

January 28, 2020

PROPOSED NEW BASIN CALCULATIONS
FOR THE SEC OF COX & TYLERSVILLE REDEVELOPMENT

1) **CYS Calculation:** (See Attached Drainage Map)

1 year pre-development (1986 ±) (See Attached Pages 1-2)

CN = 79 - Bayer Becker (2005) + AMB (1986)

Tc = 1.0 hour - Bayer Becker (2005) + AMB (1986)

Area = 69 Ac

Q_1 peak = 36.09 CFS

1 yr Volume = 6.005 Ac. Ft.

1 year proposed development (2020 ±) (See Attached Pages 3-4)

CN = 92.0

Tc = .37 hours

Area = 69 Ac

Q_1 peak = 135.14 CFS

1 yr Volume = 11.34 Ac. Ft.

$$\frac{11.34 \text{ Ac} - \text{ft} - 6.00 \text{ Ac} - \text{Ft}}{6.00 \text{ Ac. Ft.}} = 89\%$$

10 yr is the CYS

2) WQV:

$$WQV = R_v \times P \times A / 12$$

$$R_v = 0.05 + 0.9 (.76) = 0.734$$

$$P = 0.9 \text{ in}$$

$$A = 66 \text{ Ac}$$

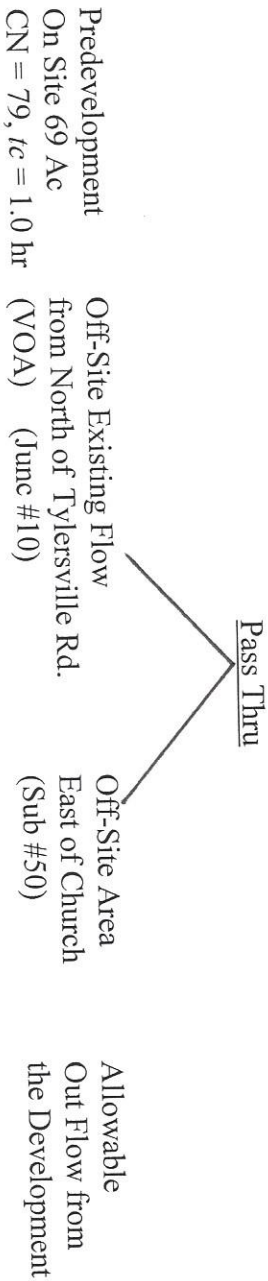
$$WQV = .734 \times .9 \text{ in} \times 66 \text{ Ac} / 12$$

$$= 3.633 \text{ Ac. Ft.}$$

$$= 158,266.5 \text{ C.F. @ } 873.23 \pm$$

3) System Design: (See Attached TR55 Calculations)

10 yr is the CYS



Design Out-Flow from the new Development			
$Q_1 = 36.09$ CFS	$Q_{10} = 70.6$ CFS	$Q_{10} = 110.59$ CFS	$Q_{10} = 64.98$ CFS
$Q_{10} = 73.68$ CFS	$Q_{25} = 84.22$ CFS	$Q_{25} = 162.65$ CFS	$Q_{25} = 84.38$ CFS
$Q_{25} = 92.34$ CFS	$Q_{50} = 95.93$ CFS	$Q_{50} = 193.73$ CFS	$Q_{50} = 102.27$ CFS
$Q_{50} = 108.25$ CFS	$Q_{100} = 112.02$ CFS	$Q_{100} = 226.6$ CFS	$Q_{100} = 125.57$ CFS

