PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376
314/397-1211 FAX 314/397-1104

LETTER OF TRANSMITTAL

DATE 01/24/95 | JOB NO. 89-204

ATTENTION MR. JIM KUNZA

RE TURTLE CREEK
(GLEN EAGLE)

TO CITY OF O'FALLON
138 SOUTH MAIN
O'FALLON, MISSOURI 63366

GENTLEMEN:

WE ARE SENDING YOU [X] Attached [X] Prints [ ] Plans [ ] Specifications [ ] Copy of letter

[X] DELIVERED

COPIES	DATE	NO.	DESCRIPTION
1			"LAKE 13" DETENTION CALCULATIONS

APPROVED
Jim Kunza
3-95

THESE ARE TRANSMITTED as checked below:

[X] For your use [ ] For approval [ ] For review and comment

[X] As requested [ ] Revised as requested [ ] FOR BIDS DUE _____ 19____

[ ] _____

REMARKS

COPY TO ED SCHULTZ W/COPY

SIGNED: Tanya Dietz
TANYA DIETZ

Turtle Creek 89204
1.24.95
Lake 13 - Calculations
(Information by others)
(Provided by Ed Schultz)

HYDROGRAPH REPORT

RECORD NUMBER : 1
TYPE : MOD. RATIONAL
DESCRIPTION : 25 YEAR 30 MIN INFLOW "13"

[HYDROGRAPH INFORMATION]

Peak Discharge	=	165.87 (cfs)
Volume	=	6.86 (acft)
Time Interval	=	5 (min)
Time to Peak	=	30.00 (min)
Time of Base	=	60.00 (min)
Multiplication factor	=	1.00

[RATIONAL HYDROGRAPH INFORMATION]

Runoff Coeficient	=	0.00000 (cfs)
Receding limb factor	=	1.00000

[BASIN DESCRIPTION]

Watershed Area	=	54.86 (ac)
Curve Number	=	0
Runoff coefficient	=	0.75

[TIME CONCENTRATION -- USER DEFINED]

Time of Concentration	=	30.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	SYNTHETIC
Total Precipitation	=	2.02 (in)
Return Period	=	25 (yr)
Storm Duration	=	0.50 (hr)

HYDROGRAPH REPORT

RECORD NUMBER : 2
TYPE : RESER STOR. IND
DESCRIPTION : 25 YEAR 30 MIN OUTFLOW

[HYDROGRAPH INFORMATION]

Peak Discharge	=	16.75 (cfs)
Volume	=	6.28 (acft)
Time Interval	=	5 (min)
Time to Peak	=	55.00 (min)
Time of Base	=	1240.00 (min)
Peak Elevation	=	583.88 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #..... = 1
Description..... = LAKE "13"
Storage type..... = MAN STAGE/AREA
Max storage..... = 272626.00 sqft
Discharge type..... = COMP STAGE/DISC
Max discharge..... = 17.02 cfs

[RESERVOIR INFORMATION]

Reservoir #..... = 1
Reservoir Description..... = LAKE "13"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #..... = 1
Hydrograph Description..... = 25 YEAR 30 MIN INFLOW "13"

RESERVOIR REPORT

RECORD NUMBER : 1
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : LAKE "13"

[RATING CURVE LIMIT]

Minimum Elevation..... = 578.00 (ft)
Maximum Elevation..... = 584.00 (ft)
Elevation Increment..... = 1.00 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
579.90	0.01
580.00	50568.80
582.00	60760.10
584.00	75252.60

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 1
TYPE : STAND PIPE WEIR
DESCRIPTION : LAKE "13"

OUTLET STRUCTURE REPORT

RECORD NUMBER : 1
TYPE : STAND PIPE WEIR
DESCRIPTION : LAKE "13"

[RATING CURVE LIMIT]

Minimum Elevation	=	578.00 (ft)
Maximum Elevation	=	584.00 (ft)
Elevation Increment	=	0.50 (ft)

[STANDPIPE INFORMATION]

DESCRIPTION : 18" STANDPIPE LAKE "13"

[OUTLET STRUCTURE INFORMATION]

Radius	=	0.75 (ft)
Crest Length	=	4.71 (ft)
Crest Elevation	=	580.00 (ft)
Fraction Open Area	=	1.00000

[RECTANGULAR STAND PIPE EQUATION]

ORIFICE EQ: Q = Co*A(2gh)^0.5
WEIR EQ: Q = Cw*L*H^exp

Coefficient Co	=	0.60000
Coefficient Cw	=	3.00000
Exponential	=	1.50000

[DEFINITIONS]

H = Headwater depth above inlet control section invert, (ft)
A = Wetted area, (sqft)
L = Crest length, (ft)

[CULVERT INFORMATION]

DESCRIPTION : LAKE "13"

[OUTLET STRUCTURE INFORMATION]

Circular Radius	=	1.00 (ft)
Culvert Invert Elevation	=	578.00 (ft)
Slope	=	0.01000
Manning's N-value	=	0.01300
Orifice Coefficient	=	0.60000
Tailwater	=	577.10 (ft)
Number barrels	=	1

OUTLET STRUCTURE REPORT

RECORD NUMBER : 1
TYPE : STAND PIPE WEIR
DESCRIPTION : LAKE "13"

[UNSUBMERGED EQUATION]

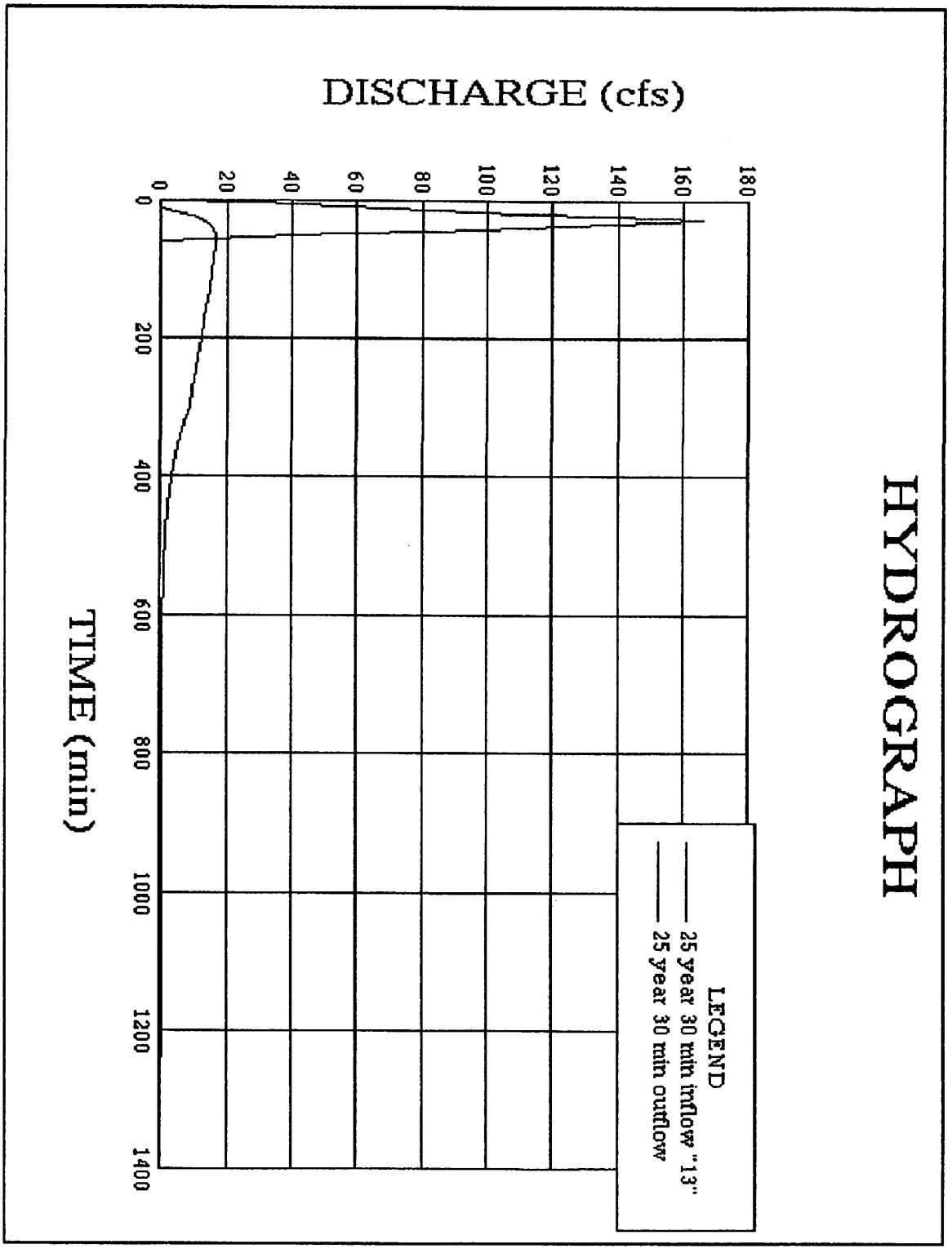
H/Diam = Hc/Diam + K *(Q/A*Diam^0.5))^M - 0.5*S^2
Coefficient K..... = 0.04500
coefficient M..... = 2.00000

[SUBMERGED EQUATION]

H/Diam = c*(Q/(A*Diam^0.5))^Z + Y - 0.5*S^2
Coefficient c..... = 0.03170
Coefficient Y..... = 0.69000

[DEFINITIONS]

H = Headwater depth above inlet control section invert, (ft)
Diam = Inerior height of culvert barrel, (ft)
Hc = Specific head at critical depth (dc + Vc^2/2g), (ft)
Q = Discharge, (cuft/s)
A = Full cross sectional area of culvert barrel, (sqft)
S = Culvert barrel slope, (ft/ft)


HYDROGRAPH
DISCHARGE (cfs)
0
20
40
60
80
100
120
140
160
180
TIME (min)
0
200
400
600
800
1000
1200
1400
LEGEND
25 year 30 min inflow "13"
25 year 30 min outflow

FILE

RECEIVED
NOV 18 1994
ENGINEERING DEPT

GEORGE BUTLER ASSOCIATES, INC
Engineers • Architects
Suite 200, 225 South Main Street
O'Fallon, Missouri 63366-2892
Telephone (314) 240-2444
FAX (314) 978-2901

November 16, 1994

Mr. Benny Hedden, P.E.
City Engineer
City of O'Fallon
138 South Main Street
O'Fallon, Missouri 63366

Re: Plan Review
Glen Eagle Subdivision: Detention Calculations (11/15/91)
Plans Revised (7/16/92)

Dear Benny:

Please find the enclosed review comments for the above referenced project as requested.

If you have any questions, please call me.

FAXED TO TONYA
12-12-94

Very truly yours,

GEORGE BUTLER ASSOCIATES, INC.

John J. Choinka, P.E.

JJC:ml

Enclosure

cc: Jerry Hurlbert

1969 1994 25th ANNIVERSARY

Other Offices: Oklahoma City, Oklahoma
Kansas City, Missouri
Springfield, Missouri
Lenexa, Kansas

25

PLAN REVIEW
CITY OF O'FALLON, MISSOURI

GLEN EAGLE SUBDIVISION
DETENTION CALCULATIONS

LAKE 5

1. Off-site drainage area map of the construction plans does not match the off-site drainage areas shown in the detention report.

2. The proposed 66" standpipe will act as a wier under low head; however, at heads of 2'-3' and greater the standpipe will act as an orifice.

3. The "C" values used in the wier equation should be close to 2.65 (depending on the head provided.)

4. 15 year storm routing has not been provided.

5. Sediment storage calculations have not been provided.

6. The detention report calls for a 66" diameter standpipe; however, the plans indicate a 7' x 7' concrete structure is to be used.

7. Provide buoyancy calculations for the outfall structure.

8. Provide calculations indicating that headwater inside the outfall structure has been checked or accounted for.

LAKE 8

1. Sediment storage calculations have not been provided.

2. 15 year storm routing has not been provided.

3. Provide a concrete spillway in lieu of a grass swale.

4. Calculations are for a 52' wide spillway; however, revisions indicate a 46.15' wide spillway is proposed.

5. A "C" coefficient of approximately 2.6 should be used for this length of wier (depending on the water depth).

6. Extend spillway on plans to three feet below the water elevation as shown on the detail.

7. Does not appear the calculations account for the 3:1 side slopes on the wier.

LAKE 13

1. Off-site drainage area map of the construction plans does not match the off-site drainage areas shown in the detention report.

2. Sediment storage calculations have not been provided.

3. 15 year storm routing has not been provided.

LAKE 14

1. A 10' wide spillway is shown on the plans and used in the calculations; however, the revisions call for a 8.26' wide spillway to be constructed.

2. The calculations do not appear to account for the 3:1 side slopes shown on the proposed wier.

3. Sediment storage calculations have not been provided.

4. 15 year storm routing has not been provided.

LAKE 17

1. Basin calculations/locations will not conform to current subdivision design.

2. Off-site drainage area map of the construction plans does not match the off-site drainage areas shown in the detention report.

3. Sediment storage calculations have not been provided.

4. 15 year storm routing has not been provided.

PICKETT, RAY & SILVER, INC.
333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376

314/441-1211 314/278-1211

LETTER OF TRANSMITTAL

DATE	JOB NO.
11/22/91	89-204

ATTENTION Mr. Frank Godwin

RE Glen Eagle Golf Course

TO City of O'Fallon
138 South Main Street
O'Fallon, Missouri 63366

RECEIVED
NOV 25 1991
BUILDING DEPT.

GENTLEMEN:

WE ARE SENDING YOU ☐ Attached ☐ Prints ☐ Plans ☐ Specifications ☐ Copy of letter

☐ _____

COPIES	DATE	NO.	DESCRIPTION
1		6	Lake Design Plans
1			Lake Design Calculations
1		2	Hydraulic Data
1		5	Culvert Design @ Sta. 20+11.50
1		2	Lake #5 O.S. Information

THESE ARE TRANSMITTED as checked below:

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☐ As requested ☐ Revised as requested ☐ FOR BIDS DUE _____ 19___

☐ _____

REMARKS

COPY TO Howard Chilcutt/The Jones Co.
John Allen/Vatterott

SIGNED: Tanya Dietz
Tanya Dietz

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MO. 63376
(314) 441-1211
(314) 278-1211

Civil Engineers
Planners
Land Surveyors

PROJECT	JOB NO.
GLEN EAGLE	89-204

Communication:

DATE	06/02/94	PAGE	1	OF	
PREPARED BY	T. Dietz	MEETING NO.			

MEETING		TELEPHONE		MEMO	X

ENCLOSURES	

Note: Recipients are requested to review all items and inform PR&S of any discrepancies.

	Organization	Individuals and Copies
In Attendance	City of O'Fallon	Frank Godwin
Fm	Tanya Dietz	

Additional Distribution

Item No.	Topic / Description	Action By
1.	"Headwater Depth for Concrete Pipe Culverts with Inlet Control"	
	1 FE S-8	
	HW 5.8 HW_{50} 7.3	
	℄ 589.03 ℄ 589.03	
	594.03 596.33	
	Top Berm = 600.2 vs 596.33 ok	
	2 FE S-18a	
	HW 4.3 HW_{50} 5.9	
	℄ 603.0 ℄ 603.0	
	607.3 608,9	
	(8/5/94 ~~td~~)	
	Top Berm = ~~609.8~~ 610.8 vs 608.9 ok (adjust berm)	
	3 FE S-33	
	HW 3.12 HW_{50} 3.78	
	℄ 604.00 ℄ 604.00	
	607.12 607.78	
	(8/5/94 ~~td~~)	
	Top Berm = ~~609.0~~ 609.8 vs 607.78 ok (adjust berm)	

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MO. 63376
(314) 441-1211
(314) 278-1211

Civil Engineers
Planners
Land Surveyors

PROJECT	JOB NO.
GLEN EAGLE	89-204

Communication:

DATE 06/02/94	PAGE 2 OF 2
PREPARED BY T. Dietz	MEETING NO.

