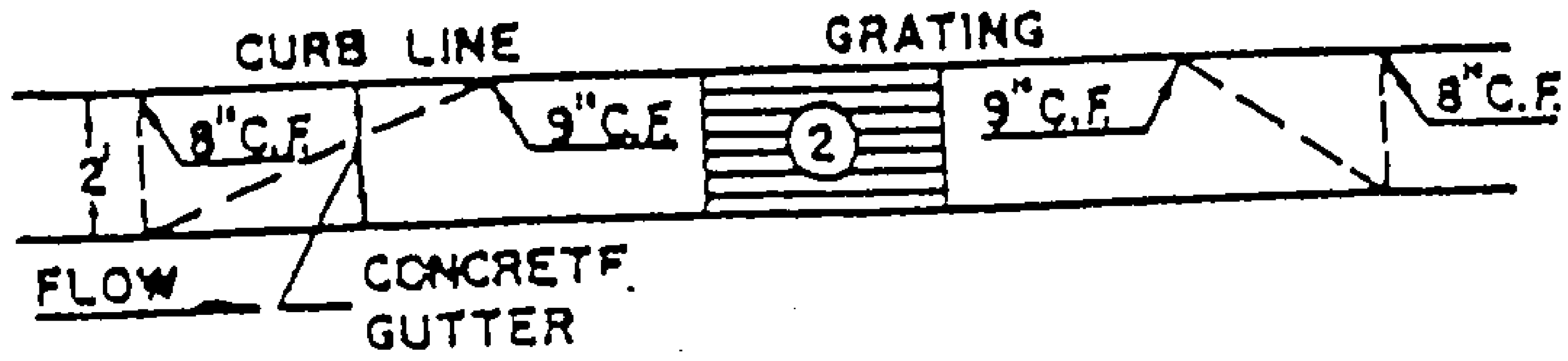

C-4
29
28
27
26
39
40
Atherton Way
Oxbow North Trail
Qi = 3.7cfs
Qi = 6.8cfs
Q100 = 5.26cfs
Q100 = 13.16cfs

