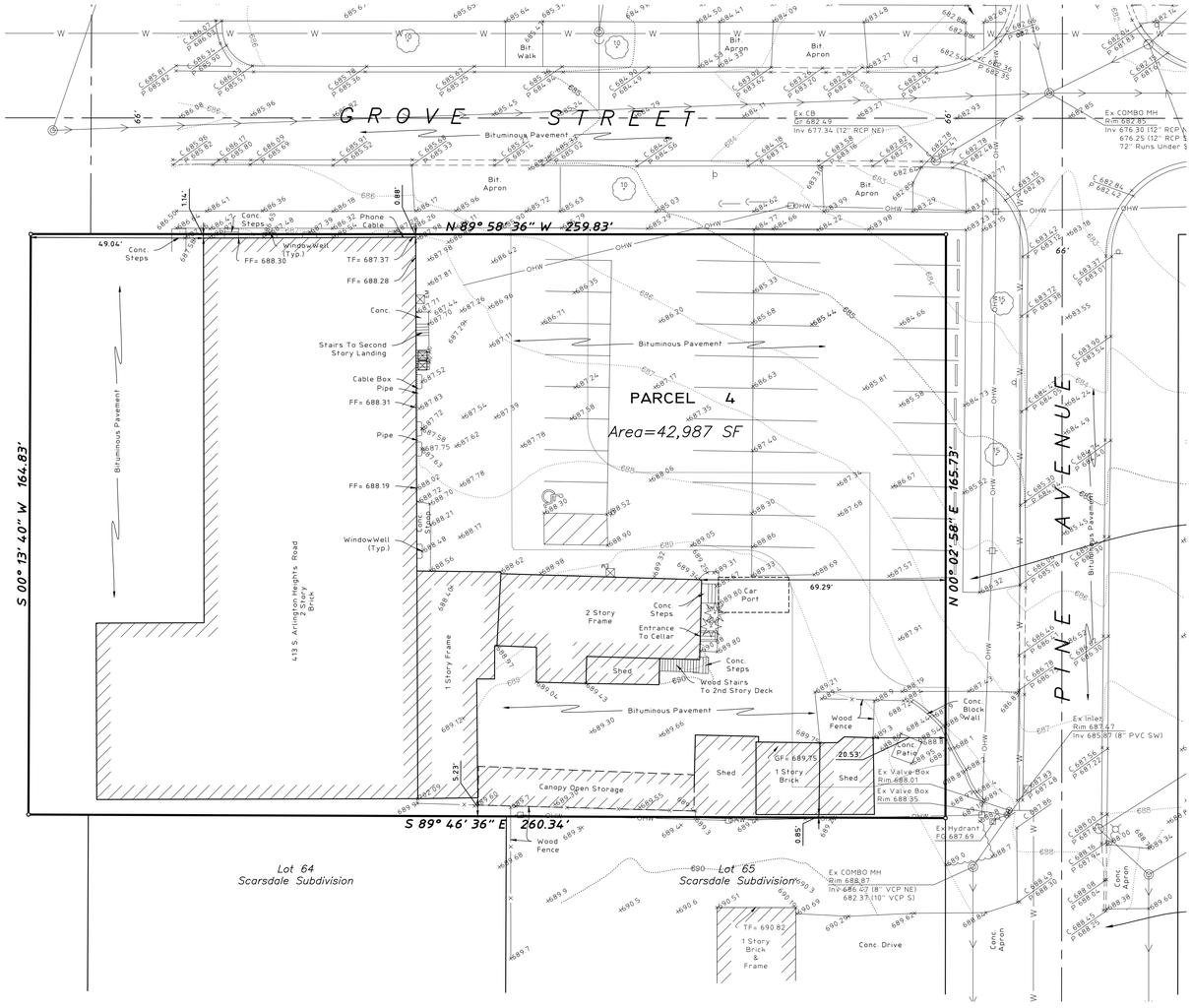
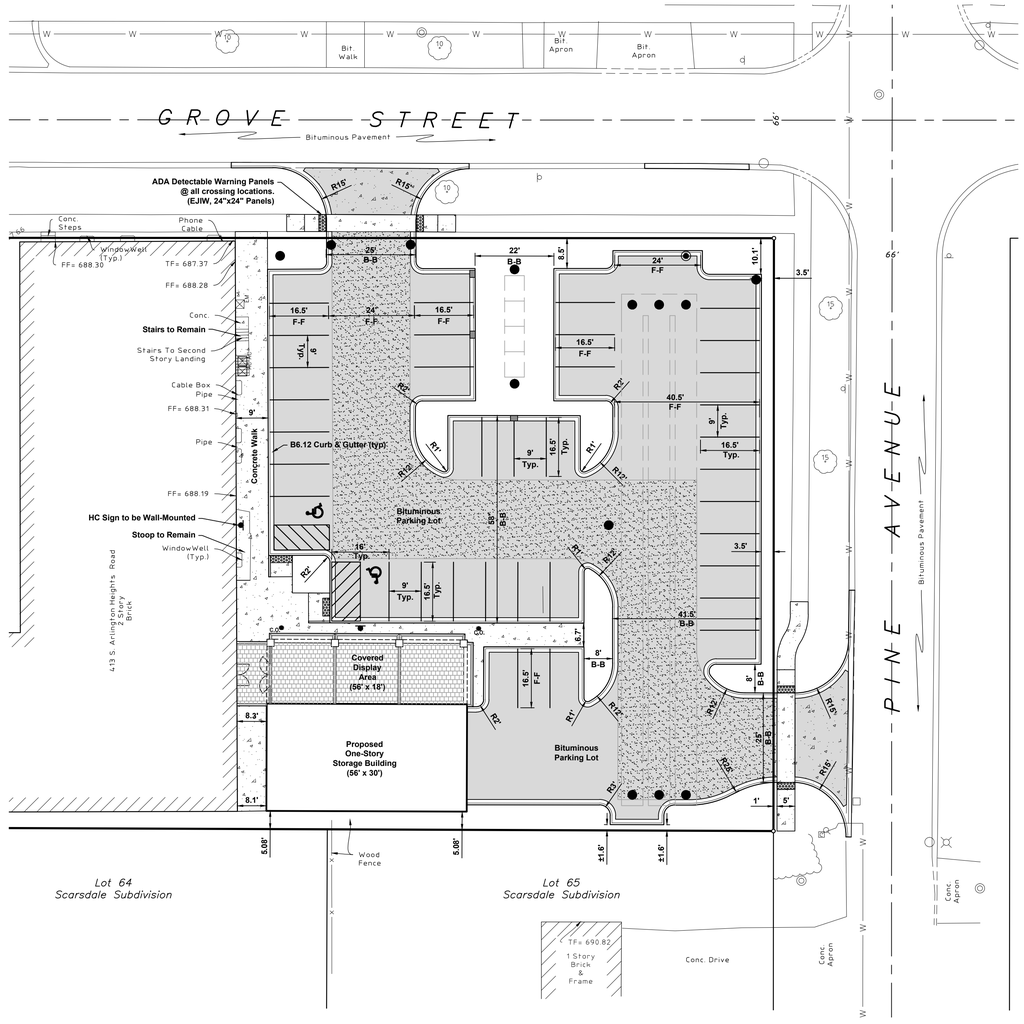
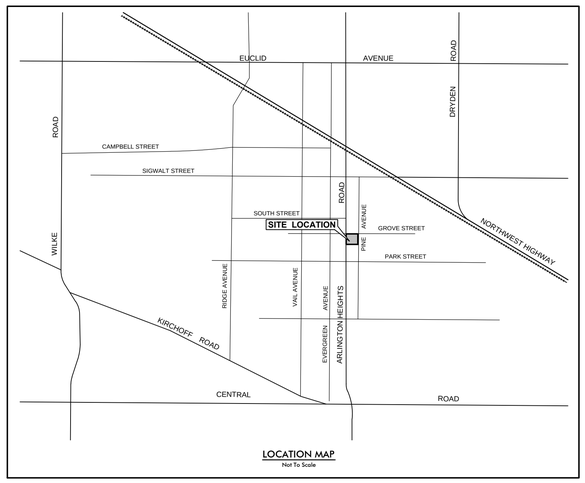
EXISTING CONDITIONS



