March 16, 2022 **SSI Project Number: 0246-002**

County Administration
262075 Rocky View Point
Rocky View County, AB, T4A 0X2

Dear Sir/ Madam:

Re: Cochrane Hamlet Conceptual Scheme (CS) Stormwater Management Plan NW ¼ 22-26-4-W5

This conceptual Stormwater Management Plan is in support of the Cochrane Hamlet CS located at the southeast corner of Cochrane Lake Road and Range Road 43 in NW ¼ 22-26-4-W5.

Introduction

The proposed development is located west of Highway 22, along Cochrane Lake Road just south of Cochrane Lake, as shown on **Figure 1**. The quarter section contains nine residential lots ranging in size from 4 to 28 acres. Several of these lots will be consolidated to form the project boundary covering a total area of 100 acres (40 hectares). An additional area of 20 acres (8 hectares) also discharges north towards the 100 acres and is included in the study area boundary, as shown on **Figure 2**.

The topography shows there is a general slope from southeast to north west. From here runoff flows north to Cochrane Lake, a terminal water body.

The housing density for the Hamlet is proposed to be 4 to 6 units per acre (upa). As such some innovative stormwater management techniques are proposed. There are three main stormwater proposals for the site:

- Using infrequent ponding zones as Municipal Reserve;
- Implementing the County's alternative road sections, where possible;
- Flow balancing with other, less dense, developments.

Design Criteria

The project lies within the Cochrane Lake catchment area boundary and, as such, follows the allowable discharge rates and volumes stated in the Cochrane Lake Sub-catchment Master Drainage Plan by SSI in 2016. These are:

Stormwater Solutions
Box 68174, 25 Crowfoot Terrace NW, T3G 3N8, Canada, AB
Tel (403) 828-9917: **Fax** (403) 374-2517

- 1:100 year maximum discharge rate of 1.39 L/s/ha;
- Average Annual Runoff of 30 – 40 mm
- Removal of 85% of 50 micron Total Suspended Solids.

Figure 2 shows the study area boundary which includes drainage areas that flow through the property. The boundary of the Cochrane Lake Sub-catchment Master Drainage Plan is also shown as it runs through the development area.

In order to determine the proposed stormwater runoff from the site, it is necessary to review the native soil types. From the Geotechnical Assessment for the Proposed Subdivision Cochrane Lake Hamlet by Watt Consulting in January 2022, the site is underlain by silty clay. This means that infiltration rates are relatively low. Clay pond liners have a design infiltration rate of 1×10^{-8} m/s, in accordance with provincial and some municipal guidelines. As the native materials contain very little sand or gravel near the surface, the above rate is assumed in the design. The soil type is Type C with a Curve Number of 72 in accordance with the USDA Soil Conservation Service 1968. A more accurate assessment of the subsurface material will be provide at the next design stage.

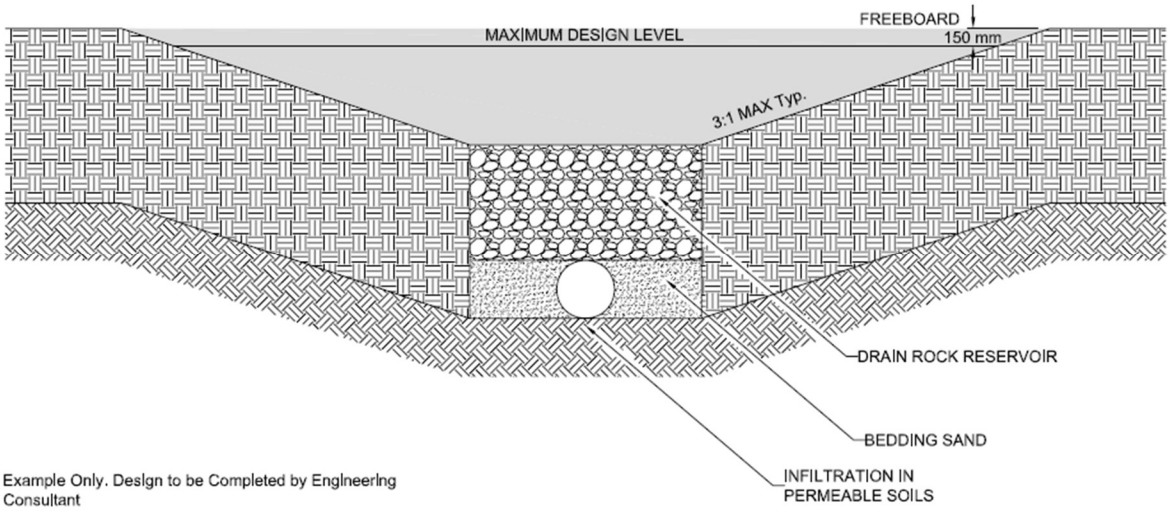
To reduce the runoff values to those stated above it is recommended that Low-Impact Development Measures are provided. A stormwater management facility is proposed in the northwest corner of the site to reduce the peak discharge rates.

To reduce runoff volumes:

- Roadside bioswales are proposed across the development in areas of low-density housing to enhance infiltration;
- Topsoil areas will be 300 mm thick;
- All roof leaders should be directed to grassed areas.

The use of an irrigation system, re-using water from the storm pond, is an option, although the initial construction costs (by the developer) and long-term maintenance costs (by the County) have not yet been quantified.

Bioswales, or bioretention areas, are Low-Impact Development (LID) Measures which allow stormwater runoff to be infiltrated rather than to discharge offsite. They not only protect downstream watercourses from excessive runoff, but also filter the water to protect fish habitat. They are typically placed at the side of a road to collect runoff from an overland swale or catchbasin. They consist of a sand/ gravel or other well-draining subsoil, below a deep, well-draining growing medium. Above this there is a ponding area of variable depth and a high-level discharge pipe or spillway. The figure opposite is an example of a bioretention zone. Trees, shrubs or other vegetation can be planted in the bioretention area as required. Below is a typical cross-section of a roadside bioswale.



In addition to the bioretention area, an additional LID measure is proposed. This is called absorbent landscaping. One approach to absorbent landscaping is simply adding topsoil to the proposed lots and roadway ditches. Construction of the roads and houses typically results in excessive topsoil. This can be stockpiled and used by homeowners during development of their lots. Further, from the Geotechnical Evaluation the topsoil across the site is approximately 300 mm. Excess topsoil, resulting from grading can be spread across the site. A plan of the borehole locations and logs is provided in the Geotechnical Assessment for the Proposed Subdivision Cochrane Lake Hamlet by Watt Consulting in January 2022.

Analysis

The Water Balance Spreadsheet for the City of Calgary (WBSCC) is used to simulate continuous rainfall over a 51 year period, and SWHYMO is used to simulate the 1:5 year and 1:100 year design storms. It is recommended that the 24-hour storm duration is used here.

The site layout is shown on **Figure 2** and are detailed in **Table 1** below.

Table 1 – Catchment Properties

Surface	Area (m^2)	% Imp	% Imp to grass
Residential	25.50	40	100
Roads	16.41	65	50
MR	4.80	5	100
Pond/ PUL	1.01	100	0
TOTAL	**47.72**	**46**	**71**

Single event analysis – SWMHYMO

The IDF parameters a, b & c are obtained from the City of Calgary Design Guidelines.

Table 2 – IDF Parameters

Return Period	a	b	c	Total 24hr Rainfall Depth from AES data (mm)
1:5 Year	353.5	2.29	0.703	51.2
1:100 Year	663.1	1.87	0.712	89.4

The CN value is the runoff curve from the USDA Soil Conservation Service 1968.

- 5 minute interval, 24 hour duration
- Peak at 30 percent of duration of storm event
- For developed grasses areas, a value of 72 was used for the curve number (CN). This corresponds with moisture condition II, urban – open space, good condition, soil group B.
- CALIB STANDHYD is a command in SWMHYMO application to simulate runoff from urban areas with impervious ratios higher than 0.20, or indirectly connected surfaces (i.e. mixed surfacing that flows overland). The user must provide the values for 'Ia' and 'N'. Rainfall losses can be simulated with either Horton's infiltration equations or modified SCS procedure or a proportional loss coefficient. In this report, modified SCS procedure was applied. Following is a description used for the runoff simulation:

- Computational Time Step (DT) = 1 or 5 minutes used in all cases, depending on the existing SWMHYMO model for external areas
- Percent Impervious XIMP - Ratio of areas directly connected to the minor system
- Percent Impervious TIMP - Ratio of total impervious areas, equal to XIMP
- Base Flows (DWF) - Zero in all cases
- CN value of grass with soil type C = 72
- Initial Abstraction (IA) - For pervious areas only
- IA = based on CN Value =0.2*(25400/CN-254) unless stated otherwise
- Depression Storage (DPSI) - Impervious areas only
- DPSI = 1.6 mm in all cases
- For pervious surfaces, MNP = 0.25.
- For impervious surfaces, MNI = 0.013 or 0.014
- SCP = 0 or 10.00 min
- SCI = 0 or 5.00 min

Following is a brief description of SWMHYMO computer model commands typically used for simulation of overland runoff interception regime to the minor system:

READ HYD	Command for reading a previously saved hydrograph from a text file
ADD HYD	Command for adding hydrographs
ROUTE RESERVOIR	Command for routing flow hydrographs through detention storage facilities (i.e. trap low, pond) with a storage-outflow relationship
DIVERT HYD	Operational command which can be used to split a hydrograph into two or more hydrographs
COMPUTE DUALHYD	Command for separating the major system (street flow) and minor system (pipe flow) hydrograph from a total hydrograph

SAVE HYD	Command for saving a hydrograph to file
COMPUTE VOLUME	An operational command that can be used to compute a total volume of a hydrograph

Continuous Modelling - WBSCC

In PCSWMM, the pond is modelled as a separate catchment, so the catchments are broken down as shown in **Table 3**.

Table 3 – PCSWMM Catchment Properties

Surface	Area (m^2)	% Imp	% Imp to grass
Residential	25.50	40	100
Roads	16.41	65	50
MR	3.94	5	100
Sub-total	**45.85**	**46**	**75**
Pond/ PUL	1.01	100	0
Pond/ MR	0.86	5	100
TOTAL	**47.72**	**46**	**71**

For the subsoil hydraulic infiltration rates, as mentioned above, a conservative value of 1×10^{-8} m/s is used. It is expected that this value will be increased during the next design stage.

The WBSCC general catchment characteristics are given in **Table 4** below.

Table 4 General Water Balance Spreadsheet Characteristics

Ref	Unit	Asphalt/Roof	Gravel*	Cut Grass
Depression Loss	mm	1.6	-	-
Sand	%	n/a	88	30
Silt	%	n/a	7	35
Clay	%	n/a	5	35
Media Depth	mm	n/a	50	150
Porosity	% vol	n/a	0.46	0.48
Field Capacity	% vol	n/a	0.10	0.36
Wilting Point	% vol	n/a	0.05	0.22
Sat. Hyd. Cond.	m/s	n/a	3.00E-05	1.19E-06
Sub-soil Hyd. Cond.	m/s	n/a	1.0 E-06	1.0 E-06
Ponding Depth	mm	n/a	3.2	3.2

* Characteristics from email from City of Calgary Water Resources 14th Feb 2013

Results

For the 1:100-year design storm, using SWMHYMO, the size of the bioretention area was adjusted until the discharge volume and peak flow rate matched the pre-development values. The 1:5-year design storm was then simulated to compare pre and post development values.

QHM was then used to compare annual runoff volumes and also to model theoretical water quality values. Once the results are compiled, the bioretention area can be altered to minimize the impact on the downstream properties and watercourse.

Table 5 below shows the size of bioretention are required.

Table 5 Proposed Pond

Elevation (m)	Step (m)	Area (m^2)	Stage Volume (m^3)	Total Volume (m^3)	Discharge (m^3/s)	Notes
1297.60	0					Btm
1298.10	0.5	1,984	331	331		
1298.60	0.5	2,460	1,109	1,440		
1299.10	0.5	2,986	1,359	2,799		
1299.60	0.5	3,561	1,635	4,434		
1300.10	0.5	4,185	1,934	6,367		
1300.60	0.5	4,859	2,259	8,627	0	NWL
1301.10	0.5	5,582	2,608	11,235	0.0223	
1301.60	0.5	6,354	2,982	14,217	0.0330	
1302.10	0.5	7,176	3,380	17,597	0.0404	
1302.50	0.4	7,869	3,008	20,605	0.0455	1:5 Yr
1302.60	0.1	9,069	846	21,451	0.0467	
1303.10	0.5	15,943	6,172	27,624	0.0522	
1303.60	0.5	17,306	8,310	35,934	0.0572	
1303.80	0.2	17,864	3,517	39,451	0.0590	HWL
1304.10	0.3	18,716	5,487	44,937	0.0617	Freeboard

Total Volume Balance

Due to the high-density nature of this development, there is a challenge to reduce the unit average annual runoff (UARR) to the required 30-40 mm. There is, however, a solution would involve a second development which is under the control of the same landowner, Cochrane North.

As Cochrane North is less dense, it would be easier to implement one of the proposed LID measures there, namely, the alternative road cross-section. If we can direct 70% of the road runoff to roadside

bioswales, we can reduce the overall discharge volume significantly. This means that we can increase the discharge volume from the Hamlet. This, in turn, means that the proposed MR would be inundated even less frequently than thought and that both subdivisions would have no need for irrigation using pond water. The design is to keep all storm event up to the 1:5 year storm inside the PUL. Any green space above this elevation would be classified as Municipal Reserve and can be used as an amenity such as a public park or public recreation area, ; in accordance with the Municipal Government Act.

Based on the above values, it is projected that the following runoff volume targets are achieved.

Table 6 Allowable Annual Runoff Volumes – WBSCC

Subdivision	Total Area (Ha)	Annual Discharge (m3)	Annual Depth (mm)
Cochrane North	108.92	37,299	34.2
Cochrane Hamlet	47.72	24,992	52.4
Total	**156.92**	**62,291**	**39.8**

From the 51 year results of the WBSCC, HYDSTAT was used to extrapolate the 1:5 year and 1:100 year volumes using statistical analysis. **Table 7** shows the results of the analysis.

Table 7 HYDSTAT Results

Statistical Distribution	1:5 Year Volume (m^3)	1:100 Year Volume (m^3)	Least-Squares Priority Order
Normal	21,209	31,411	7
Log-Normal	19,679	34,746	6
Gumbel	20,372	36,974	4
Log-Gumbel	18,782	47,373	3
Pearson III	**19,848**	**39,332**	**1**
Log-Pearson III	19,034	45,425	2
Log-Normal III	19,472	35,935	5
Storage Provided	**20,605**	**39,451**	

These results include a passive (below Normal Water Level) volume of 8,627 m^3. In order to compare the results with the single event analysis results (SWMHYMO), this value must be subtracted.

