East Basin
Total Drainage Area = 8.89 Ac
On-Site Drainage Area = 7.80 Ac
Time of Concentration to property line = 13 minutes

West Basin
Total Drainage Area = 24.66 Ac
On-Site Drainage Area = 19.85 Ac
Time of Concentration = 24 minutes

Fill Area

EXISTING CARPC ENVIRONMENTAL CORRIDOR

NW ¼ – NW ¼ 04–07–10

NE ¼ – NE ¼ 05–07–10

SW ¼ – NW ¼ 04–07–10

SE ¼ – NE ¼ 05–07–10

NW ¼ – NE ¼ 05–07–10

LANDS

CSM #13140 LOT 1

SAUTHOFF PLAT

TILTON MIDLANDS

LANSING PLACE

POND WATER ELEVATION=846.38 (AS SURVEYED ON 7/20/2022)

100-YEAR FLOODPLAIN BOUNDARY FROM WDNR

ENVIRONMENTAL CORRIDOR BOUNDARY FROM CAPITAL AREA REGIONAL PLANNING (CARPC) ONLINE DATA PORTAL

WETLAND BOUNDARY PER NEWFOUND ECOLOGICAL DELINEATION

ABANDONED RAILROAD GRADE TRACKS

RAILROAD TRACKS

EXISTING HOUSE FF=856.80

DEMOLISHED BUILDING FOUNDATION

EXISTING BARN FF=844.48

EXISTING BUILDING FF=853.64

DRIVE-OVER TRUCK SCALE

B-1 B-2 B-3 B-4 B-5 B-6 B-7 B-8 B-9 B-10

850.6'

850.3'

850.2'

849.9'

849.6'

LEGEND

- OPEN WATER
- FEMA FLOODPLAIN
- WETL — WETLAND BOUNDARY
- FLOODPLAIN BASED ON TOPOGRAPHY
- PROPOSED CARPC ENVIRONMENTAL CORRIDOR BOUNDARY
- EXISTING CONDITIONS DRAINAGE BOUNDARIES
- OFFSITE/ONSITE BOUNDARY
- TIME OF CONCENTRATION FLOW PATHS

N

The Kubala Washatko Architects, Inc.
W61 N617 Mequon Avenue
Cedarburg, WI 53012
p: 262.377.6039 | f: 262.377.2954

PROJECT

VOIT SITE

3450 Milwaukee St. Madison WI 53714

OWNER

STARKWEATHER LLC

CIVIL ENGINEER
Environmental Consulting & Technology, Inc.
403 W. St. Charles Road
Lombard, Illinois 60148
(630) 559-2000

CIVIL ENGINEER
Vierbicher
999 Fourier Drive, Suite 201
Madison, WI 53717
(608) 826-0532

LANDSCAPE DESIGN
TEN x TEN
807 Broadway St. NE, Suite 221
Minneapolis, MN 55413
(612) 440 8369

SUSTAINABILITY CONSULTING
Terrapin Bright Green
250 W 57th Street, Fl 17
New York, NY 10107
(646) 460-8400

REVISIONS

DESCRIPTION	XX-XX-XXXX

DATE

PROJECT NUMBER
244822.01

SHEET TITLE

EXISTING CONDITIONS

SHEET NUMBER

EX-1

Basin 10: Stormwater Storage
ADS StormTech MC-7200
Chamber system w/ Isolator Row
Filter pre-treatment
Drainage Area = 3.22 Ac
Required Storage = 1.04 AF

Basin 12: Stormwater Storage
ADS StormTech MC-7200
Chamber system w/ Isolator Row
Filter pre-treatment
Drainage Area = 4.89 Ac
Required Storage = 1.15 AF

Basin 22: Stormwater Storage
Naturalized Bioretention Basin
Drainage Area = 5.88 Ac
Required Storage = 0.68 AF

Basin 20: Stormwater Storage
Naturalized Infiltration Basin w/
pre-treatment from basins 22 and 21.
Drainage Area = 12.25 Ac
Required Storage = 2.17 AF

Basin 30 Stormwater Storage
ADS StormTech MC-7200
Chamber system w/ 50 cartridge
Upflow Filter pre-treatment
Drainage Area = 3.53 Ac
Provided Storage = 1.17 AF
Required Storage = 1.03 AF

Basin 22: Stormwater Storage
ADS StormTech MC-7200
Chamber system w/ 50 cartridge
Upflow Filter pre-treatment
Drainage Area = 4.35 Ac
Required Storage = 0.93 AF

Basin 40: Private Parcel
Suggested bioretention &
permeable paving system
Required Storage = 0.33 AF

Basin 50: Stormwater Storage
Permeable Paving Parking lot
Drainage Area = 0.42 Ac
Required Storage = 0.06 AF

LEVEL SPREADER

LEGEND

- 21A — CATCHMENT BOUNDARY AND CATCHMENT NUMBER
- 21 — STORMWATER STORAGE BOUNDARY AND BASIN NUMBER
- OPEN WATER
- FEMA FLOODPLAIN
- WETL — WETLAND BOUNDARY
- FLOODPLAIN BASED ON TOPOGRAPHY
- PROPOSED CARPC ENVIRONMENTAL CORRIDOR BOUNDARY

TkWA

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PROJECT

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REVISIONS

DESCRIPTION	XX-XX-XXXX

DATE

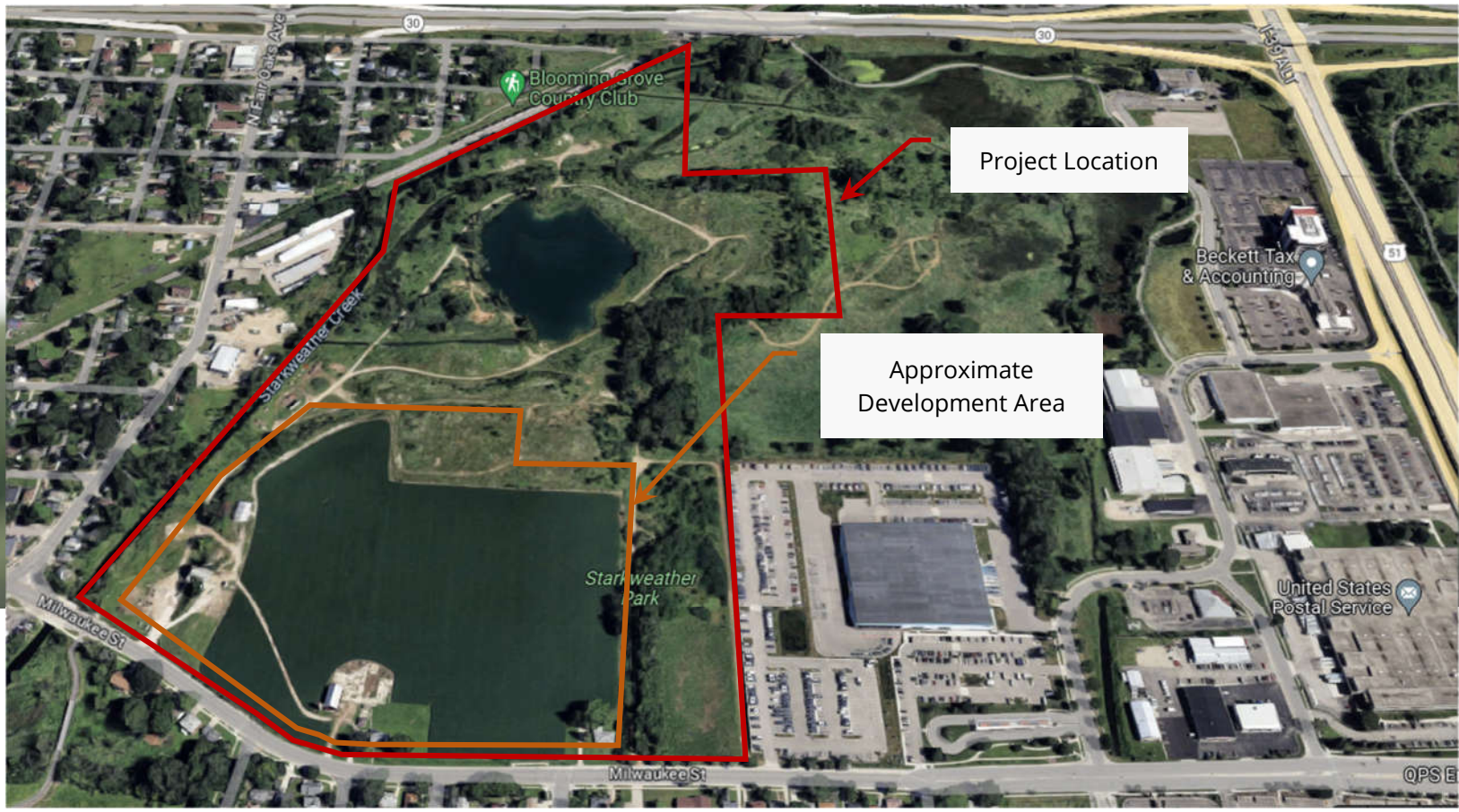
PROJECT NUMBER
244822.01

SHEET TITLE

PROPOSED CONDITIONS

SHEET NUMBER

EX-2



Starkweather Plat Stormwater Report

June 2023
ECT No. 220587

3420-3614 Milwaukee St.
Madison, WI

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Table of Contents

List of Figures

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1.0 Introduction

Starkweather proposes to annex the Voit property to the City of Madison and develop the property as indicated in this Preliminary Plat submission. This memo summarizes the proposed stormwater improvements.