GEOMETRY & PAVING PLAN





LOCATION MAP
Not To Scale

PAVING LEGEND

- Bituminous Pavement (Standard)
- Bituminous Pavement (Heavy Duty)
- Concrete Driveway Apron
- Concrete Sidewalk

IMPERVIOUS COVERAGE CALCULATIONS

PROJECT AREA = 29,665

EXISTING		PROPOSED	
STRUCTURES	*9,417*	STRUCTURES	*7,775*
PARKING LOT	*18,873*	PARKING LOT	*16,141*
MISCELLANEOUS	*148*	WALK	*1,765*
TOTAL IMPERVIOUS	*28,438*	TOTAL IMPERVIOUS	*25,681*
% IMPERVIOUS	*95.9%*	% IMPERVIOUS	*86.6%*
		NET DECREASE	*-2,757*

DIMENSION LEGEND

B-B	Back of Curb to Back of Curb
F-F	Face of Curb to Face of Curb

NORTH
10 0 20
Scale: 1" = 20'

No.	Date	Revision
1	05/11/2015	Per Village Comments

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Illinois Professional Design Firm License No.: 184.003152
www.haegerengineering.com

EXISTING CONDITIONS / GEOMETRY & PAVING PLAN

NORTHWEST METALCRAFT
ARLINGTON HEIGHTS, ILLINOIS

Project Manager: M L A
Engineer: J A C
Date: 12/04/2014
Project No. 13-144
Sheet 1/2

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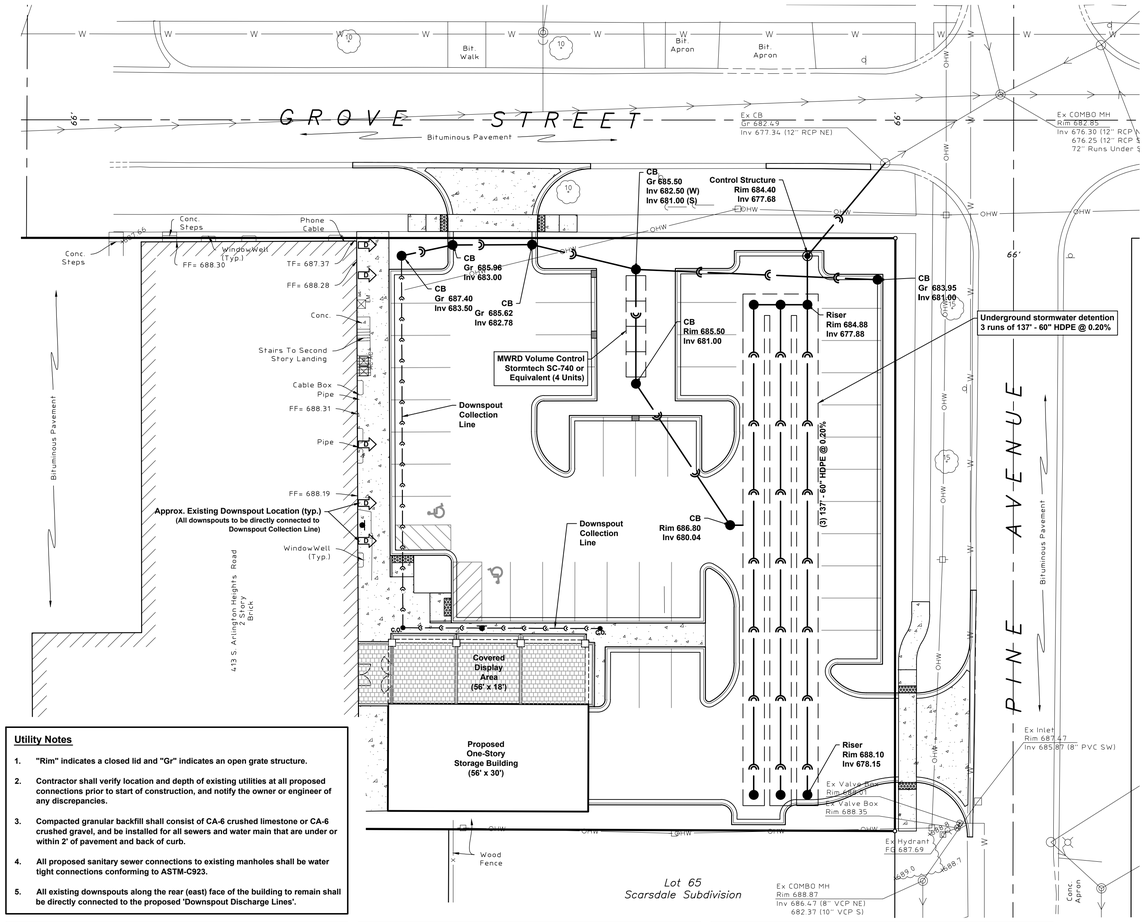
Plot Date: May 12, 2015 - 9:56am Plotted By: jeff-c
File Name: P:\2013\13144\Drawings\Preliminary\13144_Eng.dwg