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

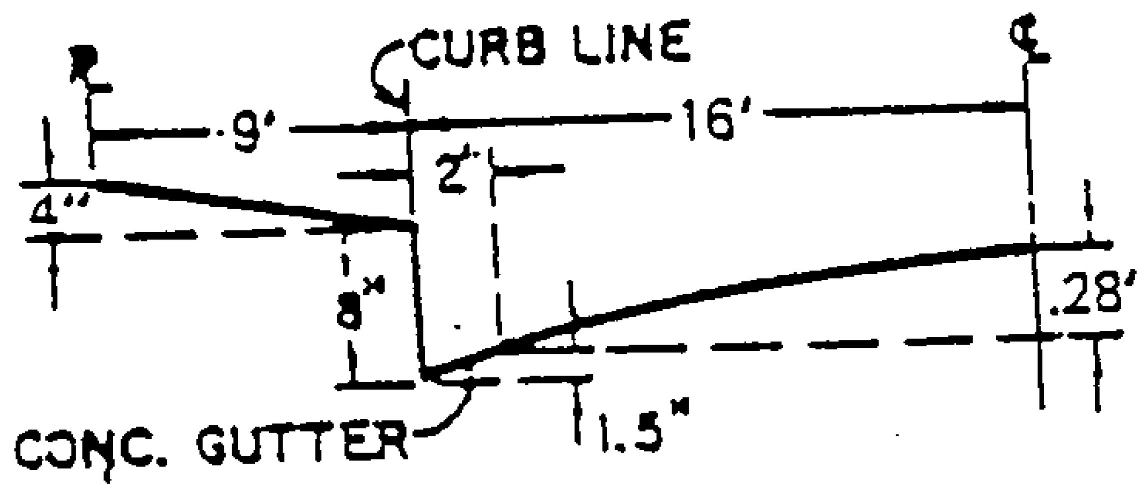


C-5

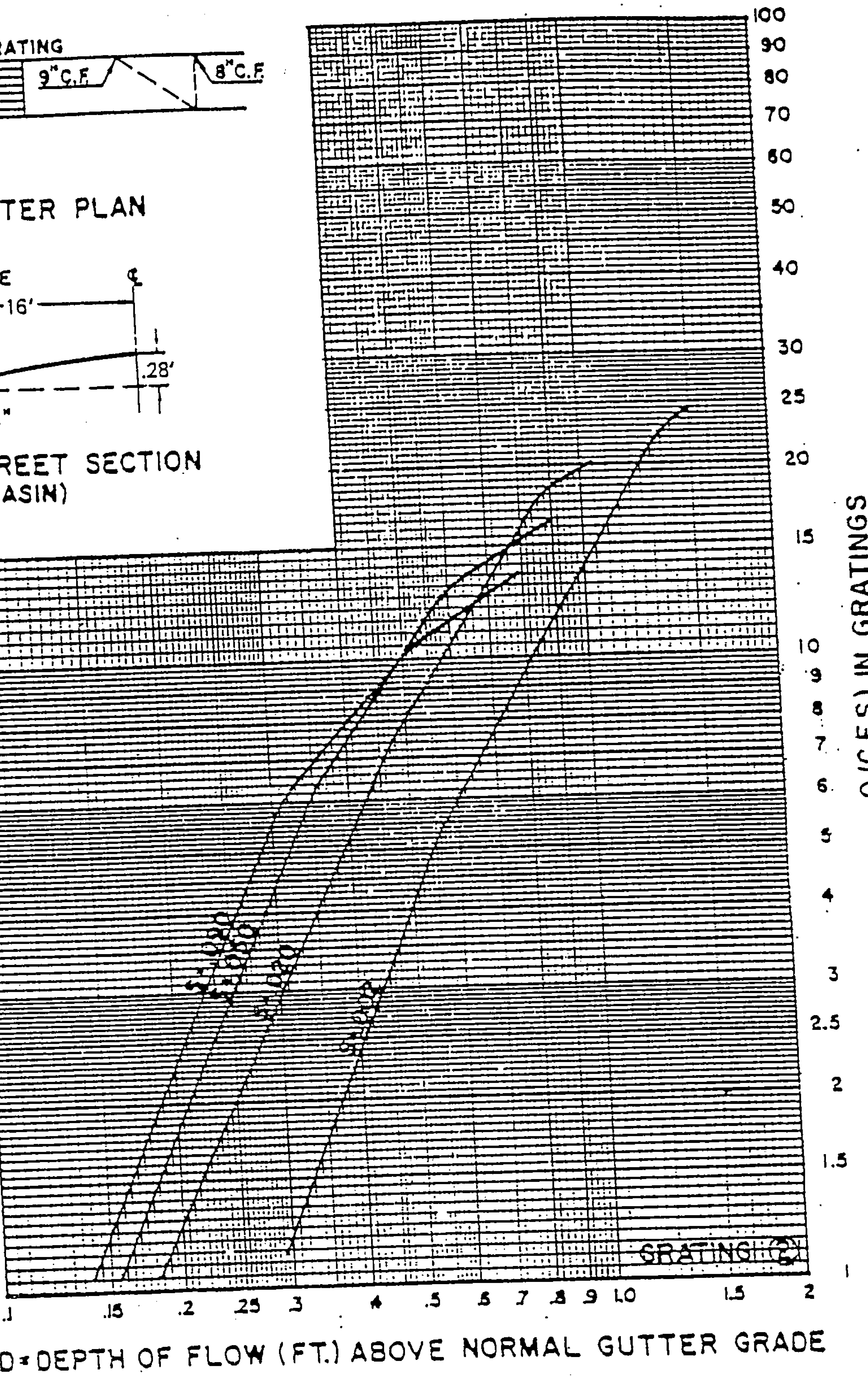
GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



ANALYSIS OF AN INLET IN A SUMP CONDITION - Unit 1 & 2

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet.

WEIR:	Q=C*L*H^1.5	ORIFICE:	Q=C*A*(2*G*H)**0.5
Wing opening	Grate opeining	Grate opening	Wing opening
C= 3.0	C=3.0	C=0.6	C=0.6
L= 4.0 ft	L(double grate)=[2(2.67')+2(1.8')]=8.	A(double grate)=8.19 sf	A=2.0 sf
Q=3.0(4.0')H**1.5= 12.0H**1.5	Q=3.0(8.94)H^1.5=26.82*H^1.5	Q=4.194*(64.4*H)^0.5	Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	12.47	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	17.64	4.55	
	0.30	0.30	1.97	4.41	21.60	8.35	
	0.40	0.40	3.04	6.78	24.94	12.86	
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.60	0.60	5.58	12.46	30.55	23.62	
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	Q(100 yr) = 24.59 cfs is provided at this depth
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.90	0.90	10.25	22.90	37.41	43.39	
ROW LIMIT	1.00	1.00	12.00	26.82	39.43	50.82	Q(2x100 yr) = 49.18 cfs is provided at this depth

NOTE: The total runoff intercepted by the inlet at the low point in the road is:

Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].