MEETING		TELEPHONE		MEMO	X

ENCLOSURES	

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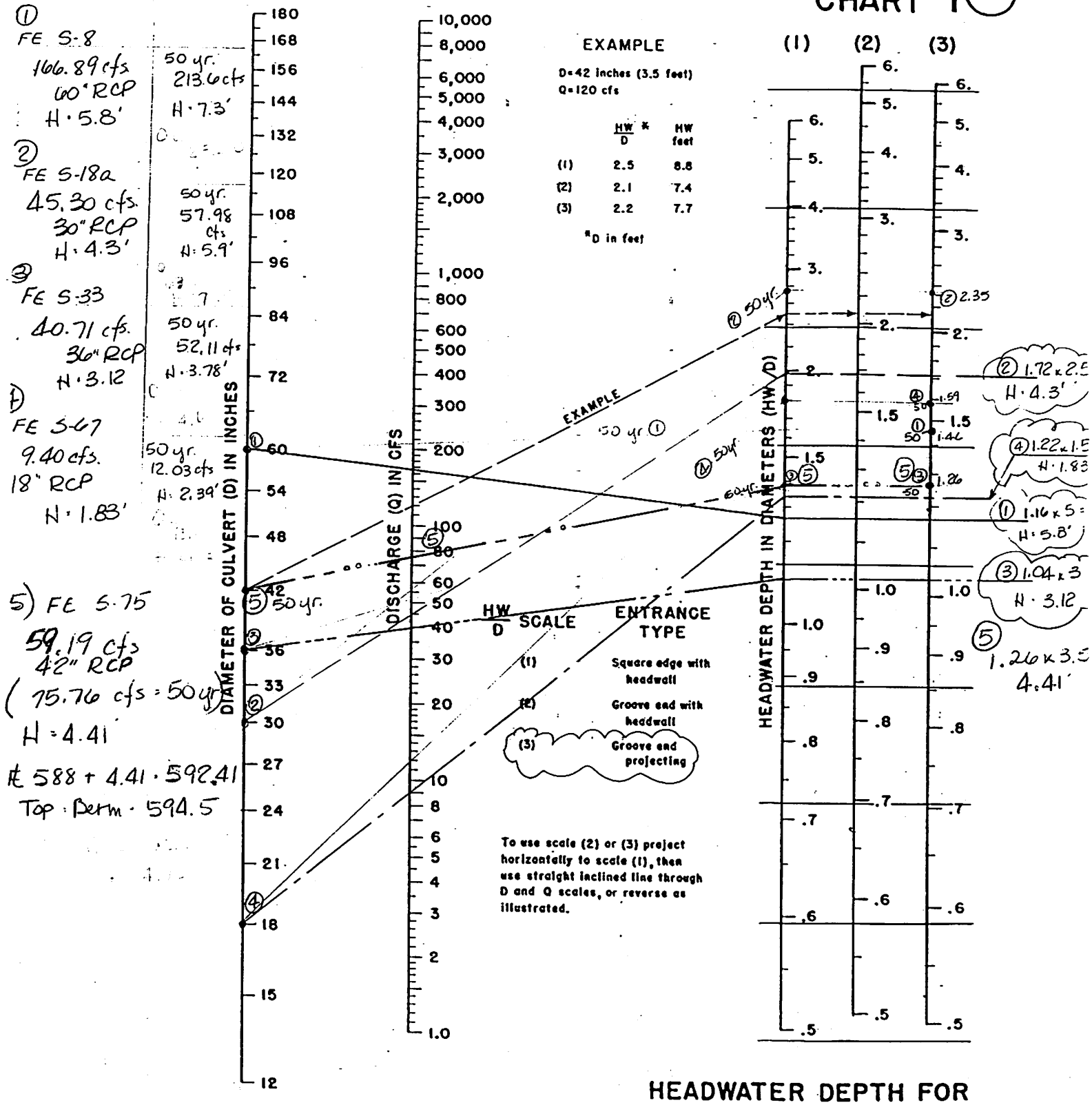
In Attendance	City of O'Fallon	Frank Godwin			
Fm	Tanya Dietz				

Additional Distribution

Item No.	Topic / Description	Action By
	4 FE S-67	
	HW 1.83 HW_{50} 2.39	
	℄ 592.00 ℄ 592.00	
	593.83 594.39	
	Top Berm = 598.0 vs 594.39 ok	
TdB	Rev. 8-2-94 TdB	
	FE S-75 HW 50 4.41	
	℄ 588.00	
	592.41	
	Top Berm = 594.5 vs 592.41	

CHART 1



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2&3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

GLEN EAGLE
89204

Rev. 8/2/94

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376
314/441-1211 314/278-1211
FAX 314/278-1104

LETTER OF TRANSMITTAL

DATE	JOB NO.
08/02/94	89-204

ATTENTION: MR. FRANK GODWIN

RE: GLEN EAGLE - SOUTH

TO
CITY OF O'FALLON
138 SOUTH MAIN
O'FALLON, MISSOURI 63366

GENTLEMEN:

WE ARE SENDING YOU [X] Attached [X] Prints [ ] Plans [ ] Specifications [ ] Copy of letter

[ ] _____

COPIES	DATE	NO.	DESCRIPTION
1		37	IMPROVEMENT PLANS
1		4	TRANSMITTAL 6/2/94 INLET CONTROL CALCULATIONS CHART
1		1	CHART 1 (78" PIPE)
1		1	OVERALL DAM
1		4	HYDRAULIC CALCULATIONS

THESE ARE TRANSMITTED as checked below:

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REMARKS

PER CITY COMMENTS
1. FIRE DISTRICT APPROVAL - FORTHCOMING
2. SANITARY SEWER - APPROVED
3. STREET CURVE DATA - SEE RECORD PLAT
4. STORM SEWERS - REVISED

4K - Per St Charles Co Hwy (They wrote program) there is no negative loss - the program will use 0 loss verse a negative ~~to~~

COPY TO MCKELVEY HOMES
MAYER HOMES
GLEN EAGLE ASSOCIATION

SIGNED: Tanya Dietz

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376
314/441-1211 314/278-1211
FAX 314/278-1104

DATE 08/02/94 JOB NO. 89-204

ATTENTION MR. FRANK GODWIN

RE GLEN EAGLE - SOUTH

TO CITY OF O'FALLON
138 SOUTH MAIN
O'FALLON, MISSOURI 63366

GENTLEMEN:

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[ ]

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2. SANITARY SEWER - APPROVED
3. STREET CURVE DATA - SEE RECORD PLAT
4. STORM SEWERS - REVISED

COPY TO GLEN EAGLE ASSOCIATION
MAYER HOMES
MCKELVEY HOMES

SIGNED

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376
314/441-1211 314/278-1211
FAX 314/278-1104

LETTER OF TRANSMITTAL

DATE	JOB NO.
06/02/94	89-204

ATTENTION FRANK

RE GLEN EAGLE

TO

CITY OF O'FALLON
138 SOUTH MAIN
O'FALLON, MISSOURI 63366

GENTLEMEN:

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[X] MAIL

COPIES	DATE	NO.	DESCRIPTION
1		3	CALCULATIONS FOR "INLET CONTROL"

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[ ] _____

REMARKS

(PREVIOUSLY FAXED)

COPY TO _____

SIGNED: Tanya

TANYA DIETZ

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MO. 63376
(314) 441-1211
(314) 278-1211

Civil Engineers
Planners
Land Surveyors

PROJECT	JOB NO.
GLEN EAGLE	89-204

Communication:

DATE 06/02/94	PAGE 2 OF 2
PREPARED BY T. Dietz	MEETING NO.

MEETING		TELEPHONE		MEMO	X

ENCLOSURES	

Note: Recipients are requested to review all items and inform PR&S of any discrepancies.

	Organization	Individuals and Copies				
In Attendance	City of O'Fallon	Frank Godwin				
Fm	Tanya Dietz					

Additional Distribution

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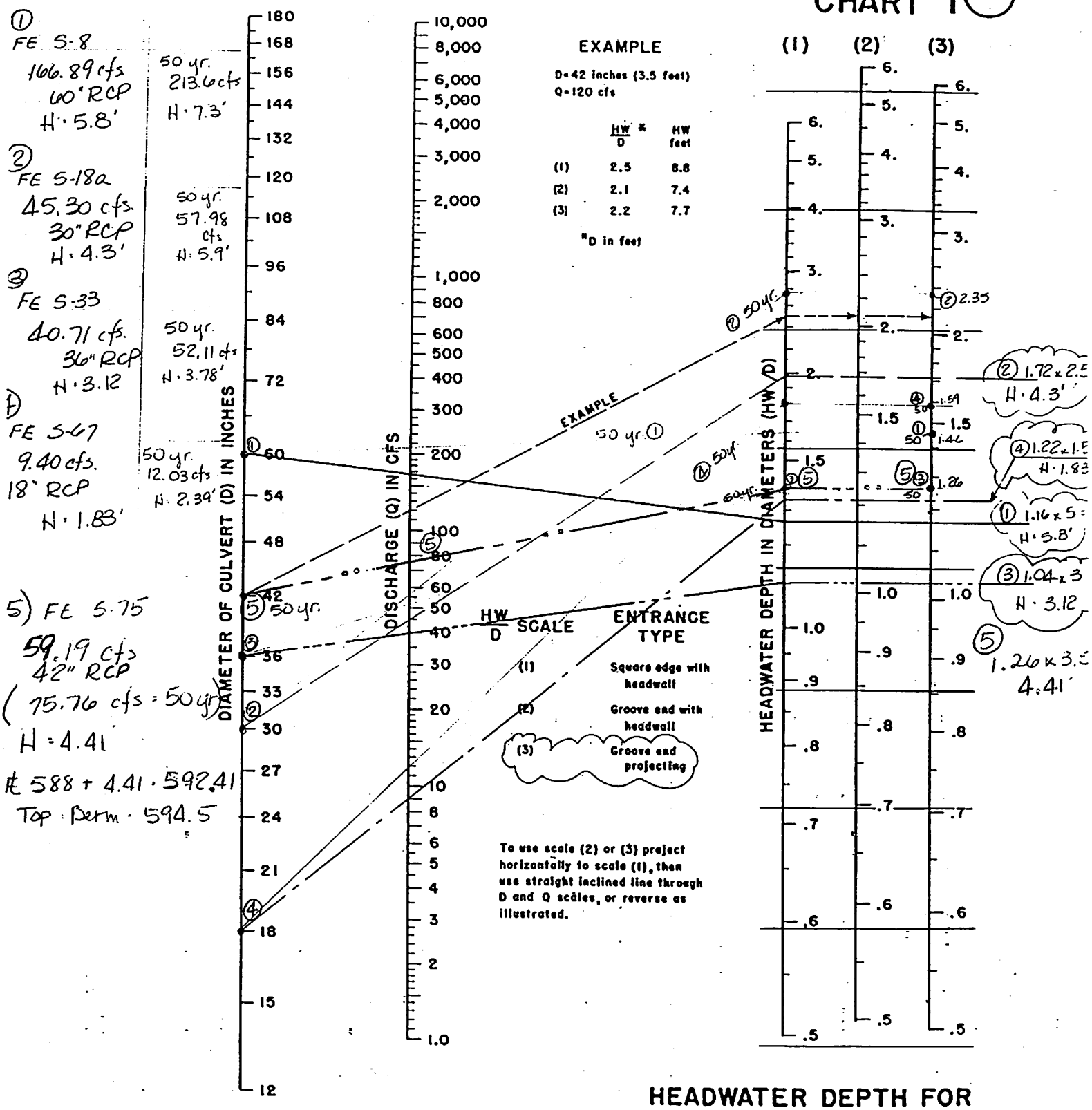
	℄ 592.00 ℄ 592.00	
	593.83 594.39	
	Top Berm = 598.0 vs 594.39 ok	
Tdj	Rev. 8-2-94 Tdj	
	FE S-75	
	HW 50 4.41	
	℄ 588.00	
	592.41	
	Top Berm = 594.5 vs 592.41 2' OK	

CHART 1



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

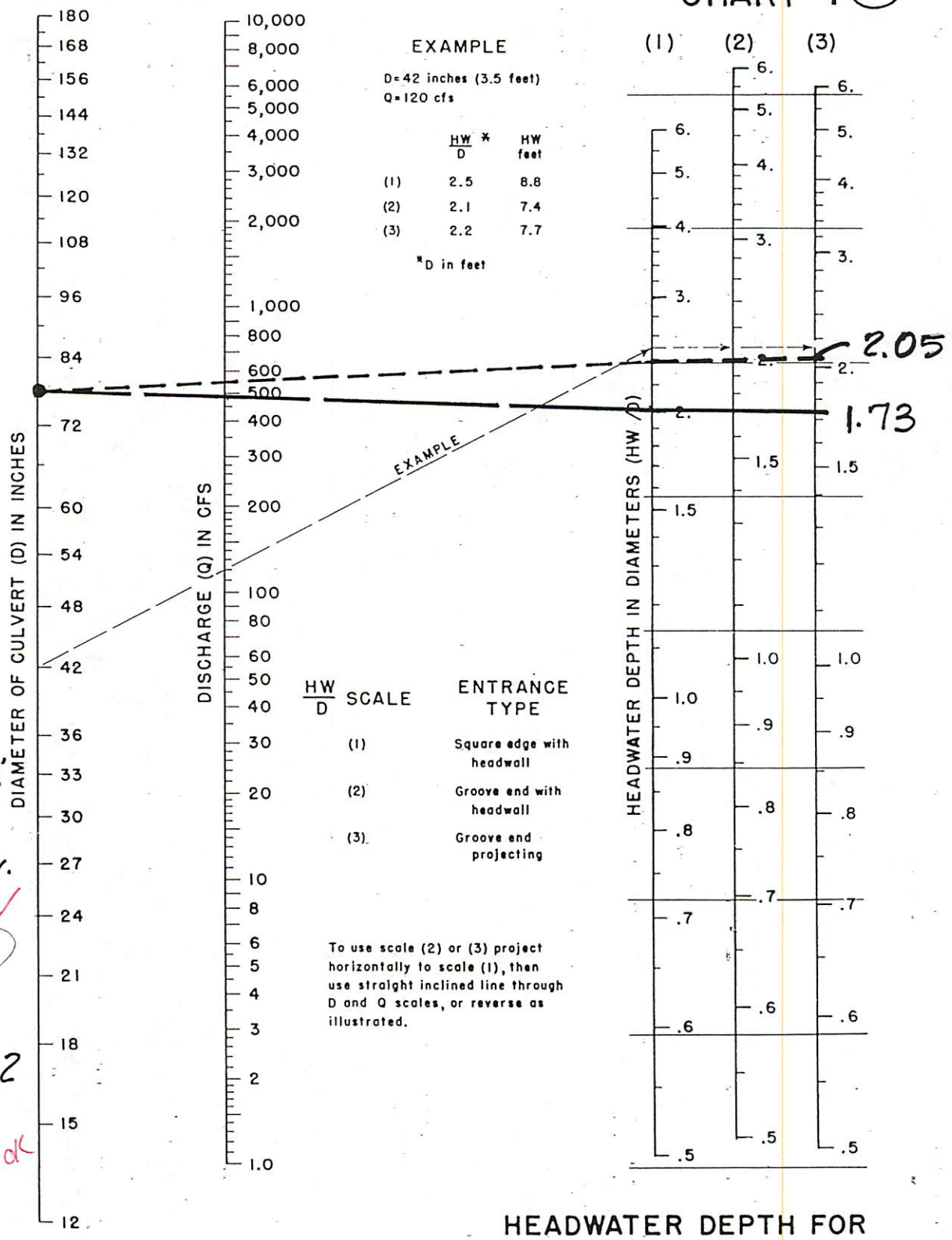
HEADWATER SCALES 2&3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

GLEN-EAGLE
89204

Rev. 8/2/94

CHART 1



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2&3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

181

Low in Road = 577.0

78" RCP @ 0.9%
160'
℄ 563.22
to
℄ 561.78

50yr. =
6.5 x 1.73 = 11.24'
563.22 + 11.24 =
574.46 ELEV.
VS
577.4 ✓
FB = 2.9'

100 yr. =
6.5 x 2.05 = 13.32
563.22 + 13.32 =
576.54
.9 FB ok

344.25 cfs
50 yr = x 1.10 x 1.28 = 484.70 cfs
100 yr = x 1.15 x 1.39 = 550.28 cfs.

(Street Elev 577.4)

89204.

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MO. 63376
(314) 441-1211
(314) 278-1211

Civil Engineers
Planners
Land Surveyors

Communication:

MEETING		TELEPHONE		MEMO	X

ENCLOSURES	

PROJECT	JOB NO.
GLEN EAGLE	89-204

DATE 06/02/94	PAGE 1 OF

PREPARED BY T. Dietz	MEETING NO.

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Fm	Tanya Dietz	

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	594.03 596.33	
	Top Berm = 600.2 vs 596.33 ok ✓	
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	HW 3.12 HW_{50} 3.78	
	℄ 604.00 ℄ 604.00	
	607.12 607.78	
	Top Berm = 609.0 vs 607.78 ok	

FILE

CITY OF O'FALLON
State of Missouri

May 6, 1992

Ms. Tanya Dietz
Pickett, Ray & Silver
333 Mid Rivers Mall Dr
St. Peters, Mo. 63376

RE: Glen Eagle Municipal Golf Course - Construction Site Plans

Dear Ms. Dietz

The plans for the project referenced above have been reviewed. Plans are approved as noted. Approval is contingent upon required easements being recorded. Construction authorization is issued on the condition that a copy of the on-site DNR permit is submitted to this office.

Once the State DNR permit has been received, sanitary sewer construction can begin. Please notify the City of O'Fallon at least 48 hours in advance of the start of construction to facilitate inspection scheduling. Also, please contact Jerry Schoenherr to set up a pre-construction meeting as soon as possible. Upon completion of the improvements and necessary tests, an engineer shall certify that construction took place according to plan with all changes noted. Please insure that the as-builts show accurately the sanitary service locations. One (1) set of reproducible as-builts should then be submitted along with three (3) copies. With this information, the City of O'Fallon can proceed to accept the public portion of these improvements.

Thank you for your cooperation in this matter. If you have any additional questions, please contact this office.

Sincerely yours

Frank Godwin

Frank Godwin
Technical Engineer/Inspector

FG/pl

Enc: Plans

cc. P. Nasi
T. Price
J. Hurlbert w/plans

15

138 SOUTH MAIN • O'FALLON, MISSOURI 63366 • (314) 272-6244 • FAX 281-4144

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376
314/441-1211 314/278-1211
FAX 314/278-1104

LETTER OF TRANSMITTAL

DATE	JOB NO.
08/06/92	89-204

ATTENTION MR. FRANK GODWIN

RE GLEN EAGLE

RECEIVED
AUG 6 - 1992
BUILDING DEPT.

