

STORM RUNOFF CALCS.

GENEVA INVESTMENT CO.
4300 DUES DRIVE

2/13/94

DAN E. ANTENEN
OHIO REG ENGR # 21804
Dan E. Antenen

Project : geneva bldg site rich genevabs User: dan Date: 01-31-94
County : butler State: oh Checked: _____ Date: _____
Subtitle: compare site runoff time to calculated hydrograph of geneva 2c

Total watershed area: 0.005 sq mi Rainfall type: 11 Frequency: 25 years

----- Subareas -----

hill
Area(sq mi) 0.00*
Rainfall(in) 4.8
Curve number 57*
Runoff(in) 1.00

TR-55 TABULAR HYDROGRAPH METHOD

VERSION 1.11

SUBAREA CONTRIBUTIONS AND TOTAL DISCHARGE (CFS) AT OUTLET

Subarea	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8
hill	0	0	0	1	1	2	2	2	1	1

File GENEVABS

Project : geneva bldg site dich genevabs User: dan Date: 01-31-94
 County : butler State: oh Checked: _____ Date: _____
 Subtitle: compare site runoff time to calculated hydrograph of geneva 2c

```
----- Subarea #1 - hill -----
Flow Type  2 year  Length  Slope Surface  n  Area  Wp  Velocity  Time
           rain    (ft)   (ft/ft)  code   (sq/ft) (ft) (ft/sec) (hr)
-----
Sheet      2.88    75      0.13    i                0.247
Sheet                      130    0.06    h                0.300
Shallow Concent'd  175    0.03    u                0.017
```

Time of Concentration = 0.56*

=====

--- Sheet Flow Surface Codes ---

A Smooth Surface	F Grass, Dense	--- Shallow Concentrated ---
B Fallow (No Res.)	G Grass, Burmuda	--- Surface Codes ---
C Cultivated < 20 % Res.	H Woods, Light	P Paved
D Cultivated > 20 % Res.	I Woods, Dense	U Unpaved
E Grass-Range, Short		

* - Generated for use by TABULAR method

Project : GENEVA ACCESS **GENEVA 2C** User: DAN Date: 01-19-94
 County : Butler State: OH Checked: _____ Date: _____
 Subtitle: Culvert Study

Total watershed area: 0.720 sq mi Rainfall type: II Frequency: 25 years

	Subareas				
	1	2	3	4	5
Area(sq mi)	0.13*	0.07*	0.12*	0.04*	0.07*
Rainfall(in)	4.8	4.8	4.8	4.8	4.8
	48*	70*	92*	48*	

TR-55 TABULAR HYDROGRAPH METHOD

VERSION 1.11

SUBAREA CONTRIBUTIONS AND TOTAL DISCHARGE (CFS) AT OUTLET

Subarea	Time									
	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8
1	0	0	0	0	1	2	5	9	14	19
2	0	0	0	0	0	1	2	3	5	6
3	9	16	32	60	92	112	106	88	67	51
4	8	13	24	45	74	91	84	66	48	35
5	0	0	0	0	1	3	5	7	8	8
6	0	0	0	1	3	5	6	6	5	4
7	3	5	9	17	30	41	48	46	40	32
8	18	29	53	96	146	166	159	126	93	71
9	0	0	0	0	0	0	1	1	2	2
10	1	1	1	2	3	5	8	11	13	14
TOTAL	39	64	119	221	350	426	424	363	295	242

File GENEVA 2C

Esc exit compute process i s p l a y e a r l i e r
 t i m e D i s p l a y
 l a t e r t i m e

Project : GENEVA ACCESS
 County : Butler
 Subtitle: Culvert Study

User: DAN
 State: OH
 Checked: _____
 Date: 01-19-94
 Date: _____

----- Subarea #8 - 8 -----

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	2.88	200	.05	f					0.303
Shallow Concent'd		1000	.05	p					0.061
Open Channel		1500	.02		.08 2		1		0.100
Time of Concentration = 0.46*									
=====									

Open Channel		1500	.02		.08 2		1		0.100
Travel Time = 0.10*									
=====									

----- Subarea #9 - 9 -----

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	2.88	300	.033	e					0.321
Shallow Concent'd		800	.005	u					0.195
Open Channel		2700	.0003		.08 2		1		1.465
Time of Concentration = 1.98*									
=====									

----- Subarea #10 - 10 -----

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	2.88	300	.1	i					0.831
Shallow Concent'd		800	.075	p					0.040
Open Channel		600	.0083		.08 2		1		0.062
Time of Concentration = 0.93*									
=====									
Open Channel		600	.0083		.08 2		1		0.062
Travel Time = 0.06*									
=====									

--- Sheet Flow Surface Codes ---

A Smooth Surface	F Grass, Dense	--- Shallow Concentrated ---
B Fallow (No Res.)	G Grass, Bermuda	--- Surface Codes ---
C Cultivated < 20 % Res.	H Woods, Light	P Paved
D Cultivated > 20 % Res.	I Woods, Dense	U Unpaved
E Grass-Range, Short		

Project : geneva bldg, drives genevabb
 County : butler State: oh
 Subtitle:

User: dan Date: 01-31-94
 Checked: ____ Date: ____

Total watershed area: 0.005 sq mi Rainfall type: II Frequency: 25 years

	Subareas		
	bldg	drives	lawn
Area(sq mi)	0.00*	0.00*	0.00*
Rainfall(in)	4.8	4.8	4.8
Curve number	98*	98*	69*
Runoff(in)	4.56	4.56	1.81

