



# ***City of Albuquerque***

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 27, 1999

James Topmiller, P.E.  
Bohannon-Huston, Inc.  
7500 Jefferson NE  
Albuquerque, NM 87109

Attn: Bruce Stidworthy

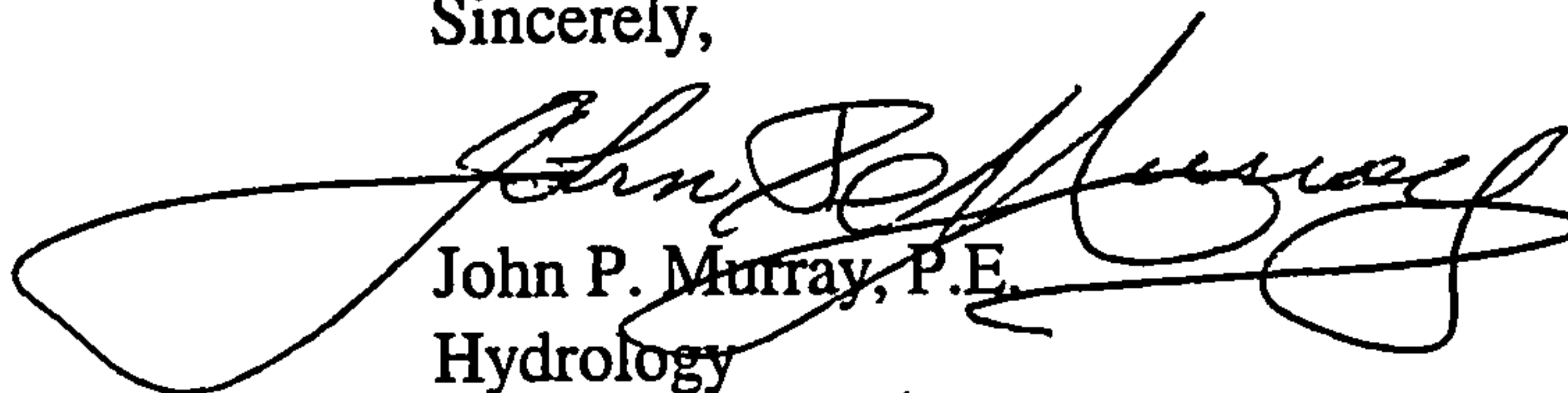
**RE: CHARTER BANK (E17-D56). ENGINEER'S CERTIFICATION FOR  
CERTIFICATE OF OCCUPANCY APPROVAL. ENGINEER'S STAMP DATED  
JULY 8, 1999.**

Dear Mr. Topmiller:

Based on the information provided on your July 8, 1999 submittal, the above referenced project is approved for Certificate of Occupancy.

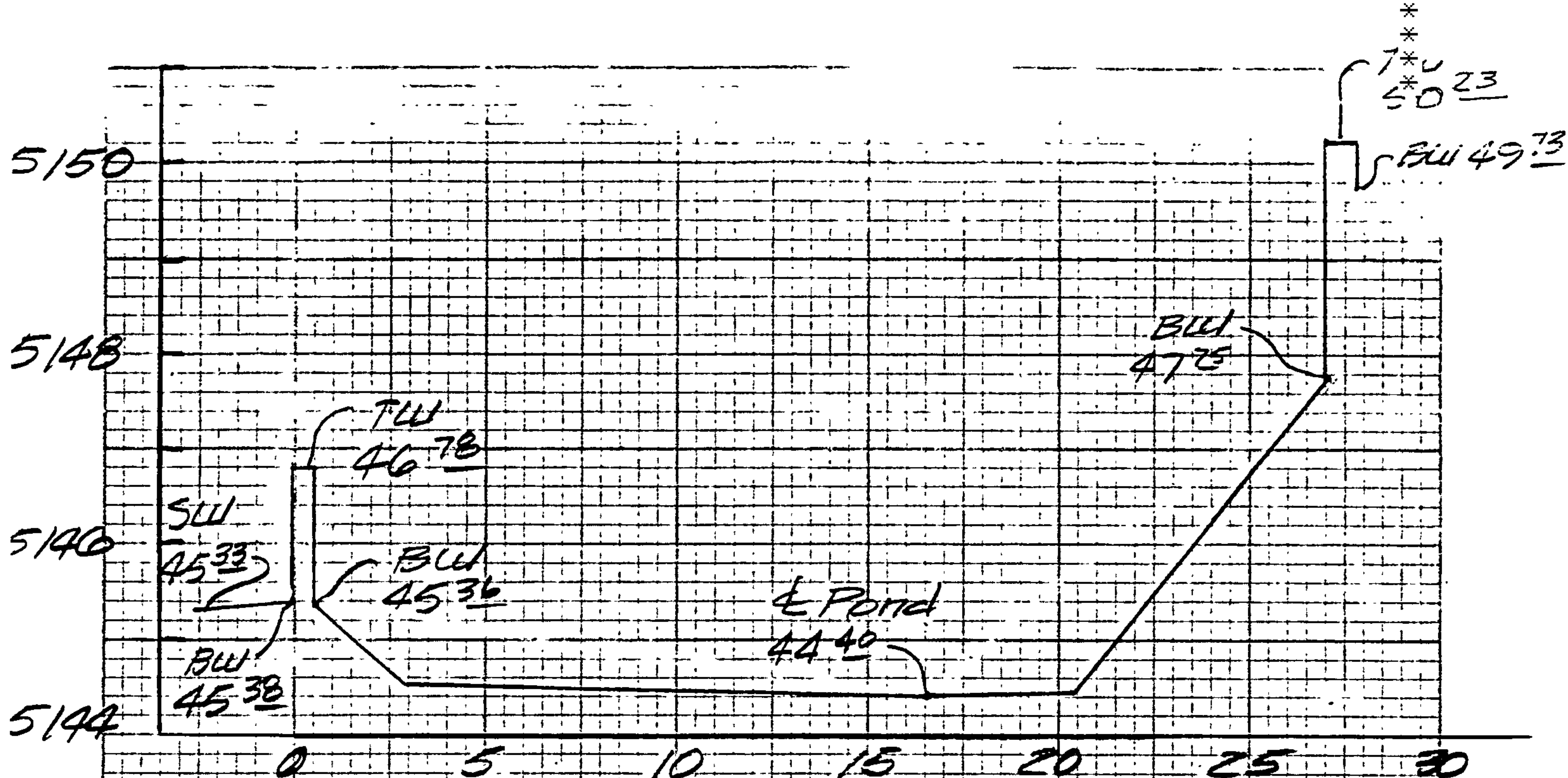
If I can be of further assistance, please feel free to call me at 924-3984.