Table 8 Pond Volumes

	1:5 Year (m^3)	1:100 Year (m^3)
SWMHYMO	9,712	23,570
HYDSTAT	11,221	30,705
Storage Provided	**11,978**	**30,824**

The results show that the continuous simulation gives the higher storage volume requirements and that both sets of data show that the pond has sufficient capacity.

References

- Geotechnical Assessment for the Proposed Subdivision Cochrane Lake Hamlet by Watt Consulting in January 2022USDA Soil Conservation Service 1968
- City of Calgary, "Stormwater Management & Design Manual", Wastewater & Drainage Department, September 2011
- J.F. Sabourin and Associates Inc., "SWMHYMO Stormwater Management Hydrologic Model – User's Manual", May 2000 (reprinted April 2005)
- Westhoff Engineering Resources, Inc. for the City of Calgary, "User Manual for Water Balance Spreadsheet, Version 1.2," November 2011

We trust that this report is acceptable but if you have any questions, or require further information, please do not hesitate to contact me.

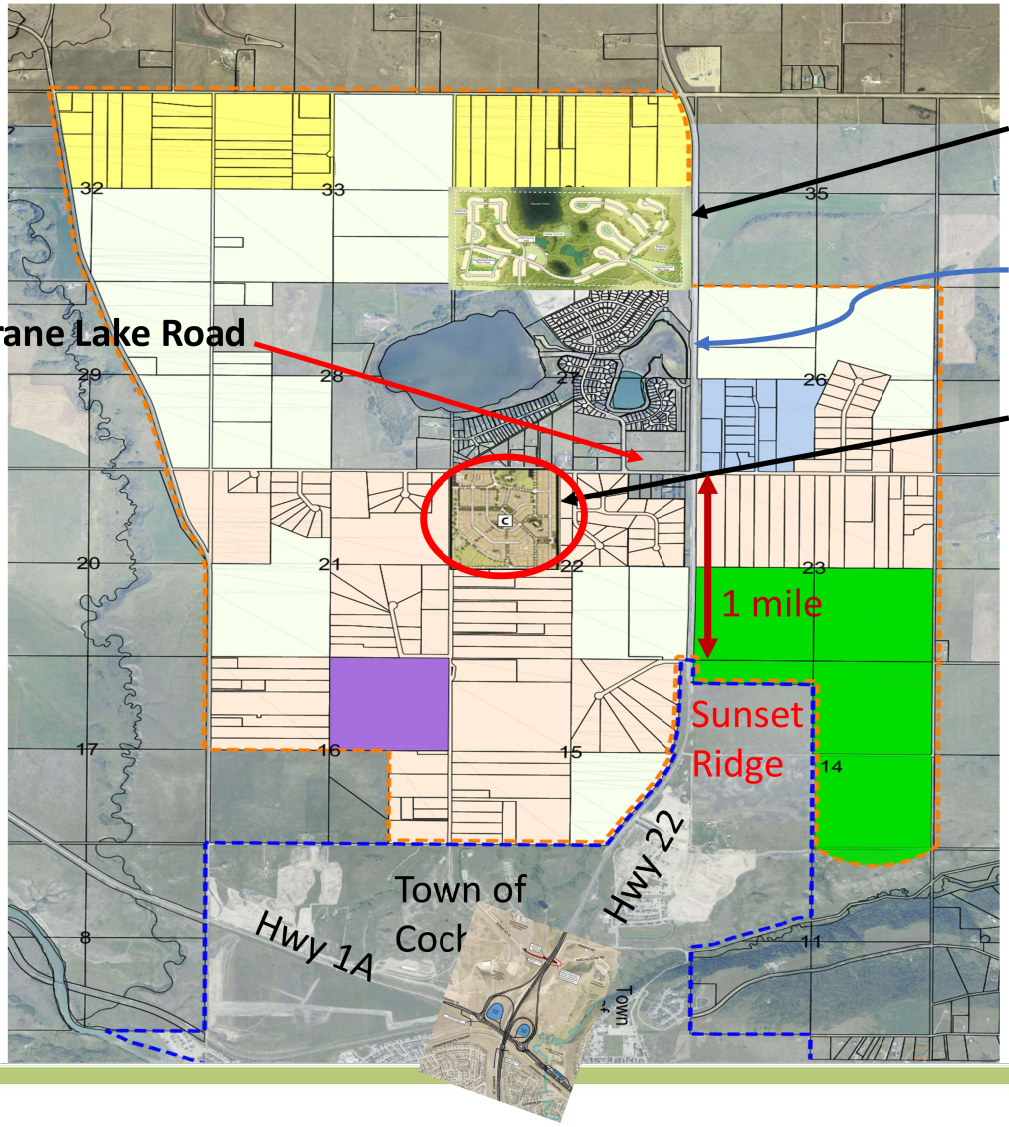
Yours truly,

PROFESSIONAL ENGINEER ALBERTA
PAUL R. JACOBS
16 MAY 2022

PERMIT TO PRACTICE
STORMWATER SOLUTIONS
RM SIGNATURE:
RM APEGA ID #: 71984
DATE: 16 May 2022
PERMIT NUMBER: P014294
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Paul Jacobs, P. Eng
Water Management Engineer

Enc:
Figure 1 – Location Plan
Figure 2 – Site Plan
Figure 3 – Pond Layout
Figure 4 – Details
SWMHYMO model files
WBSCC results files



Cochrane North
Total Area: 316acres
Status: Land Use Approved
Urban Lots: 425

Monterra Community

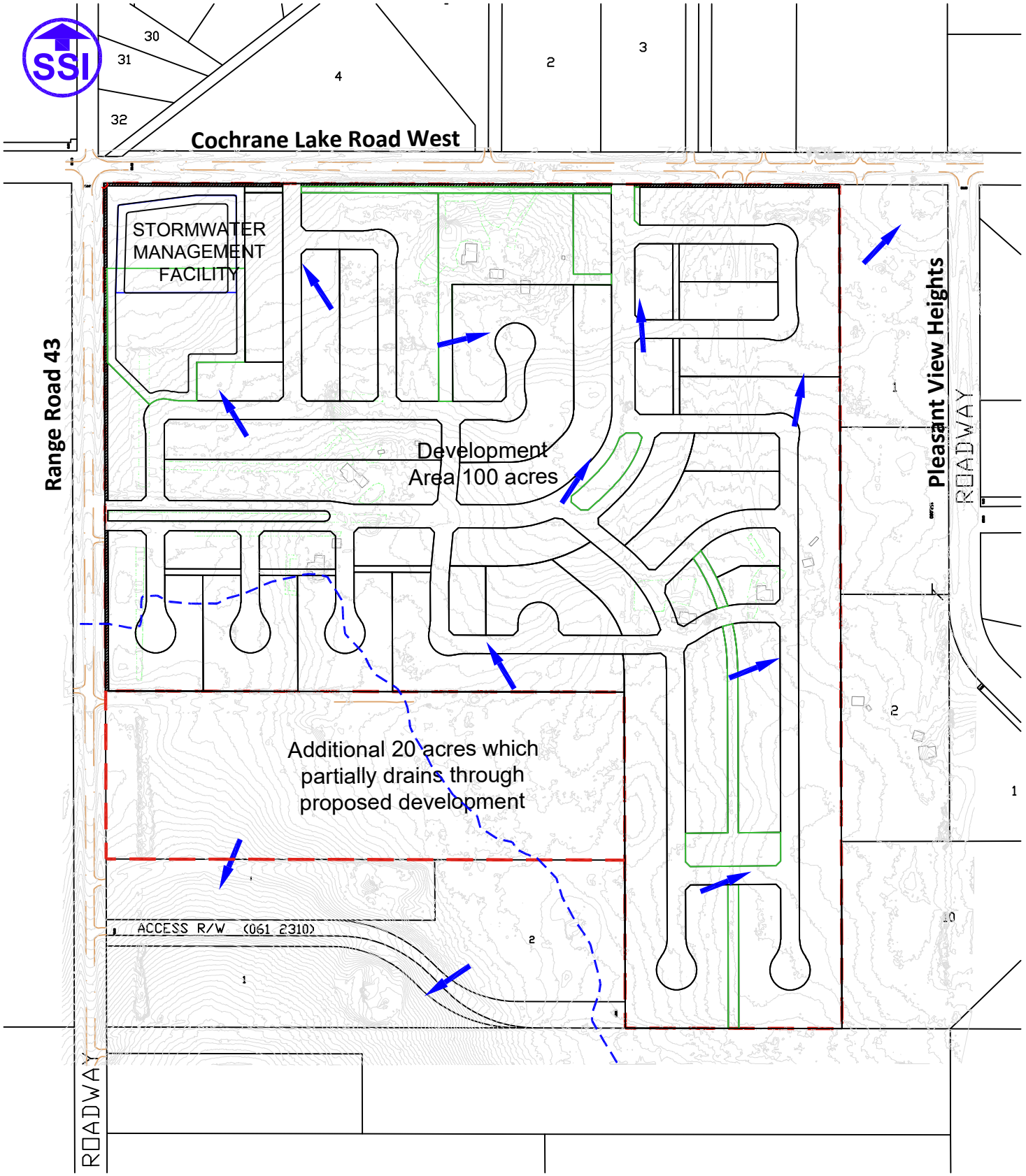
Cochrane Lake Hamlet
Total Area: ~100acres
Status: Planning To Start
Urban Lots:~ 500 to 600 units
Mini. Density: 4 to 6 upa

Stormwater Solutions

A	ISSUED FOR CONCEPT PLAN	2022-03-16

Scale N.T.S

Client: Schickedanz North Ltd
Project Name:
COCHRANE LAKE HAMLET PLAN
NEIGHBOURHOOD C
Drawing Title: Location Plan
Drawing Number: Figure 1
Project Number: 0246-002



