

# **Letter of Transmittal**

Attn: Bill Jeffers

Re: Metro Centre East - Section 9

Date: 1-21-05 Job No: 6077-4H

If enclosures are not as noted, please notify us at once. Thank you!

<u>To:</u> Vanderburgh County Surveyors Office Room 325 − Civic Center Complex Evansville, IN 47708

We are sendi	ng you by:							
☑ Messen	ger 🗀 L	JS Mail	US Mail, Certified	For Pick U	Jp [	Overnight So	ervice	Email
We are sendi	ng:							
Shop Dr	awings [	Prints	☐ Specifications	Report	□ Сору	of Letter	Othe	er
Copies	Doc. Date			Descri	ption	Tiplead	3 1 11250	
3	1/05		nage Report Revisior	ıs				
3	1/05		frastructure Plan					
3	1/05	Primary P	'lat					
These are Tra	ansmitted a	s Checke	d Below:					
For Appr	roval	ПΑ	pproved as Submitted	Resubn	mit	Copies	s for Appro	oval
☐ For Your	Use	ΠА	pproved as Noted	☐ Submit		Copies		
			eturned for Corrections	Return		Correc		
For Revie	ew & Commer	nt 🗀 o	ther			i Oonec	ited Copie	5
Remarks:			-					
error in the Form 8	suu spreadsnee	t that resulted	Report, Infrastructure Pland in an undersized retention and Infrastructure Pland	on basin. We hav	ve correcte	d the error and	d re-sized t	he hasin the
					$\mathbf{A}_{2}$	RECEIVED ANDERBUR SURVEYO	1 3 6 h	The state of the s
Copies To: SPURLING PRO FILE	PERTIES			Signed:  Matthew D.	Hall, Wallace,	P.E., Projec	et Engine	er

J:\6077\Civil\Drainage\6077Final Drainage Revisions LOT.doc

		VANDER	BURGH COU	NTY DRAIL	NAGE BOARD			
			FORM 8	00				
PROJECT:	6077-4(H)		DETENTIO	N FACILII	Y DESIGN RETUR	N PERIOD:	25	YRS
DESIGNER:	Morley and A	Assoc.		RELEASE	RATE RETURN PE	RIOD:	10	YRS
WATERSHEI	) AREA				8.22	ACRES		
TIME OF (	CONCENTRATIO	V (UNDEVE	OPED WATE	. /danba		MINUTES		
	INTENSITY (				3.04	INCHES/H	,	
UNDEVELOR	PED RUNOFF C	DEFFICIENT	(Cu):		0.21	INCRES/ H	ν.	
	PED RUNOFF R				5.09	CFS		
	RUNOFF COE				0.75	CrS		
	D RUNOFF RA		(34)		1.08	CFS		
PIPE OUTF					4.78	CFS		
					4.70	CFS		
STORM	RAINFALL	INFLOW	OUTFLOW	STORAGE	REOUIRED			
DURATION	INTENSITY		RATE	RATE	STORAGE			
Tđ	Ιđ	I(Td)	0	14111	DIOMAGE			
	25-Year	(Cd*Id*A)		I (Td) -0	(I(Td)-Q)*Td/12			
(HRS)	(INCH/HR)		(CFS)		(ACRE.FT)			
0.08	7.208	44.44	4.78	39.66	0.28		_	_
0.17	5.925	36.53	4.78	31.75	0.44			
0.25	5.033	31.03	4.78	26.25	0.55			
0.33	4.571	28.18	4.78	23.40	0.65			
0.42	4.108	25.33	4.78	20.55	0.71			
0.50	3.646	22.48	4.78	17.70	0.74			
0.58	3.385	20.87	4.78	16.09	0.78			
0.67	3.123	19.26	4.78	14.48	0.80			
0.75	2.862	17.64	4.78	12.86	0.80			
0.83	2.601	16.03	4.78	11.25	0.78			
0.92	2.339	14.42	4.78	9.64	0.74			
1.00	2.078	12.81	4.78	8.03	0.67			$\neg$
1.25	1.909	11.77	4.78	6.99	0.73			$\neg$
1.50	1.739	10.72	4.78	5.94	0.74			
1.75	1.570	9.68	4.78	4.90	0.71			
2.00	1.400	8.63	4.78	3.85	0.64			
2.50	1.210	7.46	4.78	2.68	0.56			
3.00	1.019	6.28	4.78	1.50	0.38			
4.00	0.836	5.15	4.78	0.37	0.12			
	Ì	PEAK STO	RAGE (ACR	E.FT):	0.80	Ĩ		
			RAGE (CUB					