Sincerely,



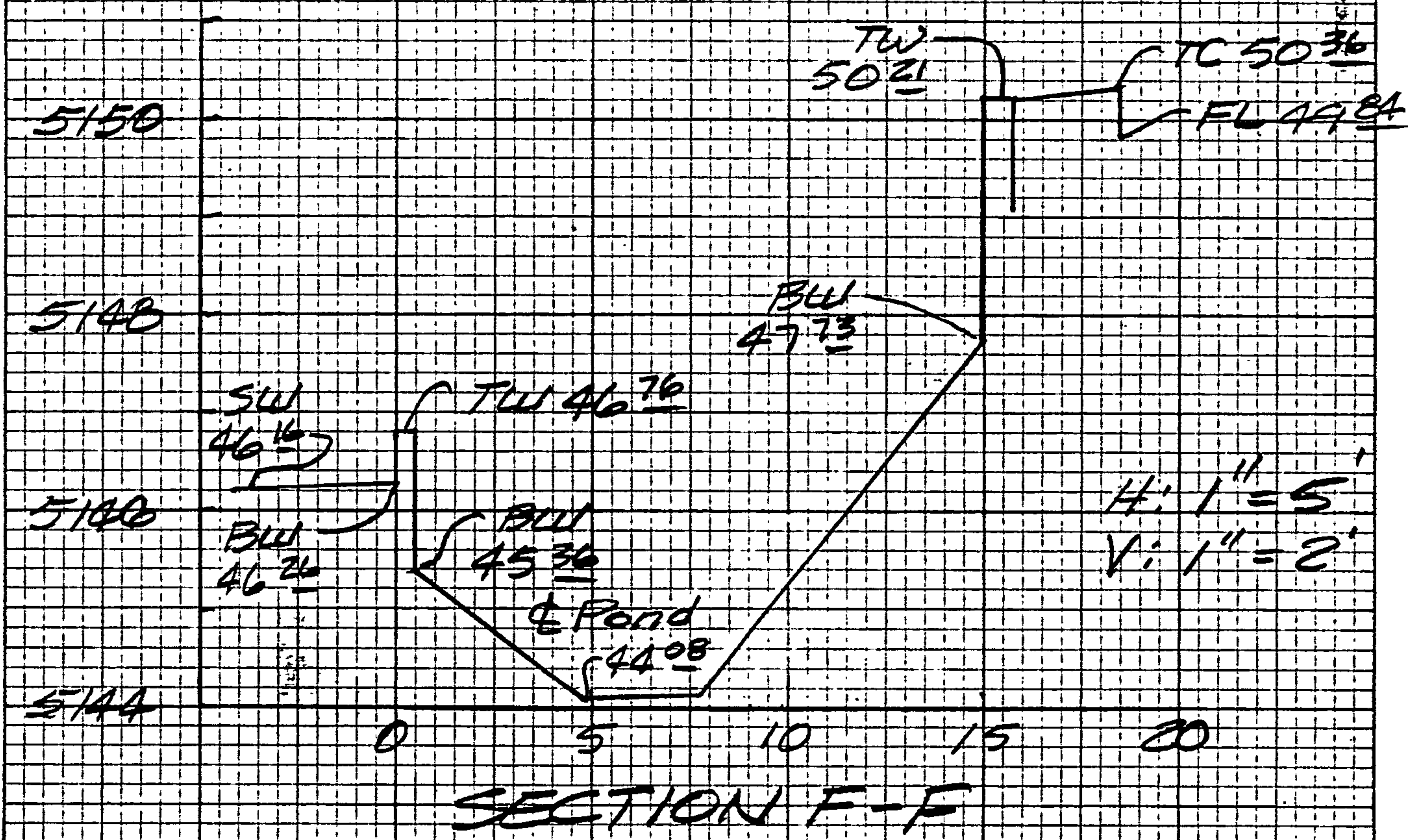
John P. Murray, P.E.  
Hydrology

c: ✓ File



SECTION E-E

H: 1" = 5'  
V: 1" = 2'



SECTION F-F

H: 1" = 5'  
V: 1" = 2'



PROJECT NAME Charter Off. Bldg. SHEET 2 OF 2  
 PROJECT NO. 98193C 07 BY MZM DATE 7-7-99  
 SUBJECT Drain. Cert. CH'D \_\_\_\_\_ DATE \_\_\_\_\_





May 28, 1998

James R. Topmiller, P.E.  
Bohannon-Huston, Inc.  
7500 Jefferson NE  
Albuquerque, NM 87109

**RE: CHARTER BANK, ONE PRESIDENTIAL PLAZA (E17-D56). DRAINAGE REPORT FOR  
ROUGH GRADING, FOUNDATION PERMIT, AND BUILDING PERMIT APPROVALS.  
ENGINEER'S STAMP DATED MAY 1, 1998.**

Dear Mr. Topmiller:

Based upon the information provided in your May 1, 1998 submittal, the above referenced project is approved for Rough Grading, Foundation, and Building Permits. The Revised Master Drainage Plan for One Presidential Plaza (E17-D55) had been approved for Building Permit on May 13, 1998.