TO CITY OF O'FALLON
138 SOUTH MAIN STREET
O'FALLON, MISSOURI 63366

GENTLEMEN:

WE ARE SENDING YOU [X] Attached [X] Prints [ ] Plans [ ] Specifications [ ] Copy of letter

[ ] _____

COPIES	DATE	NO.	DESCRIPTION
1		1	SECTION THRU PRIMARY SPILLWAY-LAKE 17
1		1	REVISED "PRINCIPLE SPILLWAY"

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[ ] As requested [X] Revised as requested [ ] FOR BIDS DUE _____ 19____

[ ] _____

REMARKS

12

VATTEROTT

COPY TO THE JONES COMPANY/HOWARD CHILICUTT

SIGNED: Tanya

TANYA DIETZ

19

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

441-1211
278-1211

333 Mid Rivers Mall Dr.
St. Peters, MO 63376

PROJECT NAME Gle Eagle
PROJECT #/JOB ORDER # 89.204
DATE 7.16.92
DESIGNER T. Dietz
PAGE 1

Lake #17

Revise "Principle Spillway":

$Q_{25} = 38.19$ cfs
C = 2.68
L = 11.0
D = 1.2

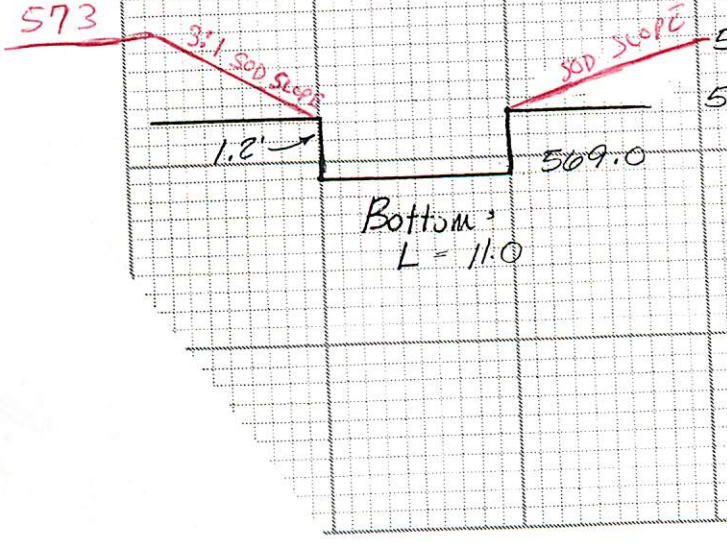
$Q = CLH^{3/2}$
$= 2.68(11.0)(1.2)^{3/2}$
$Q = 38.75$ cfs

$Q_{100} = 48.35$
C = 2.66
L = 11.0
D = 1.4

$Q = CLH^{3/2}$
$= 2.66(11)(1.4)^{3/2}$
$Q = 48.47$ cfs

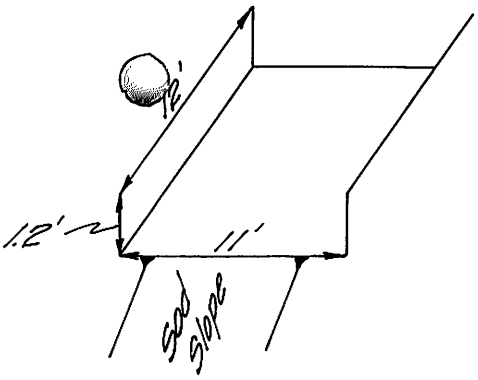
$V = \frac{Q}{A} = \frac{38.75}{13.2} = 2.93$ F.P.S. OK

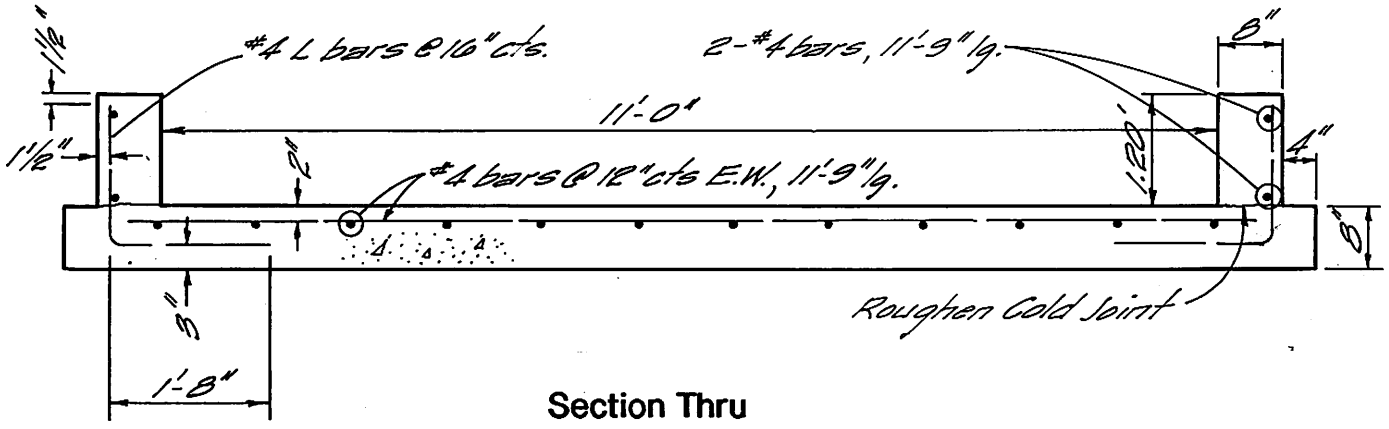
V =



570.4 = 100 yr. HW
570.2 = 25 yr. HW

GLEN EAGLE
89-204/24676





Section Thru
Primary Spillway Lake 17

PICKETT, RAY & SILVER, INC.
333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376

314/441-1211 **314/278-1211**

LETTER OF TRANSMITTAL

DATE	JOB NO.
1/24/92	89-204

ATTENTION MR. FRANK GODWIN

RE GLEN EAGLE

TO CITY OF O'FALLON
138 SOUTH MAIN
O'FALLON, MO 63366

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☒ Prints ☐ Plans ☐ Specifications ☐ Copy of letter

☐ _____

COPIES	DATE	NO.	DESCRIPTION
2		2	SHEETS 2 & 8 OF 13
2		2	HYDRAULIC DATA SHEETS

THESE ARE TRANSMITTED as checked below:

☒ For your use ☒ For approval ☐ For review and comment

☐ As requested ☒ Revised as requested ☐ FOR BIDS DUE _____ 19___

☐ _____

REMARKS

COPY TO VATTEROTT/JOHN ALLEN

SIGNED: Tanya J. Dietz
TANYA J. DIETZ

PROJECT: Glen Eagle
89-204

DESIGNER: J. Dietz

DATE: 10-15.91

HYDROLOGIC AND CHANNEL INFORMATION

Flood Plain Elev. = 542.5 ±

Flood Way = 544.0 ±

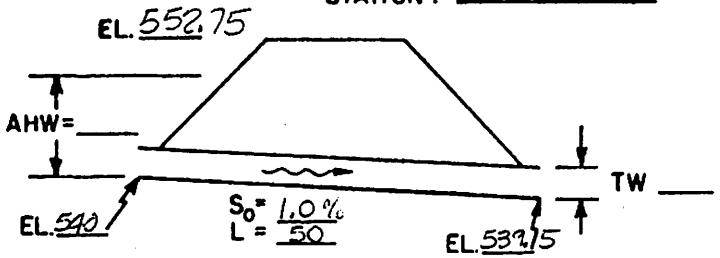
Q_1 = _____ TW_1 = _____

Q_2 = 3602 (100) TW_2 = _____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR (Q_{100}))

SKETCH

STATION: 20+11.50



MEAN STREAM VELOCITY = _____

MAX. STREAM VELOCITY = _____

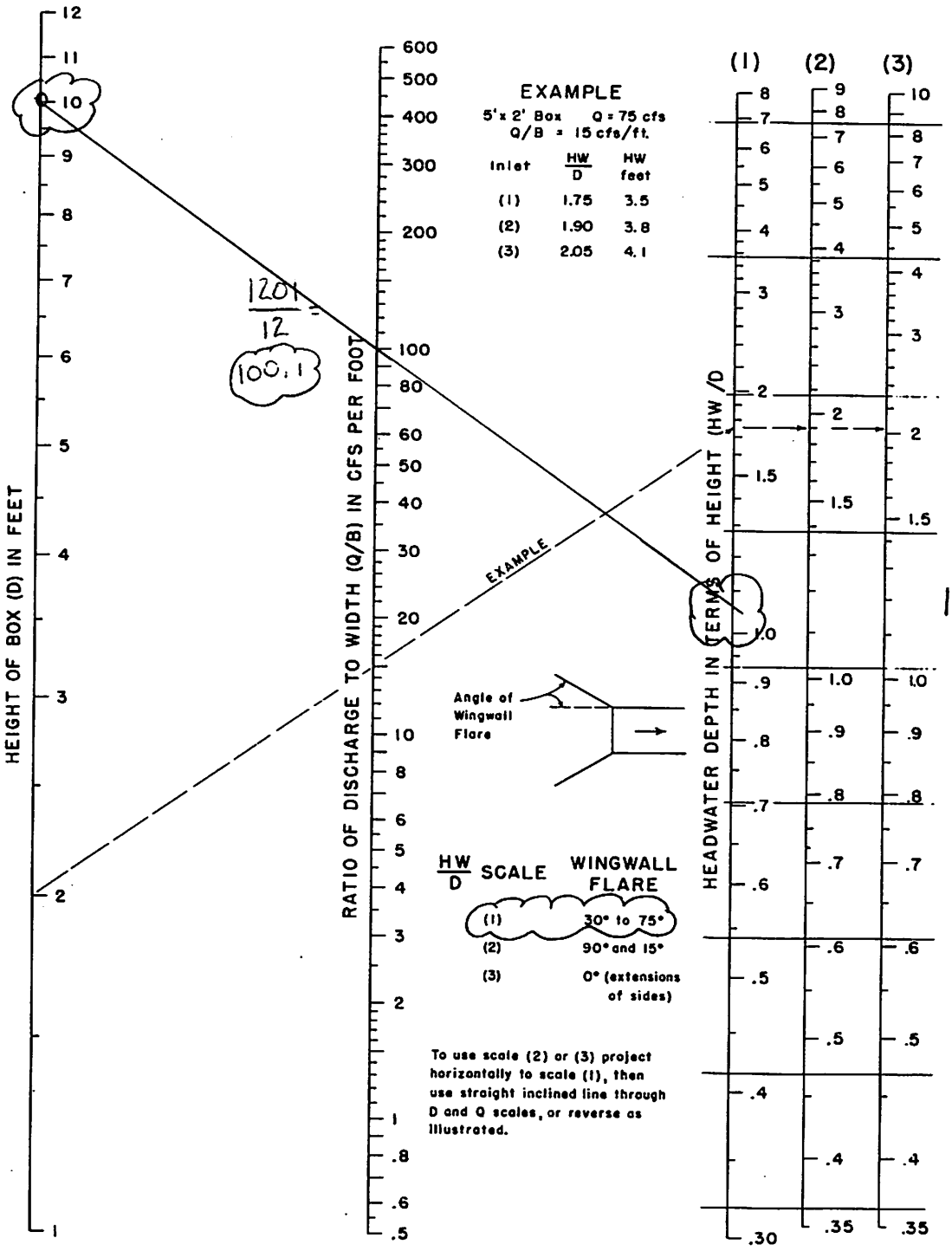
CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION										CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
			INLET CONT.		OUTLET CONTROL HW=H + h_o − LS_o											
			HW/D	HW	K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW				
1-45° Wing Walls (1302) Box Culvert 1201		3-12x10	1.05	10.5	0.4	2.4	6.8	8.4	5.0	8.4	.5	10.3	10.5			
			CHART #8	CHART #8		CHART #15	CHART #14		CHART #24							

SUMMARY & RECOMMENDATIONS:

$\frac{6.8+10}{2} = 8.4$

use > of $\frac{d_c+D}{2}$ & TW

CHART 8



1201 / 12 = 100.1

1.05' x 10' = 10.50'

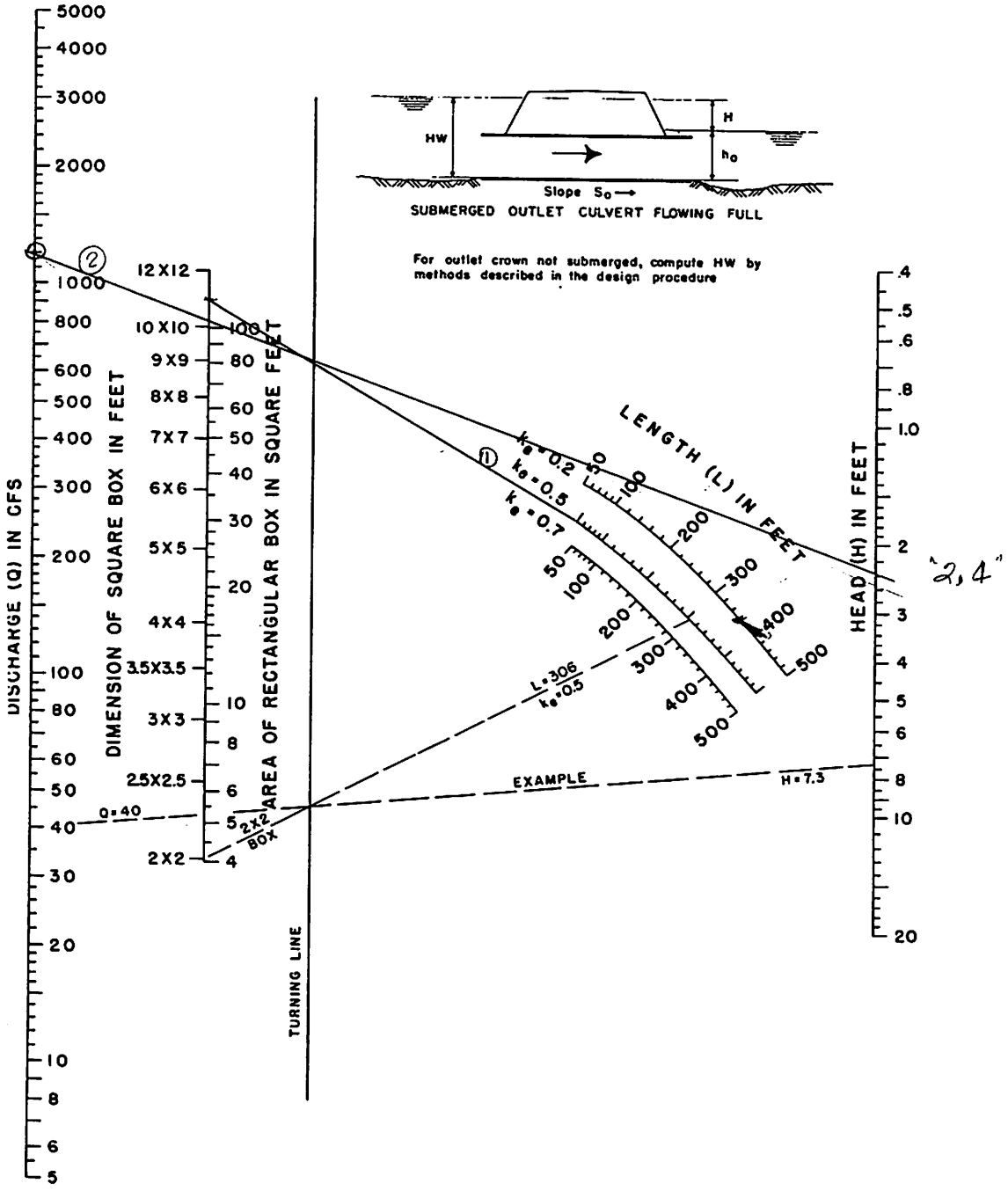
HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

* 3 - 12' W x 10' H Box.

Q_{12}: 3602 ÷ 3 = 1201 cfs / Box

CHART 15



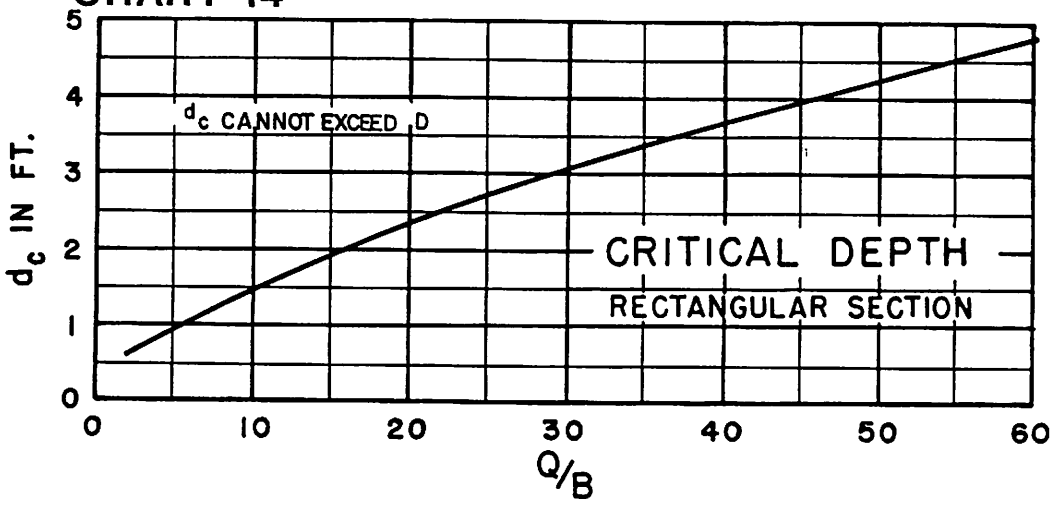
120 C.F.S.

