FINAL DRAINAGE REPORT

for:

STONECREEK SUBDIVISION SECTION 1

Prepared For:

JAGOE DEVELOPMENT CORPORATION
4215 BENTTREE DRIVE
OWENSBORO, KY 42304-3019

By:

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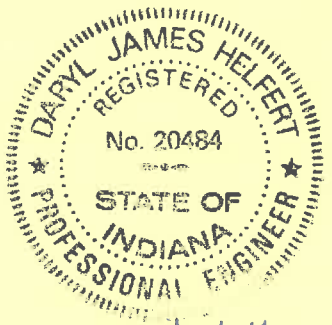
EVANSVILLE, IN 47713-1222
(812) 464-9585



Daryl J Helfert

DECEMBER 1999

PUD
WEST OF
CREEK

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Stonecreek Subdivision - Section 1

The site is located directly across from the existing intersection of Cayes Drive and Kansas Road in Center Township, Vanderburgh County.

The site consists of flat ground that has been previously cultivated. The entire site drains directly to Firlick Creek. The Floodway and Floodplain boundaries are depicted on the enclosed utility/drainage plan drawing along with the 100 yr/25 yr storm elevations provided by the Department of Natural Resources.

A retention basin will be constructed on site to provide adequate storm water detention. Storm water runoff will be conveyed to the basin via storm sewers, swales, and overland flow. Due to the topography, storm runoff from part of the site will be allowed to exit the property undetained. The total allowable discharge for the site was determined to be 6.87 cfs, which is the peak runoff rate for the 10-year storm under undeveloped conditions. When taking into account the undetained runoff leaving the site and the off-site runoff being captured and routed through the proposed retention basin, the allowable discharge rate is increased to 13.48 cfs for a 25 year storm for developed conditions. The required storm water detention volume from the Form 800 calculations is 13,899 cubic feet for the 25 year storm. The total storage volume available for the basin is 49,507 cubic feet. Due to the excess storage volume in the basin, the discharge rate was decreased to 1.7 cfs and a new Form 800 was calculated showing a required storage volume of 44,528 cubic feet which is still below the total storage volume available. Utilizing a 12" RCP as the primary spillway outlet at elevation 390.50 feet, the total storage volume provided is 46,344 cubic feet at elevation 394.3 feet for the 25 year storm.

Please note that the difference from the allowable discharge rate of 13.48 cfs and the discharge rate of the proposed basin of 1.7 cfs is 11.78 cfs. Due to future sections of Stonecreek Subdivision being directly across from Section 1 along Firlick Creek, we would like to be able to use, if needed, the additional runoff rate of 11.78 cfs for future sections. We would like to have this noted in the minutes of the Drainage Board Meeting.

As can be seen on the drainage plan, a portion of the proposed primary spillway pipe is located within the defined Floodway. Before any construction can occur within the Floodway, a Construction in a Floodway Permit will have to be obtained from the Indiana Department of Natural Resources, Division of Water. We ask that final drainage approval be given on condition that a DNR permit be obtained and submitted to the County Surveyor's Office.

The site is located in the designated 100 year flood zone according to the FIRM Panel Number 180256 0025 C, dated August 5, 1991. The location of the Floodway and Floodplain lines as parcel plots by scale on approved study by DNR dated July 21, 1999 - REC #82-990611-1 is shown.

Based on the most recent soil survey for Vanderburgh County, the following soil types are located on the proposed site: Henshaw Silt Loam (He) and Wilbur Silt Loam (Wm).

TABLE 803

UNDEVELOPED RUNOFF COEFFICIENTS (C_u)

SURFACE TYPE:

WOODLAND, TURFED MEADOWS
ROUGH PASTURE, FALLOW BRUSH:

SLOPE:	
Less than 2%	C = 0.12
2% to 5%	C = 0.24
5+% to 10%	C = 0.36
Over 10%	C = 0.48

CULTIVATED FIELDS:

Less than 2%	C = 0.20
2% to 5%	C = 0.35
5+% to 10%	C = 0.50
Over 10%	C = 0.65

TABLE 804

DEVELOPED RUNOFF COEFFICIENTS (C_d)

SURFACE TYPE:

PAVEMENT, ROOFTOP
OTHER IMPERVIOUS SURFACES:

Less than 2%	C = 0.92
2% to 5%	C = 0.94
5+% to 10%	C = 0.96
Over 10%	C = 0.98

LAWNS WITH TURF:

Less than 2%	C = 0.15
2% to 5%	C = 0.25
5+% to 10%	C = 0.40
Over 10%	C = 0.55

ALL WATER SURFACES
BASINS, PONDS & LAKES:

C = 1.00

Table 3.2.4 (cont'd)

Kerby (1959)

$$t_c = K\ (L\ N\ s^{-0.5})^{0.467}$$

where K is equal to 0.83 (US Customary units) or 1.44 (Metric units), L is the length of flow in ft (m), s is the average slope of overland flow, ft/ft (m/m), and N is the retardance roughness coefficient given in Table 3.2.5.

The length used in the equation is the straight-line distance from the most distant point of the watershed to the outlet, measured parallel to the slope of the land until a well-defined channel is reached. Watersheds of less than 10 acres were used to calibrate the model; slopes were less than 1%; N values were 0.8 and less and surface flow dominated (McCuen, 1989).

Izzard (1946)

$$t_c = \frac{K(Bi + c')\ L^{\frac{1}{3}}}{s^{\frac{1}{3}}\ i^{\frac{2}{3}}}$$

where K is equal to 41.025 for U.S. customary units (113.391 for metric), B is equal to 0.0007 for U.S custumary units (0.00027 for metric), c′ is the retardance coefficient given in Table 3.2.7, *i* is the rainfall intensity, in/hr (cm/hr), L is the length of flow path in ft (m), and s is the slope of overland flow path, ft/ft (m/m).

The product of *i* and L must be less than 500 in-ft/hr (390 cm-m/hr) to consider using this formula. In addition, well defined channels should not be present. This method was developed in laboratory experiments for the overland flow on roadway and turf surfaces.

Table 3.2.5
Values of N for Kerby's Formula (Kerby, 1959)

Type of Surface	N
Smooth impervious surface	0.02
Smooth bare packed soil	0.10
Poor grass, cultivated row crops or moderately rough bare surface	0.20
Deciduous timberland	0.60
Pasture or Overage grass	0.40
Conifer timberland, deciduous timberland with deep forest litter or dense grass	0.80

TABLE 807

RAINFALL INTENSITY-DURATION-FREQUENCY TABLE FOR EVANSVILLE

INTENSITY IN INCHES PER HOUR

STORM DURATION	STORM RETURN PERIOD IN YEARS				
	5	10	25	50	100
5 MIN	6.063	6.625	7.208	7.936	8.469
10 MIN	4.863	5.380	5.925	6.616	7.126
15 MIN	4.029	4.515	5.033	5.697	6.194
30 MIN	2.837	3.226	3.646	4.194	4.608
60 MIN	1.549	1.819	2.078	2.412	2.663
2.0 HRS	1.053	1.230	1.400	1.620	1.785
3.0 HRS	0.774	0.899	1.019	1.175	1.291
4.0 HRS	0.632	0.736	0.836	0.965	1.062
5.0 HRS	0.524	0.606	0.684	0.785	0.861
6.0 HRS	0.453	0.522	0.589	0.676	0.741
7.0 HRS	0.399	0.459	0.516	0.591	0.647
8.0 HRS	0.358	0.412	0.463	0.530	0.581
9.0 HRS	0.323	0.370	0.415	0.472	0.516
10 HRS	0.297	0.339	0.379	0.431	0.470
11 HRS	0.276	0.314	0.351	0.399	0.435
12 HRS	0.259	0.296	0.331	0.376	0.410
13 HRS	0.245	0.280	0.314	0.357	0.390
14 HRS	0.233	0.267	0.299	0.341	0.372
15 HRS	0.220	0.252	0.281	0.320	0.349
16 HRS	0.209	0.238	0.266	0.302	0.329
17 HRS	0.198	0.225	0.251	0.284	0.310

SOIL SURVEY OF

Vanderburgh County, Indiana

United States Department of Agriculture
Soil Conservation Service
In cooperation with

Purdue University Agricultural
Experiment Station

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. Other information is given in tables as follows:

Map symbol	Mapping unit	Described on page	Capability unit		Tree and shrub group
			Symbol	Page	Number
AlB2	Alford silt loam, 2 to 6 percent slopes, eroded	11	IIe-3	41	III
AlC2	Alford silt loam, 6 to 12 percent slopes, eroded	11	IIIe-3	43	III
AlC3	Alford silt loam, 6 to 12 percent slopes, severely eroded	12	IVe-3	45	III
AlD3	Alford silt loam, 12 to 18 percent slopes, severely eroded	12	VIe-1	46	III
Ba	Bartle silt loam	15	IIw-3	42	II
Bd	Birds silt loam	16	IIIw-10	44	I
Bo	Bonnie silt loam	16	IIIw-10	44	I
Br	Borrow pits	16	VIIe-3	46	IV
Ev	Evansville silt loam	17	IIw-1	41	I
Gn	Ginat silt loam	17	IIIw-12	45	I
Gu	Gullied land	17	VIIe-4	47	IV
He	Henshaw silt loam	19	IIw-2	42	II
HoA	Hosmer silt loam, 0 to 2 percent slopes	20	IIw-5	43	II
HoB2	Hosmer silt loam, 2 to 6 percent slopes, eroded	20	IIe-7	41	II
HoB3	Hosmer silt loam, 2 to 6 percent slopes, severely eroded	20	IIIe-7	43	II
HoC2	Hosmer silt loam, 6 to 12 percent slopes, eroded	20	IIIe-7	43	II
HoC3	Hosmer silt loam, 6 to 12 percent slopes, severely eroded	21	IVe-7	45	II
HoD3	Hosmer silt loam, 12 to 18 percent slopes, severely eroded	21	VIe-1	46	II
--	Huntington silty clay loam	22	I-2	41	III
--	Huntington fine sandy loam, sandy variant	22	I-2	41	III
IoA	Iona silt loam, 0 to 2 percent slopes	23	I-1	41	III
IoB2	Iona silt loam, 2 to 6 percent slopes, eroded	23	IIe-3	41	III
Iv	Iva silt loam	25	IIw-2	42	II
Ln	Lindside silty clay loam	24	I-2	41	III
Ma	Made land	24	VIIe-3	46	IV
MkB2	Markland silt loam, 2 to 6 percent slopes, eroded	24	IIIe-11	43	II
MkC2	Markland silt loam, 6 to 18 percent slopes, eroded	24	IVe-11	45	II
MlC3	Markland silty clay loam, 6 to 18 percent slopes, severely eroded	25	VIe-1	46	II
Mr	McGary silt loam	26	IIIw-6	44	II
MuA	Muren silt loam, 0 to 2 percent slopes	27	I-1	41	III
MuB2	Muren silt loam, 2 to 6 percent slopes, eroded	27	IIe-3	41	III
Nw	Newark silty clay loam	28	IIw-7	43	I
Pa	Patton silty clay loam	28	IIw-1	41	I
PrB	Princeton fine sandy loam, 2 to 6 percent slopes	28	IIe-11	41	III
Ra	Ragsdale silt loam	29	IIw-1	41	I
Rh	Rahm silty clay loam	29	IIw-7	43	I
Rs	Reesville silt loam	30	IIw-2	42	II
ScA	Sciotoville silt loam, 0 to 2 percent slopes	30	IIw-5	43	II
ScB2	Sciotoville silt loam, 2 to 6 percent slopes, eroded	31	IIe-7	41	II
St	Stendal silt loam	31	IIw-7	43	I
UnB2	Uniontown silt loam, 2 to 6 percent slopes, eroded	32	IIe-3	41	III
Wa	Wakeland silt loam	32	IIw-7	43	I
Wb	Weinbach silt loam	33	IIw-3	42	II
WeD2	Wellston silt loam, 12 to 18 percent slopes, eroded	34	IVe-3	45	III
WeD3	Wellston silt loam, 12 to 18 percent slopes, severely eroded	34	VIe-1	46	III
WeE2	Wellston silt loam, 18 to 25 percent slopes, eroded	34	VIe-1	46	III

Map symbol	Mapping unit	Described on page	Capability unit		Tree and shrub group
			Symbol	Page	Number
WeF	Wellston silt loam, 25 to 50 percent slopes	34	VIIe-1	46	III
WhA	Wheeling loam, 0 to 2 percent slopes	35	I-1	41	III
WhB2	Wheeling loam, 2 to 6 percent slopes, eroded	35	IIe-3	41	III
Wm	Wilbur silt loam	36	I-2	41	III
Wo	Woodmere silty clay loam	36	I-2	41	III
ZaC2	Zanesville silt loam, 6 to 12 percent slopes, eroded	37	IIIe-7	43	II
ZaC3	Zanesville silt loam, 6 to 12 percent slopes, severely eroded	37	IVe-7	45	II
ZaD2	Zanesville silt loam, 12 to 18 percent slopes, eroded	38	IVe-7	45	II
ZaD3	Zanesville silt loam, 12 to 18 percent slopes, severely eroded	38	VIe-1	46	II
Zp	Zipp silty clay	38	IIIw-2	44	I


15
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R. 10 W.
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(Joins sheet 16)
(Joins sheet 19)
McCutchanville
DRESS 2 MEMORIAL AIRPORT
CENTRAL
PENN
Creek
21
22
27
28
1 Mile
5000 Feet
Scale 1:15840
205 000 FEET
375 000 FEET

Undeveloped Conditions

→ 10 year peak discharge rate =
$Q_{10} = 6.87$ cfs

Developed Conditions

→ Weighted Runoff Coefficient, $C_d = .468$

→ figured from developed sub-basins 1 - 19

Detention Requirements

Retention basin will receive stormwater runoff from all sub-basins except for the following which will exit the site undetained.

Sub-basin	$Q_{(25)}$
#1	.73
#2	.23
#3	.23
#4	3.26
#17	.37
#18	.34
#19, #12, #13	.33, .80, 1.12
	7.41

→ Retention basin will also capture stormwater runoff from off-site sub-basins, which will be detained in our system before leaving the site

Off-site Sub-basin	$Q_{(25)}$
#2	2.57
#3	1.31
#4	10.14
	14.02

Allowable Discharge Rate

→ 6.87 - 7.41 + 14.02 = 13.48 cfs

Retention Basin Area/Volume

① Required Storage Volume from Form 800
25 year = 13,681 cu. ft. → @ 391.91'

Elevation	Water Surface Area (S.F.)	Storage Capacity Volume (C.F.)
390.50	7988	———
391.50	10094	9041
392.50	12301	20239
393.50	14609	33694
394.50	17017	49507

Primary Spillway - 12" RCP - 535' Long @ 0.65%
Allowable Discharge = 13.48 cfs
Proposed Discharge = 1.7 cfs

For Headwater Depth = 3.8' @ Elev. 394.3
25 yr. storage volume = 46344 cu. ft.