Stage	(ft)	Area	Volume	Cum Vol.	(c.f.)
0		9,140	0	0	
1		10,748	9,944	9,944	
2		12,456	11,602	21,545	
3		14,264	13,360	34,905	
4		16,173	15,219	50,124	

Total Available Storage (ac.ft.) 1.1	5
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<sup>%</sup> Peak Storage / Available Storage

		VANDER	BURGH COUI FORM 80	NTY DRAINA 0	AGE BOARD			
PROJECT:	6077-4 (H)		DETENTION	N FACILITY	DESIGN RETURN	N PERIOD:	100	YR
DESIGNER:	Morley and A	SSOC.		RELEASE R	ATE RETURN PER	RIOD:	10	YR
WATERSHED	AREA	(UNDEVEI	LOPED WATE	RSHED):	8.22 34.01	ACRES MINUTES		
RAINFALL	INTENSITY (I	(u):			3.04	INCHES/HR	2	
UNDEVELOP	ED RUNOFF CO	EFFICIENT	(Cu):		0.21			
UNDEVELOP	ED RUNOFF RA	$\Delta TE (Q = 0)$	Cu*Iu*A):		5.09	CFS		
DEVELOPED	RUNOFF COEF	FICIENT	(Cd):		0.75			
UNDETAINE	D RUNOFF RAT	Έ			1.27	CFS		
PIPE OUTF	LOW				4.78	CFS		
STORM	RAINFALL	INFLOW	OUTFLOW	STORAGE	REQUIRED			
DURATION	INTENSITY	RATE	RATE	RATE	STORAGE			
Tđ	Id	I(Td)	Q					
	100-Year	(Cd*Id*A)	(Cu*Iu*A)	I (Td) -Q	(I(Td)-Q)*Td/12			
(HRS)	(INCH/HR)	(CFS)	(CFS)	(CFS)	(ACRE.FT)			
0.08	8.469	52.21	4.78	47.43	0.33			
0.17	7.126	43.93	4.78	39.15	0.54			
0.25	6.194	38.19	4.78	33.41	0.70			
0.33	5.665	34.93	4.78	30.15	0.84			
0.42	5.137	31.67	4.78	26.89	0.93			
0.50	4.608	28.41	4.78	23.63	0.98			
0.58	4.284	26.41	4.78	21.63	1.05			
0.67	3.960	24.41	4.78	19.63	1.09			
0.75	3.636	22.41	4.78	17.63	1.10			
0.83	3.311	20.41	4.78	15.63	1.09			
0.92	2.987	18.42	4.78	13.64	1.04			
1.00	2.663	16.42	4.78	11.64	0.97			
1.25	2.444	15.06	4.78	10.28	1.07			
1.50	2.224	13.71	4.78	8.93	1.12			
1.75	2.005	12.36	4.78	7.58	1.11			
2.00	1.785	11.00	4.78	6.22	1.04			
2.50	1.538	9.48	4.78	4.70	0.98			
3.00	1.291	7.96	4.78	3.18	0.79			
4.00	1.062	6.55	4.78	1.77	0.59			
			ORAGE (AC	RE.FT): BIC FT):	1.12 48,629			

Stage	(ft)	Area	Volume	Cum Vol.	(c.f.)
0		9,140	0	0	
1		10,748	9,944	9,944	
2		12,456	11,602	21,545	
3		14,264	13,360	34,905	
4		16,173	15,219	50,124	

Total Available Storage (ac.ft.) 1.15	<u> </u>
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<sup>%</sup> Peak Storage / Available Storage

system is designed for pre-cast concrete structures, with pipe material of either reinforced concrete pipe (RCP) or double wall, smooth interior high-density polyethylene pipe (HDPE).