Rev.	Description	
A	ISSUED FOR CONCEPT PLAN	2022-03-16

Scale 1:5,000

Development/ Study Area Boundary

Cochrane Lake Catchment Boundary

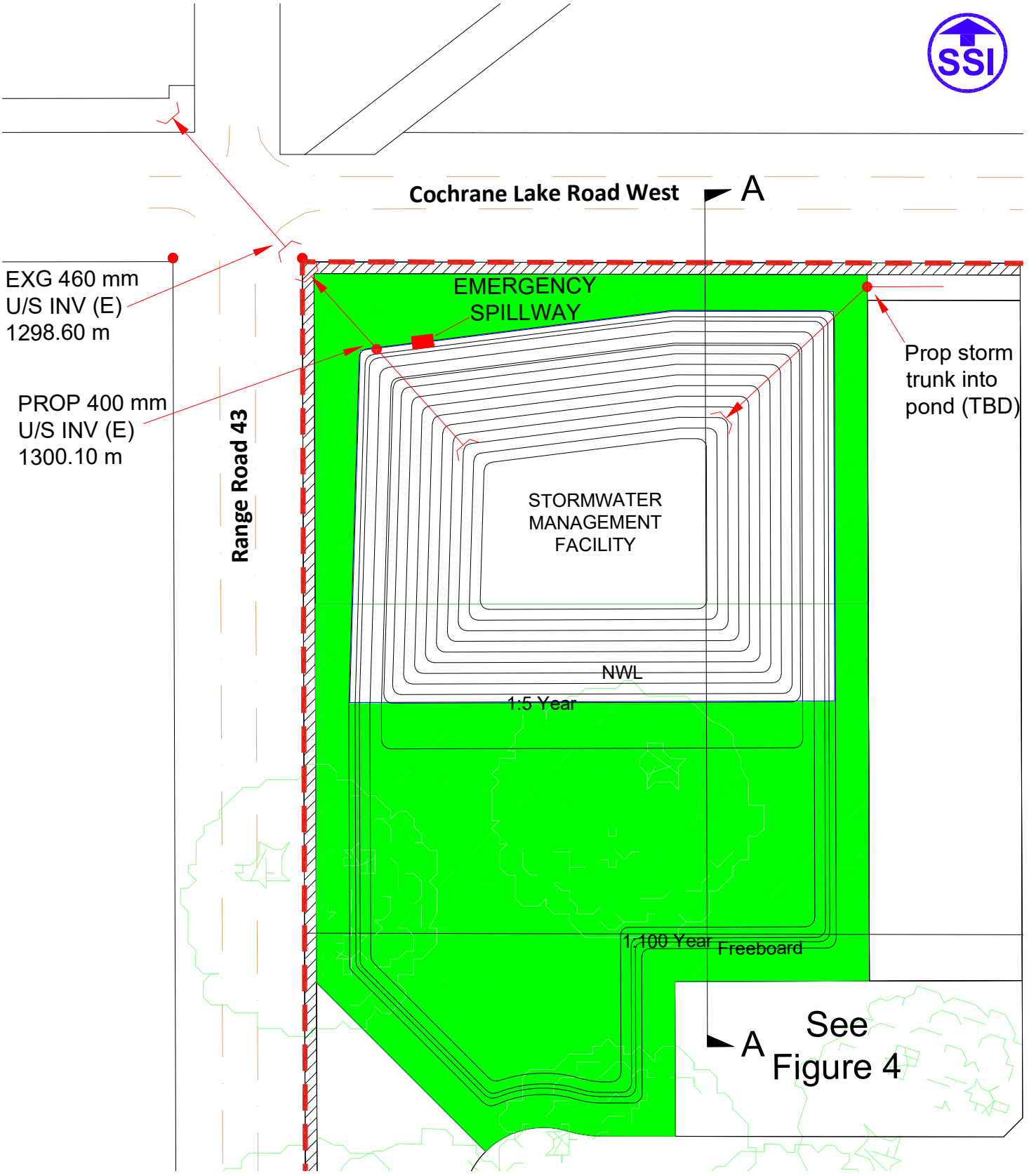
Client: Schickedanz North Ltd

Project Name:
COCHRANE LAKE HAMLET PLAN
NEIGHBOURHOOD C

Drawing Title: Site Plan

Drawing Number: Figure 2

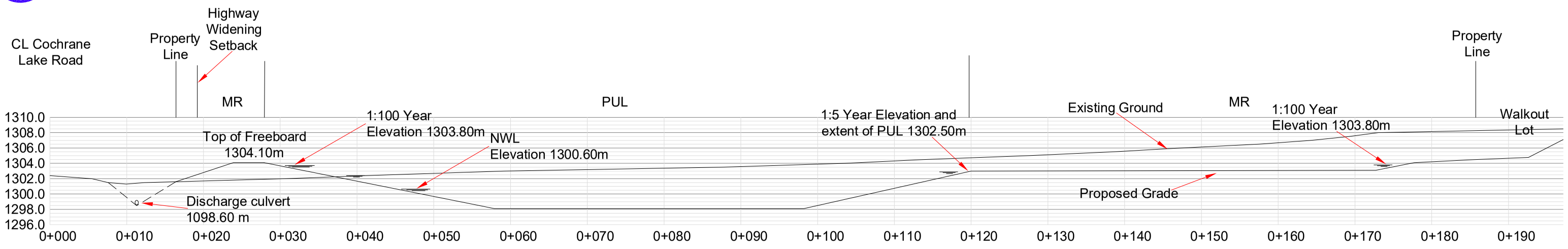
Project Number: 0246-002



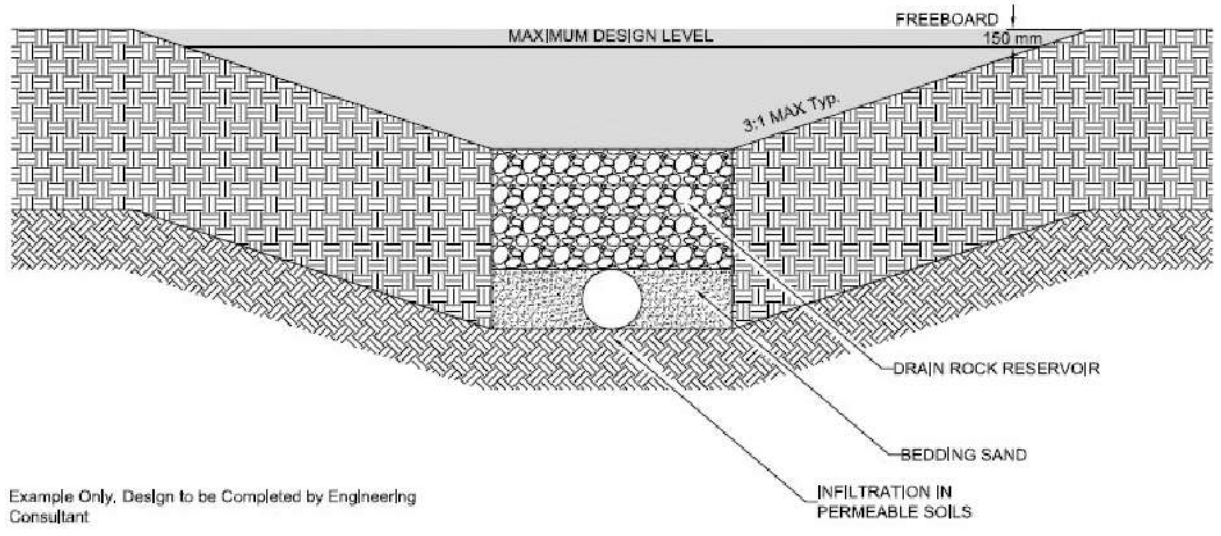
Rev.	Description	
A	ISSUED FOR CONCEPT PLAN	2022-03-16

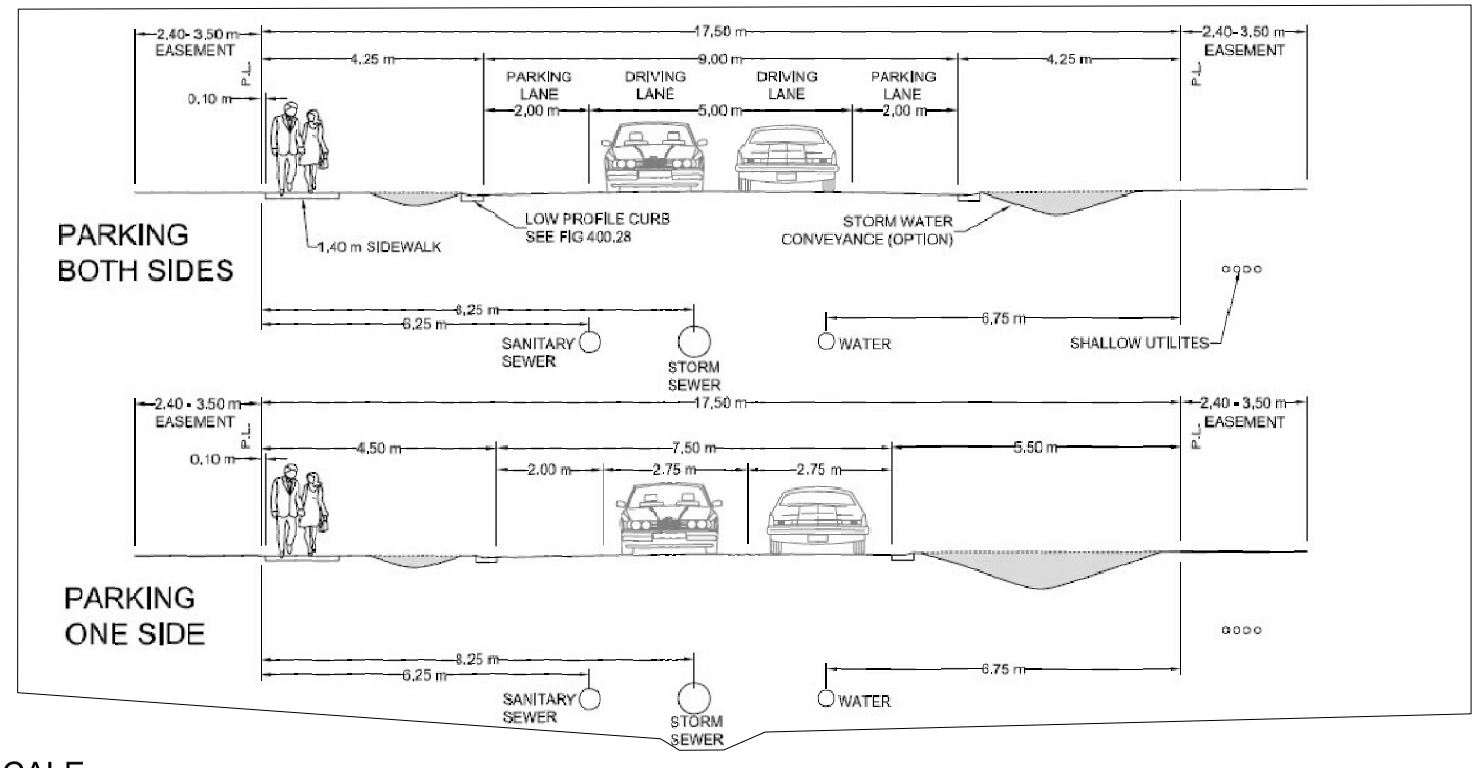
Scale 1:1,250

Client: Schickedanz North Ltd
Project Name:
COCHRANE LAKE HAMLET PLAN
NEIGHBOURHOOD C
Drawing Title: Pond Layout
Drawing Number: Figure 3
Project Number: 0246-002



