August 25, 2015

The Moorings of Arlington Heights – Drainage Study

Eriksson Engineering Associates, Ltd.

145 Commerce Drive, Suite A

Grayslake, IL 60030

847.223.4804

601 W. Randolph St., Suite 500

Chicago, IL 60661

312.463.0551

Table of Contents

- Narrative
- Existing Drainage Calculations
    - Existing Drainage Summary
    - Existing West Lake Outfall
    - Existing West Lake Volume
- Proposed Drainage Calculations
    - Proposed Drainage Summary
    - Proposed Restrictor Calculation
    - Proposed West Lake Volume Calculation
    - Proposed West Lake Detention Requirement
    - Proposed Overflow Calculation
- Storm Sewer Calculations (10-Yr)
- Storm Sewer Calculations (100-Yr)
- Appendix I – Tributary Area Exhibit
- Appendix II – Storm Sewer HGL Profile (100-Yr)
- Appendix III – MWRD Permit No. 787-87

Narrative

INTRODUCTION

Currently detention is provided for the campus in five separate detention basins: West Lake, Southwest Basin, North Basin, East Lake, and Southeast Basin and are permitted under MWRD Permit No. 87-787. Of the 7.75 acres being affected by the proposed improvements 6.57 acres are tributary to West Lake, the remaining 1.22 acres are tributary to the Southwest Basin.

EXISTING CONDITIONS

In its current state, West Lake outfalls from an existing 10" sewer that is tributary to the Southwest Basin. The release rate of this sewer is calculated to be 3.00 cfs, less than the permitted 3.50 cfs according to MWRD Permit No. 87-787. This release and the existing tributary area of 14.87 acres create a required storage volume of 3.78 acre-feet, less than the available 4.52 acre-feet at an elevation of 689.00. Overflow from West Lake is currently a grassed area to the south of the lake that conveys water to Moorings Drive and the Southwest Basin.

PROPOSED CONDITIONS

Improvements around West Lake will expand the tributary area to encompass 15.23 acres and increase the impervious area by approximately 1 acre. Per Arlington Heights allowable release of 0.18 cfs/acre and the revised tributary area for West Lake, the new allowable release will be 2.74 cfs. Including the new impervious area equates to a new required volume of 4.31 acre-feet. Although the existing lake provides adequate detention, in order to provide adequate freeboard to the proposed Finished Floor Elevations the existing High Water Level will be lowered from 689.00 to 688.25 and the existing footprint will be expanded. Overflow from West Lake will be provided for at weirs in both the Restrictor Manhole and as a 40' grass spillway on the surface to ensure water is directed away from the new Assisted Living building and Resident Fellowship Hall. Restricted flow and Overflow from West Lake will remain tributary to an existing Bypass Swale and Sewer that run along the south of the Site.

Additional flow to the Southwest Basin will be investigated but it is not anticipated that significant improvements will be required.

STORM SEWER

Currently storm water is conveyed to West Lake through two pipe networks. One located to the northwest of the lake that conveys storm water from the north end of the site and one that conveys runoff from the Skilled Care courtyard. Both systems will be impacted by the new building footprints and will be re-routed underneath the connection between the Assisted Living building and Resident Fellowship Hall.

The proposed buildings will also impact existing overland flow routes. New pipe systems tributary to West Lake will be sized to convey runoff from the 100-year rain event.

Calculations

Existing Calculations

DRAINAGE SUMMARY - EXISTING CONDITIONS

Prebysterian Homes - Site Study 05/15/15

By: C. Fish

ERIKSSON ENGINEERING ASSOCIATES, LTD.

West Lake - Existing

Total Tributary Area =	14.87	acres			
Wet Pond Area =	1.44	acres	C_{pond} =	1.00	*Per Arlington Heights Manual of Practice for The Design of Public and Private Improvements*
Impervious Area =	6.74	acres	$C_{impervious}$ =	0.95	
Pervious Area =	6.69	acres	$C_{pervious}$ =	0.50	
Runoff Coefficient (C) =	0.75				

Allowable Release Rate =	3.50	cfs	Per MWRD Permit No. 87-787
Actual Release Rate =	3.00	cfs	

100-Year Event, Bulletin 70 Rainfall Data

RUNOFF FACTOR	STORM DURATION (HRS)	RAINFALL INTENSITY (IN/HR)	DRAINAGE AREA (ACRES)	INFLOW RATE (CFS)	RELEASE RATE (CFS)	STORAGE RATE (CFS)	STORAGE REQUIRED (ACRE-FT)
0.75	0.08	11.40	14.87	127.54	3.00	124.55	0.86
0.75	0.17	9.82	14.87	109.87	3.00	106.87	1.47
0.75	0.25	8.20	14.87	91.74	3.00	88.74	1.83
0.75	0.50	5.60	14.87	62.65	3.00	59.66	2.47
0.75	1.00	3.56	14.87	39.83	3.00	36.83	3.04
0.75	2.00	2.23	14.87	24.95	3.00	21.95	3.63
0.75	3.00	1.61	14.87	18.01	3.00	15.02	3.72
0.75	6.00	0.95	14.87	10.63	3.00	7.63	3.78
0.75	12.00	0.55	14.87	6.14	3.00	3.14	3.12
0.75	18.00	0.39	14.87	4.36	3.00	1.37	2.03
0.75	24.00	0.31	14.87	3.47	3.00	0.47	0.93

Calculated	**Existing Storage Required =**	**3.78**	**acre-ft**
MWRD Permit No. 87-787	**Existing Storage Required =**	**2.15**	**acre-ft**
Elevation 689.00	**Existing Storage Provided =**	**4.52**	**acre-ft**

Culvert Capacity Calculations:

Prebysterian Homes - Site Study 05/15/15
By: C. Fish

Existing Culvert Size = 10 inch
Existing Pipe Slope = 0.03 ft/ft

Required Culvert Capacity = cfs

Cross Sectional Area:

a = Πr^2 = 0.55 ft^2

Pipe Flow Capacity (Flowing Full):

n = 0.013

Q = $(1.49/n)*a*R_h^{2/3}*s^{1/2}$
= 6.04 cfs

Capacity Of Pipe = 6.04 cfs

Pipe Flow Capacity (Including Vertical Head):

Length of Pipe = 268 ft.
Downstream Inv. = 684
hwl = 689.00
△h = hwl - Inv. = 5 ft.

$Q_{cap} = (1.49/n)*A*R_h^{2/3}*(h/L)^{1/2}$ = 3.00 cfs

Storage Volume in Detention Pond

Prebysterian Homes - Site Study 05/15/15

By: C. Fish

ERIKSSON ENGINEERING ASSOCIATES, LTD.

Grade	Area (sq. ft.)	Volume (cu ft.)
685.5	51946	
		79830.56
687	54505	
		56511.48
688	58542	
		60701.54
689	62887	
		65770.61
690	68697	
		34348.50
690.5	68697	

Total Volume =	197043.58	cu ft.
Total Volume =	**4.52**	**acre-ft**

Proposed Calculations

DRAINAGE SUMMARY PROPOSED CONDITIONS

Presbyterian Homes 06/15/15
Moorings
CMF

Proposed Conditions

Total Property Area = acres
Total Watershed Area = 15.23 acres

Proposec

						VILLAGE	
Impervious Area =	7.70	acres	$CN_{impervious}$=	98		$C_{impervious}$=	0.95
Wet Pond Area =	1.71	acres	CN_{gravel}=	100		C_{gravel}=	1.00
Pervious Area =	5.82	acres	$CN_{pervious}$=	74		$C_{pervious}$=	0.50
	2-Year		CN =	89.1		C =	0.78
Allowable Release Rate =	-	0.18 cfs/acre	% Imp =	61.79%			
	-	2.74 cfs					

	2-YEAR	VILLAGE	
MAXIMUM RESTRICTOR DIAMETER =	-	8.13	in
ACTUAL RESTRICTOR DIAMETER =	**0.00**	**8.00**	**in**
ALLOWABLE RELEASE RATE =	-	2.74	cfs
ACTUAL RELEASE RATE =	**0.00**	**2.66**	**cfs**
DETENTION VOLUME REQUIRED =		4.31	Acre*ft
DETENTION VOLUME PROVIDED =	**0.00**	**4.29**	**Acre*ft**
Restrictor Invert=	685.50	685.50	
Basin High Water Elevation=	685.50	688.25	
Basin Spill Elevation=		689.50	+/-

VILLAGE RESTRICTOR SIZING CALCULATIONS

Presbyterian Homes 06/15/15
Moorings
CMF

2-Year Restrictor

2-year high water elevation =	685.50	
C_D =	0.61	(constant)
G =	32.20	ft/sec^2
Inv. restrictor =	685.50	
$Q_{allowable}$ =	0.00	cfs

$\triangle h$ = hwe - Inv. - 1/2 Dia.

= 0.00 ft.

$Q = C_D A(2gh)^{1/2}$

$A_{restrictor} = (Q_{allowable}) / (C_D(2gh)^{1/2})$

$A_{restrictor}$ =	0.00	in^2
$D_{restrictor}$ =	0.000	in
=> Restrictor diameter =	**0.000**	**inches**

Release Rate Based on restrictor diameter

$D_{restrictor}$ =	0.00	in.
$A_{restrictor}$ =	0.00	in^2

$Q = C_D A(2gh)^{1/2}$

$Q_{release}$ = 0.00 c.f.s.

100-Year Restrictor

100-year high water elevation =	688.25	
C_D =	0.61	(constant)
G =	32.20	ft/sec^2
Inv. restrictor =	685.50	
$Q_{allowable}$ =	2.74	cfs
Q_{2year} =	0.00	cfs
Therefore: $Q_{remaining}$ =	2.74	cfs

$\triangle h$ = hwe - Inv. - 1/2 Dia.

= 2.42 ft.

$Q = C_D A(2gh)^{1/2}$

$A_{restrictor} = (Q_{allowable}) / (C_D(2gh)^{1/2})$

$A_{restrictor}$ =	51.87	in^2
$D_{restrictor}$ =	8.127	in
=> Restrictor diameter =	**8.000**	**inches**

Release Rate Based on restrictor diameter

$D_{restrictor}$ =	8.00	in.
$A_{restrictor}$ =	50.24	in^2

$Q = C_D A(2gh)^{1/2}$

$Q_{release}$ = 2.66 c.f.s.

BASIN VOLUME CALCULATIONS

Presbyterian Homes 06/15/15
Moorings
CMF

2 Year Restrictor

Dia=	0.000	in
C_d =	0.61	
Inv. rest. =	685.50	
g =	32.20	ft/sec^2
A_{rest}=	0.00	in^2

100 Year Restrictor

Dia=	8.000	in
C_d =	0.61	
Inv. rest. =	685.50	
g =	32.20	ft/sec^2
A_{rest}=	50.27	in^2

Pond

Elev	**Area** (sq. ft.)	**Increm. Volume** (cu ft.)	**Increm. Volume** (ac-ft)	**Total Volume** (ac-ft)		**Q(2-Yr)** (cfs)		**Q(100-Yr)** (cfs)		**Q(Total)** (cfs)
690	83808	81298.22	1.866	**7.48**		0.00		3.49		3.49
0	0	0.00	0.000	**5.61**		0.00		0.00		0.00
689	78814	57535.98	1.321	**5.61**		0.00		3.04		3.04
688.25	74634.25	18484.13	0.424	**4.29**		0.00		2.66		2.66
688	73241	70515.16	1.619	**3.87**		0.00		2.52		2.52
0	0	0.00	0.000	**2.25**		0.00		0.00		0.00
687	67824	98048.67	2.251	**2.25**		0.00		1.85		1.85
0	0	0.00	0.000	**0.00**		0.00		0.00		0.00
685.5	62938									

Site High Water Line =	**685.50**	**688.25**	
100-Year Storage Volume =	**0.00**	**4.29**	**acre-ft**

VILLAGE DETENTION REQUIREMENTS 100-YEAR EVENT

Presbyterian Homes 06/15/15
Moorings
CMF

Total Tributary Area:	15.23	acre	
Total Impervious Area	9.41	acre	
Allowable Release Rate Per Acre:	0.18	cfs/acre	
Allowable Release Rate:	2.74	cfs	
Actual Release Rate:	2.66	cfs	
Runoff Coefficient (C):	0.78		
100 Year Intensity:	7.58	in	Bul 70 100yr - 24hr

100-Year Event, Bulletin 70 Rainfall Data

RUNOFF FACTOR	STORM DURATION (HRS)	RAINFALL INTENSITY (IN/HR)	DRAINAGE AREA (ACRES)	INFLOW RATE (CFS)	RELEASE RATE (CFS)	STORAGE RATE (CFS)	STORAGE REQUIRED (ACRE-FT)
0.78	0.08	10.92	15.23	130.33	2.66	127.68	0.84
0.78	0.17	10.02	15.23	119.59	2.66	116.93	1.64
0.78	0.25	8.20	15.23	97.87	2.66	95.21	1.97
0.78	0.50	5.60	15.23	66.84	2.66	64.18	2.65
0.78	1.00	3.56	15.23	42.49	2.66	39.83	3.29
0.78	1.50	2.63	15.23	31.39	2.66	28.73	3.56
0.78	2.00	2.24	15.23	26.73	2.66	24.08	3.98
0.78	3.00	1.62	15.23	19.33	2.66	16.68	4.14
0.78	4.00	1.28	15.23	15.28	2.66	12.62	4.17
0.78	5.00	1.08	15.23	12.89	2.66	10.23	4.23
0.78	6.00	0.95	15.23	11.34	2.66	8.68	4.31
0.78	7.00	0.83	15.23	9.91	2.66	7.25	4.19
0.78	8.00	0.75	15.23	8.95	2.66	6.30	4.16
0.78	9.00	0.68	15.23	8.12	2.66	5.46	4.06
0.78	10.00	0.63	15.23	7.52	2.66	4.86	4.02
0.78	11.00	0.59	15.23	7.04	2.66	4.39	3.99
0.78	12.00	0.55	15.23	6.56	2.66	3.91	3.88
0.78	13.00	0.52	15.23	6.21	2.66	3.55	3.82
0.78	14.00	0.49	15.23	5.85	2.66	3.19	3.69
0.78	15.00	0.46	15.23	5.49	2.66	2.84	3.51
0.78	16.00	0.43	15.23	5.13	2.66	2.48	3.28
0.78	17.00	0.41	15.23	4.89	2.66	2.24	3.14
0.78	18.00	0.39	15.23	4.65	2.66	2.00	2.97
0.78	24.00	0.32	15.23	3.77	2.66	1.11	2.21

Required Storage: 4.31 acre-ft

Emergency Overflow Spillway Calculations

Presbyterian Homes 06/15/15
Moorings
CMF

100-year Rainfall Event

Tributary Area =	15.23	acre
Composite Runoff Coefficient =	0.78	
100 year Rainfall Depth (Bulletin 70) =	7.58	inches
100-Year Runoff Rate =	11.34	cfs
Pond Overflow Type =	Grass Spillway	

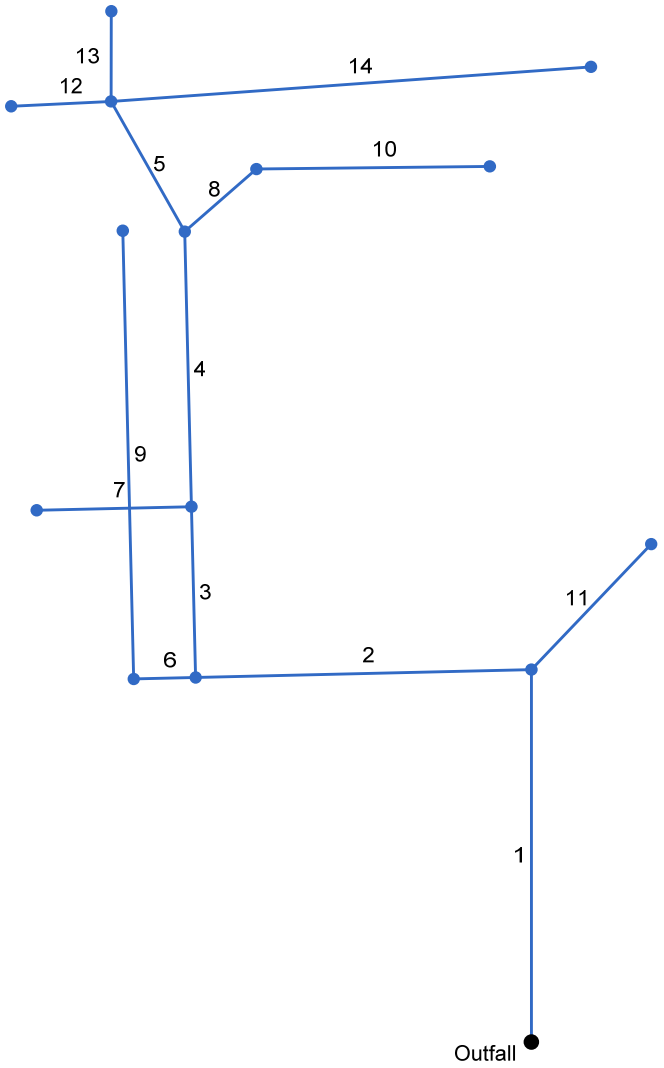
Where: L (length) = 40.00 ft.
H (head) = 0.25 ft.

Pond Overflow Rate

Q =	**13.00**	**cfs**

Weir Equation: $Q = 3.03\ L\ H^{(3/2)}$ (Broad Crested Weir) Concrete Wier Wall
Weir Equation: $Q = 2.60\ L\ H^{(3/2)}$ (Broad Crested Weir) Grass Spillway

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: Moorings.stm	Number of lines: 14	Date: 6/24/2015

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	157.000	0.00	4.99	0.00	0.00	3.82	10.0	17.4	4.8	28.37	60.85	5.42	48	0.15	684.04	684.28	685.62	686.22	0.00	698.00	
2	1	141.000	0.00	3.69	0.00	0.00	2.81	10.0	16.5	4.9	23.84	43.05	3.70	42	0.16	684.28	684.50	686.56	686.67	698.00	698.95	
3	2	72.000	0.00	2.93	0.00	0.00	2.14	10.0	16.1	4.9	20.69	32.98	3.49	36	0.21	684.50	684.65	686.89	686.94	698.95	698.95	
4	3	116.000	0.00	1.08	0.00	0.00	0.77	10.0	15.2	5.1	14.03	32.17	2.33	36	0.20	684.65	684.88	687.14	687.17	698.95	696.20	
5	4	63.000	0.19	0.97	0.75	0.14	0.68	10.0	10.5	5.8	14.08	20.18	2.96	30	0.21	684.88	685.01	687.25	687.30	696.20	689.50	
6	2	26.000	0.51	0.76	0.86	0.44	0.67	10.0	11.8	5.6	3.71	3.86	5.49	12	1.00	690.20	690.46	690.99	691.28	698.95	698.95	
7	3	65.000	1.85	1.85	0.74	1.37	1.37	10.0	10.0	5.9	8.09	16.27	4.59	18	2.05	684.65	685.98	687.14	687.45	698.95	688.43	
8	4	40.000	0.00	0.11	0.00	0.00	0.09	10.0	13.7	5.3	0.49	7.00	0.40	15	1.00	684.88	685.28	687.25	687.25	696.20	692.00	
9	6	189.000	0.25	0.25	0.91	0.23	0.23	10.0	10.0	5.9	1.34	3.86	2.73	12	1.00	690.46	692.35	691.28	692.84	698.95	694.85	
10	8	98.000	0.11	0.11	0.84	0.09	0.09	10.0	10.0	5.9	0.55	7.81	0.57	15	1.24	685.28	686.50	687.25	687.26	692.00	689.00	
11	1	73.000	1.30	1.30	0.78	1.01	1.01	10.0	10.0	5.9	5.99	8.61	9.80	12	4.99	687.25	690.89	687.86	691.84	698.00	698.00	
12	5	42.000	0.78	0.78	0.69	0.54	0.54	10.0	10.0	5.9	3.18	7.55	4.05	12	3.83	685.01	686.62	687.44	687.72	689.50	688.92	Ex.
13	5	38.000	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	4.65	0.00	5.92	12	-1.11	685.01	684.59	687.44	687.99	689.50	689.49	Ex.
14	5	202.000	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	5.47	5.46	6.97	12	2.00	685.01	689.05	687.44	691.50	689.50	692.95	Ex.

