

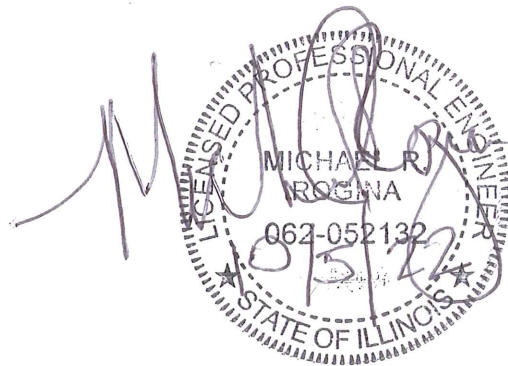
Stormwater Report

For

Lot 2 Bradford Commons Resubdivision of Lots 5 & 6 Naperville, Illinois

September 9, 2022
October 9, 2002 Revised

ROGINA Engineer & Surveyors, LLC
1225 Channahon Road
Joliet, IL 60436



Stormwater Report

Lot 2 Bradford Commons Resubdivision of Lots 5 & 6 Naperville, Illinois

Wu & Tran Naperville LLC plans on construction of a restaurant on approximately 2.16 acres of land located on Beebe Drive in Naperville, Illinois.

The site will be developed as a restaurant, with a building of approximately 16,263 square feet, a parking lot with 153 spaces, and an outdoor patio. Access to the site will be by a full access driveway to the interior driveway on Lot 4 to the west, and a full access driveway onto Fitness Drive.

Stormwater detention and PCBMP's are required by the City of Naperville. Detention must be provided utilizing current Bulletin 75 24-hour rainfall data (8.57"), and a release rate of 0.10 cfs/acre. PCBMP's must be provided in accordance with the DuPage County ordinance.

Detention

The development of the overall commercial subdivision provided stormwater detention volume for the entire center assuming a maximum CN of 90.

The 93,984 SF proposed restaurant site has only 71,859 SF of impervious area (76.46%), and therefore has far less impervious area than assumed for the design and construction of the existing stormwater facilities.

This project therefore does not need to provide stormwater detention.

PCBMP's

The overall commercial development also provided a large amount of wetlands to ensure that the stormwater runoff was filtered and treated before it was released downstream into the DuPage County Forest Preserve.

The extensive wetlands were intended to serve as a BMP, and has been acknowledged as such by the City of Naperville.

At the time of the design and review of the adjacent Walmart Superstore, Walmart commissioned a report to address the condition and efficacy of the wetlands. This report is appended to this Stormwater Report.

The wetlands condition report indicated that the wetlands area “...appears to be functioning as designed, providing an area for the surface water runoff to congregate and move slowly through, providing opportunity for attenuating peak flows, physical entrapment of suspended sediments, uptake of nutrients, and other beneficial water quality functions. We conclude the detention basin is a functioning and beneficial Best Management Practice in managing storm water runoff. The basin is also providing excellent wildlife habitat, which is an additional benefit, not only to natural resources, but from an aesthetic and community diversity perspective from the adjacent park.”

The City concurred with this opinion, and also noted that “...the management of the stormwater management area is specified in the property covenants. The covenants states that the owner must maintain the SWM area as it was designed and replace any vegetation that dies. The City is also given the authority to maintain the basins if the owner fails to do so, and at sole cost of the owner.” This indicates that the wetlands function has a mechanism in place to ensure that the wetlands continue to exist in the future and is maintained to provide the environmental protection in perpetuity. It is our opinion that the existing wetlands continue to perform their function, and will continue to do so in the future. As such, it can be concluded that the existing facilities meet the requirements of the DuPage County ordinance, and that additional BMP’s should not be required for the development of the restaurant.

Storm Sewer Calculations

Storm sewer calculations are appended to this report that indicate that the on-site storm sewer system will perform as required by the City of Naperville.

Parking Lot Overflow Calculations

Parking Lot Overflow Calculations are appended to this report that indicate that the 100-yr overflow shall pass thru a curb depression in the southeast corner of the parking lot as required by the City of Naperville.

