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STORM WATER MANAGEMENT PLAN
UNIVERSITY OF WISCONSIN– MADISON

Prepared For:

915, 917, 930, 935 West Johnson Street

213, 215, 217, 219 North Brooks Street

Madison, WI 53715

Prepared By:

Kapur & Associates, Inc.

7711 North Port Washington Road

Milwaukee, WI 53217

APRIL 2023

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1.0 Project Contacts

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2.0 Project Location and Description

The project site is located at 915, 917, 930, 935 West Johnson Street and 213, 215, 217, 219 North Brooks Street in Madison, Wisconsin. The parcel is located in part of the NW ¼ of the NW ¼ of Section 23 Town, 7 North, Range 9 East in the City of Madison, Dane County, Wisconsin. Refer to the Plat of Survey of the Plan Set in Appendix F for the exact Legal Description and figure SWMP-1 in Appendix E for an aerial photo of the existing subject site and SWMP limits.

The parcel area of the site is approximately 1.09 acres (47,347 sq.ft.). The existing project site is a developed area consisting of buildings, asphalt parking lots, concrete sidewalk areas, and landscaped areas.

The proposed project improvements include the construction of a new building, mass grading, concrete sidewalk areas, permeable pavers, pavement areas, utility improvements, and the construction of onsite stormwater management basin in the form of underground detention system.

3.0 Soil Information

Geotechnical exploration of the site was conducted by CGC, Inc. in January 2022. A Geotechnical Engineering Report based on these findings was completed on January 31st, 2022. The purpose of the exploration is to provide information and geotechnical engineering recommendations relative to subsurface soil conditions, groundwater conditions, site preparation and earthwork, excavation considerations, foundation design and construction, floor slab design and construction, seismic site classification per IBS, pavement design and construction, frost conditions, and stormwater considerations.

A total of ten (10) standard penetration test (SPT) borings were drilled at the site. These borings were performed in the proposed building location. The borings extended to a varying depth of 27 to 50 feet below existing site grades. Please refer to Appendix A for a complete copy of the Geotechnical Engineering Report. These borings showed the presence of predominately lean clay. The USDA soil types located on this site are shown on the Hydrologic Soil Group (HSG) Map in Appendix A. As shown on the HSG Map, soils can be described as Batavia silt loam and Dodge silt loam characterized as hydrologic soil classification group “C”.

4.0 Hydrology

Hydrologic conditions were modeled using HydroCAD, which is based on TR-55 methodology. Eight storm events were analyzed based on the 1-year, 2-year, 5-year, 10-year, 100-year, 200-year, and 500-year recurrence intervals with rainfall amounts of 2.49, 2.84, 3.45, 4.09, 5.02, 6.66, 7.53, and 8.94 inches per 24 hours, respectively. Rainfall amounts for the selected 24-hour storm events were based on the rainfall values contained in City of Madison Code of Ordinances, Chapter 37- The Public Stormwater System including Erosion Control.

Existing and proposed watershed locations and characteristics are provided in Figures SWMP-2 through SWMP-5 in Appendix E. The SWMP limits include all locations of land disturbance and any offsite drainage to the proposed wet pond. The SWMP limits were then divided into sub-watersheds based on the areas of captured and uncaptured runoff. Weighted Runoff Curve Numbers (CN) for all existing and proposed watersheds were computed dependent upon the area, soil type, and ground cover. The time of concentration (T_c) for each watershed was determined by selecting the longest runoff flow path (with regards to time, not necessarily distance) within the watershed basin to the point of interest. The T_c values were calculated based on a combination of sheet flow, shallow concentrated flow, and pipe flow with a 6-minute minimum Tc set as the default.

5.0 Storm Water Performance Standards

The post-construction storm water management plan shall comply with City of Madison Code of Ordinances, Chapter 37- The Public Stormwater System including Erosion Control.

Peak Discharge Control:
Per City of Madison Code of Ordinances, Chapter 37- The Public Stormwater System including Erosion Control, Section 37.09(3)(c)(3), "If the redevelopment has proposed impervious cover that exceeds 80% of the existing site impervious cover, the site shall meet the following criteria:

a) Reduce peak runoff rates by 15% compared to existing conditions during a 10-year design storm.
b) Reduce runoff volumes from the site by 5% compared to existing conditions during a 10-year design storm.
c) The required rate and volume reductions shall be completed, using green infrastructure that captures at least the first ½ inch of rainfall over the total site impervious area."

Water Quality/TSS Removal:
Per City of Madison Code of Ordinances, Chapter 37- The Public Stormwater System including Erosion Control, Section 37.09(3)(a)(3), "For redevelopment and/or resurfacing by design for local sites located within the Rock River TMDL, reduce to the maximum extent practicable, total suspended solids (TSS) loads leaving the redeveloped site or resurfaced site by eighty percent (80%), based on average annual rainfall, as compared to the existing conditions of the site prior to the proposed redevelopment and/or resurfacing".

Infiltration:
Per City of Madison Code of Ordinances, Chapter 37- The Public Stormwater System including Erosion Control, Section 37.09(5)(5)(c), redevelopment sites are exempt from infiltration requirements.

6.0 Pre-Development Site Conditions

The area enclosed by the SWMP limits totals 1.09 acres (47,347 sq. ft.). The pre-developed conditions within the SWMP limits consist of developed area consisting of buildings, access roads, sidewalk areas, and landscaped areas. Refer to Figures SWMP-2 and SWMP-4 in Appendix E for additional information. Figure SWMP-2 shows the pre-developed site conditions and Figure SWMP-4 provides information on the pre-developed drainage conditions for the storm water management area.

Refer to Table 1 for a summary of the pre-developed site conditions for the project area. Refer to Appendix B for the pre-developed HydroCAD report.

The parcel is located in part of the NW ¼ of the NW ¼ of Section 23 Town, 7 North, Range 9 East in the City of Madison, Dane County, Wisconsin. Refer to the Plat of Survey of the Plan Set in Appendix F for the exact Legal Description

Table 1 – Pre-Developed Watershed Data Summary

Project Name: UW Madison	**Parcel Size:** 1.09 acres	**Project Type:** Institutional Development
Number of Runoff Discharge Points: 1	**Watershed (Ultimate Discharge):** Yahara River and Lake Monona	
Project Watershed Area (including off-site runoff traveling through project area): 1.09 acres		
Public Land Survey Location: Part of the NW ¼ of the NW ¼ of Section 23, T7N, R9E, City of Madison, Dane County, Wisconsin		

Summary Data Elements	E1 Existing Site
Watershed Area *(see SWMP-2 in Appendix E)*	1.09 acres
Land Uses **(Acres of Each)**	0.24 Roof 0.15 Pavement 0.1 Sidewalk 0.05 Compacted Gravel 0.55 Pervious
Weighted Runoff Curve Numbers	86
Time of Concentration (Tc) *(see SWMP-4 in Appendix E)*	6.0 minutes
1-year/24-hour Peak Flow *(see Appendix B)*	2.18 cfs
2-year/24-hour Peak Flow *(See Appendix B)*	2.69 cfs
10-year/24-hour Peak Flow *(See Appendix B)*	4.54 cfs
100-year/24-hour Peak Flow *(see Appendix B)*	8.41 cfs

7.0 Post-Development Site Conditions

As previously discussed, the area enclosed by the SWMP limits totals 1.09 acres (47,347 sq. ft.). The post-developed site includes the construction of a building, and associated site improvements including concrete sidewalks, permeable pavers, utility improvements, and landscaped areas. Refer to Figures SWMP-3, and SWMP-5 in Appendix E for additional information. The proposed site development will result in an increase in impervious area of approximately 0.44-acres.

Refer to Table 2 for a summary of the post-development conditions of the watershed for the project area. Refer to Appendix C for the post-development HydroCAD report.

Table 2 – Post-Developed Watershed Data Summary

Project Name: UW Madison			**Parcel Size:** 1.09 acres			**Project Type:** Institutional Development		
Number of Runoff Discharge Points: 1				**Watershed (Ultimate Discharge):** Yahara River and Lake Monona				
Project Watershed Area (including off-site runoff traveling through project area): 1.09 acres								
Public Land Survey Location: Part of the NW ¼ of the NW ¼ of Section 23, T7N, R9E, City of Madison, Dane County, Wisconsin								
Summary Data Elements	P1 Proposed Building	P2 Captured to Underground Detention	P3 Captured to Permeable Pavers South	P4 Captured to Permeable Pavers Northwest	P5 Captured to Permeable Pavers Northeast	P6 Uncaptured East	P7 Uncaptured South	P8 Uncaptured West
Watershed Area *(see SWMP-5 in Appendix E)*	0.72 acres	0.03 acres	0.09 acres	0.08 acres	0.04 acres	0.02 acres	0.02 acres	0.09 acres
Land Uses (Acres of Each)	0.54 Roof 0.18 Green Roof	0.03 Grass	0.02 Pavement 0.01 Sidewalk 0.05 Permeable Pavers 0.01 Grass	0.01 Sidewalk 0.05 Permeable Pavers 0.02 Grass	0.02 Sidewalk 0.01 Permeable Pavers 0.01 Grass	0.02 Grass	0.02 Pavement	0.07 Sidewalk 0.02 Grass
Weighted Runoff Curve Numbers	91	76	83	80	89	89	98	95
Time of Concentration (Tc) *(see SWMP-5 in Appendix E)*	6.0 minutes	6.0 minutes	6.0 minutes	6.0 minutes	6.0 minutes	6.0 minutes	6.0 minutes	6.0 minutes
1-year/24-hour Peak Flow *(see Appendix C)*	1.85 cfs	0.03 cfs	0.15 cfs	0.11 cfs	0.11 cfs	0.05 cfs	0.05 cfs	0.26 cfs
2-year/24-hour Peak Flow *(See Appendix C)*	2.20 cfs	0.04 cfs	0.19 cfs	0.14 cfs	0.13 cfs	0.06 cfs	0.06 cfs	0.30 cfs
10-year/24-hour Peak Flow *(See Appendix C)*	3.45 cfs	0.08 cfs	0.33 cfs	0.27 cfs	0.21 cfs	0.10 cfs	0.08 cfs	0.45 cfs
100-year/24-hour Peak Flow *(see Appendix C)*	6.00 cfs	0.17 cfs	0.64 cfs	0.54 cfs	0.37 cfs	0.18 cfs	0.14 cfs	0.75 cfs

8.0 Post-Development Summary

To best manage storm water runoff from the post-developed site, an underground detention basin was proposed as part of the project. The underground detention system will treat storm water runoff from site and discharge it at a controlled rate to meet the quantity and quality requirements set by the City of Madison and WDNR. The design and specifications for the underground detention can be found in the Civil Engineering Plan Set in Appendix F.

ACO STORM BRIX-HD (UGD)

The underground detention has been designed to accommodate the entire flow from proposed Watershed areas P1, P2 and P3 as shown in the SWMP figures. Tables 3 and 4 illustrate the design parameters and performance of the underground detention.

Table 3 – ACO Storm Brix- HD (UGD) Summary	Design Data
Site Assessment Data: (Refer to Appendix E for Proposed Drainage Figures)	
Contributing Drainage Area to Underground Detention System	0.84 acres
% of Each Land Use Contributing to Drainage Area	26% Pervious, 74% Impervious
Floodplain, Shoreland, or Wetlands?	No

Table 4 – ACO Storm Brix- HD - Inflow, Outflow, & Storage Data (UGD)

(See Hydrographs in Modeling Output and Detail Drawings in Appendix C)

Design Storm	Peak Inflow Rate (cfs)	Peak Outflow Rate (cfs)	Max. Water Elevation (ft)	Storage Volume at Max. Elev. (cu ft)	Time to Drain (hrs)	Outflow Control Structures
1-yr/24-hour	2.02	1.12	857.96	1,308	1.90	#1, #2
2-yr/24-hour	2.42	1.67	858.15	1,445	2.45	#1, #2
10-yr/24-hour	3.86	2.76	858.83	1,940	3.35	#1, #2
100-yr/24-hour	6.81	4.63	860.78	2,964	6.80	#1, #2
The controlling elements are summarized below (Refer to Appendix F, Site Details for detail drawings of the outlet structure)						
#1 = Exfiltration at Elevation 855.38			#2 = 12” Culvert at 857.38			
#3 = 10” Orifice at 857.38						

Total Storm Water Flows/Peak Discharge Requirements

Table 5a summarizes the proposed outflow rate of the post-developed site versus pre-developed conditions.

Table 5a – Total Storm Water Flow Leaving Site
(See Hydrographs in Appendices B & C)

Design Storm	Pre-Developed Peak Discharge Rate	Post-Development Peak Discharge Rate
1-yr/24-hour	2.18 cfs	**1.37 cfs**
2-yr/24-hour	2.69 cfs	**2.11 cfs**
10-yr/24-hour	4.54 cfs	**3.60 cfs**
100-yr/24-hour	8.41 cfs	**6.16 cfs**

Table 5b – City of Madison Requirements
(See Hydrographs in Appendices B & C)

Design Storm	Pre-Developed Peak Discharge Rate	Allowable Discharge Rate	Post-Development Peak Discharge Rate
10-yr/24-hour	4.54 cfs	**3.859 cfs**	**3.60 cfs**
Design Storm	**Pre-Developed Runoff Volume**	**Allowable Runoff Volume**	**Post-Development Runoff Volume**
10-yr/24-hour	10,369 cf	**9,850 cf**	**7,405 cf**

As detailed in Table 5a and 5b, the post-development peak discharge rates for the 1-, 2-, 10- and 100-year storm events are less than the existing peak discharge rates of the 1-, 2-, 10- and 100-year storm events. The post-development peak discharge rate is 15% less than the pre-development peak discharge rate for the 10year storm event, and the post development runoff volume is 5% less than the pre-development runoff volume for the 10-year storm event. **Therefore, this site meets the peak discharge requirements of City of Madison Code of Ordinances and WDNR requirements.**

Total Suspended Solids/Water Quality Requirements

Table 6 – WinSLAMM Model Output Results
(See Model Output Attachment in Appendix D)

Required TSS Reduction	Modeled TSS Reduction
80%	75.45%

Based on the WinSLAMM analysis, the post-developed site reduces TSS by 75.45% which is less than the required reduction of 80% TSS removal. This is because the uncaptured areas drain directly to the right-of-way which is not possible to capture. Areas with vehicular movement are all captured and treated.

Green Infrastructure

Table 7 – Green Infrastructure Calculations (See GI Calculations in Appendix G)		
Total Site Impervious Area	**Required GI Volume**	**Provided Detention Volume**
42,887 SF	1,712 Cu. Ft.	8,075 Cu. Ft.

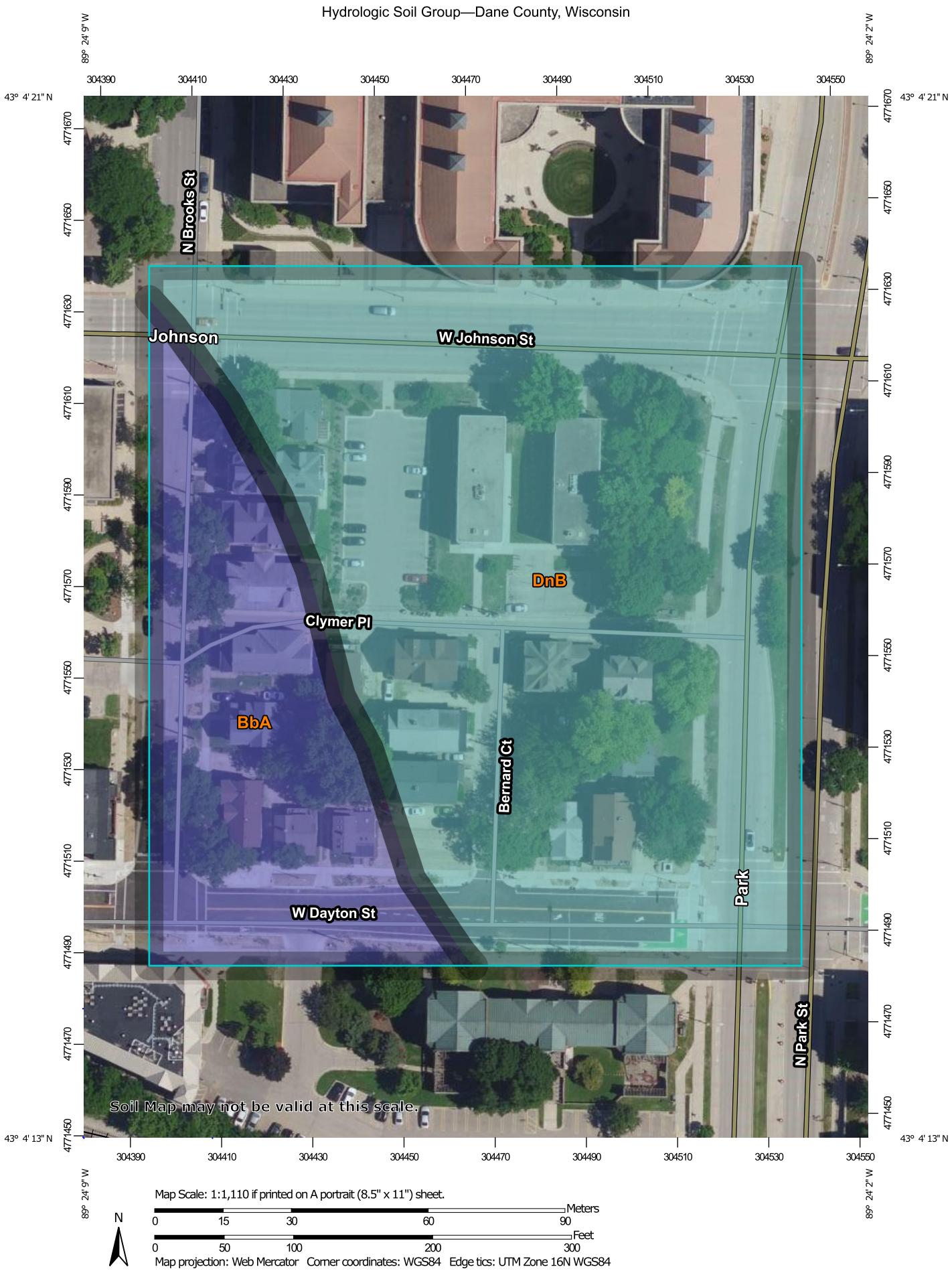
Based on the GI calculations, the post-developed site has more detention volume than the required GI. Please refer to Appendix G for GI Calculations.

Appendix A

Web Soil Survey Report

Geotechnical Engineering Report

Web Soil Survey Report



Map Scale: 1:1,110 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

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: 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
BbA	Batavia silt loam, gravelly substratum, 0 to 2 percent slopes	B	1.4	25.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	C	4.1	74.9%
Totals for Area of Interest			**5.4**	**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

Geotechnical Engineering Report

CGC, Inc.
Construction • Geotechnical
Consulting Engineering/Testing

January 31, 2022
C21685

Mr. Scott Ramlow, AIA
Ramlow/Stein Architecture + Interiors
322 East Michigan Street
Milwaukee, WI 53202

Re: Geotechnical Exploration Report
Proposed UW Madison Levy Hall
Southwest Corner of West Johnson & North Park Streets
Madison, Wisconsin

Dear Mr. Ramlow:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the subsurface exploration program for the above-referenced project. The purpose of this program was to evaluate the subsurface conditions within the proposed construction area and to provide geotechnical recommendations regarding site preparation, foundation, floor slab, below-grade wall, retaining wall and pavement design/construction. A determination of the site class for seismic design is also included. We are sending you an electronic copy of this report, and we can provide a paper copy upon request. An electronic copy is also being sent to Mr. Frederick Groth at Graef.

PROJECT AND SITE DESCRIPTION

We understand that a Letters and Science Academic Building (Levy Hall) is planned on the UW Madison Campus at the southwest corner of West Johnson Street and North Park Street in Madison, Wisconsin. The project area is comprised of three contiguous parcels, which include the Zoe Bayliss Co-Op building (915 West Johnson Street), the Susan B Davis Residence Hall (917 West Johnson Street), and associated paved parking lots. The site is bounded by West Johnson Street to the north, North Park Street to the east, Clymer Place to the south and four residential parcels lining North Brooks Street to the west. Outside of the existing building and pavement areas, the site is covered with lawn, landscaping and scattered trees. Based on a provided topographic site plan/plat of survey (Kapur; 1-ft contour lines), existing site grades generally slope from West Johnson Street down towards Clymer Place, with ground surface elevations ranging between about EL 877 and 863 ft. The existing buildings include partially exposed lower levels, with finished lower-level elevations of EL 868.19 ft (Bayliss Co-Op) and EL 867.99 ft (Davis Residence Hall) according to the Kapur survey.

It is understood that the existing buildings will be demolished to facilitate construction of the proposed Levy Hall. Although development plans are in somewhat preliminary stages of design, we understand that Levy Hall will include five-stories plus penthouse, at the West Johnson Street level, and a partial lower level below central and/or southern portions of the building footprint, which will

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be exposed and accessed at the Clymer Place level. The building footprint will likely take up much of the project area, but will be slightly less than the buildable area (approximately 32,528 SF), which is shown on the Soil Boring Location Exhibit attached in Appendix B.

Preliminary first-floor grades for the northern portion of the building without lower level are being considered at EL 875.5 or 877.5 ft, and lower-level grades are tentatively planned to be established at EL 861.5, 863.5 or 865.5 ft. Accordingly, we anticipate that some fill may be required to establish first floor grades in the north, while the lower level in southern to central parts of the building will likely be established near to several feet below existing site grades. Depending on the structural system, which has not been selected at the time of this report, typical column service loads are expected to range between 918 and 1,355 kips.

SUBSURFACE CONDITIONS

Subsurface conditions for this study were explored by drilling 10 Standard Penetration Test (SPT) soil borings at locations selected by the project design team and located in the field by CGC. The borings were drilled by Badger State Drilling (under subcontract to CGC) between January 10 and 17, 2022 using a track-mounted D-50 rotary drill rig equipped with hollow stem augers and an automatic SPT hammer. The borings were generally extended to planned depths of 50 ft below existing site grades, with the exception of B-8 which terminated at 27 ft as a result of auger refusal on a probable large cobble or boulder. The specific procedures used for drilling and sampling are described in Appendix A.

In addition to the 10 SPT borings, one temporary groundwater monitoring well (2-in. PVC casing with 10-ft screen section; labeled GWM-1) was installed to a depth of about 35 ft below the ground surface in a blind-drilled borehole (i.e., without taking samples during drilling) in the central portion of the buildable area. The locations of the soil borings and monitoring well are shown in plan on the Soil Boring Location Exhibit presented in Appendix B. Ground surface elevations at the boring and GWM locations were estimated by CGC based on 1-ft contour lines shown on the provided topographic site plan, and the elevations should therefore be considered approximate.

The subsurface profiles at the boring locations varied to some degree, but the following strata were typically encountered (in descending order):

- About 3 in. of ***asphalt pavement*** on top of about 6 to 8 in. of ***base course*** in Borings 1, 2 and 6; or
- Approximately 5 to 12 in. of ***topsoil*** or ***topsoil fill*** in the remaining borings; underlain by

- Roughly 2 to 6 ft of apparent ***fill*** in Borings 1, 2, 4, 7, 8 and 9, consisting of loose to very dense[1] sand and/or silt soils intermixed with occasional clay seams and brick fragments; or
- About 2 to 5 ft of apparently native, loose to medium dense ***silt*** or stiff to very stiff ***lean clay*** layers in Borings 3, 5, 6 and 10; over
- Generally medium dense to very dense native ***sand*** deposits, containing somewhat variable amounts of silt and gravel as well as scattered cobbles/boulders, to the maximum depths explored/the level of auger refusal.

The native sands were the predominant soils within the boring profiles. As noted above, these soils were of largely moderate to high relative density [based on SPT blow counts (N-values)], with the density generally increasing with depth. As an exception, isolated loose zones were encountered near the top of these soils in Borings 1, 3, 5 and 10. Medium dense to dense siltier zones (*sandy silt* layers) were encountered in upper portions of Borings 7 and 9, and the sand deposits were also found to be interspersed with hard *lean clay* strata at depths of approximately 12 to 22 ft and 22 to 32 ft in Borings 1 and 4, respectively.

Natural moisture contents in samples obtained from the deeper lean clay soils encountered in Borings 1 and 4 were determined in our laboratory to range between 14.1% and 16.5%. Based on the moisture contents, pocket penetrometer readings (q_p-values; an estimate of the unconfined compressive strength of cohesive soils) and N-values, these clays should be considered slightly compressible. Moisture contents were also determined for samples taken from the shallow clay soils encountered in Boring 6, which ranged between 21.0% and 24.1%. These soils should be considered slightly to moderately compressible.

Groundwater was encountered at depths between about 23.5 and 38.5 ft during drilling, corresponding to approximately EL 836.5 to 843.5 ft. However, some of the on-site soils are assumed to have a fairly low hydraulic conductivity (based on high fines-contents in combination with high relative densities), which typically delays infiltration and the subsequent stabilization of groundwater in the boreholes. Groundwater readings during the fairly short period of drilling (and shortly thereafter) should therefore be considered approximate. In light of this, the boreholes of B-4 and B-10 were left open overnight to allow for extended water level readings. On the day after these borings were completed and prior to backfilling the boreholes, groundwater levels (and borehole cave-in) were documented at depths of about 32 ft (B-4) and 26 ft (B-10), corresponding to approximately EL 843 to 841 ft.

The site is located approximately 2,000 ft south of Lake Mendota and 3,100 ft northwest of Lake Monona/Monona Bay, and groundwater levels on the site are therefore expected to be influenced by the water levels in the lakes. For reference, on the days the soil borings were conducted (January 10

[1] Relative density of surficial soils (i.e., within about the upper 1 to 2 ft below the ground surface) may have been elevated due to the presence of frost at the time of drilling, and may therefore not be representative of the actual relative density.

through 17, 2022), the water levels in Lakes Mendota and Monona were recorded at about EL 848.4 and 844.1 ft, respectively, according to the Dane County Land & Water Resources Department *Lake Levels & Information* online platform. Typical summer maximum water levels in Lakes Mendota and Monona are EL 850.1 and 845.2 ft, and 1% flood events are defined by water levels of EL 852.8 and 847.7 ft, respectively.

As noted above, a temporary groundwater monitoring well was installed in the central portion of the project area for longer-term groundwater level observations. Groundwater level readings in the monitoring well, along with recorded lake levels on the days the groundwater level readings were obtained, are summarized in the following Table 1.

TABLE 1 – Summary of Groundwater and Lake Levels

Date	January 25, 2022	January 31, 2022
Lake Mendota	848.3	848.3
GWM-1	841.8±	841.9±
Lake Monona	843.8	843.8

In addition to the influence of the lake levels and seasonal variations in precipitation, infiltration and evapotranspiration, several other factors may contribute in fluctuations of the groundwater table, including pumping rates in nearby wells, dewatering below nearby buildings, and others.

A more detailed description of the site soil and groundwater conditions is presented on the individual soil boring logs attached in Appendix B, which also contain the laboratory test results.

Note that a pressuremeter testing (PMT) program was initially planned as part of the exploration program summarized herein. However, due to the preliminary nature of the building design at the time of the field exploration, the pressuremeter testing has been put on hold. As the building design progresses and structural details, maximum column loads, the exact building footprint and location/extent of the lower level have been determined, PMTs can be performed at a later date and summarized/discussed under separate cover.

DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration, it is our opinion that the site is generally suitable for the planned redevelopment and that Levy Hall can be supported by a conventional spread footing foundation system with the understanding that undercutting of existing fill and marginal native soils may be required below the bottom of footings on a fairly isolated basis. Our geotechnical recommendations for site preparation, foundation, floor slab, below-grade wall, retaining wall and pavement design/construction, along with our assessment of the site

class for seismic design, are presented in the following subsections. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

Note that the recommendations contained herein should be considered preliminary, since the planned building/lower-level location, building grades and structural loads were not available to us at the time of this report. We ask that this information be provided to us once available, and CGC should be allowed to review and adjust the recommendations contained herein, as needed, following completion of the planned pressuremeter testing program.

1. Site Preparation

We understand the existing buildings will be demolished to facilitate the new development. We recommend that the existing structures be demolished and removed in their entirety, including the floor slabs, footings, below-grade walls and associated utilities. Where below-grade structures have been removed below planned building grades, the subgrades should be thoroughly recompacted and evaluated for their footing and floor slab support suitability, prior to placing fill to establish new building grades. Soils considered unsuitable for new footing and/or floor slab support should be undercut and replaced with well-compacted granular backfill, as needed. Existing pavement should also be removed from the proposed building area. In new pavement areas, existing structures can potentially remain in-place provided they are broken off at least 2 ft below proposed pavement subgrade elevations and do not interfere with new utility construction. Slabs and existing pavement that remain in-place below new pavement areas should be broken up (i.e., rubblized or pulverized) to promote drainage. Concrete and/or asphalt have the potential for re-use as structural fill if properly sorted, selectively stockpiled and crushed to an appropriate nominal size.

We further recommend that topsoil be stripped at least 10 ft beyond the proposed construction area, including areas requiring fill beyond the building footprint and pavement limits. The topsoil can be stockpiled on-site and later re-used as fill in landscaped areas. As mentioned earlier, topsoil was about 5 to 12 in. thick in the borings, but variable topsoil thicknesses should be expected between and beyond boring locations due to previous grading activities. Trees and root zones should also be removed from construction areas prior to or in conjunction with topsoil stripping.

After building demolition, pavement removal and topsoil stripping, exposed soils are largely expected to consist of existing granular or fine-grained fill, or of native silt or clay soils. In areas remaining at-grade or requiring additional fill, we recommend that cohesive and fine-grained subgrades (i.e., clay and silt) be statically recompacted (i.e., without vibration) and subsequently proof-rolled with a piece of heavy rubber-tire construction equipment, such as a loaded tri-axle dump truck, to check for soft/yielding areas. Where soft/yielding areas are observed, these soils should be undercut and replaced with granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557) in accordance with our Recommended Compacted Fill Specifications presented in Appendix D. Alternatively, 3-in. dense graded base (DGB) that is placed in loose 10-in. lifts and compacted until deflection ceases can also be used to restore grades in

undercut areas. Granular subgrades (i.e., sand and gravel) should be thoroughly recompacted with a vibratory smooth-drum roller, and zones that remain loose after recompaction should be undercut and replaced as described above. Areas subsequently receiving fill should be checked for their footing, floor slab and pavement support suitability prior to fill placement, as applicable. *Note that we generally expect some undercutting/stabilization of the existing fill and native silt/clay soils to be required in order to develop suitable pavement and floor slab subgrades.*

Following the development of a firm and stable subgrade, fill placement to establish site, pavement and building grades can proceed, where required. To the extent possible, we recommend using granular soils (i.e., sands/gravels, including native granular soils if selectively excavated and stockpiled) as fill within the building envelope and in the upper 2± ft in pavement areas because these soils are relatively easy to place and compact in most weather conditions compared to clay/silt soils. Clay and silt soils excavated on-site are generally not recommended as structural fill because moisture conditioning by discing and drying (aeration) will likely be required to achieve desired compaction levels, which is highly weather-dependent (i.e., dry, warm and windy conditions) and could delay construction progress. In our opinion, clay/silt soils are best used as fill in landscaping or potentially as lower lifts in pavement areas provided the moisture contents can be sufficiently lowered from the natural states to facilitate compaction efforts. We recommend that structural fill be compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557) following Appendix D guidelines. Periodic field density tests should be taken by CGC staff within the fill to document the adequacy of compaction efforts.

Depending on the northern extent of the lower level and finished lower-level grades, we expect that the mass excavation to establish lower-level grades will extend several feet below existing site grades (e.g., excavation depths between about 4 to 8 ft below the ground surface near the north-south centerline of the buildable area based on an assumed finished lower-level elevation of EL 863.5 ft). Additional excavation to footing/elevator shaft grade and potentially undercutting to remove unsuitable soils below isolated footings (and possibly in isolated floor slab areas) should also be taken into consideration. Based on the provided site layout plan, we anticipate that some excavation sidewalls can potentially be sloped back according to OSHA requirements. The cleaner natural sands (i.e., those denoted SP and/or SP-SM on the boring logs), typically classified as OSHA "Type C" soils, are anticipated to control excavation slopes, and slopes of 1.5H:1.0V are expected to be at least temporarily stable. Note that flatter side slopes may be required where perched or seeping water is present that destabilizes the side slopes. *The appropriate excavation side slopes should be determined by a competent person completing the earthwork in accordance with OSHA slope guidelines.* Where excavation occurs within close proximity to the adjacent parcels or right-of-ways and adequate sloping is not possible, temporary shoring (earth retention) will likely be required. We recommend shoring systems be designed by an appropriately qualified professional engineer.

2. Foundation Design

We understand that Levy Hall is envisioned to include a partially exposed lower level below central and/or southern portions of the building footprint, while the northern part along West Johnson Street will likely not have a below-grade portion. It is understood that finished first-floor and lower-level grades are currently being considered at EL 875.5 or 877.5 ft and EL 861.5, 863.5 or 865.5 ft, respectively. Fairly high structural loads are anticipated for the five-story building with penthouse and partial lower level. *As previously noted, the recommendations contained herein should be considered preliminary as final building/lower-level location, elevations and structural loads were not available to us at the time of this report.*

Perimeter footings are expected to bear a minimum of 4 ft below finished site grades for frost protection, and interior footings may bear at slightly shallower depths. Considering the findings in Borings 1, 4, 7 and 8, as well as a finished first floor elevation of EL 875.5 or 877.5 ft, subgrade soils for footings below the northern section of the planned building without lower level are largely anticipated to consist of existing sandy or silty fill. Towards the northwest building corner, first-floor footings may also be supported on newly-placed structural fill above current site grades. *We recommend that existing fill soils be undercut and replaced below the bottom of footings, including footings that bear above current site grades, as these soils may cause settlement in excess of typically tolerable levels over the lifetime of the building*. Footing subgrades or the base of undercut excavations should consist of at least medium dense native sand or silt soils in this area, which will likely necessitate undercuts on the order of about 3 to 6 ft below current site grades.

For the purpose of this evaluation, we have assumed that the lower-level footprint will extend below central portions of the total building area. Based on the above-stated assumptions regarding footing embedment depths, a finished lower-level elevation of EL 861.5, 863.5 or 865.5 ft, as well as the findings in Borings 2, 3, 5, 6, 9 and 10, we anticipate lower-level footing subgrades to predominantly consist of loose to dense native sand or silt soils. However, existing sandy fill (see B-2) or stiff to very stiff lean clay (see B-5 and B-6) may also be present at the bottom of some lower-level footings. *As discussed above, we recommend that existing fill soils be undercut below the bottom of footings to expose at least medium dense native sand or silt soils. Loose native sands that cannot be recompacted satisfactorily or stiff native clays may also require undercutting in isolated areas.*

In conjunction with the above recommendations, we recommend the following parameters be used for *preliminary* foundation design:

- Maximum net allowable bearing pressure: 5,000 psf

- Minimum foundation widths:
  - Continuous wall footings: 18 in.
  - Column pad footings: 30 in.

- Minimum footing depths below finish site grades:
  - Exterior/perimeter footings: 4 ft
  - Interior footings: no minimum requirement

As a variety of subsurface conditions will likely be encountered across the site, footing subgrades should be checked by a CGC field representative to document that the subgrade soils are suitable for footing support or otherwise advise on corrective measures, such as undercutting. We recommend using a smooth-edged backhoe bucket for footing and undercut excavations. The base of undercut excavations should be widened beyond the footing edges at least 0.5 ft in each direction for each foot of undercut depth for stress distribution purposes. OSHA slope guidelines should be followed if workers need to enter footing excavations. Granular soils exposed at footing grade or the bottom of undercut excavations should be thoroughly recompacted with a large vibratory plate compactor or an excavator-mounted hoe-pack prior to backfilling or formwork/concrete placement to densify soils loosened during the excavation process. Soils potentially susceptible to disturbance from vibratory compaction (e.g., cohesive/fine-grained soils or sands with elevated moisture contents) should be hand-trimmed.

As discussed above, we recommend that existing fill soils be undercut and replaced below the bottom of footings. Native clays with q_p-values of less than 2.5 tsf will also require undercutting if encountered below the bottom of footings proportioned for an allowable bearing pressure of 5,000 psf. In addition, native sand or silt soils that cannot recompacted satisfactorily should also be undercut at and slightly below footing grades. In order to re-establish footing grades in undercut areas, we recommend using granular backfill (including sand soils excavated on-site) compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557), in accordance with the Recommended Compacted Fill Specifications presented in Appendix D. Alternatively, 3-in. DGB that is placed in loose 10-in. lifts and compacted until deflection ceases can also be used to restore foundation grades.

Provided the *preliminary* foundation design/construction recommendations discussed above are followed, we estimate that total and differential settlements should be on the order of 1.0 and 0.5 in., respectively.

Note that, in order to reduce the potential for undercutting and required undercut depths below the bottom of footings to establish suitable foundation subgrades, we recommend choosing the maximum possible lower-level area and lowest possible building grades.

We understand that a PMT program is desired for this project to further evaluate the soils with regard to their bearing capacity and settlement characteristics. Pressuremeter testing can be performed after the building design has been finalized. It has been our experience that a significant improvement of the allowable bearing pressure by a factor of about 2 or more can often be realized based on PMT data obtained in sand soils, compared to an allowable bearing pressure that is solely based on SPT borings. Ultimately, however, the foundation design for this project will likely be controlled (at least

for a portion of the building) by the deeper clay layers that were encountered within the sand deposits in Borings 1 and 4. At least one PMT boring should be performed in this area to target these clay soils. Note that if footings are designed for an allowable bearing pressure in excess of 5,000 psf, differing criteria for undercutting and backfilling below footings will likely apply, which will be further discussed in a separate report after completion of the supplemental PMT program.

3. Seismic Site Class

In our opinion, the average soil properties in the upper 100 ft of the site (based on N-values projected to be greater than 50 blows/ft, on average, in the granular soils underlying the site) may be characterized as a very dense soil/soft rock profile. This characterization would place the site in Site Class C for seismic design according to the International Building Code and ASCE 7

4. Floor Slabs

A variety of granular and fine-grained existing fill, native silt and sand soils and isolated areas of native clay, as well as newly-placed (granular) structural fill soils, are expected to be present at floor slab subgrade elevations below both the first-floor slab-on-grade and the lower-level floor slab. Contrary to footing subgrades, existing fill may potentially remain in-place below floor slab areas, provided these soils are carefully evaluated for their floor slab support suitability at the time of construction. Prior to slab construction, granular subgrade soils should be thoroughly recompacted with a vibratory smooth-drum roller to densify soils that may become disturbed or loosened during construction activities. Cohesive or fine-grained subgrades should be statically recompacted and subsequently proof-rolled to check for soft/yielding areas. Areas of disturbed soil or where soils remain loose after recompaction should be undercut and replaced with compacted 3-in. DGB or granular fill. *We anticipate that some undercutting/stabilization of existing fill or native silt or clay floor slab subgrades will likely be required.*

To act as a capillary break below the slabs, we recommend including a minimum 6-in. thick layer of well-graded sand/gravel with less than 5% by weight passing the No. 200 U.S. standard sieve. Note, however, that some structural engineers require a layer of dense graded base, such as 1¼-in. DGB, rather than sand/gravel below floor slabs to increase the subgrade modulus immediately below the slabs. To further reduce the potential for moisture migration through the slabs, a plastic vapor barrier can also be utilized. Fill and base layer material below the floor slabs should be placed as described in the Site Preparation section of this report. Slabs constructed on a minimum 6-in. thick dense graded base layer may be designed utilizing a subgrade modulus of 150 pci, and a subgrade modulus of 100 pci should be used for the design of slabs that are constructed on a sand/gravel layer. The design subgrade moduli are based on a firm or adequately stabilized, recompacted subgrade such that non-yielding conditions are developed. The slabs should be structurally separated from the footings with a compressible filler and have construction joints and reinforcement for crack control.

5. Below-Grade Walls

We anticipate that below-grade walls will be laterally supported by the lower-level slab and upper-level framing. Therefore, *at-rest* lateral earth pressures should be used during design of these walls. To reduce the buildup of such pressures, high-quality backfill should be placed within 4 to 6 ft of the walls. We recommend that a perimeter drainage system be installed to intercept potential surface water infiltration, and that the granular backfill be continuously connected to the drainage system, which discharges water to one or more sumps. Alternatively, the perimeter drainage system could potentially also designed to "daylight" down slope. The granular backfill should be well-graded sand or gravel having no more than 12% by weight passing the No. 200 U.S. standard sieve (i.e., USCS designations SP, SP-SM, GP or GP-GM). Some of the cleaner native sands appear suitable for use as wall backfill if selectively excavated and stockpiled, and sand soils with higher fines-content (denoted SM on the borings logs) may potentially also be used as below-grade wall backfill if a three-dimensional drainage board is included in the wall design. Soils containing cobbles/boulders should not be used in direct contact with below-grade walls. To impede the inflow of surface moisture, the final 2 ft of backfill in unpaved areas should consist of a clayey fill cap. The clayey cap (or pavement) should be graded to promote positive drainage away from the walls.

Before placing the wall backfill, the exterior walls should be damp-proofed with spray-applied or mopped-on rubber or bituminous sealer. Compaction of the backfill within 3 to 5 ft of the walls should be performed with lightweight equipment to avoid the development of excessive lateral earth pressures. The backfill should generally be compacted to a minimum compaction level of 93% modified Proctor following Appendix D guidelines. However, we recommend a minimum of 95% compaction where shallow floor slabs, footings or stoops will bear on the wall backfill, as well as in the upper 2± ft in pavement areas. Lower-level walls constructed in accordance with the above recommendations may be designed for an equivalent fluid pressure of 55 psf per ft of depth (*at-rest* conditions). Additionally, the wall design should also account for surcharge effects that could be applied during or after construction.

6. Retaining Walls

Site retaining walls may not be laterally restrained from rotating. Therefore, these walls can be designed for *active* earth pressures behind the walls and *passive* pressures in front of the walls. Lateral earth pressures behind the retaining walls can be reduced by backfilling with sand with less than 12% by weight passing the No. 200 U.S. standard sieve, as described in the preceding section. In addition, weepholes should be placed near the base of these walls on 10-ft centers to provide drainage of the wall backfill. The weepholes should be hydraulically connected with the backfill and should be protected with a non-woven geotextile fabric to minimize soil loss through the weepholes. The wall designer may have other and/or additional drainage requirements.

Assuming *free-draining conditions*, retaining walls constructed in accordance with the above recommendations may be designed for an *active* equivalent fluid pressure of 35 psf per ft of depth.

Passive pressures are expected to be on the order of 200 psf per ft of depth. The passive pressure value includes a safety factor of 2 to prevent excessive wall deflection. The retaining wall design should also take into account surcharge effects which could be applied during or after construction.

We recommend using an *ultimate* concrete-to-soil friction factor of 0.3 for retaining wall footings bearing on at least medium stiff clay and silt soils. For footings bearing on sand, an *ultimate* concrete-to-soil friction factor of 0.4 may be implemented.

7. Pavement Design

We anticipate that pavement design will be controlled by the existing fill and native clay/silt soils, and subgrades should be prepared as described in the Site Preparation section of this report, with recompaction/proof-rolling completed prior to base course placement. *We expect that some undercutting or stabilization will be required to establish firm and stable pavement subgrades where existing fill, silt or clay is present, and we recommend that the budget include a contingency for subgrade undercutting/stabilization. Pavement subgrade improvement may involve about 12 in. of additional coarse aggregate (e.g., 3-in. DGB), potentially over biaxial geogrid (e.g., Tensar BX Type 1 or equivalent).* The need for undercutting below the pavement section will likely be reduced where site grades are raised at least 2 ft above existing grade with high quality granular fill.

We anticipate that asphalt pavement on this site will primarily be exposed to automobile traffic with less than one 18-kip equivalent single axle load (ESAL) per day. In view of this, we have assumed Traffic Class I following Wisconsin Asphalt Pavement Association (WAPA) recommendations for relatively small parking areas and driveways that are mainly used by light passenger vehicles. However, main sections of the driveway are likely to experience heavier traffic loads (e.g., due to garbage or delivery trucks). For pavement areas where trucks will routinely travel, as well as parking lots with 50 or more stalls (if any), we have assumed a traffic load of up to 5 ESALs per day and Traffic Class II according to WAPA. The pavement sections summarized in Table 2 below were selected assuming a Soil Support Value "SSV" of about 4.0 for a firm or adequately stabilized subgrade and a design life of 20 years.

TABLE 2 – Recommended Pavement Sections

Material	Thicknesses (in.)		WDOT Specification [1]
	Traffic Class I (Light Duty)	Traffic Class II (Medium Duty)	
Bituminous Upper Layer [2,3]	1.75	1.75	Section 460, Table 460-1
Bituminous Lower Layer [2,3]	1.75	2.25	Section 460, Table 460-1
Dense Graded Base Course [2,4]	8.0	10.0	Sections 301 and 305
Total Thickness	**11.5**	**14.0**	

Notes:

1) Wisconsin DOT *Standard Specifications for Highway and Structure Construction*, latest edition, including supplemental specifications, and *Wisconsin Asphalt Pavement Association 2020 Asphalt Pavement Design Guide*.

2) Compaction requirements:
   - Bituminous concrete: Refer to Section 460-3.
   - Base course: Refer to Section 301.3.4.2, Standard Compaction

3) Mixture Type LT (or E-0.3) bituminous; refer to Section 460, Table 460-2 of the *Standard Specifications*.

4) The upper 4 in. should consist of 1¼-in. DGB; the bottom part of the layer can consist of 3-in. DGB.

The medium-duty pavement section may be considered across the entire area for constructability purposes. The recommended pavement sections assume regular maintenance (crack sealing, etc.) will occur, as needed. Note that if traffic volumes are greater than those assumed, CGC should be allowed to review the recommended pavement sections and adjust them accordingly. Alternative pavement designs may prove acceptable and should be reviewed by CGC. If there is a delay between subgrade preparation and placing the base course, the subgrade should be recompacted.

Where concrete pavement may be used, such as in pavement areas subjected to concentrated wheel loads (e.g., dumpster pads), we recommend that the concrete should be at least 6 in. thick and contain adequate reinforcement for crack control. Concrete slabs underlain by a minimum 6-in. thick dense graded base layer over a firm or stabilized subgrade comprised of existing fill can be designed utilizing a subgrade modulus of 150 pci.

CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties which could be encountered on the site are discussed below:

- Due to the potentially sensitive nature of some of the on-site soils, we recommend that final site grading activities be completed during dry weather, if possible. Construction traffic should be avoided on prepared subgrades to minimize potential disturbance.

- Contingencies in the project budget for subgrade stabilization with coarse aggregate in pavement and floor slab areas should be increased if the project schedule requires that work proceed during adverse weather conditions.

- Earthwork construction during the late fall through early spring could be complicated as a result of wet weather and freezing temperatures. During cold weather, exposed subgrades should be protected from freezing before and after footing construction. Fill should never be placed while frozen or on frozen ground.

- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards. Earth retention systems, if needed, should be designed by an appropriately qualified, registered professional engineer.

- Based on preliminary building grades, as well as the observations made during our field exploration and in the temporary groundwater monitoring well thus far, we do not anticipate that lower-level, footing or undercut excavations will extend below the groundwater table. However, water accumulating at the bottom of excavations as a result of precipitation or seepage (e.g., from perched layers) should be quickly removed, with dewatering means and methods being the contractor's responsibility.

RECOMMENDED CONSTRUCTION MONITORING

The quality of the foundation, floor slab and pavement subgrades will be largely determined by the level of care exercised during site development. To check that earthwork and foundation construction proceed in accordance with our recommendations, the following operations should be monitored by CGC:

- Topsoil stripping and subgrade proof-rolling/compaction;

- Fill/backfill placement and compaction;
- Foundation excavation/subgrade preparation; and
- Concrete placement.

* * * * *

It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

Tim F. Gassenheimer, PE, CST
Senior Staff Engineer

Ryan J. Portman, PE, CST
Consulting Professional/Field Supervisor

Encl: Appendix A - Field Exploration
Appendix B - Soil Boring Location Exhibit
Logs of Test Borings (10)
Log of Test Boring-General Notes
Unified Soil Classification System
Appendix C - Document Qualifications
Appendix D - Recommended Compacted Fill Specifications

Cc: Mr. Frederick Groth, PE, SE – Graef USA

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Subsurface conditions for this study were explored by drilling 10 Standard Penetration Test (SPT) soil borings to depths between 27 and 50 ft below current site grades, which were sampled at 2.5-ft intervals to a depth of 10 ft and at 5-ft intervals thereafter. The soil samples were obtained in general accordance with specifications for standard penetration testing, ASTM D1586, and the specific procedures used for drilling and sampling are described below.

1. Boring Procedures between Samples

   The boring is extended downward, between samples, by a hollow-stem auger.

2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D1586)

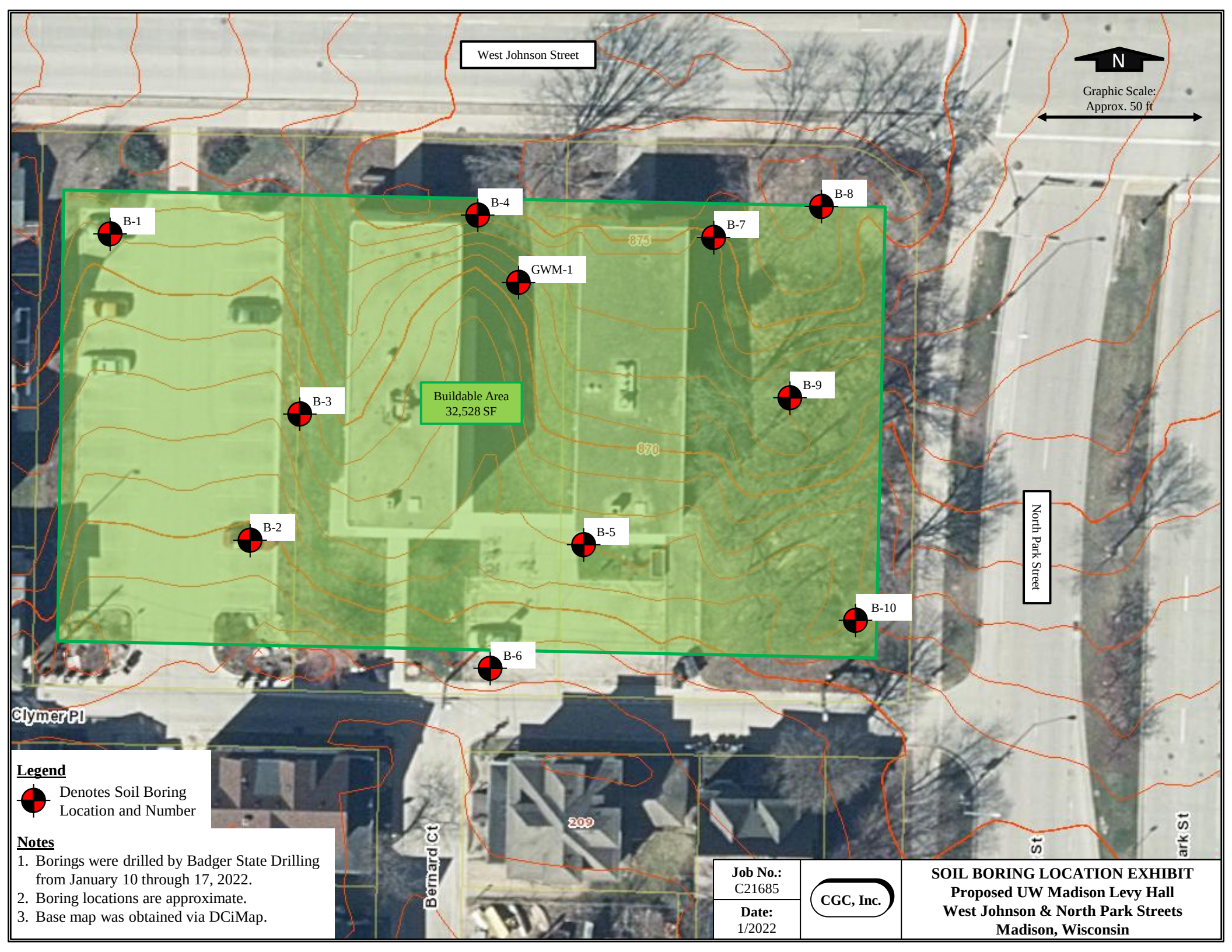
   This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance.

During the field exploration, the driller visually classified the soil and prepared a field log. *Field screening of the soil samples for possible environmental contaminants was not conducted by the drillers as these services were not part of CGC's work scope.* Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. Upon completion of drilling, the borings were backfilled with bentonite to satisfy WDNR regulations and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System.

The final logs prepared by the engineer, including laboratory test results, along with a Soil Boring Location Exhibit and a description of the Unified Soil Classification System are presented in Appendix B.

APPENDIX B

SOIL BORING LOCATION EXHIBIT
LOGS OF TEST BORINGS (10)
LOG OF TEST BORING-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



Legend

Denotes Soil Boring Location and Number

Notes

1. Borings were drilled by Badger State Drilling from January 10 through 17, 2022.
2. Boring locations are approximate.
3. Base map was obtained via DCiMap.

Job No.: C21685 **Date:** 1/2022	CGC, Inc.	**SOIL BORING LOCATION EXHIBIT** **Proposed UW Madison Levy Hall** **West Johnson & North Park Streets** **Madison, Wisconsin**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **1**
Surface Elevation (ft) **871±**
Job No. **C21685**
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. Asphalt Pavement/8 in. Base Course					
1	■	3	M	50/4"		FILL: Very Dense, Brown Fine to Medium Sand and Gravel, Trace Silt (Possibly Frozen Sample)					
2	■	18	M	9	5	Loose, Brown Fine SAND, Some Silt, Trace Gravel (SM)					
3	■	18	M	13							
4	■	18	M	23	10	Medium Dense, Brown Fine to Medium SAND, Trace to Little Silt, Trace Gravel (SP/SP-SM)					
5	■	18	M	36	15	Hard, Brown Lean CLAY, Scattered Silty Sand, Some Gravel Seams (CL)	(4.5+)	14.1			
6	■	6	M	50/3"	20		(4.5+)	15.0			
7	■	4	M	50/1"	25	Very Dense, Brown Fine to Medium SAND, Some Silt, Trace Gravel (SM)					
8	■	18	W	62	30	Very Dense, Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
9	■	18	W	58	35						
10	■	4	W	50/3"	40						
11	■	2	W	50/2"	45	Very Dense, Brown Fine to Medium SAND, Some Silt, Little Gravel, Scattered Silt Seams (SM)					
12	■	12	W	50/4"	50						
						End of Boring at 50 ft Borehole Backfilled with Bentonite Chips and Asphalt Patch					
					55						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **29.0'** Upon Completion of Drilling _____
Time After Drilling **0.5 Hour**
Depth to Water **NW** ▼
Depth to Cave in **28.5'**

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

GENERAL NOTES

Start **1/17/22** End **1/17/22**
Driller **BSD** Chief **KD** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **2**
Surface Elevation (ft) **865±**
Job No. **C21685**
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. Asphalt Pavement/6 in. Base Course					
1	■	18	M	12		FILL: Medium Dense, Brown Fine to Medium Sand, Some Silt and Gravel, Scattered Lean Clay					
2	■	18	M	16	5	Medium Dense, Brown Fine to Medium SAND, Trace to Little Silt (SP/SP-SM)					
3	■	18	M	20							
4	■	18	M	27	10	Medium Dense, Brown Silty Fine SAND, Some Gravel, Scattered Cobbles/Boulders and Silt Seams (SM)					
5	■	18	M	83/8"	15	Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulder (SM)					
6	■	10	M	50/5"	20						
7	■	14	M/W	50/4" ▽	25						
8	■	18	W	68	30	Very Dense, Brown Fine to Medium SAND, Some Gravel, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM)					
9	■	16	W	60	35						
10	■	8	W	50/2"	40						
11	■	2	W	50/3"	45						
12	■	3	W	50/3"	50						
						End of Boring at 50 ft					
					55	Borehole Backfilled with Bentonite Chips and Asphalt Patch					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **24.0'** Upon Completion of Drilling **NW**
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 **1/10/22** End **1/10/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **3**
Surface Elevation (ft) **868±**
Job No. **C21685**
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
						10 in. TOPSOIL					
1		18	M	9		Loose, Brown Sandy SILT, Trace Clay (ML)					
2		18	M	9	5	Loose to Dense, Brown Fine to Medium SAND, Some Silt, Trace Gravel (SM)					
3		18	M	17		Less Silt near 7 ft					
4		18	M	25	10						
5		18	M	49	15						
6		16	M	83/8"	20	Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulder (SM)					
7		6	M	50/3"	25						
8		6	W	50/3"	30						
9		8	W	50/4"	35						
10		6	W	50/3"	40	More Silt near 39 ft					
11		10	W	50/4"	45	Very Dense, Brown Fine to Medium SAND, Some Gravel, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM)					
12		8	W	50/3"	50						
						End of Boring at 50 ft					
					55	Borehole Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **28.5'** Upon Completion of Drilling **NW**
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 **1/11/22** End **1/11/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **4**
Surface Elevation (ft) **875±**
Job No. **C21685**
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
						12 in. TOPSOIL FILL					
1	■	18	M	7		FILL: Loose, Brown Sandy Silt					
2	■	18	M	13	5	FILL: Medium Dense, Brown Fine to Medium Sand, Some Silt and Gravel, Scattered Lean Clay and Brick Fragments					
3	■	18	M	17							
4	■	18	M	22	10	Medium Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM)					
5	■	18	M	24	15	Trace Gravel near 14 ft					
6	■	6	M	50/5"	20						
						Hard, Brown Lean CLAY (CL)					
7	■	18	M	72/9"	25		(4.5+)	16.5			
8	■	8	M	50/4"	30		(4.5+)	15.1			
						Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Trace to Little Gravel (SP-SM/SM)					
9	■	2	M	50/5"	35						
10	■	12	W	50/4"	40						
11	■	6	W	50/2"	45						
12	■	2	W	50/3"	50						
						End of Boring at 50 ft					
					55	Borehole Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **38.5'** Upon Completion of Drilling **NW**
Time After Drilling **Next Day**
Depth to Water **32.0'** ▼
Depth to Cave in **32.0'**

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

GENERAL NOTES

Start **1/13/22** End **1/13/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **5**
Surface Elevation (ft) **867±**
Job No. **C21685**
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	■	18	M	7		Stiff, Brown Lean CLAY, Little Sand (CL)	(1.5)				
2	■	18	M	9	5	Loose to Very Dense, Brown Fine SAND, Little to Some Silt, Trace Gravel (SP-SM/SM)					
3	■	18	M	14							
4	■	18	M	14	10						
5	■	18	M	15	15	More Silt near 14 ft					
6	■	18	M	54	20						
7	■	12	M	81/9"	25	Very Dense, Brown Fine to Medium SAND, Trace to Little Silt, Trace Gravel (SP/SP-SM)					
8	■	18	W	80/8"	30						
9	■	10	W	50/3"	35	Very Dense, Brown Fine to Medium SAND, Some Gravel, Trace to Little Silt (SP/SP-SM)					
10	■	6	W	50/4"	40						
11	■	12	W	86/8"	45						
12	■	6	W	82/7"	50	End of Boring at 50 ft					
					55	Borehole Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **27.0'** Upon Completion of Drilling **NW**
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 **1/14/22** End **1/14/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **6**
Surface Elevation (ft) **863±**
Job No. **C21685**
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. Asphalt Pavement/8 in. Base Course					
1	■	18	M	11		Very Stiff, Brown Lean CLAY (CL)	(2.5)	21.0			
2	■	18	M	12	5		(2.25)	24.1			
3	■	18	M	10		Medium Dense, Brown Silty Fine SAND, Trace Gravel (SM)					
4	■	18	M	12	10						
5	■	18	M	27	15						
6	■	18	M	56	20	Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Trace Gravel, Scattered Silt Layers (SP-SM/SM)					
7	■	18	W	69	25						
8	■	12	W	83/8"	30						
9	■	18	W	96/7"	35						
10	■	10	W	50/2"	40						
11	■	14	W	50/5"	45						
12	■	12	W	50/4"	50						
						End of Boring at 50 ft					
					55	Borehole Backfilled with Bentonite Chips and Asphalt Patch					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **23.5'** Upon Completion of Drilling **NW**
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 **1/14/22** End **1/14/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **7**
Surface Elevation (ft) **875±**
Job No. **C21685**
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
						10 in. TOPSOIL FILL					
1	■	18	M	12		FILL: Medium Dense, Brown Fine to Medium Sand, Some Silt and Gravel, Scattered Brick Fragments					
2	■	18	M	17	5						
3	■	18	M	25		Medium Dense to Dense, Brown Silty Fine SAND to Sandy SILT, Trace Gravel (SM/ML)					
4	■	18	M	32	10						
5	■	18	M	21	15						
6	■	6	M	50/3"		Very Dense, Brown Fine to Medium SAND, Trace Silt and Gravel, Scattered Silt Seams (SP)					
7	■	18	M	38	20	Dense, Brown Silty Fine SAND, Some Gravel, Scattered Silt Seams (SM)					
8	■	14	M	50/4"	25	Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Trace to Little Gravel (SP-SM/SM)					
9	■	10	M/W	50/3"	30						
10	■	16	W	94/9"	35 ▽						
11	■	8	W	50/2"	40	Very Dense, Brown Fine to Medium SAND, Some Gravel, Trace to Little Silt (SP/SP-SM)					
12	■	10	W	50/3"	45						
					50	End of Boring at 50 ft Borehole Backfilled with Bentonite Chips					
					55						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **38.5'** Upon Completion of Drilling **NW**
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 **1/12/22** End **1/12/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **8**
Surface Elevation (ft) **877±**
Job No. **C21685**
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 FILL					
1	■	18	M	25		FILL: Medium Dense, Brown Fine to Medium Sand, Little to Some Silt and Gravel					
2	■	18	M	10	5						
3	■	18	M	21		Medium Dense to Very Dense, Brown Fine to Medium SAND, Some Silt, Trace Gravel (SM)					
4	■	18	M	28	10						
5	■	2	M	50/3"	15						
6	■	3	M	50/4"		Very Dense, Brown to Gray Silty Fine SAND, Some Gravel (SM)					
7	■	8	M	50/4"	20						
					25	End of Boring/Auger Refusal on Probable Boulder at 27 ft					
						Borehole Backfilled with Bentonite Chips					
					30						
					35						
					40						
					45						
					50						
					55						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **NW** Upon Completion of Drilling **NW**
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 **1/13/22** End **1/13/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **9**
Surface Elevation (ft) **872±**
Job No. **C21685**
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 FILL					
1	■	18	M	24		FILL: Medium Dense, Brown to Gray Fine to Medium Sand, Scattered Lean Clay					
2	■	18	M	17	5	Medium Dense, Brown Fine to Medium SAND, Some Silt (SM - Possible Fill)					
3	■	18	M	25		Medium Dense to Dense, Brown Sandy SILT (ML)					
4	■	18	M	26	10						
5	■	18	M	31	15						
6	■	18	M	68	20	Very Dense, Brown Silty Fine SAND (SM)					
7	■	18	M	58	25						
8	■	16	M	79/8"	30	Very Dense, Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
9	■	16	M	91/8"	35						
10	■	18	W	82	40						
11	■	18	W	73	45						
12	■	12	W	86/7"	50	End of Boring at 50 ft					
					55	Borehole Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ **33.5'** Upon Completion of Drilling **NW**
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 **1/12/22** End **1/12/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC Inc.

LOG OF TEST BORING

Project **Proposed UW Madison Levy Hall**
West Johnson & North Park Streets
Location **Madison, Wisconsin**

Boring No. **10**
Surface Elevation (ft) **867±**
Job No. **C21685**
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	■	18	M	22		Medium Dense, Brown SILT, Trace Sand (ML)					
2	■	18	M	13	5						
3	■	18	M	15		Medium Dense, Brown Fine to Medium SAND, Some Silt, Trace Gravel (SM)					
4	■	18	M	8	10	Loose to Medium Dense, Brown Fine to Medium SAND, Trace to Little Silt, Trace Gravel (SP/SP-SM)					
5	■	18	M	11	15						
6	■	18	M	26		Medium Dense, Brown Fine to Medium SAND, Some Silt, Little Gravel (SM)					
7	■	18	W	18	20	Medium Dense to Very Dense, Brown Fine to Medium SAND, Trace to Little Silt, Trace Gravel (SP/SP-SM)					
8	■	18	W	27	25						
9	■	18	W	39	30						
10	■	16	W	87/7"	35						
11	■	8	W	50/3"	40						
12	■	3	W	50/4"	45	Very Dense, Brown Fine to Medium SAND, Some Gravel, Trace to Little Silt (SP/SP-SM)					
					50	End of Boring at 50 ft Borehole Backfilled with Bentonite Chips					
					55						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **23.5'**	Upon Completion of Drilling				**NW**
Time After Drilling					**Next Day**
Depth to Water					**26.0'** ▼
Depth to Cave in					**26.0'**

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

GENERAL NOTES

Start **1/13/22** End **1/13/22**
Driller **BSD** Chief **MC** Rig **D-50**
Logger **GB** Editor **BSM**
Drill Method **2.25" HSA; Autohammer**

CGC, Inc.

LOG OF TEST BORING

General Notes

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12”	Larger than 12”
Cobbles	3” to 12”	3” to 12”
Gravel: Coarse	¾” to 3”	¾” to 3”
Fine	4.76 mm to ¾”	#4 to ¾”
Sand: Coarse	2.00 mm to 4.76 mm	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm	#200 to #40
Silt	0.005 mm to 0.074 mm	Smaller than #200
Clay	Smaller than 0.005 mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

General Terminology

Physical Characteristics
Color, moisture, grain shape, fineness, etc.
Major Constituents
Clay, silt, sand, gravel
Structure
Laminated, varved, fibrous, stratified, cemented, fissured, etc.
Geologic Origin
Glacial, alluvial, eolian, residual, etc.

Relative Density

Term	“N” Value
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Over 50

Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace	0% - 5%
Little	5% - 12%
Some	12% - 35%
And	35% - 50%

Consistency

Term	q_u-tons/sq. ft
Very Soft	0.0 to 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	Over 4.0

Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic	Less than 4%
Organic Silt/Clay	4 – 12%
Sedimentary Peat	12% - 50%
Fibrous and Woody Peat	More than 50%

Plasticity

Term	Plastic Index
None to Slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6” penetrations of the 2” split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30” and is seated to a depth of 6” before commencing the standard penetration test.

SYMBOLS

Drilling and Sampling

CS – Continuous Sampling
RC – Rock Coring: Size AW, BW, NW, 2”W
RQD – Rock Quality Designation
RB – Rock Bit/Roller Bit
FT – Fish Tail
DC – Drove Casing
C – Casing: Size 2 ½”, NW, 4”, HW
CW – Clear Water
DM – Drilling Mud
HSA – Hollow Stem Auger
FA – Flight Auger
HA – Hand Auger
COA – Clean-Out Auger
SS - 2” Dia. Split-Barrel Sample
2ST – 2” Dia. Thin-Walled Tube Sample
3ST – 3” Dia. Thin-Walled Tube Sample
PT – 3” Dia. Piston Tube Sample
AS – Auger Sample
WS – Wash Sample
PTS – Peat Sample
PS – Pitcher Sample
NR – No Recovery
S – Sounding
PMT – Borehole Pressuremeter Test
VS – Vane Shear Test
WPT – Water Pressure Test

Laboratory Tests

q_a – Penetrometer Reading, tons/sq ft
q_a – Unconfined Strength, tons/sq ft
W – Moisture Content, %
LL – Liquid Limit, %
PL – Plastic Limit, %
SL – Shrinkage Limit, %
LI – Loss on Ignition
D – Dry Unit Weight, lbs/cu ft
pH – Measure of Soil Alkalinity or Acidity
FS – Free Swell, %

Water Level Measurement

▽- Water Level at Time Shown
NW – No Water Encountered
WD – While Drilling
BCR – Before Casing Removal
ACR – After Casing Removal
CW – Cave and Wet
CM – Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

Madison - Milwaukee

Unified Soil Classification System

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

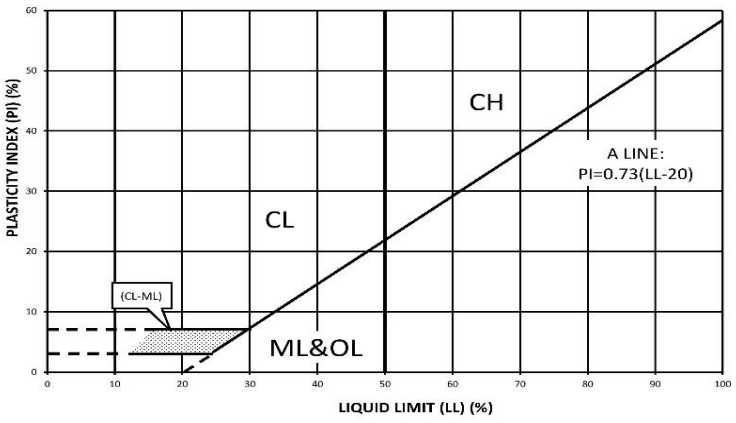
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limts below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limts above "A" line or P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



APPENDIX C

DOCUMENT QUALIFICATIONS

APPENDIX C
DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

READ THE FULL REPORT

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most

effective method of managing the risks associated with unanticipated conditions.