Project File: Moorings.stm

Number of lines: 14

Run Date: 6/24/2015

NOTES:Intensity = 144.66 / (Inlet time + 19.40) ^ 0.95; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	157.000	0.00	4.99	0.00	0.00	3.82	10.0	15.1	7.8	40.08	60.85	3.19	48	0.15	684.04	684.28	688.25	688.35	0.00	698.00	
2	1	141.000	0.00	3.69	0.00	0.00	2.81	10.0	14.5	8.0	32.54	43.05	3.38	42	0.16	684.28	684.50	688.51	688.64	698.00	698.95	
3	2	72.000	0.00	2.93	0.00	0.00	2.14	10.0	14.2	8.1	27.37	32.98	3.87	36	0.21	684.50	684.65	688.82	688.92	698.95	698.95	
4	3	116.000	0.00	1.08	0.00	0.00	0.77	10.0	13.4	8.2	16.49	32.17	2.33	36	0.20	684.65	684.88	689.15	689.21	698.95	696.20	
5	4	63.000	0.19	0.97	0.75	0.14	0.68	10.0	10.5	9.0	16.24	20.18	3.31	30	0.21	684.88	685.01	689.28	689.36	696.20	689.50	
6	2	26.000	0.51	0.76	0.86	0.44	0.67	10.0	11.2	8.8	5.86	3.86	7.46	12	1.00	690.20	690.46	691.20	691.80	698.95	698.95	
7	3	65.000	1.85	1.85	0.74	1.37	1.37	10.0	10.0	9.1	12.51	16.27	7.08	18	2.05	684.65	685.98	689.15	689.94	698.95	688.43	
8	4	40.000	0.00	0.11	0.00	0.00	0.09	10.0	12.4	8.5	0.78	7.00	0.64	15	1.00	684.88	685.28	689.28	689.29	696.20	692.00	
9	6	189.000	0.25	0.25	0.91	0.23	0.23	10.0	10.0	9.1	2.08	3.86	2.82	12	1.00	690.46	692.35	692.67	693.18	698.95	694.85	
10	8	98.000	0.11	0.11	0.84	0.09	0.09	10.0	10.0	9.1	0.84	7.81	0.69	15	1.24	685.28	686.50	689.29	689.30	692.00	689.00	
11	1	73.000	1.30	1.30	0.78	1.01	1.01	10.0	10.0	9.1	9.26	8.61	11.80	12	4.99	687.25	690.89	688.51	692.72	698.00	698.00	
12	5	42.000	0.78	0.78	0.69	0.54	0.54	10.0	10.0	9.1	4.92	7.55	6.26	12	3.83	685.01	686.62	689.54	690.22	689.50	688.92	Ex.
13	5	38.000	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	4.65	0.00	5.92	12	-1.11	685.01	684.59	689.54	690.09	689.50	689.49	Ex.
14	5	202.000	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	5.47	5.46	6.97	12	2.00	685.01	689.05	689.54	693.60	689.50	692.95	Ex.

Project File: Moorings.stm

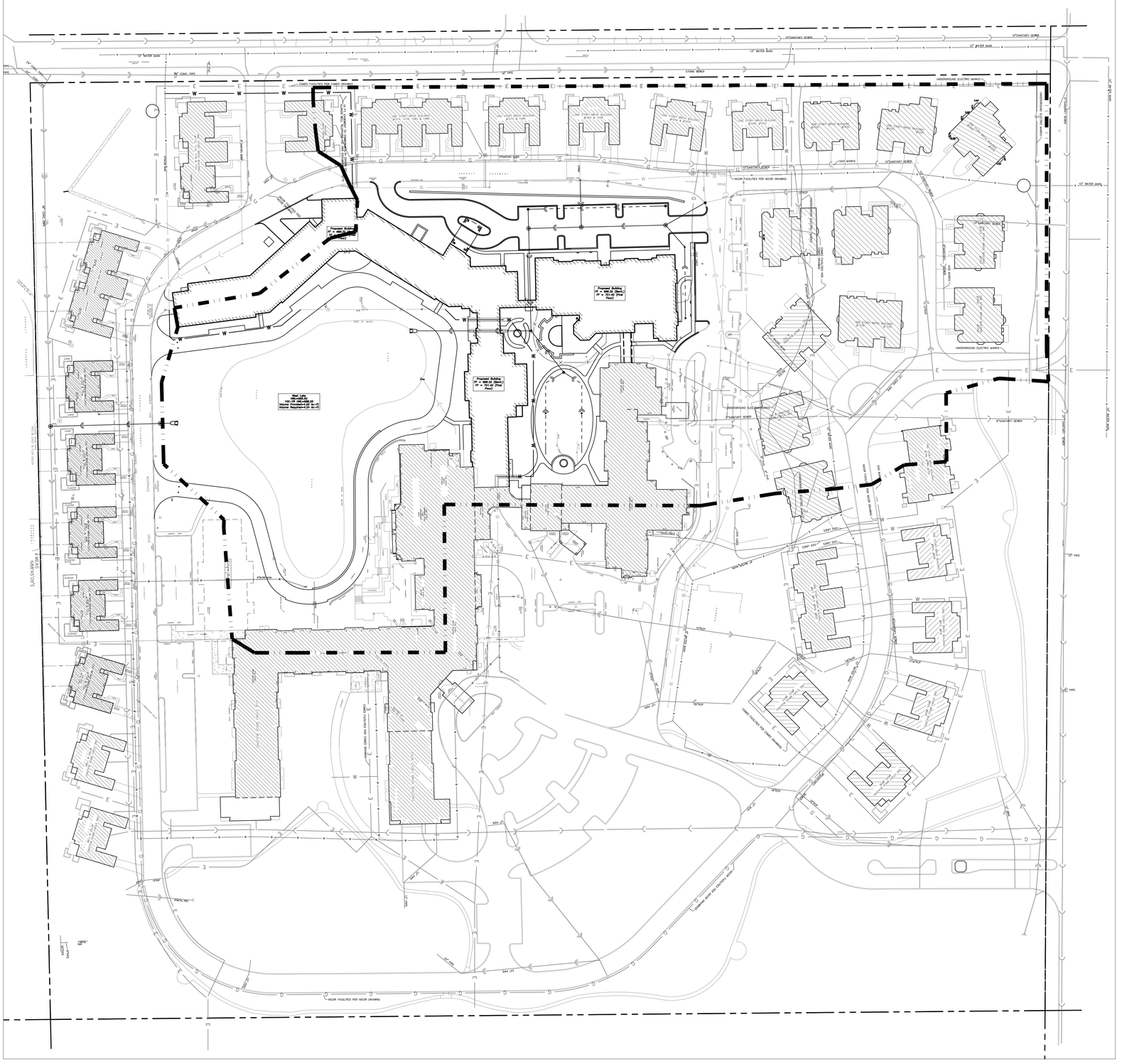
Number of lines: 14

Run Date: 6/24/2015

NOTES:Intensity = 218.93 / (Inlet time + 19.10) ^ 0.94; Return period =Yrs. 100 ; c = cir e = ellip b = box

Appendix I

Tributary Area Exhibit



ERIKSSON ENGINEERING ASSOCIATES, LTD.
145 COMMERCE DRIVE, SUITE A
GRAYSLAKE, ILLINOIS 60030
PHONE (847) 223-4804
FAX (847) 223-4864
EMAIL INFO@EEA-LTD.COM

DRAWING NO: **EX.**

WEST LAKE TRIBUTARY AREA

COMMISSION NO: 2014104 | SCALE: AS NOTED | DATE: 4/27/2015

REVISIONS

NO.	DATE	DESCRIPTION
1	06/22/2015	PUD Application Submittal

RENOVATIONS & ADDITIONS TO:
THE MOORINGS OF ARLINGTON HEIGHTS
FOR
PRESBYTERIAN HOMES
811 EAST CENTRAL ROAD, ARLINGTON HEIGHTS, IL 60005

DRAWN BY:	COORDINATED BY:	CHECKED BY:	APPROVED BY:
C.M.F	C.S.L.	-	M.J.R.

rlps architects®
architecture • master planning • interior design
250 VALLEYBROOK DRIVE, LANCASTER, PA 17601
717-560-9501 FAX: 717-560-2373 RLPS, LLP

DESIGN PHASE

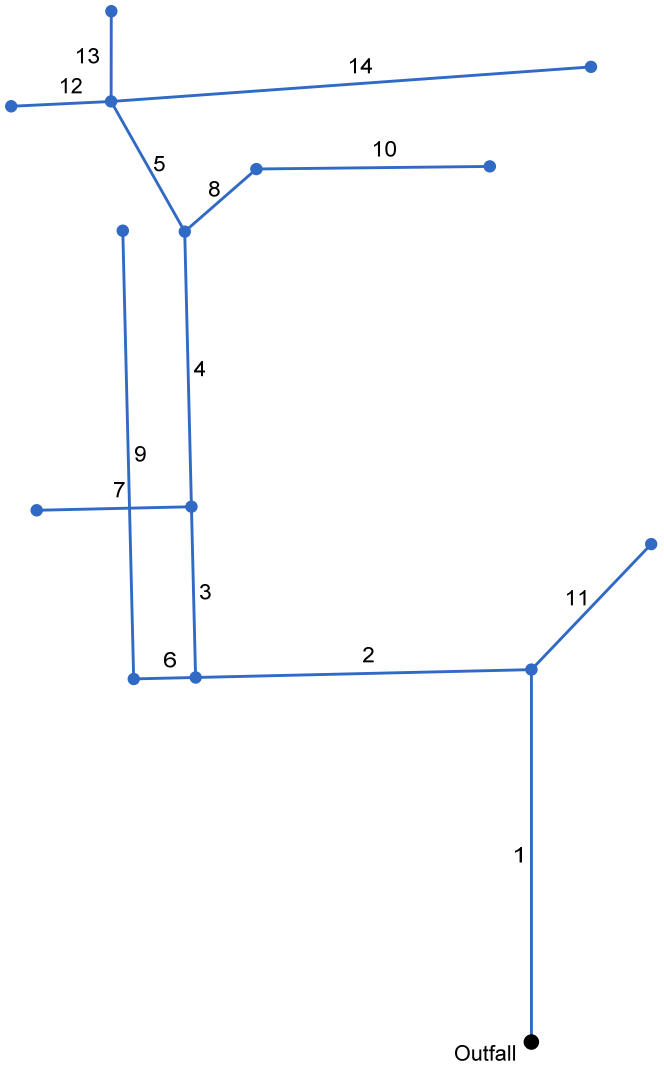
THIS DRAWING AS AN INSTRUMENT OF SERVICE, IS THE PROPERTY OF THE ARCHITECT, AND MAY NOT BE REPRODUCED WITHOUT THE ARCHITECT'S PERMISSION AND UNLESS THE REPRODUCTION CARRIES THE NAME OF THE ARCHITECT

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE BEFORE PROCEEDING WITH THE WORK

Appendix II

100-Yr HGL Profile

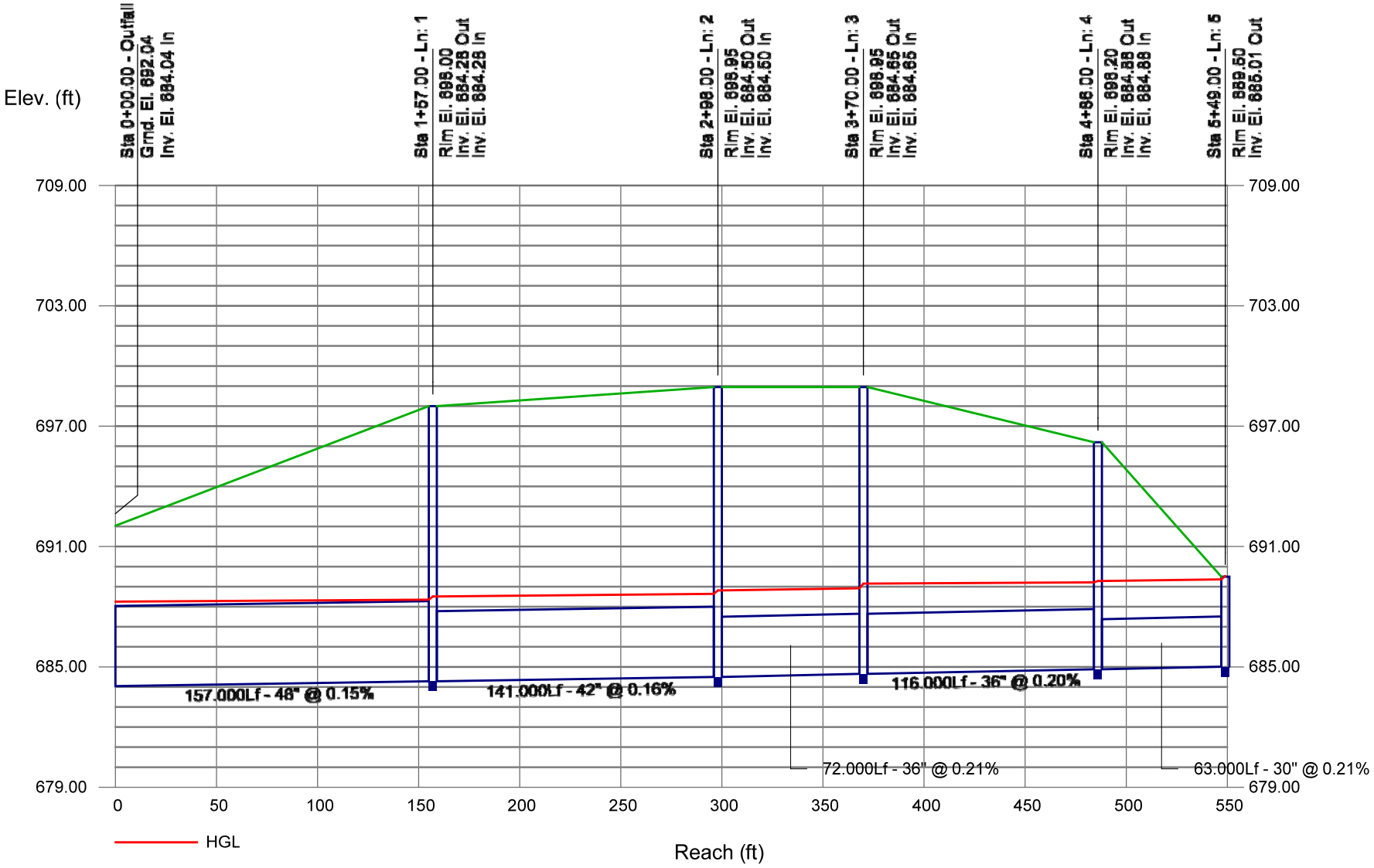
Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: Moorings.stm	Number of lines: 14	Date: 6/24/2015