Throughout this document there are references to Figures, Tables, Appendices, and Exhibits. The figures, tables and appendices are provided at the end of this document. The exhibits are 24" x 36" sheets and are provided as separate files.

2.0 Existing Conditions

The attached Exhibit 1 shows the property boundary, drainage boundaries, and natural site constraints such as floodplain and wetland. Please note that north is to the left on the exhibit.

The property is currently a mix of agricultural and open space uses and contains significant floodplain and wetland areas as well as a former quarry pond. The majority of the non-agricultural area was formerly a sand quarry, however, quarry operations have since ceased. In addition to the former mining, activities, there is a significant fill area north of the agricultural area as shown on the exhibit.

The area proposed for development is almost entirely contained within the agricultural use area with the exception of the north edge of the development that encroaches into the fill area as discussed further under Proposed Conditions.

2.1 Soils

Appendix 1 depicts the NRCS Hydrologic Soil Groups (HSG). As can be seen from the exhibit, the entire agricultural area proposed for development is HSG B (Soils BeB and DsC2). The development also encroaches into the area labeled GP and CU.

Exhibit 1 shows the locations of soil borings and Appendix 2 contains soil borings and infiltration testing results. As can be seen from the infiltration tests, the eastern portion of the site has low infiltration rates (less than 0.5 inches per hour) and the western portion of the site has relatively high infiltration rates (up to 3.6 inches per hour).

2.2 Floodplain

The FEMA floodplain boundary is shaded in dark blue on Exhibit 1. Although the flood profile is believed to be current, the boundary is based on old topography and therefore is not accurate relative to the profile. Thus, an approximate boundary based on elevation is also shown. No improvements are proposed within the floodplain with the potential exception of at-grade trails.

2.3 Wetlands

Wetlands were delineated on the site and the boundary is included on Exhibit 1. No encroachments into wetland area are proposed.

2.4 Environmental Corridor

The Capital Area Regional Plan Commission (CARPC) environmental corridor is included on Exhibit 1. The general criteria for determining the boundary of the corridor is a 75 foot setback from streams, wetlands, and other waterbodies, or the floodplain, whichever is wider. As can be seen from Exhibit 1, a portion of the corridor extends south well into the existing agricultural area. The corridor boundary was discussed with CARPC staff and it was agreed the boundary is not appropriate based on current conditions. Thus, staff provided provisional support for relocation of the corridor based on the criteria indicated above. The proposed revised boundary is shown on Exhibit 1.

2.5 Existing Conditions Stormwater

Exhibit 1 depicts the drainage boundaries for the site. As can be seen, the portion of the site where development is proposed is generally split east and west. The eastern portion drains north and ultimately discharges to wetland area owned by Madison Engineering. This area ultimately drains to Starkweather Creek. The western portion of the site drains west toward Starkweather Creek with no significantly defined drainage path. As can be seen from the exhibit, the two areas are further subdivided based on the development plan. For the eastern portion, the subdivision occurs at the property line. For the western portion, the subdivision generally coincides with the proposed platted lots where there will be ground disturbance. These subdivisions were made so that the existing and proposed drainage areas would match for the existing and proposed conditions stormwater modeling. Finally, time of concentration flow paths used in the modeling are shown on Exhibit 1.

HydroCAD V10 was used to model the existing conditions. Based on the NRCS soils map and Chapter 37, a runoff Curve Number of 68 was used for the existing conditions. The times of concentration were calculated using the standard NRCS sheet flow and shallow concentrated flow methods in HydroCAD. Table 1 included at the end of this memo shows the 2-year through 200-year runoff volumes and discharge rates the two portions of the site as well as the total.

3.0 Proposed Conditions

Starkweather proposes to develop the site as a mixed use project that will include residential, commercial, public spaces, and public streets. Exhibit 2 shows the proposed development condition along with drainage boundaries for the stormwater systems. Please also see other portions of the Preliminary Plat application for greater discussion on the proposed land uses.

Due to the high-density nature of the project, all the developed areas of the site were assumed to be 90% impervious. Also, due to the high density land uses, a significant portion of the stormwater management is proposed to be provided in underground chamber systems but the other portion is proposed to be provided in surface bioretention and infiltration systems as shown in Exhibit 2. As the project progresses to final design and engineering for construction, there is potential that portions of the underground systems may be converted to surface bioretention. However, chamber systems were used for the current analysis to verify conformance with standards if exclusive underground chamber systems are used at the locations indicated.

3.1 Modeling Methods

The proposed stormwater systems were modeled using both HydroCAD and WinSLAMM. HydroCAD was used to verify conformance with peak flow and volume control requirements for the 2-year through 200-year events. WinSLAMM was used to verify conformance with TSS removal requirements. Below are the standards for which the systems were designed per Madison Chapter 37 requirements.

3.1.1 Standard Assumptions

- **Rainfall:** NOAA Atlas 14 rainfall depths and the MSE4 rainfall distribution was used for HydroCAD modeling. For WinSLAMM modeling, the 1981 rainfall time series included with the model was used.
- **Runoff Curve Numbers (RCN):** For pre-development areas with HSG B soils (the entire development area), a value of 68 was used per Chapter 37 for the current agricultural land use. For post-development, an RCN of 98 was used for impervious areas. An RCN of 98 was also used within the boundary of the surface stormwater features. For pervious areas, the assumed HSG was increased to C per Chapter 37. Specifically, for this project a value of 74 was used. For the proposed land use, 90% impervious was used for all the development areas, including the locations of underground storage.
- **Land Use:** For WinSLAMM, the standard High Rise Residential Land Use was used for the pollutant load modeling for all the development areas.
- **Infiltration Rates:** As indicated previously, infiltration testing was conducted and low infiltration rates were found on the east side of the site and therefore an infiltration rate of zero was assumed due to the requirement that underground systems without pre-treatment to the 80% TSS rate must be sealed to prevent exfiltration. On the west side of the site where infiltration rates of 3.6 inches/hour were measured, a design infiltration rate of 1.8 inches/hour was used to provide a safety factor.
- **Peak Flow Control:** Per Chapter 37, peak flow control is required for the 1-, 2-, 10-, 25-, 100-, and 200-year events, matching post development peak flows to pre-development of the same frequency.
- **Volume Control:** Per chapter 37, volume control is required for the 2- through 200 year events where infiltration rates allow. For this project, the eastern portion of the site has low infiltration capacity per the Geotechnical information provided in Appendix 2 and therefore no volume control is required. For the western portion of the site, rates are much better and the systems were designed to meet or exceed the pre-development volumes.
- **TSS Control:** This is a new development project and therefore 80% TSS control is required overall. In addition, pre-treatment is required for infiltration-based systems. It is understood that pre-treatment to 60% is required for surface infiltration basins and that 80% pre-treatment is required for underground infiltration systems. In addition, it is understood that underground systems without 80% pre-treatment must have sealed bottoms to prevent infiltration.

3.1.2 Stormwater Storage Modeling

The paragraphs below describe the various stormwater systems that are proposed. The systems were modeled with both HydroCAD and WinSLAMM.

- **Underground chamber systems:** The basis of design for the underground systems was ADS Stormtech, and specifically model MC-7200. The chamber height for these systems are 60 inches and they require a 9-inch base stone layer and a 12-inch top stone layer for non-vehicular applications. Thus, the total height of the system is 6.75 feet.

  The chambers were modeled in HydroCAD as "Ponds" using standard storage routing procedures in HydroCAD. The storage associated with the Chambers was developed using the ADS Chamber Wizard built into HydroCAD. The discharge was modeled using the standard orifice routing, assuming a submerged orifice to minimize clogging potential. The standard V-Notch weir control was also used. Where appropriate, exfiltration from the chambers was modeled at 1.8 inches/hour.

  The chambers were modeled WinSLAMM using the "Isolator Row" control practice and using the built-in ADS systems. The "upflow filter" control practice was also used.