25 yr. storm tailwater elev. = 393.3

VANDERBURGH COUNTY DRAINAGE BOARD
FORM 800

PROJECT: Stonecreek Subdivision - Section 1 — DETENTION FACILITY DESIGN RETURN PERIOD: 25 YRS
DESIGNER: MORLEY & ASSOC. — RELEASE RATE RETURN PERIOD: 10 YRS

① → WATERSHED AREA: 13.69 ACRES
TIME OF CONCENTRATION (UNDEVELOPED WATERSHED): 21.24 MINUTES
RAINFALL INTENSITY (Iu): 3.979 INCHES/HR
UNDEVELOPED RUNOFF COEFFICIENT (Cu): 0.21
② → UNDEVELOPED RUNOFF RATE (O = Cu*Iu*A): 11.38 CFS
DEVELOPED RUNOFF COEFFICIENT (Cd): 0.399

STORM DURATION Td (HRS)	RAINFALL INTENSITY Id (INCH/HR)	INFLOW RATE I(Td) (Cd*Id*A) (CFS)	OUTFLOW RATE O (Cu*Iu*A) (CFS)	STORAGE RATE I(Td)-O (CFS)	REQUIRED STORAGE Td)-O)*Td/12 (ACRE-FT)
0.08	7.208	39.37	13.48	25.89	0.180
0.17	5.925	32.36	13.48	18.88	0.262
0.25	5.033	27.49	13.48	14.01	0.292
0.33	4.571	24.97	13.48	11.49	0.319
0.42	4.108	22.44	13.48	8.96	0.311
0.50	3.646	19.92	13.48	6.44	0.268
0.58	3.385	18.49	13.48	5.01	0.243
0.67	3.123	17.06	13.48	3.58	0.199
0.75	2.862	15.63	13.48	2.15	0.135
0.83	2.601	14.21	13.48	0.73	0.050
0.92	2.339	12.78	13.48	-0.70	-0.054
1.00	2.078	11.35	13.48	-2.13	-0.177
1.25	1.909	10.42	13.48	-3.06	-0.318
1.50	1.739	9.50	13.48	-3.98	-0.498
1.75	1.570	8.57	13.48	-4.91	-0.716
2.00	1.400	7.65	13.48	-5.83	-0.972
2.50	1.210	6.61	13.48	-6.87	-1.432
3.00	1.019	5.57	13.48	-7.91	-1.978
4.00	0.836	4.57	13.48	-8.91	-2.971

PEAK STORAGE (ACRE/FT): 0.32
PEAK STORAGE (CUBIC FT): 13,899

① Watershed Area = Dev. Sub-Basins #5-#11, #15-#16, and Off-Site UnDev. Sub-Basins #2-#4

= 13.69 acres

② Developed Runoff Coefficient = weight runoff coef. from Sub-Basins above

= .399

VANDERBURGH COUNTY DRAINAGE BOARD
FORM 800

PROJECT: Stonecreek Subdivision - Section 1 — DETENTION FACILITY DESIGN RETURN PERICD: 100 YRS
DESIGNER: MORLEY & ASSOC. — RELEASE RATE RETURN PERIOD: 10 YRS

WATERSHED AREA:	13.69	ACRES
TIME OF CONCENTRATION (UNDEVELOPED WATERSHED):	21.24	MINUTES
RAINFALL INTENSITY (Iu):	3.979	INCHES/HR
UNDEVELOPED RUNOFF COEFFICIENT (Cu):	0.21	
UNDEVELOPED RUNOFF RATE (O = Cu*Iu*A):	11.38	CFS
DEVELOPED RUNOFF COEFFICIENT (Cd):	0.399	

STORM DURATION Td (HRS)	RAINFALL INTENSITY Id (INCH/HR)	INFLOW RATE I(Td) (Cd*Id*A) (CFS)	OUTFLOW RATE O (Cu*Iu*A) (CFS)	STORAGE RATE I(Td)-O (CFS)	REQUIRED STORAGE Td)-O)*Td/12 (ACRE-FT)
0.08	8.469	46.26	13.48	32.78	0.228
0.17	7.126	38.92	13.48	25.44	0.353
0.25	6.194	33.83	13.48	20.35	0.424
0.33	5.665	30.95	13.48	17.47	0.485
0.42	5.137	28.06	13.48	14.58	0.506
0.50	4.608	25.17	13.48	11.69	0.487
0.58	4.284	23.40	13.48	9.92	0.482
0.67	3.960	21.63	13.48	8.15	0.453
0.75	3.636	19.86	13.48	6.38	0.399
0.83	3.311	18.09	13.48	4.61	0.320
0.92	2.987	16.32	13.48	2.84	0.217
1.00	2.663	14.55	13.48	1.07	0.089
1.25	2.444	13.35	13.48	-0.13	-0.014
1.50	2.224	12.15	13.48	-1.33	-0.166
1.75	2.005	10.95	13.48	-2.53	-0.369
2.00	1.785	9.75	13.48	-3.73	-0.622
2.50	1.538	8.40	13.48	-5.08	-1.058
3.00	1.291	7.05	13.48	-6.43	-1.607
4.00	1.062	5.80	13.48	-7.68	-2.560

PEAK STORAGE (ACRE/FT):	0.51
PEAK STORAGE (CUBIC FT):	22,049

VANDERBURGH COUNTY DRAINAGE BOARD
FORM 800

PROJECT: Stonecreek Subdivision - Section 1 — DETENTION FACILITY DESIGN RETURN PERIOD: 25 YRS
DESIGNER: MORLEY & ASSOC. — RELEASE RATE RETURN PERIOD: 10 YRS

WATERSHED AREA:	13.69	ACRES
TIME OF CONCENTRATION (UNDEVELOPED WATERSHED):	21.24	MINUTES
RAINFALL INTENSITY (Iu):	3.979	INCHES/HR
UNDEVELOPED RUNOFF COEFFICIENT (Cu):	0.21	
UNDEVELOPED RUNOFF RATE (O = Cu*Iu*A):	11.38	CFS
DEVELOPED RUNOFF COEFFICIENT (Cd):	0.399	

STORM DURATION Td (HRS)	RAINFALL INTENSITY Id (INCH/HR)	INFLOW RATE I(Td) (Cd*Id*A) (CFS)	OUTFLOW RATE O (Cu*Iu*A) (CFS)	STORAGE RATE I(Td)-O (CFS)	REQUIRED STORAGE Td)-O)*Td/12 (ACRE-FT)
0.08	7.208	39.37	1.70	37.67	0.262
0.17	5.925	32.36	1.70	30.66	0.426
0.25	5.033	27.49	1.70	25.79	0.537
0.33	4.571	24.97	1.70	23.27	0.646
0.42	4.108	22.44	1.70	20.74	0.720
0.50	3.646	19.92	1.70	18.22	0.759
0.58	3.385	18.49	1.70	16.79	0.816
0.67	3.123	17.06	1.70	15.36	0.853
0.75	2.862	15.63	1.70	13.93	0.871
0.83	2.601	14.21	1.70	12.51	0.868
0.92	2.339	12.78	1.70	11.08	0.846
1.00	2.078	11.35	1.70	9.65	0.804
1.25	1.909	10.42	1.70	8.72	0.909
1.50	1.739	9.50	1.70	7.80	0.975
1.75	1.570	8.57	1.70	6.87	1.002
2.00	1.400	7.65	1.70	5.95	0.991
2.50	1.210	6.61	1.70	4.91	1.022
3.00	1.019	5.57	1.70	3.87	0.967
4.00	0.836	4.57	1.70	2.87	0.955

PEAK STORAGE (ACRE/FT):	1.02
PEAK STORAGE (CUBIC FT):	44,528

PROJECT NO. 4255 Stonecreek - Section 1 DESIGNER —PJL—

DATE 11-24-99

HYDROLOGIC AND CHANNEL INFORMATION

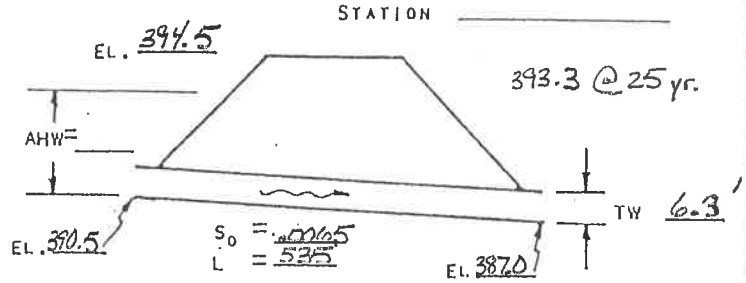
Q_1 = _____ TW_1 = _____

Q_2 = _____ TW_2 = _____

Q_1 = DESIGN DISCHARGE, SAY Q_{10}

Q_2 = CHECK DISCHARGE, SAY Q_{50}

SKETCH



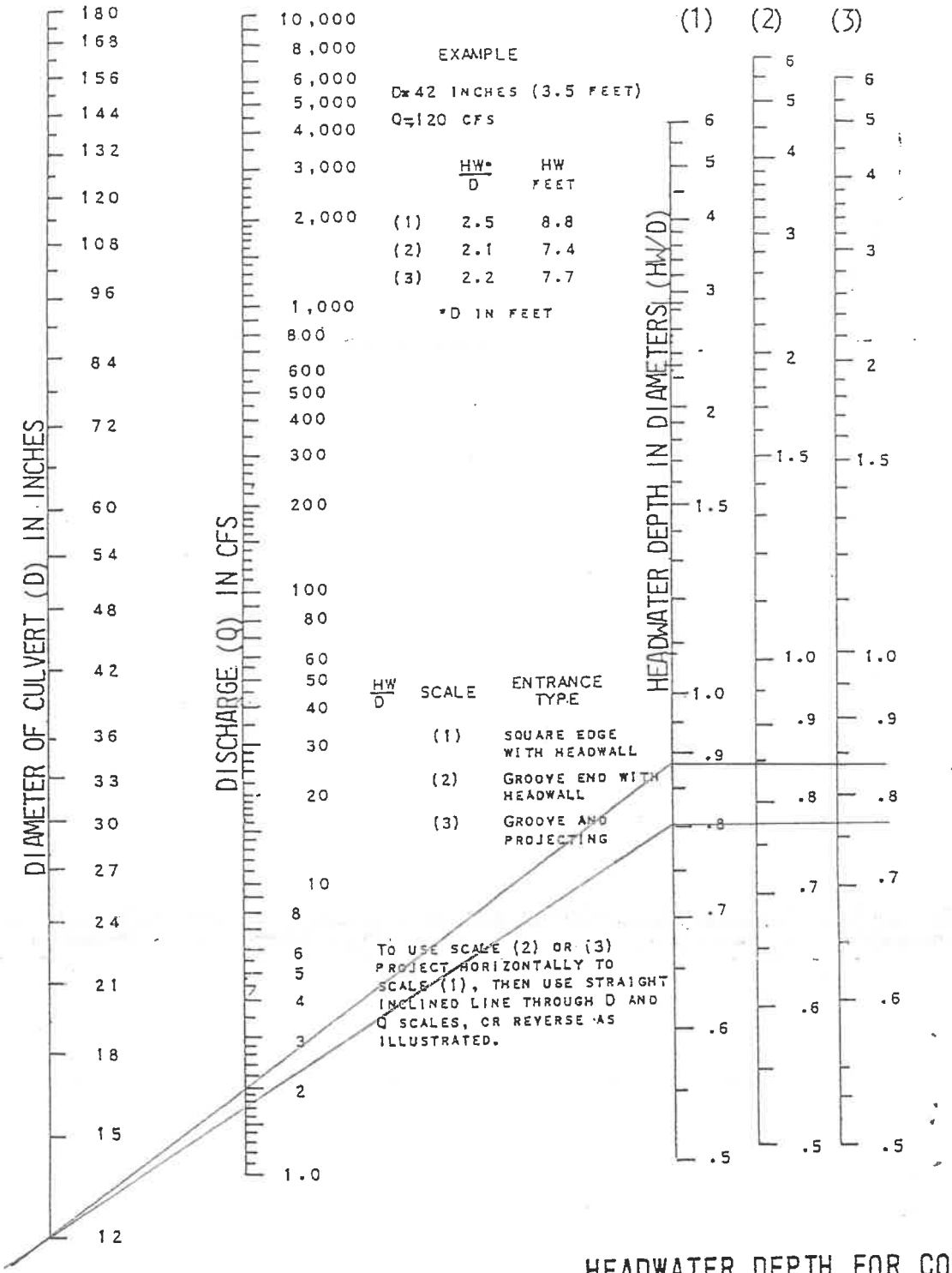
MEAN STREAM VELOCITY = _____

MAX. STREAM VELOCITY = _____

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION										CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
			INLET CONT.	OUTLET CONTROL $HW=H+h_o-LS_o$												
			$\frac{HW}{D}$	HW	K_e	H	d_c	$\frac{dc+D}{2}$	TW	h_o	LS_o	HW				
E.E.S.	2.0	12"	.85	.85	0.5	1.6	0.6	0.8	6.3	6.3	3.5'	4.3				
	1.7	12"	.77	.77	0.5	1.0	0.5	0.75	6.3	6.3	3.5	3.8				