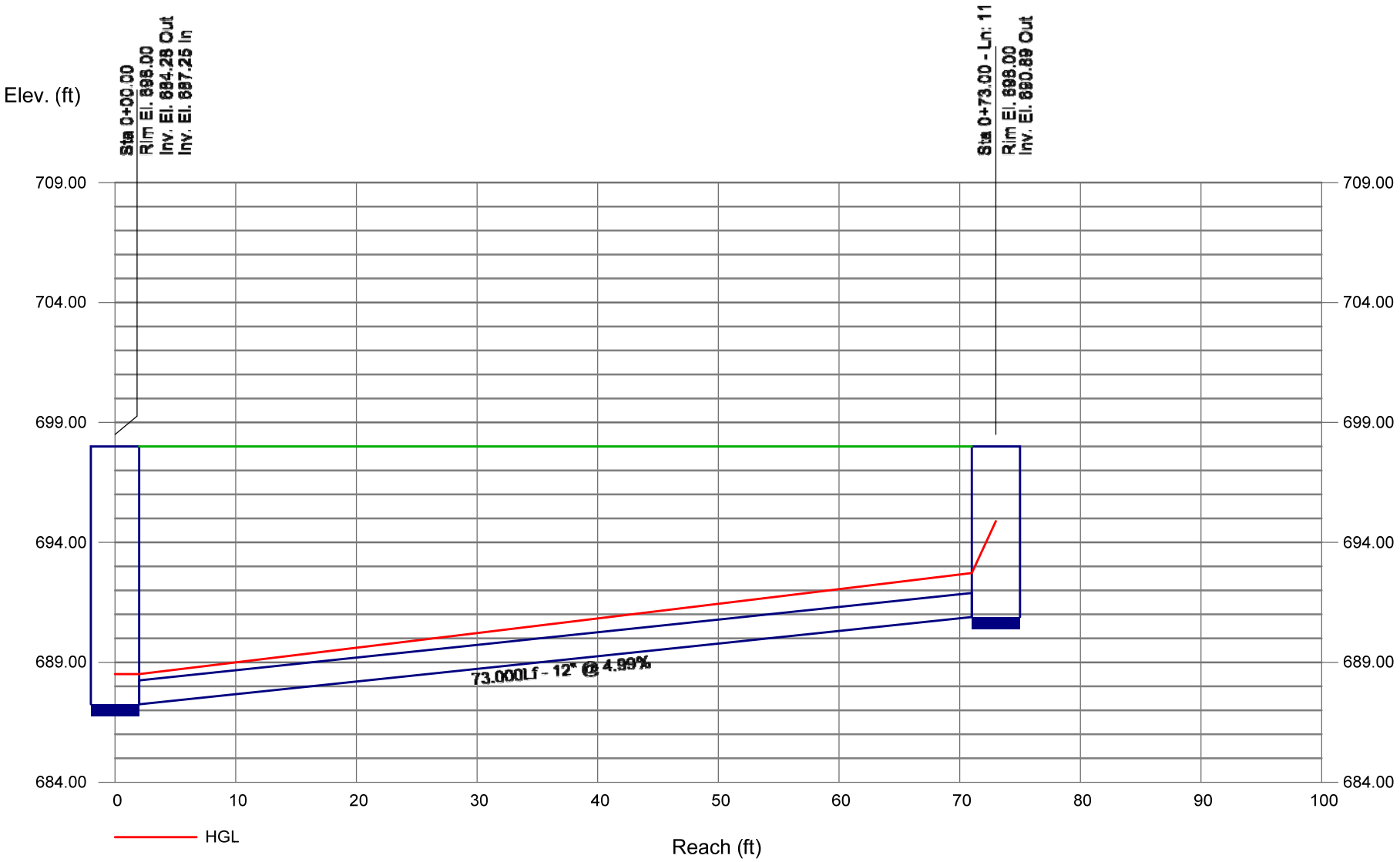
Storm Sewer Profile

Proj. file: Moorings.stm



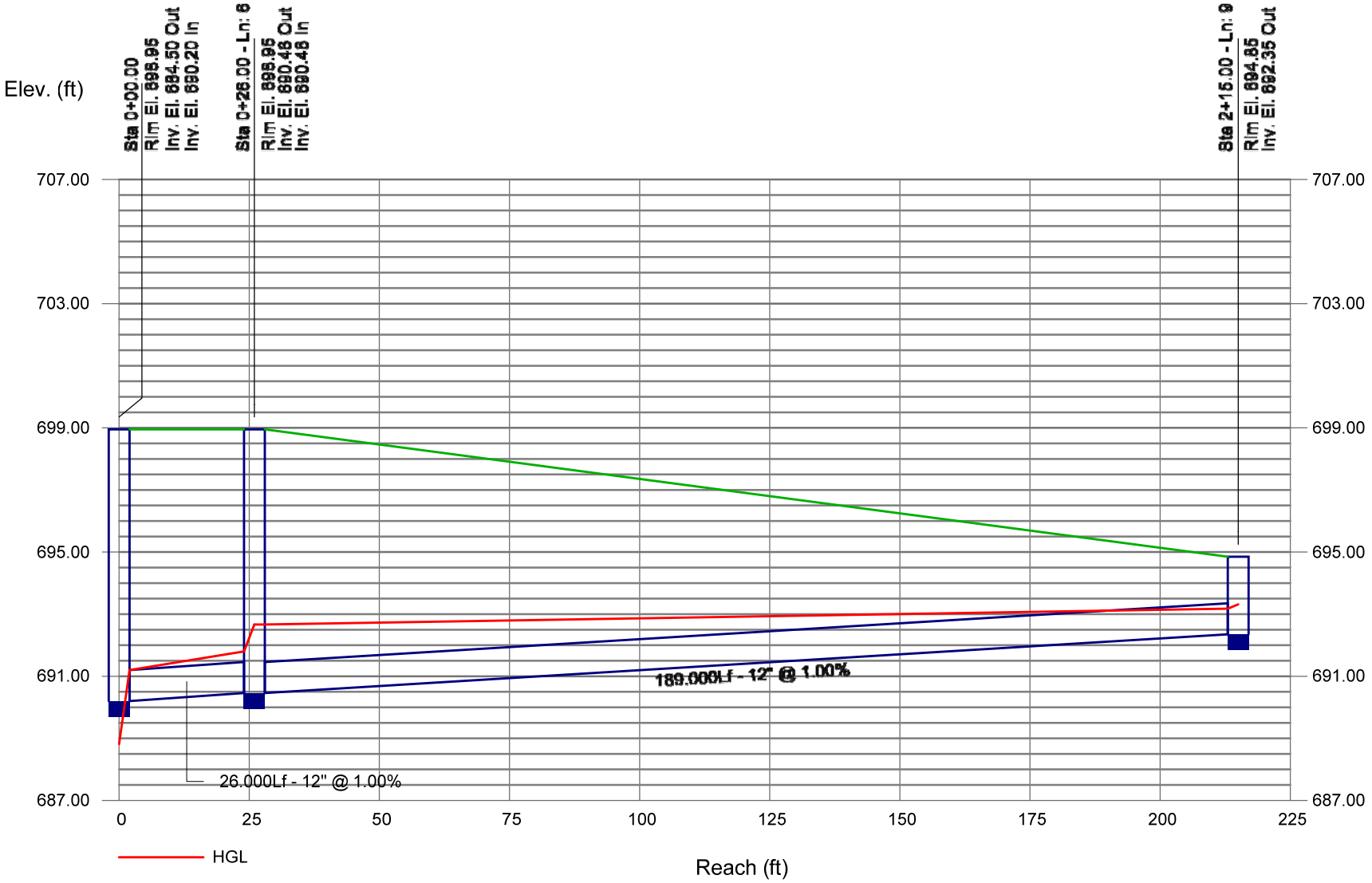
Storm Sewer Profile

Proj. file: Moorings.stm



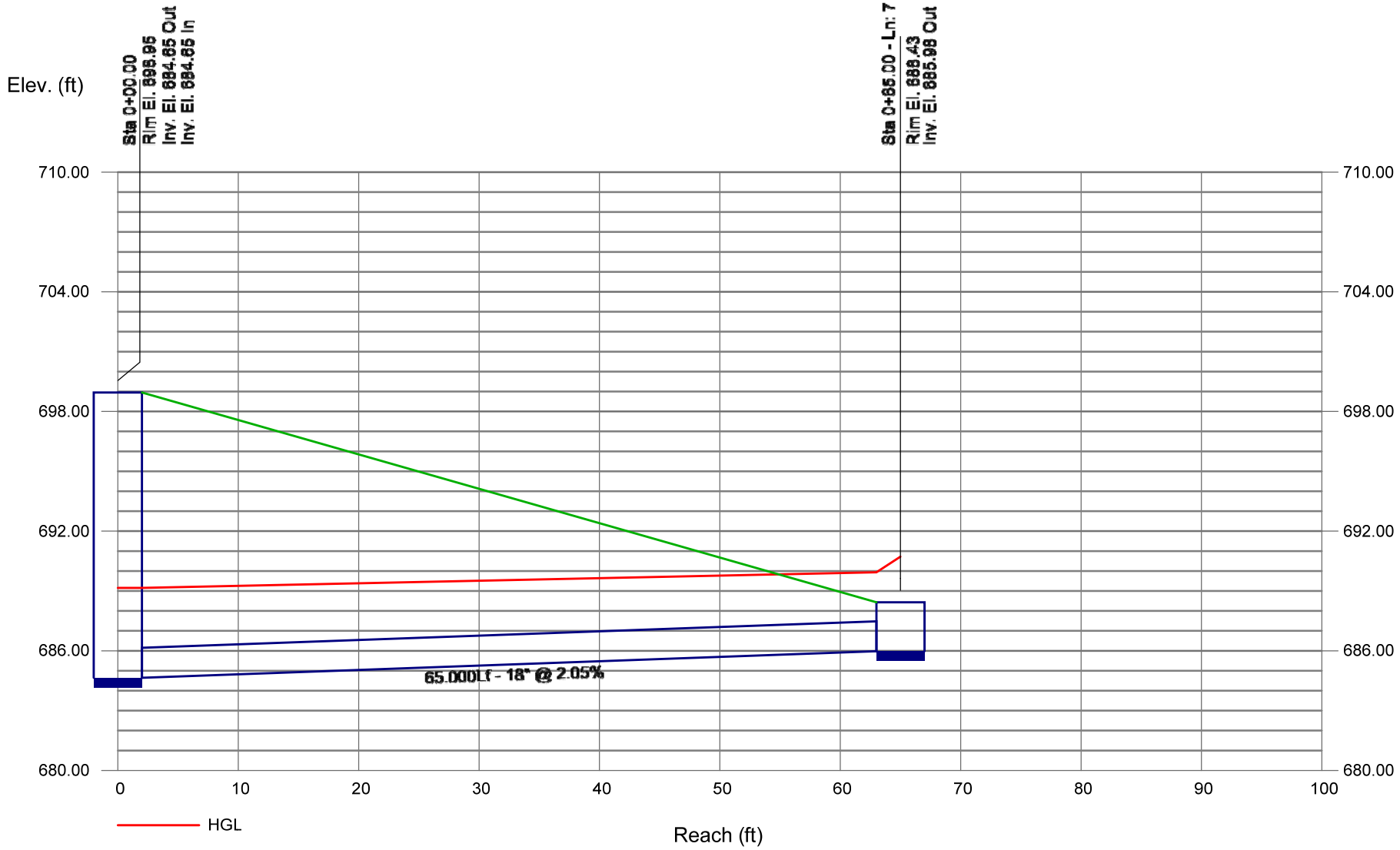
Storm Sewer Profile

Proj. file: Moorings.stm



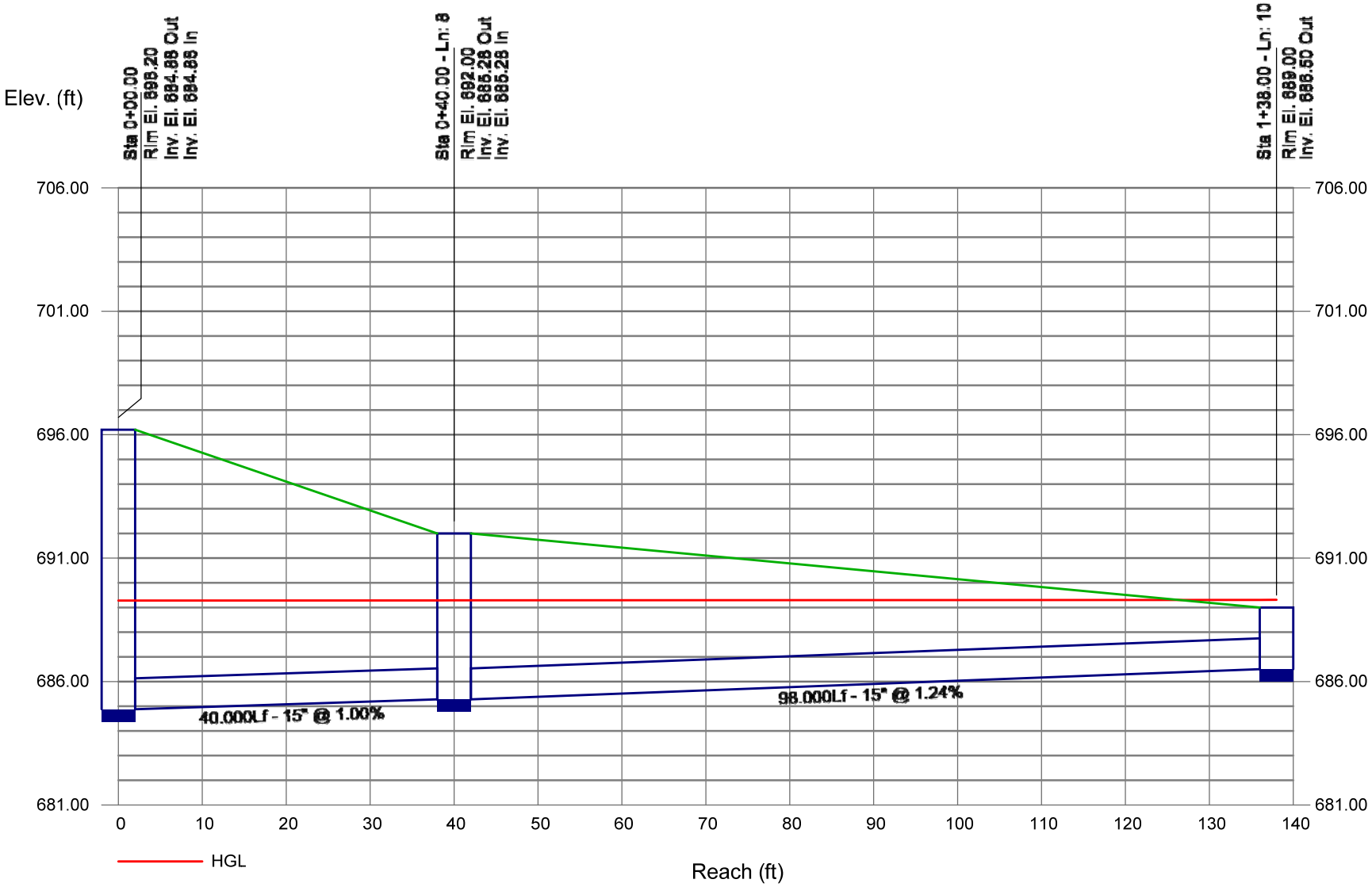
Storm Sewer Profile

Proj. file: Moorings.stm



Storm Sewer Profile

Proj. file: Moorings.stm



Appendix III

MWRD Permit No. 787-87

ORIGINAL

OFFICE COPY

MSDGC Permit No. 87-787
IEPA Log No. _____

LOCAL SEWER SYSTEMS SECTION
NOV 12 AM 9:47

SEWERAGE SYSTEM PERMIT

THE
METROPOLITAN SANITARY DISTRICT
OF GREATER CHICAGO
100 EAST ERIE, CHICAGO, ILLINOIS 60611 - 751-5600

INSTRUCTIONS FOR FILLING FORMS: Submit *typed* forms of permit and schedules in quadruplicate; complete all information or indicate non-applicability; do not leave any blank spaces; use "X" for checking applicable information. Submit four copies of location map, plans and all applicable schedules. Submit two copies of specifications, where applicable. Address all correspondence to Local Sewer Systems Section; for any inquiries or assistance, telephone 751-5789.

NAME AND LOCATION:
Name of project (as shown on plans): The Moorings of Arlington Heights, Illinois
Location of Project (street address or with respect to two major streets): 801 Central Road

Municipality (Township, if unincorporated) Arlington Heights, Illinois
Section 10, Township 41 N, Range 11 E.
Is project in MSDGC combined sewer area Yes [ ] No [X]

(OFFICE USE ONLY: X 0 0 6 4 3, Y 0 0 8 8 8, Code 0 0 2,
Receiving STP and/or Lift Station North Side Sewage Treatment Works, Skokie.)

DOCUMENTS BEING SUBMITTED: If project involves any of the items listed below, submit the corresponding schedule.

X	Basic Information (Required in all cases)	Schedule A
x	Sewer Connection(s)	Schedule B
x	Sewer Extension(s)	Schedule C
x	Detention Facilities	Schedule D
	Lift Station and/or Force Main	Schedule E
	Characteristics of Waste Discharges	Schedule F
	Treatment or Pre-treatment Facilities	Schedule G
	Certification Relative to Compliance with Art. 4-1, 6-2d, and 6-3b	Schedule H
	Affidavit Relative to Compliance with Art. 4-1, 6-2d, and 6-3b	Schedule J
X	Affidavit of Disclosure of Property Interest	Schedule K
	Notice of Requirements for Storm Water Detention	Schedule L
	Affidavit Relative to Compliance with Art. 6-4	Schedule M

OTHER DOCUMENTS: Indicate title, number of pages and originator:

Plan Sheets C-1 through C-13 entitled The Moorings of Arlington Hts., Il.
prepared by Austin Engineering Co. Inc., Peoria, Il.

OFFICE COPY

87-787

GENERAL CONDITIONS OF THE PERMIT

1. **Adequacy of Design.** The schedules, plans, specifications and all other data and documents submitted for this permit are made a part hereof. The responsibility for the adequacy of the design shall rest solely with the Design Engineer and the issuing of this permit shall not relieve him of that responsibility. The issuance of this permit shall not be construed as approval of the concept or construction details of the proposed facilities and shall not absolve the Permittee, Co-Permittee or Design Engineer of their respective responsibilities.

2. **Joint Construction and Operation Permits.** Unless otherwise stated by the Special Conditions, the issuance of this permit shall be a joint construction and operation permit provided all General, Standard and Special Conditions are complied with.

3. **Allowable Discharges.** Discharges into the sanitary sewer system constructed under this permit shall consist of sanitary sewage only. Unless otherwise stated by the Special Conditions, there shall be no discharge of industrial wastes under this permit. Storm waters shall not be permitted to enter the sanitary sewer system. Without limiting the general prohibition of the previous sentence, roof and footing drains shall not be connected to the sanitary sewer system.

4. **Construction Inspection.** All sewer construction shall be inspected and approved by a Registered Professional Engineer acting on behalf of the Permittee or the owner of the project, or by a duly authorized and competent representative of the Professional Engineer. No sewer trenches shall be backfilled except as authorized by the Inspection Engineer after having inspected and approved the sewer installation.

5. **Maintenance.** The sewer connections, lines, systems or facilities constructed hereunder or serving the facilities constructed hereunder shall be properly maintained and operated at all times in accordance with all applicable requirements. It is understood that the responsibility for maintenance shall run as a joint and several obligation against the property served, the owner and/or the operator of the facilities, and said responsibility shall not be discharged nor in any way affected by change of ownership of said property.

MSDGC STANDARD CONDITIONS

6. **Indemnification.** The Permittee shall be solely responsible for and shall defend, indemnify and save harmless the Metropolitan Sanitary District of Greater Chicago (hereinafter MSDGC) from and against any and all claims, costs, damages, or expenses the MSDGC may suffer, incur, sustain or become liable for on account of any injury to, or death of, any person or persons, or any damage to, or destruction of, any real or personal property that may be caused by the construction, use, state of repair, operation and maintenance of the proposed facilities, arising out of or in consequence of the issuance of this permit. Without limiting the generality of the preceding sentence, the provisions of this paragraph shall extend to indemnify and save harmless the MSDGC from any claims or damages arising out of or in connection with the termination or revocation of this permit.

7. **Construction by MSDGC.** Permittee understands and acknowledges that the MSDGC has the right and power to construct and extend sewer service facilities and render such services within the area to be served by the project for which this permit is issued, and that by the MSDGC constructing and extending such sewer service facilities and rendering such services, the facilities constructed by the Permittee under this permit may decrease in value, become useless or of no value whatsoever, the Permittee may also sustain a loss of business, income and profits.

   Therefore, by accepting this permit and acting thereon, the Permittee, for itself, its successors and assigns, does remise, release and forever discharge the MSDGC of any and all claims whatsoever which Permittee may now have or hereafter acquire and which Permittee's successors and assigns hereafter can, shall, or may have against the MSDGC for all losses and damages, either direct or indirect, claimed to have been incurred by reason of the construction or extension at any time hereafter by the MSDGC of sewer service facilities in the service area contemplated by this permit, the rendering of such services, which MSDGC facilities and services decrease the value of the facilities constructed by the Permittee under this permit, make same useless or of no value whatsoever, including but not limited to, any and all damages arising under Illinois Revised Statutes, Chapter 42, Section 339; the taking of private property for public use without due compensation; the interference with the contracts of Permittee; the interference with Permittee's use and enjoyment of its land; and the decrease in value of Permittee's land.

8. **Third Parties.** This permit does not grant the right or authority to the Permittee: (a) to construct or encroach upon any lands of the MSDGC or of any other parties,(b) to construct outside of the territorial boundaries of the MSDGC,(c) to construct or encroach upon the territorial boundaries of any units of local government within the MSDGC,(d) to connect to or discharge into or be served by (directly or indirectly) any sewer or sewer system owned or operated by third parties.

9. **Costs.** It is expressly stipulated and clearly understood that the sewerage system or facilities for which the permit is issued shall be constructed, operated and maintained at no cost to the MSDGC.

OFFICE COPY

MSDGC Permit No. 87-787
IEPA Log No. _____

Schedules To Be Submitted With MSDGC
And IEPA Joint Permit Applications

SCHEDULE A - BASIC INFORMATION

1. PROJECT INFORMATION:
Name of project (as shown on plans) The Moorings of Arlington Heights, Illinois
Location of project (street address or with respect to two major streets) 801 Central Road
Municipality (Township, if unincorporated) Arlington Heights, Illinois

2. APPROXIMATE TIME SCHEDULE:
Sewerage Facilities Construction Schedule: Start of Construction ASAP 9/87; Date of Completion 12/88.
Occupancy Schedule: Date Occupancy Begins 12/88; 100% Occupancy to be reached by 12/90.

3. APPURTENANCES:
Project includes the following: (check applicable items by "X"): Manholes [X]; Catch basins or inlets [X]; Catch basin restrictors [ ]; Drop Manholes [ ]; Stream Crossing [ ]; Siphon [ ]; Direct Connections to MSDGC Facilities [ ].

4. RECEIVING SANITARY SEWER SYSTEM:
System to which project will connect is existing [X]; proposed [ ]; under construction [ ]. If proposed or under construction by applicant, indicate MSDGC Permit No. N/A; (IEPA Permit No. N/A). Identify owners of all sewer systems from project to MSDGC interceptor Kimball Hill Inc., Arlington Hgts.
If project discharges directly or indirectly to a local combined sewer, the receiving combined sewer does [ ], does not [ ] have an overflow. If overflow exists, discharge is made to _____ by means of _____.
(FOR OFFICE USE: Receiving MSDGC Treatment Plant and/or Lift Station Olive T.P.
Point of Discharge of Sanitary Sewers; X [| | | | |], Y [| | | | |], Code [0101],
SB [| | | -1014])

5. EXISTING LIFT STATION: None
Receiving system includes an existing local Lift Station Yes [ ], No [ ]; Project is [ ], is not [ ] in design service area of lift station. Location of existing lift station _____; Rated capacity of lift station _____ gpm; MSDGC or other permit number under which lift station was constructed _____.
Existing lift station does [ ], does not [ ] have stand-by power; does [ ], does not [ ] have an overflow; if there is an overflow, overflow discharges to storm sewer [ ], to waterway [ ], name of waterway _____.

6. FLOOD PLAIN:
Project area is partially (or totally) in flood plain Yes [ ], No [X]; if yes, complete the following: Percent of area in flood plain _____ %. Flood crest elevation is _____; Name of USGS Quadrangle Arlington Hgts, Ill.
Volume of flood storage available prior to development (Volume between flood crest elevation and existing ground) _____ Cu. Yd. Volume of fill made in flood plain _____ Cu. Yd. Compensatory storage provided _____ Cu. Yd.
Identify any manholes in flood plain _____.

7. AREA AND DRAINAGE OF PROJECT:
Area of this project 23.342 acre(s). Total contiguous property ownership, including this project, 42.1 acre(s).
Existing impervious area within project, if any (paved, roofed, etc.) 0.928 acre(s). New impervious area created within project (paved, roofed, etc.) 11.0 acre(s). Manner of drainage: Storm sewer provided [X]; Catch basins or inlets [X]; Surface runoff [X]; Other [X], describe: lakes and detention basins.

8. DETENTION:
Detention is provided under this permit: Yes [X], No [ ]. Detention is required by MSDGC [ ], local government [X], other [ ], describe 2 lakes and 4 detention areas.
Method of detention: Detention reservoir [X]; Roof detention [ ]; Detention on parking area or ground [X]; Restriction of storm outlet [X], pipe size of restriction * inch; other method lakes.
Total area served by the detention facilities proposed 25.439 acre(s); (Submit calculations and contour/grading map of the service area). Actual detention volume provided 9.710 acre-feet; actual release rate 6.98.97 cfs (submit calculations). This project is part of the service area of an existing detention reservoir: Yes [ ], No [X]. Indicate MSDGC permit number covering the detention reservoir, No. N/A, or submit drawings and calculations.
*12", 15" and 18"

(MSDGC USE ONLY: Point of discharge of storm waters; X [| | | | |]; Y [| | | | |]; DB [5110].)

* N. Basin 8" S.E. Basin 6"
N.East. Basin 6" West Lake 10"
East Lake 8" S.West Basin 8"

Schedule K

OFFICE COPY

MSD Permit Application No. 87-787

AFFIDAVIT OF DISCLOSURE OF PROPERTY INTEREST

STATE OF ILLINOIS)
) SS
COUNTY OF COOK)

(Affidavit to be submitted with all permit applications in separate sewer areas.)