THE 100 YR STORM EVENT = 24.59 CFS at the sump condition

THE 2 x 100 YR STORM EVENT = 49.18 at the sump condition

C-7

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Unit 3**

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet.

WEIR:	Q=C*L*H^1.5	ORIFICE:	Q=C*A*(2*G*H)**0.5
Wing opening	Grate opeining	Grate opening	Wing opening
C= 3.0	C=3.0	C=0.6	C=0.6
L= 4.0 ft	L(double grate)=[2(2.67')+2(1.8')]=8.	A(double grate)=8.19 sf	A=2.0 sf
Q=3.0(4.0')H**1.5= 12.0H**1.5	Q=3.0(8.94)H^1.5=26.82*H^1.5	Q=4.194*(64.4*H)^0.5	Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	12.47	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	17.64	4.55	
	0.30	0.30	1.97	4.41	21.60	8.35	
	0.40	0.40	3.04	6.78	24.94	12.86	
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.60	0.60	5.58	12.46	30.55	23.62	
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	Q(100 yr) = 28.24 cfs is provided at this depth
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.90	0.90	10.25	22.90	37.41	43.39	
ROW LIMIT	1.00	1.00	12.00	26.82	39.43	50.82	Q(2x100 yr) = 56.48 cfs is provided at this depth

an additional double "A" is located on the opposite side of the street

NOTE: The total runoff intercepted by the inlet at the low point in the road is:

Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].

THE 100 YR STORM EVENT = 24.59 CFS at the sump condition

THE 2 x 100 YR STORM EVENT = 49.18 at the sump condition

8/8-2

Max RCP flow (non-pressure, full pipe)