DETENTION BASIN REPORT

PREPARED FOR:

City of Naperville

Located at:

T38S, R9E, Section 27, City of Naperville
DuPage County, Illinois

PREPARED BY:

Timothy Bureau Consulting, LLC

Environmental Planning · Litigation Support · Wetlands, Lakes & Streams

14050 Lockett Lane, Grand Haven, MI 49417

Phone (616) 842-6725 Cell (616) 402-0091

Email: timothyb@chartermi.net

Introduction

Timothy Bureau Consulting, LLC (TB Consulting) visited the subject property on June 8, 2012. The site is located in Section 27, T38N, R9E, City of Naperville, DuPage County, Illinois. The purpose of the site visit was to determine whether the detention basin has evolved into a self-sustaining and functional wetland.

A number of factors are used to determine whether an area is a wetland. We examine three parameters to assist in our determination. These parameters are a presence of wetland vegetation, hydric soils, and presence of hydrology or indicators of hydrology.

The National Wetland Plant List has been recently revised and categorizes plants according to their ability or inability to thrive in wetland conditions (i.e. wet conditions). They are rated on a scale from obligate wetland plants (OBL) that occur 99% of the time in wetlands to obligate upland plants (UPL) that occur rarely (about 1%) in wetlands. The following table shows the plant indicator statuses:

Table 1. Plant indicator Statuses

Name	Symbol	Occurrence in Wetland
Obligate Wetland Plants	OBL	99%
Facultative Wetland Plants	FACW	67-99%
Facultative Plants	FAC	33-67%
Facultative Upland Plants	FACU	1-33%
Obligate Upland Plants	UPL	1%

We took an inventory of the plants we saw during the site visit. The detention basin was dominated by narrow-leaf cattail in the north-south section and where the basin turned to run east-west, there were open water areas and a greater abundance of plant species. Table 2 shows the plant species we found during our site visit.

Table 2. Plant Species found in the detention basin.

Scientific Name	Common Name	Indicator Status
<i>Alisma subcordatum</i>	Water plantain	OBL
<i>Bidens sp.</i>	Beggarticks sp.	FAC (or wetter)
<i>Eleocharis obtusa</i>	Blunt spike rush	OBL
<i>Juncus effusus</i>	Soft rush	OBL
<i>Lemna sp.</i>	Duckweed sp.	OBL
<i>Phragmites australis</i>	Common reed	FACW
<i>Potamogeton natans</i>	Floating leaf pondweed	OBL
<i>Rumex crispus</i>	Curly dock	FAC
<i>Salix interior</i>	Sandbar willow	FACW
<i>Typhus angustifolia</i>	Narrow-leaf cattail	OBL

As can be seen from the plant species listed in Table 2, all the plant species found in the detention basin are considered wetland species.

The next parameter to investigate is soil. Generally, examining the soil on site can be a great indicator of whether the area is to be considered wetland. This examination is not always helpful in man-made wetlands. We know the entire area surrounding the detention basins has been disturbed, which makes analysis of the soil difficult. We used the DuPage County Soil Survey to look at the native soil on the site. There were two different types historically found on the property. Mudelein silt loam, a somewhat poorly drained soil, and Drummer silty clay loam, which is classified as a poorly drained soil. This information tells us that if a wetland is constructed within either of these soil types, it should convert to a wetland as long as it can get sufficient water. The soils are obviously supporting a healthy community of wetland plants.

Our last parameter is hydrology. The detention basin definitely holds water sufficient to support a wetland. Despite the relatively dry conditions this year has brought, the north-south basin was saturated at the surface and the east-west basin had standing water in it.

Overall, the detention basin meets the criteria for a wetland. When we appraise constructed wetlands, we also look at the overall health of the area by the wildlife observed using it. During our site visit we observed numerous frogs and many bird species using the wetland for feeding, resting, and cover. There were 24 ducks counted in the detention basin, and due to distance it was difficult to identify all the species, but we were positively able to identify mallards and blue-winged teals. The bird species observed are listed in Table 3.

Table 3. Bird Species.

