



Walter E. Deuchler
Associates, Inc.
CONSULTING ENGINEERS



MEMORANDUM

DATE: September 5, 2017

TO: Sandra Whitmer, Director
Warrenville Public Library District

FROM: John W. Frerich, P.E.

RE: Stafford Place Development, Warrenville, IL

As requested, we have completed a review of the following documents:

1. Final Engineering Improvement Plans prepared by Engineering Resource Associates, Inc. of Warrenville, Illinois, and dated June 26, 2017. Also a revised set dated August 11, 2017.
2. Stormwater Report prepared by Engineering Resource Associates, Inc. and dated June 9, 2017. Also a revised submittal dated August 11, 2017.
3. ALTA/NSPS Land Title Survey prepared by Engineering Resource Associates, Inc. and dated May 25, 2017.
4. Final Plat of Subdivision prepared by Engineering Resource Associates, Inc. and dated June 9, 2017.
5. Native Planting Plan prepared by Engineering Resource Associates, Inc. and dated June 9, 2017.
6. Report of Soils Exploration prepared by Testing Service Corporation and dated May 14, 2015.
7. Engineer's Opinion of Probable Cost for Public Improvements prepared by Engineering Resource Associates, Inc. and dated June 9, 2017.
8. DuPage County Stormwater Management Certification Application dated June 9, 2017.
9. City Engineer's review of developer submittals prepared by James J. Benes and Associates, Inc. and dated July 25, 2017.
10. Engineer's response to City's review comments prepared by Engineering Resource Associates, Inc. and dated August 11, 2017.

Our review and subsequent comments are strictly intended to address the storm water related aspects of the proposed improvements which have the potential to impact the Warrenville Public Library District property located at 28W751 Stafford Place, Warrenville, IL, and should not be considered as a complete review of all of the proposed improvements.



Based on the above, we offer the following comments:

- **Storm water detention is not required for the proposed development.** Per a City memo dated July 24, 2014 (see Attachment No. 1), any development for the site after September 2015 may allow for 66,252 sq. ft. of existing impervious area onsite. Additionally, 730 sq. ft. of existing impervious area will be removed as part of construction. A total of 90,300 sq. ft. of impervious area is proposed, which includes public streets, public sidewalks, building footprints, patios, stoops, driveways and entrance sidewalks (see Attachment No. 2). The net new impervious area for the site is:

Existing Impervious Area: $66,252 + 730 = 66,982$ Sq. Ft.

Proposed Impervious Area: 90,300 Sq. Ft.

Net New Impervious Area: $90,300 - 66,982 = 23,318$ Sq. Ft.

The net new impervious area for the development is below the 25,000 sq. ft. threshold for storm water detention defined by the DuPage County Stormwater Ordinance.

- **Post construction best management practices (PCBMPs) are required for the proposed development.** PCBMPs are required to treat the storm water runoff for pollutants of concern and to reduce runoff volume. Two natively-planted flow-through PCBMP basins are proposed: one at the northerly property line (Outlot G) and one at the easterly property line (Outlot A). These basins accept storm water from the impervious areas on site and route it through a meandering, natively-planted area. The plants slow the flow of water to allow for infiltration into the soil. The plants also allow for sediment and other contaminants in the water to settle out before entering the City's storm water system.

The PCBMP basins are designed to detain 1.25 inches of runoff over all new impervious area. They also contain restrictor outlet manholes to drain the runoff from the 2-year, 24-hour storm in a 48-96 hour period after the peak volume is stored in the basin. The proposed development has provided between 2.5 to 3.5 times more storage volume in these PCBMP basins than required by the DuPage County Stormwater Ordinance. See Attachment No. 3 for the proposed PCBMP calculations and tributary areas.

- **Existing drainage patterns have been maintained.** The proposed development maintains the existing west to east drainage pattern toward Manning Avenue. Proposed storm sewers have been designed to convey a 10-year storm. Revisions to the proposed grading plan were made along the common property line with the Warrenville Public Library District to prevent overland drainage from the proposed development from entering the District's



property, while allowing overland drainage from the District's property to enter Outlot G of the proposed development.

Overland flow routes have also been provided to convey runoff for a 100-year storm. Storm runoff tributary to the northerly PCBMP basin (Outlot G) is being conveyed via a proposed swale along the north property line to Mount Street. Storm runoff tributary to the proposed extension of Mount Street is being conveyed onto Mount Street and then easterly along the road to Manning Avenue. The proposed 100-year storm overland flow routes have been designed with excess capacity. Overland flow routes were also coordinated with the proposed landscaping plan to avoid potential blockage.

