RWG Engineering, LLC

PROJECT NARRATIVE

AND

STORM DRAINAGE ANALYSIS

FOR

ARLINGTON HEIGHTS INDUSTRIAL
703-723 ALGONQUIN ROAD
ARLINGTON HEIGHTS, IL

PREPARED FOR:

MORGAN/HARBOUR CONSTRUCTION LLC
7510 SOUTH MADISON STREET
WILLOWBROOK, IL 60527
630-734-7737

PREPARED BY:

RWG Engineering, LLC

975 E. 22nd Street
Suite 400
Wheaton, Illinois 60189
(630) 480-7889

JOB# 322-127-17-301
OCTOBER 18, 2017

Table of Contents

RWG Engineering, LLC
Civil Engineering • Real Estate Consulting • Project Management

975 E. 22nd Street, Suite 400,
Wheaton IL 60189
630.480.7889
www.rwg-engineering.com

October 18, 2017
File: 322-127-17

Arlington Heights Industrial

703-723 Algonquin Road
Arlington Heights, IL
15.41 Acre Property

Narrative Description of Proposed Development
(Refer Also to Final Engineering Plans, Notes and Exhibits.)

General:
The subject parcel is located southeasterly of Algonquin Road and Meijer Drive in Arlington Heights, Illinois. The Jane Adams Memorial Tollway (I-90) is along the southern boundary of the property. Currently, two light industrial/office buildings are on the site. The northern building is on existing Parcel 1, which consists of 7.04 acres. The southern building is on existing Parcel 2, which consists of 8.37 acres. The proposed improvements include one building of approximately 331,000 sq ft for warehousing/distribution. Construction is to proceed in two phases. The first phase would be on existing Parcel 1, during which time the existing building on Parcel 2 would remain operational. With the Phase 2 improvements, the Phase 1 building would extend into the Parcel 2 area. Since the site currently consists of two parcels, a Plat of Subdivision combining the site into one lot is proposed.

Stormwater Management:
The existing Parcel 1 drains to the north with a storm drain connection at the northeast corner of the parcel to the existing 18" storm sewer along the southerly side of Algonquin Road. Storm water discharge from the site is controlled by an existing 4" PVC pipe, as well as a secondary 10" RCP pipe at a higher elevation. The existing overland flow from Parcel 1 to Algonquin Rd is within the easterly driveway at an approximate elevation of 715.43. No improvements to this existing driveway are proposed within the Algonquin Rd right-of- way. Therefore, for design purposes an overflow elevation of 715.4 is used. At the 715.4 elevation, the existing 4" PVC has a release of approximately 0.69 cfs and the 10" RCP has a release of 4.44 cfs, for a total of 5.13 cfs.

The existing Parcel 2 drains to the south, via an existing 18" RCP pipe, which connects to an existing 36" storm sewer with discharge to an open waterway along the north side of I-90. No restrictor was located within the existing 18" RCP storm sewer. The existing overland flow from parcel 2 is to the south at an approximate elevation of 715.0. At this 715.0 overflow elevation, the existing release thru the 18" RCP is approximately 21.17". Since there is no offsite area tributary to Parcel 2 which would be impacted by a slight rise in the overflow elevation, a 715.4 high water level (HWL)/overflow elevation is used for both the Phase 1 and Phase 2 site improvements.

Stormwater detention requirements were reviewed for both the Village of Arlington Heights, and the Metropolitan Water Reclamation District of Greater Chicago (MWRD) criteria. Also, the MWRD volume control requirements were reviewed. Since there are some slight deviations in the Phase 2 improvements draining to the north from the proposed site improvements with Phase 1, both conditions were reviewed. In consideration of the worst case scenario, the proposed design implements the more restrictive criteria. A Drainage Summary Sheet, Table 1, is attached which provides a summary of the allowable release rate, as well as the detention, and volume control requirements for the various scenarios.

For the north drainage area in the proposed condition, the existing 4" PVC is to remain, and a 3-1/8" orifice plate is to be provided in the existing 10" RCP. This results in a total release of 1.21 cfs at the 715.4 elevation. For the south drainage area, a 5" orifice plate is proposed for the 18" RCP, restricting the release to 1.53 cfs at the 714.4 HWL.

The detention volumes associated with the above design release rates were reviewed. Per the attached calculations, using these design release rates, the detention storage volume for the north area would be 2.69 ac-ft, and 3.16 ac-ft for the south, phase 2 area.

A Summary of Storage Provided, Table 2, is attached outlining the storage volumes provided in the respective basins and locations. Although, there may be some minor refinement of allocations between detention and volume control storage in the underground basins, the total volumes provided are appropriate based on both the Village of Arlington Heights and the MWRD criteria. As noted, stormwater storage is provided in a combination of areas, including vegetated/open water basins, underground storage, pipe storage, and surface ponding in the truck dock areas. It is noted the ponding in the truck dock areas will occur during the more intense storms only, with the proposed rims at a 714.05 elevation. Therefore, at the upper elevations of the detention storage system, a maximum water depth of 1.35' would be expected at the 715.4 HWL/overflow elevation.

10/12/2017

TABLE 1 -- ARLINGTON HEIGHTS INDUSTRIAL - DRAINAGE SUMMARY SHEET

VILLAGE OF ARLINGTON HEIGHTS CRITERIA:

	Temp. DRAINAGE AREA (Ac.)	Offsite DRAINAGE AREA (Ac.)	Temp.TOTAL AREA (Ac.)	DRAINAGE AREA (Ac.)	Offsite DRAINAGE AREA (Ac.)	TOTAL AREA (Ac.)	IMPERVIOUS AREA (Ac.) onsite only	IMPERVIOUS AREA (Ac.) Total w/ offsite	% Impervious	COMPOSITE "C"	ALLOWABLE RELEASE (cfs)	Detention Required (ac-ft)
PHASE 1: first phase only (temporary condition)	7.04	0.396	7.436				5.843	5.902	80%	0.86	1.33	2.60
PHASE 1: full build out				6.875	0.396	6.934	5.957	6.016	87%	0.89	1.24	2.55
PHASE 2: full build out				8.540	0.016	8.556	7.498	7.514	88%	0.90	1.54	3.16

MWRD CRITERIA:

	Temp. DRAINAGE AREA (Ac.)	Offsite DRAINAGE AREA (Ac.)	Temp.TOTAL AREA (Ac.)	DRAINAGE AREA (Ac.)	Offsite DRAINAGE AREA (Ac.)	TOTAL AREA (Ac.)	IMPERVIOUS AREA (Ac.) onsite only	IMPERVIOUS AREA (Ac.) Total w/ offsite	% Impervious	COMPOSITE "CN"	ALLOWABLE RELEASE (cfs)	Detention Required (ac-ft)
PHASE 1: first phase only (temporary condition)	7.04	0.396	7.436				5.843	5.902	80%	93	2.23	1.75
PHASE 1: full build out				6.875	0.396	6.934	5.957	6.016	87%	95	2.08	1.70
PHASE 2: full build out				8.540	0.016	8.556	7.498	7.514	88%	95	2.57	2.09

MWRD VOLUME CONTROL:

PHASE 1	(full build out-max impervious)	**1" of volume over total impervious area of ----------**	**6.016**	**Ac**	**Required Volume =**	**0.50 Ac-Ft**
PHASE 2	(full build out)	**1" of volume over total impervious area of ----------**	**7.514**	**Ac**	**Required Volume =**	**0.63 Ac-Ft**

RESTRICTIVE CULVERT WORKSHEET

JOB DATA:

Job Name:	**ALGONQUIN RD IBDUSTRIAL-PH 1**
Job Number:	**322-127-17**
Designer:	**PDL**
Description	**EXIST STORM OUTFALL-4" PRIMARY**

FLOWS ARE BASED ON THE FOLLOWING EQUATION:

$$Q = A\sqrt{\frac{H}{\frac{K_e + K_o}{2g} + \frac{2.87(n)^2 L}{\sqrt[3]{\phi^4}}}}$$

Q = FLOW (cfs)
A = AREA (sqr.ft.)
H = Head (ft.)
K_e & Ko = Entrance & Outlet Loss Coefficients
n = Manning's Roughness Coeficient
g = 32.2 ft/sec^2
ϕ = diameter

PIPE DATA:

Pipe Diameter (feet)	**0.33**	ft.
Pipe Area (sqr. ft)	0.087	sqr. ft.
Slope (ft./ft.)	**-0.0023**	
Length of Pipe (ft.)	**30**	ft.
Existing Invert Elevation	**709.67**	ft.
Backwater Elevation	**710.07**	ft. (Top of 4" pipe @ outlet)
Manning's "n" value	**0.013**	
Entrance Loss Coefficient	**0.50**	
Outlet Loss Coefficient	**1.00**	

RATING TABLE:

Water Elevation (ft.)*	Head (ft.)	Q (cfs)
715.00	**4.93**	**0.66**
715.10	**5.03**	**0.67**
715.20	**5.13**	**0.67**
715.30	**5.23**	**0.68**
715.40	**5.33**	**0.69**
715.50	**5.43**	**0.69**
715.60	**5.53**	**0.70**
715.70	**5.63**	**0.70**
715.80	**5.73**	**0.71**
715.90	**5.83**	**0.72**
716.00	**5.93**	**0.72**

*Water elevation must be higher than backwater elevation.

RESTRICTIVE CULVERT WORKSHEET

JOB DATA:

Job Name:	**ALGONQUIN RD IBDUSTRIAL-PH 1**
Job Number:	**322-127-17**
Designer:	**PDL**
Description	**EXIST STM OUTFALL-10" SECONDARY**

FLOWS ARE BASED ON THE FOLLOWING EQUATION:

$$Q = A\sqrt{\frac{H}{\frac{K_e + K_o}{2g} + \frac{2.87(n)^2 L}{\sqrt[3]{\phi^4}}}}$$

Q = FLOW (cfs)
A = AREA (sqr.ft.)
H = Head (ft.)
K_e & Ko = Entrance & Outlet Loss Coefficients
n = Manning's Roughness Coeficient
g = 32.2 ft/sec^2
ϕ = diameter

PIPE DATA:

Pipe Diameter (feet)	**0.83**	ft.
Pipe Area (sqr. ft)	0.541	sqr. ft.
Slope (ft./ft.)	**-0.021**	
Length of Pipe (ft.)	**30**	ft.
Existing Invert Elevation	**711.12**	ft.
Backwater Elevation	**712.58**	ft. (Ttop of 10" pipe @ outlet)
Manning's "n" value	**0.013**	
Entrance Loss Coefficient	**0.50**	
Outlet Loss Coefficient	**1.00**	

RATING TABLE:

Water Elevation (ft.)*	Head (ft.)	Q (cfs)
715.00	**2.42**	**4.11**
715.10	**2.52**	**4.19**
715.20	**2.62**	**4.28**
715.30	**2.72**	**4.36**
715.40	**2.82**	**4.44**
715.50	**2.92**	**4.51**
715.60	**3.02**	**4.59**
715.70	**3.12**	**4.67**
715.80	**3.22**	**4.74**
715.90	**3.32**	**4.81**
716.00	**3.42**	**4.89**

*Water elevation must be higher than backwater elevation.

RESTRICTIVE CULVERT WORKSHEET

JOB DATA:

Job Name:	**ALGONQUIN RD IBDUSTRIAL-PH 2**
Job Number:	**322-127-17**
Designer:	**PDL**
Description	**EXIST STM OUTFALL-18"**

FLOWS ARE BASED ON THE FOLLOWING EQUATION:

$$Q = A\sqrt{\frac{H}{\frac{K_e + K_o}{2g} + \frac{2.87(n)^2 L}{\sqrt[3]{\phi^4}}}}$$

Q = FLOW (cfs)
A = AREA (sqr.ft.)
H = Head (ft.)
K_e & Ko = Entrance & Outlet Loss Coefficients
n = Manning's Roughness Coeficient
g = 32.2 ft/sec^2
ϕ = diameter

PIPE DATA:

Pipe Diameter (feet)	**1.50**	ft.
Pipe Area (sqr. ft)	1.767	sqr. ft.
Slope (ft./ft.)	**0**	
Length of Pipe (ft.)	**10**	ft.
Existing Invert Elevation	**709.75**	ft.
Backwater Elevation	**711.25**	ft. (Top of 18" pipe)
Manning's "n" value	**0.013**	
Entrance Loss Coefficient	**0.50**	
Outlet Loss Coefficient	**1.00**	

RATING TABLE:

Water Elevation (ft.)*	Head (ft.)	Q (cfs)
714.60	**3.35**	**20.01**
714.70	**3.45**	**20.31**
714.80	**3.55**	**20.60**
714.90	**3.65**	**20.89**
715.00	**3.75**	**21.17**
715.10	**3.85**	**21.45**
715.20	**3.95**	**21.73**
715.30	**4.05**	**22.00**
715.40	**4.15**	**22.27**
715.50	**4.25**	**22.54**
715.60	**4.35**	**22.80**

*Water elevation must be higher than backwater elevation.

ORIFICE WORKSHEET

Job Name:	**ALGONQUIN RD INDUSTRIAL-PH 1**
Job Number:	**322-127-17**
Designer:	**PDL**
Description	**PROPOSED ORIFICE IN EXIST 10" RCP**

FLOWS ARE BASED ON THE FOLLOWING EQUATION:

$$Q = AC\sqrt{2gH}$$

Q = FLOW (cfs)
A = AREA (sqr.ft.)
C = Orifice Coefficient
g = 32.2 ft/sec^2
H = Head (ft.)