SUMMARY AND RECOMMENDATIONS

FIG. 7-430.01 A



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

FIG. 7-430.01 F

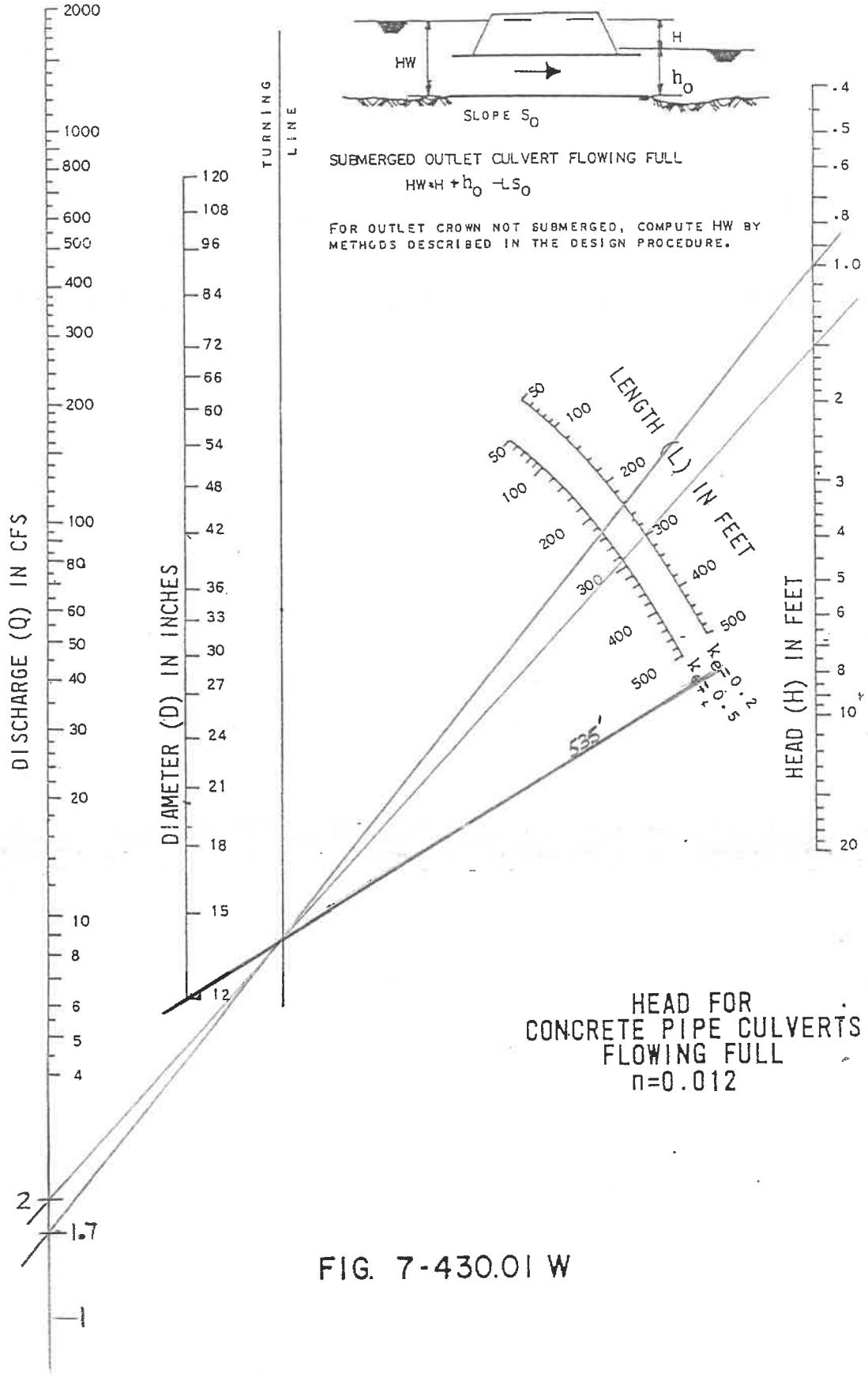
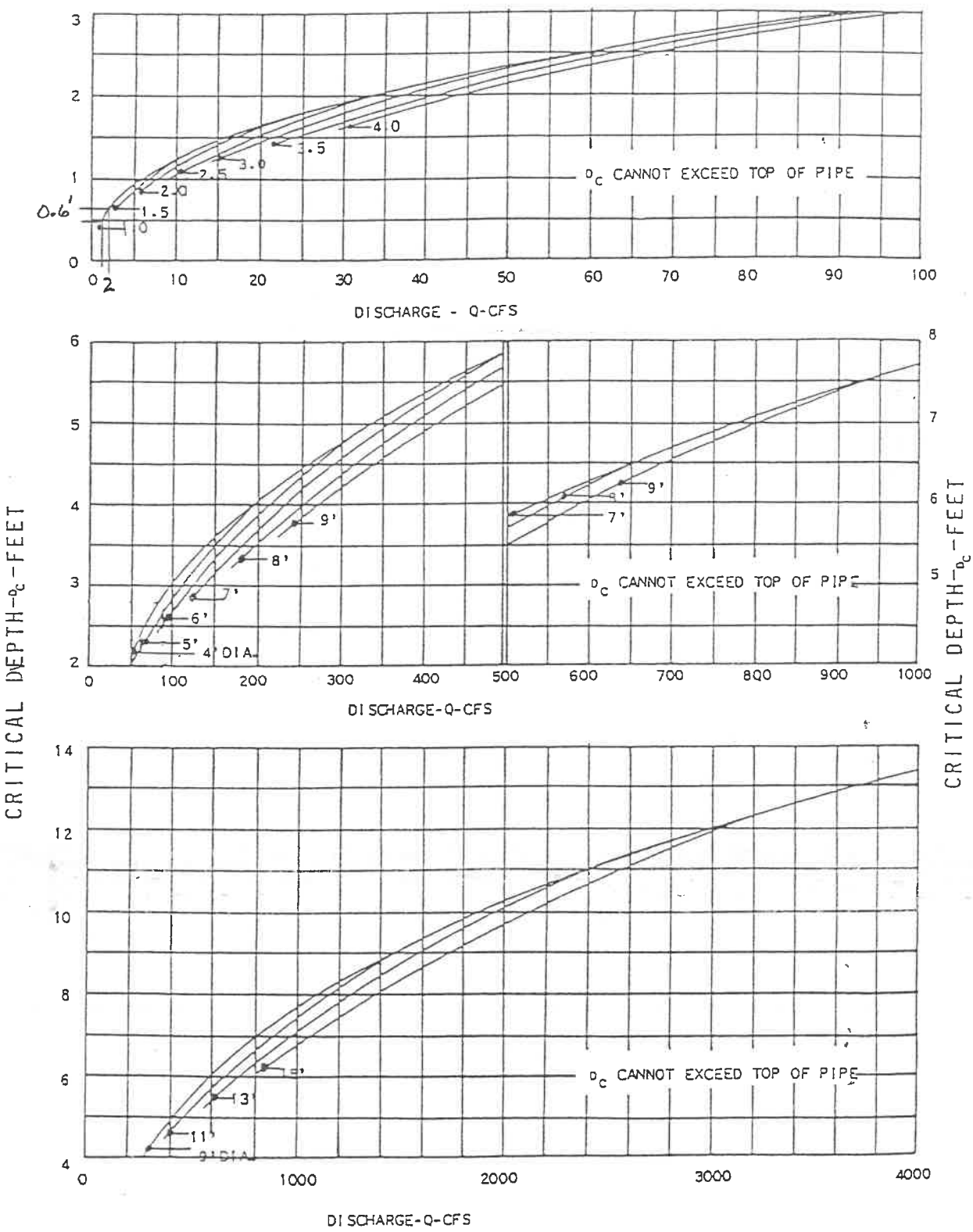

DISCHARGE (Q) IN CFS
DIAMETER (D) IN INCHES
TURNING LINE
LENGTH (L) IN FEET
HEAD (H) IN FEET
HW
H
h_o
SLOPE S_o
SUBMERGED OUTLET CULVERT FLOWING FULL
$HW = H + h_o - LS_o$
FOR OUTLET CROWN NOT SUBMERGED, COMPUTE HW BY METHODS DESCRIBED IN THE DESIGN PROCEDURE.
Ke=0.2
Ke=0.5
535
HEAD FOR
CONCRETE PIPE CULVERTS
FLOWING FULL
n=0.012

FIG. 7-430.01 W



CRITICAL DEPTH
CIRCULAR PIPE

FIG. 7-430.01 L

Box Culvert - Road #11

	25 year	100 year
OS-5	123.1	157.9
Basin #18	0.3	0.5
Basin #19	0.3	0.5
	123.7 ≈ 124 cfs	158.9 ≈ 159 cfs

℄ elevation @ Culvert - sta. 13+86± = 396.15±

Flowline of Ditch @ Box Entrance = 389.25

PROJECT NO. 4255 Stonecreek - Section 1 DESIGNER -RBL-

DATE 11-26-99

HYDROLOGIC AND CHANNEL INFORMATION

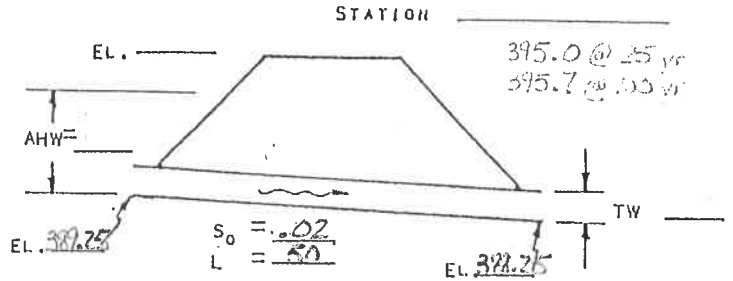
Q_1 = _____ TW_1 = _____

Q_2 = _____ TW_2 = _____

Q_1 = DESIGN DISCHARGE, SAY Q_{10}

Q_2 = CHECK DISCHARGE, SAY Q_{50}

SKETCH



MEAN STREAM VELOCITY = _____

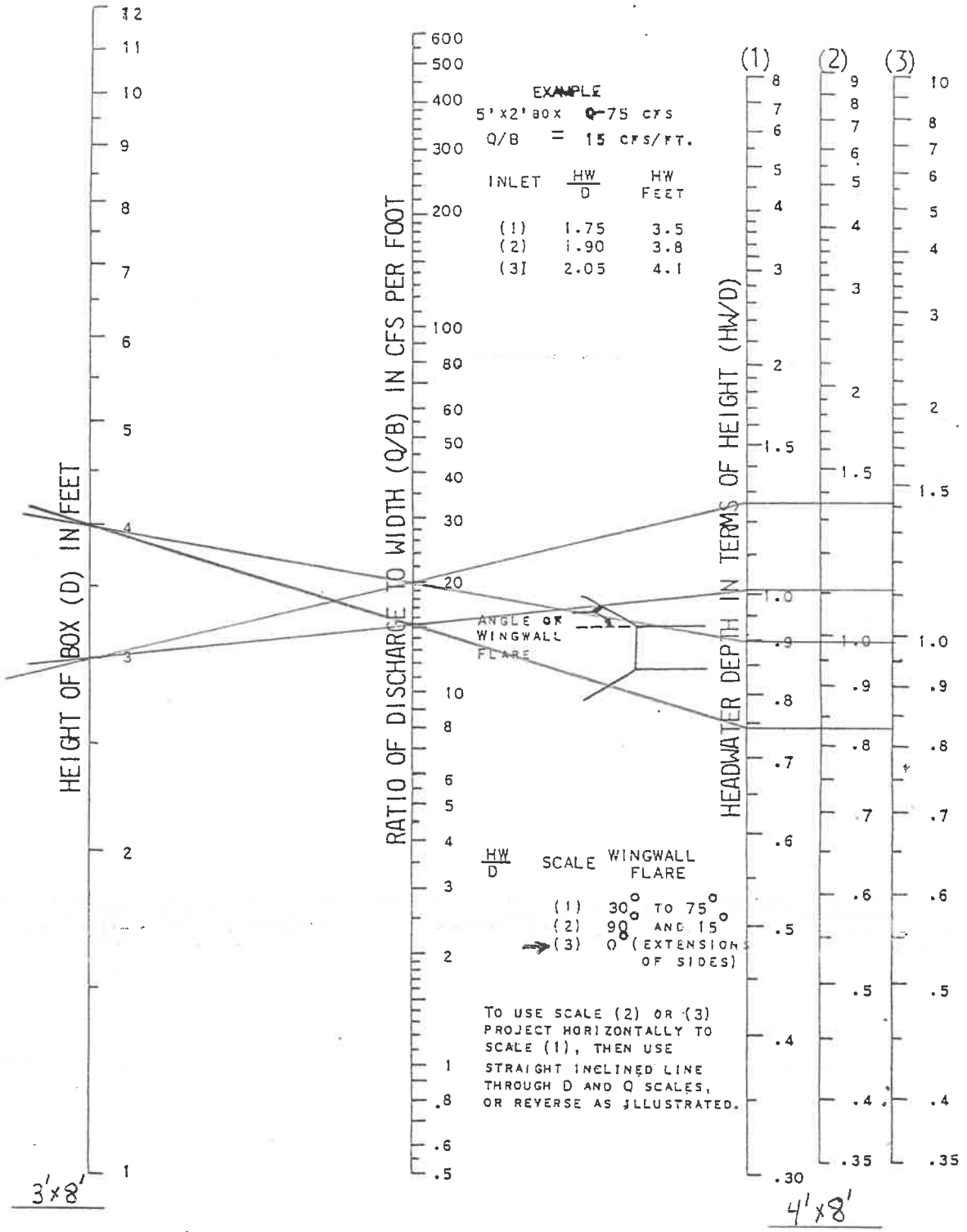
MAX. STREAM VELOCITY = _____

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION: INLET CONT. HW/D	INLET CONT. HW	OUTLET CONTROL HW=H+h_o-LS_o: K_e	H	d_c	$\frac{dc+D}{2}$	TW	h_o	LS_o	HW	CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
3'x8' Box	124		1.1	3.3	0.5	.75	2.0	2.5	6.75	2.5 / 6.75	1.0	2.25 / 6.5				
	159		1.4	4.2	0.5	1.2	2.4	2.7	7.45	2.7 / 7.45	1.0	2.90 / 7.65				
4'x8' Box	124		.83	3.32	0.5	.4	2.0	3.0	6.78	3.0 / 6.78	1.0	2.4 / 6.78				
	159		1.0	4.0	0.5	.65	2.4	3.2	7.45	3.2 / 7.45	1.0	2.85 / 7.10				

SUMMARY AND RECOMMENDATIONS

FIG. 7-430.01 A

7-430.01 F
JAN. 1971



25 year

$\frac{124}{8} = 15.5'$ D = 3'

$\frac{H_w}{D} = 1.1$

$\frac{H_w}{3} = 1.1$

$H_w = 3.3$

100 year

$\frac{159}{8} = 19.9$ D = 3'

$\frac{H_w}{D} = 1.4$

$\frac{H_w}{3} = 1.4$

$H_w = 4.2$

FIG. 7-430.01 K

HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

25 year

$\frac{127}{8} = 15.5'$ D = 4'

$\frac{H_w}{D} = .83$

$\frac{H_w}{4} = .83$

$H_w = 3.32$

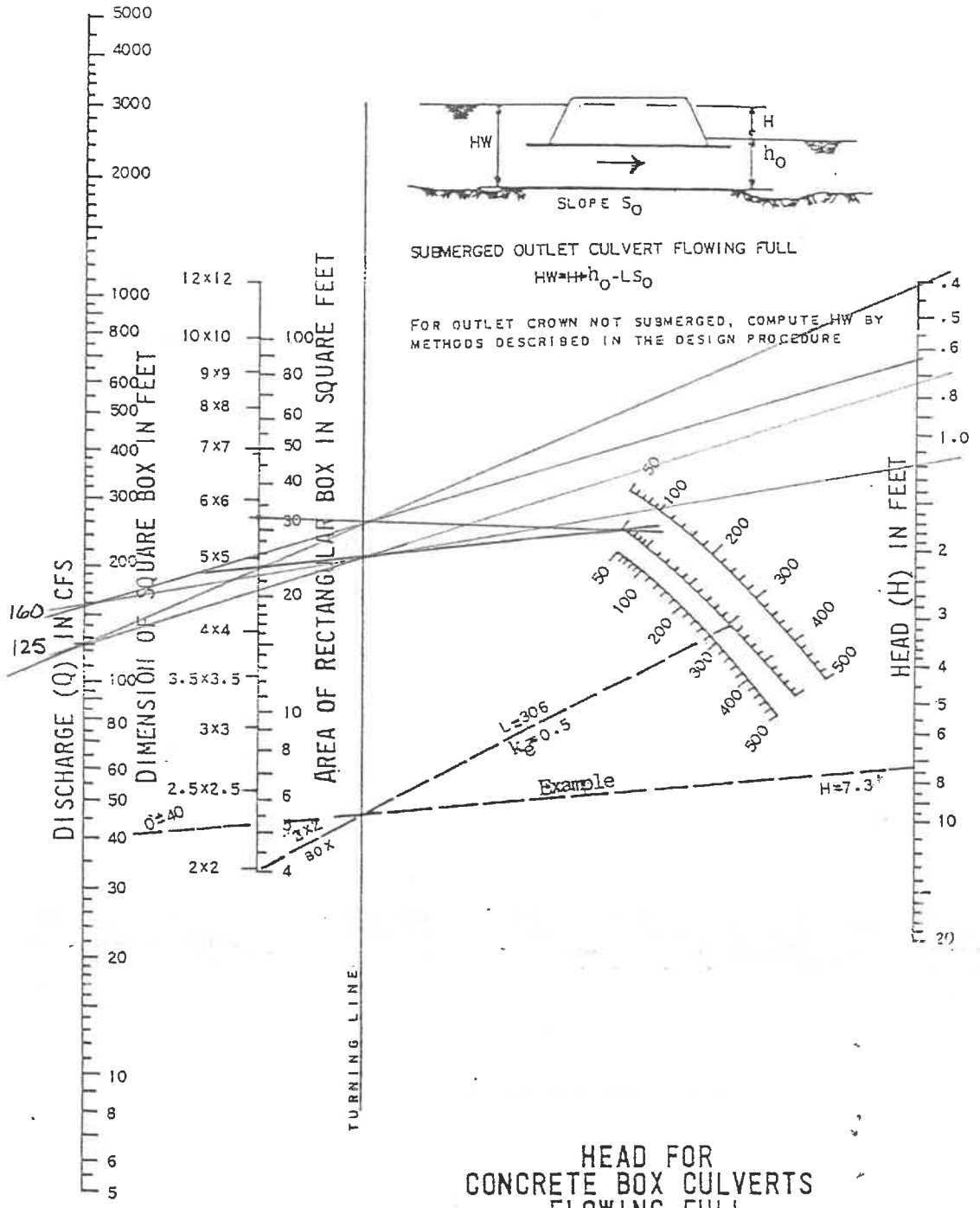
100 year

$\frac{159}{8} = 19.9$ D = 4'