CROSS-SECTION
STORMWATER MANAGEMENT FACILITY
Scale 1:500





NOT TO SCALE

Stormwater Solutions			Scale as noted
	A	ISSUED FOR CONCEPT PLAN	2022-03-16

Client: Schickedanz North Ltd
Project Name:
COCHRANE LAKE HAMLET PLAN
NEIGHBOURHOOD C
Drawing Title: Details
Drawing Number: Figure 4
Project Number: 0246-002

```
2     Metric units
**********************************************************************************
*
*FILENAME: HAMC-S01.dat
*COCHRANE HAMLET - AREA C
*Mar 2022
*PFJ
*100 YEAR DESIGN STORM (24 HOUR)
*
START               TZERO=[0.0],  METOUT=[2]
**********************************************************************************
*5 YEAR CHICAGO DESIGN STORM - Calgary
*
CHICAGO STORM       IUNITS=2 (metric) TD=24.0 hrs R=0.3 SDT=5.0 min ICASE=1
                    A=353.5  B=0.229  C=0.703
**********************************************************************************
*Prop
CALIB STANDHYD      ID  NHYD  DT(min)  AREA(ha)  XIMP   TIMP  DWF(cms)  LOSS
                    1   101    1.00     47.72    0.13   0.46   0         2
                    MODIFIED CN=72
                    PERVIOUS AREA:   DPSP(mm)  SLOPE(%)  LGP(m)  MNP   SCP
                                      3.2        2.0       20   0.250   0
                    IMPERVIOUS AREA: DPSI(mm)  SLOPE(%)  LGI(m)  MNI   SCI
                                     1.6         2.0       500   0.013    0
                       END = -1
**********************************************************************************
*Pond
ROUTE RESERVOIR      ID=2 NHYD=201 IDIN=1 DT=1.0 min
                     DISCH(cms)      STORAGE(ha m)
                         0                0
                        0.0233           0.2608
                        0.0330           0.5590
                        0.0404           0.8871
                        0.0455           1.1978
                        0.0467           1.2845
                        0.0522           1.8997
                        0.0572           2.7307
                        0.0590           3.0824
                        0.0617           3.8569
                         -1               -1
                     IDovf=3, NHYDovf=301
**********************************************************************************
**********************************************************************************
*100 YEAR CHICAGO DESIGN STORM - Calgary
*
CHICAGO STORM       IUNITS=2 (metric) TD=24.0 hrs R=0.3 SDT=5.0 min ICASE=1
                    A=663.1  B=1.87 C=0.712
**********************************************************************************
*Prop
CALIB STANDHYD      ID  NHYD  DT(min)  AREA(ha)  XIMP   TIMP  DWF(cms)  LOSS
                    1   101    1.00     47.72    0.13   0.46   0         2
                    MODIFIED CN=72
                    PERVIOUS AREA:   DPSP(mm)  SLOPE(%)  LGP(m)  MNP   SCP
                                      3.2        2.0       20   0.250   0
                    IMPERVIOUS AREA: DPSI(mm)  SLOPE(%)  LGI(m)  MNI   SCI
                                     1.6         2.0       500   0.013    0
                       END = -1
**********************************************************************************
*Pond
ROUTE RESERVOIR      ID=2 NHYD=201 IDIN=1 DT=1.0 min
                     DISCH(cms)      STORAGE(ha m)
                         0                0
                        0.0233           0.2608
                        0.0330           0.5590
                        0.0404           0.8871
                        0.0455           1.1978
                        0.0467           1.2845
                        0.0522           1.8997
                        0.0572           2.7307
                        0.0590           3.0824
                        0.0617           3.8569
                         -1               -1
                     IDovf=3, NHYDovf=301
**********************************************************************************
**********************************************************************************
*25 YEAR CHICAGO DESIGN STORM - Calgary
*
CHICAGO STORM       IUNITS=2 (metric) TD=24.0 hrs R=0.3 SDT=5.0 min ICASE=1
                    A=522.6  B=1.960 C=0.709
**********************************************************************************
*Prop
CALIB STANDHYD      ID  NHYD  DT(min)  AREA(ha)  XIMP   TIMP  DWF(cms)  LOSS
                    1   101    1.00     47.72    0.31   0.46   0         2
                    MODIFIED CN=72
                    PERVIOUS AREA:   DPSP(mm)  SLOPE(%)  LGP(m)  MNP   SCP
                                      3.2        2.0       20   0.250   0
                    IMPERVIOUS AREA: DPSI(mm)  SLOPE(%)  LGI(m)  MNI   SCI
                                     1.6         2.0       500   0.013    0
                       END = -1
**********************************************************************************
*Pond
ROUTE RESERVOIR      ID=2 NHYD=201 IDIN=1 DT=1.0 min
                     DISCH(cms)      STORAGE(ha m)
                         0                0
                        0.0233           0.2608
                        0.0330           0.5590
                        0.0404           0.8871
                        0.0455           1.1978
                        0.0467           1.2845
                        0.0522           1.8997
                        0.0572           2.7307
                        0.0590           3.0824
                        0.0617           3.8569
                         -1               -1
                     IDovf=3, NHYDovf=301
**********************************************************************************
FINISH
```

```
==============================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
                                                        9   9  9   9   # 3826891
        StormWater Management HYdrologic Model           999    999    =========

 ******************************************************************************
 **************************** SWMHYMO Ver/4.05  ***************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                OTTHYMO-83 and OTTHYMO-89.                   *********
 ******************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 ******************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: Stormwater Solutions Inc.                    +++++++++
 +++++++++                Calgary              SERIAL#:3826891        +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ******************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
 *********           Maximum value for ID numbers  :     10           *********
 *********           Max. number of rainfall points: 105408           *********
 *********           Max. number of flow points    : 105408           *********
 ******************************************************************************


 **********************   D E T A I L E D   O U T P U T   **********************
 ******************************************************************************
 *         DATE: 2022-03-15     TIME: 12:13:38     RUN COUNTER: 001680        *
 ******************************************************************************
 * Input   filename: C:\DATA\SWMHYMO\HAMC-S01.dat                             *
 * Output  filename: C:\DATA\SWMHYMO\HAMC-S01.out                             *
 * Summary filename: C:\DATA\SWMHYMO\HAMC-S01.sum                             *
 * User comments:                                                             *
 * 1:_________________________________________________________________________*
 * 2:_________________________________________________________________________*
 * 3:_________________________________________________________________________*
 ******************************************************************************

------------------------------------------------------------------------------
----
001:0001----------------------------------------------------------------------
----
******************************************************************************
*
*FILENAME: HAMC-S01.dat
*COCHRANE HAMLET - AREA C
*Mar 2022
*PFJ
*100 YEAR DESIGN STORM (24 HOUR)
*
--------------------
| START            |  Project  dir.: C:\DATA\SWMHYMO\
--------------------  Rainfall dir.: C:\DATA\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
------------------------------------------------------------------------------
----
001:0002----------------------------------------------------------------------
----
******************************************************************************
*5 YEAR CHICAGO DESIGN STORM - Calgary
*
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 353.500
| Ptotal= 51.08 mm |                          B=    .229
--------------------                          C=    .703
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  = 24.00 hrs
                         Storm time step    =  5.00 min
                         Time to peak ratio =   .30
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	.641	6.08	2.425	12.08	1.497	18.08	.855
.17	.646	6.17	2.568	12.17	1.480	18.17	.851
.25	.652	6.25	2.734	12.25	1.463	18.25	.846
.33	.657	6.33	2.928	12.33	1.446	18.33	.842
.42	.663	6.42	3.160	12.42	1.430	18.42	.837
.50	.669	6.50	3.441	12.50	1.414	18.50	.833
.58	.675	6.58	3.792	12.58	1.399	18.58	.829
.67	.681	6.67	4.245	12.67	1.384	18.67	.825
.75	.687	6.75	4.856	12.75	1.370	18.75	.820
.83	.693	6.83	5.737	12.83	1.355	18.83	.816
.92	.700	6.92	7.148	12.92	1.342	18.92	.812
1.00	.706	7.00	9.892	13.00	1.328	19.00	.808
1.08	.713	7.08	19.340	13.08	1.315	19.08	.804
1.17	.720	7.17	110.495	13.17	1.302	19.17	.800
1.25	.727	7.25	25.185	13.25	1.290	19.25	.796
1.33	.735	7.33	15.672	13.33	1.277	19.33	.793
1.42	.742	7.42	11.886	13.42	1.265	19.42	.789
1.50	.750	7.50	9.759	13.50	1.254	19.50	.785
1.58	.758	7.58	8.370	13.58	1.242	19.58	.781
1.67	.766	7.67	7.380	13.67	1.231	19.67	.778
1.75	.774	7.75	6.634	13.75	1.220	19.75	.774
1.83	.783	7.83	6.048	13.83	1.209	19.83	.771
1.92	.791	7.92	5.573	13.92	1.199	19.92	.767
2.00	.800	8.00	5.180	14.00	1.189	20.00	.763
2.08	.810	8.08	4.847	14.08	1.178	20.08	.760
2.17	.819	8.17	4.562	14.17	1.169	20.17	.757
2.25	.829	8.25	4.315	14.25	1.159	20.25	.753
2.33	.839	8.33	4.098	14.33	1.149	20.33	.750
2.42	.849	8.42	3.905	14.42	1.140	20.42	.747
2.50	.860	8.50	3.733	14.50	1.131	20.50	.743
2.58	.871	8.58	3.579	14.58	1.122	20.58	.740
2.67	.882	8.67	3.439	14.67	1.113	20.67	.737
2.75	.894	8.75	3.311	14.75	1.105	20.75	.734
2.83	.906	8.83	3.195	14.83	1.096	20.83	.730
2.92	.919	8.92	3.087	14.92	1.088	20.92	.727
3.00	.932	9.00	2.989	15.00	1.080	21.00	.724
3.08	.945	9.08	2.897	15.08	1.072	21.08	.721
3.17	.959	9.17	2.812	15.17	1.064	21.17	.718
3.25	.973	9.25	2.733	15.25	1.056	21.25	.715
3.33	.988	9.33	2.659	15.33	1.049	21.33	.712
3.42	1.004	9.42	2.590	15.42	1.041	21.42	.709
3.50	1.020	9.50	2.525	15.50	1.034	21.50	.706
3.58	1.036	9.58	2.463	15.58	1.027	21.58	.704
3.67	1.054	9.67	2.406	15.67	1.020	21.67	.701

3.75	1.072	9.75	2.351	15.75	1.013	21.75	.698
3.83	1.091	9.83	2.299	15.83	1.006	21.83	.695
3.92	1.110	9.92	2.250	15.92	.999	21.92	.692
4.00	1.131	10.00	2.204	16.00	.992	22.00	.690
4.08	1.153	10.08	2.159	16.08	.986	22.08	.687
4.17	1.175	10.17	2.117	16.17	.980	22.17	.684
4.25	1.199	10.25	2.077	16.25	.973	22.25	.682
4.33	1.224	10.33	2.038	16.33	.967	22.33	.679
4.42	1.250	10.42	2.002	16.42	.961	22.42	.676
4.50	1.277	10.50	1.966	16.50	.955	22.50	.674
4.58	1.306	10.58	1.933	16.58	.949	22.58	.671
4.67	1.337	10.67	1.900	16.67	.943	22.67	.669
4.75	1.370	10.75	1.869	16.75	.937	22.75	.666
4.83	1.404	10.83	1.839	16.83	.932	22.83	.664
4.92	1.441	10.92	1.811	16.92	.926	22.92	.661
5.00	1.480	11.00	1.783	17.00	.920	23.00	.659
5.08	1.522	11.08	1.756	17.08	.915	23.08	.656
5.17	1.566	11.17	1.731	17.17	.910	23.17	.654
5.25	1.614	11.25	1.706	17.25	.904	23.25	.652
5.33	1.666	11.33	1.682	17.33	.899	23.33	.649
5.42	1.722	11.42	1.658	17.42	.894	23.42	.647
5.50	1.783	11.50	1.636	17.50	.889	23.50	.644
5.58	1.849	11.58	1.614	17.58	.884	23.58	.642
5.67	1.922	11.67	1.593	17.67	.879	23.67	.640
5.75	2.002	11.75	1.573	17.75	.874	23.75	.638
5.83	2.090	11.83	1.553	17.83	.869	23.83	.635
5.92	2.189	11.92	1.534	17.92	.865	23.92	.633
6.00	2.300	12.00	1.515	18.00	.860	24.00	.631

001:0003

****
*Prop

| CALIB STANDHYD | Area (ha)= 47.72
| 01:000101 DT= 1.00 | Total Imp(%)= 46.00 Dir. Conn.(%)= 13.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	21.95	25.77
Dep. Storage	(mm)=	1.60	3.20
Average Slope	(%)=	2.00	2.00
Length	(m)=	500.00	20.00
Mannings n	=	.013	.250
Max.eff.Inten.	(mm/hr)=	110.49	35.68
over	(min)	5.00	12.00
Storage Coeff.	(min)=	5.24 (ii)	12.27 (ii)
Unit Hyd. Tpeak	(min)=	5.00	12.00
Unit Hyd. peak	(cms)=	.22	.09

				TOTALS
PEAK FLOW	(cms)=	1.11	1.56	2.158 (iii)
TIME TO PEAK	(hrs)=	7.22	7.33	7.300
RUNOFF VOLUME	(mm)=	49.47	21.82	25.423
TOTAL RAINFALL	(mm)=	51.08	51.08	51.076
RUNOFF COEFFICIENT	=	.97	.43	.498

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0004

****
*Pond

| ROUTE RESERVOIR | IN>01:(000101) | OUT<02:(000201)

Requested routing time step = 1.0 min.

========= OUTFLOW STORAGE TABLE =========

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.000	.0000E+00	.047	.1285E+01
.023	.2608E+00	.052	.1900E+01
.033	.5590E+00	.057	.2731E+01
.040	.8871E+00	.059	.3082E+01
.045	.1198E+01	.062	.3857E+01

ROUTING RESULTS	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW >01: (000101)	47.72	2.158	7.300	25.423
OUTFLOW<02: (000201)	47.72	.042	24.167	25.421
OVERFLOW<03: (000301)	.00	.000	.000	.000

TOTAL NUMBER OF SIMULATED OVERFLOWS = 0
CUMULATIVE TIME OF OVERFLOWS (hours)= .00
PERCENTAGE OF TIME OVERFLOWING (%)= .00

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.936
TIME SHIFT OF PEAK FLOW (min)= 1012.00
MAXIMUM STORAGE USED (ha.m.)=.9712E+00

001:0005

****
****
*100 YEAR CHICAGO DESIGN STORM - Calgary
*

| CHICAGO STORM | Ptotal= 89.67 mm |

IDF curve parameters: A= 663.100
B= 1.870
C= .712
used in: INTENSITY = A / (t + B)^C

Duration of storm = 24.00 hrs
Storm time step = 5.00 min
Time to peak ratio = .30

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	1.094	6.08	4.259	12.08	2.597	18.08	1.467
.17	1.103	6.17	4.519	12.17	2.566	18.17	1.460
.25	1.113	6.25	4.821	12.25	2.536	18.25	1.452
.33	1.122	6.33	5.176	12.33	2.506	18.33	1.444
.42	1.132	6.42	5.601	12.42	2.478	18.42	1.436
.50	1.143	6.50	6.120	12.50	2.450	18.50	1.429
.58	1.153	6.58	6.773	12.58	2.423	18.58	1.421
.67	1.163	6.67	7.624	12.67	2.396	18.67	1.414
.75	1.174	6.75	8.785	12.75	2.371	18.75	1.407
.83	1.185	6.83	10.488	12.83	2.346	18.83	1.399
.92	1.197	6.92	13.283	12.92	2.321	18.92	1.392
1.00	1.208	7.00	18.961	13.00	2.297	19.00	1.385

1.08	1.220	7.08	40.516	13.08	2.274	19.08	1.378
1.17	1.232	7.17	168.138	13.17	2.252	19.17	1.372
1.25	1.245	7.25	54.372	13.25	2.229	19.25	1.365
1.33	1.257	7.33	31.748	13.33	2.208	19.33	1.358
1.42	1.270	7.42	23.236	13.42	2.187	19.42	1.352
1.50	1.284	7.50	18.660	13.50	2.166	19.50	1.345
1.58	1.297	7.58	15.763	13.58	2.146	19.58	1.339
1.67	1.311	7.67	13.746	13.67	2.126	19.67	1.332
1.75	1.326	7.75	12.251	13.75	2.107	19.75	1.326
1.83	1.341	7.83	11.093	13.83	2.088	19.83	1.320
1.92	1.356	7.92	10.166	13.92	2.069	19.92	1.313
2.00	1.372	8.00	9.405	14.00	2.051	20.00	1.307
2.08	1.388	8.08	8.768	14.08	2.034	20.08	1.301
2.17	1.404	8.17	8.225	14.17	2.016	20.17	1.295
2.25	1.421	8.25	7.756	14.25	1.999	20.25	1.289
2.33	1.439	8.33	7.346	14.33	1.983	20.33	1.284
2.42	1.457	8.42	6.985	14.42	1.966	20.42	1.278
2.50	1.476	8.50	6.664	14.50	1.950	20.50	1.272
2.58	1.495	8.58	6.376	14.58	1.935	20.58	1.266
2.67	1.515	8.67	6.116	14.67	1.919	20.67	1.261
2.75	1.535	8.75	5.880	14.75	1.904	20.75	1.255
2.83	1.556	8.83	5.665	14.83	1.889	20.83	1.250
2.92	1.578	8.92	5.468	14.92	1.875	20.92	1.244
3.00	1.601	9.00	5.287	15.00	1.860	21.00	1.239
3.08	1.624	9.08	5.119	15.08	1.846	21.08	1.234
3.17	1.648	9.17	4.964	15.17	1.833	21.17	1.229
3.25	1.674	9.25	4.819	15.25	1.819	21.25	1.223
3.33	1.700	9.33	4.684	15.33	1.806	21.33	1.218
3.42	1.727	9.42	4.558	15.42	1.793	21.42	1.213
3.50	1.755	9.50	4.440	15.50	1.780	21.50	1.208
3.58	1.784	9.58	4.329	15.58	1.767	21.58	1.203
3.67	1.815	9.67	4.224	15.67	1.755	21.67	1.198
3.75	1.846	9.75	4.125	15.75	1.743	21.75	1.193
3.83	1.880	9.83	4.032	15.83	1.731	21.83	1.188
3.92	1.914	9.92	3.943	15.92	1.719	21.92	1.184
4.00	1.950	10.00	3.859	16.00	1.707	22.00	1.179
4.08	1.988	10.08	3.780	16.08	1.696	22.08	1.174
4.17	2.028	10.17	3.704	16.17	1.685	22.17	1.170
4.25	2.070	10.25	3.631	16.25	1.673	22.25	1.165
4.33	2.113	10.33	3.562	16.33	1.663	22.33	1.160
4.42	2.159	10.42	3.496	16.42	1.652	22.42	1.156
4.50	2.208	10.50	3.433	16.50	1.641	22.50	1.151
4.58	2.259	10.58	3.373	16.58	1.631	22.58	1.147
4.67	2.313	10.67	3.315	16.67	1.621	22.67	1.143
4.75	2.371	10.75	3.259	16.75	1.611	22.75	1.138
4.83	2.432	10.83	3.206	16.83	1.601	22.83	1.134
4.92	2.497	10.92	3.154	16.92	1.591	22.92	1.130
5.00	2.566	11.00	3.105	17.00	1.581	23.00	1.125
5.08	2.640	11.08	3.057	17.08	1.572	23.08	1.121
5.17	2.719	11.17	3.011	17.17	1.562	23.17	1.117
5.25	2.805	11.25	2.967	17.25	1.553	23.25	1.113
5.33	2.897	11.33	2.924	17.33	1.544	23.33	1.109
5.42	2.997	11.42	2.883	17.42	1.535	23.42	1.105
5.50	3.105	11.50	2.843	17.50	1.526	23.50	1.101
5.58	3.224	11.58	2.805	17.58	1.517	23.58	1.097
5.67	3.354	11.67	2.767	17.67	1.509	23.67	1.093
5.75	3.497	11.75	2.731	17.75	1.500	23.75	1.089
5.83	3.656	11.83	2.696	17.83	1.492	23.83	1.085
5.92	3.833	11.92	2.662	17.92	1.484	23.92	1.081
6.00	4.033	12.00	2.629	18.00	1.476	24.00	1.077

001:0006

```
*******************************************************************************
*Prop
----------------------
| CALIB STANDHYD     |   Area    (ha)=   47.72
| 01:000101 DT= 1.00 |   Total Imp(%)=   46.00   Dir. Conn.(%)=   13.00
----------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      21.95        25.77
     Dep. Storage     (mm)=       1.60         3.20
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     500.00        20.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     168.14       102.12
               over (min)          4.00         9.00
     Storage Coeff.  (min)=       4.43 (ii)    9.04 (ii)
     Unit Hyd. Tpeak (min)=       4.00         9.00
     Unit Hyd. peak  (cms)=        .26          .13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.94         4.60          5.883 (iii)
     TIME TO PEAK    (hrs)=       7.20         7.28          7.267
     RUNOFF VOLUME    (mm)=      88.06        51.59         56.341
     TOTAL RAINFALL   (mm)=      89.67        89.67         89.667
     RUNOFF COEFFICIENT   =        .98          .58           .628

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
----
001:0007-------------------------------------------------------------------------
----
*******************************************************************************
*Pond
----------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(000101)    |
| OUT<02:(000201)    |    =========  OUTLFOW STORAGE TABLE  =========
----------------------    OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
                            (cms)     (ha.m.)    |    (cms)     (ha.m.)
                             .000  .0000E+00     |     .047  .1285E+01
                             .023  .2608E+00     |     .052  .1900E+01
                             .033  .5590E+00     |     .057  .2731E+01
                             .040  .8871E+00     |     .059  .3082E+01
                             .045  .1198E+01     |     .062  .3857E+01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (000101)      47.72     5.883     7.267     56.341
     OUTFLOW<02: (000201)      47.72      .055    24.183     56.338
    OVERFLOW<03: (000301)        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .934
                    TIME SHIFT OF PEAK FLOW         (min)=  1015.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.2357E+01
```