ORIFICE DATA:

Orifice diameter(inches)	**3.125**	inches
Orifice area(square feet)	0.053	sqr. ft.
Proposed invert elevation	**711.12**	ft.
Centerline of flow	711.25	ft
Orifice coeficient	**0.6**	

RATING TABLE:

Water Elevation (ft.)*	Head (ft.)	Q (cfs)
715.00	**3.75**	**0.50**
715.10	**3.85**	**0.50**
715.20	**3.95**	**0.51**
715.30	**4.05**	**0.52**
715.40	**4.15**	**0.52**
715.50	**4.25**	**0.53**
715.60	**4.35**	**0.53**
715.70	**4.45**	**0.54**
715.80	**4.55**	**0.55**
715.90	**4.65**	**0.55**
716.00	**4.75**	**0.56**
716.10	**4.85**	**0.56**

*Water elevation must be higher than centerline of flow

ORIFICE WORKSHEET

Job Name:	**ALGONQUIN RD INDUSTRIAL-PH 2**
Job Number:	**322-127-17**
Designer:	**PDL**
Description	**PROPOSED ORIFICE IN EXIST 18" RCP**

FLOWS ARE BASED ON THE FOLLOWING EQUATION:

$$Q = AC\sqrt{2gH}$$

Q = FLOW (cfs)
A = AREA (sqr.ft.)
C = Orifice Coefficient
g = 32.2 ft/sec^2
H = Head (ft.)

ORIFICE DATA:

Orifice diameter(inches)	**5.000**	inches
Orifice area(square feet)	0.136	sqr. ft.
Proposed invert elevation	**709.75**	ft.
Centerline of flow	709.96	ft
Orifice coeficient	**0.6**	

RATING TABLE:

Water Elevation (ft.)*	Head (ft.)	Q (cfs)
715.00	**5.04**	**1.47**
715.10	**5.14**	**1.49**
715.20	**5.24**	**1.50**
715.30	**5.34**	**1.52**
715.40	**5.44**	**1.53**
715.50	**5.54**	**1.55**
715.60	**5.64**	**1.56**
715.70	**5.74**	**1.57**
715.80	**5.84**	**1.59**
715.90	**5.94**	**1.60**
716.00	**6.04**	**1.61**
716.10	**6.14**	**1.63**

*Water elevation must be higher than centerline of flow

RWG ENGINEERING, LLC.
975 E. 22nd Street
Wheaton, IL 60189
(630) 774-9501

Detention Calculator
Modified Rational Method

TELEPHONE (630) 774-9501 DESCRIPTION Arlington Heights - BASIN CALCULATION SHEETS
Technical Bulletin 70 (7.58 in. - 100 Year Rainfall)
STORAGE VOLUME WITH ALLOWABLE RELEASE RATE-PHASE 1 TEMPORARY

DURATION (HOURS)	TIME (MIN)	100 YR. INT (IN/HR)	INFLOW RATE (CFS)	STORED RATE (CFS)	VOLUME (ACRE-FT)		
0.50	30	5.60	35.81	34.48	1.44	Area of site in acres:	7.44
0.67	40	4.92	31.46	30.13	1.67	Trapped water area in acres:	0.00
0.83	50	4.24	27.11	25.78	1.79	Net area for release computation in acres:	0.00
1.00	60	3.56	22.77	21.44	1.79	Allowable release rate in CFS:	1.33
1.50	90	2.90	18.55	17.22	2.15	Unrestricted release rate in CFS:	0.00
2.00	120	2.24	14.32	12.99	2.17	Bypass release rate in CFS:	0.00
3.00	180	1.62	10.36	9.03	2.26	Total allowable release in CFS:	1.33
4.00	240	1.40	8.93	7.60	2.53	Developed runoff coefficient:	0.86
5.00	300	1.17	7.50	6.17	2.57		
6.00	360	0.95	6.08	4.75	2.37	**Maximum volume in Acre-Ft =**	**2.60**
7.00	420	0.88	5.65	4.32	2.52		
8.00	480	0.82	5.22	3.89	2.60		
9.00	540	0.75	4.80	3.47	2.60	<===	
10.00	600	0.68	4.37	3.04	2.53		
11.00	660	0.62	3.94	2.61	2.40		
12.00	720	0.55	3.52	2.19	2.19		
13.00	780	0.52	3.35	2.02	2.18		
14.00	840	0.50	3.18	1.85	2.15		
15.00	900	0.47	3.01	1.68	2.09	Phase 1:	
16.00	960	0.44	2.84	1.51	2.01	Total Tributary Area after Phase 1 = 7.436 ac.	
17.00	1020	0.42	2.66	1.33	1.89	Release rate = 1.33 cfs	
18.00	1080	0.39	2.49	1.16	1.75		
19.00	1140	0.38	2.42	1.09	1.72		
20.00	1200	0.37	2.34	1.01	1.69		
21.00	1260	0.36	2.27	0.94	1.65		
22.00	1320	0.34	2.20	0.87	1.59		
23.00	1380	0.33	2.12	0.79	1.52		
24.00	1440	0.32	2.05	0.72	1.43		

	% of site	"C" Factor	Composite "C"
Open Water Area	0.00	1.00	0.00
Impervious Area	80.00	0.95	0.76
Pervious Area	20.00	0.50	0.10
Total :	**100.00**		**0.86**

RWG ENGINEERING, LLC.
975 E. 22nd Street
Wheaton, IL 60189
(630) 774-9501

Detention Calculator
Modified Rational Method

TELEPHONE (630) 774-9501 DESCRIPTION Arlington Heights - BASIN CALCULATION SHEETS
Technical Bulletin 70 (7.58 in. - 100 Year Rainfall)
STORAGE VOLUME WITH ALLOWABLE RELEASE RATE-PHASE 1 BUILD-OUT

DURATION (HOURS)	TIME (MIN)	100 YR. INT (IN/HR)	INFLOW RATE (CFS)	STORED RATE (CFS)	VOLUME (ACRE-FT)		
0.50	30	5.60	34.62	33.38	1.39		
0.67	40	4.92	30.41	29.17	1.62		
0.83	50	4.24	26.21	24.97	1.73		
1.00	60	3.56	22.01	20.77	1.73		
1.50	90	2.90	17.93	16.69	2.09		
2.00	120	2.24	13.85	12.61	2.10		
3.00	180	1.62	10.01	8.77	2.19		
4.00	240	1.40	8.63	7.39	2.46		
5.00	300	1.17	7.25	6.01	2.51		
6.00	360	0.95	5.87	4.63	2.32		
7.00	420	0.88	5.46	4.22	2.46		
8.00	480	0.82	5.05	3.81	2.54		
9.00	540	0.75	4.64	3.40	2.55	<===	
10.00	600	0.68	4.22	2.98	2.49		
11.00	660	0.62	3.81	2.57	2.36		
12.00	720	0.55	3.40	2.16	2.16		
13.00	780	0.52	3.24	2.00	2.16		
14.00	840	0.50	3.07	1.83	2.14		
15.00	900	0.47	2.91	1.67	2.08		
16.00	960	0.44	2.74	1.50	2.00		
17.00	1020	0.42	2.58	1.34	1.89		
18.00	1080	0.39	2.41	1.17	1.76		
19.00	1140	0.38	2.34	1.10	1.74		
20.00	1200	0.37	2.27	1.03	1.71		
21.00	1260	0.36	2.19	0.95	1.67		
22.00	1320	0.34	2.12	0.88	1.62		
23.00	1380	0.33	2.05	0.81	1.55		
24.00	1440	0.32	1.98	0.74	1.48		

	% of site	"C" Factor	Composite "C"
Open Water Area	0.00	1.00	0.00
Impervious Area	87.00	0.95	0.83
Pervious Area	13.00	0.50	0.07
Total :	**100.00**		**0.89**

Area of site in acres:	6.93
Trapped water area in acres:	0.00
Net area for release computation in acres:	0.00
Allowable release rate in CFS:	1.24
Unrestricted release rate in CFS:	0.00
Bypass release rate in CFS:	0.00
Total allowable release in CFS:	1.24
Developed runoff coefficient:	0.89
Maximum volume in Acre-Ft =	**2.55**

Phase 1:
Total Tributary Area after development = 6.934 ac.
Release rate = 1.24 cfs

RWG ENGINEERING, LLC.
975 E. 22nd Street
Wheaton, IL 60189
(630) 774-9501

Detention Calculator
Modified Rational Method

TELEPHONE (630) 774-9501 DESCRIPTION Arlington Heights - BASIN CALCULATION SHEETS
Technical Bulletin 70 (7.58 in. - 100 Year Rainfall)
STORAGE VOLUME WITH ALLOWABLE RELEASE RATE-PHASE 2

DURATION (HOURS)	TIME (MIN)	100 YR. INT (IN/HR)	INFLOW RATE (CFS)	STORED RATE (CFS)	VOLUME (ACRE-FT)	
0.50	30	5.60	42.93	41.39	1.72	
0.67	40	4.92	37.72	36.18	2.01	
0.83	50	4.24	32.50	30.96	2.15	
1.00	60	3.56	27.29	25.75	2.15	
1.50	90	2.90	22.23	20.69	2.59	
2.00	120	2.24	17.17	15.63	2.61	
3.00	180	1.62	12.42	10.88	2.72	
4.00	240	1.40	10.71	9.17	3.06	
5.00	300	1.17	8.99	7.45	3.11	
6.00	360	0.95	7.28	5.74	2.87	
7.00	420	0.88	6.77	5.23	3.05	
8.00	480	0.82	6.26	4.72	3.15	
9.00	540	0.75	5.75	4.21	3.16	<===
10.00	600	0.68	5.24	3.70	3.08	
11.00	660	0.62	4.73	3.19	2.92	
12.00	720	0.55	4.22	2.68	2.68	
13.00	780	0.52	4.01	2.47	2.68	
14.00	840	0.50	3.81	2.27	2.65	
15.00	900	0.47	3.60	2.06	2.58	
16.00	960	0.44	3.40	1.86	2.48	
17.00	1020	0.42	3.19	1.65	2.34	
18.00	1080	0.39	2.99	1.45	2.17	
19.00	1140	0.38	2.90	1.36	2.15	
20.00	1200	0.37	2.81	1.27	2.12	
21.00	1260	0.36	2.72	1.18	2.07	
22.00	1320	0.34	2.63	1.09	2.00	
23.00	1380	0.33	2.54	1.00	1.92	
24.00	1440	0.32	2.45	0.91	1.83	

	Area of site in acres:	8.56
	Trapped water area in acres:	0.00
	Net area for release computation in acres:	0.00
	Allowable release rate in CFS:	1.54
	Unrestricted release rate in CFS:	0.00
	Bypass release rate in CFS:	0.00
	Total allowable release in CFS:	1.54
	Developed runoff coefficient:	0.90
	Maximum volume in Acre-Ft =	**3.16**
	Phase 2:	
	Total Tributary Area after development = 8.556 ac.	
	Release rate = 1.54 cfs	

	% of site	"C" Factor	Composite "C"
Open Water Area	0.00	1.00	0.00
Impervious Area	88.00	0.95	0.84
Pervious Area	12.00	0.50	0.06
Total :	**100.00**		**0.90**

RWG ENGINEERING, LLC.
975 E. 22nd Street
Wheaton, IL 60189
(630) 774-9501

Detention Calculator
Modified Rational Method

TELEPHONE (630) 774-9501 DESCRIPTION Arlington Heights - BASIN CALCULATION SHEETS
Technical Bulletin 70 (7.58 in. - 100 Year Rainfall)
STORAGE VOLUME WITH DESIGN RELEASE RATE-PHASE 1 TEMPORARY

DURATION (HOURS)	TIME (MIN)	100 YR. INT (IN/HR)	INFLOW RATE (CFS)	STORED RATE (CFS)	VOLUME (ACRE-FT)		
0.50	30	5.60	35.81	34.60	1.44	Area of site in acres:	7.44
0.67	40	4.92	31.46	30.25	1.68	Trapped water area in acres:	0.00
0.83	50	4.24	27.11	25.90	1.80	Net area for release computation in acres:	0.00
1.00	60	3.56	22.77	21.56	1.80	Design release rate in CFS:	1.21
1.50	90	2.90	18.55	17.34	2.17	Unrestricted release rate in CFS:	0.00
2.00	120	2.24	14.32	13.11	2.19	Bypass release rate in CFS:	0.00
3.00	180	1.62	10.36	9.15	2.29	Total allowable release in CFS:	1.21
4.00	240	1.40	8.93	7.72	2.57	Developed runoff coefficient:	0.86
5.00	300	1.17	7.50	6.29	2.62	**Maximum volume in Acre-Ft =**	**2.69**
6.00	360	0.95	6.08	4.87	2.43		
7.00	420	0.88	5.65	4.44	2.59		
8.00	480	0.82	5.22	4.01	2.68		
9.00	540	0.75	4.80	3.59	2.69	<===	
10.00	600	0.68	4.37	3.16	2.63		
11.00	660	0.62	3.94	2.73	2.51		
12.00	720	0.55	3.52	2.31	2.31		
13.00	780	0.52	3.35	2.14	2.31		
14.00	840	0.50	3.18	1.97	2.29		
15.00	900	0.47	3.01	1.80	2.24	Phase 1:	
16.00	960	0.44	2.84	1.63	2.17	Total Tributary Area after Phase 1 = 7.436 ac.	
17.00	1020	0.42	2.66	1.45	2.06	Release rate = 1.21 cfs	
18.00	1080	0.39	2.49	1.28	1.93		
19.00	1140	0.38	2.42	1.21	1.91		
20.00	1200	0.37	2.34	1.13	1.89		
21.00	1260	0.36	2.27	1.06	1.86		
22.00	1320	0.34	2.20	0.99	1.81		
23.00	1380	0.33	2.12	0.91	1.75		
24.00	1440	0.32	2.05	0.84	1.67		

	% of site	"C" Factor	Composite "C"
Open Water Area	0.00	1.00	0.00
Impervious Area	80.00	0.95	0.76
Pervious Area	20.00	0.50	0.10
Total :	**100.00**		**0.86**

