NEW DIMENSIONS

DRAFTING, DESIGN,
CONSTRUCTION & PLANNING ASSISTANCE

~ LETTER OF TRANSMITTAL ~

ATTENTION: *Chad Lulfs, P.E., P.S.*

FROM: *Ron Sonnenberg, 419-599-8339*

COMPANY: *City of Napoleon - Engineer*

DATE: *Jan. 23, 2008*

ENCLOSED PLEASE FIND THE FOLLOWING:

☐ SHOP DRAWINGS ☐ PRINTS ☐ PLANS ☐ SAMPLES
☐ SPECIFICATIONS ☐ COPY OF LETTER ☐ CHANGE ORDER X OTHER

DESCRIPTION:

Stormwater Abatement Credit Application for G & B Group (Custom Agri Systems, Inc.), Twp. Road R.

THESE ARE TRANSMITTED AS FOLLOWS:

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☐ FOR REVIEW & COMMENT ☐ RETURN___CORRECTED PRINTS
☐ ITEMS RETURNED AFTER LOAN TO US
☐ FOR BIDS DUE_____,___ 20___. ☐ OTHER _____

REMARKS:

Chad,

Attached please find the completed application as referenced above along with a copy of the drainage calculations as required. The application does not indicate your method of determining the credit percentage so I am guessing at the following calculation.

The calculations show a total impervious area (this includes two future buildings) of 117,787 s.f.. This amount divided by your ERU constant of 3009 s.f. would result in a total of 39.1 ERU. This would place the account in Tier four which is also their current placement based on 31.4 ERU.

P.O. BOX 174, 1445 N. SCOTT ST.
NAPOLEON, OHIO 43545

The calculations also show a "Post" development runoff rate of 8.705 cfs (@2.60"/hr.), however, due to the detention system in place the assumed actual runoff rate is 3.660 cfs..

This would result in a runoff reduction of 58%, for a ERU reduction of 22.7 units to 16.4 ERU, placing this account in Tier two of the rate structure.

Another way I have looked at this is to divide the assumed actual runoff rate of 3.660 cfs. by the calculated runoff rate of 0.321 [this is for a typical $\frac{1}{4}$ acre residential lot with 3009 s.f. of impervious area per attached calc's.]. This would result in an equivalent runoff of 11.4 ERU which would also place this account in Tier two of the rate structure.

Please review tha attached and let me know what your determination is or if you need any further information.

If you have any questions please call.

Thanks,

Ron Sonnenberg

Storm Water Calculations : FOR ¼ AC. RESIDENTIAL LOT

By:RDS Date: January 9, 2008

1) ORIGINAL [redacted] (Pre-development) runoff:

Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
0.250	Grassed area	0.35	2.60	0.228
0.000	Building roof	0.85	2.60	0.000
0.000	Existing pond area	0.10	2.60	0.000
0.000	Gravel pavement	0.90	2.60	0.000
0.250	TOTAL AREA	Total Existing Runoff		0.228

2) Proposed

Area(Ac.)	Land use description	"C"	"CA"
1570 sf 0.036	Building roof	0.85	0.031
0.000	Pond area	0.10	0.000
1440 sf 0.033	Concrete pavement	0.90	0.030
0.000	Gravel pavement	0.50	0.000
0.181	Lawn-grassed area	0.35	0.063
0.250	TOTAL AREA	TOTAL	0.124

Weighted "C" = TOTAL "CA" **0.124**

TOTAL "A" **0.250**

Weighted "C" = **0.495**

3) Proposed (Post-development) runoff:

Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
0.250	See "2" Above	0.495	2.60	0.321
		Total Proposed Runoff		0.321

4) Critical Storm Determination:

(0.321-0.228)/(0.228)=0.406 or 41% therefore : Critical Storm = 5 Year

Storm Water Detention Calculations

By:RDS Date: January 9, 2008

Total Site Area: **0.250**

Weighted "C' **0.495**

"T"(min.) Time of Concentration	"I"(in/hr) Intensity 5 Year Storm	"CA"	"Q" in (cfs)	"Q" out (cfs)	"Q"in-"Q"out (cfs)	Detention Volume(c.f.)
20	***3.15***	***0.1237***	***0.39***	***0.228***	***0.16***	***194***
30	2.45	0.1237	0.30	0.228	0.07	135
40	2.00	0.1237	0.25	0.228	0.02	46
50	1.72	0.1237	0.21	0.228	-0.02	-46
60	1.52	0.1237	0.19	0.228	-0.04	-144
70	1.26	0.1237	0.16	0.228	-0.07	-303
80	1.16	0.1237	0.14	0.228	-0.08	-406
90	1.06	0.1237	0.13	0.228	-0.10	-523