  The proposed systems include maintainable isolator row(s) to allow capture and removal of the majority of sediment. The WinSLAMM modeling shows that the systems, as a whole, are able to meet the 80% TSS removal requirement assuming zero infiltration. However, where the systems are intended to rely on exfiltration from the chamber systems to help meet volume control requirements, protocol requires that 80% TSS removal be achieved upstream of the infiltration and the isolator row portion is inadequate to achieve that level of performance. Thus, where the chamber systems are proposed to be used for infiltration, **Upflow Filters** were added to the system and the number of filters required to achieve that level of performance was determined using WinSLAMM. The individual systems are described further in subsequent paragraphs.

- **Bioretention Systems:** As shown on Exhibit 1 and the HydroCAD diagram in Figure 1, bioretention is proposed for pre-treatment of runoff prior to discharge to a surface infiltration basin. It is understood that the engineered soil layer of the system is assumed to provide adequate pre-treatment to allow the system to be used for infiltration and volume reduction.

  The bioretention basin was modeled using the "pond" routing built into HydroCAD and each of the layers was represented using the standard porosity values of 27% for engineered soil and 33% for open graded stone. Exfiltration was assumed to occur at 1.8 inches/hour and a proposed riser used for surface discharge was modeled as a horizontal "orifice/grate".

  The bioretention was modeled in WinSLAMM using the "Biofilter" control practice with 1.8 in/hour exfiltration capacity.

- **Infiltration Basin:** As show in Exhibit 1 and the HydroCAD diagram in Figure 1, a surface infiltration system is proposed. It is understood that surface infiltration basins require pre-treatment to 60% TSS level.

The infiltration basin was modeled using the "pond" routing built into HydroCAD. Exfiltration was assumed to occur at 1.8 inches/hour and a proposed riser used for surface discharge was modeled as a horizontal "orifice/grate".

The infiltration basin was modeled WinSLAMM using the "Biofilter" control practice with no engineered soil or gravel storage layers and a 1.8 in/hour exfiltration capacity.

- **Level Spreader:** The plan proposes to discharge the eastern portion of the site to Engineering property just upstream of existing wetlands on their property. A level spreader system is proposed to dissipate the energy of the storm system discharge. The proposed level spreader consists of a 2 to 3 foot high berm constructed of medium to large stone (2" to 8"). The discharge from the outlet storm sewer would pass through the stone, spreading the flow over the width of the level spreader. Larger events would pass over the level top of the level spreader. The level spreader was not modeled.

- **Catch Basins:** The Catch Basin control practice was used in WinSLAMM for two small areas that have no other control. The Catch basins were modeled with a 3 foot sump with no leakage. Catch Basin cleaning was indicated to be annual. The TSS removal by the catch basins is nominal but allowed better determination of individual loads in the WinSLAMM output.

3.2 Storage and Catchment Area Descriptions

The individual stormwater storage features are described below and the performance of the proposed system is shown in Tables 1, 2 and 3. Please also refer to Exhibit 2 and the HydroCAD diagram in Figure 1 for the locations of each of the systems described below.

- **Stormwater Storage Area 10 (Chamber System):** A chamber system with isolator row is proposed to manage the runoff from stormwater catchment area 10. The system is located in an area of low infiltration capacity soils and therefore no infiltration is required. Thus, the entire chamber system would be used to achieve the 80% TSS requirement and therefore no infiltration is allowed. Thus, the bottom of the proposed system would be sealed as required. Based on the HydroCAD modeling, the total storage utilized by the system during the 200-year event is 1.04 acre-feet and the total storage provided is 1.20 acre-feet. The discharge from this basin would be conveyed via storm sewer to the previously described level spreader.
- **Stormwater Storage 12 (Chamber System):** A chamber system identical to the one described above under Stormwater Storage Area 10 is proposed to manage the runoff from catchment area 12. The total storage used for this system during the 200-year event is 1.15 acre-feet of the provided 1.20 acre-feet.
- **Stormwater catchment area 11:** The east end of this small catchment area is too low to discharge to either storage area 10 or 12 and therefore the discharge from this small area would be unmanaged with the exception of catch basins with assumed annual cleaning. However, due to the performance of storage areas 10 and 12, the east side system, as a whole, would still meets the peak flow control requirements as shown in Table 2. The east side system, as a whole, also meets the 80% TSS reduction requirement.
- **Stormwater Storage Area 22 (Chamber System):** A chamber system with upflow filter and isolator row is proposed to manage the runoff from stormwater catchment area 22. The proposed upflow filter system includes 50 cartridges and provides 80% TSS removal based on

WinSLAMM modeling. Because the upflow filters provide pre-treatment to 80% TSS removal, the chamber system can be used for runoff volume control via infiltration. Based on the HydroCAD modeling, 0.93 acre-feet of storage is used during the 200-year event and the total storage provided is 0.96 acre-feet. Runoff that isn't infiltrated would be conveyed to the infiltration basin at Storage Area 20 described further below.

- **Stormwater Storage Area 21 (Bioretention):** A bioretention system is proposed to be used to manage the runoff from catchment areas 21A (The future bridge over Starkweather Creek), 21B (development area), and 21C (the area immediately surrounding the bioretention basin. The basin is composed of 1.5 feet of open graded stone storage covered by 1.5 feet of engineered soil consisting of compost and sand. The grading of the system provides three feet of storage. The system was designed consistent with WDNR Tech standards. The discharge from the system is proposed to be controlled via a 60" concrete riser with a rim elevation one foot above the floor of the bioretention surface storage. Based on the HydroCAD modeling, the system would pond to a depth of 2.01 feet during the 200-year event.
- **Stormwater Storage Area 20 (Infiltration Basin):** A surface infiltration basin is proposed for this area. As shown in Exhibit 2 and the Exhibit 3 HydroCAD diagram, it would receive excess runoff from the chamber system at Storage Area 22, and the bioretention system at storage area 21. In addition, it would receive surface runoff from the immediately surrounding area labeled Catchment Area 20. Storage systems 20 and 21 provide the required pre-treatment for the infiltration basin. The discharge from the system is proposed to be controlled via a 24" concrete riser with a rim elevation two feet above the floor of the infiltration basin. Based on the HydroCAD modeling, the basin would pond to a maximum depth of 4.08 feet during the 200-year event.
- **Stormwater Storage Area 30 (Chamber System):** A chamber system with upflow filter and isolator row is proposed for managing the runoff from stormwater catchment area 30. The upflow filter system includes 50 cartridges and provides 80% TSS removal based on WinSLAMM modeling. Because the upflow filters provide pre-treatment to 80% TSS removal, the chamber system can be used for runoff volume control via infiltration. Based on the HydroCAD modeling, 1.03 acre-feet of storage is used during the 200-year event and the total storage provided is 1.17 acre-feet.
- **Stormwater Storage Area 40:** Catchment Area 40 includes no street right of way or other public area. Thus, runoff management would be provided by the builder of the property. For estimating purposes, it was assumed that roof runoff would be managed by bioretention planters and the runoff from the interior courtyard would be managed using permeable paving. Based on the proximity to infiltration testing that occurred elsewhere on the site, an infiltration capacity of 1.8 inches/hour was used for design and modeling. Based on the HydroCAD modeling, 3.2 feet of open-graded stone with porosity of 0.33 would be required to control peak flows and runoff volumes.
- **Stormwater Storage Area 50:** Catchment Area 50B is primarily a proposed permeable paving parking lot and all the runoff from the catchment would be managed by the permeable paving. Based on the proximity to infiltration testing that occurred elsewhere on the site, an infiltration capacity of 1.8 inches/hour was used for design and modeling. Based on the HydroCAD modeling, only approximately 7 inches of open-graded stone with porosity of 0.33 would be required to completely infiltrate all the runoff from this subarea.
- **Stormwater Catchment 50C (portions of Leon and Slow Streets):** The southern end of Leon Street is too low to discharge to storage area 30 and therefore the discharge from this small area is proposed to be unmanaged with the exception of catch basins with assumed annual

cleaning. However, due to the performance of the other storage areas on the western portion of the site, the systems, as a whole would easily meet the peak flow, runoff volume, and TSS reduction standards as documented in Tables 2 and 3.

3.3 System Performance

The catchment areas and stormwater systems were modeled with HydroCAD and WinSLAMM as described in the previous sections. The results of the modeling are provided in Tables 1, 2, and 3.

Exhibit 1 shows the drainage boundaries for the eastern and western portions of the sites under existing conditions. The eastern portion of the site drains towards wetland areas located on Engineering property but ultimately drains to Starkweather Creek. The western portion of the site drains directly to Starkweather Creek.

Table1 provides the pre-development modeling results based on the current land used conditions, hydrologic soil group B, and the indicated times of concentration as calculated using HydroCAD. The results are divided into the eastern and western portions of the site. Both runoff volumes and peak flows are provided for each of the events.