Table assumes Manning's n = 0.013

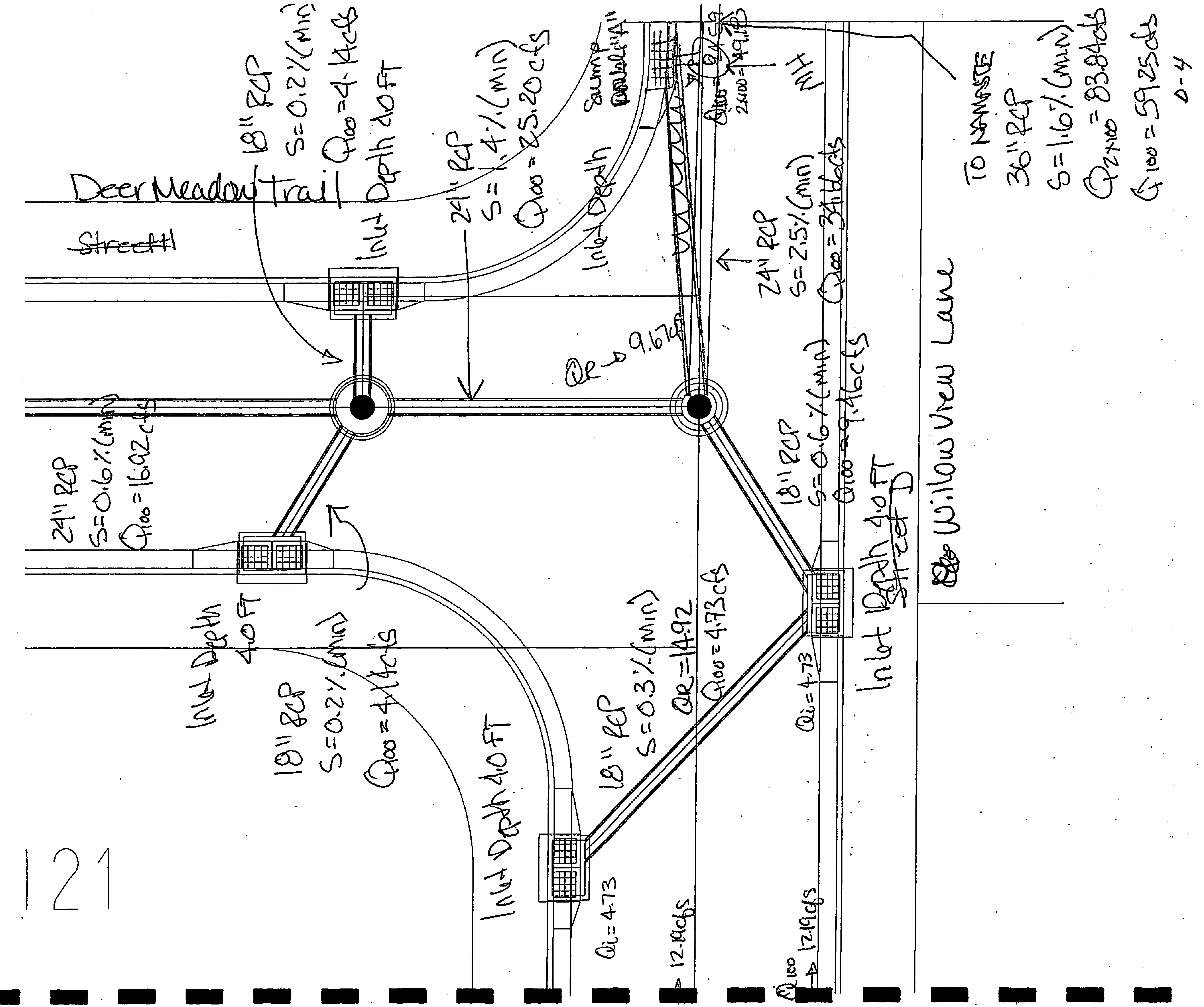
Slope	18	24	30	36	42	48	54	60	66	72	78
0.10%	3.33	7.17	13.01	21.15	31.90	45.55	62.35	82.58	106.48	134.29	166.24
0.20%	4.71	10.14	18.39	29.91	45.12	64.41	88.18	116.79	150.58	189.91	235.09
0.30%	5.77	12.42	22.53	36.63	55.25	78.89	108.00	143.03	184.43	232.59	287.93
0.40%	6.66	14.35	26.01	42.30	63.80	91.09	124.71	165.16	212.96	268.57	332.47
0.50%	7.45	16.04	29.08	47.29	71.33	101.84	139.43	184.66	238.09	300.27	371.72
1.00%	10.53	22.68	41.13	66.88	100.88	144.03	197.18	261.14	336.71	424.65	525.69
1.50%	12.90	27.78	50.37	81.91	123.55	176.40	241.49	319.83	412.39	520.09	643.83
2.00%	14.90	32.08	58.16	94.58	142.67	203.69	278.85	369.31	476.18	600.54	743.44
2.50%	16.65	35.87	65.03	105.74	159.51	227.73	311.77	412.90	532.39	671.43	831.19
3.00%	18.24	39.29	71.23	115.84	174.73	249.47	341.52	452.31	583.20	735.51	910.52
3.50%	19.70	42.44	76.94	125.12	188.73	269.46	368.89	488.55	629.93	794.44	983.47
4.00%	21.07	45.37	82.26	133.76	201.76	288.06	394.36	522.29	673.43	849.30	1051.38
4.50%	22.34	48.12	87.24	141.87	214.00	305.53	418.28	553.97	714.28	900.81	1115.15
5.00%	23.55	50.72	91.96	149.54	225.58	322.06	440.90	583.93	752.91	949.54	1175.47
5.50%	24.70	53.20	96.45	156.84	236.59	337.78	462.42	612.44	789.66	995.89	1232.85
6.00%	25.80	55.56	100.74	163.82	247.11	352.80	482.99	639.67	824.77	1040.17	1287.67
6.50%	26.85	57.83	104.85	170.51	257.20	367.21	502.71	665.79	858.45	1082.64	1340.25
7.00%	27.87	60.01	108.81	176.94	266.90	381.07	521.68	690.92	890.86	1123.51	1390.84
7.50%	28.84	62.12	112.63	183.15	276.27	394.44	540.00	715.17	922.13	1162.95	1439.66
8.00%	29.79	64.16	116.33	189.16	285.33	407.38	557.70	738.63	952.37	1201.09	1486.87
8.50%	30.71	66.13	119.91	194.98	294.11	419.92	574.87	761.36	981.68	1238.05	1532.63
9.00%	31.60	68.05	123.38	200.63	302.64	432.09	591.53	783.43	1010.14	1273.94	1577.06
9.50%	32.46	69.91	126.76	206.13	310.93	443.93	607.74	804.90	1037.82	1308.85	1620.28
10.00%	33.31	71.73	130.06	211.49	319.01	455.46	623.53	825.81	1064.78	1342.85	1662.37
10.50%	34.13	73.50	133.27	216.71	326.89	466.71	638.93	846.20	1091.07	1376.02	1703.42
11.00%	34.93	75.23	136.40	221.81	334.58	477.69	653.97	866.11	1116.75	1408.40	1743.51
11.50%	35.72	76.92	139.47	226.79	342.10	488.43	668.66	885.58	1141.85	1440.05	1782.69
12.00%	36.49	78.58	142.47	231.67	349.46	498.93	683.05	904.63	1166.41	1471.02	1821.04
12.50%	37.24	80.20	145.41	236.45	356.67	509.22	697.13	923.28	1190.46	1501.36	1858.59
13.00%	37.98	81.79	148.29	241.13	363.73	519.31	710.94	941.57	1214.04	1531.09	1895.39
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Max water into end of pipe