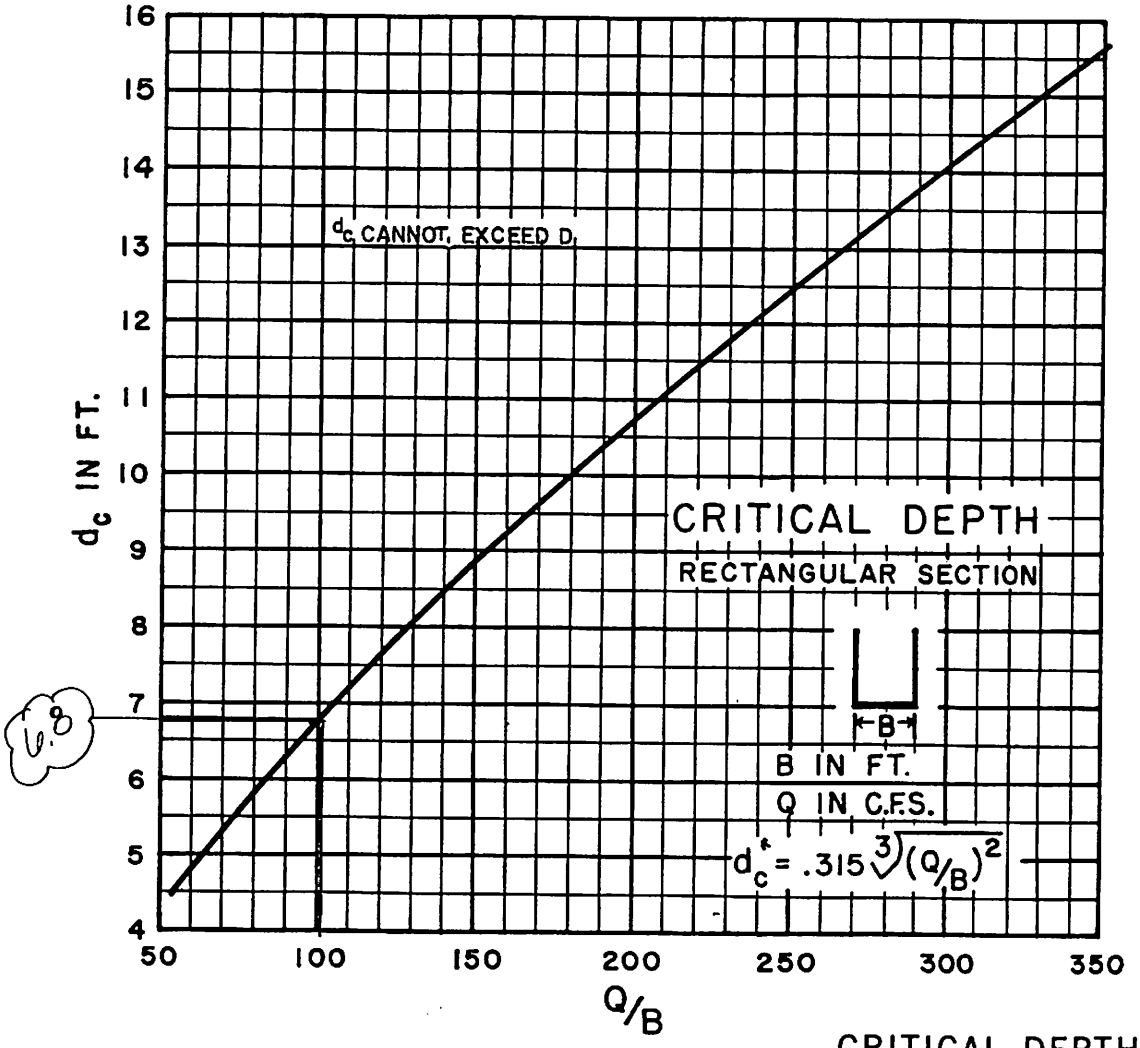
2.4'

HEAD FOR CONCRETE BOX CULVERTS FLOWING FULL n = 0.012

AU OF PUBLIC ROADS JAN. 1963

CHART 14





BUREAU OF PUBLIC ROADS JAN. 1963

CRITICAL DEPTH
RECTANGULAR SECTION

CHANNEL CHART
2:1 b = 12 FT.

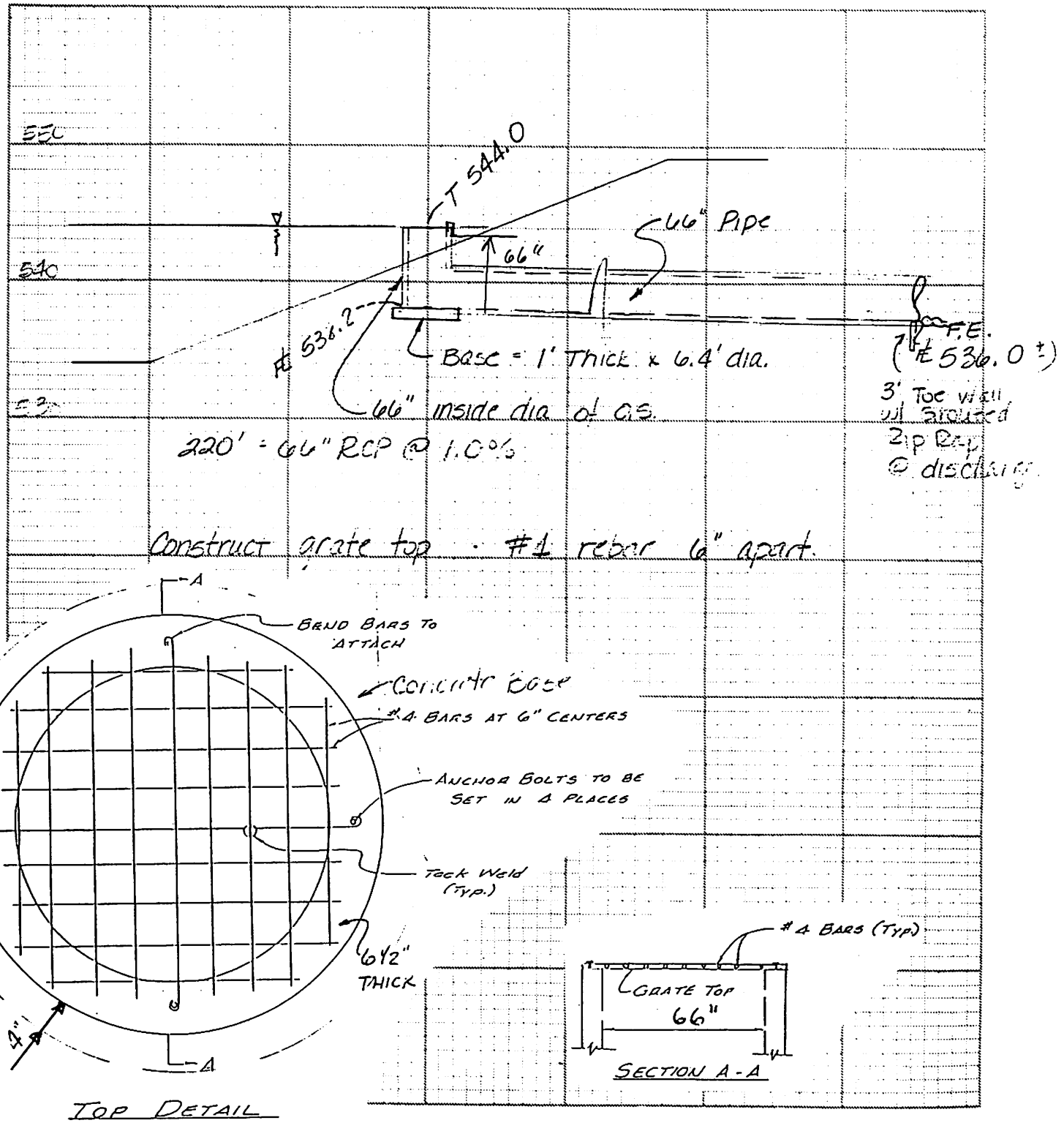
PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

333 Mid Rivers Mall Dr
St. Peters, MO 63376

441-1211
278-1211

PROJECT NAME #5 OUTFALL STRUCTURE
PROJECT #/JOB ORDER # 9934
DATE 11-15-99
DESIGNER T. Deitz
PAGE 1 of 2



Top Detail
Overflow Structure

PROJECT: _____

DESIGNER: I. Diehl

DATE: 1-20-92

HYDROLOGIC AND CHANNEL INFORMATION

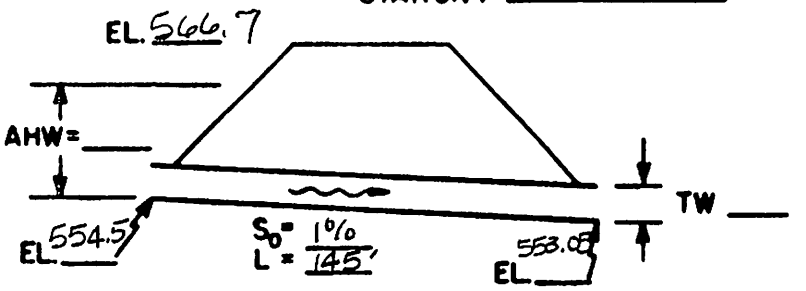
Q_1 = _____ TW_1 = _____

Q_2 (50) = 543.2 TW_2 = _____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH

STATION: 39+95 ±



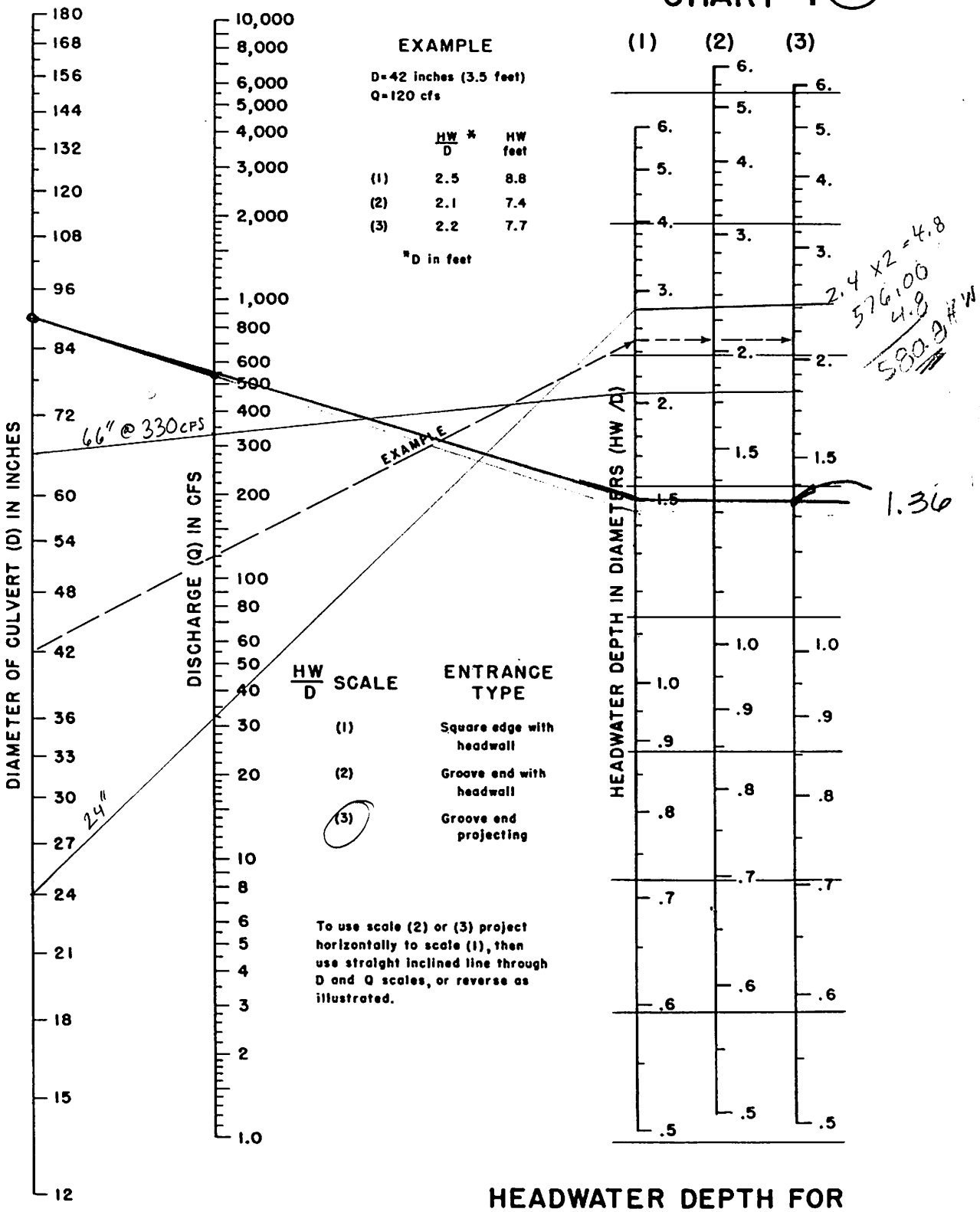
MEAN STREAM VELOCITY = _____

MAX. STREAM VELOCITY = _____

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION										CONTROLLING H.W.	OUTLET VELOCITY	COST	COMMENTS
			INLET CONT.		OUTLET CONTROL $HW = H + h_o - LS_o$											
			$\frac{HW}{D}$	HW	K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW				
90" RCP	543.2	90"	1.36	10.2	.05	4.0	5.9	6.7	3.5	6.7	1.45	9.25	10.2			

SUMMARY & RECOMMENDATIONS:

CHART 1



90"/12 = 7.5 x 1.36 = 10.2'

2.4 x 2 = 4.8
576.00
4.8
580.8 #11

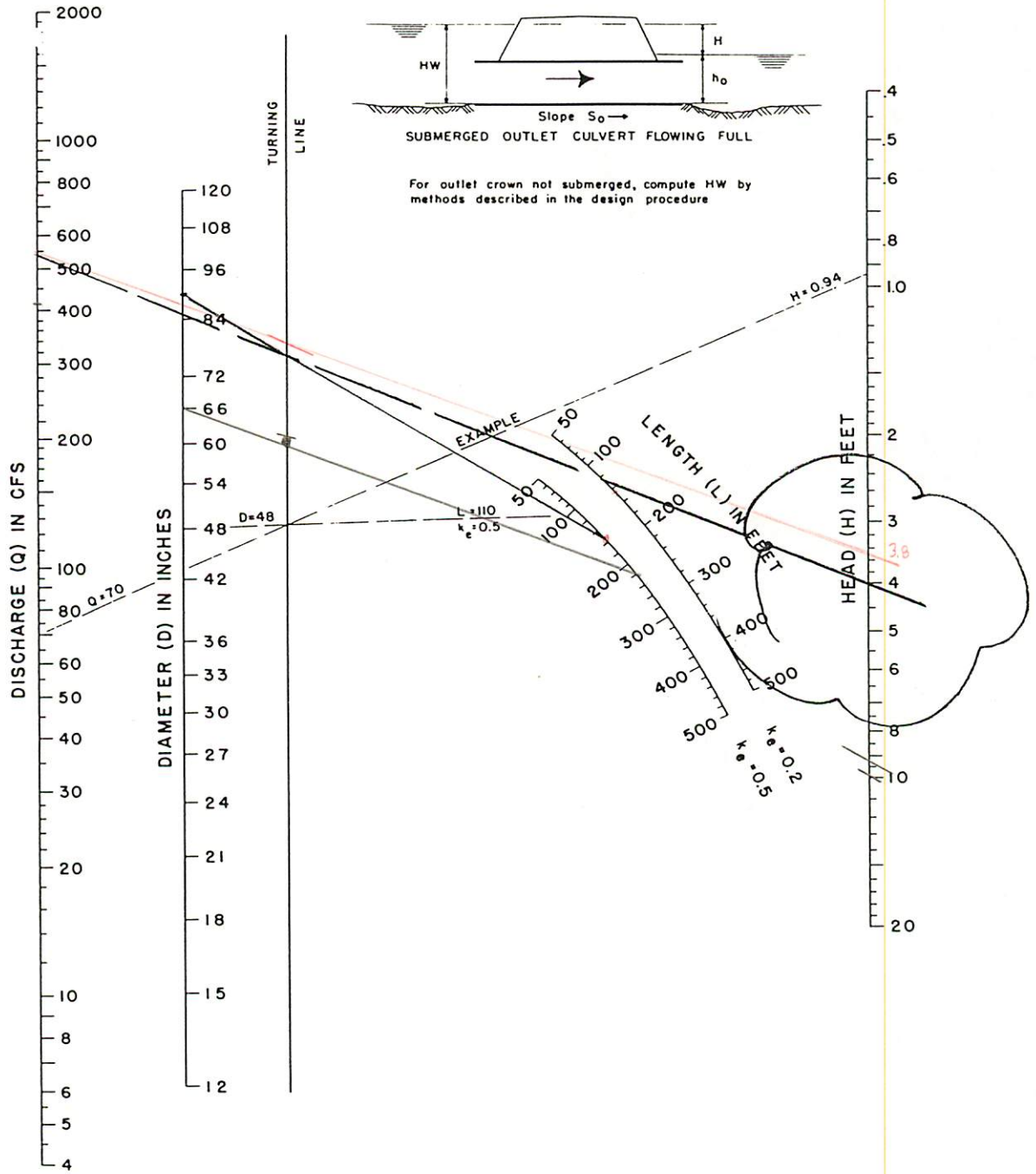
HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2&3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