The majority of the runoff generated on the site will be conveyed to the detention basin. Storm water from sub-basins 13, 17 and 18 will be allowed to drain off undetained. The lots were assumed to have approximately 75% impervious coverage. This yielded a developed runoff coefficient of 0.75. Calculations were done using the standard Form 800, and the required storage was determined to be 0.80 acre-feet. The proposed basin has an available volume of approximately 1.15 acre-feet. The proposed basin is designed to have a wet bottom and have approximately 4 feet of storage. The release rate was determined by taking the predeveloped peak discharge rate for the site for the 10 year event and adding it to the peak discharge rate for the 25 year event for the offsite area and then subtracting the peak discharge rates for the undetained areas (25 year event). This calculation yielded an allowable discharge rate of 5.15 (cfs). The basin will pass through the offsite water from sub-basin 19, 1.14 cfs, as undetained. The basin will be discharging 4.78 cfs, the available storage used for the 25 yr. event is 69.9%. The available storage used for the 100 yr. event with excess storage available.

		SSOCIATES DESIGN SHI	INC. EET - RATIONA	AL METHOD																			
PROJEC' OUR PRO IANNING	OJECT #	#	Metro Centre 6077-4(H) 0.013	East Prope	rty				DATE:	:Vanderb 1/10/05 PERIOD		YEARS											
Line umber		Upstream Structure	_	Downstream Structure		Subbasin no:	Cj	Aj (ac.)	CjAj	Sum CjAj	Tj (min) (5.0)	Tcum (min) (5.0)	I(25) (in/hr)	(cfs)	Pipe Diamete: (in) Or Swale	(ft/ft)		/elocity (ft/sec)	Travel Time (min)	Upstream Invert	Downstream Invert		Upstr y FG
1	CI	821	822	823	CI 27.28	15	0.79	0.76	0.60	0.60	15.06	15.06	5.03	3.02	15	0.24%	3.14	2.56	0.10	202			
1	CI	823	824	825	MH 7.00	14	0.79	0.82		1.25		15.24	5.01	6.24	15	1.01%	6.50	5.30	0.18	383.71	383.65	0.96	
1	MH	825	826	827	MH 242.08					1.25		15.26	5.01	6.24	21	0.16%	6.31	2.63	0.02	383.65	383.57		386.2
1A			S828A	828	FES 152.50	16	0.75	1.74	1.31		16.42		4.90	6.43	1		15.91	2.00	1.54	383.57	383.19	0.99	386.6
1A	FES	828	829	827	MH 95.50					1.31		16.42	4.90	6.43	15		10.70	8.72	1.27	387.05	385.81	0.40	
1	MH	827	830	831	FES 180.95					2.56		16.80	4.87	12.45	30		12.92	2.63	0.18 1.15	385.81	383.19	0.60	388.0
2	FES	832	833	834	FES 489.71									5.51	21	0.15%	6.03			383.01	382.30	0.91	
3			\$835	Basin	481.46										7	0.81%	15 01	2.00	4.01	387.02	383.12		