UTILITY PLAN



Utility Notes

1. "Rim" indicates a closed lid and "Gr" indicates an open grate structure.
2. Contractor shall verify location and depth of existing utilities at all proposed connections prior to start of construction, and notify the owner or engineer of any discrepancies.
3. Compacted granular backfill shall consist of CA-6 crushed limestone or CA-6 crushed gravel, and be installed for all sewers and water main that are under or within 2' of pavement and back of curb.
4. All proposed sanitary sewer connections to existing manholes shall be water tight connections conforming to ASTM-C923.
5. All existing downspouts along the rear (east) face of the building to remain shall be directly connected to the proposed 'Downspout Discharge Lines'.

MWRD VOLUME CONTROL REQUIREMENT

Proposed "New Impervious" Area (Does not include areas of parking lot removal & replacement)	4,725 sf		
Total Volume with 1" Rainfall	394 cf		
Provided Volume in Infiltration Trench			
Stormtech SC-740 Chambers* includes 6" stone bedding around unit	70 cf per Unit	4 units	280 cf Storage
CA-7 Stone around Chambers			
Volume of CA-7 Stone	421 cf	36% Porosity	152 cf Storage
Storage in voids (36%)	152 cf		
TOTAL VOLUME			432 cf Storage

ACTUAL RELEASE RATE (Based on 2" Min. Restrictor)

Orifice Sizing

Cd	0.61	
Dia	**2.00** in	(Minimum restrictor size per VAH)
Area	0.022 sq ft	
Invert of Orifice	677.68	
Center of Orifice	677.68	

100 Year Release

Elev. Stage	Head	Orifice Discharge
677.60	0.00	0.000
678.00	0.32	0.060
679.00	1.32	0.123
680.00	2.32	0.163
681.00	3.32	0.195
682.00	4.32	0.222
683.00	5.32	0.246
683.15	5.47	**0.250**

Head = Stage less Center of Orifice
Orifice Discharge = $C_d \times (2 \times g \times H)^{0.5} \times$ Area

*683.15 = top of 60" pipe at upstream end

ACTUAL RELEASE RATE @ HWL 683.15 = 0.250 cfs

REQUIRED DETENTION (Based on Allowable Release Rate)

Total Tributary Area Area (A) = 0.68 Ac.