$\frac{H_w}{D} = 1$

$\frac{H_w}{4} = 1$

$H_w = 4$

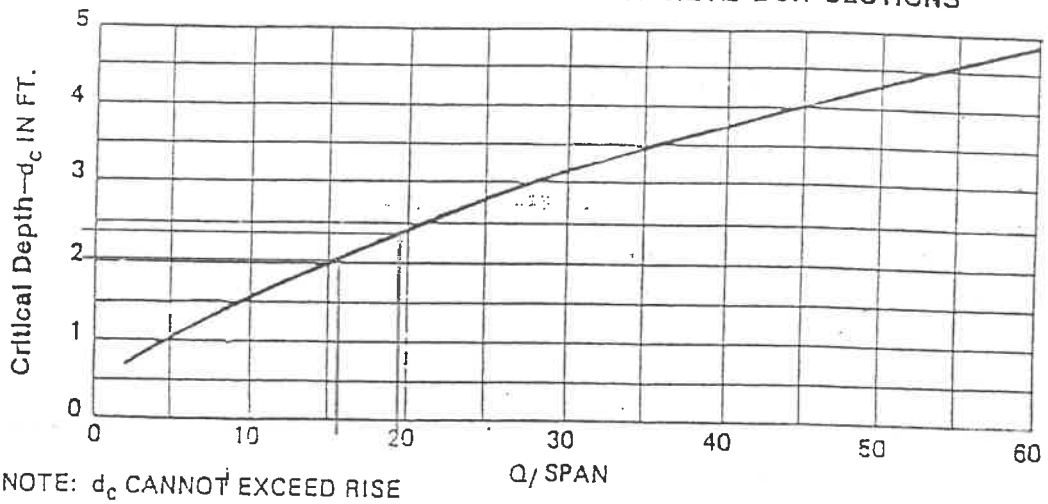


HEAD FOR
CONCRETE BOX CULVERTS
FLOWING FULL
n=0.012

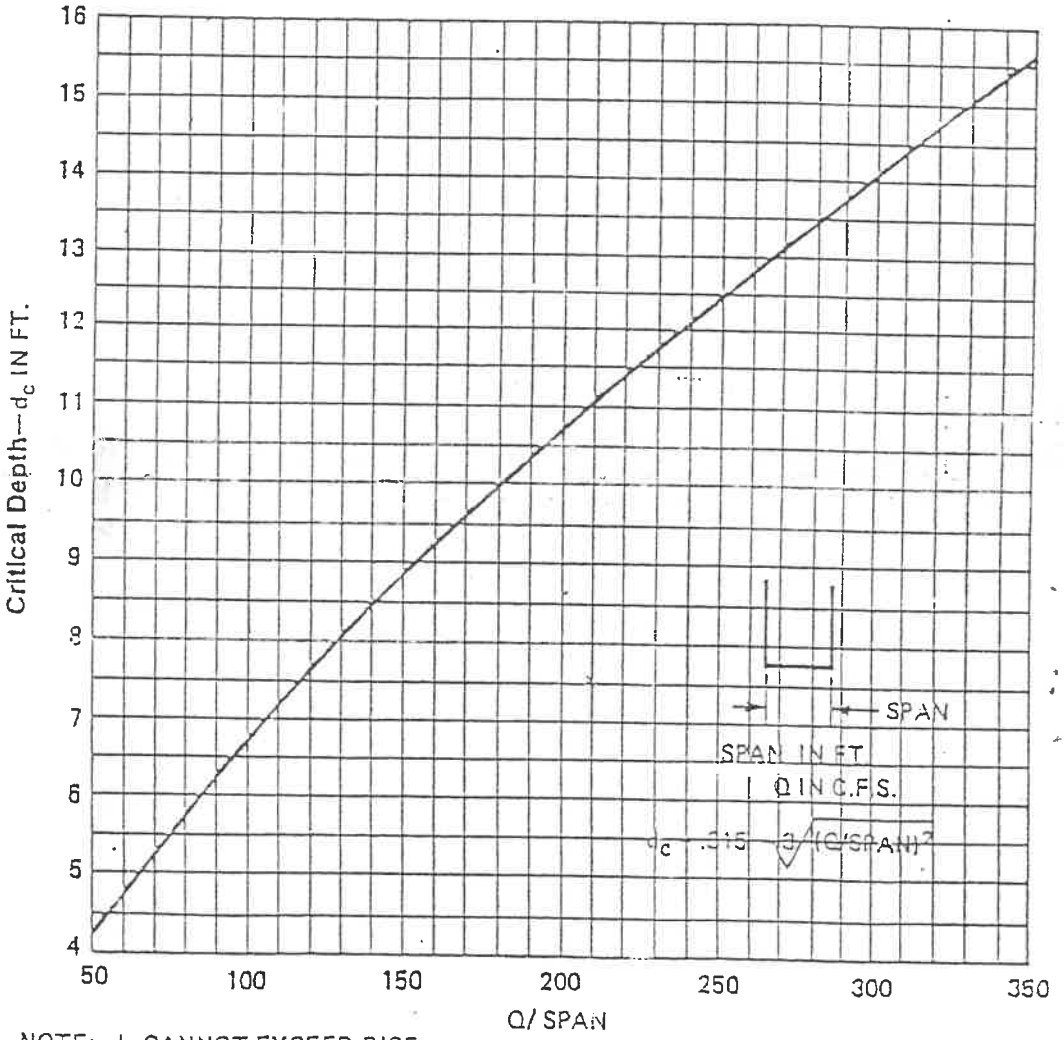
FIG. 7-430.01 X

FIGURE 32

CRITICAL DEPTH—PRECAST CONCRETE BOX SECTIONS



NOTE: d_c CANNOT EXCEED RISE



NOTE: d_c CANNOT EXCEED RISE

MORLEY AND ASSOCIATES INC.

STORM DESIGN SHEET - RATIONAL METHOD

PROJECT Stonecreek Subdivision - Section1
OUR PROJECT # 4255-4(G) DATE 11-23-99
MANNINGS n 0.011 DESIGN PERIOD 25 YEARS

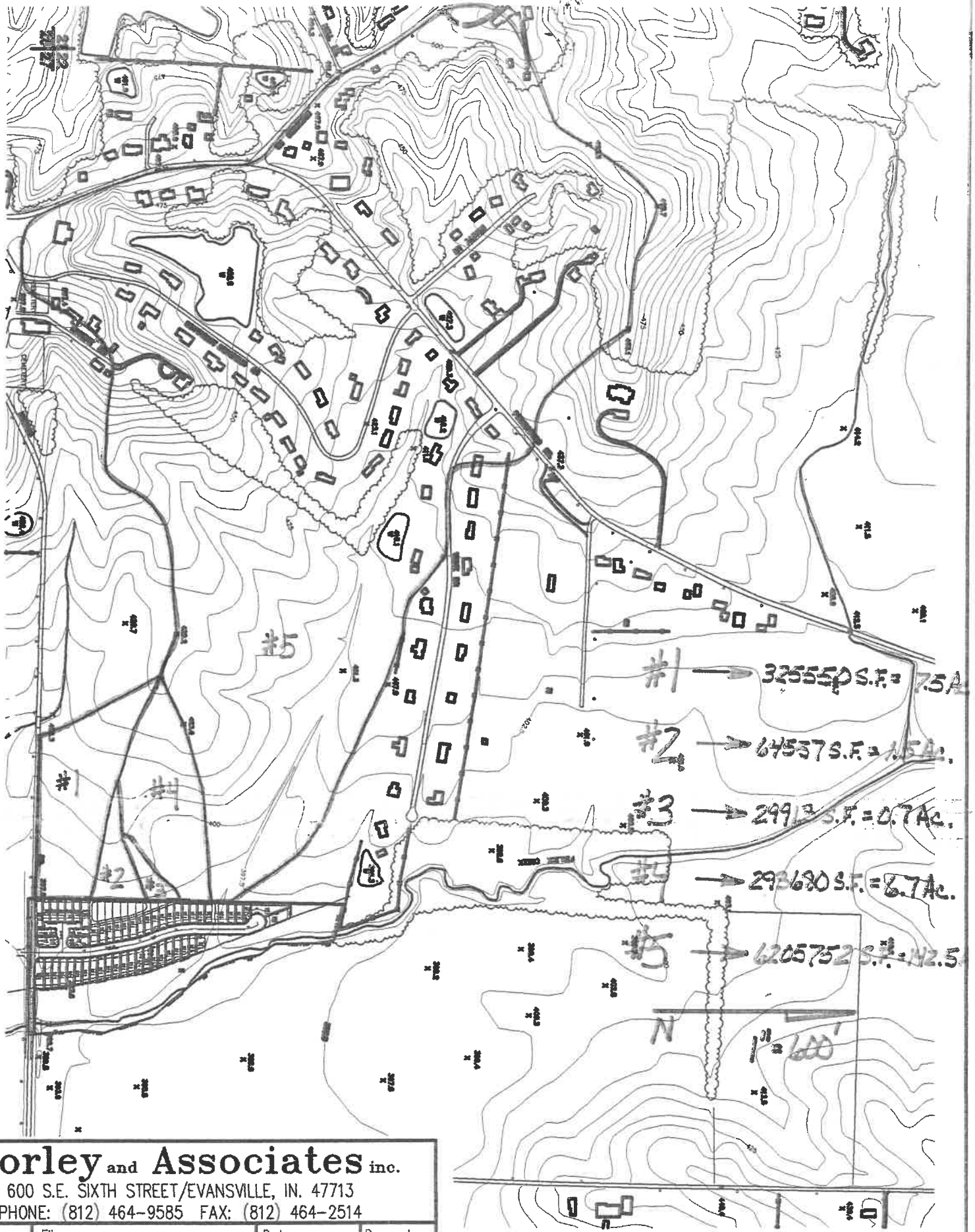
LINE NO.	UPSTREAM MANHOLE	DOWNSTREAM MANHOLE	LENGTH (ft)	Cj	Aj (ac.)	CjAj	SUM CjAj	Tj (min)	Tcum (min)	I (in/hr)	Q (cfs)	PIPE DIA. (in)	PIPE SLOPE (ft/ft)	PIPE CAP. (cfs)	VELOCITY (ft/sec)	TRAVEL TIME (min)
1	601	603	24	0.365	7.98	2.913	2.913	28.43	28.43	3.791	11.04	24	0.0039	16.69	5.32	0.08
2	603	605	42	0.610	0.05	0.031	2.943	6.03	28.51	3.784	11.14	24	0.0039	16.69	5.32	0.13
3	605	607	24	0.610	0.05	0.031	2.974	6.03	28.64	3.772	11.22	24	0.0039	16.69	5.32	0.08
4	608	612	40	0.489	0.65	0.318	0.318	17.50	17.50	4.802	1.53	12	0.0025	2.10	2.68	0.25
5	610	612	30	0.556	0.26	0.145	0.462	10.53	17.75	4.779	2.21	12	0.0050	2.98	3.79	0.13
6	612	616	88	0.597	0.40	0.239	0.701	13.72	17.88	4.767	3.34	15	0.0030	4.18	3.41	0.43
7	614	616	98	0.511	0.24	0.123	0.123	11.09	11.09	5.731	0.70	12	0.0050	2.98	3.79	0.43
8	616	618	68	-	-	-	0.824	-	18.31	4.727	3.90	15	0.0050	5.40	4.40	0.26
9	618	620	79	0.511	0.24	0.123	0.947	11.09	18.57	4.703	4.45	18	0.0025	6.20	3.51	0.37
10	620	622	19	-	-	-	0.947	-	18.94	4.669	4.42	18	0.0025	6.20	3.51	0.09
11	623	625	26	0.510	0.89	0.454	0.454	20.34	20.34	4.539	2.06	12	0.0075	3.65	4.64	0.09
12	625	627	142	0.528	0.85	0.449	0.903	19.96	20.43	4.531	4.09	15	0.0100	7.63	6.22	0.38
13	628	630	26	0.551	0.28	0.154	0.154	13.68	13.68	5.268	0.81	12	0.0020	1.88	2.40	0.18
14	630	Box Culvert	72	0.530	0.47	0.249	0.403	20.77	20.77	4.499	1.81	12	0.0040	2.66	3.39	0.35
15	636	638	49	0.350	7.75	2.713	2.713	22.96	22.96	4.297	11.66	18	0.0212	18.07	10.23	0.08

UnDeveloped Drainage Sub-Basins

Sub-basin No.: Stonecreek Section 1			Total Area =	360,677 S.F. =	8.28 Ac.		
Surface						C	N
Structures	0	Total	0 S.F. =	0 S.F. =	0.00 Ac.	0.92	0.02
Drives	0	Total	0 S.F. =	0 S.F. =	0.00 Ac.	0.92	0.02
Pavement	430	L.F.	10.0 Width =	4,300 S.F. =	0.10 Ac.	0.92	0.02
Patios	0	Total	0 S.F. =	0 S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	0	L.F.	0 Width =	0 S.F. =	0.00 Ac.	0.92	0.02
Lawn (0-2%)			S.F. =		0.00 Ac.	0.15	0.40
Lawn (2-5%)			S.F. =		0.00 Ac.	0.25	0.40
Lawn (5-10%)			S.F. =		0.00 Ac.	0.40	0.40
Lawn (>10%)			S.F. =		0.00 Ac.	0.55	0.40
Water			S.F. =		0.00 Ac.	1.00	0.00
Cultivated Field			356,377 S.F. =		8.18 Ac.	0.20	0.20

Weighted c =	0.209	
Weighted N =	0.198	
L =	460	Ft.
H =	3.5	Ft.
S =	0.0076	Ft./Ft.
tc =	21.24	Minutes
I(10) =	3.979	In./Hr.
Q(10) =	6.87	CFS

(Min. 5 minutes)



Morley and Associates inc.
600 S.E. SIXTH STREET/EVANSVILLE, IN. 47713
PHONE: (812) 464-9585 FAX: (812) 464-2514

Proj. No.:	Filename:	Date:	Drawn by:
4255-4(G)	J:\4255\CIVIL2\OFFSITE.dwg	11/22/99	R.S.L.