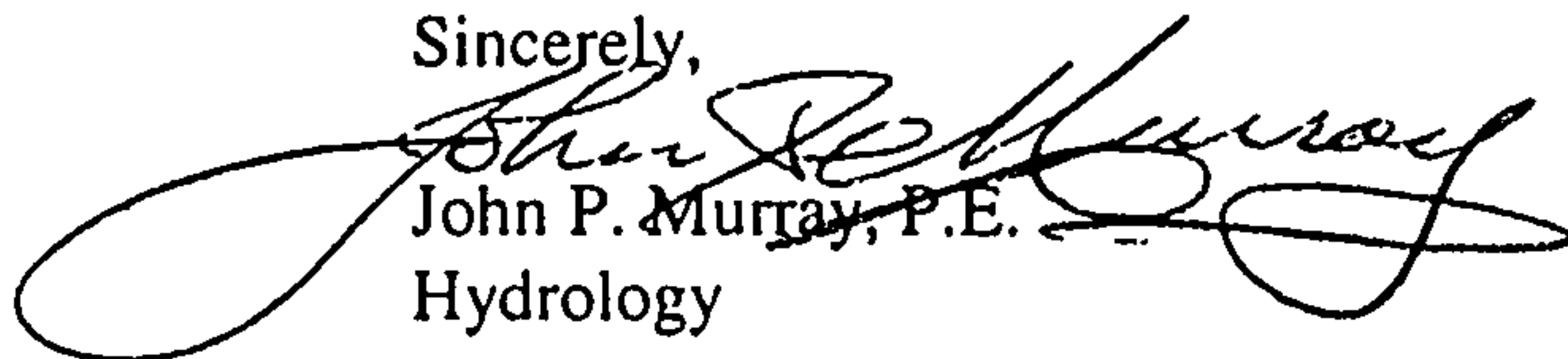
Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Prior to Certificate of Occupancy approval, an Engineer's Certification will be required.

Note on G&D Plan for Charter Bank that it is Basin B of Master Drainage Plan for One Presidential Plaza. Both G&D and Detail Plans are labeled Sh. A1.1. Indicate maximum water depth on typical pond cross-section detail. As presently configured, fencing of the ponds will be required (See enclosed p.170 of Rev.DPM).

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

  
John P. Murray, P.E.  
Hydrology

c: ☒ Andrew Garcia  
☒ File

Good for You, Albuquerque!



**DRAINAGE REPORT FOR  
CHARTER BANK  
ONE PRESIDENTIAL PLAZA**

**MAY 1, 1998**

Prepared for:

**Charter Bank  
and  
Dekker/Perich & Associates, PC  
6801 Jefferson NE  
Suite 100  
Albuquerque, NM 87109**

Prepared by:

**Bohannon Huston  
7500 Jefferson NE  
Courtyard I  
Albuquerque, NM 87109**

PREPARED BY:



*James R. Topmiller*  
James R. Topmiller, P.E.

Date

*5-1-98*

## **I. INTRODUCTION**

This report presents a drainage and grading plan for the development of a Charter Bank site within One Presidential Plaza. One Presidential Plaza is a proposed commercial subdivision located in the southeast corner of the intersection of Osuna and Jefferson roads. The project consists of a single main building structure, surrounded by paved parking areas, driveways, and landscaping.

## **II. PURPOSE OF REPORT**

The purpose of this report is to submit a grading and drainage plan for the proposed bank development in order to obtain foundation permit by June 1, 1998 and building permit by July 1, 1998. No public infrastructure items are anticipated to accomplish within this development nor do any further platting actions need to be performed (see Section IV in this report for further explanation).

## **III. METHODOLOGIES AND REFERENCES**

The hydraulic and hydrology calculations provided herein are performed in accordance with the City of Albuquerque Process Manual for a 100-year and 10-year, 6-hour storm events. The site is located within Precipitation Zone 2.

The proposed drainage conditions presented in Section VII herein comply with the Revised Master Drainage Plan for One Presidential Plaza, City Hydrology File E17-D55. This revised master plan was submitted simultaneously with but separately to this bank site report. In summary, the Master Plan required that development of this tract to restrict flows to existing discharge rates in both the 10-year and the 100-year design storm. The 10-year design storm becomes of greater interest in this particular situation due to the discharge of flows to a City major arterial, Osuna Road.

\*\*\*

#### **IV. RELATED SITE DEVELOPMENT ACTIONS**

This bank site represents the first developed property within the One Presidential Plaza commercial subdivision. The subdivision (final plat) process is nearing completion at this time but is not yet complete. The site development plan for the commercial subdivision had been reviewed and approved, with conditions, by the Environmental Planning Commission and delegated to Development Review Board (DRB). The site plan has now been approved by the DRB. Final plat have been reviewed and delegated by the DRB until financial guarantees can be presented to the board. The developer of the commercial subdivision is currently in the process of obtaining and processing those financial guarantees.