Name of Project: The Moorings of Arlington Heights, Illinois

Location of Project: 801 Central Road, Arlington Heights, Illinois

A. Michael S. McCarthy, after first being duly
(Name of Affiant - Type or Print)
sworn under oath, states that he is (the record title holder), (a principal beneficiary of land Trust), held by _____ as Trustee), (an Officer
(Name of Trust Holder)
Vice-President/Secretary of Parkside Development Corporation Corporation), (a
(official capacity) (Name of Corporation)
General Partner of _____ Partnership), which is the record title holder of
(Name of Partnership)
the property which is the subject of a certain sewerage system permit application (covering the project indicated and designated by the number shown above) filed with the Metropolitan Sanitary District of Greater Chicago, which property is shown on the attached plat of survey which together with the legal description of the property are attached hereto as Exhibit "A" and specifically incorporated by reference herein.

B. Affiant further states that said property described in Exhibit "A" has a total area of 43 acres and constitutes the total contiguous ownership of the owner, and that the portion of the property currently proposed for development consists of 43 acres, and the property is intended for use as described hereinafter: Continuing Care Retirement Community for older adults and related nursing home center.

*C. Affiant further states that, because of its size and intended use, the property described in Exhibit "A" comes under the requirements of the MSDGC with respect to the establishment of on-site storm water detention, and that such detention facilities will be provided as part of the project in accordance with the design and calculations furnished to satisfy said requirements with respect to the property described in Exhibit "A", and further states that:

1. The owner of the property or any beneficiary of a land trust, if any, which is the record title holder of the property has no present interest, nor had any interest at any time during the previous two years, in any lands contiguous to said property. (If such interest is or was held, detention must be provided for the total.)

2. No owner of any lands contiguous to the property and no beneficiary of a land trust, if any, which is the record title holder of any land contiguous to the property has any interest in the property. (If such interest is held, detention must be provided for the total.)

3. Affiant understands and agrees that any permit issued by MSDGC in reliance upon this affidavit shall be deemed to contain a special condition that if, within two years after the issuance of the permit, the owner or any beneficiary of a land trust, if any, which is the record title holder of the property, acquires any interest in lands contiguous to the property, the owner shall provide for storm water detention for such lands in which an interest is acquired, regardless of the size of such lands.

[illegible]

[illegible]

*Delete paragraph C if exemption is claimed. Delete paragraph D if no exemption is claimed.

OFFICIAL COPY

MSD Permit Application No. 87-787

[redacted]

This affidavit is given to induce the Metropolitan Sanitary District of Greater Chicago to issue its sewerage system permit with respect to the aforedescribed property and to exempt said property from any present requirements to provide and maintain storm water detention facilities thereon.

E. Affiant further states, that for the purpose of this affidavit, the following terms have the meanings indicated:

Owner: means record title holder or a beneficiary of a land trust which is the record title holder, and includes singular and plural; if the owner is other than an individual, the term includes beneficiaries, agents, shareholders, officers and directors.

Ownership: means holding of record title or any beneficial interest.

Interest: means property interest or contractual interest, legal or equitable, directly or indirectly, in part or in full, and includes option to buy. In the case of shareholder interest, the shareholder shall be deemed to have interest if he owns or controls 5% or more of the shares.

Contiguous: means adjacent to and touching at one point or more; if the lands are separated by an easement or a dedicated right-of-way, it shall be considered contiguous.

F. Affiant understands and agrees that in the event that any of the aforementioned information is incorrect, erroneous, false or misleading, the District shall have the option to immediately terminate any permit issued based on the above information.

Dated this 30th day of October 1987.

Michael S. McCoy
(Affiant)

SUBSCRIBED and SWORN to before me this 30th day of October 1987.

Pamela M. Shoaf
(Notary Public)

My Commission Expires Feb. 24, 1990

LSS-75-04/Rev. 76-03-12
Schedule K

Parcel One:
That part of the NE¼ of the NW¼ of Sec. 10, T. 41 N., R. 11 E. of the 3rd P.M., described as follows: Commencing at the SW corner of said NE¼ of the NW¼; thence Easterly along the S. line thereof, 330.53' for a point of beginning; thence Northerly along a line, 330.5' E. of and parallel with the W. line of said NE¼ of the NW¼ a distance of 192.66'; thence Easterly perpendicular to said W. line, 270.0'; thence Southeasterly along a line deflecting 45 degrees to the right from an extension of the last described line, 35.0'; thence Easterly along a line deflecting 45 degrees to the left from an extension of the last described line, 210.0'; thence Southerly parallel with said W. line, 25.0'; thence Easterly perpendicular to said W. line, 60.0'; thence Northerly parallel to said W. line, 97.48'; thence Westerly perpendicular to said W. line, 210.0'; thence Northwesterly along a line deflecting 45 degrees to the right from an extension of the last described line, 180.0'; thence Westerly along a line deflecting 45 degrees to the left from an extension of the last described line, 130.0'; thence Northerly parallel to said W. line of the NE¼ of the NW¼, a distance of 140.0'; thence Easterly perpendicular to said W. line, 190.0'; thence Northerly parallel to said W. line, 135.84' to a point on a line 749.0' S. of and parallel to the S. line of Central Avenue; thence Easterly parallel to said S. line, 170.36'; thence Northerly perpendicular to said S. line, 35.0'; thence Easterly parallel to said S. line, 200.0'; thence Northerly perpendicular to said S. line 70.0'; thence Westerly parallel to said S. line, 180.0'; thence Northerly perpendicular to said S. line, 95.0'; thence Westerly parallel with said S. line 70.0'; thence Northerly perpendicular to said S. line, 135.0'; thence Northwesterly along a line deflecting 45 degrees to the left from an extension of the last described line, 141.42'; thence Westerly along a line deflecting 45 degrees to the left from an extension of the last described line, 175.0'; thence Southerly perpendicular to the aforesaid S. line of Central Avenue, 120.0'; thence Westerly parallel with said S. line, 55.0'; thence Northerly perpendicular to said S. line, 434.0' to a point on the S. line of aforementioned Central Avenue; thence Wasterly along said S. line of Central Avenue, 902.99' to a point on the E. line of said NE¼ of the NW¼ of Sec. 10, said point being 50.0' S. of the NE corner thereof; thence Southerly along said E. line, 1368.57' to the SE corner of said NE¼ of the NW¼; thence Westerly along the S. line thereof, 991.0' to the point of beginning, containing 23.5198 acres, in Cook County, Illinois.

COPY

Parcel Two:
That part of the NE¼ of the NW¼ of Sec. 10, T. 41 N., R. 11 E. of the 3rd P.M., described as follows: Commencing at the SW corner of said NE¼ of the NW¼; thence Easterly along the S. line thereof, 330.53'; thence Northerly along a line 330.50' E. of and parallel with the W. line of said NE¼ of the NW¼, a distance of 192.66' for a point of beginning; thence continuing Northerly along the last described line, a distance of 455.0' to a point on a line 749.0' S. of and parallel with the S. line of Central Avenue; thence Easterly along said parallel line, 287.50'; thence Southerly parallel with said W. line of the NE¼ of the NW¼ a distance of 135.84'; thence Westerly perpendicular to said W. line, 190.0'; thence Southerly parallel with said W. line, 140.0'; thence Easterly perpendicular to said W. line, 130.0'; thence Southeasterly along a line deflecting 45 degrees to the right from an extension of the last described line, 180.0'; thence Easterly along a line deflecting 45 degrees to the left from an extension of the last described line, 210.0'; thence Southerly parallel with the aforesaid W. line of the NE¼ of the NW¼ of Sec. 10, a distance of 97.48'; thence Westerly perpendicular to said W. line, 60.0'; thence Northerly parallel with said W. line 25.0'; thence Westerly perpendicular to said W. line, 210.0'; thence Northwesterly along a line deflecting 45 degrees to the right from an extension of the last described line, 35.0' thence Westerly along a line deflecting 45 degrees to the left from an extension of the last described line, 270.0' to the point of beginning, containing 2.8877 acres, in Cook County, Illinois.

EXHIBIT A

Parcel Three:
That part of the NE¼ of the NW¼ of Sec. 10, T. 41 N., R. 11 E. of the 3rd P.M., described as follows: Beginning at the SW corner of said NE¼ of the NW¼ of Sec. 10; thence Northerly along the W. line thereof, 1406.13' to the Southerly line of Central Avenue, being a line 50.0' S. of and parallel with the N. line of said NE¼ of the NW¼; thence Easterly along said S. line of Central Avenue, 419.50'; thence Southerly perpendicular to said S. line, 434.0'; thence Westerly parallel with said S. line, 104.0'; thence Southerly perpendicular to said S. line 75.0'; thence Westerly parallel with said S. line, 30.0'; thence Southerly perpendicular to said S. line, 20.0'; thence Westerly parallel with said S. line, 56.0'; thence Southerly perpendicular to said S. line, 220.0' to a point on a line 749.0' S. of and parallel with the aforesaid S. line of Central Avenue; thence Easterly along said parallel line, 112.14' to a point on a line 330.50' E. of and parallel with the W. line of said NE¼ of the NW¼ of Sec. 10; thence Southerly along said parallel line, 647.66' to a point on the S. line of said NE¼ of the NW¼, 330.53' E. of the point of beginning; thence Westerly along said S. line 330.53' to the point of beginning, containing 10.8645 acres, in Cook County, Illinois.

EXHIBIT A

87-787

Parcel Four:
That part of the NE¼ of the NW¼ of Sec. 10, T. 41 N., R. 11 E. of the 3rd P.M., described as follows: Commencing at the SW corner of said NE¼ of the NW¼; thence Easterly along the S. line thereof, 330.53'; thence Northerly along a line 330.50' E. of and parallel with the W. line of said NE¼ of the NW¼, a distance of 647.66' for a point of beginning; thence Westerly parallel to the S. line of Central Avenue, a distance of 112.14'; thence Northerly perpendicular to said S. line, 220.0'; thence Easterly parallel to said S. line, 56.0'; thence Northerly perpendicular to said S. line 20.0'; thence Easterly parallel with said S. line, 30.0'; thence Northerly perpendicular to said S. line 75.0'; thence Easterly parallel with said S. line, 159.0'; thence Northerly perpendicular to said S. line 120.0'; thence Easterly parallel with said S. line 175.0'; thence Southeasterly along a line deflecting 45 degrees to the right from an extension of the last described line, 141.42'; thence Southerly along a line deflecting 45 degrees to the right from an extension of the last described line, 135.0'; thence Easterly parallel with said S. line of Central Avenue, 70.0'; thence Southerly perpendicular to said S. line, 180.0'; thence Southerly perpendicular to said S. line 70.0'; thence Westerly parallel with said S. line, 200.0'; thence Southerly perpendicular to said S. line, 35.0'; thence Westerly parallel with said S. line, 457.86' to the point of beginning, containing 4.8239 acres, in Cook County, Illinois.

EXHIBIT A

OFFICE COPY

MSDGC Permit No. 87-787
IEPA Log No. _____

ENGINEERING CERTIFICATIONS

CERTIFICATE BY DESIGN ENGINEER: I hereby certify that the project described herein has been designed in accordance with the requirements set forth in this application and all applicable ordinances, rules, regulations, Local, State and Federal Laws, and design criteria of the issuing authority; that the storm drainage and sanitary sewer system designed for this project are proper and adequate; that, where the design involves one or more connections to an existing local sewer system, the capacity of said system has been examined and the system is found to be adequate to transport the wastewater that will be added through the proposed sewer without violating any provisions of the Illinois Environmental Protection Act or the rules and regulations thereunder.

Comments, if any: Bypass storm sewer & swale designed as dictated by Arlington Heights & Mt. Prospect.

Engineering Firm: Austin Engineering Co., Inc. Telephone: (309) 691-0224

Address: 810 N. University City: Peoria Zip: 61615

JAMES R. FRANKLIN 82351 P.E. REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS SEAL

Signature _____ Date: September 21, 1987

(Name and Title)
James R. Franklin, P.E.
Vice President

CERTIFICATE BY MUNICIPAL OR SYSTEM ENGINEER: The application and the drawings, together with other data being submitted with this application, have been examined by me and are found to be in compliance with all applicable requirements. The manner of drainage is satisfactory and proper. The existing local sewer system to which the project discharges has been examined and the system is found to be adequate to transport the wastewater that will be added through the proposed sewer without violating any provisions of the Illinois Environmental Protection Act or the rules and regulations thereunder.

Comments, if any: _____

Owner of Local Sewer System Village of Arlington Heights, IL.

Acting Municipal Engineer: William C. Blecke Telephone: 312-577-5625

Address: 33 S. Arlington Heights Rd. City: Arlington Heights Zip: 60005

P.E. SEAL

Signature William C. Blecke Date: 11-10-87

(Name and Title)

CERTIFICATE BY INSPECTION ENGINEER: I hereby certify that construction of the project will be in substantial compliance with the data and the plans submitted with this application; that approval will be obtained from the issuing authority prior to making any changes that would affect capacity, maintenance, design requirements, service area or the permit requirements; that a set of "As-Constructed" drawings, certified to be correct, over the signatures of both the Contractor and the Undersigned Engineer will be furnished to the MSDGC within sixty (60) days after testing and approval by the District of the completed work.

Engineering Firm: Donald Manhard & Associates Telephone: 1-312-634-1300

Address: 900 Knightsbridge Parkway Suite 150 City: Lincolnshire, IL Zip: 60069

PETER E. MANHARD 062-046187 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Signature Peter E Manhard Date: 10/28/87

(Name and Title)

OFFICE COPY

MSDGC Permit No. 87-787
IEPA Log No. _____

SCHEDULE B - SEWER CONNECTIONS

BUILDING INFORMATION: Building sewer connections are [X], are not [ ] part of this permit; if part of this permit, complete the following:

1. **TYPE OF CONSTRUCTION:** Residential [X], Commercial [ ], Light Industrial [ ], Manufacturing [ ], Recreational [ ], Existing Septic System to be abandoned [ ], Other _____.

2. **RESIDENTIAL BUILDINGS:** Single Family [ ], Multiple Family [X]. If single family: Total dwelling units _____; Estimated total population _____. If multiple family: Number of buildings 6; Number of dwelling units per building 251 Total; Total number of sewer connections 11; Estimated total population 542 + 50 employees (est.)

3. **NON-RESIDENTIAL BUILDINGS:** Describe use of building None. Product manufactured or process used _____. Number of buildings to be served under this permit _____. Number of sewer connections under this permit _____. Estimated number of employees _____. Estimated number of occupants (transients) _____. Estimated total flow _____ gpd. Population equivalent (If based on BOD, use IPCB basis) _____.

4. **BUILDING USE:** Use of building will involve the following: Food preparation Yes [X] No [ ]; Food processing Yes [ ] No [X]; Auto Service Yes [ ] No [X]; Auto Wash Yes [ ] No [X]. If building involves any of these uses, indicate if sewer connections will receive domestic sewage only [ ], will receive other wastes (commercial, not industrial) [X]; if wastes other than domestic are discharged, indicate method of control being provided; Grease separator [X], Triple Basin [ ], Mud Basin [ ], other [ ] specify _____. Indicate whether control is inside [X], or outside building [ ]. Industrial waste is [ ], is not [X] produced by the intended use of the building. (Unless permitted under the special conditions, discharge of industrial waste is prohibited). If industrial waste is produced, submit Schedule F, indicate method of disposal N/A. This project includes a swimming pool: Yes [X], No [ ]; if yes, submit piping drawings. (Future swimming pool)

5. Complete summary of Sanitary Sewers on Schedule C.

* Apartments for rent

SCHEDULE C - SEWER EXTENSIONS

NATURE OF PROJECT: Project consists of single sewer extension to serve the building(s) indicated above (no further extension anticipated) [X]; Consists of a sewer system (to serve a subdivision) [ ]; Consists of a trunk sewer only (outlet sewer with no proposed connections) to serve future development [ ]. Project is publicly financed Yes [ ], No [X].

AREA AND POPULATION: Submit a map of service area and complete the following:

1. Area serviceable by the sewers covered by this permit (including area to be served hereunder) 23.3 acres; population 542 + 50 employees
2. Potential service area of sewers covered by this permit, including planned or anticipated extensions 28.9 acres; population 596 +50 employees
3. Design flow: average (if based on other than 100 gpcpd) 61,350 gpcpd; Maximum design flow as percent of average 400%. (Use MSDGC Manual of Procedures, Article 3 - 7).
4. Basis of design for area zoned or planned for non-residential use: Average design flow N/A gpd/acre. Maximum design flow as percent of average _____.

SUMMARY OF SANITARY SEWERS (INCLUDE ALL SEWERS IN COMBINED SEWER AREA): Include building service sewers (stubs or risers) if any.

Pipe size - inches	10"	8"	6"	#1 VCP ASTM C-700			
Total length - feet	2078	210	~~394~~ 352	#2 ASTM C-425 & D-1784			
Min. slope used - %	0.28	0.50	1.00	#3 D.I. ANSI A21.51			
Max. slope used - %	0.28	6.00	100*	#4 ANSI ANSI A21.11			
Pipe Material & Spec.	#1	#1 #3	#1	*Service riser			
Joint Material & Spec.	#2	#2 #4	#2				
Total Manholes	9						
Total Cleanouts	0	0	5				

OFFICE COPY

MSDGC Permit No. 87 787
IEPA Log No.

SYSTEMS SECTION
APR -6 AM 9:58

SCHEDULE D - DETENTION*

I. Project Information

Name of Project (as shown on plans) The Moorings of Arlington Heights, Illinois

Location 801 Central Road, Arlington Heights, Illinois

Design criteria: MSDGC [ ]; Local Government [ ]; Other [ ]

II. Determination of Allowable Release Rate - Undeveloped Site: NORTH DETENTION BASIN

1.	Area of site	80	acres
2.	Average ground slope	0.009	foot/foot
3.	Overland flow distance	700	feet
4.	Overland flow time of concentration	45	minutes
5.	Average slope of channelized flow (See Note a)	-	foot/foot
6.	Channelized flow distance (See Note a)	-	feet
7.	Channelized flow time of concentration	-	minutes
8.	Total time of concentration (Line 4 + Line 7)	45	minutes
9.	Rainfall intensity for three-year storm	1.91	inches/hr.
10.	Runoff coefficient (Use c=0.15 as maximum, see Article 6-4b(1) of the MSDGC Manual)	0.15	
11.	Allowable release rate, (line 1 x line 9 x line 10:Q=ciA)	2.29	cfs.

Note a: For flow in a well defined channel determine time of concentration from measured lengths, cross-sections and slopes and submit necessary calculations and drawings.

III. Determination of Reservoir Size - Developed Site:

12.	Impervious drainage area	3.1	acres
13.	Pervious drainage area	4.9	acres
14.	Composite runoff coefficient (c). (Submit calculations)	0.67	
15.	Required reservoir capacity (Submit calculations)	1.14	acre-feet

IV. Permissible Bypass Rate through Development Site from Upstream Area:

16.	Total area upstream	391	acres
17.	Future/present impervious area (cross out inappropriate case)	-	acres
18.	Future/present pervious area (cross out inappropriate case)	-	acres
19.	Composite runoff coefficient (Must not be less than 0.35 per MSDGC Manual of Procedures Article 6-4b(2)	0.50	
20.	Design storm frequency for the upstream area (Design storm frequency shall be as determined by local ordinance; if no local requirement is established, use 5-yr. storm frequency.)	5	year
21.	Time of concentration for the upstream area at point of entry; upstream area to be considered as developed. (By same method as line 8)	92	minutes
22.	Design storm intensity for above duration	2.06	inches/hour
23.	Permissible bypass rate (line 16 x line 19 x line 22)	*96	cfs.

*96 cfs= max. rate into Mt. Prospect storm sewer as per Mt. Prospect
*22 cfs to be carried in by-pass swale, see calculations.

If more than one detention reservoir is provided, submit separate schedules and calculations as necessary.