See Attachment No. 4 for proposed tributary areas, overland flow routes and overland flow calculations. No impacts to adjacent properties are anticipated.

- **Storm water concerns are adequately addressed by both the developer and the City of Warrenville.** It is our opinion that the review comments by James J. Benes and Associates, Inc. on behalf of the City dated July 25, 2017 and the associated responses by Engineering Resources Associates, Inc. on behalf of the developer dated August 11, 2017 adequately address potential storm water related impacts to the Warrenville Public Library District's adjacent property.



**Walter E. Deuchler
Associates, Inc.**
CONSULTING ENGINEERS

September 5, 2017
Sandra Whitmer
Warrenville Public Library District

Attachment No. 1

CITY OF WARRENVILLE

MEMO

To: Community Development Director Mentzer
From: Senior Civil Engineer Kuchler *PK*
Subject: CCRS#1 STORMWATER REQUIREMENTS
Date: July 24, 2014

The purpose of this memorandum is to summarize the requirements of the current DuPage County Countywide Stormwater and Floodplain Ordinance (Stormwater Ordinance) for a future development on the Civic Center Redevelopment Site #1 (CCRS#1).

Impervious Surfaces

The City of Warrenville contracted with K-Five Construction in 2011 to relocate Rockwell Street between Stafford Place and Illinois Route 56 and reconstruct a portion of Stafford Place. As part of that contract, K-Five removed some impervious surface from the Musselman property component of CCRS#1 to account for the additional impervious surface created by the Rockwell Street / Stafford Place project.

The City of Warrenville contracted with H. Linden & Sons in 2012 to remove the existing concrete slab and asphalt pavement on the CCRS#1 site, crush the concrete and spread the crushed concrete / CA-6 material to serve as a parking lot for various City events until the site is ultimately sold and developed. There are 66,252 square feet of impervious surface on the Musselman property component of CCRS#1.

The City of Warrenville contracted in September 2012 for the demolition and removal of the White building and parking area located at the northeast corner of CCRS#1. The total impervious surface removed was 4,140 square feet.

Site Runoff Storage (Detention)

Section 15.72 of the Stormwater Ordinance states the following:

"15.72. Site Runoff Storage. Site runoff storage facilities, consisting of site runoff storage and a control structure with an emergency overflow shall be required for all Developments.

15-72.A The following cases or special conditions represent exceptions to providing site runoff storage:

15-72.A.1 When comparing the Impervious Area of the pre-development Development Site as it existed as of February 15, 1992 to the with-development Impervious Area of the same Development Site, excluding any areas of the Development Site for which detention has

*already been provided, and the **Impervious Area** has not increased by a minimum of 25,000 sq. ft cumulatively of permitted Development; "*

Impervious Area is defined in the Stormwater Ordinance as "land cover that is including but not limited to non-porous asphalt or asphalt sealants, non-porous concrete, roofing materials except planted rooftops designed to reduce runoff, and gravel surfaces used as roadways or parking lots."

The definition also specifies that "the impervious area of a development site pre-development is the maximum extent of the impervious surfaces that existed on the development site at the same time in any of the 3-years pre-dating the date of the application."

The existing aggregate area is 66,252 square feet as aggregate was spread to the limits of the former concrete foundation and asphalt area. If this area continues to be utilized as parking, the impervious surface can be credited toward a future development.

The 4,140 square feet of former White building and parking lot impervious surfaces can only be credited toward a future development if application for that development is made within 3-years of the removal of those impervious surfaces (September 2015).

~~*Site runoff storage (detention) will be required if the proposed impervious surface exceeds the existing impervious surface (70,392 square feet) by 25,000 square feet. Once a development exceeds 25,000 square feet of net new impervious surface, the developer would be required to provide site runoff storage (detention) for the entire site as if no impervious exists on it today.*~~

If an application to develop the property is submitted by September 2015, 70,392 square feet of impervious surface can be credited toward the development. ~~If the application occurs after September 2015, 66,252 square feet of impervious surface can be credited toward the development.~~

Post Construction Best Management Practices (PCBMPs)

Section 15.63 of the Stormwater Ordinance states the following:

"15-63. PCBMPs are required to treat the stormwater runoff for pollutants of concern and reduce Runoff volume for all Developments, with the exceptions and exclusions noted below. Upon a documented finding by the Director or Administrator that providing PCBMPs is impractical, then the appropriate PCBMP fee-in-lieu shall be paid by the Applicant in lieu of providing full or partial PCBMPs.