TR-55 TABULAR HYDROGRAPH METHOD

VERSION 1.11

SUBAREA CONTRIBUTIONS AND TOTAL DISCHARGE (CFS) AT OUTLET

Subarea	Time									
	11.0	11.3	11.6	11.9	12.0	12.1	12.2	12.3	12.4	12.5
bldg	0	0	0	3	6	9	6	2	1	1
drives	0	0	0	3	6	9	6	2	1	1
lawn	0	0	0	0	1	1	1	1	0	0

TOTAL	0	0	0	6	13	19	13	5	2	2
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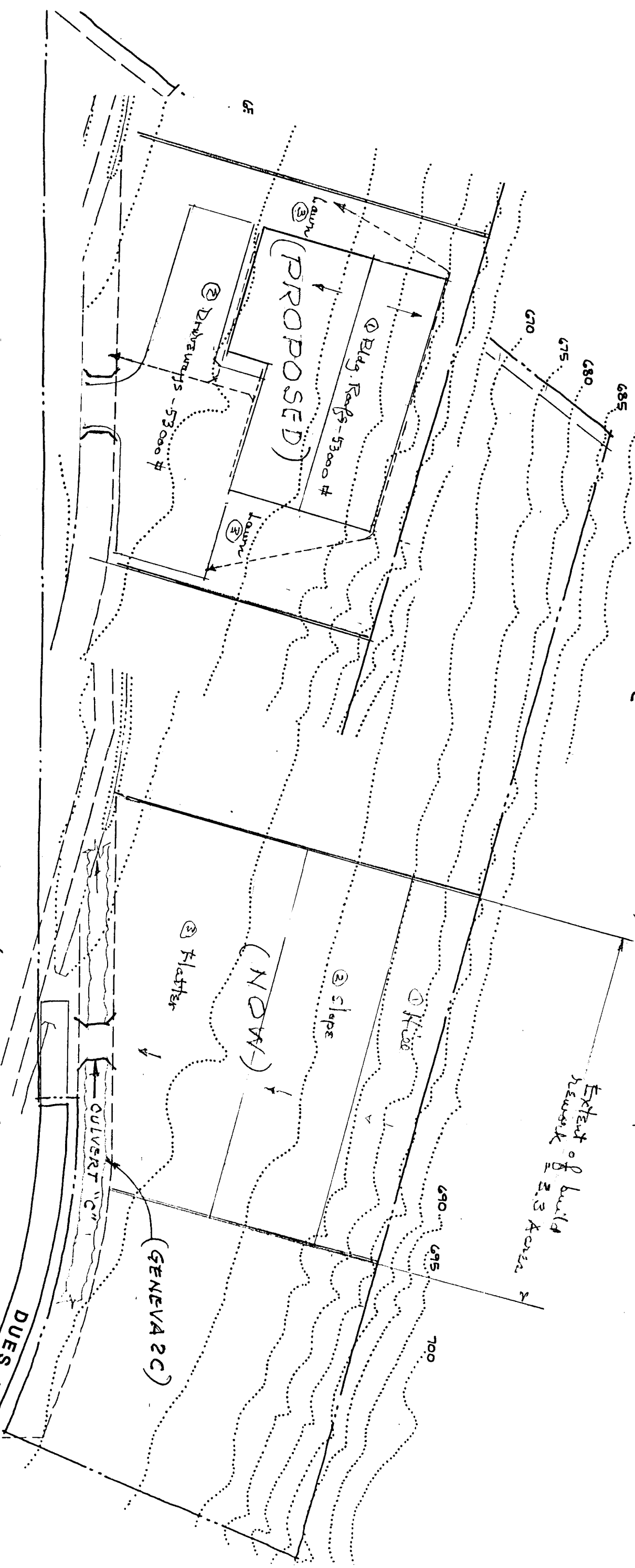
Esc exit compute process

t i m e s p l a y e
 l a t e r t i m e

File GENEVABB

a r l i e r
 i s p l a y

SITE	BEFORE CONSTRUCTION		AFTER CONSTRUCTION		Slope	1/31/34
	Subarea	Area	Area	Area		
	1	450x60	0.6	North, grass	0.13	Geneva building site discharge (GENEVA B5)
	2	450x125	1.3	W. & Bruch, grass	0.06	
	3	450x140	1.4	Lower grass	0.03	
				Imperv. Roof 14'x5'		As proposed beds, drains, lawn (GENEVA B B)
				Paving		
				Imperv. 103 slopes		
				Lawn Fair - 103 slopes		



TR 55 Summary of storm runoff, 25 year storm Type II Rainfall:

Peak discharge at culvert site from upstream

File GENEVA 2C

Add Development site dischg. File GENEVA B5

Report File GENEVA 2C

Add Road develop. site dischg. File GENEVA B B

Conclusion: No RETENTION NECESSARY.

Peak discharge is not increased.

	hrs.	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7
Effs.	39	64	119	221	359	426	424	363	295	
File GENEVA 2C	0	0	0	1	1	2	2	2	1	
File GENEVA B5	222	360	428	426	365	296				
File GENEVA B B	39	64	119	221	359	426	424	363	295	
File GENEVA B B	6	13	19	13	5	2				
Totals	234	364	428							