RWG ENGINEERING, LLC.
975 E. 22nd Street
Wheaton, IL 60189
(630) 774-9501

Detention Calculator
Modified Rational Method

TELEPHONE (630) 774-9501 DESCRIPTION Arlington Heights - BASIN CALCULATION SHEETS
Technical Bulletin 70 (7.58 in. - 100 Year Rainfall)
STORAGE VOLUME WITH DESIGN RELEASE RATE-PHASE 1 BUILD-OUT

DURATION (HOURS)	TIME (MIN)	100 YR. INT (IN/HR)	INFLOW RATE (CFS)	STORED RATE (CFS)	VOLUME (ACRE-FT)		
0.50	30	5.60	34.62	33.41	1.39		
0.67	40	4.92	30.41	29.20	1.62		
0.83	50	4.24	26.21	25.00	1.74		
1.00	60	3.56	22.01	20.80	1.73		
1.50	90	2.90	17.93	16.72	2.09		
2.00	120	2.24	13.85	12.64	2.11		
3.00	180	1.62	10.01	8.80	2.20		
4.00	240	1.40	8.63	7.42	2.47		
5.00	300	1.17	7.25	6.04	2.52		
6.00	360	0.95	5.87	4.66	2.33		
7.00	420	0.88	5.46	4.25	2.48		
8.00	480	0.82	5.05	3.84	2.56		
9.00	540	0.75	4.64	3.43	2.57	<===	
10.00	600	0.68	4.22	3.01	2.51		
11.00	660	0.62	3.81	2.60	2.39		
12.00	720	0.55	3.40	2.19	2.19		
13.00	780	0.52	3.24	2.03	2.19		
14.00	840	0.50	3.07	1.86	2.17		
15.00	900	0.47	2.91	1.70	2.12		
16.00	960	0.44	2.74	1.53	2.04		
17.00	1020	0.42	2.58	1.37	1.93		
18.00	1080	0.39	2.41	1.20	1.80		
19.00	1140	0.38	2.34	1.13	1.79		
20.00	1200	0.37	2.27	1.06	1.76		
21.00	1260	0.36	2.19	0.98	1.72		
22.00	1320	0.34	2.12	0.91	1.67		
23.00	1380	0.33	2.05	0.84	1.61		
24.00	1440	0.32	1.98	0.77	1.54		

	% of site	"C" Factor	Composite "C"
Open Water Area	0.00	1.00	0.00
Impervious Area	87.00	0.95	0.83
Pervious Area	13.00	0.50	0.07
Total :	**100.00**		**0.89**

Area of site in acres:	6.93
Trapped water area in acres:	0.00
Net area for release computation in acres:	0.00
Design release rate in CFS:	1.21
Unrestricted release rate in CFS:	0.00
Bypass release rate in CFS:	0.00
Total allowable release in CFS:	1.21
Developed runoff coefficient:	0.89
Maximum volume in Acre-Ft =	**2.57**
Phase 1:	
Total Tributary Area after development = 6.934 ac.	
Release rate = 1.21 cfs	

RWG ENGINEERING, LLC.
975 E. 22nd Street
Wheaton, IL 60189
(630) 774-9501

Detention Calculator
Modified Rational Method

TELEPHONE (630) 774-9501 DESCRIPTION Arlington Heights - BASIN CALCULATION SHEETS
Technical Bulletin 70 (7.58 in. - 100 Year Rainfall)
STORAGE VOLUME WITH DESIGN RELEASE RATE-PHASE 2

DURATION (HOURS)	TIME (MIN)	100 YR. INT (IN/HR)	INFLOW RATE (CFS)	STORED RATE (CFS)	VOLUME (ACRE-FT)		
0.50	30	5.60	42.93	41.40	1.73		
0.67	40	4.92	37.72	36.19	2.01		
0.83	50	4.24	32.50	30.97	2.15		
1.00	60	3.56	27.29	25.76	2.15		
1.50	90	2.90	22.23	20.70	2.59		
2.00	120	2.24	17.17	15.64	2.61		
3.00	180	1.62	12.42	10.89	2.72		
4.00	240	1.40	10.71	9.18	3.06		
5.00	300	1.17	8.99	7.46	3.11		
6.00	360	0.95	7.28	5.75	2.88		
7.00	420	0.88	6.77	5.24	3.06		
8.00	480	0.82	6.26	4.73	3.15		
9.00	540	0.75	5.75	4.22	3.16	<===	
10.00	600	0.68	5.24	3.71	3.09		
11.00	660	0.62	4.73	3.20	2.93		
12.00	720	0.55	4.22	2.69	2.69		
13.00	780	0.52	4.01	2.48	2.69		
14.00	840	0.50	3.81	2.28	2.66		
15.00	900	0.47	3.60	2.07	2.59		
16.00	960	0.44	3.40	1.87	2.49		
17.00	1020	0.42	3.19	1.66	2.36		
18.00	1080	0.39	2.99	1.46	2.19		
19.00	1140	0.38	2.90	1.37	2.17		
20.00	1200	0.37	2.81	1.28	2.13		
21.00	1260	0.36	2.72	1.19	2.09		
22.00	1320	0.34	2.63	1.10	2.02		
23.00	1380	0.33	2.54	1.01	1.94		
24.00	1440	0.32	2.45	0.92	1.85		

	% of site	"C" Factor	Composite "C"
Open Water Area	0.00	1.00	0.00
Impervious Area	88.00	0.95	0.84
Pervious Area	12.00	0.50	0.06
Total :	**100.00**		**0.90**

Area of site in acres:	8.56
Trapped water area in acres:	0.00
Net area for release computation in acres:	0.00
Design release rate in CFS:	1.53
Unrestricted release rate in CFS:	0.00
Bypass release rate in CFS:	0.00
Total allowable release in CFS:	1.53
Developed runoff coefficient:	0.90
Maximum volume in Acre-Ft =	**3.16**

Phase 2:
Total Tributary Area after development = 8.556 ac.
Release rate = 1.53 cfs

Runoff Curve Number

Project: Phase 1 - Final | By: mrm | Date: 10/12/2017
Location: Arlington Heights, Cook County, IL | Checked: mrm | Date: 10/12/2017
File: CN 101217.xlsx

Circle One: Present (Developed) Description: 7.436-Acre Site - Phase 1 - temp cond

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number	Area [X] acres [ ] sq. mi. [ ] %	Product of Curve Number and Area
C	Pervious Area - Open Space, Good Condition	74	1.534	113.516
C	Permeable Pavement	91	0.000	0
C	Impervious Area - Building	98	5.848	573.104
C	Impervious Area - Open Water	100	0.054	5.4
		Totals =	7.436	692.02

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{692.02}{7.436} = 93.063$$

Use CN = **93**

RUNOFF CURVE NUMBER ADJUSTMENT CALCULATOR

Site Information:

Total Site Area, A_w (ac) =	7.436	Total Impervious Area, A_I (ac) =	5.902
Runoff, R (in) =	6.75		
P = rainfall depth (in) =	7.58		
CN =	93		
S =	0.75		
Runoff Volume Over Watershed, V_w (ac-ft) =	4.18		

Volume of GI Provided:

Volume Control Storage, V_R =	0.49	ac-ft	1" of volume over impervious area
Additional Volume, V_{GI} =	0.00	ac-ft	Additional volume over the required 1"

Adjusted Volume Over Watershed, $V_{ADJ} = V_W - V_R - V_{GI}$

V_{ADJ} (ac-ft) =	3.69

Adjusted Runoff Over Watershed, $R_{ADJ} = \frac{V_{ADJ}}{A_W}$

R_{ADJ} (in) =	5.95
S_{ADJ} =	1.60
Adjusted CN for detention calcs, CN_{ADJ} =	86.22

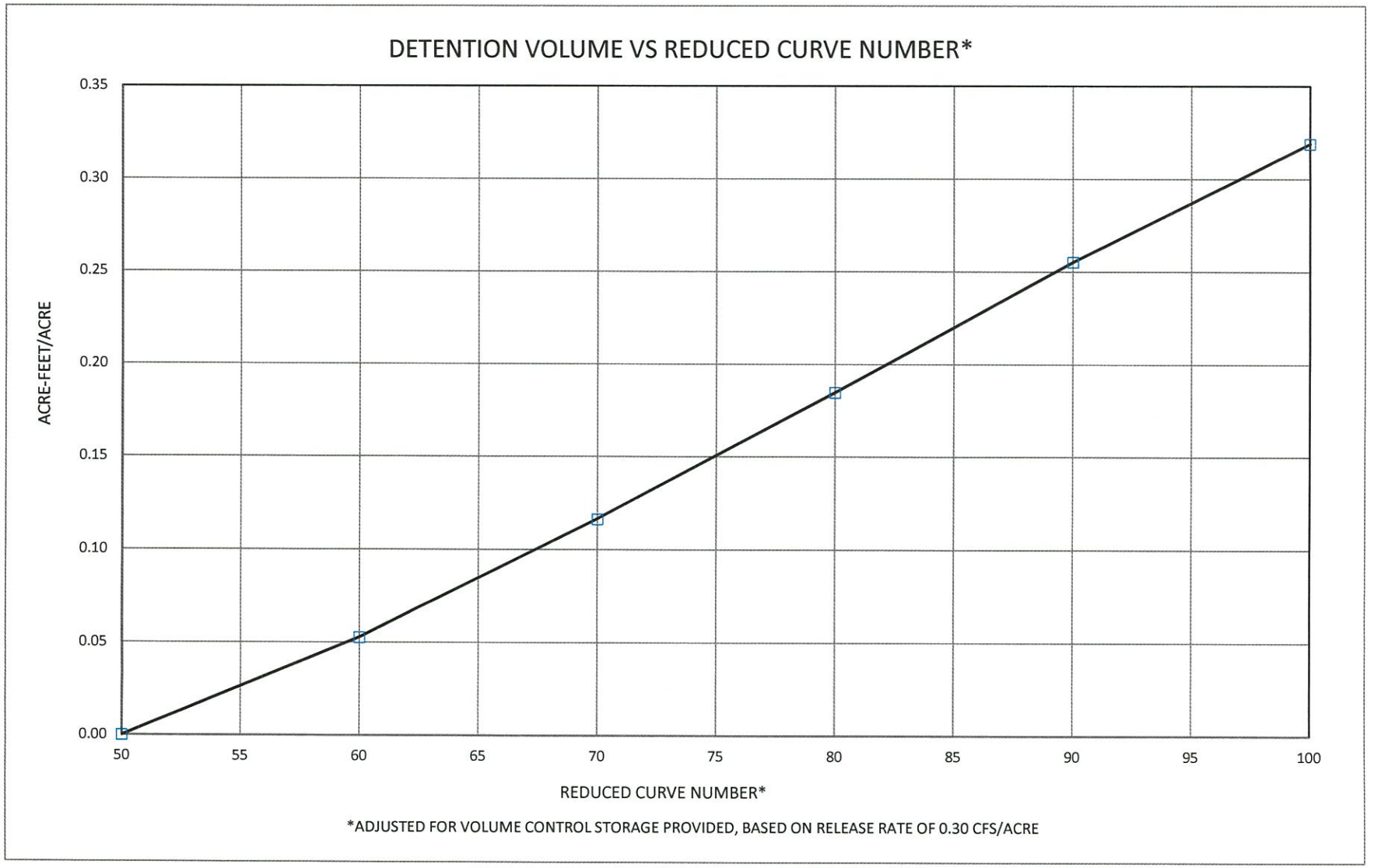
*Blue values are entered by user

Enter Site Area: 7.436 acres

*Blue Values are entered by user

Enter Reduced Curve Number for Site: 86.22

Estimated Required Detention Volume: **1.75** acre-feet



Runoff Curve Number

Project: Phase 1 - Final | By: mrm | Date: 10/12/2017
Location: Arlington Heights, Cook County, IL | Checked: mrm | Date: 10/12/2017
File: CN 101217.xlsx

Circle One: Present (Developed) Description: 6.934-Acre Site - Phase 1 - build out

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number	Area [X] acres [ ] sq. mi. [ ] %	Product of Curve Number and Area
C	Pervious Area - Open Space, Good Condition	74	0.918	67.932
C	Permeable Pavement	91	0.000	0
C	Impervious Area - Building	98	5.962	584.276
C	Impervious Area - Open Water	100	0.054	5.4
		Totals =	6.934	657.608

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{657.608}{6.934} = 94.838$$

Use CN = **95**

RUNOFF CURVE NUMBER ADJUSTMENT CALCULATOR

Site Information:

Total Site Area, A_w (ac) =	6.934	Total Impervious Area, A_I (ac) =	6.016
Runoff, R (in) =	6.98		
P = rainfall depth (in) =	7.58		
CN =	95		
S =	0.53		
Runoff Volume Over Watershed, V_w (ac-ft) =	4.04		

Volume of GI Provided:

Volume Control Storage, V_R =	0.50	ac-ft	1" of volume over impervious area
Additional Volume, V_{GI} =	0.00	ac-ft	Additional volume over the required 1"

Adjusted Volume Over Watershed, $V_{ADJ} = V_W - V_R - V_{GI}$

V_{ADJ} (ac-ft) =	3.53

Adjusted Runoff Over Watershed, $R_{ADJ} = \frac{V_{ADJ}}{A_W}$

R_{ADJ} (in) =	6.12
S_{ADJ} =	1.41
Adjusted CN for detention calcs, CN_{ADJ} =	87.68