The design of construction plans for the development of the proposed public and private roads to serve the property, as identified in the Master Site Development Plan approved the Environmental Planning Commission is underway. Work order for construction of these roads, both private and public, is anticipated to be approved in June, 1998.

Preliminary discussions with Mr. Fred Aguirre have indicated that when the financial guarantees are in place, building permit for the bank site could be approved subject to the condition that permanent certificates of occupancy would not be approved until the public work order work was complete. Any deviation from this scenario would require further discussions and approvals. ✓

#### **V. SITE LOCATION AND CHARACTERISTICS**

The bank site is located on the south side of Osuna Road (paved four-lane road), just east of Jefferson Street. The site is currently vacant and is lightly covered with grasses and small shrubs. It currently drains in a sheet flow fashion westerly to Jefferson Street (paved four-lane road). Ground slopes are mild and range from 2% to 4% on the site.

Osuna Road is a major arterial road. Jefferson Street is a minor arterial.



## VI. EXISTING HYDROLOGIC CONDITIONS

As identified in the Master Plan, the site is located completely within Basin B of the Master Drainage Plan. This 2.1-acre basin today generates 3.6 cfs in the 100-year design storm and 1.1 cfs in the 10-year design storm. These flows are currently discharged in a sheet flow manner to the west, eventually entering Jefferson Street and draining north to Osuna Road.

## VII. PROPOSED HYDROLOGIC CONDITIONS

In accordance with the revised Master Plan, the site will develop in the manner identified on the final grading/drainage plan as provided on Plate 1 in the rear pocket of this report. Developed flows will be restricted to the allowable discharge rates identified in the Master Plan (2.45 cfs for Basin B) through the use of detention ponding schemes. In order to accomplish the required restriction of developed flows, the site was subdivided into three drainage basins. These basins are identified on Plate 4 in the rear pocket of this report.

Basin B-1 (0.63 acres) comprises primarily half of the roadways around the site and a portion of the adjacent sidewalk and landscaping area. This basin generates 2.8 cfs in the 100-year storm event and 2.33 cfs in the 10-year storm event. Due to its location outside the "developable land" itself and no practical place for ponding, this flow will be permitted free discharge without restriction.

Basins B-2 and B-3 will however be restricted to 0.12 cfs by the use of hydraulically-connected detention ponds. These two basins will be permitted a controlled discharge of 0.12 cfs to the adjacent street. The total overall detention pond volume then is approximately 10000 cubic feet, minimum.

Basin B-2 (0.8 acres) generates 3.4 cfs in the 100-year storm event and 2.22 cfs in the 10-year event. The basin must be restricted to 0.06 cfs in the 10-year event (a pro-rated portion of the total allowable discharge of 0.12 cfs shared between Basins B-2 and B-3). This restriction will be accomplished by the pond and controls identified on the grading/drainage plan. Pond B-2 will discharge to Pond B-3 via 4" pipe connection. The pond volume of Pond B-2 is 3400 cubic feet.

6" shown

\*  
\*  
\*  
\*

Basin B-3 (0.67 acres) generates 3.0 cfs in the 100-year storm event and 1.98 cfs in the 10-year storm event in developed conditions. This flow must be restricted to 0.12 cfs in the 10-year storm event (pro-rated share) through the use of a separate detention pond and pond outlet controls. This pond will discharge to the private street via 4" pipe connection. The calculations for these controls are provided in the Appendix. The B-3 pond volume is 6700 cubic feet.

BOHANNAN HUSTON  
Courtlyard One  
7500 JEFFERSON NE  
Albuquerque  
NEW MEXICO 87109  
voice 505.823.1000  
fax 505.821.0892

In the event of storm events exceeding the design storm or blockage of the pond outlet, spillways are typically required. For these ponds, the "spill" can occur over the retaining wall located on the west side of pond. The top of wall elevation is lower on this side and would evenly discharge flow over the wall to sidewalk below, then street (all hard surfaces). There is little or no downstream damage potential by this spillway concept.

private road      Okay RE: Fred A.

With the pond controls in place and the free discharge of flows from B-1 basin, the total 10-year storm discharge from the site is 2.45 cfs (2.33 cfs from Basin B-1 plus 0.12 cfs from Basins B-2/B-3 single pond outlet) which complies with the Master Plan allowable discharge from Basin B.

In the 100-year storm event, the revised Master Drainage Plan requires a maximum discharge of 8.5 cfs (2.1 acres x 4.06 cfs/acre). The developed site generates 9.2 cfs, which exceeds the 8.5 cfs allowable. However, the ponding required for the 10-year storm (which due to the Osuna Road one-lane open requirement, is the controlling pond size criteria), the provided ponding reduces discharge from Basins B-2/B-3 to less than 1 cfs. The adjacent street (Basin B-1) discharges 2.8 cfs, so a total of 3.8 cfs, or less, is discharged in the 100-year storm event, well below the 8.5 cfs allowable.

SECTION 7  
PART F  
OF  
Drain. Ord.  
FENCE



**VIII. CONCLUSION**

With the presentation of this report, we are requesting foundation permit, rough grading permit and building permit approval for the proposed bank project. In accordance with our discussions with City staff, it is understood that permanent Certificates of Occupancy will be withheld until the adjacent road improvements have been constructed via public work order projects.