Arlington Heights Detention Calculations

Developed Runoff Coeff.

Impervious Area =	0.575 ac
Pervious Area =	0.106 ac
Impervious Runoff Coefficient =	0.95
Pervious Runoff Coefficient =	0.50
Combined Runoff Coefficient =	0.88

Release Rate per acre (Qr)= 0.18 cfs/ac.
Site Release Rate (Qo) = 0.123 cfs
100 yr, 24 hr storm (in) = 7.58 inches (Bulletin 70)

$V = AT(Ci-Qr)$

V= V= Volume of storage, in acre feet
A= A= Total tributary drainage area, in acres
C= C= Run-off coefficient
i100= i= 100-year storm intensity, in inches per hour
t= T= Duration of storm, in hours
Qr= Qr= Release rate, in cubic feet per second per acre

100-Year Storm

Runoff Coefficient, C	Storm Duration, t (hours)	Rainfall Intensity, i_{100} (in/hr)	Drainage Area, A (Ac)	Inflow Rate, $Q_i = C_{100}iA$ (cfs)	Release Rate, Q_o (cfs)	Storage Rate, Q_i-Q_o (cfs)	Storage Required, $V = (Q_i - Q_o)t/12$ (Ac-ft)
0.88	0.08	11.37	0.68	6.82	0.123	6.69	0.04
0.88	0.17	9.36	0.68	5.61	0.123	5.49	0.08
0.88	0.25	8.19	0.68	4.91	0.123	4.78	0.10
0.88	0.50	5.61	0.68	3.36	0.123	3.24	0.13
0.88	1.00	3.56	0.68	2.14	0.123	2.01	0.17
0.88	2.00	2.20	0.68	1.32	0.123	1.20	0.20
0.88	3.00	1.62	0.68	0.97	0.123	0.85	0.21
0.88	**6.00**	**0.95**	**0.68**	**0.57**	**0.123**	**0.45**	**0.22**
0.88	12.00	0.55	0.68	0.33	0.123	0.21	0.21
0.88	18.00	0.40	0.68	0.24	0.123	0.11	0.17
0.88	24.00	0.32	0.68	0.19	0.123	0.07	0.13

TOTAL STORAGE REQUIRED = 0.223 Ac-ft
(based on Allowable Release Rate) 9,708 Cubic Feet

REQUIRED DETENTION (Based on Actual Release Rate)

Total Tributary Area Area (A) = 0.68 Ac.

Arlington Heights Detention Calculations

Developed Runoff Coeff.

Impervious Area =	0.575 ac
Pervious Area =	0.106 ac
Impervious Runoff Coefficient =	0.95
Pervious Runoff Coefficient =	0.50
Combined Runoff Coefficient =	0.88

Release Rate per acre (Qr)= 0.18 cfs/ac.
Actual Release Rate (Qo) = 0.250 cfs
100 yr, 24 hr storm (in) = 7.58 inches (Bulletin 70)

$V = AT(Ci-Qr)$

V= V= Volume of storage, in acre feet
A= A= Total tributary drainage area, in acres
C= C= Run-off coefficient
i100= i= 100-year storm intensity, in inches per hour
t= T= Duration of storm, in hours
Qr= Qr= Release rate, in cubic feet per second per acre