Exhibit 2 shows the drainage boundaries and stormwater storage locations for the proposed stormwater system. The HydroCAD schematic in Figure 1 also shows the proposed systems. The 10 series catchments would drain to the proposed underground chamber systems and the chambers would drain to the previously described wetland area located on Engineering Property.

The 20 series catchments drain to the stormwater systems shown and then to the channel between the existing quarry pond and Starkweather Creek.

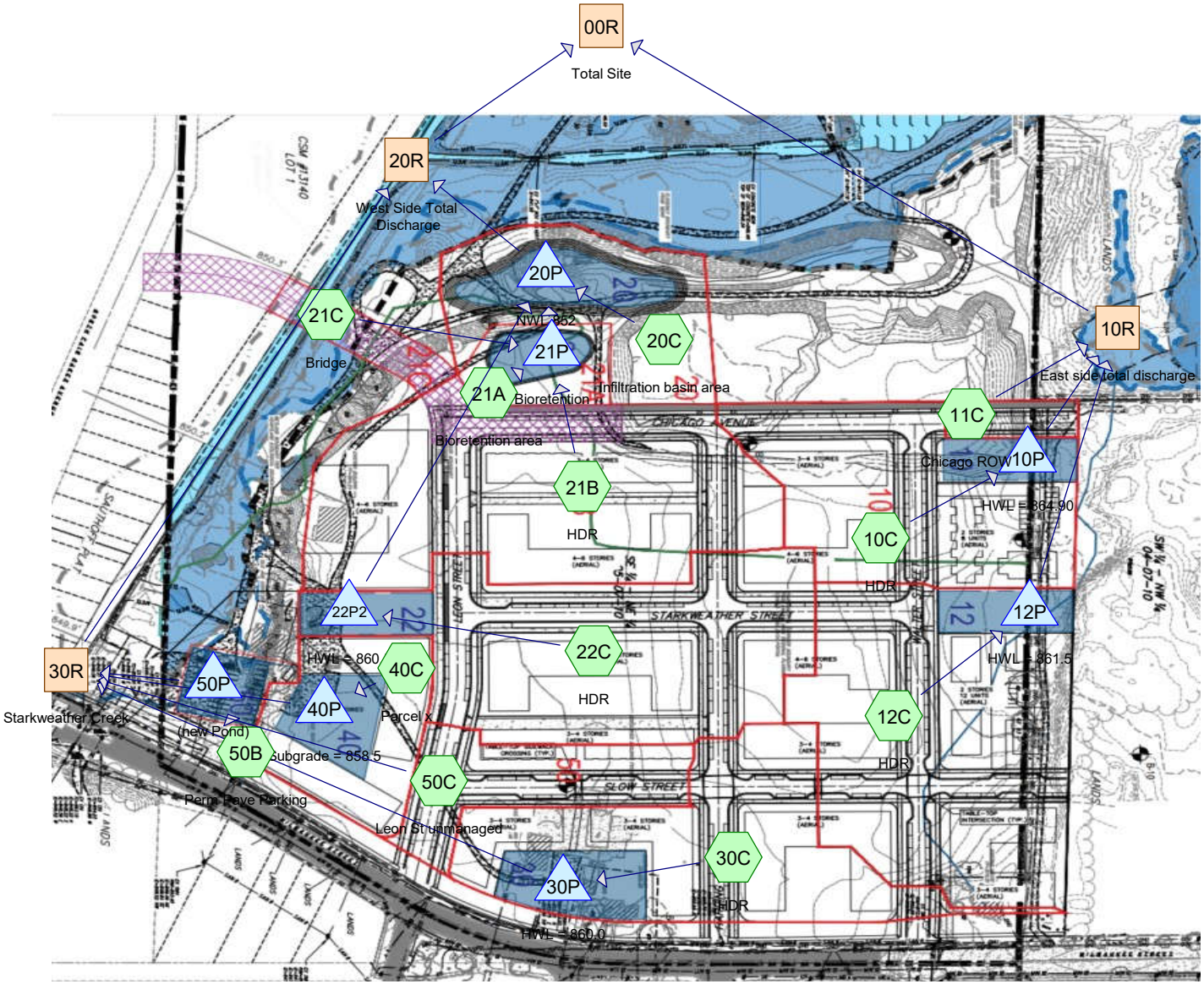
The 30, 40, and 50 series systems drain to the various stormwater systems indicated and then directly to Starkweather Creek north of Milwaukee Street.

Table 2 shows the HydroCAD modeling results for each of the major catchment areas. At the bottom of the table, the differences between the existing and proposed conditions runoff rates and volumes are provided (proposed minus existing and therefore negative numbers indicate proposed conditions rates and volumes are less than existing). As can be seen, the proposed conditions peak flow rates are significantly lower than the existing conditions flow rates for all events.

Table 2 also shows that the proposed conditions runoff volumes are lower than the existing conditions for all events for the west side of the site where infiltration is feasible and required. Although runoff volumes are not required or allowed to be controlled for the eastern portion of the site due to low infiltration capacity soils of the site, the difference in runoff volumes are provided for reference. Although the west side volume control performance is very good, the total runoff volumes for the project, as a whole, are greater under proposed conditions than under existing conditions due to the lack of volume control for the eastern portion of the site.

Table 3 shows the WinSLAMM modeling results for the East side and west side and the project as a whole. As can be seen, the modeling demonstrates that the 80% TSS removal requirement is met, individually for the eastern and western portions of the site as well as for the project, as a whole. The

runoff volume results from WinSLAMM are also shown. As can be seen from the table, the runoff volume results are very good for the standard WinSLAMM modeling year for the west side and the even the project, as a whole achieves approximately 60% runoff volume reduction.



Subcat Reach Pond Link

Routing Diagram for 2023-06-21-Proposed Conditions

Prepared by {enter your company name here}, Printed 6/22/2023

Table 1: Existing Conditions Modeling Results (HydroCAD)

East Basin

Event	Onsite Drainage Area	Time of Concentration*	Hydrologic Soil Group	Runoff CN	Runoff volume (AF)**	Peak Flow (cfs)
1	7.8	13 minutes	B	68	0.272	2.9
2	7.8	13 minutes	B	68	0.387	4.6
5	7.8	13 minutes	B	68	0.619	8.2
10	7.8	13 minutes	B	68	0.895	12.5
25	7.8	13 minutes	B	68	1.343	19.3
100	7.8	13 minutes	B	68	2.225	32.4
200	7.8	13 minutes	B	68	2.726	39.8

* Time of concentration to project boundary

** Provided for reference. Volume control not required

West Basin

Event	Onsite Drainage Area	Time of Concentration	Hydrologic Soil Group	Runoff CN	Runoff volume (AF)	Peak Flow (cfs)
1	19.83	22 minutes	B	68	0.683	5.4
2	19.83	22 minutes	B	68	0.972	8.6
5	19.83	22 minutes	B	68	1.553	15.1
10	19.83	22 minutes	B	68	2.247	23.0
25	19.83	22 minutes	B	68	3.371	35.8
100	19.83	22 minutes	B	68	5.584	60.5
200	19.83	22 minutes	B	68	6.842	74.4

Totals

Event	Onsite Drainage	Time of Concentration	Hydrologic Soil Group	Runoff CN	Runoff volume	Peak Flow (cfs)
1	27.63	-	B	68	0.955	8.3
2	27.63	-	B	68	1.359	13.2
5	27.63	-	B	68	2.172	23.3
10	27.63	-	B	68	3.142	35.5
25	27.63	-	B	68	4.714	55.0
100	27.63	-	B	68	7.809	93.0
200	27.63	-	B	68	9.568	114.2

Table 2: Proposed Conditions Hydrologic Modeling Results (HydroCAD)

East Basin 12

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak (cfs)
1	4.89	C	98/74	-	0.91
2	4.89	C	98/74	-	1.02
5	4.89	C	98/74	-	1.5
10	4.89	C	98/74	-	
25	4.89	C	98/74	-	
100	4.89	C	98/74	-	
200	4.89	C	98/74	-	

West Basin 20 (total of 20, 21, & 22)

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow (cfs)
1	12.25	C	98/74	-	
2	12.25	C	98/74	-	
5	12.25	C	98/74	-	
10	12.25	C	98/74	-	
25	12.25	C	98/74	-	
100	12.25	C	98/74	-	
200	12.25	C	98/74	-	

East Basin 10

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow
1	3.22	C	98/74	-	0.47
2	3.22	C	98/74	-	0.52
5	3.22	C	98/74	-	0.59
10	3.22	C	98/74	-	
25	3.22	C	98/74	-	
100	3.22	C	98/74	-	
200	3.22	C	98/74	-	

