TOWN OF CALEDON
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Feb 16, 2022

scs consulting group ltd

File #: 1564
Date: February 27, 2019

Mr. David Hurst, C.E.T.
Town of Caledon
6311 Old Church Road
Caledon, Ontario, L7C 1J6

Dear Mr. Hurst:

Re: **Stormwater Management Compliance Letter**
Digram Developments Caledon – Block 132
Town of Caledon, Regional Municipality of Peel

We are pleased to provide you with the following stormwater management (SWM) compliance letter in support of the proposed Digram Developments Caledon – Block 132 residential site plan development in the Town of Caledon (refer to **Figure 1**).

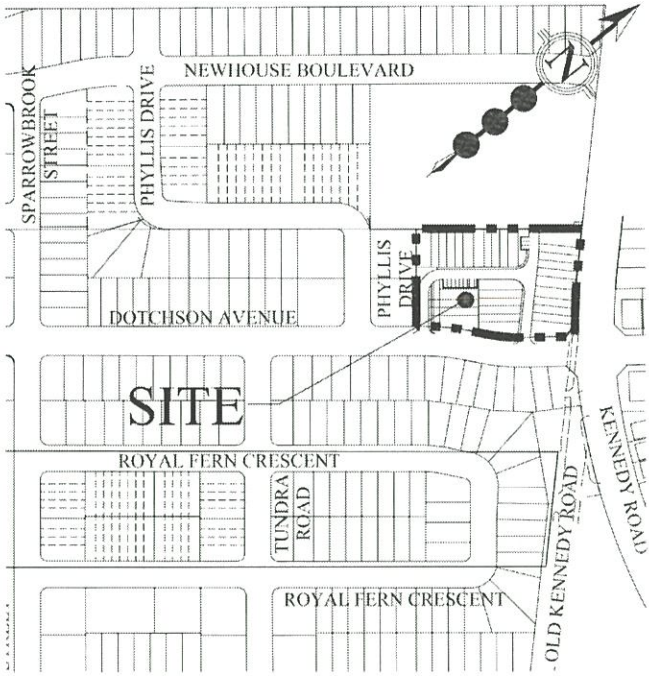

Figure 1: Site Location Map

SCS Consulting Group Ltd. has been retained by Digram Developments Caledon Inc. to prepare this SWM compliance letter in support of the proposed development within the West 'A' Residential Neighbourhood of the Mayfield West Community Secondary Plan, located in the Town of Caledon. The study area is approximately 0.79 ha in size and is bound by:

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- Kennedy Trails Development Ltd. (21T-12003C) to the north,
- Kennedy Road to the east,
- Phyllis Drive to the west,
- Dotchson Avenue to the south.

The proposed storm drainage within the subject development, per the previously approved design of the existing SWM Pond E2, was to be conveyed via the existing minor and major system infrastructure at an imperviousness of 79%. The existing SWM Pond E2 is located in the existing Argo Caledon Subdivision Phase 1 and the Moscorp VII Developments Inc. subdivisions, respectively. Refer to **Drawing STM-1** for the proposed storm drainage plan.

As shown in **Drawing STM-1**, the proposed site development area and density remains the same as what was contemplated in the design of the existing downstream SWM Facilities. Therefore, it can be concluded that the proposed development satisfies the design criteria for the existing SWM pond and can therefore rely on SWM Pond E2 for quality, quantity and erosion control.

Due to the nature of the servicing design for the subject development, the assumed conveyance method of the 10 year flow in the storm sewer (minor system) with the remaining flows conveyed via the municipal ROW (major system) cannot be achieved. This is due to a number of inlets that cannot be equipped with inlet control devices (ICDs). While ICDs have been included where feasible and/or appropriate within the laneway, the design results in four rear lot catchbasins without ICDs, one laneway catchbasin without an ICD and three catchbasin manholes without ICDs. To ensure that the downstream minor and major system conveyance infrastructure is adequately sized, an update to the existing modelling was completed by JF Sabourin on behalf of the subject development (**Attachment A**). The memo concludes that there are no negative impacts downstream.

Since the development of the Comprehensive Environmental Impact Statement and Management Plan for the Mayfield West Community Development Plan Area in 2007; new requirements for water balance have been implemented requiring the first 5 mm of rainfall to be detained on-site.

To select appropriate controls for the subject development, the following site characteristics were taken into consideration:

- Subsurface soils and groundwater information within the proposed development area were evaluated by Canadian Engineering Services Inc. Excerpts can be found in **Attachment B**. Underlying fills or reworked tills, the native subsoil mainly consist of silty sand and glacial tills ranging in gradation from clayey silt till to silty sand till;
- Water table depth is typically 0.7 m to 1.9 m below the existing grade, acknowledging this is subject to seasonal fluctuation.

Note that based on the shallow groundwater table (0.7 m to 1.9 m) and the requirements set out within the TRCA/CVC LID guidelines, infiltration measures will not be effective as they require at least 1.0 m of separation from the groundwater table which is not present. As such, soakaway pits, pervious pipe and catchbasin infiltration systems are not expected to be effective.

The following stormwater management measures are proposed to provide best efforts:

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Reduced Lot Grading

Reducing lot grading from a maximum of 5% to a minimum of 2% is suggested wherever possible to maximize lot level initial abstraction and infiltration. As shown on the engineering drawing set, provided under separate cover, lot grading on site ranges from 2%-5%.

Increased Topsoil Depth

An increase in the proposed topsoil depth on lots will also be used to promote lot level infiltration (up to 0.3 m depth).

Roof Leaders to Grassed Areas

Roof leaders and sump pumps (if required) will be discharged to grassed areas to promote lot level infiltration where feasible.

Rear Lot Catchbasin Infiltration System

Due to high groundwater elevations and the proximity of potential RLCB infiltration systems to the proposed buildings, it is not feasible to propose this solution on the subject development.

In conclusion, the proposed Caledon Block 132 private residential development is in compliance with the existing downstream SWM Pond E2, the storm conveyance infrastruture as well as with the overall Comprehensive Environmental Impact Statement and Management Plan for the Mayfield West Community Development Plan Area.

Please contact the undersigned if you have any questions or require any additional information.

Sincerely,

SCS Consulting Group Ltd.

John Priamo, P. Eng.
jpriamo@scsconsultinggroup.com

Attachments: **Drawing STM-1** – Storm Drainage Plan
Attachment A – JF Sabourin SWM Memo
Attachment B – Relevant Report Excerpts

c. Mr. A. Memon, Digram Developments Caledon Inc. (Letter only via email)

P:\1564 Digram-Caledon\Correspondence\Letters\Caledon-jmp-Block 132 Detailed Design SWM Compliance Letter-26feb19.doc

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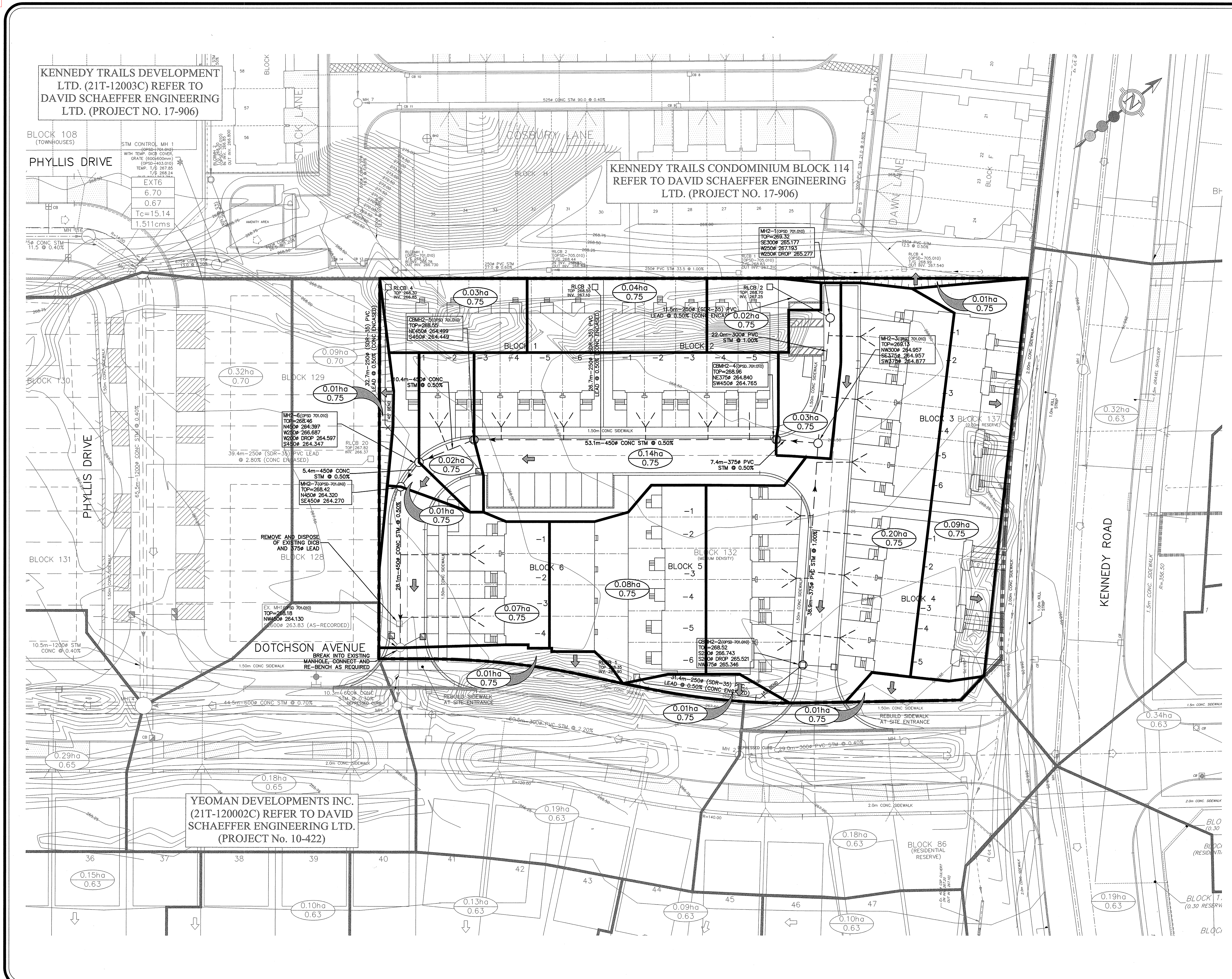

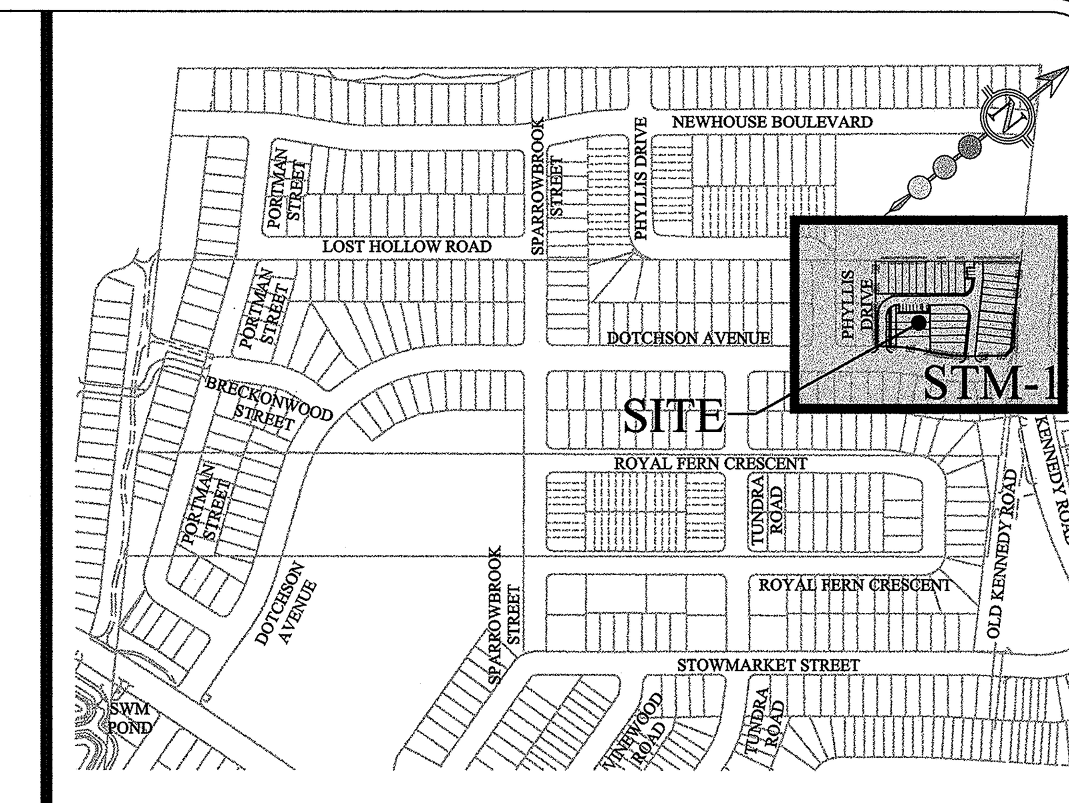

KEY PLAN
N.T.S.

BENCHMARK: ELEV. 259.419

PEEL BENCHMARK NO. 56.

LEGEND:

- STORM MANHOLE
- EXISTING/FUTURE STORM MANHOLE
- EXISTING/FUTURE SINGLE CATCHBASIN
- EXISTING/FUTURE DOUBLE CATCHBASIN
- SINGLE CATCHBASIN WITH NO ICD
- SINGLE CATCHBASIN WITH 19.8 L/S (TYPE 'A') INLET CONTROL DEVICE (ICD)
- DOUBLE CATCHBASIN WITH NO ICD
- SINGLE SERVICE CONNECTION
- DUAL SERVICE CONNECTIONS
- 100 LOT NUMBER
- 9 EXISTING/FUTURE LOT NUMBER
- LIMIT OF PROPERTY
- DRAINAGE BOUNDARY
- EXISTING/FUTURE DRAINAGE BOUNDARY
- 0.51ha DRAINAGE AREA (HECTARES); 0.50 RUNOFF COEFFICIENT
- 2.29ha EXISTING DRAINAGE AREA (HECTARES); 0.75 RUNOFF COEFFICIENT
- OVERLAND FLOW ROUTE
- EXISTING/FUTURE OVERLAND FLOW ROUTE
- 165.00 EXISTING CONTOUR
- * 100 YEAR FLOW INFORMATION FROM STORMWATER MANAGEMENT REPORT FOR KENNEDY TRAILS DEVELOPMENT LTD. PREPARED BY J.F. SABOURIN AND ASSOCIATES INC., DATED FEBRUARY 2016. EXTERNAL DRAINAGE AREA, EQUIVALENT RUNOFF AND TIME OF CONCENTRATION INFORMATION FROM 10 YEAR DESIGN SHEET FOR KENNEDY TRAILS DEVELOPMENT LTD., DATED FEBRUARY 2016; YEOMAN DEVELOPMENTS INC., DATED APRIL 2015; MOSCORP DEVELOPMENT INC., DATED OCTOBER 2013 PREPARED BY DAVID SCHAEFFER ENGINEERING LIMITED.
- EXT2
- 1.51 EXTERNAL DRAINAGE AREA (ha)
- 0.63 EQUIVALENT RUNOFF COEFFICIENT
- Tc=11.60 TIME OF CONCENTRATION (MIN.)
- 0.527cms 100-YEAR FLOW

TOPOGRAPHIC SURVEY PROVIDED BY HOLDING JONES VANDERVEEN INC., JANUARY 2016

REVISIONS

No.	DESCRIPTION	DATE	BY	APPROVED

SCS consulting group ltd
30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335

TOWN OF CALEDON
6311 OLD CHURCH ROAD
CALEDON, ONTARIO L7C 1J6
TEL: (905) 584-2272
FAX: (905) 584-4325

DIGRAM DEVELOPMENTS CALEDON INC.

CALEDON - CONDO BLOCK 132
21T-14002C (T-14002Ca)

STORM DRAINAGE PLAN

LICENSED PROFESSIONAL ENGINEER
D. WOO
100073980
Feb 28, 2019
PROVINCE OF ONTARIO

DATE:	MARCH 2019	DESIGNED BY:	D.W./C.J.C.	CHECKED BY:	M.R.C.
SCALE:	1:300	DRAWN BY:	J.Y.L.	CHECKED BY:	

1 0 5 10 15 20 25

APPROVED FOR CONSTRUCTION
THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY.

THIS APPROVAL IS SUBJECT TO THE FURTHER CERTIFICATION OF THE "AS-CONSTRUCTED" WORKS BY A REGISTERED PROFESSIONAL ENGINEER OF THE PROVINCE OF ONTARIO

DATE: ____________ APPROVED BY: ____________

PROJECT No: 1564

DRAWING No: STM-1

File: P:\1564 Digram-Caledon\Drawings\Block 132\Dr\1564D-BLCK-132-STM-1.dwg - Revised by <FBISDA> : Thu, Feb 28 2019 - 2:34pm

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ATTACHMENT A

JF SABOURIN SWM MEMO

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J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS

52 Springbrook Drive
Ottawa (Stittsville), ON K2S 1B9
TEL: (613) 836-3884
FAX: (613) 836-0332
WEB: www.jfsa.com

July 4, 2018

SCS Consulting Group Limited
30 Centurian Drive, Suite 100
Markham, Ontario L3R 8B8

Attention: **Mr. Douglas Woo, P.Eng.**

Subject: **Digram Developments Caledon Inc. /**
Downstream Impacts of Condo Block 132 SWM Design *our file: 552-05*

As requested by your office and based on the available information as described below, we have evaluated the impact of the latest design for Condo Block 132 by SCS Consulting Group Limited on the performance of downstream storm sewer system (existing and proposed) and existing Stormwater Management (SWM) Facility E2.

The proposed condo block is located within the Diagram Developments Caledon Inc. Subdivision, and north of the Yeoman Developments Inc. subdivision, within the Town of Caledon. The downstream storm sewer system and pond were designed to service a 0.79 ha area at 79% imperviousness from the condo block site, as per the August 2011 *Design Brief for Stormwater Management Pond E2 for the Mayfield West Community 3rd Registration Area* by David Schaeffer Engineering Limited and J.F. Sabourin and Associates Inc., and the more recent update to the overall model in the December 2017 *Stormwater Management Report for Kennedy Trails Development Condo Block* by J.F. Sabourin and Associates Inc. Per the December 2017 *SWM Report*, minor system capture from the condo block to Yeoman MH 3 was limited to the 10-year Rational Method flow of 221 L/s, assuming no surface storage on-site and with excess major system flows draining south to Dotchson Avenue just east of the intersection with Phyllis Drive.

The detailed design of the condo block by SCS Consulting Group Limited proposes that the 0.79 ha block be developed at an average imperviousness of 64%. Refer to Attachment C for the grading plan, servicing plan and storm drainage plan as provided by SCS Consulting Group Limited in July 2018. As the proposed imperviousness is lower than that estimated in the preliminary design (79%), it may be reasonably expected that the detailed design of the condo block will not have a negative impact on the performance of SWM Facility E2.

The SWM design by SCS Consulting Group Limited proposes an internal storm sewer system servicing 0.65 ha of the site. Excess major system flows from the 0.65 ha area will drain overland to Dotchson Avenue at two access roads to the condo block (east and west). Major system flows from the west access road drain to Dotchson Avenue just east of the intersection with Phyllis Drive, consistent with the preliminary design. However, the east access road is located at a high point on Dotchson Avenue, such that major system flows on the west side of the access road will drain west along Dotchson Avenue towards its intersection with Phyllis Avenue, and major system flows from the east side of the access road will drain east along Dotchson Avenue towards its intersection with Kennedy Road. This is not consistent with the preliminary design and may impact the performance of the major and minor systems on this segment of Dotchson Avenue and downstream Kennedy Road. Furthermore, the remaining 0.14 ha of the condo block cannot be serviced by the internal storm sewer due to grading restrictions, and sheet flows overland to Dotchson Avenue and Kennedy Road, with a small portion (0.01 ha) draining into external rearyards along the boundary of the site.

The most recent DDSWMM / XPSWMM models of the overall drainage area to SWM Facility E2, as submitted with the December 2017 *SWM Report*, were updated to reflect the detailed design of Condo Block 132 as provided by SCS Consulting Group Limited. The proposed minor and major system drainage routes for Condo Block 132

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are shown in plan view in Figure 1. Refer to the December 2017 *SWM Report* for details of the external areas included in the model. The internal storm sewer within the condo block has four (4) rearyard catchbasins without inlet control devices (ICDs), three single catchbasins with Type A ICDs, one single catchbasin without an ICD, and three catchbasin manholes without ICDs.

Within the downstream development, ICDs were used to limit minor system capture to the 10-year flow. As a result of the 0.13 ha of the condo block draining overland to Kennedy Road and Dotchson Avenue, the ICDs in the two existing catchbasins on Dotchson Avenue at its intersection with Kennedy Road (97.5 L/s combined capacity) are now undersized to fully capture the 10-year flows (112 L/s based on the updated modelling). However, the existing storm sewer is not sufficiently sized to allow for larger ICDs to be installed at this location without a negative impact on the performance of the storm sewer system. Major system flows from the condo block to this location was minimized where possible, most notably by the inclusion of a 12 cm deep static ponding area and catchbasins without ICDs on the east Condo Block access road, to ensure the capture the full 10-year flows on the east access road. Redirecting roof drainage into the internal Condo Block system from the portion of the site fronting Kennedy Road was considered, but we understand is not possible due to the peaking of the roofs. It should be noted that the full 5-year flows (87 L/s) are captured at the two existing catchbasins on Dotchson Avenue, and as such standing water at this location will not be frequent. Furthermore, all ICDs and existing catchbasins on Kennedy Road downstream of this intersection are sufficiently sized to capture the 10-year flows, so the 14.5 L/s of flow spilling during the 10-year storm is a localized issue only.

Within the downstream development, the depth of water at the gutter will be retained within the right-of-way and will not exceed the maximum allowable value of 30 cm during the 100-year Chicago Storm (refer to Calculation Sheet B-1 of Attachment B, where the calculated maximum was 24.8 cm). Furthermore, it was determined that, for the 100-year event and for all major system segments, the product of the depth of water (m) at the gutter multiplied by the velocity of flow (m/s) will not exceed the maximum allowable 0.65 m^2/s (refer to Calculation Sheet B-1 of Attachment B, where the calculated maximum was 0.371 m^2/s). Furthermore, the two 15.5 m wide overland flow routes provided north of Pond E2 still have sufficient capacity to safely convey the 100-year major system flows from Dougall Avenue to the pond (refer to Calculation Sheet B-2 of Attachment B).

Tables A-1 and A-2 of Attachment A summarizes the pipe data and hydraulic simulation results based on the updated modelling for the 100-year 4-hour Chicago design storm under free outfall conditions for the Pond E2 system under ultimate and interim conditions, respectively (for the school block to the north; refer to the December 2017 *SWM Report* for further details). Note that the flowing full pipe velocities are not less than 0.75 m/s and no greater than 6.0 m/s for all proposed pipes. The 100-year flow will surcharge most parts of the minor system; however, a freeboard of 0.3 m between the hydraulic grade line and the underside of footings has been provided throughout developments tributary to Pond E2. Note that lots marked "FUT" indicate a location where the freeboard is an estimate only, and the actual freeboard within the Digram Developments Caledon Inc. subdivision and Condo Block 132 is to be verified by SCS Consulting Group Limited.

Yours truly,
J.F. Sabourin and Associates Inc.