15-63.A PCBMPs are waived for the following Developments:

15-63.A.1 When comparing the Impervious Area of the Pre-Development Site to the with-development Impervious Area of the same Development Site, excluding any areas of the Development Site for which PCBMPs have already been provided and maintained, and the Net New Impervious Area is less than 2,500 square feet in the aggregate since April 23, 2013;"

PCBMPs will be required if the proposed impervious surface exceeds the existing impervious surface (70,392 square feet) by 2,500 square feet.

Section 15.64 of the Stormwater Ordinance states the following:

"15-64. Post Construction Best Management Practices Design Criteria.

15-64.A PCBMPs shall provide volume and pollutant control using one of the following practices:

15-64.A.1 Infiltration of 1.25 inches for all new impervious surfaces;"

If a PCBMP is required, it must provide control for a volume calculated by multiplying 1.25-inches by the total proposed impervious surface. It is important to note that this is total proposed impervious surface and not the difference between proposed impervious surface and existing impervious surface.

Please note that the PCBMP volume can be part of the site runoff storage (detention) volume for the site. The required PCBMP volume is not added to the required site runoff storage (detention) volume.



**Walter E. Deuchler
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September 5, 2017
Sandra Whitmer
Warrenville Public Library District

Attachment No. 2

Stafford Place Impervious Area Calcs

8/9/2017

MAR

Site Area

187362 s.f.
4.301239669 acres

Impervious Areas

Lots 1-3 Impervious Area:

Building Footprint:	2022 s.f.	(Avg of Farmington, Legacy, Marcella B)
Driveway:	774 s.f.	(18 x 43)
Patio	175 s.f.	
Entrance Walk:	60 s.f.	(4 x 15)
	3031 s.f.	

Lots 4-14 Impervious Area:

Building Footprint:	2226 s.f.	(Avg of Chestnut, Macrae, and St. James)
Driveway:	540 s.f.	(18 x 30)
Patio	159 s.f.	(Avg. of Chestnut and Macrae)
Entrance Walk:	60 s.f.	(4 x 20)
	2985 s.f.	

Lots 15-27 Impervious Area:

Building Footprint:	989 s.f.	
Driveway:	360 s.f.	(18 x 20)
Entrance Walk and Stoop:	105 s.f.	(7 x 15)
	1454 s.f.	

Roadway Impervious Area:

Roadway Pavement:	15125 s.f.	(25 x 605)
Roadway Aprons:	1875 s.f.	
Sidewalk:	4880 s.f.	(5 x 976)
Extra Sidewalk:	300 s.f.	(5 x 60)
	22180 s.f.	

Outlot Drives:

Outlot C:	2970 s.f.	(18 x 165)
Outlot F:	4320 s.f.	(18 x 240)
	7290 s.f.	

Credit for Mount Street Removal: 730 s.f. (Credit for West end of Mount Street)

Total Site Area:	187362	s.f.	
			(3 Ray Street Lots, 11 Mount Street Lots, 13 Row Houses)
Total New Impervious:	90300	s.f.	(Roadway, Sidewalks, Outlot Drives)
Previously Existing Impervious:	66982	s.f.	(66,252 s.f. from City of Warrenville Memo plus 730 s.f. for Mount St Pavement Removal)
Net New Impervious:	23318	s.f.	
Impervious Ratio:			47.8 Percent Impervious

Stafford Place Impervious Area Calcs

5/24/2017

MAR

House Footprints

Lots 1-3 Impervious Area:

The Farmington

Building Footprint:	2435 s.f.
Patio:	175 s.f.
	<hr/>
	2610 s.f.

The Legacy

Building Footprint:	1609 s.f.
Patio:	175 s.f.
	<hr/>
	1784 s.f.

The Marcella "B"

Building Footprint:	2022 s.f.	(Including Porch)
Patio:	175 s.f.	
	<hr/>	
	2197 s.f.	

Lots 4-14 Impervious Area:

Chestnut Hill

Building Footprint:	2311 s.f.
Patio:	153 s.f.
Porch:	172 s.f.
	<hr/>
	2636 s.f.