Scientific Name	Common Name
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Anas discors</i>	Blue winged teal
<i>Anas platyrhynchos</i>	Mallard
<i>Ardea alba</i>	Great egret
<i>Icterus galbula</i>	Baltimore oriole
<i>Riparia riparia</i>	Bank swallow

We were also able to observe while on-site, the careful consideration given to the planting on the detention basin slopes. The slopes were planted with prairie species. We observed many different species including, goatsbeard, purple prairie clover, coreopsis, and bee balm. These species can be an additional help in holding slopes in place during large rain events due to their deep rooting ability. They also enhance the plant diversity in the area.

As previously stated, the detention basin has become a successful wetland. It appears to be functioning as designed, providing an area for the surface water runoff to congregate and move slowly through, providing opportunity for attenuating peak flows, physical entrapment of suspended sediments, uptake of nutrients, and other beneficial water quality functions. We

conclude the detention basin is a functioning and beneficial Best Management Practice in managing storm water runoff. The basin is also providing excellent wildlife habitat, which is an additional benefit, not only to natural resources, but from an aesthetic and community diversity perspective from the adjacent park.

References

- Newcomb, Lawrence. 1977. *Newcomb's Wildflower Guide*. New York, NY: Little, Brown, and Company.
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- U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)*. Vicksburg, MS: U.S. Army Engineer Research and Development Center. (http://www.nwo.usace.army.mil/html/od-rnd/mw_final_supp.pdf)



Figure 1 — North-South Detention Basin, facing south. Photo taken 6/08/12.



Figure 2 — Facing southeast near south corner of the detention basin. Mallard pair shown using the wetland. Photo taken 6/08/12.

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2012 Site Photographs
Detention Basin
Wetland Determination
City of Naperville, Illinois



Figure 3—Facing south at corner of detention basin. Photo taken 6/08/12.



Figure 4 — Facing south looking at east-west detention basin. Photo taken 6/08/12.

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2012 Site Photographs
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Figure 5— Facing east looking at east-west detention basin. Taken from the storm outlet into the detention basin. Photo taken 6/08/12.