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the confirmation-dependent recommendations included in your report. *Those confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

DO NOT REDRAW THE ENGINEER'S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

GIVE CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and constructors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

ENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

Modified and reprinted with permission from:

Geotechnical Business Council
of the Geoprofessional Business Association
8811 Colesville Road, Suite G 106
Silver Spring, MD 20910

APPENDIX D

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX D

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

Table 1
Gradation of Special Fill Materials

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55			
No. 40			5-20	8-28	10-35	75 (2)		
No. 100						15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

Notes:

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction.*
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

Table 2
Compaction Guidelines

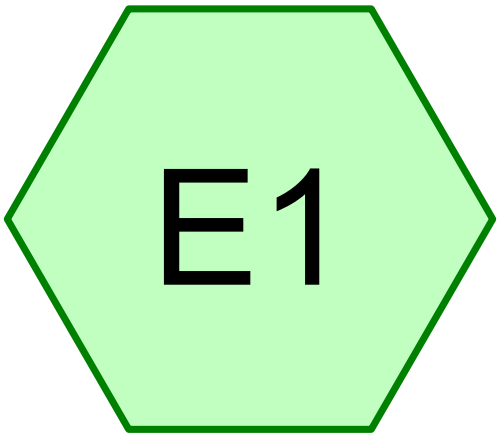
Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
Within 10 ft of building lines		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
Beyond 10 ft of building lines		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

Notes:

1. Based on Modified Proctor Dry Density (ASTM D 1557)

Appendix B

HydroCAD Analysis – Pre-Development Conditions



Existing Site

Subcat Reach Pond Link

Routing Diagram for 210713_Existing HydroCAD
Prepared by Kapur & Associates, Inc, Printed 4/17/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	MSE 24-hr	4	Default	24.00	1	2.49	2
2	2-year	MSE 24-hr	4	Default	24.00	1	2.84	2
3	5-year	MSE 24-hr	4	Default	24.00	1	3.45	2
4	10-year	MSE 24-hr	4	Default	24.00	1	4.09	2
5	100-year	MSE 24-hr	4	Default	24.00	1	6.66	2
6	200-year	MSE 24-hr	4	Default	24.00	1	7.53	2
7	500-year	MSE 24-hr	4	Default	24.00	1	8.94	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
24,192	74	>75% Grass cover, Good, HSG C (E1)
1,965	96	Compacted Gravel, HSG C (E1)
6,592	98	Pavement, HSG C (E1)
10,406	98	Roofs, HSG C (E1)
4,192	98	Sidewalk, HSG C (E1)
47,347	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
47,347	HSG C	E1
0	HSG D	
0	Other	
47,347		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	0	24,192	0	0	24,192	>75% Grass cover, Good	
0	0	1,965	0	0	1,965	Compacted Gravel	
0	0	6,592	0	0	6,592	Pavement	
0	0	10,406	0	0	10,406	Roofs	
0	0	4,192	0	0	4,192	Sidewalk	
0	**0**	**47,347**	**0**	**0**	**47,347**	**TOTAL AREA**	

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment E1: Existing Site Runoff Area=47,347 sf 44.75% Impervious Runoff Depth=1.24"
Tc=6.0 min CN=86 Runoff=2.18 cfs 4,874 cf

Total Runoff Area = 47,347 sf Runoff Volume = 4,874 cf Average Runoff Depth = 1.24"
55.25% Pervious = 26,157 sf 44.75% Impervious = 21,190 sf

Summary for Subcatchment E1: Existing Site

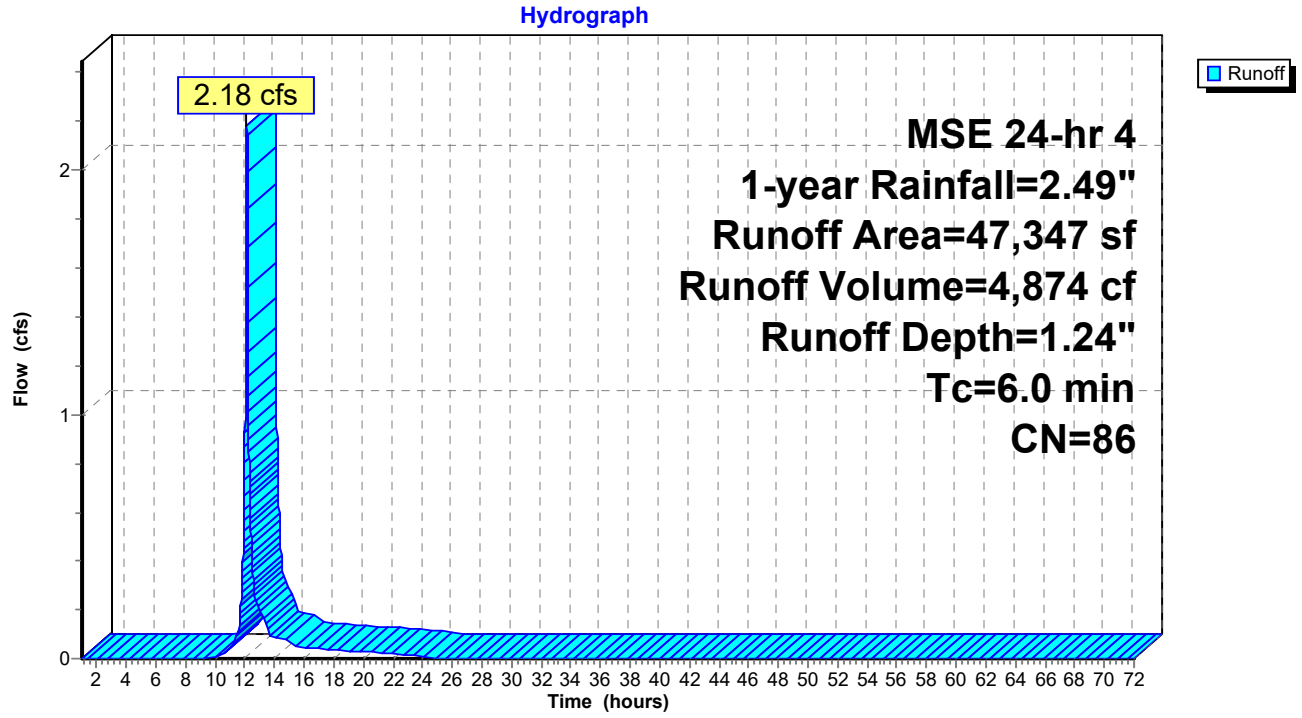
Runoff = 2.18 cfs @ 12.13 hrs, Volume= 4,874 cf, Depth= 1.24"
Routed to nonexistent node TEO

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	10,406	98	Roofs, HSG C
*	6,592	98	Pavement, HSG C
*	4,192	98	Sidewalk, HSG C
*	1,965	96	Compacted Gravel, HSG C
	24,192	74	>75% Grass cover, Good, HSG C
	47,347	86	Weighted Average
	26,157		55.25% Pervious Area
	21,190		44.75% Impervious Area

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

Subcatchment E1: Existing Site



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment E1: Existing Site Runoff Area=47,347 sf 44.75% Impervious Runoff Depth=1.53"
Tc=6.0 min CN=86 Runoff=2.69 cfs 6,022 cf

Total Runoff Area = 47,347 sf Runoff Volume = 6,022 cf Average Runoff Depth = 1.53"
55.25% Pervious = 26,157 sf 44.75% Impervious = 21,190 sf

Summary for Subcatchment E1: Existing Site

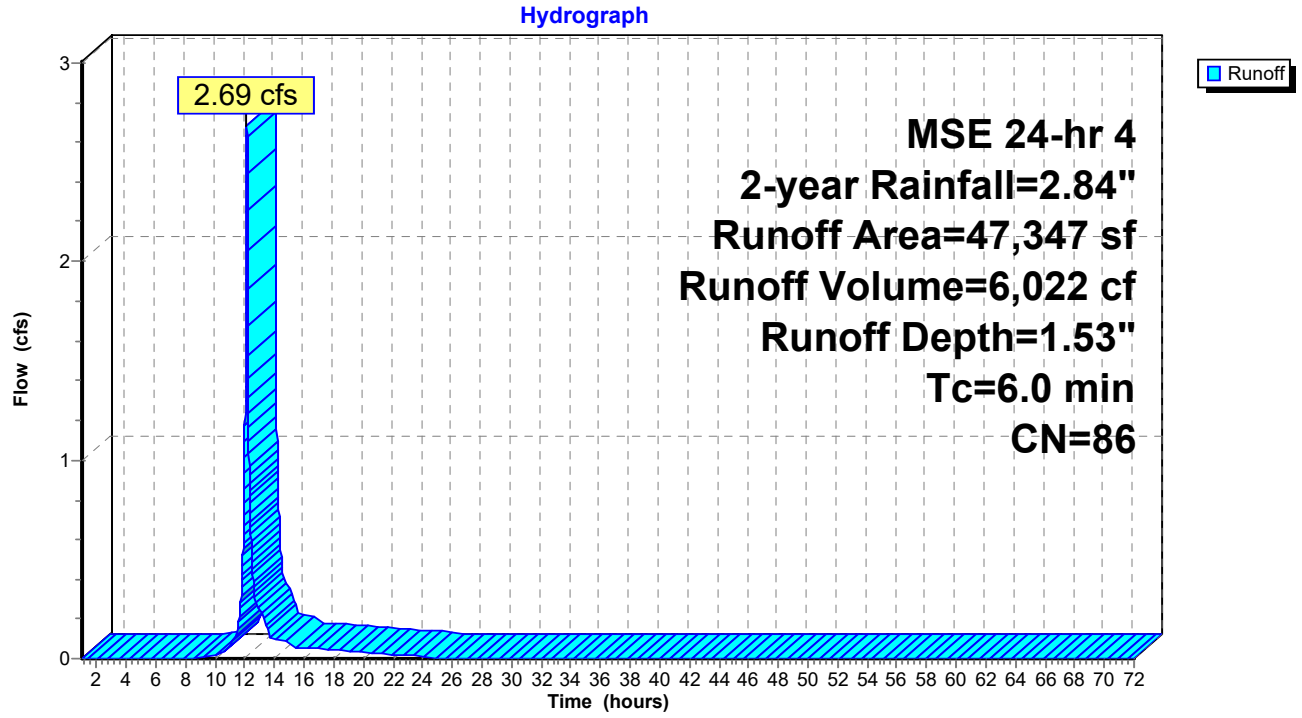
Runoff = 2.69 cfs @ 12.13 hrs, Volume= 6,022 cf, Depth= 1.53"
Routed to nonexistent node TEO

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	10,406	98	Roofs, HSG C
*	6,592	98	Pavement, HSG C
*	4,192	98	Sidewalk, HSG C
*	1,965	96	Compacted Gravel, HSG C
	24,192	74	>75% Grass cover, Good, HSG C
	47,347	86	Weighted Average
	26,157		55.25% Pervious Area
	21,190		44.75% Impervious Area

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

Subcatchment E1: Existing Site



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment E1: Existing Site Runoff Area=47,347 sf 44.75% Impervious Runoff Depth=2.05"
Tc=6.0 min CN=86 Runoff=3.59 cfs 8,105 cf

Total Runoff Area = 47,347 sf Runoff Volume = 8,105 cf Average Runoff Depth = 2.05"
55.25% Pervious = 26,157 sf 44.75% Impervious = 21,190 sf

Summary for Subcatchment E1: Existing Site

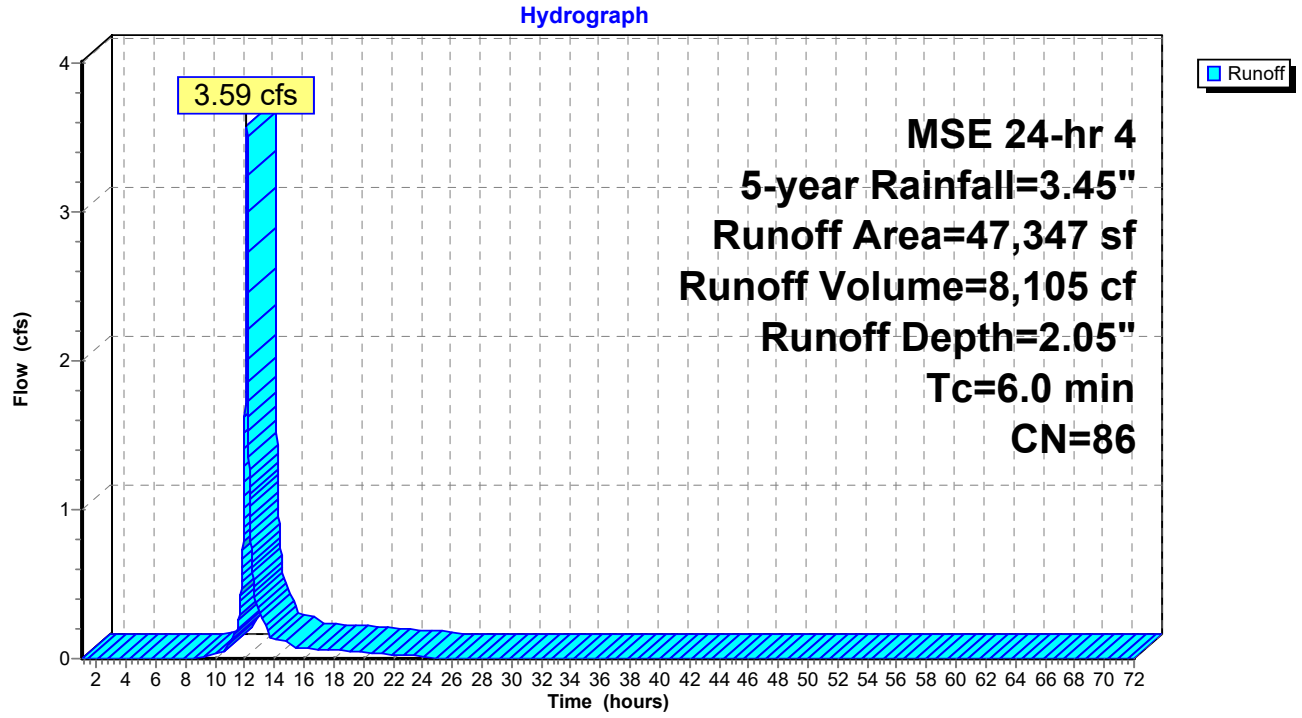
Runoff = 3.59 cfs @ 12.13 hrs, Volume= 8,105 cf, Depth= 2.05"
Routed to nonexistent node TEO

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	10,406	98	Roofs, HSG C
*	6,592	98	Pavement, HSG C
*	4,192	98	Sidewalk, HSG C
*	1,965	96	Compacted Gravel, HSG C
	24,192	74	>75% Grass cover, Good, HSG C
	47,347	86	Weighted Average
	26,157		55.25% Pervious Area
	21,190		44.75% Impervious Area

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

Subcatchment E1: Existing Site



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment E1: Existing Site Runoff Area=47,347 sf 44.75% Impervious Runoff Depth=2.63"
Tc=6.0 min CN=86 Runoff=4.54 cfs 10,369 cf

Total Runoff Area = 47,347 sf Runoff Volume = 10,369 cf Average Runoff Depth = 2.63"
55.25% Pervious = 26,157 sf 44.75% Impervious = 21,190 sf

Summary for Subcatchment E1: Existing Site

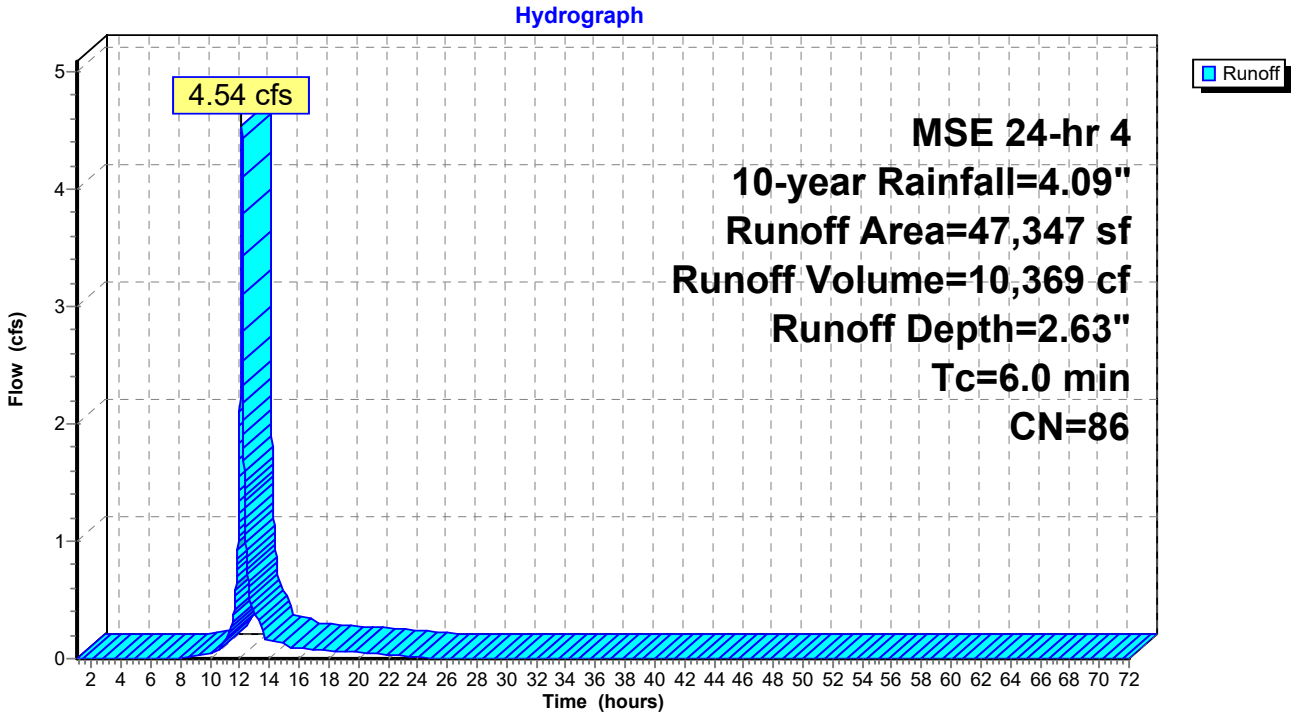
Runoff = 4.54 cfs @ 12.13 hrs, Volume= 10,369 cf, Depth= 2.63"
Routed to nonexistent node TEO

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	10,406	98	Roofs, HSG C
*	6,592	98	Pavement, HSG C
*	4,192	98	Sidewalk, HSG C
*	1,965	96	Compacted Gravel, HSG C
	24,192	74	>75% Grass cover, Good, HSG C
	47,347	86	Weighted Average
	26,157		55.25% Pervious Area
	21,190		44.75% Impervious Area

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

Subcatchment E1: Existing Site



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment E1: Existing Site Runoff Area=47,347 sf 44.75% Impervious Runoff Depth=5.04"
Tc=6.0 min CN=86 Runoff=8.41 cfs 19,883 cf

Total Runoff Area = 47,347 sf Runoff Volume = 19,883 cf Average Runoff Depth = 5.04"
55.25% Pervious = 26,157 sf 44.75% Impervious = 21,190 sf

Summary for Subcatchment E1: Existing Site

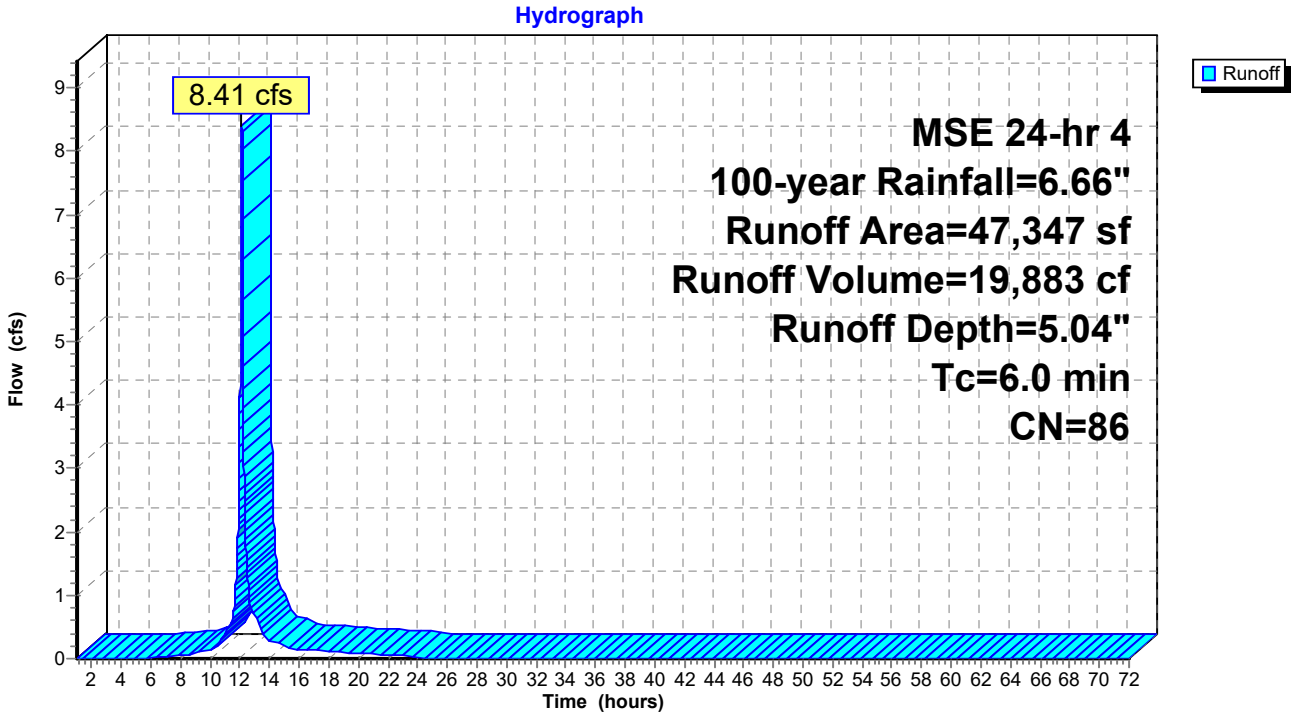
Runoff = 8.41 cfs @ 12.13 hrs, Volume= 19,883 cf, Depth= 5.04"
Routed to nonexistent node TEO

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	10,406	98	Roofs, HSG C
*	6,592	98	Pavement, HSG C
*	4,192	98	Sidewalk, HSG C
*	1,965	96	Compacted Gravel, HSG C
	24,192	74	>75% Grass cover, Good, HSG C
	47,347	86	Weighted Average
	26,157		55.25% Pervious Area
	21,190		44.75% Impervious Area

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

Subcatchment E1: Existing Site



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment E1: Existing Site Runoff Area=47,347 sf 44.75% Impervious Runoff Depth=5.88"
Tc=6.0 min CN=86 Runoff=9.71 cfs 23,186 cf

Total Runoff Area = 47,347 sf Runoff Volume = 23,186 cf Average Runoff Depth = 5.88"
55.25% Pervious = 26,157 sf 44.75% Impervious = 21,190 sf

Summary for Subcatchment E1: Existing Site

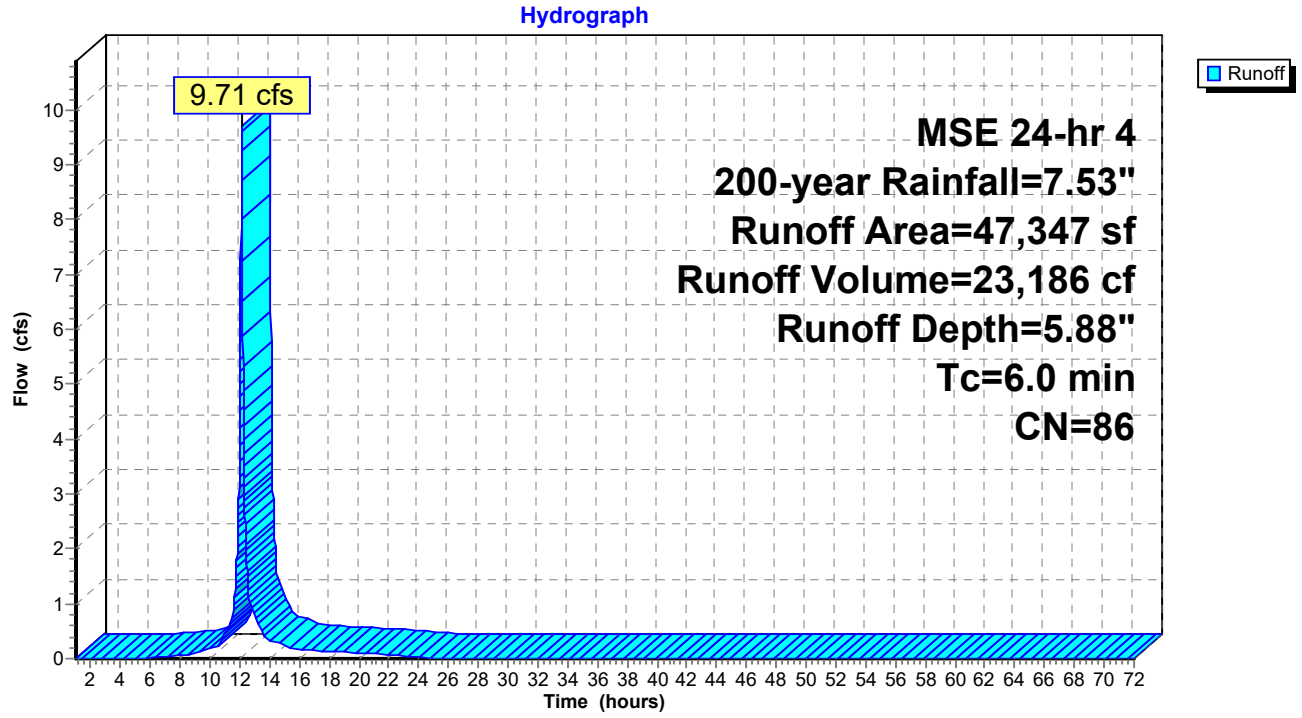
Runoff = 9.71 cfs @ 12.13 hrs, Volume= 23,186 cf, Depth= 5.88"
Routed to nonexistent node TEO

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	10,406	98	Roofs, HSG C
*	6,592	98	Pavement, HSG C
*	4,192	98	Sidewalk, HSG C
*	1,965	96	Compacted Gravel, HSG C
	24,192	74	>75% Grass cover, Good, HSG C
	47,347	86	Weighted Average
	26,157		55.25% Pervious Area
	21,190		44.75% Impervious Area

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

Subcatchment E1: Existing Site



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment E1: Existing Site Runoff Area=47,347 sf 44.75% Impervious Runoff Depth=7.25"
Tc=6.0 min CN=86 Runoff=11.81 cfs 28,587 cf

Total Runoff Area = 47,347 sf Runoff Volume = 28,587 cf Average Runoff Depth = 7.25"
55.25% Pervious = 26,157 sf 44.75% Impervious = 21,190 sf

Summary for Subcatchment E1: Existing Site

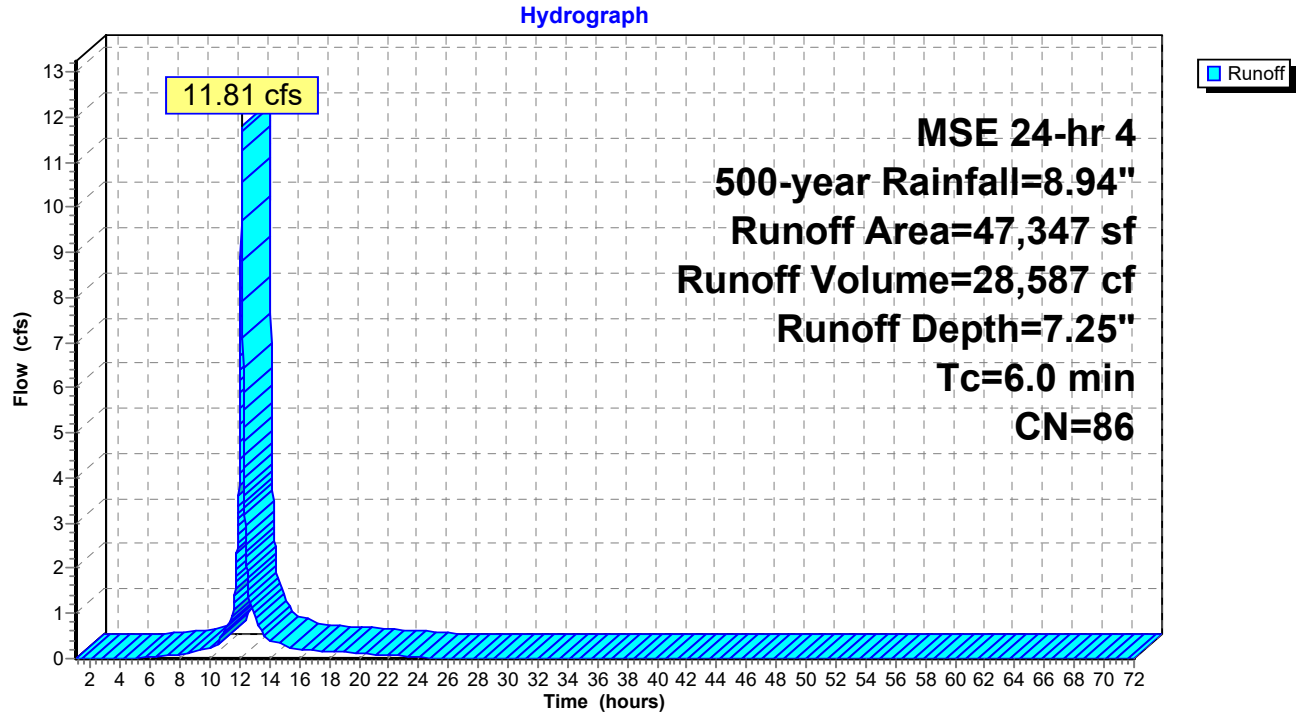
Runoff = 11.81 cfs @ 12.13 hrs, Volume= 28,587 cf, Depth= 7.25"
Routed to nonexistent node TEO

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	10,406	98	Roofs, HSG C
*	6,592	98	Pavement, HSG C
*	4,192	98	Sidewalk, HSG C
*	1,965	96	Compacted Gravel, HSG C
	24,192	74	>75% Grass cover, Good, HSG C
	47,347	86	Weighted Average
	26,157		55.25% Pervious Area
	21,190		44.75% Impervious Area

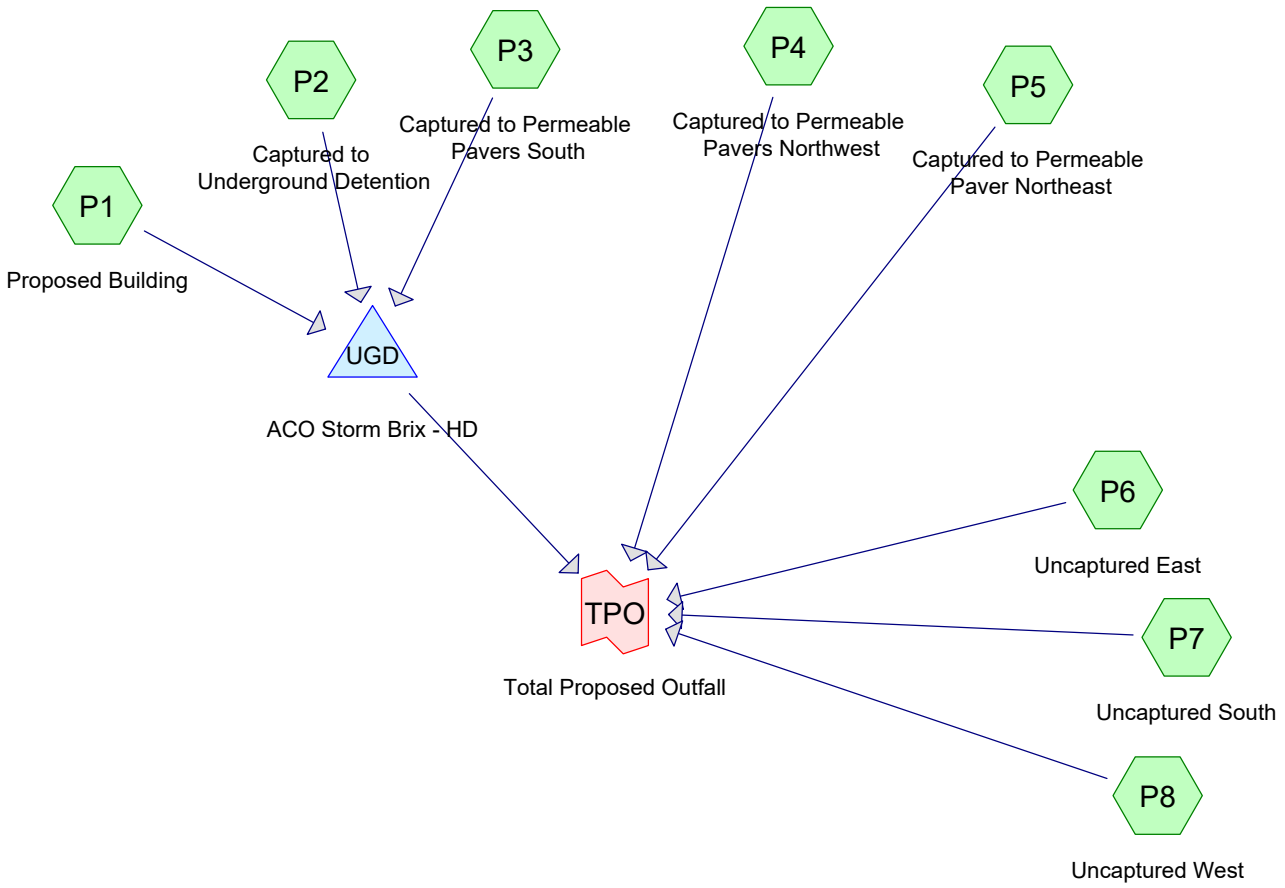
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment E1: Existing Site



Appendix C

HydroCAD Analysis – Post-Development Conditions



Subcat Reach Pond Link

Routing Diagram for 210713_Proposed HydroCAD
Prepared by Kapur & Associates, Inc, Printed 4/17/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	MSE 24-hr	4	Default	24.00	1	2.49	2
2	2-year	MSE 24-hr	4	Default	24.00	1	2.84	2
3	5-year	MSE 24-hr	4	Default	24.00	1	3.45	2
4	10-year	MSE 24-hr	4	Default	24.00	1	4.09	2
5	100-year	MSE 24-hr	4	Default	24.00	1	6.66	2
6	200-year	MSE 24-hr	4	Default	24.00	1	7.53	2
7	500-year	MSE 24-hr	4	Default	24.00	1	8.94	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
3,474	86	<50% Grass cover, Poor, HSG C (P3, P4, P5, P6, P8)
1,077	74	>75% Grass cover, Good, HSG C (P2)
7,797	68	Intensive Green Roof (P1)
1,627	98	Paved parking, HSG C (P3, P7)
4,688	74	Permeable Pavers, HSG C (P3, P4, P5)
23,760	98	Roofs, HSG C (P1)
4,924	98	Sidewalk, HSG C (P2, P3, P4, P5, P6, P7, P8)
47,347	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
39,550	HSG C	P1, P2, P3, P4, P5, P6, P7, P8
0	HSG D	
7,797	Other	P1
47,347		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	0	3,474	0	0	3,474	<50% Grass cover, Poor	
0	0	1,077	0	0	1,077	>75% Grass cover, Good	
0	0	0	0	7,797	7,797	Intensive Green Roof	
0	0	1,627	0	0	1,627	Paved parking	
0	0	4,688	0	0	4,688	Permeable Pavers	
0	0	23,760	0	0	23,760	Roofs	
0	0	4,924	0	0	4,924	Sidewalk	
0	**0**	**39,550**	**0**	**7,797**	**47,347**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	UGD	857.38	857.21	17.2	0.0099	0.013	0.0	12.0	0.0

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment P1: Proposed Building Runoff Area=31,557 sf 75.29% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=91 Runoff=1.85 cfs 4,211 cf

Subcatchment P2: Captured to Underground Runoff Area=1,163 sf 7.39% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=76 Runoff=0.03 cfs 67 cf

Subcatchment P3: Captured to Permeable Runoff Area=3,805 sf 35.72% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=83 Runoff=0.15 cfs 332 cf

Subcatchment P4: Captured to Permeable Runoff Area=3,381 sf 7.75% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=80 Runoff=0.11 cfs 248 cf

Subcatchment P5: Captured to Permeable Runoff Area=2,002 sf 47.85% Impervious Runoff Depth=1.45"
Tc=6.0 min CN=89 Runoff=0.11 cfs 241 cf

Subcatchment P6: Uncaptured East Runoff Area=945 sf 22.65% Impervious Runoff Depth=1.45"
Tc=6.0 min CN=89 Runoff=0.05 cfs 114 cf

Subcatchment P7: Uncaptured South Runoff Area=693 sf 100.00% Impervious Runoff Depth=2.26"
Tc=6.0 min CN=98 Runoff=0.05 cfs 131 cf

Subcatchment P8: Uncaptured West Runoff Area=3,801 sf 78.37% Impervious Runoff Depth=1.95"
Tc=6.0 min CN=95 Runoff=0.26 cfs 619 cf

Pond UGD: ACO Storm Brix - HD Peak Elev=857.96' Storage=1,308 cf Inflow=2.02 cfs 4,610 cf
Discarded=0.09 cfs 3,156 cf Primary=1.02 cfs 1,455 cf Outflow=1.12 cfs 4,610 cf

Link TPO: Total Proposed Outfall Inflow=1.37 cfs 2,807 cf
Primary=1.37 cfs 2,807 cf

Total Runoff Area = 47,347 sf Runoff Volume = 5,963 cf Average Runoff Depth = 1.51"
35.98% Pervious = 17,036 sf 64.02% Impervious = 30,311 sf

Summary for Subcatchment P1: Proposed Building

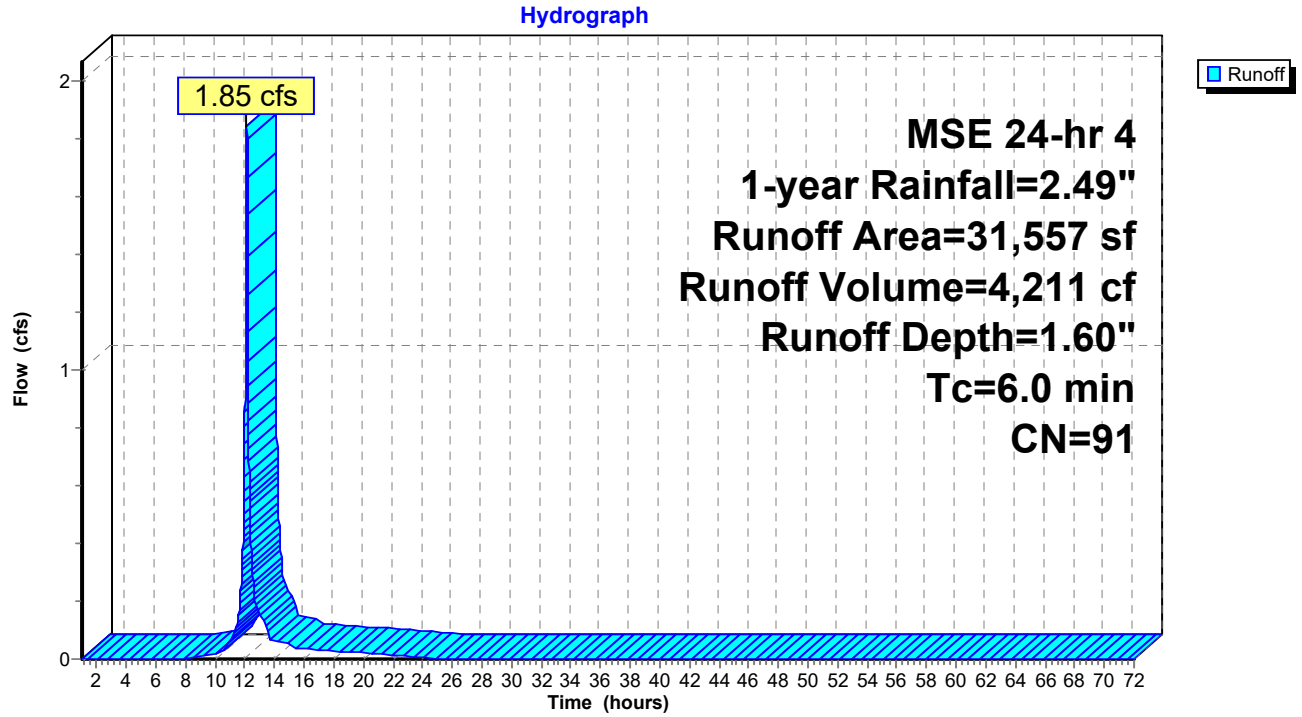
Runoff = 1.85 cfs @ 12.13 hrs, Volume= 4,211 cf, Depth= 1.60"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	23,760	98	Roofs, HSG C
*	7,797	68	Intensive Green Roof
	31,557	91	Weighted Average
	7,797		24.71% Pervious Area
	23,760		75.29% Impervious Area

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

Subcatchment P1: Proposed Building



Summary for Subcatchment P2: Captured to Underground Detention

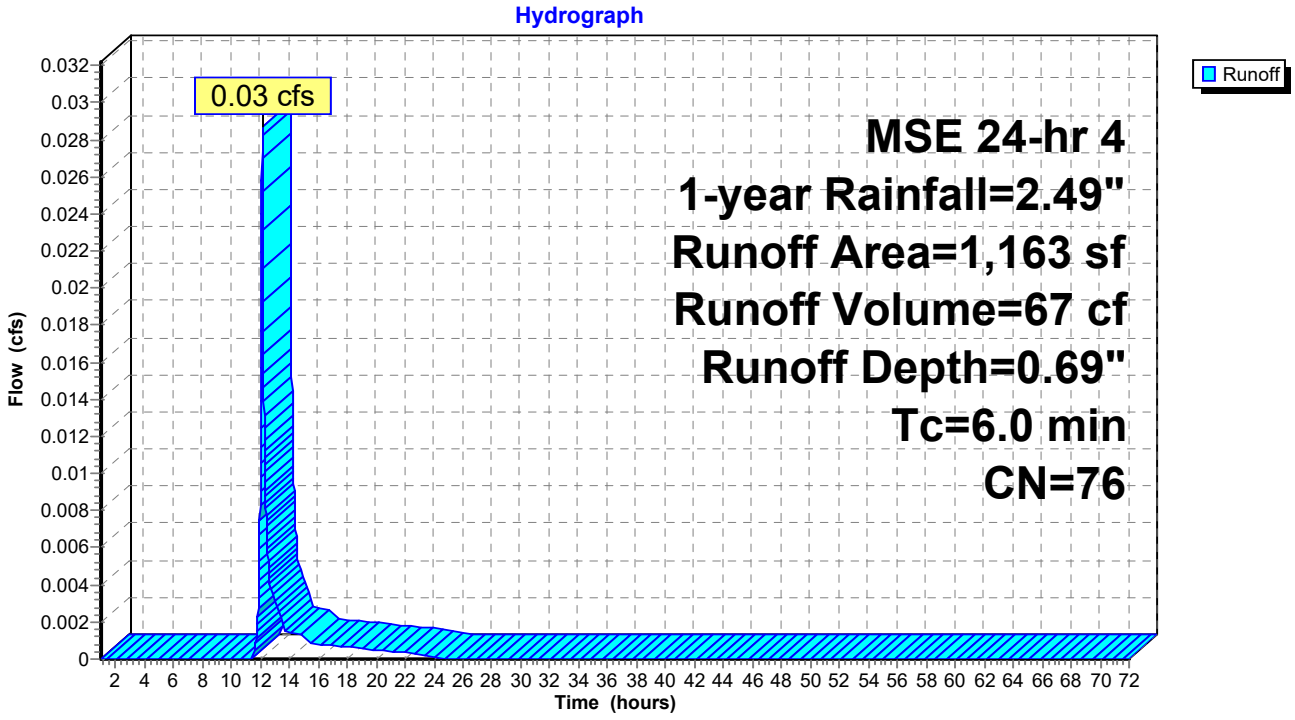
Runoff = 0.03 cfs @ 12.14 hrs, Volume= 67 cf, Depth= 0.69"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	86	98	Sidewalk, HSG C
	1,077	74	>75% Grass cover, Good, HSG C
	1,163	76	Weighted Average
	1,077		92.61% Pervious Area
	86		7.39% Impervious Area

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

Subcatchment P2: Captured to Underground Detention



Summary for Subcatchment P3: Captured to Permeable Pavers South

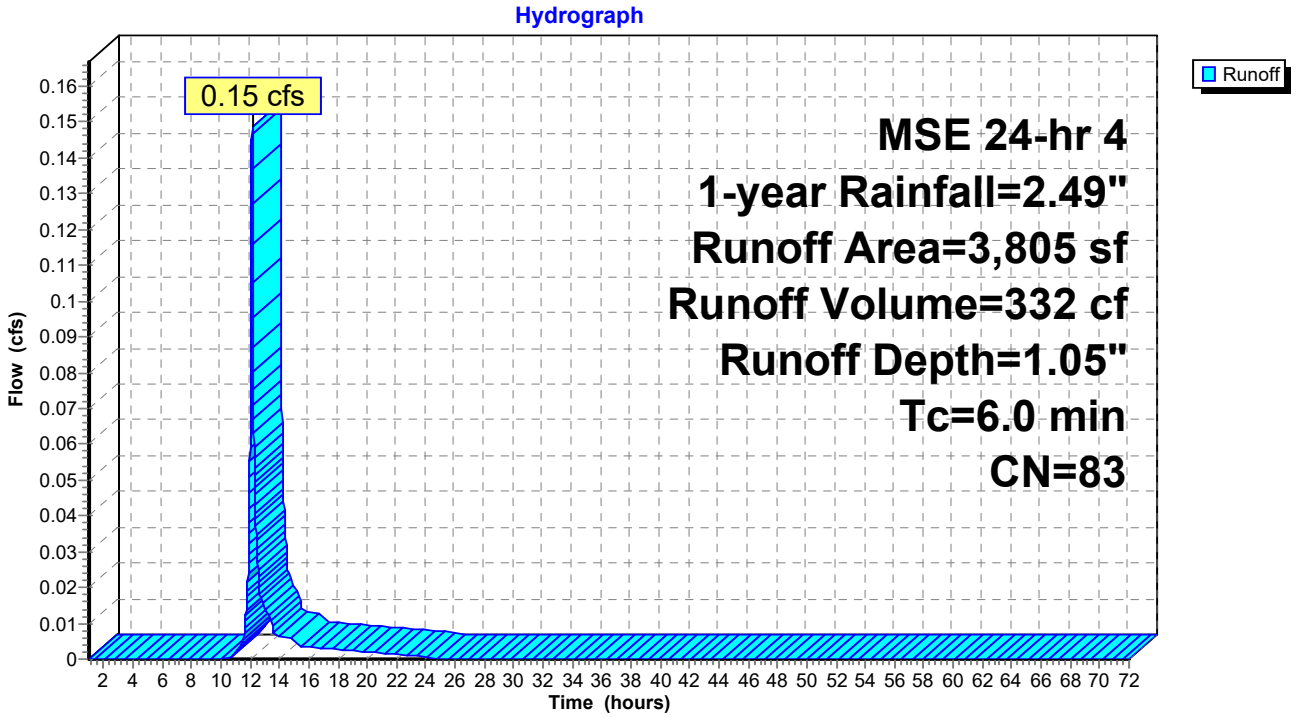
Runoff = 0.15 cfs @ 12.14 hrs, Volume= 332 cf, Depth= 1.05"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
	992	98	Paved parking, HSG C
*	367	98	Sidewalk, HSG C
*	2,194	74	Permeable Pavers, HSG C
	252	86	<50% Grass cover, Poor, HSG C
	3,805	83	Weighted Average
	2,446		64.28% Pervious Area
	1,359		35.72% Impervious Area

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

Subcatchment P3: Captured to Permeable Pavers South



Summary for Subcatchment P4: Captured to Permeable Pavers Northwest

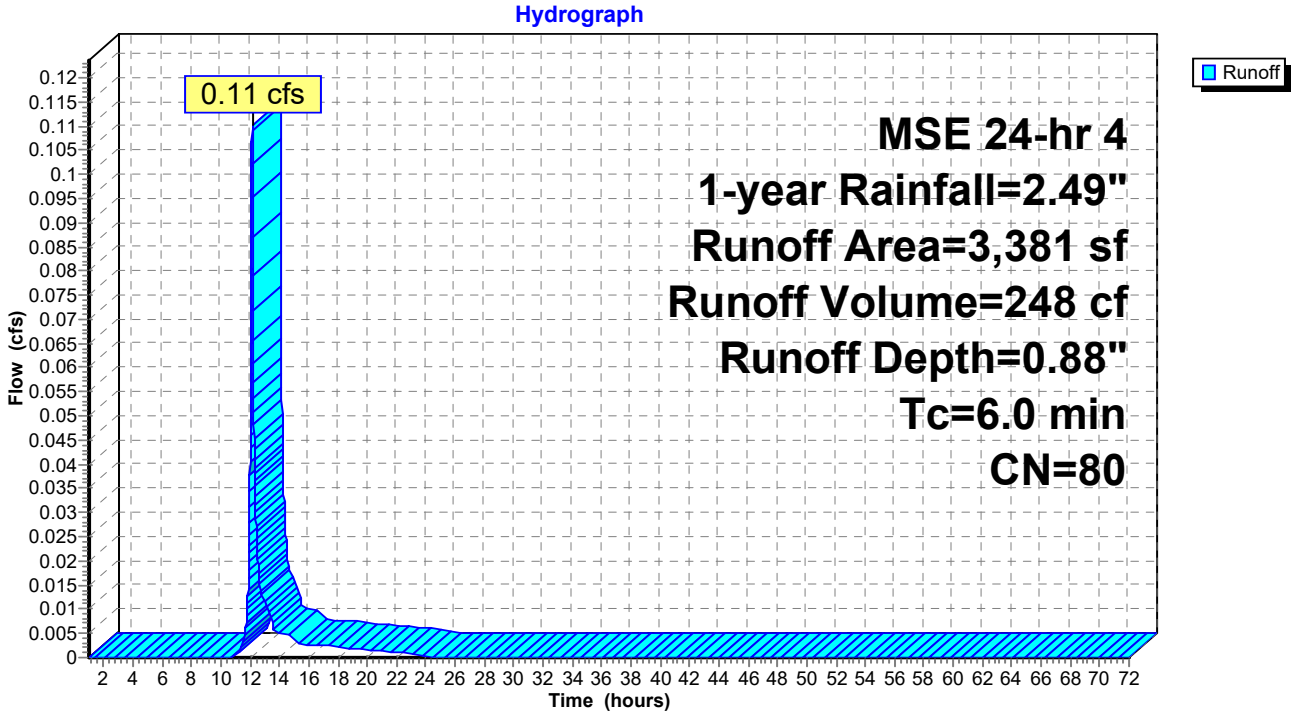
Runoff = 0.11 cfs @ 12.14 hrs, Volume= 248 cf, Depth= 0.88"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	262	98	Sidewalk, HSG C
*	1,973	74	Permeable Pavers, HSG C
	1,146	86	<50% Grass cover, Poor, HSG C
	3,381	80	Weighted Average
	3,119		92.25% Pervious Area
	262		7.75% Impervious Area

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

Subcatchment P4: Captured to Permeable Pavers Northwest



Summary for Subcatchment P5: Captured to Permeable Paver Northeast

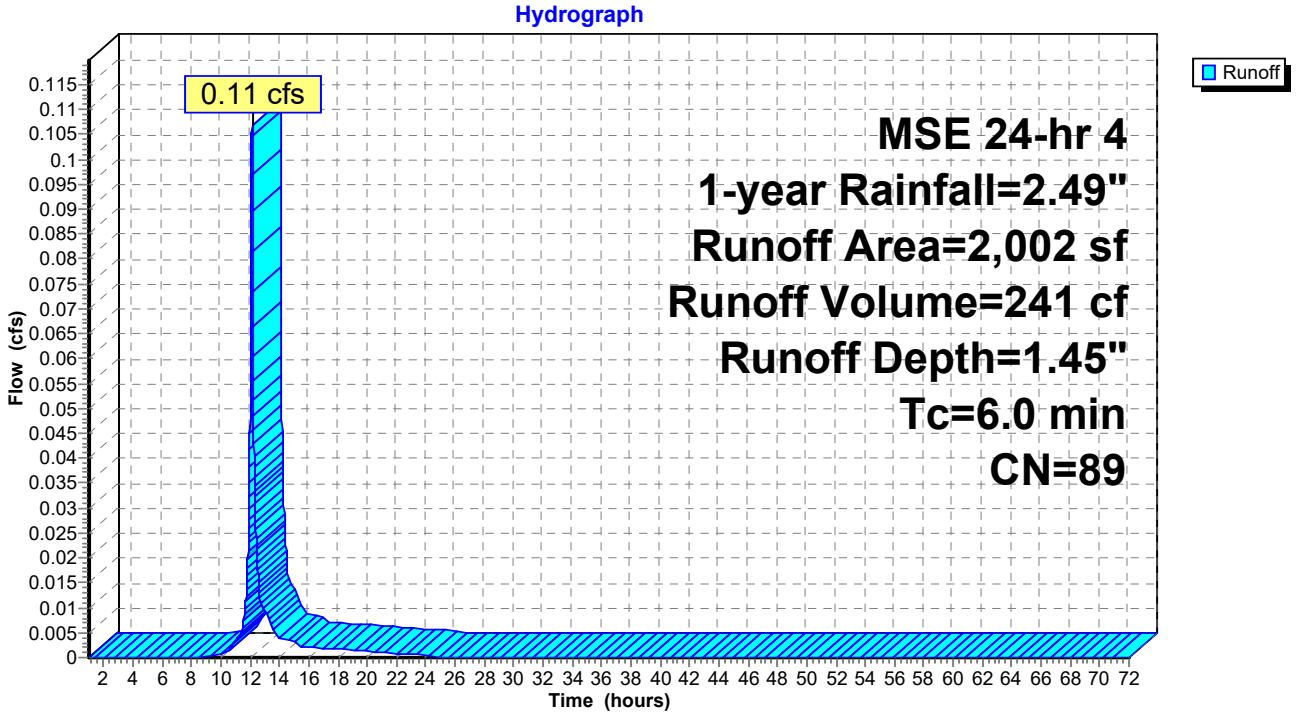
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 241 cf, Depth= 1.45"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	958	98	Sidewalk, HSG C
*	521	74	Permeable Pavers, HSG C
	523	86	<50% Grass cover, Poor, HSG C
	2,002	89	Weighted Average
	1,044		52.15% Pervious Area
	958		47.85% Impervious Area

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

Subcatchment P5: Captured to Permeable Paver Northeast



Summary for Subcatchment P6: Uncaptured East

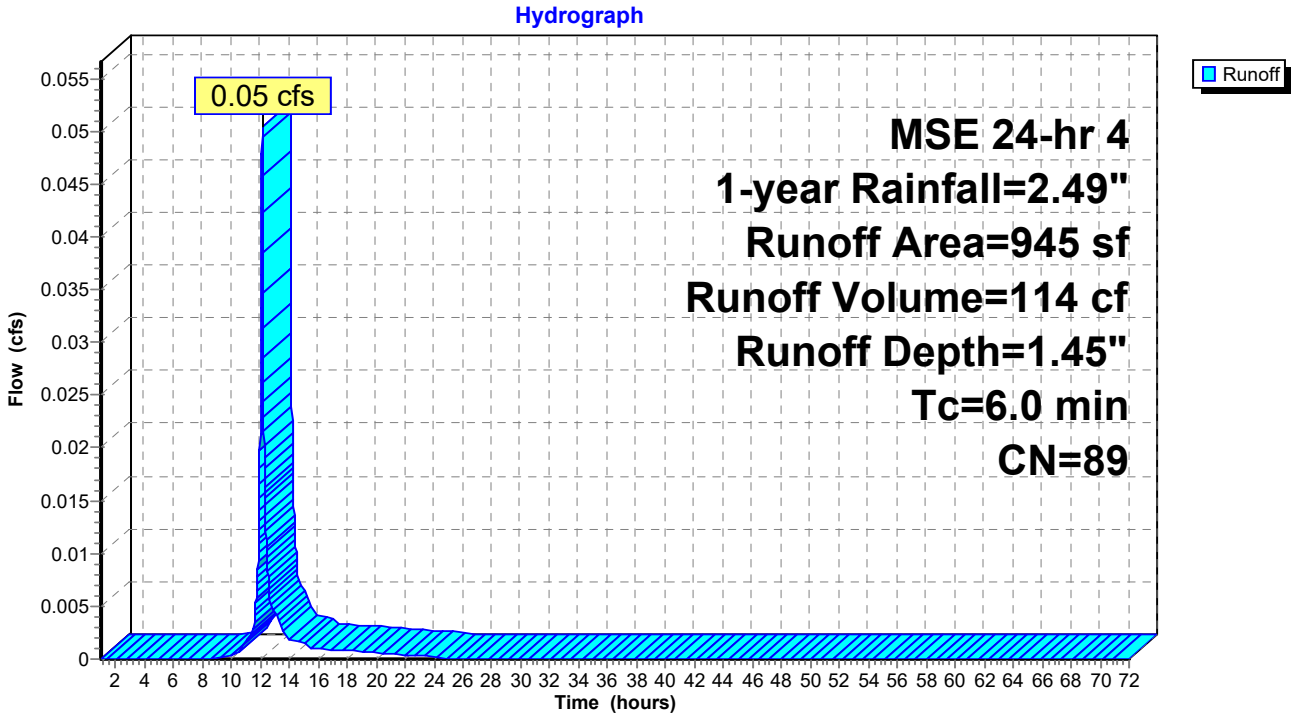
Runoff = 0.05 cfs @ 12.13 hrs, Volume= 114 cf, Depth= 1.45"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	214	98	Sidewalk, HSG C
	731	86	<50% Grass cover, Poor, HSG C
	945	89	Weighted Average
	731		77.35% Pervious Area
	214		22.65% Impervious Area

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

Subcatchment P6: Uncaptured East



Summary for Subcatchment P7: Uncaptured South

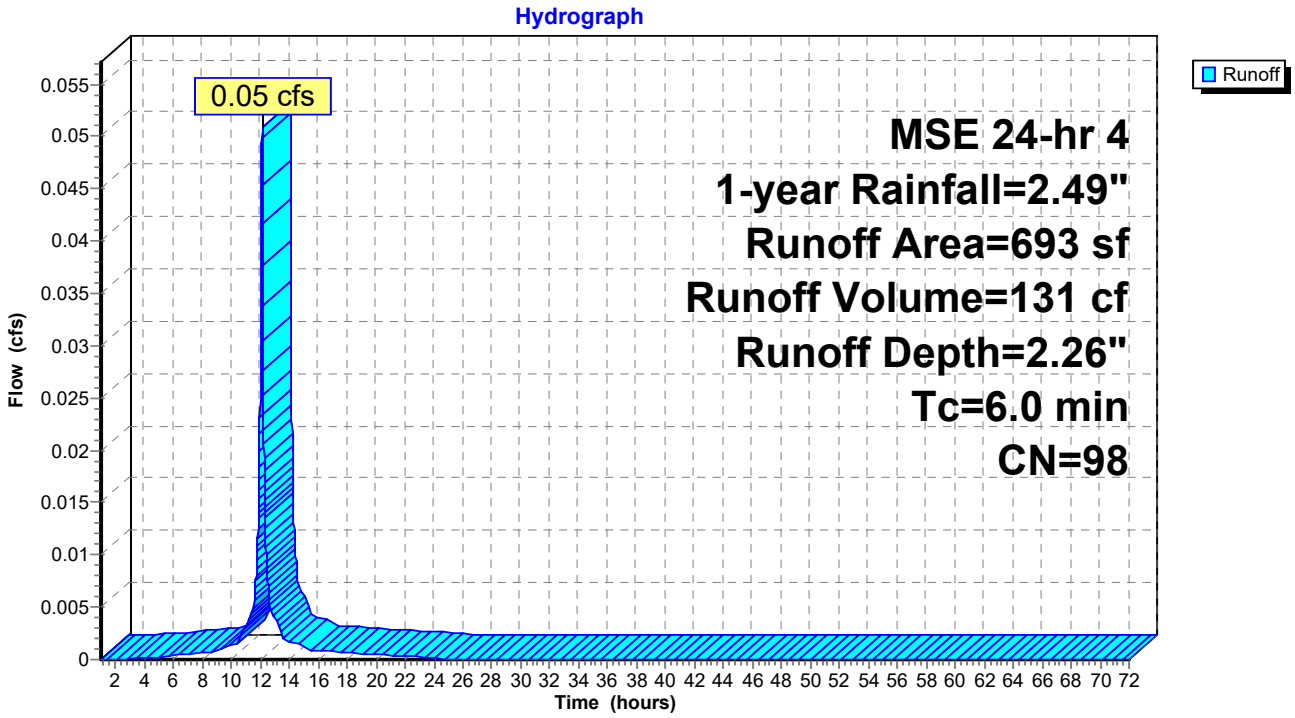
Runoff = 0.05 cfs @ 12.13 hrs, Volume= 131 cf, Depth= 2.26"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
	635	98	Paved parking, HSG C
*	58	98	Sidewalk, HSG C
	693	98	Weighted Average
	693		100.00% Impervious Area

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

Subcatchment P7: Uncaptured South



Summary for Subcatchment P8: Uncaptured West

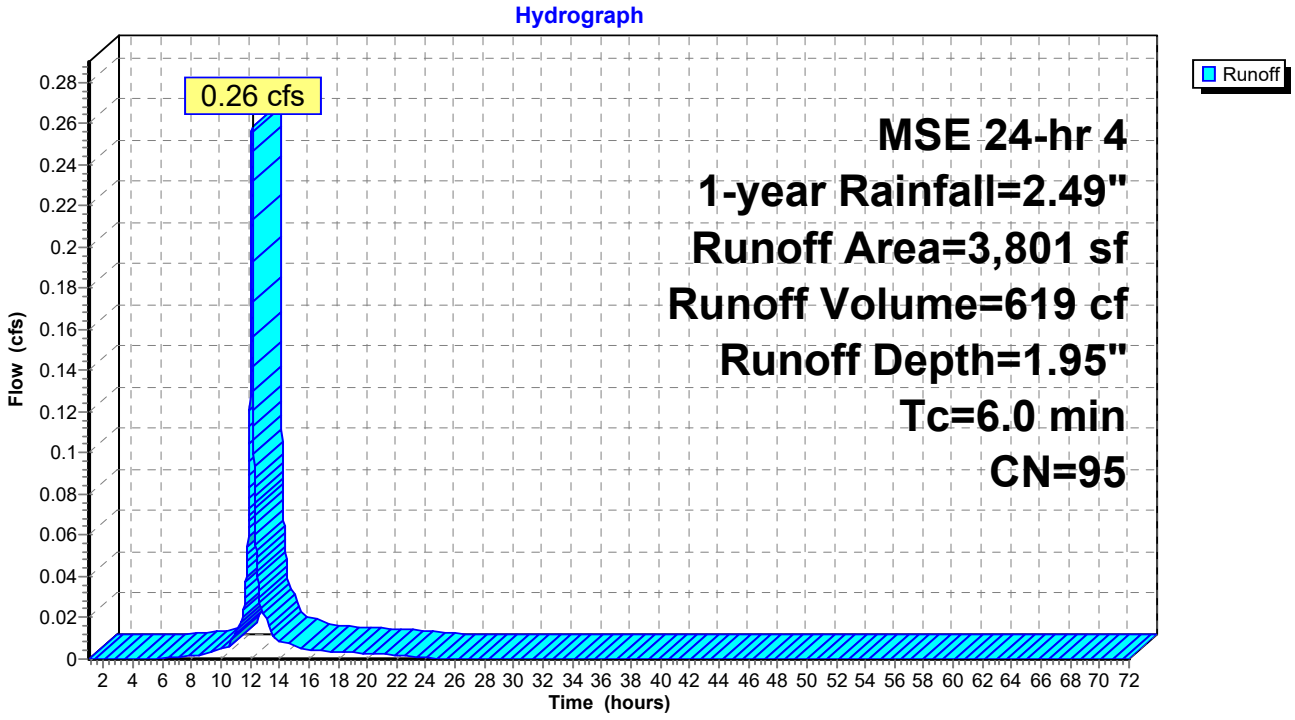
Runoff = 0.26 cfs @ 12.13 hrs, Volume= 619 cf, Depth= 1.95"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	2,979	98	Sidewalk, HSG C
	822	86	<50% Grass cover, Poor, HSG C
	3,801	95	Weighted Average
	822		21.63% Pervious Area
	2,979		78.37% Impervious Area

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

Subcatchment P8: Uncaptured West



Summary for Pond UGD: ACO Storm Brix - HD

Inflow Area = 36,525 sf, 69.01% Impervious, Inflow Depth = 1.51" for 1-year event
Inflow = 2.02 cfs @ 12.13 hrs, Volume= 4,610 cf
Outflow = 1.12 cfs @ 12.21 hrs, Volume= 4,610 cf, Atten= 45%, Lag= 4.8 min
Discarded = 0.09 cfs @ 11.56 hrs, Volume= 3,156 cf
Primary = 1.02 cfs @ 12.21 hrs, Volume= 1,455 cf
Routed to Link TPO : Total Proposed Outfall

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 857.96' @ 12.21 hrs Surf.Area= 1,101 sf Storage= 1,308 cf

Plug-Flow detention time= 61.2 min calculated for 4,610 cf (100% of inflow)
Center-of-Mass det. time= 61.2 min (865.4 - 804.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	855.38'	2,219 cf	**7.95'W x 138.42'L x 6.01'H Field A** 6,614 cf Overall - 1,067 cf Embedded = 5,547 cf x 40.0% Voids
#2A	857.38'	1,014 cf	**ACO StormBrixx HD 1** x 68 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 68 Chambers in 2 Rows
		3,232 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	855.38'	**3.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	857.38'	**12.0" Round Culvert** L= 17.2' Ke= 0.500 Inlet / Outlet Invert= 857.38' / 857.21' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	857.38'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 11.56 hrs HW=855.44' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.02 cfs @ 12.21 hrs HW=857.96' TW=0.00' (Dynamic Tailwater)
↑└**2=Culvert** (Barrel Controls 1.02 cfs @ 3.10 fps)
↑└**3=Orifice/Grate** (Passes 1.02 cfs of 1.06 cfs potential flow)

Pond UGD: ACO Storm Brix - HD - Chamber Wizard Field A

Chamber Model = ACO StormBrixx HD 1 (ACO StormBrixx® HD)
Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf
Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf

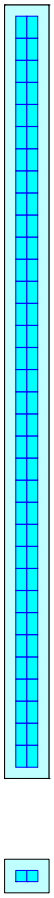
34 Chambers/Row x 3.95' Long = 134.42' Row Length +24.0" End Stone x 2 = 138.42' Base Length
2 Rows x 23.7" Wide + 24.0" Side Stone x 2 = 7.95' Base Width
24.0" Stone Base + 24.1" Chamber Height + 24.0" Stone Cover = 6.01' Field Height

68 Chambers x 14.9 cf = 1,013.6 cf Chamber Storage
68 Chambers x 15.7 cf = 1,067.0 cf Displacement

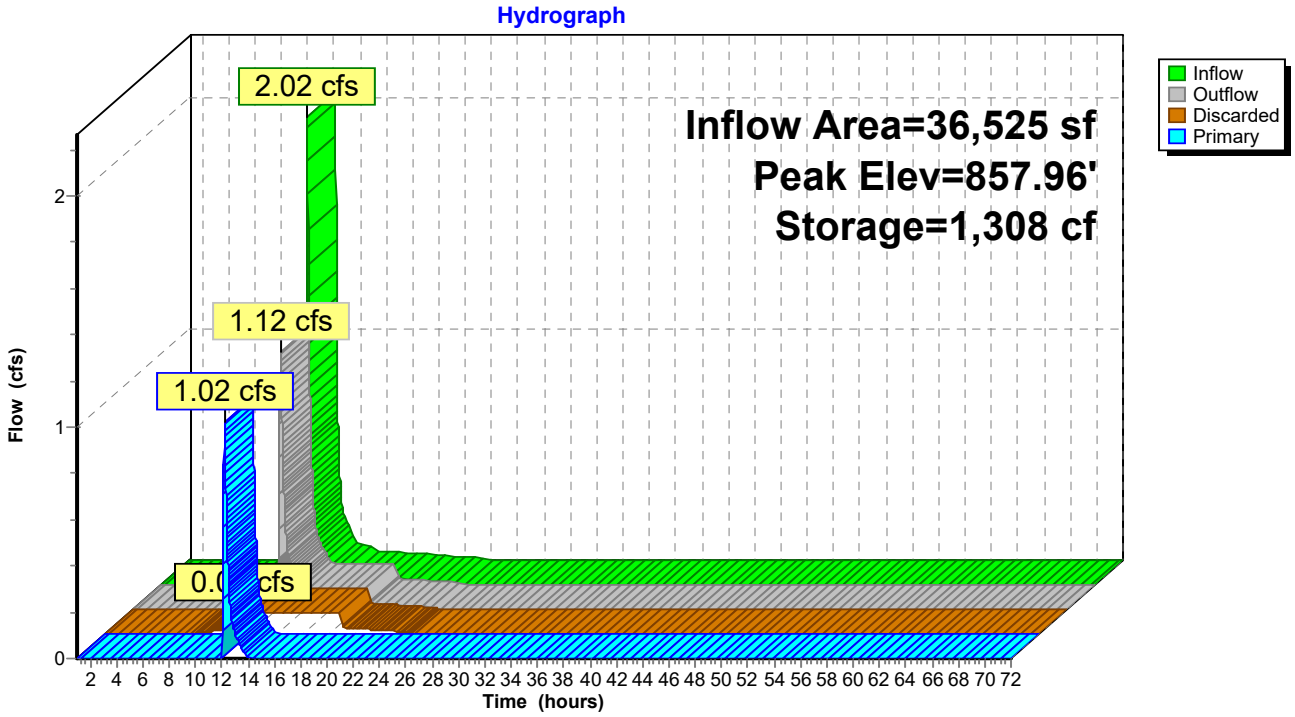
6,613.9 cf Field - 1,067.0 cf Chambers = 5,547.0 cf Stone x 40.0% Voids = 2,218.8 cf Stone Storage

Chamber Storage + Stone Storage = 3,232.4 cf = 0.074 af
Overall Storage Efficiency = 48.9%
Overall System Size = 138.42' x 7.95' x 6.01'

68 Chambers
245.0 cy Field
205.4 cy Stone



Pond UGD: ACO Storm Brix - HD

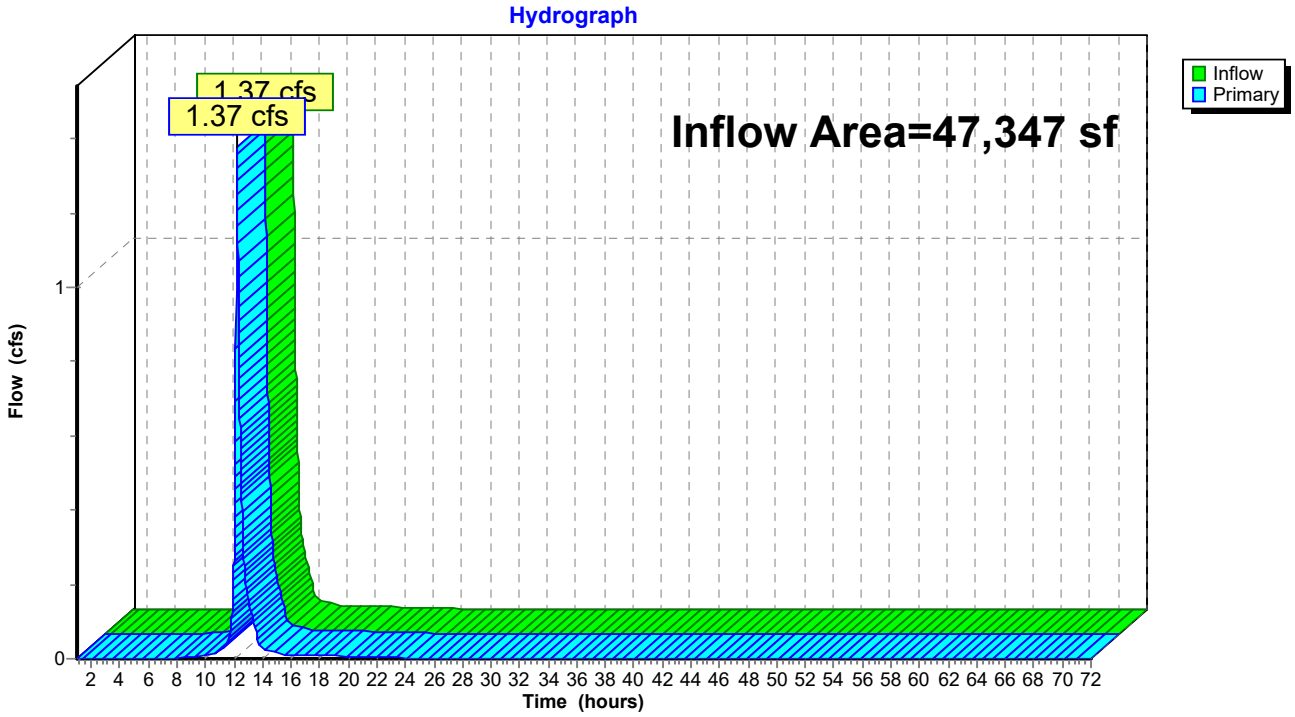


Summary for Link TPO: Total Proposed Outfall

Inflow Area = 47,347 sf, 64.02% Impervious, Inflow Depth = 0.71" for 1-year event
Inflow = 1.37 cfs @ 12.19 hrs, Volume= 2,807 cf
Primary = 1.37 cfs @ 12.19 hrs, Volume= 2,807 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link TPO: Total Proposed Outfall