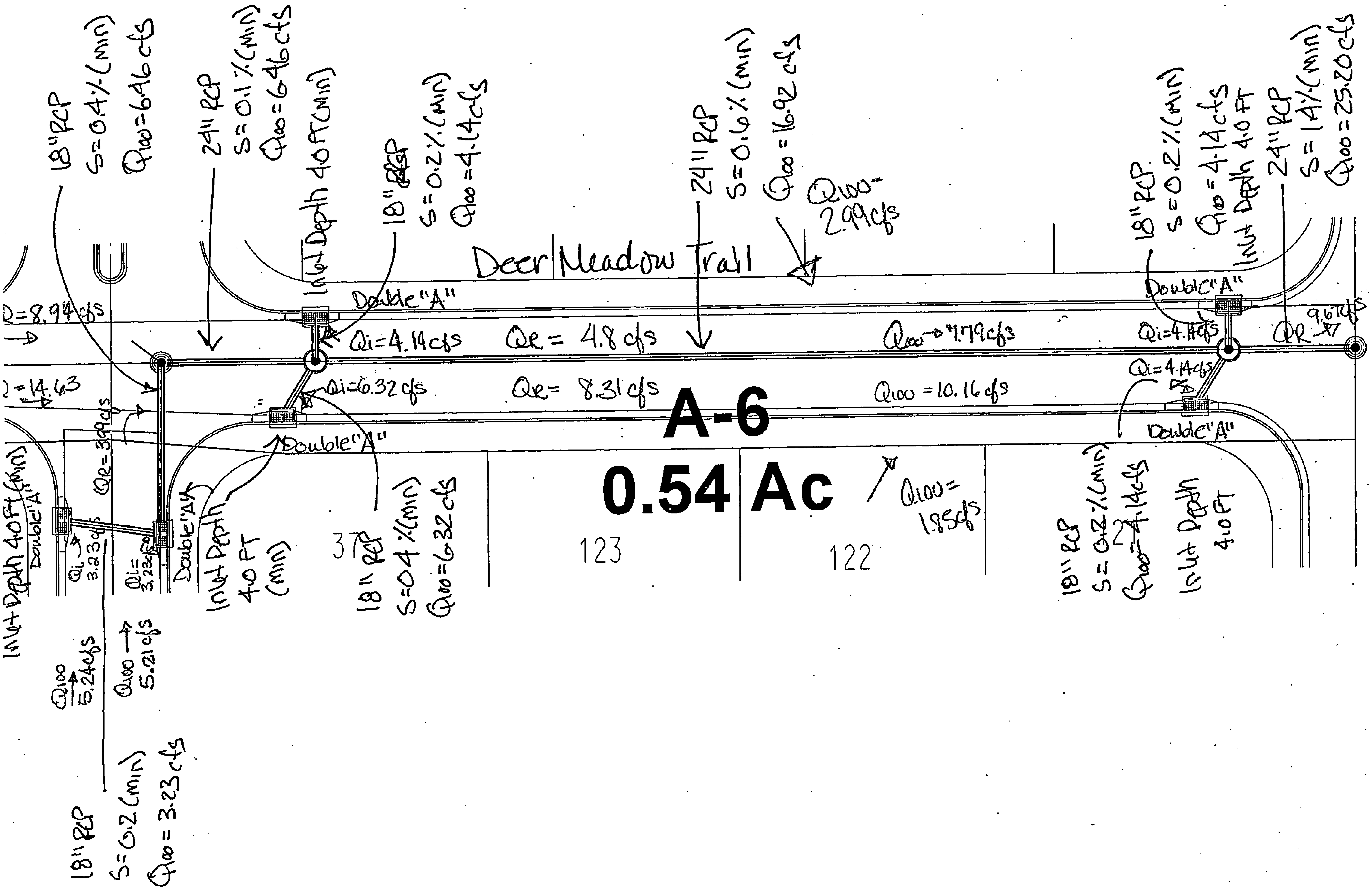
Using Orifice Equation, Coefficient = 0.62
(head measeured center of pipe to water surface)