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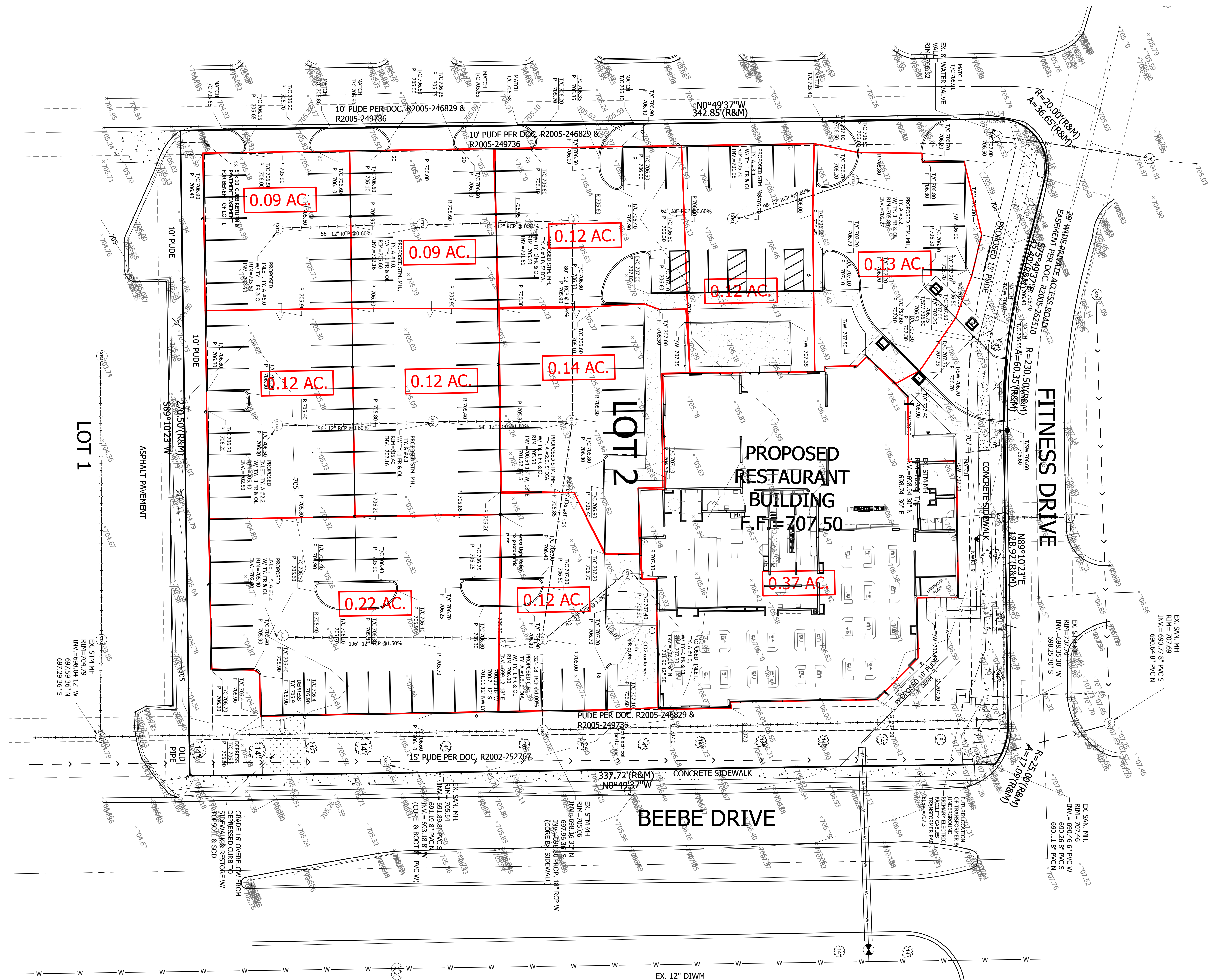
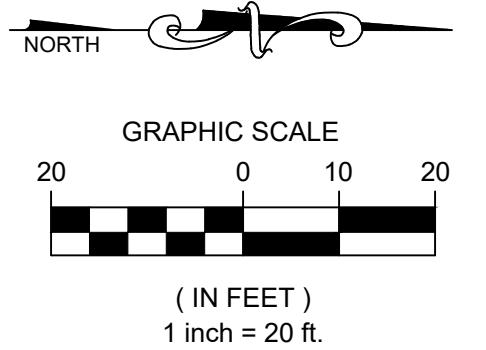
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2012 Site Photographs

Detention Basin

Wetland Determination

City of Naperville, Illinois



LEGEND

---	STORM SEWER
---	UNDER DRAIN
---	SANITARY SEWER
---	SANITARY SERVICE
---	WATER MAIN
---	CURB
---	CURB & GUTTER
---	DEPRESSED CURB

V:\Projects\Engineering\2022\2022-10-02\2022-10-02 Layout Drainage Area Map

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REVISIONS	
1	REVISE PER CITY OF NAPERVILLE REVIEW 9/09/2022
2	
3	
4	
5	
6	

PREPARED BY:



ROGINA
ENGINEERS & SURVEYORS, LLC.
1225 Chamnahon Road Joliet, Illinois 61729-0777 FAX 815/729-0782
Professional Design Firm License No. 184-006843 - Exp. 4/30/2023

CLIENT: ARCHITECTUAL STUDIOS, LTD
14421 Oakley Avenue
Orland Park, IL 60462
(708) 933-4200

PROJECT: SITE DEVELOPMENT PLANS FOR
WU'S HOUSE RESTAURANT
LOT 2 OF BRADFORD COMMONS RESUBDIVISION OF
LOTS 5 & 6 SUBDIVISION
CITY OF NAPERVILLE, DUPAGE COUNTY, ILLINOIS

PROJECT NO:
R990.02

DATE:
7/21/2022

SCALE:
1"=20'