Revised 1-28-2020

AREA NORTH OF
TYLERSVILLE RD

PONDIO

SUB AREA 40

SUB AREA
80
EX KROGER
06.523.5F3
22.64A

SUB
AREA
590
11.44AC

React 10

SUB AREA
70
17.13 AC

SUB AREA
60
9.35Ac

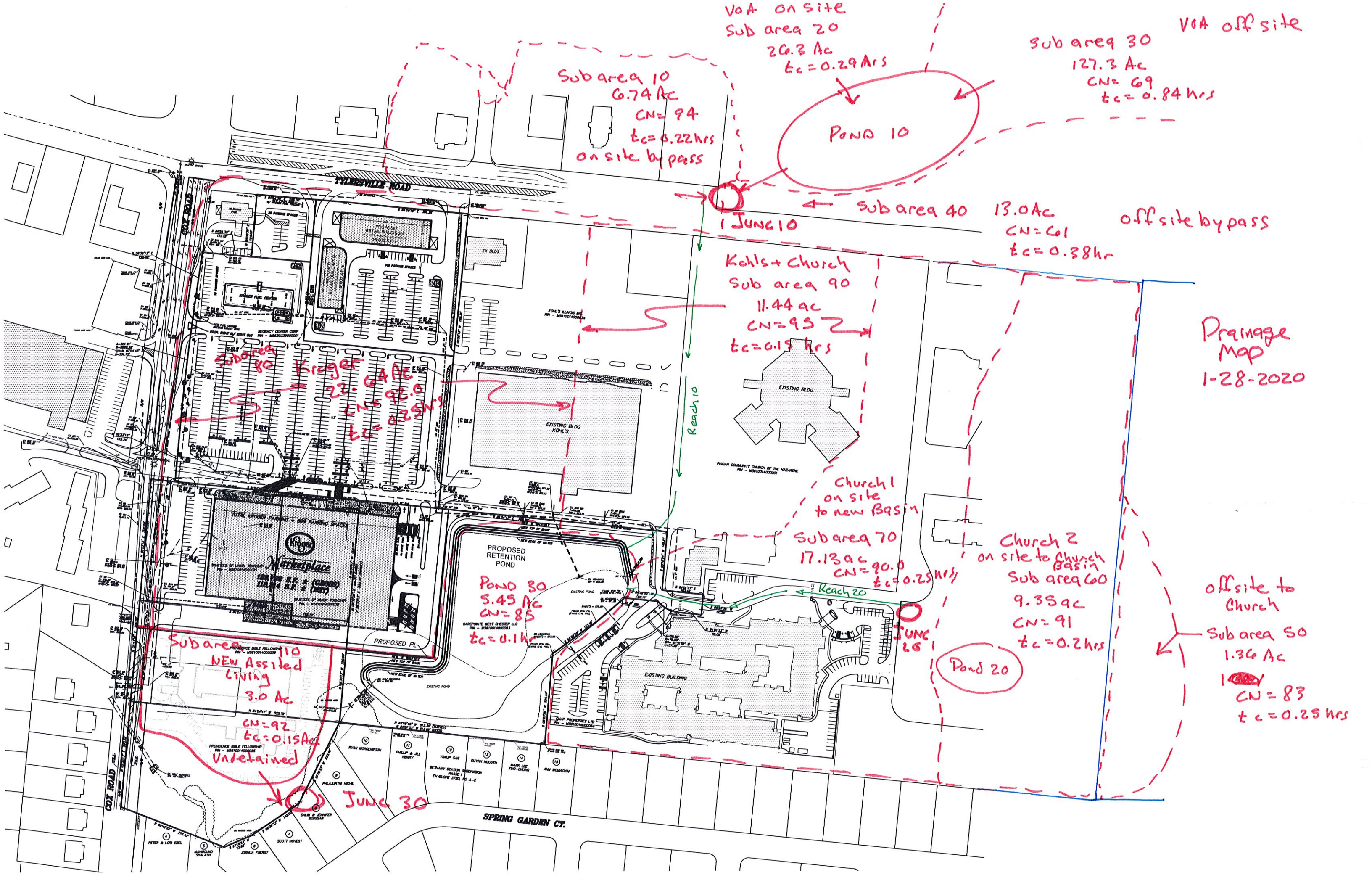
SUB AREA
50
1.36 Ac

SUB AREA
100
S. 45A

Sub Area
110
3.0 AC

5.22± ACRES (GROSS)

~~60Ac~~
69Ac



VOA on site
Sub area 20
26.3 Ac
 $t_c = 0.29$ hrs

VOA off site
Sub area 30
127.3 Ac
CN = 69
 $t_c = 0.84$ hrs

Sub area 10
6.74 Ac
CN = 94
 $t_c = 0.22$ hrs
on site by pass

Pond 10

Sub area 40
13.0 Ac
CN = 61
 $t_c = 0.38$ hr

off site by pass

Kohl's + Church
Sub area 90
11.44 ac
CN = 95
 $t_c = 0.15$ hrs

EXISTING BLDG

PRODH COMMUNITY CHURCH OF THE NAZARENE
PVI - 4081001400000

Church 1
on site
to new Basin

Sub area 70
17.13 ac
CN = 90.0
 $t_c = 0.25$ hrs

Church 2
on site to Church
Basin
Sub area 60
9.35 ac
CN = 91
 $t_c = 0.2$ hrs

Drainage
Map
1-28-2020

off site to
Church
Sub area 50
1.36 Ac
CN = 83
 $t_c = 0.25$ hrs

Sub area 80
Kroger
22.64 Ac
CN = 92.0
 $t_c = 0.25$ hrs

Kroger
Marketplace
22.64 Ac
CN = 92.0
 $t_c = 0.25$ hrs

Pond 30
5.45 Ac
CN = 85
 $t_c = 0.1$ hr

Sub area 110
NEW Assisted
Living
3.0 Ac
CN = 92
 $t_c = 0.15$ Ac
Undetained

Pond 20

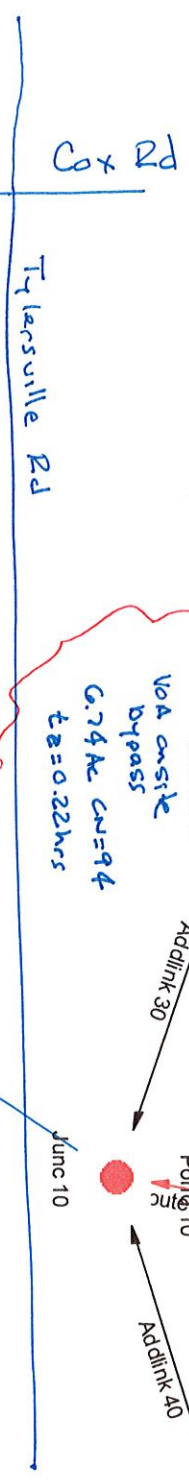
JUNE 30

SPRING GARDEN CT.