1-20-92

CHART 5

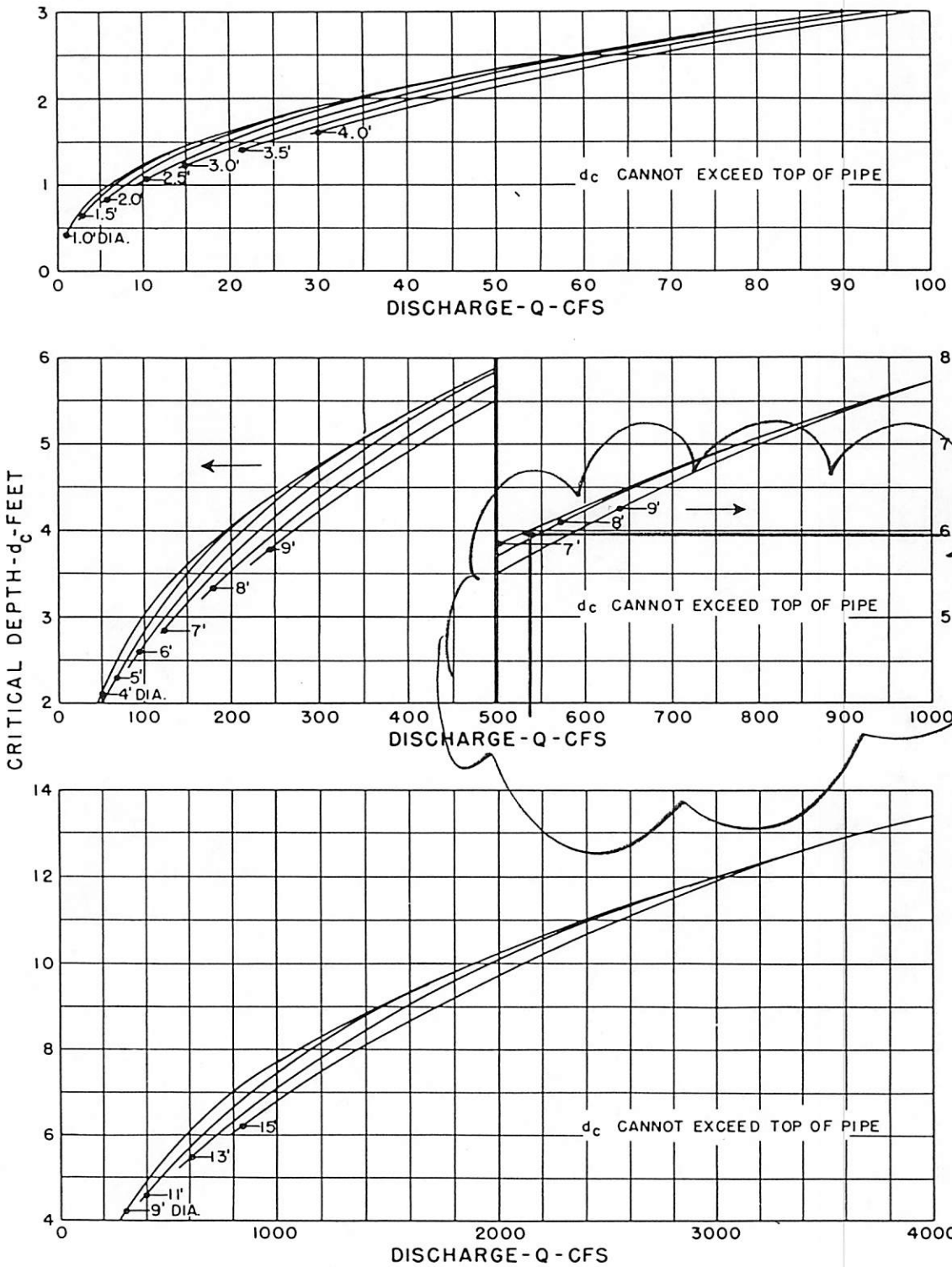


HEAD FOR CONCRETE PIPE CULVERTS FLOWING FULL n = 0.012

BUREAU OF PUBLIC ROADS JAN. 1963

1-20-92

CHART 4



BUREAU OF PUBLIC ROADS

JAN. 1964

CRITICAL DEPTH
CIRCULAR PIPE

PICKETT RAY & SILVER

333 MID RIVERS MALL DRIVE
ST. PETERS, MISSOURI 63376
314/441-1211 314/278-1211
FAX 314/278-1104

LETTER OF TRANSMITTAL

DATE	JOB NO.
07/17/92	89-204

ATTENTION: MR. FRANK GODWIN

RE: GLEN EAGLE

TO
CITY OF O'FALLON
138 SOUTH MAIN
O'FALLON, MO 63366

GENTLEMEN:

WE ARE SENDING YOU [X] Attached [X] Prints [ ] Plans [ ] Specifications [ ] Copy of letter

[ ] _____

COPIES	DATE	NO.	DESCRIPTION
2		4	REVISED LAKE #17 PRINCIPLE SPILLWAY

THESE ARE TRANSMITTED as checked below:

[X] For your use [X] For approval [ ] For review and comment

[ ] As requested [X] Revised as requested [ ] FOR BIDS DUE _____ 19____

[ ] _____

REMARKS

11

COPY TO_____

SIGNED: Tanya Dietz

TANYA DIETZ

11

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

333 Mid Rivers Mall Dr
St. Peters, MO 63376

441-1211
278-1211

PROJECT NAME Glen Eagle
PROJECT #/JOB ORDER # 89.204
DATE 7.16.92
DESIGNER T. Dietz
PAGE 1

Lake #17

Revise "Principle Spillway":

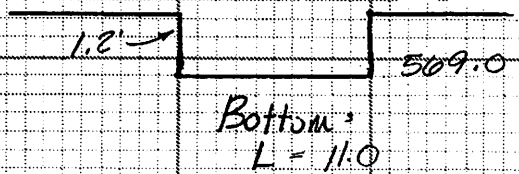
$Q_{25} = 38.19$ cfs
$C = 2.68$
$L = 11.0$
$D = 1.2$

$Q = CLH^{3/2}$
$= 2.68(11.0)(1.2)^{3/2}$
$Q = 38.75$ cfs

$Q_{100} = 48.35$
$C = 2.66$
$L = 11.0$
$D = 1.4$

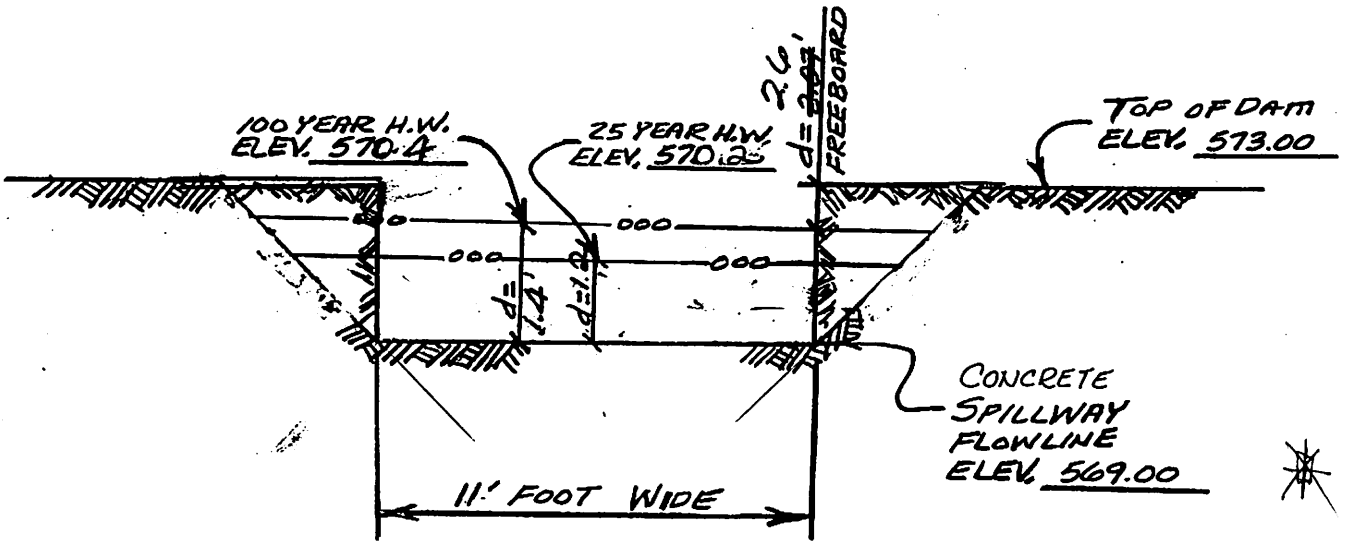
$Q = CLH^{3/2}$
$= 2.66(11)(1.4)^{3/2}$
$Q = 48.47$ cfs

570.4 = 100 yr. HW
570.2 = 25 yr. HW



Rev. 7-17-92 tdj
Rev. 3-31-92 tdj

```
I=========5 OUTLET STRUCTURES F==========;
:  Reservoir:  5                                                    :
: CULVERT STRUC  A. Q=CoA[2gh/k]^.5    CULVERT STRUC  B. Q=CoA[2gh/k]^.5 :
:                                                                   :
: 1. WIDTH  (in)     = 0..             9. WIDTH  (in)     = 0..     :
: 2. HEIGHT (in)     = 0..            10. HEIGHT (in)     = 0..     :
: 3. No. BARRELS     = 0..            11. No. BARRELS     = 0..     :
: 4. INVERT ELEV.    = 0........      12. INVERT ELEV.    = 0........ :
: 5. Co = 0.60                        13. Co = 0.60                 :
: 6. CULVERT LENGTH (ft) = 0...       14. CULVERT LENGTH (ft) = 0...  :
: 7. CULVERT SLOPE (%)   = 0...       15. CULVERT SLOPE (%)   = 0...  :
: 8. MANNING'S N-VALUE   = .013       16. MANNING'S N-VALUE   = .013  :
:                                     17. MULTI-STAGE OPTION ? (Y/N) N :
:                                                                   :
: WEIR STRUCTURE A.       Q=CwLH^EXP  WEIR STRUCTURE B.       Q=CwLH^EXP :
:                                                                   :
: 18. CREST LENGTH (ft)   = 6......   23. CREST LENGTH (ft)   = 0...... :
: 19. CREST ELEVATION     = 569....   24. CREST ELEVATION     = 0...... :
: 20. Cw = 3.00                       25. Cw = 3.00                 :
: 21. EXP = 1.50                      26. EXP = 1.50                :
: 22. MULTI-STAGE OPTION ? (Y/N) N    27. MULTI-STAGE OPTION ? (Y/N) N :
:                                                                   :
:                                                                   :
<=========================================================================
Change item number: 0                                    DY to cont
```



SPILLWAY DETAIL
N.T.S.

12

Rev. 7-17-92 kb

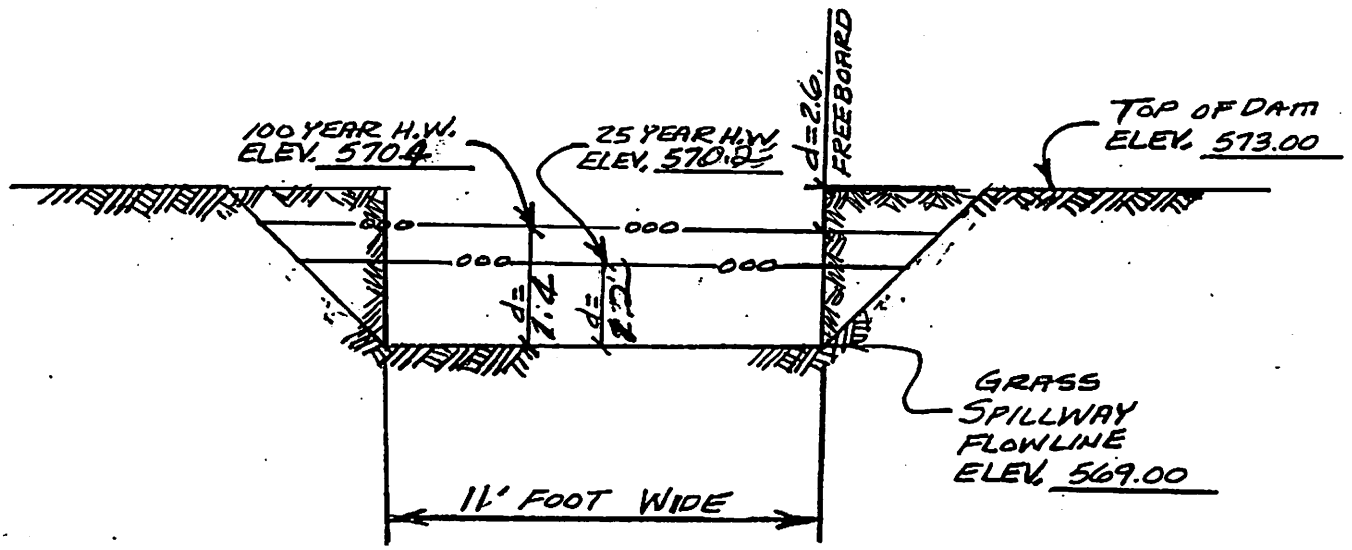
```
Reservoir:  5
CULVERT STRUC  A. Q=CoA[2gh/k]^.5          CULVERT STRUC  B. Q=CoA[2gh/k]^.5

 1. WIDTH  (in)      = 0..                  9. WIDTH  (in)      = 0..
 2. HEIGHT (in)      = 0..                 10. HEIGHT (in)      = 0..
 3. No. BARRELS      = 0..                 11. No. BARRELS      = 0..
 4. INVERT ELEV.     = 0.....              12. INVERT ELEV.     = 0.....
 5. Co = 0.60                              13. Co = 0.60
 6. CULVERT LENGTH (ft) = 0...             14. CULVERT LENGTH (ft) = 0...
 7. CULVERT SLOPE (%)   = 0...             15. CULVERT SLOPE (%)   = 0...
 8. MANNING'S N-VALUE   = .013             16. MANNING'S N-VALUE   = .013
                                           17. MULTI-STAGE OPTION ? (Y/N) N

WEIR STRUCTURE A.        Q=CwLH^EXP       WEIR STRUCTURE B.        Q=CwLH^EXP

18. CREST LENGTH (ft)  = 6.....           23. CREST LENGTH (ft)  = 0.....
19. CREST ELEVATION    = 569....          24. CREST ELEVATION    = 0.....
20. Cw = 3.00                             25. Cw = 3.00
21. EXP = 1.50                            26. EXP = 1.50
22. MULTI-STAGE OPTION ? (Y/N) N          27. MULTI-STAGE OPTION ? (Y/N) N

Change item number: 0                                          DY to cont
```



SPILLWAY DETAIL

N.T.S.

Table 5-3. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs

Measured head in feet, H	Breadth of crest of weir in feet										
	0.50	0.75	1.00	1.50	2.00	2.50	3.00	4.00	5.00	10.00	15.00
0.2	2.80	2.75	2.69	2.62	2.54	2.48	2.44	2.38	2.34	2.49	2.68
0.4	2.92	2.80	2.72	2.64	2.61	2.60	2.58	2.54	2.50	2.56	2.70
0.6	3.08	2.89	2.75	2.64	2.61	2.60	2.68	2.69	2.70	2.70	2.70
0.8	3.30	3.04	2.85	2.68	2.60	2.60	2.67	2.68	2.68	2.69	2.64
1.0	3.32	3.14	2.98	2.75	2.66	2.64	2.65	2.67	2.68	2.68	2.63
1.2	3.32	3.20	3.08	2.86	2.70	2.65	2.64	2.67	2.66	2.69	2.64
1.4	3.32	3.26	3.20	2.92	2.77	2.68	2.64	2.65	2.65	2.67	2.64
1.6	3.32	3.29	3.28	3.07	2.89	2.75	2.68	2.66	2.65	2.64	2.63
1.8	3.32	3.32	3.31	3.07	2.88	2.74	2.68	2.66	2.65	2.64	2.63
2.0	3.32	3.31	3.30	3.03	2.85	2.76	2.72	2.68	2.65	2.64	2.63
2.5	3.32	3.32	3.31	3.28	3.07	2.89	2.81	2.72	2.67	2.64	2.63
3.0	3.32	3.32	3.32	3.32	3.20	3.05	2.92	2.73	2.66	2.64	2.63
3.5	3.32	3.32	3.32	3.32	3.32	3.19	2.97	2.76	2.68	2.64	2.63
4.0	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.70	2.64	2.63
4.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.74	2.64	2.63
5.0	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.64	2.63
5.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.64	2.63

Table 5-4. Values of C in the Formula $Q = CLH^{3/2}$ for Models of Broad-crested Weirs with Rounded Upstream Corner

Name of experimenter	Radius of curve in feet	Breadth of weir in feet, B	Height of weir in feet, P	Head in feet, H									
				0.4	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Bazin	0.33	2.62	2.46	2.93	2.97	2.98	3.01	3.04					
Bazin	0.33	6.56	2.46	2.70	2.82	2.87	2.89	2.92					
U. S. Deep Waterways	0.33	2.62	4.57	....	2.77	2.80	2.83	2.92	3.00	3.08	3.17	3.34	3.50
U. S. Deep Waterways	0.33	6.56	4.56	....	....	2.83	2.83	2.83	2.82	2.82	2.82	2.82	2.81

Table 5-5. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs with Crests Inclined Slightly Downward

(*a*)

