



MEMORANDUM

To: City of Naperville

From: Eric Tracy, P.E.
Kimley-Horn and Associates, Inc.

Date: April 13, 2022

Re: ***Proposed Casey's Naperville (Ogden) Development
1420 East Ogden Avenue
Naperville, IL 60563***

Introduction

Kimley-Horn and Associates, Inc., serves as the engineering consultant for Casey's Retail Company. The proposed development is a gas station and convenience store. The sitework includes demolition, grading, storm sewer, water, sanitary sewer, and paving installation.

Existing Conditions

The 1.43 acre site is currently an existing gas station and has been acquired by the Casey's Retail Company. There is a car wash on the eastern side of the property, and there are currently two accesses along Naper Boulevard and two accesses along Ogden Avenue. The site drains from the north curb line overland to the southeast. There is offsite flow along the eastern property boundary and at the southeast Naper Boulevard access. The stormwater infrastructure drains to a 0.15 ac-ft detention basin that ultimately outfalls to a storm line in the southeast corner of the site.

See the attached Existing Impervious Area Exhibit for more information.

Proposed Conditions

The proposed development is a Casey's fuel station and convenience store with associated parking and utilities. There will be a new right turn lane along Ogden Avenue and the two accesses along Naper Boulevard will remain. The proposed drainage generally follows the existing drainage pattern. There will be 0.97 acres of onsite impervious area. In accordance with Naperville Stormwater Requirements, on-site detention is provided in order to match the existing condition. The proposed detention basin is 0.20 ac-ft, which is a 0.05 ac-ft increase from the existing condition. Storm sewer will collect runoff from the site and direct it around the west and east sides of the building where it will all discharge from one flared end section into another flared end section and connect into the existing storm via an outlet control structure.

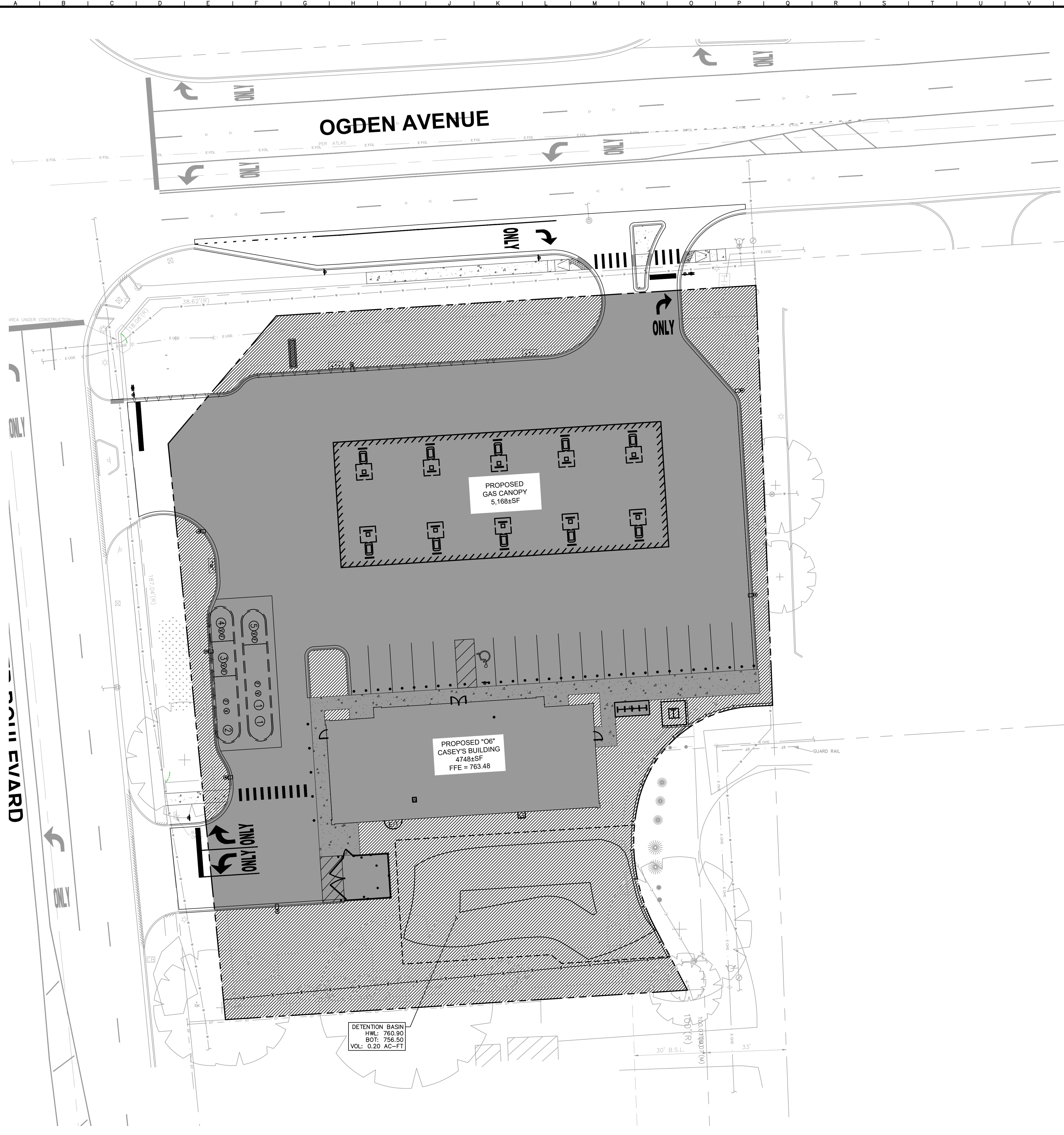
Additionally, an outlet control structure with a 4" diameter restrictor is proposed upstream of the outfall.