UnDeveloped Drainage Sub-Basins

Sub-basin No.: Off-Site #1			Total Area =			325,550	S.F. =	7.47	Ac.		
Surface										C	N
Structures	0	Total	1,800	S.F.	=	0	S.F. =	0.00	Ac.	0.92	0.02
Drives	0	Total	750	S.F.	=	0	S.F. =	0.00	Ac.	0.92	0.02
Pavement	800	L.F.	10.0	Width	=	8,000	S.F. =	0.18	Ac.	0.92	0.02
Patios	0	Total	150	S.F.	=	0	S.F. =	0.00	Ac.	0.92	0.02
Sidewalks	0	L.F.	4	Width	=	0	S.F. =	0.00	Ac.	0.92	0.02
Lawn (0-2%)				S.F.	=			0.00	Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00	Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00	Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00	Ac.	0.55	0.40
Water				S.F.	=			0.00	Ac.	1.00	0.00
Cultivated Field			317,550	S.F.	=			7.29	Ac.	0.35	0.20

Weighted c =	0.364	
Weighted N =	0.196	
L =	1,200	Ft.
H =	30.0	Ft.
S =	0.0250	Ft./Ft.
tc =	25.04	Minutes (Min. 5 minutes)
I(25) =	4.105	In./Hr.
Q(25) =	11.17	CFS

UnDeveloped Drainage Sub-Basins

Sub-basin No.: Off-Site #2			Total Area =			64,557	S.F. =	1.48	Ac.		
Surface										C	N
Structures	0	Total	1,800	S.F.	=	0	S.F. =	0.00	Ac.	0.92	0.02
Drives	0	Total	750	S.F.	=	0	S.F. =	0.00	Ac.	0.92	0.02
Pavement	0	L.F.	10.0	Width	=	0	S.F. =	0.00	Ac.	0.92	0.02
Patios	0	Total	150	S.F.	=	0	S.F. =	0.00	Ac.	0.92	0.02
Sidewalks	0	L.F.	4	Width	=	0	S.F. =	0.00	Ac.	0.92	0.02
Lawn (0-2%)				S.F.	=			0.00	Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00	Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00	Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00	Ac.	0.55	0.40
Water				S.F.	=			0.00	Ac.	1.00	0.00
Cultivated Field			64,557	S.F.	=			1.48	Ac.	0.35	0.20

Weighted c =	0.350	
Weighted N =	0.200	
L =	550	Ft.
H =	22.0	Ft.
S =	0.0400	Ft./Ft.
tc =	15.75	Minutes (Min. 5 minutes)
I(25) =	4.964	In./Hr.
Q(25) =	2.57	CFS

UnDeveloped Drainage Sub-Basins

Sub-basin No.: Off-Site #3		Total Area =	29,913	S.F. =	0.69	Ac.		
Surface							C	N
Structures	0 Total	1,800	S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Drives	0 Total	750	S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Pavement	0 L.F.	10.0	Width =	0	S.F. =	0.00	Ac.	0.92	0.02
Patios	0 Total	150	S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Sidewalks	0 L.F.	4	Width =	0	S.F. =	0.00	Ac.	0.92	0.02
Lawn (0-2%)			S.F. =			0.00	Ac.	0.15	0.40
Lawn (2-5%)			S.F. =			0.00	Ac.	0.25	0.40
Lawn (5-10%)			S.F. =			0.00	Ac.	0.40	0.40
Lawn (>10%)			S.F. =			0.00	Ac.	0.55	0.40
Water			S.F. =			0.00	Ac.	1.00	0.00
Cultivated Field		29,913	S.F. =			0.69	Ac.	0.35	0.20

Weighted c =	0.350	
Weighted N =	0.200	
L =	350	Ft.
H =	15.0	Ft.
S =	0.0429	Ft./Ft.
tc =	12.55	Minutes
I(25) =	5.470	In./Hr.
Q(25) =	1.31	CFS

(Min. 5 minutes)

UnDeveloped Drainage Sub-Basins

Sub-basin No.: Off-Site #4		Total Area =	293,680	S.F. =	6.74	Ac.		
Surface							C	N
Structures	0 Total	1,800	S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Drives	0 Total	750	S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Pavement	0 L.F.	10.0	Width =	0	S.F. =	0.00	Ac.	0.92	0.02
Patios	0 Total	150	S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Sidewalks	0 L.F.	4	Width =	0	S.F. =	0.00	Ac.	0.92	0.02
Lawn (0-2%)			S.F. =			0.00	Ac.	0.15	0.40
Lawn (2-5%)			S.F. =			0.00	Ac.	0.25	0.40
Lawn (5-10%)			S.F. =			0.00	Ac.	0.40	0.40
Lawn (>10%)			S.F. =			0.00	Ac.	0.55	0.40
Water			S.F. =			0.00	Ac.	1.00	0.00
Cultivated Field		293,680	S.F. =			6.74	Ac.	0.35	0.20

Weighted c =	0.350	
Weighted N =	0.200	
L =	1,100	Ft.
H =	35.0	Ft.
S =	0.0318	Ft./Ft.
tc =	22.96	Minutes
I(25) =	4.297	In./Hr.
Q(25) =	10.14	CFS

(Min. 5 minutes)

UnDeveloped Drainage Sub-Basins

Sub-basin No.: Off-Site #5 | **Total Area = 6,205,752 S.F. = 142.46 Ac.**

Surface									C	N
Structures	64	Total	1,800	S.F.	=	115,200	S.F. =	2.64 Ac.	0.92	0.02
Drives	64	Total	750	S.F.	=	48,000	S.F. =	1.10 Ac.	0.92	0.02
Pavement	7450	L.F.	10.0	Width	=	74,500	S.F. =	1.71 Ac.	0.92	0.02
Patios	64	Total	150	S.F.	=	9,600	S.F. =	0.22 Ac.	0.92	0.02
Sidewalks	0	L.F.	4	Width	=	0	S.F. =	0.00 Ac.	0.92	0.02
Lawn (0-2%)				S.F.	=			0.00 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)			2,789,088	S.F.	=			64.03 Ac.	0.40	0.40
Woods			1,392,700	S.F.	=			31.97 Ac.	0.36	0.60
Water			193,327	S.F.	=			4.44 Ac.	1.00	0.00
Cultivated Field			1,583,337	S.F.	=			36.35 Ac.	0.35	0.20

Weighted c =	0.418		
Weighted N =	0.366		
L =	4,450	Ft.	
H =	120.0	Ft.	
S =	0.0270	Ft./Ft.	
tc =	60.81	Minutes	(Min. 5 minutes)
I(25) =	2.069	In./Hr.	
Q(25) =	123.11	CFS	

N

1" = 400'

Lake

Off-Site
#1
Area = 54 Acres

ON-Site
#1-A
Area = 8 Acres

621

Developed Drainage Sub-Basins

Sub-basin No.: 1			Total Area =			22,196 S.F. =		0.51 Ac.		
Surface									C	N
Structures	3.5	Total	1,100	S.F.	=	3,850	S.F. =	0.09 Ac.	0.92	0.02
Drives	0	Total	200	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Pavement	220	L.F.	10.0	Width	=	2,200	S.F. =	0.05 Ac.	0.92	0.02
Patios	6	Total	75	S.F.	=	450	S.F. =	0.01 Ac.	0.92	0.02
Sidewalks	0	L.F.	4	Width	=	0	S.F. =	0.00 Ac.	0.92	0.02
Lawn (0-2%)			15,695	S.F.	=			0.36 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water				S.F.	=			0.00 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.12	0.60

Weighted c =	0.376		
Weighted N =	0.289		
L =	450	Ft.	
H =	2.0	Ft.	
S =	0.0044	Ft./Ft.	
tc =	28.43	Minutes	(Min. 5 minutes)
I(25) =	3.791	In./Hr.	
Q(25) =	0.73	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 2			Total Area =			2,347 S.F. =		0.05 Ac.		
Surface									C	N
Structures	0.25	Total	1,100	S.F.	=	275	S.F. =	0.01 Ac.	0.92	0.02
Drives	0	Total	200	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Pavement	61	L.F.	14.5	Width	=	885	S.F. =	0.02 Ac.	0.92	0.02
Patios	0	Total	75	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	61	L.F.	4	Width	=	244	S.F. =	0.01 Ac.	0.92	0.02
Lawn (0-2%)			944	S.F.	=			0.02 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water				S.F.	=			0.00 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.92	0.02

Weighted c =	0.610		
Weighted N =	0.173		
L =	55	Ft.	
H =	1.0	Ft.	
S =	0.0182	Ft./Ft.	
tc =	6.03	Minutes	(Min. 5 minutes)
I(25) =	6.944	In./Hr.	
Q(25) =	0.23	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 3			Total Area =	2,347	S.F. =	0.05	Ac.		
Surface								C	N
Structures	0.25	Total	1,100 S.F. =	275	S.F. =	0.01	Ac.	0.92	0.02
Drives	0	Total	200 S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Pavement	61	L.F.	14.5 Width =	885	S.F. =	0.02	Ac.	0.92	0.02
Patios	0	Total	75 S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Sidewalks	61	L.F.	4 Width =	244	S.F. =	0.01	Ac.	0.92	0.02
Lawn (0-2%)			944 S.F. =			0.02	Ac.	0.15	0.40
Lawn (2-5%)			S.F. =			0.00	Ac.	0.25	0.40
Lawn (5-10%)			S.F. =			0.00	Ac.	0.40	0.40
Lawn (>10%)			S.F. =			0.00	Ac.	0.55	0.40
Water			S.F. =			0.00	Ac.	1.00	0.00
Misc.			S.F. =			0.00	Ac.	0.12	0.60

Weighted c =	0.610		
Weighted N =	0.173		
L =	55	Ft.	
H =	1.0	Ft.	
S =	0.0182	Ft./Ft.	
tc =	6.03	Minutes	(Min. 5 minutes)
I(25) =	6.944	In./Hr.	
Q(25) =	0.23	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 4			Total Area =	65,158	S.F. =	1.50	Ac.		
Surface								C	N
Structures	11.5	Total	1,100 S.F. =	12,650	S.F. =	0.29	Ac.	0.92	0.02
Drives		Total	200 S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Pavement	140	L.F.	10.0 Width =	1,400	S.F. =	0.03	Ac.	0.92	0.02
Patios	23	Total	75 S.F. =	1,725	S.F. =	0.04	Ac.	0.92	0.02
Sidewalks	0	L.F.	4 Width =	0	S.F. =	0.00	Ac.	0.92	0.02
Lawn (0-2%)			S.F. =			0.00	Ac.	0.15	0.40
Lawn (2-5%)			49,383 S.F. =			1.13	Ac.	0.25	0.40
Lawn (5-10%)			S.F. =			0.00	Ac.	0.40	0.40
Lawn (>10%)			S.F. =			0.00	Ac.	0.55	0.40
Water			S.F. =			0.00	Ac.	1.00	0.00
Misc.			S.F. =			0.00	Ac.	0.92	0.02

Weighted c =	0.412		
Weighted N =	0.308		
L =	150	Ft.	
H =	2.0	Ft.	
S =	0.0133	Ft./Ft.	
tc =	13.57	Minutes	(Min. 5 minutes)
I(25) =	5.288	In./Hr.	
Q(25) =	3.26	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 5			Total Area =		28,324 S.F. =		0.65 Ac.		
Surface								C	N
Structures	4.5	Total	1,100	S.F. =	4,950	S.F. =	0.11 Ac.	0.92	0.02
Drives	9	Total	200	S.F. =	1,800	S.F. =	0.04 Ac.	0.92	0.02
Pavement	310	L.F.	14.5	Width =	4,495	S.F. =	0.10 Ac.	0.92	0.02
Patios	0	Total	75	S.F. =	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	310	L.F.	4	Width =	1,240	S.F. =	0.03 Ac.	0.92	0.02
Lawn (0-2%)			15,839	S.F. =			0.36 Ac.	0.15	0.40
Lawn (2-5%)				S.F. =			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F. =			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F. =			0.00 Ac.	0.55	0.40
Water				S.F. =			0.00 Ac.	1.00	0.00
Misc.				S.F. =			0.00 Ac.	0.12	0.60

Weighted c =	0.489		
Weighted N =	0.232		
L =	280	Ft.	
H =	2.5	Ft.	
S =	0.0089	Ft./Ft.	
tc =	17.50	Minutes	(Min. 5 minutes)
I(25) =	4.802	In./Hr.	
Q(25) =	1.53	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 6			Total Area =		11,340 S.F. =		0.26 Ac.		
Surface								C	N
Structures	1	Total	1,100	S.F. =	1,100	S.F. =	0.03 Ac.	0.92	0.02
Drives	2	Total	200	S.F. =	400	S.F. =	0.01 Ac.	0.92	0.02
Pavement	242	L.F.	14.5	Width =	3,509	S.F. =	0.08 Ac.	0.92	0.02
Patios	0	Total	75	S.F. =	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	242	L.F.	4	Width =	968	S.F. =	0.02 Ac.	0.92	0.02
Lawn (0-2%)			5,363	S.F. =			0.12 Ac.	0.15	0.40
Lawn (2-5%)				S.F. =			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F. =			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F. =			0.00 Ac.	0.55	0.40
Water				S.F. =			0.00 Ac.	1.00	0.00
Misc.				S.F. =			0.00 Ac.	0.92	0.02

Weighted c =	0.556		
Weighted N =	0.200		
L =	150	Ft.	
H =	2.5	Ft.	
S =	0.0167	Ft./Ft.	
tc =	10.53	Minutes	(Min. 5 minutes)
I(25) =	5.830	In./Hr.	
Q(25) =	0.84	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 7 | Total Area = 17,277 S.F. = 0.40 Ac.

Surface									C	N
Structures	2.5	Total	1,100	S.F.	=	2,750	S.F. =	0.06 Ac.	0.92	0.02
Drives	4	Total	200	S.F.	=	800	S.F. =	0.02 Ac.	0.92	0.02
Pavement	350	L.F.	14.5	Width	=	5,075	S.F. =	0.12 Ac.	0.92	0.02
Patios	0	Total	75	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	350	L.F.	4	Width	=	1,400	S.F. =	0.03 Ac.	0.92	0.02
Lawn (0-2%)			7,252	S.F.	=			0.17 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water				S.F.	=			0.00 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.12	0.60

Weighted c =	0.597		
Weighted N =	0.180		
L =	250	Ft.	
H =	3.0	Ft.	
S =	0.0120	Ft./Ft.	
tc =	13.72	Minutes	(Min. 5 minutes)
I(25) =	5.261	In./Hr.	
Q(25) =	1.25	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 8 | Total Area = 10,614 S.F. = 0.24 Ac.

Surface									C	N
Structures	2	Total	1,100	S.F.	=	2,200	S.F. =	0.05 Ac.	0.92	0.02
Drives	4	Total	200	S.F.	=	800	S.F. =	0.02 Ac.	0.92	0.02
Pavement	90	L.F.	18.0	Width	=	1,620	S.F. =	0.04 Ac.	0.92	0.02
Patios	0	Total	75	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	90	L.F.	4	Width	=	360	S.F. =	0.01 Ac.	0.92	0.02
Lawn (0-2%)			5,634	S.F.	=			0.13 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water				S.F.	=			0.00 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.92	0.02

Weighted c =	0.511		
Weighted N =	0.222		
L =	140	Ft.	
H =	2.0	Ft.	
S =	0.0143	Ft./Ft.	
tc =	11.09	Minutes	(Min. 5 minutes)
I(25) =	5.731	In./Hr.	
Q(25) =	0.71	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 9 — Total Area = 10,614 S.F. = 0.24 Ac.

Surface									C	N
Structures	2	Total	1,100	S.F.	=	2,200	S.F. =	0.05 Ac.	0.92	0.02
Drives	4	Total	200	S.F.	=	800	S.F. =	0.02 Ac.	0.92	0.02
Pavement	90	L.F.	18.0	Width	=	1,620	S.F. =	0.04 Ac.	0.92	0.02
Patios	0	Total	75	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	90	L.F.	4	Width	=	360	S.F. =	0.01 Ac.	0.92	0.02
Lawn (0-2%)			5,634	S.F.	=			0.13 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water				S.F.	=			0.00 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.12	0.60

Weighted c =	0.511		
Weighted N =	0.222		
L =	140	Ft.	
H =	2.0	Ft.	
S =	0.0143	Ft./Ft.	
tc =	11.09	Minutes	(Min. 5 minutes)
I(25) =	5.731	In./Hr.	
Q(25) =	0.71	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 10 — Total Area = 38,695 S.F. = 0.89 Ac.