Head	18	24	30	36	42	48	54	60	66	72	78
0.25											
0.5											
0.75	7.61										
1	8.79	15.63									
1.25	9.83	17.48	27.31								
1.5	10.77	19.14	29.91	43.07							
1.75	11.63	20.68	32.31	46.53	63.33						
2	12.43	22.11	34.54	49.74	67.70	88.42					
2.25	13.19	23.45	36.64	52.75	71.80	93.79	118.70				
2.5	13.90	24.71	38.62	55.61	75.69	98.86	125.12	154.47			
2.75	14.58	25.92	40.50	58.32	79.38	103.68	131.23	162.01	196.03		
3	15.23	27.07	42.30	60.92	82.91	108.29	137.06	169.21	204.74	243.66	
3.25	15.85	28.18	44.03	63.40	86.30	112.72	142.66	176.12	213.10	253.61	297.64
3.5	16.45	29.24	45.69	65.80	89.56	116.97	148.04	182.77	221.15	263.19	308.88
3.75	17.03	30.27	47.30	68.11	92.70	121.08	153.24	189.18	228.91	272.42	319.72
4	17.58	31.26	48.85	70.34	95.74	125.05	158.26	195.39	236.42	281.36	330.20
4.25	18.13	32.22	50.35	72.50	98.69	128.90	163.13	201.40	243.69	290.02	340.37
4.5	18.65	33.16	51.81	74.61	101.55	132.63	167.86	207.24	250.76	298.42	350.23
4.75	19.16	34.07	53.23	76.65	104.33	136.27	172.46	212.92	257.63	306.60	359.83
5	19.66	34.95	54.61	78.64	107.04	139.81	176.94	218.45	264.32	314.57	369.18
5.25	20.15	35.82	55.96	80.58	109.68	143.26	181.31	223.84	270.85	322.34	378.30
5.5	20.62	36.66	57.28	82.48	112.26	146.63	185.58	229.11	277.22	329.92	387.20
5.75	21.08	37.48	58.57	84.33	114.79	149.93	189.75	234.26	283.46	337.34	395.90
6	21.54	38.29	59.82	86.15	117.26	153.15	193.83	239.30	289.55	344.59	404.42
6.25	21.98	39.08	61.06	87.92	119.67	156.31	197.83	244.23	295.52	351.70	412.75
6.5	22.42	39.85	62.27	89.67	122.04	159.41	201.75	249.07	301.38	358.66	420.93
6.75	22.84	40.61	63.45	91.37	124.37	162.44	205.59	253.82	307.12	365.49	428.95
7	23.26	41.36	64.62	93.05	126.65	165.42	209.36	258.47	312.75	372.20	436.82
7.25	23.67	42.09	65.76	94.70	128.89	168.35	213.07	263.05	318.29	378.79	444.55
7.5	24.08	42.81	66.89	96.32	131.10	171.23	216.71	267.54	323.73	385.26	452.15
7.75	24.48	43.51	67.99	97.91	133.26	174.06	220.29	271.97	329.08	391.63	459.62
8	24.87	44.21	69.08	99.47	135.40	176.84	223.82	276.32	334.35	397.90	466.98
8.25	25.25	44.90	70.15	101.02	137.50	179.59	227.29	280.60	339.53	404.07	474.22
8.5	25.63	45.57	71.21	102.54	139.56	182.29	230.71	284.82	344.64	410.15	481.35
8.75	26.01	46.24	72.25	104.03	141.60	184.95	234.07	288.98	349.67	416.13	488.38

