Summit Credit Union – Waukesha Branch
Waukesha, Wisconsin
Stormwater Management and Erosion Control Plan

www.JSDinc.com



Planning & Development
Site/Civil Engineering
Transportation Engineering
Structural Engineering
Water Resources
Landscape Architecture
Surveying & Mapping
Construction Management

Prepared for:
Summit Credit Union
4800 American Parkway
Madison, WI 53718

JSD Project No.: 18-8469

April 6, 2018

Prepared by: Corey Huhta, P.E, C.F.M

JSD Professional Services, Inc.
• Engineers • Surveyors • Planners

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APPENDICES

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1.0 INTRODUCTION

This technical report shall serve as the stormwater management design report for the Summit Credit Union project in the City of Waukesha, Waukesha County, Wisconsin.

The proposed project is a 1.13-acre project located on Lot of Certified Survey Map (CSM) 10663. The site is a redevelopment of the existing Sonic Drive-in restaurant between East Moreland Road (USH 18) and Heritage Lane. The project scope includes the demolition of the existing building, drive-in, parking canopies, and associated parking lots. The project consists of a 3,900 square foot building, 20 parking stalls, reconnection of access drives, and an underground water quality chamber. The stormwater facilities are reconnected to the storm sewer pipe connection in Heritage Lane. The proposed construction start date is anticipated for Spring 2019 with project completion by Fall 2019.

2.0 EXISTING CONDITIONS

The existing impervious area of the site is 0.752 acres consisting of asphalt parking, driveways, sidewalk, and building footprint. The proposed impervious of the site is 0.706 acres consisting of the same. There is a decrease of 0.044 acres of impervious area with an overall site impervious ratio of 62.4%. The existing site drains to an existing private stormwater system that connects to public storm sewer within Heritage Lane to the north. The existing site generally slopes to the north with a relief of 11 feet across the site. Refer to **Appendix 1** for the ALTA/NSPS Land Title Survey for the project.

A geotechnical report is being prepared for the site and will be provided during permitting. The NRCS web soil survey report was consulted for hydrologic soil groups. The NCRS web soil survey report is located in **Appendix 2**.

Stormwater runoff form the existing site consists of a single watershed. An existing watershed map can be found in **Appendix 4**.

3.0 DESIGN CRITERIA

3.1 Municipal Code of the City of Waukesha, Wisconsin
Chapter 32 – Stormwater Management and Erosion Control

3.3 Waukesha County Code of Ordinances
Chapter 14, Article VIII – Stormwater Management and Erosion Control Ordinance

3.4 Wisconsin Administrative Code
WDNR – Technical Standards (NR 151 and NR 216)

The site will need to meet the criteria for a redevelopment site. Therefore, the requirements for this site include:

- Maintain pre-development peak discharges for the 1-, 5-, and 100-year, 24-hour storm events.
- Reduce the total suspended solids by 40% during the 1-year, 24-hour storm event assuming no re-suspension.

4.0 ANALYSIS

The stormwater management and erosion control plan have been written and analyzed for the development. Construction will include both on-site stormwater management and erosion control.

HydroCAD© stormwater modeling system (Version 10.00-20) has been used to analyze stormwater characteristics for the development. HydroCAD uses the accepted TR-55 – Urban Hydrology for Small Watersheds methodology for determining peak discharge runoff rates. The NOAA Atlas 14 rainfall depths for Waukesha County and the MSE 3 rainfall distribution were used in the hydrologic model. Due to the urbanization of the site, the minimum time of concentration of 6 minutes has been used per TR-55 standard methodology.

Curve numbers for the post-development ground cover were selected using the standard values specified TR-55. The maximum pre-development curve numbers were set per the WDNR Technical Standard NR 151. The curve number used for grassland was used in post-development conditions for pervious ground cover.

See **Table 1** below for the curve numbers that used for hydrologic modeling.

Table 1. Runoff Curve Number

Runoff Curve Number	Hydrologic Soil Group			
	A	B	C	D
Woodland	30	55	70	77
Grassland	39	61	71	78
Cropland	55	69	78	83
Impervious	98	98	98	98
Water Bodies	100	100	100	100

Refer to **Appendix 4 and 5** for further information on pre-development and post-development hydrologic modeling for the development.

Sediment control used separate WinSLAMM Version 10.3 to account for total suspended solids (TSS) removal for the site. Refer to **Appendix 7** for further information on sediment control calculations.

The storm sewer peak flow rates were calculated using the Rational Method to determine peak flow rates for the 10-year storm event. The storm sewer was analyzed per the Wisconsin Department of Natural Resources Facility Design Manual (FDM) for a closed conduit system. Refer to **Appendix 9** for further information on the storm sewer sizing.

5.0 DESIGN

The underground water quality chamber proposed will provide total suspended solids reduction and peak discharge control for the project. Parking lot runoff will be collected within private storm sewer, treated within the underground water quality chamber, and ultimately discharged to the existing storm sewer within Heritage Lane. The roof runoff will be collected through roof drain connections and route to the private storm sewer system. A small portion of the access driveways and pervious area totaling 0.30 acres will match existing drainage patterns and will leave the site untreated and drain to Heritage Road public storm sewer.

The private storm sewer system consist of 5 curb inlets which are connected to an underground water quality chamber. The underground chamber will have a three foot sump below the outlet which acts as a sedimentation basin and provides settlement for suspended solids. The water quality chamber ultimately connects to the public storm sewer in Heritage Lane. The water quality chamber will settle out up to 20 micron particle. As designed, the stormwater management facility provides approximately 40.5% TSS reduction for the site.

Due to existing drainage patterns, approximately 0.13 acres of off-site area surface drains onto the project. This runoff will be collected into the private storm sewer and routed through the chamber. However, this off-site drainage was not considered in the TSS calculations as it is an off-site area.

A proposed watershed map can be referenced in **Appendix 5.** Preliminary construction plans of improvements can be found in in **Appendix 3**.

5.1 Peak Discharge

Municipal Code of the City of Waukesha, WI Sec. 13.10 (d)(1). Total Sediment Control
A. Minimum requirement. To minimize downstream bank erosion and the failure of downstream conveyance systems, the calculated post-development peak storm water discharge rate shall not exceed the calculated pre-development discharge rates for the 2-year, 10-year, and 100-year, 24-hour design storms.

The proposed redevelopment of the site maintains existing drainage patterns and removes existing impervious surfaces on-site. This reduction reduces the uncontrolled peak discharges for the 2-, 10-, and 100-year, 24-hour design storms. The water quality chamber provides additional peak discharge reduction as runoff is routed through the system.

TABLE 2: PRE-SETTLEMENT VERSUS POST-DEVELOPMENT PEAK RUNOFF RATES

	2-year	10-year	100-year
Rainfall for each 24-hour storm event (inches)	4.17	6.47	11.35
Pre-development peak discharge rate (cfs)	**4.17**	**6.47**	**11.35**
	.		
Post-Development peak discharge rate without controls (cfs)	4.04	6.34	11.23
Post-Development peak discharge rate with detention (cfs)	**3.30**	**5.10**	**10.74**
Difference: Post-Development peak discharge rates with detention vs. Pre-Development peak discharge Rate (cfs)	**-0.87**	**-1.37**	**-0.61**

Table 2 above shows the overall development pre-development, the uncontrolled post-development, and post-development peak runoff rates comparison.

5.2 Sediment Control

Municipal Code of the City of Waukesha, WI Sec. 13.10 (d)(2). Total Sediment Control
By design, each storm water management plan shall meet the following post-development total suspended solids reduction targets, based on average annual rainfalls, as compared to no runoff management controls:

- *(i.) For new land development, 80% reduction in total suspended solids load;*
- *(ii.) For redevelopment, 40% reduction of total suspended solids load;*
- *(iii.) For in-fill development that occurs prior to October 1, 2012, 40 % reduction total suspended solids load.*
- *(iv.) For in-fill development that occurs after October 1, 2012, 80% reduction of total suspended solids load.*

The underground water quality chamber has been designed to provide sediment control for the site. Due to existing drainage patterns, approximately 0.30 acres of drainage area will bypass treatment. The overall development yields approximately 470 pounds of particulate solids. The underground water quality chamber removes approximately 190 pounds of particulate solids for a 40.5% total suspended solids reduction. The development was modeled using WinSLAMM Version 10.3.4. See **Appendix 6** for the sediment control modeling inputs and outputs.

6.0 EROSION CONTROL

Erosion control measures onsite will conform to the Wisconsin Department of Natural Resources Technical Standards and City of Waukesha requirements. These measures include, but are not

limited to: construction entrances, silt fencing, check dams, grading, seeding, mulching, and erosion matting. Construction sequencing shall be as follows:

1. Install silt fence in the appropriate locations and stone tracking pads on the entrances to be used by the construction vehicles to access the site.
2. Remove existing pavement and structures.
3. Install storm sewer system.
4. Excavate building foundations.
5. Complete all other grading.
6. Install storm sewer and inlet protection measures.
7. Install aggregate base course and paving in parking areas.
8. Stabilize newly graded soils.
9. Complete exterior building work and downspouts
10. Remove temporary erosion control practices.

For more detailed requirements regarding erosion control, refer to the proposed construction plans in **Appendix 3** and Universal Soil Loss Equation (USLE) worksheet in **Appendix 9**.