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment P1: Proposed Building Runoff Area=31,557 sf 75.29% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=91 Runoff=2.20 cfs 5,056 cf

Subcatchment P2: Captured to Underground Runoff Area=1,163 sf 7.39% Impervious Runoff Depth=0.91"
Tc=6.0 min CN=76 Runoff=0.04 cfs 88 cf

Subcatchment P3: Captured to Permeable Runoff Area=3,805 sf 35.72% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=83 Runoff=0.19 cfs 418 cf

Subcatchment P4: Captured to Permeable Runoff Area=3,381 sf 7.75% Impervious Runoff Depth=1.13"
Tc=6.0 min CN=80 Runoff=0.14 cfs 319 cf

Subcatchment P5: Captured to Permeable Runoff Area=2,002 sf 47.85% Impervious Runoff Depth=1.76"
Tc=6.0 min CN=89 Runoff=0.13 cfs 293 cf

Subcatchment P6: Uncaptured East Runoff Area=945 sf 22.65% Impervious Runoff Depth=1.76"
Tc=6.0 min CN=89 Runoff=0.06 cfs 138 cf

Subcatchment P7: Uncaptured South Runoff Area=693 sf 100.00% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=98 Runoff=0.06 cfs 151 cf

Subcatchment P8: Uncaptured West Runoff Area=3,801 sf 78.37% Impervious Runoff Depth=2.29"
Tc=6.0 min CN=95 Runoff=0.30 cfs 726 cf

Pond UGD: ACO Storm Brix - HD Peak Elev=858.15' Storage=1,445 cf Inflow=2.42 cfs 5,562 cf
Discarded=0.09 cfs 3,446 cf Primary=1.57 cfs 2,117 cf Outflow=1.67 cfs 5,562 cf

Link TPO: Total Proposed Outfall Inflow=2.11 cfs 3,744 cf
Primary=2.11 cfs 3,744 cf

Total Runoff Area = 47,347 sf Runoff Volume = 7,189 cf Average Runoff Depth = 1.82"
35.98% Pervious = 17,036 sf 64.02% Impervious = 30,311 sf

Summary for Subcatchment P1: Proposed Building

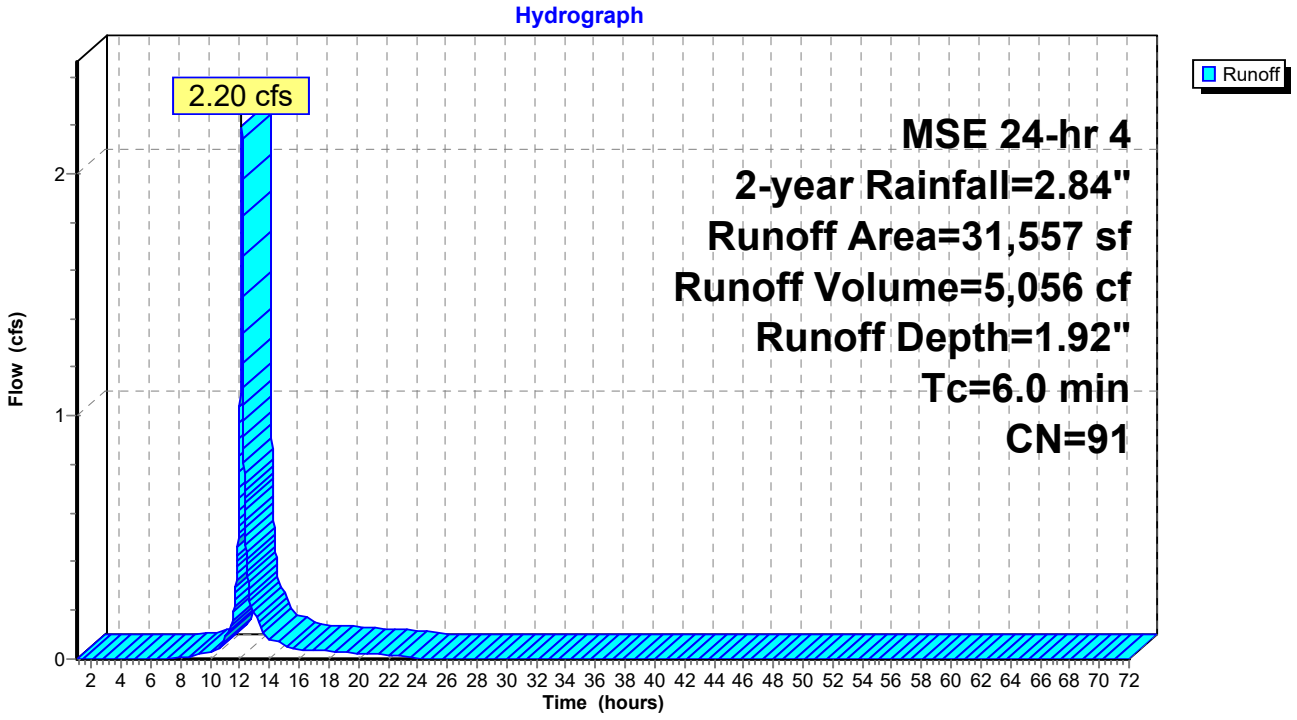
Runoff = 2.20 cfs @ 12.13 hrs, Volume= 5,056 cf, Depth= 1.92"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	23,760	98	Roofs, HSG C
*	7,797	68	Intensive Green Roof
	31,557	91	Weighted Average
	7,797		24.71% Pervious Area
	23,760		75.29% Impervious Area

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

Subcatchment P1: Proposed Building



Summary for Subcatchment P2: Captured to Underground Detention

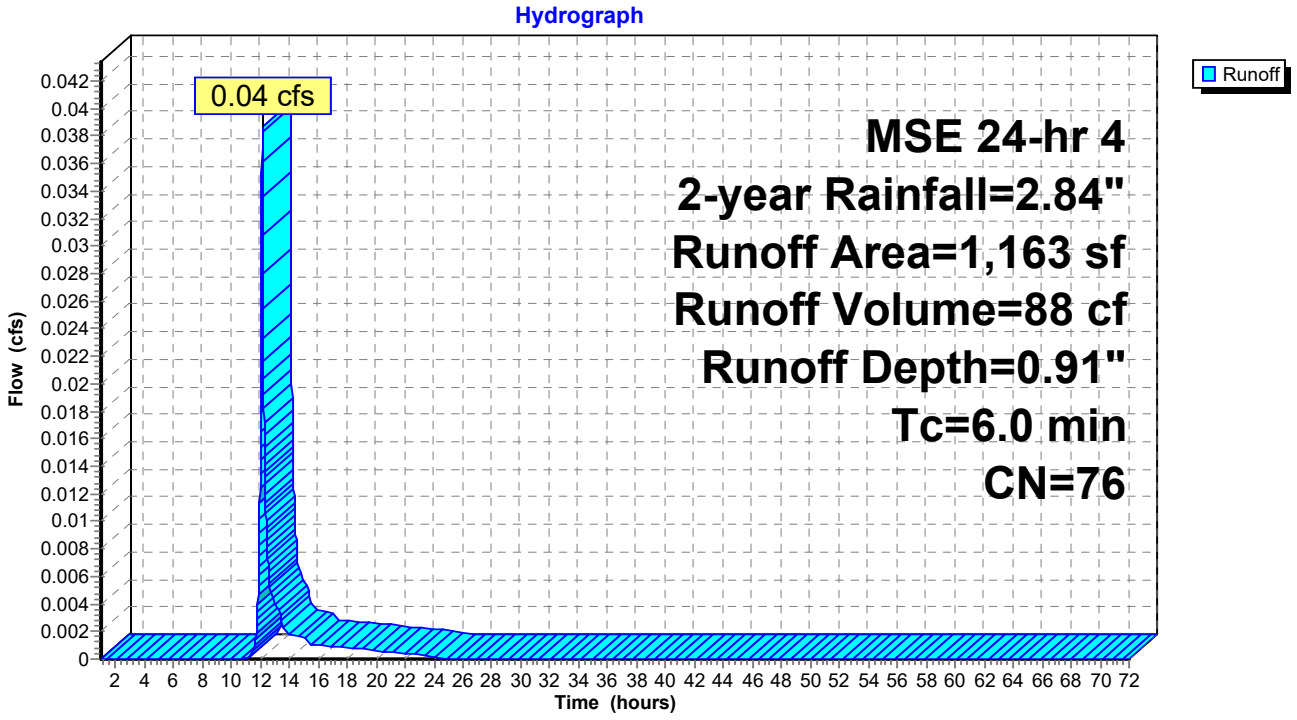
Runoff = 0.04 cfs @ 12.14 hrs, Volume= 88 cf, Depth= 0.91"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	86	98	Sidewalk, HSG C
	1,077	74	>75% Grass cover, Good, HSG C
	1,163	76	Weighted Average
	1,077		92.61% Pervious Area
	86		7.39% Impervious Area

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

Subcatchment P2: Captured to Underground Detention



Summary for Subcatchment P3: Captured to Permeable Pavers South

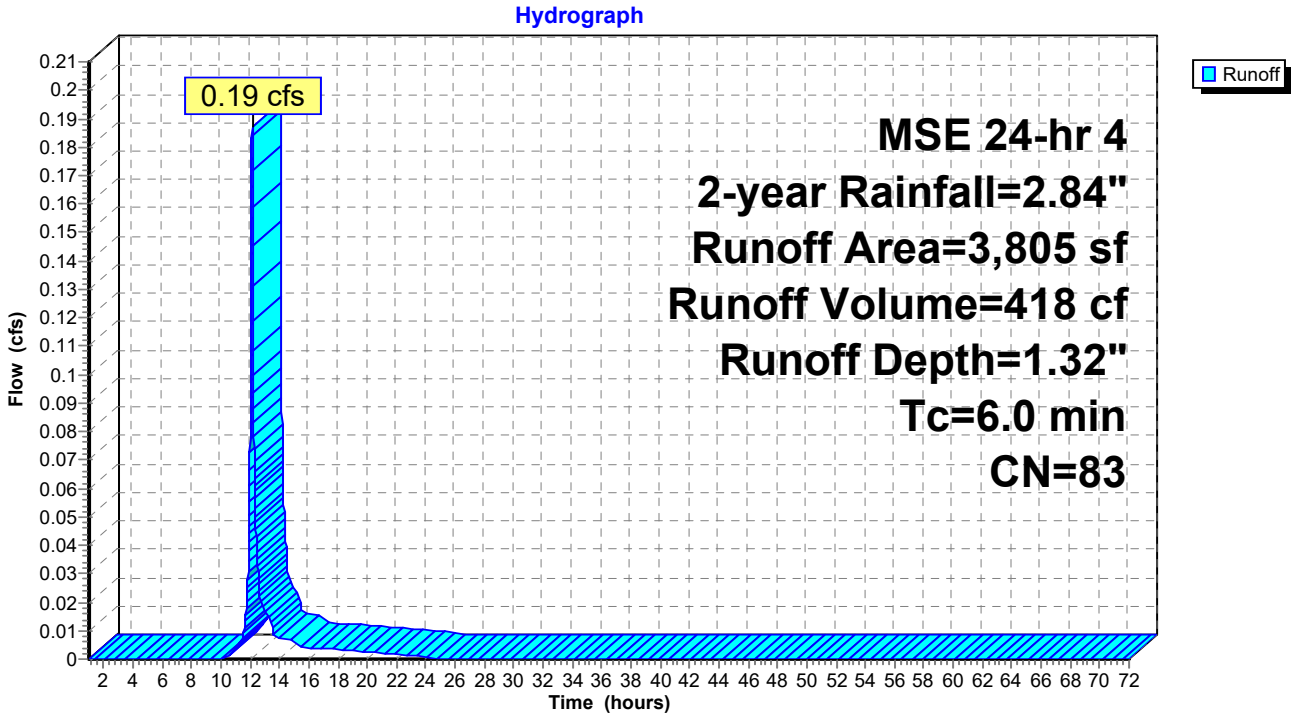
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 418 cf, Depth= 1.32"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
	992	98	Paved parking, HSG C
*	367	98	Sidewalk, HSG C
*	2,194	74	Permeable Pavers, HSG C
	252	86	<50% Grass cover, Poor, HSG C
	3,805	83	Weighted Average
	2,446		64.28% Pervious Area
	1,359		35.72% Impervious Area

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

Subcatchment P3: Captured to Permeable Pavers South



Summary for Subcatchment P4: Captured to Permeable Pavers Northwest

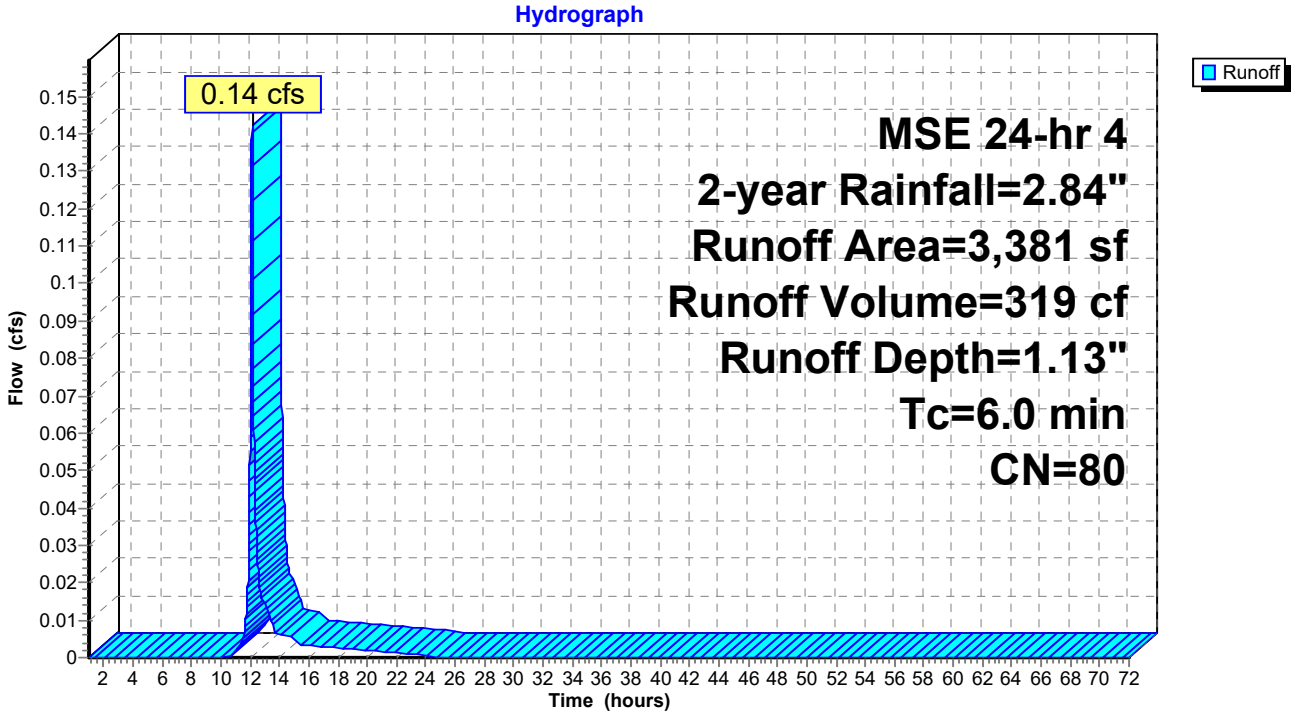
Runoff = 0.14 cfs @ 12.14 hrs, Volume= 319 cf, Depth= 1.13"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	262	98	Sidewalk, HSG C
*	1,973	74	Permeable Pavers, HSG C
	1,146	86	<50% Grass cover, Poor, HSG C
	3,381	80	Weighted Average
	3,119		92.25% Pervious Area
	262		7.75% Impervious Area

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

Subcatchment P4: Captured to Permeable Pavers Northwest



Summary for Subcatchment P5: Captured to Permeable Paver Northeast

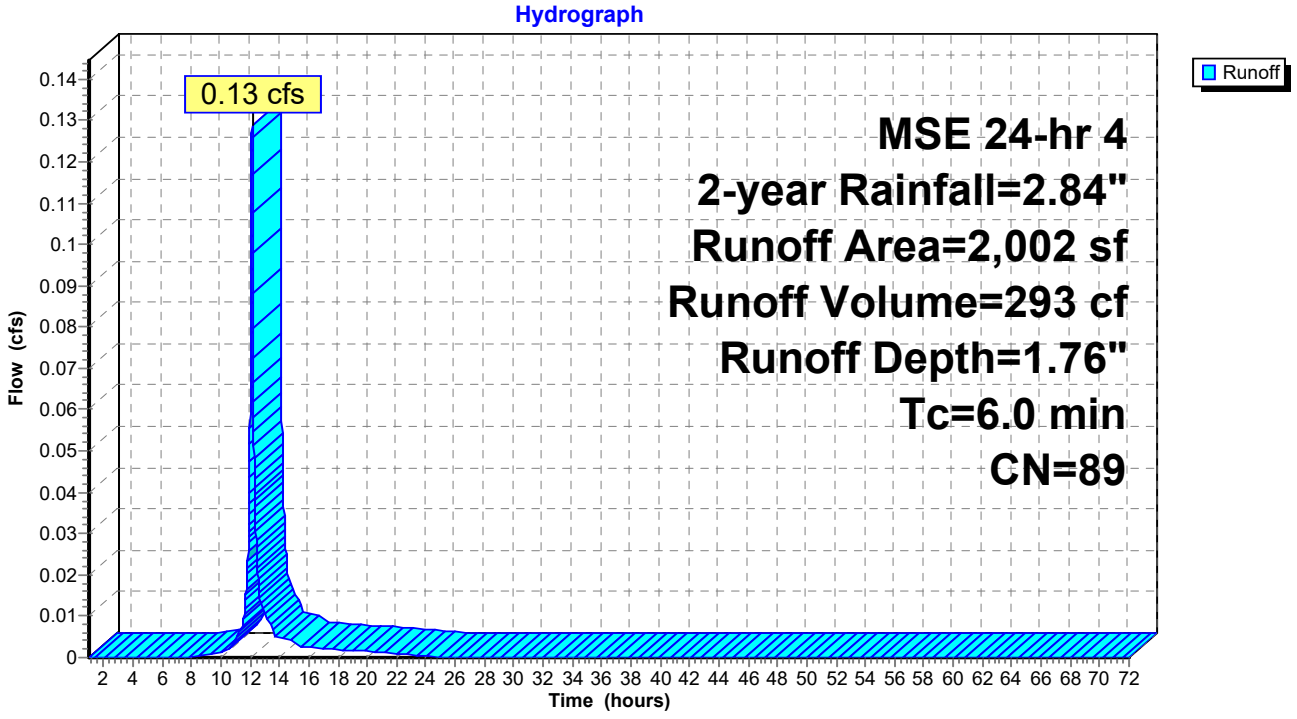
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 293 cf, Depth= 1.76"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	958	98	Sidewalk, HSG C
*	521	74	Permeable Pavers, HSG C
	523	86	<50% Grass cover, Poor, HSG C
	2,002	89	Weighted Average
	1,044		52.15% Pervious Area
	958		47.85% Impervious Area

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

Subcatchment P5: Captured to Permeable Paver Northeast



Summary for Subcatchment P6: Uncaptured East

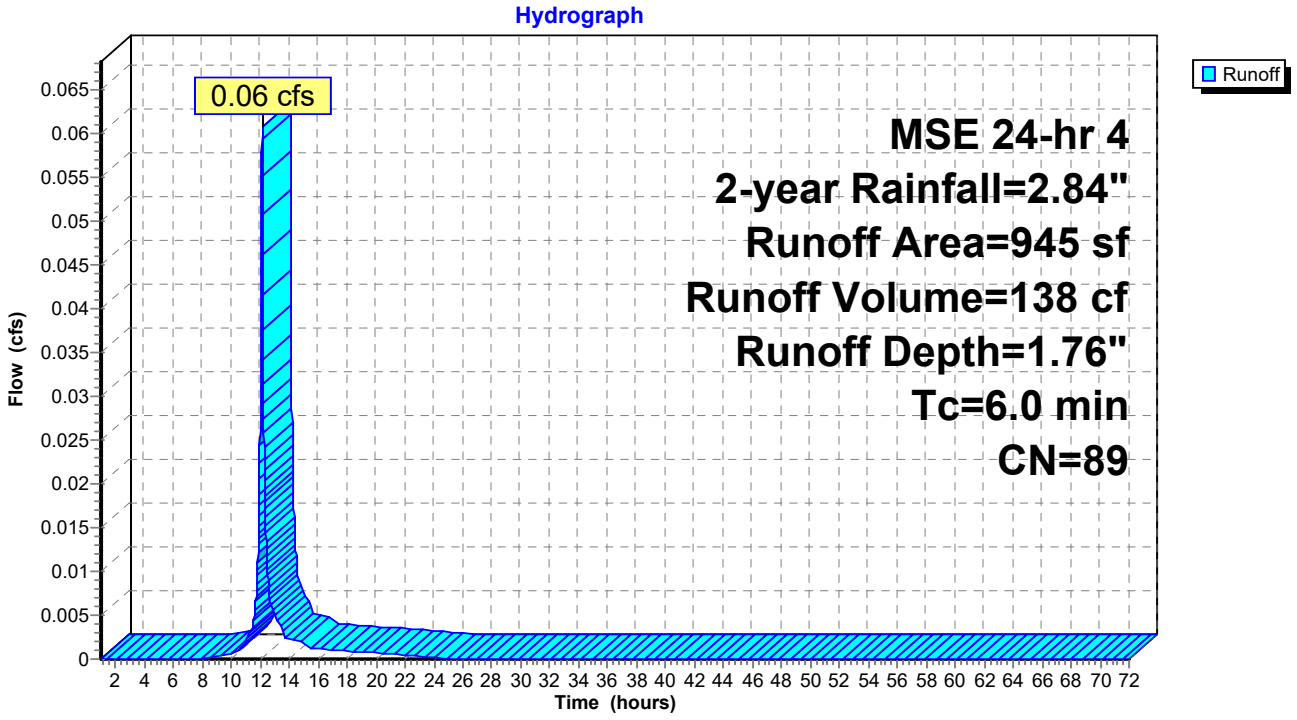
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 138 cf, Depth= 1.76"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	214	98	Sidewalk, HSG C
	731	86	<50% Grass cover, Poor, HSG C
	945	89	Weighted Average
	731		77.35% Pervious Area
	214		22.65% Impervious Area

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

Subcatchment P6: Uncaptured East



Summary for Subcatchment P7: Uncaptured South

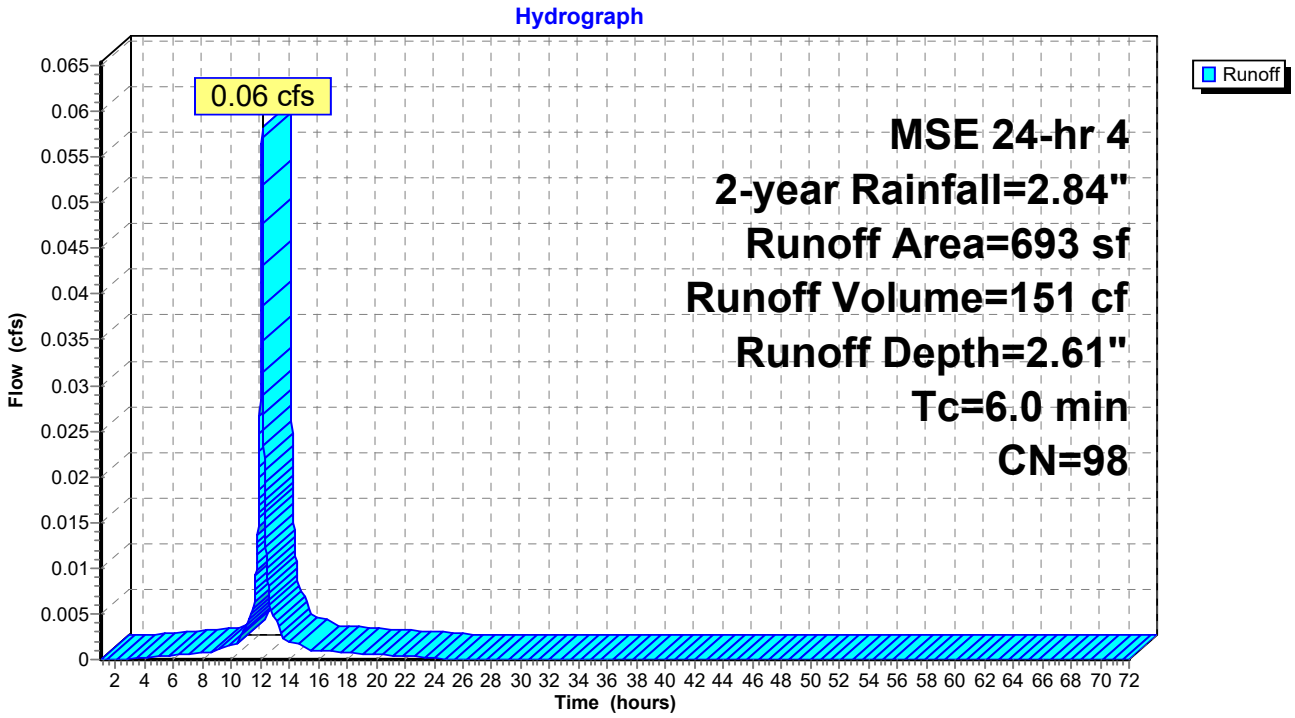
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 151 cf, Depth= 2.61"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
	635	98	Paved parking, HSG C
*	58	98	Sidewalk, HSG C
	693	98	Weighted Average
	693		100.00% Impervious Area

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

Subcatchment P7: Uncaptured South



Summary for Subcatchment P8: Uncaptured West

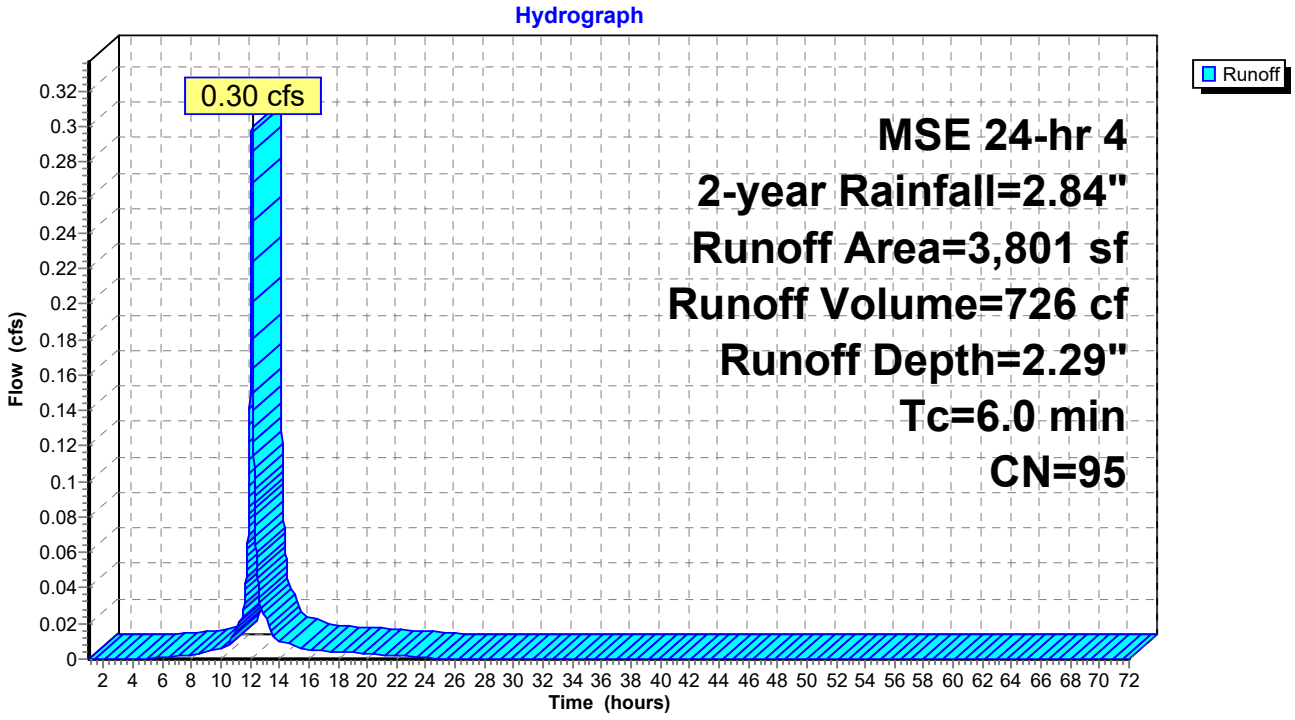
Runoff = 0.30 cfs @ 12.13 hrs, Volume= 726 cf, Depth= 2.29"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	2,979	98	Sidewalk, HSG C
	822	86	<50% Grass cover, Poor, HSG C
	3,801	95	Weighted Average
	822		21.63% Pervious Area
	2,979		78.37% Impervious Area

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

Subcatchment P8: Uncaptured West



Summary for Pond UGD: ACO Storm Brix - HD

Inflow Area = 36,525 sf, 69.01% Impervious, Inflow Depth = 1.83" for 2-year event
Inflow = 2.42 cfs @ 12.13 hrs, Volume= 5,562 cf
Outflow = 1.67 cfs @ 12.19 hrs, Volume= 5,562 cf, Atten= 31%, Lag= 3.5 min
Discarded = 0.09 cfs @ 11.34 hrs, Volume= 3,446 cf
Primary = 1.57 cfs @ 12.19 hrs, Volume= 2,117 cf
Routed to Link TPO : Total Proposed Outfall

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 858.15' @ 12.19 hrs Surf.Area= 1,101 sf Storage= 1,445 cf

Plug-Flow detention time= 57.3 min calculated for 5,561 cf (100% of inflow)
Center-of-Mass det. time= 57.3 min (857.2 - 799.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	855.38'	2,219 cf	**7.95'W x 138.42'L x 6.01'H Field A** 6,614 cf Overall - 1,067 cf Embedded = 5,547 cf x 40.0% Voids
#2A	857.38'	1,014 cf	**ACO StormBrixx HD 1** x 68 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 68 Chambers in 2 Rows
		3,232 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	855.38'	**3.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	857.38'	**12.0" Round Culvert** L= 17.2' Ke= 0.500 Inlet / Outlet Invert= 857.38' / 857.21' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	857.38'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 11.34 hrs HW=855.44' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.57 cfs @ 12.19 hrs HW=858.15' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 1.57 cfs of 1.61 cfs potential flow)
↑**3=Orifice/Grate** (Orifice Controls 1.57 cfs @ 2.99 fps)

Pond UGD: ACO Storm Brix - HD - Chamber Wizard Field A

Chamber Model = ACO StormBrixx HD 1 (ACO StormBrixx® HD)
Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf
Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf

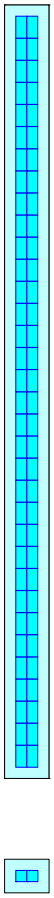
34 Chambers/Row x 3.95' Long = 134.42' Row Length +24.0" End Stone x 2 = 138.42' Base Length
2 Rows x 23.7" Wide + 24.0" Side Stone x 2 = 7.95' Base Width
24.0" Stone Base + 24.1" Chamber Height + 24.0" Stone Cover = 6.01' Field Height

68 Chambers x 14.9 cf = 1,013.6 cf Chamber Storage
68 Chambers x 15.7 cf = 1,067.0 cf Displacement

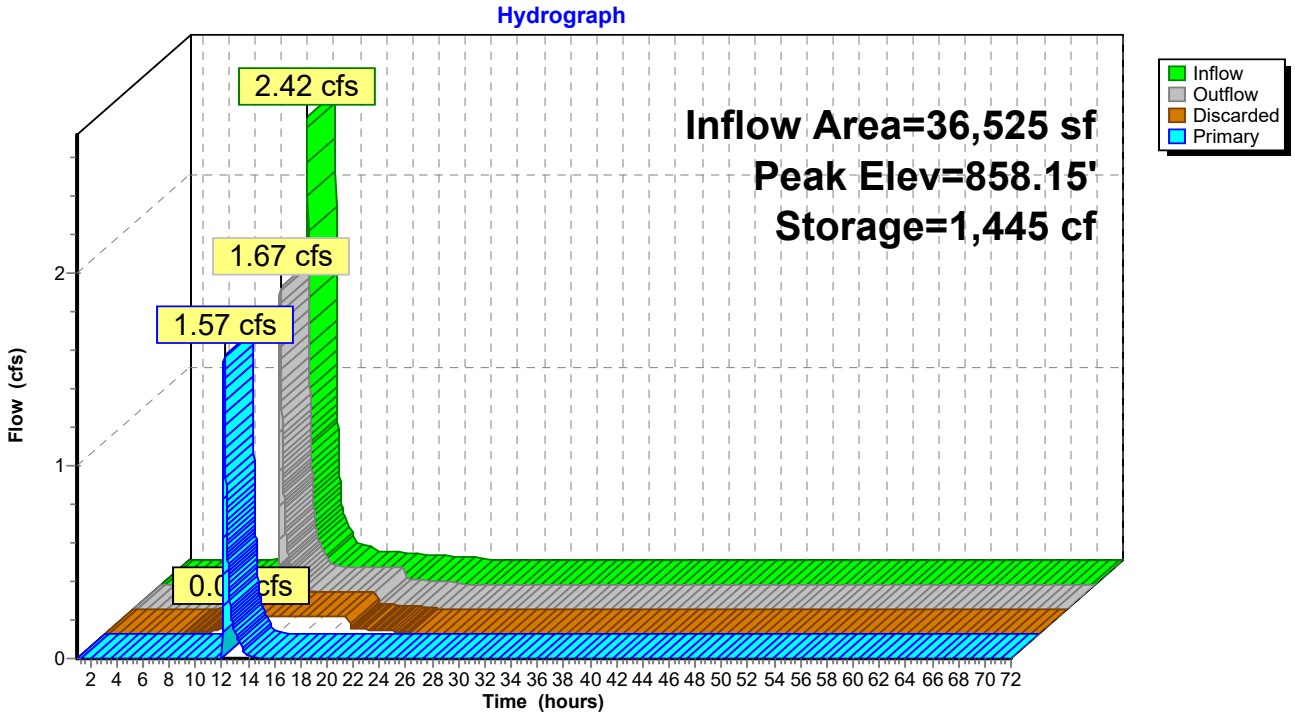
6,613.9 cf Field - 1,067.0 cf Chambers = 5,547.0 cf Stone x 40.0% Voids = 2,218.8 cf Stone Storage

Chamber Storage + Stone Storage = 3,232.4 cf = 0.074 af
Overall Storage Efficiency = 48.9%
Overall System Size = 138.42' x 7.95' x 6.01'

68 Chambers
245.0 cy Field
205.4 cy Stone



Pond UGD: ACO Storm Brix - HD

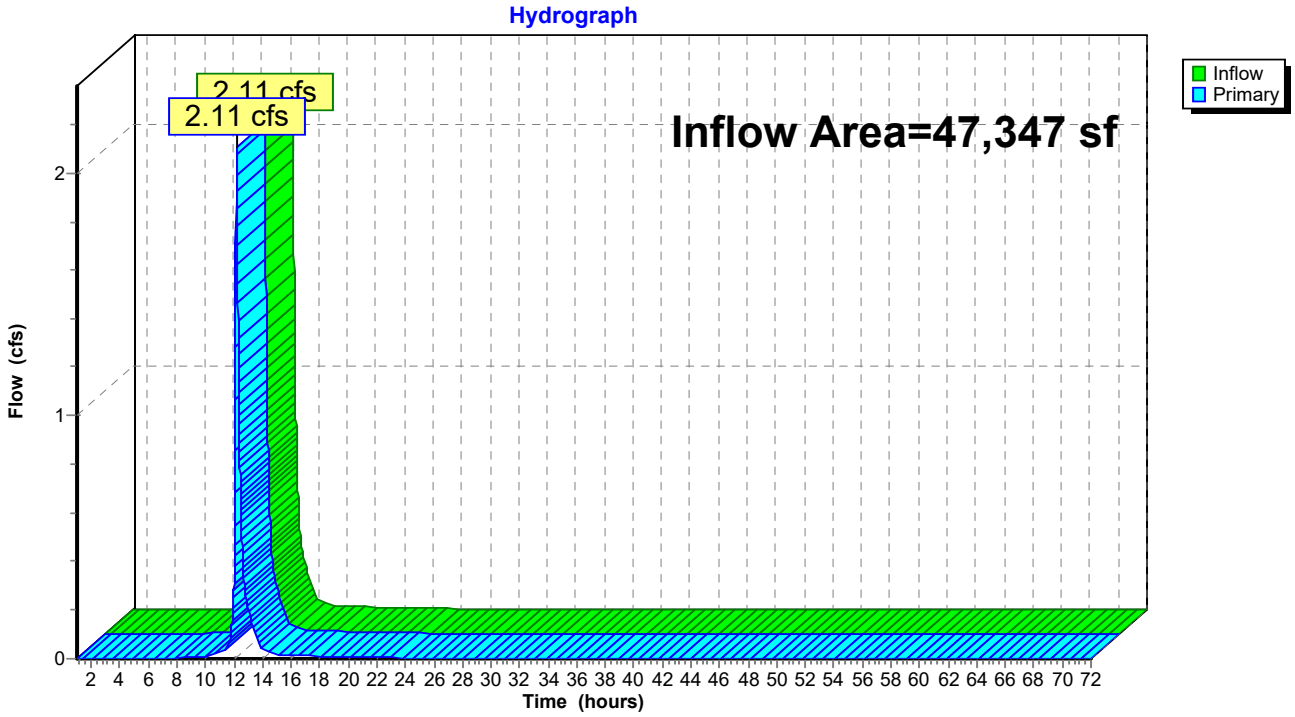


Summary for Link TPO: Total Proposed Outfall

Inflow Area = 47,347 sf, 64.02% Impervious, Inflow Depth = 0.95" for 2-year event
Inflow = 2.11 cfs @ 12.17 hrs, Volume= 3,744 cf
Primary = 2.11 cfs @ 12.17 hrs, Volume= 3,744 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link TPO: Total Proposed Outfall



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment P1: Proposed Building Runoff Area=31,557 sf 75.29% Impervious Runoff Depth=2.49"
Tc=6.0 min CN=91 Runoff=2.81 cfs 6,558 cf

Subcatchment P2: Captured to Underground Runoff Area=1,163 sf 7.39% Impervious Runoff Depth=1.33"
Tc=6.0 min CN=76 Runoff=0.06 cfs 129 cf

Subcatchment P3: Captured to Permeable Runoff Area=3,805 sf 35.72% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=83 Runoff=0.26 cfs 576 cf

Subcatchment P4: Captured to Permeable Runoff Area=3,381 sf 7.75% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=80 Runoff=0.20 cfs 450 cf

Subcatchment P5: Captured to Permeable Runoff Area=2,002 sf 47.85% Impervious Runoff Depth=2.31"
Tc=6.0 min CN=89 Runoff=0.17 cfs 386 cf

Subcatchment P6: Uncaptured East Runoff Area=945 sf 22.65% Impervious Runoff Depth=2.31"
Tc=6.0 min CN=89 Runoff=0.08 cfs 182 cf

Subcatchment P7: Uncaptured South Runoff Area=693 sf 100.00% Impervious Runoff Depth=3.22"
Tc=6.0 min CN=98 Runoff=0.07 cfs 186 cf

Subcatchment P8: Uncaptured West Runoff Area=3,801 sf 78.37% Impervious Runoff Depth=2.89"
Tc=6.0 min CN=95 Runoff=0.37 cfs 915 cf

Pond UGD: ACO Storm Brix - HD Peak Elev=858.48' Storage=1,689 cf Inflow=3.12 cfs 7,263 cf
Discarded=0.09 cfs 3,895 cf Primary=2.18 cfs 3,368 cf Outflow=2.27 cfs 7,263 cf

Link TPO: Total Proposed Outfall Inflow=2.93 cfs 5,487 cf
Primary=2.93 cfs 5,487 cf

Total Runoff Area = 47,347 sf Runoff Volume = 9,382 cf Average Runoff Depth = 2.38"
35.98% Pervious = 17,036 sf 64.02% Impervious = 30,311 sf

Summary for Subcatchment P1: Proposed Building

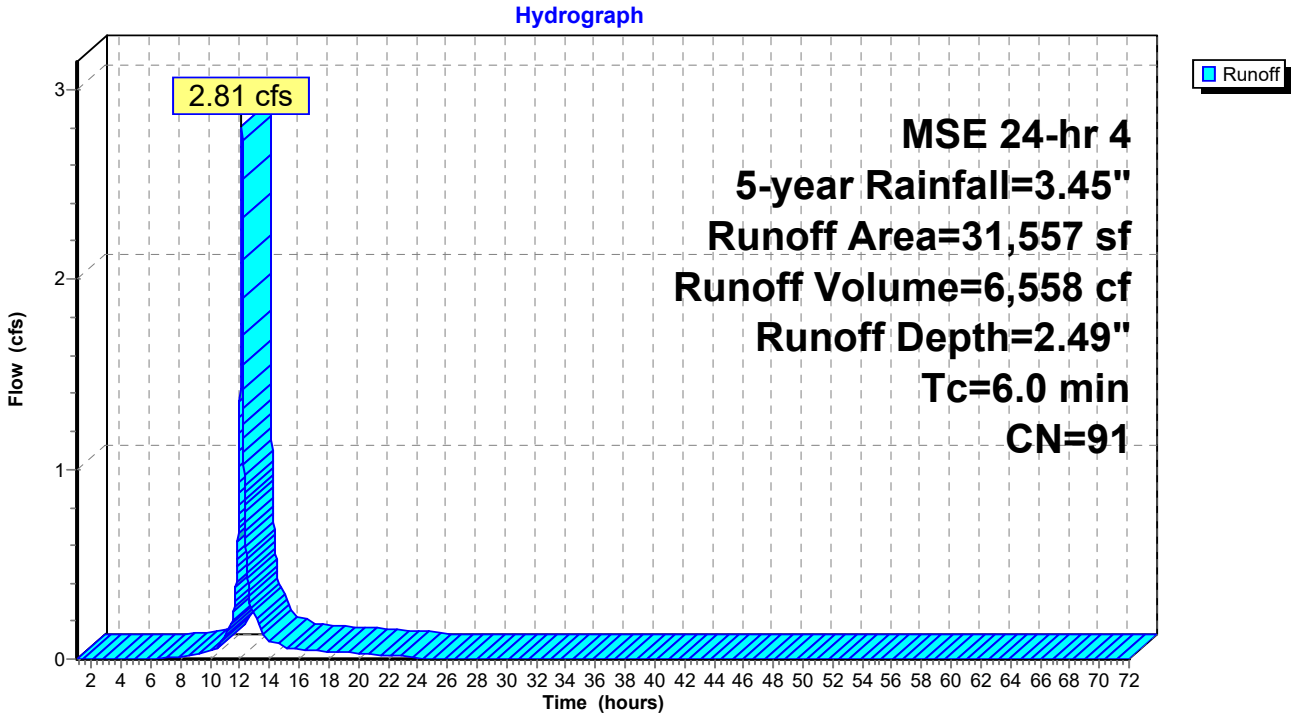
Runoff = 2.81 cfs @ 12.13 hrs, Volume= 6,558 cf, Depth= 2.49"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	23,760	98	Roofs, HSG C
*	7,797	68	Intensive Green Roof
	31,557	91	Weighted Average
	7,797		24.71% Pervious Area
	23,760		75.29% Impervious Area

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

Subcatchment P1: Proposed Building



Summary for Subcatchment P2: Captured to Underground Detention

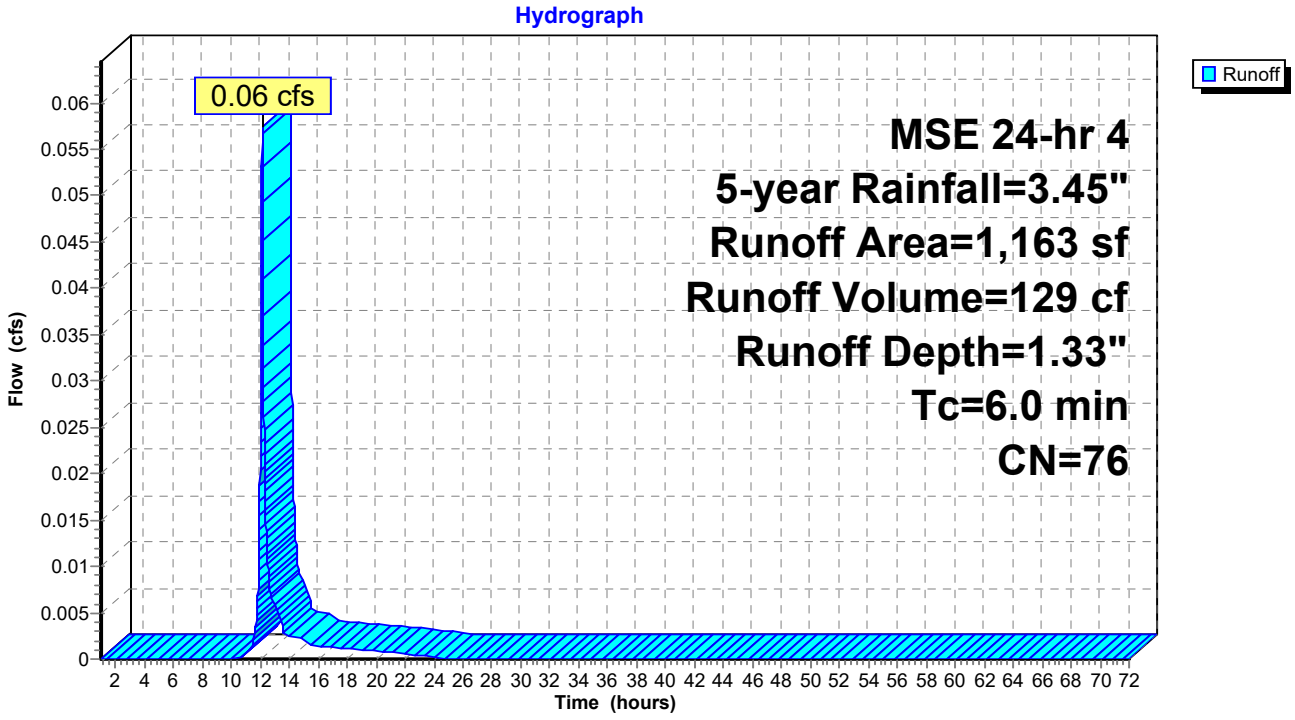
Runoff = 0.06 cfs @ 12.14 hrs, Volume= 129 cf, Depth= 1.33"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	86	98	Sidewalk, HSG C
	1,077	74	>75% Grass cover, Good, HSG C
	1,163	76	Weighted Average
	1,077		92.61% Pervious Area
	86		7.39% Impervious Area

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

Subcatchment P2: Captured to Underground Detention



Summary for Subcatchment P3: Captured to Permeable Pavers South

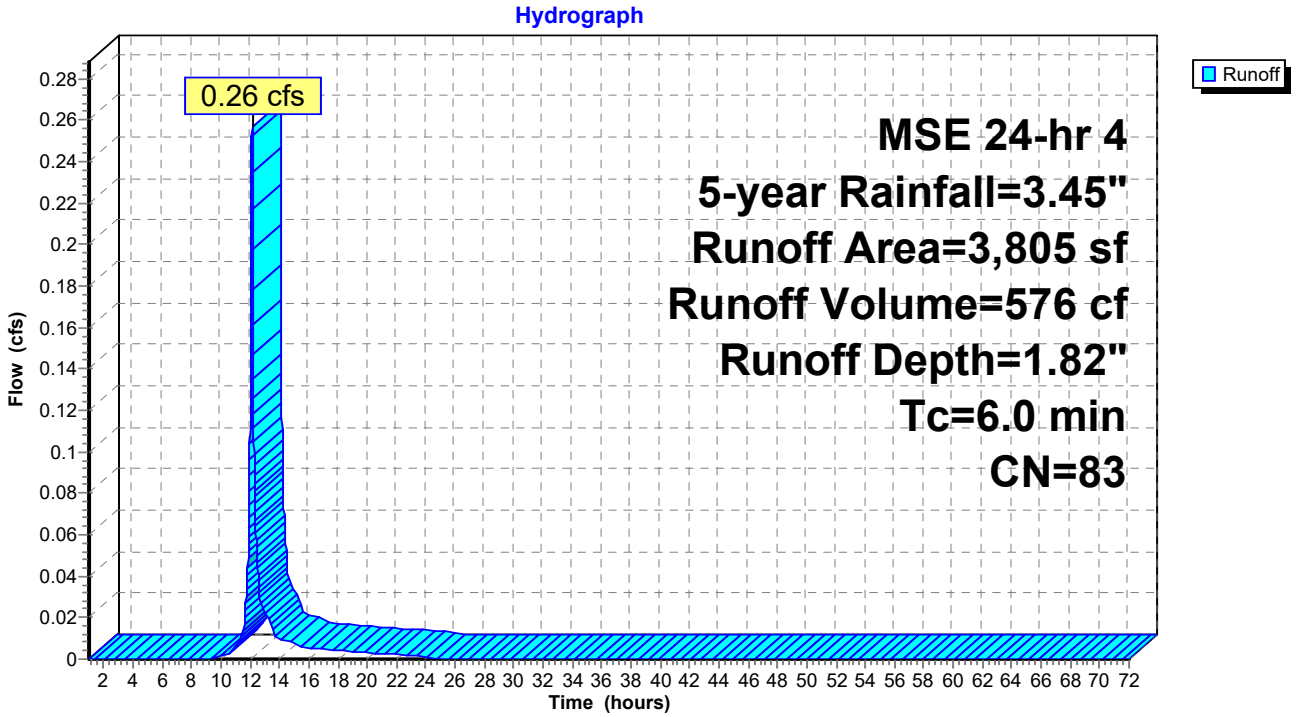
Runoff = 0.26 cfs @ 12.13 hrs, Volume= 576 cf, Depth= 1.82"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
	992	98	Paved parking, HSG C
*	367	98	Sidewalk, HSG C
*	2,194	74	Permeable Pavers, HSG C
	252	86	<50% Grass cover, Poor, HSG C
	3,805	83	Weighted Average
	2,446		64.28% Pervious Area
	1,359		35.72% Impervious Area

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

Subcatchment P3: Captured to Permeable Pavers South



Summary for Subcatchment P4: Captured to Permeable Pavers Northwest

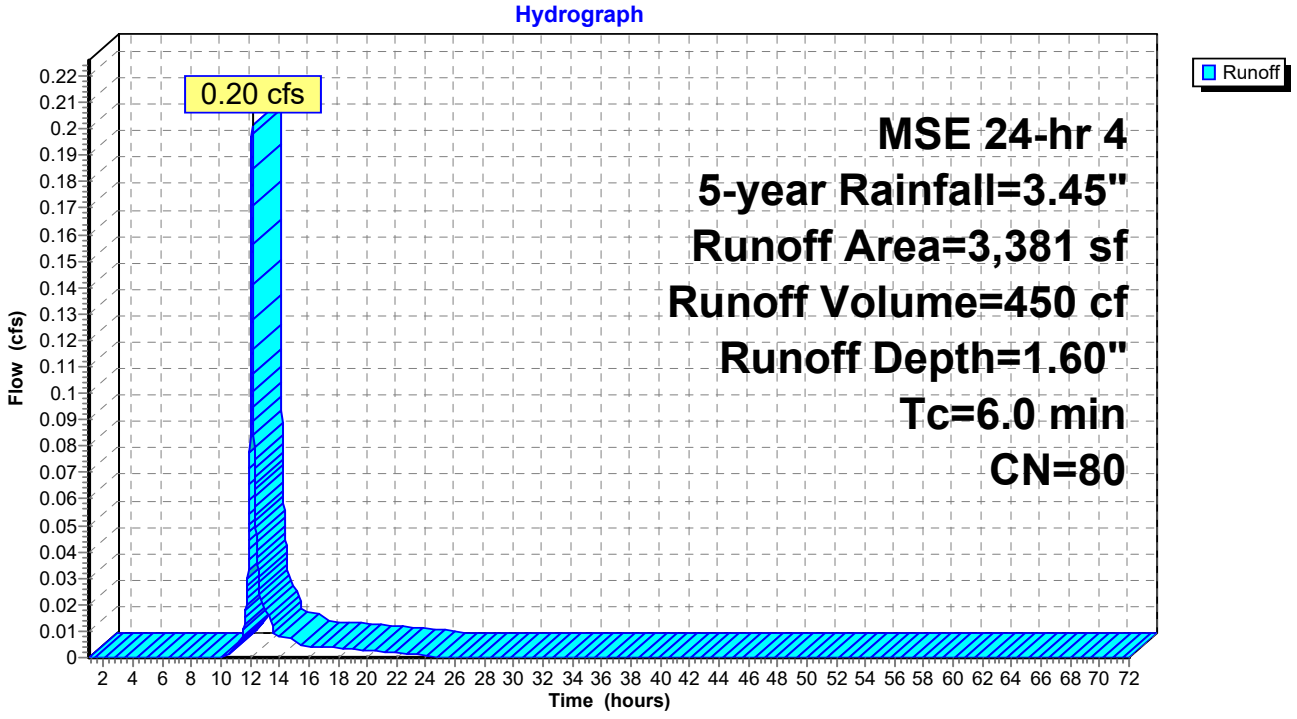
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 450 cf, Depth= 1.60"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	262	98	Sidewalk, HSG C
*	1,973	74	Permeable Pavers, HSG C
	1,146	86	<50% Grass cover, Poor, HSG C
	3,381	80	Weighted Average
	3,119		92.25% Pervious Area
	262		7.75% Impervious Area

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

Subcatchment P4: Captured to Permeable Pavers Northwest



Summary for Subcatchment P5: Captured to Permeable Paver Northeast

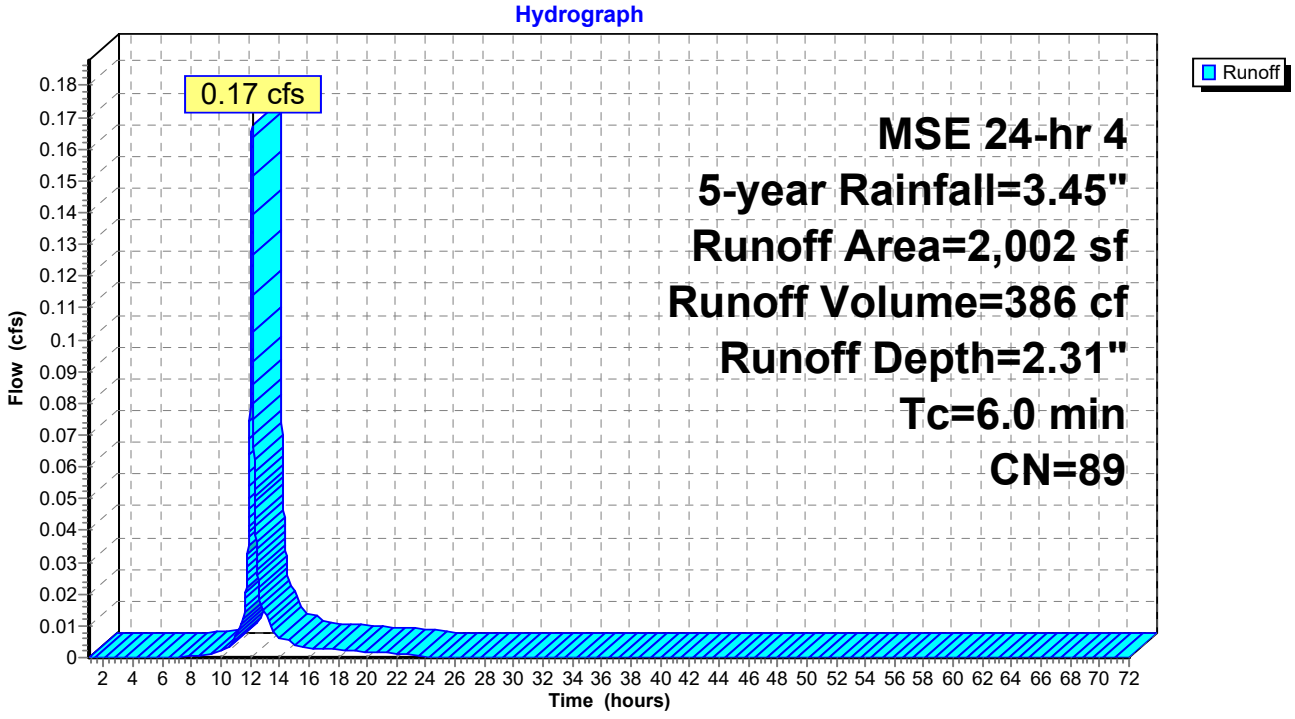
Runoff = 0.17 cfs @ 12.13 hrs, Volume= 386 cf, Depth= 2.31"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	958	98	Sidewalk, HSG C
*	521	74	Permeable Pavers, HSG C
	523	86	<50% Grass cover, Poor, HSG C
	2,002	89	Weighted Average
	1,044		52.15% Pervious Area
	958		47.85% Impervious Area

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

Subcatchment P5: Captured to Permeable Paver Northeast



Summary for Subcatchment P6: Uncaptured East

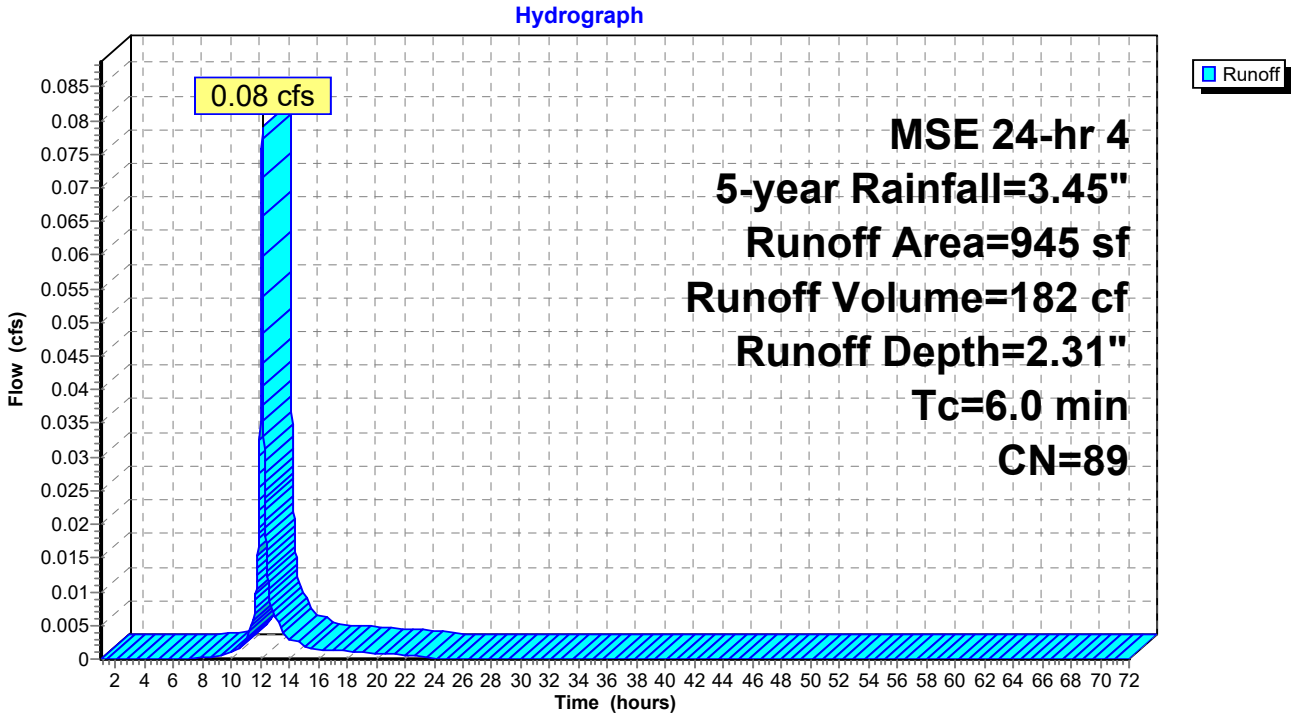
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 182 cf, Depth= 2.31"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	214	98	Sidewalk, HSG C
	731	86	<50% Grass cover, Poor, HSG C
	945	89	Weighted Average
	731		77.35% Pervious Area
	214		22.65% Impervious Area

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

Subcatchment P6: Uncaptured East



Summary for Subcatchment P7: Uncaptured South

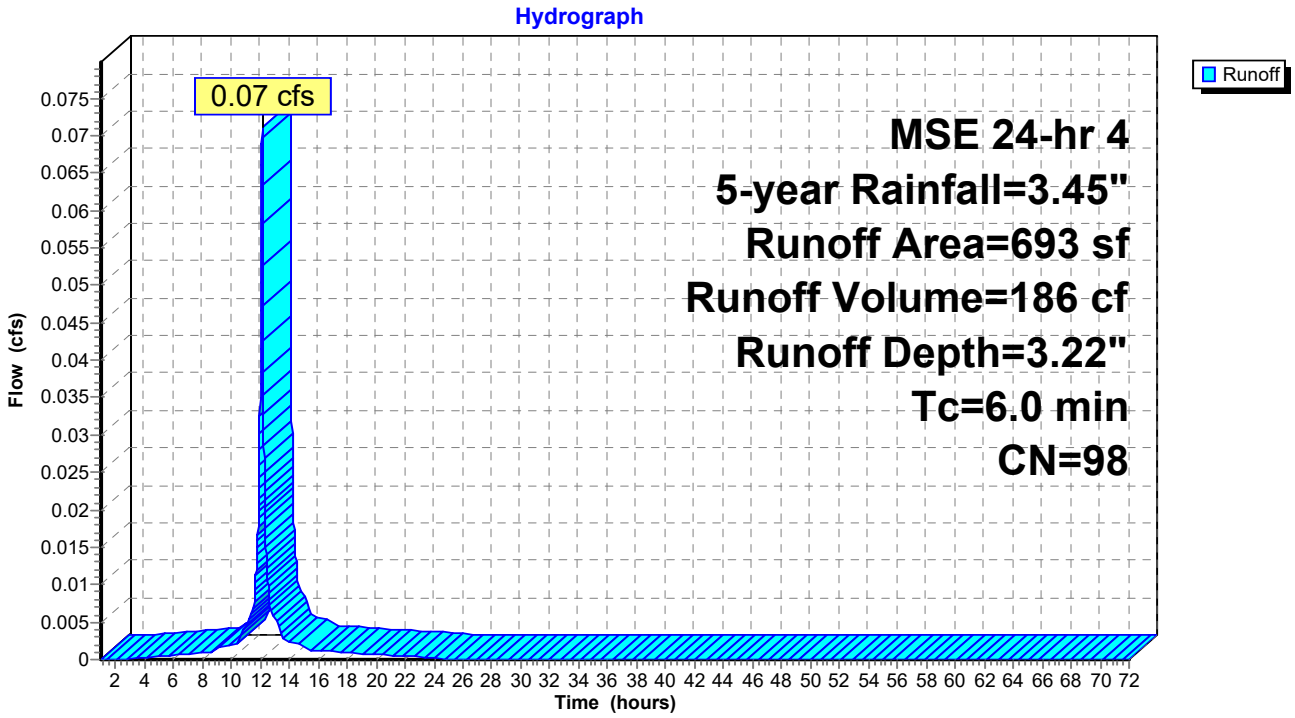
Runoff = 0.07 cfs @ 12.13 hrs, Volume= 186 cf, Depth= 3.22"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
	635	98	Paved parking, HSG C
*	58	98	Sidewalk, HSG C
	693	98	Weighted Average
	693		100.00% Impervious Area

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

Subcatchment P7: Uncaptured South



Summary for Subcatchment P8: Uncaptured West

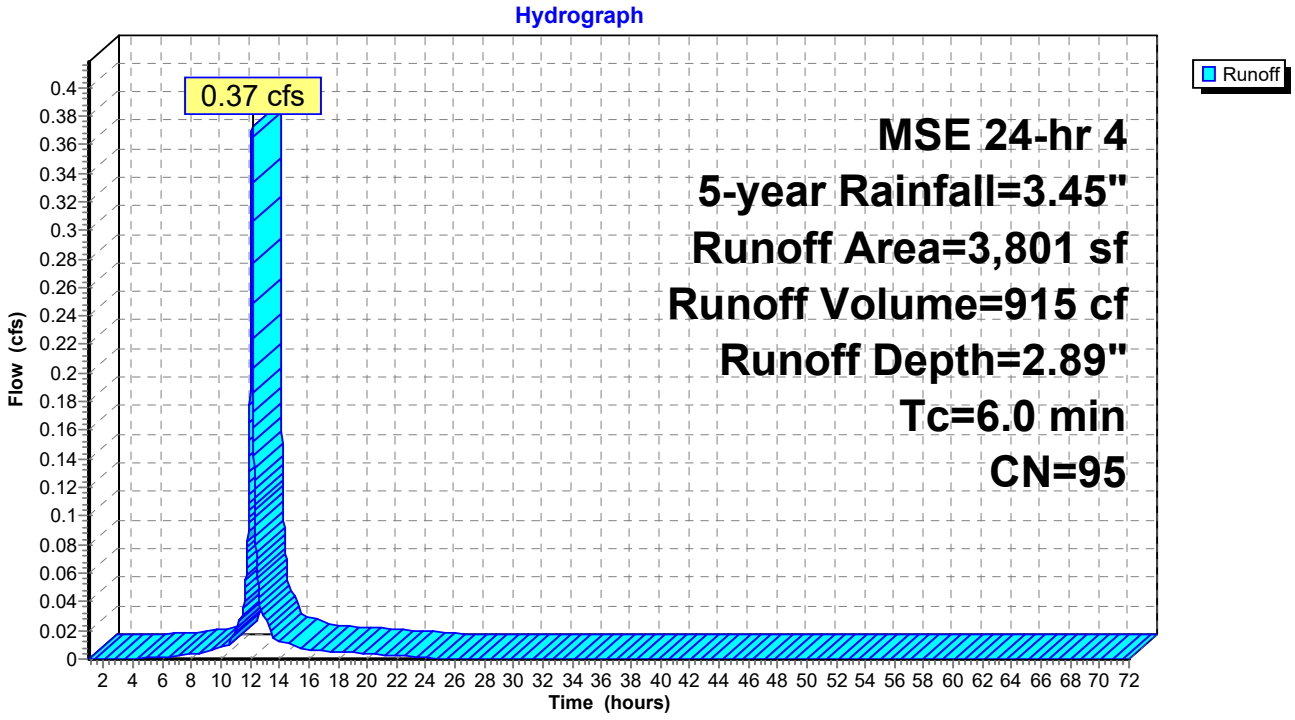
Runoff = 0.37 cfs @ 12.13 hrs, Volume= 915 cf, Depth= 2.89"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	2,979	98	Sidewalk, HSG C
	822	86	<50% Grass cover, Poor, HSG C
	3,801	95	Weighted Average
	822		21.63% Pervious Area
	2,979		78.37% Impervious Area

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

Subcatchment P8: Uncaptured West



Summary for Pond UGD: ACO Storm Brix - HD

Inflow Area = 36,525 sf, 69.01% Impervious, Inflow Depth = 2.39" for 5-year event
Inflow = 3.12 cfs @ 12.13 hrs, Volume= 7,263 cf
Outflow = 2.27 cfs @ 12.18 hrs, Volume= 7,263 cf, Atten= 27%, Lag= 3.2 min
Discarded = 0.09 cfs @ 11.03 hrs, Volume= 3,895 cf
Primary = 2.18 cfs @ 12.18 hrs, Volume= 3,368 cf
Routed to Link TPO : Total Proposed Outfall

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 858.48' @ 12.18 hrs Surf.Area= 1,101 sf Storage= 1,689 cf

Plug-Flow detention time= 52.4 min calculated for 7,262 cf (100% of inflow)
Center-of-Mass det. time= 52.4 min (846.2 - 793.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	855.38'	2,219 cf	**7.95'W x 138.42'L x 6.01'H Field A** 6,614 cf Overall - 1,067 cf Embedded = 5,547 cf x 40.0% Voids
#2A	857.38'	1,014 cf	**ACO StormBrixx HD 1** x 68 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 68 Chambers in 2 Rows
		3,232 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	855.38'	**3.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	857.38'	**12.0" Round Culvert** L= 17.2' Ke= 0.500 Inlet / Outlet Invert= 857.38' / 857.21' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	857.38'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 11.03 hrs HW=855.44' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=2.17 cfs @ 12.18 hrs HW=858.48' TW=0.00' (Dynamic Tailwater)
↑└**2=Culvert** (Passes 2.17 cfs of 2.69 cfs potential flow)
↑└**3=Orifice/Grate** (Orifice Controls 2.17 cfs @ 3.99 fps)

Pond UGD: ACO Storm Brix - HD - Chamber Wizard Field A

Chamber Model = ACO StormBrixx HD 1 (ACO StormBrixx® HD)
Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf
Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf

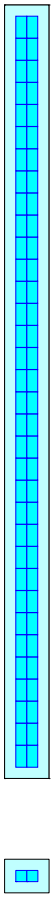
34 Chambers/Row x 3.95' Long = 134.42' Row Length +24.0" End Stone x 2 = 138.42' Base Length
2 Rows x 23.7" Wide + 24.0" Side Stone x 2 = 7.95' Base Width
24.0" Stone Base + 24.1" Chamber Height + 24.0" Stone Cover = 6.01' Field Height