L. Pipkins

Laura Pipkins, P.Eng.

cc: J.F. Sabourin, M.Eng, P.Eng.
Director of Water Resources Projects

Figure 1:	Proposed Minor and Major System
Attachment A:	Pipe Data and Hydraulic Gradeline Results; XPSWMM Model Schematic
Attachment B:	Calculation Sheets
Attachment C:	Drawings GR-1, S-1 and STM-1 (July 2018, SCS Consulting Group Limited)

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Z008R2
0.027 ha
21%

Z008NW
0.067 ha
85%

Z006N1
0.030 ha
70%

Z006NW
0.093 ha
88%

Z006NE
0.041 ha
93%

94%

C001SW
0.205 ha
66%

C001SE
0.166 ha
71%

KENNEDY ROAD

LZ006NW

LZ006SW

LZ002SE

Z008NE
0.027 ha
78%

Z006SW
0.085 ha
79%

Z006SE
0.045 ha
84%

Z006E2
0.014 ha
57%

Z002SW
0.054 ha
96%

Z008WK1
0.035 ha
71%

LZ008NW

LZ008NE

Z008R3
0.029 ha
17%

Z008R4
0.055 ha
19%

Z008R5
0.033 ha
20%

Z005R1
0.026 ha
7%

S006R1
0.033 ha
23%

S004R1
0.041 ha
25%

S004R2
0.022 ha
18%

C002NE
0.169 ha
61%

Y004R1
0.095 ha
28%

Y117SE
0.233 ha
70%

Y117R1
0.094 ha
28%

S007NW
0.042 ha
69%

S005NE
0.095 ha
87%

S004NW
0.030 ha
67%

C002NW
0.216 ha
61%

S002NE
0.126 ha
76%

PHYLLIS DRIVE

Y117SW
0.173 ha
80%

S005SE
0.046 ha
74%

Y004NW
0.014 ha
71%

S007NE
0.066 ha
76%

S002R1
0.073 ha
29%

S002SE
0.077 ha
88%

LY117SW

LY117SE

Y117E1
0.061 ha
66%

LS002SE

LS002NE

Y002NE
0.084 ha
54%

Y001NE
0.071 ha
65%

LY001NE

LP12NW

DOTCHSON AVENUE

Y004SW
0.128 ha
77%

Y004SE
0.119 ha
77%

Y002SE
0.165 ha
78%

LY001SE

LP11SW

Y001SE
0.083 ha
73%

Y024R1
0.148 ha
25%

Y024R2
0.115 ha
25%

Y024R3
0.132 ha
23%

A04NW
0.108 ha
69%

Y023R1
0.117 ha
18%

Y023R2
0.096 ha
17%

BLOCK 108 (TOWNHOUSES)

BLOCK 170

BLOCK 87 (RESIDENTIAL RESERVE)

LEGEND :

- LIMITS OF SUBDIVISION
- MAJOR SYSTEM SUBCATCHMENT BOUNDARY TO LOW POINTS AND OTHER AREAS
- MAJOR SYSTEM FLOW DIRECTION
- FIRST DIRECTION OF EXCESS MAJOR SYSTEM FLOW AT LOW POINT
- LZ003NE — LOW POINT
- Z003NE 0.114 ha 93% — SUB-CATCHMENT ID / SUB-CATCHMENT AREA / TOTAL IMPERVIOUSNESS

Inlet Control Device (ICD) Type :

- Tempest A (19.9L/s)/Ex. IPEX A (19.7L/s)
- Tempest B (28.4L/s)/Ex. IPEX B (28.0L/s)
- Tempest C (35.5L/s)/Ex. IPEX C (36.5L/s)
- Tempest D (50.1L/s)/Ex. IPEX D (54.6L/s)
- Tempest E (69.1L/s)/Ex. IPEX F (77.2L/s)
- Custom Type G (100 L/s)
- Custom Type H (136 L/s)
- Custom Type I (160 L/s)
- Custom Type J (185 L/s)

SCALE :
0 10 20 30 40m

J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

PROJECT :
DIGRAM DEVELOPMENTS CALEDON INC.
CONDO BLOCK 132

BY	DATE	DESCRIPTION	BY

PROPOSED MINOR AND MAJOR SYSTEM

FIGURE 1

DESIGNED:
DRAWN: LP
VERIFIED: JFS
APPROVED: JFS

DRAWING REF.
552-05\201806 Block 132 Subm1\Design\CAD\JFSA Figures.dwg

DATE: Jul/18
PROJECT No.: 552-05

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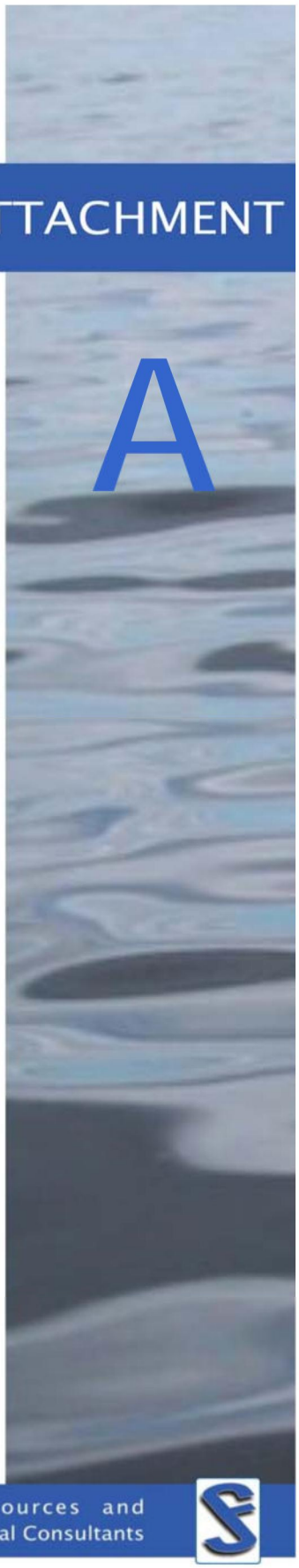

ATTACHMENT

A

Pipe Data and Hydraulic Gradeline Results

XPSWMM Model Schematic

JFSA Water Resources and Environmental Consultants

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL Length HGL (m)	Interpolated HGL Dist. From D/S MH (m)	Interpolated HGL HGL (m)
1	2	265.800	265.200	825	N/A	120.0	0.5	0.013	269.380	268.730	1.899	1.015	0.649	0.6	-0.342	1.367	266.283	265.700	N/A	N/A	N/A			
2	3	265.150	264.800	825	N/A	69.9	0.5	0.013	268.730	268.432	1.899	1.015	0.782	0.8	-0.275	1.367	265.700	265.335	N/A	N/A	N/A			
3	4	264.747	264.495	825	N/A	42.0	0.6	0.013	268.432	268.203	2.080	1.112	0.783	0.7	-0.309	1.383	265.263	265.006	N/A	N/A	N/A			
4	5	264.445	263.881	825	N/A	80.5	0.7	0.013	268.203	267.761	2.247	1.201	0.914	0.8	-0.272	1.383	264.998	264.490	5	266.48	1.252			
5	30	263.826	263.010	825	N/A	116.5	0.7	0.013	267.761	267.122	2.247	1.201	1.080	0.9	-0.161	1.383	264.490	263.865	11	265.95	1.230			
6	8	267.799	266.637	300	N/A	50.5	2.3	0.013	270.866	270.040	2.075	0.147	0.039	0.3	-0.194	1.317	267.905	266.743	32	268.80	0.665			
7	8	266.790	266.410	450	N/A	41.8	0.9	0.013	270.096	270.040	1.710	0.272	0.179	0.7	-0.128	1.383	267.112	266.742	N/A	N/A	N/A			
8	10	266.337	264.951	600	N/A	115.5	1.2	0.013	270.040	268.601	2.379	0.673	0.470	0.7	-0.195	1.350	266.742	265.887	42	267.34	0.368			
9	10	265.190	264.960	525	N/A	42.7	0.5	0.013	268.665	268.601	1.460	0.316	0.380	1.2	0.629	1.350	266.344	265.887	N/A	N/A	N/A			
10	27	264.576	264.051	975	N/A	87.5	0.6	0.013	268.601	268.046	2.325	1.736	0.900	0.5	0.336	1.400	265.887	265.652	46	266.74	0.623			
11	27	264.228	263.976	1050	N/A	42.0	0.6	0.013	267.991	268.046	2.443	2.115	1.995	0.9	0.605	1.433	265.883	265.652	N/A	N/A	N/A			
12	27	264.871	264.576	450	N/A	59.0	0.5	0.013	268.256	268.046	1.268	0.202	0.136	0.7	0.476	1.300	265.797	265.652	1	266.89	0.863			
13	14	268.238	268.064	450	N/A	43.5	0.4	0.013	271.187	271.513	1.134	0.180	0.084	0.5	-0.217	1.400	268.471	268.370	28	269.71	1.009			
14	15	267.989	267.809	525	N/A	45.0	0.4	0.013	271.513	271.276	1.256	0.272	0.165	0.6	-0.144	1.350	268.370	268.301	B60	269.71	1.110			
15	16	267.734	267.494	600	N/A	60.0	0.4	0.013	271.276	270.954	1.373	0.388	0.362	0.9	-0.033	1.350	268.301	267.888	B61	269.63	1.099			
16	17	267.414	266.070	600	N/A	112.0	1.2	0.013	270.954	269.291	2.379	0.673	0.448	0.7	-0.239	1.350	267.775	266.515	46	267.86	-0.145			
																			46	267.86	1.052	111.9	5.6	266.578
																			47	268.52	1.160	111.9	54.6	267.130
																			48	268.65	1.290	111.9	54.6	267.130
																			49	268.93	1.320	111.9	76.8	267.380
																			50	269.27	1.660	111.9	76.8	267.380
																			51	269.37	1.615	111.9	89.7	267.525
17	18	265.920	264.758	675	N/A	77.5	1.5	0.013	269.291	268.508	2.877	1.030	0.896	0.9	-0.080	1.350	266.515	265.721	41	267.20	0.455			
18	26	264.683	264.193	750	N/A	44.5	1.1	0.013	268.508	268.227	2.643	1.168	0.930	0.8	0.288	1.350	265.721	265.419	39	266.91	0.959			
19	20	266.349	266.127	300	N/A	18.5	1.2	0.013	269.482	269.300	1.499	0.106	0.055	0.5	0.410	1.350	267.059	267.004	B59N	267.90	0.611			
20	21	266.052	265.737	375	N/A	22.5	1.4	0.013	269.300	269.085	1.878	0.207	0.161	0.8	0.577	1.383	267.004	266.784	B58N	267.73	0.496			
21	22	265.437	265.019	675	N/A	104.5	0.4	0.013	269.085	268.476	1.486	0.532	0.398	0.7	0.672	1.383	266.784	266.553	B55W	267.26	0.246			
																			B55W	267.26	0.457	104.7	9.1	266.573
																			B55E	267.30	0.457	104.7	27.1	266.613
																			B56W	267.34	0.463	104.7	42.5	266.647
																			B56E	267.38	0.450	104.7	66.5	266.700
																			B57W	267.42	0.456	104.7	81.9	266.734
																			B57E	267.71	0.702	104.7	101.9	266.778
																			B162W	267.30	0.464	104.7	23.8	266.606
																			B162E	267.38	0.491	104.7	48.0	266.659
																			B161W	267.45	0.523	104.7	65.2	266.697
																			B161E	267.48	0.483	104.7	97.2	266.767
22	25	264.969	264.789	675	N/A	36.0	0.5	0.013	268.476	268.540	1.661	0.594	0.634	1.1	0.909	1.383	266.553	266.145	N/A	N/A	N/A			
23	24	265.539	265.379	300	N/A	14.5	1.1	0.013	268.536	268.609	1.435	0.101	0.044	0.4	0.345	1.367	266.184	266.154	51	267.06	0.646			
24	25	265.229	265.009	450	N/A	44.0	0.5	0.013	268.609	268.540	1.268	0.202	0.046	0.2	0.475	1.500	266.154	266.145	36	266.99	0.606			
25	26	264.709	264.193	750	N/A	86.0	0.6	0.013	268.540	268.227	1.952	0.862	0.868	1.0	0.686	1.383	266.145	265.419	33	266.72	0.345			
26	29	263.968	263.349	975	N/A	88.5	0.7	0.013	268.227	267.163	2.511	1.875	1.894	1.0	0.476	1.383	265.419	264.813	28	266.04	0.391			
27	28	263.676	263.361	1350	N/A	90.0	0.4	0.013	268.046	267.503	2.206	3.158	3.186	1.0	0.626	1.433	265.652	265.309	B68	266.31	0.428			
28	29	263.211	262.874	1500	N/A	112.5	0.3	0.013	267.503	267.163	2.191	3.872	3.737	1.0	0.598	1.417	265.309	264.813	12	265.83	0.291			
																			12	265.83	0.712	99.9	15.2	264.888
																			13	265.83	0.648	99.9	28.0	264.952
																			14	265.83	0.648	99.9	28.0	264.952
																			15	265.91	0.615	99.9	50.8	265.065
																			16	266.06	0.765	99.9	50.8	265.065
																			17	266.29	0.888	99.9	72.4	265.172
																			18	266.29	0.888	99.9	72.4	265.172
																			19	266.17	0.663	99.9	93.4	265.277
																			20	266.38	0.873	99.9	93.4	265.277

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL: Length HGL (m)	Interpolated HGL: Dist. From D/S MH (m)	Interpolated HGL: HGL (m)
																			22	266.25	0.762	99.9	89.6	265.258
																			23	266.24	0.752	99.9	89.6	265.258
																			24	266.10	0.735	99.9	64.9	265.135
																			25	266.21	0.845	99.9	64.9	265.135
																			26	266.21	0.955	99.9	42.6	265.025
																			27	266.00	0.745	99.9	42.6	265.025
29	30	262.824	262.429	1500	N/A	79.0	0.5	0.013	267.163	267.122	2.829	4.998	5.859	1.2	0.489	1.417	264.813	263.865	120	265.55	0.507			
30	35	262.335	261.885	1500	N/A	53.0	0.9	0.013	267.122	266.843	3.688	6.517	7.355	1.1	0.030	1.433	263.865	263.277	N/A	N/A	N/A			
31	32	263.059	262.909	600	N/A	37.5	0.4	0.013	266.448	266.795	1.373	0.388	0.369	1.0	0.451	1.333	264.110	263.984	Part12	265.30	0.960			
32	30	262.859	262.785	600	N/A	18.5	0.4	0.013	266.795	267.122	1.373	0.388	0.368	0.9	0.525	1.333	263.984	263.865	N/A	N/A	N/A			
35	100	261.835	261.679	1500	2400	29.5	0.5	0.013	266.843	266.641	3.345	12.040	7.520	0.6	-0.058	1.433	263.277	263.237	B122S	264.97	1.463			
36	68	261.398	260.762	1500	2400	120.0	0.5	0.013	266.363	265.468	3.345	12.040	8.113	0.7	-0.330	1.433	262.568	262.030	B95S	264.27	1.472			
38	40	268.456	267.896	375	N/A	70.0	0.8	0.013	271.790	271.439	1.420	0.157	0.065	0.4	-0.025	1.350	268.806	268.742	57	270.08	1.044			
39	40	267.623	267.451	900	N/A	43.0	0.4	0.013	271.464	271.439	1.800	1.145	1.056	0.9	0.513	1.367	269.036	268.742	N/A	N/A	N/A			
40	44	267.371	267.061	900	N/A	77.5	0.4	0.013	271.439	271.006	1.800	1.145	1.135	1.0	0.471	1.367	268.742	268.272	62	269.77	0.798			
41	44	267.233	267.061	900	N/A	43.0	0.4	0.013	270.975	271.006	1.800	1.145	1.340	1.2	0.369	1.400	268.502	268.272	N/A	N/A	N/A			
42	43	268.296	267.911	300	N/A	38.5	1.0	0.013	271.446	271.302	1.368	0.097	-0.004	0.0	-0.272	1.433	268.324	268.322	13	269.79	1.236			
43	44	267.761	267.511	450	N/A	50.0	0.5	0.013	271.302	271.006	1.268	0.202	0.086	0.4	0.111	1.350	268.322	268.272	67	269.64	1.088			
44	45	266.911	266.736	1050	N/A	25.0	0.7	0.013	271.006	270.723	2.639	2.285	2.516	1.1	0.311	1.400	268.272	268.011	N/A	N/A	N/A			
45	46	266.686	266.462	1050	N/A	32.0	0.7	0.013	270.723	270.449	2.639	2.285	2.506	1.1	0.275	1.400	268.011	267.743	B145	269.15	0.909			
46	47	266.412	265.452	1050	N/A	120.0	0.8	0.013	270.449	269.754	2.821	2.442	2.662	1.1	0.281	1.400	267.743	266.647	77	268.30	0.327			
47	37	265.402	265.050	1050	N/A	44.0	0.8	0.013	269.754	269.459	2.821	2.442	2.783	1.1	0.195	1.500	266.647	266.221	81	267.95	1.073			
48	49	264.712	264.007	1200	N/A	70.5	1.0	0.013	269.299	268.030	3.447	3.899	3.367	0.9	0.061	1.483	265.973	265.417	87	266.71	0.507			
49	50	264.007	263.887	1200	N/A	12.0	1.0	0.013	268.030	268.145	3.447	3.899	3.384	0.9	0.210	1.483	265.417	265.154	N/A	N/A	N/A			
50	51	263.837	262.437	1200	N/A	87.5	1.6	0.013	268.145	266.532	4.360	4.932	3.513	0.7	0.117	1.483	265.154	264.486	B94N	265.45	0.066			
																			B94N	265.45	0.611	87.4	16.1	264.609
																			B93S	265.60	0.642	87.4	31.7	264.728
																			B93N	266.29	1.148	87.4	55.7	264.912
																			B125S	266.32	1.061	87.4	71.1	265.029
																			B129	266.55	1.471	87.4	47.5	264.849
																			1	266.22	1.262	87.4	31.7	264.728
																			2	265.61	0.776	87.4	15.4	264.604
51	65	262.287	262.011	1350	N/A	39.5	0.7	0.013	266.532	266.418	3.120	4.466	3.830	0.9	0.849	1.483	264.486	264.035	B94S	265.25	0.534			
52	53	267.517	267.124	825	N/A	65.5	0.6	0.013	271.337	271.276	2.080	1.112	1.118	1.0	0.931	1.350	269.273	268.655	N/A	N/A	N/A			
53	54	267.044	266.765	825	N/A	46.5	0.6	0.013	271.276	270.994	2.080	1.112	1.121	1.0	0.786	1.450	268.655	268.374	42	269.59	0.705			
54	56	266.690	266.375	900	N/A	45.0	0.7	0.013	270.994	270.726	2.381	1.515	1.192	0.8	0.784	1.450	268.374	267.973	40	269.40	0.796			
55	56	267.020	266.452	825	N/A	78.5	0.7	0.013	270.864	270.726	2.247	1.201	1.291	1.1	0.665	1.350	268.510	267.973	51	269.55	0.810			
56	57	266.295	264.859	975	N/A	110.5	1.3	0.013	270.726	269.282	3.422	2.555	2.563	1.0	0.703	1.500	267.973	266.558	34	268.07	-0.133			
																			34	268.07	1.264	110.5	1.4	266.576
																			35	268.30	1.494	110.5	1.4	266.576
																			36	268.30	1.305	110.5	16.2	266.765
																			37	268.53	1.252	110.5	38.3	267.048
																			38	268.84	1.368	110.5	53.4	267.242
																			39	268.84	1.368	110.5	53.4	267.242
57	97	264.784	264.063	1050	N/A	51.5	1.4	0.013	269.282	268.695	3.731	3.231	2.770	0.9	0.724	1.533	266.558	266.046	31	267.57	0.782			
58	59	267.423	266.463	525	N/A	120.0	0.8	0.013	270.764	269.720	1.777	0.385	0.183	0.5	-0.268	1.367	267.680	266.985	20	268.32	0.410			
59	60	266.413	265.138	525	N/A	85.0	1.5	0.013	269.720	268.586	2.433	0.527	0.437	0.8	0.047	1.350	266.985	266.200	B131	267.30	0.085			
																			B131	267.30	0.853	84.8	1.8	266.217
																			B132	267.42	0.973	84.8	1.8	266.217
																			B133	267.70	1.052	84.8	23.6	266.418
																			B134	267.70	1.052	84.8	23.6	266.418
																			B135	267.89	1.031	84.8	46.3	266.629
																			B136	268.23	1.371	84.8	46.3	266.629

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL Length HGL (m)	Interpolated HGL Dist. From D/S MH (m)	Interpolated HGL HGL (m)
																			B137	268.29	1.225	84.8	68.6	266.835
																			B138	268.29	1.225	84.8	68.6	266.835
																			21	268.32	1.168	84.8	78.0	266.922
																			22	268.05	0.898	84.8	78.0	266.922
																			23	267.87	0.973	84.8	50.4	266.667
																			24	267.81	0.913	84.8	50.4	266.667
60	62	264.988	264.538	675	N/A	15.0	3.0	0.013	268.586	268.734	4.069	1.456	0.708	0.5	0.537	1.333	266.200	265.870	N/A	N/A	N/A			
61	62	265.914	265.000	300	N/A	43.5	2.1	0.013	268.976	268.734	1.982	0.140	0.126	0.9	0.372	1.350	266.586	265.870	B91	267.28	0.464			
62	63	264.458	264.038	675	N/A	30.0	1.4	0.013	268.734	268.239	2.779	0.995	0.819	0.8	0.737	1.417	265.870	265.579	7	267.01	0.910			
63	64	263.888	263.306	825	N/A	48.5	1.2	0.013	268.239	267.701	2.942	1.572	1.032	0.7	0.866	1.433	265.579	265.119	5	266.38	0.571			
64	65	262.931	262.161	1200	N/A	85.5	0.9	0.013	267.701	266.418	3.270	3.699	4.312	1.2	0.988	1.400	265.119	264.035	N/A	N/A	N/A			
65	67	261.861	261.497	1500	N/A	40.5	0.9	0.013	266.418	265.810	3.795	6.706	8.137	1.2	0.674	1.433	264.035	263.479	N/A	N/A	N/A			
66	67	262.608	262.422	525	N/A	46.5	0.4	0.013	265.876	265.810	1.256	0.272	0.266	1.0	0.601	1.367	263.734	263.479	N/A	N/A	N/A			
67	78	261.447	260.891	1500	N/A	50.5	1.1	0.013	265.810	265.678	4.195	7.414	9.630	1.3	0.532	1.433	263.479	262.523	N/A	N/A	N/A			
68	69	260.611	259.281	1500	3000	133.0	1.0	0.013	265.468	264.722	4.846	21.806	17.991	0.8	-0.081	1.467	262.030	261.143	N/A	N/A	N/A			
69	70	259.281	258.706	1500	3000	57.5	1.0	0.013	264.722	264.089	4.846	21.806	19.109	0.9	0.361	1.433	261.142	260.623	N/A	N/A	N/A			
70	70A	258.656	258.610	1500	3000	10.2	0.5	0.013	264.089	263.870	3.251	14.628	19.117	1.3	0.466	1.433	260.622	260.527	N/A	N/A	N/A			
73	74	260.456	259.664	525	N/A	99.0	0.8	0.013	264.757	264.262	1.777	0.385	0.147	0.4	-0.272	1.483	260.709	260.423	N/A	N/A	N/A			
74	75	259.589	259.421	600	N/A	43.5	0.4	0.013	264.262	263.400	1.373	0.388	0.243	0.6	0.234	1.483	260.423	260.333	N/A	N/A	N/A			
75	80	258.512	258.253	1500	3000	57.5	0.5	0.013	263.400	261.870	3.251	14.628	20.067	1.4	0.320	1.433	260.332	260.273	N/A	N/A	N/A			
76	48	265.346	265.162	750	N/A	46.0	0.4	0.013	269.631	269.299	1.594	0.704	0.306	0.4	-0.069	1.517	266.027	265.973	N/A	N/A	N/A			
77	78	263.019	262.731	375	N/A	57.5	0.5	0.013	266.101	265.678	1.123	0.124	0.060	0.5	-0.168	1.300	263.226	262.909	N/A	N/A	N/A			
78	68	260.861	260.641	1500	N/A	20.0	1.1	0.013	265.678	265.468	4.195	7.414	9.669	1.3	0.162	1.433	262.523	262.141	N/A	N/A	N/A			
80	PondE2	258.203	258.117	1500	3000	21.5	0.4	0.013	261.870	260.700	3.065	13.792	20.083	1.5	0.570	1.417	260.273	260.265	N/A	N/A	N/A			
97	64	264.033	263.081	1050	N/A	68.0	1.4	0.013	268.695	267.701	3.731	3.231	3.116	1.0	0.963	1.533	266.046	265.119	29	267.35	1.074			
310	31	263.237	263.109	600	N/A	32.0	0.4	0.013	266.131	266.448	1.373	0.388	0.371	1.0	0.383	1.333	264.220	264.110	Part1	264.92	0.470			
500	50	265.097	264.737	300	N/A	36.0	1.0	0.013	268.339	268.145	1.368	0.097	0.005	0.1	-0.230	1.450	265.167	265.154	B125N	266.60	1.203			
660	66	263.109	262.683	450	N/A	71.0	0.6	0.013	266.585	265.876	1.389	0.221	0.093	0.4	0.229	1.283	263.788	263.734	N/A	N/A	N/A			
PondE2	O210	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.782	N/A	N/A	1.933	N/A	N/A	N/A	N/A	N/A			
PondE2	EMER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.648	N/A	N/A	1.933	N/A	N/A	N/A	N/A	N/A			
O210	O211	256.300	255.994	1800	N/A	25.5	1.2	0.013	260.000	260.000	4.948	12.592	4.782	0.4	-0.893	1.933	257.207	256.779	N/A	N/A	N/A			
37	48	265.050	264.862	1050	N/A	23.5	0.8	0.013	269.459	269.299	2.821	2.442	2.803	1.1	0.121	1.500	266.221	265.973	89	268.03	1.579			
72	80	259.346	259.216	750	N/A	28.0	0.5	0.013	263.607	261.870	1.782	0.787	-0.031	0.0	0.178	1.383	260.274	260.273	N/A	N/A	N/A			
O211	OUT	255.994	255.892	1800	N/A	8.5	1.2	0.013	260.000	258.292	4.948	12.592	4.782	0.4	-1.015	1.933	256.779	256.661	N/A	N/A	N/A			
C120	C166	264.490	264.420	1050	N/A	19.3	0.4	0.013	268.210	268.110	1.995	1.727	1.496	0.9	0.512	1.483	266.052	265.989	Cole Eng.	266.72	0.438			
C140	C40	265.810	265.340	675	N/A	118.3	0.4	0.013	269.620	268.640	1.486	0.532	0.522	1.0	0.351	1.367	266.836	266.310	Cole Eng.	267.94	0.874			
C150	C59	266.750	265.810	450	N/A	94.9	1.0	0.013	270.310	269.310	1.793	0.285	0.191	0.7	-0.172	1.350	267.028	266.519	Cole Eng.	268.47	1.212			
C165	C40	265.500	265.310	900	N/A	47.3	0.4	0.013	268.640	268.640	1.800	1.145	0.830	0.7	0.004	1.367	266.404	266.310	Cole Eng.	N/A	N/A			
C166	11	264.370	264.250	1050	N/A	28.9	0.4	0.013	268.110	267.991	1.995	1.727	1.555	0.9	0.569	1.483	265.989	265.883	Cole Eng.	266.55	0.331			
C39	C140	267.940	266.890	450	N/A	105.2	1.0	0.013	270.660	269.620	1.793	0.285	0.305	1.1	-0.041	1.367	268.349	267.274	Cole Eng.	268.89	0.311			
C40	C62	264.960	264.890	1050	N/A	16.7	0.4	0.013	268.640	268.640	1.995	1.727	1.313	0.8	0.300	1.350	266.310	266.267	Cole Eng.	N/A	N/A			
C42	1	266.170	265.990	450	N/A	36.8	0.5	0.013	269.170	269.380	1.268	0.202	0.072	0.4	-0.232	1.300	266.388	266.283	Cole Eng.	N/A	N/A			
C505	1	265.910	265.830	825	N/A	17.2	0.5	0.013	269.380	269.380	1.899	1.015	0.364	0.4	-0.421	1.317	266.314	266.283	Cole Eng.	N/A	N/A			
C506	C505	266.220	265.990	750	N/A	23.1	1.0	0.013	269.380	269.380	2.520	1.113	0.365	0.3	-0.443	1.317	266.527	266.314	Cole Eng.	N/A	N/A			
C59	C60	265.730	265.630	450	N/A	9.7	1.0	0.013	269.310	269.170	1.793	0.285	0.174	0.6	0.339	1.333	266.519	266.464	Cole Eng.	267.63	0.881			
C60	9	265.550	265.270	450	N/A	37.7	0.8	0.013	269.170	268.665	1.552	0.247	0.170	0.7	0.464	1.500	266.464	266.344	Cole Eng.	267.58	0.886			
C62	C63	264.850	264.610	1050	N/A	60.5	0.4	0.013	268.640	268.300	1.995	1.727	1.422	0.8	0.367	1.433	266.267	266.094	Cole Eng.	267.21	0.713			
C63	C120	264.580	264.520	1050	N/A	13.7	0.4	0.013	268.300	268.210	1.995	1.727	1.463	0.8	0.464	1.483	266.094	266.052	Cole Eng.	266.91	0.586			
C75	7	267.270	266.940	300	N/A	32.8	1.0	0.013	270.390	270.096	1.368	0.097	0.000	0.0	-0.458	0.000	267.112	267.112	Cole Eng.	268.88	1.538			
C75	C150	267.070	266.940	300	N/A	12.7	1.0	0.013	270.390	270.310	1.368	0.097	0.000	0.0	-0.342	0.000	267.028	267.028	Cole Eng.	269.88	2.622			
C40W	C42	266.490	266.200	450	N/A	57.8	0.5	0.013	268.640	269.170	1.268	0.202	0.073	0.4	-0.263	1.283	266.677	266.388	Cole Eng.	267.52	0.613			
F1	F3	268.818	268.512	450	N/A	76.5	0.4	0.013	272.312	271.881	1.134	0.180	0.172	1.0	0.124	1.367	269.392	269.153	14	270.59	0.968			
F2	F3	269.772	269.150	300	N/A	41.5	1.5	0.013	272.721	271.881	1.675	0.118	0.045	0.4	-0.171	1.367	269.901	269.279	N/A	N/A	N/A			