Storm Water Calculations

Project: CUSTOM ARGI SERVICE, TWP. RD. R, NAPOLEON, OHIO

Runoff flows & Coefficients, Pre & Post development

By:RDS | Date: January 9, 2008 | Revised: January 23, 2008

1) ORIGINAL 1998 (Pre-development) runoff:

Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
6.651	Grassed area	0.35	2.60	6.052
0.023	Building roof	0.85	2.60	0.051
0.280	Existing pond area	0.10	2.60	0.073
0.046	Gravel pavement	0.45	2.60	0.054
7.000	TOTAL AREA	Total Existing Runoff		6.230

2) Proposed (w/2008 & FUTURE ADDITIONS) runoff:

Project Description:

Calculations are based on an existing and proposed building roof area of 46,891 s.f., a 0.4 acre pond, 17,649 square feet of existing & proposed concrete pavement and sidewalk area and 35,280 square feet of existing & proposed gravel pavement.

Area(Ac.)	Land use description		"C"	"CA"
1.076	Building roof		0.90	0.968
0.400	Pond area		0.10	0.040
0.405	Concrete pavement		0.90	0.365
1.223	Gravel pavement		0.50	0.612
3.896	Lawn-grassed area		0.35	1.364
7.000	TOTAL AREA		TOTAL	3.348

Weighted "C" = TOTAL "CA" **3.348**

TOTAL "A" **7.000**

Weighted "C" = **0.478**

3) Proposed (Post-development) runoff:

Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
7.000	See "2" Above	0.478	2.60	8.705
		Total Proposed Runoff		8.705

4) Critical Storm Determination:

(8.705-6.230)/(6.230)=0.3973 or 39.73% therefore : Critical Storm = 5 Year

Storm Water Calculations						
Project: CUSTOM AGRI SERVICE, TWP. RD. R, NAPOLEON, OHIO						
Storm Water Detention Calculations						
By:RDS		Date: January 9, 2008		Revised: January 23, 2008		
Total Site Area:		**7.000**				
Weighted "C'		**0.478**				
"T"(min.)	"I"(in/hr)	"CA"	"Q" in	"Q" out	"Q"in-"Q"out	Detention
Time of	Intensity		(cfs)	(cfs)	(cfs)	Volume(c.f.)
Concentration	5 Year Storm					
20	***3.15***	***3.3480***	***10.55***	***3.660***	***6.89***	***8263***
30	2.45	3.3480	8.20	3.660	4.54	8177
40	2.00	3.3480	6.70	3.660	3.04	7286
50	1.72	3.3480	5.76	3.660	2.10	6296
60	1.52	3.3480	5.09	3.660	1.43	5144
70	1.26	3.3480	4.22	3.660	0.56	2346
80	1.16	3.3480	3.88	3.660	0.22	1074
90	1.06	3.3480	3.55	3.660	-0.11	-600
Site #3 Area:		**2.789**				
Weighted "C'		**0.534**				
"T"(min.)	"I"(in/hr)	"CA"	"Q" in	"Q" out	"Q"in-"Q"out	Detention
Time of	Intensity		(cfs)	(cfs)	(cfs)	Volume(c.f.)
Concentration	5 Year Storm					
20	***3.15***	***1.4893***	***4.69***	***1.460***	***3.23***	***3878***
30	2.45	1.4893	3.65	1.460	2.19	3940
40	2.00	1.4893	2.98	1.460	1.52	3645
50	1.72	1.4893	2.56	1.460	1.10	3305
60	1.52	1.4893	2.26	1.460	0.80	2894
70	1.26	1.4893	1.88	1.460	0.42	1750
80	1.16	1.4893	1.73	1.460	0.27	1285
90	1.06	1.4893	1.58	1.460	0.12	641
Site #4-5 Area:		**2.756**				
Weighted "C'		**0.478**				
"T"(min.)	"I"(in/hr)	"CA"	"Q" in	"Q" out	"Q"in-"Q"out	Detention
Time of	Intensity		(cfs)	(cfs)	(cfs)	Volume(c.f.)
Concentration	5 Year Storm					
20	***3.15***	***1.3174***	***4.15***	***0.500***	***3.65***	***4380***
30	2.45	1.3174	3.23	0.500	2.73	4910
40	2.00	1.3174	2.63	0.500	2.13	5123
50	1.72	1.3174	2.27	0.500	1.77	5298
60	***1.52***	***1.3174***	***2.00***	***0.500***	***1.50***	***5409***
70	1.26	1.3174	1.66	0.500	1.16	4872
80	1.16	1.3174	1.53	0.500	1.03	4935
90	1.06	1.3174	1.40	0.500	0.90	4841