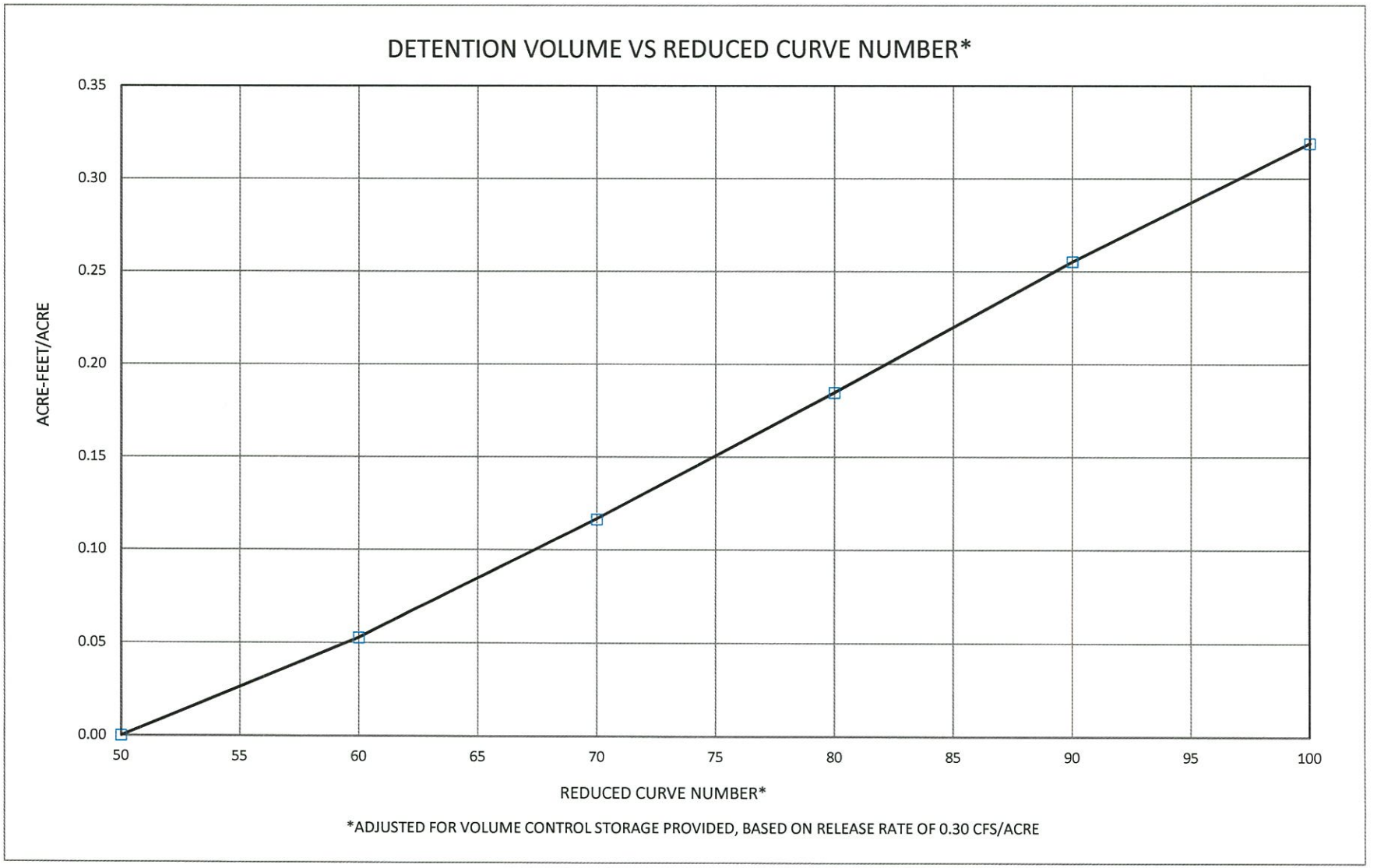
*Blue values are entered by user

Enter Site Area: 6.934 acres

*Blue Values are entered by user

Enter Reduced Curve Number for Site: 87.68

Estimated Required Detention Volume: **1.70** acre-feet



Runoff Curve Number

Project: Phase 2 - Final | By: mrm | Date: 10/12/2017
Location: Arlington Heights, Cook County, IL | Checked: mrm | Date: 10/12/2017
File: CN 101217.xlsx

Circle One: Present (Developed) Description: 8.556-Acre Site - Phase 2 - build out

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	Curve Number	Area [X] acres [ ] sq. mi. [ ] %	Product of Curve Number and Area
C	Pervious Area - Open Space, Good Condition	74	1.042	77.108
C	Permeable Pavement	91	0.000	0
C	Impervious Area - Building	98	7.514	736.372
C	Impervious Area - Open Water	100	0.000	0
		Totals =	8.556	813.48

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{813.48}{8.556} = 95.077$$

Use CN = **95**

RUNOFF CURVE NUMBER ADJUSTMENT CALCULATOR

Site Information:

Total Site Area, A_w (ac) =	8.556	Total Impervious Area, A_I (ac) =	7.514
Runoff, R (in) =	6.98		
P = rainfall depth (in) =	7.58		
CN =	95		
S =	0.53		
Runoff Volume Over Watershed, V_w (ac-ft) =	4.98		

Volume of GI Provided:

Volume Control Storage, V_R =	0.63	ac-ft	1" of volume over impervious area
Additional Volume, V_{GI} =	0.00	ac-ft	Additional volume over the required 1"

Adjusted Volume Over Watershed, $V_{ADJ} = V_W - V_R - V_{GI}$

V_{ADJ} (ac-ft) =	4.35

Adjusted Runoff Over Watershed, $R_{ADJ} = \frac{V_{ADJ}}{A_W}$

R_{ADJ} (in) =	6.10
S_{ADJ} =	1.43
Adjusted CN for detention calcs, CN_{ADJ} =	87.51

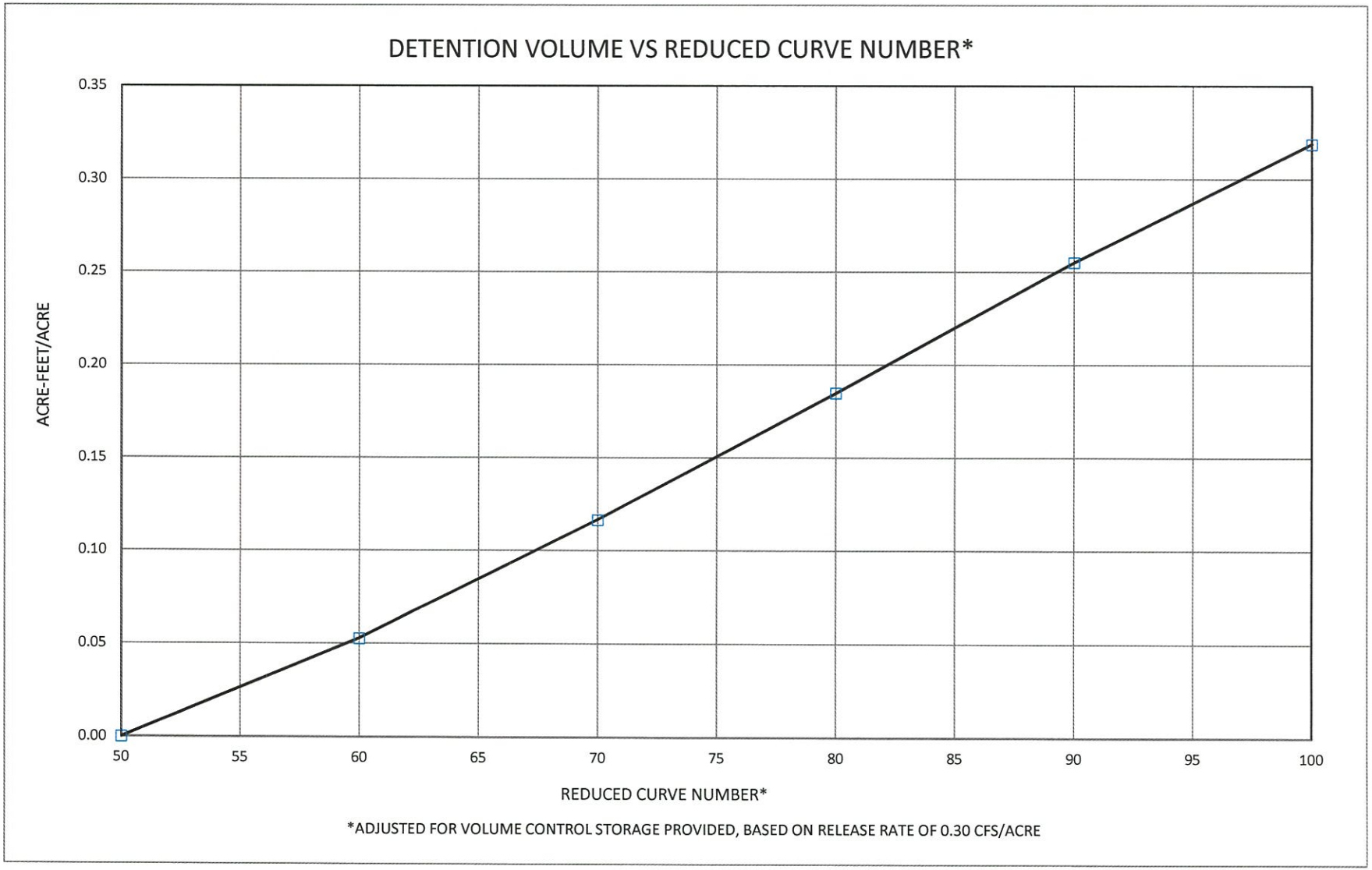
*Blue values are entered by user

Enter Site Area: 8.556 acres

*Blue Values are entered by user

Enter Reduced Curve Number for Site: 87.51

Estimated Required Detention Volume: **2.09** acre-feet



No. 322-127-17
12-Oct-17

TABLE 2
ARLINGTON HEIGHTS INDUSTRIAL
SUMMARY OF STORMWATER STORAGE PROVIDED

PHASE 1 - NORTH

Basin	Description	Det Storage (Ac-Ft)	Volume Control Storage (Ac-Ft
N-1	Existing Pond	0.370	0
N-2	Modified Pond	1.115	0.095
N-3	Underground	0.500	0.400
N-4?	Truck Dock Area	0.579	0
	Pipe Storage	0.117	0
	Total Volume:	2.681	0.495

PHASE 2 - SOUTH

Basin	Description	Det Storage (Ac-Ft)	Volume Control Storage (Ac-Ft
S-1	New Pond	0.704	0.049
S-2	Underground-W	0.938	0.429
S-3	Underground-SE	0.286	0.051
S-4	Underground-E	0.226	0.041
	Truck Dock Area	0.953	0
	Pipe Storage	0.101	0
	Total Volume:	3.208	0.569

Cut/Fill Report -- STORAGE VOLUMES PROVIDED

Generated: 2017-10-18 09:59:53

By user: RWGENGSTA07

Drawing: S:\32212717 - HP Arlington Heights Industrial\300_Engineering\310_CADD\Exhibits\S:\32212717 - HP Arlington Heights Industrial\300_Engineering\310_CADD\Exhibits\322_BASE_Basin.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)	Ac - Ft.
EX Basin N-1 (Det) NWL 710.65	full	0.000	1.000	4405.29	0.00*	597.51	597.51*	0.370
Basin N-2 (Det) NWL 710.2	full	0.000	1.000	12790.21	0.00*	1798.88	1798.88*	1.115
Basin N-2 (Vol Control)	full	0.000	1.000	5316.58	0.00*	152.88	152.88*	0.095
North Truck Dock	full	0.000	1.000	52639.96	0.00*	934.61	934.61*	0.579
Basin S-1 (Det) NWL 709.8	full	0.000	1.000	9218.35	0.00*	1134.98	1134.98*	0.704
Basin S-1 (Vol Control)	full	0.000	1.000	3112.46	0.00*	78.87	78.87*	0.049
South Truck Dock	full	0.000	1.000	85783.42	0.00*	1537.32	1537.32*	0.953

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	173266.27	0.00*	6235.04	6235.04*

* Value adjusted by cut or fill factor other than 1.0

No. 322-127-17
12-Oct-17

ARLINGTON HEIGHTS INDUSTRIAL
DETENTION STORAGE IN STORM SEWER SYSTEM
BELOW 715.4 HWL

PHASE 1 - NORTH

Pipe Storage:

Pipe Size (Inches)	Length (Feet)	Area (Sq Ft)	Volume (Cu Ft)
10	284	0.545	154.819
12	353	0.785	277.105
15	334	1.227	409.672
18	535	1.766	944.944
21	191	2.404	459.176
24	348	3.140	1092.720
30	0	4.906	0.000
36	251	7.065	1773.315
	Total Pipe Storage:		5111.751

0.117 Ac-Ft

PHASE 2 - SOUTH

Pipe Storage:

Pipe Size (Inches)	Length (Feet)	Area (Sq Ft)	Volume (Cu Ft)
10	302	0.545	164.632
12	301.5	0.785	236.678
15	325	1.227	398.633
18	341	1.766	602.291
21	0	2.404	0.000
24	182	3.140	571.480
30	405	4.906	1987.031
36	60	7.065	423.900
	Total Pipe Storage:		4384.645

0.101 Ac-Ft

Proj No. 322-127-17
Date: 10-12-2017

WEIR FLOW CALCULATIONS
ARLINGTON HEIGHTS INDUSTRIAL

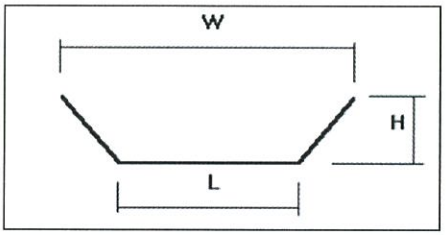
Designer:	**PDL**
Description:	**100 YEAR-PHASE 1**

BASED ON THE FOLLOWING EQUATION:

$$Q=\left[K\times 2/3\times L\times(2g)^{0.5}\times H^{1.5}\right]+\frac{1}{2}\left[K\times 8/15\times(2g)^{0.5}\times S_1\times H^{2.5}\right]+\frac{1}{2}\left[K\times 8/15\times(2g)^{0.5}\times S_2\times H^{2.5}\right]$$