Surface									C	N
Structures	6.5	Total	1,100	S.F.	=	7,150	S.F. =	0.16 Ac.	0.92	0.02
Drives	13	Total	200	S.F.	=	2,600	S.F. =	0.06 Ac.	0.92	0.02
Pavement	450	L.F.	14.5	Width	=	6,525	S.F. =	0.15 Ac.	0.92	0.02
Patios	0	Total	75	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	450	L.F.	4	Width	=	1,800	S.F. =	0.04 Ac.	0.92	0.02
Lawn (0-2%)			20,620	S.F.	=			0.47 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water				S.F.	=			0.00 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.92	0.02

Weighted c =	0.510		
Weighted N =	0.222		
L =	380	Ft.	
H =	3.0	Ft.	
S =	0.0079	Ft./Ft.	
tc =	20.34	Minutes	(Min. 5 minutes)
I(25) =	4.539	In./Hr.	
Q(25) =	2.06	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 11			Total Area =	36,860 S.F. =	0.85 Ac.		
Surface						C	N
Structures	6.5 Total	1,100 S.F. =	7,150 S.F. =	0.16 Ac.		0.92	0.02
Drives	13 Total	200 S.F. =	2,600 S.F. =	0.06 Ac.		0.92	0.02
Pavement	450 L.F.	14.5 Width =	6,525 S.F. =	0.15 Ac.		0.92	0.02
Patios	0 Total	75 S.F. =	0 S.F. =	0.00 Ac.		0.92	0.02
Sidewalks	450 L.F.	4 Width =	1,800 S.F. =	0.04 Ac.		0.92	0.02
Lawn (0-2%)		18,785 S.F. =		0.43 Ac.		0.15	0.40
Lawn (2-5%)		S.F. =		0.00 Ac.		0.25	0.40
Lawn (5-10%)		S.F. =		0.00 Ac.		0.40	0.40
Lawn (>10%)		S.F. =		0.00 Ac.		0.55	0.40
Water		S.F. =		0.00 Ac.		1.00	0.00
Misc.		S.F. =		0.00 Ac.		0.12	0.60

Weighted c =	0.528	
Weighted N =	0.214	
L =	380	Ft.
H =	3.0	Ft.
S =	0.0079	Ft./Ft.
tc =	19.96	Minutes
I(25) =	4.574	In./Hr.
Q(25) =	2.04	CFS

(Min. 5 minutes)

Developed Drainage Sub-Basins

Sub-basin No.: 12			Total Area =	12,000 S.F. =	0.28 Ac.		
Surface						C	N
Structures	1 Total	1,100 S.F. =	1,100 S.F. =	0.03 Ac.		0.92	0.02
Drives	2 Total	200 S.F. =	400 S.F. =	0.01 Ac.		0.92	0.02
Pavement	300 L.F.	14.5 Width =	4,350 S.F. =	0.10 Ac.		0.92	0.02
Patios	0 Total	75 S.F. =	0 S.F. =	0.00 Ac.		0.92	0.02
Sidewalks	100 L.F.	4 Width =	400 S.F. =	0.01 Ac.		0.92	0.02
Lawn (0-2%)		5,750 S.F. =		0.13 Ac.		0.15	0.40
Lawn (2-5%)		S.F. =		0.00 Ac.		0.25	0.40
Lawn (5-10%)		S.F. =		0.00 Ac.		0.40	0.40
Lawn (>10%)		S.F. =		0.00 Ac.		0.55	0.40
Water		S.F. =		0.00 Ac.		1.00	0.00
Misc.		S.F. =		0.00 Ac.		0.92	0.02

Weighted c =	0.551	
Weighted N =	0.202	
L =	230	Ft.
H =	3.0	Ft.
S =	0.0130	Ft./Ft.
tc =	13.68	Minutes
I(25) =	5.268	In./Hr.
Q(25) =	0.80	CFS

(Min. 5 minutes)

Developed Drainage Sub-Basins

Sub-basin No.: 13			Total Area =		20,369 S.F. =		0.47 Ac.		
Surface								C	N
Structures	3	Total	1,100	S.F. =	3,300	S.F. =	0.08 Ac.	0.92	0.02
Drives	7	Total	200	S.F. =	1,400	S.F. =	0.03 Ac.	0.92	0.02
Pavement	290	L.F.	14.5	Width =	4,205	S.F. =	0.10 Ac.	0.92	0.02
Patios	0	Total	75	S.F. =	0	S.F. =	0.00 Ac.	0.92	0.02
Sidewalks	290	L.F.	4	Width =	1,160	S.F. =	0.03 Ac.	0.92	0.02
Lawn (0-2%)			10,304	S.F. =			0.24 Ac.	0.15	0.40
Lawn (2-5%)				S.F. =			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F. =			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F. =			0.00 Ac.	0.55	0.40
Water				S.F. =			0.00 Ac.	1.00	0.00
Misc.				S.F. =			0.00 Ac.	0.12	0.60

Weighted c =	0.530		
Weighted N =	0.212		
L =	380	Ft.	
H =	2.5	Ft.	
S =	0.0066	Ft./Ft.	
tc =	20.77	Minutes	(Min. 5 minutes)
I(25) =	4.499	In./Hr.	
Q(25) =	1.12	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 15			Total Area =			S.F. =		Ac.	C	N
Surface										
Structures	3	Total	1,100	S.F.	=	3,300	S.F. =	0.08 Ac.	0.92	0.02
Drives	0	Total	200	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Pavement	0	L.F.	14.5	Width	=	0	S.F. =	0.00 Ac.	0.92	0.02
Patios	6	Total	75	S.F.	=	450	S.F. =	0.01 Ac.	0.92	0.02
Sidewalks	0	L.F.	4	Width	=	0	S.F. =	0.00 Ac.	0.92	0.02
Lawn (0-2%)			10,228	S.F.	=			0.23 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water				S.F.	=			0.00 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.12	0.60

Weighted c =	0.357		
Weighted N =	0.298		
L =	250	Ft.	
H =	3.0	Ft.	
S =	0.0120	Ft./Ft.	
tc =	17.39	Minutes	(Min. 5 minutes)
I(25) =	4.812	In./Hr.	
Q(25) =	0.55	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 16			Total Area =			S.F. =		Ac.	C	N
Surface										
Structures	4	Total	1,100	S.F.	=	4,400	S.F. =	0.10 Ac.	0.92	0.02
Drives	0	Total	200	S.F.	=	0	S.F. =	0.00 Ac.	0.92	0.02
Pavement	0	L.F.	14.5	Width	=	0	S.F. =	0.00 Ac.	0.92	0.02
Patios	8	Total	75	S.F.	=	600	S.F. =	0.01 Ac.	0.92	0.02
Sidewalks	0	L.F.	4	Width	=	0	S.F. =	0.00 Ac.	0.92	0.02
Lawn (0-2%)			27,536	S.F.	=			0.63 Ac.	0.15	0.40
Lawn (2-5%)				S.F.	=			0.00 Ac.	0.25	0.40
Lawn (5-10%)				S.F.	=			0.00 Ac.	0.40	0.40
Lawn (>10%)				S.F.	=			0.00 Ac.	0.55	0.40
Water			7,988	S.F.	=			0.18 Ac.	1.00	0.00
Misc.				S.F.	=			0.00 Ac.	0.92	0.02

Weighted c =	0.413		
Weighted N =	0.274		
L =	60	Ft.	
H =	6.5	Ft.	
S =	0.1083	Ft./Ft.	
tc =	5.14	Minutes	(Min. 5 minutes)
I(25) =	7.172	In./Hr.	
Q(25) =	2.75	CFS	

Developed Drainage Sub-Basins

Sub-basin No.: 17			Total Area =	3,768 S.F. =	0.09 Ac.		
Surface						C	N
Structures	2 Total	1,100 S.F. =	2,200 S.F. =	0.05 Ac.		0.92	0.02
Drives	0 Total	200 S.F. =	0 S.F. =	0.00 Ac.		0.92	0.02
Pavement	0 L.F.	14.5 Width =	0 S.F. =	0.00 Ac.		0.92	0.02
Patios	3 Total	75 S.F. =	225 S.F. =	0.01 Ac.		0.92	0.02
Sidewalks	0 L.F.	4 Width =	0 S.F. =	0.00 Ac.		0.92	0.02
Lawn (0-2%)		1,343 S.F. =		0.03 Ac.		0.15	0.40
Lawn (2-5%)		S.F. =		0.00 Ac.		0.25	0.40
Lawn (5-10%)		S.F. =		0.00 Ac.		0.40	0.40
Lawn (>10%)		S.F. =		0.00 Ac.		0.55	0.40
Water		S.F. =		0.00 Ac.		1.00	0.00
Misc.		S.F. =		0.00 Ac.		0.12	0.60

Weighted c =	0.646	
Weighted N =	0.155	
L =	100	Ft.
H =	2.0	Ft.
S =	0.0200	Ft./Ft.
tc =	7.42	Minutes (Min. 5 minutes)
I(25) =	6.587	In./Hr.
Q(25) =	0.37	CFS

Developed Drainage Sub-Basins

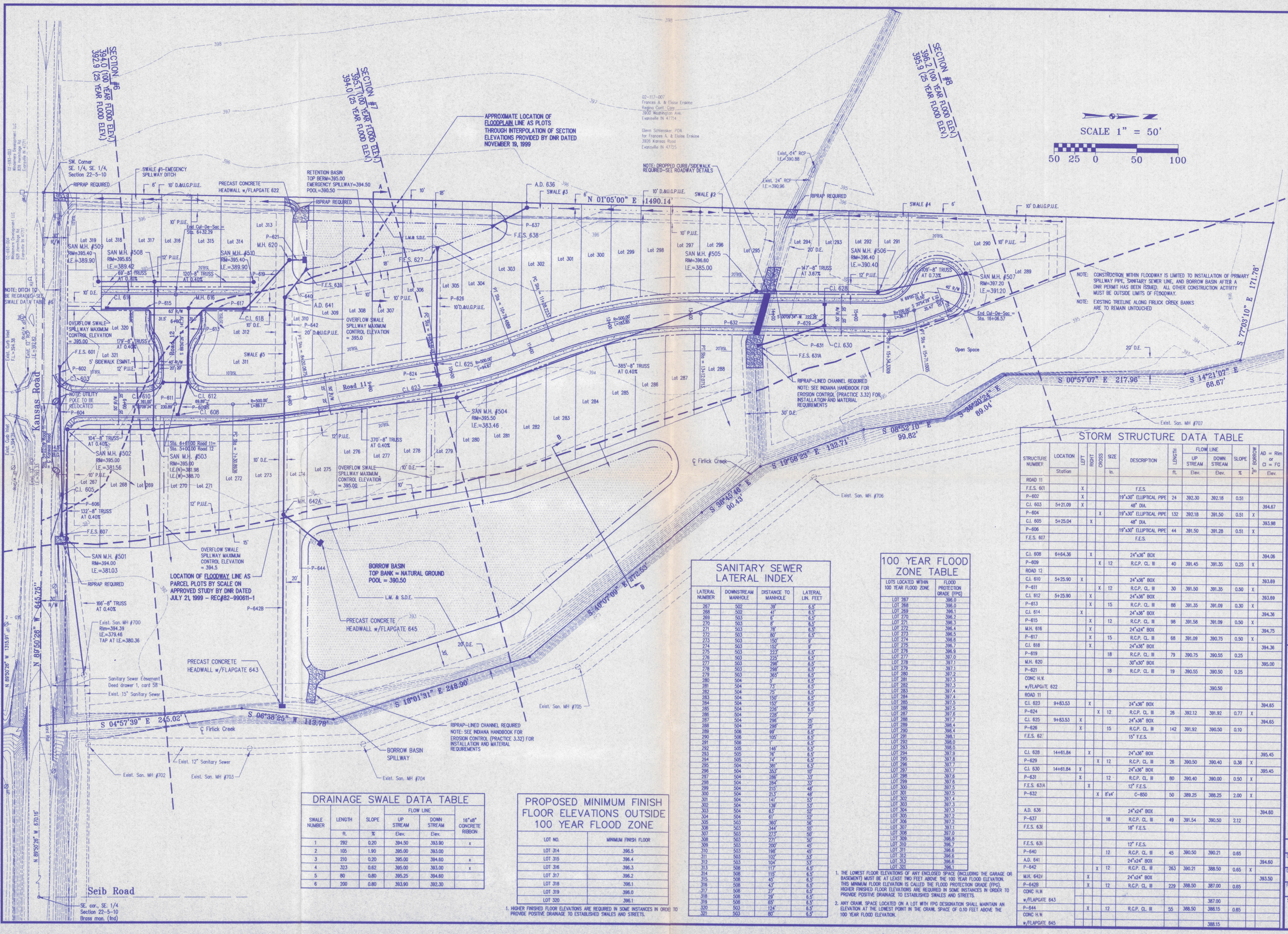
Sub-basin No.: 18			Total Area =	7,717 S.F. =	0.18 Ac.		
Surface						C	N
Structures	2 Total	1,100 S.F. =	2,200 S.F. =	0.05 Ac.		0.92	0.02
Drives	0 Total	200 S.F. =	0 S.F. =	0.00 Ac.		0.92	0.02
Pavement	0 L.F.	14.5 Width =	0 S.F. =	0.00 Ac.		0.92	0.02
Patios	4 Total	75 S.F. =	300 S.F. =	0.01 Ac.		0.92	0.02
Sidewalks	0 L.F.	4 Width =	0 S.F. =	0.00 Ac.		0.92	0.02
Lawn (0-2%)		5,217 S.F. =		0.12 Ac.		0.15	0.40
Lawn (2-5%)		S.F. =		0.00 Ac.		0.25	0.40
Lawn (5-10%)		S.F. =		0.00 Ac.		0.40	0.40
Lawn (>10%)		S.F. =		0.00 Ac.		0.55	0.40
Water		S.F. =		0.00 Ac.		1.00	0.00
Misc.		S.F. =		0.00 Ac.		0.92	0.02

Weighted c =	0.399	
Weighted N =	0.277	
L =	320	Ft.
H =	6.0	Ft.
S =	0.0188	Ft./Ft.
tc =	16.99	Minutes (Min. 5 minutes)
I(25) =	4.849	In./Hr.
Q(25) =	0.34	CFS

Developed Drainage Sub-Basins

Sub-basin No.: 19			Total Area =	9,715	S.F. =	0.22	Ac.		
Surface								C	N
Structures	1	Total	1,100 S.F. =	1,100	S.F. =	0.03	Ac.	0.92	0.02
Drives	0	Total	200 S.F. =	0	S.F. =	0.00	Ac.	0.92	0.02
Pavement	0	L.F.	14.5 Width =	0	S.F. =	0.00	Ac.	0.92	0.02
Patios	3	Total	75 S.F. =	225	S.F. =	0.01	Ac.	0.92	0.02
Sidewalks	0	L.F.	4 Width =	0	S.F. =	0.00	Ac.	0.92	0.02
Lawn (0-2%)			8,390 S.F. =			0.19	Ac.	0.15	0.40
Lawn (2-5%)			S.F. =			0.00	Ac.	0.25	0.40
Lawn (5-10%)			S.F. =			0.00	Ac.	0.40	0.40
Lawn (>10%)			S.F. =			0.00	Ac.	0.55	0.40
Water			S.F. =			0.00	Ac.	1.00	0.00
Misc.			S.F. =			0.00	Ac.	0.12	0.60

Weighted c =	0.255		
Weighted N =	0.348		
L =	150	Ft.	
H =	7.0	Ft.	
S =	0.0467	Ft./Ft.	
tc =	10.73	Minutes	(Min. 5 minutes)
I(25) =	5.795	In./Hr.	
Q(25) =	0.33	CFS	