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL: Length HGL (m)	Interpolated HGL: Dist. From D/S MH (m)	Interpolated HGL: HGL (m)
F3	F4	268.212	267.640	750	N/A	114.5	0.5	0.013	271.881	271.359	1.782	0.787	0.670	0.9	0.191	1.367	269.153	268.832	9	270.05	0.667			
F4	55	267.565	267.070	825	N/A	99.0	0.5	0.013	271.359	270.864	1.899	1.015	0.931	0.9	0.442	1.350	268.832	268.510	3	269.67	0.608			
F100	F3	268.440	268.362	600	N/A	19.5	0.4	0.013	271.710	271.881	1.373	0.388	0.349	0.9	0.235	1.367	269.275	269.153	N/A	N/A	N/A			
101	102	262.978	262.663	525	N/A	52.5	0.6	0.013	266.056	265.856	1.539	0.333	0.248	0.7	-0.185	1.367	263.318	263.000	53	264.55	1.002			
102	103	262.438	261.790	750	N/A	72.0	0.9	0.013	265.856	265.495	2.391	1.056	0.406	0.4	-0.409	1.367	262.779	262.382	47	264.37	1.361			
103	106	261.760	260.842	750	N/A	76.5	1.2	0.013	265.495	265.315	2.760	1.220	0.855	0.7	-0.128	1.367	262.382	261.789	41	263.91	1.298			
Y34	106	260.150	260.102	1500	N/A	10.8	0.5	0.013	265.456	265.315	2.683	4.742	5.346	1.1	0.211	1.417	261.861	261.789	FUT	263.89	1.795			
105	106	262.342	261.142	450	N/A	120.0	1.0	0.013	265.505	265.315	1.793	0.285	0.379	1.3	1.376	1.367	264.168	261.789	29	263.74	-0.658			
																			29	263.74	1.184	120.0	27.1	262.326
																			28	263.96	1.146	120.0	40.1	262.584
																			27	264.06	1.246	120.0	40.1	262.584
																			26	264.22	0.970	120.0	62.1	263.020
																			25	264.22	0.970	120.0	62.1	263.020
106	107	260.092	259.808	1500	N/A	35.5	0.8	0.013	265.315	265.195	3.578	6.323	6.528	1.0	0.197	1.433	261.789	261.457	N/A	N/A	N/A			
107	108	259.758	259.486	1500	N/A	34.0	0.8	0.013	265.195	265.182	3.578	6.323	6.854	1.1	0.199	1.433	261.457	261.104	70	263.62	1.933			
108	115	259.436	258.824	1500	N/A	76.5	0.8	0.013	265.182	264.761	3.578	6.323	7.009	1.1	0.168	1.433	261.104	260.382	B108S	263.21	1.876			
100	36	261.679	261.398	1500	N/A	53.0	0.5	0.013	266.641	266.363	2.912	5.146	7.810	1.5	0.058	1.433	263.237	262.568	B122S	264.99	1.523			
110	112	262.130	261.790	525	N/A	42.5	0.8	0.013	265.608	265.342	1.777	0.385	0.285	0.7	0.522	1.417	263.177	262.996	67	263.98	0.573			
112	113	261.715	261.445	600	N/A	54.0	0.5	0.013	265.342	265.038	1.536	0.434	0.354	0.8	0.681	1.400	262.996	262.772	B104S	263.55	0.324			
113	114	261.365	261.203	600	N/A	27.0	0.6	0.013	265.038	264.865	1.682	0.476	0.451	0.9	0.807	1.400	262.772	262.609	84	263.21	0.208			
																			84	263.21	0.361	27.1	1.6	262.619
																			85	263.29	0.358	27.1	15.4	262.702
																			86	263.44	0.446	27.1	25.7	262.764
114	115	261.153	260.754	600	N/A	57.0	0.7	0.013	264.865	264.761	1.817	0.514	0.761	1.5	0.856	1.367	262.609	261.302	81	263.13	0.291			
																			81	263.13	1.210	57.2	17.0	261.690
																			82	263.43	1.167	57.2	32.0	262.033
																			83	263.43	0.833	57.2	46.6	262.367
115	116	258.794	258.590	1500	2400	68.0	0.3	0.013	264.761	264.341	2.516	9.059	8.037	0.9	0.088	1.433	260.382	260.299	B106S	263.53	2.918			
116	125	258.590	258.527	1500	2400	21.0	0.3	0.013	264.341	264.463	2.516	9.059	8.039	0.9	0.209	1.433	260.299	260.290	N/A	N/A	N/A			
117	118	261.674	260.972	450	N/A	117.0	0.6	0.013	265.535	264.950	1.389	0.221	0.095	0.4	-0.232	1.350	261.892	261.521	B109S	263.40	1.278			
118	119	260.922	260.702	450	N/A	31.5	0.7	0.013	264.950	265.137	1.500	0.239	0.263	1.1	0.149	1.350	261.521	261.062	N/A	N/A	N/A			
119	125	260.622	259.452	525	N/A	97.5	1.2	0.013	265.137	264.463	2.176	0.471	0.356	0.8	-0.181	1.350	260.966	260.290	16	263.24	2.044			
120	121	261.339	260.851	375	N/A	61.0	0.8	0.013	265.068	264.687	1.420	0.157	0.064	0.4	-0.203	1.367	261.511	261.140	7	263.08	1.339			
121	123	260.771	260.339	450	N/A	48.0	0.9	0.013	264.687	264.403	1.701	0.270	0.152	0.6	-0.081	1.400	261.140	261.022	3	262.83	1.460			
123	124	260.289	260.009	450	N/A	25.5	1.1	0.013	264.403	264.351	1.880	0.299	0.378	1.3	0.283	1.367	261.022	260.422	1	262.64	1.388			
124	125	259.929	259.527	450	N/A	17.5	2.3	0.013	264.351	264.463	2.719	0.432	0.377	0.9	-0.070	1.367	260.309	260.290	N/A	N/A	N/A			
125	126	258.477	258.371	1500	2400	37.5	0.3	0.013	264.463	264.186	2.516	9.059	8.766	1.0	0.313	1.433	260.290	260.279	80	262.79	2.270			
126	129	258.371	258.325	1500	2400	15.5	0.3	0.013	264.186	264.080	2.516	9.059	8.769	1.0	0.408	1.433	260.279	260.276	77	262.83	2.321			
127	128	260.302	259.506	450	N/A	88.5	0.9	0.013	263.784	264.067	1.701	0.270	0.380	1.4	1.238	1.367	261.990	260.435	72	262.58	0.360			
128	129	259.456	259.375	450	N/A	13.5	0.6	0.013	264.067	264.080	1.389	0.221	0.380	1.7	0.529	1.367	260.435	260.276	N/A	N/A	N/A			
129	180	258.325	258.220	1500	2400	35.0	0.3	0.013	264.080	261.080	2.516	9.059	9.137	1.0	0.451	1.433	260.276	260.267	N/A	N/A	N/A			
180	PondE2	258.135	258.100	1500	2400	11.5	0.3	0.013	261.080	260.700	2.516	9.059	9.119	1.0	0.632	1.433	260.267	260.265	N/A	N/A	N/A			
1M	110	263.050	262.210	450	N/A	120.0	0.7	0.013	266.242	265.608	1.500	0.239	0.140	0.6	-0.052	1.467	263.448	263.177	64	264.32	0.642			
1M	2M	263.004	262.674	525	N/A	88.0	0.4	0.013	266.242	266.601	1.256	0.272	0.191	0.7	-0.081	1.367	263.448	263.344	Part29	264.67	0.992			
2M	100	262.524	262.306	675	N/A	56.0	0.4	0.013	266.601	266.641	1.486	0.532	0.330	0.6	0.145	1.367	263.344	263.237	Part47	264.78	1.206			
CMH5	310	263.450	263.388	450	N/A	12.5	0.5	0.013	266.340	266.131	1.268	0.202	0.138	0.7	0.399	1.433	264.299	264.220	N/A	N/A	N/A			
DICB1	101	263.361	263.129	375	N/A	15.5	1.5	0.013	265.800	266.056	1.944	0.215	0.076	0.4	-0.179	1.317	263.557	263.318	N/A	N/A	N/A			
T1	T2	269.951	269.547	375	N/A	50.5	0.8	0.013	272.822	272.450	1.420	0.157	0.026	0.2	-0.270	1.367	270.056	269.651	17	271.20	0.914			
T1	T3	269.917	269.553	375	N/A	56.0	0.7	0.013	272.822	272.515	1.280	0.141	0.041	0.3	-0.236	1.367	270.056	269.691	41	271.14	0.854			
T2	F100	269.397	268.515	525	N/A	98.0	0.9	0.013	272.450	271.710	1.885	0.408	0.152	0.4	-0.298	1.367	269.624	269.275	25	270.49	0.636			
T3	T4	269.403	268.993	525	N/A	63.0	0.7	0.013	272.515	272.160	1.602	0.347	0.041	0.1	-0.403	1.367	269.525	269.173	2	270.78	1.025			
T4	T5	268.843	268.247	675	N/A	149.0	0.4	0.013	272.160	271.777	1.486	0.532	0.248	0.5	-0.345	1.367	269.173	268.916	54	270.48	1.077			
T5	41	268.022	267.290	900	N/A	146.5	0.5	0.013	271.777	270.975	2.012	1.280	1.078	0.8	-0.006	1.367	268.916	268.502	Part7	269.70	0.554			

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL		
																						Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
T6	T7	269.774	269.644	300	N/A	13.0	1.0	0.013	272.613	272.453	1.368	0.097	0.079	0.8	0.006	1.367	270.080	270.003	72	271.49	1.180			
T6	T9	269.661	269.269	525	N/A	87.0	0.5	0.013	272.613	272.520	1.333	0.288	0.202	0.7	-0.106	1.367	270.080	269.951	74	271.18	0.870			
T7	T8	269.494	268.474	450	N/A	120.0	0.9	0.013	272.453	271.766	1.653	0.263	0.187	0.7	0.059	1.367	270.003	269.594	B128	270.36	0.127			
																			B128	270.36	0.531	120.2	1.4	269.599
																			63	270.47	0.641	120.2	1.4	269.599
																			64	270.55	0.629	120.2	28.4	269.691
																			65	270.55	0.629	120.2	28.4	269.691
																			66	270.65	0.640	120.2	54.6	269.780
																			67	270.70	0.690	120.2	54.6	269.780
																			68	270.70	0.604	120.2	80.0	269.866
																			69	270.84	0.744	120.2	80.0	269.866
																			70	270.84	0.654	120.2	106.3	269.956
																			71	270.89	0.704	120.2	106.3	269.956
																			98	271.09	0.926	120.2	99.8	269.934
																			99	271.09	0.926	120.2	99.8	269.934
																			100	270.99	0.916	120.2	73.6	269.844
																			101	270.82	0.746	120.2	73.6	269.844
																			102	270.72	0.735	120.2	47.4	269.755
																			103	270.64	0.655	120.2	47.4	269.755
																			104	270.58	0.683	120.2	21.5	269.667
																			105	270.40	0.503	120.2	21.5	269.667
T8	T12	268.244	267.881	600	N/A	33.0	1.1	0.013	271.766	271.539	2.278	0.644	0.395	0.6	0.750	1.333	269.594	269.387	Part4	270.20	0.376			
T9	T10	269.194	269.150	600	N/A	14.5	0.3	0.013	272.520	272.353	1.189	0.336	0.238	0.7	0.157	1.367	269.951	269.927	82	271.14	0.959			
T10	T11	269.100	268.125	600	N/A	97.5	1.0	0.013	272.353	271.833	2.172	0.614	0.415	0.7	0.227	1.367	269.927	269.521	B133	270.20	0.043			
																			B133	270.20	0.444	97.3	1.3	269.526
																			90	270.25	0.432	97.3	16.1	269.588
																			89	270.31	0.492	97.3	16.1	269.588
																			88	270.37	0.445	97.3	41.8	269.695
																			87	270.44	0.515	97.3	41.8	269.695
																			86	270.50	0.465	97.3	68.0	269.805
																			85	270.57	0.535	97.3	68.0	269.805
																			84	270.63	0.486	97.3	94.2	269.914
																			83	270.63	0.486	97.3	94.2	269.914
																			97	271.13	1.023	97.3	85.2	269.877
																			96	271.13	1.023	97.3	85.2	269.877
																			95	270.76	0.762	97.3	59.1	269.768
																			94	270.76	0.762	97.3	59.1	269.768
																			93	270.59	0.702	97.3	32.9	269.658
																			92	270.59	0.702	97.3	32.9	269.658
																			91	270.40	0.576	97.3	17.4	269.594
T11	T12	267.967	267.811	750	N/A	39.0	0.4	0.013	271.833	271.539	1.594	0.704	0.510	0.7	0.804	1.483	269.521	269.387	Part3	270.15	0.399			
T12	52	267.731	267.595	750	N/A	19.5	0.7	0.013	271.539	271.337	2.108	0.931	0.853	0.9	0.906	1.483	269.387	269.273	N/A	N/A	N/A			
T13	T14	269.222	268.800	600	N/A	105.5	0.4	0.013	272.254	272.129	1.373	0.388	0.227	0.6	-0.263	1.367	269.559	269.385	B123W	270.50	0.711			
T14	T15	268.750	268.442	600	N/A	44.0	0.7	0.013	272.129	271.890	1.817	0.514	0.333	0.6	0.035	1.350	269.385	269.278	Part14	270.22	0.605			
T15	T21	268.367	268.121	675	N/A	41.0	0.6	0.013	271.890	271.662	1.820	0.651	0.494	0.8	0.236	1.367	269.278	269.155	Part15W	270.06	0.552			
T16	T17	269.547	269.251	375	N/A	74.0	0.4	0.013	272.395	272.209	1.004	0.111	0.040	0.4	-0.215	1.300	269.707	269.406	112	271.11	1.173			
T17	T18	269.176	268.884	450	N/A	58.5	0.5	0.013	272.209	271.888	1.268	0.202	0.097	0.5	-0.220	1.350	269.406	269.294	Part41	270.50	0.864			
T18	T19	268.834	268.738	450	N/A	12.0	0.8	0.013	271.888	271.741	1.603	0.255	0.102	0.4	0.010	1.483	269.294	269.280	Part42	270.30	0.776			
T19	T20	268.663	268.465	525	N/A	36.0	0.6	0.013	271.741	271.527	1.473	0.319	0.141	0.4	0.092	1.483	269.280	269.255	Part46	270.21	0.700			
T20	T21	268.265	268.121	675	N/A	24.0	0.6	0.013	271.527	271.662	1.820	0.651	0.351	0.5	0.315	1.317	269.255	269.155	Part22	270.46	0.975			
T21	39	267.971	267.755	825	N/A	36.0	0.6	0.013	271.662	271.464	2.080	1.112	0.819	0.7	0.359	1.500	269.155	269.036	Part16W	269.91	0.525			
CMH3	4	264.692	264.635	375	N/A	11.5	0.5	0.013	268.180	268.203	1.123	0.124	0.049	0.4	-0.051	1.433	265.016	264.998	N/A	N/A	N/A			
Y1	Y2	265.512	265.222	300	N/A	29.0	1.0	0.013	268.294	268.509	1.368	0.097	0.098	1.0	-0.047	1.283	265.765	265.465	69	266.80	0.805			

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL		
																						Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
Y2	Y3	265.172	264.022	300	N/A	60.5	1.9	0.013	268.509	268.054	1.886	0.133	0.142	1.1	-0.025	1.317	265.447	264.303	41	266.52	0.843			
Y3	Y4	263.722	263.410	600	N/A	44.5	0.7	0.013	268.054	267.689	1.817	0.514	0.364	0.7	-0.019	1.350	264.303	264.173	37	266.12	1.587			
Y4	Y7	262.810	262.550	1200	N/A	65.0	0.4	0.013	267.689	267.220	2.180	2.466	2.567	1.0	0.163	1.400	264.173	263.433	33	265.85	1.447			
Y5	Y6	264.608	264.230	675	N/A	75.5	0.5	0.013	268.358	267.827	1.661	0.594	0.590	1.0	0.039	1.383	265.322	264.972	26	266.26	0.708			
Y6	Y7	264.155	263.743	750	N/A	82.5	0.5	0.013	267.827	267.220	1.782	0.787	0.776	1.0	0.067	1.383	264.972	264.289	32	265.75	0.548			
Y7	Y25	261.367	261.034	1350	N/A	83.2	0.4	0.013	267.220	266.477	2.358	3.376	3.917	1.2	0.228	1.400	262.945	262.537	N/A	N/A	N/A			
Y21	Y22	263.484	262.846	375	N/A	63.8	1.0	0.013	267.204	266.726	1.587	0.175	0.153	0.9	-0.097	1.350	263.762	263.167	63	265.38	1.388			
Y22	Y25	262.771	261.882	450	N/A	70.9	1.3	0.013	266.726	266.477	2.004	0.319	0.275	0.9	-0.054	1.367	263.167	262.537	59	265.11	1.713			
Y23	Y24	263.512	263.174	375	N/A	33.8	1.0	0.013	267.341	267.201	1.587	0.175	0.065	0.4	-0.208	1.367	263.679	263.465	49	265.94	2.031			
Y24	Y25	263.024	261.800	525	N/A	116.5	1.1	0.013	267.201	266.477	2.036	0.441	0.386	0.9	-0.084	1.367	263.465	262.537	56	265.14	1.445			
Y25	Y33	260.862	260.558	1500	N/A	76.0	0.4	0.013	266.477	265.820	2.530	4.471	4.565	1.0	0.175	1.400	262.537	262.245	FUT	264.91	2.140			
Y26	Y27	263.562	262.843	375	N/A	71.9	1.0	0.013	267.410	266.435	1.587	0.175	0.085	0.5	-0.172	1.367	263.765	263.028	FUT	265.84	1.845			
Y27	Y28	262.693	262.277	525	N/A	83.3	0.5	0.013	266.435	265.950	1.405	0.304	0.163	0.5	-0.218	1.367	263.000	262.892	FUT	264.87	1.635			
Y28	Y33	262.247	261.503	525	N/A	74.4	1.0	0.013	265.950	265.820	1.987	0.430	0.384	0.9	0.120	1.367	262.892	262.245	FUT	264.38	1.258			
Y29	Y30	264.287	263.726	300	N/A	51.0	1.1	0.013	267.240	266.842	1.435	0.101	0.048	0.5	-0.150	1.367	264.437	263.871	FUT	265.67	1.003			
Y30	Y31	263.181	263.100	375	N/A	11.2	0.7	0.013	266.842	266.715	1.328	0.147	0.073	0.5	-0.169	1.383	263.387	263.285	FUT	265.27	1.655			
Y31	Y32	262.621	262.259	525	N/A	72.2	0.5	0.013	266.715	266.108	1.405	0.304	0.125	0.4	-0.287	1.367	262.859	262.613	FUT	265.15	2.056			
Y32	Y33	262.215	261.503	525	N/A	71.2	1.0	0.013	266.108	265.820	1.987	0.430	0.278	0.6	-0.127	1.367	262.613	262.245	FUT	264.54	1.695			
Y33	Y34	260.528	260.208	1500	N/A	71.2	0.5	0.013	265.820	265.456	2.683	4.742	5.351	1.1	0.217	1.417	262.245	261.861	FUT	264.25	1.775			
T101	T102	269.597	269.263	450	N/A	83.5	0.4	0.013	272.551	272.327	1.134	0.180	0.116	0.6	-0.176	1.367	269.871	269.563	B7S	270.63	0.529			
T102	T104	269.213	269.177	450	N/A	9.0	0.4	0.013	272.327	272.440	1.134	0.180	0.113	0.6	-0.100	1.383	269.563	269.478	B5N	270.85	1.057			
T103	T104	269.612	269.252	375	N/A	45.0	0.8	0.013	272.477	272.440	1.420	0.157	0.144	0.9	-0.088	1.367	269.899	269.533	B4E	270.61	0.481			
T104	T105	268.952	268.636	675	N/A	79.0	0.4	0.013	272.440	272.063	1.486	0.532	0.400	0.8	-0.149	1.367	269.478	269.297	B2W	270.60	0.892			
T105	T106	268.586	268.554	675	N/A	8.0	0.4	0.013	272.063	271.980	1.486	0.532	0.425	0.8	0.036	1.383	269.297	269.270	B1N	270.31	0.783			
T106	T107	268.504	268.360	675	N/A	36.0	0.4	0.013	271.980	271.935	1.486	0.532	0.616	1.2	0.091	1.367	269.270	269.110	B1S	270.15	0.650			
T107	T5	268.310	268.248	675	N/A	12.5	0.5	0.013	271.935	271.777	1.661	0.594	0.614	1.0	0.125	1.367	269.110	268.916	N/A	N/A	N/A			
70A	75	258.610	258.512	1500	3000	21.8	0.5	0.013	263.870	263.400	3.251	14.628	19.558	1.3	0.417	1.433	260.527	260.332	N/A	N/A	N/A			
V1	V3	261.668	260.688	300	N/A	24.5	4.0	0.013	265.632	264.642	2.736	0.193	0.027	0.1	-0.219	1.350	261.749	261.383	BF27/28	263.31	1.331			
V2	V3	261.213	260.618	375	N/A	59.5	1.0	0.013	264.947	264.642	1.587	0.175	0.091	0.5	-0.067	1.333	261.521	261.383	BJ68/69	262.60	0.849			
V3	V5	260.538	260.282	450	N/A	36.5	0.7	0.013	264.642	264.402	1.500	0.239	0.144	0.6	0.395	1.417	261.383	261.292	BE22	262.65	1.037			
V4	V5	261.021	260.357	375	N/A	83.0	0.8	0.013	264.768	264.402	1.420	0.157	0.169	1.1	0.613	1.317	262.009	261.292	BG38/39	262.52	0.281			
																			BG38/39	262.52	0.849	83.1	17.3	261.441
																			BG40/41	262.52	0.737	83.1	30.2	261.553
																			BG42/43	262.52	0.626	83.1	43.1	261.664
																			BH49/50	262.60	0.572	83.1	58.7	261.798
																			BH51/52	262.60	0.460	83.1	71.6	261.910
																			BH53	262.60	0.387	83.1	80.1	261.983
																			BI54/55	262.93	0.914	83.1	57.3	261.786
																			BI56/57	262.93	1.025	83.1	44.4	261.675
																			BJ62/63	262.87	1.100	83.1	28.7	261.540
																			BJ64/65	262.60	0.942	83.1	15.8	261.428
V5	V9	260.207	260.008	525	N/A	28.5	0.7	0.013	264.402	264.136	1.662	0.360	0.287	0.8	0.560	1.383	261.292	261.167	BE18/19	262.38	0.858			
V6	V7	261.300	261.210	300	N/A	9.0	1.0	0.013	264.061	264.167	1.368	0.097	0.019	0.2	-0.194	1.267	261.406	261.343	N/A	N/A	N/A			
V7	V9	260.573	260.038	450	N/A	107.0	0.5	0.013	264.167	264.136	1.268	0.202	0.128	0.6	0.320	1.283	261.343	261.167	BC13/14	262.14	0.567			
V8	V9	260.398	260.183	300	N/A	19.5	1.1	0.013	264.162	264.136	1.435	0.101	0.086	0.8	0.685	1.350	261.383	261.167	BD15/16	262.36	0.747			
V9	V10	259.958	259.508	525	N/A	22.5	2.0	0.013	264.136	264.077	2.810	0.608	0.536	0.9	0.684	1.367	261.167	260.826	N/A	N/A	N/A			
V10	70A	259.420	259.080	600	N/A	17.0	2.0	0.013	264.077	263.870	3.071	0.868	0.534	0.6	0.806	1.367	260.826	260.538	N/A	N/A	N/A			
Y101	Y102	268.078	266.768	375	N/A	65.5	2.0	0.013	270.964	269.863	2.245	0.248	0.226	0.9	-0.045	1.350	268.408	267.066	32	268.65	0.012			
																			32	268.65	0.858	65.7	24.3	267.562
																			31	268.70	0.908	65.7	24.3	267.562
																			30	268.91	0.609	65.7	49.2	268.071
																			29	269.11	0.809	65.7	49.2	268.071
																			28	269.33	0.719	65.7	64.4	268.381