Crest	Energy head = H_e								
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.5
Level	2.78	2.79	2.80	2.81	2.82	2.83	2.85	2.85	2.85
Slope = 0.004	2.95	2.94	2.93	2.92	2.91	2.90	2.88	2.87	2.87
Slope = 0.026	3.07	3.06	3.05	3.04	3.03	3.02	3.00	2.99	

(*b*)

Slope of crest	Length of weir in feet	Head in feet, H						
		0.1	0.2	0.3	0.4	0.5	0.6	0.7
12 to 1	3.0	2.58	2.87	2.57	2.60	2.84	2.81	2.70
18 to 1	3.0	2.91	2.92	2.53	2.60	2.80	2.74	2.62
18 to 1	10.0	2.52	2.68	2.73	2.80	2.90	2.80	2.68

Table 5-6. Values of C in the Formula $Q = CLH^{3/2}$ for Weirs of Triangular Cross Section with Vertical Upstream Face and Sloping Downstream Face

Slope of downstream face	Height of weir in feet, P	Head in feet, H										
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5
Hor. Vert.												
1 to 1	2.46	3.88	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
2 to 1	2.46	3.48	3.48	3.49	3.49	3.50	3.50	3.50	3.50	3.50	3.51	3.51
2 to 1	1.64	3.56	3.47	3.47	3.51	3.54	3.57	3.58	3.58	3.58	3.59	3.57
3 to 1	1.64	....	2.90	3.11	3.22	3.26	3.33	3.37	3.40	3.40	3.41	3.41
5 to 1	2.46	....	3.08	3.06	3.05	3.05	3.07	3.09	3.12	3.13	3.13	3.13
10 to 1	2.46	....	2.82	2.83	2.84	2.86	2.89	2.90	2.91	2.91	2.92	2.93

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

333 Mid Rivers Mall Dr.
St. Peters, MO 63376

441-1211
278-1211

PROJECT NAME Glen Eagle
PROJECT #/JOB ORDER # 89.204
DATE 7.16.92
DESIGNER T. Dietz
PAGE 1

Lake #17

Revise "Principle Spillway":

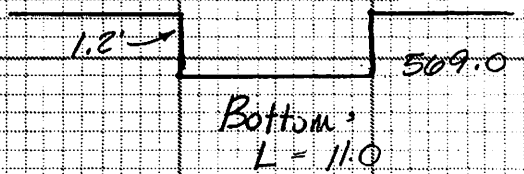
$Q_{25} = 38.19$ cfs
$C = 2.68$
$L = 11.0$
$D = 1.2$

$Q = CLH^{3/2}$
$= 2.68(11.0)(1.2)^{3/2}$
$Q = 38.75$ cfs

$Q_{100} = 48.35$
$C = 2.66$
$L = 11.0$
$D = 1.4$

$Q = CLH^{3/2}$
$= 2.66(11)(1.4)^{3/2}$
$Q = 48.47$ cfs

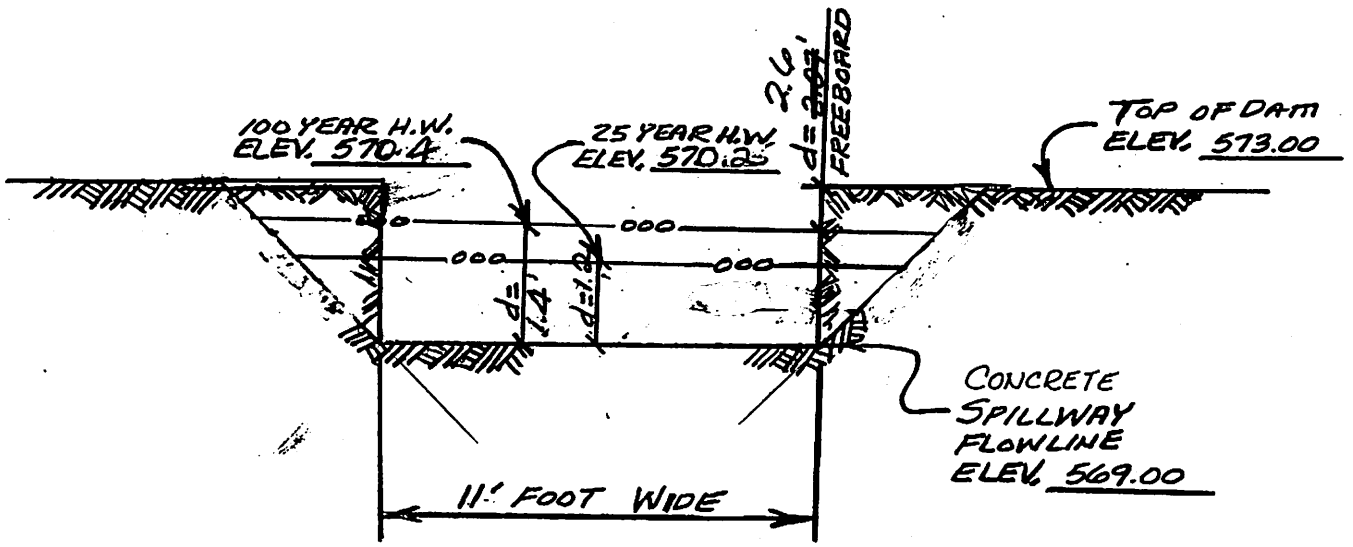
570.4 = 100 yr. HW
570.2 = 25 yr. HW



Bottom;
$L = 11.0$

Rev. 7-17-92 tdj
Rev. 3-31-92 tdj

```
I5 OUTLET STRUCTURES F
:  Reservoir:  5
: CULVERT STRUC  A. Q=CoA[2gh/k]^.5     CULVERT STRUC  B. Q=CoA[2gh/k]^.5
:
: 1. WIDTH  (in)      = 0..              9. WIDTH  (in)      = 0..
: 2. HEIGHT (in)      = 0..             10. HEIGHT (in)      = 0..
: 3. No. BARRELS      = 0..             11. No. BARRELS      = 0..
: 4. INVERT ELEV.     = 0.........      12. INVERT ELEV.     = 0.........
: 5. Co = 0.60                          13. Co = 0.60
: 6. CULVERT LENGTH (ft) = 0....        14. CULVERT LENGTH (ft) = 0....
: 7. CULVERT SLOPE (%)   = 0....        15. CULVERT SLOPE (%)   = 0....
: 8. MANNING'S N-VALUE   = .013         16. MANNING'S N-VALUE   = .013
:                                       17. MULTI-STAGE OPTION ? (Y/N) N
:
: WEIR STRUCTURE A.       Q=CwLH^EXP    WEIR STRUCTURE B.       Q=CwLH^EXP
:
: 18. CREST LENGTH (ft)   = 6.......    23. CREST LENGTH (ft)   = 0.......
: 19. CREST ELEVATION     = 569.....    24. CREST ELEVATION     = 0.......
: 20. Cw = 3.00                         25. Cw = 3.00
: 21. EXP = 1.50                        26. EXP = 1.50
: 22. MULTI-STAGE OPTION ? (Y/N) N      27. MULTI-STAGE OPTION ? (Y/N) N
:
Change item number: 0                                          DY to cont
```



SPILLWAY DETAIL

N.T.S.

Rev. 7-17-92 KB

OUTLET STRUCTURES

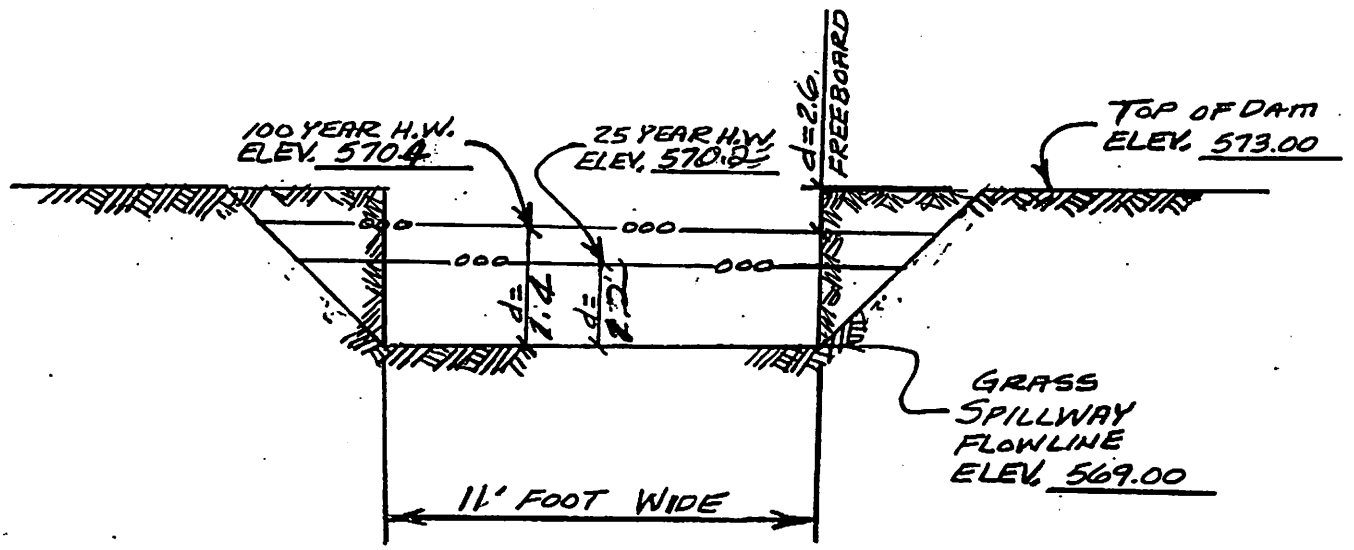
Reservoir: 5

CULVERT STRUC A. Q=CoA[2gh/k]^.5		CULVERT STRUC B. Q=CoA[2gh/k]^.5	
1. WIDTH (in)	= 0..	9. WIDTH (in)	= 0..
2. HEIGHT (in)	= 0..	10. HEIGHT (in)	= 0..
3. No. BARRELS	= 0..	11. No. BARRELS	= 0..
4. INVERT ELEV.	= 0.....	12. INVERT ELEV.	= 0.....
5. Co = 0.60		13. Co = 0.60	
6. CULVERT LENGTH (ft)	= 0...	14. CULVERT LENGTH (ft)	= 0...
7. CULVERT SLOPE (%)	= 0...	15. CULVERT SLOPE (%)	= 0...
8. MANNING'S N-VALUE	= .013	16. MANNING'S N-VALUE	= .013
		17. MULTI-STAGE OPTION ? (Y/N)	N

WEIR STRUCTURE A. Q=CwLH^EXP		WEIR STRUCTURE B. Q=CwLH^EXP	
18. CREST LENGTH (ft)	= 6.....	23. CREST LENGTH (ft)	= 0.....
19. CREST ELEVATION	= 569....	24. CREST ELEVATION	= 0.....
20. Cw = 3.00		25. Cw = 3.00	
21. EXP = 1.50		26. EXP = 1.50	
22. MULTI-STAGE OPTION ? (Y/N)	N	27. MULTI-STAGE OPTION ? (Y/N)	N

Change item number: 0

DY to cont



SPILLWAY DETAIL

N.T.S.

Table 5-3. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs

Measured head in feet, H	Breadth of crest of weir in feet										
	0.50	0.75	1.00	1.50	2.00	2.50	3.00	4.00	5.00	10.00	15.00
0.2	2.80	2.75	2.69	2.62	2.54	2.48	2.44	2.38	2.34	2.49	2.68
0.4	2.92	2.80	2.72	2.64	2.61	2.60	2.58	2.54	2.50	2.56	2.70
0.6	3.08	2.89	2.75	2.64	2.61	2.60	2.68	2.69	2.70	2.70	2.70
0.8	3.30	3.04	2.85	2.68	2.60	2.60	2.67	2.68	2.68	2.69	2.64
1.0	3.32	3.14	2.98	2.75	2.66	2.64	2.65	2.67	2.68	2.68	2.63
1.2	3.32	3.20	3.08	2.86	2.70	2.65	2.64	2.67	2.66	2.69	2.64
1.4	3.32	3.26	3.20	2.92	2.77	2.68	2.64	2.65	2.65	2.67	2.64
1.6	3.32	3.29	3.28	3.07	2.89	2.75	2.68	2.66	2.65	2.64	2.63
1.8	3.32	3.32	3.31	3.07	2.88	2.74	2.68	2.66	2.65	2.64	2.63
2.0	3.32	3.31	3.30	3.03	2.85	2.76	2.72	2.68	2.65	2.64	2.63
2.5	3.32	3.32	3.31	3.28	3.07	2.89	2.81	2.72	2.67	2.64	2.63
3.0	3.32	3.32	3.32	3.32	3.20	3.05	2.92	2.73	2.66	2.64	2.63
3.5	3.32	3.32	3.32	3.32	3.32	3.19	2.97	2.76	2.68	2.64	2.63
4.0	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.70	2.64	2.63
4.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.74	2.64	2.63
5.0	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.64	2.63
5.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.64	2.63

Table 5-4. Values of C in the Formula $Q = CLH^{3/2}$ for Models of Broad-crested Weirs with Rounded Upstream Corner

Name of experimenter	Radius of curve in feet	Breadth of weir in feet, B	Height of weir in feet, P	Head in feet, H									
				0.4	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Bazin	0.33	2.62	2.46	2.93	2.97	2.98	3.01	3.04					
Bazin	0.33	6.56	2.46	2.70	2.82	2.87	2.89	2.92					
U. S. Deep Waterways	0.33	2.62	4.57	....	2.77	2.80	2.83	2.92	3.00	3.08	3.17	3.34	3.50
U. S. Deep Waterways	0.33	6.56	4.56	....	....	2.83	2.83	2.83	2.82	2.82	2.82	2.82	2.81

Table 5-5. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs with Crests Inclined Slightly Downward

(*a*)

Crest	Energy head = H_e								
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.5
Level	2.78	2.79	2.80	2.81	2.82	2.83	2.85	2.85	2.85
Slope = 0.004	2.95	2.94	2.93	2.92	2.91	2.90	2.88	2.87	2.87
Slope = 0.026	3.07	3.06	3.05	3.04	3.03	3.02	3.00	2.99	

(*b*)

Slope of crest	Length of weir in feet	Head in feet, H						
		0.1	0.2	0.3	0.4	0.5	0.6	0.7
12 to 1	3.0	2.58	2.87	2.57	2.60	2.84	2.81	2.70
18 to 1	3.0	2.91	2.92	2.53	2.60	2.80	2.74	2.62
18 to 1	10.0	2.52	2.68	2.73	2.80	2.90	2.80	2.68

Table 5-6. Values of C in the Formula $Q = CLH^{3/2}$ for Weirs of Triangular Cross Section with Vertical Upstream Face and Sloping Downstream Face

Slope of downstream face	Height of weir in feet, P	Head in feet, H										
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5
Hor. Vert.												
1 to 1	2.46	3.88	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
2 to 1	2.46	3.48	3.48	3.49	3.49	3.50	3.50	3.50	3.50	3.50	3.51	3.51
2 to 1	1.64	3.56	3.47	3.47	3.51	3.54	3.57	3.58	3.58	3.58	3.59	3.57
3 to 1	1.64	....	2.90	3.11	3.22	3.26	3.33	3.37	3.40	3.40	3.41	3.41
5 to 1	2.46	....	3.08	3.06	3.05	3.05	3.07	3.09	3.12	3.13	3.13	3.13
10 to 1	2.46	....	2.82	2.83	2.84	2.86	2.89	2.90	2.91	2.91	2.92	2.93

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

333 Mid Rivers Mall Dr
St. Peters, MO 63376

441-1211
278-1211

PROJECT NAME Glen Eagle

PROJECT #/JOB ORDER #

DATE

DESIGNER

PAGE 1

Lake #5

1. tributary area = 104.90 Ac
2. Rational method Runoff Coefficient = C = 0.6
3. Sediment Storage (per chart) = 80 c.f./yr.
4. Total Sediment Storage = 80 x 104.9 = 8392 x 2 yrs = 16,784 cf

per Calc = total Storage = 282,073

req'd Storage =

Lake #8

1. area = 134 Ac
2. C = 0.6
3. Storage = 78 cf/yr.
4. Total = 78 x 134 = 10452 x 2 yrs = 20,904 cf

Lake #13

1. 35.3 acres
2. C = 0.6
3. Storage = 110 cf/yr
4. Total = 110 x 35.3 = 3883 x 2 yrs = 7,766

8

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Civil Engineers
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St Peters, MO 63376

441-1211
278-1211

PROJECT NAME
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DATE
DESIGNER
PAGE 2

Lake # 14

1. Area - 12 Ac
2. C - 0.6
3. Storage - 145
4. Total = 145 x 12 = 1740 x 2 yrs = 3480 cf

per Calc = total Storage - 98824
storage Req'd = 60,300 cf (for 33.5 cfs)

Lake # 17

1. area - 14.7 Ac
2. C - 0.6
3. Storage - 140
4. Total - 140 x 14.7 - 2058 x 2 yrs - 4116 cf