Macrae Ranch

Building Footprint:	2043 s.f.
Patio:	153 s.f.
Porch:	146 s.f.
	<hr/>
	2342 s.f.

St. James

Building Footprint:	2322 s.f.
Patio:	153 s.f.
Porch:	48 s.f.
	<hr/>
	2523 s.f.

Lots 15-27 Impervious Area:

Bove

Building Footprint:	851.2 s.f.
Porch:	138 s.f.
	<hr/>
	989.2 s.f.

Maciejewski

Building Footprint:	851.2 s.f.
Porch:	138 s.f.
	<hr/>
	989.2 s.f.

McAlister Cape Cod

Building Footprint:	851.2 s.f.
Porch:	138 s.f.
	<hr/>
	989.2 s.f.

McAlister Dutch Colonial

Building Footprint:	851.2 s.f.
Porch:	138 s.f.
	<hr/>
	989.2 s.f.



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September 5, 2017
Sandra Whitmer
Warrenville Public Library District

Attachment No. 3

Stafford Place Impervious Area Calcs

8/9/2017

MAR

Site Area

187362 s.f.
4.30124 acres

Outlot G Calcs

Impervious Area:

8 Full Row House Lots:	11632 s.f.	(8 x 1454)
Half Row house with no driveway:	547 s.f.	(1 x 547)
1.5 Mount Street houses, no Drive or Walk:	3578 s.f.	(1.5 x (2226 + 159))
2 full Mount Street Houses:	5970 s.f.	(2 x 2985)
Outlot F drive:	4320 s.f.	
5 Mount Street Drives and Walks:	3000 s.f.	(5 x (540 + 60))
Roadway and Sidewalk:	13475 s.f.	
	TOTAL:	42522 s.f.

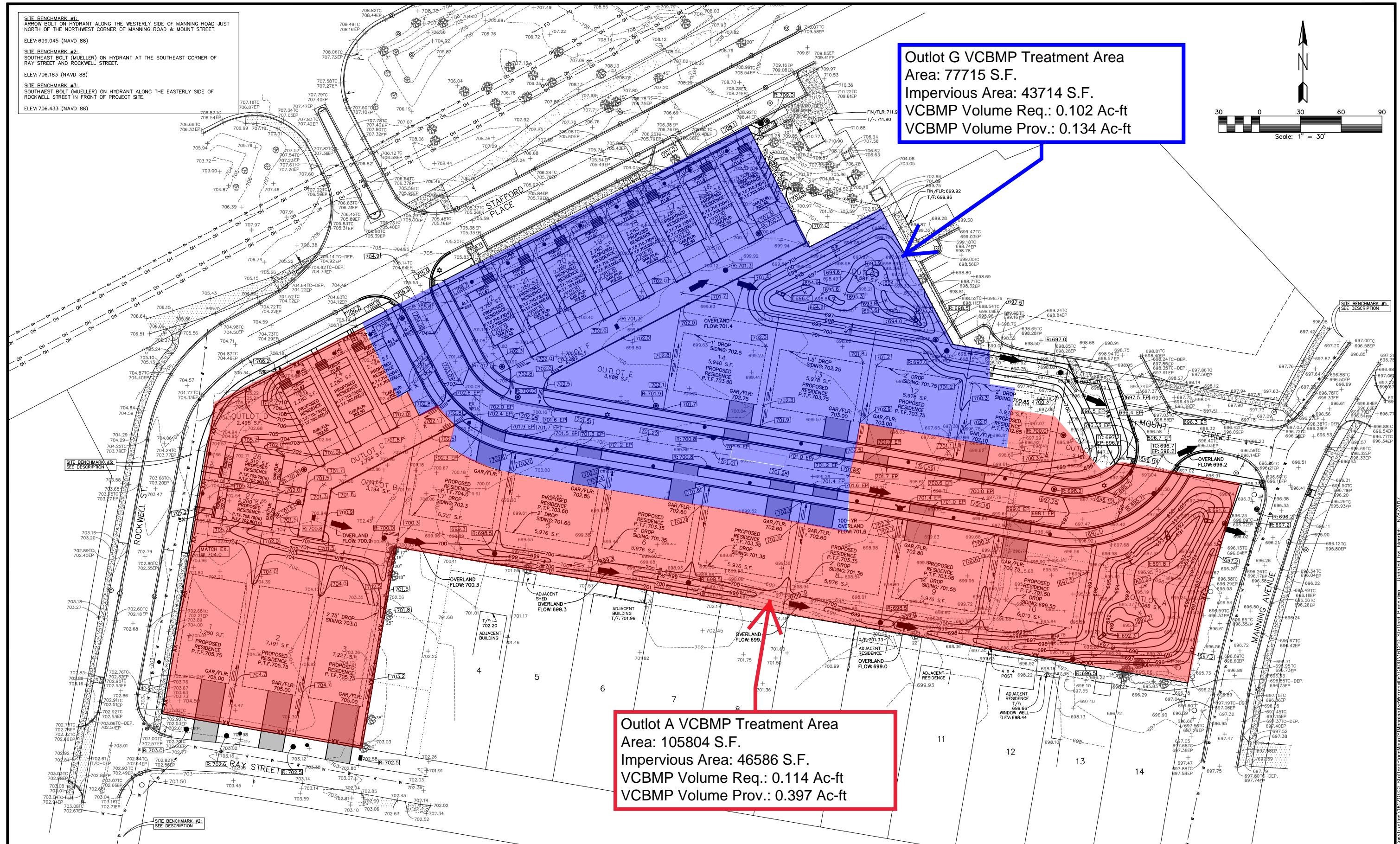
Rainfall to Store:	1.25 in.	(from DuPage Stormwater Ordinance)
VCBMP Volume Required:	4429 c.f.	
	0.102 ac-ft	
VCBMP Volume Provided:	0.246 ac-ft	