BOHANNAN HUSTON  
Courtlyard One  
7500 JEFFERSON NE  
Albuquerque  
NEW MEXICO 87109  
voice 505.823.1000  
fax 505 821 0892

# CHARTER BANK HYDROLOGY CALCULATIONS

## I. EXISTING CONDITIONS

Acreage = 2.1 acres

$Q_{100} = 8.5 \text{ cfs}$  (from approved Master Plan)

Zone 2

## II. PROPOSED CONDITIONS - 100-YEAR Storm Event

1. Basin B-1

Total Acreage = 0.63 acres

Land treatment B = 0.04 ac

C = 0.03 ac

D = 0.56 ac

$$Q_{100} = 0.04(2.28 \text{ cfs/ac}) + 0.03(3.14) + 0.56(4.7)$$

$$\boxed{Q_{100} = 2.8 \text{ cfs}} \text{ (100-year, 6-hour)} \\ \text{(using Table A-9, OPM)}$$

Basin B-2

Total Acreages = 0.8 ac

Land treatment B = 0.08 ac

" " C = 0.08

" " D = 0.63 ac

$$Q_{100} = 0.08(2.28) + 0.08(3.14) + 0.63(4.7)$$

$$\boxed{Q_{100} = 3.4 \text{ cfs}}$$

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10000 BOHANNON DRIVE  
HOUSTON, TEXAS 77055  
(713) 861-1111

CHARTER BANK

Basin B-3

total Average = 0.67 ac

land treatment B = 0.035

" " C = 0.035

" " D = 0.60

$$Q_{100} = 0.035(2.28) + 0.035(3.14) + 0.60(4.7)$$

$$Q_{100} = 3.0 \text{ cfs}$$

TOTAL SITE FLOW (including to center of adjacent roads) = 9.2 cfs (100-yr)  
100-year

Since 9.2 cfs > 8.5 cfs allowed by Master Plan, detention ponding is required.

## 2. DETENTION PONDING (100-year storm)

- Basin B-1 can not be ponded, it will be allowed free discharge.
- Basin B-2 and B-3 will have individual ponds, sized to proportionately restrict discharge to allowables

- RESULT. (see also text in report)  
The pond sizes/volumes are controlled by the 10-year storm discharge allowed by the Master Plan.

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# III. PROPOSED CONDITIONS - 10-YEAR<sup>\*\*\*</sup> storm event

1. Basin B-1,  $Q_{10} = 2.33$  cfs

(using total acreage &  
land treatment % from  
section II, but applying  
10-year rates from table A-9 in bpm)

Basin B-2,  $Q_{10} = 2.2$  cfs

Basin B-3,  $Q_{10} = 2.36$  cfs

total site Flow =  $2.33 + 2.2 + 2.36$   
 $\approx 6.9$  cfs (10-yr) generated flow

Since  $6.9$  cfs  $> 2.45$  cfs allowable, by Master Plan,  
detention ponding is req'd.

## 2. DETENTION PONDING

- Basin B-1 will not be ponded.

- Basins B-2 and B-3 will be hydraulically-  
connected via pipe to the ponds. Allowable  
discharge is  $0.12$  cfs by Master Plan.  
Req'd ponding is  $9994$  cubic ft.  
(see attached)

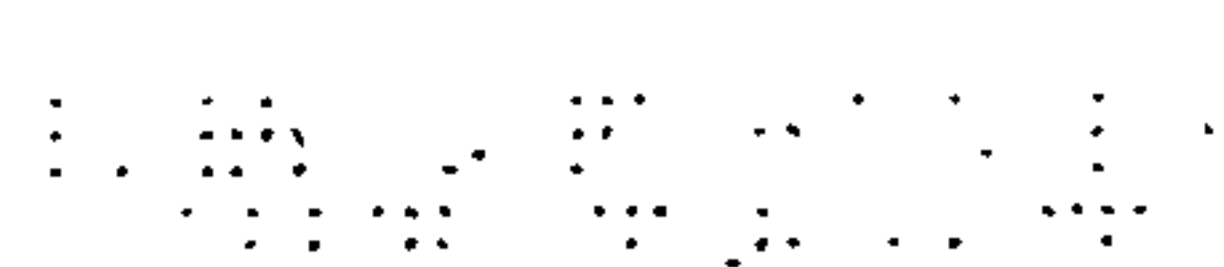
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# Detention Pond Volume Calculations, 10-Year Calculation

required pond  
volume  
calculation

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. 10-year, 6-hour storm event

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

Zone	A	B	C	D
1	0.24	0.76	1.49	2.89
2	0.38	0.95	1.71	3.14
3	0.58	1.19	2.00	3.39
4	0.87	1.45	2.26	3.57

Basin Name :

Choose Zone (1 - 4)

Basin Area = (acres)

Exist Conditions				Proposed Conditions			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A		1.35	0.51	A		0.00	0.00
B		0.00	0.00	B		0.15	0.14
C		0.04	0.08	C		0.15	0.25
D		0.07	0.23	D		1.18	3.69
Q Peak - exist.=			0.82	Peak Q Developed=			4.08

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ??