## VANDERBURGH COUNTY DRAINAGE BOARD FORM 800 PROJECT: 6077-4(H) DETENTION FACILITY DESIGN RETURN PERIOD: 25 YRS DESIGNER: Morley and Assoc. RELEASE RATE RETURN PERIOD: 10 YRS WATERSHED AREA 8.22 ACRES TIME OF CONCENTRATION (UNDEVELOPED WATERSHED): 34.01 MINUTES RAINFALL INTENSITY (Iu): 3.04 INCHES/HR UNDEVELOPED RUNOFF COEFFICIENT (Cu): 0.21 UNDEVELOPED RUNOFF RATE (Q = Cu\*Iu\*A): 5.09 CFS DEVELOPED RUNOFF COEFFICIENT (Cd): 0.75 UNDETAINED RUNOFF RATE 1.08 CFS PIPE OUTFLOW 4.78 CFS STORM RAINFALL INFLOW OUTFLOW STORAGE REQUIRED DURATION INTENSITY RATE RATE RATE STORAGE Τd IdI(Td) Q 25-Year (Cd\*Id\*A) (Cu\*Iu\*A) I (Td) -Q (I(Td)-Q)\*Td/12 (HRS) (INCH/HR) (CFS) (CFS) (CFS) (ACRE.FT) 0.08 7.208 44.44 4.78 39.66 0.28 0.17 5.925 36.53 4.78 31.75 0.44 0.25 5.033 31.03 4.78 26.25 0.55 0.33 4.571 28.18 4.78 23.40 0.65 0.42 4.108 25.33 4.78 20.55 0.71 0.50 3.646 22.48 4.78 17.70 0.74 3.385 0.58 20.87 4.78 16.09 0.78 0.67 3.123 19.26 4.78 14.48 0.80 0.75 2.862 17.64 4.78 12.86 0.80 0.83 2.601 16.03 4.78 11.25 0.78 0.92 2.339 14.42 4.78 9.64 0.74 1.00 2.078 12.81 4.78 8.03 0.67 1.25 1.909 11.77 4.78 6.99 0.73 1.50 1.739 10.72 4.78 5.94 0.74 1.570 1.75 9.68 4.78 4.90 0.71 2.00 1.400 8.63 4.78 3.85 0.64 2.50 1.210 7.46 4.78 2.68 0.56 4.78 3.00 1.019 6.28 1.50 0.38 4.00 0.836 5.15 4.78 0.37 0.12 PEAK STORAGE (ACRE.FT): 0.80 PEAK STORAGE (CUBIC FT): 35,030

Stage	(ft)	Area	Volume	Cum Vol.	(c.f.)
0		9,140	0	0	
1		10,748	9,944	9,944	
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Į	Total	Available	Storage	(ac.ft.)	1.15

<sup>%</sup> Peak Storage / Available Storage

# VANDERBURGH COUNTY DRAINAGE BOARD FORM 800 PROJECT: 6077-4(H) DETENTION FACILITY DESIGN RETURN PERIOD: 100 YRS DESIGNER: Morley and Assoc. RELEASE RATE RETURN PERIOD: 10 YRS WATERSHED AREA 8.22 ACRES TIME OF CONCENTRATION (UNDEVELOPED WATERSHED): 34.01 MINUTES RAINFALL INTENSITY (Iu): 3.04 INCHES/HR UNDEVELOPED RUNOFF COEFFICIENT (Cu): 0.21 UNDEVELOPED RUNOFF RATE (Q = Cu\*Iu\*A): 5.09 CFS DEVELOPED RUNOFF COEFFICIENT (Cd): 0.75 UNDETAINED RUNOFF RATE 1.27 CFS PIPE OUTFLOW 4.78 CFS STORM RAINFALL INFLOW OUTFLOW STORAGE REOUIRED DURATION INTENSITY RATE RATE STORAGE RATE Τđ Id I(Td) 0 100-Year (Cd\*Id\*A) (Cu\*Iu\*A) I(Td)-Q (I(Td)-Q)\*Td/12 (HRS) (INCH/HR) (CFS) (CFS) (CFS) (ACRE.FT) 0.08 8.469 52.21 4.78 47.43 0.33 0.17 7.126 43.93 4.78 39.15 0.54 0.25 6.194 38.19 4.78 33.41 0.70 0.33 5.665 34.93 4.78 30.15 0.84 0.42 5.137 31.67 4.78 26.89 0.93 0.50 4.608 28.41 4.78 23.63 0.98 0.58 4.284 26.41 4.78 21.63 1.05 0.67 3.960 24.41 19.63 4.78 1.09 0.75 3.636 22.41 4.78 17.63 1.10 0.83 3.311 20.41 4.78 15.63 1.09 0.92 2.987 18.42 4.78 13.64 1.04 1.00 2.663 16.42 4.78 11.64 0.97 1.25 2.444 15.06 4.78 10.28 1.07 1.50 2.224 . 13.71 4.78 8.93 1.12 1.75 2.005 12.36 4.78 7.58 1.11 2.00 1.785 11.00 4.78 6.22 1.04 2.50 1.538 9.48 4.78 4.70 0.98 3.00 1.291 7.96 4.78 3.18 0.79 4.00 1.062 6.55 4.78 1.77 0.59 PEAK STORAGE (ACRE.FT): 1.12 PEAK STORAGE (CUBIC FT): 48,629