Outlot A Calcs

Impervious Area:

3 Full Ray Street Lots:	9093 s.f.	(3 x 3031)
4 Full Row House Lots:	5816 s.f.	(4 x 1454)
Half Row house with driveway:	907 s.f.	
2 Mount Street Houses:	5970 s.f.	(2 x 2985)
5.5 Mount Street houses, no Drive or Walk:	13118 s.f.	(5.5 x (2226 + 159))
2 Mount Street Drives and Walks:	1200 s.f.	(2 x (540 + 60))
Outlot C Drive:	2970 s.f.	
Roadway and Sidewalk:	8705 s.f.	
	TOTAL:	47779 s.f.

Rainfall to Store:	1.25 in.	(from DuPage Stormwater Ordinance)
VCBMP Volume Required:	4977 c.f.	
	0.114 ac-ft	
VCBMP Volume Provided:	0.397 ac-ft	



REVISIONS:					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
		DRAWN BY: B.L.			CHECKED BY: M.H.
		APPROVED BY: J.G.			



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AIRHART DEVELOPMENT, LLC

VCBMP Treatment Area Map

SCALE: 1"=30'
DATE: JUNE 9, 2017
JOB NO: 161210

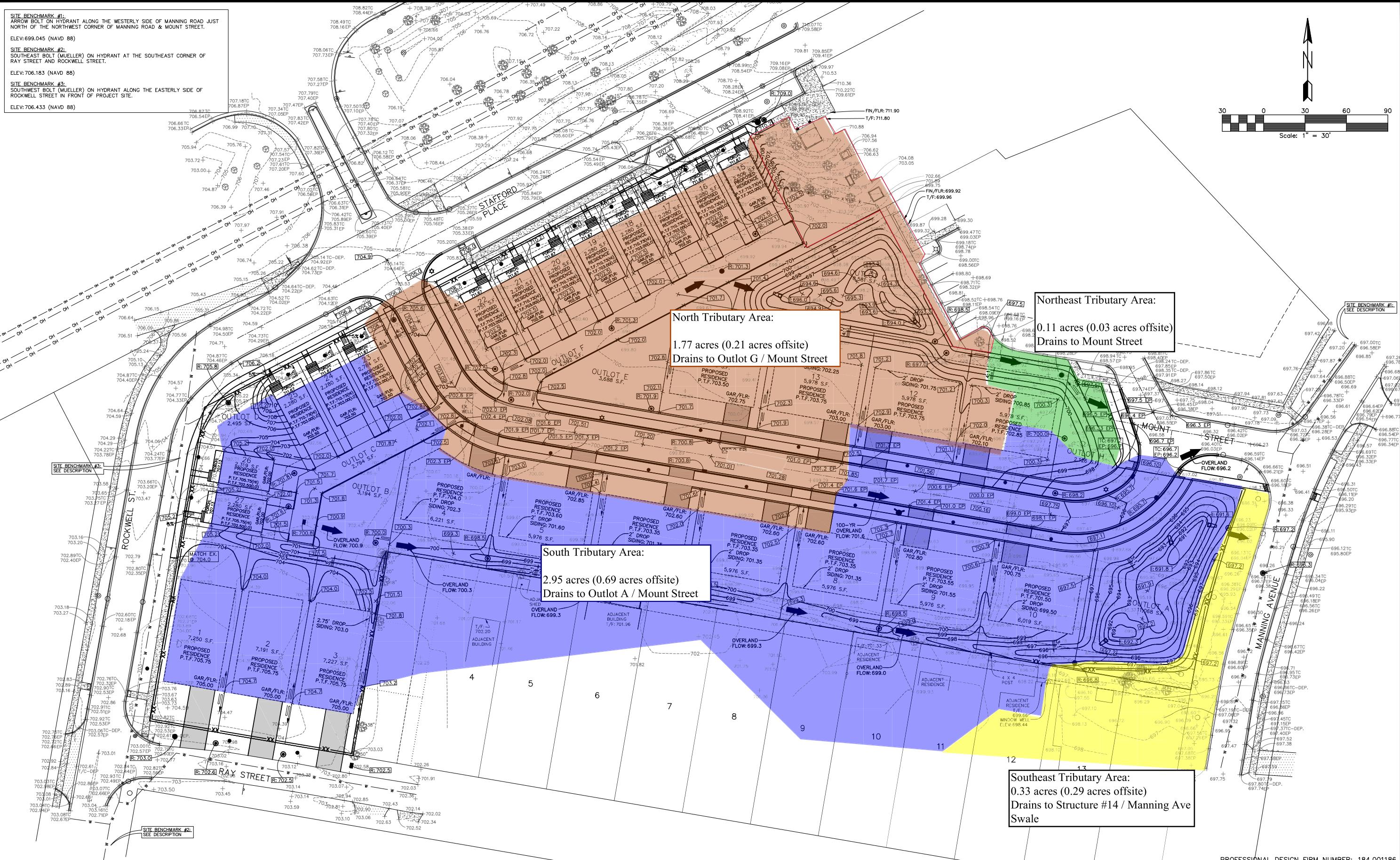
SHEET 7 OF 15



**Walter E. Deuchler
Associates, Inc.**
CONSULTING ENGINEERS

September 5, 2017
Sandra Whitmer
Warrenville Public Library District

Attachment No. 4



REVISIONS:						DRAWN BY: B.L.	PROFESSIONAL DESIGN FIRM NUMBER: 184.001186
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CHECKED BY: M.H.	SCALE: 1"=30'
06/26/17	B.L.	PER OWNER COMMENTS				APPROVED BY: J.G.	DATE: JUNE 9, 2017 JOB NO: 161210 PROJECT: Airhart Construction \61210_StaffordPlace\Warrenville\ADD161210_StaffordPlace.dwg Updated by: bieprh 6/27/2017