7303-9-20-19-prog-sys

SYSTEM MAP 1-28-2020

173.34K
North of
Tylersville Rd



Subarea 10
VOA onsite
bypass
6.74 Ac CN=94
tc=0.22hrs

VOA onsite
to basin
24.31 Ac CN=96
tc=0.29hrs



VOA offsite
to basin
121.3 Ac CN=69
tc=0.84 hrs

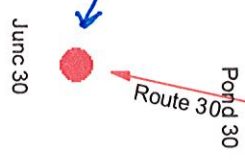
Subarea 40
offsite
by pass
13.0 Ac CN=61
tc=0.38 Ac

Koger
22.64 Ac CN=92
tc=0.25 hrs

Kohl's
11.44 Ac CN=95
tc=0.15 hrs

Pond
3.45 Ac CN=85
tc=0.1 hr

Subarea 110
undertained
New Assisted
Living
3.0 Ac
CN=92
tc=0.15 Ac



Reach 20
48" e 0.5%



Sub 50

Church 1
on site
to new basin
17.13 Ac CN=96.0
tc=0.25 hrs

Church 2
on site to
Church basin
9.35 Ac CN=91
tc=0.24

offsite
to Church
basin
1.36 Ac CN=83
tc=0.25 hrs

SITE
AREA
= 691 Ac

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Butler

Return Event	Total Depth in	Rainfall Type	RNF ID	
-----	-----	-----	-----	-----
1	2.8000	Synthetic Curve	TypeII	24hr
5	3.6000	Synthetic Curve	TypeII	24hr
10	4.1000	Synthetic Curve	TypeII	24hr
25	4.7000	Synthetic Curve	TypeII	24hr
50	5.2000	Synthetic Curve	TypeII	24hr
100	5.8000	Synthetic Curve	TypeII	24hr
2	2.9000	Synthetic Curve	TypeII	24hr

694c
Site Only

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
-----	-----	-----	-----	---	-----	-----	-----	-----
*JUNC 30	JCT	1	6.006		12.5500	36.09		
*JUNC 30	JCT	5	9.453		12.5000	58.62		
*JUNC 30	JCT	10	11.759		12.5000	73.68		
*JUNC 30	JCT	25	14.635		12.5000	92.34		
*JUNC 30	JCT	50	17.104		12.5000	108.25		
*JUNC 30	JCT	100	20.134		12.5000	127.64		
*JUNC 30	JCT	2	6.416		12.5500	38.78		
SUBAREA 90	AREA	1	6.006		12.5500	36.09		
SUBAREA 90	AREA	5	9.453		12.5000	58.62		
SUBAREA 90	AREA	10	11.759		12.5000	73.68		
SUBAREA 90	AREA	25	14.635		12.5000	92.34		
SUBAREA 90	AREA	50	17.104		12.5000	108.25		
SUBAREA 90	AREA	100	20.134		12.5000	127.64		
SUBAREA 90	AREA	2	6.416		12.5500	38.78		

Type.... Unit Hyd. Summary Page 7.03
Name.... SUBAREA 90 Tag: 1 Event: 1 yr
File.... C:\Haestad\PROJECTS\7303_9_20_19_EXISTING_ON_SITE_ONLY.PPW
Storm... TypeII 24hr Tag: 1

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
Duration = 24.0000 hrs Rain Depth = 2.8000 in
Rain Dir = C:\Haestad\PROJECTS\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\Haestad\PROJECTS\
HYG File - ID = - SUBAREA 90 1
Tc = 1.0000 hrs
Drainage Area = 69.000 acres Runoff CN= 79

=====
Computational Time Increment = .13333 hrs
Computed Peak Time = 12.5333 hrs
Computed Peak Flow = 36.33 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.5500 hrs
Peak Flow, Interpolated Output = 36.09 cfs
=====

69 Ac
Site Only

DRAINAGE AREA

ID:SUBAREA 90
CN = 79
Area = 69.000 acres
S = 2.6582 in
0.2S = .5316 in

Cumulative Runoff

1.0444 in
6.005 ac-ft

HYG Volume... 6.006 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 1.00000 hrs (ID: SUBAREA 90)
Computational Incr, Tm = .13333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 78.18 cfs
Unit peak time Tp = .66667 hrs
Unit receding limb, Tr = 2.66667 hrs
Total unit time, Tb = 3.33333 hrs

Type.... Unit Hyd. Summary Page 7.03
Name.... SUBAREA 90 Tag: 1 Event: 1 yr
File.... C:\Haestad\PROJECTS\7303_9_20_19_PROP_ON_SITE_ONLY.PPW
Storm... TypeII 24hr Tag: 1

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
Duration = 24.0000 hrs Rain Depth = 2.8000 in
Rain Dir = C:\Haestad\PROJECTS\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\Haestad\PROJECTS\
HYG File - ID = - SUBAREA 90 1
Tc = .3700 hrs
Drainage Area = 69.000 acres Runoff CN= 92

69 Ac
Site Only

=====
Computational Time Increment = .04933 hrs
Computed Peak Time = 12.0867 hrs
Computed Peak Flow = 135.79 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.1000 hrs
Peak Flow, Interpolated Output = 135.14 cfs
=====

DRAINAGE AREA

ID: SUBAREA 90
CN = 92
Area = 69.000 acres
S = .8696 in
0.2S = .1739 in

Cumulative Runoff

1.9728 in
11.344 ac-ft

HYG Volume... 11.343 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .37000 hrs (ID: SUBAREA 90)
Computational Incr, Tm = .04933 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 211.30 cfs
Unit peak time, Tp = .24667 hrs
Unit receding limb, Tr = .98667 hrs
Total unit time, Tb = 1.23333 hrs

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Butler

Return Event	Total Depth in	Rainfall Type	RNF ID	
-----	-----	-----	-----	
1	2.8000	Synthetic Curve	TypeII	24hr
5	3.6000	Synthetic Curve	TypeII	24hr
10	4.1000	Synthetic Curve	TypeII	24hr
25	4.7000	Synthetic Curve	TypeII	24hr
50	5.2000	Synthetic Curve	TypeII	24hr
100	5.8000	Synthetic Curve	TypeII	24hr
2	2.9000	Synthetic Curve	TypeII	24hr