Stage	(ft)	Area	Volume	Cum Vol.	(c.f.)
0		9,140	0 .	0	
1		10,748	9,944	9,944	
2		12,456	11,602	21,545	
3		14,264	13,360	34,905	
4		16,173	15,219	50,124	

Total Available Storage	(ac.ft.)	1.15
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<sup>%</sup> Peak Storage / Available Storage 97:0%

system is designed for pre-cast concrete structures, with pipe material of either reinforced concrete pipe (RCP) or double wall, smooth interior high-density polyethylene pipe (HDPE).

The majority of the runoff generated on the site will be conveyed to the detention basin. Storm water from sub-basins 13, 17 and 18 will be allowed to drain off undetained. The lots were assumed to have approximately 75% impervious coverage. This yielded a developed runoff coefficient of 0.75. Calculations were done using the standard Form 800, and the required storage was determined to be 0.80 acre-feet. The proposed basin has an available volume of approximately 1.15 acre-feet. The proposed basin is designed to have a wet bottom and have approximately 4 feet of storage. The release rate was determined by taking the predeveloped peak discharge rate for the site for the 10 year event and adding it to the peak discharge rate for the 25 year event for the offsite area and then subtracting the peak discharge rates for the undetained areas (25 year event). This calculation yielded an allowable discharge rate of 5.15 (cfs). The basin will pass through the offsite water from sub-basin 19, 1.14 cfs, as undetained. The basin will be discharging 4.78 cfs, the available storage used for the 25 yr. event is 69.9%. The available storage used for the 100 yr. event is 97.0%; therefore we are able to store the 100 yr. event with excess storage available.

		ASSOCIATES DESIGN SHE	INC. ET - RATIONA	AL METHOD																			
ROJEC' UR PRO	JECT	#	Metro Centre 5077-4(H) 0.013	East Prope	erty				DATE:	:Vanderb 1/10/05 PERIOD		YEARS											
ine mber		Upstream Structure	Pipe # or Swale	Downstream Structure	-	Subbasin no.	Сj	Aj (ac.)	CjAj	Sum CjAj	Tj (min) (5.0)	Tcum (min) (5.0)	I(25) (in/hr)	(cfs)			Pipe or Swale Cap. (cfs)	/elocity e (ft/sec)	Travel Time (min)	Upstream Invert	Downstream Invert		
1	CI	821	822	823	CI 27.28	15	0.79	0.76	0.60	0.60	15.06	15 06	5.03	3.02	1.5	0.010							
1	CI	823	824	825	MH 7.00	14	0.79		0.65		14.95		5.01		15	0.24%	3.14	2.56	0.18	383.71	383.65	0.96	386.2
1	MH	825	826	827	MH 242.08					1.25	11.75	15.24	5.01	6.24	15	1.01%	6.50	5.30	0.02	383.65	383.57	0.96	386.2
lA			S828A	828	FES 152.50	16	0.75	1.74	1 31		16 10			6.24	21	0.16%	6.31	2.63	1.54	383.57	383.19	0.99	386.6
1.A	FES	828	829	827	MH 95.50					1.31	16.42		4.90	6.43	1		15.91	2.00	1.27	387.05	385.81	0.40	
1	MH	827	830	831	FES 180.95							16.42	4.90	6.43	15		10.70	8.72	0.18	385.81	383.19	0.60	388.0
										2.56		16.80	4.87	12.45	30	0.10%	12.92	2.63	1.15	383.19	383.01		
2	FES	832	833	834	FES 489.71																		
														5.51	21	0.15%	6.03			383.01	382.30	0.91	
3			S835	Basin	481.46											0.81%							