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL Length HGL (m)	Interpolated HGL Dist. From D/S MH (m)	Interpolated HGL HGL (m)
																			27	269.55	0.939	65.7	64.4	268.381
Y102	Y103	266.618	265.648	525	N/A	97.0	1.0	0.013	269.863	268.810	1.987	0.430	0.442	1.0	-0.077	1.367	267.066	266.093	91	267.53	0.234			
																			91	267.53	1.083	97.2	12.4	266.217
																			92	267.78	1.333	97.2	12.4	266.217
																			93	267.98	1.313	97.2	34.4	266.437
																			94	267.98	1.313	97.2	34.4	266.437
																			95	268.01	1.122	97.2	56.4	266.658
																			96	268.29	1.402	97.2	56.4	266.658
																			97	268.29	1.184	97.2	78.2	266.876
																			98	268.49	1.384	97.2	78.2	266.876
Y103	Y5	265.491	264.688	600	N/A	73.0	1.1	0.013	268.810	268.358	2.278	0.644	0.536	0.8	-0.001	1.367	266.090	265.322	FUT	267.24	0.920			
Y110	Y111	266.309	265.877	600	N/A	108.0	0.4	0.013	269.419	270.586	1.373	0.388	0.397	1.0	-0.081	1.367	266.828	266.424	1	268.09	1.032			
																			1	268.09	1.042	107.9	105.3	266.818
																			2	268.09	1.042	107.9	105.3	266.818
																			3	268.10	1.109	107.9	90.0	266.761
																			4	268.42	1.429	107.9	90.0	266.761
																			5	268.77	1.861	107.9	68.0	266.679
																			6	268.77	1.861	107.9	68.0	266.679
																			7	268.93	2.104	107.9	46.0	266.596
																			8	269.15	2.324	107.9	46.0	266.596
																			9	269.37	2.626	107.9	24.0	266.514
																			10	269.37	2.626	107.9	24.0	266.514
Y111	Y112	265.652	265.184	825	N/A	117.0	0.4	0.013	270.586	272.103	1.698	0.908	0.969	1.1	-0.053	1.383	266.424	265.974	11	269.63	2.976			
Y112	Y113	265.109	264.829	900	N/A	70.0	0.4	0.013	272.103	271.237	1.800	1.145	0.974	0.9	-0.035	1.450	265.974	265.619	26	269.89	3.686			
Y113	Y114	264.749	264.397	900	N/A	88.0	0.4	0.013	271.237	270.497	1.800	1.145	1.108	1.0	-0.030	1.450	265.619	265.265	B111S	268.07	2.221			
Y114	Y115	264.347	264.277	900	N/A	17.5	0.4	0.013	270.497	270.335	1.800	1.145	1.121	1.0	0.018	1.450	265.265	265.151	B114S	268.06	2.565			
Y115	Y116	264.202	263.720	975	N/A	120.5	0.4	0.013	270.335	269.418	1.898	1.417	1.368	1.0	-0.026	1.450	265.151	264.704	B109W	267.25	1.869			
Y116	Y117	263.670	263.624	975	N/A	11.5	0.4	0.013	269.418	269.228	1.898	1.417	1.439	1.0	0.059	1.450	264.704	264.557	B109E	267.25	2.316			
Y117	Y4	263.194	262.890	1200	N/A	76.0	0.4	0.013	269.228	267.689	2.180	2.466	2.003	0.8	0.163	1.400	264.557	264.173	FUT	267.66	2.871			
Y1110	Y111	265.813	265.757	750	N/A	14.0	0.4	0.013	270.628	270.586	1.594	0.704	0.410	0.6	-0.057	1.483	266.506	266.424	N/A	N/A	N/A			
Z1	Z4	268.018	266.998	300	N/A	25.5	4.0	0.013	270.871	270.005	2.736	0.193	0.000	0.0	-0.300	0.000	268.018	266.640	BLL66	269.03	0.782			
Z2	Z6	266.800	266.542	375	N/A	64.5	0.4	0.013	269.671	269.651	1.004	0.111	0.091	0.8	-0.111	1.283	267.064	266.846	BEL20	267.75	0.456			
																			BEL20	267.75	0.634	64.4	11.8	266.886
																			BEL17	267.89	0.733	64.4	24.0	266.927
																			BDL16	267.89	0.681	64.4	39.3	266.979
																			BDL12	267.78	0.502	64.4	59.6	267.048
Z3	Z4	266.636	266.322	450	N/A	78.5	0.4	0.013	269.747	270.005	1.134	0.180	0.175	1.0	-0.021	1.300	267.065	266.640	BIL55	267.87	0.575			
																			BIL55	267.87	0.921	78.5	14.5	266.719
																			BIL40	268.09	1.026	78.5	35.8	266.834
																			BJL50	268.09	0.938	78.5	52.1	266.922
																			BJL46	267.71	0.443	78.5	73.4	267.037
																			BCL11	267.81	0.532	78.5	75.3	267.048
																			BCL8	268.32	1.108	78.5	63.1	266.982
																			BBL7	268.32	1.195	78.5	47.1	266.895
																			BBL4	268.72	1.661	78.5	34.9	266.829
																			BAL3	268.72	1.737	78.5	20.9	266.753
																			BAL1	268.85	1.911	78.5	12.8	266.709
Z4	Z7	266.242	266.102	450	N/A	35.0	0.4	0.013	270.005	269.236	1.134	0.180	0.185	1.0	-0.052	1.317	266.640	266.508	BKL60	267.83	0.960			
Z5	Z6	266.785	266.617	300	N/A	21.0	0.8	0.013	269.764	269.651	1.224	0.086	0.010	0.1	-0.229	1.433	266.856	266.846	BFL24	267.69	0.604			
																			BFL24	267.69	0.606	20.9	15.7	266.854
																			BFL21	267.75	0.672	20.9	3.5	266.848
Z6	Z7	266.392	266.032	525	N/A	90.0	0.4	0.013	269.651	269.236	1.256	0.272	0.236	0.9	-0.071	1.317	266.846	266.508	BHL35	267.28	0.204			
																			BHL35	267.28	0.481	89.9	16.1	266.569

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Table A-1: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL Length HGL (m)	Interpolated HGL Dist. From D/S MH (m)	Interpolated HGL HGL (m)
																			BHL30	267.42	0.530	89.9	40.3	266.660
																			BGL29	267.45	0.511	89.9	53.5	266.709
																			BGL25	267.59	0.575	89.9	73.6	266.785
																			BJL45	267.71	0.698	89.9	73.0	266.782
																			BJL41	267.78	0.848	89.9	51.7	266.702
																			BIL40	267.78	0.909	89.9	35.4	266.641
																			BIL36	267.64	0.849	89.9	14.1	266.561
Z7	Z8	265.952	265.841	600	N/A	18.5	0.6	0.013	269.236	268.839	1.682	0.476	0.421	0.9	-0.044	1.333	266.508	266.266	BKL56	267.13	0.392			
																			BKL56	267.13	0.444	18.7	14.7	266.456
Z8	ZCMH1	265.761	265.443	600	N/A	26.5	1.2	0.013	268.839	268.463	2.379	0.673	0.555	0.8	-0.171	1.350	266.190	265.859	N/A	N/A	N/A			
ZCMH1	Y117	263.915	263.850	675	N/A	13.0	0.5	0.013	268.463	269.228	1.661	0.594	0.552	0.9	0.133	1.350	264.723	264.557	N/A	N/A	N/A			
MH2-1	MH2-3	265.117	264.955	300	N/A	22.2	1.0	0.013	269.280	269.080	1.368	0.097	-0.004	0.0	-0.248	1.267	265.169	265.167	FUT	267.71	2.311			
MH2-2	MH2-3	265.347	264.955	300	N/A	39.3	1.0	0.013	268.540	269.080	1.368	0.097	0.133	1.4	0.545	1.283	266.192	265.228	FUT	266.97	0.548			
MH2-3	MH2-4	264.875	264.840	375	N/A	7.1	0.5	0.013	269.080	268.960	1.123	0.124	0.133	1.1	-0.083	1.283	265.167	265.109	FUT	267.51	2.113			
MH2-4	MH2-5	264.765	264.499	450	N/A	53.1	0.5	0.013	268.960	268.550	1.268	0.202	0.157	0.8	-0.145	1.350	265.070	264.810	FUT	267.39	2.090			
MH2-5	MH2-6	264.449	264.397	450	N/A	10.4	0.5	0.013	268.550	268.460	1.268	0.202	0.186	0.9	-0.089	1.350	264.810	264.732	FUT	266.98	1.940			
MH2-6	MH2-7	264.347	264.320	450	N/A	5.4	0.5	0.013	268.460	268.420	1.268	0.202	0.198	1.0	-0.065	1.367	264.732	264.672	FUT	266.89	1.928			
MH2-7	MH1	264.270	264.130	450	N/A	28.1	0.5	0.013	268.420	268.180	1.268	0.202	0.234	1.2	-0.048	1.350	264.672	264.471	FUT	266.85	1.948			
MH1	Y3	263.830	263.779	600	N/A	10.3	0.5	0.013	268.180	268.054	1.536	0.434	0.233	0.5	-0.065	1.350	264.365	264.303	FUT	266.61	2.015			

Note: [1] A negative surcharge implies that the pipe is not flowing full

266.886 Interpolated HGL elevation

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL		
																						Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
1	2	265.800	265.200	825	N/A	120.0	0.5	0.013	269.380	268.730	1.899	1.015	0.682	0.7	-0.327	1.367	266.298	265.708	N/A	N/A	N/A			
2	3	265.150	264.800	825	N/A	69.9	0.5	0.013	268.730	268.432	1.899	1.015	0.799	0.8	-0.267	1.367	265.708	265.341	N/A	N/A	N/A			
3	4	264.747	264.495	825	N/A	42.0	0.6	0.013	268.432	268.203	2.080	1.112	0.800	0.7	-0.301	1.383	265.271	265.014	N/A	N/A	N/A			
4	5	264.445	263.881	825	N/A	80.5	0.7	0.013	268.203	267.761	2.247	1.201	0.931	0.8	-0.264	1.383	265.006	264.509	5	266.48	1.244			
5	30	263.826	263.010	825	N/A	116.5	0.7	0.013	267.761	267.122	2.247	1.201	1.097	0.9	-0.142	1.383	264.509	263.872	11	265.95	1.211			
6	8	267.799	266.637	300	N/A	50.5	2.3	0.013	270.866	270.040	2.075	0.147	0.039	0.3	-0.194	1.317	267.905	266.743	32	268.80	0.665			
7	8	266.790	266.410	450	N/A	41.8	0.9	0.013	270.096	270.040	1.710	0.272	0.179	0.7	-0.128	1.383	267.112	266.743	N/A	N/A	N/A			
8	10	266.337	264.951	600	N/A	115.5	1.2	0.013	270.040	268.601	2.379	0.673	0.470	0.7	-0.194	1.350	266.743	265.893	42	267.34	0.367			
9	10	265.190	264.960	525	N/A	42.7	0.5	0.013	268.665	268.601	1.460	0.316	0.380	1.2	0.636	1.350	266.351	265.893	N/A	N/A	N/A			
10	27	264.576	264.051	975	N/A	87.5	0.6	0.013	268.601	268.046	2.325	1.736	0.900	0.5	0.342	1.433	265.893	265.658	46	266.74	0.617			
11	27	264.228	263.976	1050	N/A	42.0	0.6	0.013	267.991	268.046	2.443	2.115	1.995	0.9	0.612	1.433	265.890	265.658	N/A	N/A	N/A			
12	27	264.871	264.576	450	N/A	59.0	0.5	0.013	268.256	268.046	1.268	0.202	0.136	0.7	0.482	1.300	265.803	265.658	1	266.89	0.857			
13	14	268.238	268.064	450	N/A	43.5	0.4	0.013	271.187	271.513	1.134	0.180	0.084	0.5	-0.217	1.400	268.471	268.370	28	269.71	1.009			
14	15	267.989	267.809	525	N/A	45.0	0.4	0.013	271.513	271.276	1.256	0.272	0.165	0.6	-0.144	1.350	268.370	268.301	B60	269.71	1.110			
15	16	267.734	267.494	600	N/A	60.0	0.4	0.013	271.276	270.954	1.373	0.388	0.362	0.9	-0.033	1.350	268.301	267.888	B61	269.63	1.099			
16	17	267.414	266.070	600	N/A	112.0	1.2	0.013	270.954	269.291	2.379	0.673	0.448	0.7	-0.239	1.350	267.775	266.516	46	267.86	-0.145			
																			46	267.86	1.051	111.9	5.6	266.579
																			47	268.52	1.160	111.9	54.6	267.130
																			48	268.65	1.290	111.9	54.6	267.130
																			49	268.93	1.320	111.9	76.8	267.380
																			50	269.27	1.660	111.9	76.8	267.380
																			51	269.37	1.615	111.9	89.7	267.525
17	18	265.920	264.758	675	N/A	77.5	1.5	0.013	269.291	268.508	2.877	1.030	0.896	0.9	-0.079	1.350	266.516	265.726	41	267.20	0.454			
18	26	264.683	264.193	750	N/A	44.5	1.1	0.013	268.508	268.227	2.643	1.168	0.929	0.8	0.293	1.350	265.726	265.424	39	266.91	0.954			
19	20	266.349	266.127	300	N/A	18.5	1.2	0.013	269.482	269.300	1.499	0.106	0.055	0.5	0.412	1.350	267.061	267.007	B59N	267.90	0.609			
20	21	266.052	265.737	375	N/A	22.5	1.4	0.013	269.300	269.085	1.878	0.207	0.161	0.8	0.580	1.383	267.007	266.787	B58N	267.73	0.493			
21	22	265.437	265.019	675	N/A	104.5	0.4	0.013	269.085	268.476	1.486	0.532	0.398	0.7	0.675	1.383	266.787	266.555	B55W	267.26	0.243			
																			B55W	267.26	0.455	104.7	9.1	266.575
																			B55E	267.30	0.455	104.7	27.1	266.615
																			B56W	267.34	0.461	104.7	42.5	266.649
																			B56E	267.38	0.448	104.7	66.5	266.702
																			B57W	267.42	0.454	104.7	81.9	266.736
																			B57E	267.71	0.699	104.7	101.9	266.781
																			B162W	267.30	0.462	104.7	23.8	266.608
																			B162E	267.38	0.489	104.7	48.0	266.661
																			B161W	267.45	0.521	104.7	65.2	266.699
																			B161E	267.48	0.480	104.7	97.2	266.770
22	25	264.969	264.789	675	N/A	36.0	0.5	0.013	268.476	268.540	1.661	0.594	0.634	1.1	0.911	1.383	266.555	266.147	N/A	N/A	N/A			
23	24	265.539	265.379	300	N/A	14.5	1.1	0.013	268.536	268.609	1.435	0.101	0.043	0.4	0.346	1.367	266.185	266.156	51	267.06	0.645			
24	25	265.229	265.009	450	N/A	44.0	0.5	0.013	268.609	268.540	1.268	0.202	0.046	0.2	0.477	1.500	266.156	266.147	36	266.99	0.604			
25	26	264.709	264.193	750	N/A	86.0	0.6	0.013	268.540	268.227	1.952	0.862	0.868	1.0	0.688	1.383	266.147	265.424	33	266.72	0.343			
26	29	263.968	263.349	975	N/A	88.5	0.7	0.013	268.227	267.163	2.511	1.875	1.895	1.0	0.481	1.383	265.424	264.819	28	266.04	0.386			
27	28	263.676	263.361	1350	N/A	90.0	0.4	0.013	268.046	267.503	2.206	3.158	3.187	1.0	0.632	1.433	265.658	265.315	B68	266.31	0.422			
28	29	263.211	262.874	1500	N/A	112.5	0.3	0.013	267.503	267.163	2.191	3.872	3.740	1.0	0.604	1.417	265.315	264.819	12	265.83	0.285			
																			12	265.83	0.706	99.9	15.2	264.894
																			13	265.83	0.642	99.9	28.0	264.958
																			14	265.83	0.642	99.9	28.0	264.958
																			15	265.91	0.609	99.9	50.8	265.071
																			16	266.06	0.759	99.9	50.8	265.071
																			17	266.29	0.882	99.9	72.4	265.178
																			18	266.29	0.882	99.9	72.4	265.178
																			19	266.17	0.657	99.9	93.4	265.283
																			20	266.38	0.867	99.9	93.4	265.283

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL: Length HGL (m)	Interpolated HGL: Dist. From D/S MH (m)	Interpolated HGL: HGL (m)
																			22	266.25	0.756	99.9	89.6	265.264
																			23	266.24	0.746	99.9	89.6	265.264
																			24	266.10	0.729	99.9	64.9	265.141
																			25	266.21	0.839	99.9	64.9	265.141
																			26	266.21	0.949	99.9	42.6	265.031
																			27	266.00	0.739	99.9	42.6	265.031
29	30	262.824	262.429	1500	N/A	79.0	0.5	0.013	267.163	267.122	2.829	4.998	5.861	1.2	0.495	1.417	264.819	263.872	120	265.55	0.501			
30	35	262.335	261.885	1500	N/A	53.0	0.9	0.013	267.122	266.843	3.688	6.517	7.380	1.1	0.037	1.433	263.872	263.283	N/A	N/A	N/A			
31	32	263.059	262.909	600	N/A	37.5	0.4	0.013	266.448	266.795	1.373	0.388	0.370	1.0	0.456	1.333	264.115	263.991	Part12	265.30	0.955			
32	30	262.859	262.785	600	N/A	18.5	0.4	0.013	266.795	267.122	1.373	0.388	0.369	1.0	0.532	1.333	263.991	263.872	N/A	N/A	N/A			
35	100	261.835	261.679	1500	2400	29.5	0.5	0.013	266.843	266.641	3.345	12.040	7.545	0.6	-0.052	1.433	263.283	263.243	B122S	264.97	1.457			
36	68	261.398	260.762	1500	2400	120.0	0.5	0.013	266.363	265.468	3.345	12.040	8.134	0.7	-0.326	1.433	262.572	262.039	B95S	264.27	1.468			
38	40	268.456	267.896	375	N/A	70.0	0.8	0.013	271.790	271.439	1.420	0.157	0.065	0.4	-0.025	1.350	268.806	268.742	57	270.08	1.044			
39	40	267.623	267.451	900	N/A	43.0	0.4	0.013	271.464	271.439	1.800	1.145	1.056	0.9	0.513	1.367	269.036	268.742	N/A	N/A	N/A			
40	44	267.371	267.061	900	N/A	77.5	0.4	0.013	271.439	271.006	1.800	1.145	1.135	1.0	0.471	1.367	268.742	268.272	62	269.77	0.798			
41	44	267.233	267.061	900	N/A	43.0	0.4	0.013	270.975	271.006	1.800	1.145	1.340	1.2	0.369	1.400	268.502	268.272	N/A	N/A	N/A			
42	43	268.296	267.911	300	N/A	38.5	1.0	0.013	271.446	271.302	1.368	0.097	-0.004	0.0	-0.272	1.433	268.324	268.322	13	269.79	1.236			
43	44	267.761	267.511	450	N/A	50.0	0.5	0.013	271.302	271.006	1.268	0.202	0.086	0.4	0.111	1.350	268.322	268.272	67	269.64	1.088			
44	45	266.911	266.736	1050	N/A	25.0	0.7	0.013	271.006	270.723	2.639	2.285	2.516	1.1	0.311	1.400	268.272	268.011	N/A	N/A	N/A			
45	46	266.686	266.462	1050	N/A	32.0	0.7	0.013	270.723	270.449	2.639	2.285	2.506	1.1	0.275	1.400	268.011	267.743	B145	269.15	0.909			
46	47	266.412	265.452	1050	N/A	120.0	0.8	0.013	270.449	269.754	2.821	2.442	2.662	1.1	0.281	1.400	267.743	266.647	77	268.30	0.327			
47	37	265.402	265.050	1050	N/A	44.0	0.8	0.013	269.754	269.459	2.821	2.442	2.783	1.1	0.195	1.500	266.647	266.221	81	267.95	1.073			
48	49	264.712	264.007	1200	N/A	70.5	1.0	0.013	269.299	268.030	3.447	3.899	3.367	0.9	0.061	1.483	265.973	265.417	87	266.71	0.507			
49	50	264.007	263.887	1200	N/A	12.0	1.0	0.013	268.030	268.145	3.447	3.899	3.384	0.9	0.210	1.483	265.417	265.154	N/A	N/A	N/A			
50	51	263.837	262.437	1200	N/A	87.5	1.6	0.013	268.145	266.532	4.360	4.932	3.513	0.7	0.117	1.483	265.154	264.486	B94N	265.45	0.066			
																			B94N	265.45	0.611	87.4	16.1	264.609
																			B93S	265.60	0.642	87.4	31.7	264.728
																			B93N	266.29	1.148	87.4	55.7	264.912
																			B125S	266.32	1.061	87.4	71.1	265.029
																			B129	266.55	1.471	87.4	47.5	264.849
																			1	266.22	1.262	87.4	31.7	264.728
																			2	265.61	0.776	87.4	15.4	264.604
51	65	262.287	262.011	1350	N/A	39.5	0.7	0.013	266.532	266.418	3.120	4.466	3.830	0.9	0.849	1.483	264.486	264.035	B94S	265.25	0.534			
52	53	267.517	267.124	825	N/A	65.5	0.6	0.013	271.337	271.276	2.080	1.112	1.118	1.0	0.931	1.350	269.273	268.655	N/A	N/A	N/A			
53	54	267.044	266.765	825	N/A	46.5	0.6	0.013	271.276	270.994	2.080	1.112	1.121	1.0	0.786	1.450	268.655	268.374	42	269.59	0.705			
54	56	266.690	266.375	900	N/A	45.0	0.7	0.013	270.994	270.726	2.381	1.515	1.192	0.8	0.784	1.450	268.374	267.973	40	269.40	0.796			
55	56	267.020	266.452	825	N/A	78.5	0.7	0.013	270.864	270.726	2.247	1.201	1.291	1.1	0.665	1.350	268.510	267.973	51	269.55	0.810			
56	57	266.295	264.859	975	N/A	110.5	1.3	0.013	270.726	269.282	3.422	2.555	2.563	1.0	0.703	1.500	267.973	266.558	34	268.07	-0.133			
																			34	268.07	1.264	110.5	1.4	266.576
																			35	268.30	1.494	110.5	1.4	266.576
																			36	268.30	1.305	110.5	16.2	266.765
																			37	268.53	1.252	110.5	38.3	267.048
																			38	268.84	1.368	110.5	53.4	267.242
																			39	268.84	1.368	110.5	53.4	267.242
57	97	264.784	264.063	1050	N/A	51.5	1.4	0.013	269.282	268.695	3.731	3.231	2.770	0.9	0.724	1.533	266.558	266.046	31	267.57	0.782			
58	59	267.423	266.463	525	N/A	120.0	0.8	0.013	270.764	269.720	1.777	0.385	0.183	0.5	-0.268	1.367	267.680	266.985	20	268.32	0.410			
59	60	266.413	265.138	525	N/A	85.0	1.5	0.013	269.720	268.586	2.433	0.527	0.437	0.8	0.047	1.350	266.985	266.200	B131	267.30	0.085			
																			B131	267.30	0.853	84.8	1.8	266.217
																			B132	267.42	0.973	84.8	1.8	266.217
																			B133	267.70	1.052	84.8	23.6	266.418
																			B134	267.70	1.052	84.8	23.6	266.418
																			B135	267.89	1.031	84.8	46.3	266.629
																			B136	268.23	1.371	84.8	46.3	266.629