West Basin 30

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow (cfs)
1	3.53	C	98/74	-	
2	3.53	C	98/74	-	
5	3.53	C	98/74	-	
10	3.53	C	98/74	-	
25	3.53	C	98/74	-	
100	3.53	C	98/74	-	
200	3.53	C	98/74	-	

East Basin 11

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow
1	0.31	C	98/74	-	
2	0.31	C	98/74	-	
5	0.31	C	98/74	-	
10	0.31	C	98/74	-	
25	0.31	C	98/74	-	
100	0.31	C	98/74	-	
200	0.31	C	98/74	-	

West Basin 40

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow (cfs)
1	1.66	C	98/74	-	
2	1.66	C	98/74	-	
5	1.66	C	98/74	-	
10	1.66	C	98/74	-	
25	1.66	C	98/74	-	
100	1.66	C	98/74	-	
200	1.66	C	98/74	-	

East Total

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow
1	8.42	B	68	1.31	2.18
2	8.42	B	68	1.544	2.46
5	8.42	B	68	1.957	3.53
10	8.42	B	68	2.392	5.65
25	8.42	B	68	3.029	10.26
100	8.42	B	68	4.16	22.78
200	8.42	B	68	4.763	29.31

West Basin 50

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow (cfs)
1	1.77	C	98/74	-	
2	1.77	C	98/74	-	
5	1.77	C	98/74	-	
10	1.77	C	98/74	-	
25	1.77	C	98/74	-	
100	1.77	C	98/74	-	
200	1.77	C	98/74	-	

Site Total (West + East Basins)

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow
1	27.63	C	98/74	1.614	7
2	27.63	C	98/74	2.067	9.67
5	27.63	C	98/74	2.746	12.3
10	27.63	C	98/74	3.551	17.95
25	27.63	C	98/74	5.285	25.64
100	27.63	C	98/74	8.532	45.22
200	27.63	C	98/74	10.304	59.86

West Basin Total

Event	Drainage Area	HSG	Runoff CN	Runoff (AF)	Peak Flow (cfs)
1	19.21	C	98/74	0.304	4.82
2	19.21	C	98/74	0.523	7.21
5	19.21	C	98/74	0.789	8.77
10	19.21	C	98/74	1.159	12.3
25	19.21	C	98/74	2.256	15.38
100	19.21	C	98/74	4.372	22.44
200	19.21	C	98/74	5.541	30.55

Peak Flow and Runoff Volume Differences for East Basin, West Basin, and Total Project Area (post-pre)

Event	East Difference* Runoff (AF)	East Difference* Peak (cfs)
1	1.038	-0.73
2	1.157	-2.18
5	1.338	-4.63
10	1.497	-6.81
25	1.686	-8.99
100	1.935	-9.64
200	2.037	-10.48

Event	West Difference Runoff (AF)	West Difference Peak
1	-0.379	-0.54
2	-0.449	-1.34
5	-0.764	-6.33
10	-1.088	-10.72
25	-1.115	-20.37
100	-1.212	-38.09
200	-1.301	-43.89

Event	Total Difference* Runoff (AF)	Total Difference* Peak (cfs)
1	0.659	-1.27
2	0.708	-3.52
5	0.574	-10.96
10	0.409	-17.53
25	0.571	-29.36
100	0.723	-47.73
200	0.736	-54.37

* The East Basin and the post development Total runoff volumes are not required to be less than existing.

Table 3: WinSLAMM Modeling Results

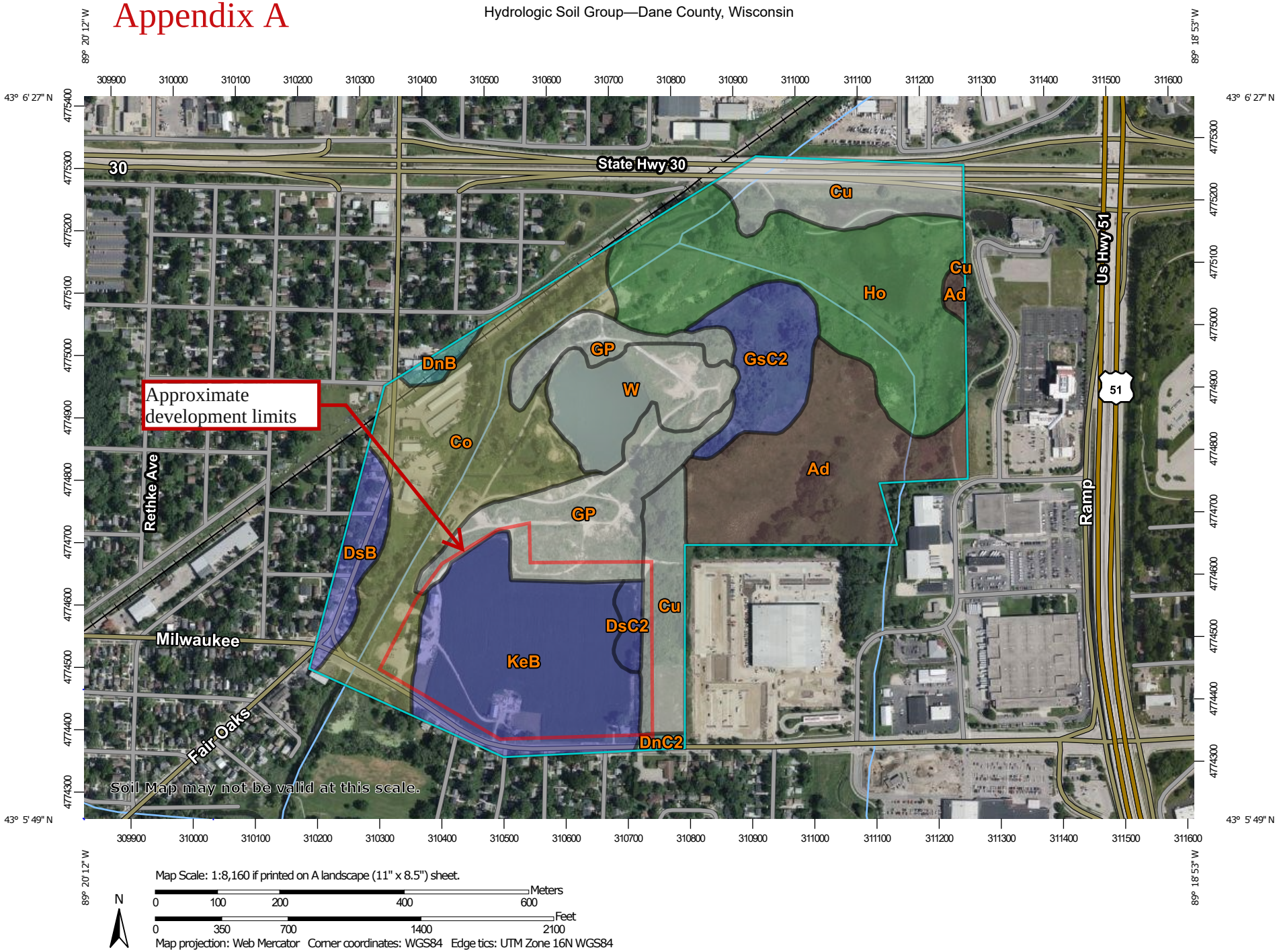
East Side							
	Drainage Area	TSS Load (lbs)			Runoff Volumes (ac-ft)		
Basin	(ac)	Influent	Effluent	Removal %	Influent	Effluent	Removal %
12 chamber system	4.89	1,962	336	82.9%	282,241	278,663	1.27%
10 chamber system	3.22	1,292	177	86.3%	185,854	182,060	2.04%
11 catch basin cleaning	0.307	184	128	30.2%	21,753	21,753	0.00%
Total East Side	**8.417**	**3,438**	**641**	**81.3%**	**489,848**	**482,476**	**1.50%**

West Side							
	Drainage Area	TSS Load (lbs)			Runoff Volumes (ac-ft)		
Basin	(ac)	Influent	Effluent	Removal %	Influent	Effluent	Removal %
22 Upflow Filter	4.35	1,745	343	80.3%	251,074	251,074	0.0%
22 chamber system	4.35	343	2	99.5%	251,074	3,318	98.7%
22 Cumulative System	**4.35**	**1,745**	**2**	**99.9%**	**251,074**	**3,318**	**98.7%**
21 Bioretention	5.88	2,358	18	99.2%	339,270	2,912	99.1%
20 Infiltration basin	12.27	20	0	100.0%	6,230	0	100.0%
20 Cumulative System	**12.27**	**4,103**	**0**	**100.0%**	**590,344**	**0**	**100.0%**
30 Upflow filter	3.53	1,416	225	84.1%	203,690	203,690	0.0%
30 Chamber System	3.53	225	0	100.0%	203,690	0	100.0%
30 Cumulative System	**3.53**	**1,416**	**0**	**100.0%**	**203,690**	**0**	**100.0%**
40 Permeable paving	**1.66**	**853**	**302**	**64.6%**	**142,501**	**43,641**	**69.4%**
50 catch basin cleaning	1.35	737	521	29.3%	95,972	95,972	0.0%
50 Permeable Paving	0.42	283	0	100.0%	34,888	0	100.0%
50 Cumulative System	**1.77**	**1,020**	**521**	**49.0%**	**130,860**	**95,972**	**26.7%**
Total West Side	**19.23**	**7,392**	**823**	**88.9%**	**1,067,395**	**139,613**	**86.9%**