Engineering Firm Austin Engineering Co., Inc., Peoria, Illinois

JAMES R. FRANKLIN 22751 REGISTERED PROFESSIONAL ENGINEER P.E. SEAL ILLINOIS

Signature [signature] Date Oct. 20, 1987
(Name and Title) Rev. 2/10/88

James R. Franklin, P.E. Vice President

OFFICE COPY

MSDGC Permit No. 87 787
IEPA Log No. _____

SCHEDULE D - DETENTION*

I. Project Information

Name of Project (as shown on plans) The Moorings of Arlington Heights

Location 801 Central Road, Arlington Hts., IL

Design criteria: MSDGC [ ]; Local Government [X]; Other [ ] _____

II. Determination of Allowable Release Rate - Undeveloped Site: Northeast Detention Basin

1.	Area of site	2.10	acres
2.	Average ground slope		foot/foot
3.	Overland flow distance		feet
4.	Overland flow time of concentration	45	minutes
5.	Average slope of channelized flow (See Note a)		foot/foot
6.	Channelized flow distance (See Note a)	1	feet
7.	Channelized flow time of concentration		minutes
8.	Total time of concentration (Line 4 + Line 7)	45	minutes
9.	Rainfall intensity for three-year storm	1.91	inches/hr.
10.	Runoff coefficient (Use c=0.15 as maximum, see Article 6-4b(1) of the MSDGC Manual)	0.15	
11.	Allowable release rate, (line 1 x line 9 x line 10: Q=ciA)	0.60	cfs.

Note a: For flow in a well defined channel determine time of concentration from measured lengths, cross-sections and slopes and submit necessary calculations and drawings.

III. Determination of Reservoir Size - Developed Site:

12.	Impervious drainage area	0	acres
13.	Pervious drainage area	2.10	acres
14.	Composite runoff coefficient (c). (Submit calculations)	0.5	
15.	Required reservoir capacity (Submit calculations)	0.20	acre-feet

IV. Permissible Bypass Rate through Development Site from Upstream Area:

16.	Total area upstream		acres
17.	Future/present impervious area (cross out inappropriate case)		acres
18.	Future/present pervious area (cross out inappropriate case)		acres
19.	Composite runoff coefficient (Must not be less than 0.35 per MSDGC Manual of Procedures Article 6-4b(2)		
20.	Design storm frequency for the upstream area (Design storm frequency shall be as determined by local ordinance; if no local requirement is established, use 5-yr. storm frequency.)		year
21.	Time of concentration for the upstream area at point of entry; upstream area to be considered as developed. (By same method as line 8)		minutes
22.	Design storm intensity for above duration		inches/hour
23.	Permissible bypass rate (line 16 x line 19 x line 22)		cfs.

*If more than one detention reservoir is provided, submit separate schedules and calculations as necessary.

PETER E. MANHARD 062-043187 REGISTERED PROFESSIONAL ENGINEER SEAL ILLINOIS

Firm Donald Manhard Associates, Inc.

Signature _____ Proj. Eng. Date 2/10/88

(Name and Title)

OFFICE COPY

MSDGC Permit No. 87 787
IEPA Log No. _____

SCHEDULE D - DETENTION*

I. Project Information

Name of Project (as shown on plans) The Moorings of Arlington Heights, Illinois

Location 801 Central Road, Arlington Heights, Illinois

Design criteria: MSDGC [ ]; Local Government [ ]; Other [ ] EAST LAKE

II. Determination of Allowable Release Rate - Undeveloped Site:

1.	Area of site	6.26	acres
2.	Average ground slope	0.014	foot/foot
3.	Overland flow distance	440	feet
4.	Overland flow time of concentration	45	minutes
5.	Average slope of channelized flow (See Note a)	-	foot/foot
6.	Channelized flow distance (See Note a)	-	feet
7.	Channelized flow time of concentration	-	minutes
8.	Total time of concentration (Line 4 + Line 7)	45	minutes
9.	Rainfall intensity for three-year storm	1.91	inches/hr.
10.	Runoff coefficient (Use c=0.15 as maximum, see Article 6-4b(1) of the MSDGC Manual)	0.15	
11.	Allowable release rate, (line 1 x line 9 x line 10:Q=ciA)	* 1.79	cfs.

(USE 1.47 CFS AS PER VILLAGE RESTRICTIONS

Note a: For flow in a well defined channel determine time of concentration from measured lengths, cross-sections and slopes and submit necessary calculations and drawings.

III. Determination of Reservoir Size - Developed Site:

12.	Impervious drainage area	2.84	acres
13.	Pervious drainage area	3.42	acres
14.	Composite runoff coefficient (c). (Submit calculations)	0.70	
15.	Required reservoir capacity (Submit calculations)	1.00	acre-feet

IV. Permissible Bypass Rate through Development Site from Upstream Area:

16.	Total area upstream		acres
17.	Future/present impervious area (cross out inappropriate case)		acres
18.	Future/present pervious area (cross out inappropriate case)		acres
19.	Composite runoff coefficient (Must not be less than 0.35 per MSDGC Manual of Procedures Article 6-4b(2)		
20.	Design storm frequency for the upstream area (Design storm frequency shall be as determined by local ordinance; if no local requirement is established, use 5-yr. storm frequency.)		year
21.	Time of concentration for the upstream area at point of entry; upstream area to be considered as developed. (By same method as line 8)		minutes
22.	Design storm intensity for above duration		inches/hour
23.	Permissible bypass rate (line 16 x line 19 x line 22)		cfs.

If more than one detention reservoir is provided, submit separate schedules and calculations as necessary.

JAMES R. FRANKLIN 22751 REGISTERED PROFESSIONAL ENGINEER P.E. SEAL ILLINOIS

Engineering Firm Austin Engineering Co., Inc., Peoria, Illinois

Signature _____ Date Oct. 20, 1987

(Name and Title)

James R. Franklin, P.E. Vice President

Rev. 2/10/88

OFFICE COPY

MSDGC Permit No. 87 787
IEPA Log No. _____

SCHEDULE D - DETENTION*

I. Project Information

Name of Project (as shown on plans) The Moorings of Arlington Heights, Illinois

Location 801 Central Road, Arlington Heights, Illinois

Design criteria: MSDGC [ ]; Local Government [ ]; Other [ ] _____

SOUTHEAST DETENTION BASIN

II. Determination of Allowable Release Rate - Undeveloped Site:

1.	Area of site	4.17	acres
2.	Average ground slope	0.005	foot/foot
3.	Overland flow distance	950	feet
4.	Overland flow time of concentration	45	minutes
5.	Average slope of channelized flow (See Note a)	-	foot/foot
6.	Channelized flow distance (See Note a)	-	feet
7.	Channelized flow time of concentration	-	minutes
8.	Total time of concentration (Line 4 + Line 7)	45	minutes
9.	Rainfall intensity for three-year storm	1.91	inches/hr.
10.	Runoff coefficient (Use c=0.15 as maximum, see Article 6-4b(1) of the MSDGC Manual)	0.15	
11.	Allowable release rate, (line 1 x line 9 x line 10:Q=ciA)	* 1.19	cfs.

(USE 0.98 CFS AS PER VILLAGE RESTRICTIONS)

Note a: For flow in a well defined channel determine time of concentration from measured lengths, cross-sections and slopes and submit necessary calculations and drawings.

* 1.19 cfs + 1.79 cfs from lake
TOTAL RELEASE = 2.98 cfs (use 2.45 cfs as per Village restructions)

III. Determination of Reservoir Size - Developed Site:

12.	Impervious drainage area	1.21	acres
13.	Pervious drainage area	2.96	acres
14.	Composite runoff coefficient (c). (Submit calculations)	0.63	
15.	Required reservoir capacity (Submit calculations)	0.58	acre-feet

IV. Permissible Bypass Rate through Development Site from Upstream Area:

16.	Total area upstream	_____	acres
17.	Future/present impervious area (cross out inappropriate case)	_____	acres
18.	Future/present pervious area (cross out inappropriate case)	_____	acres
19.	Composite runoff coefficient (Must not be less than 0.35 per MSDGC Manual of Procedures Article 6-4b(2)	_____	
20.	Design storm frequency for the upstream area (Design storm frequency shall be as determined by local ordinance; if no local requirement is established, use 5-yr. storm frequency.)	_____	year
21.	Time of concentration for the upstream area at point of entry; upstream area to be considered as developed. (By same method as line 8)	_____	minutes
22.	Design storm intensity for above duration	_____	inches/hour
23.	Permissible bypass rate (line 16 x line 19 x line 22)	_____	cfs.

If more than one detention reservoir is provided, submit separate schedules and calculations as necessary.

JAMES R. FRANKLIN 22751 REGISTERED PROFESSIONAL ENGINEER ILLINOIS P.E. SEAL

Engineering Firm Austin Engineering Co., Inc., Peoria, Illinois

Signature _____ Date Oct. 20, 1987

(Name and Title)

James R. Franklin, P.E. Vice President

Rev. 2/10/88

6 C

OFFICE COPY

MSDGC Permit No. 87-787
IEPA Log No.

SCHEDULE D - DETENTION*

I. Project Information

Name of Project (as shown on plans) The Moorings of Arlington Heights, Illinois

Location 801 Central Road, Arlington Heights, Illinois

Design criteria: MSDGC [ ]; Local Government [ ]; Other [ ] WEST LAKE

II. Determination of Allowable Release Rate - Undeveloped Site:

1.	Area of site	14.86	acres
2.	Average ground slope	0.0033	foot/foot
3.	Overland flow distance	1200	feet
4.	Overland flow time of concentration	45	minutes
5.	Average slope of channelized flow (See Note a)	-	foot/foot
6.	Channelized flow distance (See Note a)	-	feet
7.	Channelized flow time of concentration	-	minutes
8.	Total time of concentration (Line 4 + Line 7)	45	minutes
9.	Rainfall intensity for three-year storm	1.91	inches/hr.
10.	Runoff coefficient (Use c=0.15 as maximum, see Article 6-4b(1) of the MSDGC Manual)	0.15	
11.	Allowable release rate, (line 1 x line 9 x line 10: Q=ciA)	4.26	cfs.

Note a: For flow in a well defined channel determine time of concentration from measured lengths, cross-sections and slopes and submit necessary calculations and drawings.

* use 3.50 cfs detention basin restriction

III. Determination of Reservoir Size - Developed Site:

12.	Impervious drainage area	5.0	acres
13.	Pervious drainage area	9.86	acres
14.	Composite runoff coefficient (c). (Submit calculations)	0.65	
15.	Required reservoir capacity (Submit calculations)	2.15	acre-feet

IV. Permissible Bypass Rate through Development Site from Upstream Area:

16.	Total area upstream		acres
17.	Future/present impervious area (cross out inappropriate case)		acres
18.	Future/present pervious area (cross out inappropriate case)		acres
19.	Composite runoff coefficient (Must not be less than 0.35 per MSDGC Manual of Procedures Article 6-4b(2)		
20.	Design storm frequency for the upstream area (Design storm frequency shall be as determined by local ordinance; if no local requirement is established, use 5-yr. storm frequency.)		year
21.	Time of concentration for the upstream area at point of entry; upstream area to be considered as developed. (By same method as line 8)		minutes
22.	Design storm intensity for above duration		inches/hour
23.	Permissible bypass rate (line 16 x line 19 x line 22)		cfs.

If more than one detention reservoir is provided, submit separate schedules and calculations as necessary.

JAMES R. FRANKLIN 22751 REGISTERED PROFESSIONAL ENGINEER ILLINOIS PE. SEAL

Engineering Firm Austin Engineering Co., Inc., Peoria, Illinois

Signature [signature] Date Oct. 20, 1987

(Name and Title) James R. Franklin, P.E. Vice President

Rev. 2/10/88

OFFICE COPY

MSDGC Permit No. 87-787
IEPA Log No. _____

SCHEDULE D - DETENTION*

I. **Project Information**

Name of Project (as shown on plans) The Moorings of Arlington Heights, Illinois

Location 801 Central Road, Arlington Heights, Illinois

Design criteria: MSDGC [ ]; Local Government [ ]; Other [ ] _____

SOUTHWEST DETENTION BASIN

II. **Determination of Allowable Release Rate - Undeveloped Site:**

1.	Area of site	4.02	acres
2.	Average ground slope	0.0008	foot/foot
3.	Overland flow distance	600	feet
4.	Overland flow time of concentration	45	minutes
5.	Average slope of channelized flow (See Note a)	-	foot/foot
6.	Channelized flow distance (See Note a)	-	feet
7.	Channelized flow time of concentration	-	minutes
8.	Total time of concentration (Line 4 + Line 7)	45	minutes
9.	Rainfall intensity for three-year storm	1.91	inches/hr.
10.	Runoff coefficient (Use c=0.15 as maximum, see Article 6-4b(1) of the MSDGC Manual)	0.15	
11.	Allowable release rate, (line 1 x line 9 x line 10; Q=ciA)	*1.15	cfs.

(USE 0.98 CFS AS PER VILLAGE RESTRICTION)

Note a: For flow in a well defined channel determine time of concentration from measured lengths, cross-sections and slopes and submit necessary calculations and drawings.

*1.15 + 4.26 from west lake
TOTAL RELEASE = 5.41 cfs (use 4.45 cfs as per Village restructions

III. **Determination of Reservoir Size - Developed Site:**

12.	Impervious drainage area	1.39	acres
13.	Pervious drainage area	2.63	acres
14.	Composite runoff coefficient (c). (Submit calculations)	0.66	
15.	Required reservoir capacity (Submit calculations)	0.59	acre-feet

IV. **Permissible Bypass Rate through Development Site from Upstream Area:**

16.	Total area upstream		acres
17.	Future/present impervious area (cross out inappropriate case)		acres
18.	Future/present pervious area (cross out inappropriate case)		acres
19.	Composite runoff coefficient (Must not be less than 0.35 per MSDGC Manual of Procedures Article 6-4b(2)		
20.	Design storm frequency for the upstream area (Design storm frequency shall be as determined by local ordinance; if no local requirement is established, use 5-yr. storm frequency.)		year
21.	Time of concentration for the upstream area at point of entry; upstream area to be considered as developed. (By same method as line 8)		minutes
22.	Design storm intensity for above duration		inches/hour
23.	Permissible bypass rate (line 16 x line 19 x line 22)		cfs.

*If more than one detention reservoir is provided, submit separate schedules and calculations as necessary.

JAMES R. FRANKLIN 22751 PROFESSIONAL ENGINEER STATE OF ILLINOIS SEAL

Engineering Firm Austin Engineering Co., Inc., Peoria, Illinois

Signature _____ Date Oct. 20, 1987

(Name and Title)

James R. Franklin, P.E. Vice President

Rev. 2/10/88

SPECIAL CONDITIONS FOR PERMIT NO. 87-787

1. All waste containing grease shall be discharged to a grease interceptor or grease trap before discharge into the sewer with the exception of restaurant dishwashers, which shall have their discharge bypass the grease separator or grease trap and discharge to an open drain or directly to the sanitary sewer.

2. This permit is issued in reliance upon the Affidavit of Disclosure of Property Interest (Schedule K) submitted by the owner, and said Affidavit is incorporated herein and made a part hereof.

3. The storm water detention facilities shown on the plans are made a part of this permit. Constructon of these facilities shall proceed prior to or concurrently with other construction on the project and shall be completed before any occupancy occurs. The detention is provided by two (2) lakes and four (4) detention basins with 6 outlet pipes as tabulated:

Basin/Lake	Outlet Pipe Diameter (inches)
North Basin	8
N.E. Basin	6
East Lake	8
S.E. Basin	6
West Lake	10
S.W. Basin	8

4. A swimming pool is not included under this permit. A new permit will be required for the swimming pool.

10. **Other Construction.** The MSDGC reserves the right, privilege and authority to permit others to reconstruct, change, alter and replace all sewers and appurtenances thereto at the point of connection of any sewerage system to an MSDGC interceptor and/or in public right-of-ways of MSDGC easements, and to introduce additional sewage flow through this connection into the intercepting sewer of said MSDGC.

11. **Change of Use.** This permit shall be incorporated in the Building and Occupancy Permit for the building or buildings served under this permit. The owner or occupant of any building served under this permit shall not cause, or permit, a change of use of the building to a use other than that indicated in this permit without first having obtained a written permission from the General Superintendent of the MSDGC.

12. **Interceptors Overloading.** The MSDGC hereby serves notice that its interceptors may flow full and may surcharge, and flooding of the proposed system may occur. The Permittee agrees that the proposed systems shall be constructed, operated and maintained at the sole risk of the Permittee.

13. **Non-Transferability.** This permit may not be assigned or transferred without the written consent of the General Superintendent of the MSDGC.

14. **Termination.** It is understood and agreed that in the event the Permittee shall default in or fail to perform and carry out any of the covenants, conditions and provisions of this permit and such default or violation shall continue for sixty (60) days after receipt or notice thereof in writing given by the General Superintendent of the MSDGC, then it shall be lawful for the MSDGC at or after the expiration of said sixty (60) days to declare said permit terminated. The Permittee agrees that immediately upon receipt of written notice of such termination it will stop all operations, discontinue any discharges and disconnect the sewerage system or facilities constructed under this permit. If the Permittee fails to do so, the MSDGC shall have the right to disconnect said system. The Permittee hereby agrees to pay for any costs incurred by the MSDGC for said disconnection. The various rights and remedies of the MSDGC contained in this permit shall be construed as cumulative, and no one of them shall be construed as exclusive of any one or more of the others or exclusive of any other rights or remedies allowed by applicable rules, regulations, ordinances and laws. An election by the MSDGC to enforce any one or more of its rights or remedies shall not be construed as a waiver of the rights of the MSDGC to pursue any other rights or remedies provided under the terms and provisions of this permit or under any applicable rules, regulations, ordinances or laws.

15. **Expiration.** This permit shall expire if construction has not started within one (1) year from the date of issue. Construction under an expired permit is deemed construction without a permit. All construction under this permit shall be completed within two (2) years after start of construction. If conditions so warrant, an extension may be granted. For publicly financed projects (e.g. special assessments) the one (1) year period indicated will be considered from the date of final court action.

16. **Revocation.** In issuing this permit, the MSDGC has relied upon the statements and representations made by the Permittee or his agent. Any incorrect statements or representations shall be cause for revocation of this permit, and all the rights of the Permittee hereunder shall immediately become null and void.

17. **Advance Notice.** Prior to commencement of construction under this permit, the Permittee shall give the MSDGC an advance notice of at least two working days. When advance notice is given, the Permittee shall provide the permit number, municipality and location.

18. **Compliance with Plans and Specifications.** All construction shall be in accordance with the plans and specifications submitted for this permit and made a part hereof. No changes in, or deviation from the plans and specifications which affect capacity, maintenance, design requirements, service area or permit requirements shall be permitted unless revised plans shall have been submitted to, and approved by, the MSDGC. The permit together with a set of the plans and specifications (revised plans and specifications, if any) shall be kept on the job site at all times during construction until final inspection and approval by the MSDGC.

19. **Testing and Approval.** All construction under this permit shall be subject to inspection, testing and approval by the MSDGC. All testing shall be made, or caused to be made, by the Permittee at no cost to the MSDGC and in the presence of the MSDGC representative. Upon satisfactory completion of construction, the Permittee and the owner shall submit, or cause to be submitted, a completion certificate and request for approval on the form prescribed by the MSDGC. No sewer or other facilities shall be put in service until all the conditions of the permit have been satisfactorily met.

20. **"As-Constructed Drawings."** Within sixty (60) days after final inspection and approval by the MSDGC, the Permittee shall furnish, or cause to be furnished to the MSDGC, a set of "As-Constructed" drawings, or a statement that the project was constructed in accordance with the original plans and specifications.

21. **Compliance with Rules and Regulations.** The Permittee hereby expressly assumes all responsibilities for meeting the requirements of all applicable rules, regulations, ordinances and laws of Local, State and Federal authorities. Issuance of this permit shall not constitute a waiver of any applicable requirements.

OFFICE COPY

MSDGC Permit No. _____
IEPA Log No. 87-787

SPECIAL CONDITIONS: This permit is issued subject to the MSDGC's General Conditions, Standard Conditions and the following Special Conditions:

ATTACHED HERETO IS ONE PAGE OF SPECIAL CONDITIONS MADF A PART HEREOF.

CERTIFICATE BY APPLICANTS: We have read and thoroughly understand the conditions and requirements of this permit application, and agree to conform to the permit conditions and other applicable requirements of the MSDGC. It is understood that construction hereunder, after the permit is granted, shall constitute acceptance by the applicants of any Special Conditions that may be placed hereon by the MSDGC. It is further understood that this application shall not constitute a permit until it is approved, signed and returned by the Chief Engineer of the MSDGC.

Title to permit premises is held in a land trust: Yes[ ], No [X]. If yes, disclosure of beneficiaries is required.