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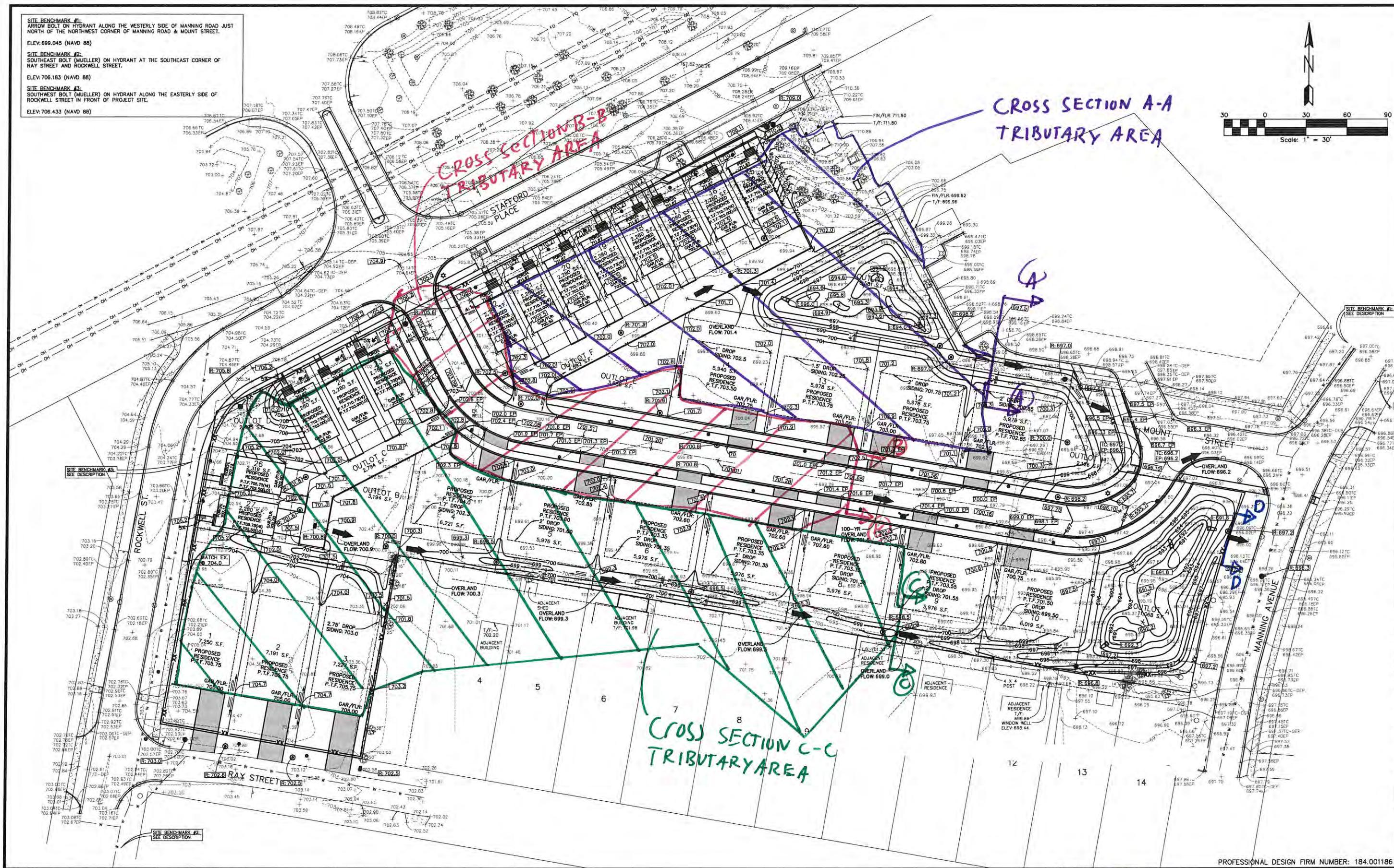
2416 GALEN DRIVE
CHAMPAIGN, ILLINOIS 61821
PHONE (217) 351-6268
FAX (217) 355-1902

AIRHART DEVELOPMENT, LLC

Prop. Conditions Tributary Area Exhibit

DATE: JUNE 9, 2017
JOB NO: 161210
PROJECT: Airhart Construction \61210_StaffordPlace\Warrenville\ADD161210_StaffordPlace.dwg Updated by: bieprh 6/27/2017

SHEET 7 OF 15



PROFESSIONAL DESIGN FIRM NUMBER: 184.001186

REVISIONS:		DATE		BY		DESCRIPTION		DATE		BY		DESCRIPTION		DRAWN BY: B.L.		CHECKED BY: M.H.		APPROVED BY: J.G.	
DATE	BY	PER OWNER COMMENTS																	
06/26/17	B.L.																		



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AIRHART DEVELOPMENT, LLC

100-YR OVERLAND
FLOW MAP

SCALE: 1'=30'
DATE: JUNE 9, 2017
JOB NO: 161210
SHEET 7 OF 15



STAFFORD PLACE OVERLAND FLOW CALCS

$$Q = C \cdot i \cdot A$$

C = RUNOFF COEFF.

i = INTENSITY (in/hr)

A = DRAINAGE AREA (Acres)

CROSS SECTION A-A

C = 0.68 - ASSUMED FROM SITE IMPERVIOUS DATA

i = 4.458 (BULLETIN 70 FOR TC = 41 min)

A = 1.17 Ac

$$C \cdot i \cdot A = Q = 0.68 \cdot 4.458 \cdot 1.17 = \underline{3.55 \text{ CFS}}$$

CROSS SECTION B-B

C = 0.68

i = 10.92 (BULLETIN 70 FOR TC = 5 min)

A = 0.64 Ac

$$Q = 0.68 \cdot 10.92 \cdot 0.64 = \underline{4.75 \text{ CFS}}$$

CROSS SECTION C-C

C = 0.68

i = 4.028 (BULLETIN 70 FOR TC = 51 min)