Total Project Area							
Total Project Area	**27.647**	**10,829**	**1,464**	**86.5%**	**1,557,243**	**622,089**	**60.1%**

Appendix A

Hydrologic Soil Group—Dane County, Wisconsin



Map Scale: 1:8,160 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

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: Dane County, Wisconsin
Survey Area Data: Version 20, Sep 7, 2021

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

Date(s) aerial images were photographed: Jun 13, 2020—Jul 31, 2020

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
Ad	Adrian muck, 0 to 2 percent slopes	B/D	21.0	13.2%
Co	Colwood silt loam, 0 to 2 percent slopes	C/D	27.6	17.3%
Cu	Cut and fill land		16.1	10.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	C	1.0	0.6%
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	C	0.5	0.3%
DsB	Dresden silt loam, 2 to 6 percent slopes	B	4.2	2.6%
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	B	1.4	0.9%
GP	Gravel pit		17.5	11.0%
GsC2	Grays silt loam, 6 to 12 percent slopes, eroded	B	8.1	5.1%
Ho	Houghton muck	A/D	28.4	17.8%
KeB	Kegonsa silt loam, 2 to 6 percent slopes	B	23.8	14.9%
W	Water		9.8	6.2%
Totals for Area of Interest			**159.4**	**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 B

DRAFT

CGC Inc.

LOG OF TEST BORING

Project: Voit Property Development
Milwaukee Street
Location: Madison, Wisconsin

Boring No. 1
Surface Elevation (ft) 866±
Job No. C22302
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						6± in. TOPSOIL					
1		14	M	9		FILL: Stiff, Brown Lean Clay, Trace to Little Sand and Gravel, Scattered Sand Seams	(1.75)				
2		10	M	3			(1.25-2.0)				
3		15	M	13	5	FILL: Medium Stiff to Very Stiff, Dark Gray to Black Lean to Silty Clay, Little Sand and Gravel, Trace Organics	(2.0-2.25)				
4		11	M	24			(2.25)				
5		14	M/W	8	10		(2.0-3.75)				
6		15	M/W	4	15		(0.75-1.25)				
7		12	W	4	20	FILL: Very Loose to Loose, Gray to Dark Gray Clayey Fine Sand, Trace Organics					
8		7	W	7	25	FILL: Stiff, Black Lean Clay, Some Sand, Little Gravel, Trace Organics	(1.75)				
9		16	W	23	30	Medium Dense, Tan Fine SAND, Trace Silt and Gravel (SP)					
					35	End of Boring at 35 ft Boreholes Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ 23.0' Upon Completion of Drilling
Time After Drilling Next day
Depth to Water 6.0' ▼
Depth to Cave in 10.0'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 8/2/22 End 8/2/22
Driller OSE Chief Gage Rig Geoprobe
Logger Editor TFG 7822DT
Drill Method 2.25" HSA; Autohammer

DRAFT

CGC Inc.

LOG OF TEST BORING

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **2**
Surface Elevation (ft) **851±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						8± in. TOPSOIL					
1		13	M	8		Hard, Gray Lean CLAY, Trace to Little Sand and Gravel (CL; Possible Fill)	(4.5+)				
2		12	M	2	5	Very Loose, Black Fibrous PEAT (PT)					
3		17	W	7		Loose, Brown Fine to Medium SAND, Little Gravel, Trace Silt (SP)					
4		13	W	9	10						
5		8	W	8	15	Loose, Brown Sandy Fine to Coarse GRAVEL, Trace Silt (SP)					
6		10	W	10	20	Interbedded, Medium Dense, Tan Fine SAND, Trace to Little Silt, and Brown/Gray Fine to Coarse GRAVEL, Some Sand, Trace Silt (SP/SP-SM/GP)					
7		6	W	11	25	End of Boring at 25 ft Boreholes Backfilled with Bentonite Chips					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **6.0'** Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/3/22** End **8/3/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger _____ Editor **TFG** **7822DT**
Drill Method **3.25" HSA to 10' / switch to Mud-Rotary; Autohammer**

DRAFT

CGC Inc.

LOG OF TEST BORING

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **3**
Surface Elevation (ft) **857±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						6± in. TOPSOIL					
1		10	M	15		FILL: Medium Dense, Brown Fine to Coarse Sand, Some Silt and Gravel, Scattered Possible Cinders/Asphalt Pieces					
2		4	M	14	5						
3		8	M	8		Loose, Tan Fine to Coarse SAND, Little to Some Gravel, Trace Silt (SP)					
4		11	M	9	10						
5		14	W	7	15	Very Loose to Medium Dense, Brown Fine to Medium SAND, Trace Silt and Gravel (SP)					
6		18	W	3	20						
7		16	W	10	25						
8		18	W	38	30	Dense, Brown Sandy Fine to Coarse GRAVEL, Trace Silt (SP)					
						End of Boring at 30 ft					
					35	Boreholes Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **11.0'** Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/2/22** End **8/2/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger Editor **TFG** **7822DT**
Drill Method **3.25" HSA to 10' / switch to Mud-Rotary; Autohammer**

CGC Inc.

LOG OF TEST BORING

DRAFT

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **4**
Surface Elevation (ft) **857±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						3± in. TOPSOIL					
1		13	M	17		FILL: Medium Dense, Brown Fine to Medium Sand, Some Silt and Gravel					
2		12	M	6	5	FILL: Medium Stiff to Stiff, Gray Silty Clay, Little Sand and Gravel, Scattered Sand/Gravel Seams and Possible Cinders/Asphalt Pieces	(1.5-1.75)				
3		13	M	2			(0.75-1.0)				
4		14	M	12	10	FILL: Medium Dense, Gray Sandy Silt, Some Gravel, Scattered Possible Cinders/Asphalt Pieces					
5		13	W	9	15	Loose, Brown Sandy Fine to Coarse GRAVEL, Trace Silt (SP)					
6		17	W	3	20	Very Loose to Medium Dense, Tan Fine to Medium SAND, Trace Silt and Gravel (SP)					
7		2	W	14	25	End of Boring at 25 ft Boreholes Backfilled with Bentonite Chips					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **14.0'** Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ **Next day**
Depth to Water _____ _____ _____ **10.0'** ▼
Depth to Cave in _____ _____ _____ **10.5'**

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/2/22** End **8/2/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger _____ Editor **TFG** **7822DT**
Drill Method **2.25" HSA; Autohammer**

DRAFT

CGC Inc.

LOG OF TEST BORING

Project: **Voit Property Development**
Milwaukee Street
Location: **Madison, Wisconsin**

Boring No. **5**
Surface Elevation (ft) **871±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						5± in. TOPSOIL					
1		11	M	9		FILL: Intermixed, Very Stiff, Brown to Gray Silty Clay, Little Sand, and Loose to Medium Dense, Brown Silty Fine to Medium Sand, Little Gravel	(2.75-4.0)				
2		11	M	14	5		(3.0-3.25)				
3		7	M	9		Very Stiff to Hard, Gray/Brown (Mottled) Lean to Silty CLAY, Little Sand and Gravel, Trace Organics (CL/CL-ML; Possible Fill)	(3.5-4.5+)				
4		18	M	16		Medium Dense, Tan Fine to Medium SAND, Trace Silt and Gravel (SP; Possible Fill)	(0.75-1.0)				
					10	Medium Stiff to Stiff, Gray to Dark Gray Silty CLAY, Some Sand, Trace Gravel and Organics, Scattered Possible Cinders/Asphalt Pieces (CL-ML; Possible Fill)					
5		8	M	3			(1.5-1.75)				
					15						
6		12	M	4			(1.75)				
					20	Very Loose to Loose, Tan/Light Gray (Lightly Mottled) Sandy SILT, Little Gravel (ML)					
7		16	M/W	41		Dense, Brown Fine to Medium SAND, Little Gravel, Trace Silt (SP)					
					25	End of Boring at 25 ft					
						Boreholes Backfilled with Bentonite Chips					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽	NW		Upon Completion of Drilling	NW
Time After Drilling				Next day
Depth to Water				▼
Depth to Cave in				4.0'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/2/22** End **8/2/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger Editor **TFG** **7822DT**
Drill Method **2.25" HSA; Autohammer**

DRAFT

CGC Inc.