68 Chambers x 14.9 cf = 1,013.6 cf Chamber Storage
68 Chambers x 15.7 cf = 1,067.0 cf Displacement

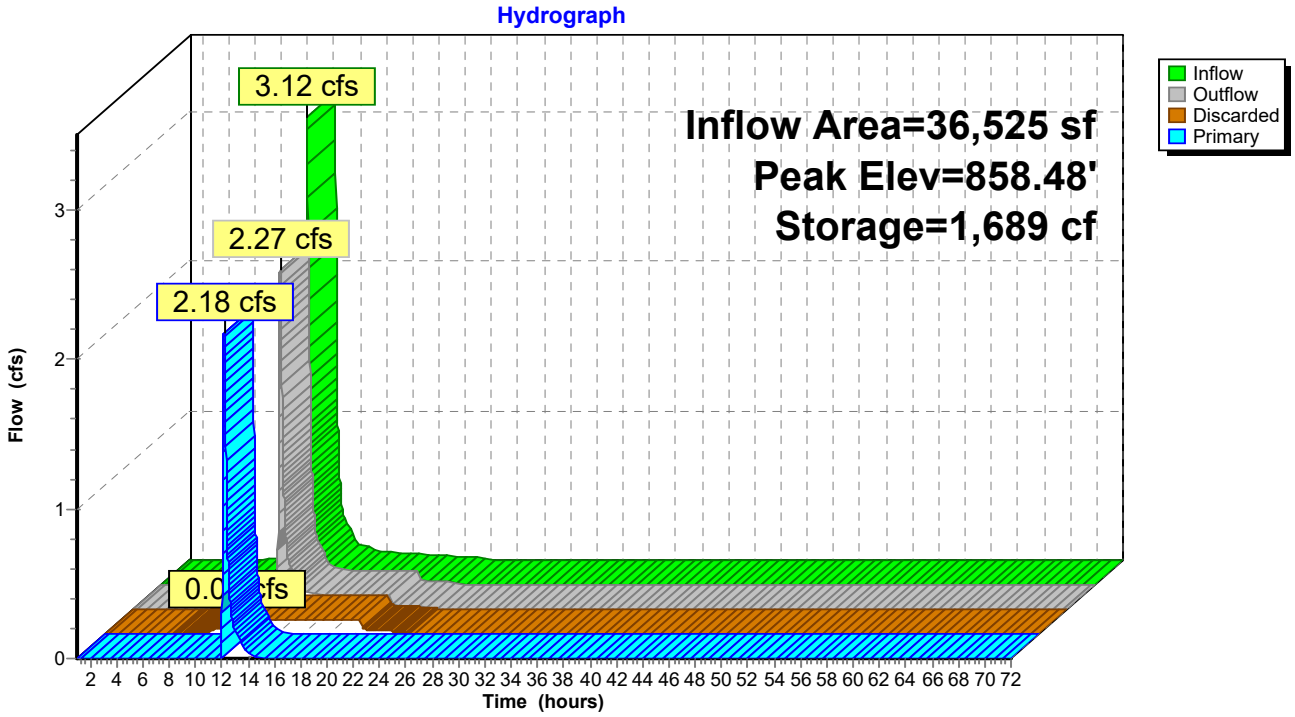
6,613.9 cf Field - 1,067.0 cf Chambers = 5,547.0 cf Stone x 40.0% Voids = 2,218.8 cf Stone Storage

Chamber Storage + Stone Storage = 3,232.4 cf = 0.074 af
Overall Storage Efficiency = 48.9%
Overall System Size = 138.42' x 7.95' x 6.01'

68 Chambers
245.0 cy Field
205.4 cy Stone



Pond UGD: ACO Storm Brix - HD

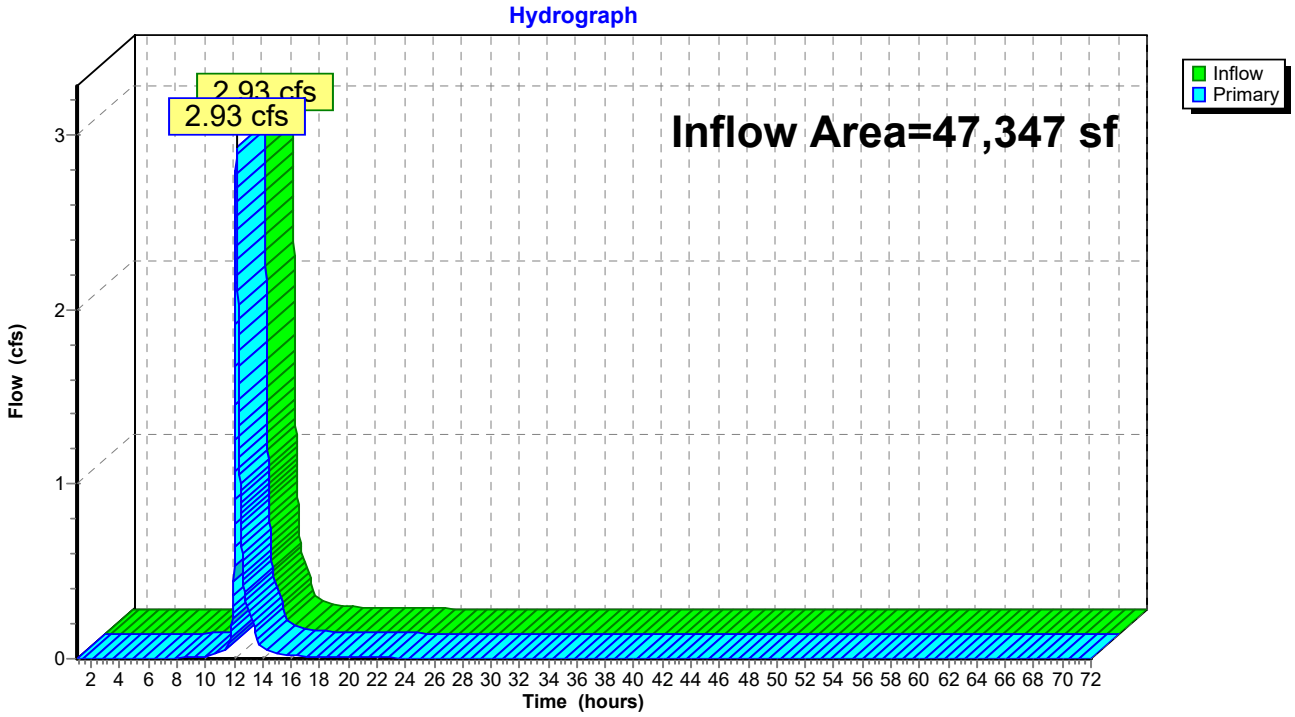


Summary for Link TPO: Total Proposed Outfall

Inflow Area = 47,347 sf, 64.02% Impervious, Inflow Depth = 1.39" for 5-year event
Inflow = 2.93 cfs @ 12.16 hrs, Volume= 5,487 cf
Primary = 2.93 cfs @ 12.16 hrs, Volume= 5,487 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link TPO: Total Proposed Outfall



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment P1: Proposed Building Runoff Area=31,557 sf 75.29% Impervious Runoff Depth=3.10"
Tc=6.0 min CN=91 Runoff=3.45 cfs 8,162 cf

Subcatchment P2: Captured to Underground Runoff Area=1,163 sf 7.39% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=76 Runoff=0.08 cfs 175 cf

Subcatchment P3: Captured to Permeable Runoff Area=3,805 sf 35.72% Impervious Runoff Depth=2.36"
Tc=6.0 min CN=83 Runoff=0.33 cfs 750 cf

Subcatchment P4: Captured to Permeable Runoff Area=3,381 sf 7.75% Impervious Runoff Depth=2.12"
Tc=6.0 min CN=80 Runoff=0.27 cfs 596 cf

Subcatchment P5: Captured to Permeable Runoff Area=2,002 sf 47.85% Impervious Runoff Depth=2.91"
Tc=6.0 min CN=89 Runoff=0.21 cfs 485 cf

Subcatchment P6: Uncaptured East Runoff Area=945 sf 22.65% Impervious Runoff Depth=2.91"
Tc=6.0 min CN=89 Runoff=0.10 cfs 229 cf

Subcatchment P7: Uncaptured South Runoff Area=693 sf 100.00% Impervious Runoff Depth=3.85"
Tc=6.0 min CN=98 Runoff=0.08 cfs 223 cf

Subcatchment P8: Uncaptured West Runoff Area=3,801 sf 78.37% Impervious Runoff Depth=3.52"
Tc=6.0 min CN=95 Runoff=0.45 cfs 1,115 cf

Pond UGD: ACO Storm Brix - HD Peak Elev=858.83' Storage=1,940 cf Inflow=3.86 cfs 9,087 cf
Discarded=0.09 cfs 4,330 cf Primary=2.66 cfs 4,757 cf Outflow=2.76 cfs 9,087 cf

Link TPO: Total Proposed Outfall Inflow=3.60 cfs 7,405 cf
Primary=3.60 cfs 7,405 cf

Total Runoff Area = 47,347 sf Runoff Volume = 11,734 cf Average Runoff Depth = 2.97"
35.98% Pervious = 17,036 sf 64.02% Impervious = 30,311 sf

Summary for Subcatchment P1: Proposed Building

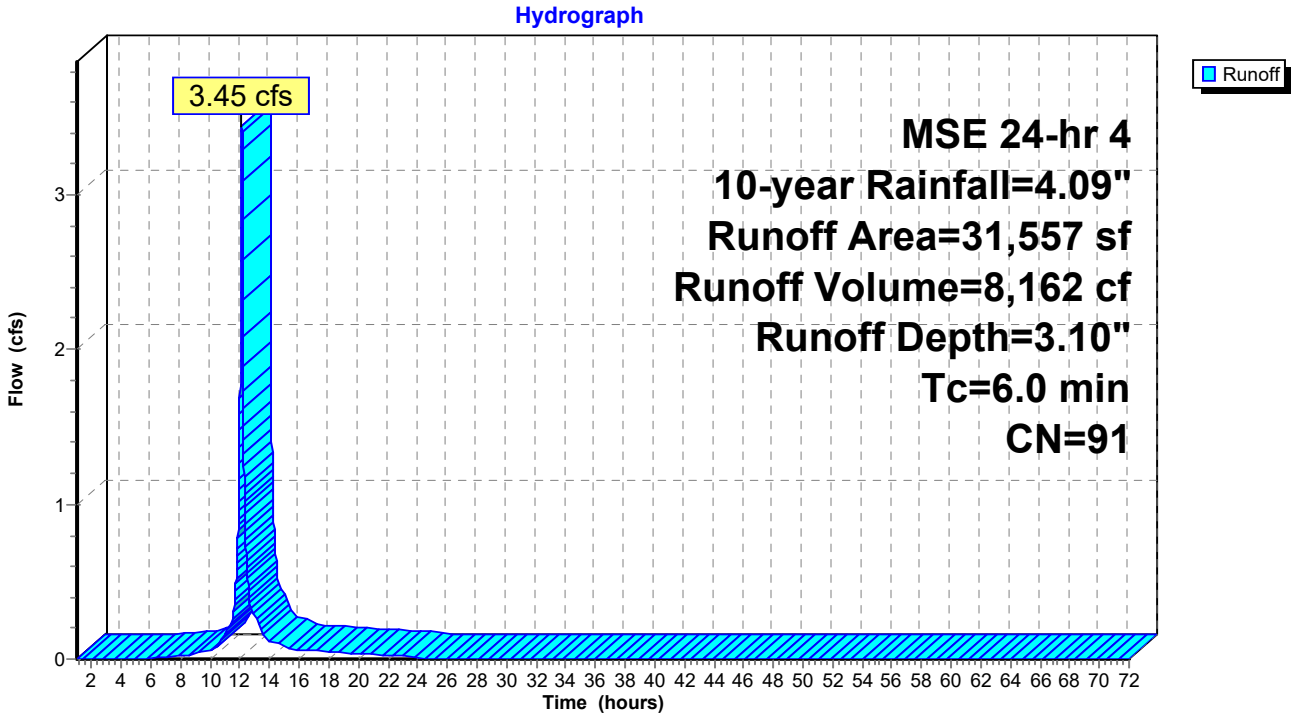
Runoff = 3.45 cfs @ 12.13 hrs, Volume= 8,162 cf, Depth= 3.10"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	23,760	98	Roofs, HSG C
*	7,797	68	Intensive Green Roof
	31,557	91	Weighted Average
	7,797		24.71% Pervious Area
	23,760		75.29% Impervious Area

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

Subcatchment P1: Proposed Building



Summary for Subcatchment P2: Captured to Underground Detention

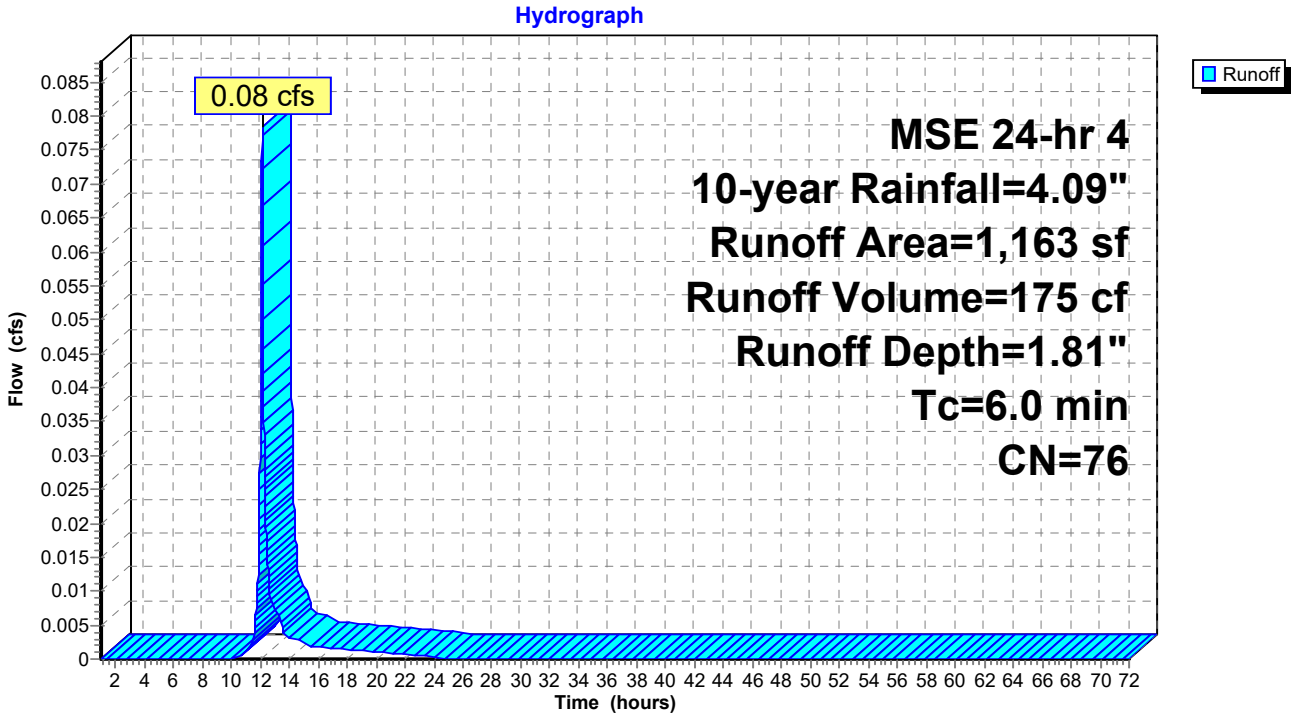
Runoff = 0.08 cfs @ 12.14 hrs, Volume= 175 cf, Depth= 1.81"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	86	98	Sidewalk, HSG C
	1,077	74	>75% Grass cover, Good, HSG C
	1,163	76	Weighted Average
	1,077		92.61% Pervious Area
	86		7.39% Impervious Area

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

Subcatchment P2: Captured to Underground Detention



Summary for Subcatchment P3: Captured to Permeable Pavers South

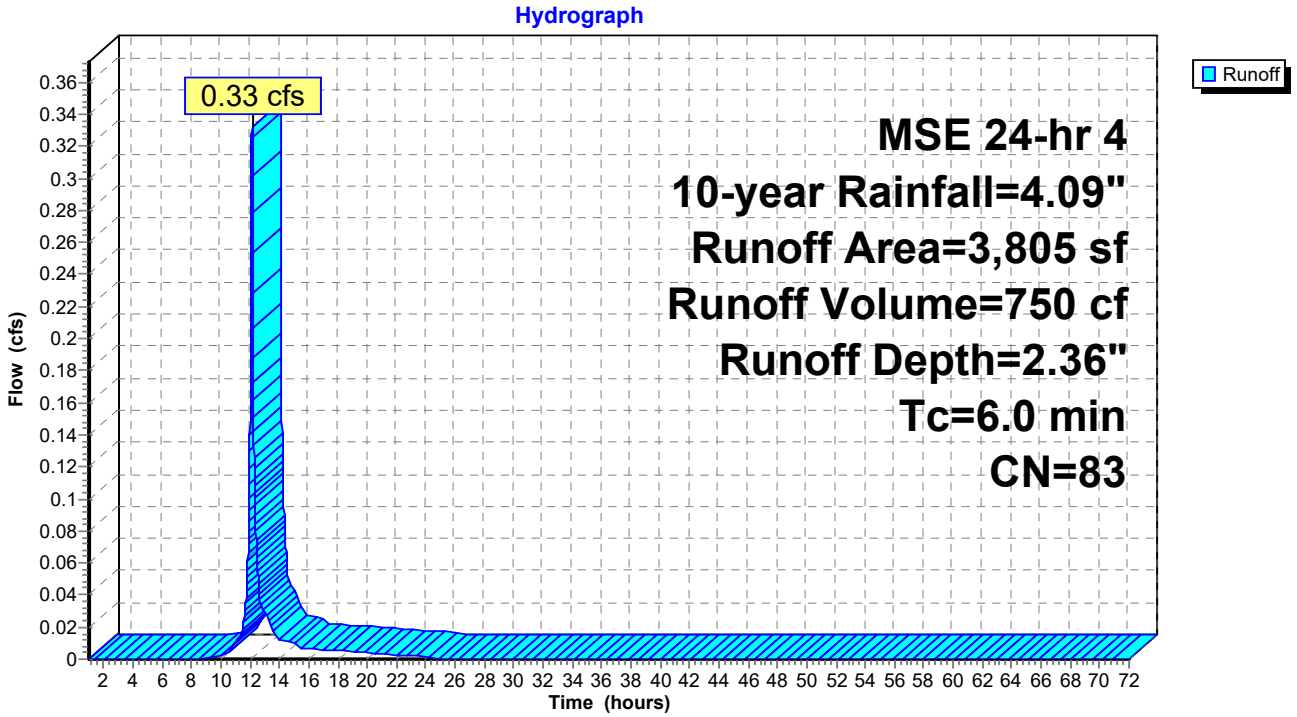
Runoff = 0.33 cfs @ 12.13 hrs, Volume= 750 cf, Depth= 2.36"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
	992	98	Paved parking, HSG C
*	367	98	Sidewalk, HSG C
*	2,194	74	Permeable Pavers, HSG C
	252	86	<50% Grass cover, Poor, HSG C
	3,805	83	Weighted Average
	2,446		64.28% Pervious Area
	1,359		35.72% Impervious Area

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

Subcatchment P3: Captured to Permeable Pavers South



Summary for Subcatchment P4: Captured to Permeable Pavers Northwest

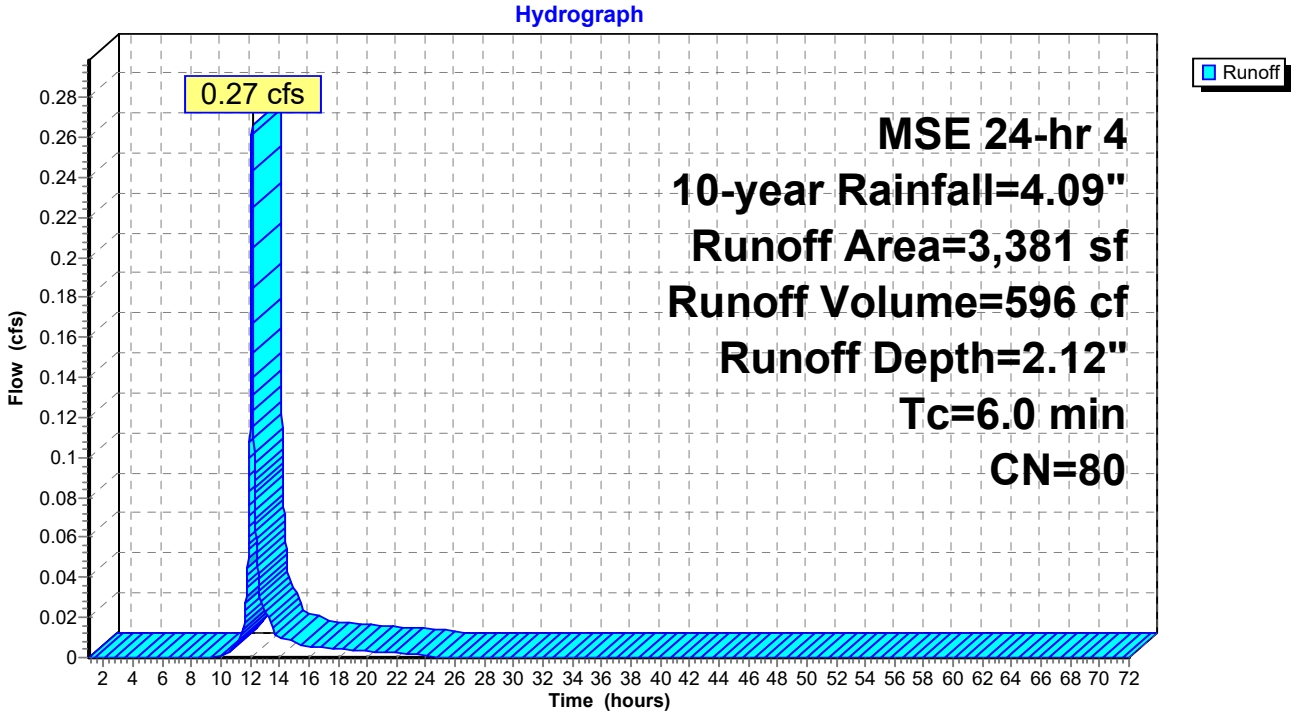
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 596 cf, Depth= 2.12"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	262	98	Sidewalk, HSG C
*	1,973	74	Permeable Pavers, HSG C
	1,146	86	<50% Grass cover, Poor, HSG C
	3,381	80	Weighted Average
	3,119		92.25% Pervious Area
	262		7.75% Impervious Area

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

Subcatchment P4: Captured to Permeable Pavers Northwest



Summary for Subcatchment P5: Captured to Permeable Paver Northeast

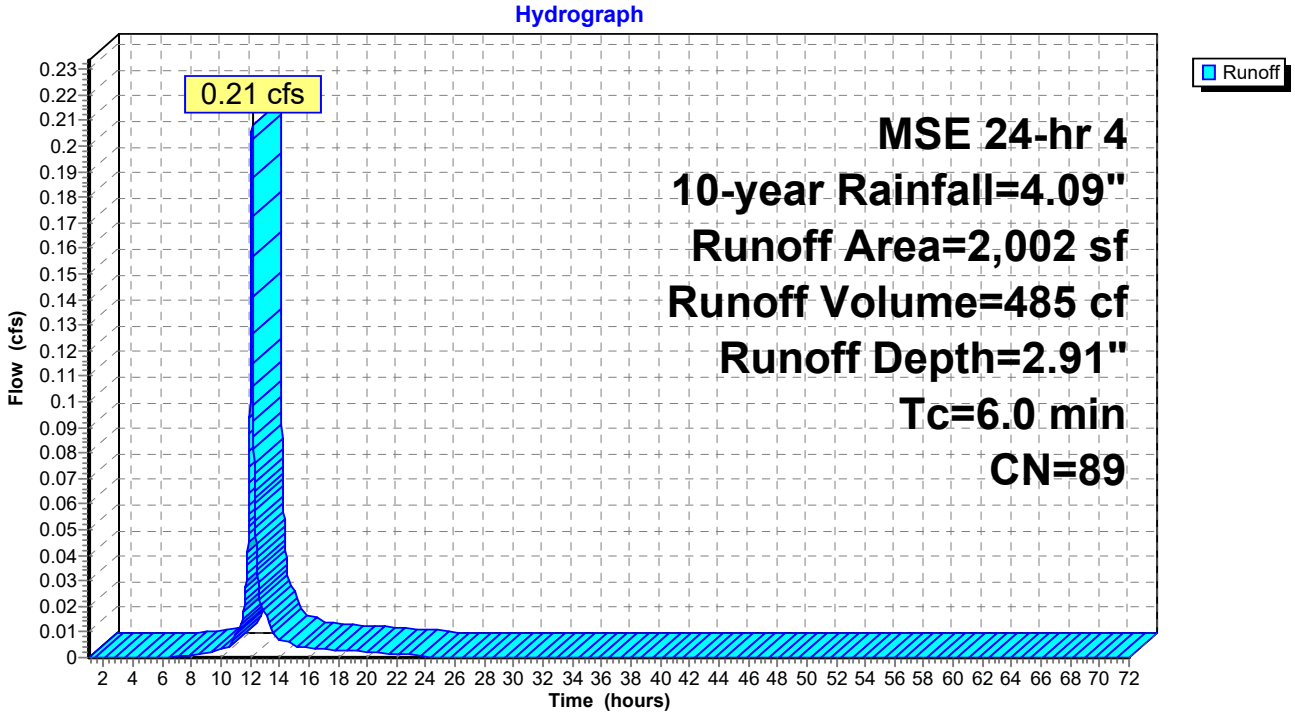
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 485 cf, Depth= 2.91"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	958	98	Sidewalk, HSG C
*	521	74	Permeable Pavers, HSG C
	523	86	<50% Grass cover, Poor, HSG C
	2,002	89	Weighted Average
	1,044		52.15% Pervious Area
	958		47.85% Impervious Area

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

Subcatchment P5: Captured to Permeable Paver Northeast



Summary for Subcatchment P6: Uncaptured East

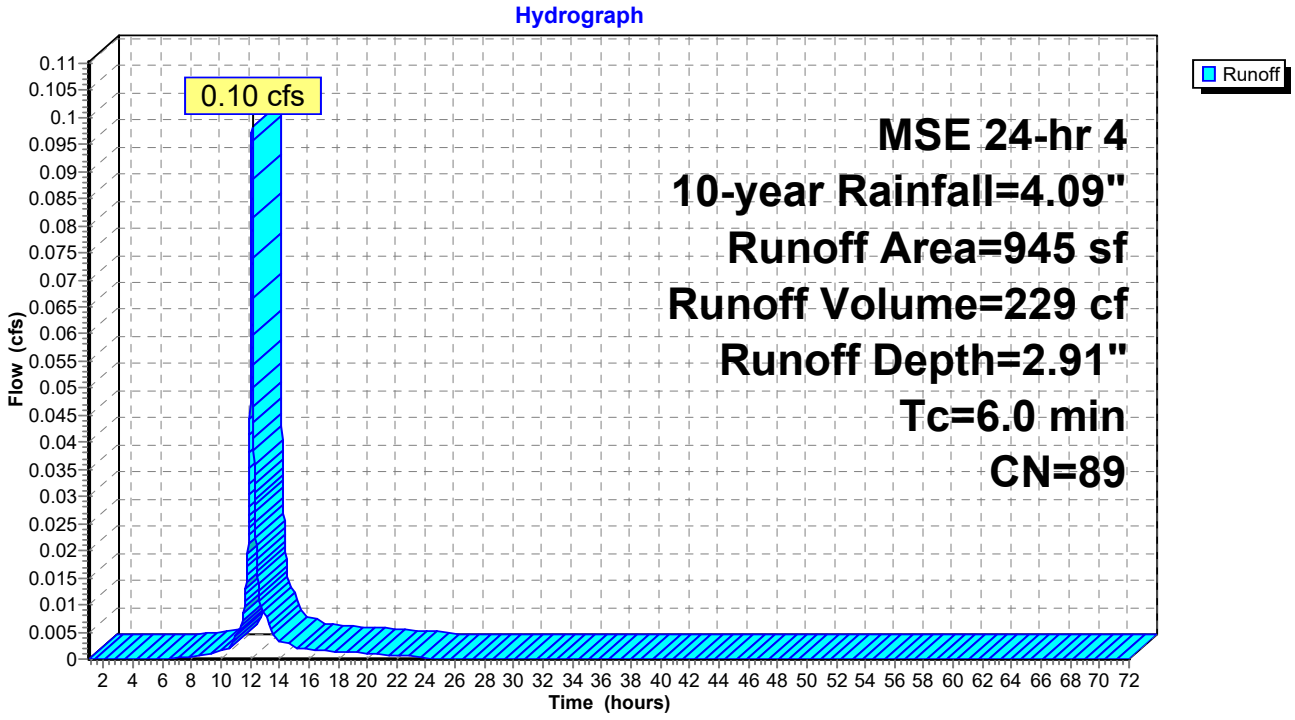
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 229 cf, Depth= 2.91"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	214	98	Sidewalk, HSG C
	731	86	<50% Grass cover, Poor, HSG C
	945	89	Weighted Average
	731		77.35% Pervious Area
	214		22.65% Impervious Area

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

Subcatchment P6: Uncaptured East



Summary for Subcatchment P7: Uncaptured South

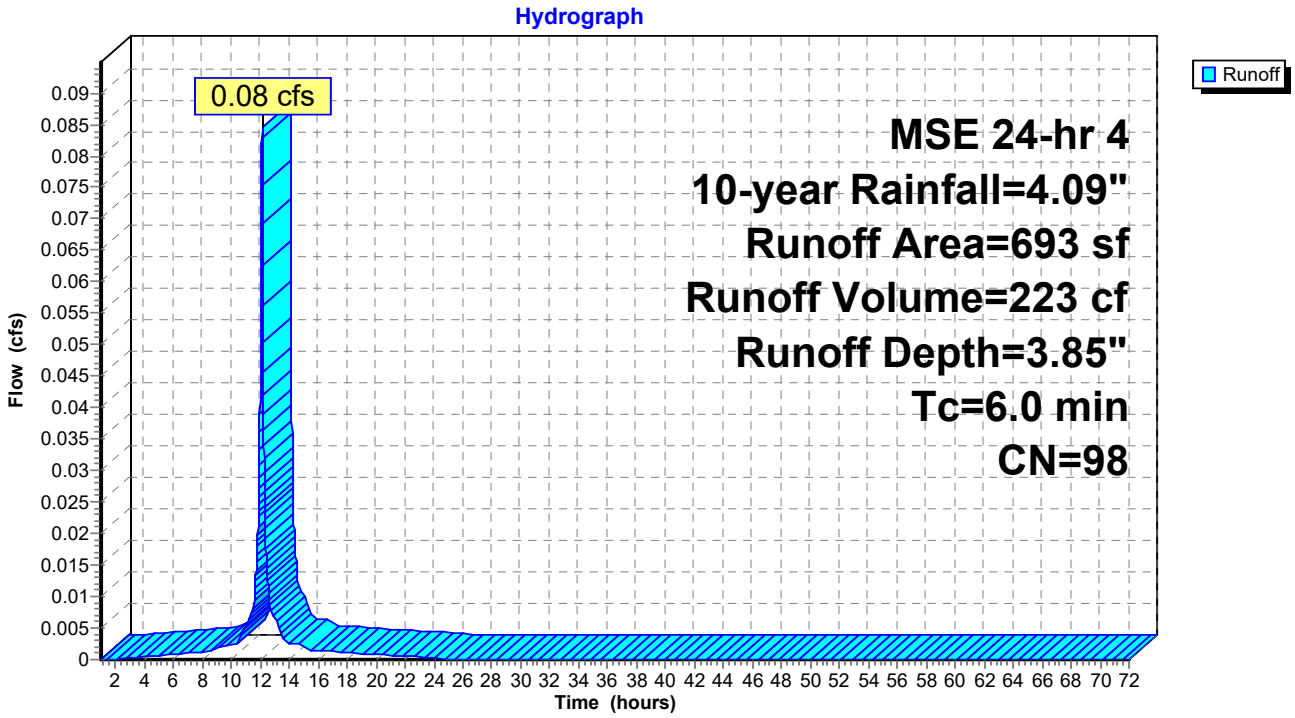
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 223 cf, Depth= 3.85"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
	635	98	Paved parking, HSG C
*	58	98	Sidewalk, HSG C
	693	98	Weighted Average
	693		100.00% Impervious Area

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

Subcatchment P7: Uncaptured South



Summary for Subcatchment P8: Uncaptured West

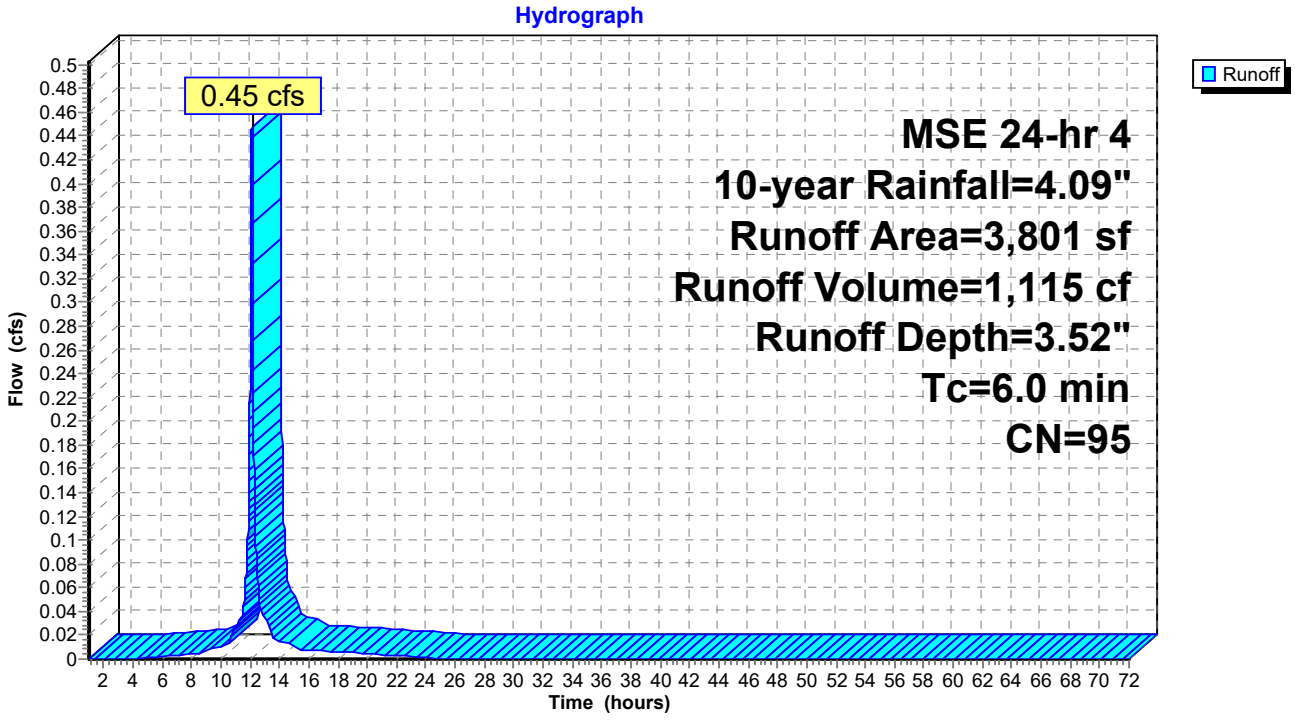
Runoff = 0.45 cfs @ 12.13 hrs, Volume= 1,115 cf, Depth= 3.52"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	2,979	98	Sidewalk, HSG C
	822	86	<50% Grass cover, Poor, HSG C
	3,801	95	Weighted Average
	822		21.63% Pervious Area
	2,979		78.37% Impervious Area

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

Subcatchment P8: Uncaptured West



Summary for Pond UGD: ACO Storm Brix - HD

Inflow Area = 36,525 sf, 69.01% Impervious, Inflow Depth = 2.99" for 10-year event
Inflow = 3.86 cfs @ 12.13 hrs, Volume= 9,087 cf
Outflow = 2.76 cfs @ 12.18 hrs, Volume= 9,087 cf, Atten= 29%, Lag= 3.3 min
Discarded = 0.09 cfs @ 10.81 hrs, Volume= 4,330 cf
Primary = 2.66 cfs @ 12.18 hrs, Volume= 4,757 cf
Routed to Link TPO : Total Proposed Outfall

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 858.83' @ 12.18 hrs Surf.Area= 1,101 sf Storage= 1,940 cf

Plug-Flow detention time= 49.1 min calculated for 9,087 cf (100% of inflow)
Center-of-Mass det. time= 49.1 min (837.8 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	855.38'	2,219 cf	**7.95'W x 138.42'L x 6.01'H Field A** 6,614 cf Overall - 1,067 cf Embedded = 5,547 cf x 40.0% Voids
#2A	857.38'	1,014 cf	**ACO StormBrixx HD 1** x 68 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 68 Chambers in 2 Rows
		3,232 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	855.38'	**3.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	857.38'	**12.0" Round Culvert** L= 17.2' Ke= 0.500 Inlet / Outlet Invert= 857.38' / 857.21' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	857.38'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 10.81 hrs HW=855.44' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=2.66 cfs @ 12.18 hrs HW=858.82' TW=0.00' (Dynamic Tailwater)
↑└**2=Culvert** (Passes 2.66 cfs of 3.46 cfs potential flow)
↑└**3=Orifice/Grate** (Orifice Controls 2.66 cfs @ 4.88 fps)

Pond UGD: ACO Storm Brix - HD - Chamber Wizard Field A

Chamber Model = ACO StormBrixx HD 1 (ACO StormBrixx® HD)
Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf
Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf

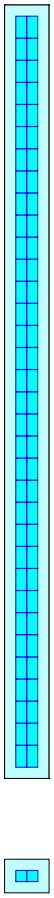
34 Chambers/Row x 3.95' Long = 134.42' Row Length +24.0" End Stone x 2 = 138.42' Base Length
2 Rows x 23.7" Wide + 24.0" Side Stone x 2 = 7.95' Base Width
24.0" Stone Base + 24.1" Chamber Height + 24.0" Stone Cover = 6.01' Field Height

68 Chambers x 14.9 cf = 1,013.6 cf Chamber Storage
68 Chambers x 15.7 cf = 1,067.0 cf Displacement

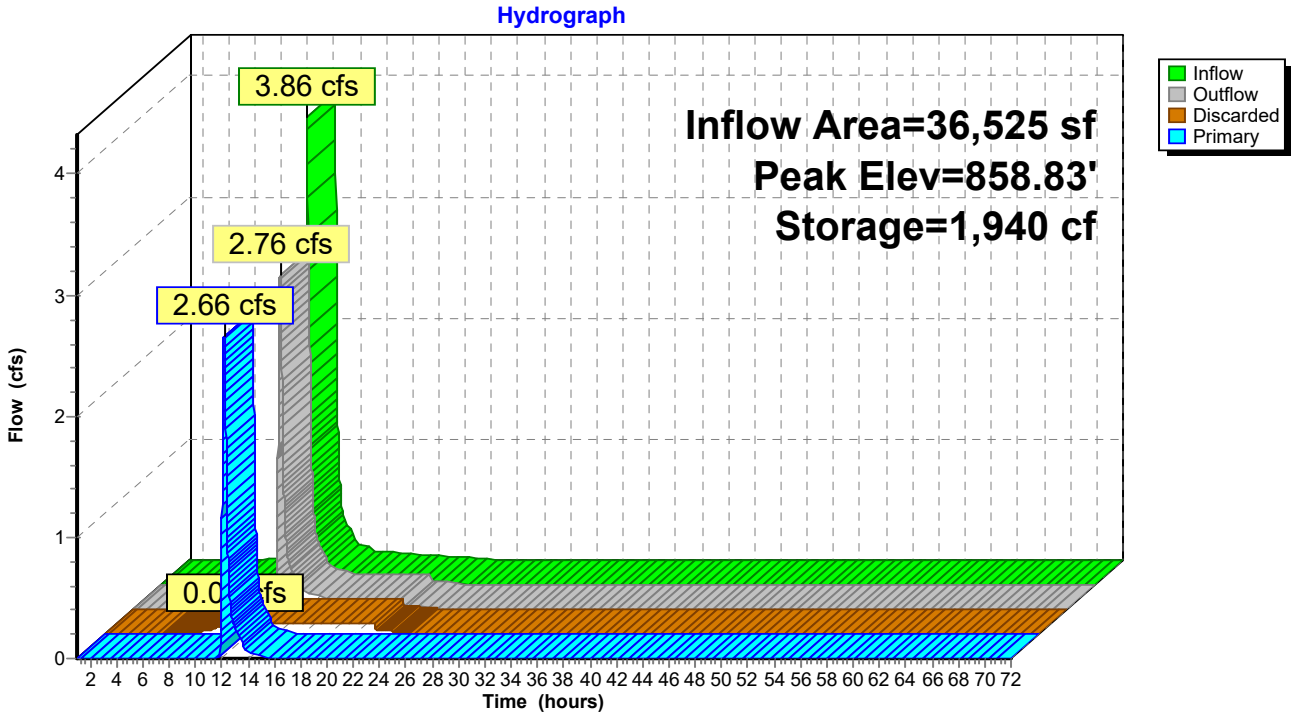
6,613.9 cf Field - 1,067.0 cf Chambers = 5,547.0 cf Stone x 40.0% Voids = 2,218.8 cf Stone Storage

Chamber Storage + Stone Storage = 3,232.4 cf = 0.074 af
Overall Storage Efficiency = 48.9%
Overall System Size = 138.42' x 7.95' x 6.01'

68 Chambers
245.0 cy Field
205.4 cy Stone



Pond UGD: ACO Storm Brix - HD

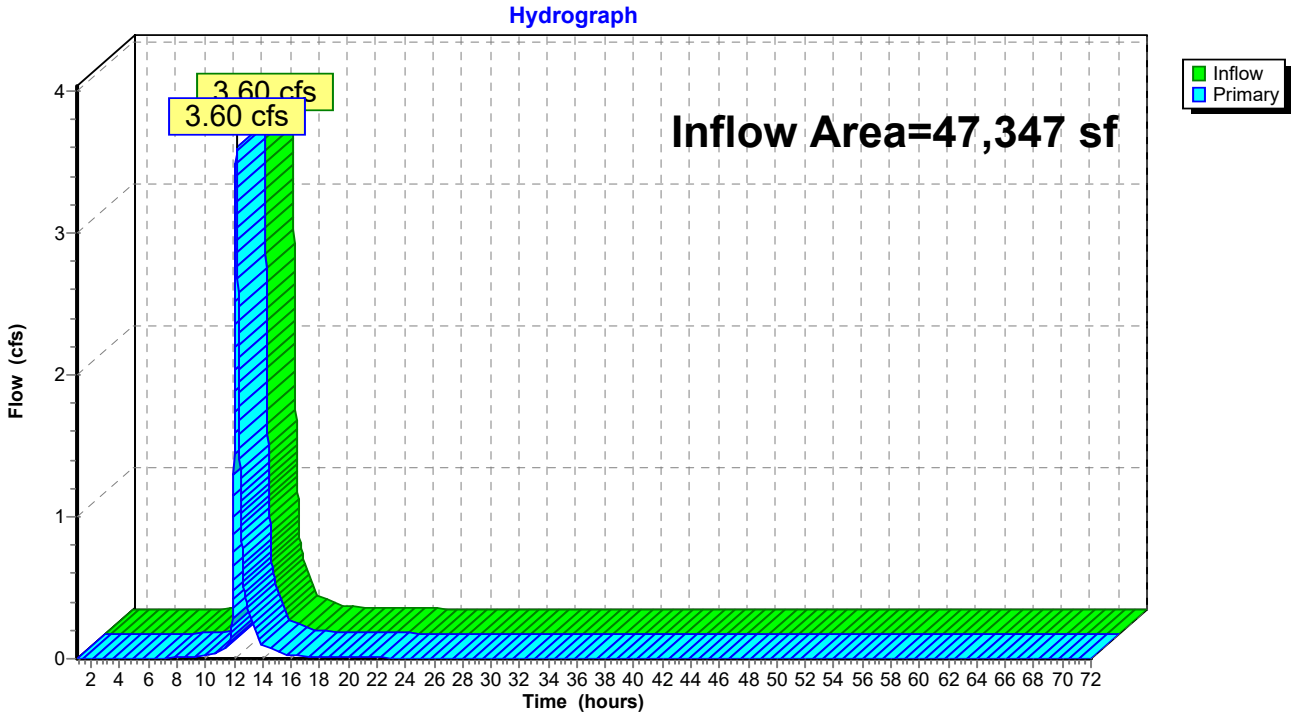


Summary for Link TPO: Total Proposed Outfall

Inflow Area = 47,347 sf, 64.02% Impervious, Inflow Depth = 1.88" for 10-year event
Inflow = 3.60 cfs @ 12.15 hrs, Volume= 7,405 cf
Primary = 3.60 cfs @ 12.15 hrs, Volume= 7,405 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link TPO: Total Proposed Outfall



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment P1: Proposed Building Runoff Area=31,557 sf 75.29% Impervious Runoff Depth=5.60"
Tc=6.0 min CN=91 Runoff=6.00 cfs 14,738 cf

Subcatchment P2: Captured to Underground Runoff Area=1,163 sf 7.39% Impervious Runoff Depth=3.96"
Tc=6.0 min CN=76 Runoff=0.17 cfs 383 cf

Subcatchment P3: Captured to Permeable Runoff Area=3,805 sf 35.72% Impervious Runoff Depth=4.71"
Tc=6.0 min CN=83 Runoff=0.64 cfs 1,493 cf

Subcatchment P4: Captured to Permeable Runoff Area=3,381 sf 7.75% Impervious Runoff Depth=4.38"
Tc=6.0 min CN=80 Runoff=0.54 cfs 1,235 cf

Subcatchment P5: Captured to Permeable Runoff Area=2,002 sf 47.85% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=89 Runoff=0.37 cfs 897 cf

Subcatchment P6: Uncaptured East Runoff Area=945 sf 22.65% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=89 Runoff=0.18 cfs 423 cf

Subcatchment P7: Uncaptured South Runoff Area=693 sf 100.00% Impervious Runoff Depth=6.42"
Tc=6.0 min CN=98 Runoff=0.14 cfs 371 cf

Subcatchment P8: Uncaptured West Runoff Area=3,801 sf 78.37% Impervious Runoff Depth=6.07"
Tc=6.0 min CN=95 Runoff=0.75 cfs 1,922 cf

Pond UGD: ACO Storm Brix - HD Peak Elev=860.78' Storage=2,964 cf Inflow=6.81 cfs 16,614 cf
Discarded=0.09 cfs 5,716 cf Primary=4.53 cfs 10,898 cf Outflow=4.63 cfs 16,614 cf

Link TPO: Total Proposed Outfall Inflow=6.16 cfs 15,746 cf
Primary=6.16 cfs 15,746 cf

Total Runoff Area = 47,347 sf Runoff Volume = 21,462 cf Average Runoff Depth = 5.44"
35.98% Pervious = 17,036 sf 64.02% Impervious = 30,311 sf

Summary for Subcatchment P1: Proposed Building

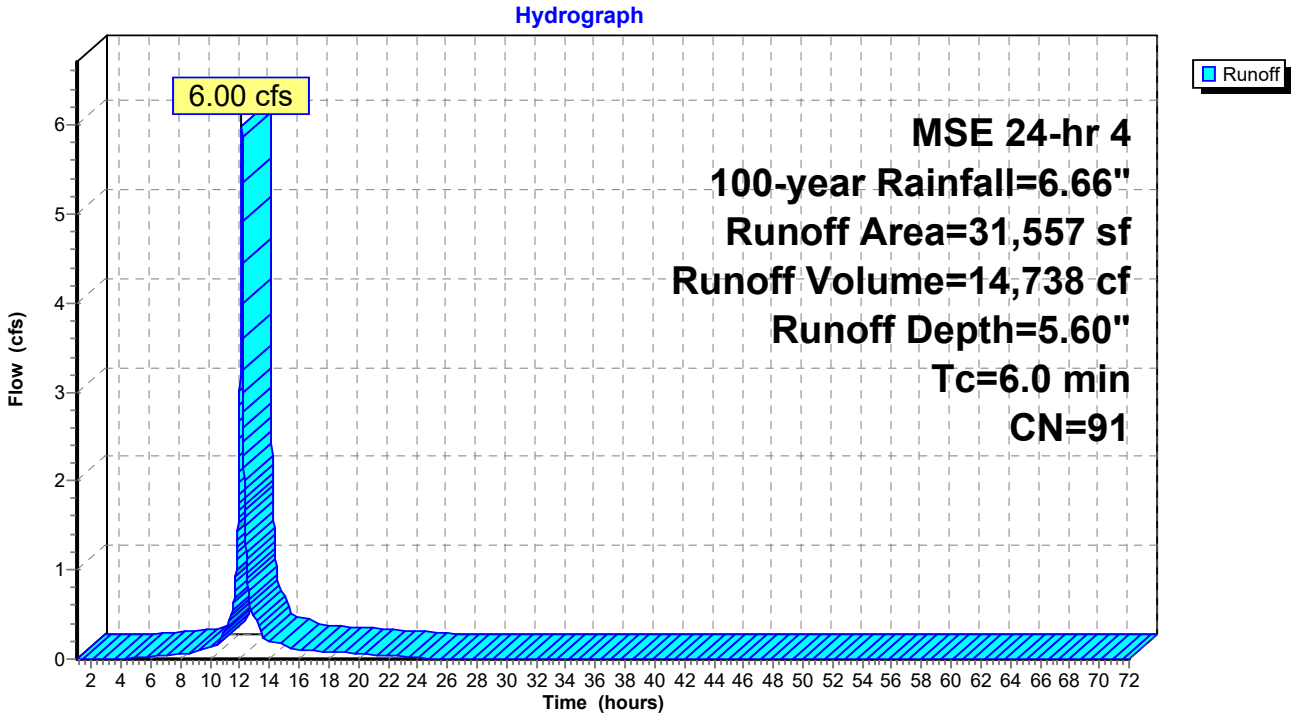
Runoff = 6.00 cfs @ 12.13 hrs, Volume= 14,738 cf, Depth= 5.60"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	23,760	98	Roofs, HSG C
*	7,797	68	Intensive Green Roof
	31,557	91	Weighted Average
	7,797		24.71% Pervious Area
	23,760		75.29% Impervious Area

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

Subcatchment P1: Proposed Building



Summary for Subcatchment P2: Captured to Underground Detention

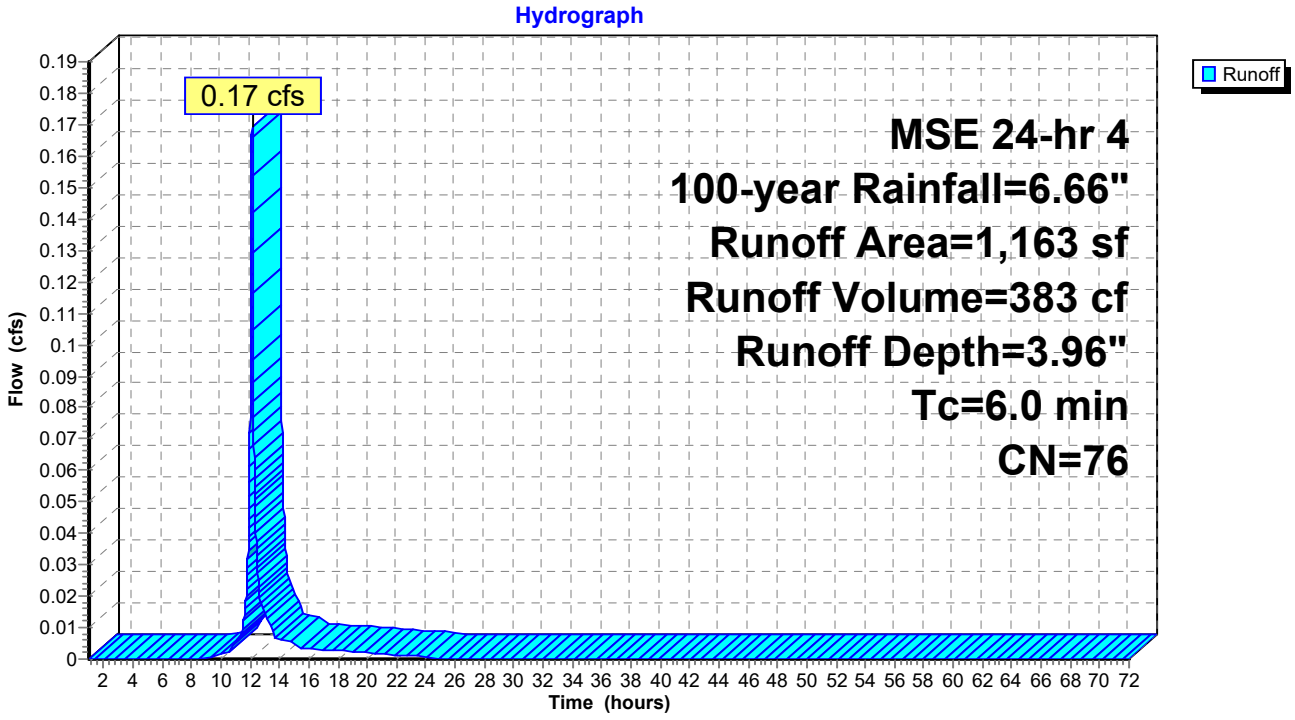
Runoff = 0.17 cfs @ 12.13 hrs, Volume= 383 cf, Depth= 3.96"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	86	98	Sidewalk, HSG C
	1,077	74	>75% Grass cover, Good, HSG C
	1,163	76	Weighted Average
	1,077		92.61% Pervious Area
	86		7.39% Impervious Area

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

Subcatchment P2: Captured to Underground Detention



Summary for Subcatchment P3: Captured to Permeable Pavers South

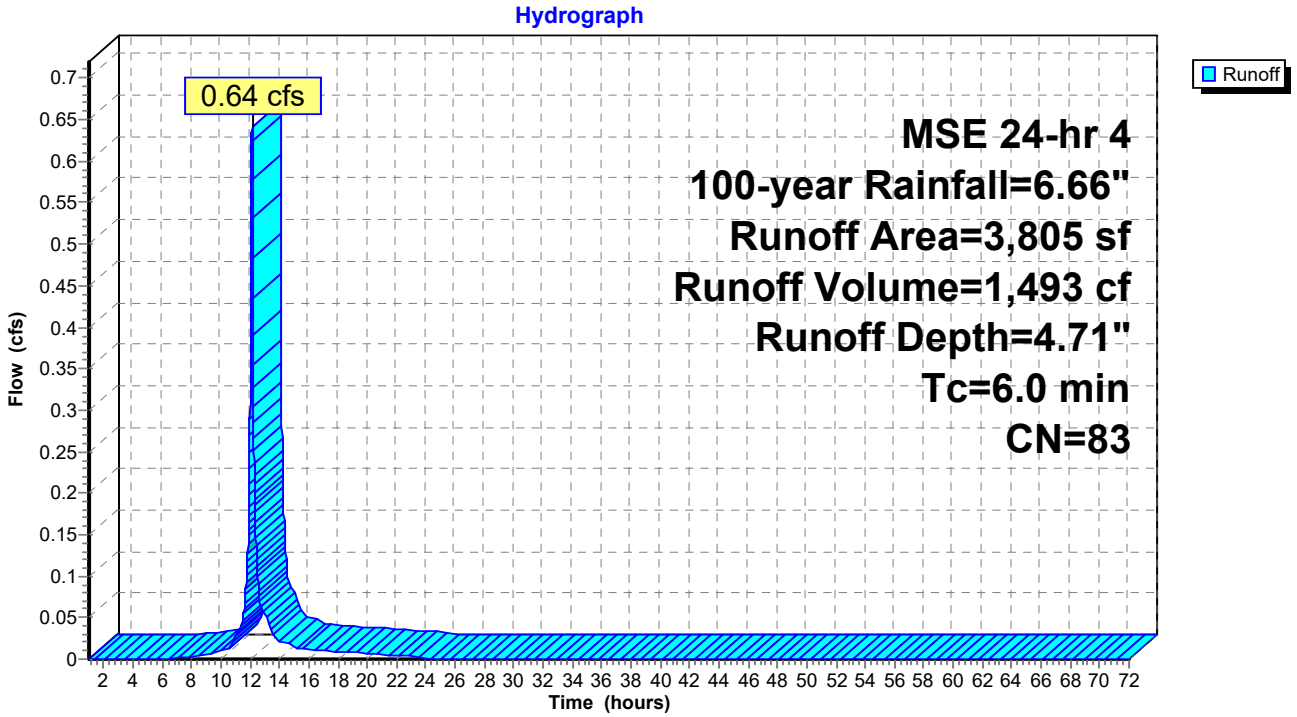
Runoff = 0.64 cfs @ 12.13 hrs, Volume= 1,493 cf, Depth= 4.71"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
	992	98	Paved parking, HSG C
*	367	98	Sidewalk, HSG C
*	2,194	74	Permeable Pavers, HSG C
	252	86	<50% Grass cover, Poor, HSG C
	3,805	83	Weighted Average
	2,446		64.28% Pervious Area
	1,359		35.72% Impervious Area

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

Subcatchment P3: Captured to Permeable Pavers South



Summary for Subcatchment P4: Captured to Permeable Pavers Northwest

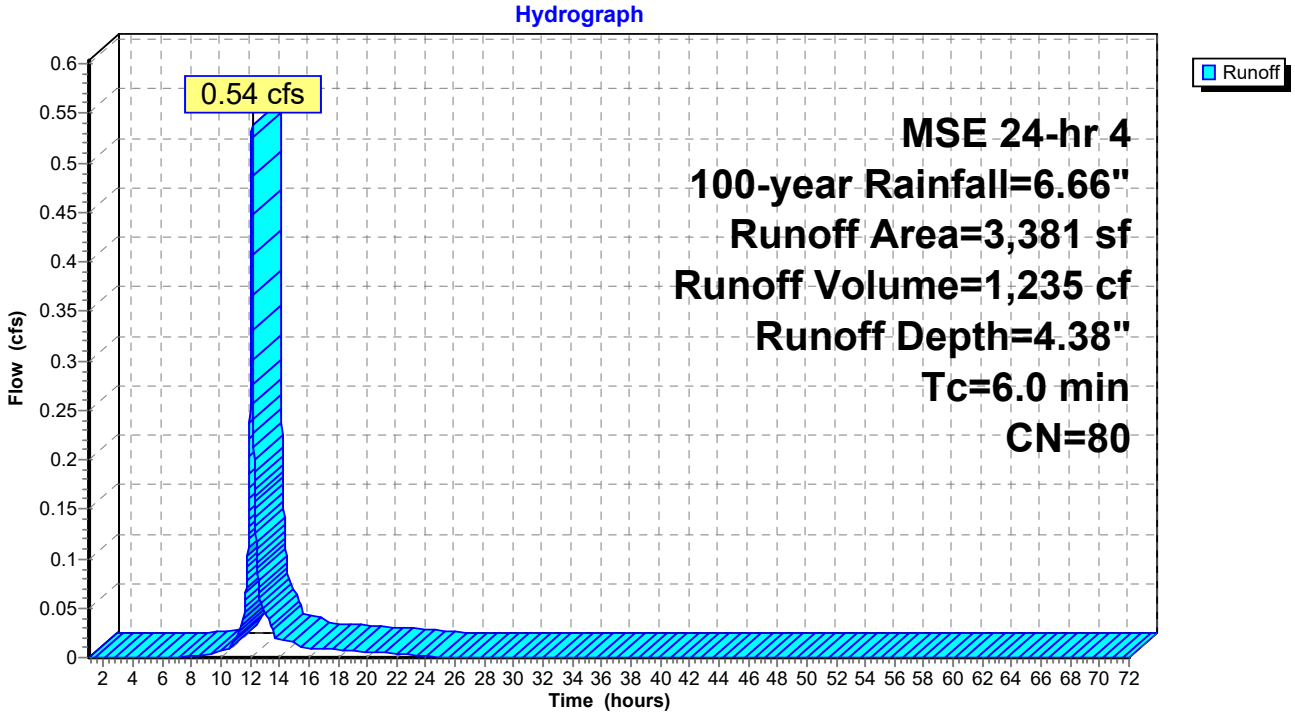
Runoff = 0.54 cfs @ 12.13 hrs, Volume= 1,235 cf, Depth= 4.38"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	262	98	Sidewalk, HSG C
*	1,973	74	Permeable Pavers, HSG C
	1,146	86	<50% Grass cover, Poor, HSG C
	3,381	80	Weighted Average
	3,119		92.25% Pervious Area
	262		7.75% Impervious Area

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

Subcatchment P4: Captured to Permeable Pavers Northwest



Summary for Subcatchment P5: Captured to Permeable Paver Northeast

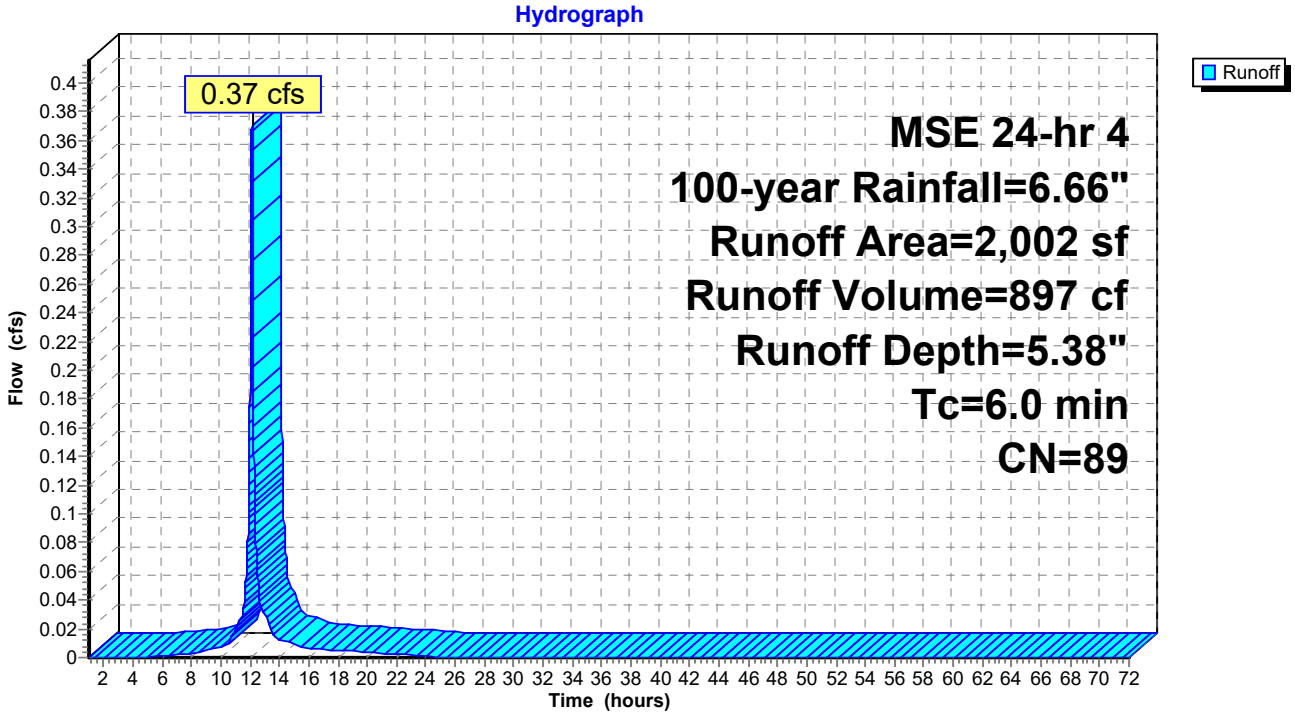
Runoff = 0.37 cfs @ 12.13 hrs, Volume= 897 cf, Depth= 5.38"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	958	98	Sidewalk, HSG C
*	521	74	Permeable Pavers, HSG C
	523	86	<50% Grass cover, Poor, HSG C
	2,002	89	Weighted Average
	1,044		52.15% Pervious Area
	958		47.85% Impervious Area

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

Subcatchment P5: Captured to Permeable Paver Northeast



Summary for Subcatchment P6: Uncaptured East

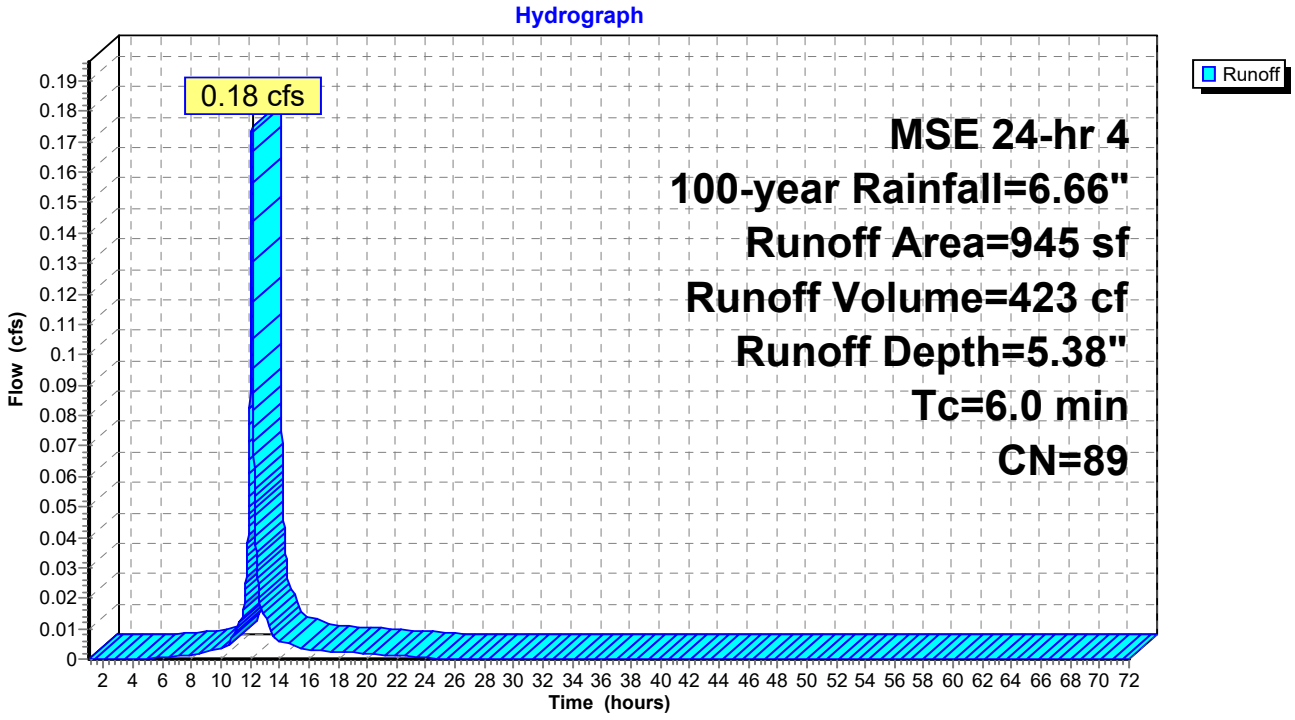
Runoff = 0.18 cfs @ 12.13 hrs, Volume= 423 cf, Depth= 5.38"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	214	98	Sidewalk, HSG C
	731	86	<50% Grass cover, Poor, HSG C
	945	89	Weighted Average
	731		77.35% Pervious Area
	214		22.65% Impervious Area

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

Subcatchment P6: Uncaptured East



Summary for Subcatchment P7: Uncaptured South

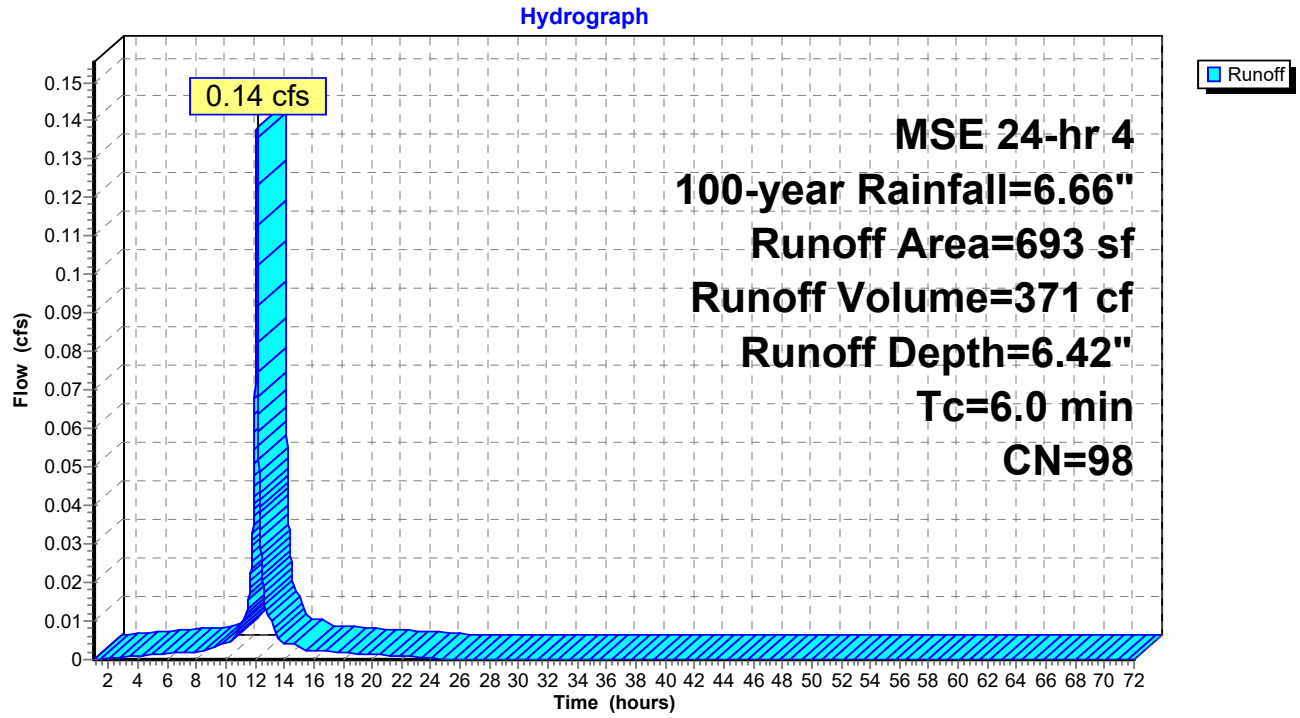
Runoff = 0.14 cfs @ 12.13 hrs, Volume= 371 cf, Depth= 6.42"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
	635	98	Paved parking, HSG C
*	58	98	Sidewalk, HSG C
	693	98	Weighted Average
	693		100.00% Impervious Area

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

Subcatchment P7: Uncaptured South



Summary for Subcatchment P8: Uncaptured West

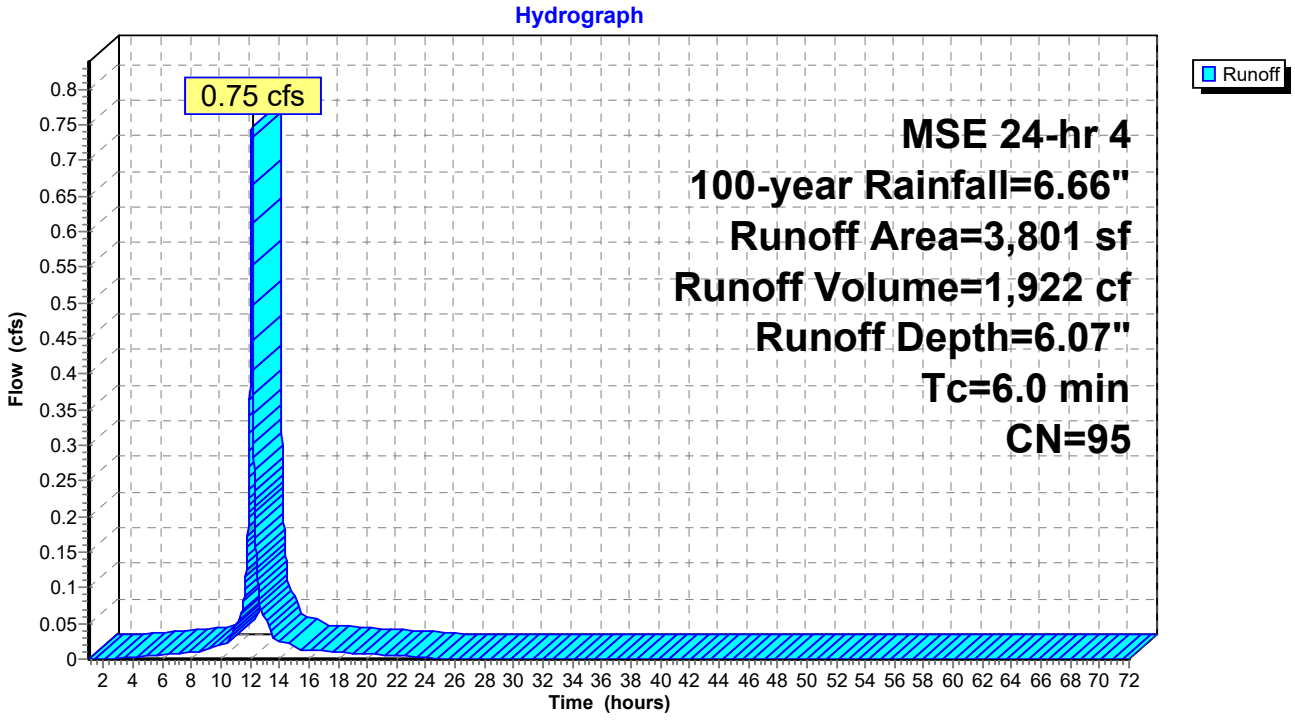
Runoff = 0.75 cfs @ 12.13 hrs, Volume= 1,922 cf, Depth= 6.07"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	2,979	98	Sidewalk, HSG C
	822	86	<50% Grass cover, Poor, HSG C
	3,801	95	Weighted Average
	822		21.63% Pervious Area
	2,979		78.37% Impervious Area