```
--------------------------------------------------------------------------------
----
001:0008--------------------------------------------------------------------------
----
********************************************************************************
********************************************************************************
*25 YEAR CHICAGO DESIGN STORM - Calgary
*
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 522.600
| Ptotal= 72.22 mm |                          B=   1.960
--------------------                          C=    .709
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  = 24.00 hrs
                        Storm time step    =  5.00 min
                        Time to peak ratio =   .30
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	.890	6.08	3.448	12.08	2.106	18.08	1.193
.17	.898	6.17	3.658	12.17	2.081	18.17	1.186
.25	.906	6.25	3.901	12.25	2.057	18.25	1.180
.33	.914	6.33	4.187	12.33	2.033	18.33	1.174
.42	.922	6.42	4.530	12.42	2.010	18.42	1.168
.50	.930	6.50	4.949	12.50	1.987	18.50	1.162
.58	.938	6.58	5.475	12.58	1.966	18.58	1.156
.67	.947	6.67	6.160	12.67	1.944	18.67	1.150
.75	.955	6.75	7.095	12.75	1.924	18.75	1.144
.83	.964	6.83	8.466	12.83	1.903	18.83	1.138
.92	.974	6.92	10.716	12.92	1.884	18.92	1.132
1.00	.983	7.00	15.283	13.00	1.864	19.00	1.126
1.08	.992	7.08	32.555	13.08	1.846	19.08	1.121
1.17	1.002	7.17	132.056	13.17	1.827	19.17	1.115
1.25	1.012	7.25	43.630	13.25	1.809	19.25	1.110
1.33	1.023	7.33	25.552	13.33	1.792	19.33	1.104
1.42	1.033	7.42	18.719	13.42	1.775	19.42	1.099
1.50	1.044	7.50	15.041	13.50	1.758	19.50	1.094
1.58	1.055	7.58	12.711	13.58	1.742	19.58	1.089
1.67	1.067	7.67	11.088	13.67	1.726	19.67	1.083
1.75	1.078	7.75	9.885	13.75	1.710	19.75	1.078
1.83	1.090	7.83	8.953	13.83	1.695	19.83	1.073
1.92	1.103	7.92	8.207	13.92	1.680	19.92	1.068
2.00	1.115	8.00	7.595	14.00	1.665	20.00	1.063
2.08	1.128	8.08	7.081	14.08	1.651	20.08	1.058
2.17	1.142	8.17	6.644	14.17	1.637	20.17	1.054
2.25	1.156	8.25	6.266	14.25	1.623	20.25	1.049
2.33	1.170	8.33	5.936	14.33	1.610	20.33	1.044
2.42	1.184	8.42	5.646	14.42	1.597	20.42	1.039
2.50	1.199	8.50	5.387	14.50	1.584	20.50	1.035
2.58	1.215	8.58	5.155	14.58	1.571	20.58	1.030
2.67	1.231	8.67	4.945	14.67	1.558	20.67	1.026
2.75	1.248	8.75	4.755	14.75	1.546	20.75	1.021
2.83	1.265	8.83	4.582	14.83	1.534	20.83	1.017
2.92	1.282	8.92	4.423	14.92	1.522	20.92	1.012
3.00	1.301	9.00	4.277	15.00	1.511	21.00	1.008
3.08	1.320	9.08	4.141	15.08	1.500	21.08	1.004
3.17	1.339	9.17	4.016	15.17	1.488	21.17	.999
3.25	1.360	9.25	3.900	15.25	1.477	21.25	.995
3.33	1.381	9.33	3.791	15.33	1.467	21.33	.991
3.42	1.403	9.42	3.689	15.42	1.456	21.42	.987
3.50	1.426	9.50	3.594	15.50	1.446	21.50	.983
3.58	1.449	9.58	3.504	15.58	1.436	21.58	.979
3.67	1.474	9.67	3.420	15.67	1.426	21.67	.975
3.75	1.500	9.75	3.340	15.75	1.416	21.75	.971
3.83	1.526	9.83	3.265	15.83	1.406	21.83	.967
3.92	1.554	9.92	3.193	15.92	1.396	21.92	.963
4.00	1.584	10.00	3.126	16.00	1.387	22.00	.959
4.08	1.614	10.08	3.061	16.08	1.378	22.08	.955
4.17	1.646	10.17	3.000	16.17	1.369	22.17	.952
4.25	1.680	10.25	2.942	16.25	1.360	22.25	.948
4.33	1.715	10.33	2.886	16.33	1.351	22.33	.944
4.42	1.753	10.42	2.833	16.42	1.342	22.42	.941
4.50	1.792	10.50	2.782	16.50	1.334	22.50	.937
4.58	1.833	10.58	2.733	16.58	1.325	22.58	.933
4.67	1.877	10.67	2.686	16.67	1.317	22.67	.930
4.75	1.924	10.75	2.641	16.75	1.309	22.75	.926
4.83	1.973	10.83	2.598	16.83	1.301	22.83	.923
4.92	2.025	10.92	2.557	16.92	1.293	22.92	.919
5.00	2.081	11.00	2.517	17.00	1.285	23.00	.916
5.08	2.141	11.08	2.478	17.08	1.277	23.08	.912
5.17	2.205	11.17	2.441	17.17	1.270	23.17	.909
5.25	2.274	11.25	2.405	17.25	1.262	23.25	.906
5.33	2.349	11.33	2.371	17.33	1.255	23.33	.902
5.42	2.429	11.42	2.338	17.42	1.248	23.42	.899
5.50	2.517	11.50	2.305	17.50	1.240	23.50	.896
5.58	2.613	11.58	2.274	17.58	1.233	23.58	.892
5.67	2.717	11.67	2.244	17.67	1.226	23.67	.889
5.75	2.833	11.75	2.215	17.75	1.220	23.75	.886
5.83	2.961	11.83	2.186	17.83	1.213	23.83	.883
5.92	3.104	11.92	2.159	17.92	1.206	23.92	.880
6.00	3.266	12.00	2.132	18.00	1.199	24.00	.877

```
--------------------------------------------------------------------------------
----
001:0009--------------------------------------------------------------------------
----
********************************************************************************
*Prop
----------------------
| CALIB STANDHYD     |   Area    (ha)=   47.72
| 01:000101 DT= 1.00 |   Total Imp(%)=   46.00   Dir. Conn.(%)=   31.00
----------------------
                                    IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      21.95         25.77
     Dep. Storage     (mm)=       1.60          3.20
     Average Slope     (%)=       2.00          2.00
     Length            (m)=     500.00         20.00
     Mannings n             =       .013          .250

     Max.eff.Inten.(mm/hr)=     132.06         42.67
               over (min)         5.00         11.00
     Storage Coeff.  (min)=       4.88 (ii)    11.42 (ii)
     Unit Hyd. Tpeak (min)=       5.00         11.00
     Unit Hyd. peak  (cms)=        .23           .10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       3.43          1.87          4.594 (iii)
     TIME TO PEAK    (hrs)=       7.22          7.33          7.233
     RUNOFF VOLUME    (mm)=      70.61         33.05         44.706
     TOTAL RAINFALL   (mm)=      72.22         72.22         72.224
     RUNOFF COEFFICIENT   =        .98           .46           .619

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
----
```

```
001:0010--------------------------------------------------------------------------------
----
********************************************************************************
*Pond
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(000101)   |
| OUT<02:(000201)   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                           .000  .0000E+00   |     .047  .1285E+01
                           .023  .2608E+00   |     .052  .1900E+01
                           .033  .5590E+00   |     .057  .2731E+01
                           .040  .8871E+00   |     .059  .3082E+01
                           .045  .1198E+01   |     .062  .3857E+01

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (000101)      47.72     4.594     7.233     44.706
     OUTFLOW<02: (000201)      47.72      .051    24.150     44.703
    OVERFLOW<03: (000301)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=    1.121
                  TIME SHIFT OF PEAK FLOW         (min)=  1015.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1821E+01

--------------------------------------------------------------------------------
----
001:0011--------------------------------------------------------------------------------
----
********************************************************************************
      FINISH
--------------------------------------------------------------------------------
----
********************************************************************************
****
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2022-03-15     at 12:13:38
================================================================================
====
```

WBSCC

Water Balance Spreadsheet for the City of Calgary
Version 1.2

PROJECT SUMMARY SHEET

Project Name:	Area C = 100 acres
Project Description:	Slightly bigger pond
Location:	
Date:	NOV 2021
Designed by:	PAUL JACOBS
Company Name:	STORMWATER SOLUTIONS
Reviewed by:	

WBSCC - PROJECT DATA SHEET - Environmental Information

Minimum Temperature to Trigger Runoff (°C)	0
Sublimation Losses (%)	0
Precipitation Multiplication Factor (% Decrease)	0

Month	Is Winter or Summer?	Crop Water Requirement (mm/month)			
		KENTUCKY BLUE GRAS	SAGE BRUSH	Unnamed 1	Unnamed 2
January	Winter	0	0	0	0
February	Winter	0	0	0	0
March	Winter	0	0	0	0
April	Summer	0	0	0	0
May	Summer	0	50	0	0
June	Summer	0	50	0	0
July	Summer	0	60	0	0
August	Summer	0	50	0	0
September	Summer	0	50	0	0
October	Summer	0	20	0	0
November	Winter	0	0	0	0
December	Winter	0	0	0	0

Catchment Area Data

Sub-Catchment	Description of Sub-catchment Use	Area (ha)
Sub-Catchment 1	ALL	45.8487
Sub-Catchment 2		
Sub-Catchment 3		
Sub-Catchment 4		
Sub-Catchment 5		
Total		45.8487

Pond Area Data

Pond	Description of Pond	Pond Area (m^2)
Pond 1	Pond	18716
Pond 2		0

WBSCC - PROJECT DATA SHEET - Sub-Catchment 1: Parameters, Runoff Allocation

Usage: ALL

Sub-catchment Parameters		Cover Type					
		Impervious Surface	Pervious Surface	Absorbent Landscaping	Green Roof Media	Bioretention/ Bioswale Medium	Unassigned Area
Area (Total: 45.8487)	(ha)	21.0634	24.7853	0	0	0	0
Depression Loss	(mm)	1.6					
Soil Type: Sand			30	30	0	88	
Silt			35	35	0	7	
Clay			35	35	0	5	
Custom							
Unassigned			0	0	100	0	
Soil or Media Depth	(mm)		300	50	200	300	
Porosity			0.48	0.46	0.512	0.46	
Field Capacity			0.36	0.1	0.132	0.1	
Wilting Point			0.22	0.05	0.057	0.05	
Saturated Hydraulic Conductivity	(m/s)		1.19E-06	3.00E-05	2.50E-05	3.00E-05	
Sub-soil Hydraulic Conductivity	(m/s)		1.00E-08	1.00E-08		1.00E-08	
Ponding Depth	(mm)		3.2	0	0	0	
Inv. Slope of Log. Tension Moisture Curve			7.75	5.51	4.55	5.51	
Subdrain Invert (above bottom of media)	(mm)					0	
Subdrain Capacity	(m^3/s)					0	

% of Runoff Allocated To:	Runoff Allocated from Cover Type/ Facility:						
	Impervious Surface	Pervious Surface	Absorbent Landscaping	Green Roof Media	Bioretention/ Bioswale Media	Storage/ Reuse Tank	Discharge
Pervious Surface	74.7			0			
Absorbent Landscaping	0	0		0			
Green Roof Media	0						
Storage/ Reuse Tank	0	0	0	0			
Bioretention/Bioswale Media	0	0	0	0			
Discharge	25.3	100	100	100	100	100	
Pond 1/Pond 2							POND #1

WBSCC - PROJECT DATA SHEET - Pond 1: Parameters, Elevation-Area-Discharge-Volume Relationship

Pond 1 Parametrs		Values
Base Elevation	(m)	1297.60
Starting Water Elevation	(m)	1300.50
Starting Discharge Elevation (UNWL)	(m)	1300.60
High Water Level (HWL)	(m)	1304.10
Lower Normal Water Level (LNWL)	(m)	1298.60
Seepage Rate	(mm/hr)	0.00
Discharge and Overflow Routed to:		OUTFALL

Pond 1 Pertinent Volumes (m^3)	Values
Volume at Base Elevation	0
Volume at Stating Water Elevation	8175
Volume at LNWL	1440
Volume at UNWL	8627
Volume at HWL	44937

Pond 1 Bed Soil Parameters		
Soil Type: Sand		30
Silt		35
Clay		35
Custom		
Unassigned		0
Soil or Media Depth	(mm)	150
Porosity		0.48
Field Capacity		0.36
Wilting Point		0.22
Saturated Hydraulic Conductivity	(m/s)	1.19E-06
Sub-soil Hydraulic Conductivity	(m/s)	1.00E-08
Ponding Depth	(mm)	0
Inv. Slope of Log. Tension Moisture Curve		7.75

Elevation (m)	Area (m^2)	Discharge (m^3/s)
1297.60	0	0
1298.10	1,984	0
1298.60	2,460	0
1299.10	2,986	0
1299.60	3,561	0
1300.10	4,185	0
1300.60	4,859	0
1301.10	5,582	0.0233
1301.60	6,354	0.033
1302.10	7,176	0.0404
1302.50	7,869	0.0455
1302.60	9,068	0.0467
1303.10	15,943	0.0522
1303.60	17,306	0.0572
1303.80	17,864	0.059
1304.10	18,716	0.0617
1304.10	18,716	0.0617
1304.10	18,716	0.0617
1304.10	18,716	0.0617
1304.10	18,716	0.0617
1304.10	18,716	0.0617

SUBCATCHMENT 1	(mm)	(m3)
TOTAL MSC PRECIPITATION	20897.0	9581002.8
AVERAGE PRECIPITATION	409.7	
MEDIAN PRECIPITATION	404.7	
TOTAL RUNOFF (INCLUDING SUBDRAIN)	2529.0	1159529.5
% OF RAINFALL AS RUNOFF	12.1	
AVERAGE RUNOFF (INCLUDING SUBDRAIN)	49.6	22735.9
MEDIAN RUNOFF (INCLUDING SUBDRAIN)	42.3	19377.4
TOTAL IRRIGATION DEMAND	0.0	0.0
MAXIMUM RUNOFF (ANY TIMESTEP)	57.9	26565.5
AVERAGE EVAPORATION	279.4	128115.2
AVERAGE PERCOLATION	35.1	16101.0
TOTAL RUNOFF + EVAP + PERCOLATION	364.1	166952.1

SUBCATCHMENT 1	
OVERALL WATER BALANCE OVER 51 YEARS	(m3)
TOTAL MSC PRECIPITATION	9581002.8
TOTAL EXTERNAL RUNON	0.0
TOTAL RUNOFF (INCLUDING SUBDRAIN)	1159529.5
TOTAL EVAPORATION IMPERVIOUS AREAS	1060247.3
TOTAL EVAPOTRANSP PERVIOUS AREAS	6533876.3
TOTAL RECHARGE FROM PONDS TO STORAGE TANK	0.0
TOTAL PERCOLATION	821150.5
TOTAL SUBLIMATION LOSSES	0.0
SNOW PACK AT THE END OF SIMULATION	3026.0
TANK WATER BALANCE	0.0
WATER BALANCE	-28.8
CONTINUITY ERROR	0.0