If permit is granted: please return two copies of the permit to the Permittee [ ]/Please mail one copy to Permittee and one copy to the person designated below [X]:

Name James R. Franklin, P.E. Address Austin Engineering Co., Inc. 8100 N. University, Peoria, IL 61615

PERMITTEE	CO-PERMITTEE*
Municipality Village of Arlington Heights, IL	Owner Parkside Development Corporation c/o Lutheran General Health Care System
Address 33 S. Arlington Road	Address 1775 Dempster St.
Arlington Heights, IL Zip 60005	Parkridge, ~~Illinois~~ Zip 60068
Signature Willis C. Bleck	Signature Robert Underwood
Name & Title ACTING DIR. OF ENG.	Name & Title Robert F. Underwood Associate Director
Date 11-10-87 Phone 577 5625	Date _____ Phone 312-696-7190

*(As required by MSDGC Ordinance; in other cases, as requested by Permittee)

RAYMUNDO DINGLE DYSICO 31894 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

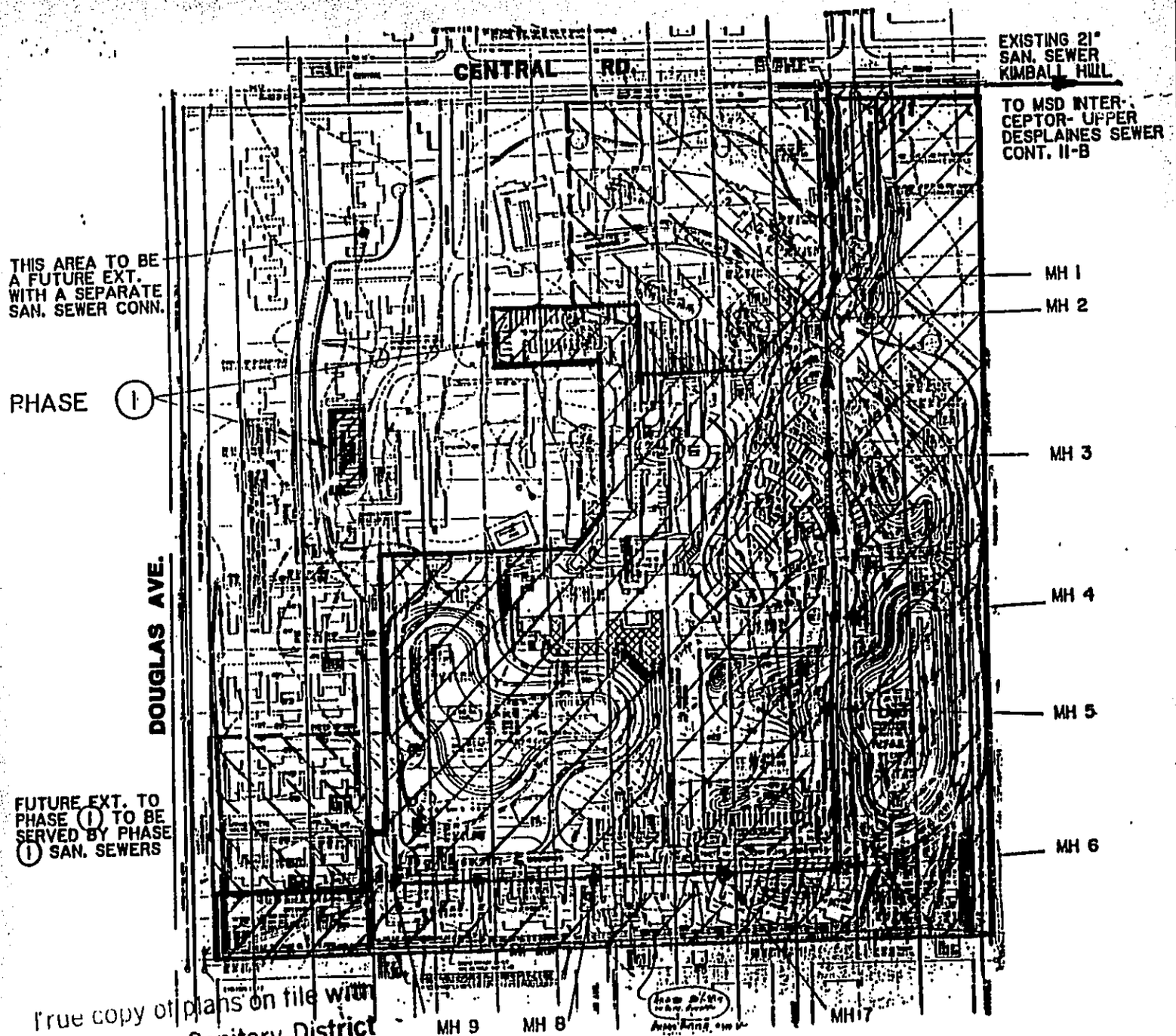
REVIEW AND APPROVAL BY THE MSDGC

Reviewed by Raymundo Dingle Dysico Jr (Local Sewer Systems) Date 4.8.88

Approved for issue:

THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO

Date of Issue: APR - 8 1988 By: F E Juliano For the (Chief Engineer)

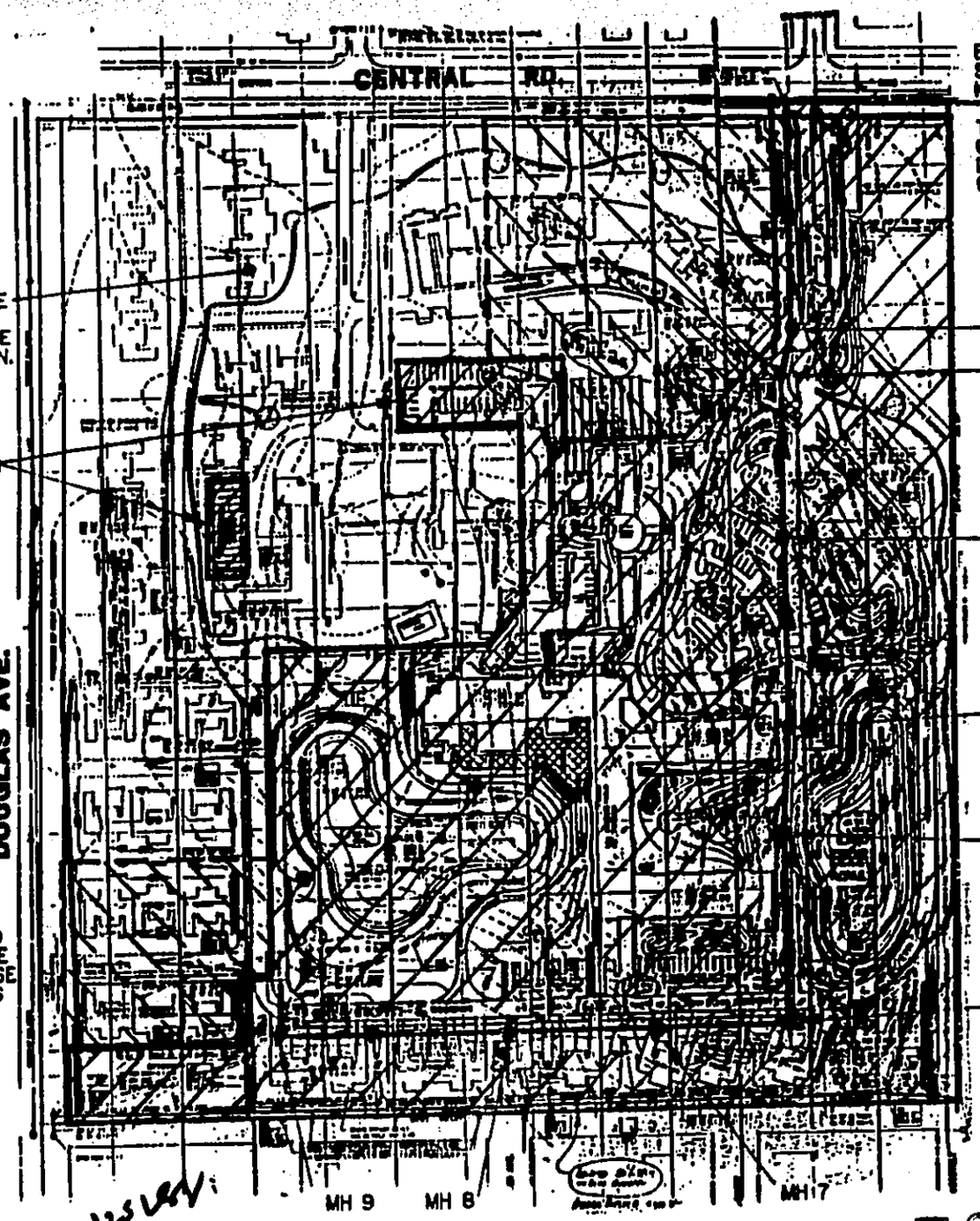


True copy of plans on file with Metropolitan Sanitary District of Greater Chicago Sewerage
Permit 87-787
OFFICE COPY

	TOTAL PROPERTY AREA	42.1 ACRES
▨	AREA OF PHASE (1)	23.3 ACREA
▨	FUTURE EXTENSION TO PHASE (1)	5.6 ACRES
	REMAINING PROPERTY TO BE SERVED BY SEPARATE SAN. SEWER CONNECTION	13.2 ACRES

THE MOORINGS OF ARLINGTON HEIGHTS, IL.

AUSTIN ENGINEERING CO., INC.



Rec'd 2/25/87

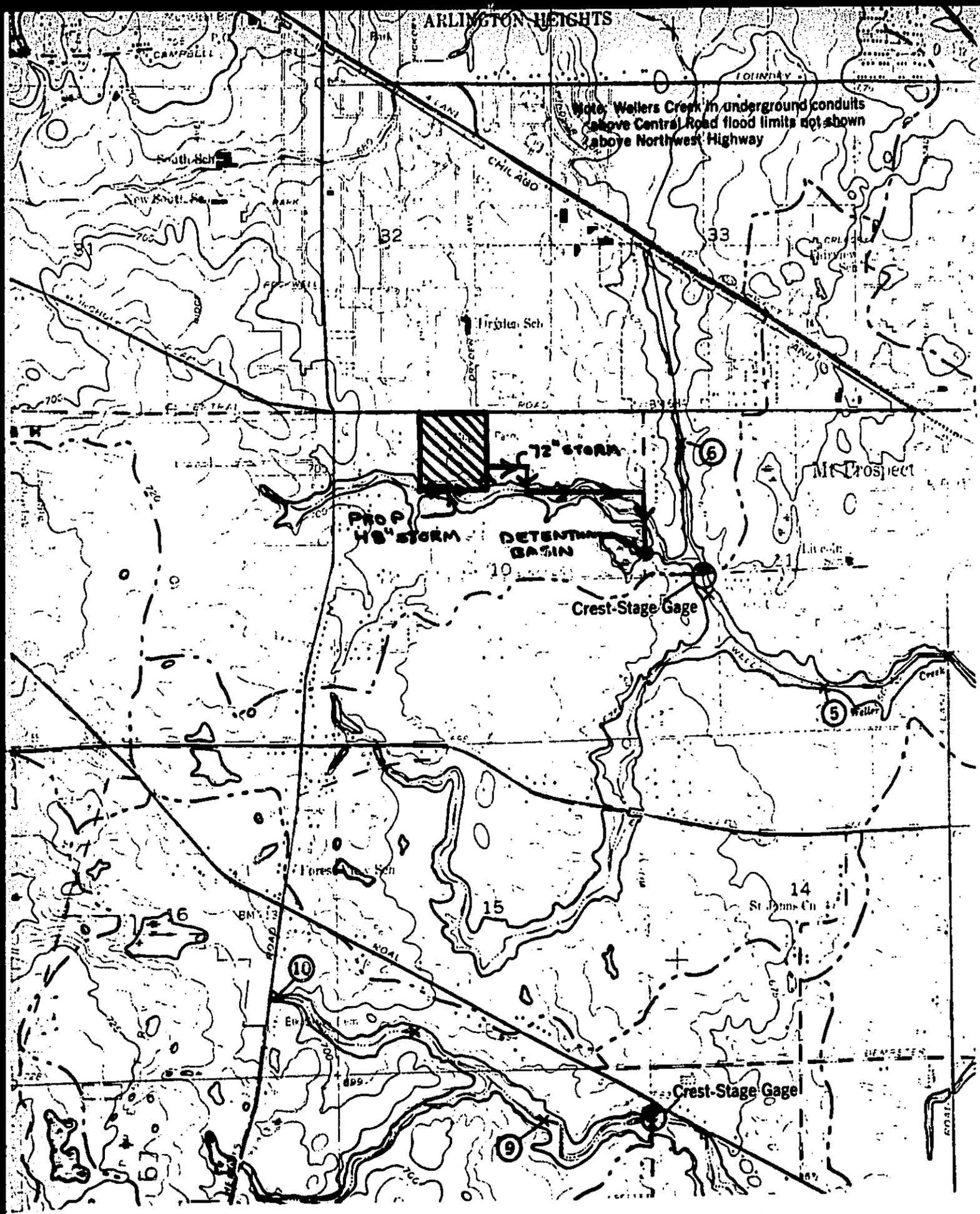
OFFICE COPY

87 787

	TOTAL PROPERTY AREA	42.1 ACRES
	AREA OF PHASE (1)	23.3 ACREA
	FUTURE EXTENSION TO PHASE (1)	5.6 ACRES
	REMAINING PROPERTY TO BE SERVED BY SEPARATE SAN. SEWER CONNECTION	13.2 ACRES

THE MOORINGS OF ARLINGTON HEIGHTS, IL.

AUSTIN ENGINEERING CO., INC.

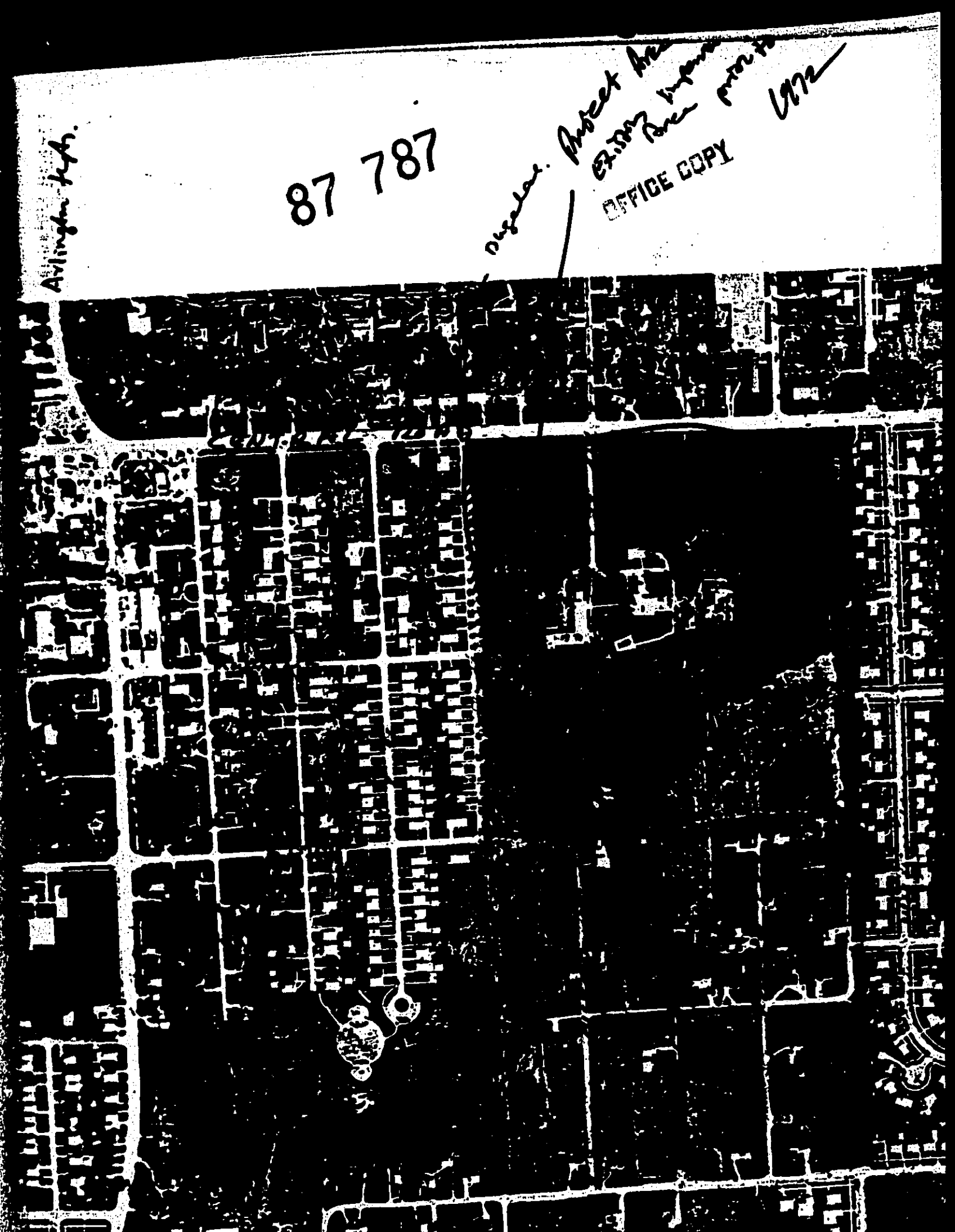


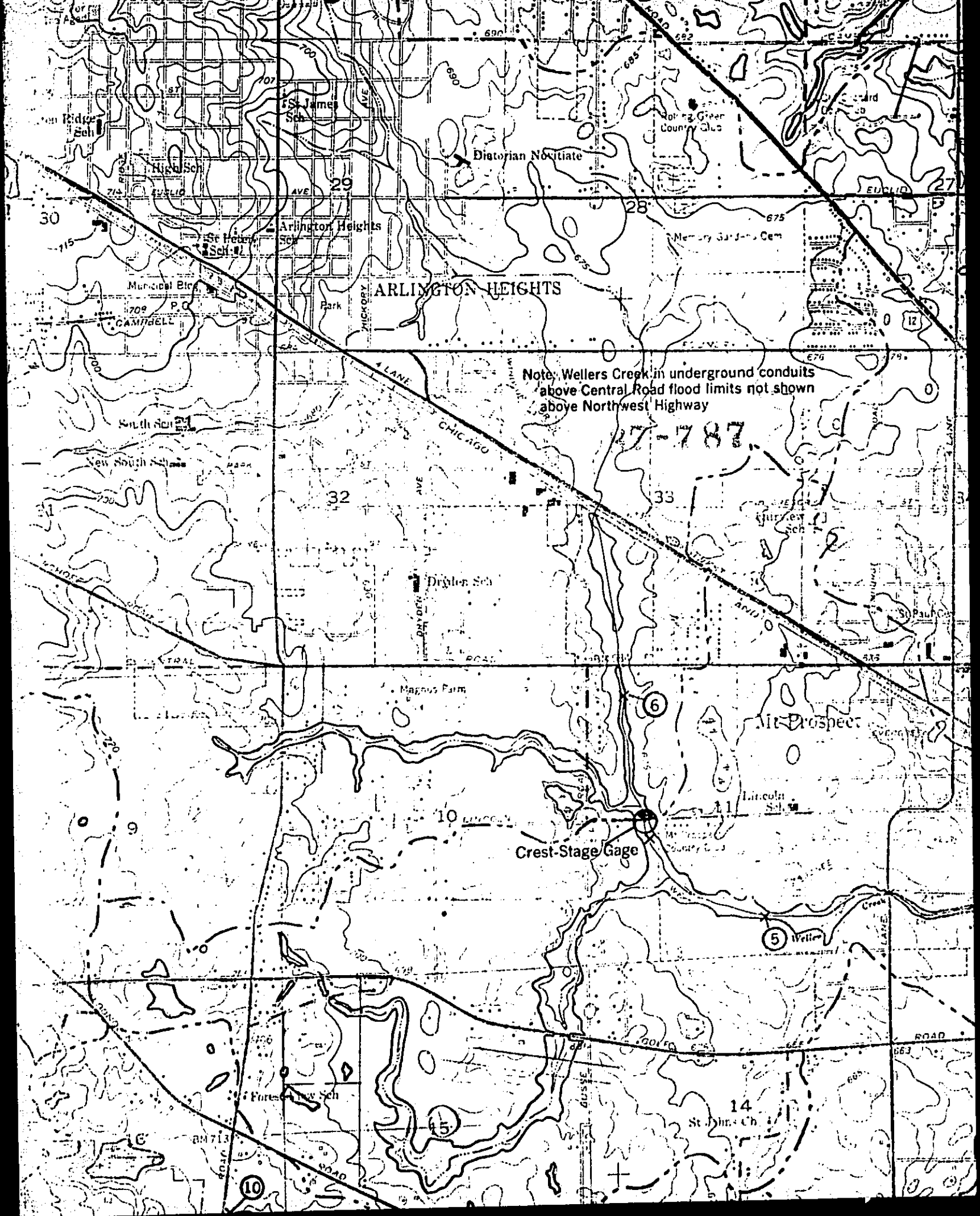
87-787

ARLINGTON HEIGHTS QUANDRANGLE MAP
USGS TOPOGRAPHY

OUTLET STORM SEWER ROUTING

SHEET 19A OF 19


87 787
OFFICE COPY



Note: Wellers Creek in underground conduits above Central Road flood limits not shown above Northwest Highway
27-787
ARLINGTON HEIGHTS
Arlington Heights Sch
St James Sch
High Sch
Diatorian Novitiate
Rolling Green Country Club
Memory Gardens Cem
Municipal Bldg
CAMPBELL
South Sch
New South Sch
Dryden Sch
Magnus Farm
Mt Prospect
Lincoln Sch
Crest-Stage Gage
Forest View Sch
St Johns Ch
EUCLID
CHICAGO
4 LANE
CENTRAL
ROAD
GOLF
ROAD
Weller
Creek

DETENTION REVIEW SHEET

A. PROJECT

Permit No. 87 787 ; Date Received 11/12/88

Name of Project The Moorings of Arlington Hgts

Location 801 Central Road

B. Basic Information

1. Total Project Area 42.1 Acres

2. Impervious Area: (a) Existing 28 ; (b) New 11.0 APP

3. Runoff Coefficient See calculations

4. Project is: Residential ✓ ; Non-Residential ___

5. Project is in flood plain area ..... yes/(no)

6. Building Connections are proposed under this permit ..... (yes)/no

7. Detention is required for the project covered by this permit ..... (yes)/no

8. Detention is provided under this permit ..... (yes)/no

9. Detention criteria: MSD ✓ ; Other ___

C. Non-Applicability

Detention requirements are not applicable for the reason(s) indicated:

1. Project is in combined sewer area ..... ___

2. Total contiguous ownership is less than 5 acres ..... ___

3. Remaining developable ownership as of 1/1/72 is less than 5 acres . ___

4. Project is single family, residential and area is less than 10 acres ..... ___

5. Project consists of an outlet sewer only and no connections are proposed ..... ___

6. Project consists of sewer rehabilitation work only ..... ___

7. Buildings existing and currently served by septic system ..... ___

8. No new impervious area proposed ..... ___

9. Other _____ ..... ___

D. Relation with Other Projects

1. Detention required for this project is provided by existing/ proposed detention facilities ..... ___
Facilities are covered by Permit No. _____

MSD Permit No. 87 787

D. Relation with Other Projects

2. Detention facilities provided under this permit are intended to serve other areas ..... _____
If so, contributing area is _____ acres.