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

Subcatchment P8: Uncaptured West



Summary for Pond UGD: ACO Storm Brix - HD

Inflow Area = 36,525 sf, 69.01% Impervious, Inflow Depth = 5.46" for 100-year event
Inflow = 6.81 cfs @ 12.13 hrs, Volume= 16,614 cf
Outflow = 4.63 cfs @ 12.19 hrs, Volume= 16,614 cf, Atten= 32%, Lag= 3.6 min
Discarded = 0.09 cfs @ 9.37 hrs, Volume= 5,716 cf
Primary = 4.53 cfs @ 12.19 hrs, Volume= 10,898 cf
Routed to Link TPO : Total Proposed Outfall

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 860.78' @ 12.19 hrs Surf.Area= 1,101 sf Storage= 2,964 cf

Plug-Flow detention time= 43.5 min calculated for 16,612 cf (100% of inflow)
Center-of-Mass det. time= 43.5 min (818.8 - 775.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	855.38'	2,219 cf	**7.95'W x 138.42'L x 6.01'H Field A** 6,614 cf Overall - 1,067 cf Embedded = 5,547 cf x 40.0% Voids
#2A	857.38'	1,014 cf	**ACO StormBrixx HD 1** x 68 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 68 Chambers in 2 Rows
		3,232 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	855.38'	**3.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	857.38'	**12.0" Round Culvert** L= 17.2' Ke= 0.500 Inlet / Outlet Invert= 857.38' / 857.21' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	857.38'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 9.37 hrs HW=855.44' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=4.53 cfs @ 12.19 hrs HW=860.78' TW=0.00' (Dynamic Tailwater)
↑└**2=Culvert** (Passes 4.53 cfs of 6.44 cfs potential flow)
↑└**3=Orifice/Grate** (Orifice Controls 4.53 cfs @ 8.31 fps)

Pond UGD: ACO Storm Brix - HD - Chamber Wizard Field A

Chamber Model = ACO StormBrixx HD 1 (ACO StormBrixx® HD)
Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf
Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf

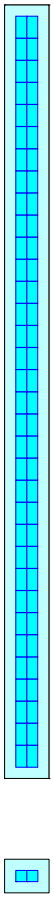
34 Chambers/Row x 3.95' Long = 134.42' Row Length +24.0" End Stone x 2 = 138.42' Base Length
2 Rows x 23.7" Wide + 24.0" Side Stone x 2 = 7.95' Base Width
24.0" Stone Base + 24.1" Chamber Height + 24.0" Stone Cover = 6.01' Field Height

68 Chambers x 14.9 cf = 1,013.6 cf Chamber Storage
68 Chambers x 15.7 cf = 1,067.0 cf Displacement

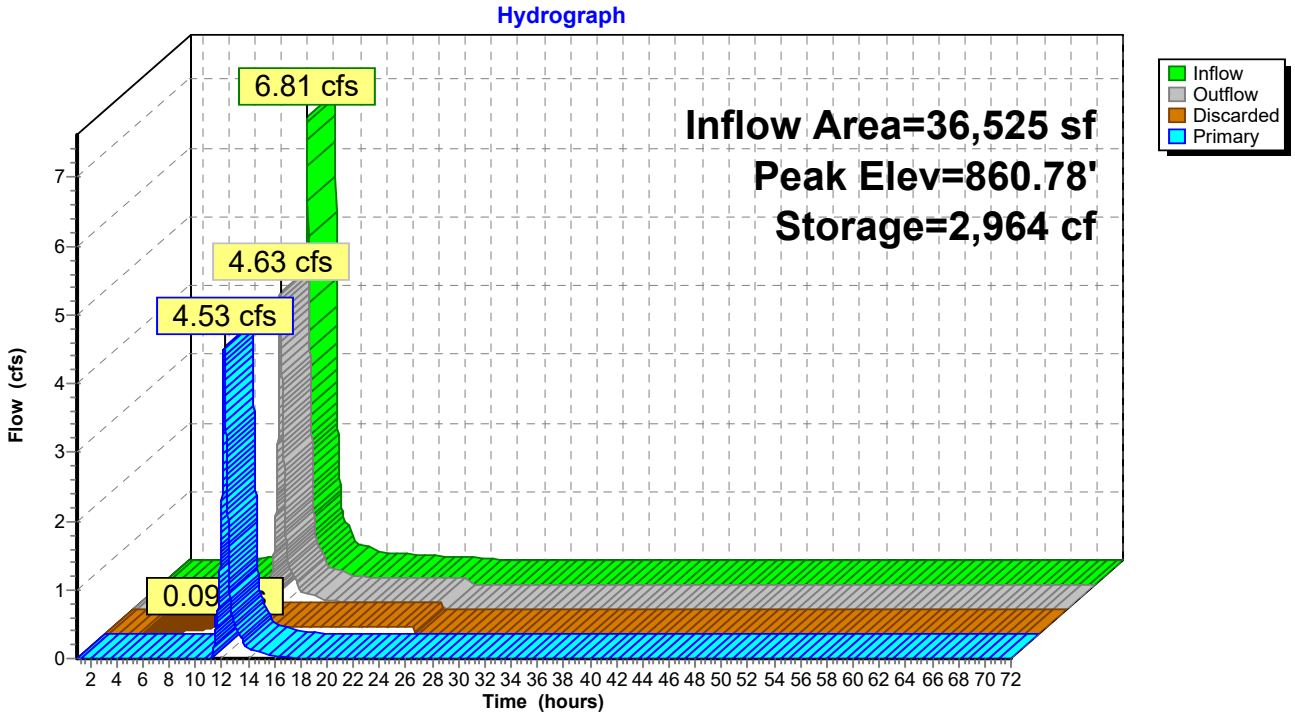
6,613.9 cf Field - 1,067.0 cf Chambers = 5,547.0 cf Stone x 40.0% Voids = 2,218.8 cf Stone Storage

Chamber Storage + Stone Storage = 3,232.4 cf = 0.074 af
Overall Storage Efficiency = 48.9%
Overall System Size = 138.42' x 7.95' x 6.01'

68 Chambers
245.0 cy Field
205.4 cy Stone



Pond UGD: ACO Storm Brix - HD

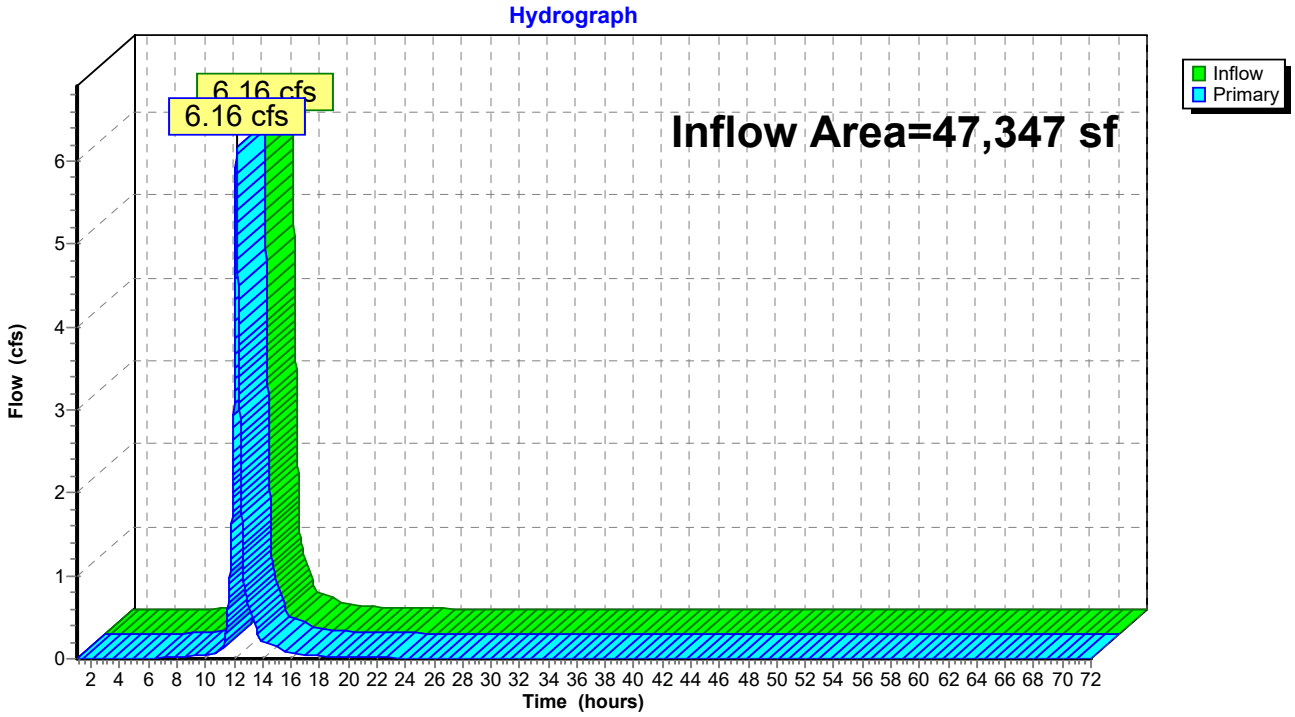


Summary for Link TPO: Total Proposed Outfall

Inflow Area = 47,347 sf, 64.02% Impervious, Inflow Depth = 3.99" for 100-year event
Inflow = 6.16 cfs @ 12.16 hrs, Volume= 15,746 cf
Primary = 6.16 cfs @ 12.16 hrs, Volume= 15,746 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link TPO: Total Proposed Outfall



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment P1: Proposed Building Runoff Area=31,557 sf 75.29% Impervious Runoff Depth=6.46"
Tc=6.0 min CN=91 Runoff=6.85 cfs 16,990 cf

Subcatchment P2: Captured to Underground Runoff Area=1,163 sf 7.39% Impervious Runoff Depth=4.73"
Tc=6.0 min CN=76 Runoff=0.20 cfs 459 cf

Subcatchment P3: Captured to Permeable Runoff Area=3,805 sf 35.72% Impervious Runoff Depth=5.53"
Tc=6.0 min CN=83 Runoff=0.75 cfs 1,753 cf

Subcatchment P4: Captured to Permeable Runoff Area=3,381 sf 7.75% Impervious Runoff Depth=5.19"
Tc=6.0 min CN=80 Runoff=0.63 cfs 1,461 cf

Subcatchment P5: Captured to Permeable Runoff Area=2,002 sf 47.85% Impervious Runoff Depth=6.23"
Tc=6.0 min CN=89 Runoff=0.43 cfs 1,039 cf

Subcatchment P6: Uncaptured East Runoff Area=945 sf 22.65% Impervious Runoff Depth=6.23"
Tc=6.0 min CN=89 Runoff=0.20 cfs 490 cf

Subcatchment P7: Uncaptured South Runoff Area=693 sf 100.00% Impervious Runoff Depth=7.29"
Tc=6.0 min CN=98 Runoff=0.16 cfs 421 cf

Subcatchment P8: Uncaptured West Runoff Area=3,801 sf 78.37% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=95 Runoff=0.85 cfs 2,196 cf

Pond UGD: ACO Storm Brix - HD Peak Elev=866.34' Storage=3,232 cf Inflow=7.80 cfs 19,202 cf
Discarded=0.09 cfs 6,052 cf Primary=7.68 cfs 13,150 cf Outflow=7.77 cfs 19,202 cf

Link TPO: Total Proposed Outfall Inflow=9.54 cfs 18,758 cf
Primary=9.54 cfs 18,758 cf

Total Runoff Area = 47,347 sf Runoff Volume = 24,809 cf Average Runoff Depth = 6.29"
35.98% Pervious = 17,036 sf 64.02% Impervious = 30,311 sf

Summary for Subcatchment P1: Proposed Building

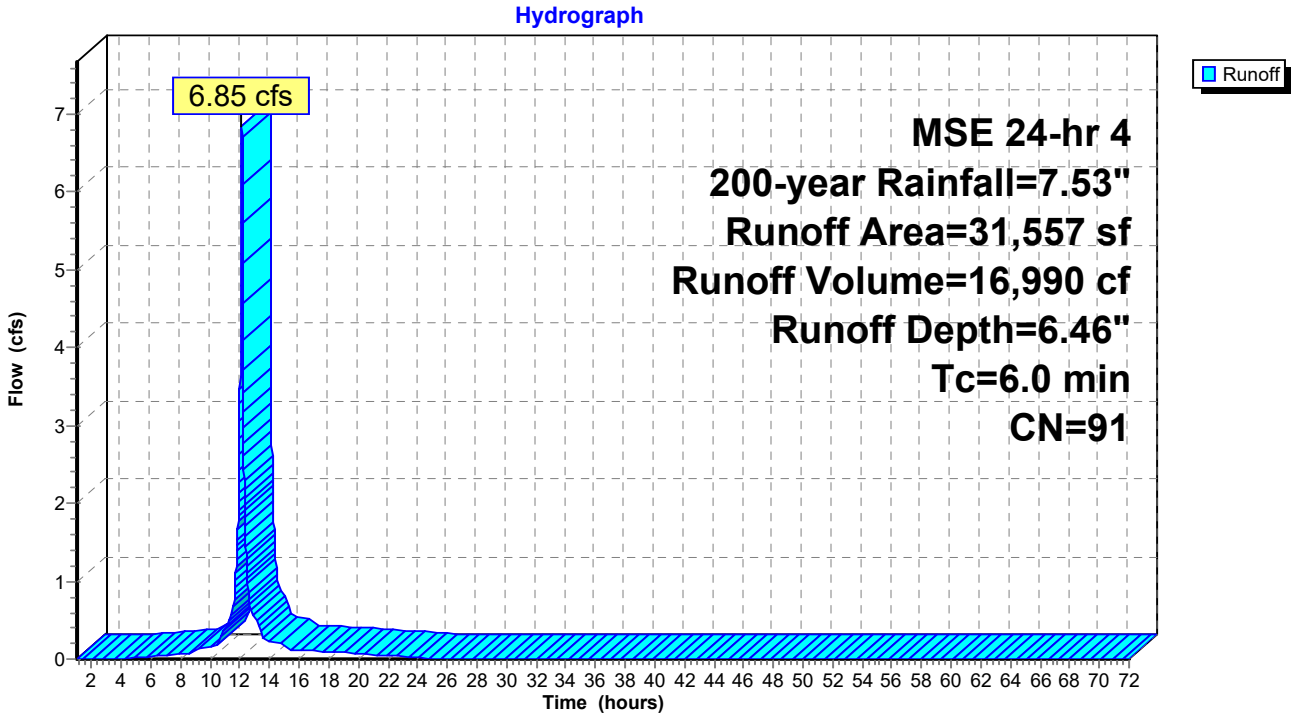
Runoff = 6.85 cfs @ 12.13 hrs, Volume= 16,990 cf, Depth= 6.46"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	23,760	98	Roofs, HSG C
*	7,797	68	Intensive Green Roof
	31,557	91	Weighted Average
	7,797		24.71% Pervious Area
	23,760		75.29% Impervious Area

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

Subcatchment P1: Proposed Building



Summary for Subcatchment P2: Captured to Underground Detention

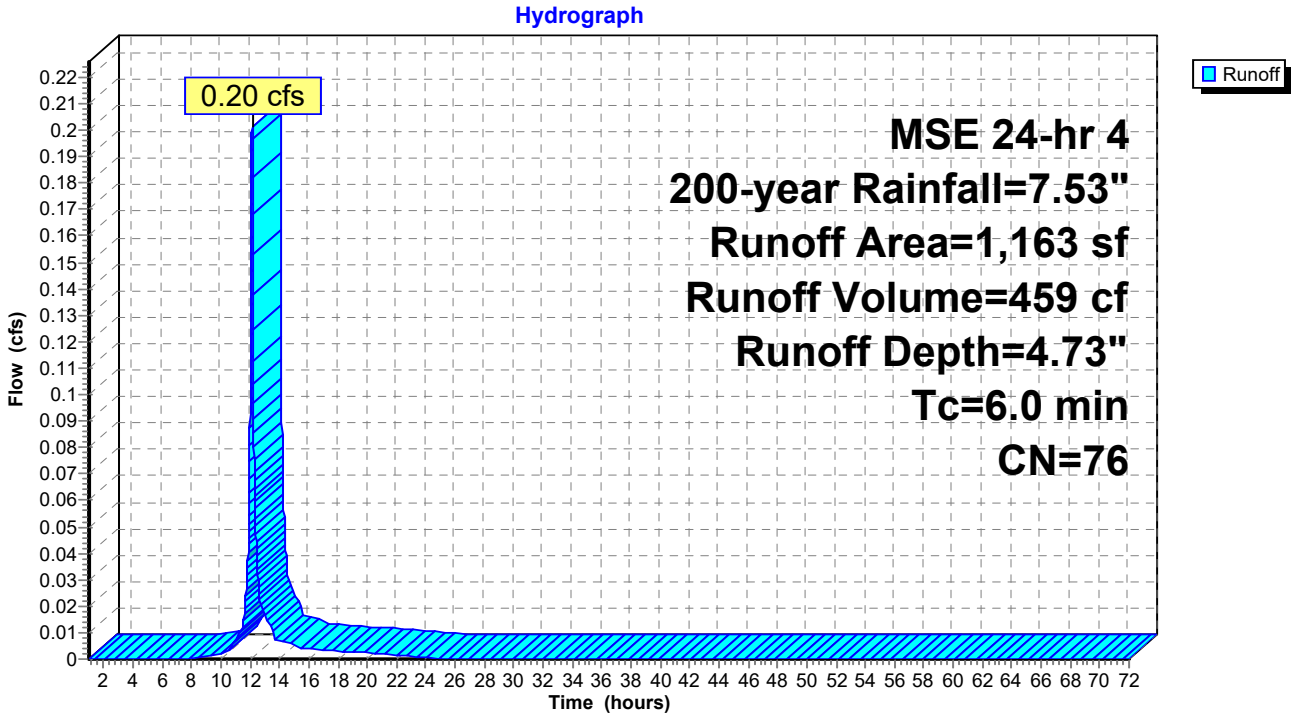
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 459 cf, Depth= 4.73"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	86	98	Sidewalk, HSG C
	1,077	74	>75% Grass cover, Good, HSG C
	1,163	76	Weighted Average
	1,077		92.61% Pervious Area
	86		7.39% Impervious Area

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

Subcatchment P2: Captured to Underground Detention



Summary for Subcatchment P3: Captured to Permeable Pavers South

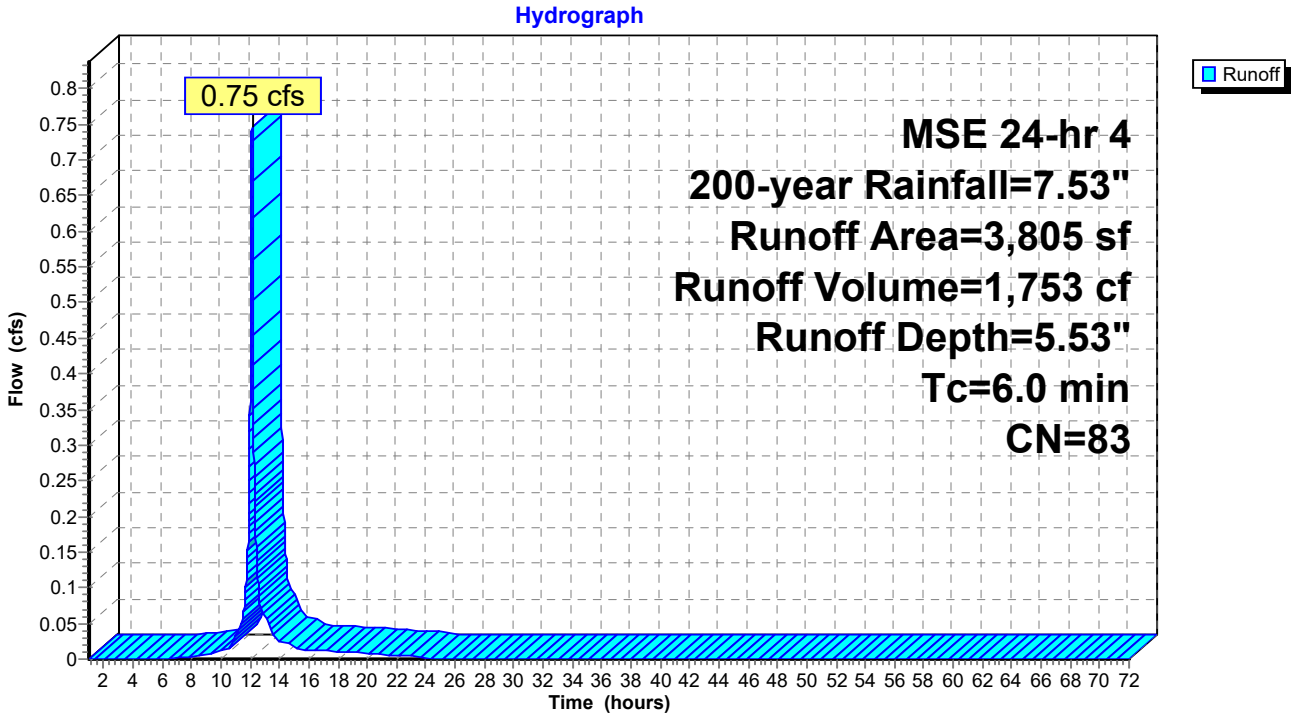
Runoff = 0.75 cfs @ 12.13 hrs, Volume= 1,753 cf, Depth= 5.53"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
	992	98	Paved parking, HSG C
*	367	98	Sidewalk, HSG C
*	2,194	74	Permeable Pavers, HSG C
	252	86	<50% Grass cover, Poor, HSG C
	3,805	83	Weighted Average
	2,446		64.28% Pervious Area
	1,359		35.72% Impervious Area

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

Subcatchment P3: Captured to Permeable Pavers South



Summary for Subcatchment P4: Captured to Permeable Pavers Northwest

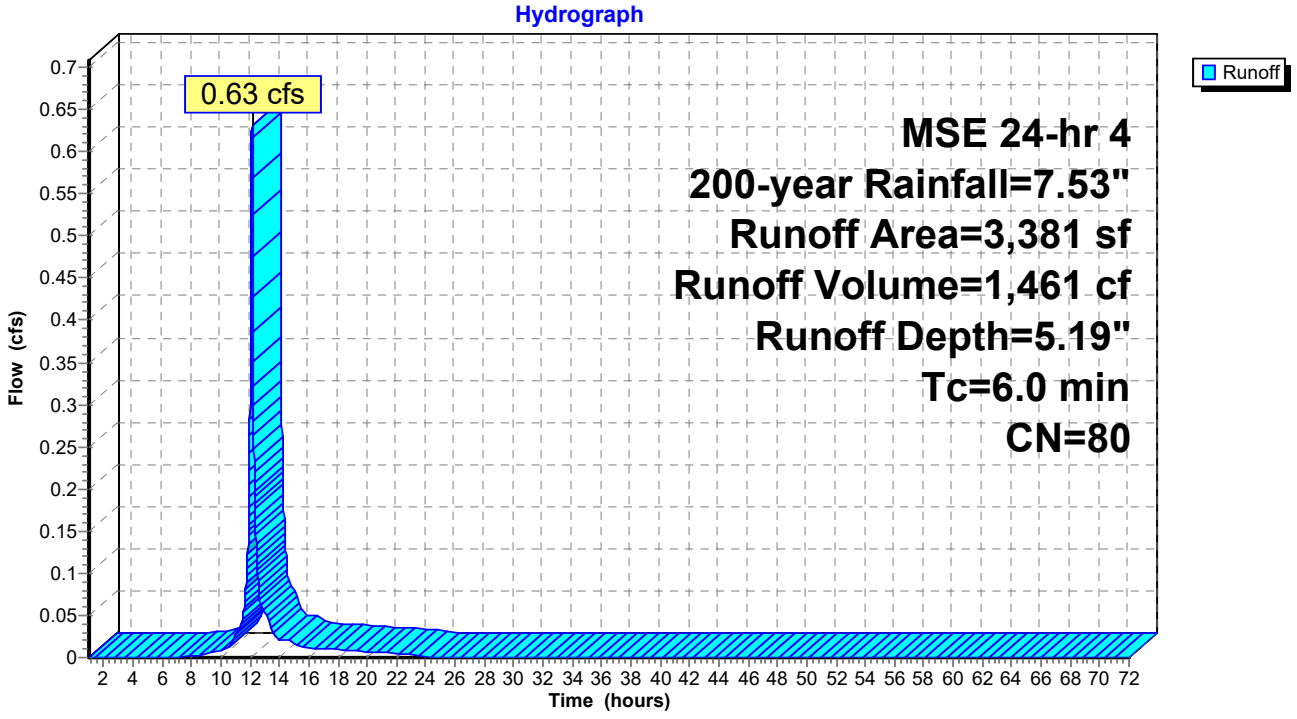
Runoff = 0.63 cfs @ 12.13 hrs, Volume= 1,461 cf, Depth= 5.19"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	262	98	Sidewalk, HSG C
*	1,973	74	Permeable Pavers, HSG C
	1,146	86	<50% Grass cover, Poor, HSG C
	3,381	80	Weighted Average
	3,119		92.25% Pervious Area
	262		7.75% Impervious Area

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

Subcatchment P4: Captured to Permeable Pavers Northwest



Summary for Subcatchment P5: Captured to Permeable Paver Northeast

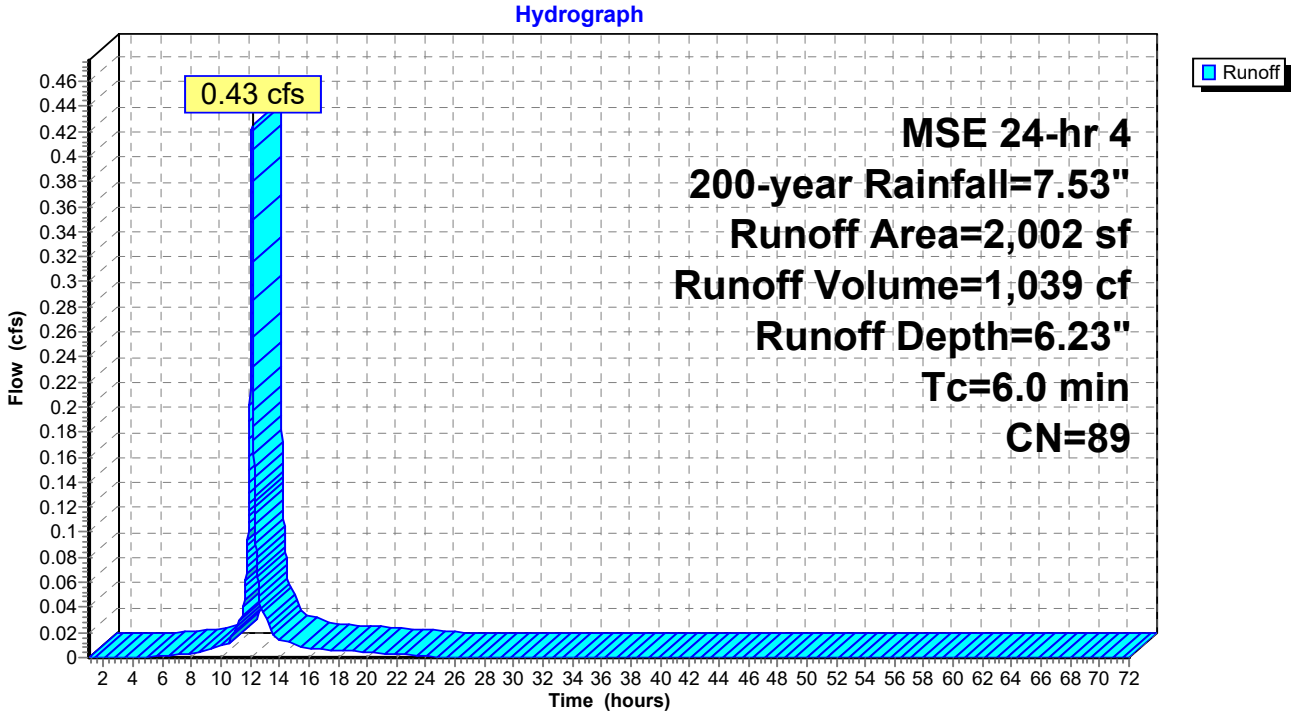
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 1,039 cf, Depth= 6.23"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	958	98	Sidewalk, HSG C
*	521	74	Permeable Pavers, HSG C
	523	86	<50% Grass cover, Poor, HSG C
	2,002	89	Weighted Average
	1,044		52.15% Pervious Area
	958		47.85% Impervious Area

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

Subcatchment P5: Captured to Permeable Paver Northeast



Summary for Subcatchment P6: Uncaptured East

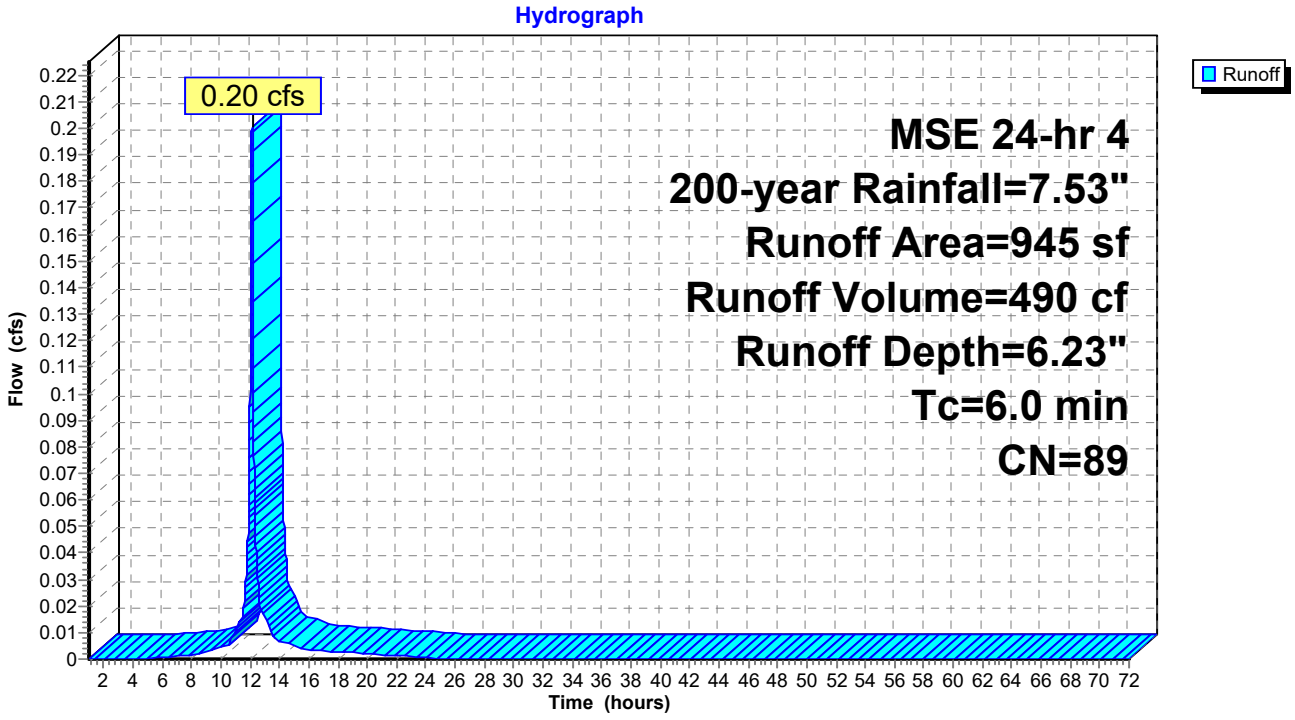
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 490 cf, Depth= 6.23"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	214	98	Sidewalk, HSG C
	731	86	<50% Grass cover, Poor, HSG C
	945	89	Weighted Average
	731		77.35% Pervious Area
	214		22.65% Impervious Area

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

Subcatchment P6: Uncaptured East



Summary for Subcatchment P7: Uncaptured South

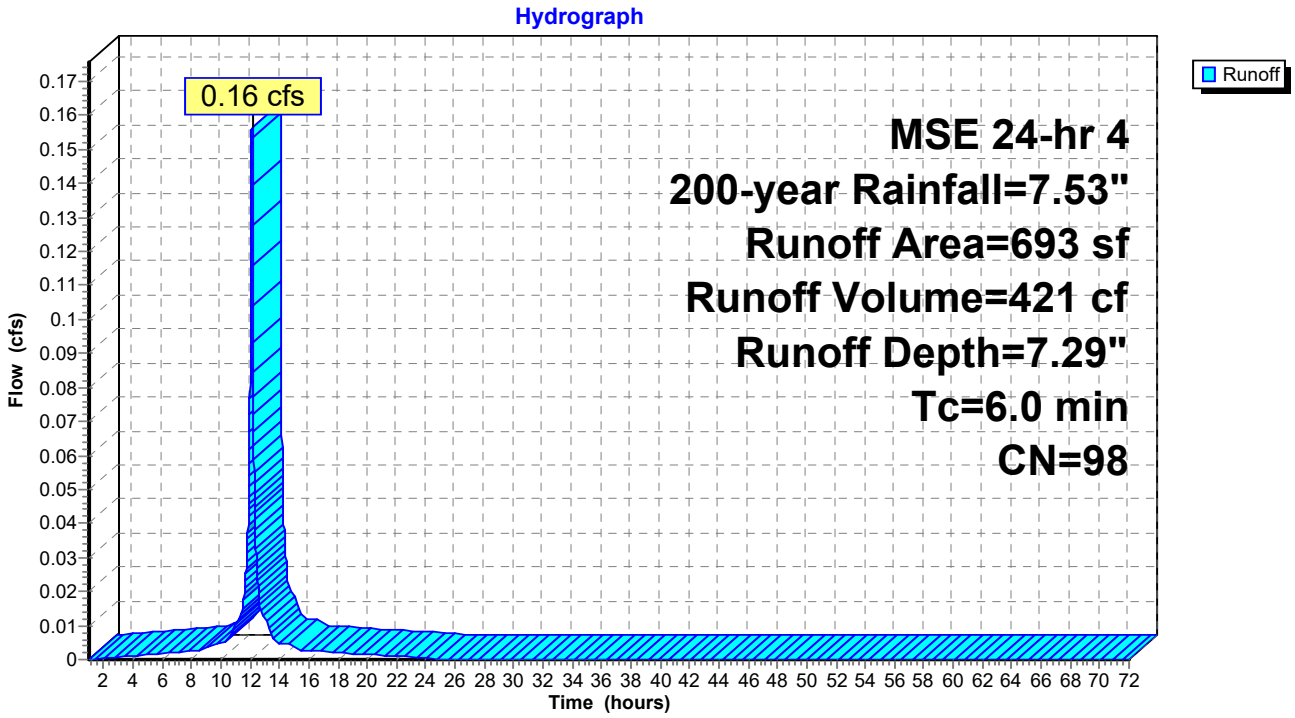
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 421 cf, Depth= 7.29"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
	635	98	Paved parking, HSG C
*	58	98	Sidewalk, HSG C
	693	98	Weighted Average
	693		100.00% Impervious Area

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

Subcatchment P7: Uncaptured South



Summary for Subcatchment P8: Uncaptured West

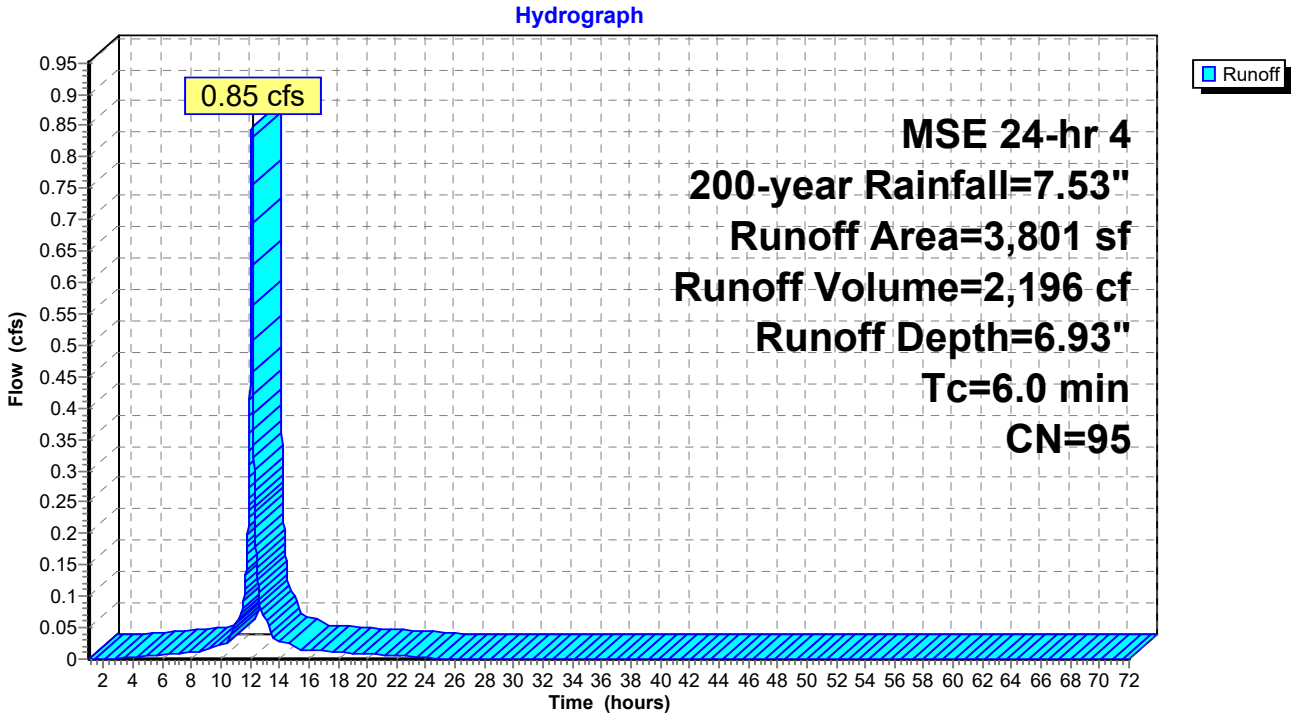
Runoff = 0.85 cfs @ 12.13 hrs, Volume= 2,196 cf, Depth= 6.93"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	2,979	98	Sidewalk, HSG C
	822	86	<50% Grass cover, Poor, HSG C
	3,801	95	Weighted Average
	822		21.63% Pervious Area
	2,979		78.37% Impervious Area

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

Subcatchment P8: Uncaptured West



Summary for Pond UGD: ACO Storm Brix - HD

[93] Warning: Storage range exceeded by 4.96'

Inflow Area = 36,525 sf, 69.01% Impervious, Inflow Depth = 6.31" for 200-year event
Inflow = 7.80 cfs @ 12.13 hrs, Volume= 19,202 cf
Outflow = 7.77 cfs @ 12.17 hrs, Volume= 19,202 cf, Atten= 0%, Lag= 2.4 min
Discarded = 0.09 cfs @ 9.23 hrs, Volume= 6,052 cf
Primary = 7.68 cfs @ 12.17 hrs, Volume= 13,150 cf
Routed to Link TPO : Total Proposed Outfall

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 866.34' @ 12.17 hrs Surf.Area= 1,101 sf Storage= 3,232 cf

Plug-Flow detention time= 41.3 min calculated for 19,199 cf (100% of inflow)
Center-of-Mass det. time= 41.3 min (813.4 - 772.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	855.38'	2,219 cf	**7.95'W x 138.42'L x 6.01'H Field A** 6,614 cf Overall - 1,067 cf Embedded = 5,547 cf x 40.0% Voids
#2A	857.38'	1,014 cf	**ACO StormBrixx HD 1** x 68 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 68 Chambers in 2 Rows
		3,232 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	855.38'	**3.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	857.38'	**12.0" Round Culvert** L= 17.2' Ke= 0.500 Inlet / Outlet Invert= 857.38' / 857.21' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	857.38'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 9.23 hrs HW=855.44' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=7.68 cfs @ 12.17 hrs HW=866.34' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 7.68 cfs of 11.00 cfs potential flow)
↑**3=Orifice/Grate** (Orifice Controls 7.68 cfs @ 14.08 fps)

Pond UGD: ACO Storm Brix - HD - Chamber Wizard Field A

Chamber Model = ACO StormBrixx HD 1 (ACO StormBrixx® HD)
Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf
Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf

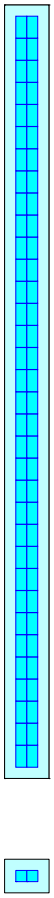
34 Chambers/Row x 3.95' Long = 134.42' Row Length +24.0" End Stone x 2 = 138.42' Base Length
2 Rows x 23.7" Wide + 24.0" Side Stone x 2 = 7.95' Base Width
24.0" Stone Base + 24.1" Chamber Height + 24.0" Stone Cover = 6.01' Field Height

68 Chambers x 14.9 cf = 1,013.6 cf Chamber Storage
68 Chambers x 15.7 cf = 1,067.0 cf Displacement

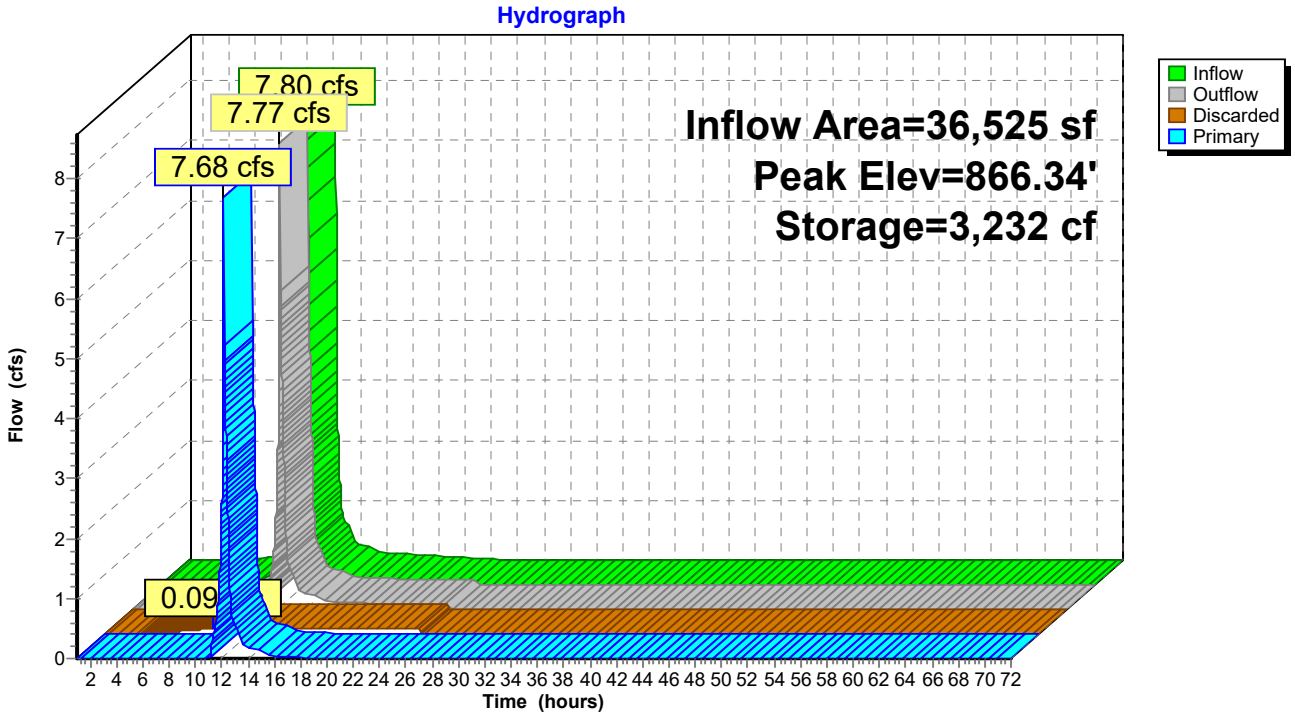
6,613.9 cf Field - 1,067.0 cf Chambers = 5,547.0 cf Stone x 40.0% Voids = 2,218.8 cf Stone Storage

Chamber Storage + Stone Storage = 3,232.4 cf = 0.074 af
Overall Storage Efficiency = 48.9%
Overall System Size = 138.42' x 7.95' x 6.01'

68 Chambers
245.0 cy Field
205.4 cy Stone



Pond UGD: ACO Storm Brix - HD

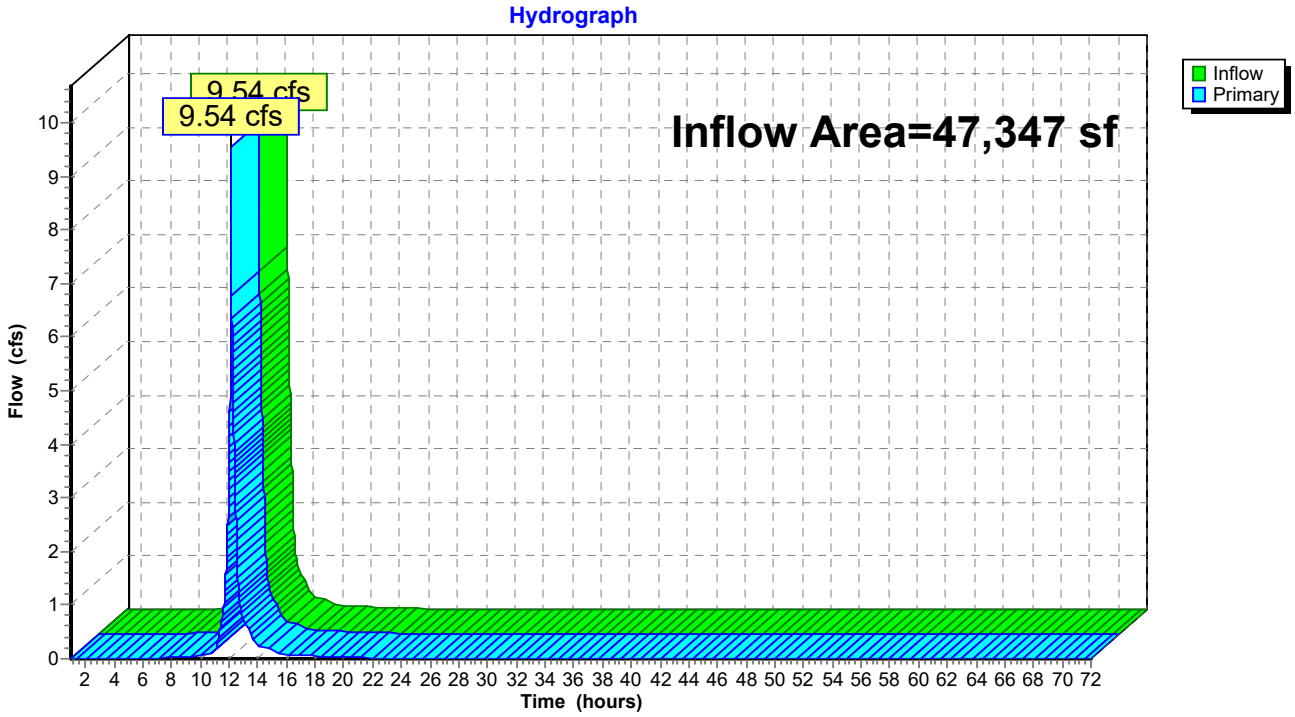


Summary for Link TPO: Total Proposed Outfall

Inflow Area = 47,347 sf, 64.02% Impervious, Inflow Depth = 4.75" for 200-year event
Inflow = 9.54 cfs @ 12.17 hrs, Volume= 18,758 cf
Primary = 9.54 cfs @ 12.17 hrs, Volume= 18,758 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link TPO: Total Proposed Outfall



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment P1: Proposed Building Runoff Area=31,557 sf 75.29% Impervious Runoff Depth=7.85"
Tc=6.0 min CN=91 Runoff=8.22 cfs 20,653 cf

Subcatchment P2: Captured to Underground Runoff Area=1,163 sf 7.39% Impervious Runoff Depth=6.02"
Tc=6.0 min CN=76 Runoff=0.25 cfs 583 cf

Subcatchment P3: Captured to Permeable Runoff Area=3,805 sf 35.72% Impervious Runoff Depth=6.88"
Tc=6.0 min CN=83 Runoff=0.92 cfs 2,181 cf

Subcatchment P4: Captured to Permeable Runoff Area=3,381 sf 7.75% Impervious Runoff Depth=6.51"
Tc=6.0 min CN=80 Runoff=0.78 cfs 1,835 cf

Subcatchment P5: Captured to Permeable Runoff Area=2,002 sf 47.85% Impervious Runoff Depth=7.61"
Tc=6.0 min CN=89 Runoff=0.51 cfs 1,270 cf

Subcatchment P6: Uncaptured East Runoff Area=945 sf 22.65% Impervious Runoff Depth=7.61"
Tc=6.0 min CN=89 Runoff=0.24 cfs 599 cf

Subcatchment P7: Uncaptured South Runoff Area=693 sf 100.00% Impervious Runoff Depth=8.70"
Tc=6.0 min CN=98 Runoff=0.19 cfs 502 cf

Subcatchment P8: Uncaptured West Runoff Area=3,801 sf 78.37% Impervious Runoff Depth=8.34"
Tc=6.0 min CN=95 Runoff=1.01 cfs 2,641 cf

Pond UGD: ACO Storm Brix - HD Peak Elev=874.22' Storage=3,232 cf Inflow=9.39 cfs 23,418 cf
Discarded=0.09 cfs 6,504 cf Primary=10.64 cfs 16,914 cf Outflow=10.74 cfs 23,418 cf

Link TPO: Total Proposed Outfall Inflow=13.38 cfs 23,761 cf
Primary=13.38 cfs 23,761 cf

Total Runoff Area = 47,347 sf Runoff Volume = 30,265 cf Average Runoff Depth = 7.67"
35.98% Pervious = 17,036 sf 64.02% Impervious = 30,311 sf

Summary for Subcatchment P1: Proposed Building

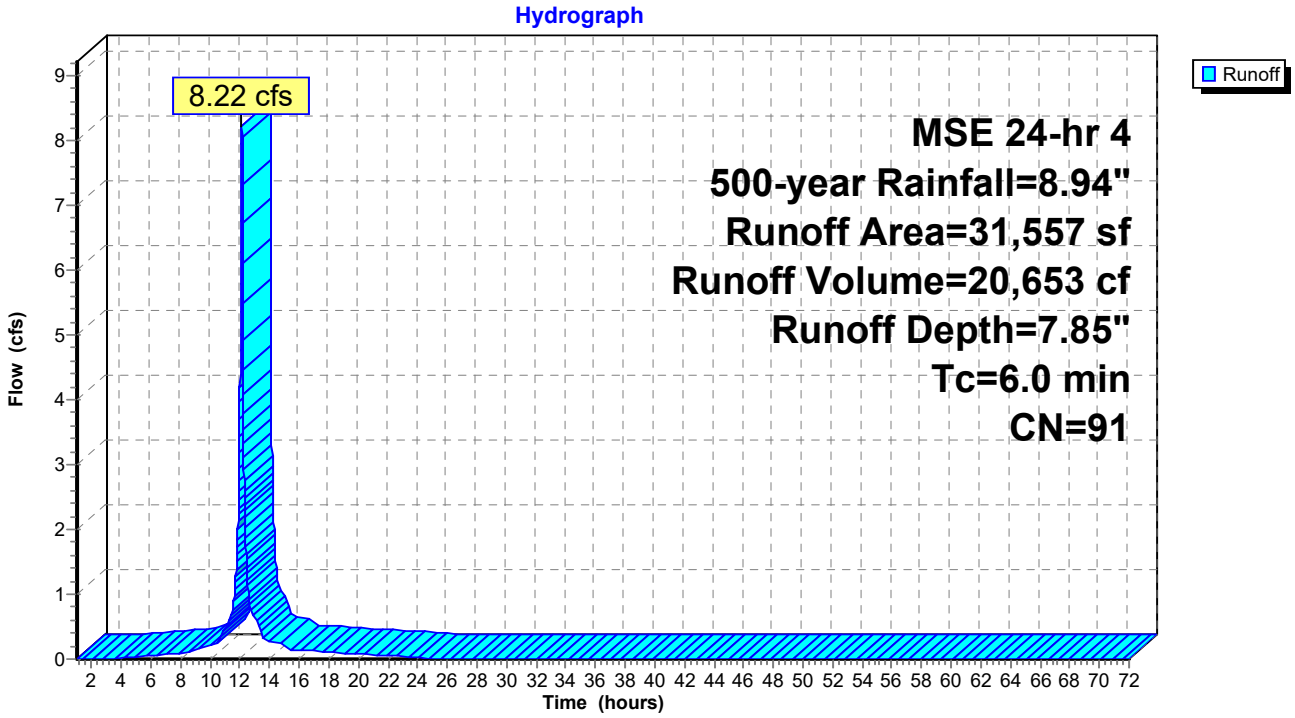
Runoff = 8.22 cfs @ 12.13 hrs, Volume= 20,653 cf, Depth= 7.85"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	23,760	98	Roofs, HSG C
*	7,797	68	Intensive Green Roof
	31,557	91	Weighted Average
	7,797		24.71% Pervious Area
	23,760		75.29% Impervious Area

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

Subcatchment P1: Proposed Building



Summary for Subcatchment P2: Captured to Underground Detention

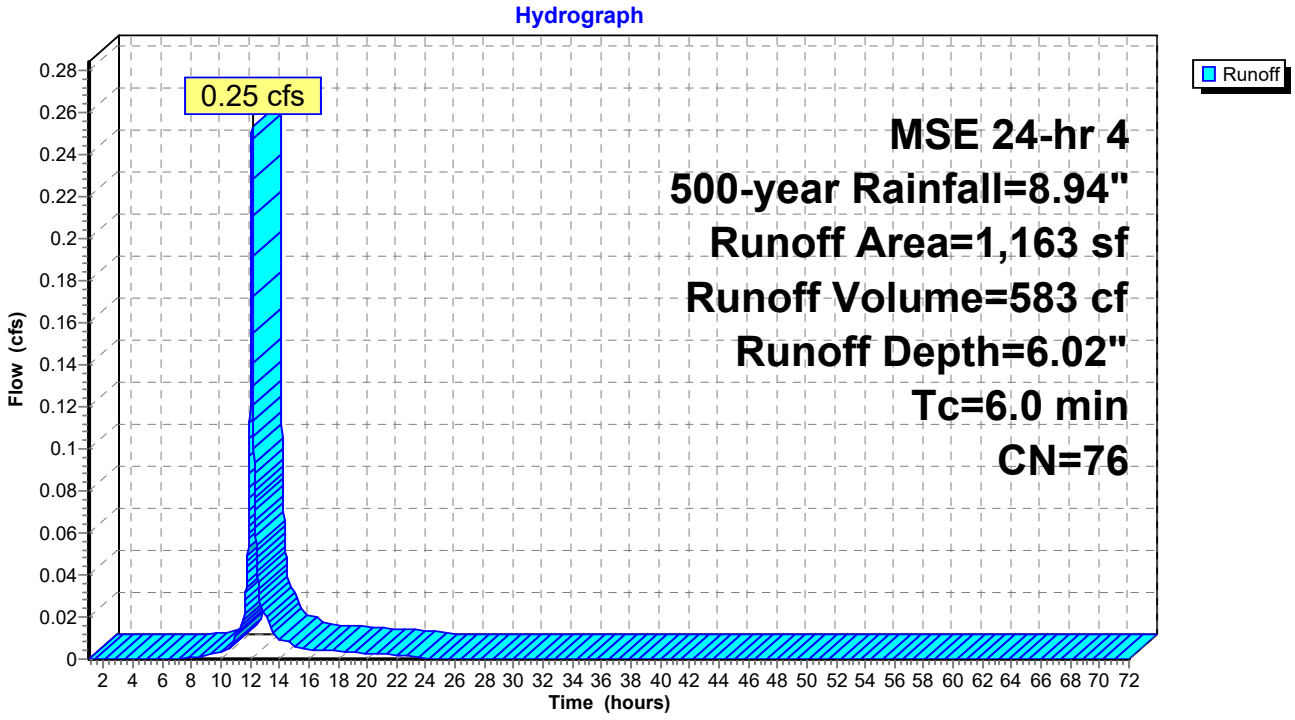
Runoff = 0.25 cfs @ 12.13 hrs, Volume= 583 cf, Depth= 6.02"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	86	98	Sidewalk, HSG C
	1,077	74	>75% Grass cover, Good, HSG C
	1,163	76	Weighted Average
	1,077		92.61% Pervious Area
	86		7.39% Impervious Area

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

Subcatchment P2: Captured to Underground Detention



Summary for Subcatchment P3: Captured to Permeable Pavers South

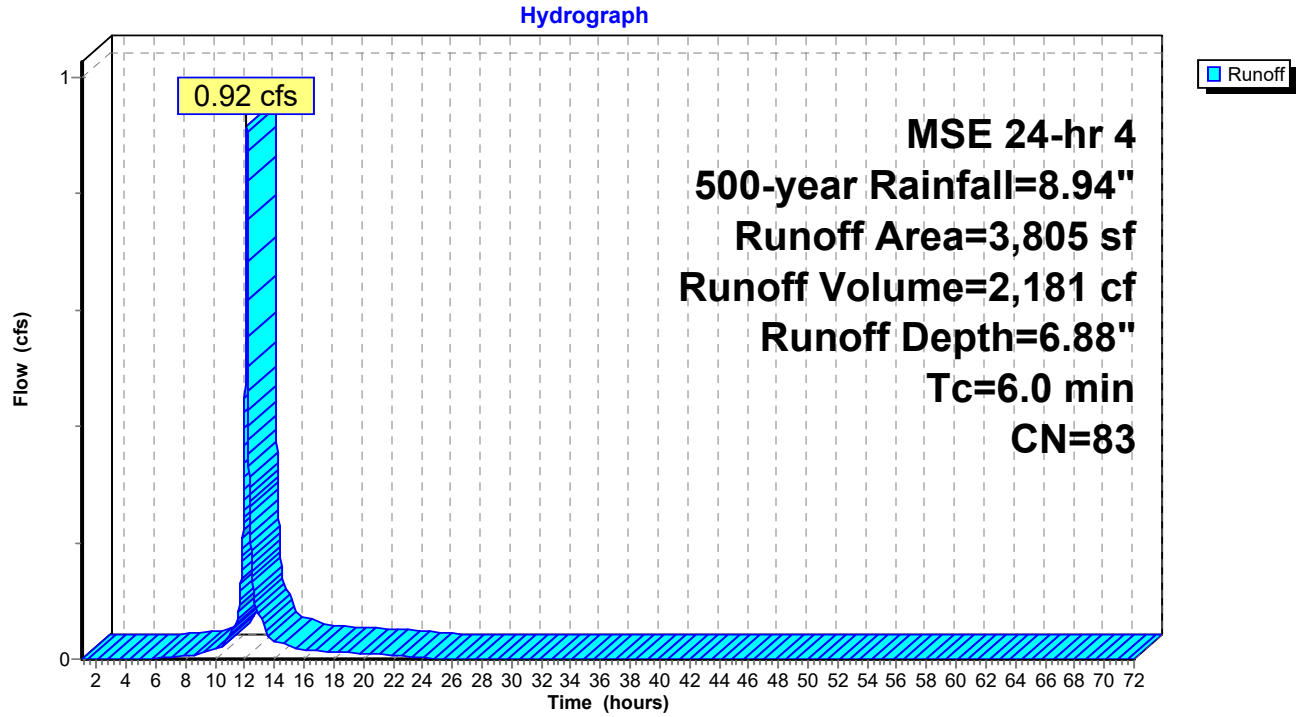
Runoff = 0.92 cfs @ 12.13 hrs, Volume= 2,181 cf, Depth= 6.88"
Routed to Pond UGD : ACO Storm Brix - HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
	992	98	Paved parking, HSG C
*	367	98	Sidewalk, HSG C
*	2,194	74	Permeable Pavers, HSG C
	252	86	<50% Grass cover, Poor, HSG C
	3,805	83	Weighted Average
	2,446		64.28% Pervious Area
	1,359		35.72% Impervious Area

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

Subcatchment P3: Captured to Permeable Pavers South



Summary for Subcatchment P4: Captured to Permeable Pavers Northwest

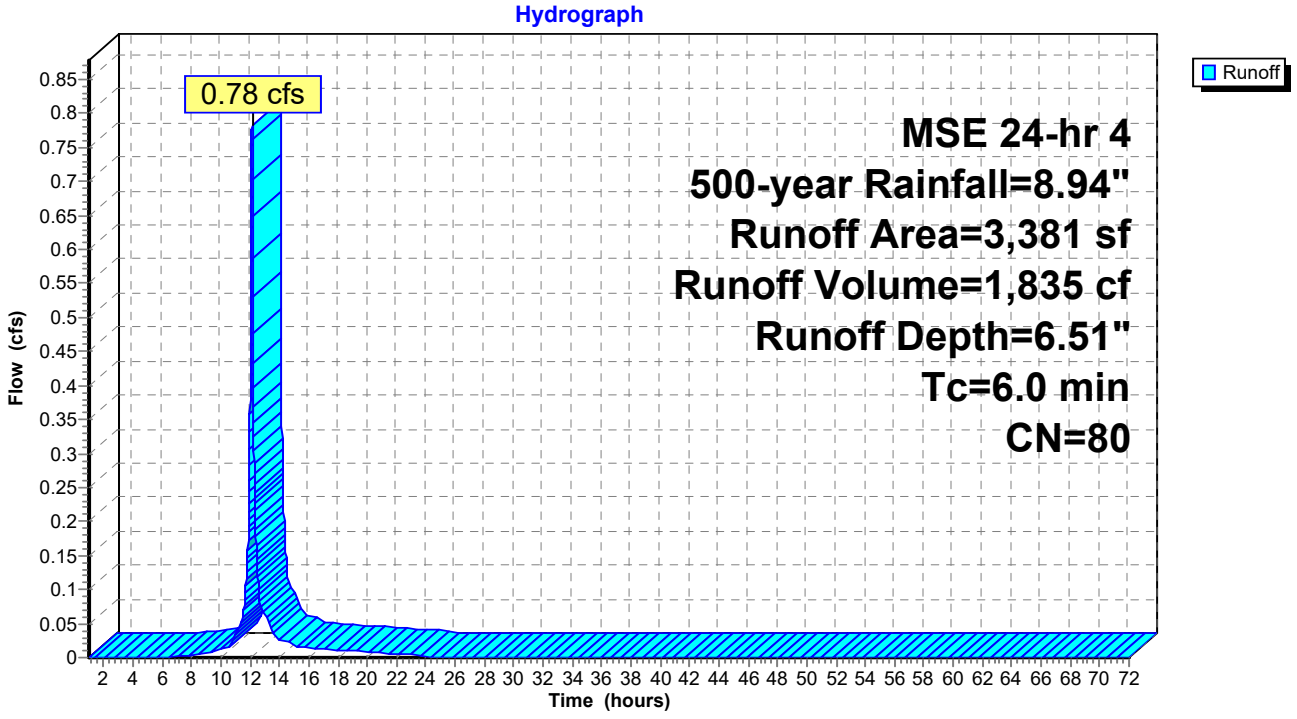
Runoff = 0.78 cfs @ 12.13 hrs, Volume= 1,835 cf, Depth= 6.51"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	262	98	Sidewalk, HSG C
*	1,973	74	Permeable Pavers, HSG C
	1,146	86	<50% Grass cover, Poor, HSG C
	3,381	80	Weighted Average
	3,119		92.25% Pervious Area
	262		7.75% Impervious Area

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

Subcatchment P4: Captured to Permeable Pavers Northwest



Summary for Subcatchment P5: Captured to Permeable Paver Northeast

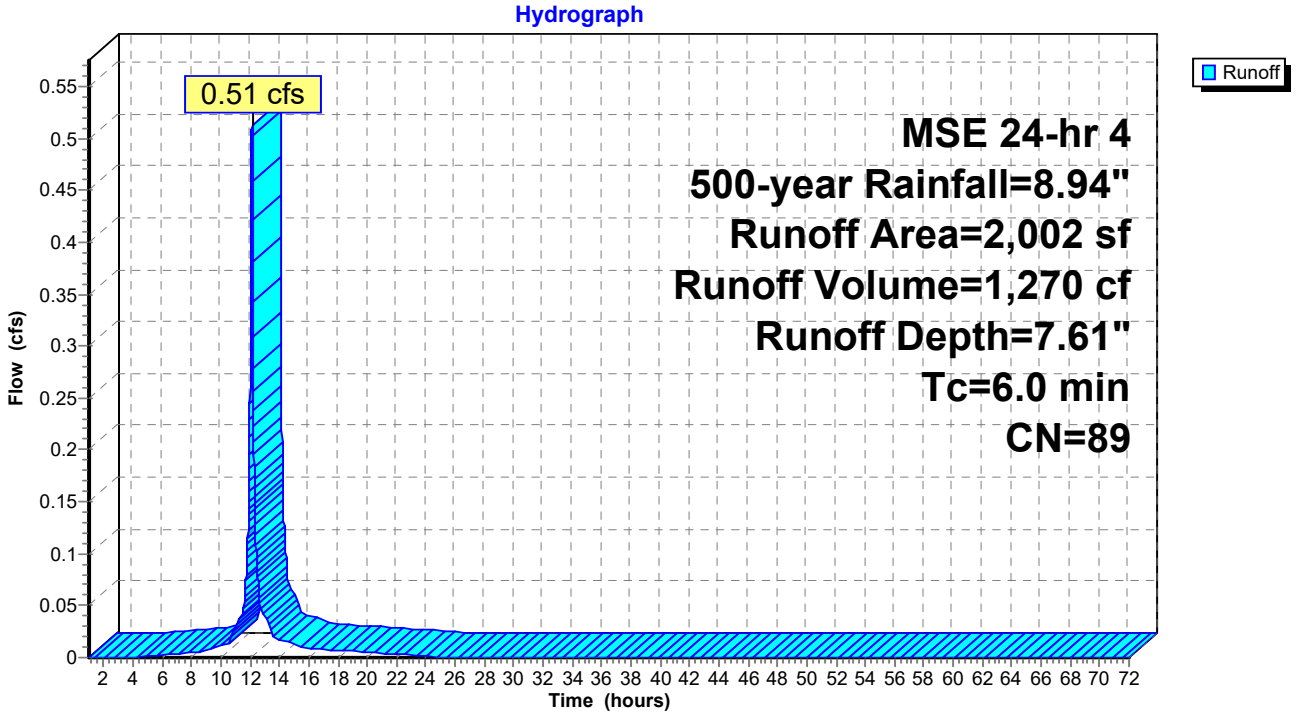
Runoff = 0.51 cfs @ 12.13 hrs, Volume= 1,270 cf, Depth= 7.61"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	958	98	Sidewalk, HSG C
*	521	74	Permeable Pavers, HSG C
	523	86	<50% Grass cover, Poor, HSG C
	2,002	89	Weighted Average
	1,044		52.15% Pervious Area
	958		47.85% Impervious Area

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

Subcatchment P5: Captured to Permeable Paver Northeast



Summary for Subcatchment P6: Uncaptured East

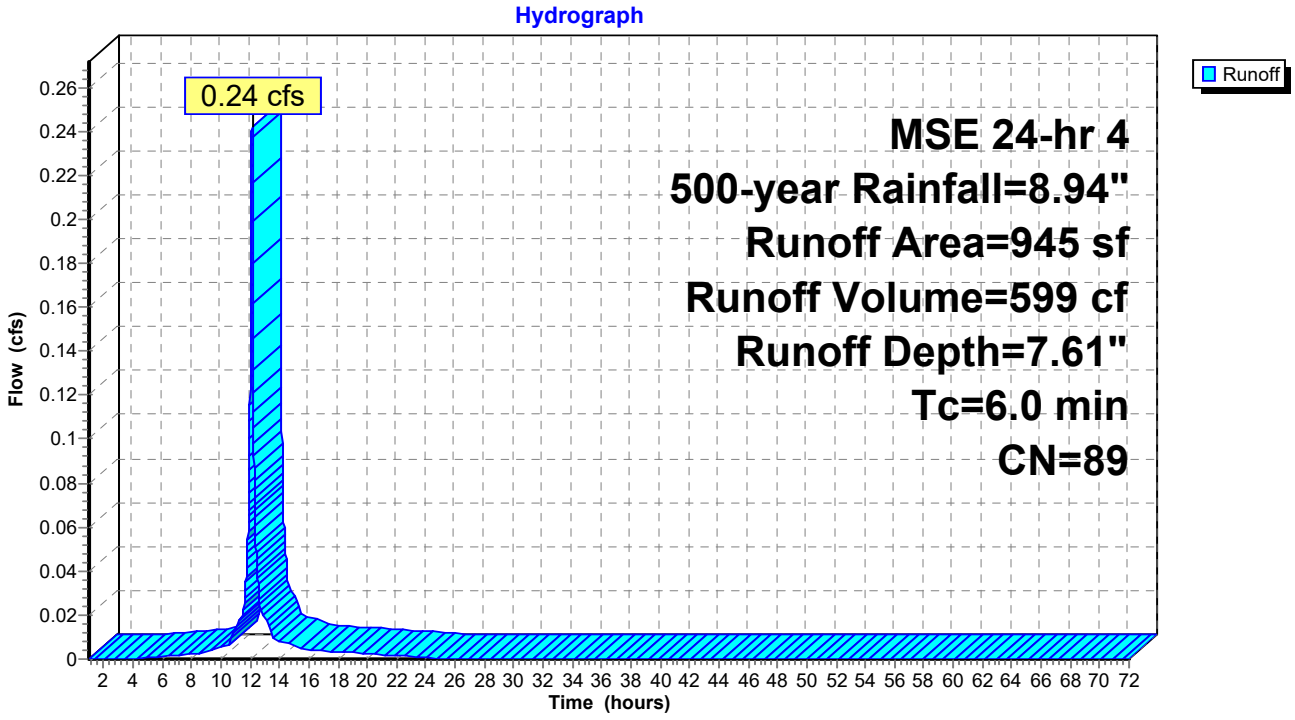
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 599 cf, Depth= 7.61"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	214	98	Sidewalk, HSG C
	731	86	<50% Grass cover, Poor, HSG C
	945	89	Weighted Average
	731		77.35% Pervious Area
	214		22.65% Impervious Area