DESIGNED BY:
MRR

DRAWN BY:
CRR

CHECKED BY:
MRR

DRAINAGE AREA MAP

SHEET NO. 1 OF 1

Design Event
10 Year

Station		Length (feet)	Drainage Area (acres)		"C"	C * A		Flow Time (min)		Intensity BULL75 (in/hr)	Catchment Runoff (cfs)	Incr. Bypass (cfs)	Total Bypass (cfs)	Total Flow (cfs)	Pipe Dia (in)	Mannings n default 0.013	Minimum Factor of Safety for Flow	Full Pipe Capacity (cfs)	Velocity (fps)		Manhole Invert Elevations		Slope of Sewer (ft/ft)
From	To		incr.	total	default 0.9	Increm	Total	to upper end	in section										full flow	design no double	upper end	lower end	
5.00	4.00	48	0.13	0.13	0.90	0.12	0.12	15.00	0.22	5.56	0.65	0.00	0.00	0.65	12	0.013	1	2.87	3.65	3.65	702.27	701.98	0.0060
4.00	3.00	62	0.12	0.25	0.90	0.11	0.23	15.22	0.28	5.56	1.25	0.00	0.00	1.25	12	0.013	1	2.87	3.65	3.65	701.98	701.61	0.0060
3.20	3.10	56	0.09	0.09	0.90	0.08	0.08	15.00	0.26	5.56	0.45	0.00	0.00	0.45	12	0.013	1	2.87	3.65	3.65	702.50	702.16	0.0060
3.10	3.00	60	0.09	0.18	0.90	0.08	0.16	15.26	0.22	5.56	0.90	0.00	0.00	0.90	12	0.013	1	3.53	4.50	4.50	702.16	701.61	0.0091
3.00	2.00	80	0.12	0.55	0.90	0.11	0.50	15.48	0.24	5.56	2.75	0.00	0.00	2.75	12	0.013	1	4.29	5.46	5.46	701.61	700.54	0.0134
2.20	2.10	56	0.12	0.12	0.90	0.11	0.11	15.00	0.26	5.56	0.60	0.00	0.00	0.60	12	0.013	1	2.87	3.65	3.65	702.50	702.16	0.0060
2.10	2.00	54	0.12	0.24	0.90	0.11	0.22	15.26	0.19	5.56	1.20	0.00	0.00	1.20	12	0.013	1	3.71	4.72	4.72	702.16	701.62	0.0100
2.00	1.00	90	0.14	0.93	0.90	0.13	0.84	15.72	0.31	5.56	4.65	0.00	0.00	4.65	18	0.013	1	8.46	4.79	4.79	700.54	700.00	0.0060
INL	1.00	42	0.37	0.37	0.90	0.33	0.33	15.00	0.19	5.56	1.85	0.00	0.00	1.85	12	0.013	1	2.87	3.65	3.65	702.90	702.65	0.0060
1.20	1.00	106	0.22	0.22	0.90	0.20	0.20	16.03	0.31	5.50	1.09	0.00	0.00	0.27	12	0.013	1	4.54	5.78	5.78	702.30	700.71	0.0150
1.00	EX STM MH	32	0.12	1.64	0.90	0.11	1.48	16.34	0.09	5.45	8.04	0.27	0.00	8.31	18	0.013	1	10.92	6.18	6.18	699.12	698.80	0.0100

PROJECT: Wu's House Restaurant

BY: MRR

CHECKED:

SUBJECT: 100-yr Overflow

DATE: 9/19/2022

DATE: 10/5/2022

SHEET

JOB NO.: R990.01

1

DETAIL: Curb depression - SE corner

100-yr Design Flow

C' Calculation

C=

0.90

Per Stormwater Report
for Overall Development

100 Year Peak

C= 0.90
I(100)@ 15 min. 9.28 in/hr
A= 1.64 Acre
Q= 13.70 cfs

15.0 min Tc per Storm calcs
Per Storm Calculations

100-yr Parking Lot Overflow- Curb Depression

$$Q = CLh^{1.5}$$

C= 2.50

L= 16.00 ft

H= 0.50 ft

HWL - 706.4
TOP - 705.9

$$Q = \boxed{14.14} \text{ cfs}$$