69 Ac
Site onlyMASTER NETWORK SUMMARY
SCS Unit Hydrograph Method(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
-----	-----	-----	-----	---	-----	-----	-----	-----
*JUNC 30	JCT	1	11.343		12.1000	135.14		
*JUNC 30	JCT	5	15.711		12.1000	184.87		
*JUNC 30	JCT	10	18.480		12.1000	215.85		
*JUNC 30	JCT	25	21.829		12.1000	252.89		
*JUNC 30	JCT	50	24.635		12.1000	283.63		
*JUNC 30	JCT	100	28.017		12.1000	320.39		
*JUNC 30	JCT	2	11.883		12.1000	141.36		
SUBAREA 90	AREA	1	11.343		12.1000	135.14		
SUBAREA 90	AREA	5	15.711		12.1000	184.87		
SUBAREA 90	AREA	10	18.480		12.1000	215.85		
SUBAREA 90	AREA	25	21.829		12.1000	252.89		
SUBAREA 90	AREA	50	24.635		12.1000	283.63		
SUBAREA 90	AREA	100	28.017		12.1000	320.39		
SUBAREA 90	AREA	2	11.883		12.1000	141.36		

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Butler

Return Event	Total Depth in	Rainfall Type	RNF ID	
-----	-----	-----	-----	-----
1	2.8000	Synthetic Curve	TypeII	24hr
5	3.6000	Synthetic Curve	TypeII	24hr
10	4.1000	Synthetic Curve	TypeII	24hr
25	4.7000	Synthetic Curve	TypeII	24hr
50	5.2000	Synthetic Curve	TypeII	24hr
100	5.8000	Synthetic Curve	TypeII	24hr
2	2.9000	Synthetic Curve	TypeII	24hr

DA to combined
outlet

= 243.7 Ac

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol cu.ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage cu.ft
-----	-----	-----	-----	---	-----	-----	-----	-----
JUNC 10	JCT	1	552733		12.7000	36.53		
JUNC 10	JCT	5	869871		12.7500	57.82		
JUNC 10	JCT	10	1087485		12.8000	70.60		
JUNC 10	JCT	25	1363837		12.6000	84.22		
JUNC 10	JCT	50	1604522		12.1000	95.93		
JUNC 10	JCT	100	1903581		12.1000	112.02		
JUNC 10	JCT	2	589901		12.7000	39.19		
JUNC 20	JCT	1	70359		12.2500	7.87		
JUNC 20	JCT	5	99075		12.2000	15.18		
JUNC 20	JCT	10	117403		12.1500	20.25		
JUNC 20	JCT	25	139654		12.1500	26.89		
JUNC 20	JCT	50	158356		12.1500	32.67		
JUNC 20	JCT	100	180940		12.1500	38.85		
JUNC 20	JCT	2	73895		12.2500	8.66		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol cu.ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage cu.ft
*JUNC 30	JCT	1	1011783	R	14.0000	30.94		
*JUNC 30	JCT	5	1519801	R	13.1000	59.42		
*JUNC 30	JCT	10	1858899	R	13.9500	64.98		
*JUNC 30	JCT	25	2282505	R	13.8500	84.38		
*JUNC 30	JCT	50	2646773	R	13.7000	102.27		
*JUNC 30	JCT	100	3094960	R	13.4000	125.57		
*JUNC 30	JCT	2	1072496	R	14.0000	33.52		
POND 10	IN	POND	1		12.1000	76.71		
POND 10	IN	POND	5		12.1000	116.65		
POND 10	IN	POND	10		12.1000	144.65		
POND 10	IN	POND	25		12.1000	180.14		
POND 10	IN	POND	50		12.1000	210.94		
POND 10	IN	POND	100		12.1500	249.34		
POND 10	IN	POND	2		12.1000	81.27		
POND 10	OUT	POND	1		12.7500	34.11	880.96	114891
POND 10	OUT	POND	5		12.8000	54.26	881.64	195710
POND 10	OUT	POND	10		12.8500	66.36	882.05	258553
POND 10	OUT	POND	25		12.9000	78.93	882.56	345000
POND 10	OUT	POND	50		12.9500	87.81	883.01	429098
POND 10	OUT	POND	100		13.0000	100.74	883.54	533563
POND 10	OUT	POND	2		12.7500	36.62	881.04	123525
POND 20	IN	POND	1		12.0000	24.69		
POND 20	IN	POND	5		12.0000	34.35		
POND 20	IN	POND	10		12.0000	40.41		
POND 20	IN	POND	25		12.0000	47.68		
POND 20	IN	POND	50		12.0000	53.72		
POND 20	IN	POND	100		12.0000	60.95		
POND 20	IN	POND	2		12.0000	25.89		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol cu.ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage cu.ft
POND 20	OUT	POND 1	70360		12.2500	7.87	885.97	27638
POND 20	OUT	POND 5	99075		12.2000	15.18	886.26	36098
POND 20	OUT	POND 10	117403		12.1500	20.25	886.41	40617
POND 20	OUT	POND 25	139654		12.1500	26.89	886.57	45723
POND 20	OUT	POND 50	158356		12.1500	32.67	886.68	49367
POND 20	OUT	POND 100	180941		12.1500	38.85	886.79	53287
POND 20	OUT	POND 2	73896		12.2500	8.66	886.01	28771
POND 30	IN	POND 1	1018977		12.0500	161.29		
POND 30	IN	POND 5	1519307		12.0500	225.59		
POND 30	IN	POND 10	1853431		12.0500	268.95		
POND 30	IN	POND 25	2270952		12.0500	323.30		
POND 30	IN	POND 50	2630112		12.0500	369.51		
POND 30	IN	POND 100	3072082		12.0500	425.42		
POND 30	IN	POND 2	1078758		12.0500	169.05		
POND 30	OUT	POND 1	990301	R	14.0500	30.65	875.12	447579
POND 30	OUT	POND 5	1490045	R	14.5000	58.90	875.82	571410
POND 30	OUT	POND 10	1823898	R	13.9500	64.51	876.56	709427
POND 30	OUT	POND 25	2241161	R	13.8500	83.81	877.20	831104
POND 30	OUT	POND 50	2600115	R	13.7000	101.59	877.55	897918
POND 30	OUT	POND 100	3041895	R	13.4500	124.69	877.90	966044
POND 30	OUT	POND 2	1049991	R	14.0000	33.21	875.23	467492
SUBAREA 10	AREA	1	52772		12.0000	17.61		
SUBAREA 10	AREA	5	71758		12.0000	23.57		
SUBAREA 10	AREA	10	83728		12.0000	27.27		
SUBAREA 10	AREA	25	98157		12.0000	31.69		
SUBAREA 10	AREA	50	110222		12.0000	35.36		
SUBAREA 10	AREA	100	124735		12.0000	39.75		
SUBAREA 10	AREA	2	55131		12.0000	18.35		