A = 1.73 Ac

$$Q = 0.68 \cdot 4.028 \cdot 1.73 = \underline{4.74 \text{ CFS}}$$

CROSS SECTION D-D

Q = 10.34 (FROM OUTLATA TR-20 ANALYSIS)



35701 West Avenue, Suite 150
Warrenville, IL 60555
p 630.393.3060 f 630.393.2152

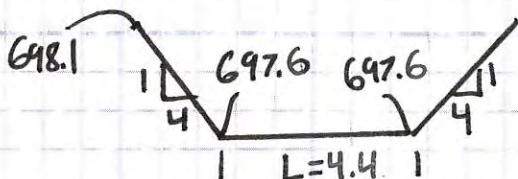
3002 Crossing Court
Champaign, IL 61822
p 217.351.6268 f 217.355.1902

Title _____ Sheet _____ of _____

Job No. _____ By _____ Date _____

STAFFORD PL OVERLAND FLOW CALCS

CROSS-SECTION A-A



$$Q = 3.3 \times L \times H^{3/2}$$

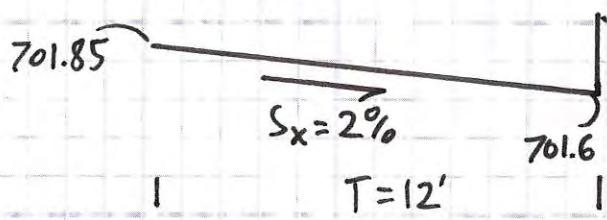
$$H = 0.5 \text{ FT } L = 4.4 \text{ FT}$$

$$Q = 3.3 \times 4.4 \times 0.5^{3/2} = 5.13 \text{ CFS}$$

$$Q_{100} = 3.55 \text{ CFS}$$

$$5.13 > 3.55 \text{ OK}$$

CROSS SECTION B-B



$$Q = \frac{0.56}{n} \times S_x^{5/3} \cdot S^{1/2} \cdot T^{8/3}$$

$$n = 0.011 \quad S_x = 0.02 \quad S = 0.03$$

$$T = 12 \text{ FT}$$

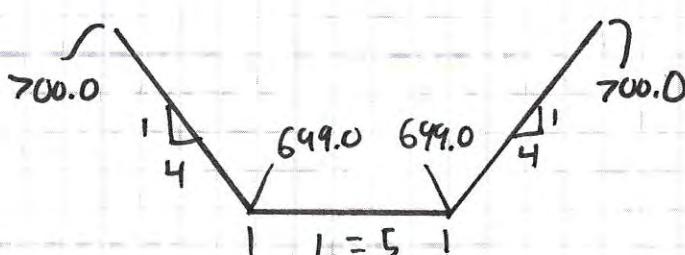
$$Q = \frac{0.56}{0.11} \cdot 0.02^{5/3} \cdot 0.03^{1/2} \cdot 12^{8/3}$$

$$Q = 9.81 \text{ CFS}$$

$$Q_{100} = 4.75 \text{ CFS}$$

$$9.81 > 4.75 \text{ OK}$$

CROSS-SECTION C-C



$$Q = 3.3 \times L \times H^{3/2}$$

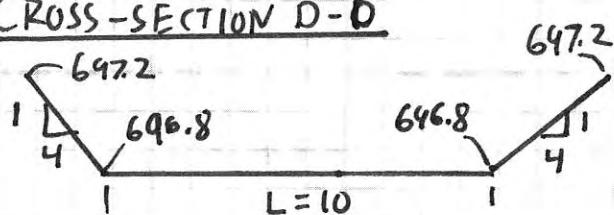
$$H = 1.0 \text{ FT } L = 5 \text{ FT}$$

$$Q = 3.3 \cdot 5 \times 1^{3/2} = 16.5 \text{ CFS}$$

$$Q_{100} = 4.74 \text{ CFS}$$

$$16.5 > 4.74 \text{ OK}$$

CROSS-SECTION D-D



$$Q = 3.3 \times L \times H^{3/2}$$

$$H = 0.5 \text{ FT } L = 10 \text{ FT}$$

$$Q = 3.3 \times 10 \times 0.5^{3/2}$$

$$= 11.67 \text{ CFS}$$

$$Q_{100} = 10.34 \text{ CFS} \quad [11.67 > 10.34 \text{ OK}]$$