Storm Water Calculations						
Project: CUSTOM AGRI SERVICE, TWP. RD. R, NAPOLEON, OHIO						
Drainage Area Flow Calculations						
R.D.S.		Date: January 9, 2008				
		Revised: January 23, 2008		Design Storm "I" in./hr.=		**3.15**
				Time/Concentration "T" m		**20**
Area 1	Description:				5 Yr. Stm.	
		NW Cor. to Road ditch				
		Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
		0.000	Building roof	0.9	3.15	0.000
		0.014	Asphalt pavement	0.85	3.15	0.037
		0.000	Concrete pavement	0.90	3.15	0.000
		0.585	Lawn-grassed area	0.35	3.15	0.645
				Total Flow ~ Area 1		0.682
Area 2	Description:					
		NE Cor. to Road ditch				
		Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
		0.000	Building roof	0.90	3.15	0.000
		0.017	Asphalt pavement	0.85	3.15	0.046
		0.103	Gravel pavement	0.50	3.15	0.162
		0.733	Lawn-grassed area	0.35	3.15	0.808
				Total Flow ~ Area 2		1.016
Area 3	Description:					
		SE Cor. to US 24, E outlet				
		Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
		0.327	Building roof	0.90	3.15	0.927
		0.328	Concrete pavement	0.90	3.15	0.930
		1.024	Gravel pavement	0.50	3.15	1.613
		1.110	Lawn-grassed area	0.35	3.15	1.224
				Total Flow ~ Area 3		4.694

Storm Water Calculations						
Project: CUSTOM AGRI SERVICE, TWP. RD. R, NAPOLEON, OHIO						
Drainage Area Flow Calculations						
R.D.S.		Date: January 9, 2008				
		Revised: January 23, 2008		Design Storm "I" in./hr.=		**3.15**
				Time/Concentration "T" m		**20**
Area 4	Description:				5 Yr. Stm.	
		SW Cor. to US 24, W outlet				
		Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
		0.150	Building roof	0.90	3.15	0.425
		0.039	Concrete pavement	0.90	3.15	0.111
		0.052	Gravel pavement	0.50	3.15	0.082
		0.571	Lawn-grassed area	0.35	3.15	0.630
				Total Flow ~ Area 4		1.247
Area 5	Description:					
		To pond w/Detention				
		Area(Ac.)	Land use description	"C"	"I"in/hr	"Q"cfs
		0.599	Building roof	0.90	3.15	1.698
		0.007	Concrete pavement	0.90	3.15	0.020
		0.044	Gravel pavement	0.50	3.15	0.069
		0.400	Pond area	0.10	3.15	0.126
		0.894	Lawn-grassed area	0.35	3.15	0.986
				Total Flow ~ Area 5		2.899
Outlet size; flow requirement				Critical Storm "I" in./hr.=		**3.15**
	Description:			Time/Concentration "T" m		**20**
	Total site draining to City storm sewer			5 Yr. Stm.		
	Area(Ac.)		Weighted "C"	"I"in/hr	"Q"cfs	
	7.000	Total site	0.478	3.15	10.540	
	Maximum discharge allowable per City of Napoleon = Q2 = 6.23					
EXISTING STORM OUTLETS/CAPACITIES FROM PROPERTY:						
				EST.	**ACTUAL**	
1) 8" field tile outlet to U.S. 24 Ditch, W. side of property = 0.4 cfs (est.)					0.500	w/3.2' Head
2) 8" field tile outlet to U.S. 24 Ditch, E. side of property = 0.4 cfs (est.)					1.462	w/6.5' Head
3) Twp. Rd. R road ditch west @ NW cor. of property = 2.4 cfs (est.)					0.682	
4) Twp. Rd. R road ditch east @ NE cor. of property = 3.3 cfs (est.)					1.016	
EXISTING STORM OUTLET CAPACITY: = 6.5 cfs (est.)					**3.660**	
NOTE: ONLY EXISTING STORM DRAINAGE OUTLETS HAVE BEEN UTILIZED.						
NO ADDITIONAL STORM OUTLETS FROM PROPERTY ARE PROPOSED.						
Storm water detention is provided by means of the new pond and also						
in the drainage swales on either side of the entrance drive as well as						
the swales along the east propoerty line.						