7.0 CONCLUSION

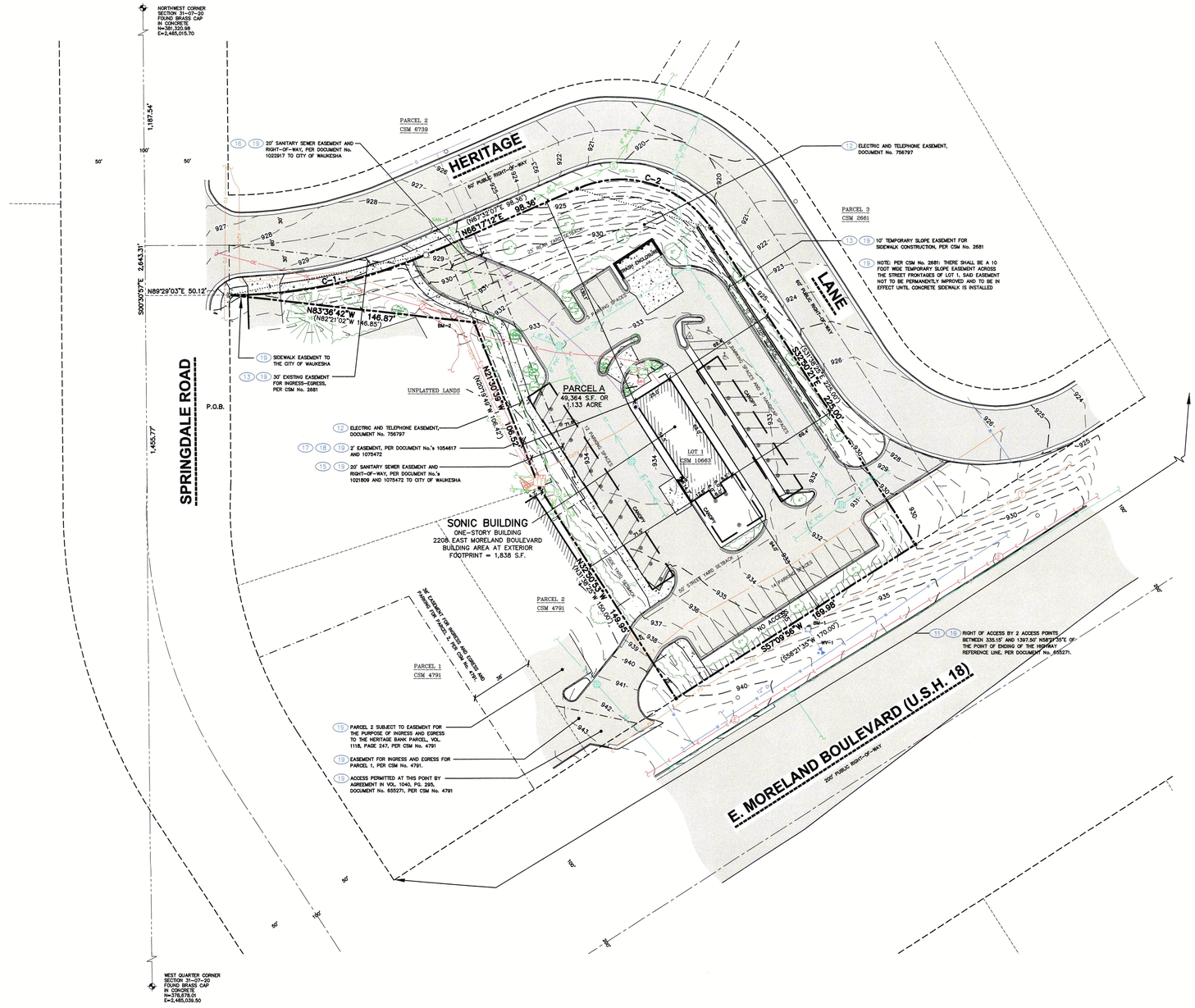
Stormwater management features for Summit Credit Union – Waukesha Branch have been designed in accordance with applicable standards per Chapter 32 of the Municipal Code of the City of Waukesha, Chapter 14 of the Waukesha County Code of Ordinances, and WDNR standards NR151 and NR216. The development features an underground water quality chamber and public storm sewer. These facilities will treat for sediment, oil and grease, runoff rate, infiltration, and outlet controls. Erosion control practices will limit soil loss to 7.5 tons per acre annually, and regulate soil transportation within development boundaries.

APPENDIX 1

ALTA/NSPS LAND TITLE SURVEY

ALTA/NSPS LAND TITLE SURVEY

LOT 1, CERTIFIED SURVEY MAP No. 10663, LOCATED IN THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 31, TOWNSHIP 07 NORTH, RANGE 20 EAST, CITY OF WAUKESHA, WAUKESHA COUNTY, WISCONSIN.



LEGEND

- GOVERNMENT CORNER
- 1" IRON PIPE FOUND
- CHISELED "X" FOUND
- COTTON SPINDLE SET
- FINISHED FLOOR SHOT LOCATION
- SIGN
- SANITARY MANHOLE
- CLEAN OUT
- HYDRANT
- WATER VALVE
- ROUND CASTED INLET
- CURB INLET
- GAS REGULATOR/METER
- MANHOLE – GREASE TRAP
- ELECTRIC MANHOLE
- ELECTRIC PEDESTAL
- POWER POLE W/GUY
- LIGHT POLE
- TELEPHONE PEDESTAL
- TELEPHONE MANHOLE
- DECIDUOUS TREE
- CONIFEROUS TREE
- BUSH
- HANDICAP PARKING
- PARCEL BOUNDARY
- SECTION LINE
- RIGHT-OF-WAY LINE
- CENTERLINE
- CHORD LINE
- PLATTED LOT LINE
- EASEMENT LINE
- CONCRETE CURB & GUTTER
- SANITARY SEWER
- WATER LINE
- STORM SEWER
- NATURAL GAS
- OVERHEAD ELECTRIC DISTRIBUTION
- UNDERGROUND ELECTRIC
- FIBER OPTIC
- UNDERGROUND TELEPHONE
- UNDERGROUND CABLE
- EDGE OF WOODS OR BRUSH
- BUILDING
- WALL LINE
- 935 INDEX CONTOUR
- 934 INTERMEDIATE CONTOUR
- x924.49 SPOT ELEVATION
- BITUMINOUS PAVEMENT
- RETAINING WALL
- CONCRETE PAVEMENT
- NO ACCESS
- PAVEMENT STRIPING
- END OF FLAGGED UTILITIES
- ( ) DENOTES RECORD DATA DEPICTING THE SAME LINE ON THE GROUND AS RETRACED BY THIS SURVEY
- CANOPY COLUMN (TYP)
- EDGE OF CANOPY

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON MARCH 29, 2018.
2. BEARINGS FOR THIS SURVEY AND MAP ARE BASED ON THE SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION (SEWRPC), THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 31-07-20, BEARS S00°30'57"E.
3. ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29). BENCHMARK IS A BRASS CAP IN CONCRETE MARKING THE NORTHWEST CORNER OF SECTION 31-07-20, ELEVATION = 901.30'
4. CONTOUR INTERVAL IS ONE FOOT.
5. SUBSURFACE UTILITIES AND FEATURES SHOWN ON THIS MAP HAVE BEEN APPROXIMATED BY LOCATING SURFICIAL FEATURES AND APPURTENANCES, LOCATING DIGGERS HOTLINE FIELD MARKINGS AND BY REFERENCE TO UTILITY RECORDS AND MAPS. DIGGER'S HOTLINE TICKET No.s 20181108335, 20181108347, 20181108366, 20181108372, 20181108416 AND 20181108425, WITH A CLEAR DATE OF MARCH 26, 2018.
6. UTILITY COMPANIES CONTACTED THRU DIGGERS HOTLINE:
   - CITY OF DELAFIELD DEPARTMENT OF PUBLIC WORKS
   - WISCONSIN DOT–ITS EQUIPMENT
   - AT&T TRANSMISSION
   - CENTURYLINK
   - WE ENERGIES
   - WISCONSIN DOT SOUTHEAST REGION
   - LEVEL 3 COMMUNICATIONS
   - TIME WARNER CABLE
7. BEFORE EXCAVATION, APPROPRIATE UTILITY COMPANIES SHOULD BE CONTACTED. FOR EXACT LOCATION OF UNDERGROUND UTILITIES, CONTACT DIGGERS HOTLINE, AT 1.800.242.8511.
8. JSD PROFESSIONAL SERVICES, INC. DOES NOT GUARANTEE THAT THE BENCHMARK ELEVATIONS LISTED ON THIS MAP HAVE NOT BEEN DISTURBED SINCE THE DATE OF THIS SURVEY AND SHOULD BE VERIFIED PRIOR TO CONSTRUCTION ACTIVITIES.
9. SET BACKS ARE BASED ON CHAPTER 22, 22.37(7). THERE ARE NO REFERENCES MADE TO CORNER LOTS. SET BACKS ALONG HERITAGE LANE MAY BE GREATER, CONTACT CITY OF WAUKESHA ZONING DEPARTMENT.
10. SANITARY SEWER AND WATER SERVICE LATERAL SIZE AND LOCATION ARE UNKNOWN.

NOTES CORRESPONDING TO TABLE A REQUIREMENTS:

ITEM 3 THE SUBJECT PROPERTY LIES IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER FEMA MAP NUMBER 55047901 86F, EFFECTIVE DATE OF NOVEMBER 19, 2008.

ITEM 6(b) CURRENT ZONING CLASSIFICATION IS B-5, COMMUNITY BUSINESS, FROM CITY WEB SITE.

ITEM 9 THERE ARE 10 REGULAR PARKING SPACES AND 1 HANDICAP SPACE FOR A TOTAL OF 11 PARKING SPACES.

ITEM 10(a) THERE ARE NO DIVISION OR PARTY WALLS WITH RESPECT TO ADJOINING PROPERTIES.

ITEM 11 SOURCE INFORMATION FROM PLANS AND MARKING WILL BE COMBINED WITH OBSERVED EVIDENCE OF UTILITIES PURSUANT TO SECTION 5.E.iv. TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, WHERE MULTIPLE UTILITIES IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE, IN WHICH CASE THE SURVEYOR SHALL NOTE ON THE PLAT OR MAP HOW THIS AFFECTED THE SURVEYOR'S ASSESSMENT OF THE LOCATION OF THE UTILITIES. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION AND/OR A PRIVATE UTILITY LOCATE REQUEST MAY BE NECESSARY.

ITEM 16 THERE IS NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS AT THE TIME OF THIS SURVEY.

ITEM 17 THERE ARE NO PROPOSED CHANGES IN THE STREET RIGHT-OF-WAY LINES PER CITY OF DELAFIELD. THERE IS NO OBSERVED EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.

ITEM 18 THERE HAS BEEN NO FIELD DELINEATION OF WETLANDS CONDUCTED FOR THIS SITE.

ITEM 19 ANY OFFSITE EASEMENT FOR THE SUBJECT PROPERTY IS SHOWN IN ITS ENTIRETY.

NOTES CORRESPONDING TO SCHEDULE B–SECTION TWO EXCEPTIONS

(CHICAGO TITLE INSURANCE COMPANY, COMMITMENT No.: CO-7333, COMMITMENT DATE: MARCH 6, 2018)

(10) EASEMENT(S) FOR THE PURPOSE(S) AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT, GRANTED TO WISCONSIN TELEPHONE COMPANY AND WISCONSIN ELECTRIC POWER COMPANY, FOR UTILITY PURPOSES, RECORDED ON APRIL 6, 1960, AS DOCUMENT No. 520759.
THIS ITEM DOES NOT AFFECT THE SUBJECT PROPERTY AND IS NOT PLOTTED HEREON. (IS IN CURRENT HIGHWAY RIGH-OF-WAY).