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

Subcatchment P6: Uncaptured East



Summary for Subcatchment P7: Uncaptured South

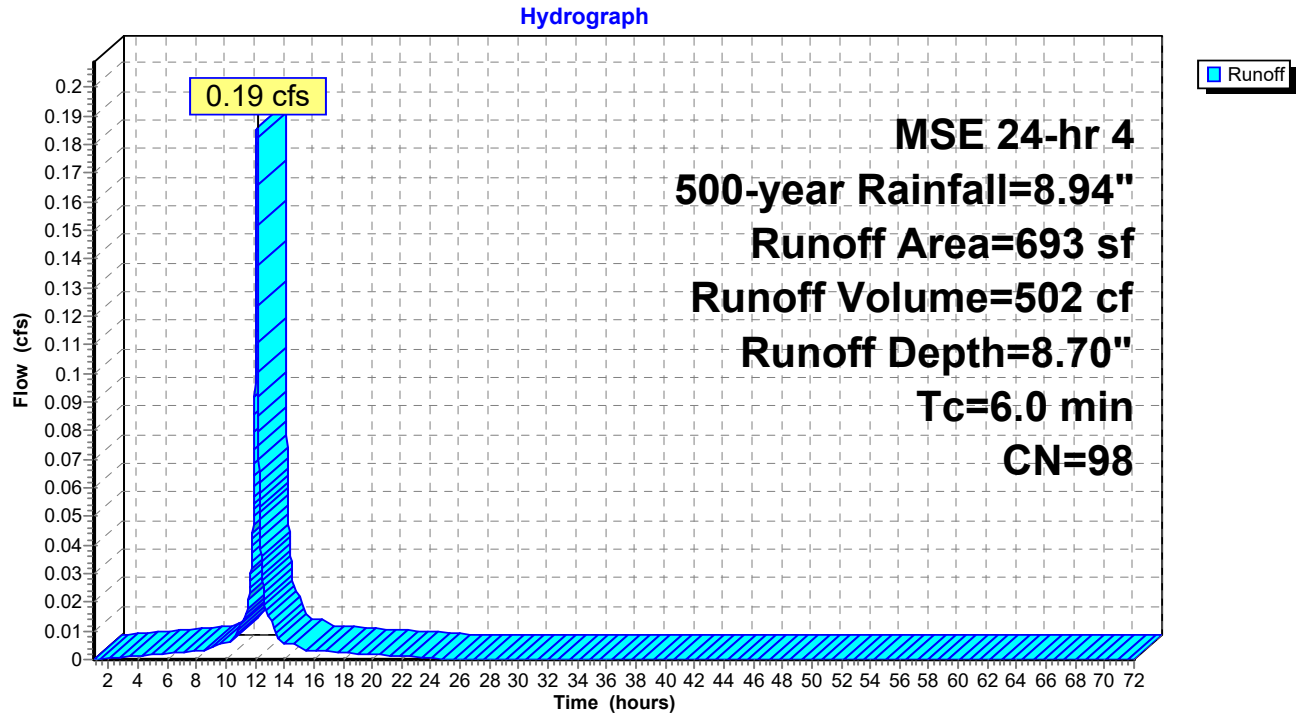
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 502 cf, Depth= 8.70"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
	635	98	Paved parking, HSG C
*	58	98	Sidewalk, HSG C
	693	98	Weighted Average
	693		100.00% Impervious Area

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

Subcatchment P7: Uncaptured South



Summary for Subcatchment P8: Uncaptured West

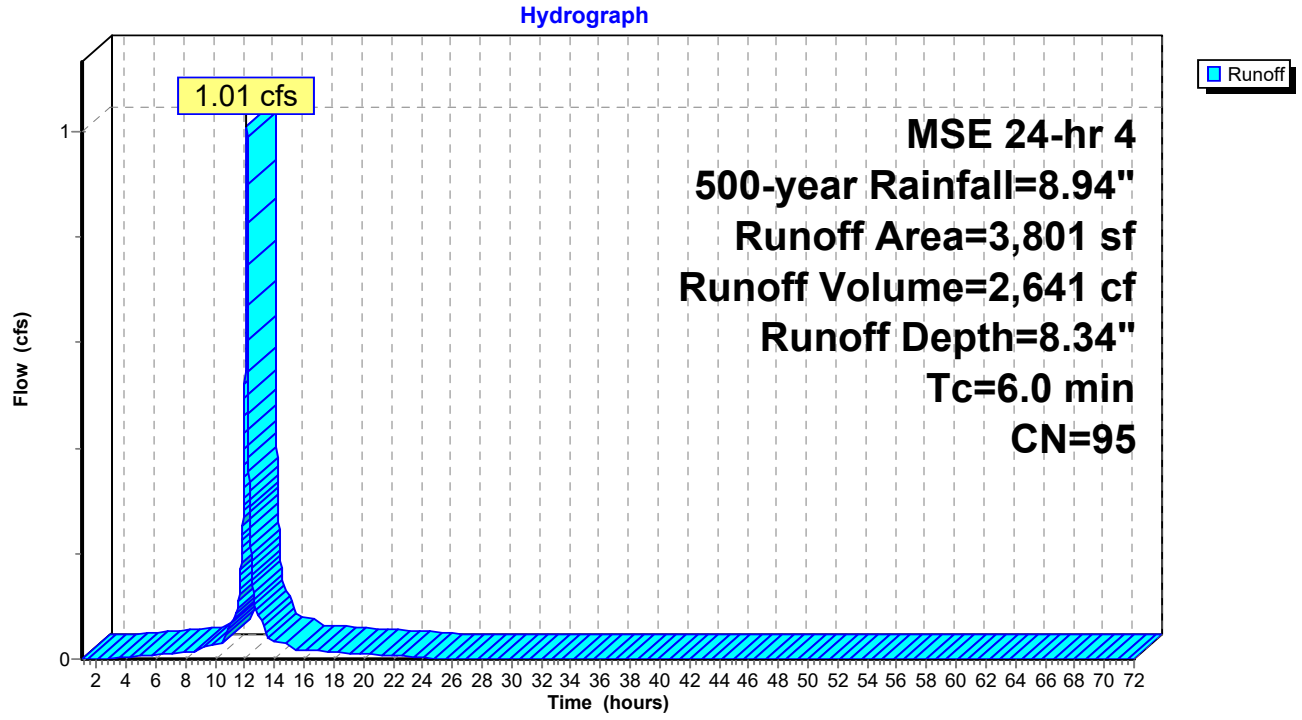
Runoff = 1.01 cfs @ 12.13 hrs, Volume= 2,641 cf, Depth= 8.34"
Routed to Link TPO : Total Proposed Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	2,979	98	Sidewalk, HSG C
	822	86	<50% Grass cover, Poor, HSG C
	3,801	95	Weighted Average
	822		21.63% Pervious Area
	2,979		78.37% Impervious Area

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

Subcatchment P8: Uncaptured West



Summary for Pond UGD: ACO Storm Brix - HD

[93] Warning: Storage range exceeded by 12.83'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 36,525 sf, 69.01% Impervious, Inflow Depth = 7.69" for 500-year event
Inflow = 9.39 cfs @ 12.13 hrs, Volume= 23,418 cf
Outflow = 10.74 cfs @ 12.13 hrs, Volume= 23,418 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.09 cfs @ 8.67 hrs, Volume= 6,504 cf
Primary = 10.64 cfs @ 12.13 hrs, Volume= 16,914 cf
Routed to Link TPO : Total Proposed Outfall

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 874.22' @ 12.13 hrs Surf.Area= 1,101 sf Storage= 3,232 cf

Plug-Flow detention time= 37.6 min calculated for 23,415 cf (100% of inflow)
Center-of-Mass det. time= 37.6 min (805.6 - 768.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	855.38'	2,219 cf	**7.95'W x 138.42'L x 6.01'H Field A** 6,614 cf Overall - 1,067 cf Embedded = 5,547 cf x 40.0% Voids
#2A	857.38'	1,014 cf	**ACO StormBrixx HD 1** x 68 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 68 Chambers in 2 Rows
		3,232 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	855.38'	**3.600 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	857.38'	**12.0" Round Culvert** L= 17.2' Ke= 0.500 Inlet / Outlet Invert= 857.38' / 857.21' S= 0.0099 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	857.38'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.09 cfs @ 8.67 hrs HW=855.44' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=10.64 cfs @ 12.13 hrs HW=874.20' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 10.64 cfs of 15.28 cfs potential flow)
↑**3=Orifice/Grate** (Orifice Controls 10.64 cfs @ 19.50 fps)

Pond UGD: ACO Storm Brix - HD - Chamber Wizard Field A

Chamber Model = ACO StormBrixx HD 1 (ACO StormBrixx® HD)
Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf
Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf

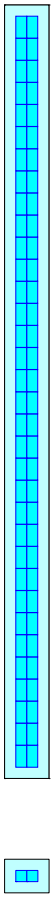
34 Chambers/Row x 3.95' Long = 134.42' Row Length +24.0" End Stone x 2 = 138.42' Base Length
2 Rows x 23.7" Wide + 24.0" Side Stone x 2 = 7.95' Base Width
24.0" Stone Base + 24.1" Chamber Height + 24.0" Stone Cover = 6.01' Field Height

68 Chambers x 14.9 cf = 1,013.6 cf Chamber Storage
68 Chambers x 15.7 cf = 1,067.0 cf Displacement

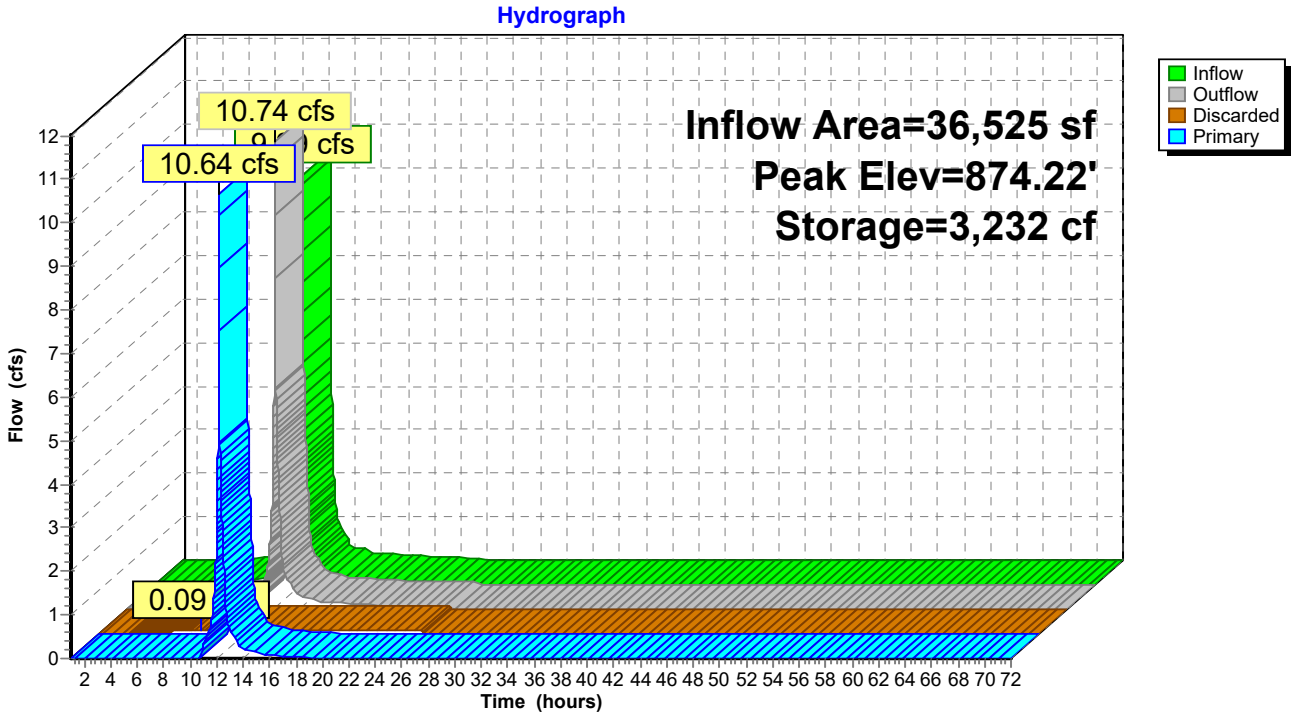
6,613.9 cf Field - 1,067.0 cf Chambers = 5,547.0 cf Stone x 40.0% Voids = 2,218.8 cf Stone Storage

Chamber Storage + Stone Storage = 3,232.4 cf = 0.074 af
Overall Storage Efficiency = 48.9%
Overall System Size = 138.42' x 7.95' x 6.01'

68 Chambers
245.0 cy Field
205.4 cy Stone



Pond UGD: ACO Storm Brix - HD

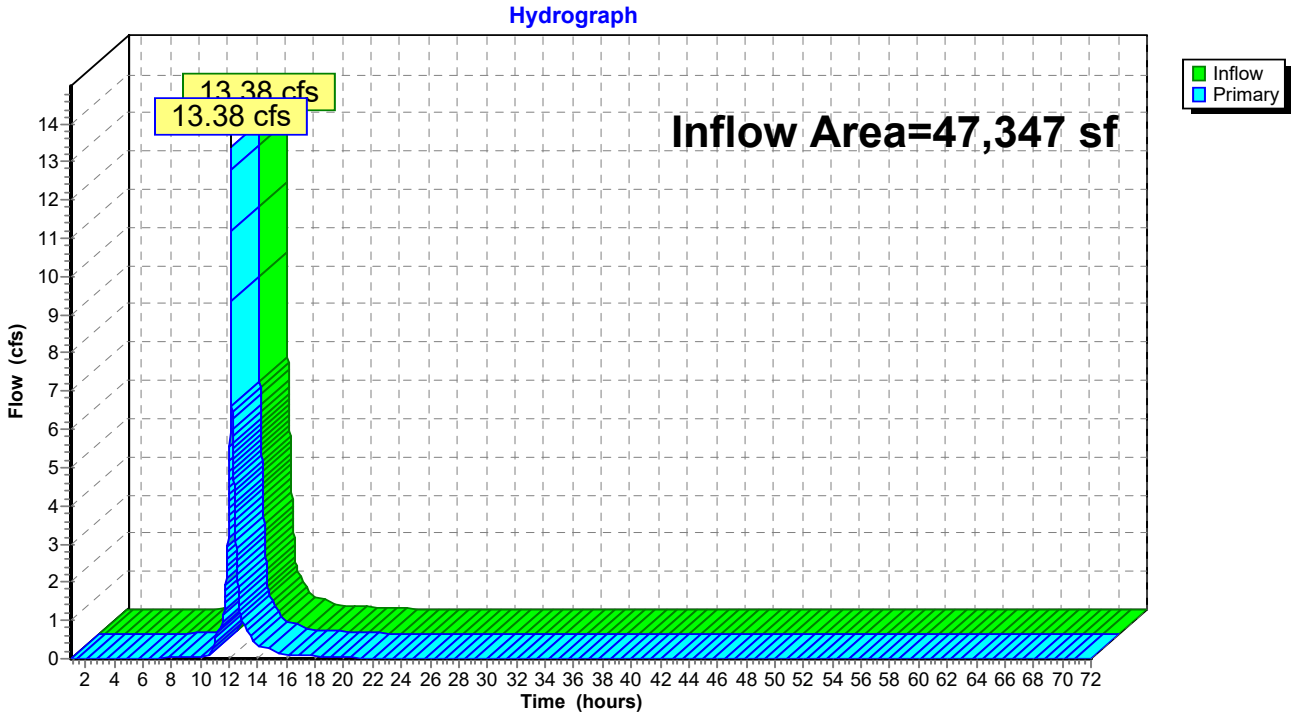


Summary for Link TPO: Total Proposed Outfall

Inflow Area = 47,347 sf, 64.02% Impervious, Inflow Depth = 6.02" for 500-year event
Inflow = 13.38 cfs @ 12.13 hrs, Volume= 23,761 cf
Primary = 13.38 cfs @ 12.13 hrs, Volume= 23,761 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

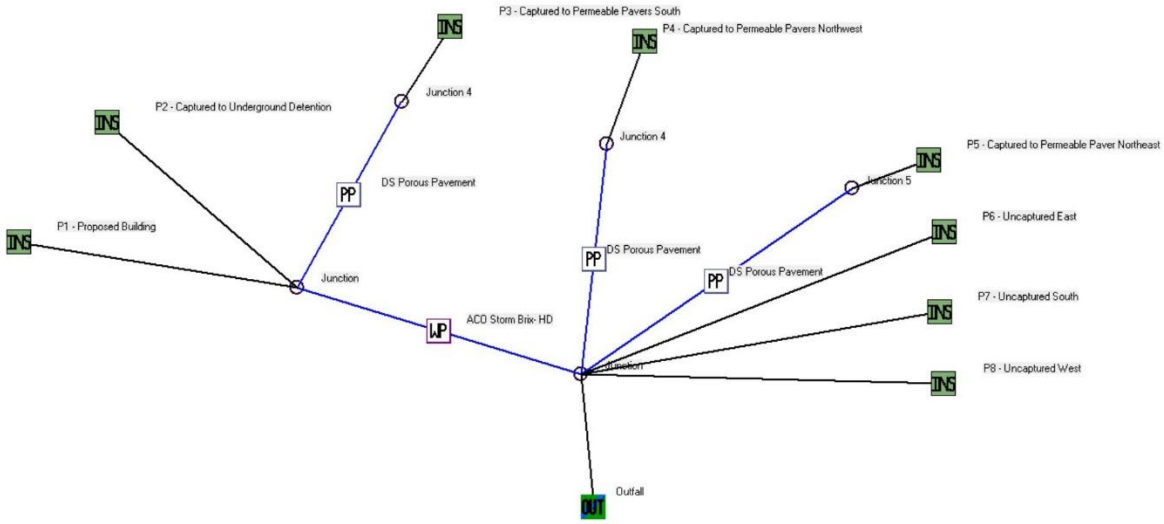
Link TPO: Total Proposed Outfall



Appendix D

SLAMM Analysis

University of Wisconsin Madison – SLAMM Analysis



Input Data:

Data file name: S:_SiteDsgn\Ramlow Stein\210713 20K1G UW Levy Hall\SWMP\WinSLAMM\210713_SLAMM.NEW.mdb
WinSLAMM Version 10.5.0
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: 04-17-2023 Time: 15:25:05
Site information:

Pre-Development Area Description	Pre-Development Area (ac)	Pre-Development CN
Existing	1.090	86
Total Area (ac)/Composite CN	1.090	86

LU# 1 - Institutional: P1 - Proposed Building Total area (ac): 0.730
1 - Roofs 1: 0.550 ac. Flat Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.180 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Institutional: P3 - Captured to Permeable Pavers South Total area (ac): 0.090
13 - Paved Parking 1: 0.020 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
32 - Sidewalks 2: 0.050 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.010 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Institutional: P2 - Captured to Underground Detention Total area (ac): 0.030
31 - Sidewalks 1: 0.010 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
71 - Other Pervious Areas 1: 0.020 ac. Normal Clayey Medium/High Density No Alleys Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Institutional: P5 - Captured to Permeable Paver Northeast Total area (ac): 0.040
31 - Sidewalks 1: 0.020 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
32 - Sidewalks 2: 0.010 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.010 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 5 - Institutional: P4 - Captured to Permeable Pavers Northwest Total area (ac): 0.080
31 - Sidewalks 1: 0.010 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
32 - Sidewalks 2: 0.040 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.030 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 6 - Institutional: P6 - Uncaptured East Total area (ac): 0.020
31 - Sidewalks 1: 0.010 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.010 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 7 - Institutional: P7 - Uncaptured South Total area (ac): 0.020
13 - Paved Parking 1: 0.010 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

LU# 8 - Institutional: P8 - Uncaptured West Total area (ac): 0.080
31 - Sidewalks 1: 0.070 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.010 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Porous Pavement CP# 1 (DS) - DS Porous Pavement
Porous pavement area (ac): 0.05
Inflow hydrograph peak to average flow ratio: 3.8
Porous pavement thickness (in): 2.4
Porous pavement porosity: 0.25
Aggregate bedding thickness (in): 1.5
Aggregate bedding porosity: 0.3
Aggregate base reservoir thickness (in): 12
Aggregate base reservoir porosity: 0.3
Porous pavement surface area to aggregate base area ratio: 1
Underdrain diameter (in): 6
Underdrain outlet invert elevation (inches above datum): 0
Number of underdrains: 1
Subgrade seepage rate (in/hr): 0
Use random number generation to account for uncertainty in seepage rate: 0
Subgrade seepage rate COV: 0
Surface pavement initial infiltration rate (in/hr): 100
Surface Pavement Percent Solids Removal Upon Cleaning: 50
Porous pavement surface clogging load (lbs/sf): 0.6
Porous pavement restorative cleaning frequency: Semi-annually
TSS concentration reduction percentage through underdrain: 65
Porous pavement particle size distribution file name: Not needed - calculated by program

Control Practice 2: Wet Detention Pond CP# 1 (DS) - ACO Storm Brix- HD
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 0.01
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.83
2. Number of orifices: 1
3. Invert elevation above datum (ft): 2

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 0.01
2. Weir crest width (ft): 0.01
3. Height from datum to bottom of weir opening: 3.99

Outlet type: Seepage field

1. Infiltration rate (inches/hr): 3.6
2. Width of device (ft): 7.95
3. Length of device (ft): 138.42
4. Invert elevation of seepage basin inlet above datum (ft): 0

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0101	0.00	0.00
2	1.00	0.0101	0.00	0.00
3	2.00	0.0101	0.00	0.00
4	3.00	0.0168	0.00	0.00
5	4.00	0.0168	0.00	0.00

Control Practice 3: Porous Pavement CP# 2 (DS) - DS Porous Pavement

Porous pavement area (ac): 0.045
Inflow hydrograph peak to average flow ratio: 3.8
Porous pavement thickness (in): 2.4
Porous pavement porosity: 0.25
Aggregate bedding thickness (in): 1.5
Aggregate bedding porosity: 0.3
Aggregate base reservoir thickness (in): 12
Aggregate base reservoir porosity: 0.3
Porous pavement surface area to aggregate base area ratio: 1
Underdrain diameter (in): 6
Underdrain outlet invert elevation (inches above datum): 0
Number of underdrains: 1
Subgrade seepage rate (in/hr): 0
Use random number generation to account for uncertainty in seepage rate: 0
Subgrade seepage rate COV: 0
Surface pavement initial infiltration rate (in/hr): 100
Surface Pavement Percent Solids Removal Upon Cleaning: 50
Porous pavement surface clogging load (lbs/sf): 0.6
Porous pavement restorative cleaning frequency: Semi-annually

TSS concentration reduction percentage through underdrain: 65
Porous pavement particle size distribution file name: Not needed - calculated by program

Control Practice 4: Porous Pavement CP# 3 (DS) - DS Porous Pavement
Porous pavement area (ac): 0.01
Inflow hydrograph peak to average flow ratio: 3.8
Porous pavement thickness (in): 2.4
Porous pavement porosity: 0.25
Aggregate bedding thickness (in): 1.5
Aggregate bedding porosity: 0.3
Aggregate base reservoir thickness (in): 12
Aggregate base reservoir porosity: 0.3
Porous pavement surface area to aggregate base area ratio: 1
Underdrain diameter (in): 6
Underdrain outlet invert elevation (inches above datum): 0
Number of underdrains: 1
Subgrade seepage rate (in/hr): 0
Use random number generation to account for uncertainty in seepage rate: 0
Subgrade seepage rate COV: 0
Surface pavement initial infiltration rate (in/hr): 100
Surface Pavement Percent Solids Removal Upon Cleaning: 50
Porous pavement surface clogging load (lbs/sf): 0.6
Porous pavement restorative cleaning frequency: Semi-annually
TSS concentration reduction percentage through underdrain: 65
Porous pavement particle size distribution file name: Not needed - calculated by program

Output Summary:

SLAMM for Windows Version 10.5.0

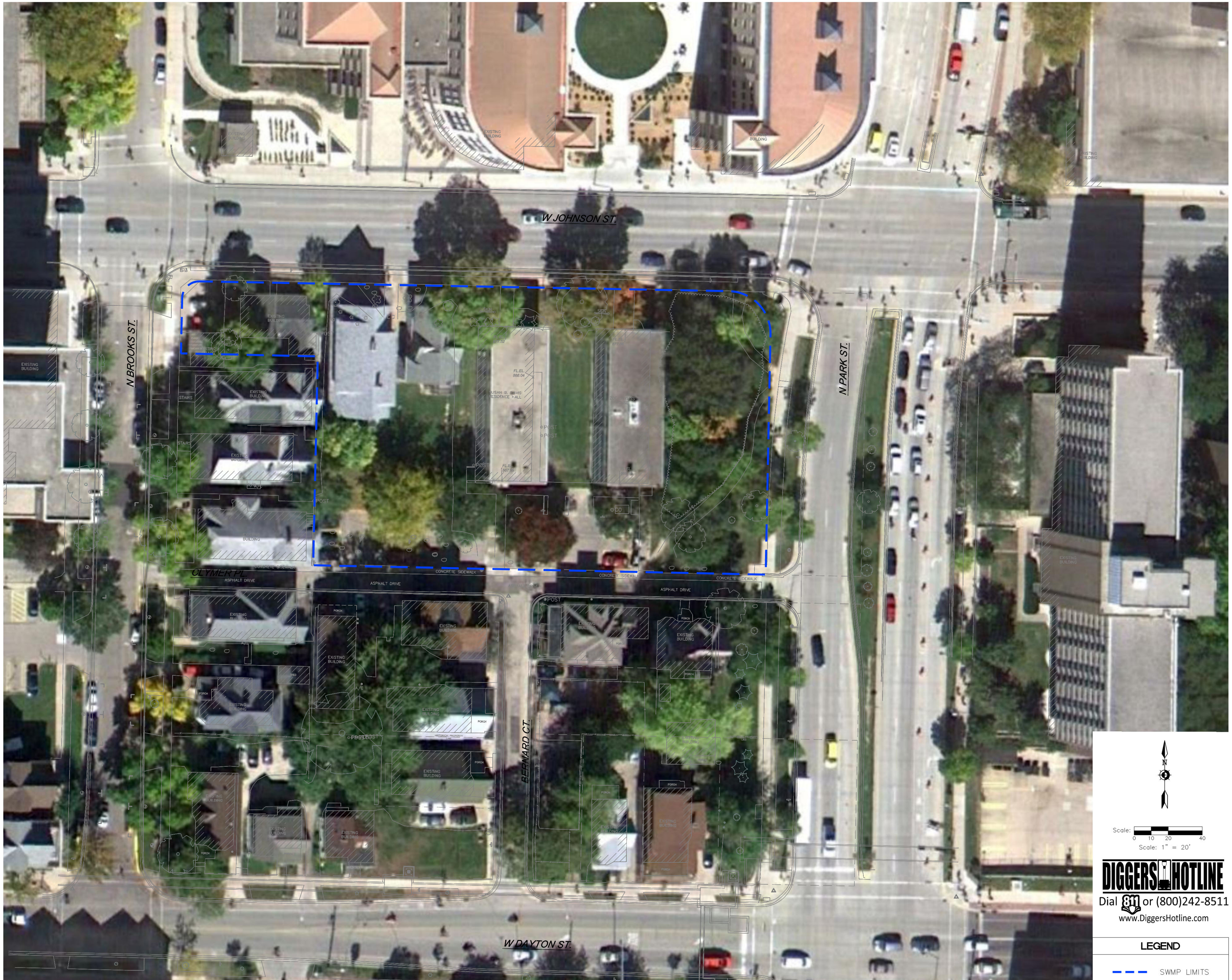
Data file name: S:_SiteDsgn\Ramlow Stein\210713 20K1G UW Levy Hall\SWMP\WinSLAMM\210713_SLAMM.NEW.mdb
Data file description:
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
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
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
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: 04-17-2023 Time of run: 15:28:24
Total Area Modeled (acres): 1.090
Years in Model Run: 1.00

	Runoff Volume	Percent Runoff Volume	Particulate Solids Conc	Particulate Solids Yield	Percent Particulate Solids Reduction
	(cu ft)		(mg/L)	(lbs)	
Total of all Land Uses without Controls:	66342	-	52.91	219.1	-
Outfall Total with Controls:	17859	73.08%	48.24	53.78	75.45%
Annualized Total After Outfall Controls:	17908			53.93	

Pollutants	Concentration – No Controls	Concentration – With Controls	Pollutant Yield No Controls	Pollutant Yield With Controls	Percent Reduction
	(mg/L)	(mg/L)	(lbs)	(lbs)	
Particulate Solids	52.91	48.24	219.1	53.78	75.45%
Total Solids	128.8	126.0	533.6	140.5	73.67%
Particulate Phosphorus	0.2054	0.1254	0.8508	0.1398	83.57%
Total Phosphorus	0.2752	0.2405	1.140	0.2681	76.48%

Appendix E

SWMP-1	**Aerial View of Pre-Developed Site Conditions**
SWMP-2	**Pre-Developed Site Conditions**
SWMP-3	**Post-Developed Site Conditions**
SWMP-4	**Pre-Developed Drainage Conditions**
SWMP-5	**Post-Developed Drainage Conditions**
SWMP-6	**Storm Sewer Sizing Plan**



R/S BORA

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State of Wisconsin
Department of Administration
Division of Facilities Development

232 N. PARK ST.
MADISON, WI 53715

NEW ACADEMIC BUILDING
LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

AERIAL VIEW OF PRE-DEVELOPED SITE CONDITIONS

Scale: 0 10 20 40

Scale: 1" = 20'

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LEGEND

SWMP LIMITS

Graphic Scale	
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	SWMP-1

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SWMP LIMITS

EXISTING PERVIOUS VS. IMPERVIOUS AREAS			
		SQUARE FEET	ACRES
AREA OF SUBJECT SITE (SWMP LIMITS)		47,347 SQUARE FEET	1.09 ACRES
IMPERVIOUS AREAS			
BUILDING / ALTERNATE BUILDING AREA		10,406 SQUARE FEET	0.24 ACRES
DRIVEWAY / ROADWAY AREA		6,592 SQUARE FEET	0.15 ACRES
SIDEWALK / PEDESTRIAN AREAS		4,192 SQUARE FEET	0.1 ACRES
COMPACTED GRAVEL AREAS		1,965 SQUARE FEET	0.05 ACRES
TOTAL EXISTING IMPERVIOUS AREA		23,155 SQUARE FEET	0.54 ACRES
PERVIOUS AREAS			
TOTAL EXISTING PERVIOUS AREA		24,192 SQUARE FEET	0.55 ACRES

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PRELIMINARY
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LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

PRE-DEVELOPED SITE CONDITIONS

Graphic Scale	
DFD Number:	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number:	SWMP-2

Scale: 0 10 20 40
Scale: 1" = 20'

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LEGEND

SWMP LIMITS

PROPOSED PERVIOUS VS. IMPERVIOUS AREAS

	SQUARE FEET	ACRES
AREA OF SUBJECT SITE (SWMP LIMITS)	47,347 SQUARE FEET	1.09 ACRES
IMPERVIOUS AREAS		
BUILDING / ALTERNATE BUILDING AREA	23,760 SQUARE FEET	0.54 ACRES
DRIVEWAY / ROADWAY AREA	1,627 SQUARE FEET	0.04 ACRES
SIDEWALK / PEDESTRIAN AREAS	4,924 SQUARE FEET	0.11 ACRES
PERMEABLE PAVERS AREA	4,688 SQUARE FEET	0.11 ACRES
TOTAL PROPOSED IMPERVIOUS AREA	34,999 SQUARE FEET	0.80 ACRES
PERVIOUS AREAS		
GRASS AREA	4,551 SQUARE FEET	0.11 ACRES
GREEN ROOF AREA	7,797 SQUARE FEET	0.18 ACRES
TOTAL PROPOSED PERVIOUS AREA	12,348 SQUARE FEET	0.29 ACRES

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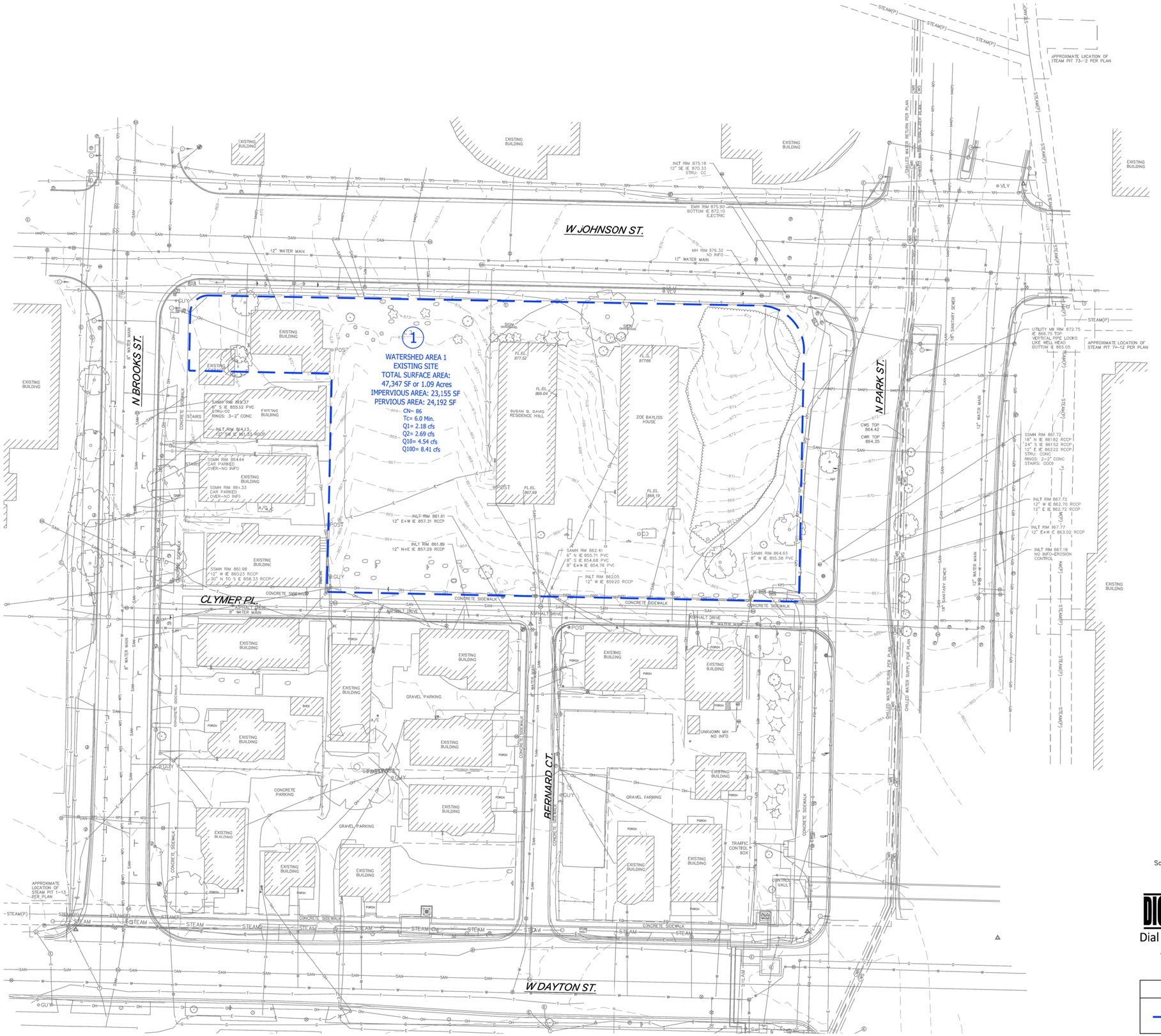
POST DEVELOPED SITE CONDITIONS

Graphic Scale	
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	SWMP-3



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LEGEND	
- - -	SWMP LIMITS

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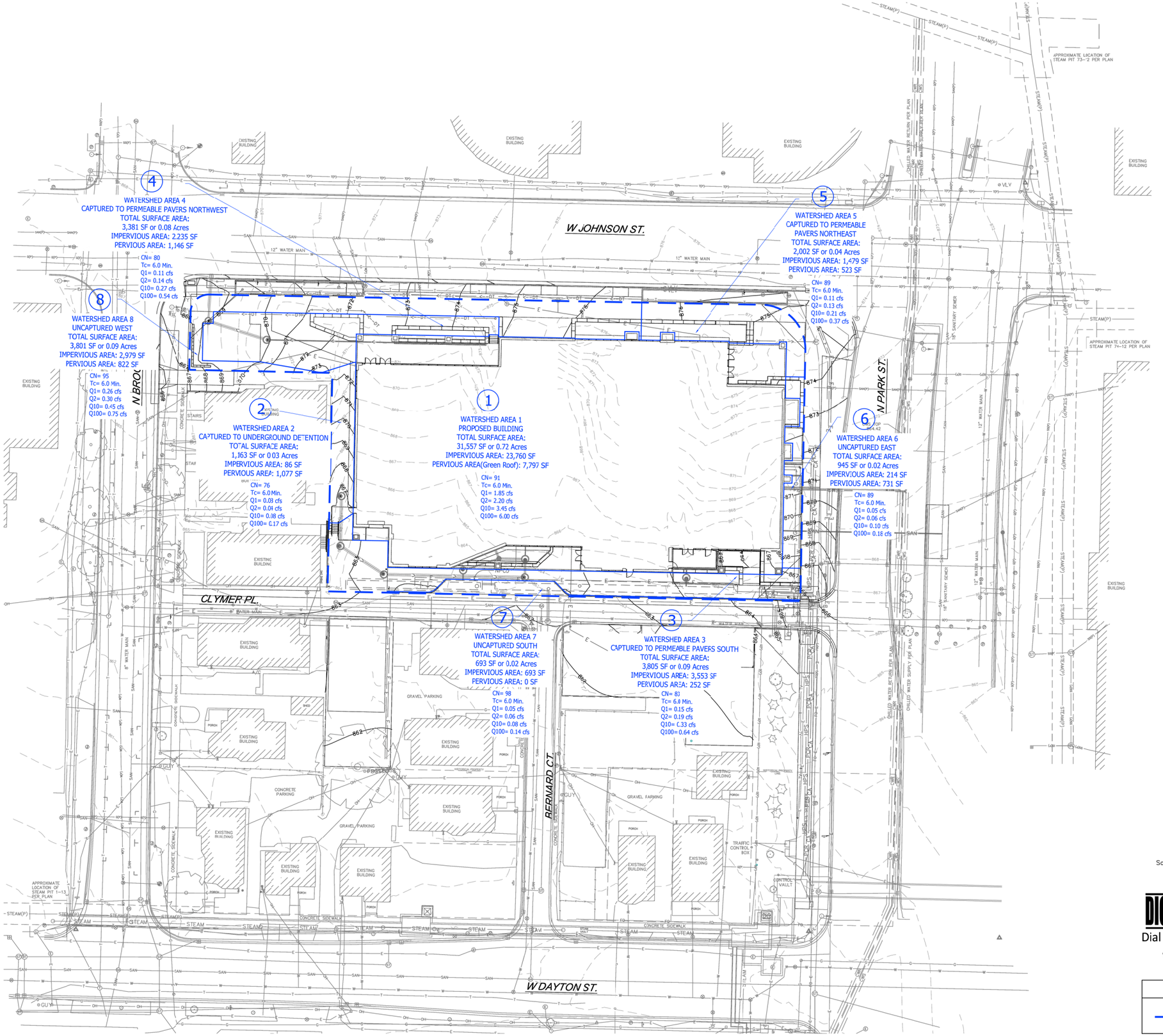
PRE-DEVELOPED SITE DRAINAGE CONDITIONS

Graphic Scale	
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	SWMP-4



Scale: 0 10 20 40
Scale: 1" = 20'

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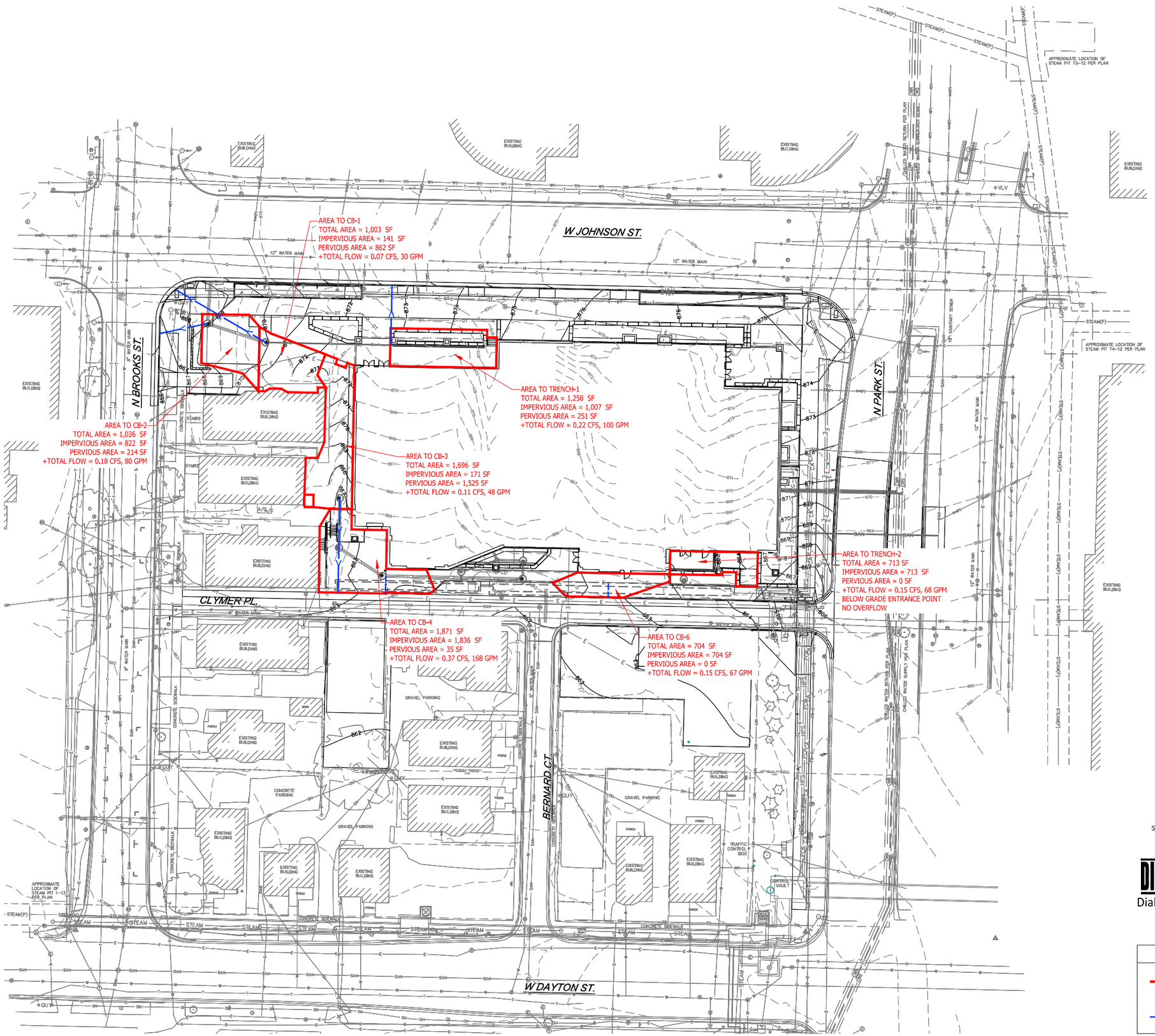
POST DEVELOPED SITE DRAINAGE CONDITIONS

Graphic Scale	
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	SWMP-5



Scale: 0 10 20 40
Scale: 1" = 20'

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LEGEND

- STORM SEWER SIZING LIMIT
- OVERFLOW PATH

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STORM SEWER SIZING PLAN

Graphic Scale	
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	SWMP-6

Appendix F

Civil Engineering Plan Set

GENERAL DEMOLITION NOTES:

1. CONSULT WITH OWNER TO DETERMINE A SAFE STORAGE LOCATION OF ITEMS SPECIFICALLY CALLED OUT TO BE SALVAGED FOR OWNER REUSE. EXERCISE CARE DURING REMOVAL AND TRANSPORT TO PREVENT DAMAGE.
2. THE UNDERGROUND AND OVERHEAD UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN PART, UPON INFORMATION FURNISHED BY UTILITY COMPANIES, LOCAL MUNICIPALITY, PROPERTY OWNER, AND DIGGERS HOTLINE. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED NOR CERTIFIED TO.
3. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS SHALL APPLY FOR AND OBTAIN ALL THEIR REQUIRED PERMITS AND APPROVALS PRIOR TO THE START OF THEIR WORK. GENERAL CONTRACTOR TO CONSULT WITH AND OBTAIN FROM ENGINEER COPIES OF ENGINEERING DESIGN APPROVAL PERMITS, INCLUDING BUT NOT LIMITED TO WDNR, STATE OR LOCAL PLUMBING, AND STORM WATER MANAGEMENT.
4. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS SHALL CONTACT DIGGER'S HOTLINE TO ALLOW THEM SUFFICIENT TIME TO LOCATE EXISTING UTILITIES PRIOR TO COMMENCEMENT OF WORK.
5. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR COORDINATING THEIR WORK WITH ALL OTHER CONTRACTORS.
6. FOR ALL WORK, GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR REVIEWING BID DOCUMENTS, VERIFYING THE VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES WITHIN THE PROJECT LIMITS.
7. GENERAL CONTRACTOR SHALL MAINTAIN ANY EXISTING DRAINAGE PATTERNS ONCE STRUCTURES ARE REMOVED UNTIL THE PROPOSED STRUCTURES ARE FULLY INSTALLED AND OPERATIONAL.
8. CONTACT UW-MADISON CAMPUS REPRESENTATIVE A MINIMUM OF 5 DAYS PRIOR TO ANTICIPATED VEGETATION REMOVALS TO PROVIDE CAMPUS GROUNDS THE OPPORTUNITY TO TRANSPLANT ANY EXISTING VEGETATION ON SITE.
9. THE STATE, UNDER SEPARATE CONTRACT WILL REMOVE ALL REGULATED ASBESTOS CONTAINING MATERIAL (RACM), AND ASBESTOS CONTAINING FLOORING FROM THE BUILDINGS PRIOR TO DEMOLITION. CATEGORY I NON-FRIABLE ACM DOES NOT NEED TO BE REMOVED FROM A BUILDING PRIOR TO DEMOLITION IF THE WASTE GENERATED FROM THE DEMOLITION IS TAKEN TO A DNR APPROVED C & D WASTE LANDFILL. IF THE CONTRACTOR CHOOSES TO RECYCLE BUILDING MATERIALS FROM A BUILDING TO BE DEMOLISHED, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL CATEGORY I NON-FRIABLE ACM IN ACCORDANCE WITH APPLICABLE REGULATIONS PRIOR TO DEMOLITION. IF THE CONTRACTOR'S DEMOLITION METHODS WILL CAUSE NON-FRIABLE ACM TO BECOME FRIABLE, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL CATEGORY I NON-FRIABLE ACM IN ACCORDANCE WITH APPLICABLE REGULATIONS PRIOR TO DEMOLITION. REFER TO GENERAL REQUIREMENTS, ARTICLE 5 FOR ASBESTOS TESTING INFORMATION. UNLESS OTHERWISE INDICATED, ALL CAULKING, SEALANTS, GLAZING COMPOUNDS, GASKETS, ASPHALT ROOFING MATERIALS, DAMP PROOFING AND MISCELLANEOUS ADHESIVES ARE ASSUMED TO CONTAIN ASBESTOS AND ARE CONSIDERED TO BE CATEGORY I NON-FRIABLE ACM AS DEFINED IN NR 447.
10. DEMOLITION, ABATEMENT, INCLUDING UTILITY DISCONNECTS OF EXISTING STRUCTURES LOCATED AT 911 & 923 CLYMER PLACE AND 209 BERNARD COURT TO BE HANDLED UNDER SEPARATE DFD PROJECT #20K1G-02. ANTICIPATED NOTICE TO PROCEED FOR -02 PROJECT IS JANUARY 3, 2024. ESTIMATED PROJECT COMPLETION DATE IS APRIL 1, 2024.
11. 20K1G-01 GENERAL CONTRACTOR TO PROVIDE 20K1G-02 CONTRACTOR ACCESS TO 911 & 923 CLYMER PLACE AND 209 BERNARD COURT BEGINNING JANUARY 3, 2024. -01 GENERAL CONTRACTOR AND -02 CONTRACTOR TO COORDINATE CONSTRUCTION FENCE ADJUSTMENTS NEEDED TO ACCESS HOME SITES. -01 GENERAL CONTRACTOR TO ASSUME RESPONSIBILITY OF -02 CONSTRUCTION FENCING AND EROSION CONTROL WITHIN PROJECT LIMITS AT THE CONCLUSION OF THE -02 PROJECT.
12. AT THE CONCLUSION OF PROJECT 20K1G-02, THE -01 GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR BACKFILLING THE HOLES CREATED BY THE FOUNDATION REMOVALS OF THE THREE STRUCTURES. REFER TO SPECIFICATION SECTION 31 20 00 – EARTHMOVING.

CITY OF MADISON FORESTRY NOTES:

1. CONTRACTOR SHALL TAKE PRECAUTIONS DURING CONSTRUCTION TO NOT DISFIGURE, SCAR OR IMPAIR THE HEALTH OF ANY STREET TREE. CONTRACTOR SHALL OPERATE EQUIPMENT IN A MANNER AS TO NOT DAMAGE THE BRANCHES OF THE STREET TREE(S). THIS MAY REQUIRE USING SMALLER EQUIPMENT AND LOADING AND UNLOADING MATERIALS IN A DESIGNATED SPACE AWAY FROM TREES ON THE CONSTRUCTION SITE. ANY DAMAGE OR INJURY TO EXISTING STREET TREES (EITHER ABOVE OR BELOW GROUND) SHALL BE REPORTED IMMEDIATELY TO CITY FORESTRY AT (608) 266-4816. PENALTIES AND REMEDIATION SHALL BE REQUIRED.
2. AS DEFINED BY THE SECTION 107.13 OF CITY OF MADISON STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION: NO EXCAVATION IS PERMITTED WITHIN 5 FEET OF THE TRUNK OF THE STREET TREE OR WHEN CUTTING ROOTS OVER 3 INCHES IN DIAMETER. IF EXCAVATION IS NECESSARY, THE CONTRACTOR SHALL CONTACT MADISON CITY FORESTRY AT (608) 266-4816. PRIOR TO EXCAVATION. CITY OF MADISON FORESTRY PERSONNEL SHALL ASSESS THE IMPACT TO THE TREE AND TO ITS ROOT SYSTEM PRIOR TO WORK COMMENCING. TREE PROTECTION SPECIFICATIONS CAN BE FOUND ON THE FOLLOWING WEBSITE: HTTPS://WWW.CITYOFMADISON.COM/BUSINESS/PW/SPECS.CFM.
3. SECTION 107.13(G) OF CITY OF MADISON STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (WEBSITE: HTTPS://WWW.CITYOFMADISION.COM/BUSINESS/PW/SPECS.CFM) ADDRESSES SOIL COMPACTION NEAR STREET TREES AND SHALL BE FOLLOWED BY CONTRACTOR. THE STORAGE OF PARKED VEHICLES, CONSTRUCTION EQUIPMENT, BUILDING MATERIALS, REFUSE, EXCAVATED SPOILS OR DUMPING OF POISONOUS MATERIALS ON OR AROUND TREES AND ROOTS WITHIN FIVE (5) FEET OF THE TREE OR WITHIN THE PROTECTION ZONE IS PROHIBITED.
4. STREET TREE PRUNING SHALL BE COORDINATED WITH CITY FORESTRY AT A MINIMUM OF TWO WEEKS PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT. CONTACT CITY FORESTRY AT (608) 266-4816. ALL PRUNING SHALL FOLLOW THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) A300 – PART 1 STANDARDS FOR PRUNING.
5. CITY FORESTRY WILL ISSUE A STREET TREE REMOVAL PERMIT FOR SIX TREES: 2" OAK & 2" ELM WITHIN WEST SIDE N PARKS ST TERRACE AND 4", 5", 5" -CRABAPPLES & 14" ELM WITHIN CENTER MEDIAN OF N PARK ST TERRACE DUE TO UNDERGROUND UTILITY INSTALLATION. THE CONTRACTOR SHALL CONTACT CITY FORESTRY AT (608) 266 -4816 TO OBTAIN PERMIT.
6. ANY ADDITIONAL STREET TREE REMOVALS REQUESTED WILL REQUIRE A MINIMUM OF A 72-HOUR REVIEW PERIOD WHICH SHALL INCLUDE THE NOTIFICATION OF THE ALDERPERSON WITHIN WHO'S DISTRICT IS AFFECTED BY THE STREET TREE REMOVAL(S) PRIOR TO AN ADDITIONAL STREET TREE REMOVAL PERMIT BEING ISSUED BY CITY FORESTRY.

GENERAL EROSION CONTROL NOTES:

1. INSTALL EROSION MAT ON ALL SLOPES GREATER THAN 4:1 AND ALL DRAINAGE SWALES.
2. PROTECT STORM SEWER INLETS AND CATCH BASINS IN ACCORDANCE WITH THE EROSION CONTROL PLAN. IF NOT SPECIFIED, PROTECT INLETS WITH STRAW BALE BARRIERS, SILT FENCING, FILTER BASKET, GABION STONE WEEPERS, OR OTHER EQUIVALENT METHODS APPROVED BY THE A/E WHICH PROVIDE THE NECESSARY EROSION PROTECTION. REPAIR OR REPLACE DAMAGED INLET PROTECTION.
3. INSTALL INLET PROTECTION ON ALL PROPOSED INLETS AFTER THEY HAVE BEEN CONSTRUCTED.
4. REMOVE SEDIMENT FROM STORMWATER AND EROSION CONTROL STRUCTURES AND VESSELS AS NECESSARY.
5. MINIMIZE WATER RUNOFF AND RETAIN OR DETAIN ON-SITE WHENEVER POSSIBLE SO AS TO PROMOTE SETTLING OF SOLIDS AND GROUNDWATER RECHARGE.
6. CONVEY DRAINAGE TO THE NEAREST ADEQUATE PUBLIC FACILITY. DO NOT DISCHARGE WATER IN A MANNER THAT WILL CAUSE EROSION OR SEDIMENTATION OF THE SITE OR RECEIVING FACILITY.
7. DIVERT ROOF DRAINAGE AND RUNOFF FROM ALL AREAS UPSLOPE OF THE SITE AROUND AREAS TO BE DISTURBED OR CHANNEL THEM THROUGH THE SITE IN A MANNER THAT WILL NOT CAUSE EROSION.
8. MINIMIZE THE PUMPING OF SEDIMENTS WHEN DEWATERING. DISCHARGE TO A SEDIMENTATION BASIN OR SEDIMENTATION VESSEL TO REDUCE THE DISCHARGE OF SEDIMENTS. DO NOT DISCHARGE WATER IN A MANNER THAT WILL CAUSE EROSION OR SEDIMENTATION OF THE SITE OR RECEIVING FACILITY.
9. REMOVE ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROADWAY, PARKING LOT, SIDEWALK, OR OTHER PAVED AREA. DO NOT REMOVE TRACKED SEDIMENTS BY FLUSHING. COMPLETELY REMOVE ANY ACCUMULATIONS NOT REQUIRING IMMEDIATE ATTENTION AT LEAST ONCE DAILY AT THE END OF THE WORKDAY.
10. FREQUENTLY DISPOSE OF ALL WASTE AND UNUSED CONSTRUCTION MATERIALS IN LICENSED SOLID WASTE OR WASTEWATER FACILITIES. DO NOT BURY, DUMP, OR DISCHARGE, ANY GARBAGE, DEBRIS, CLEANING WASTES, TOXIC MATERIALS, OR HAZARDOUS MATERIALS ON THE SITE, ON THE LAND SURFACE OR IN DETENTION BASINS, OR OTHERWISE ALLOW MATERIALS TO BE CARRIED OFF THE SITE BY RUNOFF ONTO ADJACENT LANDS OR INTO RECEIVING WATERS OR STORM SEWER SYSTEMS.
11. CONTRACTOR SHALL DESIGN TEMPORARY SOIL RETENTION AS NECESSARY TO INSTALL BUILDING FOUNDATIONS AND UTILITIES WITHIN RESTORATION LIMITS ON PLANS. PROVIDE ENGINEERED SHOP DRAWINGS FOR APPROVAL.

EROSION CONTROL OPERATION SEQUENCE & SCHEDULE:

INSTALL EROSION CONTROL MEASURES AS REQUIRED BY THE EROSION CONTROL PLAN AND CONTRACT DOCUMENTS. PROVIDE ADDITIONAL EROSION CONTROL MEASURES AS DICTATED BY CONTRACTOR'S MEANS AND METHODS, OR BY DIFFERING SITE CONDITIONS. NOTIFY DFD PROJECT REPRESENTATIVE OF ADDITIONAL EROSION CONTROL FEATURES THAT ARE PROVIDED, BUT NOT SHOWN ON THE PLAN.

THE GENERAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL SILT FENCES, SEEDING, EROSION MATTING, AND OTHER EROSION CONTROL MEASURES. GENERAL CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PRIOR TO COMMENCING GRADING, GRUBBING, OR OTHER LAND DISTURBING ACTIVITIES. EROSION CONTROL MEASURES MUST BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF EVERY PRECIPITATION EVENT OF $\frac{1}{4}$ INCH OR GREATER. IN ADDITION, THE ACTIVE CONTRACTOR SHALL CONDUCT DAILY INSPECTIONS AND DOCUMENT CONDITIONS AND REPAIRS MADE, ALONG WITH DATE, TIME OF INSPECTION, AND WEATHER CONDITIONS IN A DAILY LOG BOOK. THE DAILY LOG BOOK, WEEKLY / 0.25 INCH PRECIPITATION REPORTS, APPROVED PLANS, WPDES PERMIT & CHAPTER 30 PERMIT SHALL BE KEPT IN AN ACCESSIBLE LOCATION, LIKE A MAILBOX, WITHIN THE STAGING AREA. EROSION CONTROL INSPECTIONS WITH DIGITAL PHOTOGRAPHS, INCLUDING ANY REPAIRS NEEDED/ACTIONS TAKEN AT THE SITE SHALL ALSO BE DOCUMENTED ON THE CITY OF MADISON EROSION CONTROL WEBSITE. THE PERMITTEE WILL BE GIVEN ACCESS TO THIS WEBSITE.

AT ABSOLUTELY NO TIME MAY CONSTRUCTION EQUIPMENT, DEBRIS, FILL, ETC. BE PLACED WITHIN WETLANDS, WATERWAYS OR FLOODPLAINS UNLESS IDENTIFIED IN THE PLANS & APPROVED BY WDNR/ USACE.

ALL REGULATORY PERMITS, PROJECT PLANS, AND INSPECTION LOGS SHALL BE KEPT ON SITE IN AN ACCESSIBLE LOCATION, SUCH AS A MAILBOX, AVAILABLE TO REGULATORY AGENCIES UPON REQUEST.

CONTRACTORS ARE TO MAINTAIN THE CONSTRUCTION SITE IN A NEAT AND TIDY MANNER FOR THE DURATION OF THE PROJECT.

THE TIMING AND SEQUENCE OF CONSTRUCTION IS SCHEDULED AS FOLLOWS:

1. OBTAIN PLAN APPROVAL FROM THE CITY OF MADISON, AND ALL APPLICABLE PERMITS, INCLUDING EROSION CONTROL PERMIT.
2. CONSTRUCTION IS SCHEDULED TO BEGIN IN FALL 2023, DEPENDING ON WEATHER & GROUND CONDITIONS.
3. A GRAVEL TRACKING PAD UNDERLAIN WITH WISDOT TYPE R GEOTEXTILE FABRIC SHALL BE INSTALLED AS SHOWN ON THE PLANS. REPLACE OR SUPPLEMENT STONE TRACKING PADS WITH ADDITIONAL STONE WHEN THEY BECOME INEFFECTIVE. INSTALL CONSTRUCTION FENCE AND ANY TEMPORARY TRAFFIC CONTROLS
4. SILT FENCE, INLET FILTER PROTECTION, AND TRIANGULAR SILT DIKES SHALL BE INSTALLED AS SHOWN ON THE PLANS, AND INSPECTED PRIOR TO COMMENCING OF ANY LAND DISTURBING ACTIVITIES PER PROJECT PLANS AND DETAILS. SEDIMENT DEPOSITS WILL BE REMOVED FROM BEHIND THE SILT FENCE WHEN THEY REACH A DEPTH OF 1/2 FENCE HEIGHT.
5. SITE DEMOLITION OF PAVEMENT, ETC. WILL OCCUR AFTER ALL EROSION CONTROL MEASURES ARE IN PLACE.
6. CONSTRUCTION OF THE BUILDING, STARTING WITH THE FOUNDATION, WILL BEGIN AFTER THE SITE DEMOLITION IS COMPLETE.
7. TOPSOIL STRIPPING AND ROUGH GRADING WILL FOLLOW.
8. UTILITY INSTALLATION WILL OCCUR NEXT AND CONTINUE UNTIL ALL UTILITIES ARE INSTALLED.
9. AFTER ROUGH GRADING IS COMPLETE IN HARD SURFACE AREAS SUCH AS ROADWAYS, PARKING LOTS, AND BUILDINGS, THE REQUIRED THICKNESS OF DENSE GRADED BASE COURSE, PER THE PROJECT PLANS AND DETAILS WILL BE APPLIED FOR STABILIZATION. AFTER ROUGH GRADING IS COMPLETE OUTSIDE OF HARD SURFACE AREAS, THE TOPSOIL WILL BE REAPPLIED AND THE LANDSCAPE CONTRACTOR WILL COMPLETE SODDING/FERTILIZING/MULCHING AND INSTALL EROSION MATTING AS PER APPROVED PLANS AND SPECIFICATIONS. REMOVE SURPLUS EXCAVATION MATERIALS FROM THE SITE IMMEDIATELY AFTER ROUGH GRADING. THE DISPOSAL SITE FOR THE SURPLUS EXCAVATION MATERIALS SHALL ALSO BE SUBJECT TO THESE EROSION CONTROL REQUIREMENTS.
10. FINAL SITE STABILIZATION IS ANTICIPATED FOLLOWING THE COMPLETION OF GRADING ACTIVITIES PER WDNR TECHNICAL STANDARD 1059. IF SITE STABILIZATION CANNOT BE COMPLETED BY OCTOBER 15, THEN THE USE OF ANIONIC POLYACRYLAMIDE CONFORMING TO WDNR TECHNICAL STANDARD 1050 SHALL BE USED. IN ADDITION, ALL SLOPES OF GREATER THAN 20% MUST ADHERE TO THE SCHEDULE IN TABLE 1 BELOW.
11. AFTER ALL TOPSOIL HAS BEEN REAPPLIED AND STABILIZATION IS UNDERWAY, ROADWAY, PARKING LOT, AND SIDEWALK BASE MATERIAL WILL BE APPLIED PER PROJECT SPECIFICATIONS.
12. AFTER THE SITE HAS BEEN STABILIZED THE GENERAL CONTRACTOR WILL FILE A EROSION CONTROL NOTICE OF TERMINATION WITH THE CITY OF MADISON ENGINEERING DEPARTMENT AND WDNR. UPON APPROVAL, ALL SILT FENCES, INLET FILTER PROTECTION, AND TRIANGULAR SILT DIKES SHALL BE REMOVED.
13. "AS-BUILT" SURVEYS ARE TO BE CONDUCTED BY THE CONTRACTOR AND FINAL DOCUMENTS FORWARDED TO THE OWNER.
14. BARE SOIL LEFT UNDISTURBED FOR 14 CALENDAR DAYS MUST BE TEMPORARILY STABILIZED PER WDNR TECHNICAL STANDARD 1059. BY OCTOBER 15, THE SITE SHALL BE STABILIZED PER NOTE 10 ABOVE.

IF CONSTRUCTION SCHEDULES SHOULD CHANGE SIGNIFICANTLY, THIS PLAN NARRATIVE WILL BE UPDATED AND RESUBMITTED BY THE GENERAL CONTRACTOR TO THE CITY AND WDNR.

TABLE 1 - MAXIMUM PERIOD OF BARE SOIL FOR SLOPES GREATER THAN 20%

SLOPE AREA DRAINS TO SEDIMENT BASIN?	LAND DISTURBANCE BETWEEN SEPT. 16 AND MAY 1	LAND DISTURBANCE BETWEEN MAY 2 AND SEPT. 15
YES	90 DAYS	90 DAYS
NO	60 DAYS	30 DAYS

TABLE FROM WDNR GUIDANCE DOC # 3800-2015-06

EROSION CONTROL MEASURES:

1. CONTRACTOR TO INSTALL AND MAINTAIN EROSION CONTROL MEASURES AS INDICATED ON THIS PLAN AND PER THE LATEST WDNR TECHNICAL STANDARDS. TECHNICAL STANDARDS MAY BE VIEWED ONLINE AT: http://dnr.wi.gov/topic/stormwater/standards/const_standards.html
2. INLETS AND CATCH BASINS SHALL BE PROTECTED WITH INLET FILTERS THAT ARE PHASED IN WITH CONSTRUCTION TO REDUCE SEDIMENT FROM ENTERING THESE AREAS PER WDNR TECHNICAL STANDARD 1060 AS FOLLOWS:

   ALL FABRIC BARRIERS SELECTED FOR INLET/CATCH BASIN PROTECTION DEVICES SHALL BE SELECTED FROM THE LIST OF APPROVED FABRICS CERTIFIED FOR INLET PROTECTION, GEOTEXTILE FABRIC, TYPE FF IN THE CURRENT EDITION OF THE WiscDOT PRODUCT ACCEPTABILITY LIST, TO OBTAIN THE PAL, PLEASE REFER TO THIS WEBSITE: http://wisconsindot.gov/Documents/doing-bus/eng-consultants /cnslt-rsrces/tools/pal/pal-7-14.pdf

   A. INLET PROTECTION SHALL BE AT A MINIMUM INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT OF 0.25 INCH OR GREATER DURING A 24-HOUR PERIOD.
   B. PLACEMENT OF SPOIL MATERIAL, DEBRIS, SOILS, ETC. ON TOP OF INLETS/CATCH BASINS, EVEN IF TEMPORARY, IS STRICTLY DISCOURAGED AND PROHIBITED.
   C. SEDIMENT DEPOSITS SHALL BE REMOVED AND THE INLET PROTECTION DEVICE RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED BETWEEN 1/3 TO ½ THE DESIGN DEPTH OF THE DEVICE FOR TYPES A-C, WHEN SEDIMENT IS WITHIN 6" OF THE BOTTOM OF THE OVERFLOW HOLE FOR TYPE D, OR WHEN THE DEVICE IS NO LONGER FUNCTIONING PER MANUFACTURER'S SPECIFICATIONS. ALL SEDIMENT COLLECTED SHALL BE PROPERLY DISPOSED OF TO PREVENT DISCHARGE INTO AREA WATERWAYS AND WETLANDS.
   D. DUE CARE SHALL BE TAKEN TO ENSURE SEDIMENT DOES NOT FALL INTO THE INLETS/CATCH BASINS AND IMPEDE THE INTENDED FUNCTION OF THE DEVICE. ANY MATERIAL FALLING INTO THE INLET/CATCH BASIN SHALL BE REMOVED AND PROPERLY DISPOSED OF PER NOTE C ABOVE.
   E. INLET FILTERS MAY BE REMOVED AND PROPERLY DISPOSED OF UPON COMPLETION OF CONSTRUCTION, HAULING OR MOVEMENT OF CONSTRUCTION EQUIPMENT THROUGHOUT THE SITE, AND ONCE THE SITE IS ADEQUATELY STABILIZED, UNLESS AS OTHERWISE NOTIFIED BY THE WDNR.
3. A TRACKING PAD SHALL BE INSTALLED AS SHOWN ON THE PLAN SHEET PRIOR TO THE START OF CONSTRUCTION TO REDUCE OFF-SITE SEDIMENTATION BY ELIMINATING THE TRACKING OF SEDIMENT FROM THE SITE PER WDNR TECHNICAL STANDARD 1057 AS FOLLOWS:
   A. AGGREGATE USED FOR TRACKING PADS SHALL BE 3 TO 6 INCH CLEAR OR WASHED STONE. ALL MATERIAL TO BE RETAINED BY 3 INCH SIEVE.
   B. THE AGGREGATE SHALL BE PLACED IN A LAYER OF AT LEAST 12 INCHES THICK. ON SITES WITH A HIGH WATER TABLE, OR WHERE SATURATED CONDITIONS ARE EXPECTED, TRACKING PADS WILL BE UNDERLAIN WITH WisDOT TYPE R GEOTEXTILE FABRIC.
   C. THE TRACKING PAD SHALL BE THE FULL WIDTH OF THE EGRESS POINT (MIN. 15 FEET WIDE) AND BE AT LEAST 50 FEET LONG.
   D. VEHICLES TRAVELING ACROSS THE TRACKING PAD SHALL MAINTAIN A SLOW CONSTANT SPEED.
   E. ANY SEDIMENT OR ROCK ACCUMULATION ONTO LOCAL ROADWAYS SHALL BE REMOVED BY STREET CLEANING, NOT FLUSHING BEFORE THE END OF EACH WORKING DAY.
   F. THE TRACKING PAD SHALL, AT A MINIMUM BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT OF 0.25 INCH OF RAIN OR MORE DURING A 24-HOUR PERIOD.
   G. THE TRACKING PAD PERFORMANCE SHALL BE MAINTAINED AT A MINIMUM OF 12" BY SCRAPING OR TOP-DRESSING WITH ADDITIONAL AGGREGATE.
4. THE CONSTRUCTION SITE PERIMETER SHALL BE PROTECTED WITH SILT FENCE AS SHOWN ON THE PLAN SHEET PRIOR TO THE START OF CONSTRUCTION TO INTERCEPT AND REDUCE THE FLOW OF SEDIMENT-LADEN SHEET FLOW RUNOFF FROM THE CONSTRUCTION SITE PER WDNR TECHNICAL STANDARD 1056 AS FOLLOWS:
   A. SILT FENCE ENDS SHALL BE EXTENDED UPSLOPE TO PREVENT WATER FROM FLOWING AROUND THE ENDS OF THE FENCE AS SHOWN ON THE PLAN SHEET.
   B. INSTALLED SILT FENCE SHALL BE A MINIMUM 14 INCHES HIGH AND SHALL NOT EXCEED 28 INCHES IN HEIGHT MEASURED FROM THE INSTALLED GROUND ELEVATION.
   C. SILT FENCE SHALL BE SUPPORTED BY EITHER STEEL OR WOOD SUPPORT POSTS.
   D. THE MAXIMUM SPACING OF POSTS FOR NONWOVEN SILT FENCE SHALL BE 3 FEET OR FOR WOVEN FABRIC 8 FEET.
   E. SILT FENCE SHALL HAVE A SUPPORT CORD AT THE TOP OF THE FENCE.
   F. WHERE JOINTS ARE NEEDED, EACH END OF THE FABRIC SHALL BE SECURELY FASTENED TO A POST. THE POSTS SHALL BE WRAPPED AROUND EACH OTHER TO PRODUCE A STABLE AND SECURE JOINT OR SHALL BE OVERLAPPED THE DISTANCE BETWEEN TWO POSTS.
   G. A MINIMUM OF 20 INCHES OF THE POSTS SHALL EXTEND INTO THE GROUND AFTER INSTALLATION.
   H. SILT FENCE SHALL BE ANCHORED BY SPREADING AT LEAST 8 INCHES OF THE FABRIC IN A 4 INCH WIDE BY 6 INCH DEEP TRENCH, OR 6 INCH DEEP V-TRENCH ON THE UPSLOPE SIDE OF THE FENCE. THE TRENCH SHALL BE BACKFILLED AND COMPACTED. TRENCHES SHALL NOT BE EXCAVATED ANY WIDER OR DEEPER THAN NECESSARY FOR PROPER INSTALLATION.
   I. ON THE TERMINAL ENDS OF THE SILT FENCE THE FABRIC SHALL BE WRAPPED AROUND THE POST SUCH THAT THE STAPLES ARE NOT VISIBLE.
   J. GEOTEXTILE FABRIC SPECIFICATIONS SHALL MEET VALUES ESTABLISHED IN TECHNICAL STANDARD 1056.
   K. SILT FENCE SHALL BE REMOVED ONCE THE SITE IS ADEQUATELY STABILIZED.
   L. WHEN PLACING SILT FENCE NEAR TREES, CARE SHALL BE TAKEN TO MINIMIZE DAMAGE TO THE ROOT SYSTEM BY AVOIDING COMPACTION AND ROOT CUTTING WITHIN A RADIUS OF 1.5 FEET MULTIPLIED BY THE INCH DIAMETER OF THE TREE.
   M. THE CONTRACTOR MAY FURTHER STRENGTHEN THE SILT FENCE BY USING HAY BALES ON THE DOWN SLOPE SIDE AS NEEDED.
   N. SILT FENCE SHALL AT A MINIMUM BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.25 INCH OF RAIN OR MORE DURING A 24 HOUR PERIOD.
   O. DAMAGED OR DECOMPOSED SILT FENCE, UNDERCUTTING, OR FLOW CHANNELS AROUND THE END OF BARRIERS SHALL BE REPAIRED OR CORRECTED.
   P. SEDIMENT SHALL BE PROPERLY DISPOSED OF ONCE THE DEPOSITS REACH ½ THE HEIGHT OF THE FENCE TO PREVENT DISCHARGE INTO AREA WATERWAYS AND WETLANDS.
5. MULCHING TECHNIQUES SHALL BE USED ON AREAS OF EXPOSED SOIL WHERE THE ESTABLISHMENT OF VEGETATION IS DESIRED. MULCH SHALL BE UTILIZED THROUGHOUT THE DURATION OF CONSTRUCTION TO ESTABLISH TEMPORARY VEGETATION TO HELP REDUCE EROSION PER WDNR TECHNICAL STANDARDS 1058 RESPECTIVELY AS FOLLOWS:
   A. DURING CONSTRUCTION, AREAS THAT HAVE BEEN MULCHED SHALL AT A MINIMUM BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.25 INCHES OF RAIN OR MORE DURING A 24 HOUR PERIOD. INSPECT WEEKLY DURING THE GROWING SEASON UNTIL VEGETATION IS DENSELY ESTABLISHED OR THE SOD IS LAID. REPAIR AND REINSTALL MULCH IN AREAS THAT HAVE EROSION DAMAGE AS NECESSARY.
   B. MULCH SHOULD BE PLACED WITHIN 24 HOURS OF SODDING.
   C. MULCHING OPERATIONS SHALL NOT TAKE PLACE DURING PERIODS OF EXCESSIVELY HIGH WINDS THAT WOULD PRECLUDE THE PROPER PLACEMENT OF MULCH.
   D. MULCH THAT IS DISPLACED SHALL BE REAPPLIED AND PROPERLY ANCHORED. MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE WITH CONSIDERATION TO SITE CONDITIONS.
6. A COPY OF EROSION CONTROL INSPECTION REPORTS AND THE APPROVED EROSION CONTROL PLANS SHALL BE KEPT ON SITE.
7. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL PRACTICES BY THE END OF EACH WORKDAY.
8. LOCAL ROADS SHALL BE CLEAN BY THE END OF EACH WORKDAY. CONTRACTOR SHALL HAVE LOCAL ROADS SWEPT WHERE SEDIMENT ACCUMULATES.