6.74 Ac

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation; Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol cu.ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage cu.ft
SUBAREA 100	AREA	1	28124		11.9500	11.65		
SUBAREA 100	AREA	5	41615		11.9500	17.12		
5.45 Ac SUBAREA 100	AREA	10	50392		11.9500	20.60		
SUBAREA 100	AREA	25	61164		11.9500	24.81		
SUBAREA 100	AREA	50	70293		11.9500	28.34		
SUBAREA 100	AREA	100	81388		11.9500	32.56		
SUBAREA 100	AREA	2	29763		11.9500	12.32		
SUBAREA 110	AREA	1	21483		11.9000	8.84		
SUBAREA 110	AREA	5	29756		11.9000	12.09		
3.0 Ac SUBAREA 110	AREA	10	35001		11.9000	14.12		
SUBAREA 110	AREA	25	41344		11.9000	16.54		
SUBAREA 110	AREA	50	46660		11.9000	18.55		
SUBAREA 110	AREA	100	53065		11.9000	20.95		
SUBAREA 110	AREA	2	22506		11.9000	9.24		
SUBAREA 20	AREA	1	224882		12.0500	66.00		
SUBAREA 20	AREA	5	300186		12.0500	86.71		
26.3 Ac SUBAREA 20	AREA	10	347447		12.0500	99.58		
SUBAREA 20	AREA	25	404286		12.0500	114.96		
SUBAREA 20	AREA	50	451726		12.0500	127.73		
SUBAREA 20	AREA	100	508717		12.0500	143.02		
SUBAREA 20	AREA	2	234266		12.0500	68.60		
SUBAREA 30	AREA	1	261290		12.4500	33.37		
SUBAREA 30	AREA	5	468761		12.4500	68.24		
127.3 Ac SUBAREA 30	AREA	10	615561		12.4500	93.18		
SUBAREA 30	AREA	25	805128		12.4500	125.30		
SUBAREA 30	AREA	50	972242		12.4000	153.51		
SUBAREA 30	AREA	100	1181764		12.4000	189.16		
SUBAREA 30	AREA	2	285038		12.4500	37.28		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol cu.ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage cu.ft
SUBAREA 40	AREA	1	13798		12.2000	2.00		
SUBAREA 40	AREA	5	29176		12.1500	6.00		
SUBAREA 40	AREA	10	40760		12.1500	9.27		
SUBAREA 40	AREA	25	56275		12.1500	13.68		
SUBAREA 40	AREA	50	70342		12.1500	17.66		
SUBAREA 40	AREA	100	88374		12.1500	22.74		
SUBAREA 40	AREA	2	15476		12.2000	2.41		
SUBAREA 50	AREA	1	6355		12.0500	2.12		
SUBAREA 50	AREA	5	9592		12.0500	3.20		
SUBAREA 50	AREA	10	11716		12.0500	3.90		
SUBAREA 50	AREA	25	14336		12.0500	4.75		
SUBAREA 50	AREA	50	16566		12.0500	5.46		
SUBAREA 50	AREA	100	19284		12.0500	6.33		
SUBAREA 50	AREA	2	6746		12.0500	2.25		
SUBAREA 60	AREA	1	64026		12.0000	22.68		
SUBAREA 60	AREA	5	89505		12.0000	31.28		
SUBAREA 60	AREA	10	105709		12.0000	36.65		
SUBAREA 60	AREA	25	125339		12.0000	43.07		
SUBAREA 60	AREA	50	141811		12.0000	48.40		
SUBAREA 60	AREA	100	161678		12.0000	54.77		
SUBAREA 60	AREA	2	67171		12.0000	23.76		
SUBAREA 70	AREA	1	112013		12.0500	36.96		
SUBAREA 70	AREA	5	158050		12.0500	51.45		
SUBAREA 70	AREA	10	187427		12.0500	60.51		
SUBAREA 70	AREA	25	223084		12.0500	71.37		
SUBAREA 70	AREA	50	253047		12.0500	80.39		
SUBAREA 70	AREA	100	289225		12.0500	91.17		
SUBAREA 70	AREA	2	117682		12.0500	38.77		