(11) ACCESS LIMITATIONS AND DEVELOPMENT RESTRICTIONS SET FORTH IN INDENTURE RECORDED FEBRUARY 9, 1966 AS DOCUMENT No. 655271.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(12) EASEMENT(S) FOR THE PURPOSE(S) AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT, GRANTED TO WISCONSIN ELECTRIC POWER COMPANY AND WISCONSIN TELEPHONE COMPANY, FOR UTILITY PURPOSES, RECORDED ON MARCH 13, 1970, AS DOCUMENT No. 756797.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(13) RECITALS AS SHOWN ON CERTIFIED SURVEY MAP No. 2681 RECORDED ON SEPTEMBER 1, 1976, AS DOCUMENT No. 965499, WHICH AMONG OTHER THINGS RECITES EASEMENT FOR INGRESS AND EGRESS, RESTRICTIONS AND NOTES.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(14) MEMORANDUM OF AGREEMENT RECORDED MARCH 8, 1977 AS DOCUMENT No. 987077.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS NOT GRAPHIC IN NATURE, THEREFORE IT IS NOT PLOTTED HEREON.

(15) EASEMENT(S) FOR THE PURPOSE(S) AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT, GRANTED TO THE CITY OF WAUKESHA, FOR SANITARY SEWER PURPOSES, RECORDED ON OCTOBER 25, 1977, AS DOCUMENT No. 1021809.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(16) EASEMENT(S) FOR THE PURPOSE(S) AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT, GRANTED TO THE CITY OF WAUKESHA, FOR SANITARY SEWER PURPOSES, RECORDED ON NOVEMBER 2, 1977, AS DOCUMENT No. 1022917.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(17) EASEMENT(S) FOR THE PURPOSE(S) AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT, GRANTED TO THE CITY OF WAUKESHA, FOR SANITARY SEWER PURPOSES, RECORDED ON JUNE 30, 1978, AS DOCUMENT No. 1054617.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(18) SANITARY SEWER EASEMENT RECORDED DECEMBER 7, 1978 AS DOCUMENT No. 1075472.
THIS ITEM DOES AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

(19) RECITALS AS SHOWN ON CERTIFIED SURVEY MAP No. 10663 RECORDED ON MARCH 31, 2009, AS DOCUMENT No. 3641473, WHICH AMONG OTHER THINGS RECITES SIDEWALK EASEMENT, RESTRICTIONS, NOTES, INGRESS/EGRESS EASEMENT, CROSS ACCESS EASEMENT, TEMPORARY SLOPE EASEMENT FOR SIDEWALK CONSTRUCTION AND ACCESS LIMITATIONS.
THIS ITEM MAY AFFECT THE SUBJECT PROPERTY AND IS PLOTTED HEREON.

LEGAL DESCRIPTION (AS FURNISHED)

(CHICAGO TITLE INSURANCE COMPANY, COMMITMENT No.: CO-7333, COMMITMENT DATE: MARCH 6, 2018)

LOT 1 OF CERTIFIED SURVEY MAP No. 10663, RECORDED MARCH 31, 2009, IN VOLUME 102 OF CERTIFIED SURVEY MAPS ON PAGES 309 OT 313 AS DOCUMENT No. 3641473, A DIVISION OF PARCEL 6 OF CERTIFIED SURVEY MAP No. 2681 AND LANDS IN THE NORTHWEST 1/4 OF THE NORTHWEST 1/4 OF SECTION 31, TOWN 7 NORTH, RANGE 20 EAST, IN THE CITY OF WAUKESHA, COUNTY OF WAUKESHA, STATE OF WISCONSIN.

TAX KEY No.: WAKC 1130.115.001

ADDRESS: 2208 E. MORELAND BLVD.

SURVEYOR'S CERTIFICATE

TO:

i) PINNACLE WAUKESHA BURGERS, LLC, A WISCONSIN LIMITED LIABILITY COMPANY,
ii) BANK MUTUAL,
iii) CHICAGO TITLE INSURANCE COMPANY,

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS AND INCLUDES ITEMS 1, 2, 3, 4, 5, 6(b), 7(a), 7(b)(1), 7(c), 8, 9, 10(a), 11, 13, 14, 16, 17, 18, 19 AND 20 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 29, 2018.

JOHN KREBS, S-1878
PROFESSIONAL LAND SURVEYOR

4/4/18
DATE

WISCONSIN JOHN KREBS S-1878 McFARLAND, WISCONSIN PROFESSIONAL LAND SURVEYOR

STORM SEWER MANHOLES					
STRUCT. ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
STM–1	930.77	NE	928.67	6"	PVC
		SW	928.68	6"	PVC
		NW	928.17	10"	PVC
STM–2	933.33	SE	930.98	6"	PVC
		NW	930.38	10"	PVC
STM–3	932.92	SE	929.62	10"	PVC
		SW	929.59	6"	PVC
		NW	930.29	6"	PVC
		NE	927.97	10"	PVC

STORM SEWER INLETS					
INLET ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
INL–1	931.90	SW	928.12	10"	PVC
		SE	926.28	10"	PVC
		NE	924.22	10"	PVC
INL–2	919.30	SW	916.73	10"	PVC
		NE	915.75	12"	RCP
INL–3	919.32	SW	915.47	12"	RCP
		NW	915.47	12"	RCP

SANITARY SEWER MANHOLES					
STRUCT. ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
SAN–1	936.92	SE	930.66	6"	PVC
		SW	930.51	6"	PVC
		NW	930.58	6"	PVC
		NW	930.21	8"	PVC
SAN–2	927.79	SE	922.65	8"	PVC
		NE	922.55	8"	PVC
SAN–3	920.49	SW	913.99	8"	PVC
		NE	913.79	8"	PVC

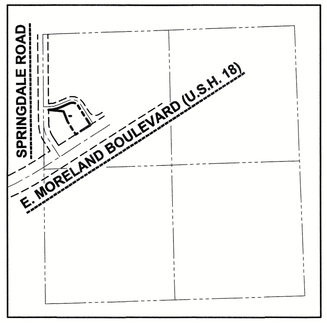
WATER VALVES					
VALVE No.	SIZE	RIM ELEVATION	INVERT	TOP NUT ELEVATION	PIPE INVERT
WV–1	10"	938.75	TN	932.45	930.70

TN=TOP NUT OF WATER VALVE

BENCHMARKS		
BENCH MARK	ELEVATION	DESCRIPTION
BM–1	938.42	ARROW ON HYDRANT IN FRONT OF SITE
BM–2	935.18	RR SPIKE IN UTILITY POLE, NORTHWEST CORNER OF SITE

*JSD PROFESSIONAL SERVICES, INC. DOES NOT GUARANTEE THAT THE BENCHMARK ELEVATIONS LISTED ON THIS MAP HAVE NOT BEEN DISTURBED SINCE THE DATE OF THIS SURVEY AND SHOULD BE VERIFIED PRIOR TO CONSTRUCTION ACTIVITIES.

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	CHORD BEARING
C–1	120.51'	286.55'	24°05'43"	119.62'	N78°24'32"E
( )	120.51'	286.55'	24°05'43"	119.62'	N79°34'58"E
C–2	90.85'	63.96'	81°22'52"	83.40'	S73°24'56"E
( )	90.80'	63.96'	81°20'08"	83.36'	S72°10'24"E



VICINITY MAP
SCALE 1" = 600'

north
0 15' 30' 60'
SCALE: 1" = 30'

JSD Professional Services, Inc.
Engineers • Surveyors • Planners
CREATE THE VISION TELL THE STORY
MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU
MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
SUMMIT CREDIT UNION

CLIENT ADDRESS:
4800 AMERICAN PARKWAY
MADISON, WI 53718-8308

PROJECT:
WAUKESHA

PROJECT LOCATION:
CITY OF WAUKESHA
WAUKESHA COUNTY, WISCONSIN

PLAN MODIFICATIONS:

#	Date:	Description:
1	-	-
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: JK
Approved: TJB

SHEET TITLE:
ALTA/NSPS LAND TITLE SURVEY

MAP NO: E–*
SHEET NUMBER:
1 OF 1

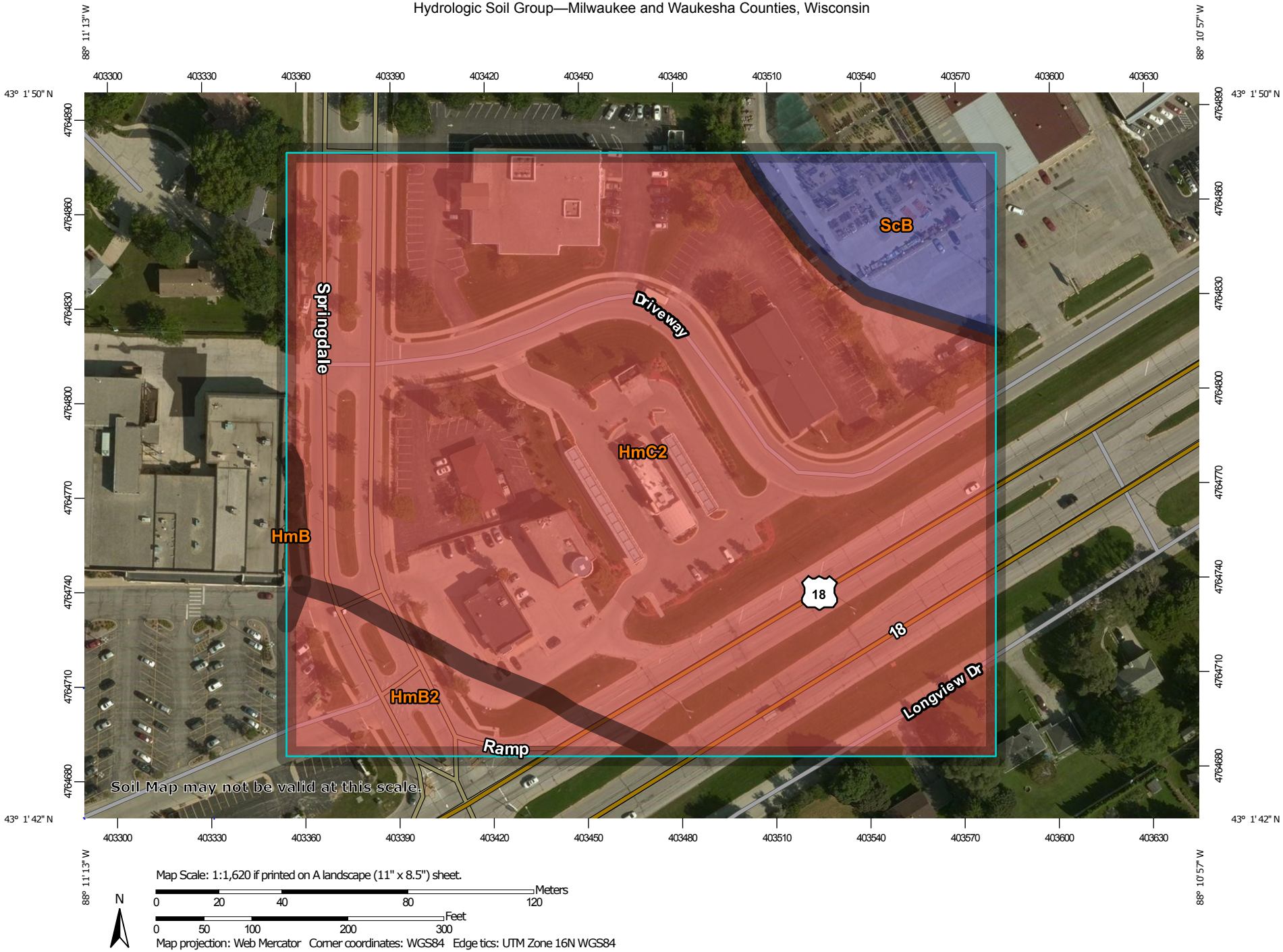
JSD PROJECT NO: 18-8469

File: I:\2018\18-8469\DWG\18-8469 Basemap.dwg Layout: ALTA User: jk Plotted: Apr 04, 2018 – 12:03pm Xref's:

APPENDIX 2

SOILS INFORMATION

USDA NRCS WEB SOIL SURVEY



Map Scale: 1:1,620 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Milwaukee and Waukesha Counties, Wisconsin
Survey Area Data: Version 13, Oct 6, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 7, 2014—Sep 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HmB	Hochheim loam, 2 to 6 percent slopes	D	0.0	0.4%
HmB2	Hochheim loam, 2 to 6 percent slopes, eroded	D	0.9	8.0%
HmC2	Hochheim loam, 6 to 12 percent slopes, eroded	D	9.0	84.2%
ScB	St. Charles silt loam, 2 to 6 percent slopes	B	0.8	7.4%
Totals for Area of Interest			**10.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

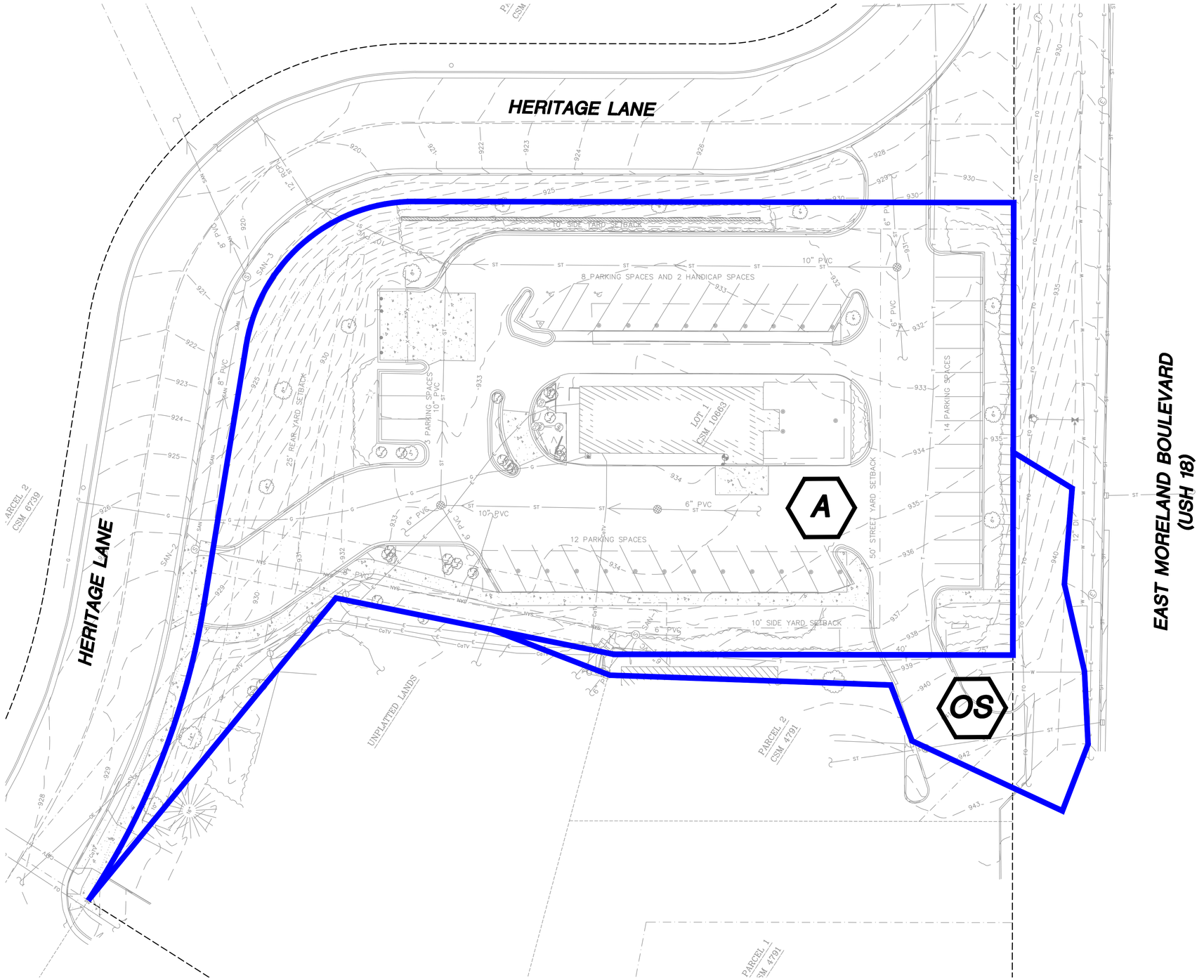
APPENDIX 3

PRELIMINARY PLANS

APPENDIX 4

PRE-DEVELOPMENT HYDROLOGIC CALCULATIONS

EXISTING WATERSHED MAP
PRE-DEVELOPMENT HYDROCAD OUTPUT



LEGEND (PROPOSED)

- PROPERTY LINE
- SETBACK LINE
- EASEMENT LINE
- BUILDING LINE
- BUILDING OVERHANG LINE
- EDGE OF CONCRETE
- STANDARD CURB AND GUTTER
- REJECT CURB AND GUTTER
- PROPOSED CONCRETE PAVEMENT
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- LIGHT POLE
- BOLLARD

WATERSHED CHARACTERISTICS

WATERSHED A
49,353 SF (66.4% IMPERVIOUS)
6 MINUTE TIME OF CONCENTRATION (MINIMUM)

WATERSHED OS
5663 SF (25.0% IMPERVIOUS)
6 MINUTE TIME OF CONCENTRATION (MINIMUM)

north

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CLIENT:
SUMMIT CREDIT UNION

CLIENT ADDRESS:
4800 American Parkway
MADISON, WI 53718

PROJECT:
SUMMIT CREDIT UNION - WAUKESHA BRANCH

PROJECT LOCATION:
2208 E MORELAND BOULEVARD
WAUKESHA COUNTY

PLAN MODIFICATIONS:

#	Date:	Description:
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH
Approved: WHD

SHEET TITLE:
EXISTING DRAINAGE AREA MAP

SHEET NUMBER:
EX1.0

JSD PROJECT NO: 18-8469

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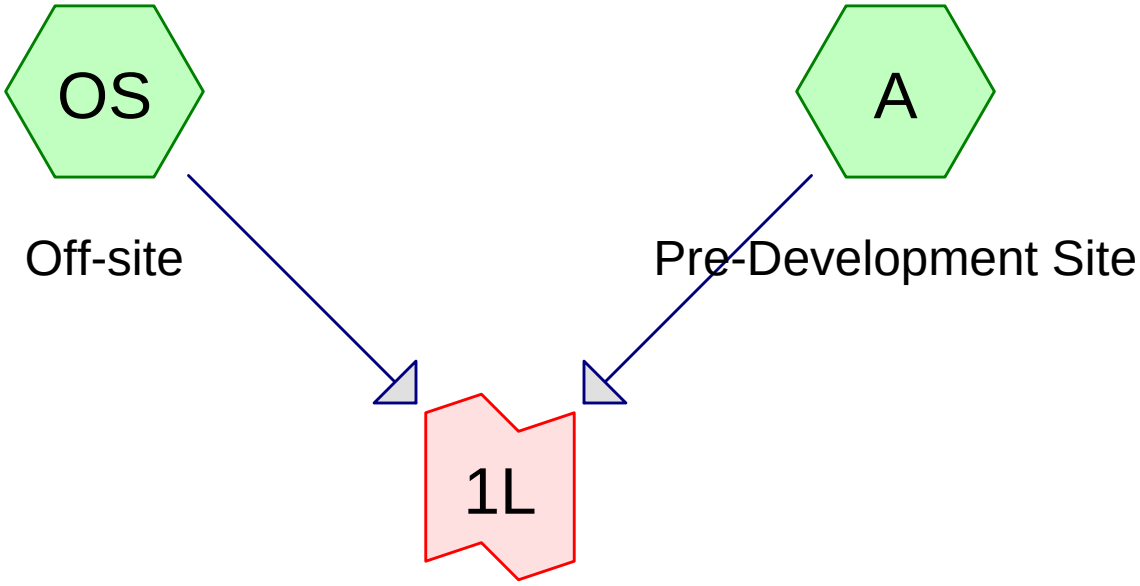


Subcat Reach Pond Link

Routing Diagram for Predevelopment
Prepared by Microsoft, Printed 4/6/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.849	98	Impervious, HSG D (A, OS)
0.381	78	Pervious, HSG D (A)
0.033	78	Pervsious, HSG D (OS)
1.263	**91**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
1.263	HSG D	A, OS
0.000	Other	
1.263		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.849	0.000	0.849	Impervious	A, OS
0.000	0.000	0.000	0.381	0.000	0.381	Pervious	A
0.000	0.000	0.000	0.033	0.000	0.033	Pervsious	OS
0.000	**0.000**	**0.000**	**1.263**	**0.000**	**1.263**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Link 1L: Pre-Development Inflow=3.98 cfs 0.184 af
Primary=3.98 cfs 0.184 af

Subcatchment A: Pre-Development Site Runoff Area=49,353 sf 66.36% Impervious Runoff Depth>1.73"
Tc=6.0 min CN=91 Runoff=3.54 cfs 0.163 af

Subcatchment OS: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>1.90"
Tc=6.0 min CN=93 Runoff=0.44 cfs 0.021 af

Total Runoff Area = 1.263 ac Runoff Volume = 0.184 af Average Runoff Depth = 1.74"
32.75% Pervious = 0.414 ac 67.25% Impervious = 0.849 ac

Summary for Link 1L: Pre-Development

Inflow Area = 1.263 ac, 67.25% Impervious, Inflow Depth > 1.74" for 2-year event
Inflow = 3.98 cfs @ 12.13 hrs, Volume= 0.184 af
Primary = 3.98 cfs @ 12.13 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment A: Pre-Development Site