WHERE:

Q = DISCHARGE IN CFS
K = WEIR COEFFICIENT
L = LENGTH IN FEET
g = 32.2 FT/SEC
H = HEAD IN FEET
S1 = LEFT SIDE SLOPE
S2 = RIGHT SIDE SLOPE



WEIR DATA: OVERFLOW CHANNEL AA-AA

1.	LENGTH, L	26.0	FEET
2.	WEIR COEFFICIENT, K (K<1.0)	0.57	
3.	LEFT SIDE SLOPE, S (H:V)	1	: 1
4	RIGHT SIDE SLOPE, S (H:V)	1	: 1

5 RATING TABLE

HEAD (FEET)	DISCHARGE (CFS)
0.20	7.14
0.25	9.99
0.30	13.15
0.35	16.59
0.40	20.31
0.45	24.27
0.50	28.46
0.55	32.89
0.60	37.53
0.65	42.38

Proj No. 322-127-17
Date: 10-12-2017

WEIR FLOW CALCULATIONS
ARLINGTON HEIGHTS INDUSTRIAL

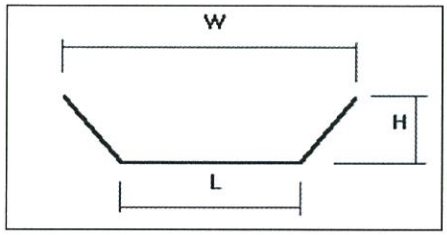
Designer:	**PDL**
Description:	**100 YEAR-PHASE 2**

BASED ON THE FOLLOWING EQUATION:

$$Q = \left[K \times 2/3 \times L \times (2g)^{0.5} \times H^{1.5}\right] + \frac{1}{2}\left[K \times 8/15 \times (2g)^{0.5} \times S_1 \times H^{2.5}\right] + \frac{1}{2}\left[K \times 8/15 \times (2g)^{0.5} \times S_2 \times H^{2.5}\right]$$

WHERE:

Q = DISCHARGE IN CFS
K = WEIR COEFFICIENT
L = LENGTH IN FEET
g = 32.2 FT/SEC
H = HEAD IN FEET
S1 = LEFT SIDE SLOPE
S2 = RIGHT SIDE SLOPE



WEIR DATA: OVERFLOW CHANNEL AA-AA

1.	LENGTH, L	20.0	FEET
2.	WEIR COEFFICIENT, K (K<1.0)	0.50	
3.	LEFT SIDE SLOPE, S (H:V)	1	: 4
4	RIGHT SIDE SLOPE, S (H:V)	1	: 4

5 RATING TABLE

HEAD (FEET)	DISCHARGE (CFS)
0.30	8.90
0.35	11.23
0.40	13.75
0.45	16.44
0.50	19.29
0.55	22.30
0.60	25.46
0.65	28.77
0.70	32.21
0.75	35.79
0.80	39.51
0.85	43.35
0.90	47.32
0.95	51.42
1.00	55.64

STORM SEWER WORKSHEET

Designer:	**PDL**	**Date: 09-22-17** **Update:10-12-17**
Description:	**PROPOSED ALGONQUIN ROAD** **INDUSTRIAL PARCEL-PH 1 (NORTH)** **ARLINGTON HEIGHTS, IL**	

FREQUENCY: 10 YR.* ROUGH. COEFF. 0.013 RUNOFF COEFF: Varies (See Below)

* TYPICAL 10 YR FREQUENCY, EXCEPT RUN FROM EX STR 28 TO UNDERGROUND BASIN WHICH IS A 100 YEAR FREQUENCY-SEE BELOW

MH-MH	ADDED "C"	ADDED AREA AC	TOTAL "C"	TOTAL AREA AC	C X A	TIME FLOW MIN	TIME T/C MIN	I IN/HR	Q CFS	PIPE DIA IN	PIPE SLOPE %	VEL FPS	L FT	CAP CFS	COMMENTS
East Run															
60-61	0.87	0.208	0.87	0.208	0.18	0.1	10.0	5.88	1.06	10.00	0.80	3.59	25	1.96	N13-Build-Out (Ph 2)
58-60	0.95	0.717	0.93	0.925	0.86	0.5	10.1	5.88	5.07	15.00	0.70	4.40	131	5.40	Add B8
56-58	0.85	0.201	0.92	1.126	1.03	0.5	10.6	5.88	6.07	18.00	0.40	3.76	122	6.64	N12/Str 59
54-56	0.84	0.153	0.91	1.279	1.16										N11/Str57
	0.95	0.719	0.92	1.998	1.84	0.4	11.2	5.68	10.48	21.00	0.50	4.66	123	11.20	Add B7
Ex28-54	0.83	0.098	0.92	2.096	1.93	0.2	11.6	5.68	10.94	21.00	0.50	4.66	68	11.20	N10/Str 55
Tributary Lateral Runs From South Curb Line															
58-59	0.85	0.201	0.85	0.201	0.171	0.1	10.0	5.88	1.00	10.00	0.80	3.59	13	1.96	N12
56-57	0.84	0.153	0.84	0.153	0.129	0.1	10.0	5.88	0.76	10.00	0.80	3.59	13	1.96	N11
54-55	0.83	0.098	0.83	0.098	0.081	0.1	10.0	5.88	0.48	10.00	0.80	3.59	13	1.96	N10
62-63	0.78	0.093	0.78	0.093	0.073	0.1	10.0	5.88	0.43	10.00	1.25	4.49	16	2.45	N9
North Parking Area-Restrictor MH to Basin N-2 -10 Year Frequency															
Ex 28-62	0.92	2.096	0.92	2.096	1.93	0.1	11.6	5.68	10.94	36.00	0.03	1.63	10	11.55	From Str 54
62-64	0.77	0.093	0.91	2.189	2.00										N9
	0.95	0.261	0.92	2.450	2.25	0.6	11.7	5.68	12.75	36.00	0.04	1.89	70	13.34	Add B11
64-65	0.82	0.283	0.91	2.733	2.48	0.8	12.3	5.47	13.55	36.00	0.05	2.11	106	14.91	N8
65-68	0.84	0.186	0.90	2.919	2.63	0.5	13.2	5.26	13.85	24.00	0.38	4.44	128	13.95	N6
68-71	0.82	0.054	0.90	2.973	2.68										N4
	0.76	0.096	0.90	3.069	2.75	0.3	13.6	5.26	14.47	24.00	0.41	4.61	82	14.49	Add N1
71-70	0.93	0.088	0.90	3.157	2.83	0.2	13.9	5.26	14.90	24.00	0.44	4.78	51	15.01	N2
70-74	0.89	0.086	0.90	3.243	2.91	0.2	14.1	5.05	14.69	24.00	0.44	4.78	54	15.01	N3
74-73	0.95	0.073	0.90	3.316	2.98	0.1	14.3	5.05	15.04	24.00	0.45	4.83	33	15.18	Add B9
North Parking Area-Restrictor MH to Basin N-3 -100 Year Frequency															
Ex 28-62	0.92	2.096	0.92	2.096	1.93	0.1	11.6	9.66	18.60	36.00	0.08	2.67	10	18.86	From Str 54
62-64	0.77	0.093	0.91	2.189	2.00										N9
	0.95	0.261	0.92	2.450	2.25	0.4	11.7	9.66	21.69	36.00	0.11	3.13	70	22.12	Add B11
64-65	0.82	0.283	0.91	2.733	2.48	0.5	12.0	9.29	23.02	36.00	0.12	3.27	106	23.10	N8
65-66	0.84	0.186	0.90	2.919	2.63	0.3	12.6	9.29	24.47	36.00	0.13	3.40	65	24.05	N6
66-Basins	0.88	0.215	0.90	3.134	2.82		12.9	9.29	26.23	18.00	6.25	14.86	5	26.26	N7

Req'd H	Total H	Elev	
0.003	1.517	713.72	OK, Rim @ 715.55
	1.514	713.71	
0.028	1.514	713.71	OK, Rim @ 715.20
0.053	1.486	713.69	
0.486	1.433	713.63	(Flow to Basin N-3 Begins at 713.41-
	0.947	713.15	Would Reduce Flow To Basin N-2
0.336	0.947	713.15	Not Considered)
0.224	0.611	712.81	
0.238	0.386	712.59	
0.149	0.149	712.35	712.20 (Pipe Crown @ FES)

Req'd H	Total H	Elev	
0.008	0.609	715.48	OK, Rim @ 715.55
	0.601	715.47	
0.077	0.601	715.47	Rim @ 715.20 (Overflow @ 715.4)
0.127	0.524	715.39	
0.085	0.397	715.27	
0.313	0.313	715.18	714.87 Crown Basin N-3

RWG ENGINEERING, LLC.
WHEATON, IL

Proj #: 276-114-16

FREQUENCY: 10 YR.* ROUGH. COEFF. 0.013 RUNOFF COEFF: Varies (See Below)

* TYPICAL 10 YR FREQUENCY, EXCEPT RUN FROM EX STR 28 TO UNDERGROUND BASIN WHICH IS A 100 YEAR FREQUENCY-SEE BELOW

MH-MH	ADDED "C"	ADDED AREA AC	TOTAL "C"	TOTAL AREA AC	C X A	TIME FLOW MIN	TIME T/C MIN	I IN/HR	Q CFS	PIPE DIA IN	PIPE SLOPE %	VEL FPS	L FT	CAP CFS	COMMENTS
North Parking-Tributary lateral Runs From Curb Line															
68-69	0.76	0.096	0.76	0.096	0.07	0.1	10.0	5.88	0.43	10.00	2.60	6.48	53	3.53	N1
Str 67	0.93	0.119	0.93	0.119	0.11		10.0	5.88	0.65						N5-Direct to Basin
West Dock - Parallel Run (Design Gradients)															
85-85A	0.50	0.230	0.50	0.230	0.12	0.1	10.0	5.88	0.68	8.00	0.50	2.45	22	0.85	N22-Temp-Ph 1 only
84-85	0.95	0.131	0.66	0.361	0.24	0.7	10.0	5.88	1.41	12.00	0.20	2.03	82	1.59	Add B6-Temp
84-85	0.95	0.262	0.95	0.262	0.25	0.7	10.0	5.88	1.46	12.00	0.20	2.03	82	1.59	B6 Build Out-Use
83-84	0.89	0.363	0.92	0.625	0.57	0.4	10.7	5.88	3.36	15.00	0.15	2.04	52	2.50	N21
82-83	0.95	0.120	0.92	0.745	0.69	0.3	11.1	5.68	3.90	15.00	0.15	2.04	40	2.50	N20
86-82	0.95	0.130	0.93	0.875	0.81										N19
	0.95	0.524	0.93	1.399	1.31	0.5	11.4	5.68	7.43	15.00	0.17	2.17	59	2.66	Add B7
76-86									7.43	18.00	0.15	2.30	232	4.07	
80-81	0.95	0.121	0.95	0.121	0.11	0.3	10.0	5.88	0.68	12.00	0.22	2.13	40	1.67	N18
79-80	0.95	0.130	0.95	0.251	0.24	0.4	10.3	5.88	1.40	12.00	0.22	2.13	50	1.67	N17
78-79	0.95	0.122	0.95	0.373	0.35	0.3	10.7	5.88	2.08	15.00	0.15	2.04	40	2.50	N16
77-78	0.95	0.168	0.95	0.541	0.51										N15
	0.95	0.485	0.95	1.026	0.97	0.4	11.0	5.68	5.54	18.00	0.15	2.30	52	4.07	Add B8
76-77	0.92	0.210	0.94	1.236	1.17	0.4	11.4	5.68	6.63	18.00	0.15	2.30	59	4.07	N14
75-76	0.87	1.498	0.90	2.734	2.47	0.5	11.8	5.68	14.04	18.00	0.15	2.30	65	4.07	Add Run 76-86
West Dock - Parallel Run (Required Gradients)															
84-85	0.95	0.262	0.95	0.262	0.25	0.7	10.0	5.88	1.46	12.00	0.17	1.87	82	1.47	B6 Bild Out- Use
83-84	0.89	0.363	0.92	0.625	0.57	0.3	10.7	5.88	3.36	15.00	0.27	2.74	52	3.36	N21
82-83	0.95	0.120	0.92	0.745	0.69	0.2	11.0	5.68	3.90	15.00	0.37	3.20	40	3.93	N20
86-82	0.95	0.130	0.93	0.875	0.81										N19
	0.95	0.524	0.93	1.399	1.31	0.2	11.3	5.68	7.43	15.00	1.33	6.07	59	7.45	Add B2
76-86									7.43	18.00	0.50	4.20	232	7.43	
80-81	0.95	0.121	0.95	0.121	0.11	0.7	10.0	5.88	0.68	12.00	0.04	0.91	40	0.71	N18
79-80	0.95	0.130	0.95	0.251	0.24	0.5	10.7	5.88	1.40	12.00	0.16	1.81	50	1.43	N17
78-79	0.95	0.122	0.95	0.373	0.35	0.4	11.2	5.68	2.01	15.00	0.10	1.66	40	2.04	N16
77-78	0.95	0.168	0.95	0.541	0.51										N15
	0.95	0.485	0.95	1.026	0.97	0.3	11.6	5.68	5.54	18.00	0.28	3.15	52	5.56	Add B3

Above worst case. Allowabe/design release rate from site, as well as flow to Basin N-2 via 24" RCP not deducted from above flow review to Basin N-3

Req'd H	Total H	Elev	
0.140	2.202	713.90	OK, Rim @ 714.05
0.148	2.062	713.76	
0.000	1.914	713.61	
0.785	1.914	713.61	
	1.129	712.83	(Str 76 below)
0.016	1.646	713.35	
0.080	1.630	713.33	
0.040	1.550	713.25	
0.000	1.510	713.21	
0.146	1.510	713.21	