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL		
																						Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
																			B137	268.29	1.225	84.8	68.6	266.835
																			B138	268.29	1.225	84.8	68.6	266.835
																			21	268.32	1.168	84.8	78.0	266.922
																			22	268.05	0.898	84.8	78.0	266.922
																			23	267.87	0.973	84.8	50.4	266.667
																			24	267.81	0.913	84.8	50.4	266.667
60	62	264.988	264.538	675	N/A	15.0	3.0	0.013	268.586	268.734	4.069	1.456	0.708	0.5	0.537	1.333	266.200	265.870	N/A	N/A	N/A			
61	62	265.914	265.000	300	N/A	43.5	2.1	0.013	268.976	268.734	1.982	0.140	0.126	0.9	0.372	1.350	266.586	265.870	B91	267.28	0.464			
62	63	264.458	264.038	675	N/A	30.0	1.4	0.013	268.734	268.239	2.779	0.995	0.819	0.8	0.737	1.417	265.870	265.579	7	267.01	0.910			
63	64	263.888	263.306	825	N/A	48.5	1.2	0.013	268.239	267.701	2.942	1.572	1.032	0.7	0.866	1.433	265.579	265.119	5	266.38	0.571			
64	65	262.931	262.161	1200	N/A	85.5	0.9	0.013	267.701	266.418	3.270	3.699	4.312	1.2	0.988	1.400	265.119	264.035	N/A	N/A	N/A			
65	67	261.861	261.497	1500	N/A	40.5	0.9	0.013	266.418	265.810	3.795	6.706	8.137	1.2	0.674	1.433	264.035	263.479	N/A	N/A	N/A			
66	67	262.608	262.422	525	N/A	46.5	0.4	0.013	265.876	265.810	1.256	0.272	0.266	1.0	0.601	1.367	263.734	263.479	N/A	N/A	N/A			
67	78	261.447	260.891	1500	N/A	50.5	1.1	0.013	265.810	265.678	4.195	7.414	9.630	1.3	0.532	1.433	263.479	262.523	N/A	N/A	N/A			
68	69	260.611	259.281	1500	3000	133.0	1.0	0.013	265.468	264.722	4.846	21.806	18.001	0.8	-0.072	1.467	262.039	261.147	N/A	N/A	N/A			
69	70	259.281	258.706	1500	3000	57.5	1.0	0.013	264.722	264.089	4.846	21.806	19.119	0.9	0.365	1.450	261.146	260.622	N/A	N/A	N/A			
70	70A	258.656	258.610	1500	3000	10.2	0.5	0.013	264.089	263.870	3.251	14.628	19.121	1.3	0.465	1.450	260.621	260.526	N/A	N/A	N/A			
73	74	260.456	259.664	525	N/A	99.0	0.8	0.013	264.757	264.262	1.777	0.385	0.147	0.4	-0.272	1.483	260.709	260.421	N/A	N/A	N/A			
74	75	259.589	259.421	600	N/A	43.5	0.4	0.013	264.262	263.400	1.373	0.388	0.243	0.6	0.232	1.483	260.421	260.332	N/A	N/A	N/A			
75	80	258.512	258.253	1500	3000	57.5	0.5	0.013	263.400	261.870	3.251	14.628	20.073	1.4	0.320	1.433	260.332	260.261	N/A	N/A	N/A			
76	48	265.346	265.162	750	N/A	46.0	0.4	0.013	269.631	269.299	1.594	0.704	0.306	0.4	-0.069	1.517	266.027	265.973	N/A	N/A	N/A			
77	78	263.019	262.731	375	N/A	57.5	0.5	0.013	266.101	265.678	1.123	0.124	0.060	0.5	-0.168	1.300	263.226	262.909	N/A	N/A	N/A			
78	68	260.861	260.641	1500	N/A	20.0	1.1	0.013	265.678	265.468	4.195	7.414	9.669	1.3	0.162	1.433	262.523	262.141	N/A	N/A	N/A			
80	PondE2	258.203	258.117	1500	3000	21.5	0.4	0.013	261.870	260.700	3.065	13.792	20.088	1.5	0.558	1.433	260.261	260.253	N/A	N/A	N/A			
97	64	264.033	263.081	1050	N/A	68.0	1.4	0.013	268.695	267.701	3.731	3.231	3.116	1.0	0.963	1.533	266.046	265.119	29	267.35	1.074			
310	31	263.237	263.109	600	N/A	32.0	0.4	0.013	266.131	266.448	1.373	0.388	0.371	1.0	0.389	1.333	264.226	264.115	Part1	264.92	0.464			
500	50	265.097	264.737	300	N/A	36.0	1.0	0.013	268.339	268.145	1.368	0.097	0.005	0.1	-0.230	1.450	265.167	265.154	B125N	266.60	1.203			
660	66	263.109	262.683	450	N/A	71.0	0.6	0.013	266.585	265.876	1.389	0.221	0.093	0.4	0.229	1.283	263.788	263.734	N/A	N/A	N/A			
PondE2	O210	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.559	N/A	N/A	1.950	N/A	N/A	N/A	N/A	N/A			
PondE2	EMER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.486	N/A	N/A	1.950	N/A	N/A	N/A	N/A	N/A			
O210	O211	256.300	255.994	1800	N/A	25.5	1.2	0.013	260.000	260.000	4.948	12.592	4.559	0.4	-0.919	1.950	257.181	256.759	N/A	N/A	N/A			
37	48	265.050	264.862	1050	N/A	23.5	0.8	0.013	269.459	269.299	2.821	2.442	2.803	1.1	0.121	1.500	266.221	265.973	89	268.03	1.579			
72	80	259.346	259.216	750	N/A	28.0	0.5	0.013	263.607	261.870	1.782	0.787	-0.029	0.0	0.166	1.383	260.262	260.261	N/A	N/A	N/A			
O211	OUT	255.994	255.892	1800	N/A	8.5	1.2	0.013	260.000	258.292	4.948	12.592	4.559	0.4	-1.035	1.950	256.759	256.641	N/A	N/A	N/A			
C120	C166	264.490	264.420	1050	N/A	19.3	0.4	0.013	268.210	268.110	1.995	1.727	1.496	0.9	0.519	1.483	266.059	265.996	Cole Eng.	266.72	0.431			
C140	C40	265.810	265.340	675	N/A	118.3	0.4	0.013	269.620	268.640	1.486	0.532	0.522	1.0	0.359	1.367	266.844	266.317	Cole Eng.	267.94	0.866			
C150	C59	266.750	265.810	450	N/A	94.9	1.0	0.013	270.310	269.310	1.793	0.285	0.191	0.7	-0.172	1.350	267.028	266.526	Cole Eng.	268.47	1.212			
C165	C40	265.500	265.310	900	N/A	47.3	0.4	0.013	268.640	268.640	1.800	1.145	0.830	0.7	0.012	1.367	266.412	266.317	Cole Eng.	N/A	N/A			
C166	11	264.370	264.250	1050	N/A	28.9	0.4	0.013	268.110	267.991	1.995	1.727	1.555	0.9	0.576	1.483	265.996	265.890	Cole Eng.	266.55	0.324			
C39	C140	267.940	266.890	450	N/A	105.2	1.0	0.013	270.660	269.620	1.793	0.285	0.305	1.1	-0.041	1.367	268.349	267.274	Cole Eng.	268.89	0.311			
C40	C62	264.960	264.890	1050	N/A	16.7	0.4	0.013	268.640	268.640	1.995	1.727	1.313	0.8	0.307	1.350	266.317	266.274	Cole Eng.	N/A	N/A			
C42	1	266.170	265.990	450	N/A	36.8	0.5	0.013	269.170	269.380	1.268	0.202	0.071	0.4	-0.228	1.300	266.392	266.298	Cole Eng.	N/A	N/A			
C505	1	265.910	265.830	825	N/A	17.2	0.5	0.013	269.380	269.380	1.899	1.015	0.437	0.4	-0.394	1.417	266.341	266.298	Cole Eng.	N/A	N/A			
C506	C505	266.220	265.990	750	N/A	23.1	1.0	0.013	269.380	269.380	2.520	1.113	0.436	0.4	-0.411	1.400	266.559	266.341	Cole Eng.	N/A	N/A			
C59	C60	265.730	265.630	450	N/A	9.7	1.0	0.013	269.310	269.170	1.793	0.285	0.174	0.6	0.346	1.333	266.526	266.471	Cole Eng.	267.63	0.874			
C60	9	265.550	265.270	450	N/A	37.7	0.8	0.013	269.170	268.665	1.552	0.247	0.170	0.7	0.471	1.500	266.471	266.351	Cole Eng.	267.58	0.879			
C62	C63	264.850	264.610	1050	N/A	60.5	0.4	0.013	268.640	268.300	1.995	1.727	1.422	0.8	0.374	1.433	266.274	266.101	Cole Eng.	267.21	0.706			
C63	C120	264.580	264.520	1050	N/A	13.7	0.4	0.013	268.300	268.210	1.995	1.727	1.462	0.8	0.471	1.483	266.101	266.059	Cole Eng.	266.91	0.579			
C75	7	267.270	266.940	300	N/A	32.8	1.0	0.013	270.390	270.096	1.368	0.097	0.000	0.0	-0.458	0.000	267.112	267.112	Cole Eng.	268.88	1.538			
C75	C150	267.070	266.940	300	N/A	12.7	1.0	0.013	270.390	270.310	1.368	0.097	0.000	0.0	-0.342	0.000	267.028	267.028	Cole Eng.	269.88	2.622			
C40W	C42	266.490	266.200	450	N/A	57.8	0.5	0.013	268.640	269.170	1.268	0.202	0.073	0.4	-0.263	1.283	266.677	266.392	Cole Eng.	267.52	0.613			
F1	F3	268.818	268.512	450	N/A	76.5	0.4	0.013	272.312	271.881	1.134	0.180	0.172	1.0	0.124	1.367	269.392	269.153	14	270.59	0.968			
F2	F3	269.772	269.150	300	N/A	41.5	1.5	0.013	272.721	271.881	1.675	0.118	0.045	0.4	-0.171	1.367	269.901	269.279	N/A	N/A	N/A			

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL: Length HGL (m)	Interpolated HGL: Dist. From D/S MH (m)	Interpolated HGL: HGL (m)
F3	F4	268.212	267.640	750	N/A	114.5	0.5	0.013	271.881	271.359	1.782	0.787	0.670	0.9	0.191	1.367	269.153	268.832	9	270.05	0.667			
F4	55	267.565	267.070	825	N/A	99.0	0.5	0.013	271.359	270.864	1.899	1.015	0.931	0.9	0.442	1.350	268.832	268.510	3	269.67	0.608			
F100	F3	268.440	268.362	600	N/A	19.5	0.4	0.013	271.710	271.881	1.373	0.388	0.349	0.9	0.235	1.367	269.275	269.153	N/A	N/A	N/A			
101	102	262.978	262.663	525	N/A	52.5	0.6	0.013	266.056	265.856	1.539	0.333	0.248	0.7	-0.185	1.367	263.318	263.000	53	264.55	1.002			
102	103	262.438	261.790	750	N/A	72.0	0.9	0.013	265.856	265.495	2.391	1.056	0.407	0.4	-0.408	1.367	262.780	262.331	47	264.37	1.360			
103	106	261.760	260.842	750	N/A	76.5	1.2	0.013	265.495	265.315	2.760	1.220	0.865	0.7	-0.179	1.367	262.331	261.653	41	263.91	1.349			
Y34	106	260.150	260.102	1500	N/A	10.8	0.5	0.013	265.456	265.315	2.683	4.742	5.024	1.1	0.072	1.433	261.722	261.653	FUT	263.89	1.934			
105	106	262.342	261.142	450	N/A	120.0	1.0	0.013	265.505	265.315	1.793	0.285	0.379	1.3	1.203	1.367	263.995	261.653	29	263.74	-0.485			
																			29	263.74	1.328	120.0	27.1	262.182
																			28	263.96	1.294	120.0	40.1	262.436
																			27	264.06	1.394	120.0	40.1	262.436
																			26	264.22	1.125	120.0	62.1	262.865
																			25	264.22	1.125	120.0	62.1	262.865
106	107	260.092	259.808	1500	N/A	35.5	0.8	0.013	265.315	265.195	3.578	6.323	6.210	1.0	0.061	1.433	261.653	261.335	N/A	N/A	N/A			
107	108	259.758	259.486	1500	N/A	34.0	0.8	0.013	265.195	265.182	3.578	6.323	6.533	1.0	0.077	1.433	261.335	260.993	70	263.62	2.055			
108	115	259.436	258.824	1500	N/A	76.5	0.8	0.013	265.182	264.761	3.578	6.323	6.685	1.1	0.057	1.433	260.993	260.312	B108S	263.21	1.987			
100	36	261.679	261.398	1500	N/A	53.0	0.5	0.013	266.641	266.363	2.912	5.146	7.834	1.5	0.064	1.433	263.243	262.572	B122S	264.99	1.517			
110	112	262.130	261.790	525	N/A	42.5	0.8	0.013	265.608	265.342	1.777	0.385	0.285	0.7	0.526	1.417	263.181	262.997	67	263.98	0.569			
112	113	261.715	261.445	600	N/A	54.0	0.5	0.013	265.342	265.038	1.536	0.434	0.354	0.8	0.682	1.400	262.997	262.773	B104S	263.55	0.323			
113	114	261.365	261.203	600	N/A	27.0	0.6	0.013	265.038	264.865	1.682	0.476	0.451	0.9	0.808	1.400	262.773	262.610	84	263.21	0.207			
																			84	263.21	0.360	27.1	1.6	262.620
																			85	263.29	0.357	27.1	15.4	262.703
																			86	263.44	0.445	27.1	25.7	262.765
114	115	261.153	260.754	600	N/A	57.0	0.7	0.013	264.865	264.761	1.817	0.514	0.762	1.5	0.857	1.367	262.610	261.302	81	263.13	0.290			
																			81	263.13	1.209	57.2	17.0	261.691
																			82	263.43	1.166	57.2	32.0	262.034
																			83	263.43	0.832	57.2	46.6	262.368
115	116	258.794	258.590	1500	2400	68.0	0.3	0.013	264.761	264.341	2.516	9.059	7.703	0.9	0.018	1.433	260.312	260.274	B106S	263.53	2.988			
116	125	258.590	258.527	1500	2400	21.0	0.3	0.013	264.341	264.463	2.516	9.059	7.696	0.8	0.184	1.433	260.274	260.268	N/A	N/A	N/A			
117	118	261.674	260.972	450	N/A	117.0	0.6	0.013	265.535	264.950	1.389	0.221	0.095	0.4	-0.232	1.350	261.892	261.521	B109S	263.40	1.278			
118	119	260.922	260.702	450	N/A	31.5	0.7	0.013	264.950	265.137	1.500	0.239	0.263	1.1	0.149	1.350	261.521	261.062	N/A	N/A	N/A			
119	125	260.622	259.452	525	N/A	97.5	1.2	0.013	265.137	264.463	2.176	0.471	0.356	0.8	-0.182	1.350	260.965	260.268	16	263.24	2.045			
120	121	261.339	260.851	375	N/A	61.0	0.8	0.013	265.068	264.687	1.420	0.157	0.064	0.4	-0.203	1.367	261.511	261.140	7	263.08	1.339			
121	123	260.771	260.339	450	N/A	48.0	0.9	0.013	264.687	264.403	1.701	0.270	0.152	0.6	-0.081	1.400	261.140	261.022	3	262.83	1.460			
123	124	260.289	260.009	450	N/A	25.5	1.1	0.013	264.403	264.351	1.880	0.299	0.378	1.3	0.283	1.367	261.022	260.422	1	262.64	1.388			
124	125	259.929	259.527	450	N/A	17.5	2.3	0.013	264.351	264.463	2.719	0.432	0.378	0.9	-0.081	1.367	260.298	260.268	N/A	N/A	N/A			
125	126	258.477	258.371	1500	2400	37.5	0.3	0.013	264.463	264.186	2.516	9.059	8.409	0.9	0.291	1.433	260.268	260.262	80	262.79	2.292			
126	129	258.371	258.325	1500	2400	15.5	0.3	0.013	264.186	264.080	2.516	9.059	8.406	0.9	0.391	1.450	260.262	260.260	77	262.83	2.338			
127	128	260.302	259.506	450	N/A	88.5	0.9	0.013	263.784	264.067	1.701	0.270	0.380	1.4	1.238	1.367	261.990	260.427	72	262.58	0.360			
128	129	259.456	259.375	450	N/A	13.5	0.6	0.013	264.067	264.080	1.389	0.221	0.380	1.7	0.521	1.367	260.427	260.260	N/A	N/A	N/A			
129	180	258.325	258.220	1500	2400	35.0	0.3	0.013	264.080	261.080	2.516	9.059	8.773	1.0	0.435	1.450	260.260	260.254	N/A	N/A	N/A			
180	PondE2	258.135	258.100	1500	2400	11.5	0.3	0.013	261.080	260.700	2.516	9.059	8.752	1.0	0.619	1.450	260.254	260.253	N/A	N/A	N/A			
1M	110	263.050	262.210	450	N/A	120.0	0.7	0.013	266.242	265.608	1.500	0.239	0.141	0.6	-0.050	1.467	263.450	263.181	64	264.32	0.640			
1M	2M	263.004	262.674	525	N/A	88.0	0.4	0.013	266.242	266.601	1.256	0.272	0.190	0.7	-0.079	1.367	263.450	263.349	Part29	264.67	0.990			
2M	100	262.524	262.306	675	N/A	56.0	0.4	0.013	266.601	266.641	1.486	0.532	0.329	0.6	0.150	1.367	263.349	263.243	Part47	264.78	1.201			
CMH5	310	263.450	263.388	450	N/A	12.5	0.5	0.013	266.340	266.131	1.268	0.202	0.138	0.7	0.405	1.433	264.305	264.226	N/A	N/A	N/A			
DICB1	101	263.361	263.129	375	N/A	15.5	1.5	0.013	265.800	266.056	1.944	0.215	0.076	0.4	-0.179	1.317	263.557	263.318	N/A	N/A	N/A			
T1	T2	269.951	269.547	375	N/A	50.5	0.8	0.013	272.822	272.450	1.420	0.157	0.026	0.2	-0.270	1.367	270.056	269.651	17	271.20	0.914			
T1	T3	269.917	269.553	375	N/A	56.0	0.7	0.013	272.822	272.515	1.280	0.141	0.041	0.3	-0.236	1.367	270.056	269.691	41	271.14	0.854			
T2	F100	269.397	268.515	525	N/A	98.0	0.9	0.013	272.450	271.710	1.885	0.408	0.152	0.4	-0.298	1.367	269.624	269.275	25	270.49	0.636			
T3	T4	269.403	268.993	525	N/A	63.0	0.7	0.013	272.515	272.160	1.602	0.347	0.041	0.1	-0.403	1.367	269.525	269.173	2	270.78	1.025			
T4	T5	268.843	268.247	675	N/A	149.0	0.4	0.013	272.160	271.777	1.486	0.532	0.248	0.5	-0.345	1.367	269.173	268.916	54	270.48	1.077			
T5	41	268.022	267.290	900	N/A	146.5	0.5	0.013	271.777	270.975	2.012	1.280	1.078	0.8	-0.006	1.367	268.916	268.502	Part7	269.70	0.554			

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL Length HGL (m)	Interpolated HGL Dist. From D/S MH (m)	Interpolated HGL HGL (m)
T6	T7	269.774	269.644	300	N/A	13.0	1.0	0.013	272.613	272.453	1.368	0.097	0.079	0.8	0.006	1.367	270.080	270.003	72	271.49	1.180			
T6	T9	269.661	269.269	525	N/A	87.0	0.5	0.013	272.613	272.520	1.333	0.288	0.202	0.7	-0.106	1.367	270.080	269.951	74	271.18	0.870			
T7	T8	269.494	268.474	450	N/A	120.0	0.9	0.013	272.453	271.766	1.653	0.263	0.187	0.7	0.059	1.367	270.003	269.594	B128	270.36	0.127			
																			B128	270.36	0.531	120.2	1.4	269.599
																			63	270.47	0.641	120.2	1.4	269.599
																			64	270.55	0.629	120.2	28.4	269.691
																			65	270.55	0.629	120.2	28.4	269.691
																			66	270.65	0.640	120.2	54.6	269.780
																			67	270.70	0.690	120.2	54.6	269.780
																			68	270.70	0.604	120.2	80.0	269.866
																			69	270.84	0.744	120.2	80.0	269.866
																			70	270.84	0.654	120.2	106.3	269.956
																			71	270.89	0.704	120.2	106.3	269.956
																			98	271.09	0.926	120.2	99.8	269.934
																			99	271.09	0.926	120.2	99.8	269.934
																			100	270.99	0.916	120.2	73.6	269.844
																			101	270.82	0.746	120.2	73.6	269.844
																			102	270.72	0.735	120.2	47.4	269.755
																			103	270.64	0.655	120.2	47.4	269.755
																			104	270.58	0.683	120.2	21.5	269.667
																			105	270.40	0.503	120.2	21.5	269.667
T8	T12	268.244	267.881	600	N/A	33.0	1.1	0.013	271.766	271.539	2.278	0.644	0.395	0.6	0.750	1.333	269.594	269.387	Part4	270.20	0.376			
T9	T10	269.194	269.150	600	N/A	14.5	0.3	0.013	272.520	272.353	1.189	0.336	0.238	0.7	0.157	1.367	269.951	269.927	82	271.14	0.959			
T10	T11	269.100	268.125	600	N/A	97.5	1.0	0.013	272.353	271.833	2.172	0.614	0.415	0.7	0.227	1.367	269.927	269.521	B133	270.20	0.043			
																			B133	270.20	0.444	97.3	1.3	269.526
																			90	270.25	0.432	97.3	16.1	269.588
																			89	270.31	0.492	97.3	16.1	269.588
																			88	270.37	0.445	97.3	41.8	269.695
																			87	270.44	0.515	97.3	41.8	269.695
																			86	270.50	0.465	97.3	68.0	269.805
																			85	270.57	0.535	97.3	68.0	269.805
																			84	270.63	0.486	97.3	94.2	269.914
																			83	270.63	0.486	97.3	94.2	269.914
																			97	271.13	1.023	97.3	85.2	269.877
																			96	271.13	1.023	97.3	85.2	269.877
																			95	270.76	0.762	97.3	59.1	269.768
																			94	270.76	0.762	97.3	59.1	269.768
																			93	270.59	0.702	97.3	32.9	269.658
																			92	270.59	0.702	97.3	32.9	269.658
																			91	270.40	0.576	97.3	17.4	269.594
T11	T12	267.967	267.811	750	N/A	39.0	0.4	0.013	271.833	271.539	1.594	0.704	0.510	0.7	0.804	1.483	269.521	269.387	Part3	270.15	0.399			
T12	52	267.731	267.595	750	N/A	19.5	0.7	0.013	271.539	271.337	2.108	0.931	0.853	0.9	0.906	1.483	269.387	269.273	N/A	N/A	N/A			
T13	T14	269.222	268.800	600	N/A	105.5	0.4	0.013	272.254	272.129	1.373	0.388	0.227	0.6	-0.263	1.367	269.559	269.385	B123W	270.50	0.711			
T14	T15	268.750	268.442	600	N/A	44.0	0.7	0.013	272.129	271.890	1.817	0.514	0.333	0.6	0.035	1.350	269.385	269.278	Part14	270.22	0.605			
T15	T21	268.367	268.121	675	N/A	41.0	0.6	0.013	271.890	271.662	1.820	0.651	0.494	0.8	0.236	1.367	269.278	269.155	Part15W	270.06	0.552			
T16	T17	269.547	269.251	375	N/A	74.0	0.4	0.013	272.395	272.209	1.004	0.111	0.040	0.4	-0.215	1.300	269.707	269.406	112	271.11	1.173			
T17	T18	269.176	268.884	450	N/A	58.5	0.5	0.013	272.209	271.888	1.268	0.202	0.097	0.5	-0.220	1.350	269.406	269.294	Part41	270.50	0.864			
T18	T19	268.834	268.738	450	N/A	12.0	0.8	0.013	271.888	271.741	1.603	0.255	0.102	0.4	0.010	1.483	269.294	269.280	Part42	270.30	0.776			
T19	T20	268.663	268.465	525	N/A	36.0	0.6	0.013	271.741	271.527	1.473	0.319	0.141	0.4	0.092	1.483	269.280	269.255	Part46	270.21	0.700			
T20	T21	268.265	268.121	675	N/A	24.0	0.6	0.013	271.527	271.662	1.820	0.651	0.351	0.5	0.315	1.317	269.255	269.155	Part22	270.46	0.975			
T21	39	267.971	267.755	825	N/A	36.0	0.6	0.013	271.662	271.464	2.080	1.112	0.819	0.7	0.359	1.500	269.155	269.036	Part16W	269.91	0.525			
CMH3	4	264.692	264.635	375	N/A	11.5	0.5	0.013	268.180	268.203	1.123	0.124	0.048	0.4	-0.044	1.433	265.023	265.006	N/A	N/A	N/A			
Y1	Y2	265.512	265.222	300	N/A	29.0	1.0	0.013	268.294	268.509	1.368	0.097	0.098	1.0	-0.047	1.283	265.765	265.465	69	266.80	0.805			