SC1: IMPERVIOUS AREA	(mm)	(m3)
TOTAL MSC PRECIPITATION	20897.0	4401618.7
TOTAL RUNOFF	15856.8	3339981.2
% OF RAINFALL AS RUNOFF	75.9	
AVERAGE RUNOFF	310.9	65489.8
MEDIAN RUNOFF	307.0	64664.6
MAXIMUM RUNOFF (ANY TIMESTEP)	91.0	19167.7
TOTAL RUNON	0.0	0.0
TOTAL DEP STORAGE (EVAPORATION LOSS)	5033.6	1060247.3
TOTAL SUBLIMATION LOSS	0.0	0.0
SNOW PACK AT THE END OF SIMULATION	6.6	1390.2
WATER BALANCE (OVER PERIOD OF RECORD)	0.0	0.0

SC1: PERVIOUS AREA	(mm)	(m3)
TOTAL MSC PRECIPITATION	20897.0	5179384.1
TOTAL RUNOFF	1269.0	314514.3
% OF RAINFALL AS RUNOFF	6.1	
AVERAGE RUNOFF	24.9	6166.9
MEDIAN RUNOFF	11.9	2937.3
MAXIMUM RUNOFF (ANY TIMESTEP)	87.6	21716.1
TOTAL IRRIGATION DEMAND	0.0	0.0
AVERAGE IRRIGATION DEMAND	0.0	0.0
MEDIAN IRRIGATION DEMAND	0.0	0.0
TOTAL RUNON	10066.3	2494966.0
AVERAGE RUNON	197.4	48920.9
MEDIAN RUNON	194.9	48304.5
TOTAL SEEPAGE	3313.1	821150.5
AVERAGE SEEPAGE	65.0	16101.0
MEDIAN SEEPAGE	64.8	16059.1
TOTAL EVAPORATION	26361.9	6533876.3
AVERAGE EVAPORATION	516.9	128115.2
MEDIAN EVAPORATION	514.4	127484.8
TOTAL SUBLIMATION LOSSES	0.0	0.0
SNOW PACK AT THE END OF SIMULATION	6.6	1635.8
WATER BALANCE (OVER PERIOD OF RECORD)	-0.1	-28.8

ANNUAL SUMMARIES

	IMPERVIOUS SURFACE				PERVIOUS SURFACE					
YEAR	MSC PRECIP	TOTAL RUNOFF	% RUNOFF	MAX RUNOFF	TOTAL IRRIGATION	TOTAL RUNON	SEEPAGE	EVAPORATION	TOTAL RUNOFF	% RUNOFF
	(mm)	(mm)	(-)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(-)
1960	373.0	277.4	74.4	34.1	0.0	176.1	23.0	492.2	8.2	2.2
1961	392.1	305.6	77.9	35.7	0.0	194.0	64.9	475.7	35.4	9.0
1962	285.3	187.2	65.6	27.4	0.0	118.8	15.2	432.1	0.0	0.0
1963	425.0	341.6	80.4	41.1	0.0	216.9	69.7	532.3	5.1	1.2
1964	392.4	283.1	72.1	38.5	0.0	179.7	67.5	445.3	32.5	8.3
1965	590.2	491.5	83.3	49.2	0.0	312.0	221.6	604.3	82.4	14.0
1966	403.7	322.4	79.9	53.3	0.0	204.7	64.8	504.5	37.8	9.4
1967	256.4	181.2	70.7	20.6	0.0	115.0	33.0	328.3	49.8	19.4
1968	358.6	253.0	70.6	38.3	0.0	160.6	56.2	459.0	0.0	0.0

1969	428.1	357.5	83.5	28.9	0.0	227.0	112.2	546.5	11.9	2.8
1970	397.8	300.1	75.4	74.3	0.0	190.5	45.8	463.4	59.2	14.9
1971	392.5	296.8	75.6	30.7	0.0	188.4	62.7	502.5	9.5	2.4
1972	482.4	395.7	82.0	35.9	0.0	251.2	75.1	594.2	37.0	7.7
1973	361.5	282.2	78.1	23.3	0.0	179.1	19.9	522.5	17.8	4.9
1974	347.7	259.5	74.6	27.9	0.0	164.7	69.2	470.7	13.4	3.8
1975	369.2	255.2	69.1	30.3	0.0	162.0	14.0	472.3	0.0	0.0
1976	405.8	307.0	75.7	28.4	0.0	194.9	33.4	575.4	2.6	0.6
1977	420.5	300.7	71.5	25.5	0.0	190.9	50.9	576.9	0.0	0.0
1978	533.2	426.1	79.9	53.7	0.0	270.5	131.4	620.7	50.4	9.5
1979	285.2	205.9	72.2	24.4	0.0	130.7	2.3	413.3	0.0	0.0
1980	446.2	341.1	76.4	36.6	0.0	216.5	87.7	540.4	8.2	1.8
1981	507.3	392.4	77.4	50.2	0.0	249.1	80.3	681.6	26.5	5.2
1982	420.9	320.8	76.2	30.2	0.0	203.7	67.7	562.0	0.0	0.0
1983	294.8	189.1	64.1	30.8	0.0	120.0	13.2	396.5	0.0	0.0
1984	367.2	280.8	76.5	39.2	0.0	178.3	85.0	449.3	0.0	0.0
1985	388.7	301.5	77.6	91.0	0.0	191.4	37.3	451.3	87.6	22.5
1986	462.3	362.1	78.3	59.1	0.0	229.9	111.9	510.6	87.5	18.9
1987	351.8	258.5	73.5	21.4	0.0	164.1	75.8	455.1	0.0	0.0
1988	404.7	313.7	77.5	63.4	0.0	199.1	81.4	481.2	35.6	8.8
1989	387.5	269.4	69.5	20.4	0.0	171.0	0.0	529.0	0.0	0.0
1990	398.2	270.0	67.8	27.8	0.0	171.4	56.1	514.4	0.0	0.0
1991	406.6	308.0	75.8	33.0	0.0	195.5	89.3	534.7	0.0	0.0
1992	494.9	360.9	72.9	43.0	0.0	229.1	76.1	529.5	63.2	12.8
1993	449.5	353.1	78.6	36.6	0.0	224.2	100.0	616.7	18.8	4.2
1994	355.1	258.1	72.7	24.2	0.0	163.8	17.0	482.6	0.0	0.0
1995	414.8	308.3	74.3	33.8	0.0	195.7	62.9	506.4	0.0	0.0
1996	376.4	266.0	70.7	28.8	0.0	168.9	42.4	470.8	30.9	8.2
1997	425.2	353.3	83.1	40.4	0.0	224.3	93.1	540.0	81.3	19.1
1998	537.7	431.0	80.2	52.0	0.0	273.6	149.8	554.8	80.3	14.9
1999	458.6	362.0	78.9	50.8	0.0	229.8	123.8	568.7	23.5	5.1
2000	412.6	312.9	75.8	30.0	0.0	198.6	30.8	572.9	0.0	0.0
2001	318.4	244.8	76.9	25.8	0.0	155.4	36.5	407.3	12.8	4.0
2002	344.5	241.4	70.1	24.4	0.0	153.2	2.1	495.6	0.0	0.0
2003	430.0	343.6	79.9	26.8	0.0	218.1	63.1	576.6	0.0	0.0
2004	386.8	262.2	67.8	44.2	0.0	166.5	18.3	550.3	0.0	0.0
2005	539.6	445.0	82.5	63.2	0.0	282.5	137.8	553.2	140.9	26.1
2006	419.6	320.3	76.3	31.0	0.0	203.3	92.9	493.2	8.2	2.0
2007	511.4	399.8	78.2	70.8	0.0	253.8	87.1	631.1	69.2	13.5
2008	502.6	368.8	73.4	33.4	0.0	234.1	87.4	595.8	13.1	2.6
2009	328.0	232.4	70.9	27.8	0.0	147.5	28.5	436.1	28.2	8.6
2010	454.5	355.8	78.3	32.8	0.0	225.9	45.2	641.9	0.0	0.0

STORAGE/ REUSE TANK	(m3)
MAXIMUM VOLUME	0.0
MINIMUM VOLUME	0.0
TOTAL INFLOW	0.0
TOTAL DEMAND	0.0
TOTAL OVERFLOW	0.0
TOTAL MUN. MAKE-UP WATER	0.0
TOTAL RECHARGE	0.0

TOTAL AREA	
TOTAL IMPERVIOUS AREA	
DIRECTLY CONNECTED IMPERVIOUS AREA	
IMPERVIOUS TO ABSORBENT LANDSCAPING	
IMPERVIOUS TO BIORETENTION	
PERVIOUS AREA	
ABSORBENT LANDSCAPING AREA	
GREEN ROOF AREA	
BIORETENTION AREA	

SC1: ABSORBENT AREA	(mm)	(m3)
TOTAL MSC PRECIPITATION	20897.0	0.0
TOTAL RUNOFF	2415.9	0.0
% OF RAINFALL AS RUNOFF	11.6	
AVERAGE RUNOFF	47.4	0.0
MEDIAN RUNOFF	40.7	0.0
MAXIMUM RUNOFF (ANY TIMESTEP)	72.1	0.0
TOTAL IRRIGATION DEMAND	0.0	0.0
AVERAGE IRRIGATION DEMAND	0.0	0.0
MEDIAN IRRIGATION DEMAND	0.0	0.0
TOTAL RUNON	0.0	0.0
AVERAGE RUNON	0.0	0.0
MEDIAN RUNON	0.0	0.0
TOTAL SEEPAGE	4454.9	0.0
AVERAGE SEEPAGE	87.4	0.0
MEDIAN SEEPAGE	82.5	0.0
TOTAL EVAPORATION	14043.4	0.0
AVERAGE EVAPORATION	275.4	0.0
MEDIAN EVAPORATION	277.5	0.0
TOTAL SUBLIMATION LOSSES	0.0	0.0
SNOW PACK AT THE END OF SIMULATION	6.6	0.0
WATER BALANCE (OVER PERIOD OF RECORD)	-39.5	0.0

SC1: GREENROOF	(mm)
TOTAL MSC PRECIPITATION	20897.0
TOTAL RUNOFF	726.2
% OF RAINFALL AS RUNOFF	3.5
AVERAGE RUNOFF	14.2
MEDIAN RUNOFF	8.2
MAXIMUM RUNOFF (ANY TIMESTEP)	42.4
TOTAL IRRIGATION DEMAND	0.0
AVERAGE IRRIGATION DEMAND	0.0
MEDIAN IRRIGATION DEMAND	0.0
TOTAL RUNON	0.0
AVERAGE RUNON	0.0
MEDIAN RUNON	0.0
TOTAL SEEPAGE	20110.1
AVERAGE SEEPAGE	394.3
MEDIAN SEEPAGE	390.4
TOTAL EVAPORATION	0.0
AVERAGE EVAPORATION	0.0
MEDIAN EVAPORATION	0.0
TOTAL SUBLIMATION LOSSES	0.0
SNOW PACK AT THE END OF SIMULATION	6.6
WATER BALANCE (OVER PERIOD OF RECORD)	0.0

ABSORBENT LANDSCAPING

MAX RUNOFF	TOTAL IRRIGATION	TOTAL RUNON	SEEPAGE	EVAPORATION	TOTAL RUNOFF	% RUNOFF
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(-)
8.2	0.0	0.0	69.8	263.9	20.9	5.6
18.7	0.0	0.0	104.5	254.4	41.0	10.5
0.0	0.0	0.0	53.2	224.3	14.4	5.1
5.1	0.0	0.0	77.7	264.5	70.5	16.6
26.2	0.0	0.0	67.5	238.8	62.8	16.0
22.4	0.0	0.0	152.5	315.3	140.1	23.7
15.7	0.0	0.0	91.8	233.0	79.4	19.7
20.2	0.0	0.0	50.4	177.3	40.7	15.9
0.0	0.0	0.0	82.4	225.9	41.5	11.6

GREEN ROOF MEDIA

MAX RUNOFF	TOTAL IRRIGATION	TOTAL RUNON	SEEPAGE	EVAPORATION
(mm)	(mm)	(mm)	(mm)	(mm)
16.5	0.0	0.0	312.9	0.0
17.7	0.0	0.0	386.7	0.0
8.5	0.0	0.0	292.3	0.0
23.9	0.0	0.0	402.1	0.0
19.6	0.0	0.0	378.4	0.0
30.3	0.0	0.0	573.7	0.0
34.6	0.0	0.0	390.4	0.0
24.6	0.0	0.0	236.3	0.0
22.6	0.0	0.0	357.2	0.0