3. Project covered by permit receives drainage from another area and the flow is bypassed ..... _____

4. This project is part of a previous development that exceeded five/ten acres and for which detention has been previously provided in full or in part ..... _____

5. This project is part of a total contiguous land holding that exceeds five/ten acres and for which no detention has been provided ..... _____

6. This project is part of an area previously encumbered for detention ..... _____

E. Design Summary

	MSD Requirements	Project Design
1. Drainage area for which detention is provided under this permit	xxxx	39.41 acre
2. Detention requirements for area above	5.66 ac. ft.	10.94 ac. ft.
3. Detention requirements for this project	5.66 ac. ft.	10.94 ac. ft.
4. Release rate for drainage area (1) above	11.28 cfs	8.97 cfs
5. Bypass rate, if any (Bypass is routed thru the property without going thru the ponds)	* 284.0 cfs	284.00 cfs
6. Total discharge	295.28 cfs	292.97 cfs

* 96 cfs thru the proposed 48" Dia Pipe
188 cfs. thru the channel along S. Property line

F. Method of Detention

1. Method of Storage: Roof___, Ground___, Parking Lot___, Pond___, Other___

2. Method of Control: Roof Restrictor _____, Weir_____.
Pipe Outlet ____, Size_____, Length_____,

Restrictor/Orifice_____, Size_____, Edge Type_____

G. Other Comments

Trib. Area Acs.	Pond	Vol. Req. Ac. ft.	Vol. Prov. Ac. ft.	MSD Allow Release cfs.	Actual Rel. cfs	Rest. Size	Village All. Rel cfs.
8.0	North Basin	1.14	1.15	2.29	2.23	8"-100' Long	
2.10	N. East Basin	0.2	0.20	0.60	0.60	6"-90' Long	
6.26	East Lake	1.0	2.73	1.79 } 2.98	1.19 } 2.25	8"-85' Long	1.47 } 2.45 final All. Area
4.17	S. East Basin	0.58	1.17	1.19	1.06	6"-40' Long	0.98
14.86	West Lake	2.15	5.04	4.26	3.25 } 3.89	10"-150' Long	3.5 } 4.45
4.02	S. West Basin	0.59	0.65	1.15	0.64	8"-32' Long	0.95
Acs. 39.41		5.66	10.94	11.28	8.97		6.90 All. Release fixed by the Village

Reviewed: M.P. Date 4/7/88 Checked_____ Date_____

LSS-72-09-01 Rev. 2/27/81

DETENTION RELEASE RATE SUMMARY

1. TOTAL SITE AREA = 42.1 ACRES

T_c = 45 MIN. I_3 = 1.91 IN/HR , C = 0.15

ALLOWABLE SITE RELEASE RATE = (42.1)(1.91)(0.15) =
= 12.06 CFS

2. AREA TRIBUTARY TO DETENTION BASINS

= 8.0 + 2.10 + 6.26 + 4.17 + 14.86 + 4.02 = 39.41 AC. ✓

3. UNDETAINED AREA = 42.10 - 39.41 = 2.69 AC ✓

Note: Existing Impervious area is approximately 2.8 Acs. for which det. is not required. (developed prior to 1972). Therefore credit could be given for unrestricted release for equal area.

IMPERVIOUS AREA = 0.48 AC
PERVIOUS AREA = 2.21 AC

$$C = \frac{(0.48 \times 0.95) + (2.21 \times 0.2)}{2.69} = 0.33$$

T_c = 45 MIN I_{100} = 3.45 IN/HR

$Q_{UND.}$ = (2.69)(3.45)(0.33) = 3.06 CFS

4. ALLOWABLE DETENTION BASIN RELEASE = 12.06 - 3.06
= 9.00 CFS

Allowable release 39.41 x 1.91 x 0.15 = 11.29 CFS.

ACTUAL BASIN RELEASE RATES

NORTH	2.23 CFS ✓
NORTHEAST	0.60 CFS ✓
EAST & SOUTHEAST	2.25 CFS ✓
WEST & SOUTHWEST	3.89 CFS ✓
TOTAL BASIN RELEASE	8.97 CFS ✓ Σ 11.29

ok.

121960 59 ft
2.8 AC

PEM

NORTH DETENTION POND

87-787

VOLUME TO ELEV. 689.5

EL.	685.5	0	~~2664~~ 318
.33	686	~~5328~~ 1906	~~8496~~ 5747
1.66	687	11664 9588	14 724
2.9	688	17784	18,864
3.92	689	19944	10,360
3.97	689.5	21096	

Invert 684.81

50013 = 1.15 AC.ft.

TOTAL ~~55,108~~ CF
= 1.27 AF

ALLOWABLE REL. RATE = 2.29 CFS
H = 689.5 (HWL) − 685.47 (TOP OF 8" PIPE) = 4.08
ASSUME 8" PIPE

$$Q = (0.349)\left[\frac{4.08}{\frac{1+0.1}{2(32.2)} + \frac{2.87(0.013)^2(100)}{(0.67)^{2/3}}}\right]^{1/2} = 2.23$$

4.03 95

OK

2.26

∴ USE 8" PIPE

87-787

NORTH DETENTION BASIN

Attachment 1

A Duration Time (Hrs.)	(Min.)	B Intensity for 100-Yr. Storm (In./Hr.)	C Inflow Rate (Line 1 x Line 14 x Col. B) (cfs)	D Stored Rate (Col. C-Line 11) (cfs)	E Reservoir Size (Col. A(Hrs.) x Col. D ÷ 12) (Ac.-Ft.)
0.17	10	7.60	40.74 (5.36)	38.45 (2.29)	0.53
0.33	20	5.50	29.48	27.19	0.76
0.50	30	4.40	23.58	21.29	0.89
0.67	40	3.70	19.83	17.54	0.97
0.83	50	3.20	17.15	14.86	1.03
1.0	60	2.80	15.01	12.72	1.06
1.5	90	2.10	11.26	8.97	1.12
2.0	120	1.70	9.11	6.82	1.14
3.0	180	1.20	6.43	4.14	1.04
4.0	240	1.00	5.36	3.07	1.02

COMPOSITE 'C'

IMPERVIOUS AREA = 3.1 ACRES

PERVIOUS AREA = 4.9 ACRES

TOT. 8.0 ACRES

$$C = \frac{(3.1 \times 0.95) + (4.9 \times 0.5)}{8.0} = 0.67$$

87-787

NORTHEAST DETENTION BASIN

VOLUME TO ELEV 688.0

ELEV.	686.5	0	1494
	687	5977	7318
	688	8659	

TOTAL 8812 CF

= 0.20 AF

ALLOWABLE RELEASE RATE = 0.60 CFS

H = 688 (HWL) - 686.82 (TOP OF 6" PIPE) = 1.18

ASSUME 6" PIPE

$$Q = (0.196)\left[\frac{1.18}{\frac{1+0.1}{2(32.2)} + \frac{2.87(0.013)^2(90)}{(0.5)^{4/3}}}\right]^{1/2} = 0.60 \text{ CFS}$$ ✓ OK

∴ USE 6" PIPE

87-787

Attachment 1

A Duration Time (Hrs.)	(Min.)	B Intensity for 100-Yr. Storm (In./Hr.)	C 1.05 Inflow Rate (Line 1 x Line 14 x Col. B) (cfs)	D 0.60 Stored Rate (Col. C-Line 11) (cfs)	E Reservoir Size (Col. A(Hrs.)x Col. D + 12) (Ac.-Ft.)
0.17	10	7.60	7.98	7.38	0.10
0.33	20	5.50	5.78	5.18	0.14
0.50	30	4.40	4.62	4.12	0.17
0.67	40	3.70	3.89	3.29	0.18
0.83	50	3.20	3.36	2.76	0.19
1.0	60	2.80	2.94	2.34	0.20
1.5	90	2.10	2.21	1.61	0.20 ←
2.0	120	1.70	1.79	1.19	0.20
3.0	180	1.20	1.26	0.66	0.17
4.0	240	1.00	1.05	0.45	0.15

IMP. AREA = 0 Ac.
PERV. AREA = 2.10 Ac.

C = 0.50

PEM

87-787

EAST LAKE

VOLUME TO ELEV. 689

686 34,452 SF 39618(3) = 2.73 AF
689 44,784 SF

TOTAL ALLOWABLE RELEASE TO 48" STORM SEWER AS PER VILLAGE = 6.90 CFS

TOTAL TRIBUTARY AREA = 6.26 + 4.17 + 14.86 + 4.02
= 29.31 ACRES

ALLOWABLE RELEASE RATE (EAST LAKE =

$$= \frac{6.26}{29.31} \times 6.9 = 1.47 \text{ CFS}$$

$$Q = A \left[\frac{H}{\frac{K_e + K_o}{2g} + \frac{2.87 n^2 L}{D^{4/3}}} \right]^{1/2}$$

Q = 1.47 CFS
A = RELEASE PIPE CROSS SECTION (8") = 0.349 SF
H = HEAD = 689 - 688 = 1.0' (DIFF. IN HWL)
L = LENGTH OF PIPE = 83'
K_e = 1
K_o = 0.1
G = 32.2
n = 0.013
D = PIPE DIAMETER = 0.67'

$$Q = (0.349) \left[\frac{1}{\frac{1+0.1}{2(32.2)} + \frac{2.87(0.013)^2(83)}{(0.67)^{4/3}}} \right]^{1/2} = 1.19 \text{ CFS}$$

OK

∴ USE 8" PIPE

PEM

THE MOORINGS
EAST LAKE

87-787

Attachment 1

A Duration Time (Hrs.)	(Min.)	B Intensity for 100-Yr. Storm (In./Hr.)	C 4.38 Inflow Rate (Line 1 x Line 14 x Col. B) (cfs)	D 1.49 Stored Rate (Col. C-Line 11) (cfs)	E Reservoir Size (Col. A(Hrs.)x Col. D ÷ 12) (Ac.-Ft.)
0.17	10	7.60	33.30	31.83	0.44
0.33	20	5.50	24.10	22.63	0.63
0.50	30	4.40	19.28	17.81	0.74
0.67	40	3.70	16.21	14.74	0.82
0.83	50	3.20	14.02	12.55	0.87
1.0	60	2.80	12.27	10.80	0.90
1.5	90	2.10	9.20	7.73 8.01	0.96
2.0	120	1.70	7.45	5.98 6.26	1.00
3.0	180	1.20	5.26	3.79 4.07	0.95
4.0	240	1.00	4.38	2.91 3.19	0.97

COMPOSITE "C"

IMP. AREA	2.84 AC
PER. AREA	3.42 AC
	6.26 AC

$$C = \frac{(2.84)(0.95) + (3.42)(0.5)}{6.26} = 0.70$$

PEM

87-787

SOUTHEAST DETENTION BASIN

VOLUME TO ELEV. 688

682	0	600
683	3600	5994
684	8388	19368
685	10980	24840
688	13860	

TOTAL PROVIDED = 50,802 CF
= 1.17 AF

ALLOWABLE RELEASE RATE = $\frac{4.17}{29.31} \times 6.90 = 0.98$ CFS

TOTAL RELEASE RATE = 0.98 + 1.47 (EAST LAKE) = 2.45 CFS

ASSUME 6" RELEASE PIPE

H = 688 (HWL) − 679.30 (TOP OF 6" PIPE) = 8.70'

D = 0.5' A = 0.196 SF

$$Q = (0.196)\left[\frac{8.70}{\frac{1+0.1}{2(32.2)} + \frac{2.87(0.013)^2(40)}{(0.50)^{4/3}}}\right]^{1/2} = 2.25 \text{ CFS} < 2.45 \text{ OK}$$

∴ USE 6" RELEASE PIPE

PEM

87-787

Attachment 1

A Duration Time (Hrs.)	(Min.)	B Intensity for 100-Yr. Storm (In./Hr.)	C 2.63 Inflow Rate (Line 1 x Line 14 x Col. B) (cfs)	D 0.98 Stored Rate (Col. C-Line 11) (cfs)	E Reservoir Size (Col. A(Hrs.)x Col. D ÷ 12) (Ac.-Ft.)
0.17	10	7.60	19.99	19.01	0.26
0.33	20	5.50	14.47	13.49	0.37
0.50	30	4.40	11.57	10.59	0.44
0.67	40	3.70	9.73	8.75	0.49
0.83	50	3.20	8.42	7.44	0.51
1.0	60	2.80	7.36	6.38	0.53
1.5	90	2.10	5.52	4.54	0.57
2.0	120	1.70	4.47	3.49	0.58 ←
3.0	180	1.20	3.16	2.18	0.55
4.0	240	1.00	2.63	1.65	0.55

COMPOSITE "C"

IMP. AREA = 1.21 AC
PER. AREA = 2.96 AC
= 4.17 AC

$$C = \frac{(1.21 \times 0.95) + (2.96 \times 0.5)}{4.17} = 0.63$$

PEM

87-787

WEST LAKE

VOL. TO ELEV. 690

686	46296 SF	54,900(4)	= 5.04 AF
690	63504 SF		

ALLOWABLE REL. RATE = $\frac{14.86}{29.31} \times 6.90 = 3.50$ CFS

H = 690 HWL − 686.07 (TOP OF 10" PIPE) = 3.93

ASSUME 10" PIPE

$$Q = \left[\frac{3.93}{\frac{1+0.1}{2(32.2} + \frac{2.87(0.013)^2\,150}{(0.83)^{4/3}}}\right]^{1/2} 0.545 = 3.25 \text{ CFS} \checkmark$$

OK

∴ USE 10" PIPE

PEM

WEST LAKE 87-787

Attachment 1

A Duration Time (Hrs.)	(Min.)	B Intensity for 100-Yr. Storm (In./Hr.)	C (9.66) Inflow Rate (Line 1 x Line 14 x Col. B) (cfs)	D (3.50, 3.25) Stored Rate (Col. C-Line 11) (cfs)	E Reservoir Size (Col. A(Hrs.)x Col. D + 12) (Ac.-Ft.)
0.17	10	7.60	73.42	69.92	0.97
0.33	20	5.50	53.13	49.63	1.37
0.50	30	4.40	42.50	39.00	1.62
0.67	40	3.70	35.74	32.24	1.79
0.83	50	3.20	30.91	27.41	1.90
1.0	60	2.80	27.05	23.55	1.96
1.5	90	2.10	20.29	(20.08) 16.79	2.10 (2.13)
2.0	120	1.70	16.42	(13.17) 12.92	2.15 ← (2.2) ✓
3.0	180	1.20	11.59	(8.34) 8.09	2.02 (2.09)
4.0	240	1.00	9.66	6.16	2.05

COMPOSITE 'C'

IMP. AREA = 5.0 AC
PERV. AREA = 9.86 AC
TOT 14.86 AC.

$$C = \frac{(5.0 \times 0.95) + (9.86 \times 0.50)}{14.86} = 0.65$$

PEM

87-787

SOUTHWEST DETENTION POND

VOLUME TO ELEV. 688.0

684.65	0	235
685	2160	7182
686	12,204	13,302
687.5	15,516	20,790

TOTAL = 36,235 CF = 0.65 AF ✓

ALLOWABLE RELEASE RATE = $\frac{4.02}{29.31} \times 6.90 = 0.95$ CFS

TOTAL REL RATE = 0.95 + 3.50 (FROM WEST LAKE) = 4.45 CFS

ASSUME 8" PIPE

H = 688 (INVIL) - 682.58 (TOP OF 8" PIPE) = 5.42'

$$Q = 0.349 \left[\frac{5.42'}{\frac{1 + 0.1}{2(32.2)} + \frac{2.97(0.013)^2(52)}{(0.67)^{4/3}}} \right]^{1/2} = 3.89 \text{ CFS} \checkmark$$

JK

∴ USE 8" PIPE

12

PEM

SOUTHWEST BASIN

87-787

Attachment 1

A Duration Time (Hrs.)	(Min.)	B Intensity for 100-Yr. Storm (In./Hr.)	C 2.65 Inflow Rate (Line 1 x Line 14 x Col. B) (cfs)	D 0.95 0.64 Stored Rate (Col. C-Line 11) (cfs)	E Reservoir Size (Col. A(Hrs.)x Col. D ÷ 12) (Ac.-Ft.)
0.17	10	7.60	20.14	19.19	0.27
0.33	20	5.50	14.58	13.63	0.38
0.50	30	4.40	11.66	10.71	0.45
0.67	40	3.70	9.81	8.86	0.49
0.83	50	3.20	8.48	7.53	0.52
1.0	60	2.80	7.42	6.47 4.93	0.54 .62
1.5	90	2.10	5.57	4.62 3.87	0.57 0.65
2.0	120	1.70	4.51	3.56 2.54	0.59 0.64 ←
3.0	180	1.20	3.18	2.23	0.56
4.0	240	1.00	2.65	1.70	0.57

COMPOSITE "C"

IMP. AREA 1.39 AC
PER. AREA 2.63 AC
4.02 AC

$$C = \frac{(1.39 \times 0.95) + (2.63 \times 0.50)}{4.02} = 0.66$$

MO
10/14/87
PEM

87-787

THE MOORINGS

DESIGN CALCULATIONS FOR

THE BYPASS STORM SEWER SYSTEM

(SEE ATTACHED MAP)

EXISTING OUTLET STORM SEWER @ SOUTHEAST CORNER OF THE PROJECT = 72" PIPE @ 0.20%

EXISTING INLET STORM SEWER FROM SOUTH
48" PIPE @ 0.27%

ADDITIONAL CONTRIBUTING AREA FROM SOUTH OVERLAND INTO EXISTING FIELD TILES
A = 10 ACRES, L = 1200', T_c = 40 MIN., I_5 = 2.59"/HR
C = 0.35