An analysis of the storm sewer system was completed using the Hydraflow Storm Sewers Extension for AutoCAD 2020. Rainfall data was obtained from Illinois Bulletin #75. The storm system is designed to convey the 10-year storm event.

Attachments

- Existing Impervious Area Exhibit
- Proposed Impervious Area Exhibit
- Drainage Area Map Exhibit
- Hydraflow Calculations
- Detention Calculations

Re-use of and improper reliance on this document without written authorization and adaptation by Kinley-Horn and Associates, Inc. shall be without liability to Kinley-Horn and Associates, Inc.



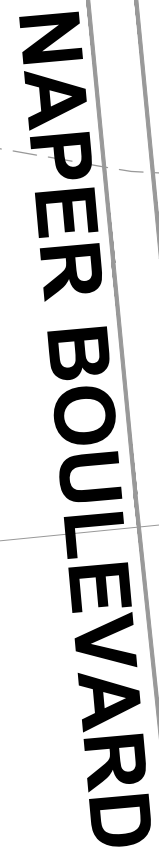
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LAND COVER LEGEND

	IMPERVIOUS AREA AREA = 42,537 SF (0.97 AC)
	PERMEOUS AREA AREA = 15,946 SF (0.46 AC)

The map shows a rectangular site with a north arrow pointing towards the top right. A graphic scale in feet is provided below the north arrow, ranging from 0 to 40 feet. The site is divided into two main land cover types: Impervious Area (solid gray) and Permeous Area (hatched). The Impervious Area is located in the upper left and center, while the Permeous Area is located in the lower right. A road or boundary line runs along the top and right edges of the site. A small rectangular area is marked with a crosshair in the upper right corner.