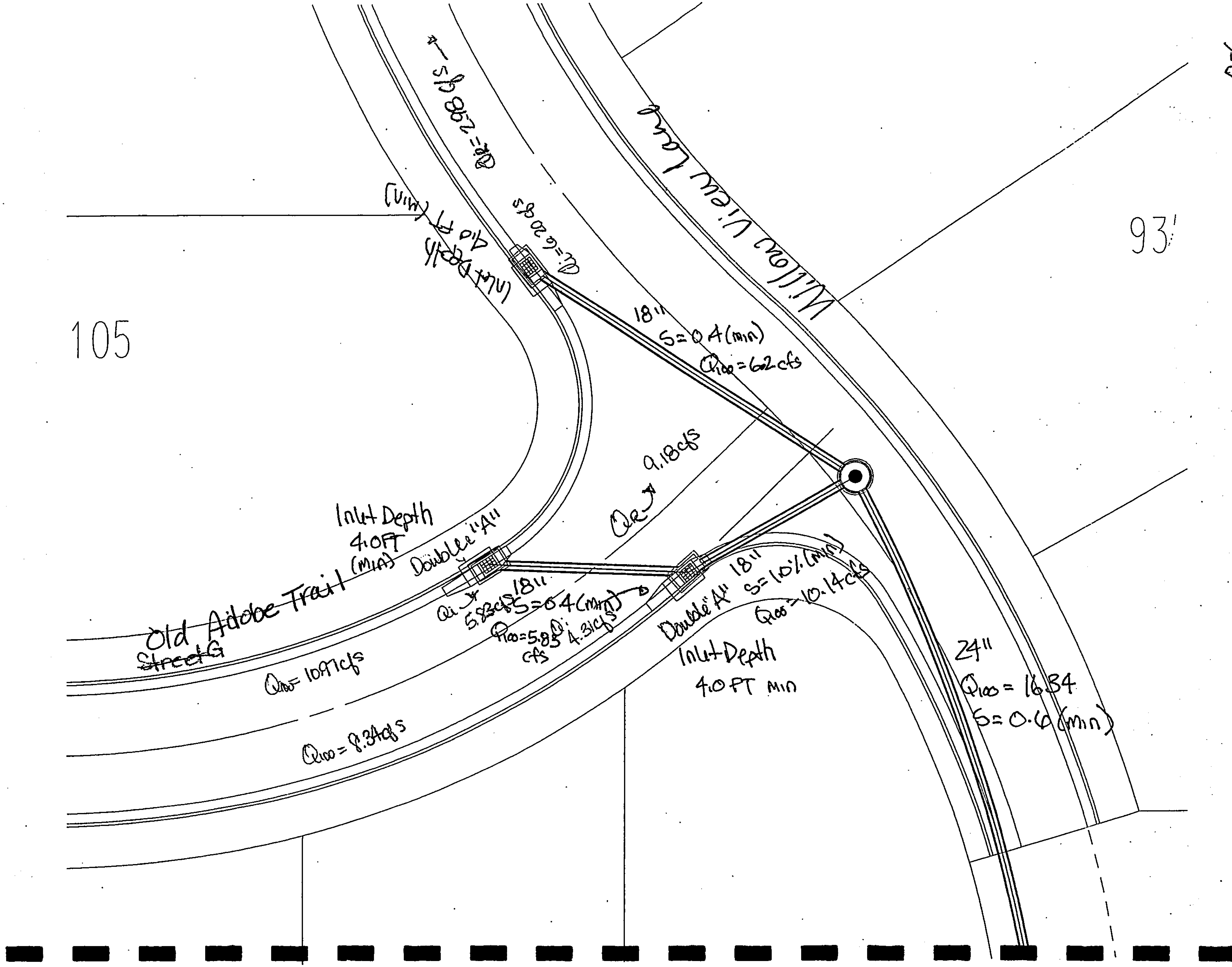
9	26.38	46.89	73.27	105.51	143.61	187.57	237.40	293.08	354.63	422.04	495.31
9.25	26.74	47.54	74.28	106.96	145.59	190.16	240.67	297.12	359.52	427.86	502.14
9.5	27.10	48.18	75.28	108.40	147.54	192.71	243.90	301.11	364.34	433.60	508.88
9.75	27.45	48.81	76.26	109.82	149.47	195.23	247.09	305.05	369.11	439.27	515.53
10	27.80	49.43	77.23	111.22	151.38	197.72	250.24	308.93	373.81	444.86	522.10
10.25	28.15	50.04	78.19	112.60	153.26	200.17	253.35	312.77	378.45	450.39	528.58
10.5	28.49	50.65	79.14	113.96	155.12	202.60	256.42	316.56	383.04	455.85	534.99
10.75	28.83	51.25	80.08	115.31	156.95	205.00	259.45	320.31	387.57	461.25	541.32
11	29.16	51.84	81.00	116.64	158.77	207.37	262.45	324.01	392.06	466.58	547.58
11.25	29.49	52.43	81.92	117.96	160.56	209.71	265.42	327.67	396.49	471.85	553.77