LOG OF TEST BORING

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **6**
Surface Elevation (ft) **854±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						8± in. TOPSOIL					
1		8	M	7		Stiff to Very Stiff, Brown Lean CLAY, Trace to Little Sand and Gravel, Scattered Sand Seams (CL; Possible Fill)	(3.5-4.0)				
2		12	M	3			(1.75-2.0)				
3		14	M	4	5	Very Loose, Brown Fine to Medium SAND, Trace Silt and Gravel (SP)					
4		18	M/W	5		Very Loose to Medium Dense, Tan Fine SAND, Trace Silt and Gravel (SP)					
5		16	W	2	10						
6		15	W	6	15						
7		14	W	10	20						
8		13	W	15	25						
					30	End of Boring at 30 ft Boreholes Backfilled with Bentonite Chips					
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **8.0'** Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/3/22** End **8/3/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger Editor **TFG** **7822DT**
Drill Method **3.25" HSA to 10' / switch to Mud-Rotary; Autohammer**

DRAFT

CGC Inc.

LOG OF TEST BORING

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **7**
Surface Elevation (ft) **865±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						18± in. TOPSOIL					
1		10	M	3		Stiff to Very Stiff, Brown/Gray (Mottled) Lean CLAY, Trace Sand (CL)	(1.25-2.25)				
2		18	M	4	5		(2.75-3.0)				
3		11	M	4		Very Loose to Loose, Tan Fine SAND, Trace Silt and Gravel (SP)					
4		13	M	4	10						
5		16	M	4	15						
6		18	W	1	20						
7		5	W	3	25						
8		10	W	10	30	Medium Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					
9		12	W	12	35						
						End of Boring at 35 ft Boreholes Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **17.0'** Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/3/22** End **8/3/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger _____ Editor **TFG** **7822DT**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

DRAFT

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **8**
Surface Elevation (ft) **864±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						5± in. TOPSOIL					
1		5	M	22		Medium Dense, Brown Gravelly Fine to Coarse SAND, Little to Some Silt (SP-SM/SM; Possible Fill)					
2		13	M	31	5	Medium Dense to Very Dense, Tan Sandy Fine to Coarse GRAVEL, Trace to Little Silt (GP/GP-GM)					
3		11	M	18							
4		10	M	16	10						
5		7	M	15	15	▽					
6		10	W	11	20						
7		8	W	88/7"	25	End of Boring at 25 ft Boreholes Backfilled with Bentonite Chips					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **16.0'** Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/4/22** End **8/4/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger _____ Editor **TFG** **7822DT**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

DRAFT

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **9**
Surface Elevation (ft) **872±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						5± in. TOPSOIL					
1		16	M	5		Very Stiff, Brown Lean CLAY, Trace Sand and Gravel (CL; Possible Fill)	(3.25-3.75)				
2		11	M	2	5	Medium Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.25-2.5)				
3		16	M	5			(2.75-3.0)				
4		18	M/W	3	10	Very Loose to Very Dense, Tan Sandy Fine to Coarse GRAVEL, Trace to Little Silt (GP/GP-GM)	(0.75-1.5)				
5		14	M	41	15						
6		15	M	76	20						
7		17	W	13		Medium Dense, Grayish Brown SILT, Little Sand (ML)					
					25	End of Boring at 25 ft Boreholes Backfilled with Bentonite Chips					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **23.0'** Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start **8/5/22** End **8/5/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger _____ Editor **TFG** **7822DT**
Drill Method **3.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Voit Property Development**
Milwaukee Street
Location **Madison, Wisconsin**

Boring No. **10**
Surface Elevation (ft) **871±**
Job No. **C22302**
Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						4± in. TOPSOIL					
1		12	M	34		FILL: Dense, Black Fine to Coarse Sand, Some Silt and Gravel (Possible Foundry Sand)					
2		13	M	11	5	FILL: Very Stiff to Hard, Dark Gray to Black Lean Clay, Little Sand and Gravel, Trace Organics, Scattered Possible Cinders/Asphalt Pieces	(2.0-4.5+)				
3		14	M	23			(3.0-3.75)				
4		12	M	15	10	Medium Dense to Very Dense, Tan Silty Fine SAND, Some Gravel, Scattered Cobbles/Boulders (SM)					
5		18	M	24	15						
6		18	M	59	20						
7		2	M	50/2"	25	End of Boring/Auger Refusal on Possible Cobble/Boulder or Bedrock at 24 ft Boreholes Backfilled with Bentonite Chips					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **NW** Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

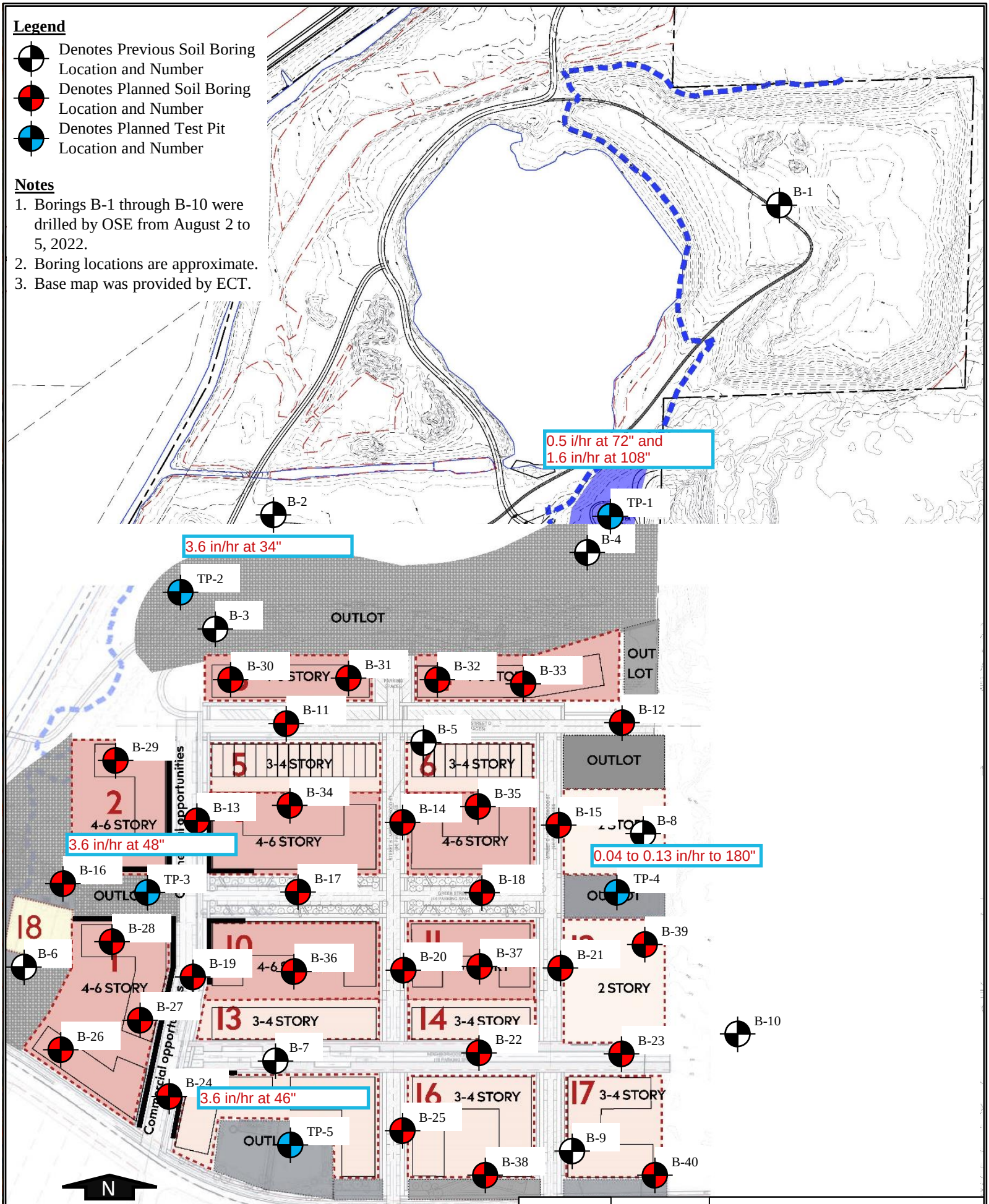
Start **8/4/22** End **8/4/22**
Driller **OSE** Chief **Gage** Rig **Geoprobe**
Logger Editor **TFG** **7822DT**
Drill Method **3.25" HSA; Autohammer**

Legend

- Denotes Previous Soil Boring Location and Number
- Denotes Planned Soil Boring Location and Number
- Denotes Planned Test Pit Location and Number

Notes

1. Borings B-1 through B-10 were drilled by OSE from August 2 to 5, 2022.
2. Boring locations are approximate.
3. Base map was provided by ECT.