9.6	0.0	0.0	103.7	294.7	51.1	11.9	12.9	0.0	0.0	436.0	0.0
49.0	0.0	0.0	82.1	241.5	55.4	13.9	55.4	0.0	0.0	355.8	0.0
9.1	0.0	0.0	78.9	256.5	57.4	14.6	15.2	0.0	0.0	376.4	0.0
35.1	0.0	0.0	90.2	307.0	77.2	16.0	19.0	0.0	0.0	439.4	0.0
14.8	0.0	0.0	73.6	263.8	40.3	11.2	17.0	0.0	0.0	352.1	0.0
11.7	0.0	0.0	73.4	251.1	43.3	12.4	24.7	0.0	0.0	347.0	0.0
0.0	0.0	0.0	48.3	274.0	16.6	4.5	11.4	0.0	0.0	335.1	0.0
2.6	0.0	0.0	60.3	323.0	30.9	7.6	9.8	0.0	0.0	397.0	0.0
0.0	0.0	0.0	115.6	277.5	31.4	7.5	9.2	0.0	0.0	424.7	0.0
20.6	0.0	0.0	128.8	320.6	89.1	16.7	40.0	0.0	0.0	512.0	0.0
0.0	0.0	0.0	56.5	225.7	8.8	3.1	5.5	0.0	0.0	285.6	0.0
8.2	0.0	0.0	129.7	282.1	31.4	7.0	17.7	0.0	0.0	425.2	0.0
16.3	0.0	0.0	141.8	332.2	52.8	10.4	31.3	0.0	0.0	497.7	0.0
0.0	0.0	0.0	95.5	304.5	17.2	4.1	11.3	0.0	0.0	409.8	0.0
0.0	0.0	0.0	49.5	215.7	16.4	5.5	11.9	0.0	0.0	284.6	0.0
0.0	0.0	0.0	75.1	275.7	25.6	7.0	20.3	0.0	0.0	368.5	0.0
87.6	0.0	0.0	65.3	245.6	77.4	19.9	72.1	0.0	0.0	345.2	0.0
53.0	0.0	0.0	103.6	276.5	88.8	19.2	40.2	0.0	0.0	462.6	0.0
0.0	0.0	0.0	111.8	242.2	3.8	1.1	2.5	0.0	0.0	356.5	0.0
35.5	0.0	0.0	82.5	259.6	63.5	15.7	48.5	0.0	0.0	381.2	0.0
0.0	0.0	0.0	46.6	322.7	4.4	1.1	2.0	0.0	0.0	358.7	0.0
0.0	0.0	0.0	75.7	309.6	8.9	2.2	8.9	0.0	0.0	398.0	0.0
0.0	0.0	0.0	91.1	298.7	34.8	8.6	14.1	0.0	0.0	396.1	0.0
39.5	0.0	0.0	95.3	293.9	78.6	15.9	30.5	0.0	0.0	461.4	0.0
9.9	0.0	0.0	111.9	308.0	60.0	13.4	17.7	0.0	0.0	454.2	0.0
0.0	0.0	0.0	70.6	264.7	12.9	3.6	9.2	0.0	0.0	350.2	0.0
0.0	0.0	0.0	71.4	296.8	36.8	8.9	20.4	0.0	0.0	385.4	0.0
22.3	0.0	0.0	89.4	228.3	34.8	9.2	16.6	0.0	0.0	336.2	0.0
24.1	0.0	0.0	80.9	283.9	101.2	23.8	23.6	0.0	0.0	433.6	0.0
51.5	0.0	0.0	141.5	305.6	74.7	13.9	35.0	0.0	0.0	472.3	0.0
13.5	0.0	0.0	103.1	297.9	76.4	16.7	31.9	0.0	0.0	478.7	0.0
0.0	0.0	0.0	94.4	288.9	19.4	4.7	11.1	0.0	0.0	399.9	0.0
12.8	0.0	0.0	71.5	219.1	22.9	7.2	11.5	0.0	0.0	301.3	0.0
0.0	0.0	0.0	57.2	283.8	8.2	2.4	5.5	0.0	0.0	333.8	0.0
0.0	0.0	0.0	105.3	294.4	28.1	6.5	7.9	0.0	0.0	411.4	0.0
0.0	0.0	0.0	44.7	313.6	31.3	8.1	25.3	0.0	0.0	389.8	0.0
59.9	0.0	0.0	125.3	288.9	134.0	24.8	48.8	0.0	0.0	546.4	0.0
4.7	0.0	0.0	110.2	245.3	48.2	11.5	18.0	0.0	0.0	397.3	0.0
41.4	0.0	0.0	85.0	328.9	107.8	21.1	51.9	0.0	0.0	474.3	0.0
11.5	0.0	0.0	116.3	329.7	26.5	5.3	14.5	0.0	0.0	465.7	0.0
13.2	0.0	0.0	53.0	253.6	32.8	10.0	24.7	0.0	0.0	283.9	0.0
0.0	0.0	0.0	98.2	320.0	43.1	9.5	14.0	0.0	0.0	459.4	0.0

45.8 ha		
21.1 ha	0.5	of total area
15.7 ha	0.7	of total impervious area
21.1 ha	1.0	of total impervious area
21.1 ha	1.0	of total impervious area
24.8 ha	0.5	of total area
0.0 ha	0.0	of total area
0.0 ha	0.0	of total area
0.0 ha	0.0	of total area

(m3)	SC1: BIOSWALE	(mm)	(m3)	SC1: STORAGE / REUSE
0.0	TOTAL MSC PRECIPITATION	20897.0	0.0	MAXIMUM VOLUME OVER RECOR
0.0	TOTAL SURFACE RUNOFF	0.0	0.0	AVERAGE MAX. VOLUME
	% OF RAINFALL AS SURFACE RUNOFF + SUBDRAI	0.0		MEDIAN MAX. VOLUME
0.0	AVERAGE SURFACE RUNOFF	0.0	0.0	MINIMUM VOLUME OVER RECORI
0.0	MEDIAN SURFACE RUNOFF	0.0	0.0	AVERAGE MIN. VOLUME
0.0	MAXIMUM RUNOFF (ANY TIMESTEP)	0.0	0.0	MEDIAN MIN. VOLUME
0.0	TOTAL RUNON	0.0	0.0	TOTAL INFLOW
0.0	AVERAGE RUNON	0.0	0.0	AVERAGE INFLOW
0.0	MEDIAN RUNON	0.0	0.0	MEDIAN INFLOW
0.0	TOTAL PERCOLATION	245.1	0.0	TOTAL DEMAND
0.0	AVERAGE PERCOLATION	4.8	0.0	AVERAGE DEMAND
0.0	MEDIAN PERCOLATION	0.1	0.0	MEDIAN DEMAND
0.0	TOTAL EVAPORATION	20635.5	0.0	TOTAL OVERFLOW
0.0	AVERAGE EVAPORATION	404.6	0.0	AVERAGE OVERFLOW
0.0	MEDIAN EVAPORATION	398.6	0.0	MEDIAN OVERFLOW
0.0	TOTAL SUBDRAIN	0.0	0.0	TOTAL MUN. MAKE-UP WATER
0.0	AVERAGE SUBDRAIN	0.0	0.0	AVERAGE MUN. MAKE-UP WATEF
0.0	MEDIAN SUBDRAIN	0.0	0.0	MEDIAN MUN. MAKE-UP WATER
0.0	TOTAL SUBLIMATION LOSSES	0.0	0.0	TOTAL RECHARGE FROM PONDS
0.0	SNOW PACK AT THE END OF SIMULATION	6.6	0.0	AVERAGE RECHARGE FROM PON
0.0	WATER BALANCE (OVER PERIOD OF RECORD)	-0.1	0.0	MEDIAN RECHARGE FROM POND
				WATER BALANCE (OVER PERIOD

BIOSWALE / BIORETENTION MEDIA

STORAGE / REUSE SYSTEM

TOTAL RUNOFF	% RUNOFF	MAX RUNOFF	TOTAL RUNON	PERCOLATION	EVAPORATION	SUBDRAIN	TOTAL RUNOFF	% RUNOFF	MAX RUNOFF	TOTAL INFLOW	MAX VOLUME
(mm)	(-)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(-)	(mm)	(m3)	(m3)
0.0	0.0	0.0	0.0	0.0	356.2	0.0	0.0	0.0	0.0	0.0	0.0
17.1	4.4	7.4	0.0	1.6	390.9	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	300.3	0.0	0.0	0.0	0.0	0.0	0.0
4.9	1.1	3.9	0.0	0.1	405.3	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.4	370.8	0.0	0.0	0.0	0.0	0.0	0.0
21.0	3.6	6.3	0.0	26.5	572.4	0.0	0.0	0.0	0.0	0.0	0.0
13.3	3.3	7.2	0.0	1.7	398.6	0.0	0.0	0.0	0.0	0.0	0.0
32.5	12.7	11.0	0.0	13.2	271.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.1	350.4	0.0	0.0	0.0	0.0	0.0	0.0

8.2	1.9	4.1	0.0	1.0	448.9	0.0	0.0	0.0	0.0	0.0	0.0
28.0	7.1	27.9	0.0	22.8	352.8	0.0	0.0	0.0	0.0	0.0	0.0
7.3	1.8	5.1	0.0	0.2	387.8	0.0	0.0	0.0	0.0	0.0	0.0
31.5	6.5	23.8	0.0	0.1	471.9	0.0	0.0	0.0	0.0	0.0	0.0
24.5	6.8	13.2	0.0	0.0	367.9	0.0	0.0	0.0	0.0	0.0	0.0
22.7	6.5	9.2	0.0	0.0	378.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	334.2	0.0	0.0	0.0	0.0	0.0	0.0
17.5	4.3	8.6	0.0	0.0	417.9	0.0	0.0	0.0	0.0	0.0	0.0
10.1	2.4	3.9	0.0	0.0	426.1	0.0	0.0	0.0	0.0	0.0	0.0
19.3	3.6	6.9	0.0	1.9	535.9	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	287.5	0.0	0.0	0.0	0.0	0.0	0.0
5.3	1.2	3.6	0.0	3.2	427.3	0.0	0.0	0.0	0.0	0.0	0.0
32.8	6.5	15.4	0.0	2.7	530.9	0.0	0.0	0.0	0.0	0.0	0.0
14.8	3.5	4.2	0.0	0.0	416.8	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	282.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	1.2	354.4	0.0	0.0	0.0	0.0	0.0	0.0
42.4	10.9	42.4	0.0	25.2	362.2	0.0	0.0	0.0	0.0	0.0	0.0
7.8	1.7	7.8	0.0	35.7	436.8	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	370.8	0.0	0.0	0.0	0.0	0.0	0.0
17.9	4.4	17.9	0.0	5.4	399.2	0.0	0.0	0.0	0.0	0.0	0.0
3.9	1.0	2.5	0.0	0.0	370.2	0.0	0.0	0.0	0.0	0.0	0.0
5.3	1.3	1.5	0.0	0.1	394.6	0.0	0.0	0.0	0.0	0.0	0.0
22.8	5.6	10.4	0.0	0.0	425.4	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	15.3	437.7	0.0	0.0	0.0	0.0	0.0	0.0
36.8	8.2	12.7	0.0	0.1	493.3	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	348.4	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	385.0	0.0	0.0	0.0	0.0	0.0	0.0
37.3	9.9	12.3	0.0	0.0	371.2	0.0	0.0	0.0	0.0	0.0	0.0
35.7	8.4	9.5	0.0	1.2	466.0	0.0	0.0	0.0	0.0	0.0	0.0
37.4	7.0	31.3	0.0	16.8	504.5	0.0	0.0	0.0	0.0	0.0	0.0
2.1	0.5	2.1	0.0	1.6	476.1	0.0	0.0	0.0	0.0	0.0	0.0
14.5	3.5	8.4	0.0	0.0	402.2	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.6	311.8	0.0	0.0	0.0	0.0	0.0	0.0
10.9	3.2	7.1	0.0	0.0	348.0	0.0	0.0	0.0	0.0	0.0	0.0
16.4	3.8	8.3	0.0	0.0	427.3	0.0	0.0	0.0	0.0	0.0	0.0
5.5	1.4	4.0	0.0	0.0	389.8	0.0	0.0	0.0	0.0	0.0	0.0
2.4	0.4	2.4	0.0	48.3	499.2	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	1.2	402.6	0.0	0.0	0.0	0.0	0.0	0.0
54.3	10.6	21.7	0.0	16.4	505.3	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.4	470.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	18.5	24.2	0.0	0.0	339.8	0.0	0.0	0.0	0.0	0.0	0.0
1.4	0.3	0.6	0.0	0.0	461.5	0.0	0.0	0.0	0.0	0.0	0.0

(m3)

D	0.0
	0.0
	0.0
)	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
	0.0
۲	0.0
	0.0
	0.0
IDS	0.0
S	0.0
OF RECORD)	0.0

MIN VOLUME	TOTAL DEMAND	TOTAL OVERFLOW	TOTAL MUNICIPAL MAKE-UP WATER	RECHARGE VOLUME	SUB CATCHMEN DISCHARGE	EXTERNAL RUN-ON TOTAL INFLOW VOLUME
(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)
0.0	0.0	0.0	0.0	0.0	16824.8	0.0
0.0	0.0	0.0	0.0	0.0	25068.3	0.0
0.0	0.0	0.0	0.0	0.0	9976.0	0.0
0.0	0.0	0.0	0.0	0.0	19474.0	0.0
0.0	0.0	0.0	0.0	0.0	23145.5	0.0
0.0	0.0	0.0	0.0	0.0	46618.2	0.0
0.0	0.0	0.0	0.0	0.0	26550.5	0.0
0.0	0.0	0.0	0.0	0.0	22007.0	0.0
0.0	0.0	0.0	0.0	0.0	13482.5	0.0

0.0	0.0	0.0	0.0	0.0	21988.6	0.0
0.0	0.0	0.0	0.0	0.0	30674.4	0.0
0.0	0.0	0.0	0.0	0.0	18178.1	0.0
0.0	0.0	0.0	0.0	0.0	30260.5	0.0
0.0	0.0	0.0	0.0	0.0	19441.8	0.0
0.0	0.0	0.0	0.0	0.0	17145.7	0.0
0.0	0.0	0.0	0.0	0.0	13599.7	0.0
0.0	0.0	0.0	0.0	0.0	16992.3	0.0
0.0	0.0	0.0	0.0	0.0	16024.4	0.0
0.0	0.0	0.0	0.0	0.0	35201.2	0.0
0.0	0.0	0.0	0.0	0.0	10972.5	0.0
0.0	0.0	0.0	0.0	0.0	20208.3	0.0
0.0	0.0	0.0	0.0	0.0	27483.9	0.0
0.0	0.0	0.0	0.0	0.0	17095.6	0.0
0.0	0.0	0.0	0.0	0.0	10077.2	0.0
0.0	0.0	0.0	0.0	0.0	14963.9	0.0
0.0	0.0	0.0	0.0	0.0	37783.2	0.0
0.0	0.0	0.0	0.0	0.0	40990.3	0.0
0.0	0.0	0.0	0.0	0.0	13775.6	0.0
0.0	0.0	0.0	0.0	0.0	25544.2	0.0
0.0	0.0	0.0	0.0	0.0	14356.4	0.0
0.0	0.0	0.0	0.0	0.0	14388.4	0.0
0.0	0.0	0.0	0.0	0.0	16413.4	0.0
0.0	0.0	0.0	0.0	0.0	34894.4	0.0
0.0	0.0	0.0	0.0	0.0	23485.2	0.0
0.0	0.0	0.0	0.0	0.0	13754.3	0.0
0.0	0.0	0.0	0.0	0.0	16429.4	0.0
0.0	0.0	0.0	0.0	0.0	21828.2	0.0
0.0	0.0	0.0	0.0	0.0	38966.3	0.0
0.0	0.0	0.0	0.0	0.0	42877.0	0.0
0.0	0.0	0.0	0.0	0.0	25123.6	0.0
0.0	0.0	0.0	0.0	0.0	16674.6	0.0
0.0	0.0	0.0	0.0	0.0	16218.6	0.0
0.0	0.0	0.0	0.0	0.0	12864.3	0.0
0.0	0.0	0.0	0.0	0.0	18310.6	0.0
0.0	0.0	0.0	0.0	0.0	13972.7	0.0
0.0	0.0	0.0	0.0	0.0	58628.6	0.0
0.0	0.0	0.0	0.0	0.0	19099.6	0.0
0.0	0.0	0.0	0.0	0.0	38463.6	0.0
0.0	0.0	0.0	0.0	0.0	22894.1	0.0
0.0	0.0	0.0	0.0	0.0	19377.4	0.0
0.0	0.0	0.0	0.0	0.0	18960.7	0.0