CALCULATE ALLOWABLE BYPASS FROM THE WEST ALONG THE PROJECT'S SOUTH PROPERTY LINE, ASSUMING PIPES FLOWING FULL

EXISTING 72" PIPE @ 0.20% = 180 CFS

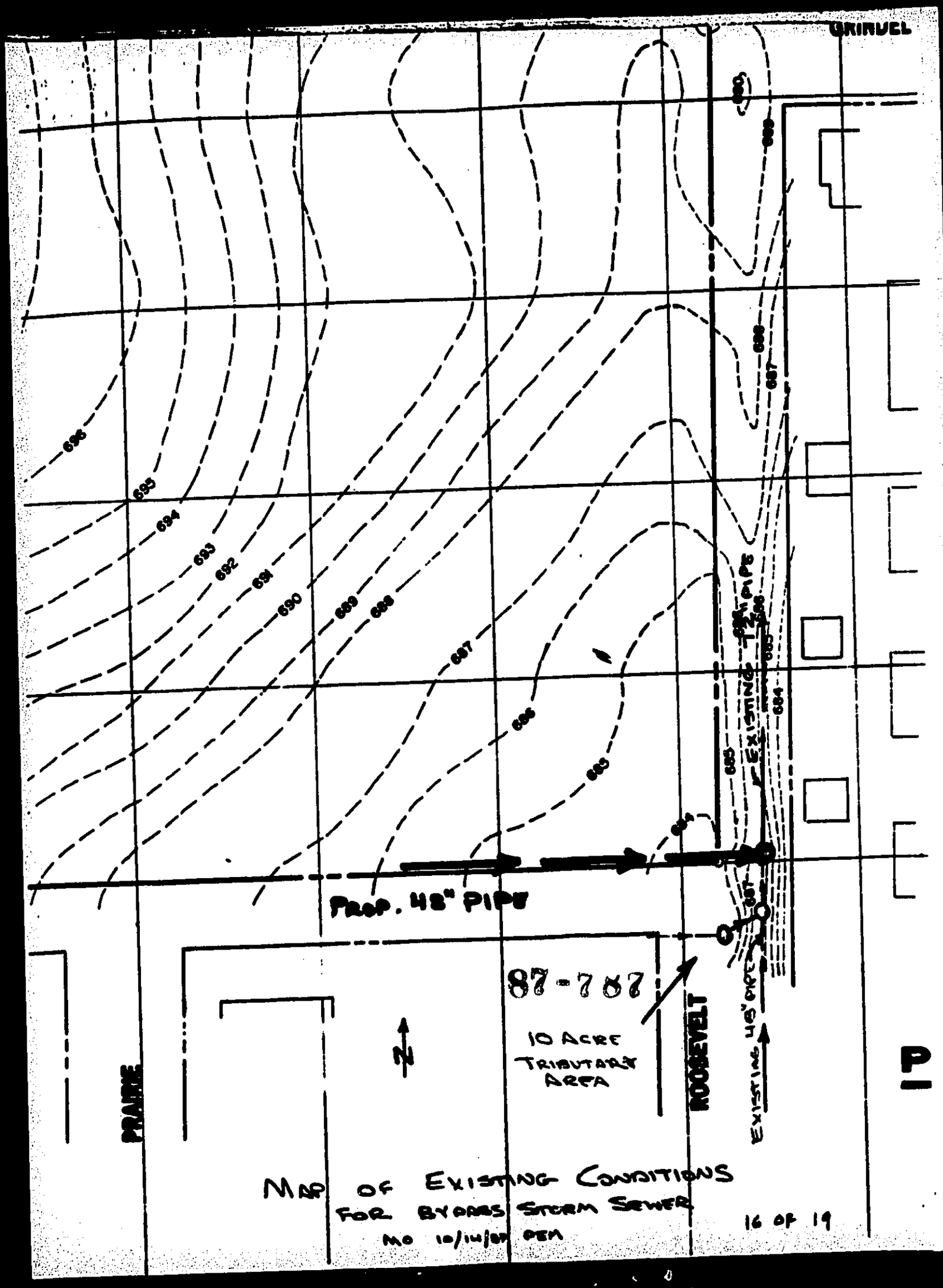
LESS EXISTING 48" PIPE @ 0.27% = - 75 CFS

LESS CONTRIBUTING AREA $Q = (0.35)(2.59)(10\ AC)$ = - 9 CFS

*ALLOWABLE BYPASS = 96 CFS
(AS REQUIRED BY MOUNT PROSPECT)

∴ USE 48" PIPE @ 0.48%

PREPARED BY:
DONALD MANNARD & ASSOC
LINCOLNSHIRE, IL



MAP OF EXISTING CONDITIONS FOR BYARS STORM SEWER
MO 10/14/87 PEA

MD
10/14/87
PEM

THE MOORINGS

87-787

DESIGN CALCULATIONS FOR THE BYPASS DITCH ALONG S.P.L.

(SEE ATTACHED MAP)

C = COMPOSITE RUNOFF FACTOR FOR EXISTING CONDITIONS OF ENTIRE TRIBUTARY AREA = 0.50

A = TRIBUTARY AREA TO BYPASS DITCH :

AREA 'A' = 0 ACRES (TRIBUTARY EAST OF PROPERTY
AREA 'B-1' = 0 ACRES (TRIBUTARY EAST OF PROPERTY
AREA 'B-2' = 0 ACRES, REL. RATE OF 6.9 CFS
AREA 'B-3' = 25 ACRES
AREA 'B-4' = 115 ACRES
AREA 'C-1' = 190 ACRES
AREA 'C-2' = 0 ACRES (TRIBUTARY CENTRAL AVE.)
AREA 'D' = 61 ACRES

TOTAL TRIBUTARY AREA = 391 ACRES

T_c = TIME OF CONCENTRATION = 92 MIN.

I_{100} = 100 YEAR RAINFALL INTENSITY = 2.06 IN/HR

Q_{100} = 100 YEAR TRIBUTARY RUNOFF = CIA + AREA B-2 REL. RATE

$= (0.50)(391)(2.06)+6.9 = 410$ CFS

THIS QUANTITY WILL BE REDUCED BY THE EXISTNG 54" PIPE ON ARLINGTON HEIGHTS ROAD & THE PROPOSED 48" PIPE ALONG THE SOUTH PROPERTY LINE. AS FOLLOWS:

EXISTING 54" PIPE @ 0.48% = 126 CFS
PROPOSED 48" PIPE @ 0.48% = 96 CFS
TOTAL BYPASS = 222 CFS

DONALD MANNARO & ASSOC
LINCOLNSHIRE IL
11 of 19

MS
10/14/87
PEM

∴ TOTAL REQUIRED BYPASS DITCH CAPACITY

$Q_{BYPASS} = 410 CFS - 222 CFS = 188 CFS$

BYPASS DITCH DESIGN

87-787

S = SLOPE = 0.30%

n = COEFFICIENT OF ROUGHNESS = 0.025

$W_P = 10' + 6.7' + 6.7' = 23.4'$

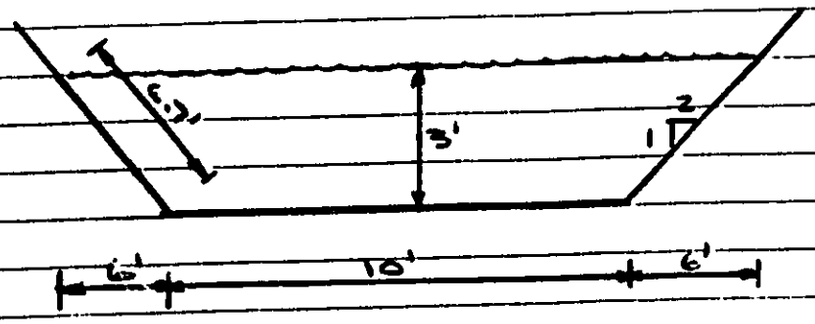
$A = (2(\frac{1}{2} \times 6) + 10)\ 3 = 48\ SF$

$R = \text{HYD. RADIUS} = \frac{A}{W_P} = \frac{48}{23.4} = 2.05'$

V = 5.2 FPS (SEE ATTACHED CHART)

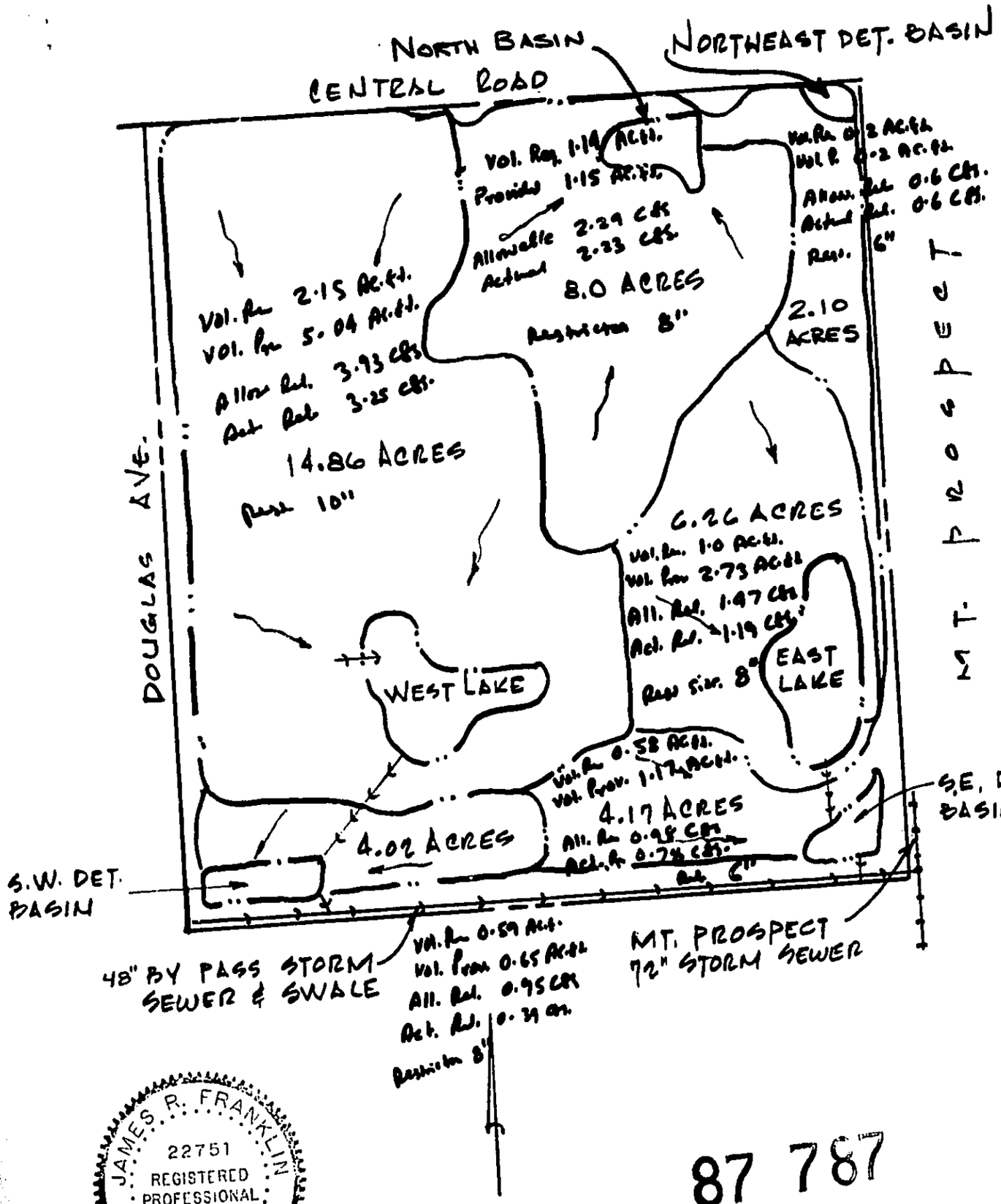
∴ $Q = AV = 48 \times 5.2 = 250\ CFS$ / > 188 CFS

= MAX. PROPOSED CAPACITY > REQUIRED 100 YEAR BYPASS



TYPICAL DITCH CROSS-SECTION

DONALD MANNARD & ASSOC.
LINCOLNSHIRE IL



JAMES R. FRANKLIN
22751
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

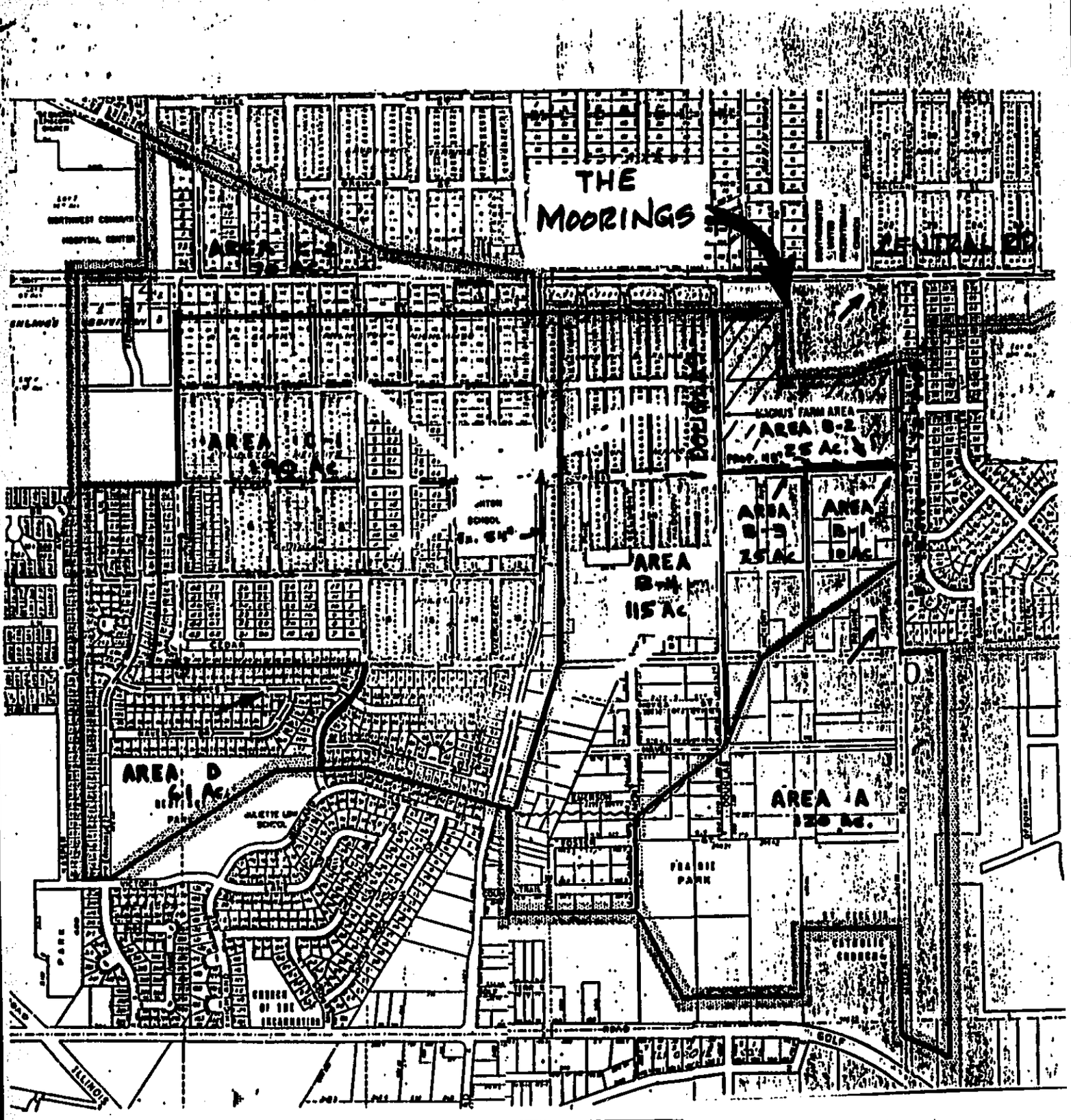
10/20/87

87 787

THE MOORINGS OF ARLINGTON HTS.
GENERAL DRAINAGE AREA MAP

1/19

REV. 2/10/88



97-787

THE MOORINGS OF ARLINGTON HTS.
UPSTREAM DRAINAGE AREAS

87 787

For The Moorings of Arlington Heights
MSD Permit Number 87-787

OFFICE COPY

SEWER LINE AGREEMENT

This Agreement made this 28th day of March, 1988, by and between PARKSIDE DEVELOPMENT CORPORATION d/b/a THE MOORINGS, a Delaware non-profit corporation, with its office and principal place of business at 1775 West Dempster Street, Park Ridge, Illinois 60068 (hereinafter referred to as "PDC") and KIMBALL HILL, an individual with his principal place of business at 900 Des Plaines Avenue, Des Plaines, Illinois 60016 (hereinafter referred to as "Kimball Hill").

WITNESSETH

WHEREAS Kimball Hill owns and maintains the sanitary sewer along Central Road in Arlington Heights, Illinois (hereinafter "Sewer");

WHEREAS PDC is the owner of a certain parcel of property upon which it is developing an older adult retirement facility and health care center located at 801 Central Road, Arlington Heights, Illinois, known as The Moorings (hereinafter referred to as "Facility"); and

WHEREAS PDC is desirous of connecting the Facility to the Sewer if the same is extended southerly toward the Facility.

NOW THEREFORE, the parties hereto, in consideration of the mutual covenants and agreements herein, do hereby agree as follows:

Section 1. Construction of Sewer Line

Subject to the terms and conditions of this Agreement, PDC is granted the perpetual non-exclusive right to construct a sanitary sewer line (the "Project") northerly across its property suitable for the Facility's connection to the Sewer at Central Road.

87-787

Section 2. Payment of the Tap-in Fee

PDC agrees to pay Kimball Hill upon the execution of this Agreement a one-time tap-in fee for the perpetual non-exclusive right to tap-on to and use the Sewer for the entire Facility's sanitary sewage needs.

Section 3. Notice to Governmental Authorities

Upon execution of this Agreement, Kimball Hill will, upon the request of PDC, notify the Metropolitan Sanitary District ("MSD"), the Village of Arlington Heights ("Village") and other appropriate parties of the grant by Kimball Hill to PDC to tap-in to the Sewer in accordance with the terms of this Agreement. PDC shall obtain all required governmental and other permits, licenses, approvals and other consents, and shall comply with all applicable laws, rules and regulations.

Section 4. Title to the Sewer Line

Title to the Sewer is vested in Kimball Hill. Neither PDC, the Village or MSD shall have any claim of ownership in or to the Sewer or the Project.

Section 5 Maintenance of the Sewer Line

Kimball Hill shall keep and maintain, or cause to be kept and maintained, the Sewer and its related systems in good operating condition, repair and working order, ordinary wear and tear excepted, and will provide, at its own expense, all maintenance and service and make all repairs necessary for such purpose.

Section 6. Indemnification

The parties agree to indemnify and hold each other harmless from any liability claim for personal injuries, deaths, mechanics liens, judgments, lawsuits, claims or other costs, including reasonable attorneys' fees, arising out of or in connection with the intentional or negligent acts of their respective employees and/or agents as a consequence of or resulting from, directly or indirectly, the tap-in or use of the Sewer.

Section 7. Termination for Breach of Contract.

If either party shall violate any of the covenants undertaken herein, or any of the duties imposed upon it by this Agreement, such violation shall entitle the other party to terminate this Agreement, provided that the party desiring to terminate for such cause shall give the offending party at least thirty (30) days written notice, specifying the particulars wherein it is claimed that there has been a violation hereof; and if at the end of such time the party notified has not removed the cause of complaint, or remedied the purported violation, then the termination of this Agreement shall be deemed complete.

Section 8. Specific Performance

The parties hereto each acknowledge and agree that in the event of any breach of this Agreement, the non-breaching party would be irreparably harmed and could not be made whole by monetary damages alone. It is accordingly agreed that such parties, in addition to any other remedy to which they may be entitled at law or in equity, shall

be entitled to compel specific performance of this Agreement in any action instituted in any Court of the United States or any state having subject matter jurisdiction.

Section 9. Amendments

This Agreement may be amended only by a written instrument signed by all parties to this Agreement.

Section 10. Law of the State of Illinois to Govern

This Agreement and the rights and obligations of the parties hereunder shall be governed by, and construed in accordance with, the laws of the State of Illinois.

Section 11. Successors and Assigns

This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their heirs, successors and assigns. This Agreement may not be assigned by any party without the consent of all the other parties.

Section 12. Interpretation of Agreement

The rule of strict construction does not apply to this grant. This grant shall be given a reasonable construction so that the intention of the parties to confer a commercially useable right of enjoyment to the Sewer is carried out.

Section 13. Notices

All notices and other communications shall be sufficiently given and shall be deemed to be given when hand delivered or mailed by registered or certified mail, postage prepaid, addressed as follows: