

August 25, 2023

Jesus McKeag
Engineering Development Services
City of Santa Rosa

**Subject: Preliminary Hydrology and Hydraulics Report
Giffen Avenue (2711) – Giffen Building 1
City Project Tracking Number: DR22-042
B&R Project No. 3163.33**

Dear Jesus,

The intent of this report is to verify that the existing Storm Drain System downstream of this project was designed to accept the anticipated storm drain flows from this project. This is being done to make sure that this project will not increase the 10-Year or 100-year flows beyond what the existing downstream system was designed to accept. The existing SD system consists of an 18" storm drain line in Giffen Avenue (in the street frontage south of the proposed project). The 18" line increases to a 36" storm drain 81' west of the project which further enlarges to a 42" pipe and then a 48" pipe in the westerly most segment of Giffen Avenue before connecting to a pair of 72" storm drain lines in Corporate Center Drive heading south discharging into Roseland Creek south of the Northpoint Parkway.

Extensive research of previously approved Hydrology & Hydraulic reports was undertaken to verify the C-Value assumed for the area associated with this project. In our research, we discovered that the existing 18" storm drain system directly south of our project in Giffen Ave was constructed in 1973 under City File number 73-198. At that time, the storm drain line shown in City file 73-198 discharged into a temporary bubble-up structure 81 feet west of the proposed project and then into a system of interim open trenches heading west along the future anticipated extension of Giffen Avenue. In 1983 Optical Coating Laboratory Inc (OCLI) initiated the construction of Building F (located just SW of this project on the south side of Giffen Avenue). This project extended the Storm Drain System west of the bubble up structure in a 36" and larger pipes (as described in the paragraph above). We discovered that the 1983 Hydrology and Hydraulics report for OCLI Building F has been used as the main reference report for a number of subsequent Hydrology and Hydraulic Reports on Giffen Avenue previously approved by SCWA (including OCLI Buildings E and 8 which were designed and approved in 2000).

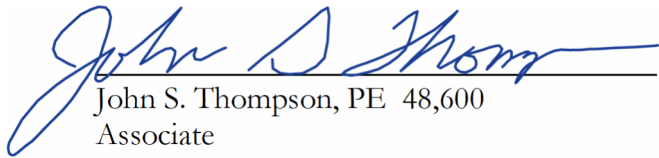
The 1983 OCLI Hydrology and Hydraulic Report assumed a C - Value of 0.9 for the subject project area and ALL of the tributary area upstream on the project tributary to the existing 18" SD line in the Giffen Avenue (see highlighted extract from the HYDROLOGY section of the 1983 Hydrology & Hydraulic Report). The approximate composite C - Value for this project is 0.86, which is less than the previously assumed C-Value of C = 0.9. Please note that they also assumed a time of concentration of 7 minutes for the first 6.2 Acre portion of the upstream tributary area, which is very conservative, since the actual time of concentration for such a large (over 6 acre) commercial area

would be closer to 15 minutes. Using a time of concentration 15 min instead of 7 would reduce the 10-Year flow by about 30%. The 10-Year Hydraulic Grade at the existing inlet 81' south of the project is 103.39 (see highlighted extract from the HYDRAULIC CALCULATIONS section of the 1983 Hydrology & Hydraulic Report). This is approximately 2 feet below the top of curb elevation at the existing catch basin where we propose to tie into the existing storm drain system.

The attached Hydrology and Hydraulic Calculations support the fact that this project will not add additional flows to the downstream storm drain system above that anticipated in the design of the that system, which (based on previous discussions with Gabe Osburn) meets the intent of the current requirement of a preliminary Hydrology and Hydraulic report for the Design Review Package at this time. A full Drainage Report for the project will be prepared with the Construction Document Phase of the project studying the proposed on-site storm drain system after Design Review has been completed.