POND 1 **POND #1** **CATCHMENT AREA SIZE**

DISCHARGES TO OUTFALL 45.8 ha - DIRECT

45.8 ha - TOTAL

	MAX	MIN	AVG	MEDIAN
VOLUME (m3)	34545.6	7395.9	8669.4	8624.9
LEVEL (m)	1303.5	1300.3	1300.5	1300.6

UNIT AREA RESULTS BASED ON TOTAL CATCHMENT SIZE

	MAX	TOTAL	AVG	MEDIAN		MAX	TOTAL	AVG	MEDIAN
INFLOW (m3)	59721.0	1171923.9	22978.9	19533.6	(mm)	130.3	2556.1	50.1	42.6
DIRECT PRECIPITATION (m3)	3373.2	107016.3	2098.4	2050.4	(mm)	7.4	233.4	4.6	4.5
EVAPORATION LOSS (m3)	4043.0	188286.3	3691.9	3683.9	(mm)	8.8	410.7	8.1	8.0
SEEPAGE LOSS (m3)	0.0	0.0	0.0	0.0	(mm)	0.0	0.0	0.0	0.0
DISCHARGE (m3)	59234.0	1090198.8	21376.4	17533.5	(mm)	129.2	2377.8	46.6	38.2
OVERFLOW (m3)	0.0	0.0	0.0	0.0	(mm)	0.0	0.0	0.0	0.0
MAKE-UP WATER (m3)	0.0	0.0	0.0	0.0	(mm)	0.0	0.0	0.0	0.0
DEMAND (m3)	0.0	0.0	0.0	0.0	(mm)	0.0	0.0	0.0	0.0
WATER BALANCE (m3)		0.0							

ANNUAL SUMMARIES

POND #1

YEAR	VOLUME MAX	VOLUME MIN	LEVEL MAX	LEVEL MIN	Inflow	Direct Precipitation	Evaporation	Seepage	Discharge	Overflow	Make-Up Water	Demand
	(m3)	(m3)	(m)	(m)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)	(m3)
1960	11354.5	8174.9	1301.1	1300.5	16938.1	1827.8	3678.0	0.0	14633.6	0.0	0.0	0.0
1961	16319.3	7969.3	1301.9	1300.5	25213.7	1999.9	3737.6	0.0	23475.9	0.0	0.0	0.0
1962	9511.2	8317.2	1300.8	1300.5	9979.8	1399.8	3445.7	0.0	8020.4	0.0	0.0	0.0
1963	10700.8	8067.7	1301.0	1300.5	19580.4	2119.4	3766.0	0.0	17846.0	0.0	0.0	0.0
1964	15790.1	7804.0	1301.8	1300.4	23394.9	1983.1	3499.8	0.0	21880.7	0.0	0.0	0.0
1965	13606.1	8256.1	1301.5	1300.5	47331.6	2996.8	3191.1	0.0	47134.0	0.0	0.0	0.0
1966	14575.1	8162.0	1301.7	1300.5	27057.8	2062.6	3488.2	0.0	25634.6	0.0	0.0	0.0
1967	13563.1	7395.9	1301.5	1300.3	22571.0	1245.8	3558.6	0.0	20571.2	0.0	0.0	0.0
1968	10112.5	8231.3	1300.9	1300.5	13577.9	1774.4	3321.1	0.0	11718.8	0.0	0.0	0.0
1969	11686.8	8279.6	1301.2	1300.5	22134.4	2146.2	3654.0	0.0	20645.6	0.0	0.0	0.0
1970	23756.0	8130.0	1302.8	1300.5	31202.1	2389.8	4008.9	0.0	29565.4	0.0	0.0	0.0
1971	10861.8	8161.3	1301.0	1300.5	18418.9	1936.1	4043.0	0.0	16311.3	0.0	0.0	0.0
1972	17390.2	8377.1	1302.1	1300.5	30676.6	2395.2	3578.2	0.0	29481.9	0.0	0.0	0.0
1973	11897.9	8360.6	1301.2	1300.5	19607.7	1780.1	3928.8	0.0	17470.4	0.0	0.0	0.0
1974	11918.9	8090.1	1301.2	1300.5	17449.4	1717.2	3711.5	0.0	15456.1	0.0	0.0	0.0
1975	9584.6	8331.2	1300.8	1300.5	13599.7	1809.8	3659.8	0.0	11725.8	0.0	0.0	0.0
1976	10173.9	8331.2	1300.9	1300.5	17015.7	2005.0	3958.5	0.0	15080.3	0.0	0.0	0.0
1977	9521.1	8097.3	1300.8	1300.5	16105.1	2072.1	3852.3	0.0	14327.3	0.0	0.0	0.0
1978	15519.0	8476.3	1301.8	1300.6	35795.1	2716.3	3504.5	0.0	35010.2	0.0	0.0	0.0
1979	9483.8	8199.7	1300.8	1300.5	10972.5	1395.4	3693.9	0.0	8677.2	0.0	0.0	0.0
1980	11150.7	8014.0	1301.1	1300.5	20208.3	2212.2	3790.3	0.0	18620.9	0.0	0.0	0.0
1981	15173.3	8290.6	1301.7	1300.5	27780.6	2570.9	3802.9	0.0	26557.0	0.0	0.0	0.0
1982	9614.5	8199.1	1300.8	1300.5	17095.6	2076.5	3643.4	0.0	15527.1	0.0	0.0	0.0
1983	9449.1	8171.2	1300.8	1300.5	10077.2	1447.4	3656.8	0.0	7867.1	0.0	0.0	0.0
1984	9728.8	8102.8	1300.8	1300.5	14989.2	1812.6	3639.9	0.0	13161.8	0.0	0.0	0.0
1985	34545.6	8146.4	1303.5	1300.5	38602.6	2492.7	3794.0	0.0	37304.2	0.0	0.0	0.0
1986	25108.7	8154.2	1302.9	1300.5	41746.7	2746.8	3683.3	0.0	40824.7	0.0	0.0	0.0
1987	9498.2	7940.4	1300.8	1300.4	13775.6	1738.2	3943.5	0.0	11609.3	0.0	0.0	0.0
1988	19656.1	7832.8	1302.4	1300.4	25983.8	2148.0	3940.9	0.0	24140.1	0.0	0.0	0.0
1989	9293.6	8390.1	1300.7	1300.5	14356.4	1899.8	3652.2	0.0	12586.9	0.0	0.0	0.0
1990	9626.8	8390.0	1300.8	1300.5	14388.4	1964.0	3602.3	0.0	12762.4	0.0	0.0	0.0
1991	9698.3	8135.0	1300.8	1300.5	16413.4	2010.4	3741.5	0.0	14711.1	0.0	0.0	0.0
1992	24279.0	8328.7	1302.8	1300.5	35429.2	2663.1	3523.0	0.0	34538.8	0.0	0.0	0.0
1993	11006.8	8371.3	1301.1	1300.5	23854.2	2239.1	3395.4	0.0	22701.6	0.0	0.0	0.0
1994	9633.8	8259.6	1300.8	1300.5	13754.3	1750.9	3782.5	0.0	11719.7	0.0	0.0	0.0
1995	9814.5	8469.7	1300.8	1300.6	16501.0	2050.4	3503.8	0.0	15048.1	0.0	0.0	0.0
1996	13783.9	8093.5	1301.5	1300.5	22109.4	1844.7	3448.2	0.0	20501.5	0.0	0.0	0.0
1997	15997.2	8220.8	1301.9	1300.5	39576.9	2173.3	3761.2	0.0	37995.3	0.0	0.0	0.0
1998	23058.4	8177.5	1302.7	1300.5	43489.0	2958.5	3884.6	0.0	42554.4	0.0	0.0	0.0
1999	14453.6	8344.0	1301.6	1300.5	25387.9	2336.6	3513.2	0.0	24245.7	0.0	0.0	0.0
2000	9703.0	8379.4	1300.8	1300.5	16674.6	2039.2	3873.4	0.0	14811.1	0.0	0.0	0.0
2001	12535.5	8021.7	1301.3	1300.5	16301.3	1584.3	3994.8	0.0	13893.8	0.0	0.0	0.0
2002	9424.5	8153.1	1300.8	1300.5	12864.3	1687.5	3671.2	0.0	10875.5	0.0	0.0	0.0
2003	9657.4	8322.5	1300.8	1300.5	18310.6	2124.7	3684.4	0.0	16760.5	0.0	0.0	0.0
2004	10194.5	8430.3	1300.9	1300.6	14067.5	1907.3	3688.7	0.0	12276.6	0.0	0.0	0.0
2005	30400.2	8274.3	1303.3	1300.5	59721.0	3373.2	3867.6	0.0	59234.0	0.0	0.0	0.0
2006	10764.5	8134.9	1301.0	1300.5	19335.2	2096.1	3674.6	0.0	17697.7	0.0	0.0	0.0
2007	25904.2	8310.8	1303.0	1300.5	39088.9	2933.1	3795.4	0.0	38281.2	0.0	0.0	0.0
2008	11976.2	8417.9	1301.2	1300.6	22920.8	2502.4	3702.1	0.0	21718.0	0.0	0.0	0.0
2009	11840.8	8124.2	1301.2	1300.5	19533.6	1609.3	3668.0	0.0	17472.7	0.0	0.0	0.0
2010	9761.0	8331.5	1300.8	1300.5	18964.0	2250.3	3683.9	0.0	17533.5	0.0	0.0	0.0

POND 2 **POND #2** **CATCHMENT AREA SIZE**

DISCHARGES TO

0.0 ha - DIRECT

0.0 ha - TOTAL

	MAX	MIN	AVG	MEDIAN
VOLUME (m3)	0.0	0.0	0.0	0.0
LEVEL (m)	0.0	0.0	0.0	0.0

	MAX	TOTAL	AVG	MEDIAN
INFLOW (m3)	0.0	0.0	0.0	0.0
DIRECT PRECIPITATION (m3)	0.0	0.0	0.0	0.0
EVAPORATION LOSS (m3)	0.0	0.0	0.0	0.0
SEEPAGE LOSS (m3)	0.0	0.0	0.0	0.0
DISCHARGE (m3)	0.0	0.0	0.0	0.0
OVERFLOW (m3)	0.0	0.0	0.0	0.0
MAKE-UP WATER (m3)	0.0	0.0	0.0	0.0
DEMAND (m3)	0.0	0.0	0.0	0.0
WATER BALANCE (m3)		0.0		

UNIT AREA RESULTS BASED ON TOTAL CATCHMENT SIZE

	MAX	TOTAL	AVG	MEDIAN
(mm)	N/A	N/A	N/A	N/A
(mm)	N/A	N/A	N/A	N/A
(mm)	N/A	N/A	N/A	N/A
(mm)	N/A	N/A	N/A	N/A
(mm)	N/A	N/A	N/A	N/A
(mm)	N/A	N/A	N/A	N/A
(mm)	N/A	N/A	N/A	N/A
(mm)	N/A	N/A	N/A	N/A

POND #2

VOLUME MAX (m3)	VOLUME MIN (m3)	LEVEL MAX (m)	LEVEL MIN (m)	Inflow (m3)	Direct Precipitation (m3)	Evaporation (m3)	Seepage (m3)	Discharge (m3)	Overflow (m3)	Make-Up Water (m3)	Demand (m3)
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

POND #1 -> POND #2		POND #2 -> POND #1		OUTFALL	
TOT VOLUME	MAX VOLUME	TOT VOLUME	MAX VOLUME	TOT VOLUME	MAX VOLUME
(m3)	(m3)	(m3)	(m3)	(m3)	(m3)
0.0	0.0	0.0	0.0	14633.6	1284.0
0.0	0.0	0.0	0.0	23475.9	3052.8
0.0	0.0	0.0	0.0	8020.4	552.1
0.0	0.0	0.0	0.0	17846.0	1161.3
0.0	0.0	0.0	0.0	21880.7	2774.6
0.0	0.0	0.0	0.0	47134.0	2227.0
0.0	0.0	0.0	0.0	25634.6	2902.8
0.0	0.0	0.0	0.0	20571.2	2219.3
0.0	0.0	0.0	0.0	11718.8	942.7
0.0	0.0	0.0	0.0	20645.6	1585.8
0.0	0.0	0.0	0.0	29565.4	4030.6
0.0	0.0	0.0	0.0	16311.3	1110.1
0.0	0.0	0.0	0.0	29481.9	3111.1
0.0	0.0	0.0	0.0	17470.4	1512.1
0.0	0.0	0.0	0.0	15456.1	1520.9
0.0	0.0	0.0	0.0	11725.8	602.2
0.0	0.0	0.0	0.0	15080.3	1065.1
0.0	0.0	0.0	0.0	14327.3	559.1
0.0	0.0	0.0	0.0	35010.2	3096.5
0.0	0.0	0.0	0.0	8677.2	536.0
0.0	0.0	0.0	0.0	18620.9	1468.0
0.0	0.0	0.0	0.0	26557.0	2777.2
0.0	0.0	0.0	0.0	15527.1	620.7
0.0	0.0	0.0	0.0	7867.1	622.2
0.0	0.0	0.0	0.0	13161.8	761.8
0.0	0.0	0.0	0.0	37304.2	4742.8
0.0	0.0	0.0	0.0	40824.7	4265.4
0.0	0.0	0.0	0.0	11609.3	607.4
0.0	0.0	0.0	0.0	24140.1	3504.1
0.0	0.0	0.0	0.0	12586.9	419.0
0.0	0.0	0.0	0.0	12762.4	634.0
0.0	0.0	0.0	0.0	14711.1	685.8
0.0	0.0	0.0	0.0	34538.8	4045.7
0.0	0.0	0.0	0.0	22701.6	1133.9
0.0	0.0	0.0	0.0	11719.7	670.1
0.0	0.0	0.0	0.0	15048.1	744.5
0.0	0.0	0.0	0.0	20501.5	2301.4
0.0	0.0	0.0	0.0	37995.3	2817.5
0.0	0.0	0.0	0.0	42554.4	4089.8
0.0	0.0	0.0	0.0	24245.7	2705.8
0.0	0.0	0.0	0.0	14811.1	671.9
0.0	0.0	0.0	0.0	13893.8	1770.5
0.0	0.0	0.0	0.0	10875.5	498.7
0.0	0.0	0.0	0.0	16760.5	757.5
0.0	0.0	0.0	0.0	12276.6	975.7
0.0	0.0	0.0	0.0	59234.0	4541.0
0.0	0.0	0.0	0.0	17697.7	1309.1
0.0	0.0	0.0	0.0	38281.2	4213.2
0.0	0.0	0.0	0.0	21718.0	1719.6
0.0	0.0	0.0	0.0	17472.7	1486.3
0.0	0.0	0.0	0.0	17533.5	707.9