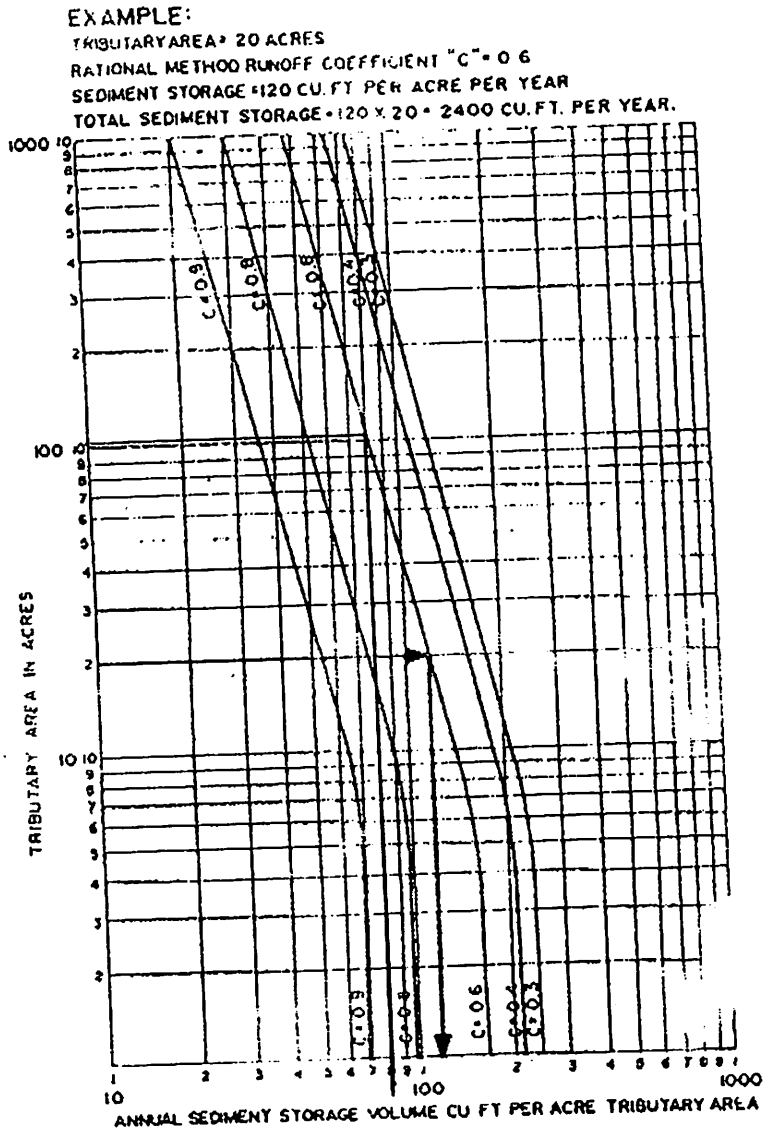
per Calc: total storage - 134437
storage Req'd - 132660 (73.70 cfs)

(1777 cf difference)

7/27/90

FIGURE 1

#5



ANNUAL SEDIMENT STORAGE

FIG. 6

Changes 1-92 w/ 7/27 TB

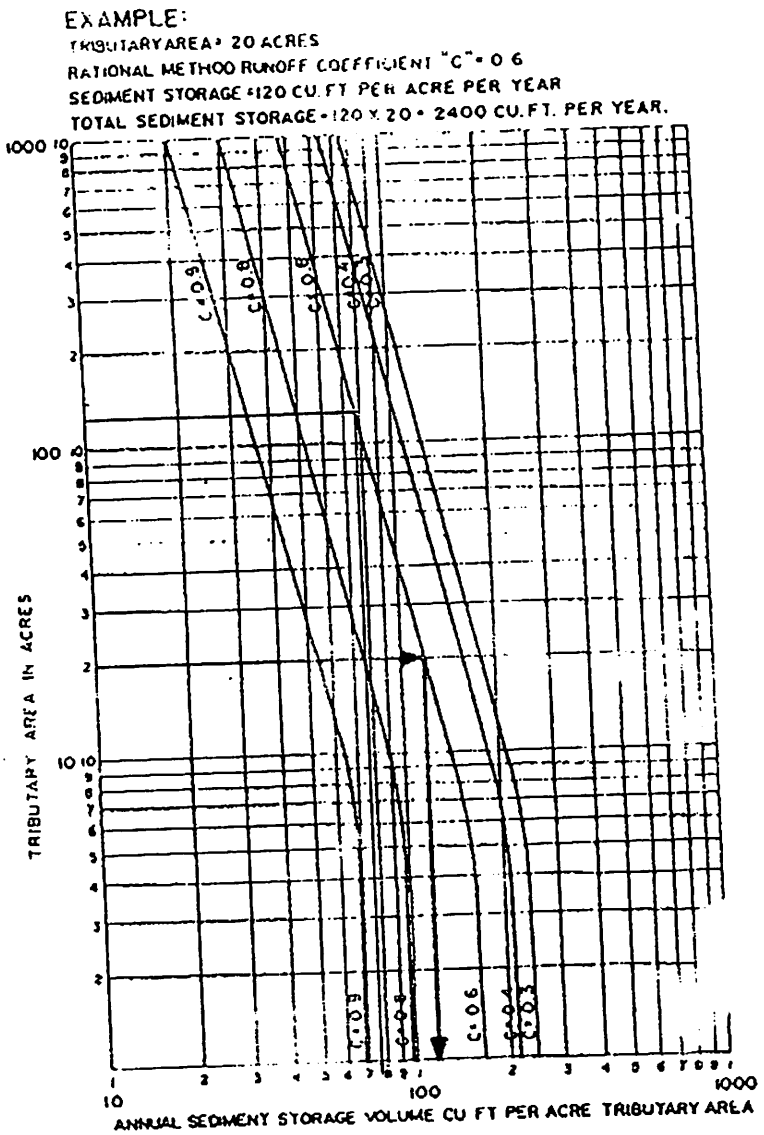
~~by using Figure 1. All other detention facilities shall provide storage for 2 years of sediment accumulation by using Figure 1~~, except for those using roofs of buildings, paved parking areas or other facilities designed to preclude

Re: Jerry Thurber 7/27/90 use 5 years

7/27/90

FIGURE 1

#8



ANNUAL SEDIMENT STORAGE

FIG. 6

Changed 1-92 ws 7-95 TB

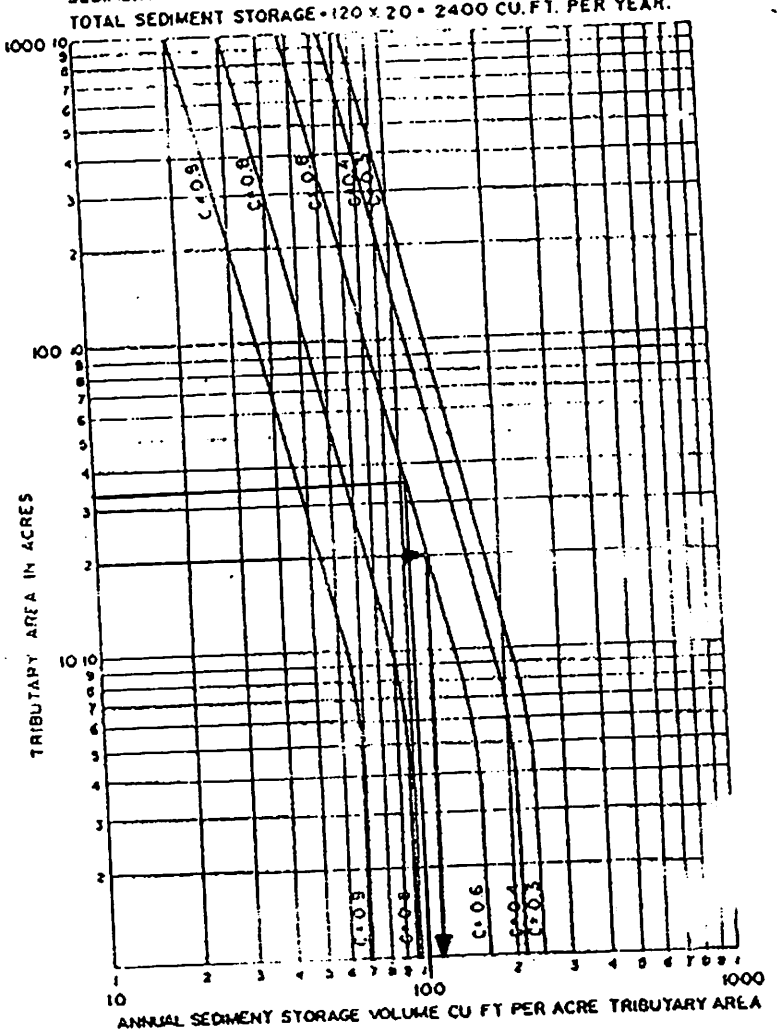
~~by using Figure 1. All other detention facilities shall provide storage for 2 years of sediment accumulation by using Figure 1,~~ except for those using roofs of buildings, paved parking areas or other facilities designed to preclude

Re! Use 5 years

7/27/90

FIGURE 1

#13



ANNUAL SEDIMENT STORAGE

FIG. 6

Changed 1.92 ws 24 TB

~~Accumulation accounted~~ by using Figure 1. ~~All other detention facilities shall provide storage for 2 years of sediment accumulation by using Figure 1~~, except for those using roofs of buildings, paved parking areas or other facilities designed to preclude

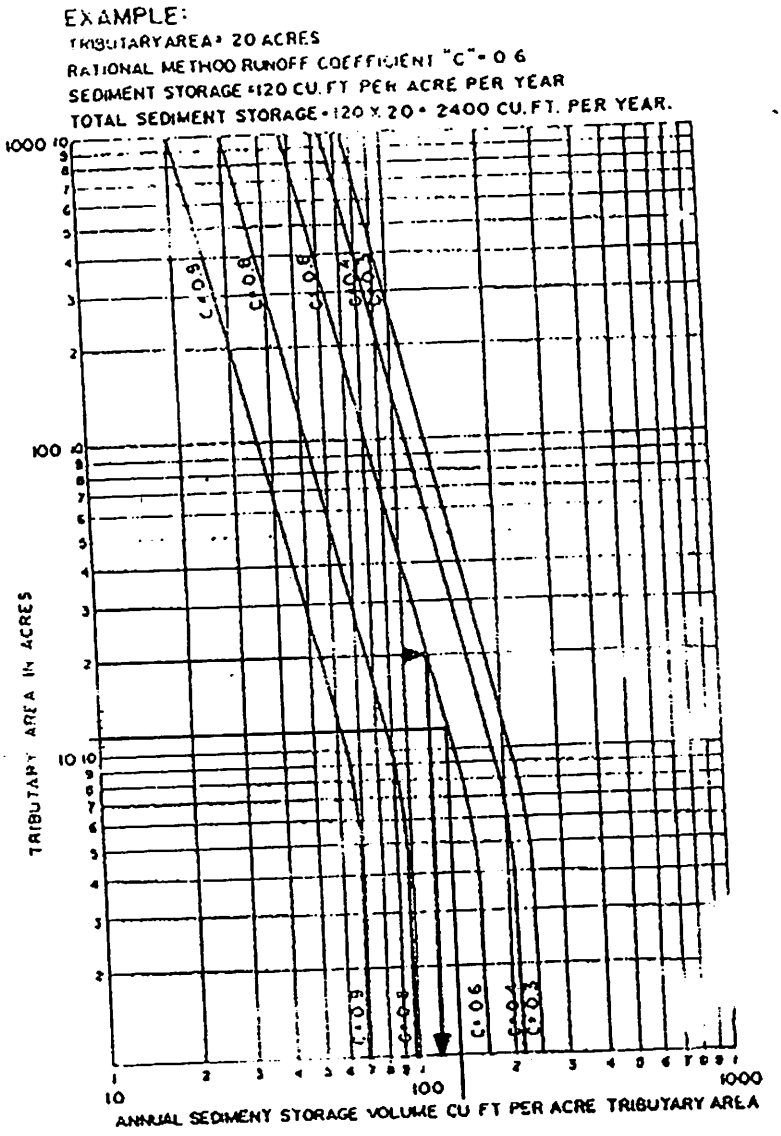
Re: Jerry Switzer 7-27-90 Use 5 years

7/27/90

6

FIGURE 1

#14



ANNUAL SEDIMENT STORAGE

FIG. 6

Changes 1-92 ww 7 95 TB

~~by using Figure 1. All other detention facilities shall provide storage for 2 years of sediment accumulation by using Figure 1,~~ except for those using roofs of buildings, paved parking areas or other facilities designed to preclude

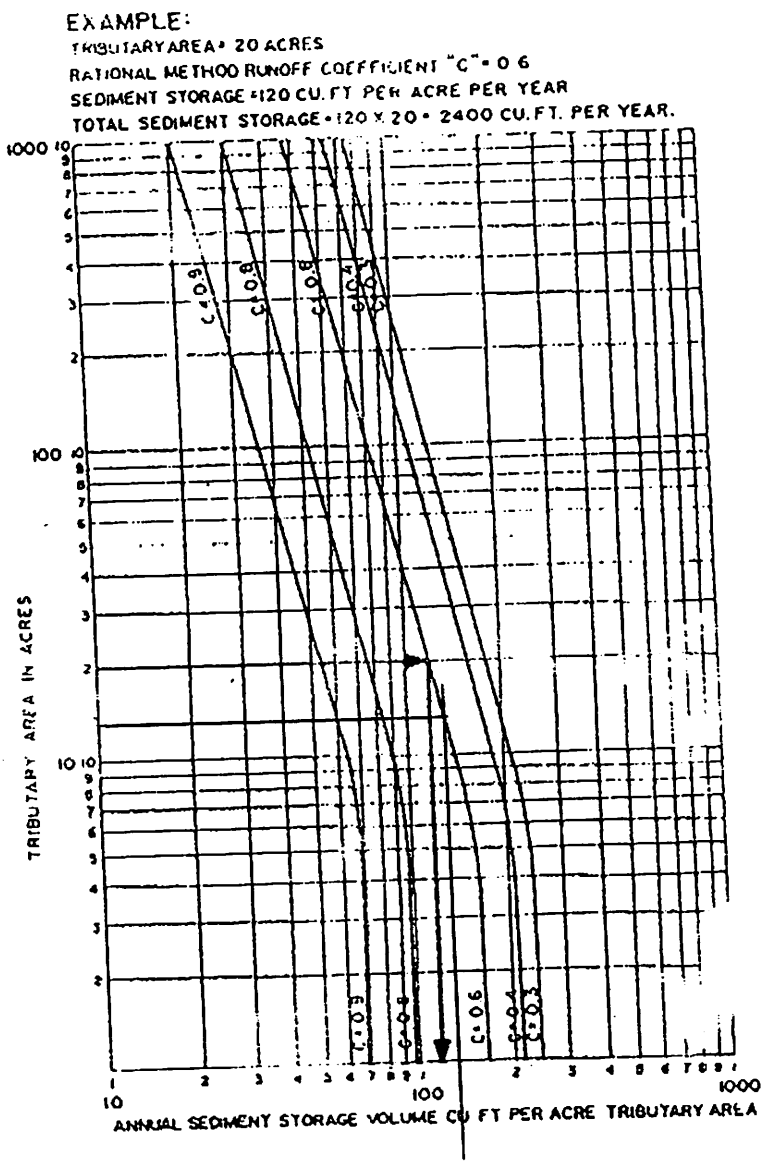
Per Jerry Swinford 7/27/90 Code 55 Sheet

7

7/27/90

FIGURE 1

#17



ANNUAL SEDIMENT STORAGE

FIG. 6

Changed 1-92 ws 28 TB

~~by using Figure 1. All other detention facilities shall provide storage for 2 years of sediment accumulation by using Figure 1~~, except for those using roofs of buildings, paved parking areas or other facilities designed to preclude

Re! 7.27.90 use 15 years

PROJECT: Glen Eagle 89-204

DESIGNER: T. Dietz

DATE: 10-15-91

HYDROLOGIC AND CHANNEL INFORMATION

Flood Plain Elev. = 542.5 ±

Flood Way = 544.0 ±

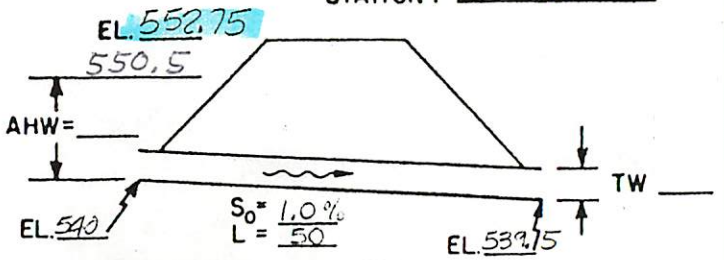
Q_1 = _____ TW_1 = _____

Q_2 = 3602 (100) TW_2 = _____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR (Q_{100}))