Runoff = 3.54 cfs @ 12.13 hrs, Volume= 0.163 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.70"

	Area (sf)	CN	Description
*	32,752	98	Impervious, HSG D
*	16,601	78	Pervious, HSG D
	49,353	91	Weighted Average
	16,601		33.64% Pervious Area
	32,752		66.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS: Off-site

Runoff = 0.44 cfs @ 12.13 hrs, Volume= 0.021 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Link 1L: Pre-Development Inflow=6.11 cfs 0.290 af
Primary=6.11 cfs 0.290 af

Subcatchment A: Pre-Development Site Runoff Area=49,353 sf 66.36% Impervious Runoff Depth>2.74"
Tc=6.0 min CN=91 Runoff=5.45 cfs 0.259 af

Subcatchment OS: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>2.94"
Tc=6.0 min CN=93 Runoff=0.66 cfs 0.032 af

Total Runoff Area = 1.263 ac Runoff Volume = 0.290 af Average Runoff Depth = 2.76"
32.75% Pervious = 0.414 ac 67.25% Impervious = 0.849 ac

Summary for Link 1L: Pre-Development

Inflow Area = 1.263 ac, 67.25% Impervious, Inflow Depth > 2.76" for 10-year event
Inflow = 6.11 cfs @ 12.13 hrs, Volume= 0.290 af
Primary = 6.11 cfs @ 12.13 hrs, Volume= 0.290 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment A: Pre-Development Site

Runoff = 5.45 cfs @ 12.13 hrs, Volume= 0.259 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.81"

	Area (sf)	CN	Description
*	32,752	98	Impervious, HSG D
*	16,601	78	Pervious, HSG D
	49,353	91	Weighted Average
	16,601		33.64% Pervious Area
	32,752		66.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS: Off-site

Runoff = 0.66 cfs @ 12.13 hrs, Volume= 0.032 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Link 1L: Pre-Development Inflow=10.61 cfs 0.526 af
Primary=10.61 cfs 0.526 af

Subcatchment A: Pre-Development Site Runoff Area=49,353 sf 66.36% Impervious Runoff Depth>4.97"
Tc=6.0 min CN=91 Runoff=9.50 cfs 0.469 af

Subcatchment OS: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=93 Runoff=1.11 cfs 0.056 af

Total Runoff Area = 1.263 ac Runoff Volume = 0.526 af Average Runoff Depth = 4.99"
32.75% Pervious = 0.414 ac 67.25% Impervious = 0.849 ac

Summary for Link 1L: Pre-Development

Inflow Area = 1.263 ac, 67.25% Impervious, Inflow Depth > 4.99" for 100-year event
Inflow = 10.61 cfs @ 12.13 hrs, Volume= 0.526 af
Primary = 10.61 cfs @ 12.13 hrs, Volume= 0.526 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment A: Pre-Development Site

Runoff = 9.50 cfs @ 12.13 hrs, Volume= 0.469 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.18"

	Area (sf)	CN	Description
*	32,752	98	Impervious, HSG D
*	16,601	78	Pervious, HSG D
	49,353	91	Weighted Average
	16,601		33.64% Pervious Area
	32,752		66.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS: Off-site

Runoff = 1.11 cfs @ 12.13 hrs, Volume= 0.056 af, Depth> 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.18"

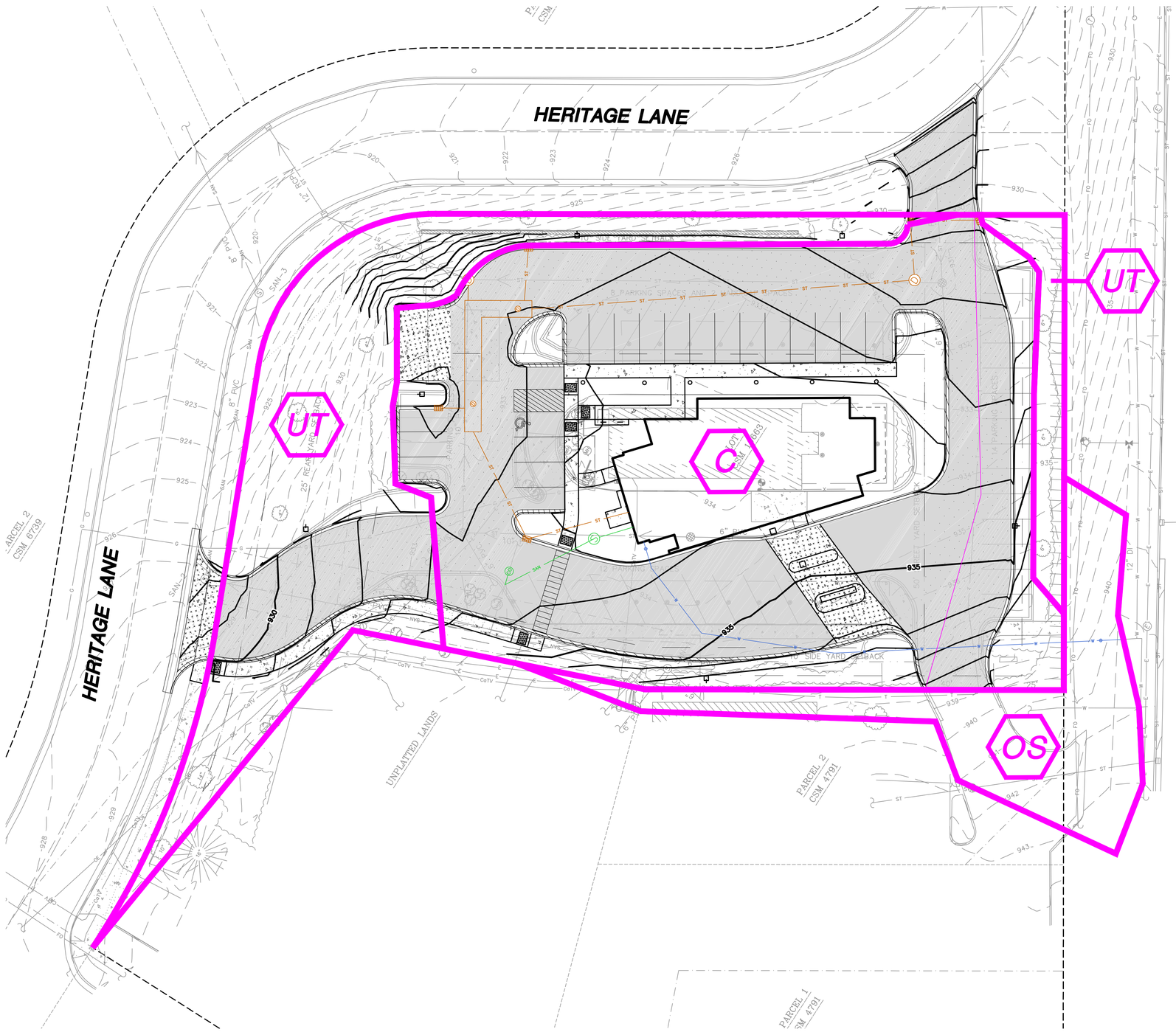
	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

APPENDIX 5

POST-DEVELOPMENT HYDROLOGIC CALCULATIONS

PROPOSED WATERSHED MAP
POST-DEVELOPMENT HYDROCAD OUTPUT



LEGEND (PROPOSED)

- PROPERTY LINE
- SETBACK LINE
- EASEMENT LINE
- BUILDING LINE
- BUILDING OVERHANG LINE
- EDGE OF CONCRETE
- STANDARD CURB AND GUTTER
- REJECT CURB AND GUTTER
- PROPOSED CONCRETE PAVEMENT
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- LIGHT POLE
- BOLLARD

WATERSHED CHARACTERISTICS

WATERSHED C
34,815 SF (57.0% IMPERVIOUS)
6 MINUTE TIME OF CONCENTRATION (MINIMUM)

WATERSHED UT
12,918 SF (57.0% IMPERVIOUS)
6 MINUTE TIME OF CONCENTRATION (MINIMUM)

WATERSHED OS
5663 SF (25.0% IMPERVIOUS)
6 MINUTE TIME OF CONCENTRATION (MINIMUM)

north

SCALE IN FEET
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CLIENT:
SUMMIT CREDIT UNION

CLIENT ADDRESS:
4800 American Parkway
MADISON, WI 53718

PROJECT:
SUMMIT CREDIT UNION - WAUKESHA BRANCH

PROJECT LOCATION:
2208 E MORELAND BOULEVARD
WAUKESHA COUNTY

PLAN MODIFICATIONS:

#	Date:	Description:
1	04.09.18	CITY PLAN REVIEW
2	05.14.18	CITY RESUBMITTAL
3		
4		
5		
6		
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10		
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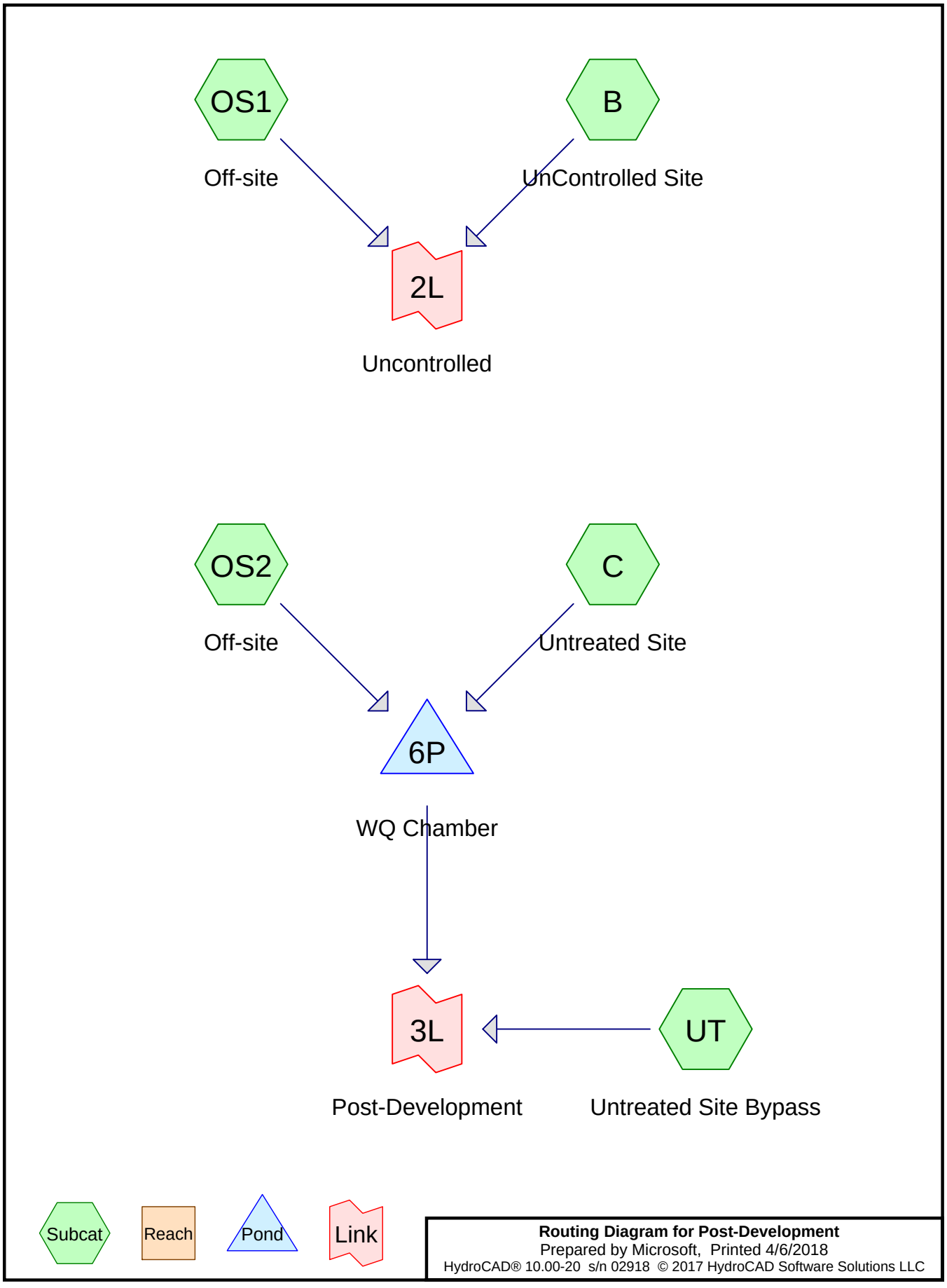
12		
13		
14		
15		