# VANDERBURGH COUNTY DRAINAGE BOARD FORM 800 PROJECT: 6077-4(H) DETENTION FACILITY DESIGN RETURN PERIOD: 25 YRS DESIGNER: Morley and Assoc. RELEASE RATE RETURN PERIOD: 10 YRS WATERSHED AREA 8.22 **ACRES** TIME OF CONCENTRATION (UNDEVELOPED WATERSHED): 34.01 MINUTES RAINFALL INTENSITY (Iu): 3.04 INCHES/HR UNDEVELOPED RUNOFF COEFFICIENT (Cu): 0.21 UNDEVELOPED RUNOFF RATE (Q = Cu\*Iu\*A): 5.09 CFS DEVELOPED RUNOFF COEFFICIENT (Cd): 0.75 UNDETAINED RUNOFF RATE 1.08 CFS PIPE OUTFLOW 4.78 CFS STORM RAINFALL INFLOW OUTFLOW STORAGE REQUIRED DURATION INTENSITY RATE RATE RATE STORAGE Td Id I(Td) Q 25-Year (Cd\*Id\*A) (Cu\*Iu\*A) I(Td)-Q (I(Td)-Q)\*Td/12 (HRS) (INCH/HR) (CFS) (CFS) (CFS) (ACRE.FT) 0.08 7.208 44.44 4.78 39.66 0.28 0.17 5.925 36.53 4.78 31.75 0.44 0.25 5.033 31.03 4.78 26.25 0.55 0.33 4.571 28.18 4.78 23.40 0.65 0.42 4.108 25.33 4.78 20.55 0.71 0.50 3.646 22.48 4.78 17.70 0.74 0.58 3.385 20.87 4.78 16.09 0.78 0.67 3.123 19.26 4.78 14.48 0.80 0.75 2.862 17.64 4.78 12.86 0.80 0.83 2.601 16.03 4.78 11.25 0.78 0.92 2.339 14.42 4.78 9.64 0.74 1.00 2.078 12.81 4.78 8.03 0.67 1.25 1.909 11.77 4.78 6.99 0.73 1.50 1.739 10.72 4.78 5.94 0.74 1.75 1.570 9.68 4.78 4.90 0.71 2.00 1.400 8.63 4.78 3.85 0.64 2.50 1.210 7.46 4.78 2.68 0.56 3.00 1.019 6.28 4.78 1.50 0.38 4.00 0.836 5.15 4.78 0.37 0.12 PEAK STORAGE (ACRE.FT): 0.80 PEAK STORAGE (CUBIC FT): 35,030

Stage	(ft)	Area	Volume	Cum Vol.	(c.f.)
0		9,140	0	0	
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Total	Available	Storage	(ac:ft.)	1.15