Deer Meadow Trail
~~Street H~~
Willow View Lane
18" RCP S=0.2%(MIN) Q100=4.14cfs
Inlet Depth 4.0 FT
24" RCP S=1.4%(MIN) Q100=25.20 cfs
Sump Inlet Depth
Q100=149.05
MH
TO MANSTE
36" RCP S=1.6%(MIN) Q2x100=83.84cfs Q100=59.25cfs
24" RCP S=2.5%(MIN) Q100=34.46cfs
QR=9.67
24" RCP S=0.6%(MIN) Q100=16.92cfs
18" RCP S=0.6%(MIN) Q100=9.46cfs
Inlet Depth 4.0 FT
~~Street D~~
Inlet Depth 4.0 FT
18" RCP S=0.2%(MIN) Q100=4.14cfs
18" RCP S=0.3%(MIN) QR=14.92 Q100=4.73cfs
Inlet Depth 4.0 FT
Qi=4.73
Qi=4.73
12.19cfs
Q100 12.19cfs
121
D-4



Deer Meadow Trail
A-6
0.54 Ac
18" RCP
S=0.4% (MIN)
Q100=6.46 cfs
24" RCP
S=0.1% (MIN)
Q100=6.46 cfs
Inlet Depth 4.0 FT (MIN)
18" RCP
S=0.2% (MIN)
Q100=4.14 cfs
24" RCP
S=0.6% (MIN)
Q100=16.92 cfs
Q100=2.99 cfs
18" RCP
S=0.2% (MIN)
Q100=4.14 cfs
Inlet Depth 4.0 FT
24" RCP
S=1.4% (MIN)
Q100=25.20 cfs
Double "A"
Qi=4.14 cfs
QR = 4.8 cfs
Q100=7.79 cfs
Qi=4.14 cfs
QR 9.67 cfs
Qi=6.32 cfs
QR= 8.31 cfs
Q100 =10.16 cfs
Qi=4.14 cfs
Double "A"
Double "A"
Q100= 1.85 cfs
18" RCP
S=0.4% (MIN)
Q100=6.32 cfs
Inlet Depth 4.0 FT (MIN)
Double "A"
18" RCP
S=0.2% (MIN)
Q100=4.14 cfs
Inlet Depth 4.0 FT
Inlet Depth 4.0 FT (MIN)
Double "A"
Qi 3.23 cfs
Qi= 3.23 cfs
QR=3.39 cfs
Q100 5.24 cfs
Q100 5.21 cfs
18" RCP
S=0.2 (MIN)
Q100 = 3.23 cfs
R=8.94 cfs
Q=14.63
123
122


D-9
105
93'
Willow View Lane
Q_{bp} = 2.98 cfs
Q_i = 6.20 cfs
Inlet Depth 4.0 ft (min)
18"
S = 0.4 (min)
Q_{100} = 6.2 cfs
Q_c 9.18 cfs
Inlet Depth 4.0 FT (MIN)
Double "A"
Old Adobe Trail
~~Street G~~
Q_i 5.83 cfs
18"
S = 0.4 (min)
Q_{100} = 5.83 cfs
Q_i 4.31 cfs
Double "A"
18"
S = 1.0% (min)
Q_{100} = 10.14 cfs
Inlet Depth 4.0 FT Min
24"
Q_{100} = 16.34
S = 0.6 (min)
Q_{100} = 10.97 cfs
Q_{100} = 8.34 cfs

40
39
Oxbow North Trail
Atherton Way
Q_{100} = 13.16 cfs
Q_{100} = 5.26 cfs
Q_i = 6.8 cfs
Q_i = 37 cfs
Inlet Depth = 40 FT
18"
S = 0.5% (min)
Q_{100} = 6.8 cfs
18"
S = 1.5% (min)
Q_{100} = 10.5 cfs
24" S = 2.0% (min)
Q_{100} = 10.5 cfs
18"
S = 3.0% (min)
36"
S = 1.0% (min)
Inlet depth 4.0 FT
30"
S = 2.0% (min)
Q_{100} = 18.29 cfs
$Q_{2\times100}$ = 56.48 cfs
Q_{100} = 28.24 cfs
Inlet depth 5.5 FT
26
27
28
29

D-7

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ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

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D-8/8