Proposal: C978.234	CGC, Inc.	**SOIL BORING & TEST PIT LOCATION EXHIBIT**
Date: 11/2022		**Voit Property Development** Milwaukee Street Madison, Wisconsin

Division of Industry Services
P.O. Box 2658
Madison, Wisconsin 53701

Attachment 2:

SOIL AND SITE EVALUATION - STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road ***Please print all information*** Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]	County: Dane Parcel I.D.: 251/0710-051-1019-4 Reviewed by: Date:

Property Owner: Voit Land LLC		Property Location: Govt. Lot NE ¼ NE ¼ S 5 T 7 N R 10 E	
Property Owner's Mail Address: 4526 Sandpiper Trl		Lot #:	Block#: Subd. Name or CSM #:
City: Cottage Grove	State: WI / Zip Code: 53527 / Phone Number:	[X] City [ ] Village [ ] Town: Madison	Nearest Road: 3450 Milwaukee St
Drainage area: _____ [ ] sq ft [ ] acres		Hydraulic Application Test Method	Soil Moisture Date of soil borings: _____ USDA-NRCS WETS Value:
Test site suitable for (check all that apply): [ ] Site not suitable;		[X] Morphological Evaluation	[ ] Dry = 1;
[ ] Bioretention; [ ] Subsurface Disperal System;		[ ] Double Ring Infiltrometer	[ ] Normal = 2;
[ ] Reuse; [ ] Irrigation; [ ] Other _____		[ ] Other: (specify) _____	[ ] Wet = 3.

TP-1 #OBS. [X] Pit [ ] Boring Ground surface elevation 856.0 ft. Elevation of limiting factor 847.0 ft. (Color) 845.0 ft. (Groundwater)

Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-5	10YR 4/2	none	SL *(fill)*	1fsbk	mvfr	gs	<10		0.50 (1)
2	5-72	10YR 5/3	none	GRSL, SiL, CL *(fill)*	variable		gs	var.		0.03-0.50 (1)
3	72-108	10YR 5/3 to 6/4	none	GRSL	0sg	ml	gs	20-30		0.50
4	108-144	2.5Y 5/1	none	GRLS	0sg	ml	n/a	25-35		1.63

Comments: Groundwater seepage was observed at about 11 ft below grade during and upon the completion of excavating. However, gray matrix color in Horizon 4 suggests the level of seasonal high groundwater at about 9 ft.
(1) Infiltration rates in *fill* should be considered very approximate due to variable composition.

Overall Site Comments: See Comments above and Stormwater Infiltration Potential section in our Geotechnical Exploration Report (CGC Project No. C22302-1; dated January x, 2023).

Name (Please Print): Tim F. Gassenheimer	Signature		Credential Number: SP-011900004
Address: 129 Milky Way, Madison, WI 53718		Date Evaluation Conducted: December 8, 2022	Telephone Number: (608) 288-4100

Division of Industry Services
P.O. Box 2658
Madison, Wisconsin 53701

Attachment 2:

SOIL AND SITE EVALUATION - STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road

Please print all information

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]

County	Dane
Parcel I.D.	251/0710-051-1019-4
Reviewed by:	
Date:	

Property Owner: Voit Land LLC			Property Location: Govt. Lot SE ¼ NE ¼ S 5 T 7 N R 10 E
Property Owner's Mail Address: 4526 Sandpiper Trl		Lot #	Block# / Subd. Name or CSM #
City: Cottage Grove	State: WI	Zip Code: 53527	Phone Number
[X] City [ ] Village [ ] Town: Madison			Nearest Road: 3450 Milwaukee St

Drainage area _____ [ ] sq ft [ ] acres

Test site suitable for (check all that apply): [ ] Site not suitable;
[ ] Bioretention; [ ] Subsurface Disperal System;
[ ] Reuse; [ ] Irrigation; [ ] Other _____

Hydraulic Application Test Method
[X] Morphological Evaluation
[ ] Double Ring Infiltrometer
[ ] Other: (specify) _____

Soil Moisture
Date of soil borings: _____
USDA-NRCS WETS Value:
[ ] Dry = 1;
[ ] Normal = 2;
[ ] Wet = 3.

TP-2 #OBS. [X] Pit [ ] Boring Ground surface elevation 854.0 ft. Elevation of limiting factor 844.0 ft. (Groundwater)

Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-7	10YR 4/2	none	GRSL *(fill)*	1fsbk	mvfr	gs	15-25		0.50 (1)
2	7-34	10YR 5/3	none	VGRSL, SiL, CL *(fill)*	variable		gs	var.		0.03-0.50 (1)
3	34-47	10YR 6/4	none	XGRS	0sg	ml	gs	80-90		3.60
4	47-102	10YR 7/3	none	S, *FS/SiL Seams*	0sg	ml	gs	2 (2)	3 (2)	0.13-3.60 (3)
5	102-120	10YR 6/3	none	VGRS	0sg	ml	n/a	50-60		3.60

Comments: Groundwater seepage was observed at about 10 ft below grade during and upon the completion of excavating.

(1) Infiltration rates in *fill* should be considered very approximate due to variable composition.

(2) Based on a sample taken at about 7.5 ft below grade.

(3) Vertical infiltration rate is expected to be controlled by scattered *fine sand and silt loam seams* , but can likely be improved by excavating/turning over (i.e., deep-tilling) the granular deposit to break up the lower-permeability seams; samples should be collected during construction to check that the texture of the blended soil is consistent with the design infiltration rate.

Overall Site Comments: See Comments above and Stormwater Infiltration Potential section in our Geotechnical Exploration Report (CGC Project No. C22302-1; dated January x, 2023).

Name (Please Print): Tim F. Gassenheimer	Signature		Credential Number: SP-011900004
Address: 129 Milky Way, Madison, WI 53718		Date Evaluation Conducted: December 8, 2022	Telephone Number: (608) 288-4100

TP-3 #OBS. [X] Pit [ ] Boring Ground surface elevation 865.0 ft. Elevation of limiting factor <854.0 ft.

Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-10	10YR 4/1	none	SiL	1mpl	mfr	cs	<10		0.13 (1)
2	10-48	10YR 5/4	none	SiCL	2msbk	mfi	cs	<5		0.04
3	48-78	10YR 7/4	none	VGRS	0sg	ml	gs	40-50		3.60
4	78-132	10YR 7/4	none	GRS	0sg	ml	n/a	15-25		3.60

Comments: Groundwater was not encountered during or shortly after excavating. Test pit terminated at 11 ft below grade due to excessive sidewall cave-in/lack of excavation progress.

(1) Platy structure may reduce infiltration rate below published value.

TP-4 #OBS. [X] Pit [ ] Boring Ground surface elevation 863.0 ft. Elevation of limiting factor 857.5 ft. (Color/redox) 853.5 ft. (Poss. GW)

Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-34	10YR 5/2	none	SiL	1fabk	mvfr	cs	<5		0.13
2	34-66	10YR 5/4	none	SiCL	0m	mfi	gs	<5		0.04
3	66-114	10YR 7/1	c2d 10YR 5/4, 4/6	SiCL	2msbk	mfi	gs	<5		0.04
4	114-156	10YR 5/4	none	GRSL, *SiL Seams*	0sg	ml	cs	20-30		0.13-0.50 (1)
5	156-180	5Y 6/1	c2d 10YR 5/4	SiL	1csbk	mfr	n/a	<10		0.13

Comments: Groundwater seepage was not observed during or shortly after excavating. However, soil saturation suggests groundwater table (or possible perched water) near 9.5 ft below grade. Gray matrix color and redox in Horizon 3 may indicate the level of seasonal high grondwater (or possible perched water) at about 5.5 ft.

(1) Vertical infiltration rate is expected to be controlled by scattered *silt loam seams* , but can likely be improved by excavating/turning over (i.e., deep-tilling) the granular deposit to break up the lower-permeability seams; samples should be collected during construction to check that the texture of the blended soil is consistent with the design infiltration rate.

TP-5 #OBS. [X] Pit [ ] Boring Ground surface elevation 864.0 ft. Elevation of limiting factor <851.0 ft.

Horizon	Approx. Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines (P200)	Hydraulic App Rate Inches/Hr
1	0-8	10YR 4/2	none	SiL	1fgr	mvfr	cs	<10		0.13
2	8-46	10YR 5/4	none	SiCL	2msbk	mfi	cs	<5		0.04
3	46-156	10YR 6/4	none	VGRS	0sg	ml	n/a	44 (1)	3 (1)	3.60

Comments: Groundwater was not encountered during or shortly after excavating. Test pit terminated at 13 ft below grade due to excessive sidewall cave-in/lack of excavation progress.

(1) Based on a sample taken at about 12 ft below grade.