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)

$$\%A \times E = 0.00$$

$$\%B \times E = 0.08$$

$$\%C \times E = 0.11$$

$$\%D \times E = 1.70$$

$$\text{Avg E(in)} = 1.89$$

Determine Tb (hours)

$$Tb = 1.231$$

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

$$Tc =$$

Determine Tp and Duration of Peak (hours)

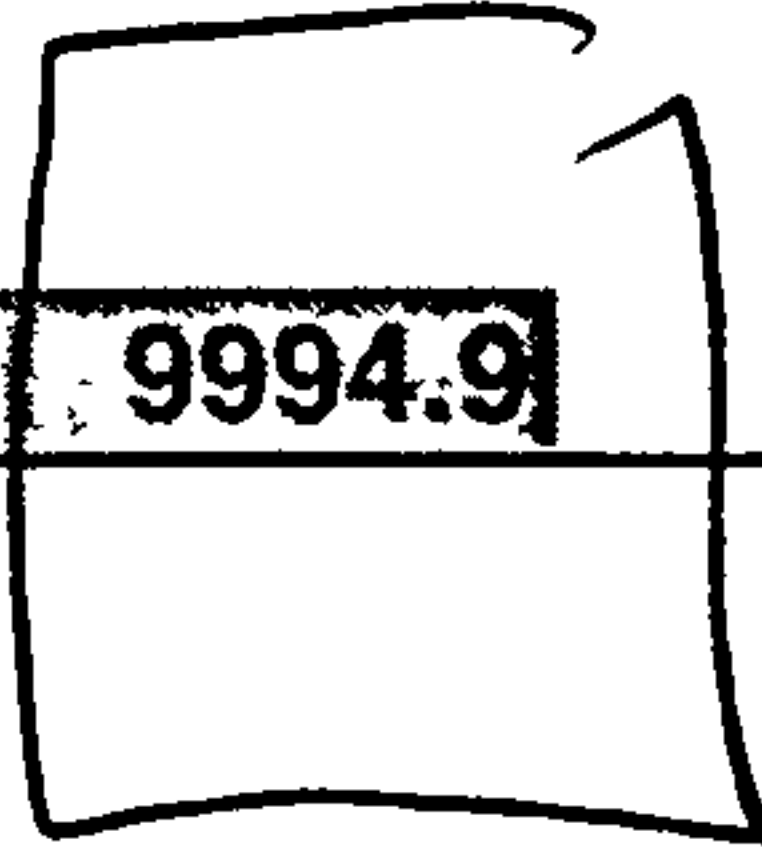
$T_p = 0.206667$   
Peak Duration = 0.2

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Compute the required retention volume using the simple hydrograph, Figure A-3 in DPM Section 22.

Time to Control Q (hrs) = 0.006  
Time to end of Control Q (hrs) = 1.206983  
Duration of Control Q (hrs) = 1.201

**Required Detention Volume (CF) = 9994.9**



POND  
VOLUME  
REQ'D  
(minimum)



# POND VOLUMES

Pond B-2

Approximate  
overall pond

surface area = 1439 sq ft

Approx. Average depth = 2.4'

Volume = 3460 cubic feet

Pond B-3

Surface Area = 2800 sq ft

Avg. depth = 2.4'

Volume = 6700 cubic ft.

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TOTAL = 10,100 cubic ft.  
OK

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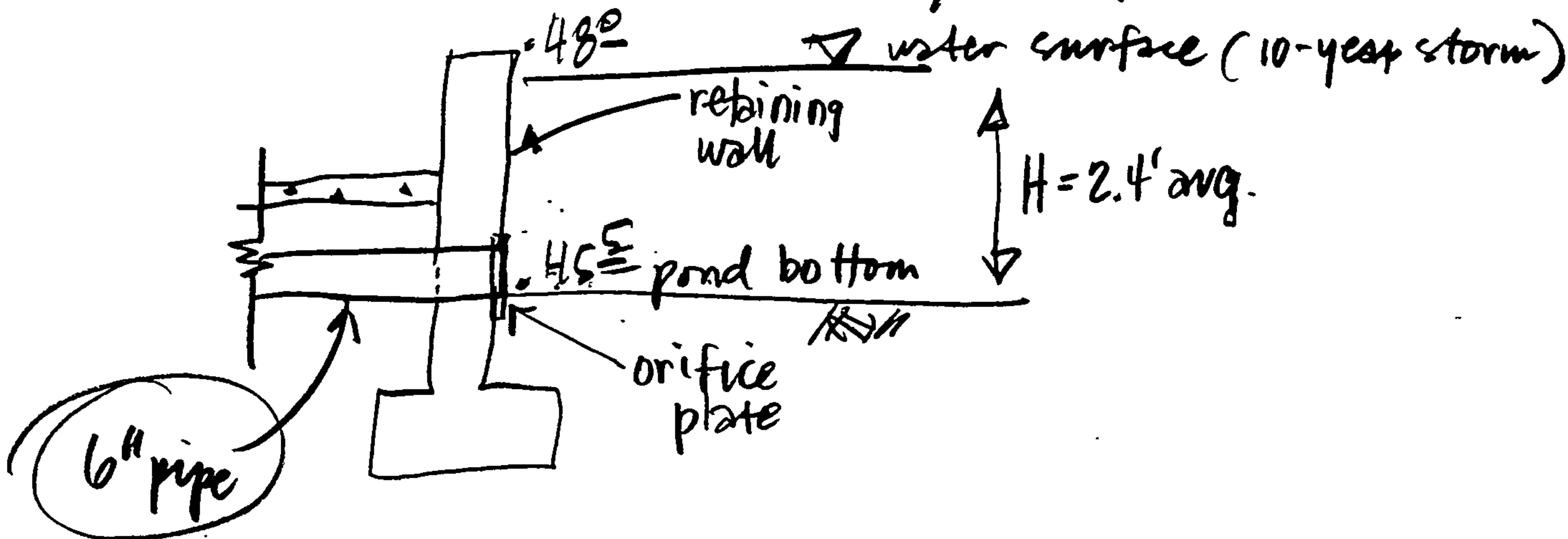