100-Year Storm

Runoff Coefficient, C	Storm Duration, t (hours)	Rainfall Intensity, i_{100} (in/hr)	Drainage Area, A (Ac)	Inflow Rate, $Q_i = C_{100}iA$ (cfs)	Release Rate, Q_o (cfs)	Storage Rate, Q_i-Q_o (cfs)	Storage Required, $V = (Q_i - Q_o)t/12$ (Ac-ft)
0.88	0.08	11.37	0.68	6.82	0.250	6.57	0.044
0.88	0.17	9.36	0.68	5.61	0.250	5.36	0.076
0.88	0.25	8.19	0.68	4.91	0.250	4.66	0.097
0.88	0.50	5.61	0.68	3.36	0.250	3.11	0.130
0.88	1.00	3.56	0.68	2.14	0.250	1.89	0.157
0.88	2.00	2.20	0.68	1.32	0.250	1.07	0.178
0.88	3.00	1.62	0.68	0.97	0.250	0.72	0.180
0.88	**6.00**	**0.95**	**0.68**	**0.57**	**0.250**	**0.32**	**0.159**
0.88	12.00	0.55	0.68	0.33	0.250	0.08	0.080
0.88	18.00	0.40	0.68	0.24	0.250	0.00	0.000
0.88	24.00	0.32	0.68	0.19	0.250	0.00	0.000

TOTAL STORAGE REQUIRED = 0.180 Ac-ft
(based on Actual Release Rate) 7,836 Cubic Feet

PROPOSED DETENTION STORAGE

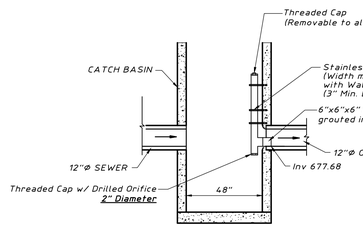
PIPE STORAGE CALCULATIONS

Diameter (in)	Length (LF)	Storage per LF (Cu-Ft/Ft)	Total Storage (Cu-Ft)
60	137	19.63	2,690
60	137	19.63	2,690
60	137	19.63	2,690
TOTAL STORAGE PROVIDED =			8,070

DETENTION SUMMARY

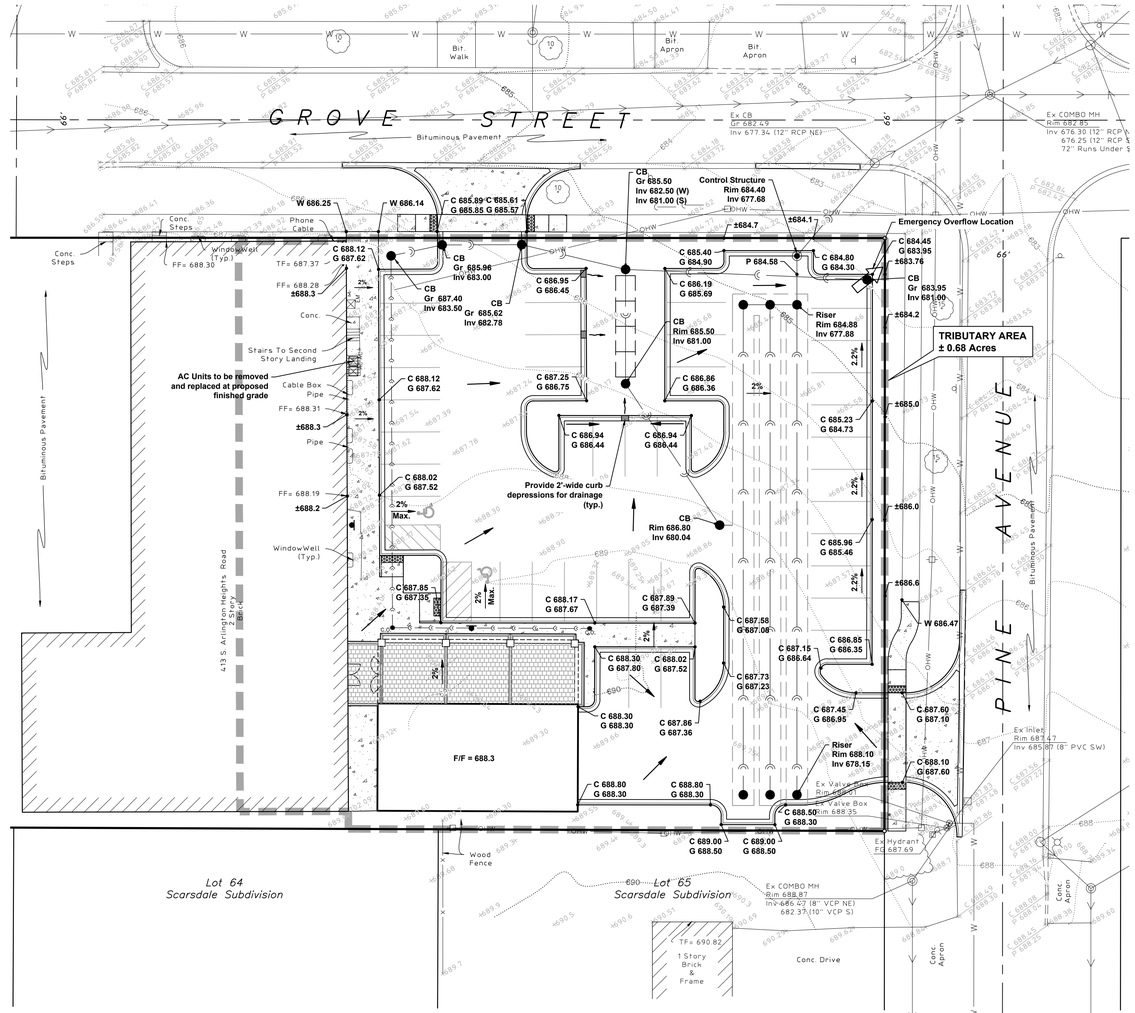
REQUIRED DETENTION (Based on Allowable Release)...	9,700 cu-ft
REQUIRED DETENTION (Based on Actual Release)...	7,836 cu-ft
STORAGE PROVIDED...	8,070 cu-ft