Design/Drawn: CLH
Approved: WHD

SHEET TITLE:
PROPOSED DRAINAGE AREA MAP

SHEET NUMBER:
EX2.0

JSD PROJECT NO: 18-8469



Routing Diagram for Post-Development
Prepared by Microsoft, Printed 4/6/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.439	98	Impervious, HSG D (B, C, OS1, OS2, UT)
1.022	78	Pervious, HSG D (B, C, UT)
0.065	78	Pervsious, HSG D (OS1, OS2)
2.526	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
2.526	HSG D	B, C, OS1, OS2, UT
0.000	Other	
2.526		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	1.439	0.000	1.439	Impervious	B, C, OS1, OS2, UT
0.000	0.000	0.000	1.022	0.000	1.022	Pervious	B, C, UT
0.000	0.000	0.000	0.065	0.000	0.065	Pervsious	OS1, OS2
0.000	**0.000**	**0.000**	**2.526**	**0.000**	**2.526**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Link 2L: Uncontrolled Inflow=3.84 cfs 0.176 af
Primary=3.84 cfs 0.176 af

Link 3L: Post-Development Inflow=3.16 cfs 0.154 af
Primary=3.16 cfs 0.154 af

Pond 6P: WQ Chamber Peak Elev=927.42' Storage=0.031 af Inflow=2.72 cfs 0.124 af
12.0" Round Culvert n=0.011 L=8.0' S=0.0100 '/' Outflow=2.45 cfs 0.121 af

Subcatchment B: UnControlled Site Runoff Area=49,353 sf 62.45% Impervious Runoff Depth>1.65"
Tc=6.0 min CN=90 Runoff=3.40 cfs 0.155 af

Subcatchment C: Untreated Site Runoff Area=34,499 sf 57.01% Impervious Runoff Depth>1.57"
Tc=6.0 min CN=89 Runoff=2.28 cfs 0.103 af

Subcatchment OS1: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>1.90"
Tc=6.0 min CN=93 Runoff=0.44 cfs 0.021 af

Subcatchment OS2: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>1.90"
Tc=6.0 min CN=93 Runoff=0.44 cfs 0.021 af

Subcatchment UT: Untreated Site Bypass Runoff Area=0.341 ac 24.93% Impervious Runoff Depth>1.15"
Tc=6.0 min CN=83 Runoff=0.74 cfs 0.033 af

Total Runoff Area = 2.526 ac Runoff Volume = 0.333 af Average Runoff Depth = 1.58"
43.03% Pervious = 1.087 ac 56.97% Impervious = 1.439 ac

Summary for Link 2L: Uncontrolled

Inflow Area = 1.263 ac, 63.74% Impervious, Inflow Depth > 1.67" for 2-year event
Inflow = 3.84 cfs @ 12.13 hrs, Volume= 0.176 af
Primary = 3.84 cfs @ 12.13 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 3L: Post-Development

Inflow Area = 1.263 ac, 50.20% Impervious, Inflow Depth > 1.46" for 2-year event
Inflow = 3.16 cfs @ 12.15 hrs, Volume= 0.154 af
Primary = 3.16 cfs @ 12.15 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 6P: WQ Chamber

Inflow Area = 0.922 ac, 59.55% Impervious, Inflow Depth > 1.61" for 2-year event
Inflow = 2.72 cfs @ 12.13 hrs, Volume= 0.124 af
Outflow = 2.45 cfs @ 12.16 hrs, Volume= 0.121 af, Atten= 10%, Lag= 1.9 min
Primary = 2.45 cfs @ 12.16 hrs, Volume= 0.121 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 926.00' Surf.Area= 0.009 ac Storage= 0.019 af
Peak Elev= 927.42' @ 12.16 hrs Surf.Area= 0.008 ac Storage= 0.031 af (0.012 af above start)

Plug-Flow detention time= 66.7 min calculated for 0.102 af (82% of inflow)
Center-of-Mass det. time= 8.2 min (782.6 - 774.4)

Volume	Invert	Avail.Storage	Storage Description
#1	923.25'	0.042 af	**72.0" Round Pipe Storage** L= 65.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	926.25'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 926.25' / 926.17' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=2.39 cfs @ 12.16 hrs HW=927.39' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.39 cfs @ 3.05 fps)

Summary for Subcatchment B: UnControlled Site

Runoff = 3.40 cfs @ 12.13 hrs, Volume= 0.155 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.70"

	Area (sf)	CN	Description
*	30,820	98	Impervious, HSG D
*	18,533	78	Pervious, HSG D
	49,353	90	Weighted Average
	18,533		37.55% Pervious Area
	30,820		62.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment C: Untreated Site

Runoff = 2.28 cfs @ 12.13 hrs, Volume= 0.103 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.70"

	Area (sf)	CN	Description
*	19,669	98	Impervious, HSG D
*	14,830	78	Pervious, HSG D
	34,499	89	Weighted Average
	14,830		42.99% Pervious Area
	19,669		57.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS1: Off-site

Runoff = 0.44 cfs @ 12.13 hrs, Volume= 0.021 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS2: Off-site

Runoff = 0.44 cfs @ 12.13 hrs, Volume= 0.021 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment UT: Untreated Site Bypass

Runoff = 0.74 cfs @ 12.14 hrs, Volume= 0.033 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-year Rainfall=2.70"

	Area (ac)	CN	Description
*	0.256	78	Pervious, HSG D
*	0.085	98	Impervious, HSG D
	0.341	83	Weighted Average
	0.256		75.07% Pervious Area
	0.085		24.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Link 2L: Uncontrolled Inflow=5.97 cfs 0.281 af
Primary=5.97 cfs 0.281 af

Link 3L: Post-Development Inflow=4.83 cfs 0.255 af
Primary=4.83 cfs 0.255 af

Pond 6P: WQ Chamber Peak Elev=928.21' Storage=0.037 af Inflow=4.27 cfs 0.200 af
12.0" Round Culvert n=0.011 L=8.0' S=0.0100 '/' Outflow=3.62 cfs 0.197 af

Subcatchment B: UnControlled Site Runoff Area=49,353 sf 62.45% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=90 Runoff=5.32 cfs 0.250 af

Subcatchment C: Untreated Site Runoff Area=34,499 sf 57.01% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=89 Runoff=3.62 cfs 0.168 af

Subcatchment OS1: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>2.94"
Tc=6.0 min CN=93 Runoff=0.66 cfs 0.032 af

Subcatchment OS2: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>2.94"
Tc=6.0 min CN=93 Runoff=0.66 cfs 0.032 af

Subcatchment UT: Untreated Site Bypass Runoff Area=0.341 ac 24.93% Impervious Runoff Depth>2.03"
Tc=6.0 min CN=83 Runoff=1.29 cfs 0.058 af

Total Runoff Area = 2.526 ac Runoff Volume = 0.539 af Average Runoff Depth = 2.56"
43.03% Pervious = 1.087 ac 56.97% Impervious = 1.439 ac

Summary for Link 2L: Uncontrolled

Inflow Area = 1.263 ac, 63.74% Impervious, Inflow Depth > 2.67" for 10-year event
Inflow = 5.97 cfs @ 12.13 hrs, Volume= 0.281 af
Primary = 5.97 cfs @ 12.13 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 3L: Post-Development

Inflow Area = 1.263 ac, 50.20% Impervious, Inflow Depth > 2.42" for 10-year event
Inflow = 4.83 cfs @ 12.15 hrs, Volume= 0.255 af
Primary = 4.83 cfs @ 12.15 hrs, Volume= 0.255 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 6P: WQ Chamber

Inflow Area = 0.922 ac, 59.55% Impervious, Inflow Depth > 2.60" for 10-year event
Inflow = 4.27 cfs @ 12.13 hrs, Volume= 0.200 af
Outflow = 3.62 cfs @ 12.17 hrs, Volume= 0.197 af, Atten= 15%, Lag= 2.4 min
Primary = 3.62 cfs @ 12.17 hrs, Volume= 0.197 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 926.00' Surf.Area= 0.009 ac Storage= 0.019 af
Peak Elev= 928.21' @ 12.17 hrs Surf.Area= 0.007 ac Storage= 0.037 af (0.018 af above start)

Plug-Flow detention time= 51.8 min calculated for 0.178 af (89% of inflow)
Center-of-Mass det. time= 7.3 min (773.7 - 766.4)

Volume	Invert	Avail.Storage	Storage Description
#1	923.25'	0.042 af	**72.0" Round Pipe Storage** L= 65.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	926.25'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 926.25' / 926.17' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=3.54 cfs @ 12.17 hrs HW=928.15' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.54 cfs @ 4.50 fps)

Summary for Subcatchment B: UnControlled Site

Runoff = 5.32 cfs @ 12.13 hrs, Volume= 0.250 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.81"