[illegible]

[illegible]

TRIBUTARY AREA

SITE OUTFALL LOCATION

FLOW ROUTE

EXISTING CONTOUR

PROPERTY LINE

EXISTING STORM LINE

PERVIOUS AREA

IMPERVIOUS AREA

[illegible]

Proposed 10-Year Hydraflow Report - Casey's Naperville (Ogden)																								
Line	Inlet ID	DnStrm Line No.	Line Length	Incr.Area	Total Area	Runoff Coeff.	IncrC x A	TotalC x A	InletTime	Tc	iSys	Total Runoff	Known Q	Flow Rate	Capacity Full	Vel Ave	Pipe Size	Pipe Slope	Invert Dn	Invert Up	HGL Dn	HGL Up	Grnd/Rim Elev Dn	Grnd/Rim Elev Up
			(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
1	D11 TO EX1	Outfall	20.713	0.2	0.24	0.82	0.16	0.19	10	10.9	6.27	1.17	0	1.17	1.59	2.91	12	0.2	760.37	760.41	760.83	761	763.33	763.33
2	D7 TO D11	1	10.059	0.04	0.04	0.64	0.02	0.02	10	10	6.47	0.15	0	0.15	2.01	0.27	12	0.32	760.41	760.44	761.08	761.08	763.33	763.91
3	D9 TO D8	Outfall	18.622	0	1.08	0	0	0.9	0	12.5	5.95	5.37	0	5.37	8.5	4.9	18	0.66	756.6	756.72	757.49	757.61	758.39	761.68
4	126 TO D9	3	35.533	0	1.03	0	0	0.85	0	12.3	5.99	5.1	0	5.1	5.9	3.76	18	0.32	757	757.11	758.08	758.19	761.68	762.25
5	128 TO 126	4	35.467	0	0.99	0	0	0.82	0	12.1	6.03	4.95	0	4.95	5.94	3.1	18	0.32	757.11	757.23	758.41	758.47	762.25	763.25
6	RD1 TO 128	5	10.304	0.02	0.02	0.9	0.02	0.02	10	10	6.47	0.14	0	0.14	0.61	2.29	6	1	758.7	758.8	758.86	758.99	763.25	763.48
7	RD3 TO D9	3	10.304	0.03	0.03	0.9	0.03	0.03	10	10	6.47	0.2	0	0.2	0.61	2.57	6	1	758.5	758.6	758.7	758.83	761.68	763.48
8	RD2 TO 126	4	10.304	0.03	0.03	0.9	0.03	0.03	10	10	6.47	0.2	0	0.2	0.61	2.56	6	1	758.5	758.6	758.7	758.83	762.25	763.48
9	D4 TO 128	5	23.503	0	0.97	0	0	0.8	0	11.9	6.06	4.84	0	4.84	5.94	2.84	18	0.32	757.23	757.3	758.63	758.67	763.25	762.46
10	D3 TO D4	9	100.791	0.45	0.97	0.81	0.36	0.8	10	11.3	6.18	4.94	0	4.94	5.94	2.86	18	0.32	757.3	757.62	758.79	758.99	762.46	762.01
11	D2 TO D3	10	130	0	0.52	0	0	0.44	0	10.4	6.39	2.79	0	2.79	3.59	2.28	15	0.31	757.62	758.02	759.12	759.36	762.01	762.63
12	D1 TO D2	11	51.812	0.52	0.52	0.84	0.44	0.44	10	10	6.47	2.83	0	2.83	3.81	2.31	15	0.35	758.02	758.21	759.38	759.45	762.63	762.1
13	125 TO D9	3	35.515	0	0.02	0	0	0.02	0	10.3	6.41	0.13	0	0.13	0.61	0.95	6	1	757	757.36	757.61	757.63	761.68	761.68
14	RD4 TO 125	13	10.304	0.02	0.02	0.9	0.02	0.02	10	10	6.47	0.14	0	0.14	0.61	1.6	6	1	757.36	757.46	757.66	757.64	761.68	763.48