RWG ENGINEERING, LLC.
WHEATON, IL

Proj #: 276-114-16

FREQUENCY: 10 YR.* ROUGH. COEFF. 0.013 RUNOFF COEFF: Varies (See Below)

* TYPICAL 10 YR FREQUENCY, EXCEPT RUN FROM EX STR 28 TO UNDERGROUND BASIN WHICH IS A 100 YEAR FREQUENCY-SEE BELOW

MH-MH	ADDED "C"	ADDED AREA AC	TOTAL "C"	TOTAL AREA AC	C X A	TIME FLOW MIN	TIME T/C MIN	I IN/HR	Q CFS	PIPE DIA IN	PIPE SLOPE %	VEL FPS	L FT	CAP CFS	COMMENTS
76-77	0.92	0.210	0.94	1.236	1.17	0.3	11.9	5.68	6.63	18.00	0.40	3.76	59	6.64	N14
75-76	0.87	1.498	0.90	2.734	2.47	0.1	12.1	5.47	13.52	18.00	1.66	7.66	68	13.53	Add Run 76-86
Review Full Flow Velocity (Design Gradients) For Min 2.0 fps Velocity:										12.00	0.20	2.03		1.59	
										15.00	0.15	2.04		2.50	
										18.00	0.15	2.30		4.07	
										24.00	0.10	2.28		7.15	
										36.00	0.10	2.98		21.09	
Roof Drains															
B6	0.95	0.131	0.95	0.131	0.124	0.0	10.0	5.88	0.73	10.00	2.00	5.68	10	3.10	
B7	0.95	0.524	0.95	0.524	0.498	0.1	10.0	5.88	2.93	10.00	1.80	5.39	22	2.94	
B8	0.95	0.485	0.95	0.485	0.461	0.0	10.0	5.88	2.71	10.00	1.70	5.24	12	2.86	
B9	0.95	0.073	0.95	0.073	0.069	0.0	10.0	5.88	0.41	10.00	4.00	8.03	23	4.38	
B10	0.95	0.270	0.95	0.270	0.257	0.1	10.0	5.88	1.51	10.00	1.50	4.92	37	2.68	
B11	0.95	0.261	0.95	0.261	0.248	0.2	10.0	5.88	1.46	10.00	1.00	4.02	47	2.19	
B12	0.95	0.719	0.95	0.719	0.683	0.1	10.0	5.88	4.02	12.00	3.57	8.57	60	6.73	
B13	0.95	0.717	0.95	0.717	0.681	0.1	10.0	5.88	4.01	12.00	2.50	7.17	39	5.63	

0.236	1.365	713.06		
1.129	1.129	712.83	711.70 (Pipe Crown @FES)	

STORM SEWER WORKSHEET

Designer:
Description: **Phase 2 East Section**

FREQUENCY: 10 YR. ROUGH. COEFF. 0.013 RUNOFF COEFF: 0.50

MH-MH	ADDED "C"	ADDED AREA AC	TOTAL "C"	TOTAL AREA AC	C X A	TIME FLOW MIN	TIME T/C MIN	I IN/HR	Q CFS	PIPE DIA IN	PIPE SLOPE %	VEL FPS	L FT	CAP CFS	UPPER MH RIM	UPPER MH CROWN	UPPER MH INV	LOWER MH RIM	LOWER MH CROWN	LOWER MH INV	COMMENTS	
B14-106	0.95	0.718																				
106-107	0.84	0.140	0.93	0.858	0.800	0.5	10.0	5.88	4.70	18	0.20	2.66	83	4.70	716.50	714.79	713.29	716.88	714.62	713.12		
108-107	0.86	0.114	0.86	0.114	0.098	0.2	10.5	5.88	0.58	10	0.25	2.01	21	1.10	716.50	714.01	713.18	716.88	713.96	713.12		
107- S-4	0.00	0.000	0.92	0.972	0.898	0.1	10.7	5.88	5.28	18	0.26	3.03	16	5.36	716.88	714.62	713.12		714.58	713.08		
110-S-4	0.86	0.180	0.86	0.180	0.155	0.2	10.0	5.88	0.91	10	0.25	2.01	21	1.10	715.85	713.61	712.78		713.56	712.73		
112-S-4	0.85	0.206	0.85	0.206	0.175	0.2	10.0	5.88	1.03	10	0.25	2.01	21	1.10	715.60	712.92	712.09		712.87	712.04		
114-S-4	0.84	0.150	0.84	0.150	0.126	0.2	10.0	5.88	0.74	10	0.25	2.01	21	1.10	715.50	712.20	711.37		712.15	711.32		
116-S-4	0.86	0.118	0.86	0.118	0.101	0.2	10.0	5.88	0.60	10	0.25	2.01	21	1.10	715.40	711.14	710.31		711.09	710.26		

tc	i
10	5.88
11	5.68
12	5.47
13	5.26
14	5.05
15	4.84
16	4.74
17	4.63
20	4.33

STORM SEWER WORKSHEET

Designer:
Description: **Phase 2 West Section**

FREQUENCY: 10 YR. ROUGH. COEFF. 0.013 RUNOFF COEFF: 0.50

MH-MH	ADDED "C"	ADDED AREA AC	TOTAL "C"	TOTAL AREA AC	C X A	TIME FLOW MIN	TIME T/C MIN	I IN/HR	Q CFS	PIPE DIA IN	PIPE SLOPE %	VEL FPS	L FT	CAP CFS	UPPER MH RIM	UPPER MH CROWN	UPPER MH INV	LOWER MH RIM	LOWER MH CROWN	LOWER MH INV	COMMENTS
87-88	0.87	0.230	0.87	0.230	0.200	0.2	10	5.88	1.18	10.00	0.30	2.20	26	1.20	714.05	711.98	711.15	714.05	711.90	711.07	
88-89	0.95	0.116	0.90	0.346	0.310	0.4	10.2	5.88	1.82	15.00	0.15	2.04	52	2.50	714.05	712.32	711.07	714.05	712.24	710.99	
89-90	0.95	0.117	0.91	0.463	0.421	0.3	10.6	5.88	2.48	15.00	0.15	2.04	39	2.50	714.05	712.24	710.99	714.05	712.18	710.93	
B5-90	0.95	0.524																			
90-91	0.95	0.134	0.93	1.121	1.047	0.3	10.9	5.88	6.15	18.00	0.35	3.52	72	6.21	714.05	712.34	710.84	715.69	712.09	710.59	
91-96	0.00	0.000	0.93	1.121	1.047			5.88	6.15	24.00	0.08	2.04	182	6.40	715.69	712.59	710.59	715.60	712.44	710.44	
92-93	0.95	0.117	0.95	0.117	0.111	0.3	10	5.88	0.65	10.00	0.25	2.01	39	1.10	714.05	711.98	711.15	714.05	711.88	711.05	
93-94	0.95	0.134	0.95	0.251	0.238	0.4	10.3	5.88	1.40	15.00	0.15	2.04	52	2.50	714.05	712.30	711.05	714.05	712.22	710.97	
94-95	0.95	0.117	0.95	0.368	0.350	0.3	10.7	5.88	2.06	15.00	0.15	2.04	39	2.50	714.05	712.22	710.97	714.05	712.16	710.91	
B4-95	0.95	0.524																			
95-96	0.95	0.134	0.95	1.026	0.975	0.4	11.1	5.68	5.54	18.00	0.28	3.15	72	5.56	714.05	712.34	710.84	715.60	712.14	710.64	
96-103	0.00	0.000	0.94	2.147	2.021	1.6	11.4	5.68	11.48	30.00	0.10	2.64	260	12.97	715.60	712.94	710.44	715.46	712.68	710.18	
97-98	0.95	0.115	0.95	0.115	0.109	0.3	10	5.88	0.64	10.00	0.25	2.01	39	1.10	714.05	711.98	711.15	714.05	711.88	711.05	
98-99	0.95	0.134	0.95	0.249	0.237	0.3	10.3	5.88	1.39	10.00	0.40	2.54	52	1.39	714.05	711.88	711.05	714.05	711.68	710.84	
99-100	0.95	0.117	0.95	0.366	0.348	0.3	10.7	5.88	2.04	15.00	0.15	2.04	39	2.50	714.05	712.09	710.84	714.05	712.03	710.78	
100-101	0.95	0.134	0.95	0.500	0.475	0.4	11.0	5.68	2.70	15.00	0.18	2.23	52	2.74	714.05	712.03	710.78	714.05	711.94	710.69	
B3-101	0.95	0.486																			
101-102	0.95	0.099	0.95	1.085	1.031	0.1	11.4	5.68	5.85	18.00	0.31	3.31	26	5.85	714.05	712.19	710.69	714.05	712.11	710.61	
102-103	0.89	0.269	0.94	1.354	1.270	0.3	11.5	5.68	7.21	18.00	0.48	4.12	72	7.28	714.05	712.11	710.61	715.46	711.76	710.26	
103-104	0.00	0.000	0.94	3.501	3.291	0.6	11.8	5.68	18.70	30.00	0.21	3.83	145	18.80	715.46	712.68	710.18	716.78	712.38	709.88	
105-104	0.95	0.082	0.95	0.082	0.078	0.3	10	5.88	0.46	10.00	0.25	2.01	39	1.10	715.88	713.71	712.88	716.78	713.62	712.78	
B1-104	0.95	0.073																			
104-V	0.00	0.000	0.94	3.656	3.439	0.3	12.4	5.47	18.81	36.00	0.13	3.40	60	24.05	716.78	712.88	709.88	N/A	712.80	**709.80**	

tc	i
10	5.88
11	5.68
12	5.47
13	5.26
14	5.05
15	4.84
16	4.74
17	4.63
20	4.33

BOUNDARY AND TOPOGRAPHIC SURVEY

BY

GENTILE AND ASSOCIATES, INC.

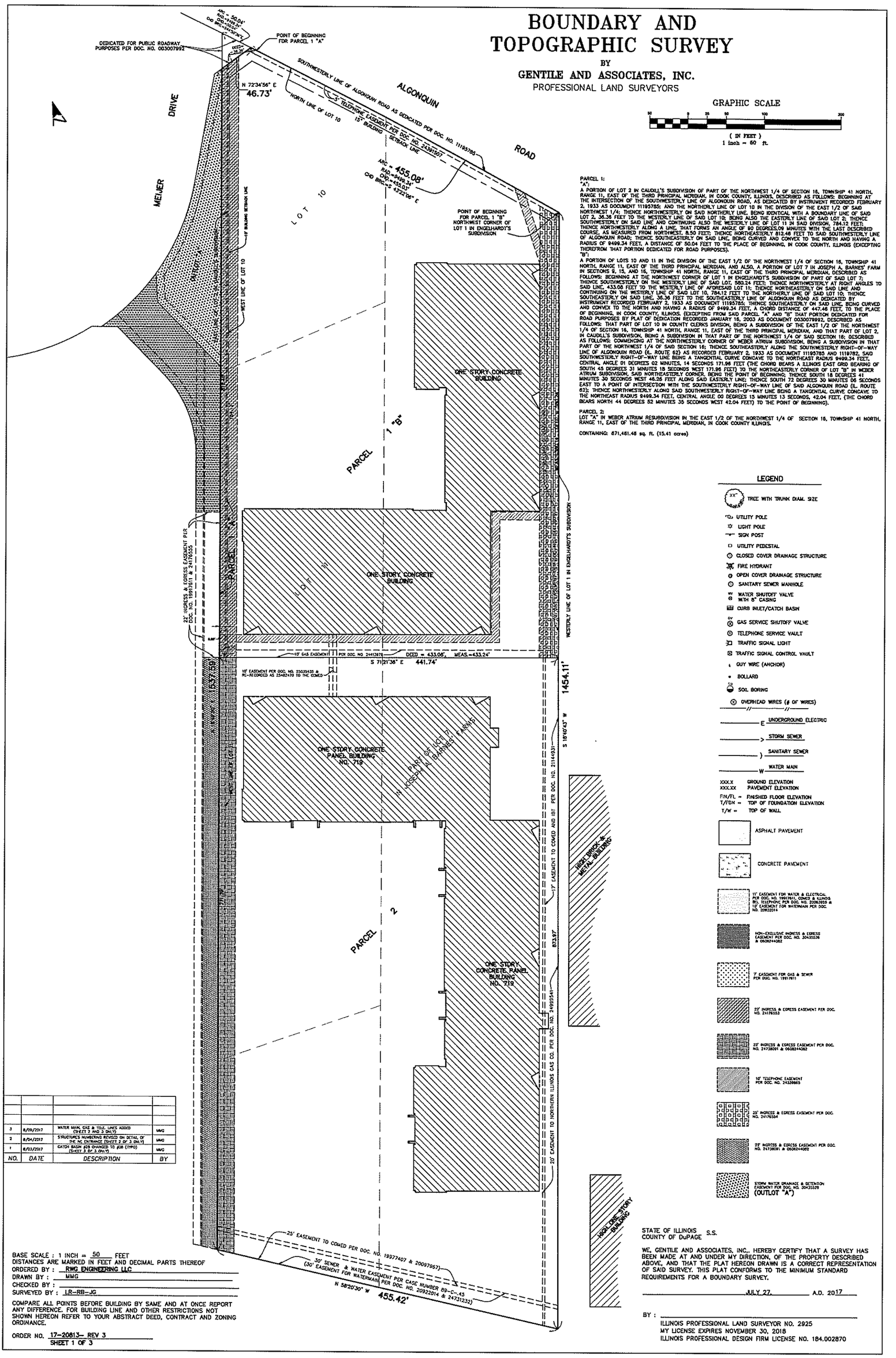
PROFESSIONAL LAND SURVEYORS

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 60 ft.