SKETCH

STATION: 20+11.50



MEAN STREAM VELOCITY = _____

MAX. STREAM VELOCITY = _____

2' FB OK

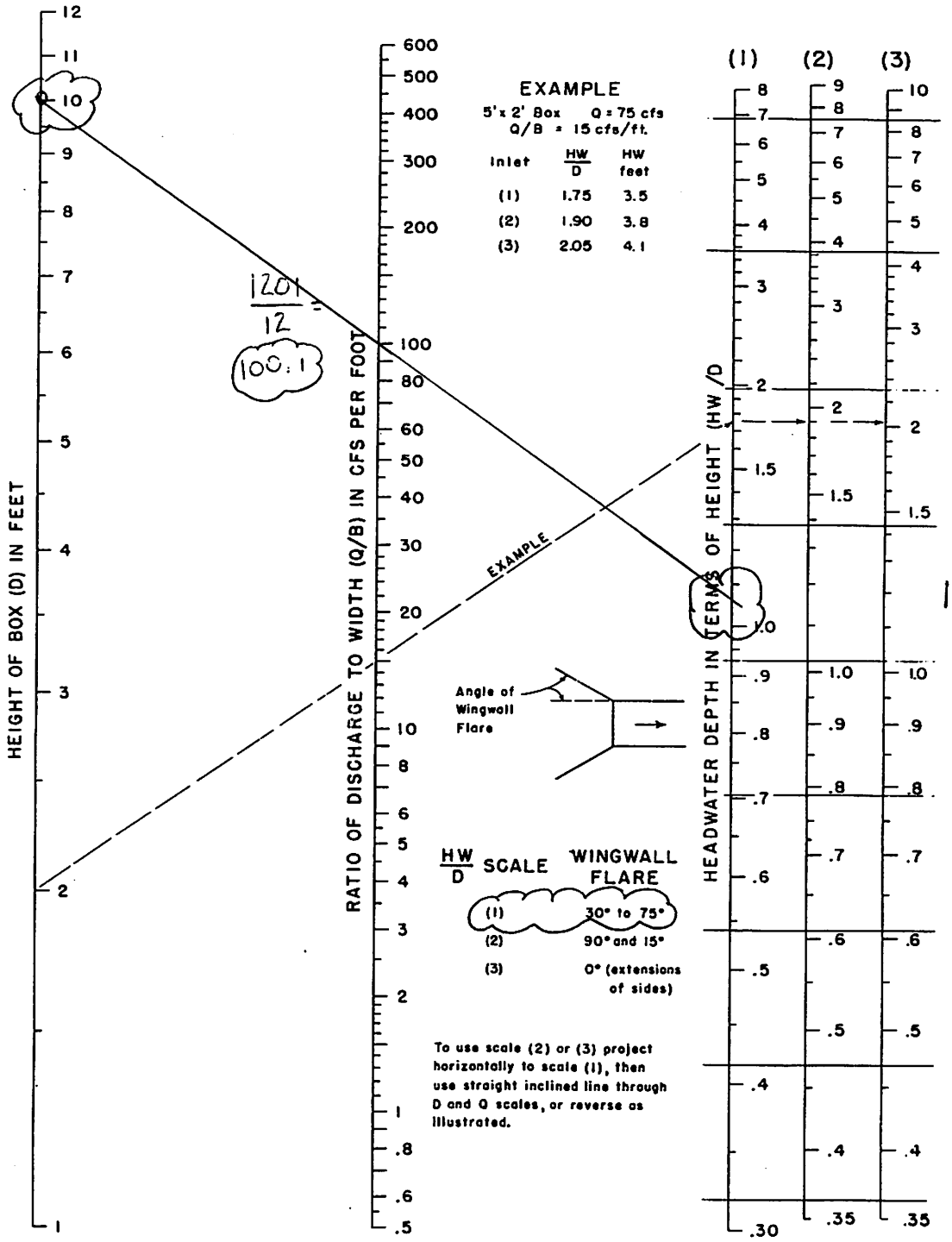
CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION										CONTROLLING H.W.	OUTLET VELOCITY	COST	COMMENTS
			INLET CONT.		OUTLET CONTROL HW = H + h_o − LS_o											
			HW/D	HW	K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW				
1-45° Wing Walls Box Culvert	(1302) 1201	3-12x10	1.05	10.5	0.4	2.4	6.8	8.4	5.0	8.4	.5	10.3	10.5			
			CHART #8	CHART #8		CHART #15	CHART #14		CHART #24							

SUMMARY & RECOMMENDATIONS:

$\frac{6.8+10}{2}$ = 8.4

use > of $\frac{d_c+D}{2}$ + TW

CHART 8



1201 / 12 = 100:1

1.05' x 10' = 10.50'

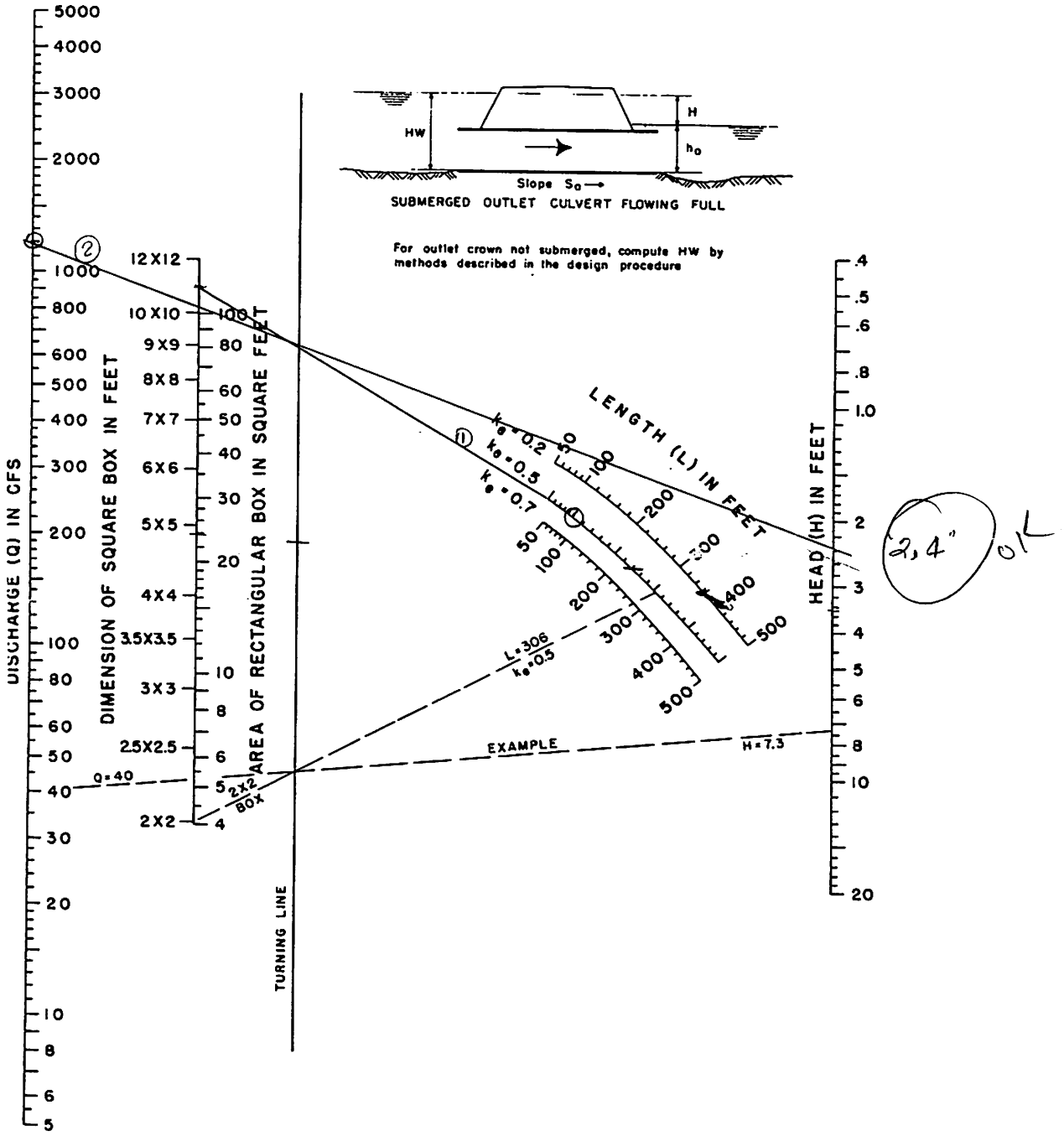
HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

* 3 - 12' W x 10' H Box

Q_{12}: 3602 ÷ 3 = 1201 cfs/Box

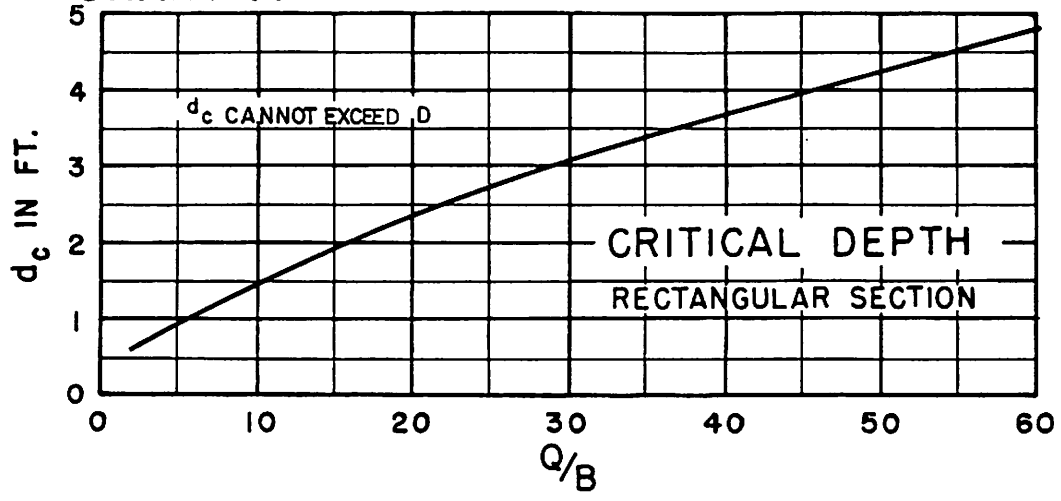
CHART 15

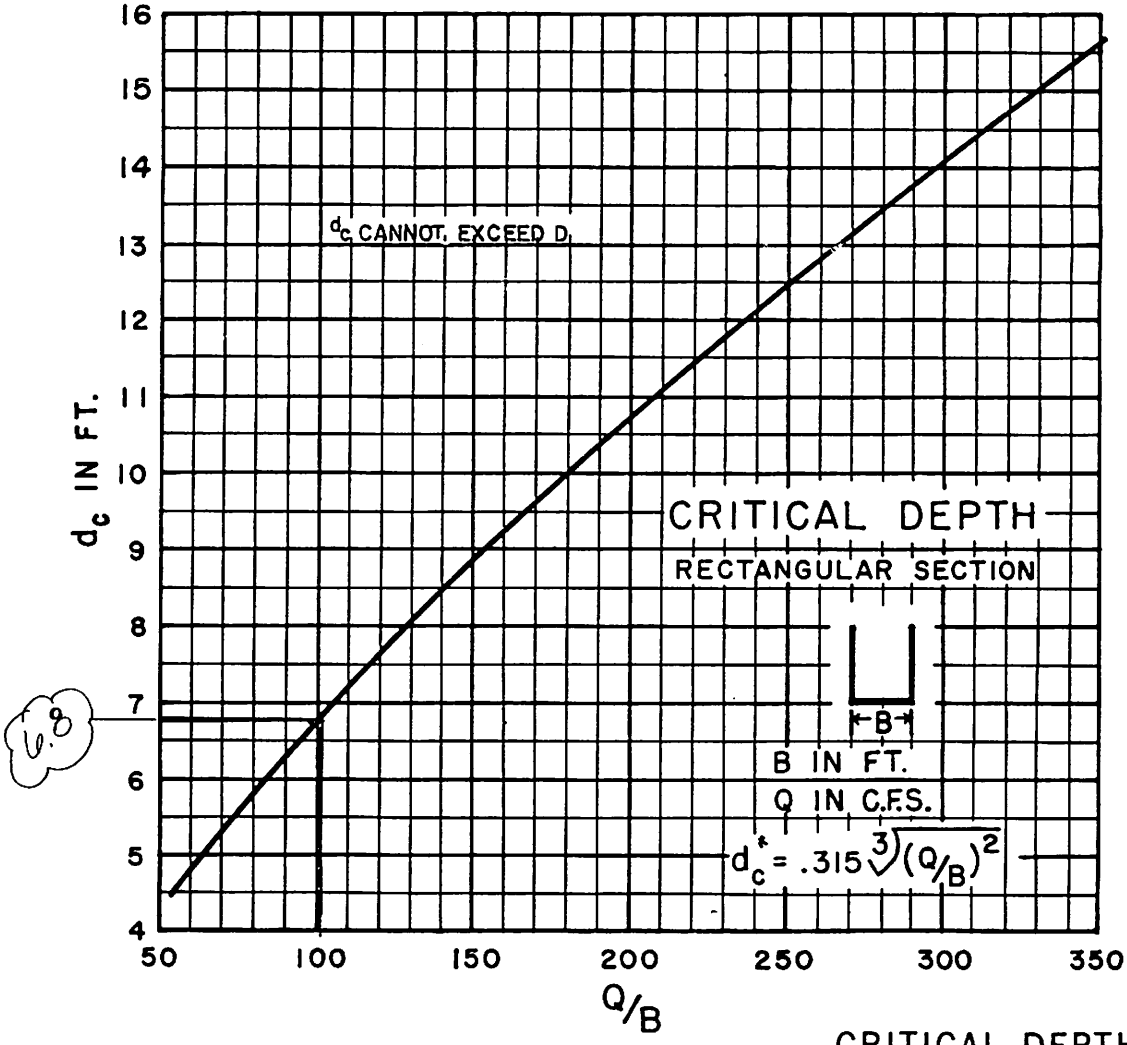


HEAD FOR CONCRETE BOX CULVERTS FLOWING FULL n = 0.012

AU OF PUBLIC ROADS JAN. 1963

CHART 14





BUREAU OF PUBLIC ROADS JAN. 1963

CRITICAL DEPTH
RECTANGULAR SECTION

5-38

CHART 24
DISCHARGE CUBIC FEET PER SECOND - Q
VELOCITY F.P.S.
DEPTH IN FEET
SLOPE — FEET PER FOOT
CRITICAL
CURVE f
n=.03
2:1
12'
Vn SCALE
Qn
CHANNEL CHART
2:1 b = 12 FT.

PICKETT RAY & SILVER

Civil Engineers
Planners
Land Surveyors

333 Mid Rivers Mall Dr
St Peters, MO 63376

441-1211
278-1211

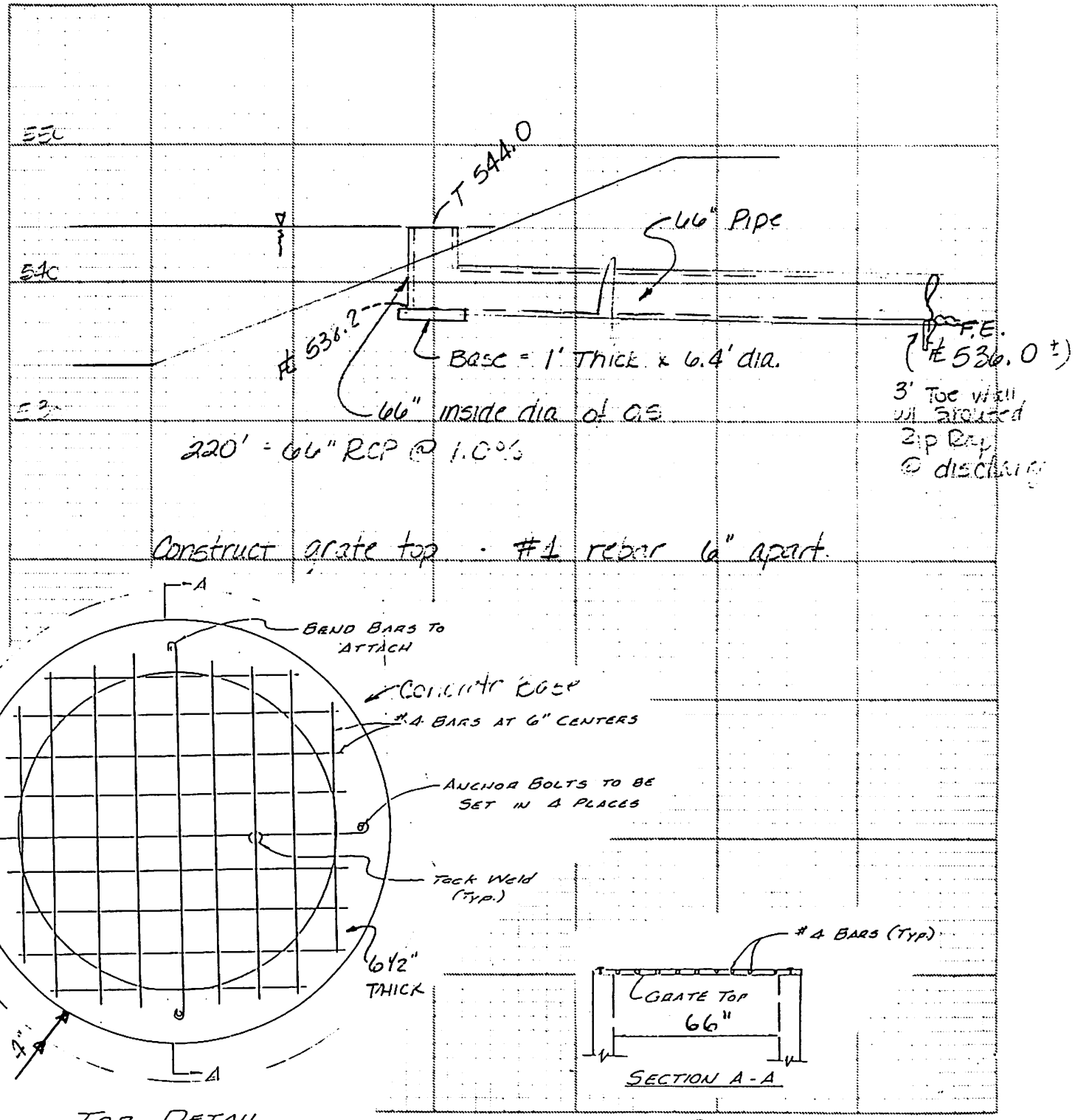
PROJECT NAME #5 OUTFALL STRUCTURE

PROJECT #/JOB ORDER # 9904

DATE 11-15-99

DESIGNER T. Detz

PAGE 1 of 2



TOP DETAIL
OVERFLOW STRUCTURE