Proposed 100-Year Hydraflow Report - Casey's Naperville (Ogden)																								
Line	Inlet ID	DnStrm Line No.	Line Length	Incr.Area	Total Area	Runoff Coeff.	IncrC x A	TotalC x A	InletTime	Tc	iSys	Total Runoff	Known Q	Flow Rate	Capacity Full	Vel Ave	Pipe Size	Pipe Slope	Invert Dn	Invert Up	HGL Dn	HGL Up	Grnd/Rim Elev Dn	Grnd/Rim Elev Up
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2	D7 TO D11	1	10.059	0.04	0.04	0.64	0.02	0.02	10	10	10.79	0.24	0	0.24	2.01	0.33	12	0.32	760.41	760.44	761.31	761.31	763.33	763.91
3	D9 TO D8	Outfall	18.622	0	1.08	0	0	0.9	0	11.5	10.24	9.25	0	9.25	8.5	5.96	18	0.66	756.6	756.72	757.77	758.02	758.39	761.68
4	126 TO D9	3	35.533	0	1.03	0	0	0.85	0	11.4	10.28	8.75	0	8.75	5.9	4.95	18	0.32	757	757.11	758.52	758.77	761.68	762.25
5	128 TO 126	4	35.467	0	0.99	0	0	0.82	0	11.3	10.32	8.47	0	8.47	5.94	4.79	18	0.32	757.11	757.23	759.15	759.38	762.25	763.25
6	RD1 TO 128	5	10.304	0.02	0.02	0.9	0.02	0.02	10	10	10.79	0.23	0	0.23	0.61	1.15	6	1	758.7	758.8	759.74	759.75	763.25	763.48
7	RD3 TO D9	3	10.304	0.03	0.03	0.9	0.03	0.03	10	10	10.79	0.34	0	0.34	0.61	2.99	6	1	758.5	758.6	758.77	758.9	761.68	763.48
8	RD2 TO 126	4	10.304	0.03	0.03	0.9	0.03	0.03	10	10	10.79	0.33	0	0.33	0.61	1.69	6	1	758.5	758.6	759.15	759.18	762.25	763.48
9	D4 TO 128	5	23.503	0	0.97	0	0	0.8	0	11.2	10.35	8.28	0	8.28	5.94	4.69	18	0.32	757.23	757.3	759.74	759.89	763.25	762.46
10	D3 TO D4	9	100.791	0.45	0.97	0.81	0.36	0.8	10	10.8	10.49	8.38	0	8.38	5.94	4.74	18	0.32	757.3	757.62	760.23	760.87	762.46	762.01
11	D2 TO D3	10	130	0	0.52	0	0	0.44	0	10.2	10.7	4.68	0	4.68	3.59	3.81	15	0.31	757.62	758.02	761.21	761.9	762.01	762.63
12	D1 TO D2	11	51.812	0.52	0.52	0.84	0.44	0.44	10	10	10.79	4.72	0	4.72	3.81	3.85	15	0.35	758.02	758.21	761.97	762.24	762.63	762.1
13	125 TO D9	3	35.515	0	0.02	0	0	0.02	0	10.2	10.73	0.23	0	0.23	0.61	1.15	6	1	757	757.36	758.52	758.57	761.68	761.68
14	RD4 TO 125	13	10.304	0.02	0.02	0.9	0.02	0.02	10	10	10.79	0.23	0	0.23	0.61	1.15	6	1	757.36	757.46	758.59	758.61	761.68	763.48

STAGE STORAGE

POND: <u>Detention Basin</u> JOB NO. <u>168865010</u> Side Slopes PROJECT: <u>Casey's - Naperville (Ogden)</u> <u>1</u> DATE: <u>04/13/2022</u>					
PROPOSED CONDITION					
	Area		Average	Incremental	Cummulative
Elevation			Area	Storage	Storage
(ft)	(ft ²)	(acre)	(acre)	(acre-ft)	(acre-ft)
756.50	385	0.009			0.000
			0.012	0.01	
757.00	670	0.015			0.01
			0.023	0.02	
758.00	1,318	0.030			0.03
			0.039	0.04	
759.00	2,085	0.048			0.07
			0.058	0.06	
760.00	2,980	0.068			0.126
			0.080	0.07	
760.90	3,950	0.091			0.20
				TOTAL:	0.20