PARCEL 1:

"A":

A PORTION OF LOT 2 IN CAUDILL'S SUBDIVISION OF PART OF THE NORTHWEST 1/4 OF SECTION 16, TOWNSHIP 41 NORTH, RANGE 11, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN COOK COUNTY, ILLINOIS, DESCRIBED AS FOLLOWS: BEGINNING AT THE INTERSECTION OF THE SOUTHWESTERLY LINE OF ALGONQUIN ROAD, AS DEDICATED BY INSTRUMENT RECORDED FEBRUARY 2, 1933 AS DOCUMENT 11195785; AND THE NORTHERLY LINE OF LOT 10 IN THE DIVISION OF THE EAST 1/2 OF SAID NORTHWEST 1/4; THENCE NORTHWESTERLY ON SAID NORTHERLY LINE, BEING IDENTICAL WITH A BOUNDARY LINE OF SAID LOT 2, 36.36 FEET TO THE WESTERLY LINE OF SAID LOT 10; BEING ALSO THE EASTERLY LINE OF SAID LOT 2; THENCE SOUTHWESTERLY ON SAID LINE AND CONTINUING ALSO THE WESTERLY LINE OF LOT 11 IN SAID DIVISION, 784.12 FEET; THENCE NORTHWESTERLY ALONG A LINE, THAT FORMS AN ANGLE OF 90 DEGREES 09 MINUTES WITH THE LAST DESCRIBED COURSE, AS MEASURED FROM NORTHWEST, 8.50 FEET; THENCE NORTHEASTERLY 812.48 FEET TO SAID SOUTHWESTERLY LINE OF ALGONQUIN ROAD; THENCE SOUTHEASTERLY ON SAID LINE, BEING CURVED AND CONVEX TO THE NORTH AND HAVING A RADIUS OF 9499.54 FEET, A DISTANCE OF 50.04 FEET TO THE PLACE OF BEGINNING, IN COOK COUNTY, ILLINOIS (EXCEPTING THEREFROM THAT PORTION DEDICATED FOR ROAD PURPOSES).

"B":

A PORTION OF LOTS 10 AND 11 IN THE DIVISION OF THE EAST 1/2 OF THE NORTHWEST 1/4 OF SECTION 16, TOWNSHIP 41 NORTH, RANGE 11, EAST OF THE THIRD PRINCIPAL MERIDIAN, AND ALSO, A PORTION OF LOT 7 IN JOSEPH A. BARNES' FARM IN SECTIONS 9, 15, AND 16, TOWNSHIP 41 NORTH, RANGE 11, EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: BEGINNING AT THE NORTHWEST CORNER OF LOT 1 IN ENGELHARDT'S SUBDIVISION OF PART OF SAID LOT 7; THENCE SOUTHWESTERLY ON THE WESTERLY LINE OF SAID LOT, 580.24 FEET; THENCE NORTHWESTERLY AT RIGHT ANGLES TO SAID LINE, 433.08 FEET TO THE WESTERLY LINE OF AFORESAID LOT 11; THENCE NORTHEASTERLY ON SAID LINE AND CONTINUING ON THIS WESTERLY LINE OF SAID LOT 10, 784.12 FEET TO THE NORTHERLY LINE OF SAID LOT 10; THENCE SOUTHEASTERLY ON SAID LINE, 36.36 FEET TO THE SOUTHEASTERLY LINE OF ALGONQUIN ROAD AS DEDICATED BY INSTRUMENT RECORDED FEBRUARY 2, 1933 AS DOCUMENT 11195785; THENCE SOUTHEASTERLY ON SAID LINE, BEING CURVED AND CONVEX TO THE NORTH AND HAVING A RADIUS OF 9499.54 FEET, A CHORD DISTANCE OF 447.46 FEET, TO THE PLACE OF BEGINNING, IN COOK COUNTY, ILLINOIS. (EXCEPTING FROM SAID PARCEL "A" AND "B" THAT PORTION DEDICATED FOR ROAD PURPOSES BY PLAT OF DEDICATION RECORDED JANUARY 16, 2003 AS DOCUMENT 0030079992, DESCRIBED AS FOLLOWS: THAT PART OF LOT 10 IN COUNTY CLERKS DIVISION, BEING A SUBDIVISION OF THE EAST 1/2 OF THE NORTHWEST 1/4 OF SECTION 16, TOWNSHIP 41 NORTH, RANGE 11, EAST OF THE THIRD PRINCIPAL MERIDIAN, AND THAT PART OF LOT 2, IN CAUDILL'S SUBDIVISION, BEING A SUBDIVISION IN THAT PART OF THE NORTHWEST 1/4 OF SAID SECTION 16; DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWESTERLY CORNER OF WEBER ATRIUM SUBDIVISION, BEING A SUBDIVISION IN THAT PART OF THE NORTHWEST 1/4 OF SAID SECTION 16; THENCE SOUTHEASTERLY ALONG THE SOUTHWESTERLY RIGHT-OF-WAY LINE OF ALGONQUIN ROAD (IL. ROUTE 62) AS RECORDED FEBRUARY 2, 1933 AS DOCUMENT 11195785 AND 11197782, SAID SOUTHWESTERLY RIGHT-OF-WAY LINE BEING A TANGENTIAL CURVE CONCAVE TO THE NORTHEAST RADIUS 9499.54 FEET, CENTRAL ANGLE 01 DEGREES 02 MINUTES, 14 SECONDS 171.98 FEET (THE CHORD BEARS A ILLINOIS EAST GRID BEARING OF SOUTH 45 DEGREES 31 MINUTES 18 SECONDS WEST 171.96 FEET) TO THE NORTHEASTERLY CORNER OF LOT "B" IN WEBER ATRIUM SUBDIVISION, SAID NORTHEASTERLY CORNER, BEING THE POINT OF BEGINNING; THENCE SOUTH 18 DEGREES 41 MINUTES 30 SECONDS WEST 48.26 FEET ALONG SAID EASTERLY LINE; THENCE SOUTH 72 DEGREES 30 MINUTES 06 SECONDS EAST TO A POINT OF INTERSECTION WITH THE SOUTHWESTERLY RIGHT-OF-WAY LINE OF SAID ALGONQUIN ROAD (IL. ROUTE 62); THENCE NORTHWESTERLY ALONG SAID SOUTHWESTERLY RIGHT-OF-WAY LINE BEING A TANGENTIAL CURVE CONCAVE TO THE NORTHEAST RADIUS 9499.54 FEET, CENTRAL ANGLE 00 DEGREES 15 MINUTES 13 SECONDS, 42.04 FEET, (THE CHORD BEARS NORTH 44 DEGREES 52 MINUTES 35 SECONDS WEST 42.04 FEET) TO THE POINT OF BEGINNING).

PARCEL 2:

LOT "A" IN WEBER ATRIUM RESUBDIVISION IN THE EAST 1/2 OF THE NORTHWEST 1/4 OF SECTION 16, TOWNSHIP 41 NORTH, RANGE 11, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN COOK COUNTY ILLINOIS.

CONTAINING: 671,461.46 sq. ft. (15.41 acres)

LEGEND

- XX" TREE WITH TRUNK DIAM. SIZE
- UTILITY POLE
- LIGHT POLE
- SIGN POST
- UTILITY PEDESTAL
- CLOSED COVER DRAINAGE STRUCTURE
- FIRE HYDRANT
- OPEN COVER DRAINAGE STRUCTURE
- SANITARY SEWER MANHOLE
- WATER SHUTOFF VALVE WITH 8" CASING
- CURB INLET/CATCH BASIN
- GAS SERVICE SHUTOFF VALVE
- TELEPHONE SERVICE VAULT
- TRAFFIC SIGNAL LIGHT
- TRAFFIC SIGNAL CONTROL VAULT
- GUY WIRE (ANCHOR)
- BOLLARD
- SOIL BORING
- OVERHEAD WIRES (# OF WIRES)
- E — UNDERGROUND ELECTRIC
- STORM SEWER
- SANITARY SEWER
- W — WATER MAIN
- XXX.X GROUND ELEVATION
- XXX.XX PAVEMENT ELEVATION
- FIN/FL = FINISHED FLOOR ELEVATION
- T/FDN = TOP OF FOUNDATION ELEVATION
- T/W = TOP OF WALL
- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- 11' EASEMENT FOR WATER & ELECTRICAL PER DOC. NO. 19921911, COMED & ILLINOIS BELL TELEPHONE PER DOC. NO. 20063959 & 10' EASEMENT FOR WATERMAIN PER DOC. NO. 20922014
- NON-EXCLUSIVE INGRESS & EGRESS EASEMENT PER DOC. NO. 24435326 & 0020614082
- 7' EASEMENT FOR GAS & SEWER PER DOC. NO. 19919911
- 25' INGRESS & EGRESS EASEMENT PER DOC. NO. 24176553
- 25' INGRESS & EGRESS EASEMENT PER DOC. NO. 24738091 & 0020614082
- 10' TELEPHONE EASEMENT PER DOC. NO. 24328863
- 25' INGRESS & EGRESS EASEMENT PER DOC. NO. 24176554
- 25' INGRESS & EGRESS EASEMENT PER DOC. NO. 24738091 & 0020614082
- STORM WATER DRAINAGE & DETENTION EASEMENT PER DOC. NO. 20433529 (OUTLOT "A")

NO.	DATE	DESCRIPTION	BY
3	8/09/2017	WATER MAIN, GAS & TELE. LINES ADDED (SHEET 2 AND 3 ONLY)	MMG
2	8/04/2017	STRUCTURE NUMBERS REVISED ON DETAIL OF THE NC ENTRANCE (SHEET 2 OF 3 ONLY)	MMG
1	8/03/2017	CATCH BASIN #28 CHANGED TO #38 (TYPO) (SHEET 3 OF 3 ONLY)	MMG

BASE SCALE : 1 INCH = 50 FEET

DISTANCES ARE MARKED IN FEET AND DECIMAL PARTS THEREOF

ORDERED BY : RWG ENGINEERING LLC

DRAWN BY : MMG

CHECKED BY :

SURVEYED BY : LR-RB-JG

COMPARE ALL POINTS BEFORE BUILDING BY SAME AND AT ONCE REPORT ANY DIFFERENCE. FOR BUILDING LINE AND OTHER RESTRICTIONS NOT SHOWN HEREON REFER TO YOUR ABSTRACT DEED, CONTRACT AND ZONING ORDINANCE.

ORDER NO. 17-20813- REV 3

SHEET 1 OF 3

STATE OF ILLINOIS S.S.
COUNTY OF DuPAGE

WE, GENTILE AND ASSOCIATES, INC., HEREBY CERTIFY THAT A SURVEY HAS BEEN MADE AT AND UNDER MY DIRECTION, OF THE PROPERTY DESCRIBED ABOVE, AND THAT THE PLAT HEREON DRAWN IS A CORRECT REPRESENTATION OF SAID SURVEY. THIS PLAT CONFORMS TO THE MINIMUM STANDARD REQUIREMENTS FOR A BOUNDARY SURVEY.

JULY 27, A.D. 2017

BY :

ILLINOIS PROFESSIONAL LAND SURVEYOR NO. 2925
MY LICENSE EXPIRES NOVEMBER 30, 2018
ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184.002870

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

DRAINAGE AREA SUMMARY

Parcel 1:

No.	Area (ac):
1	0.20
2	1.15
3	0.19
4	0.12
5	0.16
6	0.93
w/ building	1.06
7	0.10
8	1.04
w/ building	1.20
9	0.09
10	0.17
11	0.33
12	0.13
13	0.13
14	0.06
Subtotal:	7.06

DATE | REVISIONS | DRAWN BY

HAMILTON PARTNERS ARLINGTON HEIGHTS INDUSTRIAL
ARLINGTON HEIGHTS, ILLINOIS

EXHISTING DRAINAGE EXHIBIT - PARCEL 1 / PHASE 1

RWG Engineering, LLC
Civil Engineering • Real Estate Consulting • Project Management
975 E. 22nd St. Suite 400
Wheaton, IL 60189
630.460.7889
www.rwg-engineering.com

PROJECT NO. 32212717
DATE 10/18/17
SCALE 1"=30'
PROJ. MGR. PDL
PROJ. ASSOC. RWG
DRAWN BY TLM

SHEET
1 OF 2

October 18, 2017 9:31:53 a.m. AcadVer:22.0s (LMS Tech)
Drawing: S:\32212717 – HP ARLINGTON HEIGHTS INDUSTRIAL\300_ENGINEERING\310_CADD\RELIM\329_BASE_EXISTING_DRAINAGE_EXHIBIT.DWG

DRAINAGE AREA SUMMARY			
Parcel 2:			
No.	Area (ac):	Parcel 2: (cont.)	
15	0.42	22	1.11
16	0.18	23	0.16
17	0.34	24	0.11
18	0.07	w/ building	1.07
19	0.09	25	0.41
20	1.20	w/ building	0.45
w/ building	1.21	26	0.47
21	1.07	Subtotal:	8.36