Very truly yours,

BRELJE & RACE



John S. Thompson, PE 48,600
Associate

enc. *Excerpts from the Hydrology and Hydraulic report for "Optical Coating Laboratory Inc., Building F Site Improvements" dated August 1983)*

cc: *Gabe Osburn (City of Santa Rosa)*

BRELJE & RACE, CARLILE/DAUGHERTY/CARLENZOLI

CONSULTING CIVIL ENGINEERS

SANTA ROSA, CALIFORNIA

PROJECT OCLI - Bldg. F Site Improvements

JOB No. 481.31

DESIGNED BY DCH DATE 8/83

SHEET 1 OF 2

HYDROLOGY

Assumed C-Value

RATIONAL METHOD DRAINAGE STUDY

Point of Conc	Area	Elev. Distance	Slope %	Vel. fps	10 yr		100 yr		Intensity		K	C	A ² A _{ac} Σ A _{ac}	KCA _A	ΣKCA _A	Q ₁₀ cfs	Q ₁₀₀ cfs
					Travel Time	Total Time	Travel Time	Total Time	I ₁₀	I ₁₀₀							
	20										1.0	0.9	6.2 6.2	5.58			
S						7.0		7.0	2.6	3.6					5.58	14.5	20.1
	21	290	0.3	3.0	1.6						1.0	0.9	2.84 9.04	2.56			
J						8.6		7.7	2.4	3.5					8.14	19.4	28.5
	22	290	0.3	3.0	1.6						1.0	0.9	2.84 11.88	2.56			
T						10.2		9.2	2.1	3.1					11.7	24.6	36.3
	26	50	0.3	4.0	0.2						1.0	0.7	0.55 12.43	0.39			
V						10.4		9.3	2.1	3.1					12.1	25.4	37.5
	27	220	0.3	4.0	0.9						1.0	0.7	0.51 12.94	0.36			
W						11.3		10.2	2.0	2.9					12.5	25.0	36.3
	28										1.0	0.9	0.76 13.70	0.68			
X						7.0		7.0	2.6	3.6					0.68	1.8	2.5
	29	300	0.3	4.0	1.25						1.0	0.9	0.76 14.46	0.68			
Y						12.6		11.3	1.9	2.8					13.86	26.3	38.8
	23										1.0	0.9	5.2 5.2	4.68			
U						7.0		7.0	2.3	3.6					4.68	12.2	16.9
	24	640	0.3	3.5	3.1						1.0	0.9	5.1 10.3	4.59			
G						10.1		9.1	2.1	3.1					9.27	19.5	28.7

HYDRAULIC CALCULATIONS

Location Giffen Avenue
Major Drainage Conduit

BACKWATER CURVE

Design Storm 10 Year

CATEGORY	PIPE DATA			FLOW DATA					HEAD LOSSES					ELEVATIONS			
	ITEM	LENGTH	DIAMETER	AREA	MANNINGS COEFF	FLOW	VELOCITY	VELOCITY HEAD	FRICITION SLOPE	FRICITION LOSS	CONTRACTI-ON LOSS	ENLARGE-MENT LOSS	BENDS & OTHER LOSSES	SUMMA-TION OF LOSSES	ENERGY GRADE	HYDRAULIC GRADE	INLET GRADE
SYMBOL	L	D	A	n	Q	V	V ² /2g	$S_f = 4.49 \frac{Q^2}{A^5}$	$H_f = S_f L$	H_c	H_e	H_b	ΣH	EGL	HGL	FG	INV
UNIT ELEMENT	FT	FT	FT ²		FT ³ /sec	FT/sec	FT	FT/FT	FT	FT	FT	FT	FT	ELEV IN FT	ELEV IN FT	ELEV IN FT	ELEV IN FT
36" SD	220	3.0	7.07	0.014	25	3.54	0.19	0.0016	0.36				0.36				
Inlet							0.19			0.05			0.05	102.81			
CB 202														102.84	102.65		97.78
Outlet							0.19				0.05		0.05	102.89			
36" SD	176	3.0	7.07	0.014	25.4	3.54	0.19	0.0016	0.28				0.28				
Inlet							0.19			0.04			0.04	103.17			
CB 203														103.21	103.02		98.31
Outlet							0.12				0.03		0.03	103.24			
36" SD	266	3.0	7.07	0.014	19.4	2.74	0.12	0.0010	0.26				0.26				
Inlet							0.12			0.01			0.01	103.50			
SDMI 403														103.51	103.59		99.1
SDMI 402														102.44	102.14		97.12
Outlet							0.01				0.01		0.01	102.45			
30" SD	58	2.5	4.91	0.014	6.8	1.0	0.01	0.0001	0.01			0.01	0.02				
Inlet							0.01							102.47			
CB 207														102.47	102.46		97.80
Outlet							0.03				0.01		0.01	102.48			
30" SD	85	2.5	4.91	0.014	6.8	1.4	0.03	0.0003	0.03				0.03				
Inlet							0.03							102.51			100.0

HGL-10 at structure 81' west of Project on Giffen Ave.

SDMI 403

103.59