	Area (sf)	CN	Description
*	30,820	98	Impervious, HSG D
*	18,533	78	Pervious, HSG D
	49,353	90	Weighted Average
	18,533		37.55% Pervious Area
	30,820		62.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment C: Untreated Site

Runoff = 3.62 cfs @ 12.13 hrs, Volume= 0.168 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.81"

	Area (sf)	CN	Description
*	19,669	98	Impervious, HSG D
*	14,830	78	Pervious, HSG D
	34,499	89	Weighted Average
	14,830		42.99% Pervious Area
	19,669		57.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS1: Off-site

Runoff = 0.66 cfs @ 12.13 hrs, Volume= 0.032 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS2: Off-site

Runoff = 0.66 cfs @ 12.13 hrs, Volume= 0.032 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment UT: Untreated Site Bypass

Runoff = 1.29 cfs @ 12.13 hrs, Volume= 0.058 af, Depth> 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.81"

	Area (ac)	CN	Description
*	0.256	78	Pervious, HSG D
*	0.085	98	Impervious, HSG D
	0.341	83	Weighted Average
	0.256		75.07% Pervious Area
	0.085		24.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Link 2L: Uncontrolled Inflow=10.49 cfs 0.515 af
Primary=10.49 cfs 0.515 af

Link 3L: Post-Development Inflow=10.71 cfs 0.483 af
Primary=10.71 cfs 0.483 af

Pond 6P: WQ Chamber Peak Elev=934.26' Storage=0.042 af Inflow=7.58 cfs 0.370 af
12.0" Round Culvert n=0.011 L=8.0' S=0.0100 '/' Outflow=8.22 cfs 0.366 af

Subcatchment B: UnControlled Site Runoff Area=49,353 sf 62.45% Impervious Runoff Depth>4.86"
Tc=6.0 min CN=90 Runoff=9.38 cfs 0.459 af

Subcatchment C: Untreated Site Runoff Area=34,499 sf 57.01% Impervious Runoff Depth>4.75"
Tc=6.0 min CN=89 Runoff=6.46 cfs 0.313 af

Subcatchment OS1: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=93 Runoff=1.11 cfs 0.056 af

Subcatchment OS2: Off-site Runoff Area=5,663 sf 75.00% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=93 Runoff=1.11 cfs 0.056 af

Subcatchment UT: Untreated Site Bypass Runoff Area=0.341 ac 24.93% Impervious Runoff Depth>4.10"
Tc=6.0 min CN=83 Runoff=2.51 cfs 0.117 af

Total Runoff Area = 2.526 ac Runoff Volume = 1.001 af Average Runoff Depth = 4.76"
43.03% Pervious = 1.087 ac 56.97% Impervious = 1.439 ac

Summary for Link 2L: Uncontrolled

Inflow Area = 1.263 ac, 63.74% Impervious, Inflow Depth > 4.89" for 100-year event
Inflow = 10.49 cfs @ 12.13 hrs, Volume= 0.515 af
Primary = 10.49 cfs @ 12.13 hrs, Volume= 0.515 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link 3L: Post-Development

Inflow Area = 1.263 ac, 50.20% Impervious, Inflow Depth > 4.59" for 100-year event
Inflow = 10.71 cfs @ 12.14 hrs, Volume= 0.483 af
Primary = 10.71 cfs @ 12.14 hrs, Volume= 0.483 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 6P: WQ Chamber

Inflow Area = 0.922 ac, 59.55% Impervious, Inflow Depth > 4.81" for 100-year event
Inflow = 7.58 cfs @ 12.13 hrs, Volume= 0.370 af
Outflow = 8.22 cfs @ 12.14 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.8 min
Primary = 8.22 cfs @ 12.14 hrs, Volume= 0.366 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 926.00' Surf.Area= 0.009 ac Storage= 0.019 af
Peak Elev= 934.26' @ 12.14 hrs Surf.Area= 0.000 ac Storage= 0.042 af (0.023 af above start)

Plug-Flow detention time= 37.7 min calculated for 0.347 af (94% of inflow)
Center-of-Mass det. time= 6.0 min (761.9 - 755.8)

Volume	Invert	Avail.Storage	Storage Description
#1	923.25'	0.042 af	**72.0" Round Pipe Storage** L= 65.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	926.25'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 926.25' / 926.17' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=7.85 cfs @ 12.14 hrs HW=933.67' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 7.85 cfs @ 10.00 fps)

Summary for Subcatchment B: UnControlled Site

Runoff = 9.38 cfs @ 12.13 hrs, Volume= 0.459 af, Depth> 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.18"

	Area (sf)	CN	Description
*	30,820	98	Impervious, HSG D
*	18,533	78	Pervious, HSG D
	49,353	90	Weighted Average
	18,533		37.55% Pervious Area
	30,820		62.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment C: Untreated Site

Runoff = 6.46 cfs @ 12.13 hrs, Volume= 0.313 af, Depth> 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.18"

	Area (sf)	CN	Description
*	19,669	98	Impervious, HSG D
*	14,830	78	Pervious, HSG D
	34,499	89	Weighted Average
	14,830		42.99% Pervious Area
	19,669		57.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS1: Off-site

Runoff = 1.11 cfs @ 12.13 hrs, Volume= 0.056 af, Depth> 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment OS2: Off-site

Runoff = 1.11 cfs @ 12.13 hrs, Volume= 0.056 af, Depth> 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,247	98	Impervious, HSG D
*	1,416	78	Pervsious, HSG D
	5,663	93	Weighted Average
	1,416		25.00% Pervious Area
	4,247		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

Summary for Subcatchment UT: Untreated Site Bypass

Runoff = 2.51 cfs @ 12.13 hrs, Volume= 0.117 af, Depth> 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-year Rainfall=6.18"

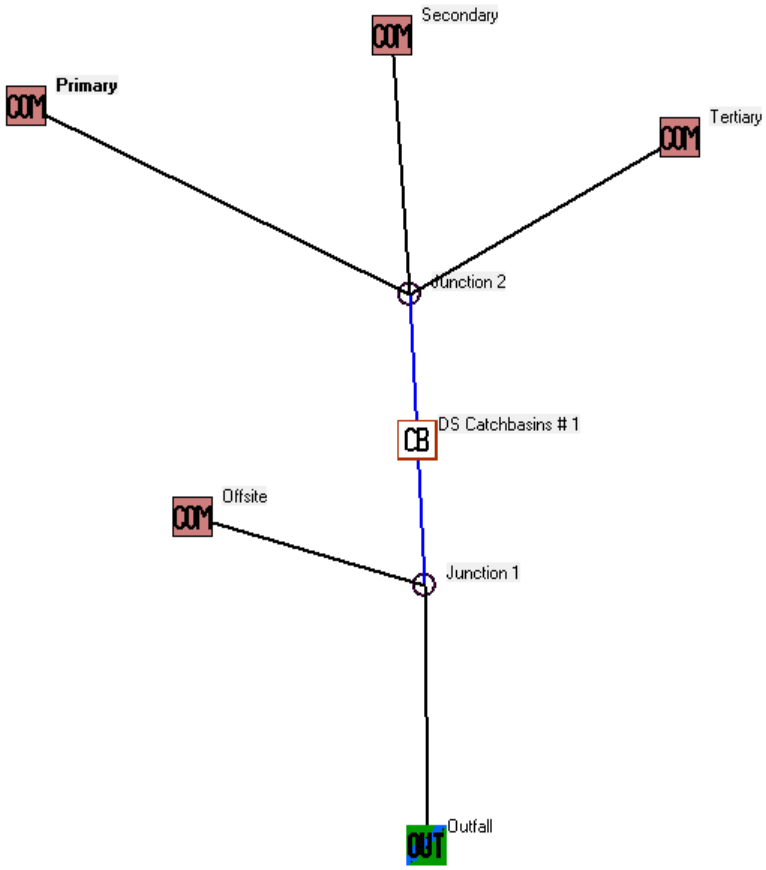
	Area (ac)	CN	Description
*	0.256	78	Pervious, HSG D
*	0.085	98	Impervious, HSG D
	0.341	83	Weighted Average
	0.256		75.07% Pervious Area
	0.085		24.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum TC**

APPENDIX 6

SEDIMENT CALCULATIONS

WINSLAMM DIAGRAM
WINSLAMM INPUT
WINSLAMM OUTPUT


Secondary
Primary
Tertiary
Junction 2
DS Catchbasins # 1
Offsite
Junction 1
Outfall

Data file name: I:\2018\188469\Civil\SWMP\Modeling\Slamm\TSS Calculations.mdb
WinSLAMM Version 10.3.4
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 04-06-2018 Time: 10:44:20
Site information:

LU# 1 - Commercial: Primary Total area (ac): 0.340
  13 - Paved Parking 1: 0.082 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  25 - Driveways 1: 0.126 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  26 - Driveways 2: 0.018 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  31 - Sidewalks 1: 0.007 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  32 - Sidewalks 2: 0.003 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  51 - Small Landscaped Areas 1: 0.093 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  52 - Small Landscaped Areas 2: 0.011 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Commercial: Offsite Total area (ac): 0.341
  13 - Paved Parking 1: 0.008 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  25 - Driveways 1: 0.044 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  26 - Driveways 2: 0.022 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  31 - Sidewalks 1: 0.008 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  32 - Sidewalks 2: 0.003 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  51 - Small Landscaped Areas 1: 0.250 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  52 - Small Landscaped Areas 2: 0.006 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Commercial: Secondary Total area (ac): 0.317

1 - Roofs 1: 0.078 ac. Flat Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.067 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.107 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.010 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.055 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Commercial: Tertiary Total area (ac): 0.135
13 - Paved Parking 1: 0.108 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.010 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.017 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Catchbasin Cleaning CP# 1 (DS) - DS Catchbasins # 1
1. Fraction of area served by catchbasins = 1.00
2. Number of catchbasins = 1
3. Average sump depth below catchbasin outlet invert (feet) = 3
4. Depth of sediment in catchbasin sump at beginning of study period (ft) = 0
5. Typical outlet pipe diameter (ft) = 1
6. Typical outlet pipe Mannings n = 0.012
7. Typical outlet pipe slope (ft/ft) = 0.01
8. Typical catchbasin sump surface area (square feet) = 390
9. Total catchbasin depth (feet) = 8
10. Inflow hydrograph peak to average flow ratio = 3.8
11. Leakage rate through sump bottom (in/hr) = 0
12. Catchbasin Critical Particle Size File Name: Not needed - calculated by program

SLAMM for Windows Version 10.3.4

Data file name: I:\2018\188469\Civil\SWMP\Modeling\Slamm\TSS Calculations.mdb
Data file description:
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81
Date of run: 04-06-2018 Time of run: 10:43:12
Total Area Modeled (acres): 1.133
Years in Model Run: 1.00