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 inch = 30 ft

DRAWN BY

DATE | REVISIONS

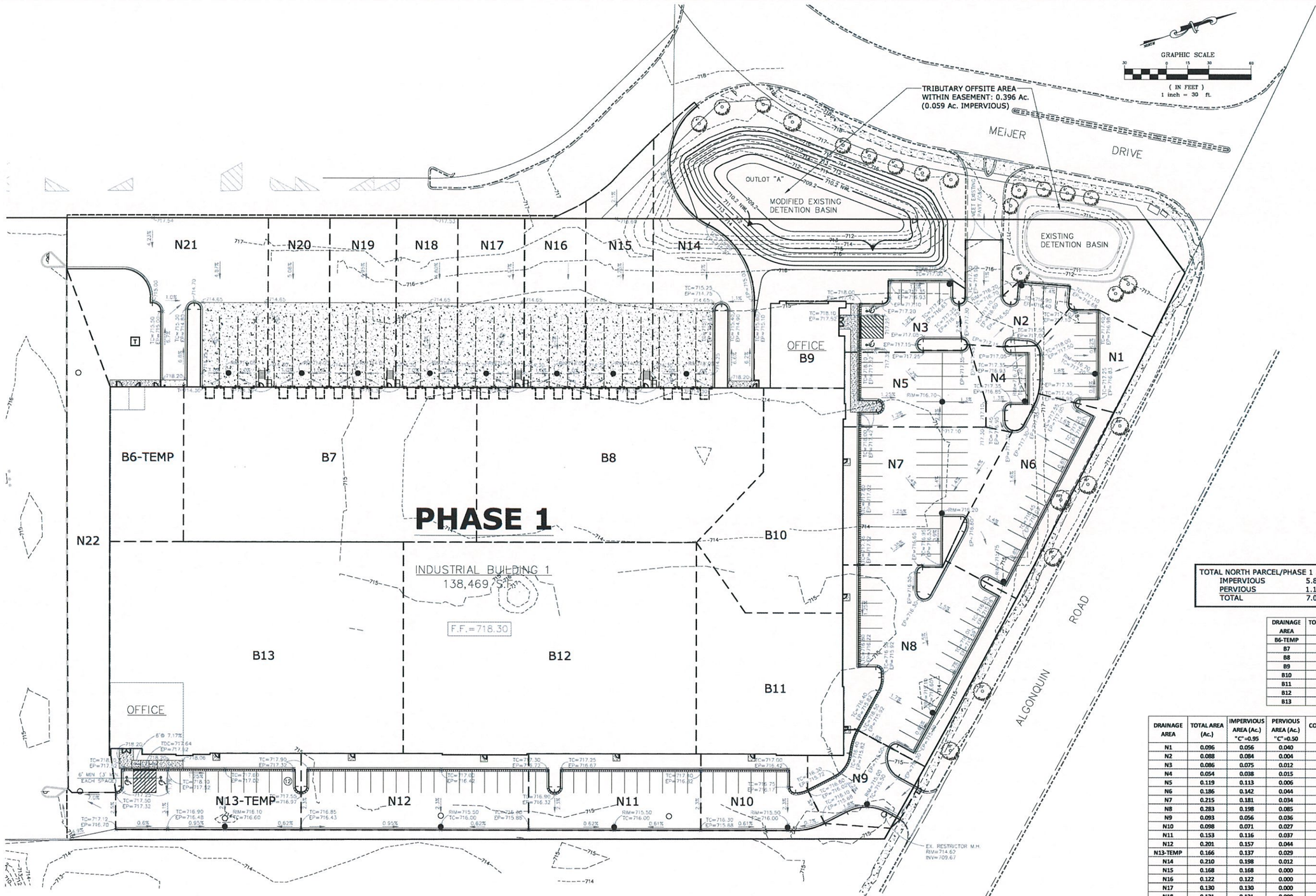
HAMILTON PARTNERS ARLINGTON HEIGHTS INDUSTRIAL
ARLINGTON HEIGHTS, ILLINOIS
EXISTING DRAINAGE EXHIBIT - PARCEL 2 / PHASE 2

RWG Engineering, LLC
Civil Engineering ♦ Real Estate Consulting ♦ Project Management
975 E. 22nd St. Suite 400
Wheaton, IL 60189
630.480.7889
www.rwg-engineering.com

PROJECT NO. 22212717
DATE 10/18/17
SCALE 1"=30'
PROJ. MGR. PDL
PROJ. ASSOC. RWG
DRAWN BY TLM

SHEET
2 OF 2

Drawing: S:\22212717 - HP ARLINGTON HEIGHTS INDUSTRIAL\300_ENGINEERING\310_CADD\PRELIM\327_BASE_EXISTING_DRAINAGE_EXHIBIT.DWG
October 18, 2017 8:32:14 a.m. AcadVer:22.0s (LMS Tech)



TOTAL NORTH PARCEL/PHASE 1 SITE:	
IMPERVIOUS	5.843 Ac.
PERVIOUS	1.197 Ac.
TOTAL	7.04 Ac.

DRAINAGE AREA	TOTAL AREA (Ac.)
B6-TEMP	0.131
B7	0.524
B8	0.485
B9	0.073
B10	0.270
B11	0.261
B12	0.719
B13	0.717

DRAINAGE AREA	TOTAL AREA (Ac.)	IMPERVIOUS AREA (Ac.) "C"=0.95	PERVIOUS AREA (Ac.) "C"=0.50	COMPOSITE "C"
N1	0.096	0.056	0.040	0.76
N2	0.088	0.084	0.004	0.93
N3	0.086	0.075	0.012	0.89
N4	0.054	0.038	0.015	0.82
N5	0.119	0.113	0.006	0.93
N6	0.186	0.142	0.044	0.84
N7	0.215	0.181	0.034	0.88
N8	0.283	0.198	0.085	0.82
N9	0.093	0.056	0.036	0.77
N10	0.098	0.071	0.027	0.83
N11	0.153	0.116	0.037	0.84
N12	0.201	0.157	0.044	0.85
N13-TEMP	0.166	0.137	0.029	0.87
N14	0.210	0.198	0.012	0.92
N15	0.168	0.168	0.000	0.95
N16	0.122	0.122	0.000	0.95
N17	0.130	0.130	0.000	0.95
N18	0.121	0.121	0.000	0.95
N19	0.130	0.130	0.000	0.95
N20	0.120	0.120	0.000	0.95
N21	0.363	0.264	0.099	0.83
N22	0.230	0.000	0.230	0.50

Drawing: S:\32212717 - HP ARLINGTON HEIGHTS INDUSTRIAL\300_ENGINEERING\310_CADD\EXHIBITS\320_BASE_DRAINAGE.DWG (Tech)

DRAWN BY
REVISIONS
DATE

ARLINGTON HEIGHTS INDUSTRIAL

ARLINGTON HEIGHTS, ILLINOIS

PHASE 1 (NORTH) DRAINAGE AREA EXHIBIT

RWG Engineering, LLC
Civil Engineering ♦ Real Estate Consulting ♦ Project Management
975 E. 22nd St. Suite 400
Wheaton, IL 60189
630.480.7889
www.rwg-engineering.com

PROJECT NO. 32212717
DATE 09/22/17
SCALE 1"=30'
PROJ. MGR. PDL
PROJ. ASSOC. RWG
DRAWN BY AVS

SHEET 1 OF 1

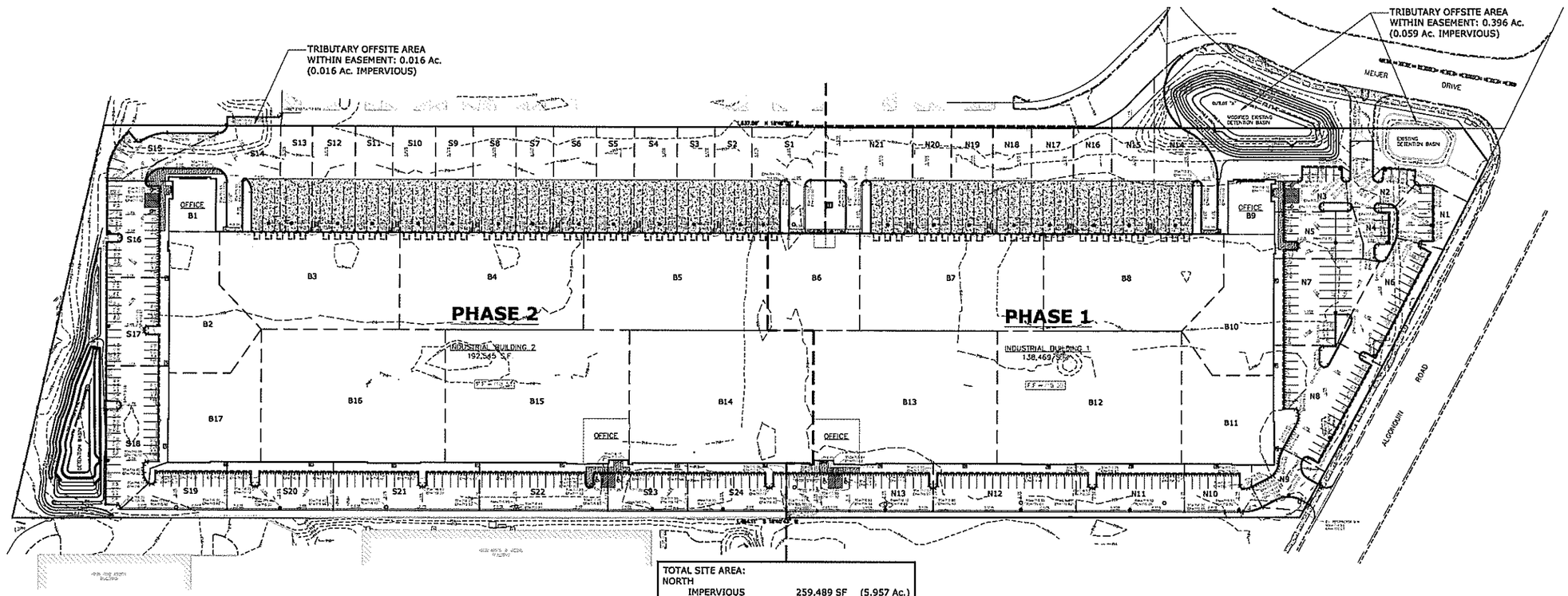
DRAINAGE AREA	TOTAL AREA (Ac.)	IMPERVIOUS AREA (Ac.) "C"=0.95	PERVIOUS AREA (Ac.) "C"=0.50	COMPOSITE "C"
N1	0.096	0.056	0.040	0.76
N2	0.088	0.084	0.004	0.93
N3	0.086	0.075	0.012	0.89
N4	0.054	0.038	0.015	0.82
N5	0.119	0.113	0.006	0.93
N6	0.186	0.142	0.044	0.84
N7	0.215	0.181	0.034	0.88
N8	0.283	0.198	0.085	0.82
N9	0.093	0.056	0.036	0.77
N10	0.098	0.071	0.027	0.83
N11	0.153	0.116	0.037	0.84
N12	0.201	0.157	0.044	0.85
N13	0.208	0.168	0.039	0.87
N14	0.210	0.198	0.012	0.92
N15	0.168	0.168	0.000	0.95
N16	0.122	0.122	0.000	0.95
N17	0.130	0.130	0.000	0.95
N18	0.121	0.121	0.000	0.95
N19	0.130	0.130	0.000	0.95
N20	0.120	0.120	0.000	0.95
N21	0.271	0.232	0.039	0.88

DRAINAGE AREA	TOTAL AREA (Ac.)	IMPERVIOUS AREA (Ac.) "C"=0.95	PERVIOUS AREA (Ac.) "C"=0.50	COMPOSITE "C"
S1	0.230	0.190	0.040	0.87
S2	0.116	0.116	0.000	0.95
S3	0.117	0.117	0.000	0.95
S4	0.134	0.134	0.000	0.95
S5	0.117	0.117	0.000	0.95
S6	0.134	0.134	0.000	0.95
S7	0.117	0.117	0.000	0.95
S8	0.134	0.134	0.000	0.95
S9	0.117	0.117	0.000	0.95
S10	0.134	0.134	0.000	0.95
S11	0.117	0.117	0.000	0.95
S12	0.134	0.134	0.000	0.95
S13	0.099	0.099	0.000	0.95
S14	0.269	0.236	0.033	0.89
S15	0.082	0.082	0.000	0.95
S16	0.178	0.153	0.025	0.89
S17	0.163	0.132	0.031	0.86
S18	0.226	0.188	0.038	0.87
S19	0.118	0.093	0.024	0.86
S20	0.150	0.114	0.037	0.84
S21	0.206	0.159	0.046	0.85
S22	0.180	0.145	0.036	0.86
S23	0.114	0.092	0.023	0.86
S24	0.140	0.105	0.035	0.84

DRAINAGE AREA	TOTAL AREA (Ac.)
B1	0.073
B2	0.269
B3	0.486
B4	0.524
B5	0.524
B6	0.262
B7	0.524
B8	0.485
B9	0.073
B10	0.270
B11	0.261
B12	0.719
B13	0.717
B14	0.718
B15	0.717
B16	0.719
B17	0.261

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.



TOTAL SITE AREA:		
NORTH		
IMPERVIOUS	259,489 SF	(5.957 Ac.)
PERVIOUS	39,983 SF	(0.918 Ac.)
TOTAL	299,472 SF	(6.875 Ac.)
SOUTH		
IMPERVIOUS	326,595 SF	(7.498 Ac.)
PERVIOUS	45,394 SF	(1.042 Ac.)
TOTAL	371,989 SF	(8.540 Ac.)

DRAWN BY

DATE REVISIONS

ARLINGTON HEIGHTS INDUSTRIAL
ARLINGTON HEIGHTS, ILLINOIS
MASTER DRAINAGE AREA EXHIBIT

RWG Engineering, LLC
Civil Engineering • Real Estate Consulting • Project Management
975 E. 22nd St, Suite 400
Wheaton, IL 60189
630.481.7899
www.rwg-engineering.com

PROJECT NO. 32212717
DATE 09/22/17
SCALE 1"=60'
PROJ. MGR. RDL
PROJ. ASSOC. RMG
DRAWN BY AVS

SHEET
1 OF 1

October 18, 2017 10:11:24 a.m. AcadVer:22.0s (LMS Tech)
Drawing: S:\32212717 - HP ARLINGTON HEIGHTS INDUSTRIAL\300_ENGINEERING\310_CAD\EXHIBITS\32_BASE_DRAINAGE.DWG