<sup>%</sup> Peak Storage / Available Storage

# VANDERBURGH COUNTY DRAINAGE BOARD FORM 800 DETENTION FACILITY DESIGN RETURN PERIOD: 100 YRS PROJECT: 6077-4(H) DESIGNER: Morley and Assoc. RELEASE RATE RETURN PERIOD: 10 YRS WATERSHED AREA 8.22 ACRES TIME OF CONCENTRATION (UNDEVELOPED WATERSHED): 34.01 MINUTES RAINFALL INTENSITY (Iu): 3.04 INCHES/HR UNDEVELOPED RUNOFF COEFFICIENT (Cu): 0.21 UNDEVELOPED RUNOFF RATE (Q = Cu\*Iu\*A): 5.09 CFS DEVELOPED RUNOFF COEFFICIENT (Cd): 0.75 UNDETAINED RUNOFF RATE 1.27 CFS PIPE OUTFLOW 4.78 CFS STORM RAINFALL INFLOW OUTFLOW STORAGE REOUIRED DURATION INTENSITY RATE RATE RATE STORAGE Td Id I(Td) Q (Cd\*Id\*A) (Cu\*Iu\*A) I(Td)-Q 100-Year (I(Td)-Q)\*Td/12 (INCH/HR) (HRS) (CFS) (CFS) (CFS) (ACRE.FT) 0.08 8.469 52.21 4.78 47.43 0.33 0.17 7.126 43.93 4.78 39.15 0.54 0.25 6.194 38.19 4.78 33.41 0.70 0.33 5.665 34.93 4.78 30.15 0.84 0.42 5.137 31.67 4.78 26.89 0.93 0.50 4.608 28.41 4.78 23.63 0.98 0.58 4.284 26.41 4.78 21.63 1.05 0.67 3.960 24.41 4.78 19.63 1.09 0.75 3.636 22.41 4.78 17.63 1.10 0.83 3.311 20.41 4.78 15.63 1.09 0.92 2.987 18.42 4.78 13.64 1.04 1.00 2.663 16.42 11.64 4.78 0.97 1.25 2.444 15.06 4.78 10.28 1.07 1.50 2.224 13.71 4.78 8.93 1.12 1.75 2.005 4.78 12.36 7.58 1.11 2.00 1.785 11.00 4.78 6.22 1.04 2.50 1.538 9.48 4.78 4.70 0.98 3.00 7.96 1.291 4.78 3.18 0.79 4.00 1.062 6.55 4.78 1.77 0.59 PEAK STORAGE (ACRE.FT): 1.12 PEAK STORAGE (CUBIC FT): 48,629

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Total Available Storage	(ac.ft.)	1.15
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<sup>%</sup> Peak Storage / Available Storage 97.0%

system is designed for pre-cast concrete structures, with pipe material of either reinforced concrete pipe (RCP) or double wall, smooth interior high-density polyethylene pipe (HDPE).

The majority of the runoff generated on the site will be conveyed to the detention basin. Storm water from sub-basins 13, 17 and 18 will be allowed to drain off undetained. The lots were assumed to have approximately 75% impervious coverage. This yielded a developed runoff coefficient of 0.75. Calculations were done using the standard Form 800, and the required storage was determined to be 0.80 acre-feet. The proposed basin has an available volume of approximately 1.15 acre-feet. The proposed basin is designed to have a wet bottom and have approximately 4 feet of storage. The release rate was determined by taking the predeveloped peak discharge rate for the site for the 10 year event and adding it to the peak discharge rate for the 25 year event for the offsite area and then subtracting the peak discharge rates for the undetained areas (25 year event). This calculation yielded an allowable discharge rate of 5.15 (cfs). The basin will pass through the offsite water from sub-basin 19, 1.14 cfs, as undetained. The basin will be discharging 4.78 cfs, the available storage used for the 25 yr. event is 69.9%. The available storage used for the 100 yr. event is 97.0%; therefore we are able to store the 100 yr. event with excess storage available.