DEWATERING PLAN:

TO FACILITATE CONSTRUCTION AT THE PROJECT SITE, DEWATERING MAY TAKE PLACE BY THE SELECTED CONTRACTOR. CONTRACTOR TO FOLLOW THESE INSTRUCTIONS WHILE PERFORMING DEWATERING ACTIVITIES ON-SITE. IF DEWATERING IS TO TAKE PLACE AT THE SITE, IT WILL OCCUR BETWEEN STEPS 3 AND 12 OF THE EROSION CONTROL OPERATION SEQUENCE.

NOTE: THESE INSTRUCTIONS DO NOT APPLY TO WATER BEING DISCHARGED DIRECTLY TO GROUNDWATER OR KARST FEATURES OR WELL DEWATERING SYSTEMS. CONTRACTOR SHALL COORDINATE ACCORDINGLY FOR OTHER DEWATERING ACTIVITIES AS DEEMED NECESSARY WITH THE WDNR.

1. THE CONTRACTOR SHALL ENSURE THAT THE DEWATERING PRACTICES CARRIED OUT MEET OR EXCEED WNDR TECHNICAL STANDARD NUMBER 1061.
2. A PAN OR OTHER CONTAINMENT DEVICE SHALL BE PLACED UNDERNEATH THE PUMP TO CAPTURE ANY SPILLS. OILS, GASOLINE, ETC. SHALL NOT BE STORED WITHIN WETLANDS, NEAR THE STORMWATER POND, OR OTHER ON-SITE WATER AREAS.
3. A TYPE 2 GEOTEXTILE BAG THAT IS NO SMALLER THAN 100 SQUARE FEET; HAS A MAXIMUM APPARENT OPENING SIZE OF 0.212 mm; HAS A GRAB TENSILE STRENGTH OF 300 LBS; MULLEN BURST OF 580 PSI; PERMEABILITY OF 0.2 CM/SEC; FABRIC WEIGHT OF 12 OZ SHALL BE USED. THE GEOTEXTILE BAG AREA AND DOWNGRADE FLOW AREA SHALL CONSIST OF VEGETATED AND UNDISTURBED SOILS.
4. POLYMER APPROVED BY THE WDNR MEETING WDNR TECHNICAL STANDARD 1051 MAY BE USED IN COMBINATION WITH THE DEWATERING BAG IF THE DEWATERING BAG IS NOT DOING AN ADEQUATE JOB ALONE OF FILTERING SEDIMENTS. THE CONTRACTOR SHALL SUPPLY TOXICITY TESTING DATA TO THE WDNR BEFORE USE ON-SITE FOR WDNR APPROVAL. POLYMER SHALL NOT BE DIRECTLY APPLIED TO SURFACE WATER. CONTRACTOR SHALL OBTAIN THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR THE SELECTED POLYMER, MANUFACTURER'S INFORMATION AND WDNR USE RESTRICTIONS (SEE TECHNICAL STANDARD 1051) AND KEEP ALL THIS INFORMATION ON-SITE. CONTRACTOR SHALL ADHERE TO MANUFACTURER AND WDNR'S APPLICATION RATES FOR THE POLYMER, WITH THE WDNR'S RATE TAKING PRECEDENCE. THE CONTRACTOR SHALL TAKE STEPS TO ENSURE THAT THE POLYMER IS NOT SPILLED. SPILL KITS SHALL BE KEPT ON SITE; THE MANUFACTURER'S RECOMMENDED CLEANUP PROCEDURES SHALL BE FOLLOWED IN THE EVENT OF A SPILL.
5. A TARP MAY BE UTILIZED UNDERNEATH THE TYPE 2 GEOTEXTILE BAG AND JUST DOWN SLOPE OF THE BAG TO DISCOURAGE EROSION AND SCOUR.
6. A FLOATING SUCTION HOSE OR OTHER FLOTATION METHOD SHALL BE UTILIZED WHEN PUMPING FROM AN AREA WITH STANDING WATER TO AVOID SUCKING SEDIMENT FROM GRADE.
7. IF TURBID WATER IS LEAVING THE GEOTEXTILE BAG, THE CONTRACTOR SHALL SHUT OFF THE PUMP TO ALLOW SEDIMENTS TO SETTLE INTO THE BAG. CONTRACTOR SHALL FOLLOW THE MANUFACTURER'S SPECIFICATIONS FOR DETERMINING THE SEDIMENT CAPACITY OF THE GEOTEXTILE BAG USING GOOD COMMON SENSE. SEDIMENT LEVELS CONTAINED IN THE BAG SHALL BE MONITORED TO MEASURE THE LOSS OF STORAGE CAPACITY OVER TIME. THE CONTRACTOR SHALL PROPERLY DISPOSE OF THE GEOTEXTILE BAG IN A WASTE RECEPTACLE ONCE IT IS NO LONGER USED.
8. DURING DEWATERING ACTIVITIES THE CONTRACTOR SHALL MONITOR DEWATERING PRACTICES AND KEEP A LOG OF THE FOLLOWING:
   A. DISCHARGE DURATION AND SPECIFIED PUMPING RATE.
   B. OBSERVED WATER TABLE AT TIME OF DEWATERING.
   C. MAINTENANCE ACTIVITIES
   D. NAME AND QUANTITY OF POLYMER USED. PRODUCT TYPE.
      APPLICATION RATE OF POLYMER IN POUNDS/ACRE FEET OF WATER.
      DATE AND TIME APPLIED.
      WEATHER CONDITIONS DURING APPLICATION.
      METHOD OF APPLICATION.

THIS LOG NEEDS TO BE KEPT ON SITE FOR WDNR REGULATORY REVIEW. COPIES OF THIS DOCUMENTATION SHOULD BE KEPT IN THE CONTRACTOR'S MONITORING LOG AND MADE AVAILABLE UPON REQUEST.

REVIEW THE FOLLOWING FOR MORE INFORMATION:

WDNR TECHNICAL STANDARD 1061 FOR DEWATERING – http://dnr.wi.gov/topic/stormWater/documents/Dewatering_1061.pdf

WDNR TECHNICAL STANDARD 1051 FOR POLYMER – http://dnr.wi.gov/topic/stormWater/documents/dnr1051.pdf

ABBREVIATIONS

AB	-ABANDON
A/C	-AIR CONDITIONING
AGG	-AGGERGATE
BLDG	-BUILDING
BM	-BENCHMARK
BOT	-BOTTOM
CA	-COMPRESSED AIR
CB	-CATCH BASIN
C/L	-CENTERLINE
CO	-CLEANOUT
CONC	-CONCRETE
CP	-CONTROL POINT
CPLA	-CAMPUS PLANNING & LANDSCAPE ARCHITECTURE
CWR	-CHILLED WATER RETURN
CWS	-CHILLED WATER SUPPLY
DFD	-DEPARTMENT OF FACILITIES DEVELOPMENT
DT	-DRAINTILE
EMH	-ELECTRIC MANHOLE
EL	-ELEVATION
EX	-EXISTING
FEMA	-FEDERAL EMERGENCY MANAGEMENT AGENCY
FFE	-FIRST FLOOR ELEVATION
FIT	-FITTING
FL	-FLOOR
FO	-FIBER OPTIC
GA	-GAUGE
GAL	-GALVANIZED
GC	-GENERAL CONTRACTOR
HDPE	-HIGH-DENSITY POLYETHLENE
HPS	-HIGH PRESSURE STEAM
IE	-INVERT
INLT	-INLET
M.C.	-MECHANICAL CONTRACTOR
MP	-MARKER POST
MUTCD	-MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
NAVD	-NORTH AMERICAN VERTICAL DATUM
NPCD	-NON-POTABLE CISTERN PUMP DISCHARGE
NPCW	-NON-POTABLE COLD WATER
O.C.	-OFF CENTER
O.D.	-OUTER DIAMETER
OH	-OVERHEAD UTILITY
PCR	-PUMP CONDENSATE RETURN
PK	-POINT KNOWN
PVC	-POLYVINYL CHLORIDE
R.A.	-RECORDED AS
RCCP	-REINFORCED CONCRETE PIPE
RIM	-REINFORCED CONCRETE PIPE
ROW	-TOP OF CASTING ELEVATION
SAMH	-SANITARY SEWER MANHOLE
SAN	-SANITARY SEWER
SDR	-STANDARD DIMENSION RATIO
SSMH	-STORM SEWER MANHOLE
ST	-STORM SEWER
ST.	-STREET
STA	-STATION
T.B.	-TRAFFIC BOND
TYP	-TYPICAL
UGS	-UNDERGROUND STORAGE SYSTEM
USACE	-UNITED STATES ARMY CORPS OF ENGINEERS
UW	-UNIVERSITY OF WISCONSIN
VLV	-VALVE
WATMH	-WATER MANHOLE
WDNR	-WISCONSIN DEPARTMENT OF NATURAL RESOURCES
WISCRS	-WISCONSIN COORDINATE REFERENCE SYSTEMS
WISDOT	-WISCONSIN DEPARTMENT OF TRANSPORTATION
WM	-WATERMAIN

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CIVIL GENERAL NOTES

Revisions:

No.	Date:	Description:

Graphic Scale	NOT TO SCALE
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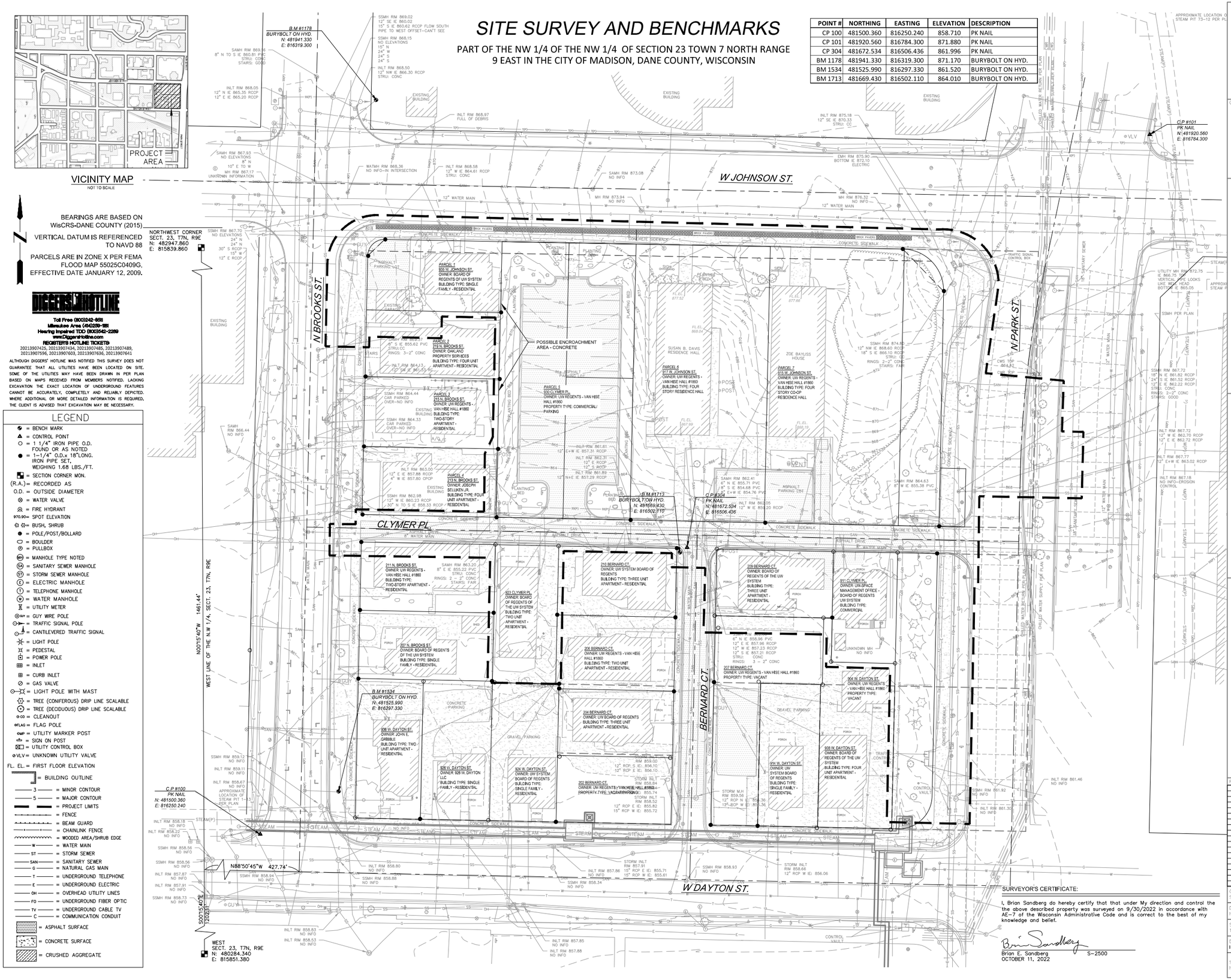
Sheet Number	C001

SITE SURVEY AND BENCHMARKS

PART OF THE NW 1/4 OF THE NW 1/4 OF SECTION 23 TOWN 7 NORTH RANGE 9 EAST IN THE CITY OF MADISON, DANE COUNTY, WISCONSIN

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP 100	481500.360	816250.240	858.710	PK NAIL
CP 101	481920.560	816784.300	871.880	PK NAIL
CP 304	481672.534	816506.436	861.996	PK NAIL
BM 1178	481941.330	816319.300	871.170	BURYBOLT ON HYD.
BM 1534	481525.990	816297.330	861.520	BURYBOLT ON HYD.
BM 1713	481669.430	816502.110	864.010	BURYBOLT ON HYD.



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SITE SURVEY AND BENCHMARKS

Revisions:

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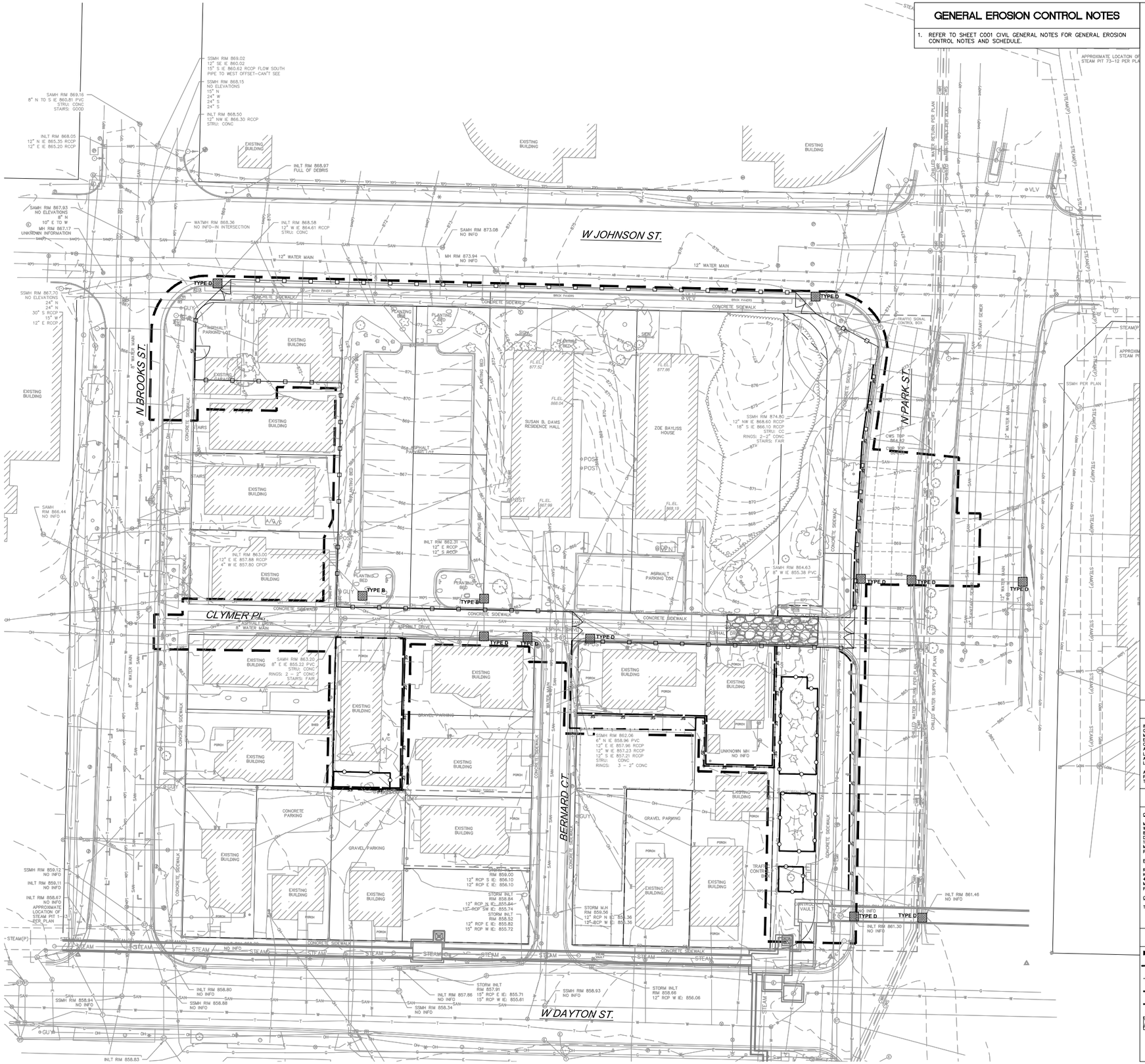
Date Issued	04/21/2023
Sheet Number	C010



GENERAL EROSION CONTROL NOTES

1. REFER TO SHEET C001 CIVIL GENERAL NOTES FOR GENERAL EROSION CONTROL NOTES AND SCHEDULE.

Scale: 0 10 20 40

Scale: 1" = 20'

DIGGERS HOTLINE

Dial 811 or (800)242-8511

www.DiggersHotline.com

EROSION NOTES

INSPECT ALL EROSION CONTROL MEASURES PRIOR TO COMMENCING GRADING, GRUBBING OR OTHER LAND DISTURBING ACTIVITIES. EROSION CONTROL MEASURES MUST BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF EVERY PRECIPITATION EVENT OF 0.25 INCH OR GREATER. IN ADDITION THE CONTRACTOR SHALL CONDUCT DAILY INSPECTIONS AND DOCUMENT CONDITIONS AND REPAIRS MADE ALONG WITH DATE, TIME OF INSPECTION AND WEATHER CONDITIONS IN A DAILY LOG BOOK. THE DAILY LOG BOOK, WEEKLY / 0.25 INCH PRECIPITATION REPORTS, APPROVED PLANS AND WPDES PERMIT SHALL BE KEPT IN AN ACCESSIBLE LOCATION, LIKE A MAILBOX, WITHIN THE STAGING AREA.

AT ABSOLUTELY NO TIME MAY CONSTRUCTION EQUIPMENT, DEBRIS, FILL, ETC. BE PLACED WITHIN WETLANDS, WATERWAYS OR FLOOD PLAINS UNLESS IDENTIFIED IN THE PLANS.

POINTS OF CONTACT

OWNER CONTACT:

MATTHEW DAPP – TEAM LEADER
WISCONSIN DEPARTMENT OF ADMINISTRATION
BUREAU OF ARCHITECTURE & ENGINEERING
DIVISION OF FACILITIES DEVELOPMENT
101 E. WILSON STREET
MADISON, WI 53703
PHONE: (608) 513-8220

PROJECT ENGINEER:

RYAN BIRSCHBACH
KAPUR & ASSOCIATES, INC
400 E. WISCONSIN AVENUE
MILWAUKEE, WI 53202
PHONE: (262) 758-6035

CONSTRUCTION MANAGER:

TBD

KEY INDEX

- PROJECT LIMITS
- SF FILTER FABRIC FENCE — 1 C154
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K1G-02 CONTRACTOR
- TREE PROTECTION FENCING — 5 C154
- STONE TRACKING PAD REQUIRED. LOCATION TO BE DETERMINED BY SELECTED CONTRACTOR'S APPROVED WORK PLAN. — 2 C154
- DESIGNATES EXISTING INLETS THAT MUST BE PROTECTED — 4 C154

R/S BORA

Consultant:

kapur

400 E. Wisconsin Ave.
Milwaukee, WI 53202
www.kapurinc.com

State of Wisconsin
Department of Administration
Division of Facilities Development

232 N. PARK ST.
MADISON, WI 53715

NEW ACADEMIC BUILDING
LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

CONSTRUCTION STAGING AND EROSION CONTROL PLAN

Revisions:

No.	Date:	Description:

Graphic Scale	0 5' 10' 20' 30'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C100

GENERAL SITE DEMOLITION NOTES

1. REFER TO SHEET C001 CIVIL GENERAL NOTES FOR GENERAL DEMOLITION, CITY FORESTRY NOTES, & EROSION CONTROL NOTES.

DIGGERS HOTLINE
Dial 811 or (800)242-8511
www.DiggersHotline.com

Scale: 0 10 20 40
Scale: 1" = 20'

ZONE 1
SEE ENLARGEMENT SHEET C111 FOR MORE INFORMATION

ZONE 2
SEE ENLARGEMENT SHEET C112 FOR MORE INFORMATION

ZONE 3
SEE ENLARGEMENT SHEET C113 FOR MORE INFORMATION

W JOHNSON ST.
W DAYTON ST.
N BROOKS ST.
N PARK ST.
CLYMER PL.
TERRACE

UW LETTERS AND SCIENCE - .EVY HALL TREE SURVEY

TREE CODE	SPECIES	DBH	NOTES
1	Black Cherry	4"	Multi-stem
2	Basswood	14"	Multi-stem
3	Basswood	12"	Multi-stem
4	Basswood	10"	Multi-stem
5	Eastern Cottonwood	10"	
6	Eastern Cottonwood	10"	
7	Eastern Cottonwood	10"	
8	Suma:	4"	Multi-stem
9	Northern Hackberry	16"	
10	Suma:	6"	
11	Amercan Elm	4"	
12	Black Cherry	4"	
13	Black Cherry	4"	
14	Black Cherry	4"	
15	Northern Red Oak	18"	
16	Basswood	12"	
17	Basswood	30"	
18	Black Walnut	18"	
19	Basswood	24"	
20	Sugar maple	18"	
21	Eastern Red Cedar	6"	
22	Basswood	18"	
23	Basswood	16"	
24	Black Walnut	16"	
25	Black Walnut	6"	
26	Northern Hackberry	24"	
27	Hop-hornbeam	4"	
28	Norway Maple	24"	
29	Basswood	18"	
30	Chinquapin Oak	2"	Withir ROW
31	River birch	8"	Multi-stem Withir ROW
32	River birch	8"	Multi-stem Withir ROW
33	Basswood	30"	Withir ROW
34	River birch	8"	Multi-stem Withir ROW
35	Arborvitae	4"	Multi-stem Withir ROW
36	Arborvitae	6"	Multi-stem Withir ROW
37	Arborvitae	6"	Multi-stem Withir ROW
38	Arborvitae	6"	Multi-stem Withir ROW
39	Arborvitae	6"	Multi-stem Withir ROW
40	Arborvitae	6"	Multi-stem Withir ROW
41	Elm	2"	Withir ROW
42	River birch	4"	Withir ROW Removed in 15K1F01
43	River birch	6"	Multi-stem Withir ROW Removed in 15K1F01
44	River birch	8"	Multi-stem Withir ROW Removed in 15K1F01
45	Hop-hornbeam	6"	
46	Amur Maple	12"	
47	Northern Hackberry	14"	
48	Northern Hackberry	18"	
49	Black Walnut	12"	
50	Norway Maple	12"	
51	Northern Hackberry	8"	
52	Northern Hackberry	10"	
53	Arborvitae	6"	
54	Arborvitae	6"	
55	Sugar Maple	36"	
56	Amercan Elm	12"	
57	River birch	6"	
58	Crabapple	5"	Withir ROW
59	Crabapple	4"	Withir ROW
60	Crabapple	5"	Withir ROW
61	Elm	14"	Withir ROW
MIXED WOODS	Thickets of young sumac, eastern cottonwood, norway maple, and black cherry.	< 4'	

KEY INDEX

- PROJECT LIMITS
- VEGETATION TO BE REMOVED & DISPOSED OF OFFSITE. UNUSED TOPSOIL TO BE REMOVED OFFSITE. TOPSOIL THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
- ASPHALT PAVEMENT & BASE MATERIAL TO BE REMOVED TO SUB-BASE & DISPOSED OF OFFSITE. PAVEMENT & BASE THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
- CONCRETE & BASE MATERIAL TO BE REMOVED TO SUB-BASE & DISPOSED OF OFFSITE. CONCRETE & BASE THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
- GRAVEL MATERIAL TO BE REMOVED & DISPOSED OF OFFSITE. UNUSED GRAVEL MATERIAL TO BE REMOVED OFFSITE. GRAVEL THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
- CLEAR & GRUB VEGETATION. REMOVE ROOTS & STUMPS. REMOVE & DISPOSE OF OFFSITE.
- EXISTING BUILDING & FOUNDATION TO BE RAZED. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
- XXXXXXXX SAWCUT FULL DEPTH
- X TREES & STUMPS TO BE REMOVED
- DENOTES UTILITIES TO BE ABANDONED & REMOVED.
- DENOTES UTILITIES TO BE ABANDONED IN PLACE.
- UTILITY STRUCTURE REMOVAL/ABANDONMENT
- 30 TREE CODE
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K1G-02 CONTRACTOR
- TREE PROTECTION FENCING

5 / C154

R/S BORA

Consultant:
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State of Wisconsin
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MADISON, WI 53715

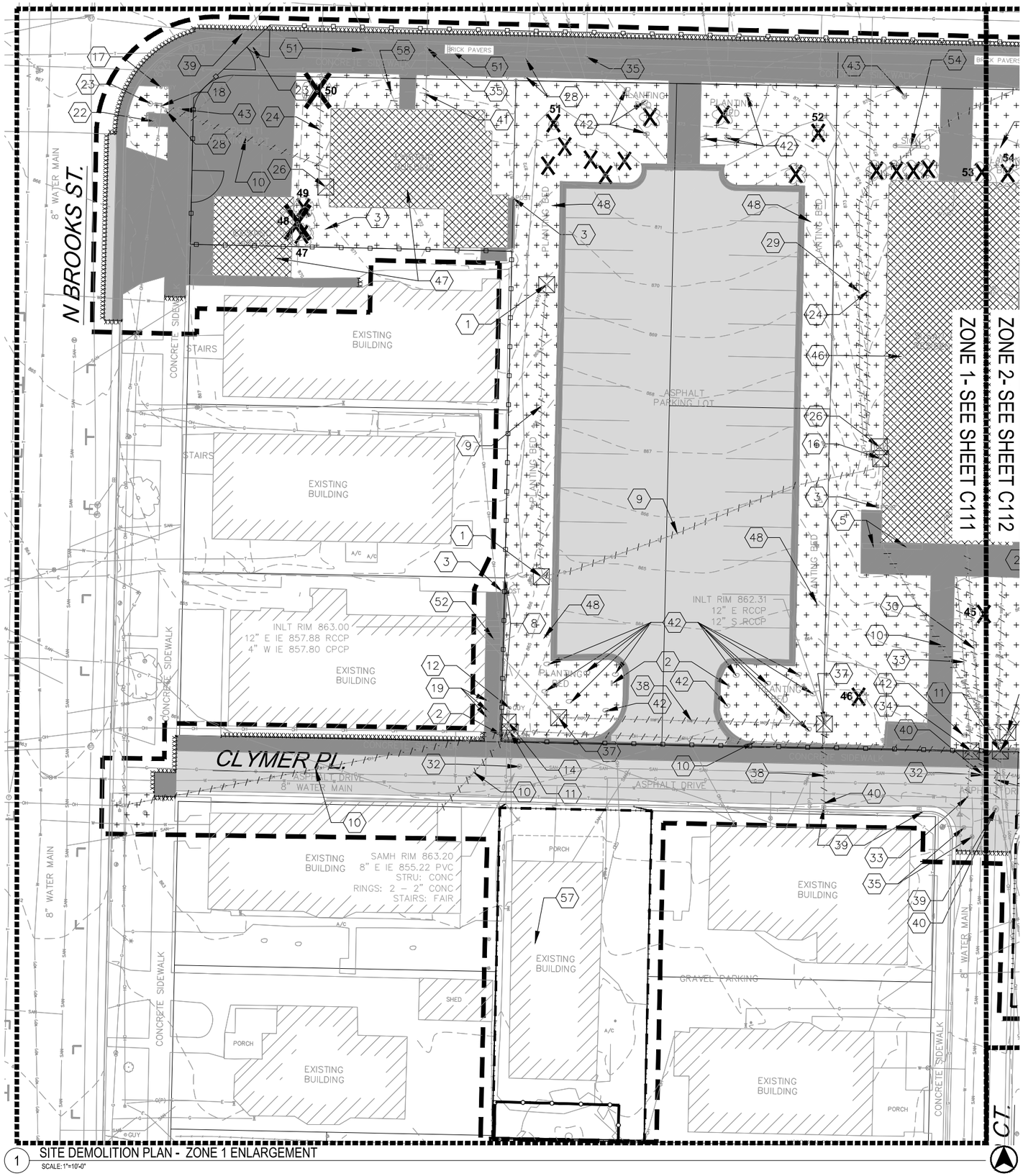
NEW ACADEMIC BUILDING
LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE DEMOLITION PLAN - OVERALL

Revisions:

No.	Date:	Description:

Graphic Scale: 0 5' 10' 20' 30'
DFD Number: 20K1G-01
Set Type: FR
Date Issued: 04/21/2023
Sheet Number: C110



1 SITE DEMOLITION PLAN - ZONE 1 ENLARGEMENT
SCALE: 1"=10'-0"

GENERAL SITE DEMOLITION NOTES

1. REFER TO SHEET C001 CIVIL GENERAL NOTES FOR GENERAL DEMOLITION, CITY FORESTRY NOTES, & EROSION CONTROL NOTES.

Scale: 0 5 10 20
Scale: 1" = 10'

DIGGERS HOTLINE
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www.DiggersHotline.com

UW LETTERS AND SCIENCE - .EVY HALL TREE SURVEY

TREE CODE	SPECIES	DBH	NOTES
1	Black Cherry	4"	Multi-stem
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3	Basswood	12"	Multi-stem
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10	Suma:	6"	
11	American Elm	4"	
12	Black Cherry	4"	
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17	Basswood	30"	
18	Black Walnut	18"	
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22	Basswood	18"	
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25	Black Walnut	6"	
26	Northern Hackberry	24"	
27	Hop-hornbeam	4"	
28	Norway Maple	24"	
29	Basswood	18"	
30	Chinquapin Oak	2"	Withir ROW
31	River Birch	8"	Multi-stem Withir ROW
32	River Birch	8"	Multi-stem Withir ROW
33	Basswood	30"	Withir ROW
34	River Birch	8"	Multi-stem Withir ROW
35	Arborvitae	4"	Multi-stem Withir ROW
36	Arborvitae	6"	Multi-stem Withir ROW
37	Arborvitae	6"	Multi-stem Withir ROW
38	Arborvitae	6"	Multi-stem Withir ROW
39	Arborvitae	6"	Multi-stem Withir ROW
40	Arborvitae	6"	Multi-stem Withir ROW
41	Elm	2"	Withir ROW
42	River Birch	4"	Withir ROW Removed in 15K1F 01
43	River Birch	6"	Multi-stem Withir ROW Removed in 15K1F 01
44	River Birch	8"	Multi-stem Withir ROW Removed in 15K1F 01
45	Hop-hornbeam	6"	
46	Amur Maple	12"	
47	Northern Hackberry	14"	
48	Northern Hackberry	18"	
49	Black Walnut	12"	
50	Norway Maple	12"	
51	Northern Hackberry	8"	
52	Northern Hackberry	10"	
53	Arborvitae	6"	
54	Arborvitae	6"	
55	Sugar Maple	36"	
56	American Elm	12"	
57	River Birch	6"	
58	Crabapple	5"	Withir ROW
59	Crabapple	4"	Withir ROW
60	Crabapple	5"	Withir ROW
61	Elm	14"	Withir ROW
MIXED WOODS	Thickets of young sumac, eastern cottonwood, norway maple, and black cherry.	< 4'	

KEY INDEX

49 REMOVE AND DISPOSE OF EXISTING WATERMAIN LATERAL PIPE FROM EXISTING BUILDING TO PROPERTY LINE. DRAIN, PLUG, & CAP PIPE AT PROPERTY LINE.

50 REMOVE AND DISPOSE OF EXISTING BURIED ELECTRICAL LINE. ELECTRIC LINE TO REMAIN IN SERVICE UNTIL NEW ELECTRICAL LINES IS INSTALLED. REFER TO SITE UTILITY PLANS SHEETS C500'S FOR PROPOSED ELECTRIC LINE LOCATION. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.

51 EXISTING SIGN TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

52 REMOVE AND DISPOSE OF EXISTING CONCRETE STAIRS.

53 EXISTING TREE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

54 STANDARD BUILDING ID SIGNS TO BE SALVAGED AND RETURNED TO UW MADISON FOR REUSE. REMOVE WITH CARE. CUT SIGNPOSTS AT TOP OF CONCRETE FOOTING. CONTRACTOR TO DELIVER SIGN TO UW HORSE BARN. COORDINATE DELIVERY WITH UW MADISON CPLA.

55 EXISTING CONTROL VAULT TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

56 CONTRACTOR TO REMOVE AND SALVAGE EXISTING LIGHT FIXTURE. REFER TO C500 SITE UTILITY PLAN SHEETS FOR PROPOSED LOCATION.

57 AT THE CONCLUSION OF PROJECT 20K1G–02, THE –01 GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR BACKFILLING THE HOLES CREATED BY THE FOUNDATION REMOVALS OF THE THREE STRUCTURES.

58 REMOVE AND DISPOSE OF EXISTING SANITARY SEWER PIPE FROM EXISTING BUILDING TO PROPERTY LINE. CAP PIPE AT PROPERTY LINE.

KEY INDEX

- PROJECT LIMITS
- VEGETATION TO BE REMOVED & DISPOSED OF OFFSITE. UNUSED TOPSOIL TO BE REMOVED OFFSITE. TOPSOIL THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
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- CLEAR & GRUB VEGETATION, REMOVE ROOTS & STUMPS. REMOVE & DISPOSE OF OFFSITE.
- EXISTING BUILDING & FOUNDATION TO BE RAZED. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
- XXXXXXX SAWCUT FULL DEPTH
- TREES & STUMPS TO BE REMOVED
- DENOTES UTILITIES TO BE ABANDONED & REMOVED.
- DENOTES UTILITIES TO BE ABANDONED IN PLACE.
- –UTILITY STRUCTURE REMOVAL/ABANDONMENT
- 30 TREE CODE
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K1G–02 CONTRACTOR
- TREE PROTECTION FENCING (5 / C154)

1 REMOVE & SALVAGE EXISTING LIGHT POLES. RETURN TO UW MADISON. COORDINATE DELIVERY WITH UW MADISON CPLA.
2 REMOVE & DISPOSE OF EXISTING SIGN INCLUDING POST & FOOTING
3 REMOVE & DISPOSE OF EXISTING POST & FOOTING
4 REMOVE AND DISPOSE OF EXISTING GRILLS.
5 REMOVE AND DISPOSE OF EXISTING BIKE RACKS.
6 REMOVE AND DISPOSE OF EXISTING TABLES.
7 REMOVE AND DISPOSE OF EXISTING RAISED GARDEN.
8 REMOVE AND DISPOSE OF EXISTING CONCRETE RETAINING WALL.
9 REMOVE AND DISPOSE OF EXISTING BURIED ELECTRICAL LINE.
10 REMOVE AND DISPOSE OF EXISTING OVERHEAD ELECTRICAL LINE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
11 REMOVE AND DISPOSE OF EXISTING OVERHEAD POLE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
12 REMOVE AND DISPOSE OF EXISTING GUY WIRE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
13 REMOVE AND DISPOSE OF EXISTING ELECTRICAL BOX. ELECTRICAL BOX TO REMAIN IN SERVICE UNTIL NEW ELECTRICAL BOX IS INSTALLED. REFER TO SITE UTILITY PLANS SHEETS C500'S FOR PROPOSED ELECTRIC BOX LOCATION. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
14 REMOVE AND DISPOSE OF EXISTING PEDESTAL. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
15 REMOVE AND DISPOSE OF EXISTING PULLBOX. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
16 REMOVE AND DISPOSE OF EXISTING ELECTRICAL METER.
17 EXISTING GUY WIRE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
18 EXISTING OVERHEAD POLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
19 EXISTING ELECTRIC METER TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
20 EXISTING LIGHT POLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
21 REMOVE AND RELOCATE EXISTING TRAFFIC CONTROL BOX. REFER TO SITE UTILITY PLANS SHEETS C500'S FOR TEMPORARY AND PROPOSED TRAFFIC CONTROL BOX LOCATIONS.
22 EXISTING TRAFFIC CONTROL BOX AND ELECTRIC METER TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
23 EXISTING TRAFFIC SIGNAL TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
24 REMOVE AND DISPOSE OF EXISTING GAS LINE. FROM EXISTING BUILDING TO PROPERTY LINE. CAP GAS PIPE AT PROPERTY LINE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
25 REMOVE AND DISPOSE OF GAS LATERAL TO EXISTING GAS MAIN.
26 REMOVE AND DISPOSE OF EXISTING GAS METER. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
27 EXISTING GAS VALVE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
28 EXISTING VALVE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
29 REMOVE AND DISPOSE OF EXISTING CHARTER TELECOMMUNICATIONS LINE TO EXISTING POLE BOX AT RIGHT OF WAY.
30 REMOVE AND DISPOSE OF EXISTING SANITARY SEWER PIPE.
31 REMOVE AND DISPOSE OF EXISTING SANITARY SEWER MANHOLE.
32 EXISTING SANITARY MANHOLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
33 REMOVE AND DISPOSE OF EXISTING WATERMAIN.
34 REMOVE AND DISPOSE OF EXISTING WATER VALVE.
35 EXISTING WATER VALVE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
36 CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING CLEANOUT AND PIPE
37 REMOVE AND DISPOSE OF EXISTING STORM SEWER STRUCTURE.
38 REMOVE AND DISPOSE OF EXISTING STORM SEWER PIPE.
39 EXISTING STORM SEWER STRUCTURE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
40 CAP REMOVED PIPE AT EXISTING STRUCTURE TO REMAIN.
41 EXISTING MANHOLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION. REFER TO C500 SHEETS FOR RIM ADJUSTMENTS.
42 REMOVE AND SALVAGE EXISTING BOULDERS. CONTRACTOR TO RETURN TO UW MADISON.
43 EXISTING PULLBOX TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
44 REMOVE AND DISPOSE OF EXISTING FIBER OPTIC LINE. COORDINATE REMOVAL WITH UTILITY OWNER.
45 CONTRACTOR TO DEMOLISH ZOE BAYLISS HOUSE. REFER TO SHEETS A010, P010 & M010 FOR MORE INFORMATION.
46 CONTRACTOR TO DEMOLISH SUSAN B. DAVIS RESIDENCE HALL. REFER TO SHEETS A011, P011 & M011 FOR MORE INFORMATION.
47 CONTRACTOR TO DEMOLISH NORTHWEST RESIDENCE BUILDING AND GARAGE.
48 CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING PLANTING BED PLANTS AND MULCH

R/S BORA

Consultant:
kapur
400 E. Wisconsin Ave.
Milwaukee, WI 53202
www.kapurinc.com

State of Wisconsin
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MADISON, WI 53715

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UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE DEMOLITION PLAN – ZONE 1 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale: 0 2.5' 5' 10' 15'
DFD Number: 20K1G–01
Set Type: FR
Date Issued: 04/21/2023
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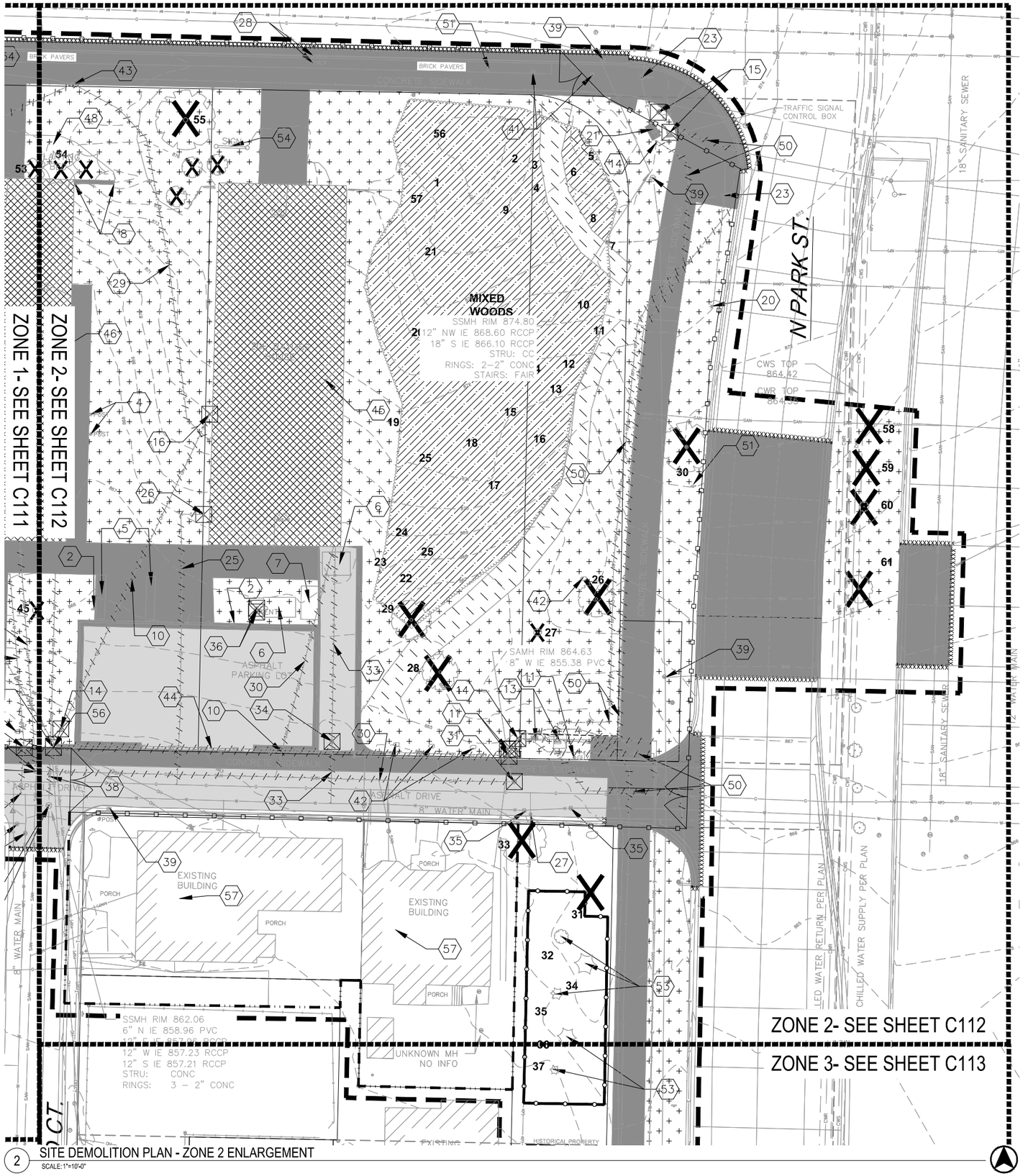

2 SITE DEMOLITION PLAN - ZONE 2 ENLARGEMENT
SCALE: 1"=10'-0"

GENERAL SITE DEMOLITION NOTES

1. REFER TO SHEET C001 CIVIL GENERAL NOTES FOR GENERAL DEMOLITION, CITY FORESTRY NOTES, & EROSION CONTROL NOTES.

Scale: 0 5 10 20
Scale: 1" = 10'

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UW LETTERS AND SCIENCE - .EVY HALL TREE SURVEY

TREE CODE	SPECIES	DBH	NOTES
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3	Basswood	12"	Multi-stem
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9	Northern Hackberry	16"	
10	Suma:	6"	
11	American Elm	4"	
12	Black Cherry	4"	
13	Black Cherry	4"	
14	Black Cherry	4"	
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16	Basswood	12"	
17	Basswood	30"	
18	Black Walnut	18"	
19	Basswood	24"	
20	Sugar maple	18"	
21	Eastern Red Cedar	6"	
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24	Black Walnut	16"	
25	Black Walnut	6"	
26	Northern Hackberry	24"	
27	Hop-hornbeam	4"	
28	Norway Maple	24"	
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MIXED WOODS	Thickets of young sumac, eastern cottonwood, norway maple, and black cherry.	< 4'	

KEY INDEX

49 REMOVE AND DISPOSE OF EXISTING WATERMAIN LATERAL PIPE FROM EXISTING BUILDING TO PROPERTY LINE. DRAIN, PLUG, & CAP PIPE AT PROPERTY LINE.

50 REMOVE AND DISPOSE OF EXISTING BURIED ELECTRICAL LINE. ELECTRIC LINE TO REMAIN IN SERVICE UNTIL NEW ELECTRICAL LINES IS INSTALLED. REFER TO SITE UTILITY PLANS SHEETS C500'S FOR PROPOSED ELECTRIC LINE LOCATION. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.

51 EXISTING SIGN TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

52 REMOVE AND DISPOSE OF EXISTING CONCRETE STAIRS.

53 EXISTING TREE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

54 STANDARD BUILDING ID SIGNS TO BE SALVAGED AND RETURNED TO UW MADISON FOR REUSE. REMOVE WITH CARE. CUT SIGNPOSTS AT TOP OF CONCRETE FOOTING. CONTRACTOR TO DELIVER SIGN TO UW HORSE BARN. COORDINATE DELIVERY WITH UW MADISON CPLA.

55 EXISTING CONTROL VAULT TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

56 CONTRACTOR TO REMOVE AND SALVAGE EXISTING LIGHT FIXTURE. REFER TO C500 SITE UTILITY PLAN SHEETS FOR PROPOSED LOCATION.

57 AT THE CONCLUSION OF PROJECT 20K1G-02, THE -01 GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR BACKFILLING THE HOLES CREATED BY THE FOUNDATION REMOVALS OF THE THREE STRUCTURES.

58 REMOVE AND DISPOSE OF EXISTING SANITARY SEWER PIPE FROM EXISTING BUILDING TO PROPERTY LINE. CAP PIPE AT PROPERTY LINE.

KEY INDEX

- PROJECT LIMITS
- VEGETATION TO BE REMOVED & DISPOSED OF OFFSITE. UNUSED TOPSOIL TO BE REMOVED OFFSITE. TOPSOIL THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
- ASPHALT PAVEMENT & BASE MATERIAL TO BE REMOVED TO SUB-BASE & DISPOSED OF OFFSITE. PAVEMENT & BASE THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
- CONCRETE & BASE MATERIAL TO BE REMOVED TO SUB-BASE & DISPOSED OF OFFSITE. CONCRETE & BASE THICKNESS MAY VARY. REFER TO GEOTECHNICAL REPORT.
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- EXISTING BUILDING & FOUNDATION TO BE RAZED. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
- XXXXXXX SAWCUT FULL DEPTH
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2 REMOVE & DISPOSE OF EXISTING SIGN INCLUDING POST & FOOTING
3 REMOVE & DISPOSE OF EXISTING POST & FOOTING
4 REMOVE AND DISPOSE OF EXISTING GRILLS.
5 REMOVE AND DISPOSE OF EXISTING BIKE RACKS.
6 REMOVE AND DISPOSE OF EXISTING TABLES.
7 REMOVE AND DISPOSE OF EXISTING RAISED GARDEN.
8 REMOVE AND DISPOSE OF EXISTING CONCRETE RETAINING WALL.
9 REMOVE AND DISPOSE OF EXISTING BURIED ELECTRICAL LINE.
10 REMOVE AND DISPOSE OF EXISTING OVERHEAD ELECTRICAL LINE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
11 REMOVE AND DISPOSE OF EXISTING OVERHEAD POLE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
12 REMOVE AND DISPOSE OF EXISTING GUY WIRE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
13 REMOVE AND DISPOSE OF EXISTING ELECTRICAL BOX. ELECTRICAL BOX TO REMAIN IN SERVICE UNTIL NEW ELECTRICAL BOX IS INSTALLED. REFER TO SITE UTILITY PLANS SHEETS C500'S FOR PROPOSED ELECTRIC BOX LOCATION. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
14 REMOVE AND DISPOSE OF EXISTING PEDESTAL. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
15 REMOVE AND DISPOSE OF EXISTING PULLBOX. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
16 REMOVE AND DISPOSE OF EXISTING ELECTRICAL METER.
17 EXISTING GUY WIRE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
18 EXISTING OVERHEAD POLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
19 EXISTING ELECTRIC METER TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
20 EXISTING LIGHT POLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
21 REMOVE AND RELOCATE EXISTING TRAFFIC CONTROL BOX. REFER TO SITE UTILITY PLANS SHEETS C500'S FOR TEMPORARY AND PROPOSED TRAFFIC CONTROL BOX LOCATIONS.
22 EXISTING TRAFFIC CONTROL BOX AND ELECTRIC METER TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
23 EXISTING TRAFFIC SIGNAL TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
24 REMOVE AND DISPOSE OF EXISTING GAS LINE. FROM EXISTING BUILDING TO PROPERTY LINE. CAP GAS PIPE AT PROPERTY LINE. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
25 REMOVE AND DISPOSE OF GAS LATERAL TO EXISTING GAS MAIN.
26 REMOVE AND DISPOSE OF EXISTING GAS METER. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.
27 EXISTING GAS VALVE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
28 EXISTING VALVE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
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31 REMOVE AND DISPOSE OF EXISTING SANITARY SEWER MANHOLE.
32 EXISTING SANITARY MANHOLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
33 REMOVE AND DISPOSE OF EXISTING WATERMAIN.
34 REMOVE AND DISPOSE OF EXISTING WATER VALVE.
35 EXISTING WATER VALVE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
36 CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING CLEANOUT AND PIPE
37 REMOVE AND DISPOSE OF EXISTING STORM SEWER STRUCTURE.
38 REMOVE AND DISPOSE OF EXISTING STORM SEWER PIPE.
39 EXISTING STORM SEWER STRUCTURE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
40 CAP REMOVED PIPE AT EXISTING STRUCTURE TO REMAIN.
41 EXISTING MANHOLE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION. REFER TO C500 SHEETS FOR RIM ADJUSTMENTS.
42 REMOVE AND SALVAGE EXISTING BOULDERS. CONTRACTOR TO RETURN TO UW MADISON.
43 EXISTING PULLBOX TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.
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47 CONTRACTOR TO DEMOLISH NORTHWEST RESIDENCE BUILDING AND GARAGE.
48 CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING PLANTING BED PLANTS AND MULCH

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SITE DEMOLITION PLAN - ZONE 2 ENLARGEMENT

Revisions:

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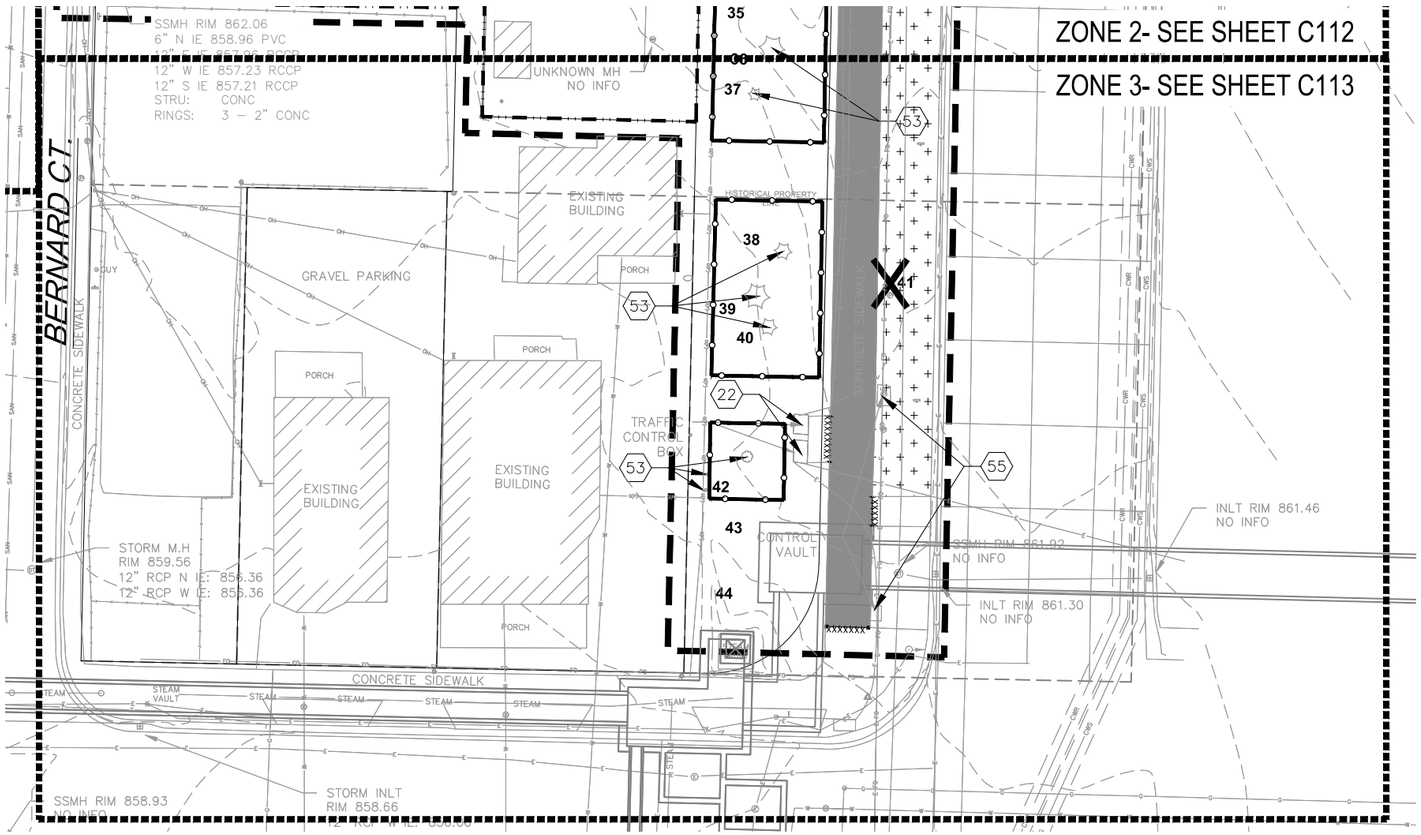

3 SITE DEMOLITION PLAN - ZONE 3 ENLARGEMENT
SCALE: 1"=10'-0"

GENERAL SITE DEMOLITION NOTES

1. REFER TO SHEET C001 CIVIL GENERAL NOTES FOR GENERAL DEMOLITION, CITY FORESTRY NOTES, & EROSION CONTROL NOTES.

N

Scale: 0 5 10 20
Scale: 1" = 10'

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UW LETTERS AND SCIENCE - .EVY HALL TREE SURVEY

TREE CODE	SPECIES	DBH	NOTES
1	Black Cherry	4"	Multi-stem
2	Basswood	14"	Multi-stem
3	Basswood	12"	Multi-stem
4	Basswood	10"	Multi-stem
5	Eastern Cottonwood	10"	
6	Eastern Cottonwood	10"	
7	Eastern Cottonwood	10"	
8	Sumac	4"	Multi-stem
9	Northern Hackberry	16"	
10	Sumac	6"	
11	American Elm	4"	
12	Black Cherry	4"	
13	Black Cherry	4"	
14	Black Cherry	4"	
15	Northern Red Oak	18"	
16	Basswood	12"	
17	Basswood	30"	
18	Black Walnut	18"	
19	Basswood	24"	
20	Sugar maple	18"	
21	Eastern Red Cedar	6"	
22	Basswood	18"	
23	Basswood	16"	
24	Black Walnut	16"	
25	Black Walnut	6"	
26	Northern Hackberry	24"	
27	Hop-hornbeam	4"	
28	Norway Maple	24"	
29	Basswood	18"	
30	Chinquapin Oak	2"	Withir ROW
31	River Birch	8"	Multi-stem Withir ROW
32	River Birch	8"	Multi-stem Withir ROW
33	Basswood	30"	Withir ROW
34	River Birch	8"	Multi-stem Withir ROW
35	Arborvitae	4"	Multi-stem Withir ROW
36	Arborvitae	6"	Multi-stem Withir ROW
37	Arborvitae	6"	Multi-stem Withir ROW
38	Arborvitae	6"	Multi-stem Withir ROW
39	Arborvitae	6"	Multi-stem Withir ROW
40	Arborvitae	6"	Multi-stem Withir ROW
41	Elm	2"	Withir ROW
42	River Birch	4"	Withir ROW Removed in 15K1F-01
43	River Birch	6"	Multi-stem Withir ROW Removed in 15K1F-01
44	River Birch	8"	Multi-stem Withir ROW Removed in 15K1F-01
45	Hop-hornbeam	6"	
46	Amur Maple	12"	
47	Northern Hackberry	14"	
48	Northern Hackberry	18"	
49	Black Walnut	12"	
50	Norway Maple	12"	
51	Northern Hackberry	8"	
52	Northern Hackberry	10"	
53	Arborvitae	6"	
54	Arborvitae	6"	
55	Sugar Maple	36"	
56	American Elm	12"	
57	River Birch	6"	
58	Crabapple	5"	Withir ROW
59	Crabapple	4"	Withir ROW
60	Crabapple	5"	Withir ROW
61	Elm	14"	Withir ROW
MIXED WOODS	Thickets of young sumac, eastern cottonwood, norway maple, and black cherry.	< 4'	

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49 REMOVE AND DISPOSE OF EXISTING WATERMAIN LATERAL PIPE FROM EXISTING BUILDING TO PROPERTY LINE. DRAIN, PLUG, & CAP PIPE AT PROPERTY LINE.
REMOVE AND DISPOSE OF EXISTING BURIED ELECTRICAL LINE. ELECTRIC LINE TO REMAIN IN SERVICE UNTIL NEW ELECTRICAL LINES IS INSTALLED. REFER TO SITE UTILITY PLANS SHEETS C500'S FOR PROPOSED ELECTRIC LINE LOCATION. COORDINATE REMOVAL WITH MADISON GAS & ELECTRIC.

50 EXISTING SIGN TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

51 REMOVE AND DISPOSE OF EXISTING CONCRETE STAIRS.

52 EXISTING TREE TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

53 STANDARD BUILDING ID SIGNS TO BE SALVAGED AND RETURNED TO UW MADISON FOR REUSE. REMOVE WITH CARE. CUT SIGNPOSTS AT TOP OF CONCRETE FOOTING. CONTRACTOR TO DELIVER SIGN TO UW HORSE BARN. COORDINATE DELIVERY WITH UW MADISON CPLA.

54 EXISTING CONTROL VAULT TO REMAIN. CONTRACTOR TO PROTECT THROUGHOUT CONSTRUCTION.

55 CONTRACTOR TO REMOVE AND SALVAGE EXISTING LIGHT FIXTURE. REFER TO C500 SITE UTILITY PLAN SHEETS FOR PROPOSED LOCATION.

56 AT THE CONCLUSION OF PROJECT 20K1G-02, THE -01 GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR BACKFILLING THE HOLES CREATED BY THE FOUNDATION REMOVALS OF THE THREE STRUCTURES.

57 REMOVE AND DISPOSE OF EXISTING SANITARY SEWER PIPE FROM EXISTING BUILDING TO PROPERTY LINE. CAP PIPE AT PROPERTY LINE.

58

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SITE DEMOLITION PLAN – ZONE 3 ENLARGEMENT

Revisions:

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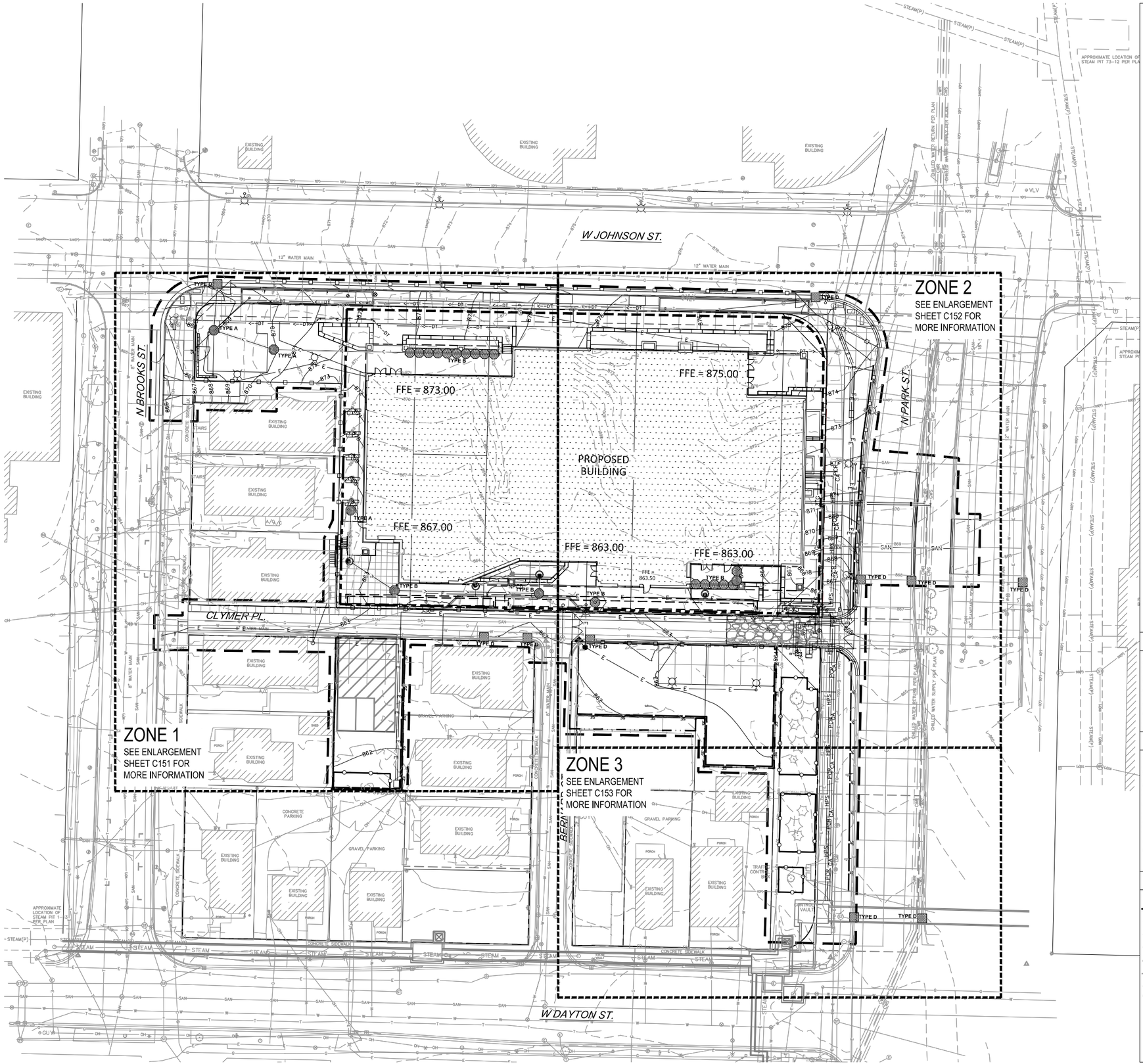

Scale: 0 10 20 40

Scale: 1" = 20'

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EROSION NOTES

INSPECT ALL EROSION CONTROL MEASURES PRIOR TO COMMENCING GRADING, GRUBBING OR OTHER LAND DISTURBING ACTIVITIES. EROSION CONTROL MEASURES MUST BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF EVERY PRECIPITATION EVENT OF 0.25 INCH OR GREATER. IN ADDITION THE CONTRACTOR SHALL CONDUCT DAILY INSPECTIONS AND DOCUMENT CONDITIONS AND REPAIRS MADE ALONG WITH DATE, TIME OF INSPECTION AND WEATHER CONDITIONS IN A DAILY LOG BOOK. THE DAILY LOG BOOK, WEEKLY / 0.25 INCH PRECIPITATION REPORTS, APPROVED PLANS AND WPDES PERMIT SHALL BE KEPT IN AN ACCESSIBLE LOCATION, LIKE A MAILBOX, WITHIN THE STAGING AREA.

AT ABSOLUTELY NO TIME MAY CONSTRUCTION EQUIPMENT, DEBRIS, FILL, ETC. BE PLACED WITHIN WETLANDS, WATERWAYS OR FLOOD PLAINS UNLESS IDENTIFIED IN THE PLANS.