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL		
																						Length HGL (m)	Dist. From D/S MH (m)	HGL (m)
Y2	Y3	265.172	264.022	300	N/A	60.5	1.9	0.013	268.509	268.054	1.886	0.133	0.142	1.1	-0.025	1.317	265.447	264.294	41	266.52	0.843			
Y3	Y4	263.722	263.410	600	N/A	44.5	0.7	0.013	268.054	267.689	1.817	0.514	0.370	0.7	-0.139	1.350	264.183	264.047	37	266.12	1.707			
Y4	Y7	262.810	262.550	1200	N/A	65.0	0.4	0.013	267.689	267.220	2.180	2.466	2.296	0.9	0.037	1.400	264.047	263.385	33	265.85	1.573			
Y5	Y6	264.608	264.230	675	N/A	75.5	0.5	0.013	268.358	267.827	1.661	0.594	0.590	1.0	0.039	1.383	265.322	264.972	26	266.26	0.708			
Y6	Y7	264.155	263.743	750	N/A	82.5	0.5	0.013	267.827	267.220	1.782	0.787	0.776	1.0	0.067	1.383	264.972	264.289	32	265.75	0.548			
Y7	Y25	261.367	261.034	1350	N/A	83.2	0.4	0.013	267.220	266.477	2.358	3.376	3.628	1.1	0.011	1.383	262.728	262.352	N/A	N/A	N/A			
Y21	Y22	263.484	262.846	375	N/A	63.8	1.0	0.013	267.204	266.726	1.587	0.175	0.153	0.9	-0.097	1.350	263.762	263.165	63	265.38	1.388			
Y22	Y25	262.771	261.882	450	N/A	70.9	1.3	0.013	266.726	266.477	2.004	0.319	0.275	0.9	-0.056	1.367	263.165	262.352	59	265.11	1.715			
Y23	Y24	263.512	263.174	375	N/A	33.8	1.0	0.013	267.341	267.201	1.587	0.175	0.065	0.4	-0.208	1.367	263.679	263.465	49	265.94	2.031			
Y24	Y25	263.024	261.800	525	N/A	116.5	1.1	0.013	267.201	266.477	2.036	0.441	0.382	0.9	-0.084	1.367	263.465	262.352	56	265.14	1.445			
Y25	Y33	260.862	260.558	1500	N/A	76.0	0.4	0.013	266.477	265.820	2.530	4.471	4.303	1.0	-0.010	1.383	262.352	262.085	FUT	264.91	2.325			
Y26	Y27	263.562	262.843	375	N/A	71.9	1.0	0.013	267.410	266.435	1.587	0.175	0.085	0.5	-0.172	1.367	263.765	263.028	FUT	265.84	1.845			
Y27	Y28	262.693	262.277	525	N/A	83.3	0.5	0.013	266.435	265.950	1.405	0.304	0.163	0.5	-0.229	1.367	262.989	262.785	FUT	264.87	1.646			
Y28	Y33	262.247	261.503	525	N/A	74.4	1.0	0.013	265.950	265.820	1.987	0.430	0.389	0.9	0.013	1.383	262.785	262.085	FUT	264.38	1.365			
Y29	Y30	264.287	263.726	300	N/A	51.0	1.1	0.013	267.240	266.842	1.435	0.101	0.048	0.5	-0.150	1.367	264.437	263.871	FUT	265.67	1.003			
Y30	Y31	263.181	263.100	375	N/A	11.2	0.7	0.013	266.842	266.715	1.328	0.147	0.073	0.5	-0.169	1.383	263.387	263.285	FUT	265.27	1.655			
Y31	Y32	262.621	262.259	525	N/A	72.2	0.5	0.013	266.715	266.108	1.405	0.304	0.125	0.4	-0.287	1.367	262.859	262.571	FUT	265.15	2.056			
Y32	Y33	262.215	261.503	525	N/A	71.2	1.0	0.013	266.108	265.820	1.987	0.430	0.283	0.7	-0.169	1.367	262.571	262.085	FUT	264.54	1.737			
Y33	Y34	260.528	260.208	1500	N/A	71.2	0.5	0.013	265.820	265.456	2.683	4.742	5.036	1.1	0.057	1.383	262.085	261.722	FUT	264.25	1.935			
T101	T102	269.597	269.263	450	N/A	83.5	0.4	0.013	272.551	272.327	1.134	0.180	0.116	0.6	-0.176	1.367	269.871	269.563	B7S	270.63	0.529			
T102	T104	269.213	269.177	450	N/A	9.0	0.4	0.013	272.327	272.440	1.134	0.180	0.113	0.6	-0.100	1.383	269.563	269.478	B5N	270.85	1.057			
T103	T104	269.612	269.252	375	N/A	45.0	0.8	0.013	272.477	272.440	1.420	0.157	0.144	0.9	-0.088	1.367	269.899	269.533	B4E	270.61	0.481			
T104	T105	268.952	268.636	675	N/A	79.0	0.4	0.013	272.440	272.063	1.486	0.532	0.400	0.8	-0.149	1.367	269.478	269.297	B2W	270.60	0.892			
T105	T106	268.586	268.554	675	N/A	8.0	0.4	0.013	272.063	271.980	1.486	0.532	0.425	0.8	0.036	1.383	269.297	269.270	B1N	270.31	0.783			
T106	T107	268.504	268.360	675	N/A	36.0	0.4	0.013	271.980	271.935	1.486	0.532	0.616	1.2	0.091	1.367	269.270	269.110	B1S	270.15	0.650			
T107	T5	268.310	268.248	675	N/A	12.5	0.5	0.013	271.935	271.777	1.661	0.594	0.614	1.0	0.125	1.367	269.110	268.916	N/A	N/A	N/A			
70A	75	258.610	258.512	1500	3000	21.8	0.5	0.013	263.870	263.400	3.251	14.628	19.558	1.3	0.416	1.433	260.526	260.332	N/A	N/A	N/A			
V1	V3	261.668	260.688	300	N/A	24.5	4.0	0.013	265.632	264.642	2.736	0.193	0.027	0.1	-0.219	1.350	261.749	261.387	BF27/28	263.31	1.331			
V2	V3	261.213	260.618	375	N/A	59.5	1.0	0.013	264.947	264.642	1.587	0.175	0.091	0.5	-0.064	1.333	261.524	261.387	BJ68/69	262.60	0.846			
V3	V5	260.538	260.282	450	N/A	36.5	0.7	0.013	264.642	264.402	1.500	0.239	0.144	0.6	0.399	1.417	261.387	261.296	BE22	262.65	1.033			
V4	V5	261.021	260.357	375	N/A	83.0	0.8	0.013	264.768	264.402	1.420	0.157	0.169	1.1	0.619	1.317	262.015	261.296	BG38/39	262.52	0.275			
																			BG38/39	262.52	0.844	83.1	17.3	261.446
																			BG40/41	262.52	0.733	83.1	30.2	261.557
																			BG42/43	262.52	0.621	83.1	43.1	261.669
																			BH49/50	262.60	0.566	83.1	58.7	261.804
																			BH51/52	262.60	0.455	83.1	71.6	261.915
																			BH53	262.60	0.381	83.1	80.1	261.989
																			BI54/55	262.93	0.908	83.1	57.3	261.792
																			BI56/57	262.93	1.020	83.1	44.4	261.680
																			BJ62/63	262.87	1.096	83.1	28.7	261.544
																			BJ64/65	262.60	0.937	83.1	15.8	261.433
V5	V9	260.207	260.008	525	N/A	28.5	0.7	0.013	264.402	264.136	1.662	0.360	0.287	0.8	0.564	1.383	261.296	261.169	BE18/19	262.38	0.854			
V6	V7	261.300	261.210	300	N/A	9.0	1.0	0.013	264.061	264.167	1.368	0.097	0.019	0.2	-0.194	1.267	261.406	261.347	N/A	N/A	N/A			
V7	V9	260.573	260.038	450	N/A	107.0	0.5	0.013	264.167	264.136	1.268	0.202	0.128	0.6	0.324	1.283	261.347	261.169	BC13/14	262.14	0.563			
V8	V9	260.398	260.183	300	N/A	19.5	1.1	0.013	264.162	264.136	1.435	0.101	0.085	0.8	0.689	1.350	261.387	261.169	BD15/16	262.36	0.743			
V9	V10	259.958	259.508	525	N/A	22.5	2.0	0.013	264.136	264.077	2.810	0.608	0.537	0.9	0.686	1.367	261.169	260.828	N/A	N/A	N/A			
V10	70A	259.420	259.080	600	N/A	17.0	2.0	0.013	264.077	263.870	3.071	0.868	0.535	0.6	0.808	1.367	260.828	260.534	N/A	N/A	N/A			
Y101	Y102	268.078	266.768	375	N/A	65.5	2.0	0.013	270.964	269.863	2.245	0.248	0.226	0.9	-0.045	1.350	268.408	267.066	32	268.65	0.012			
																			32	268.65	0.858	65.7	24.3	267.562
																			31	268.70	0.908	65.7	24.3	267.562
																			30	268.91	0.609	65.7	49.2	268.071
																			29	269.11	0.809	65.7	49.2	268.071
																			28	269.33	0.719	65.7	64.4	268.381

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL Length HGL (m)	Interpolated HGL Dist. From D/S MH (m)	Interpolated HGL HGL (m)
																			27	269.55	0.939	65.7	64.4	268.381
Y102	Y103	266.618	265.648	525	N/A	97.0	1.0	0.013	269.863	268.810	1.987	0.430	0.442	1.0	-0.077	1.367	267.066	266.093	91	267.53	0.234			
																			91	267.53	1.083	97.2	12.4	266.217
																			92	267.78	1.333	97.2	12.4	266.217
																			93	267.98	1.313	97.2	34.4	266.437
																			94	267.98	1.313	97.2	34.4	266.437
																			95	268.01	1.122	97.2	56.4	266.658
																			96	268.29	1.402	97.2	56.4	266.658
																			97	268.29	1.184	97.2	78.2	266.876
																			98	268.49	1.384	97.2	78.2	266.876
Y103	Y5	265.491	264.688	600	N/A	73.0	1.1	0.013	268.810	268.358	2.278	0.644	0.536	0.8	-0.001	1.367	266.090	265.322	FUT	267.24	0.920			
Y110	Y111	266.309	265.877	600	N/A	108.0	0.4	0.013	269.419	270.586	1.373	0.388	0.399	1.0	-0.096	1.383	266.813	266.291	1	268.09	1.047			
																			1	268.09	1.060	107.9	105.3	266.800
																			2	268.09	1.060	107.9	105.3	266.800
																			3	268.10	1.144	107.9	90.0	266.726
																			4	268.42	1.464	107.9	90.0	266.726
																			5	268.77	1.920	107.9	68.0	266.620
																			6	268.77	1.920	107.9	68.0	266.620
																			7	268.93	2.186	107.9	46.0	266.514
																			8	269.15	2.406	107.9	46.0	266.514
																			9	269.37	2.733	107.9	24.0	266.407
																			10	269.37	2.733	107.9	24.0	266.407
Y111	Y112	265.652	265.184	825	N/A	117.0	0.4	0.013	270.586	272.103	1.698	0.908	0.633	0.7	-0.315	1.367	266.162	265.704	11	269.63	3.238			
Y112	Y113	265.109	264.829	900	N/A	70.0	0.4	0.013	272.103	271.237	1.800	1.145	0.643	0.6	-0.305	1.383	265.704	265.344	26	269.89	3.956			
Y113	Y114	264.749	264.397	900	N/A	88.0	0.4	0.013	271.237	270.497	1.800	1.145	0.786	0.7	-0.305	1.383	265.344	264.980	B111S	268.07	2.496			
Y114	Y115	264.347	264.277	900	N/A	17.5	0.4	0.013	270.497	270.335	1.800	1.145	0.785	0.7	-0.267	1.400	264.980	264.874	B114S	268.06	2.850			
Y115	Y116	264.202	263.720	975	N/A	120.5	0.4	0.013	270.335	269.418	1.898	1.417	1.045	0.7	-0.303	1.400	264.874	264.479	B109W	267.25	2.146			
Y116	Y117	263.670	263.624	975	N/A	11.5	0.4	0.013	269.418	269.228	1.898	1.417	1.124	0.8	-0.166	1.417	264.479	264.341	B109E	267.25	2.541			
Y117	Y4	263.194	262.890	1200	N/A	76.0	0.4	0.013	269.228	267.689	2.180	2.466	1.729	0.7	-0.053	1.400	264.341	264.047	FUT	267.66	3.087			
Y1110	Y111	265.813	265.757	750	N/A	14.0	0.4	0.013	270.628	270.586	1.594	0.704	0.050	0.1	-0.397	1.667	266.166	266.162	N/A	N/A	N/A			
Z1	Z4	268.018	266.998	300	N/A	25.5	4.0	0.013	270.871	270.005	2.736	0.193	0.000	0.0	-0.300	0.000	268.018	266.640	BLL66	269.03	0.782			
Z2	Z6	266.800	266.542	375	N/A	64.5	0.4	0.013	269.671	269.651	1.004	0.111	0.091	0.8	-0.111	1.283	267.064	266.846	BEL20	267.75	0.456			
																			BEL20	267.75	0.634	64.4	11.8	266.886
																			BEL17	267.89	0.733	64.4	24.0	266.927
																			BDL16	267.89	0.681	64.4	39.3	266.979
																			BDL12	267.78	0.502	64.4	59.6	267.048
Z3	Z4	266.636	266.322	450	N/A	78.5	0.4	0.013	269.747	270.005	1.134	0.180	0.175	1.0	-0.021	1.300	267.065	266.640	BIL55	267.87	0.575			
																			BIL55	267.87	0.921	78.5	14.5	266.719
																			BIL40	268.09	1.026	78.5	35.8	266.834
																			BJL50	268.09	0.938	78.5	52.1	266.922
																			BJL46	267.71	0.443	78.5	73.4	267.037
																			BCL11	267.81	0.532	78.5	75.3	267.048
																			BCL8	268.32	1.108	78.5	63.1	266.982
																			BBL7	268.32	1.195	78.5	47.1	266.895
																			BBL4	268.72	1.661	78.5	34.9	266.829
																			BAL3	268.72	1.737	78.5	20.9	266.753
																			BAL1	268.85	1.911	78.5	12.8	266.709
Z4	Z7	266.242	266.102	450	N/A	35.0	0.4	0.013	270.005	269.236	1.134	0.180	0.185	1.0	-0.052	1.317	266.640	266.508	BKL60	267.83	0.960			
Z5	Z6	266.785	266.617	300	N/A	21.0	0.8	0.013	269.764	269.651	1.224	0.086	0.010	0.1	-0.229	1.433	266.856	266.846	BFL24	267.69	0.604			
																			BFL24	267.69	0.606	20.9	15.7	266.854
																			BFL21	267.75	0.672	20.9	3.5	266.848
Z6	Z7	266.392	266.032	525	N/A	90.0	0.4	0.013	269.651	269.236	1.256	0.272	0.236	0.9	-0.071	1.317	266.846	266.508	BHL35	267.28	0.204			
																			BHL35	267.28	0.481	89.9	16.1	266.569

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Table A-2: Pipe Data and Hydraulic Simulation Results for the 100-Year, 4-Hour Chicago Storm (Pond E2 - Interim Conditions)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Width (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [1] (m)	Time to Peak (h)	Max. U/S HGL (m)	Max. D/S HGL (m)	Lot Number	BF (m)	Freeboard (m)	Interpolated HGL Length HGL (m)	Interpolated HGL Dist. From D/S MH (m)	Interpolated HGL HGL (m)
																			BHL30	267.42	0.530	89.9	40.3	266.660
																			BGL29	267.45	0.511	89.9	53.5	266.709
																			BGL25	267.59	0.575	89.9	73.6	266.785
																			BJL45	267.71	0.698	89.9	73.0	266.782
																			BJL41	267.78	0.848	89.9	51.7	266.702
																			BIL40	267.78	0.909	89.9	35.4	266.641
																			BIL36	267.64	0.849	89.9	14.1	266.561
Z7	Z8	265.952	265.841	600	N/A	18.5	0.6	0.013	269.236	268.839	1.682	0.476	0.421	0.9	-0.044	1.333	266.508	266.266	BKL56	267.13	0.392			
																			BKL56	267.13	0.444	18.7	14.7	266.456
Z8	ZCMH1	265.761	265.443	600	N/A	26.5	1.2	0.013	268.839	268.463	2.379	0.673	0.555	0.8	-0.171	1.350	266.190	265.859	N/A	N/A	N/A			
ZCMH1	Y117	263.915	263.850	675	N/A	13.0	0.5	0.013	268.463	269.228	1.661	0.594	0.555	0.9	0.017	1.350	264.607	264.341	N/A	N/A	N/A			
MH2-1	MH2-3	265.117	264.955	300	N/A	22.2	1.0	0.013	269.280	269.080	1.368	0.097	-0.004	0.0	-0.248	1.267	265.169	265.167	FUT	267.71	2.311			
MH2-2	MH2-3	265.347	264.955	300	N/A	39.3	1.0	0.013	268.540	269.080	1.368	0.097	0.133	1.4	0.545	1.283	266.192	265.228	FUT	266.97	0.548			
MH2-3	MH2-4	264.875	264.840	375	N/A	7.1	0.5	0.013	269.080	268.960	1.123	0.124	0.133	1.1	-0.083	1.283	265.167	265.109	FUT	267.51	2.113			
MH2-4	MH2-5	264.765	264.499	450	N/A	53.1	0.5	0.013	268.960	268.550	1.268	0.202	0.157	0.8	-0.145	1.350	265.070	264.810	FUT	267.39	2.090			
MH2-5	MH2-6	264.449	264.397	450	N/A	10.4	0.5	0.013	268.550	268.460	1.268	0.202	0.186	0.9	-0.089	1.350	264.810	264.732	FUT	266.98	1.940			
MH2-6	MH2-7	264.347	264.320	450	N/A	5.4	0.5	0.013	268.460	268.420	1.268	0.202	0.198	1.0	-0.065	1.367	264.732	264.672	FUT	266.89	1.928			
MH2-7	MH1	264.270	264.130	450	N/A	28.1	0.5	0.013	268.420	268.180	1.268	0.202	0.234	1.2	-0.048	1.350	264.672	264.471	FUT	266.85	1.948			
MH1	Y3	263.830	263.779	600	N/A	10.3	0.5	0.013	268.180	268.054	1.536	0.434	0.234	0.5	-0.142	1.367	264.288	264.183	FUT	266.61	2.092			

Note: [1] A negative surcharge implies that the pipe is not flowing full

266.886 Interpolated HGL elevation

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Figure A-1: XPSWMM MODEL SCHEMATIC

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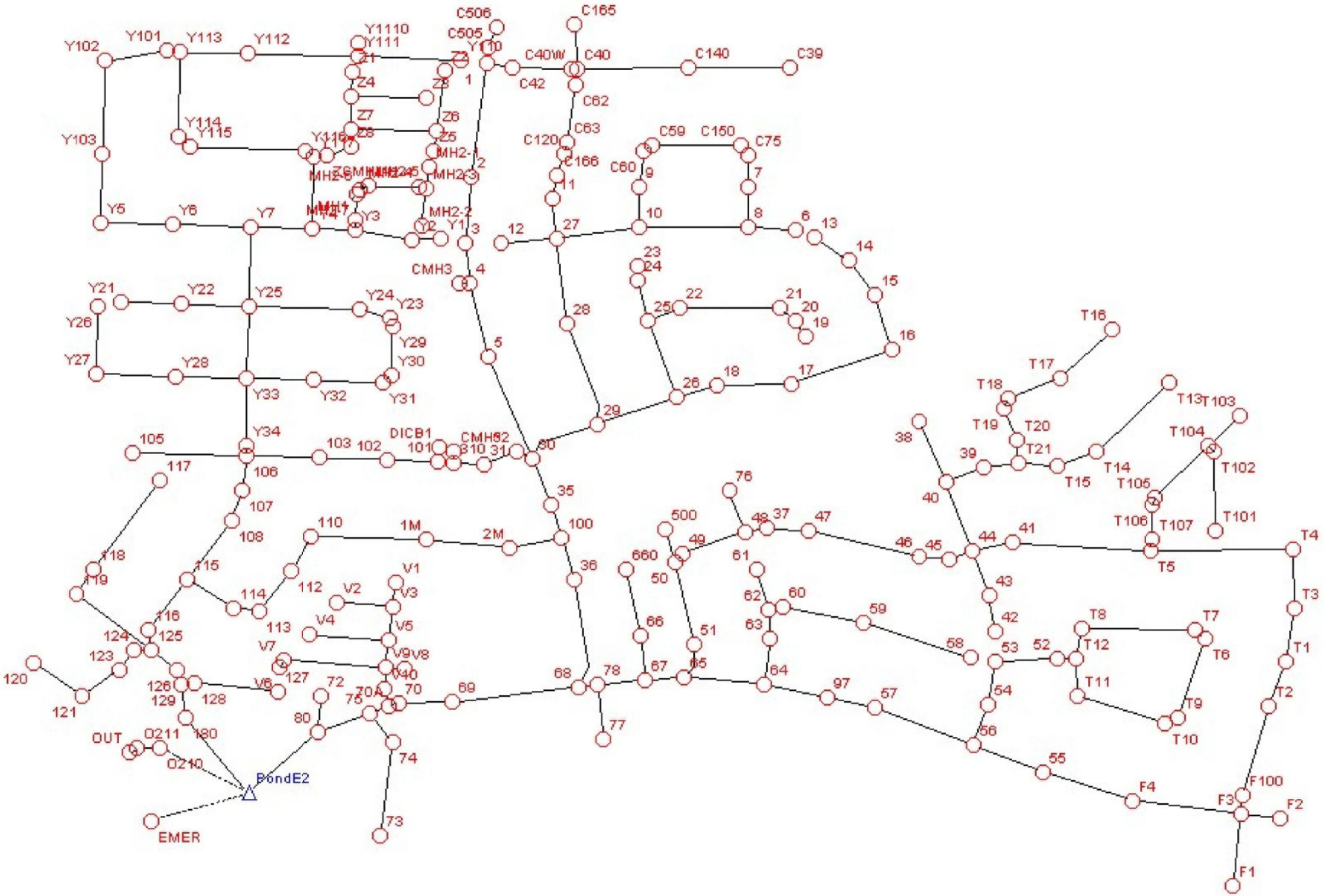