MASTER NETWORK SUMMARY
 SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
 (Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

22.64A

11.44A

Node ID	Type	Return Event	HYG Vol cu.ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage cu.ft
SUBAREA 80	AREA	1	162136		12.0500	52.80		
SUBAREA 80	AREA	5	224572		12.0500	71.95		
SUBAREA 80	AREA	10	264155		12.0500	83.87		
SUBAREA 80	AREA	25	312024		12.0500	98.12		
SUBAREA 80	AREA	50	352139		12.0500	109.94		
SUBAREA 80	AREA	100	400475		12.0500	124.07		
SUBAREA 80	AREA	2	169860		12.0500	55.19		
SUBAREA 90	AREA	1	93619		11.9500	34.04		
SUBAREA 90	AREA	5	126130		11.9500	45.14		
SUBAREA 90	AREA	10	146578		11.9500	52.03		
SUBAREA 90	AREA	25	171196		11.9500	60.25		
SUBAREA 90	AREA	50	191760		11.9500	67.08		
SUBAREA 90	AREA	100	216478		11.9500	75.24		
SUBAREA 90	AREA	2	97664		11.9500	35.44		

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POND VOLUME CALCULATIONS

Planimeter scale: 1.00 ft/in

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sq ^r (A1*A2) (acres)	Volume (cu.ft)	Volume Sum (cu.ft)
872.30	146500.000	3.3632	.0000	0	0
873.00	152000.000	3.4894	10.2783	104471	104471
874.00	160800.000	3.6915	10.7699	156379	260850
876.00	183750.000	4.2183	11.8559	344295	605145
878.00	196900.000	4.5202	13.1052	380574	985719
878.50	200000.000	4.5914	13.6672	99224	1084943

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$\text{Volume} = (1/3) * (\text{EL2}-\text{EL1}) * (\text{Area1} + \text{Area2} + \text{sq.rt.}(\text{Area1}*\text{Area2}))$$

where: EL1, EL2 = Lower and upper elevations of the increment
 Area1,Area2 = Areas computed for EL1, EL2, respectively
 Volume = Incremental volume between EL1 and EL2

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REQUESTED POND WS ELEVATIONS:

Min. Elev.= 872.30 ft
Increment = .20 ft
Max. Elev.= 878.50 ft

OUTLET CONNECTIVITY

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft	
-----	----		-----	-----	-----	
User Defined Table	U0	--->	TW	873.220	878.500	- culvert (Ex)
Orifice-Circular	O0	--->	TW	872.300	878.500	- wq control 8" diameter (prop)
Weir-XY Points	W0	--->	TW	876.820	878.500	- overflow weir (Ex)
TW SETUP, DS Channel						

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OUTLET STRUCTURE INPUT DATA

Structure ID = U0
Structure Type = User Defined Table

ELEV-FLOW RATING TABLE

Elev, ft	Flow, cfs
-----	-----
873.22	.10
873.40	.41
873.60	1.61
873.80	3.64
874.00	6.51
874.20	9.94
874.40	13.40
874.60	17.17
874.80	21.22
875.00	25.37
875.20	29.72
875.40	34.11
875.60	68.68
875.80	43.29
876.00	47.98
876.20	52.62
876.40	57.37
876.60	61.96
876.80	66.59
877.00	71.18
877.20	75.61
877.40	80.00
877.60	84.20
877.80	88.24
878.00	92.23
878.20	95.90
878.40	99.26
878.50	100.30

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OUTLET STRUCTURE INPUT DATA

Structure ID = 00
Structure Type = Orifice-Circular

of Openings = 1
Invert Elev. = 872.30 ft
Diameter = .6700 ft
Orifice Coeff. = .610

Structure ID = W0
Structure Type = Weir-XY Points

of Openings = 1
WEIR X-Y GROUND POINTS

X, ft	Elev, ft
.00	878.50
8.00	876.96
16.00	876.82
24.00	878.50

Lowest Elev. = 876.82 ft
Weir Coeff. = 2.600000
Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

LEVEL POOL ROUTING DATA

HYG Dir = C:\Haestad\PROJECTS\
 Inflow HYG file = NONE STORED - POND 30 IN 1
 Outflow HYG file = NONE STORED - POND 30 OUT 1

Pond Node Data = POND 30
 Pond Volume Data = POND 30
 Pond Outlet Data = Outlet 3

No Infiltration

INITIAL CONDITIONS

 Starting WS Elev = 872.30 ft
 Starting Volume = 0 cu.ft
 Starting Outflow = .00 cfs
 Starting Infiltr. = .00 cfs
 Starting Total Qout= .00 cfs
 Time Increment = .0500 hrs