STORM STRUCTURE DATA TABLE

STRUCTURE NUMBER	LOCATION Station	LEFT	RIGHT	CROSS	SIZE in.	DESCRIPTION	LENGTH ft.	FLOW LINE UP STREAM Elev.	FLOW LINE DOWN STREAM Elev.	SLOPE %	75" BORROW	AD = Rim CI = FG Elev.
ROAD 11												
F.E.S. 601		X				F.E.S.						
P-602		X				19"x30" ELLIPTICAL PIPE	24	392.30	392.18	0.51		
C.I. 603	5+21.09	X				48" DIA.						394.67
P-604				X		19"x30" ELLIPTICAL PIPE	132	392.18	391.50	0.51	X	
C.I. 605	5+25.04		X			48" DIA.						393.98
P-606						19"x30" ELLIPTICAL PIPE	44	391.50	391.28	0.51	X	
F.E.S. 607						F.E.S.						
C.I. 608	6+64.36		X			24"x36" BOX						394.06
P-609				X	12	R.C.P. CL. III	40	391.45	391.35	0.25	X	
ROAD 12												
C.I. 610	5+25.90	X				24"x36" BOX						393.69
P-611				X	12	R.C.P. CL. III	30	391.50	391.35	0.50	X	
C.I. 612	5+25.90		X			24"x36" BOX						393.69
P-613			X		15	R.C.P. CL. III	88	391.35	391.09	0.30	X	
C.I. 614		X				24"x36" BOX						394.36
P-615			X		12	R.C.P. CL. III	98	391.58	391.09	0.50	X	
M.H. 616			X			24"x24" BOX						394.75
P-617			X		15	R.C.P. CL. III	68	391.09	390.75	0.50	X	
C.I. 618			X			24"x36" BOX						394.36
P-619					18	R.C.P. CL. III	79	390.75	390.55	0.25		
M.H. 620						30"x30" BOX						395.00
P-621					18	R.C.P. CL. III	19	390.55	390.50	0.25		
CONC H.W. w/FLAPGATE 622									390.50			
ROAD 11												
C.I. 623	9+83.53		X			24"x36" BOX						394.65
P-624				X	12	R.C.P. CL. III	26	392.12	391.92	0.77	X	
C.I. 625	9+83.53	X				24"x36" BOX						394.65
P-626		X			15	R.C.P. CL. III	142	391.92	390.50	0.10		
F.E.S. 627						15" F.E.S.						
C.I. 628	14+61.84		X			24"x36" BOX						395.45
P-629				X	12	R.C.P. CL. III	26	390.50	390.40	0.38	X	
C.I. 630	14+61.84	X				24"x36" BOX						395.45
P-631		X			12	R.C.P. CL. III	80	390.40	390.00	0.50	X	
F.E.S. 631A			X			12" F.E.S.						
P-632				X	8'x4'	C-850	50	389.25	388.25	2.00	X	
A.D. 636						24"x24" BOX						394.60
P-637					18	R.C.P. CL. III	49	391.54	390.50	2.12		
F.E.S. 638						18" F.E.S.						
F.E.S. 639						12" F.E.S.						
P-640					12	R.C.P. CL. III	45	390.50	390.21	0.65		
A.D. 641						24"x24" BOX						394.60
P-642				X	12	R.C.P. CL. III	263	390.21	388.50	0.65	X	
M.H. 642A			X			24"x24" BOX						393.50
P-642B			X		12	R.C.P. CL. III	229	388.50	387.00	0.65		
CONC H.W. w/FLAPGATE 643									387.00			
P-644		X			12	R.C.P. CL. III	55	388.50	388.15	0.65		
CONC H.W. w/FLAPGATE 645									388.15			

DRAINAGE SWALE DATA TABLE

SWALE NUMBER	LENGTH ft.	SLOPE %	FLOW LINE UP STREAM Elev.	FLOW LINE DOWN STREAM Elev.	16"x8" CONCRETE RIBBON
1	292	0.20	394.50	393.90	x
2	105	1.90	395.00	393.00	
3	210	0.20	395.00	394.60	x
4	323	0.62	395.00	393.00	x
5	80	0.80	395.25	394.60	
6	200	0.80	393.90	392.30	

PROPOSED MINIMUM FINISH FLOOR ELEVATIONS OUTSIDE 100 YEAR FLOOD ZONE

LOT NO.	MINIMUM FINISH FLOOR
LOT 314	396.5
LOT 315	396.4
LOT 316	396.3
LOT 317	396.2
LOT 318	396.1
LOT 319	396.0
LOT 320	396.1

1. HIGHER FINISHED FLOOR ELEVATIONS ARE REQUIRED IN SOME INSTANCES IN ORDE TO PROVIDE POSITIVE DRAINAGE TO ESTABLISHED SWALES AND STREETS.

SANITARY SEWER LATERAL INDEX

LATERAL NUMBER	DOWNSTREAM MANHOLE	DISTANCE TO MANHOLE	LATERAL LIN. FEET
267	502	39'	6.5'
268	502	41'	6.5'
269	503	6'	6.5'
270	503	8'	6.5'
271	503	78'	6.5'
272	503	80'	6.5'
273	503	150'	9'
274	503	152'	9'
275	503	223'	6.5'
276	503	225'	6.5'
277	503	296'	6.5'
278	503	298'	6.5'
279	503	365'	6.5'
280	504	5'	6.5'
281	504	73'	6.5'
282	504	75'	6.5'
283	504	150'	6.5'
284	504	152'	6.5'
285	504	228'	6.5'
286	504	228'	7'
287	504	296'	25'
288	504	298'	25'
289	506	99'	6.5'
290	506	105'	6.5'
291	506	1'	6.5'
292	505	146'	6.5'
293	505	76'	6.5'
294	505	74'	6.5'
295	504	381'	6.5'
296	504	353'	10'
297	504	286'	33'
298	504	284'	33'
299	504	215'	48'
300	504	213'	48'
301	504	141'	53'
302	504	139'	53'
303	504	63'	52'
304	504	61'	52'
305	503	360'	56'
306	503	344'	55'
307	503	273'	50'
308	503	271'	50'
309	503	200'	45'
310	503	198'	45'
311	503	102'	53'
312	503	104'	53'
313	508	117'	6.5'
314	508	115'	6.5'
315	508	45'	6.5'
316	508	43'	6.5'
317	508	27'	6.5'
318	508	29'	6.5'
319	508	65'	6.5'
320	503	124'	6.5'
321	503	80'	6.5'

100 YEAR FLOOD ZONE TABLE

LOTS LOCATED WITHIN 100 YEAR FLOOD ZONE	FLOOD PROTECTION GRADE (FPG)
LOT 267	398.0
LOT 268	398.0
LOT 269	398.1
LOT 270	396.2
LOT 271	396.3
LOT 272	396.4
LOT 273	396.5
LOT 274	396.6
LOT 275	396.7
LOT 276	396.9
LOT 277	397.0
LOT 278	397.1
LOT 279	397.1
LOT 280	397.2
LOT 281	397.3
LOT 282	397.3
LOT 283	397.4
LOT 284	397.4
LOT 285	397.5
LOT 286	397.5
LOT 287	397.6
LOT 288	397.7
LOT 289	398.4
LOT 290	398.4
LOT 291	398.1
LOT 292	398.0
LOT 293	398.0
LOT 294	397.9
LOT 295	397.8
LOT 296	397.7
LOT 297	397.7
LOT 298	397.6
LOT 299	397.6
LOT 300	397.5
LOT 301	397.5
LOT 302	397.4
LOT 303	397.3
LOT 304	397.3
LOT 305	397.2
LOT 306	397.2
LOT 307	397.1
LOT 308	397.0
LOT 309	396.8
LOT 310	396.7
LOT 311	396.6
LOT 312	396.6
LOT 313	396.6
LOT 321	396.1

1. THE LOWEST FLOOR ELEVATIONS OF ANY ENCLOSED SPACE (INCLUDING THE GARAGE OR BASEMENT) MUST BE AT LEAST TWO FEET ABOVE THE 100 YEAR FLOOD ELEVATION. THIS MINIMUM FLOOR ELEVATION IS CALLED THE FLOOD PROTECTION GRADE (FPG). HIGHER FINISHED FLOOR ELEVATIONS ARE REQUIRED IN SOME INSTANCES IN ORDER TO PROVIDE POSITIVE DRAINAGE TO ESTABLISHED SWALES AND STREETS.
2. ANY CRAWL SPACE LOCATED ON A LOT WITH FPG DESIGNATION SHALL MAINTAIN AN ELEVATION AT THE LOWEST POINT IN THE CRAWL SPACE OF 0.10 FEET ABOVE THE 100 YEAR FLOOD ELEVATION.

Morley and Associates, INC.
Consulting Engineers/Surveyors/Architects
600 S.E. Sixth Street
Evansville, Indiana 47713
(812) 464-9585

Revisions

No.	By	Date	Description

DAVID W. SCHLENKER REGISTERED No. 19500175 STATE OF INDIANA PROFESSIONAL ENGINEER

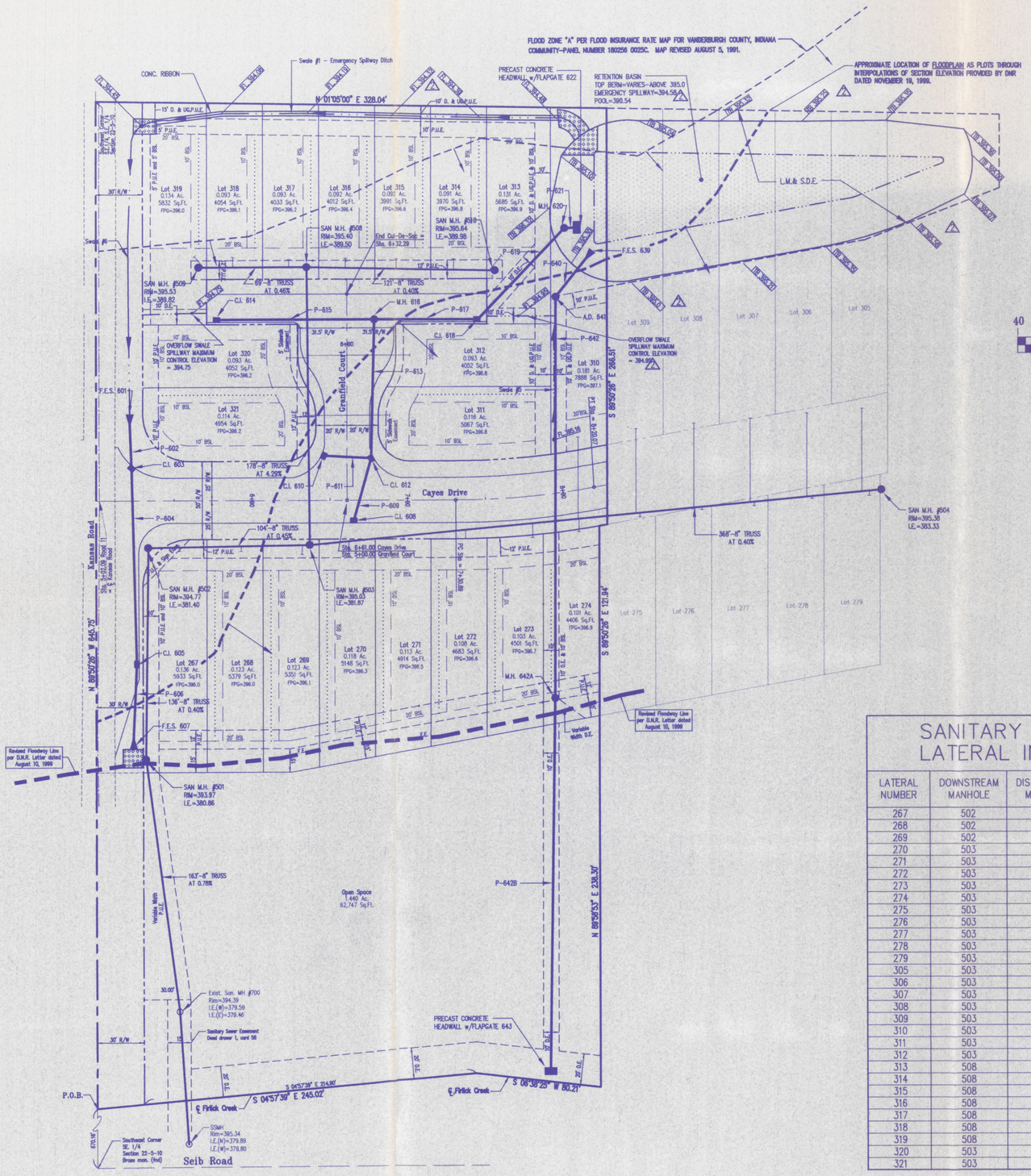
Project: Stonecreek Subdivision - Section 1

Sheet Title: Utility/Drainage Plan

Scale: 1"=50'

Designed By: R.S.L.
Job Number: 4255-4(G)
Drawn By: G.A.H.
Date: 1/06/00
Filename: J:\4255\CIVIL2\BASE.dwg

Sheet Number: 3 of: 10



I, David W. Schminke, certify and affirm that the completed storm water drainage system for this project complies with the final Drainage Plan as approved by the Vanderburgh County Drainage Board and as amended as follows:

1. Emergency overflow swale between Lot 269 and 270 was removed, as approved by Vanderburgh County Engineering Department (PER LETTER DATED 9/22/2000)

David W. Schminke
Signature

19500175
Indiana Registration Number

8-9-01
Date

SCALE 1" = 40'

40 0 40 80 120

STORM STRUCTURE DATA TABLE

STRUCTURE NUMBER	LEFT	RIGHT	CROSS	SIZE	LENGTH	FLOW LINE UP STREAM	FLOW LINE DOWN STREAM	SLOPE	FES = IE AD = Rim or CI = FG
				in.	ft.	Elev.	Elev.	%	Elev.
ROAD 11									
F.E.S. 601	X								392.31
P-602	X			19x30	28	392.28	392.16	0.44	
C.I. 603	X								394.44
P-604			X	19x30	126	392.16	391.59	0.45	
C.I. 605		X							393.93
P-606				19x30	48	391.59	391.14	0.94	
F.E.S. 607									391.08
C.I. 608		X							394.01
P-609			X	12	42	391.66	391.36	0.71	
ROAD 12									
C.I. 610	X								393.40
P-611			X	12	30	391.47	391.36	0.37	
C.I. 612		X							393.71
P-613		X		15	89	391.36	391.03	0.37	
C.I. 614	X								394.36
P-615		X		12	101	391.72	391.03	0.68	
M.H. 616		X							394.66
P-617		X		15	66	391.03	390.96	0.11	
C.I. 618		X							394.34
P-619				18	82	390.96	390.52	0.54	
M.H. 620									394.79
P-621				18	8	390.52	390.52	---	
CONC H.W. w/FLAPGATE 622							390.52		
F.E.S. 639									390.54
P-640				12	32	390.48	390.13	1.08	
A.D. 641									394.19
P-642			X	12	258	390.13	388.35	0.69	
M.H. 642A		X							393.64
P-642B		X		12	239	388.35	386.85	0.63	
CONC H.W. w/FLAPGATE 643							386.85		

NOTE: All PIPE ARE R.C.P. UNLESS OTHERWISE NOTED

SANITARY SEWER LATERAL INDEX

LATERAL NUMBER	DOWNSTREAM MANHOLE	DISTANCE TO MANHOLE	LATERAL LIN. FEET
267	502	20'	2.5'
268	502	60'	3.5'
269	502	99'	6.0'
270	503	24'	10'
271	503	61'	2.5'
272	503	100'	6.0'
273	503	143'	9.0'
274	503	173'	8.5'
275	503	213'	3.0'
276	503	253'	2.0'
277	503	287'	2.5'
278	503	324'	1.5'
279	503	361'	3.0'
305	503	356'	53.0'
306	503	320'	53.5'
307	503	284'	53.5'
308	503	248'	53.5'
309	503	210'	53.5'
310	503	173'	52.0'
311	503	83'	52.0'
312	503	122'	66.0'
313	508	118'	12.0'
314	508	95'	7.0'
315	508	58'	6.5'
316	508	25'	6.0'
317	508	11'	5.0'
318	508	47'	6.5'
319	508	66'	9.0'
320	503	120'	13.5'
321	503	78'	7.5'

DRAINAGE SWALE DATA TABLE

SWALE NUMBER	LENGTH	SLOPE	FLOW LINE UP STREAM	FLOW LINE DOWN STREAM	16"x8" CONCRETE RIBBON
	ft.	%	Elev.	Elev.	
1	270	0.42	394.58	393.45	x
5	92	1.05	395.16	394.19	
6	188	0.61	393.45	392.31	

Morley and Associates, INC.
Consulting Engineers/Surveyors/Architects
600 S.E. Sixth Street
Evansville, Indiana 47713
(812) 464-9585

No.	By	Date	Revisions Description
1	GAM	3-7-01	Sanitary sewer as-builts Section 2–Phase 1
2	RSL	8/07/01	Storm sewer as-builts Section 2–Phase 1

8-9-01
DAVID W. SCHMINKE REGISTERED No 19500175 STATE OF INDIANA PROFESSIONAL ENGINEER
David W. Schminke

Project: Stonecreek P.U.D. Section 2 – Phase 1

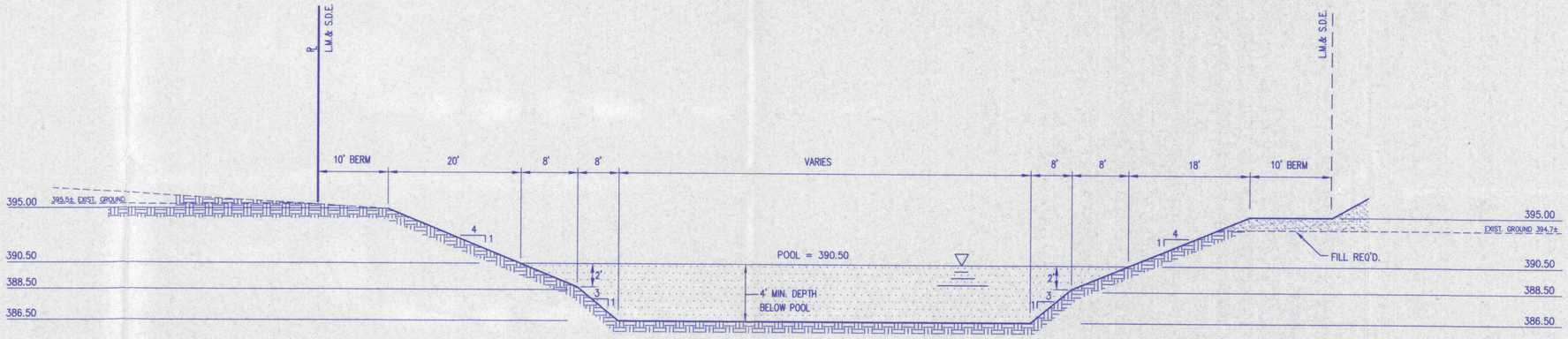
Sheet Title: Utility/Drainage Plan Record Drawing

Scale: 1" = 40'

Designed By:	Job Number:
R.S.L.	4255-4(H)
Drawn By:	Date:
G.A.M.	4-18-00

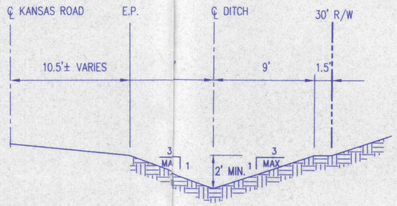
Filename: J:/4255/Civil2/BASERECORD.dwg

Sheet Number: 1 Of: —



Retention Basin Section A–A

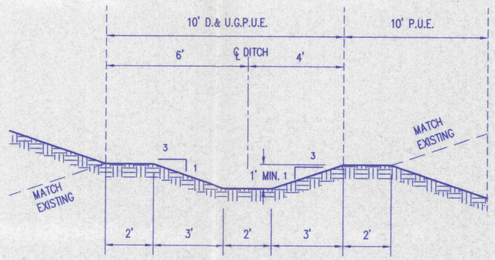
No Scale



NOTE: SEE DRAINAGE SWALE DATA TABLE (SHEET 3)
SWALE #6 - #7 FOR FLOWLINE (℄ DITCH) ELEVATIONS

Kansas Road–Ditch Profile

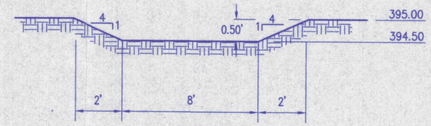
No Scale



NOTE:
1. SOD REQUIRED IF LONGITUDINAL SLOPE IS 4% OR GREATER.
2. 16"x8" CONCRETE RIBBON REQUIRED IF LONGITUDINAL SLOPE IS LESS THAN 0.8%
3. RIP-RAP OR EROSION CONTROL BLANKET REQUIRED ON SIDE SLOPES GREATER THAN 3:1. REFER TO EROSION/SEDIMENT CONTROL PLAN

Section A–A Drainage Swale

No Scale



Retention Basin Emergency Spillway

No Scale

Morley and Associates, INC.
Consulting Engineers/Surveyors/Architects
600 S.E. Sixth Street
Evansville, Indiana 47713
(812) 464-9585

Revisions

No.	By	Date	Description

DARYL JAMES HELFERT
REGISTERED
No. 20484
STATE OF INDIANA
PROFESSIONAL ENGINEER

Project: Stonecreek Subdivision – Section 1

Sheet Title: Drainage Details

Scale: AS SHOWN

Designed By:	Job Number:
R.S.L.	4255-4(G)
Drawn By:	Date:
G.A.H.	12/06/99

Filename: J:\4255\4255DRN.DWG

Sheet Number: 6 of 10

THIS PLAN IS DEPENDS ON OFFSITE AREA CONTINUING TO DRAIN INTO PUD

SECTION #6
394.0 (100 YEAR FLOOD ELEV.)
392.9 (25 YEAR FLOOD ELEV.)

SECTION #7
395.1 (100 YEAR FLOOD ELEV.)
394.0 (25 YEAR FLOOD ELEV.)

SECTION #8
396.2 (100 YEAR FLOOD ELEV.)
395.9 (25 YEAR FLOOD ELEV.)

SCALE 1" = 50'
50 25 0 50 100

LOCATION OF FLOODPLAIN LINE AS PARCEL PLOTS BY SCALE ON APPROVED STUDY BY DNR DATED JULY 21, 1999 – REC#82-990611-1

LOCATION OF FLOODWAY LINE AS PARCEL PLOTS BY SCALE ON APPROVED STUDY BY DNR DATED JULY 21, 1999 – REC#82-990611-1

NOTE: CONSTRUCTION WITHIN FLOODWAY IS LIMITED TO INSTALLATION OF PRIMARY SPILLWAY PIPE AND SANITARY SEWER LINE AFTER A DNR PERMIT HAS BEEN ISSUED. ALL OTHER CONSTRUCTION ACTIVITY MUST BE OUTSIDE LIMITS OF FLOODWAY.

STORM STRUCTURE DATA TABLE

STRUCTURE NUMBER	LOCATION Station	LEFT	RIGHT	CROSS	SIZE In.	DESCRIPTION	LENGTH Ft.	FLOW LINE UP STREAM Elev.	FLOW LINE DOWN STREAM Elev.	SLOPE %	"a" BORROW	AD = Rim or CI = FG Elev.
ROAD 1												
F.E.S. 601		X				F.E.S.						
P-602		X				18"x30" ELLIPTICAL PIPE	24	392.30	392.21	0.38		
C.I. 603	5+21.09	X				48" DIA.						394.67
P-604			X			18"x30" ELLIPTICAL PIPE	42	392.21	392.04	0.40	X	
C.I. 605	5+21.09		X			48" DIA.						394.59
P-606			X			18"x30" ELLIPTICAL PIPE	24	392.04	391.94	0.42		
F.E.S. 607						F.E.S.						
C.I. 608	6+64.36		X			24"x36" BOX						394.06
P-609				X	12	R.C.P. CL. III	40	391.45	391.35	0.25	X	
ROAD 12												
C.I. 610	5+25.90	X				24"x36" BOX						393.69
P-611			X		12	R.C.P. CL. III	30	391.50	391.35	0.50	X	
C.I. 612	5+25.90		X			24"x36" BOX						393.69
P-613			X		15	R.C.P. CL. III	88	391.35	391.09	0.30	X	
C.I. 614		X				24"x36" BOX						394.36
P-615			X		12	R.C.P. CL. III	88	391.58	391.09	0.50	X	
M.H. 616			X			24"x24" BOX						394.75
P-617			X		15	R.C.P. CL. III	68	391.09	390.75	0.50	X	
C.I. 618			X			24"x36" BOX						394.36
P-619					18	R.C.P. CL. III	79	390.75	390.55	0.25		
M.H. 620						24"x24" BOX						395.00
P-621					18	R.C.P. CL. III	19	390.55	390.50	0.25		
CONC H.W. w/FLAPGATE 622									390.50			
ROAD 1												
C.I. 625	9+83.53		X			24"x36" BOX						394.65
P-624				X	12	R.C.P. CL. III	26	392.12	391.92	0.77	X	
C.I. 625	9+83.53	X				24"x36" BOX						394.65
P-626		X			15	R.C.P. CL. III	142	391.92	390.50	0.10		
F.E.S. 627						15" F.E.S.						
C.I. 628	14+61.84		X			24"x36" BOX						395.45
P-629				X	12	R.C.P. CL. III	26	391.35	391.29	0.20	X	
C.I. 630	14+61.84	X				24"x36" BOX						395.45
P-631		X			12	R.C.P. CL. III	66	391.29	391.00	0.44	X	
P-632				X	8'x4'	C-850	50	389.25	388.25	2.00	X	
A.D. 631						24"x24" BOX						394.60
P-637					18	R.C.P. CL. III	49	391.54	390.50	2.12		
F.E.S. 637						18" F.E.S.						
F.E.S. 639						12" F.E.S.						
P-640					12	R.C.P. CL. III	45	390.50	390.21	0.65		
A.D. 641						24"x24" BOX						394.60
P-642				X	12	R.C.P. CL. III	492	390.21	387.00	0.65	X	
CONC H.W. w/FLAPGATE 643									387.00			

SANITARY SEWER LATERAL INDEX

LATERAL NUMBER	DOWNSTREAM MANHOLE	DISTANCE TO MANHOLE	LATERAL LIN. FEET
267	502	39'	6.5'
268	502	41'	6.5'
269	503	6'	6.5'
270	503	8'	6.5'
271	503	78'	6.5'
272	503	80'	6.5'
273	503	150'	9'
274	503	152'	9'
275	503	223'	6.5'
276	503	225'	6.5'
277	503	296'	6.5'
278	503	298'	6.5'
279	503	365'	6.5'
280	504	5'	6.5'
281	504	73'	6.5'
282	504	75'	6.5'
283	504	150'	6.5'
284	504	152'	6.5'
285	504	226'	6.5'
286	504	228'	7'
287	504	296'	25'
288	504	298'	25'
289	506	99'	6.5'
290	506	105'	6.5'
291	506	1'	6.5'
292	505	146'	6.5'
293	505	76'	6.5'
294	505	74'	6.5'
295	504	381'	6.5'
296	504	353'	10'
297	504	286'	33'
298	504	284'	33'
299	504	215'	48'
300	504	213'	48'
301	504	141'	53'
302	504	139'	53'
303	504	63'	52'
304	504	61'	52'
305	503	360'	56'
306	503	344'	55'
307	503	273'	50'
308	503	271'	50'
309	503	200'	45'
310	503	198'	45'
311	503	102'	53'
312	503	104'	53'
313	508	117'	6.5'
314	508	115'	6.5'
315	508	45'	6.5'
316	508	43'	6.5'
317	508	27'	6.5'
318	508	29'	6.5'
319	508	65'	6.5'
320	503	124'	6.5'
321	503	80'	6.5'

100 YEAR FLOOD ZONE TABLE

LOTS LOCATED WITHIN 100 YEAR FLOOD ZONE	FLOOD PROTECTION GRADE (FPG)
LOT 267	396.0
LOT 268	396.0
LOT 269	396.1
LOT 270	396.2
LOT 271	396.3
LOT 272	396.4
LOT 273	396.5
LOT 274	396.6
LOT 275	396.7
LOT 276	396.9
LOT 277	397.0
LOT 278	397.1
LOT 279	397.1
LOT 280	397.2
LOT 281	397.3
LOT 282	397.3
LOT 283	397.4
LOT 284	397.4
LOT 285	397.5
LOT 286	397.5
LOT 287	397.6
LOT 288	397.7
LOT 289	398.4
LOT 290	398.4
LOT 291	398.1
LOT 292	398.0
LOT 293	398.0
LOT 294	397.9
LOT 295	397.8
LOT 296	397.7
LOT 297	397.7
LOT 298	397.6
LOT 299	397.6
LOT 300	397.5
LOT 301	397.5
LOT 302	397.4
LOT 303	397.3
LOT 304	397.3
LOT 305	397.2
LOT 306	397.2
LOT 307	397.1
LOT 308	397.0
LOT 309	396.8
LOT 310	396.7
LOT 311	396.6
LOT 312	396.6
LOT 313	396.6
LOT 321	396.1

1. THE LOWEST FLOOR ELEVATIONS OF ANY ENCLOSED SPACE (INCLUDING THE GARAGE OR BASEMENT) MUST BE AT LEAST TWO FEET ABOVE THE 100 YEAR FLOOD ELEVATION. THIS MINIMUM FLOOR ELEVATION IS CALLED THE FLOOD PROTECTION GRADE (FPG). HIGHER FINISHED FLOOR ELEVATIONS ARE REQUIRED IN SOME INSTANCES IN ORDER TO PROVIDE POSITIVE DRAINAGE TO ESTABLISHED SWALES AND STREETS.
2. ANY CRAWL SPACE LOCATED ON A LOT WITH FPG DESIGNATION SHALL MAINTAIN AN ELEVATION AT THE LOWEST POINT IN THE CRAWL SPACE OF 0.10 FEET ABOVE THE 100 YEAR FLOOD ELEVATION.

DRAINAGE SWALE DATA TABLE

SWALE NUMBER	LENGTH	SLOPE	FLOW LINE UP STREAM	FLOW LINE DOWN STREAM	16"x8" CONCRETE RIBBON
	ft.	%	Elev.	Elev.	
1	292	0.20	394.50	393.90	x
2	105	1.90	395.00	393.00	
3	210	0.20	395.00	394.60	x
4	323	0.62	395.00	393.00	x
5	80	0.80	395.25	394.60	
6	200	0.80	393.90	392.30	
7	125	0.63	391.94	391.15 Match Exist. Flowline	

PROPOSED MINIMUM FINISH FLOOR ELEVATIONS OUTSIDE 100 YEAR FLOOD ZONE

LOT NO.	MINIMUM FINISH FLOOR
LOT 314	396.5
LOT 315	396.4
LOT 316	396.3
LOT 317	396.2
LOT 318	396.1
LOT 319	396.0
LOT 320	396.1

1. HIGHER FINISHED FLOOR ELEVATIONS ARE REQUIRED IN SOME INSTANCES IN ORER TO PROVIDE POSITIVE DRAINAGE TO ESTABLISHED SWALES AND STREETS.

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Revisions

No.	By	Date	Description

DARYL JAMES HELFERT REGISTERED No. 20484 STATE OF INDIANA PROFESSIONAL ENGINEER
Daryl Helfert

Project: Stonecreek Subdivision – Section 1

Sheet Title: Utility/Drainage Plan

Scale: 1"=50'

Designed By: R.S.L. | Job Number: 4255-4(G)
Drawn By: G.A.H. | Date: 12/06/99
Filename: J:\4255\CIVIL2\BASE.dwg
Sheet Number: 3 of 10