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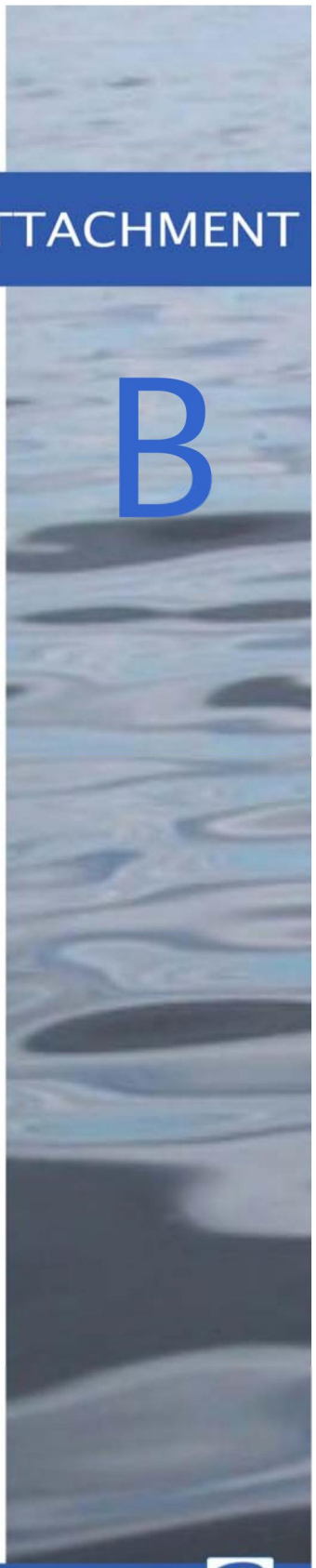
B

Calculation Sheets



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Calculation Sheet B-1: Flow Depth and Spread at Location with Highest Peak Flow on a Typical Street

Sub-catchment(s)		M075NE and M075SE	Ultimate Conditions
Location		Dougall Avenue	12.5 m wide road
Q_{M075NE}		2.593	
Q_{M075SE}		0.764	
$Q_{combined}$ (2)		3.357	for 100-Year Storm
Tr	(m)	6.25	
So	(m/m)	0.005	
W	(m)	0.000	
Sw	(m/m)	0.000	
T	(m)	8.257	
Sx	(m/m)	0.03	
n_{road}		0.013	
dc	(m)	0.15	
Se	(m/m)	0.03	
$n_{shoulder}$		0.025	
dw	(m)	0.000	
Ts	(m)	8.257	
ds	(m)	0.248	
d	(m)	0.248	
d_{crown}	(m)	**0.187**	
dd	(m)	**0.060**	dd < 0.15 m, the max. depth over road crown of an arterial road
de	(m)	**0.098**	
Te	**(m)**	**3.257**	Flow is contained within ROW
$Q_{area(A+B)}$	(m^3/s)	0.000	
$Q_{area(B)}$	(m^3/s)	0.000	
$Q_{area(A)}$	(m^3/s)	0.000	
$Q_{area(B+C+D)}$	(m^3/s)	1.645	
$Q_{area(D)}$	(m^3/s)	0.038	
$Q_{area(B+C)}$	(m^3/s)	1.607	
$Q_{area(E)}$	(m^3/s)	0.072	
$Q_{area(A+B+C+E)}$	(m^3/s)	1.678	
$Q_{two\ sides}$	**(m^3/s)**	**3.357**	
d_{Flow} (3)	(m)	0.248	d_{flow} < 0.30 m, the maximum allowable depth of flow
$A_{flow\ two\ sides}$	(m^2)	2.243	
v	(m/s)	1.497	
v×d	**(m^2/s)**	**0.371**	v×d < 0.65 m^2/s

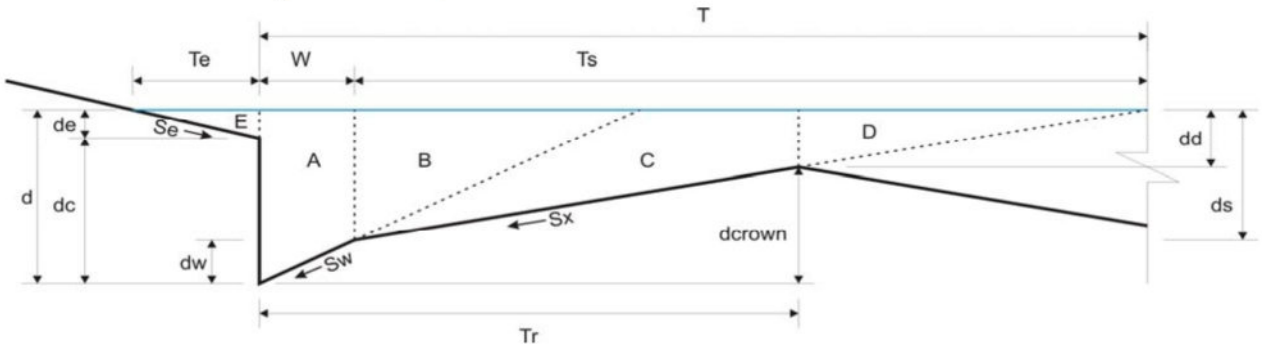
Notes:

(1) 100-year flow from DDSWMM model (Chicago storm).

(2) The computations assume that the total incoming flow is equally divided on both sides on the road.

(3) Computations based on methodology described in MTO Drainage Management Manual, 1997, Ch.4, pp. 59-60.

So is the longitudinal road slope



Equations:

$Q_{area(A+B)} = 0.375 \times So^{0.5} \times d^{2.667} / (n_{road} \times Sw)$

$Q_{area(B)} = 0.375 \times So^{0.5} \times (ds)^{2.667} / (n_{road} \times Sw)$

$Q_{area(B+C+D)} = 0.375 \times So^{0.5} \times (ds)^{2.667} / (n_{road} \times Sx)$

$Q_{area(D)} = 0.375 \times So^{0.5} \times (dd)^{2.667} / (n_{road} \times Sx)$

$Q_{area(E)} = 0.375 \times So^{0.5} \times (de)^{2.667} / (n_{shoulder} \times Se)$

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CALCULATION SHEET B-2A : POND E2 EAST OVERLAND FLOW ROUTE

EAST OVERLAND FLOW ROUTE AT DOUGALL AVENUE (NORTH SIDE OF POND) - CURB CUT WEIR

Approaching flow =	2.960	m^3/s	for 100-yr event (on MAJ road segment)
Curb cut width =	15.5	m	as per DSEL grading plan
Curb cut height =	0.050	m	as per DSEL
Maximum flow depth at gutter =	0.293	m	(0.15 m +0.03×4.75 m = 0.293 m for flow contained within RW)
Average head of water over curb cut =	0.243	m	(0.15 m +0.03×4.75 m - 0.050 m = 0.243 m)
Curb cut weir coefficient =	1.84		
Maximum flow through cub cut =	3.406	m^3/s	for 100-yr event

Therefore the capacity of the curb cut (3.406 m^3/s) is higher than the computed overland flow (2.960 m^3/s)

EAST OVERLAND FLOW ROUTE DOWNSTREAM OF CURB CUT (NORTH SIDE OF POND)

$Q = 1/n \times AR^{2/3}S^{1/2}$

	Min. Slope		Max. Slope
normal depth =	**0.224**	m	**0.074**
n =	0.03		0.03
Channel width =	15.5	m	15.5
A (area of flow) =	3.471	m^2	1.144
wetted perimeter =	15.948	m	15.648
R (hydraulic radius) =	0.218	m	0.073
S (slope) =	0.005	m/m	0.197
Q (flow) =	2.960	m^3/s	2.960
velocity =	0.85	m/s	2.59

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CALCULATION SHEET B-2B : POND E2 WEST OVERLAND FLOW ROUTE

WEST OVERLAND FLOW ROUTE AT DOUGALL AVENUE (NORTH SIDE OF POND) - CURB CUT WEIR

Approaching flow =	1.805	m^3/s	for 100-yr event (on MAJ road segment)
Curb cut width =	15.5	m	as per DSEL grading plan
Curb cut height =	0.050	m	as per DSEL
Maximum flow depth at gutter =	0.293	m	(0.15 m +0.03×4.75 m = 0.293 m for flow contained within RW)
Average head of water over curb cut =	0.243	m	(0.15 m +0.03×4.75 m - 0.050 m = 0.243 m)
Curb cut weir coefficient =	1.84		
Maximum flow through cub cut =	3.406	m^3/s	for 100-yr event

Therefore the capacity of the curb cut (3.406 m^3/s) is higher than the computed overland flow (1.808 m^3/s)

WEST OVERLAND FLOW ROUTE DOWNSTREAM OF CURB CUT (NORTH SIDE OF POND)

$Q = 1/n \times AR^{2/3}S^{1/2}$

	Min. Slope		Max. Slope
normal depth =	**0.166**	m	**0.056**
n =	0.03		0.03
Channel width =	15.5	m	15.5
A (area of flow) =	2.572	m^2	0.867
wetted perimeter =	15.832	m	15.612
R (hydraulic radius) =	0.162	m	0.056
S (slope) =	0.005	m/m	0.184
Q (flow) =	1.805	m^3/s	1.805
velocity =	0.70	m/s	2.08

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Drawings GR-1, S-1 and STM-1
(July 2018, SCS Consulting Group Limited)

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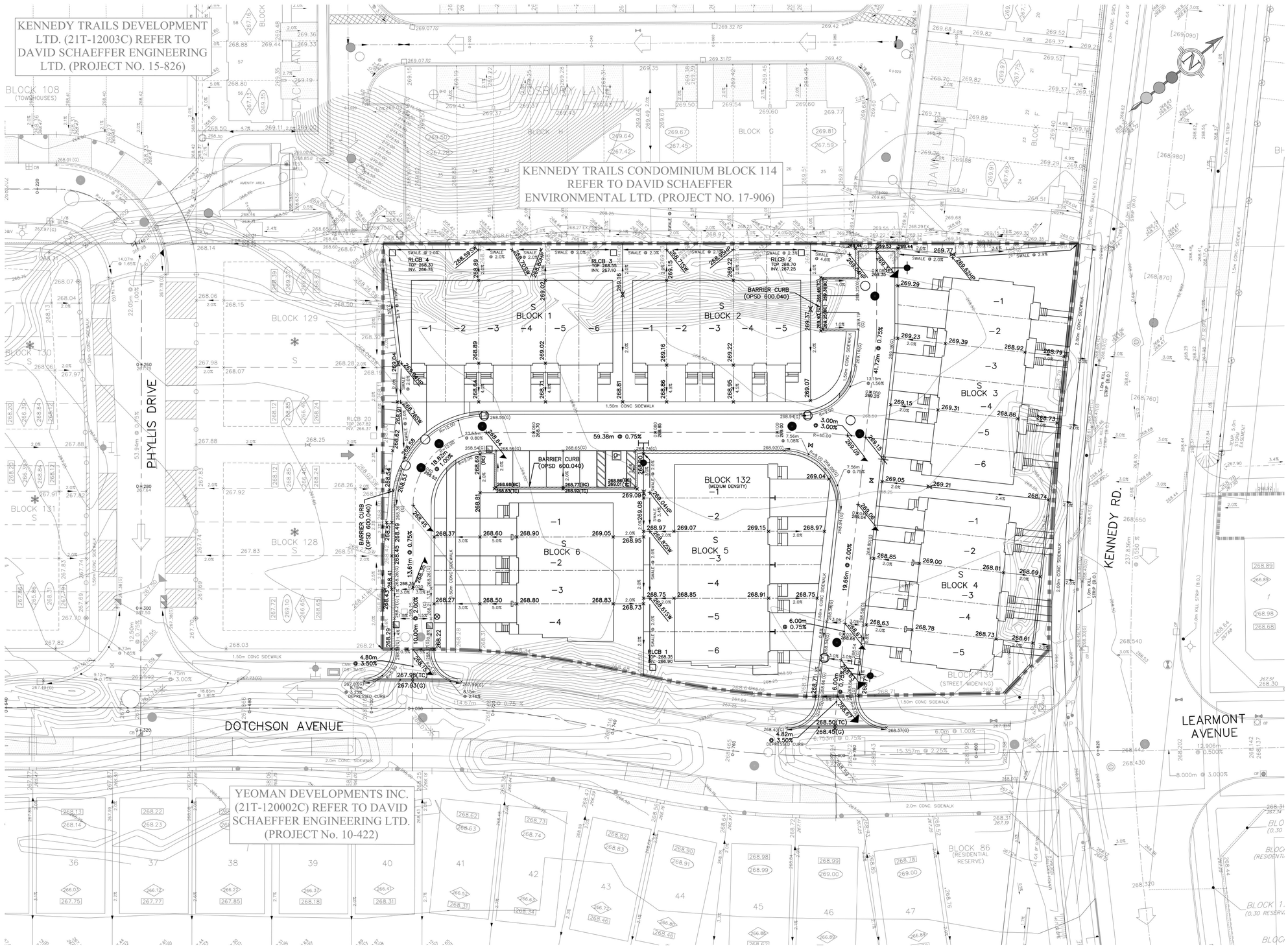
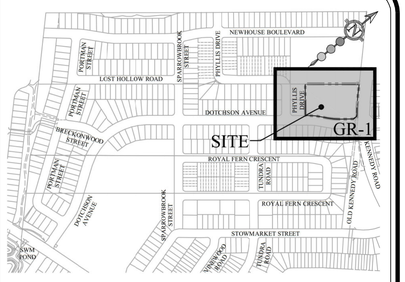
KENNEDY TRAILS DEVELOPMENT LTD. (21T-12003C) REFER TO DAVID SCHAEFFER ENGINEERING LTD. (PROJECT NO. 15-826)

KENNEDY TRAILS CONDOMINIUM BLOCK 114 REFER TO DAVID SCHAEFFER ENVIRONMENTAL LTD. (PROJECT NO. 17-906)

YEOMAN DEVELOPMENTS INC. (21T-120002C) REFER TO DAVID SCHAEFFER ENGINEERING LTD. (PROJECT No. 10-422)





KEY PLAN
N.T.S.

BENCHMARK: ELEV. 259.419
PEEL BENCHMARK NO. 56.

LEGEND:

- LIMIT OF PROPERTY
- SANITARY MANHOLE
- STORM MANHOLE
- EXISTING/FUTURE SANITARY MANHOLE
- EXISTING/FUTURE STORM MANHOLE
- SINGLE CATCHBASIN WITH NO ICD
- SINGLE CATCHBASIN WITH 19.8 L/S (TYPE 'A') INLET CONTROL DEVICE (ICD)
- DOUBLE CATCHBASIN WITH NO ICD
- EXISTING SINGLE CATCHBASIN
- EXISTING DOUBLE CATCHBASIN
- FUTURE SINGLE CATCHBASIN
- FUTURE DOUBLE CATCHBASIN
- HYDRANT AND VALVE
- EXISTING/FUTURE HYDRANT AND VALVE
- WATERMAIN VALVE BOX
- 25mm WATER SERVICE BOX LOCATION (WATER SERVICE AT 90° TO WATERMAIN UNLESS OTHERWISE SHOWN)
- WATERMAIN VALVE CHAMBER
- 88 LOT/BLOCK NUMBER
- 65 FUTURE / EXISTING LOT NUMBER
- 176.00 EXISTING CONTOUR AND ELEVATION
- ×123.23EX EXISTING ELEVATION
- ×123.23 FUTURE ELEVATION
- 270.20 EXTERNAL DESIGN ELEVATION
- 269.00 EXISTING ELEVATION
- ×123.23 PROPOSED ELEVATION
- ×123.23(G) PROPOSED GUTTER ELEVATION
- 259.25SW PROPOSED SWALE ELEVATION
- F FRONT DRAINING LOT
- S SPLIT DRAINAGE LOT
- TR TRANSITION TYPE LOT
- ENGINEERED FILL LOTS
- MBE=258.90 MINIMUM BASEMENT ELEVATION
- OVERLAND FLOW
- 100-YEAR EMERGENCY OUTLET
- PROPOSED EMBANKMENT (MAX. 4:1 UNLESS OTHERWISE NOTED)
- BARRIER CURB (AS PER OPSD 600.040)
- EXISTING/FUTURE DRIVEWAY LOCATION
- CMB(## #MOD) COMMUNITY MAILBOX PAD, SEE DETAILS ON 900 SERIES DRAWINGS
  - CANADA POST SPEC. E1OX-ENG-## NUMBER OF MODULES
- 267.40 FRONT/REAR HOUSE ELEVATION
- 267.85 FINISHED FLOOR ELEVATION
- 265.40 BASEMENT SLAB ELEVATION

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No.	REVISIONS DESCRIPTION	DATE	BY	APPROVED

SCS consulting group ltd
30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335

TOWN OF CALEDON
6311 OLD CHURCH ROAD
CALEDON, ONTARIO L7C 1J6
TEL: (905) 584-2272
FAX: (905) 584-4325

DIGRAM DEVELOPMENTS CALEDON INC.

CALEDON - CONDO BLOCK 132
21T-14002C (T-14002Ca)

GRADING PLAN

DATE: JULY 2018	DESIGNED BY: D.W./C.J.C.	CHECKED BY: M.R.C./S.M.S.
SCALE: 1:300	DRAWN BY: J.Y.L.	CHECKED BY: P.A.S.

1 0 5 10 15 20 25

APPROVED FOR CONSTRUCTION
THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY.

THIS APPROVAL IS SUBJECT TO THE FURTHER CERTIFICATION OF THE "AS-CONSTRUCTED" WORKS BY A REGISTERED PROFESSIONAL ENGINEER OF THE PROVINCE OF ONTARIO

DATE:_____ APPROVED BY: _____

PROJECT No: 1564

DRAWING No: GR-1

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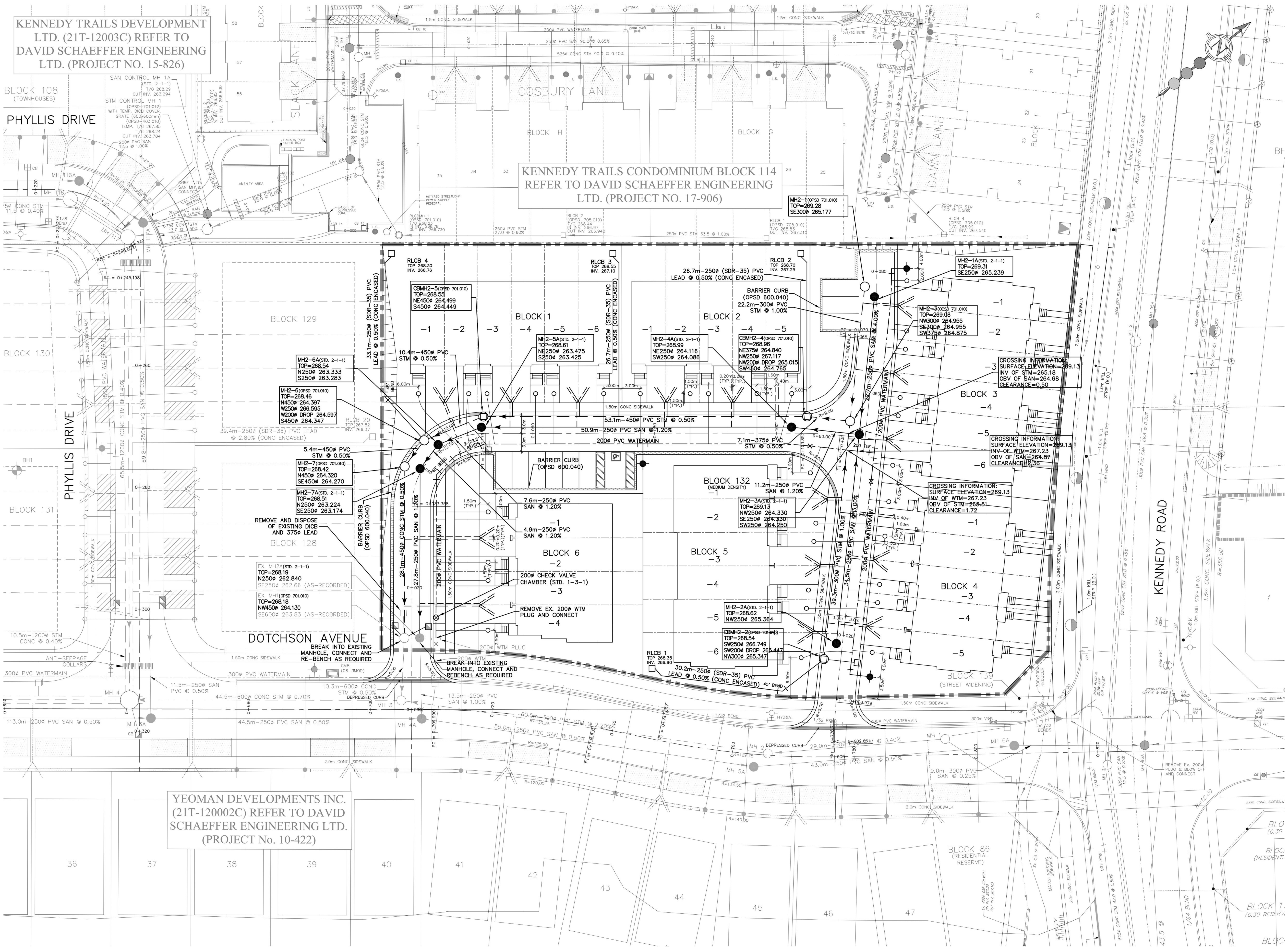

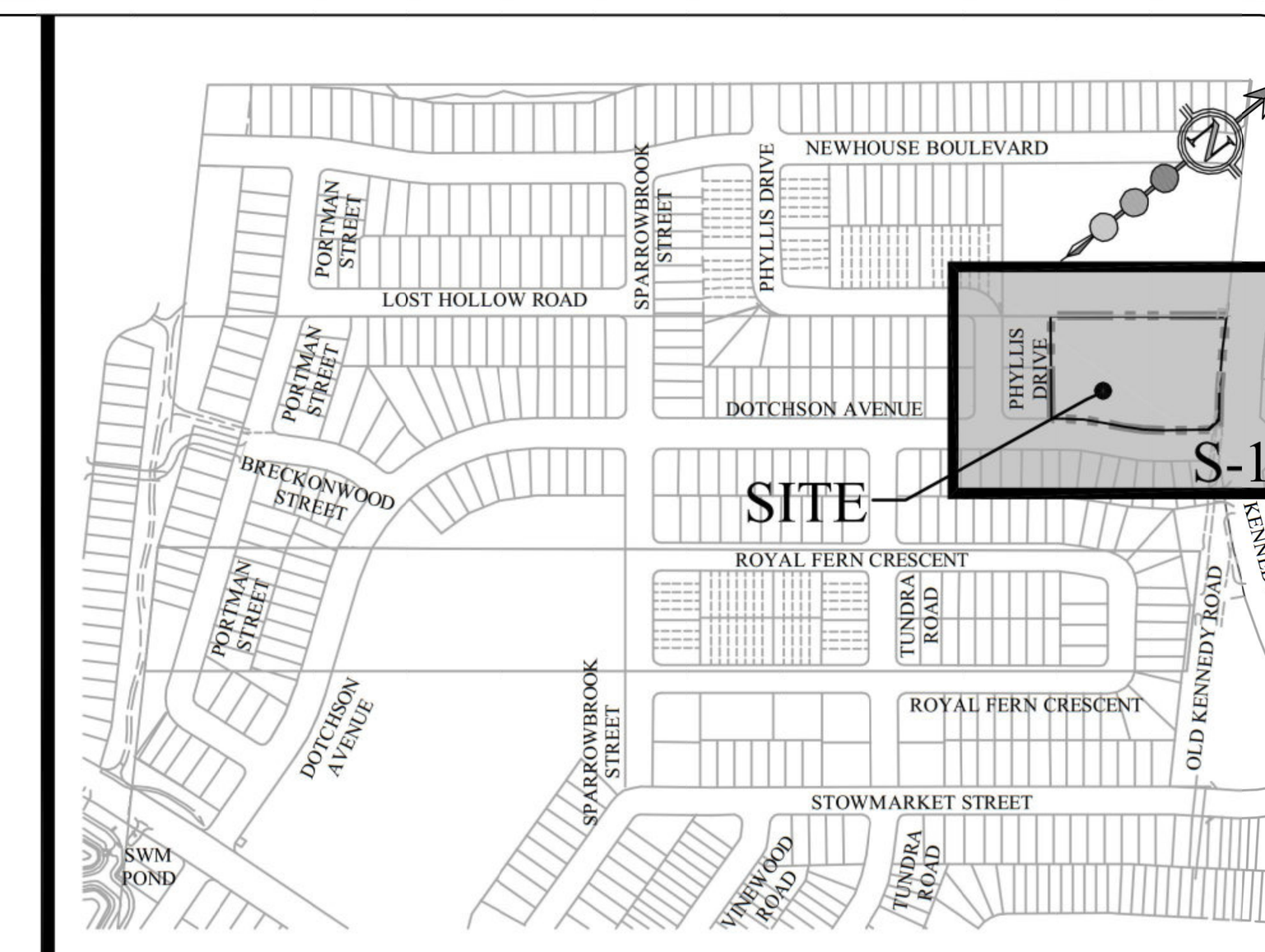

KEY PLAN
N.T.S.