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	56938	-	132.3	470.1	-
Outfall Total with Controls:	56937	0.00%	78.65	279.6	40.52%
Annualized Total After Outfall Controls:	57093			280.3	

APPENDIX 7

STORM SEWER SIZING CALCULATIONS

STORM SEWER SYSTEM CALCULATIONS

STORM SEWER SIZING CALCULATIONS - 10 YEAR STORM

PIPE	Pipe Run		Manhole Size	Length	Pipe Diameter	Slope	Pipe Material	Mannings (n)	Pipe Area	Hydraulic Radius	DA	Drainage Areas			Runoff Coef.	Upstream End	Area x C		Time of Conc.		Rainfall Intensity	Design Storm Event	Total Runoff	Design Capacity	Percent Full	Velocity Full	Downstream I.E.	Upstream I.E.	Upstream T/P Elev.	Pipe Cover	Upstream Rim Elev.	Upstream HGL Cover	Comments
	From	To	(in.)	(ft.)	(inches)	(%)			(sq. ft.)	(ft.)		Imp. (acres)	Perv. (acres)	Total (acres)	C	(Y/N)	Increment	Total	To Structure (min.)	Pipe (min.)	(in/hr)		(cfs)	(cfs)	(%)	(ft/sec)	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(ft)	
P-1	STO INL-1	STO INL-2	2x3	23	10	0.25	PVC	0.010	0.55	0.21	P-1	0.155	0.166	0.321	0.59	Y	0.19	0.19	6.0	0.15	6.68	10	1.26	1.43	88.5%	2.62	927.88	927.94	928.85	1.92	930.77		
P-2	STO INL-2	STO MH 1	2x3	20	12	0.40	PVC	0.010	0.79	0.25	INL 2	0.092	0.024	0.116	0.80	N	0.09	0.28	6.1	0.09	6.68	10	1.89	2.94	64.3%	3.74	927.70	927.78	928.86	1.19	930.05		
P-3	STO MH 1	WQ Chamber	36	137	12	0.98	PVC	0.010	0.79	0.25						N	0.00	0.28	6.2	0.39	6.68	10	1.89	4.61	41.0%	5.87	926.25	927.60	928.68	3.27	931.95		
P-4	STO INL-3	WQ Chamber	2x3	19	6	5.00	PVC	0.010	0.20	0.13	INL 3	0.079	0.011	0.090	0.86	Y	0.08	0.08	6.0	0.04	6.68	10	0.52	1.64	31.9%	8.33	928.75	929.70	930.28	3.27	933.55		
P-5	STO INL-4	WQ Chamber	2x3	15	6	5.00	PVC	0.010	0.20	0.13	INL 4	0.098	0.024	0.122	0.81	Y	0.10	0.10	6.0	0.03	6.68	10	0.66	1.64	40.4%	8.33	928.75	929.50	930.08	3.96	934.04		
P-8	RD	STO INL-6	-	37	6	5.00	PVC	0.010	0.20	0.13	RD	0.000	0.090	0.090	0.25	Y	0.02	0.02	6.0	0.07	6.68	10	0.15	1.64	9.2%	8.33	931.05	932.90	933.48	3.72	937.20		
P-7	STO INL-6	STO INL-5	2x3	10	6	5.00	PVC	0.010	0.20	0.13						N	0.00	0.02	6.0	0.02	6.68	10	0.15	1.64	9.2%	8.33	930.45	930.95	931.53	2.49	934.02		
P-6	STO INL-5	WQ Chamber	2x3	32	6	5.00	PVC	0.010	0.20	0.13	INL 5	0.153	0.029	0.182	0.84	N	0.15	0.18	6.0	0.06	6.68	10	1.17	1.64	71.7%	8.33	928.75	930.35	930.93	3.50	934.43		
P-9	WQ Chamber	STO MH 2	-	8	12	1.00	PVC	0.010	0.79	0.25	HYDROCAD MODEL																926.17	926.25	927.33	7.27	934.60		

APPENDIX 7

USLE INFORMATION

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Official Version 1.0 (05-15-2015)

YEAR 1

Developer: Summit Credit Union

Project: Summit Credit Union - Waukesha Branch

Date: 4/6/2018

County: Waukesha

Version 1.0

Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	4/29/2019	5/10/2019	3.6%	130	Clay	0.32	40.0%	32	8.20	1.00	12.2	Silt Fence	4.3
Mulch or Erosion Mat	5/10/2019	10/15/2019	81.8%	130	Clay	0.32	40.0%	95	14.13	0.20	96.2	Sediment Basin	0.0
End	10/15/2019	-----	-----	-----	-------	-----			-----	------	-----		0.0
		-----	-----	-----	-------	-----			-----	-----	-----		0.0
		-----	-----	-----	-------	-----			-----	-----	-----		0.0
		-----	-----	-----	-------	-----			-----	-----	-----		0.0
										TOTAL	**108.4**	**TOTAL**	**4.3**
												% Reduction Required	**NONE**

SLOPE > 20% USE PRESCRIPTIVE COMPLIANCE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/1-5/15	and	8/7-8/29	Turf, introduced grasses and legumes
Thaw-6/30			Native Grasses, forbs, and legumes

Designed By:	CLH
Date	4/6/2018

APPENDIX 9

MAINTAINENCE AGREEMENT

AGREEMENT FOR MAINTENANCE OF STORMWATER MANAGEMENT MEASURES

This space is reserved for recording data

Return to:
Waukesha County Register of Deeds
515 W Moreland Blvd Rm AC110
Waukesha, Wisconsin 53188

Parcel Number(s):

WAKC113015001

RECITALS:

A. *Summit Credit Union*, is*(are)* the owner*(s)* of property in the City of Waukesha, County of Waukesha, State of Wisconsin, more particularly described on Exhibit A attached hereto ("Property").

B. The County requires Owner to record this Agreement regarding maintenance of stormwater management measures to be located on the Property. Owner agrees to maintain the stormwater management measures and to grant to the County the rights set forth below.

NOW, THEREFORE, in consideration of the agreement herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the owner agrees as follows:

1. Maintenance. Owner and its successors and assigns shall be responsible to repair and maintain the stormwater management measures located on the Property in good condition and in working order and such that the measures comply with approved plans on file with Waukesha County. Said maintenance shall be at the Owner's sole cost and expense. Owner will conduct such maintenance or repair work in accordance with all applicable laws, codes, regulations, and similar requirements. Specific maintenance task are more particularly described on Exhibit A.

2. Easement to County. If Owner fails to maintain the stormwater management measures as required in Section 1, then County shall have the right, after providing Owner with written notice of the maintenance issue ("Maintenance Notice") and thirty (30) days to comply with the County's maintenance request, to enter the Property in order to conduct the maintenance specified in the Maintenance Notice. County will conduct such maintenance work in accordance with all applicable laws, codes, regulations, and similar requirements and will not unreasonably interfere with Owner's use of the Property. All costs and expenses incurred by the County in conducting such maintenance may be charged to the owner of the Property by placing the amount on the tax roll for the Property as a special assessment in accordance with Section 66.0703, Wis. Stats. and applicable portions of the Waukesha County Ordinances.

3. Term/Termination. The term of this Agreement shall commence on the date that this Agreement is recorded with the Register of Deeds Office for Waukesha County, Wisconsin, and except as otherwise herein specifically provided, shall continue in perpetuity. Notwithstanding the foregoing, this Agreement may be terminated by recording with the Register of Deeds Office for Waukesha County, Wisconsin, a written instrument of termination signed by the County and all of the then-owners of the Property.

4. Miscellaneous.

   (a) Notices. Any notice, request or demand required or permitted under this Agreement shall be in writing and shall be deemed given when personally served or three (3) days after the same has been deposited with the United States Post Office, registered or certified mail, return receipt requested, postage prepaid and addressed as follows:

   If to Owner: _____
   _____
   _____
   _____

If to County: Waukesha County Land & Water Resources
515 W Moreland Blvd Rm AC110
Waukesha, Wisconsin 53188

Any party may change its address for the receipt of notice by written notice to the other.

(b) Governing Law. This Agreement shall be governed and construed in accordance with the laws of the State of Wisconsin.

(c) Amendments or Further Agreements to be in Writing. This Agreement may not be modified in whole or in part unless such agreement is in writing and signed by all parties bound hereby.

(d) Covenants Running with the Land. All of the easements, restrictions, covenants and agreements set forth in this Agreement are intended to be and shall be construed as covenants running with the land, binding upon, inuring to the benefit of, and enforceable by the parties hereto and their respective successors and assigns.

(e) Partial Invalidity. If any provisions, or portions thereof, of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Agreement, or the application of such provision, or portion thereof, to any other persons or circumstances shall not be affected thereby and each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

X_____
Land Records Staff Signature

_____
Print or type name

State of WI, County of_____; Subscribed and sworn before me on_____by the above named person(s).

_____
Notary Public

Print or type name: _____

My Commission Expires:_____

X_____
Owner Signature

_____
Print or type name

State of WI, County of _____; Subscribed and sworn before me on _____ by the above named person(s).

_____
Notary Public

Print or type name: _____

My Commission Expires:_____

DRAFTED BY: _____
_____
_____
_____

EXHIBIT A

Lot 1 of CSM #10663

EXHIBIT B

Maintenance Provisions:

Storm Sewer System

The owner shall maintain all components of the storm sewer system located onsite. Installation and maintenance shall be in accordance with the manufacturer's guidelines. At a minimum the storm sewer system shall be inspected annually and cleaned as needed to maintain functionality and design capacity. The sumps located in the storm sewer system shall be inspected a minimum of three (3) times per year. Sediment should be removed from the sumps when sediment depth is greater than 1.5'. Owner shall maintain records of inspections, cleaning and replacement of the system or components of the system all in accordance with City of Waukesha Ordinances.

Underground Water Quality System

The owner shall install and maintain an underground storage chamber system as distributed by StormTech or approved equivalent. Said system is installed for detention and infiltration purposes to infiltrate roof water runoff. Installation and maintenance shall be in accordance with the manufacturer's guidelines. Inspect the StormTech system immediately following construction completion. Inspection of the underground storage structure shall be done a minimum of two (2) times per year or as needed until an understanding of the site characteristics is developed. More specifically, the StormTech rows shalls be visually inspected via the inspection port and is to be JetVac cleaned any time sediment has accumulated to an average depth exceeding three (3) inches. Owner shall maintain records of inspections and cleaning of the rows in accordance with the City of Waukesha Ordinances.

Detailed information regarding installation and maintenance can be found on the Internet at www.stormtech.com or by calling StormTech at 888-892-2694.