		AL METHOD																			
#	6077-4(H)	East Prope	erty				DATE:	1/10/05		YEARS											
Upstream Structure	Pipe # or Swale		5	Subbasin no.	Cj	Aj (ac.)	CjAj	Sum CjAj	Tj (min) (5.0)	Tcum (min) (5.0)	I(25) (in/hr)	(cfs)	(in) Or Swal	(ft/ft) e	Pipe or Swale Cap. (cfs)	7elocity (ft/sec)	Travel Time (min)	Upstream Invert			
821	822	823	CI 27.28	1.5	0.79	0.76	0.60	0.60	15.00	15.06	F 00										
823	824	825													3.14	2.56	0.18	383.71	383.65	0.96	386
825	826	827	MH 242.08			0.02	0.05		14.95					1.01%	6.50	5.30	0.02	383.65	383.57		386.
	S828A	828	FES 152.50	16	0.75	1.74	1 31		16 45				21			2.63	1.54	383.57	383.19		
828	829	827	MH 95.50				1.01		10.42				1			2.00	1.27	387.05	385.81		
827	830	831	FES 180.95													8.72	0.18	385.81	383.19		388.0
								2.50		16.80	4.87	12.45	30	0.10%	12.92	2.63	1.15	383.19	383.01		388.1
832	833	834	FES 489.71									5 51	21	0 150	- OO						
	S835	Basin										J.J.	21	0.15%	6.03			383.01	382.30	0.91	
	# Upstream Structure  821 823 825	# 6077-4(H) 0.013  Upstream Pipe Structure # or Swale  821 822 823 824 825 826 S828A 828 829 827 830  832 833	# 6077-4(H) 0.013  Upstream Pipe Downstream Structure # Structure or Swale  821 822 823 823 824 825 825 826 827 S828A 828 828 829 827 827 830 831	Upstream Pipe Structure # Structure (ft) or Swale  821 822 823 CI 27.28 823 824 825 MH 7.00 825 826 827 MH 242.08 828 829 827 MH 95.50 827 830 831 FES 180.95	# 6077-4(H) 0.013  Upstream Pipe Downstream Length Subbasin (ft) no.  or Swale  821 822 823 CI 27.28 15 823 824 825 MH 7.00 14 825 826 827 MH 242.08  8828 829 827 MH 242.08 828 829 827 MH 95.50 827 830 831 FES 180.95	# 6077-4(H) 0.013  Upstream Pipe Structure # Structure (ft) no. or Swale  821 822 823 CI 27.28 15 0.79 823 824 825 MH 7.00 14 0.79 825 826 827 MH 242.08  S828A 828 FES 152.50 16 0.75 828 829 827 MH 95.50 827 830 831 FES 180.95	# 6077-4(H) 0.013  Upstream Pipe Downstream Length Subbasin Cj Aj Structure # Structure (ft) no. (ac.) or Swale  821 822 823 CI 27.28 15 0.79 0.76 823 824 825 MH 7.00 14 0.79 0.82 825 826 827 MH 242.08 S828A 828 FES 152.50 16 0.75 1.74 828 829 827 MH 95.50 827 830 831 FES 180.95	# 6077-4(H) 0.013  **DATE: DESIGN**  Upstream	# 6077-4(H) 0.013  DATE: 1/10/05 DESIGN PERIOD  Sum  Structure  # Structure (ft) no. (ac.)  Or Swale  821 822 823 CI 27.28 15 0.79 0.76 0.60 0.60 823 824 825 MH 7.00 14 0.79 0.82 0.65 1.25 825 826 827 MH 242.08  S828 829 827 MH 95.50 827 830 831 FES 180.95  832 833 834 FES 489.71	# 6077-4(H) 0.013    DATE: 1/10/05     DATE: 1/10/05     DATE: 1/10/05     DESIGN PERIOD   25     Sum   Sum   Cj   Aj   CjAj   CjAj   Tj     Structure	# 6077-4(H) 0.013  DATE: 1/10/05  DESIGN PERIOD 25 YEARS  Sum  Sum  Sum  (ft) no. Cip Aj CjAj CjAj Tj Tcum (ac.) Cip Aj CjAj Tj Tcum (min) (min) (min) (5.0) (5.0)  821 822 823 CI 27.28 15 0.79 0.76 0.60 0.60 15.06 15.06 823 824 825 MH 7.00 14 0.79 0.82 0.65 1.25 14.95 15.24 825 826 827 MH 242.08	# 6077-4 (H) 0.013    DATE   1/10/05     DATE   1/1	# 6077-4(H) 0.013    DATE: 1/10/05   DATE: 1/10/05	# 6077-4 (H) 0.013    DATE: 1/10/05   DESIGN PERIOD   25   YEARS	# 6077-4 (H) 0.013    DATE: 1/10/05   DATE: 1/10/05   DATE: 1/10/05	# 6077-4(H) 0.013    DATE:   1/10/05	## 6077-4 (H) 0 - 013	# 6077 - 4 (H)	# 6077-4 (H) 0.013    Pipe	# 6077-4 (H) 0.013    Part   P	# 6077 - 4 (H) 0.0 13