BENCHMARK: ELEV. 259.419
PEEL BENCHMARK NO. 56.

LEGEND:

- LIMIT OF PROPERTY
- SANITARY SEWER/MANHOLE
- STORM SEWER/MANHOLE
- EXISTING/FUTURE SANITARY MANHOLE
- EXISTING/FUTURE STORM MANHOLE
- SINGLE CATCHBASIN WITH NO ICD
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- EXISTING SINGLE CATCHBASIN
- EXISTING DOUBLE CATCHBASIN
- FUTURE SINGLE CATCHBASIN
- FUTURE DOUBLE CATCHBASIN
- HYDRANT AND VALVE
- EXISTING/FUTURE HYDRANT AND VALVE
- WATERMAIN VALVE BOX
- EXISTING/FUTURE VALVE AND BOX
- CHECK VALVE CHAMBER (STD. 1-34)
- EXISTING VALVE CHAMBER
- EXISTING HYDRO POLE/LAMP STANDARDS
- 93 LOT/BLOCK NUMBER
- 65 EXISTING/FUTURE LOT NUMBER
- EXISTING/FUTURE WATER SERVICE BOX LOCATION
- 25mm WATER SERVICE BOX LOCATION (WATER SERVICE AT 90° TO WATERMAIN UNLESS OTHERWISE SHOWN)
- TYPICAL DUAL SERVICE CONNECTION INCLUDES ONE DOUBLE STORM CONNECTION AND ONE DOUBLE SANITARY CONNECTIONS AT 90° TO SEWERS AS PER REGION OF PEEL STANDARD DWG 2-4-3 (UNLESS OTHERWISE SHOWN)
- SINGLE STORM AND SINGLE SANITARY CONNECTIONS
- CMB(##-##MOD) COMMUNITY MAILBOX PAD, SEE DETAILS ON 900 SERIES DRAWINGS; CANADA POST SPEC. E10X-ENG-##; NUMBER OF MODULES
- BARRIER CURB (AS PER OPSD 600.040)
- EXISTING/FUTURE DRIVEWAY LOCATION
- BH6 BOREHOLE LOCATION

TOPOGRAPHIC SURVEY PROVIDED BY HOLDING JONES VANDERVEEN INC., JANUARY 2016

REVISIONS

No.	DESCRIPTION	DATE	BY	APPROVED

SCS consulting group ltd
30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335

TOWN OF CALEDON
6311 OLD CHURCH ROAD
CALEDON, ONTARIO L7C 1J6
TEL: (905) 584-2272
FAX: (905) 584-4325

DIGRAM DEVELOPMENTS CALEDON INC.

CALEDON - CONDO BLOCK 132
21T-14002C (T-14002Ca)

SERVICING PLAN

DATE: JULY 2018	DESIGNED BY: D.W./C.J.C.	CHECKED BY: M.R.C./S.M.S.
SCALE: 1:300	DRAWN BY: J.Y.L.	CHECKED BY: P.A.S.

1 0 5 10 15 20 25

APPROVED FOR CONSTRUCTION
THIS APPROVAL CONSTITUTES A GENERAL REVIEW AND DOES NOT CERTIFY DIMENSIONAL ACCURACY.

THIS APPROVAL IS SUBJECT TO THE FURTHER CERTIFICATION OF THE "AS-CONSTRUCTED" WORKS BY A REGISTERED PROFESSIONAL ENGINEER OF THE PROVINCE OF ONTARIO

DATE: ____________ APPROVED BY: ____________

PROJECT No: 1564

DRAWING No: S-1

File: P:\1564 Digram-Caledon\Drawings\Block 132\Gen\1564D-BLCK-132-S-1.dwg - Revised by <JCASEY> : Wed, Jul 04 2018 - 3:37pm

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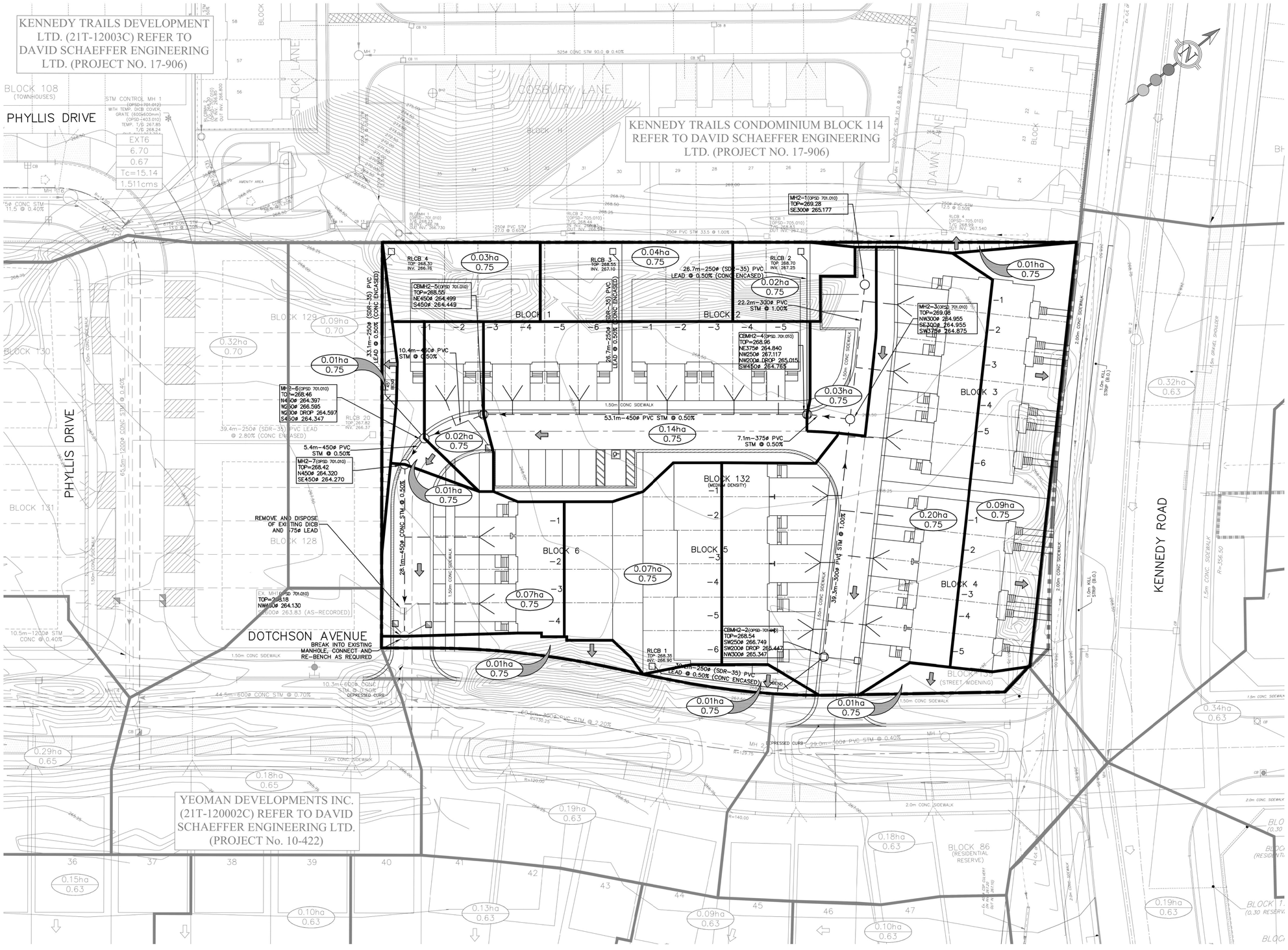
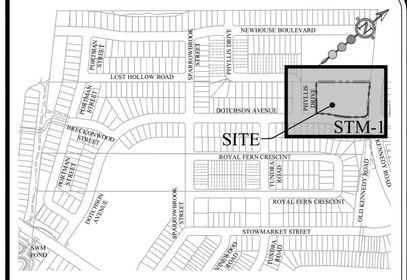
KENNEDY TRAILS DEVELOPMENT LTD. (21T-12003C) REFER TO DAVID SCHAEFFER ENGINEERING LTD. (PROJECT NO. 17-906)

KENNEDY TRAILS CONDOMINIUM BLOCK 114 REFER TO DAVID SCHAEFFER ENGINEERING LTD. (PROJECT NO. 17-906)

YEOMAN DEVELOPMENTS INC. (21T-120002C) REFER TO DAVID SCHAEFFER ENGINEERING LTD. (PROJECT No. 10-422)





KEY PLAN
N.T.S.

BENCHMARK: ELEV. 259.419
PEEL BENCHMARK NO. 56.

LEGEND:

- STORM MANHOLE
- EXISTING/FUTURE STORM MANHOLE
- EXISTING/FUTURE SINGLE CATCHBASIN
- EXISTING/FUTURE DOUBLE CATCHBASIN
- SINGLE CATCHBASIN WITH NO ICD
- SINGLE CATCHBASIN WITH 19.8 L/S (TYPE 'A') INLET CONTROL DEVICE (ICD)
- DOUBLE CATCHBASIN WITH NO ICD
- SINGLE SERVICE CONNECTION
- DUAL SERVICE CONNECTIONS
- 100 — LOT NUMBER
- 9 — EXISTING/FUTURE LOT NUMBER
- LIMIT OF PROPERTY
- DRAINAGE BOUNDARY
- EXISTING/FUTURE DRAINAGE BOUNDARY
- 0.51ha / 0.50 — DRAINAGE AREA (HECTARES) / RUNOFF COEFFICIENT
- 2.29ha / 0.75 — EXISTING DRAINAGE AREA (HECTARES) / RUNOFF COEFFICIENT
- OVERLAND FLOW ROUTE
- EXISTING/FUTURE OVERLAND FLOW ROUTE
- 165.00 — EXISTING CONTOUR

100 YEAR FLOW INFORMATION FROM STORMWATER MANAGEMENT REPORT FOR KENNEDY TRAILS DEVELOPMENT LTD. PREPARED BY J.F. SABOURIN AND ASSOCIATES INC., DATED FEBRUARY 2016, EXTERNAL DRAINAGE AREA, EQUIVALENT RUNOFF AND TIME OF CONCENTRATION INFORMATION FROM 10 YEAR DESIGN SHEET FOR KENNEDY TRAILS DEVELOPMENT LTD., DATED FEBRUARY 2016; YEOMAN DEVELOPMENTS INC., DATED APRIL 2015; MOSCORP DEVELOPMENT INC., DATED OCTOBER 2013 PREPARED BY DAVID SCHAEFFER ENGINEERING LIMITED.

EXT2	
1.51	EXTERNAL DRAINAGE AREA (ha)
0.63	EQUIVALENT RUNOFF COEFFICIENT
Tc=11.60	TIME OF CONCENTRATION (MIN.)
0.527cms	100-YEAR FLOW

TOPOGRAPHIC SURVEY PROVIDED BY HOLDING JONES VANDERVEEN INC., JANUARY 2016

REVISIONS

No.	DESCRIPTION	DATE	BY	APPROVED

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MARKHAM, ONTARIO L3R 8B8
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TOWN OF CALEDON
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CALEDON, ONTARIO L7C 1J6
TEL: (905) 584-2272
FAX: (905) 584-4325

DIGRAM DEVELOPMENTS CALEDON INC.

CALEDON - CONDO BLOCK 132
21T-14002C (T-14002Ca)

STORM DRAINAGE PLAN

DATE: JULY 2018	DESIGNED BY: D.W./C.J.C.	CHECKED BY:	M.R.C./S.M.S.
SCALE: 1:300	DRAWN BY: J.Y.L.	CHECKED BY:	P.A.S.

1 0 5 10 15 20 25

APPROVED FOR CONSTRUCTION
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DATE:_____ APPROVED BY:_____

PROJECT No: 1564

DRAWING No: STM-1

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ATTACHMENT B

RELEVANT REPORT EXCERPTS

SCS consulting group ltd

TOWN OF CALEDON
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Feb 16, 2022

February 18, 2014

Report No. 130177-H4

North Star Investments
1862 Albion Road
Rexdale, Ontario
M9W 5T2

Attention: Mr. Tony Ferrara

HYDROGEOLOGIC STUDY FOR PROPOSED RESIDENTIAL SUBDIVISION 12654, 12728 AND 12738 KENNEDY ROAD TOWN OF CALEDON, ONTARIO

Prepared for:

North Star Investments

CANADA ENGINEERING SERVICES INC.
39 Davisbrook Blvd., Scarborough
Toronto, Ontario M1T 2H6
Phone 416 492 4000
Fax 416 492 4001
Email cesi@cesi.ca

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Underlying the till unit are silty fine sands which have been encountered at depths of 3.0 m to 4.9 m below grade and extended down to the bases of all boreholes at a depth of 6.6 m. These silty fine sand deposits are very dense and are confined under hydrostatic pressure with water levels when allowed to slowly rise, reaching the existing ground surface.

2.2 TOPOGRAPHY

The site is located at 12654, 12728 and 12738 Kennedy Road, Town of Caledon, Ontario, in a predominantly residential area with recently built residential houses and new residential subdivision sites surrounding it.

For convenience Kennedy Road is taken as running in a North-South direction for this report. The site is bounded by Kennedy Road on the east side, new residential subdivision sites on the north, south and west sides. Further east, beyond the Kennedy Road are newly built residential houses and further north beyond the residential subdivision site are vacant farm lands.

The subject lands are gently sloping toward the rear of the subject property in a southwest direction. The site is currently a vacant field with forested lands in the middle portion of 12728 Kennedy Road which at the time of the investigation was almost fully covered with snow. Generally surface water flow is expected to flow naturally toward the south, draining into tributaries of the Etobicoke Creek and is then carried to Lake Ontario, via Etobicoke Creek. Groundwater level in this surficial layer generally parallels the ground surface at depths varying from 0.6 m to 1.5 m in all the boreholes. These groundwater levels more or less parallel the contour of the land.

The project area is relatively flat with a gradual slope to the southwest of the site. The elevation of the site ranges from a maximum of approximately 267 m to the northeast to approximately 261 m to the southwest. Site topography is somewhat influenced by two man-made ponds on the subject property. Based on the aerial photographs, it has been established that these ponds did not exist on the site prior to 1988. Surface water drainage from the site is primarily from ground surface to Etobicoke Creek to the south of the site, and then to Lake Ontario.

Due to the fair permeability surficial silty sand at the site, surface water infiltration will tend to be significantly high following rainfall events. The coefficient of permeability of this surficial silty sand at the site is expected to be around 10^{-3} cm/second.

3.0 HYDROGEOLOGIC PROCEDURE

The field work for the boreholes was carried out with two track-mounted drill rigs with continuous flight solid stem auger equipment on December 23, 2013 and on January 2, 2014. It was supervised by an engineer from our office. A total of eight boreholes were put down over the entire site.

TOWN OF CALEDON
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Each of the eight boreholes was put down at the site to a depth of 6.6 m and one piezometer was placed in each borehole. From the boreholes, soil samples were taken at 500 mm intervals between the ground surface and a depth of 3.0 m and thereafter at depths of 1.5 m to the termination of the boreholes.
The samples were taken by means of a split-spoon sampler, in accordance with the requirements of the Standard Penetration Test, (CSA test specifications A119.1).

All the samples taken were brought back to our laboratory where moisture content tests, three grain size analysis tests and further visual observations were carried out. Our field and laboratory findings are plotted on the borehole log numbers 1 to 8.

The locations and elevations of the boreholes were established by the property owner's surveyor, Calder Engineering Limited and are shown on drawing numbers 1 and 2. The geotechnical terms and symbols used in this report are shown in Appendix "A".

3.1 HYDROGEOLOGY

Regional ground water flow at the site is directed to the south, toward Lake Ontario, through the Etobicoke Creek. There are essentially three ground water flow systems present across the site. A shallow unconfined flow system within the medium permeability soils near the surface and a confined slow moving system consisting of silty fine sand, trapped by the dense sand till above. A deeper aquifer system below the silty fine sand within the bedrock at a depth of around 20 m to 30 m used for private well water supplies. Our boreholes do not extend to this aquifer system, but this data was obtained from MOE well records and this final flow system is not expected to be affected by the development of the subdivision. Some groundwater recharge is also expected to occur upstream from higher lands.

All boreholes encountered water in the surficial silty sand layer which was close to the ground surface. No water or silt or sand seams were found within the silty sand till, though they may be present between soil samples.

All boreholes were terminated within the very dense silty fine sand. Piezometers installed in this stratum and sealed in the relatively impermeable silty sand till rose slowly in the piezometers to close to ground surface, indicating that this is a confined aquifer.

Water infiltration and recharge rates for the site and surrounding areas are well covered in a report prepared by Shaheen and Peaker Limited for the site and surrounding areas, referred to as the Mayfield Community. They estimated a recharge rate for the area on the order of 150 mm/a.

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Detailed soil descriptions are shown on the borehole log numbers 1 to 8. Grain size analysis curves of the different soil types found at the site were plotted and are shown in Figure No. 1.

3.3 STRATIGRAPHY

The site consists mainly forested and grass lands with residential houses in front. A defined topsoil layer was found at the surface of all the boreholes, This was followed by a layer of silty sand, which in some places was reworked or relocated at the site.

Below this was a very dense silty sand till. This in turn was underlain by a very dense silty fine sand, confined aquifer where all the boreholes were terminated at a depth of 6.6 m.

3.4 GROUND AND SURFACE WATER FLOW

One piezometer was installed in each of the boreholes and was extended down close to the base of the borehole. The piezometers were sealed in the dense silty sand till and at the surface and therefore the water levels obtained from these piezometers were of the confined very dense silty fine sand below the silty sand till. Water levels in borehole numbers 1, 2, 3, 4, 5 and 6 were at depths of 1.8 m (elev 282.28 m), 1.6 m (elev 282.16 m), 1.5 m (281.84 m), 1.5 m (elev 280.06 m), 2.7 m (elev 277.54 m) and 2.3 m (elev 280.02 m) respectively. The soils in borehole numbers 1 to 6 caved at depths of 3.2 m, 5.2 m, 4.1 m, 3.1 m, 3.1 m and 5.2 m respectively. The water levels taken in these piezometers represent the confined aquifer water levels and are summarized in the table below:

Date Taken	Borehole Number (Depth/Elevation: (m))							
	1	2	3	4	5	6	7	8
Upon Completion date: Dec 23, 2013	5.50/ 261.56	5.5/ 261.42	N/A	N/A	4.0/ 257.93	4.60/ 258.81	4.60/ 259.4	N/A
Upon Completion date: Jan 2, 2014	N/A	N/A	0.60/ 265.42	4.60/ 260.77	N/A	N/A	N/A	0.30/ 263.32
January 2, 2014	1.13/ 265.9	1.90/ 265.02	N/A	N/A	1.3/ 260.63	0.60/ 262.81	1.7/ 262.3	N/A
January 9, 2014	1.14/ 265.91	1.90/ 265.02	1.40/ 266.22	2.40/ 262.97	1.60/ 260.93	0.70/ 262.91	1.90/ 262.5	0.00/ 263.62

De-watering is recommended prior to excavation to maintain stable soil footings and to assist in maintaining stable soil slopes for open cut excavation.

TOWN OF CALEDON
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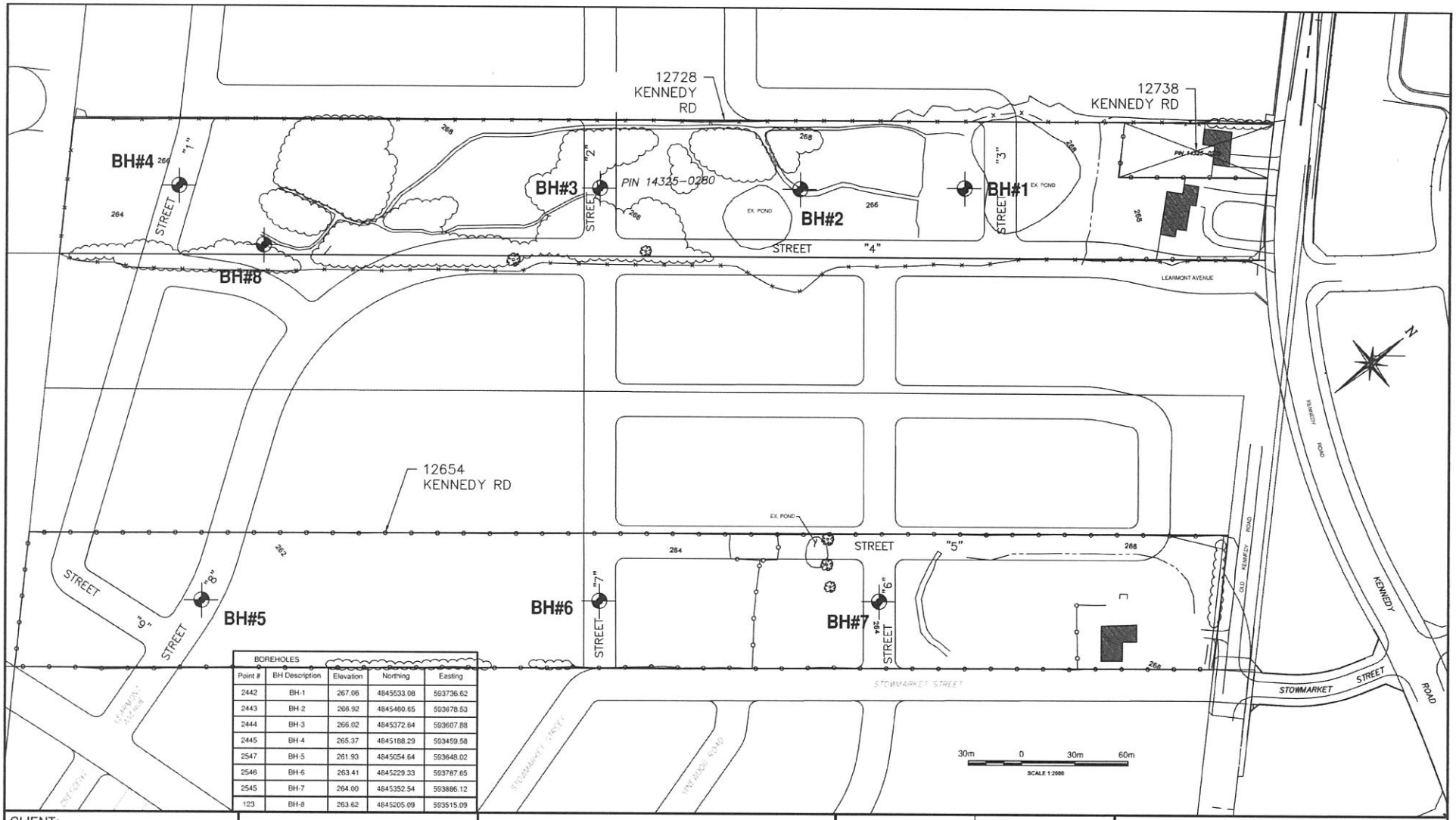
Feb 16, 2022



BOREHOLES

Point #	BH Description	Elevation	Northing	Easting
2442	BH-1	267.06	4845533.08	593736.62
2443	BH-2	266.92	4845460.65	593678.53
2444	BH-3	266.02	4845372.64	593607.88
2445	BH-4	265.37	4845188.29	593459.58
2547	BH-5	261.93	4845054.64	593648.02
2546	BH-6	263.41	4845229.33	593787.65
2545	BH-7	264.00	4845352.54	593886.12
123	BH-8	263.62	4845205.09	593515.09

CLIENT:

NORTH STAR INVESTMENTS

12654,12728 &12738 KENNEDY RD,
CALEDON, ONTARIO

BOREHOLE SITE LOCATION PLAN

12654,12728 & 12738 KENNEDY RD,
CALEDON, ONTARIO

NOTE:
-DRAWINGS WAS OBTAINED FROM CALDER TOPOGRAPHIC SURVEY DONE IN DECEMBER 2013

SCALE:	DATE:
1:2000	JAN/14
DRAWING NO:	PROJECT NO:
2	130177

CANADA ENGINEERING SERVICES INC.
39 DAVISBROOK BOULEVARD
SCARBOROUGH, ONTARIO M1T 2H6
Ph: 416 492 4000 Fax: 416 492 4001
E-mail address: cesi@cesi.ca