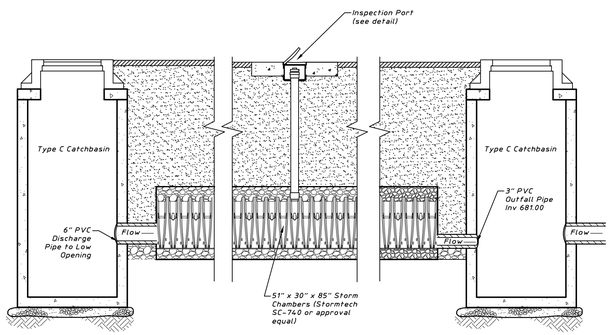
Note:
The Village of Arlington Heights will require a 'fee in lieu of' to be paid for the difference between the 'storage provided' and the 'required detention (based on allowable release)' at a rate of $1.00 per cubic foot. The final deficiency and fee amount will be determined during the final engineering phase.



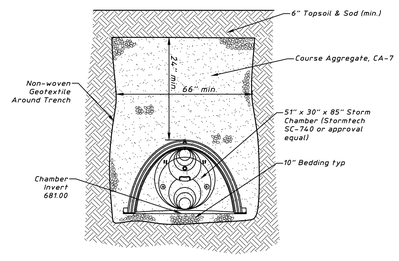
CONTROL STRUCTURE DETAIL
NOT TO SCALE

GRADING PLAN





VOLUME CONTROL SYSTEM
CROSS-SECTION



VOLUME CONTROL SYSTEM
INFILTRATION TRENCH WITH
STORM CHAMBERS
NOT TO SCALE

NORTH
10 0 20
Scale: 1" = 20'

No.	Date	Revision
1	05/11/2015	Per Village Comments

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UTILITY PLAN /
GRADING PLAN
NORTHWEST
METALCRAFT
ARLINGTON HEIGHTS, ILLINOIS

Project Manager: M L A
Engineer: J A C
Date: 12/04/2014
Project No. 13-144
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Plot Date: May 12, 2015 - 9:56am Plotted By: jeff-c
File Name: P:\2013\13144\Drawings\Preliminary\13144_Eng.dwg