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# CALCULATE OUTLET CONTROLS

Pond B-2 (North pond from Basin B-2)

Allowable Discharge = 0.06 cfs (proposed discharge based on basin size)  
Use Orifice Control over/on Pipe Outlet



Using orifice control:

$$Q = CA\sqrt{2gh}, \text{ where } Q = 0.06 \text{ cfs}$$

$$\text{Area of Orifice, } A = 0.008 \text{ sq. ft}$$

$$\text{Orifice diameter} = 1.2" \quad (\text{circular})$$

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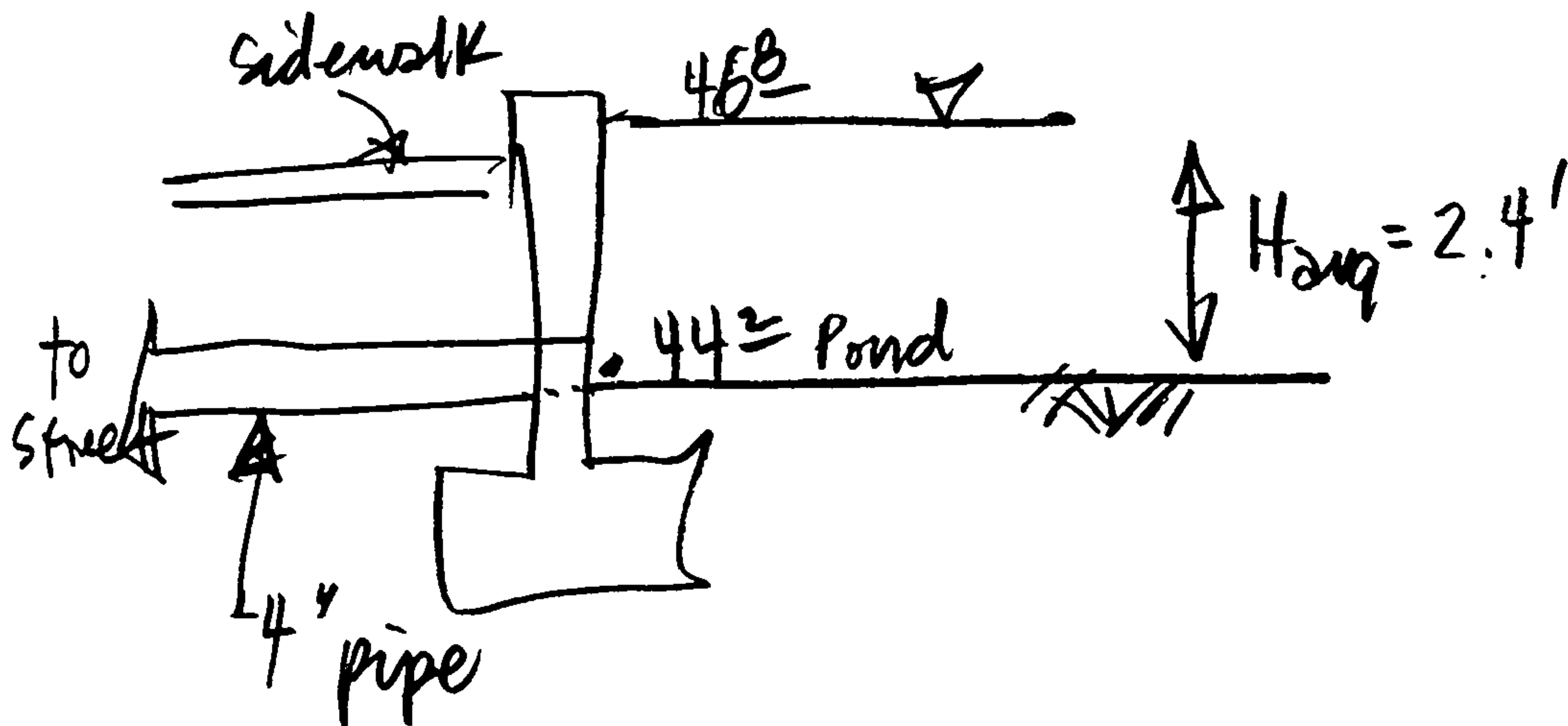
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CIVIL ENGINEERS