Elevation ft	Outflow cfs	Storage cu.ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
872.30	.00	0	3.3632	.00	.00	.00
872.50	.11	29458	3.3990	.00	.11	327.41
872.70	.39	59229	3.4350	.00	.39	658.49
872.90	.79	89305	3.4713	.00	.79	993.07
873.10	1.18	119711	3.5094	.00	1.18	1331.29
873.22	1.42	138117	3.5334	.00	1.42	1536.05
873.30	1.64	150461	3.5494	.00	1.64	1673.43
873.50	2.61	181561	3.5897	.00	2.61	2019.95
873.70	4.41	213013	3.6303	.00	4.41	2371.21
873.90	7.01	244809	3.6710	.00	7.01	2727.12
874.10	10.31	276982	3.7170	.00	10.31	3087.89
874.30	13.90	309589	3.7682	.00	13.90	3453.78
874.50	17.64	342645	3.8199	.00	17.64	3824.81
874.70	21.67	376152	3.8719	.00	21.67	4201.14
874.90	25.89	410103	3.9242	.00	25.89	4582.59
875.10	30.25	444522	3.9769	.00	30.25	4969.38
875.30	34.73	479401	4.0299	.00	34.73	5361.41
875.50	54.32	514744	4.0833	.00	54.32	5773.70
875.70	59.00	550554	4.1371	.00	59.00	6176.27
875.90	48.75	586823	4.1911	.00	48.75	6569.00

LEVEL POOL ROUTING DATA

HYG Dir = C:\Haestad\PROJECTS\
 Inflow HYG file = NONE STORED - POND 30 IN 1
 Outflow HYG file = NONE STORED - POND 30 OUT 1

Pond Node Data = POND 30
 Pond Volume Data = POND 30
 Pond Outlet Data = Outlet 3

No Infiltration

INITIAL CONDITIONS

 Starting WS Elev = 872.30 ft
 Starting Volume = 0 cu.ft
 Starting Outflow = .00 cfs
 Starting Infiltr. = .00 cfs
 Starting Total Qout= .00 cfs
 Time Increment = .0500 hrs

Elevation ft	Outflow cfs	Storage cu.ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
876.10	53.51	623548	4.2332	.00	53.51	6981.82
876.30	58.30	660559	4.2629	.00	58.30	7397.84
876.50	63.06	697830	4.2928	.00	63.06	7816.73
876.70	67.75	735362	4.3228	.00	67.75	8238.44
876.82	70.58	758004	4.3408	.00	70.58	8492.85
876.90	72.55	773144	4.3529	.00	72.55	8663.04
877.10	79.26	811200	4.3831	.00	79.26	9092.59
877.30	88.01	849519	4.4134	.00	88.01	9527.11
877.50	98.51	888103	4.4438	.00	98.51	9966.32
877.70	110.70	926952	4.4743	.00	110.70	10410.17
877.90	124.70	966056	4.5049	.00	124.70	10858.65
878.10	140.52	1005436	4.5344	.00	140.52	11312.03
878.30	158.10	1045065	4.5628	.00	158.10	11769.94
878.50	177.04	1084943	4.5914	.00	177.04	12231.96

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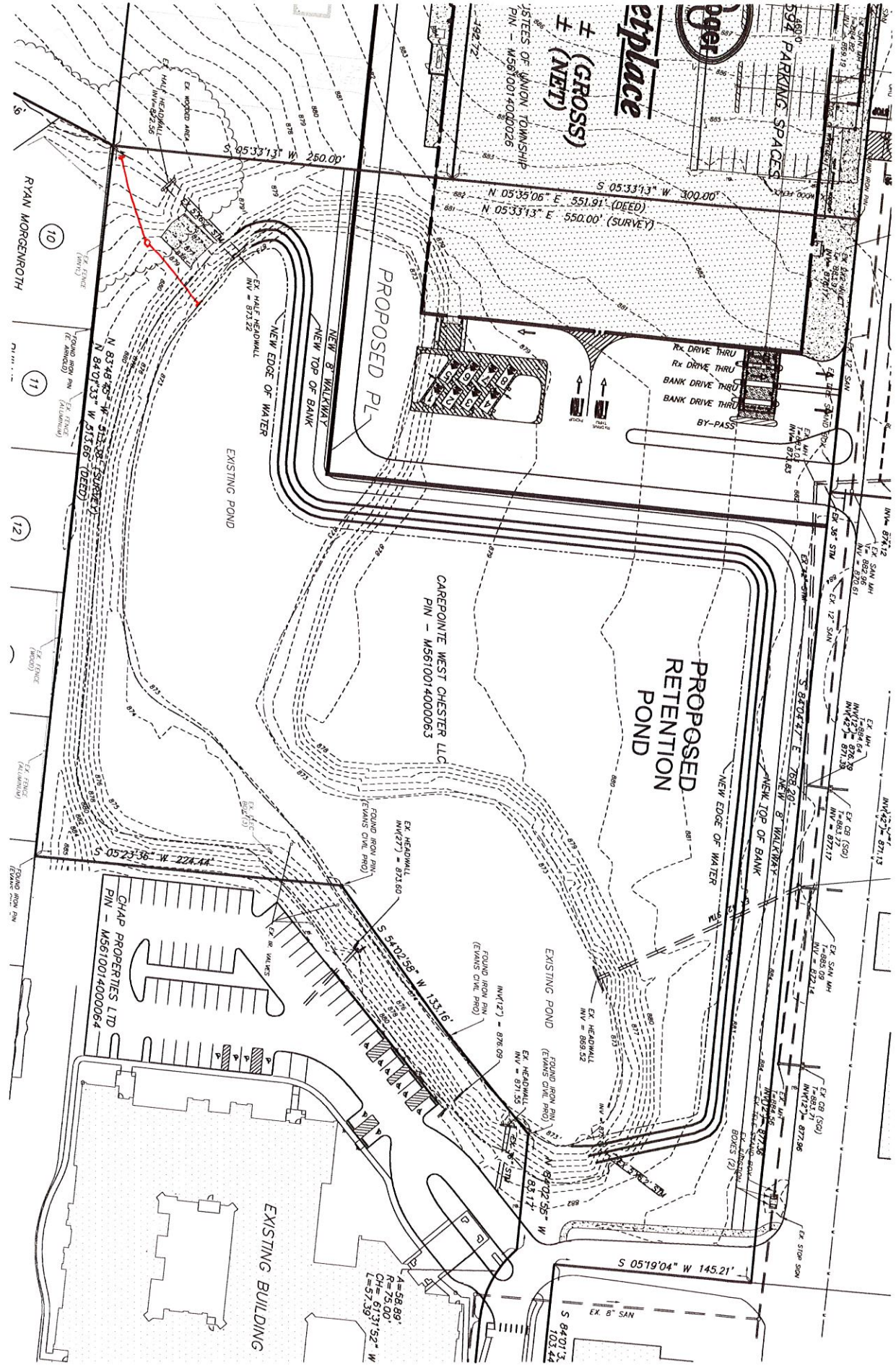
New Basin