# Pond B-3 (south pond)

Allowable Discharge = 0.12 cfs



orifice controls rise

$$Q = CA\sqrt{2gh}$$

$$A = 0.016 \text{ sq. ft.}$$

$$\text{Dia. of Orifice} = 0.14' = 1.7'' (\text{inches})$$

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0.0000000000000000000000000000000246519032881566189191165176650824130710759618523297996042003631591796875 0.00000000000000000000000000000001232595164407830945955825883254120653553798092616489980210018157958984375 0.000000000000000000000000000000006162975822039154729779129416270603267768990463082449901050090789794921875 0.0000000000000000000000000000000030814879110195773648895647081353016338844952315412249505250453948974609375 0.00000000000000000000000000000000154074395550978868244478235406765081694224761577061247526252269744873046875 0.000000000000000000000000000000000770371977754894341222391177033825408471123807885306237631261348724365234375 0.0000000000000000000000000000000003851859888774471706111955885169127042355619039426531188156306743621826171875 0.00000000000000000000000000000000019259299443872358530559779425845635211778095197132655940781533718109130859375 0.000000000000000000000000000000000096296497219361792652798897129228176058890475985663279703907668590545654296875 0.0000000000000000000000000000000000481482486096808963263994485646140880294452379928316398519538342952728271484375 0.00000000000000000000000000000000002407412430484044816319972428230704401472261899641581992597691714763641357421875 0.000000000000000000000000000000000012037062152420224081599862141153522007361309498207909962988458573818206787109375 0.0000000000000000000000000000000000060185310762101120407999310705767610036806547491039549814942292869091033935546875 0.00000000000000000000000000000000000300926553810505602039996553528838050184032737455197749074711464345455169677734375 0.000000000000000000000000000000000001504632769052528010199982767644190250920163687275988745373557321727275848388671875 0.00000000000000000000000000000000000075231638452626400509999138382209512546008184363799437268677866086363792416943359375 0.000000000000000000000000000000000000376158192263132002549995691911047562730040921826897186343389330431818962084716796875 0.0000000000000000000000000000000000001880790961315660012749978459555237813650204609134485931716946652159094810423583984375 0.0000000000000000000000000000000000000940395480657830006374989229777618906825102304567222965858473326079547405211791696875 0.00000000000000000000000000000000000004701977403289150031874946148888094534125511522836114829292366630397737026058958484375 0.000000000000000000000000000000000000023509887016445750159374730744440472670627557614180574146461833151988685130294792421875 0.0000000000000000000000000000000000000117549435082228750796873653722202363503137788070902870732309165759943425651473962109375 0.00000000000000000000000000000000000000587747175411143753984368268611011817515688940354514353661545828799717128257369810546875 0.000000000000000000000000000000000000002938735877055718769921841343055059087578444701772571768307729143998585641286849052734375 0.0000000000000000000000000000000000000014693679385278593849609206715275295437892223508862858841538645719992928206434245263671875 0.0000000000000000000000000000000000000007346839692639296924804603357637647718946111754431429420769322859996464103217122631684375 0.00000000000000000000000000000000000000036734198463196484624023016788188238594730558777217147103846614299982320516085613158421875 0.000000000000000000000000000000000000000183670992315982423120115083940941192973652793886085735519233071499911602580428065792109375 0.00918354961579912115600575419704705964868263969430428677596165357499558012902140328960546875 0.004591774807899560578002877098523529824341319847152143387980826787497790064510701644802734375 0.0022958874039497802890014385492617649121706599235760716939904133937488950322553508224013671875 0.00114794370197489014450071927463088245608532996178803584699520669687444751612767541120068359375 0.000573971850987445072250359637315441228042664980894017923497603348437223758063837705600341796875 0.0002869859254937225361251798186577206140213324904470089617488016742186118790319188528001708984375 0.00014349296274686126806258990932886030701066624522350448087440083710930593951595942640008544921875 0.0071746481373430634031294954664430153505333122611752240437200418554652969757979713200042724609375 0.00358732406867153170156474773322150767526665613058761202186002092773264848789898566000213623046875 0.001793662034335765850782373866610753837633328065293806010930010463866324243949492830001068115234375 0.00089683101716788292539118693330537691881666640326469030046500523193316212197474641500005340576171875 0.00044841550858394146269559346665268845940833320163234515023250261596658106098737320750002670288089375 0.0002242077542919707313477967333263442297041666008161725751162513079832905304936866037500133514440446875 0.00011210387714598536567389836666317211485208330040808628755812565399164526524684330187500667572202234375 0.0056051938572992682836949183331586057426041650204043143779062826995822632623421650937500333786101171875 0.00280259692864963414184745916657930287130208251020215718895314134979113163117108254687500166893050859375 0.0014012984643248170709237295832896514356510412551010785944765706748955658155855412734375000834465254296875 0.0007006492321624085354618647916448257178255206275505392972382853374477829077927706367187500041723262771484375 0.0003503246160812042677309323958224128589127603137752696486191426687238914



# Detention Pond Volume Calculations, 100-year Calculation

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 :

Choose Zone (1 - 4)

Basin Area = (acres)

Exist Conditions				Proposed Conditions			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A		1.35	2.11	A		0.00	0.00
B		0.00	0.00	B		0.15	0.34
C		0.04	0.14	C		0.15	0.46
D		0.07	0.35	D		1.18	5.53
Q Peak - exist=			2.59	Peak Q Developed=			6.32

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ??

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)

$$\begin{aligned}\%A \times E &= 0.00 \\ \%B \times E &= 0.08 \\ \%C \times E &= 0.11 \\ \%D \times E &= 1.70 \\ \text{Avg } E(\text{in}) &= 1.89\end{aligned}$$

Determine Tb (hours)

$$T_b = 0.724$$

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

$$T_c =$$

Determine Tp and Duration of Peak (hours)

$$\begin{aligned}T_p &= 0.206667 \\ \text{Peak Duration} &= 0.2\end{aligned}$$

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

$$\begin{aligned}\text{Time to Control } Q \text{ (hrs)} &= 0.033 \\ \text{Time to end of Control } Q \text{ (hrs)} &= 0.673989 \\ \text{Duration of Control } Q \text{ (hrs)} &= 0.641\end{aligned}$$

Required Detention Volume (CF) = 8062.34

BASIN

B-2, B-3

1 cfs  
discharge  
from ponds,

this means  
that actual  
discharge is  
less than  
1 cfs (since  
the full ponding  
capacity is still  
not used at  
1 cfs)

still  
less than  
ponding  
actually  
req'd (ie, 10,000 cubic ft)