Cox & Tinsville

TGA # 7303
1-28-2020

0 100' 200'

1"=100'

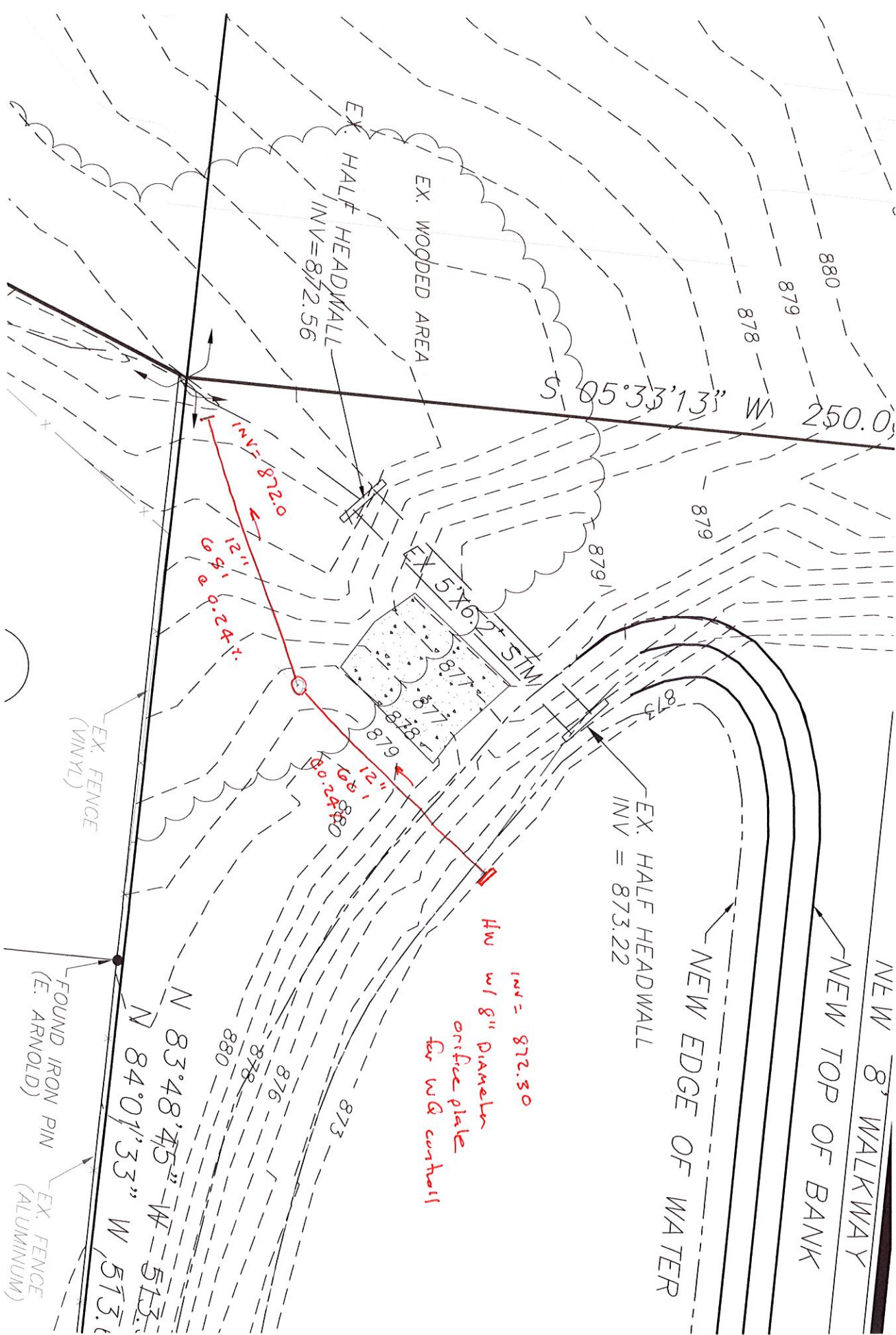


Cox + Tyldsville
TGA # 7303
1-28-2020

W& outlet

1" = 30'

0 30' 60'



PROJECT: Kroger
Cox & Tylersville
JOB No. 7303A
ORIFICE
SIZE(INCHES)

8

43733.00

ELEVATION	VOLUME (CF)	STAGE	RATE (CFS)	CHANGE IN VOLUME (CF)	TIME (HRS)
872.30	0.00	0.00	0	0.00	
872.76	79133.00	0.46	1.1589	79133.00	18.97
873.23	158266.00	0.47	1.6478	79133.00	13.34

TOTAL TIME

32.31