REFER TO SHEET C001 CIVIL GENERAL NOTES FOR EROSION CONTROL NOTES AND SCHEDULE

POINTS OF CONTACT

OWNER CONTACT:

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CONSTRUCTION MANAGER:

TBD

KEY INDEX

- PROJECT LIMITS
- FILTER FABRIC FENCE — 1 / C154
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K1G-02 CONTRACTOR
- TREE PROTECTION FENCING — 5 / C154
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- STONE TRACKING PAD REQUIRED. LOCATION TO BE DETERMINED BY SELECTED CONTRACTOR'S APPROVED WORK PLAN. — 2 / C154
- TRIANGULAR SILT DIKES — 3 / C154
- DESIGNATES PROPOSED INLETS THAT MUST BE PROTECTED AFTER THEY HAVE BEEN CONSTRUCTED. — 4 / C154
- DESIGNATES EXISTING INLETS THAT MUST BE PROTECTED — 4 / C154

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SITE EROSION CONTROL PLAN – OVERALL

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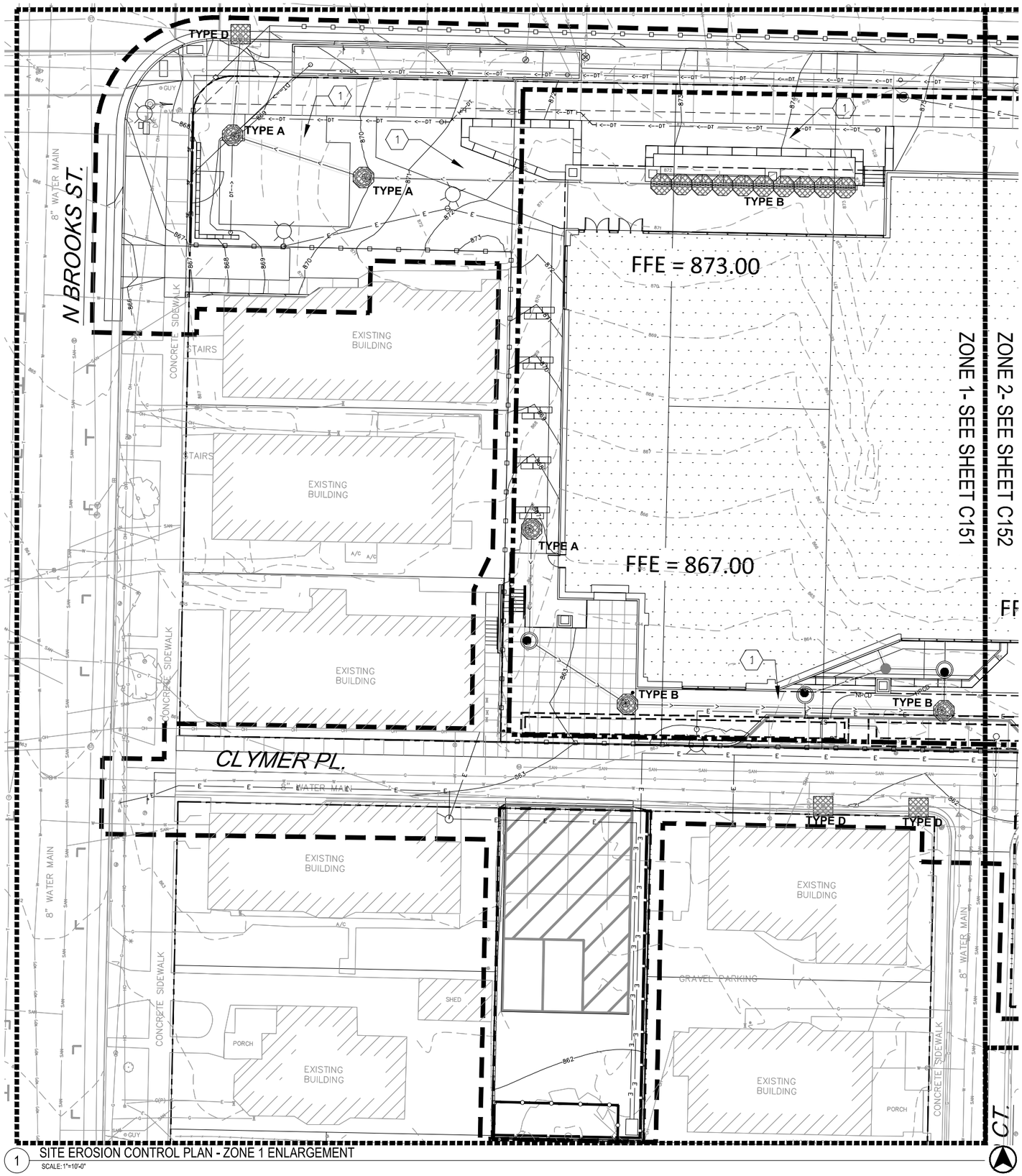

1 SITE EROSION CONTROL PLAN - ZONE 1 ENLARGEMENT
SCALE: 1"=10'-0"

Scale: 0 5 10 20
Scale: 1" = 10'

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- DESIGNATES PROPOSED INLETS THAT MUST BE PROTECTED AFTER THEY HAVE BEEN CONSTRUCTED. — 4 C154
- DESIGNATES EXISTING INLETS THAT MUST BE PROTECTED — 4 C154
- 1 FOLLOWING INSTALLATION OF PERMEABLE PAVERS, CONTRACTOR TO PROTECT PERMEABLE PAVERS TO ENSURE PAVER JOINTS DO NOT CLOG WITH CONSTRUCTION DEBRIS. FOLLOWING THE COMPLETION OF SITE CONSTRUCTION, CONTRACTOR TO TO VACUUM CLEAN PERMEABLE PAVERS USING REGENERATIVE AIR OR VACUUM SWEEPING METHODS.

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SITE EROSION CONTROL PLAN – ZONE 1 ENLARGEMENT

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Date Issued: 04/21/2023
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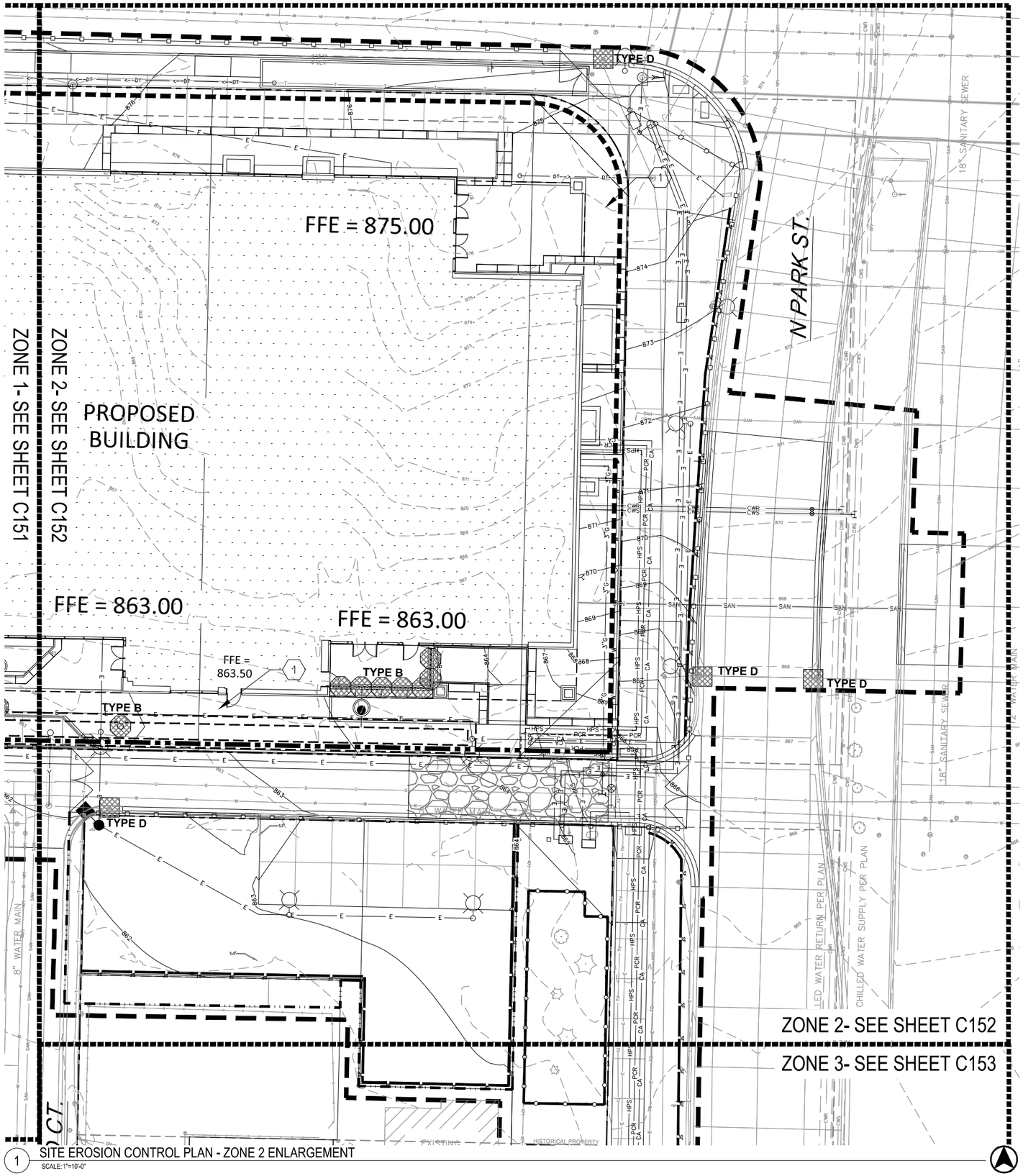

1 SITE EROSION CONTROL PLAN - ZONE 2 ENLARGEMENT
SCALE: 1"=10'-0"

N

Scale: 0 5 10 20
Scale: 1" = 10'

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EROSION NOTES

INSPECT ALL EROSION CONTROL MEASURES PRIOR TO COMMENCING GRADING, GRUBBING OR OTHER LAND DISTURBING ACTIVITIES. EROSION CONTROL MEASURES MUST BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF EVERY PRECIPITATION EVENT OF 0.25 INCH OR GREATER. IN ADDITION THE CONTRACTOR SHALL CONDUCT DAILY INSPECTIONS AND DOCUMENT CONDITIONS AND REPAIRS MADE ALONG WITH DATE, TIME OF INSPECTION AND WEATHER CONDITIONS IN A DAILY LOG BOOK. THE DAILY LOG BOOK, WEEKLY / 0.25 INCH PRECIPITATION REPORTS, APPROVED PLANS AND WPDES PERMIT SHALL BE KEPT IN AN ACCESSIBLE LOCATION, LIKE A MAILBOX, WITHIN THE STAGING AREA.

AT ABSOLUTELY NO TIME MAY CONSTRUCTION EQUIPMENT, DEBRIS, FILL, ETC. BE PLACED WITHIN WETLANDS, WATERWAYS OR FLOOD PLAINS UNLESS IDENTIFIED IN THE PLANS.

REFER TO SHEET C001 CIVIL GENERAL NOTES FOR EROSION CONTROL NOTES AND SCHEDULE

POINTS OF CONTACT

OWNER CONTACT:

MATTHEW DAPP – TEAM LEADER
WISCONSIN DEPARTMENT OF ADMINISTRATION
BUREAU OF ARCHITECTURE & ENGINEERING
DIVISION OF FACILITIES DEVELOPMENT
101 E. WILSON STREET
MADISON, WI 53703
PHONE: (608) 513-8220

PROJECT ENGINEER:

RYAN BIRSCHBACH
KAPUR & ASSOCIATES, INC
400 E. WISCONSIN AVENUE
MILWAUKEE, WI 53202
PHONE: (262) 758-6035

CONSTRUCTION MANAGER:

TBD

KEY INDEX

- PROJECT LIMITS
- FILTER FABRIC FENCE — 1 / C154
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K10-02 CONTRACTOR
- TREE PROTECTION FENCING — 5 / C154
- SOIL RETENTION LIMITS IF NECESSARY
- SOIL RETENTION LIMITS IF NECESSARY (SOIL NAILS, DRIVEN SHEETS, OR DRIVEN PILES NOT ALLOWED IN THIS AREA)
- STONE TRACKING PAD REQUIRED. LOCATION TO BE DETERMINED BY SELECTED CONTRACTOR'S APPROVED WORK PLAN. — 2 / C154
- TRIANGULAR SILT DIKES — 3 / C154
- DESIGNATES PROPOSED INLETS THAT MUST BE PROTECTED AFTER THEY HAVE BEEN CONSTRUCTED. — 4 / C154
- DESIGNATES EXISTING INLETS THAT MUST BE PROTECTED — 4 / C154
- (1) FOLLOWING INSTALLATION OF PERMEABLE PAVERS, CONTRACTOR TO PROTECT PERMEABLE PAVERS TO ENSURE PAVER JOINTS DO NOT CLOG WITH CONSTRUCTION DEBRIS. FOLLOWING THE COMPLETION OF SITE CONSTRUCTION, CONTRACTOR TO TO VACUUM CLEAN PERMEABLE PAVERS USING REGENERATIVE AIR OR VACUUM SWEEPING METHODS.

R/S BORA

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Milwaukee, WI 53202
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State of Wisconsin
Department of Administration
Division of Facilities Development

232 N. PARK ST.
MADISON, WI 53715

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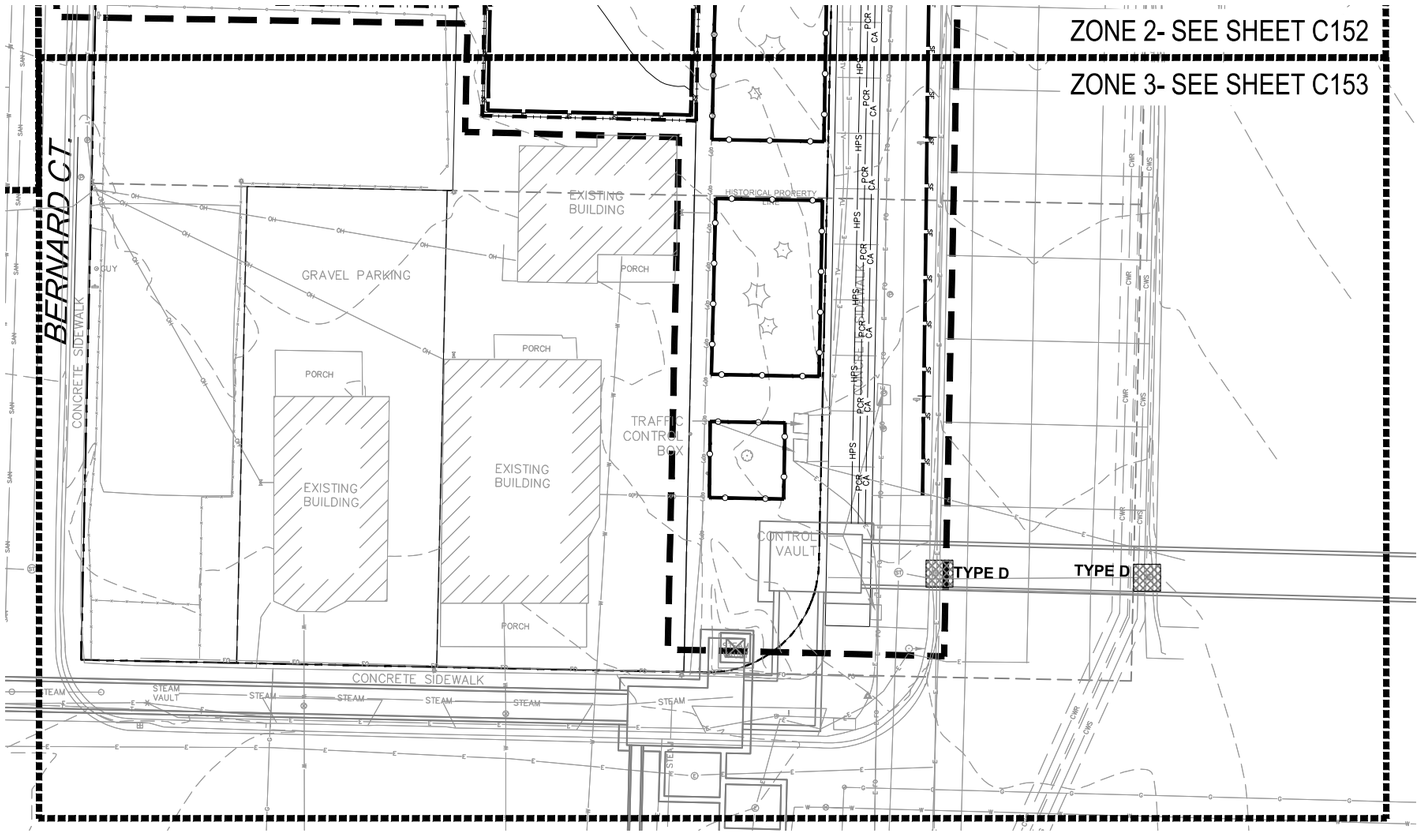
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE EROSION CONTROL PLAN – ZONE 2 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0 2.5' 5' 10' 15'
DFD Number	20K10-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C152



1 SITE EROSION CONTROL PLAN - ZONE 3 ENLARGEMENT
SCALE: 1"=10'-0"

Scale: 0 5 10 20
Scale: 1" = 10'

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EROSION NOTES

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AT ABSOLUTELY NO TIME MAY CONSTRUCTION EQUIPMENT, DEBRIS, FILL, ETC. BE PLACED WITHIN WETLANDS, WATERWAYS OR FLOOD PLAINS UNLESS IDENTIFIED IN THE PLANS.

REFER TO SHEET C001 CIVIL GENERAL NOTES FOR EROSION CONTROL NOTES AND SCHEDULE

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CONSTRUCTION MANAGER:

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MADISON, WI 53715

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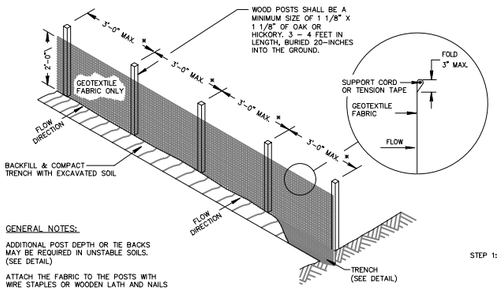
SITE EROSION CONTROL PLAN – ZONE 3 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0 2.5 5 10 15
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C153



GENERAL NOTES:

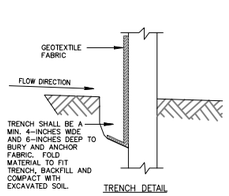
ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS. (SEE DETAIL)

ATTACH THE FABRIC TO THE POSTS WITH WIRE STAPLES OR WOODEN LATH AND NAILS

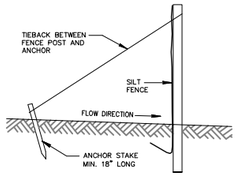
*8'–0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.

IF POSSIBLE, CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL TO AVOID JOINTS. IF A JOINT IS NECESSARY, USE ONE OF THE FOLLOWING METHODS: (1)TWIST METHOD: OVERLAP END POSTS & TWIST AT LEAST 180 DEGREES. (2)HOOK METHOD: HOOK THE END OF EACH SILT FENCE LENGTH.

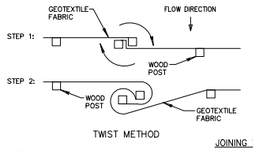
AXONIMETRIC VIEW



TRENCH DETAIL

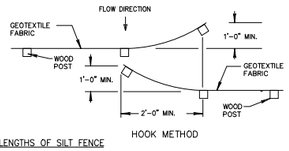


SILT FENCE TIE BACK
(WHEN ADDITIONAL SUPPORT REQUIRED)



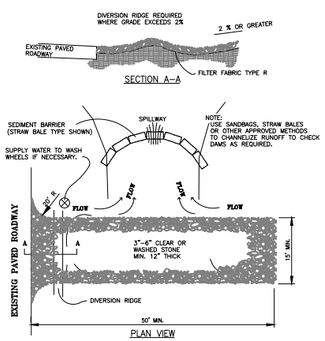
TWIST METHOD

JOINING TWO LENGTHS OF SILT FENCE



HOOK METHOD

1 / C154 FILTER FABRIC SILT FENCE DETAIL
N.T.S.



GENERAL NOTES:

THE AGGREGATE SIZE FOR CONSTRUCTION OF THE PAD SHALL BE 3– TO 6–INCH STONE. PLACE THE GRAVEL TO THE SPECIFIC GRADE & DIMENSIONS SHOWN ON THE PLANS & GRADE TO CREATE A SMOOTH SURFACE.

THE THICKNESS OF THE PAD SHALL NOT BE LESS THAN 12 INCHES. USE GEOTEXTILE FABRICS, IF NECESSARY, TO IMPROVE STABILITY OF THE FOUNDATION IN LOCATIONS SUBJECT TO SEEPAGE OR HIGH WATER TABLE.

THE WIDTH OF THE PAD SHALL NOT BE LESS THAN THE FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS & IN ANY CASE SHALL NOT BE LESS THAN 15 FEET WIDE.

THE LENGTH OF THE PAD SHALL BE AS REQUIRED, BUT NOT LESS THAN 50 FEET.

LOCATE CONSTRUCTION ENTRANCES & EXITS TO LIMIT SEDIMENT LEAVING THE SITE & TO PROVIDE FOR MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES. AVOID ENTRANCES WHICH HAVE STEEP GRADES & ENTRANCES AT CURVES IN PUBLIC ROADS.

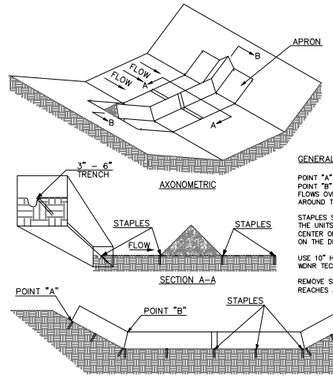
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE & REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY SHALL BE REMOVED BY THE END OF THE WORK DAY.

PROVIDE DRAINAGE FOR A 2 YEAR – 24 HOUR EVENT TO CARRY WATER TO A SEDIMENT TRAP OR OTHER SUITABLE OUTLET.

WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, DESIGNATE AN AREA WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

2 / C154 STONE TRACKING CONSTRUCTION ENTRANCE
N.T.S.



GENERAL NOTES:

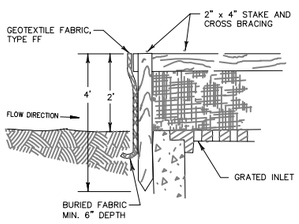
POINT "A" MUST BE HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE & NOT AROUND THE ENDS.

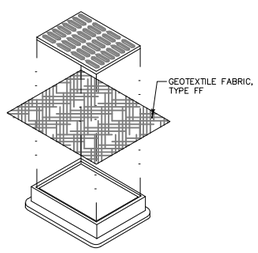
STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP & IN THE CENTER OF THE 7' UNIT AS SHOWN ON THE DIAGRAMS.

USE 10" HIGH SILT DIKE AS PER WDNR TECHNICAL STANDARD 1062.

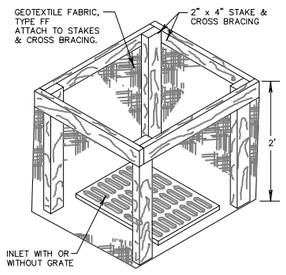
REMOVE SEDIMENT WHEN IT REACHES A HEIGHT OF 5".

3 / C154 TRIANGULAR SILT DIKE
N.T.S.

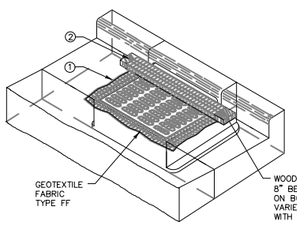




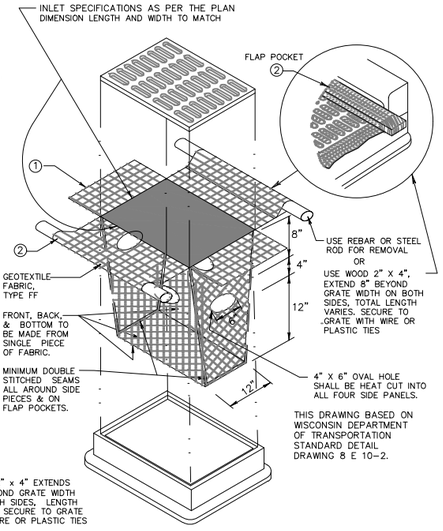
INLET PROTECTION, TYPE B, WITHOUT CURB BOX
(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE A



INLET PROTECTION, TYPE C, WITH CURB BOX



INLET PROTECTION, TYPE D,
(CAN BE INSTALLED IN ANY INLET TYPE, WITH OR WITHOUT A CURB BOX)

GENERAL NOTES

MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

① FINISHED SIZE SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL. SIDE FLAPS, WHERE REQUIRED SHALL BE A MIN. OF TWO INCHES LONG. FOLD THE FABRIC OVER AND REINFORCE WITH MULTIPLE STITCHES.

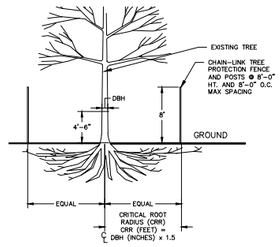
② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2"X4". THE REBAR, STEEL PIPE, OR WOOD SHALL BE INSTALLED IN THE FLAP AND NOT BLOCK THE TOP HALF OF THE CURB BOX OPENING.

INSTALLATION NOTES

TYPE B & C
TRIM EXCESS FABRIC A MINIMUM OF 10" AROUND GRATE FOR MAINTENANCE OR REMOVAL. THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D
UTILIZE INLET PROTECTION TYPE D IN INLETS DEEPER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3".
WHERE NECESSARY THE CONTRACTOR MAY CINCH THE BAG, USING PLASTIC ZIP TIES, TO FIT INLETS LESS THAN 30" DEPTH. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

4 / C154 INLET PROTECTION DETAIL
N.T.S.



NOTES:
1. PROTECT ALL EXISTING TREES, SHRUBS OR PLANTING BEDS SHOWN TO BE RETAINED WITHIN THE LIMITS OF CONSTRUCTION AND/OR ADJACENT THE LIMITS OF CONSTRUCTION WITH FENCING.
2. PROTECT TREE CANOPIES FROM OVERHEAD DAMAGE.
3. CRITICAL ROOT RADIUS (CRR): THE AREA OF ROOTS PROVIDING WATER AND MINERAL UPTAKE FOR THE PHYSIOLOGICAL HEALTH OF THE TREE. MEASURED AS 1.5x TRUNK DIAMETER AT DBH, EXPRESSED IN FEET. TREE PROTECTION MEASURES SHALL BE PLACED TO MINIMIZE ENCROACHING ON CRITICAL ROOT ZONE AND SO THAT NO MORE THAN 25% OF CRR IS DISTURBED.
4. INSTALL TREE PROTECTION FENCING PRIOR TO COMMENCEMENT OF ANY SITE DEMOLITION OR PREPARATION WORK (CLEARING, GRUBBING,, GRADING, EROSION CONTROL, ETC.) AND MAINTAIN THROUGHOUT ALL PHASES OF PROJECT CONSTRUCTION.
5. TREE PROTECTION FENCE LOCATIONS AND EXTENTS HAVE BEEN INDICATED IN THE DRAWINGS; IN NO INSTANCE SHALL TREE PROTECTION FENCE BE INSTALLED CLOSER THAN 5' FROM THE TRUNK OF ANY TREE WITHOUT PRIOR WRITTEN APPROVAL FROM DFD CONSTRUCTION AND CAMPUS REPRESENTATIVES.
6. NO STORAGE OF CONSTRUCTION MATERIALS, EQUIPMENT, OR SUPPLIES PERMITTED WITHIN TREE PROTECTION ZONES.
7. NO DISPOSAL OF CONSTRUCTION MATERIALS, BYPRODUCTS, OR SOLUTIONS PERMITTED WITHIN TREE PROTECTION ZONES.
8. TRUNK DBH IS MEASURED 4.5' ABOVE THE GROUND.
9. PROVIDE TREE PROTECTION FENCE POSTS AT 8–FEET O.C. (MAX.) SPACING. REFER TO SECTION 31 13 16 FOR ADDITIONAL INFORMATION.
10. GRADING, EXCAVATION, AND TRENCHING WITHIN TREE PROTECTION ZONES IS PERMITTED ONLY AS DESCRIBED IN SECTION 31 13 16.

5 / C154 TREE PROTECTION
N.T.S.

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SITE EROSION CONTROL DETAILS

Revisions:

No.	Date:	Description:

Graphic Scale	NOT TO SCALE
DFD Number	20K1G–01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C154

GENERAL TRAFFIC CONTROL NOTES:

1. UTMOST ATTENTION AND SAFETY MEASURES MUST BE USED WHEN DETOURING PEDESTRIAN AND VEHICLE TRAFFIC ROUTES. ALL TRAFFIC CONTROL SIGNS, BARRICADES, DEVICES, AND OTHER WARNINGS SHALL BE ADEQUATE TO PREVENT INJURIES AND ACCIDENTS. ALL TRAFFIC CONTROL SIGNS AND DEVICES SHALL MEET OR EXCEED THE LATEST EDITION OF MUTCD STANDARDS FOR MATERIALS AND SIZES.
2. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO TOM MOHR, 608-267-8725, TMOHR@CITYOFMADISON.COM AT LEAST 14 WORKING DAYS PRIOR TO START OR CHANGE TO TRAFFIC CONTROL. TRAFFIC CONTROL PLANS AND DEVICES (EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES) SHALL BE FIELD ADJUSTED TO FIT FIELD CONDITIONS AS DIRECTED BY THE CITY TRAFFIC ENGINEER. NO WORK IS ALLOWED TO BEGIN UNTIL THE PROPER TRAFFIC CONTROL DEVICES ARE IN PLACE, AND ARE APPROVED THE ENGINEER.
3. CONTRACTOR SHALL FURNISH, MOVE AND ADJUST FENCING, SIGNAGE, BARRIERS, AND ALL OTHER TRAFFIC CONTROL DEVICES AS NECESSARY BASED ON FIELD CONDITIONS, OBSERVATIONS, AND AT THE REQUEST OF UW-MADISON. ADDITIONAL FENCING, SIGNS, BARRIERS, OR TRAFFIC CONTROL DEVICES MAY BE REQUESTED TO LIMIT PEDESTRIAN AND VEHICULAR TRAFFIC AND PHASE WORK AT THE CONTRACTOR'S EXPENSE. ALL ADJUSTMENTS MUST BE APPROVED BY THE DFD PROJECT REPRESENTATIVE AND UW MADISON.
4. THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH EXISTING SIGNS. TRAFFIC CONTROL SIGNS SHOULD PROVIDE A MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.
5. ALL TEMPORARY SIGNS SHALL BE ATTACHED TO FIXED STRUCTURES WHICH ARE NOT EASILY MOVED. SIGNS SHALL BE POST MOUNTED OR SECURELY ATTACHED TO FENCING. CONTRACTOR IS RESPONSIBLE TO REPLACE ANY DAMAGED OR STOLEN SIGNS.
6. ANY SIGNS, TEMPORARY OR EXISTING, WHICH CONFLICT WITH THE TRAFFIC CONTROL IN USE SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER. NO WARNING LIGHT SHALL BE WORKING ON "COVERED" OR "DOWNED" SIGNS.
7. DO NOT DISTURB, OR REMOVE ANY TRAFFIC CONTROL SIGNS, ADVISORY SIGNS, SHOULDER DELINEATORS IN PLACE ALONG THE TRAVELED ROADWAYS WITHOUT THE APPROVAL OF THE CITY ENGINEER AND THE DFD PROJECT REPRESENTATIVE. COORDINATE WITH THE CITY OF MADISON PRIOR TO WORK RELATED TO CITY SIGNAGE OR LIGHTING.
8. ELECTRONIC MESSAGE BOARDS WILL BE REQUIRED FOR SEVEN DAYS PRIOR TO THE START OF WORK AND ANY PHASE CHANGES.
9. AN 8' HIGH CHAIN LINK FENCE SHALL BE INSTALLED AROUND THE CONSTRUCTION LIMITS AND STAGING AREAS TO ENSURE PEDESTRIANS AND VEHICLES ARE EXCLUDED FROM THE CONSTRUCTION AREA. THE FENCE SHALL BE SECURED TO THE GROUND BY MEANS OF STABILIZING FEET. CONTRACTOR TO COORDINATE EXACT FENCE LOCATION WITH DFD CONSTRUCTION REPRESENTATIVE, CITY OF MADISON, AND UW MADISON.
10. REFER TO SECTION 02 92 30 FOR FENCE SPECIFICATION AND SITE TRAFFIC CONTROL PLANS SHEETS C300S FOR APPROXIMATE FENCE LOCATIONS.
11. LANE WIDTHS TO BE 11' MINIMUM, 12' DESIRABLE.
12. EXISTING PAVEMENT MARKINGS TO BE IN CONFLICT WITH TEMPORARY TRAFFIC CONTROL MARKINGS (I.E. CROSSWALKS, LANE MARKINGS) SHALL BE REMOVE BY THE CONTRACTOR. REMOVALS TO BE PERFORMED UNDER SINGLE LANE ROLLING CLOSURE DURING OFF-PEAK HOURS AS APPROVED BY THE DFD PROJECT REPRESENTATIVE, CITY OF MADISON, AND UW MADISON.
13. AT COMPLETION OF PROJECT, CONTRACTOR SHALL REMOVE ALL TEMPORARY TRAFFIC CONTROL PAVEMENT MARKINGS AND RESTORE PAVEMENT MARKINGS TO PRE-CONSTRUCTION CONDITIONS. APPLICATION OF EPOXY PAVEMENT MARKINGS TO BE PERFORMED UNDER SINGLE LANE ROLLING CLOSURE DURING OFF-PEAK HOURS AS APPROVED BY DFD PROJECT REPRESENTATIVE, CITY OF MADISON, AND UW MADISON.
14. AT COMPLETION OF PROJECT, CONTRACTOR TO RESTORE SOUTH LANE OF JOHNSON STREET WITH BUS RAPID TRANSIT PAVEMENT MARKINGS.
15. EMERGENCY VEHICLE ACCESS TO BE MAINTAINED AT ALL TIMES. ACCESS MUST ALSO BE MAINTAINED FOR SERVICE DELIVERIES AND MAINTENANCE VEHICLES.

DO NOT CLOSE OR OBSTRUCT STREETS, ALLEYS, DRIVEWAYS, PARKING SPACES, WALKWAYS, OR OTHER FACILITIES WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION. ACCESS TO NEIGHBORING RESIDENCES AND BUSINESSES (211 N. BROOKS AND 204, 206 & 210 BERNARD CT.) THROUGHOUT CONSTRUCTION.

16. SHALL BE MAINTAINED AT ALL TIMES. PROVIDE ALTERNATIVE ROUTES AROUND CLOSED OR OBSTRUCTED.
17. TEMPORARY COVERED WALKWAY TO BE INCLUDED TO NORTH OF CONSTRUCTION LIMITS ALONG JOHNSON STREET. WALKWAY TO HAVE A MINIMUM CLEAR WIDTH OF 5 FEET.
18. HAVE AVAILABLE AT ALL TIMES SUFFICIENT EXPERIENCED PERSONNEL TO PROMPTLY INSTALL, REMOVE AND REINSTALL THE REQUIRED TRAFFIC CONTROL DEVICES TO ROUTE TRAFFIC IN ORDER TO PERFORM THE OPERATIONS.
19. PROVIDE THE CITY OF MADISON POLICE DEPARTMENT, UW POLICE DEPARTMENT, AND THE DFD PROJECT REPRESENTATIVE A CURRENT TELEPHONE NUMBER WITH WHICH THE GENERAL PRIME CONTRACTOR OR HIS REPRESENTATIVE CAN BE CONTACTED DURING NON-WORKING HOURS IN THE EVENT A SAFETY HAZARD DEVELOPS. DO NOT PARK OR STORE EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIALS OUTSIDE THE STAGED WORK ZONE AS DESIGNATED ON THE PLANS OR ANY ROADWAY CARRYING TRAFFIC DURING NON-WORKING HOURS EXCEPT AT LOCATIONS AND PERIODS OF TIME APPROVED BY THE DFD PROJECT REPRESENTATIVE AND THE CITY OF MADISON.
20. CONTRACTOR TO COORDINATE FINAL LOCATION OF EXTERIOR MOCKUP WITH ARCHITECT PRIOR TO INSTALLATION.
21. CONTRACTOR TO COORDINATE INSTALLATION AND CHANGES TO TRAFFIC CONTROL ALONG PARK STREET WITH 15K1F-01 CONTRACTOR.
22. SEE SHEETS C807 & C808 FOR TRAFFIC CONTROL DETAILS.

JOHNSON STREET TRAFFIC CONTROL NOTES:

1. CONTRACTOR SHALL PLACE A PORTABLE ELECTRONIC MESSAGE BOARD SEVEN DAYS IN ADVANCE OF THE SOUTHERN EASTBOUND TRAFFIC LANE CLOSURE WEST OF THE INTERSECTION OF CHARTER AND JOHNSON STREETS. THE MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD SHALL BE APPROVED BY CITY OF MADISON TRAFFIC ENGINEER TOM MOHR (608-267-8725). MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD TO READ "LANE CLOSURE AHEAD; STARTS DAY 'MONTH/DAY'; EXPECT PK HOUR DELAYS."
2. STAGING AND DELIVERY AREA ALONG JOHNSON STREET IS ONLY FOR CONSTRUCTION MATERIAL AND VEHICLES. CONTRACTOR PERSONAL VEHICLES SHALL NOT BE PARKED IN THIS AREA.
3. CONTRACTOR TO PROVIDE FLAGGER AT CONSTRUCTION ENTRANCES/EXITS ALONG JOHNSON STREET WHENEVER CONSTRUCTION EQUIPMENT IS ENTERING OR LEAVING THE CONSTRUCTION SITE/STAGING AREA TO ENSURE SAFE CROSSING OF PEDESTRIANS. AT NO TIME SHALL VEHICLES ENTER OR EXIT THE CONSTRUCTION SITE/STAGING AREA WITHOUT FLAGGERS PRESENT TO DIRECT PEDESTRIANS AND TRAFFIC. THE CONSTRUCTION FENCE AND GATE MUST BE CLOSED AND SECURE AT ALL TIMES VEHICLES ARE NOT ENTERING OR EXITING THE CONSTRUCTION SITE/STAGING AREA.

PARK STREET 36 HOUR SHUTDOWN TRAFFIC CONTROL NOTES:

1. CONTRACTOR SHALL PLACE PORTABLE ELECTRONIC MESSAGE BOARDS SEVEN DAYS IN ADVANCE OF THE SOUTHBOUND TRAFFIC CLOSURE SOUTH OF THE INTERSECTION OF PARK STREET AND UNIVERSITY AVENUE AND WEST OF THE INTERSECTION OF CHARTER AND JOHNSON STREETS. THE MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD SHALL BE APPROVED BY CITY OF MADISON TRAFFIC ENGINEER TOM MOHR (608-267-8725). MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD TO READ "PARK ST CLOSED AHEAD; STARTS SATURDAY 7:00 AM."
2. CONTRACTOR SHALL LEAVE PORTABLE ELECTRONIC MESSAGE BOARD IN PLACE SOUTH OF THE INTERSECTION OF PARK STREET AND UNIVERSITY AVENUE DURING ROAD CLOSURE. THE MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD SHALL BE APPROVED BY CITY OF MADISON TRAFFIC ENGINEER TOM MOHR (608-267-8725). MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD TO READ "PARK ST CLOSED AHEAD; FOLLOW DETOUR."
3. CONTRACTOR TO PROVIDE FLAGGER AT CONSTRUCTION ENTRANCES/EXITS ALONG PARK STREET WHENEVER CONSTRUCTION EQUIPMENT IS ENTERING OR LEAVING THE CONSTRUCTION SITE/STAGING AREA TO ENSURE SAFE CROSSING OF PEDESTRIANS. AT NO TIME SHALL VEHICLES ENTER OR EXIT THE CONSTRUCTION SITE/STAGING AREA WITHOUT FLAGGERS PRESENT TO DIRECT PEDESTRIANS AND TRAFFIC.

PARK STREET 36 HOUR SHUTDOWN SCHEDULE:

DAY 1 (SATURDAY):

- 7:00 AM – 9:00 AM
  - CLOSE PARK STREET BETWEEN JOHNSON AND DAYTON STREETS AND INSTALL PROPER TRAFFIC CONTROL SIGNS, BARRICADES AND OTHER DEVICES.
- 9:00 AM – 7:00 PM
  - TEMPORARY CRANE DELIVERY AND SETUP.

OVERNIGHT (NO NOISE):

- TWO TRUCKS WITH GIRDERS ARRIVE AND ARE STAGED IN CLOSED SECTION OF PARK STREET UNTIL MORNING.

DAY 2 (SUNDAY):

- 7:00 AM – 8:00 AM
  - FINAL INSPECTION OF TEMPORARY CRANE SETUP.
- 8:00 AM – 2:00 AM
  - PICK AND PLACEMENT OF TWO GIRDERS.
- 2:00 PM – 6:00 PM
  - TAKE DOWN AND REMOVAL OF TEMPORARY CRANE.
- 6:00 PM – 7:00 PM
  - TEMPORARY PARK STREET CLOSURE TRAFFIC CONTROL TAKE DOWN AND REOPENING OF PARK STREET.

PARK STREET LANE SHUTDOWN TRAFFIC CONTROL NOTES:

1. CONTRACTOR SHALL PLACE A PORTABLE ELECTRONIC MESSAGE BOARD SEVEN DAYS IN ADVANCE OF THE PARK STREET WEST SOUTHBOUND TRAFFIC LANE CLOSURE SOUTH OF THE INTERSECTION OF PARK STREET AND UNIVERSITY AVENUE. THE MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD SHALL BE APPROVED BY CITY OF MADISON TRAFFIC ENGINEER TOM MOHR (608-267-8725). MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD TO READ "LANE CLOSURE AHEAD; STARTS DAY 'MONTH/DAY';EXPECT PK HOUR DELAYS."
2. CONTRACTOR SHALL PLACE A PORTABLE ELECTRONIC MESSAGE BOARD SEVEN DAYS IN ADVANCE OF THE PARK STREET WEST NORTHBOUND TRAFFIC LANE CLOSURE NORTH OF THE INTERSECTION OF PARK AND SPRING STREETS. THE MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD SHALL BE APPROVED BY CITY OF MADISON TRAFFIC ENGINEER TOM MOHR (608-267-8725). MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD TO READ "LANE CLOSURE AHEAD; STARTS DAY 'MONTH/DAY';EXPECT PK HOUR DELAYS."
3. CONTRACTOR SHALL PLACE A PORTABLE ELECTRONIC MESSAGE BOARD SEVEN DAYS IN ADVANCE OF THE SWITCHING OF PARK STREET SOUTHBOUND TRAFFIC LANE CLOSURES NORTH OF THE INTERSECTION OF PARK AND SPRING STREETS. THE MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD SHALL BE APPROVED BY CITY OF MADISON TRAFFIC ENGINEER TOM MOHR (608-267-8725). MESSAGE ON THE PORTABLE ELECTRONIC MESSAGE BOARD TO READ "NEW TRAFFIC PATTERN; STARTS DAY 'MONTH/DAY'."
4. CONTRACTOR TO PROVIDE FLAGGER AT CONSTRUCTION ENTRANCES/EXITS ALONG PARK STREET WHENEVER CONSTRUCTION EQUIPMENT IS ENTERING OR LEAVING THE CONSTRUCTION SITE/STAGING AREA TO ENSURE SAFE CROSSING OF PEDESTRIANS. AT NO TIME SHALL VEHICLES ENTER OR EXIT THE CONSTRUCTION SITE/STAGING AREA WITHOUT FLAGGERS PRESENT TO DIRECT PEDESTRIANS AND TRAFFIC.

R/S BORA

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State of Wisconsin
Department of Administration
Division of Facilities Development
232 N. PARK ST.
MADISON, WI 53715

NEW ACADEMIC BUILDING
LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE TRAFFIC CONTROL PLAN NOTES

Revisions:

No.	Date:	Description:

Graphic Scale	0' 20' 40' 80' 120'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C300

Scale: 0 40 80 160
Scale: 1" = 80'

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LEGEND

- TYPE III BARRICADE WITH WARNING LIGHTS TYPE A
- TYPE III BARRICADE WITH WARNING LIGHTS TYPE A AND ATTACHED SIGN
- TRAFFIC CONTROL DRUM WITH WARNING LIGHT TYPE C
- FLASHING ARROW BOARD
- SIGN ON PERMANENT SUPPORT
- TYPE II BARRICADE WITH WARNING LIGHTS TYPE A AND ATTACHED SIGN
- WORK ZONE THIS STAGE
- CONCRETE BARRIER TEMPORARY PRECAST
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K1G-02 CONTRACTOR, AT CONCLUSION OF -02, FENCE TRANSFERRED TO -01 CONTRACTOR
- DIRECTIONAL ARROW FOR INFORMATIONAL PURPOSE ONLY
- MB PORTABLE ELECTRONIC MESSAGE BOARD

*REFER TO SHEET C300 FOR TRAFFIC CONTROL NOTES

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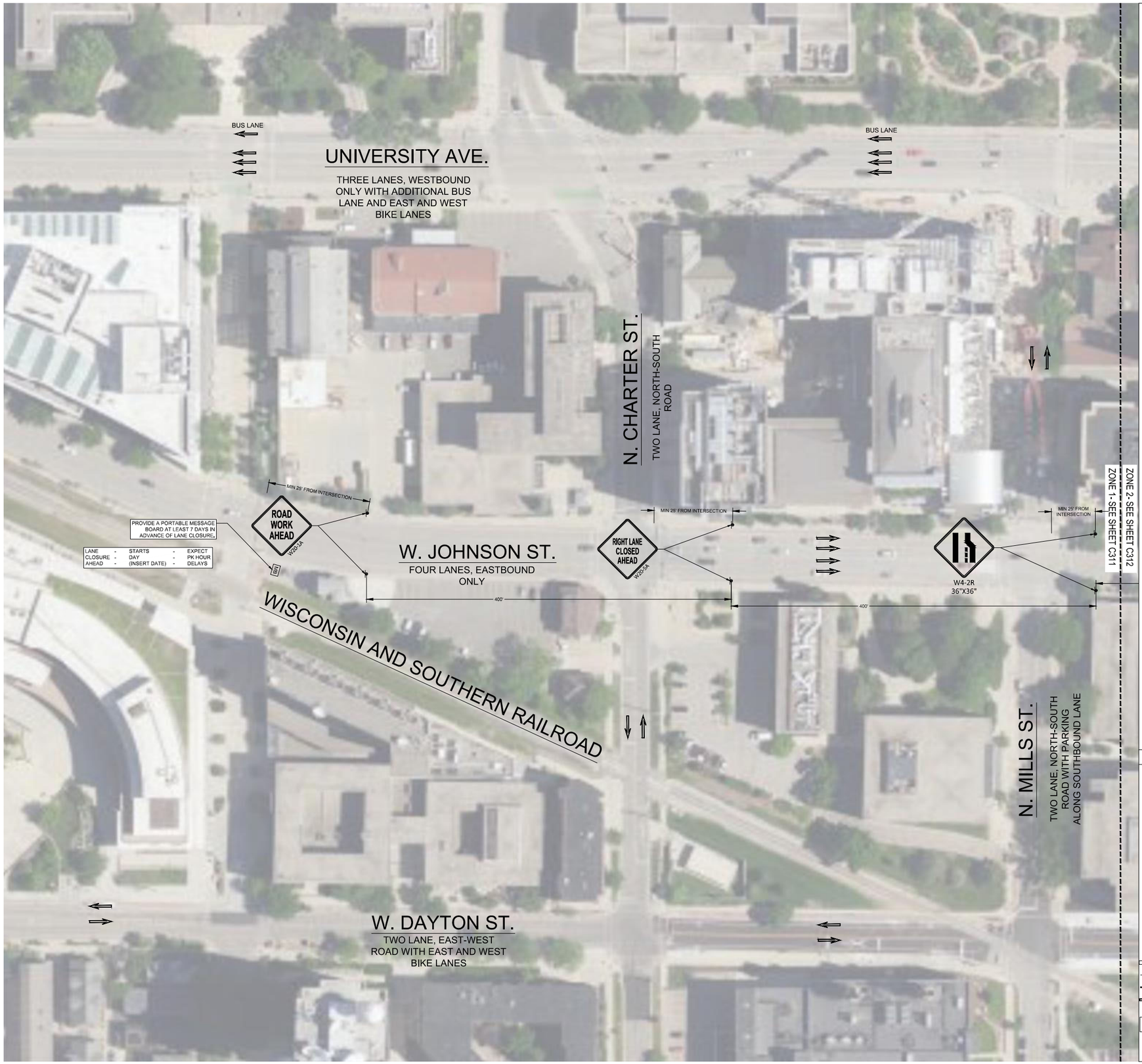
SITE TRAFFIC CONTROL PLAN GENERAL CONDITIONS - OVERALL

Revisions:

No.	Date:	Description:

Graphic Scale	0' 20' 40' 80' 120'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C310



Scale: 0 20 40 80
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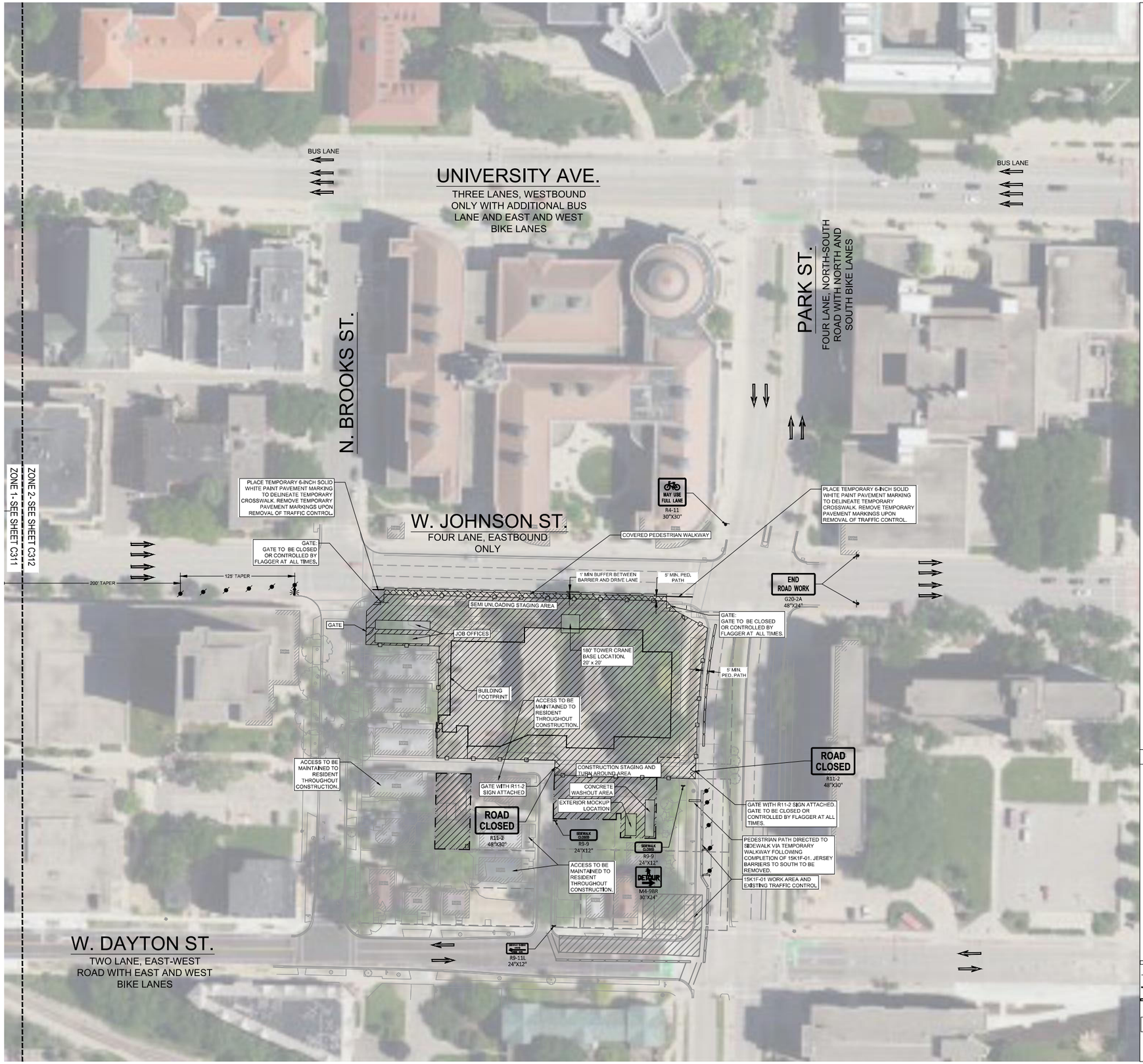
SITE TRAFFIC CONTROL PLAN GENERAL CONDITIONS - ZONE 1 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0' 10' 20' 40' 60'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C311



Scale: 0 20 40 80
Scale: 1" = 40'

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SITE TRAFFIC CONTROL PLAN GENERAL CONDITIONS - ZONE 2 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0' 10' 20' 40' 60'
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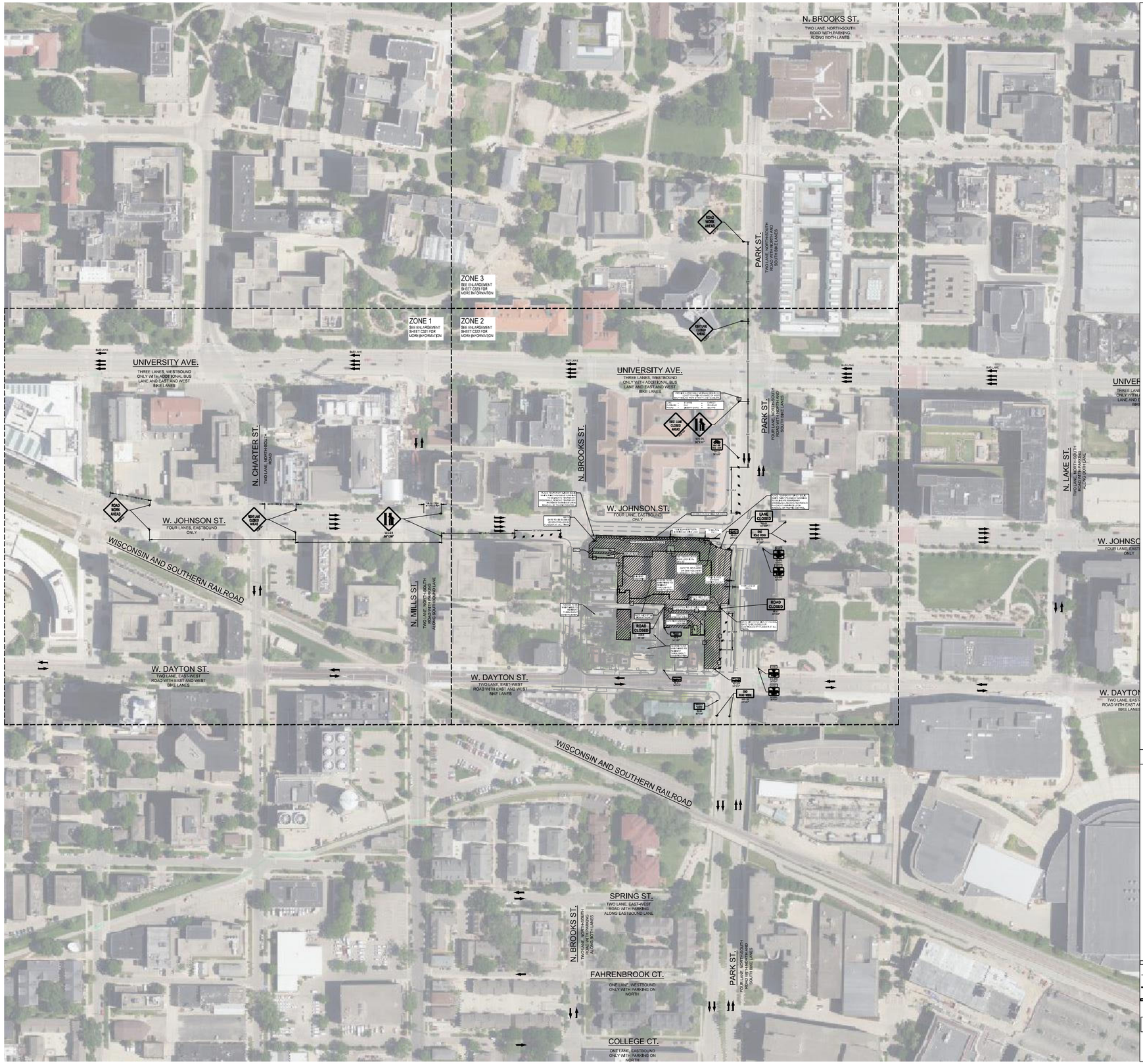

Scale: 0 50 100 200
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LEGEND

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SITE TRAFFIC CONTROL PLAN UTILITY PART A - OVERALL

Revisions:

No.	Date:	Description:

Graphic Scale	0 25' 50' 100' 150'
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Date Issued	04/21/2023
Sheet Number	C320

N

Scale: 0 20 40 80
Scale: 1" = 40'

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SITE TRAFFIC CONTROL PLAN UTILITY PART A – ZONE 1 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0' 10' 20' 40' 60'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C321

ZONE 3- SEE SHEET C323

ZONE 2- SEE SHEET C322

ZONE 1- SEE SHEET C321

ZONE 2- SEE SHEET C322

RIGHT LANE CLOSED AHEAD
W20-5A

BUS LANE

UNIVERSITY AVE.
THREE LANES, WESTBOUND ONLY WITH ADDITIONAL BUS LANE AND EAST AND WEST BIKE LANES

BUS LANE

PROVIDE A PORTABLE MESSAGE BOARD AT LEAST 7 DAYS IN ADVANCE OF WEST SOUTHBOUND PARK STREET LANE CLOSURE.

LANE CLOSURE AHEAD	-	STARTS DAY (INSERT DATE)	-	EXPECT PK HOUR DELAYS

MB

BIKE LANE CLOSED AHEAD
W20-5A

W4-2R
36"X36"

MAY USE FULL LANE
R4-11
30"X30"

200'

200'

PARK ST.
FOUR LANE, NORTH-SOUTH ROAD WITH NORTH AND SOUTH BIKE LANES

N. BROOKS ST.

125' TAPER

PLACE TEMPORARY 6-INCH SOLID WHITE PAINT PAVEMENT MARKING TO DELINEATE TEMPORARY CROSSWALK. REMOVE TEMPORARY PAVEMENT MARKINGS UPON REMOVAL OF TRAFFIC CONTROL.

PLACE TEMPORARY 6-INCH SOLID WHITE PAINT PAVEMENT MARKING TO DELINEATE TEMPORARY CROSSWALK. REMOVE TEMPORARY PAVEMENT MARKINGS UPON REMOVAL OF TRAFFIC CONTROL.

W. JOHNSON ST.
FOUR LANE, EASTBOUND ONLY

COVERED PEDESTRIAN WALKWAY

LANE CLOSED
R13-2L
48"X30"

GATE
GATE TO BE CLOSED OR CONTROLLED BY FLAGGER AT ALL TIMES.

200' TAPER

125' TAPER

1' MIN BUFFER BETWEEN BARRIER AND DRIVE LANE

5' MIN. PED. PATH

R9-11L
24"X12"

END ROAD WORK
G20-2A
48"X24"

SEMI UNLOADING STAGING AREA

GATE

JOB OFFICES

180' TOWER CRANE BASE LOCATION, 20' x 20'

GATE
GATE TO BE CLOSED OR CONTROLLED BY FLAGGER AT ALL TIMES.

BUILDING FOOTPRINT

ACCESS TO BE MAINTAINED TO RESIDENT THROUGHOUT CONSTRUCTION.

1' MIN BUFFER BETWEEN BARRIER AND CUT

11' MIN LANE OF TRAVEL

EAST DETOUR
M4-9BL
30"X24"

WEST DETOUR
M4-9BR
30"X24"

GATE WITH R11-2 SIGN ATTACHED

ROAD CLOSED
R11-2
48"X30"

ACCESS TO BE MAINTAINED TO RESIDENT THROUGHOUT CONSTRUCTION.

CONSTRUCTION STAGING AND TURN AROUND AREA

GATE WITH R11-2 SIGN ATTACHED

CONCRETE WASHOUT AREA

EXTERIOR MOCKUP LOCATION

ROAD CLOSED
R11-2
48"X30"

GATE WITH R11-2 SIGN ATTACHED. GATE TO BE CLOSED OR CONTROLLED BY FLAGGER AT ALL TIMES.

100' TAPER

SIDEWALK CLOSED
R9-9
24"X12"

ACCESS TO BE MAINTAINED TO RESIDENT THROUGHOUT CONSTRUCTION.

R9-11L
24"X12"

R9-11R
24"X12"

EAST DETOUR
M4-9BR
30"X24"

WEST DETOUR
M4-9BL
30"X24"

END ROAD WORK
G20-2A
48"X24"

SIDEWALK CLOSED AHEAD
R9-9A
30"X18"

W. DAYTON ST.
TWO LANE, EAST-WEST ROAD WITH EAST AND WEST BIKE LANES

N

Scale: 0 20 40 80
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LEGEND

- TYPE III BARRICADE WITH WARNING LIGHTS TYPE A
- TYPE III BARRICADE WITH WARNING LIGHTS TYPE A AND ATTACHED SIGN
- TRAFFIC CONTROL DRUM WITH WARNING LIGHT TYPE C
- FLASHING ARROW BOARD
- SIGN ON PERMANENT SUPPORT
- TYPE II BARRICADE WITH WARNING LIGHTS TYPE A AND ATTACHED SIGN
- WORK ZONE THIS STAGE
- CONCRETE BARRIER TEMPORARY PRECAST
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K1G-02 CONTRACTOR. AT CONCLUSION OF -02, FENCE TRANSFERRED TO -01 CONTRACTOR
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- MB PORTABLE ELECTRONIC MESSAGE BOARD

*REFER TO SHEET C300 FOR TRAFFIC CONTROL NOTES

R/S BORA

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LEVY HALL
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SITE TRAFFIC CONTROL PLAN UTILITY PART A – ZONE 2 ENLARGEMENT

Revisions:

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Graphic Scale: 0' 10' 20' 40' 60'

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Sheet Number	C322

N

Scale: 0 20 40 80
Scale: 1" = 40'

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SITE TRAFFIC CONTROL PLAN UTILITY PART A - ZONE 3 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0' 10' 20' 40' 60'
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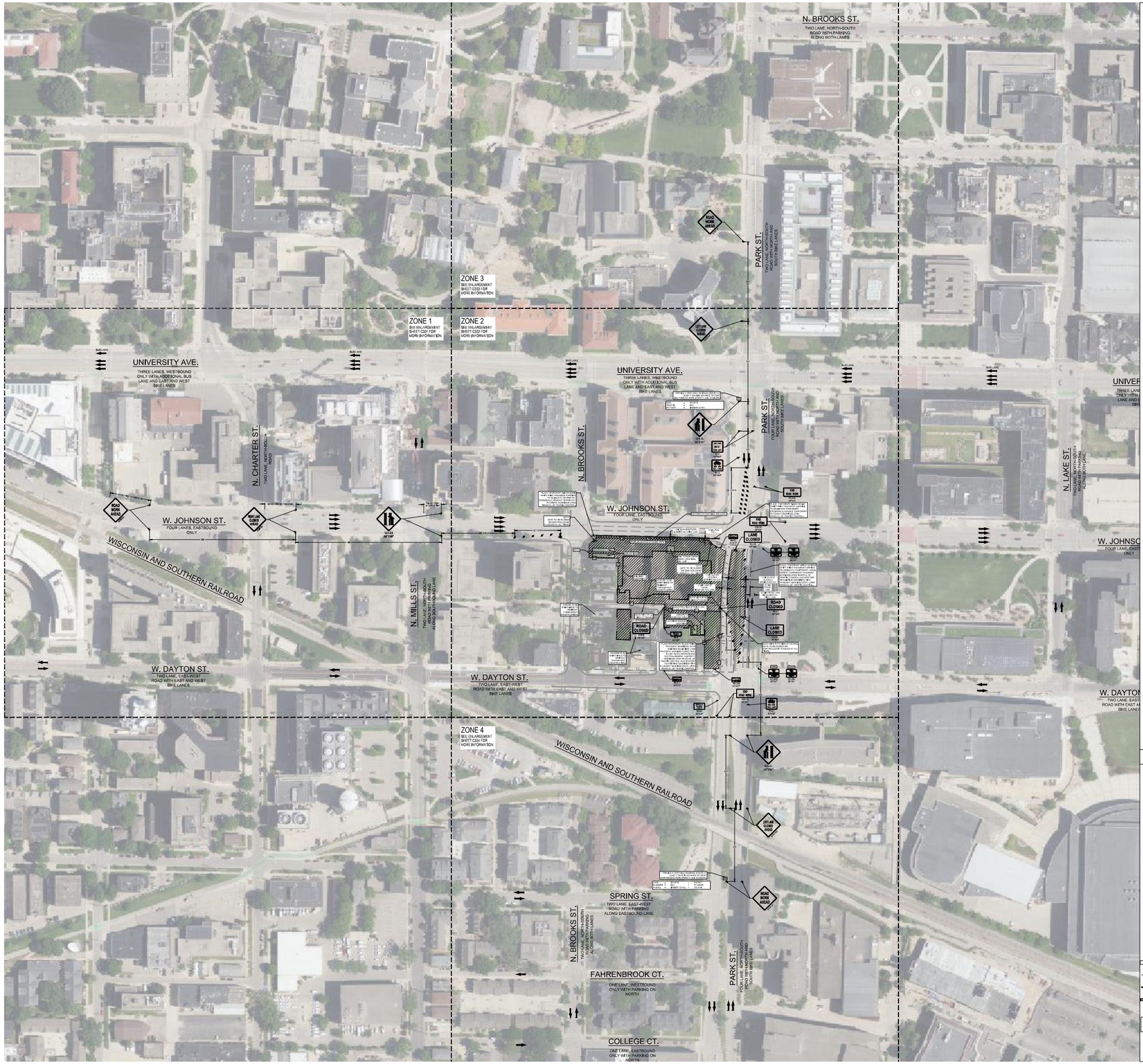
Date Issued	04/21/2023
Sheet Number	C323



Scale:
0 50 100 200
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SITE TRAFFIC CONTROL PLAN UTILITY PART B - OVERALL

Revisions:

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Sheet Number	C330

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LEGEND

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State of Wisconsin
Department of Administration
Division of Facilities Development

232 N. PARK ST.
MADISON, WI 53715

NEW ACADEMIC BUILDING
LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE TRAFFIC CONTROL PLAN UTILITY PART B - ZONE 1 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0 10' 20' 40' 60'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C331

ZONE 3- SEE SHEET C333

ZONE 2- SEE SHEET C332

ZONE 1- SEE SHEET C331

ZONE 2- SEE SHEET C332

LEFT LANE CLOSED AHEAD
W20-5SA

BUS LANE

UNIVERSITY AVE.
THREE LANES, WESTBOUND ONLY WITH ADDITIONAL BUS LANE AND EAST AND WEST BIKE LANES

BUS LANE

PROVIDE A PORTABLE MESSAGE BOARD AT LEAST 7 DAYS IN ADVANCE OF EAST SOUTHBOUND PARK STREET LANE CLOSURE.

NEW	-	STARTS
TRAFFIC	-	DAY
PATTERN	-	(INSERT DATE)

MB

W4-2L
36"X36"

N. BROOKS ST.

PARK ST.
FOUR LANE, NORTH-SOUTH ROAD WITH NORTH AND SOUTH BIKE LANES

200'

100'

100'

LEFT LANE MUST TURN LEFT
R3-7L
30"X30"

MAY USE FULL LANE
R4-11
30"X30"

125' TAPER

END ROAD WORK
G20-2A
48"X24"

PLACE TEMPORARY 6-INCH SOLID WHITE PAINT PAVEMENT MARKING TO DELINEATE TEMPORARY CROSSWALK. REMOVE TEMPORARY PAVEMENT MARKINGS UPON REMOVAL OF TRAFFIC CONTROL.

PLACE TEMPORARY 6-INCH SOLID WHITE PAINT PAVEMENT MARKING TO DELINEATE TEMPORARY CROSSWALK. REMOVE TEMPORARY PAVEMENT MARKINGS UPON REMOVAL OF TRAFFIC CONTROL.

W. JOHNSON ST.
FOUR LANE, EASTBOUND ONLY

COVERED PEDESTRIAN WALKWAY

GATE
GATE TO BE CLOSED OR CONTROLLED BY FLAGGER AT ALL TIMES.

200' TAPER

125' TAPER

1' MIN BUFFER BETWEEN BARRIER AND DRIVE LANE

5' MIN. PED. PATH

SEMI UNLOADING STAGING AREA

R9-11L
24"X12"

LANE CLOSED
R11-2L
48"X30"

EAST
DETOUR
M4-9BL
30"X24"

WEST
DETOUR
M4-9BR
30"X24"

GATE

JOB OFFICES

180' TOWER CRANE BASE LOCATION. 20' x 20'

GATE
GATE TO BE CLOSED OR CONTROLLED BY FLAGGER AT ALL TIMES.

BUILDING FOOTPRINT

ACCESS TO BE MAINTAINED TO RESIDENT THROUGHOUT CONSTRUCTION.

1' MIN BUFFER BETWEEN BARRIERS AND CUT

14' MIN LANE OF TRAVEL BIKES USE FULL LANE

1' MIN BUFFER BETWEEN BARRIER AND CUT

12' MIN TRAVEL LANE

12' MIN TRAVEL LANE BIKES USES FULL RIGHT LANE

PLACE TEMPORARY 6-INCH DASHED WHITE PAINT PAVEMENT MARKING TO DELINEATE TEMPORARY LANES. REMOVE TEMPORARY PAVEMENT MARKINGS UPON REMOVAL OF TRAFFIC CONTROL AND RESTORE TO EXISTING CONDITION WITH PAVEMENT MARKING EPOXY UPON REMOVAL OF TRAFFIC CONTROL.

GATE WITH R11-2 SIGN ATTACHED

ROAD CLOSED
R11-2
48"X30"

ACCESS TO BE MAINTAINED TO RESIDENT THROUGHOUT CONSTRUCTION.

GATE WITH R11-2 SIGN ATTACHED

CONSTRUCTION STAGING AND TURN AROUND AREA

CONCRETE WASHOUT AREA

EXTERIOR MOCKUP LOCATION

ROAD CLOSED
R11-2
48"X30"

SIDEWALK CLOSED
R9-9
24"X12"

160' TAPER

125' TAPER

LANE CLOSED
R11-2L
48"X30"

GATE WITH R11-2 SIGN ATTACHED, GATE TO BE CLOSED OR CONTROLLED BY FLAGGER AT ALL TIMES.

ACCESS TO BE MAINTAINED TO RESIDENT THROUGHOUT CONSTRUCTION.

PLACE TEMPORARY BLACK PAINT PAVEMENT MARKINGS OVER EXISTING SOLID BIKE LANE PAVEMENT MARKING ALONG PARK ST, BETWEEN JOHNSON AND DAYTON. REMOVE TEMPORTY MARKINGS UPON REMOVAL OF TRAFFIC CONTROL AND RESTORE TO EXISTING CONDITION WITH PAVEMENT MARKING EPOXY UPON REMOVAL OF TRAFFIC CONTROL.

EAST
DETOUR
M4-9BR
30"X24"

WEST
DETOUR
M4-9BL
30"X24"

W. DAYTON ST.
TWO LANE, EAST-WEST ROAD WITH EAST AND WEST BIKE LANES

R9-11L
24"X12"

R9-11R
24"X12"

END ROAD WORK
G20-2A
48"X24"

200'

SIDEWALK CLOSED AHEAD
R9-9A
30"X18"

MAY USE FULL LANE
R4-11
30"X30"

ZONE 2- SEE SHEET C332

ZONE 4- SEE SHEET C334

N

Scale:
0 20 40 80
Scale: 1" = 40'

DIGGERS HOTLINE
Dial 811 or (800)242-8511
www.DiggersHotline.com

LEGEND

- TYPE III BARRICADE WITH WARNING LIGHTS TYPE A
- TYPE III BARRICADE WITH WARNING LIGHTS TYPE A AND ATTACHED SIGN
- TRAFFIC CONTROL DRUM WITH WARNING LIGHT TYPE C
- FLASHING ARROW BOARD
- SIGN ON PERMANENT SUPPORT
- TYPE II BARRICADE WITH WARNING LIGHTS TYPE A AND ATTACHED SIGN
- WORK ZONE THIS STAGE
- CONCRETE BARRIER TEMPORARY PRECAST
- CONSTRUCTION FENCE
- CONSTRUCTION FENCE BY 20K1G-02 CONTRACTOR, AT CONCLUSION OF -02, FENCE TRANSFERRED TO -01 CONTRACTOR
- DIRECTIONAL ARROW FOR INFORMATIONAL PURPOSE ONLY
- MB PORTABLE ELECTRONIC MESSAGE BOARD

*REFER TO SHEET C300 FOR TRAFFIC CONTROL NOTES

R/S BORA

Consultant:
kapur
400 E. Wisconsin Ave.
Milwaukee, WI 53202
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NEW ACADEMIC BUILDING
LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE TRAFFIC CONTROL PLAN UTILITY PART B - ZONE 2 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale: 0' 10' 20' 40' 60'

DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C332

N

Scale: 0 20 40 80
Scale: 1" = 40'

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MADISON, WISCONSIN

SITE TRAFFIC CONTROL PLAN UTILITY PART B - ZONE 3 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0' 10' 20' 40' 60'
DFD Number	20K1G-01
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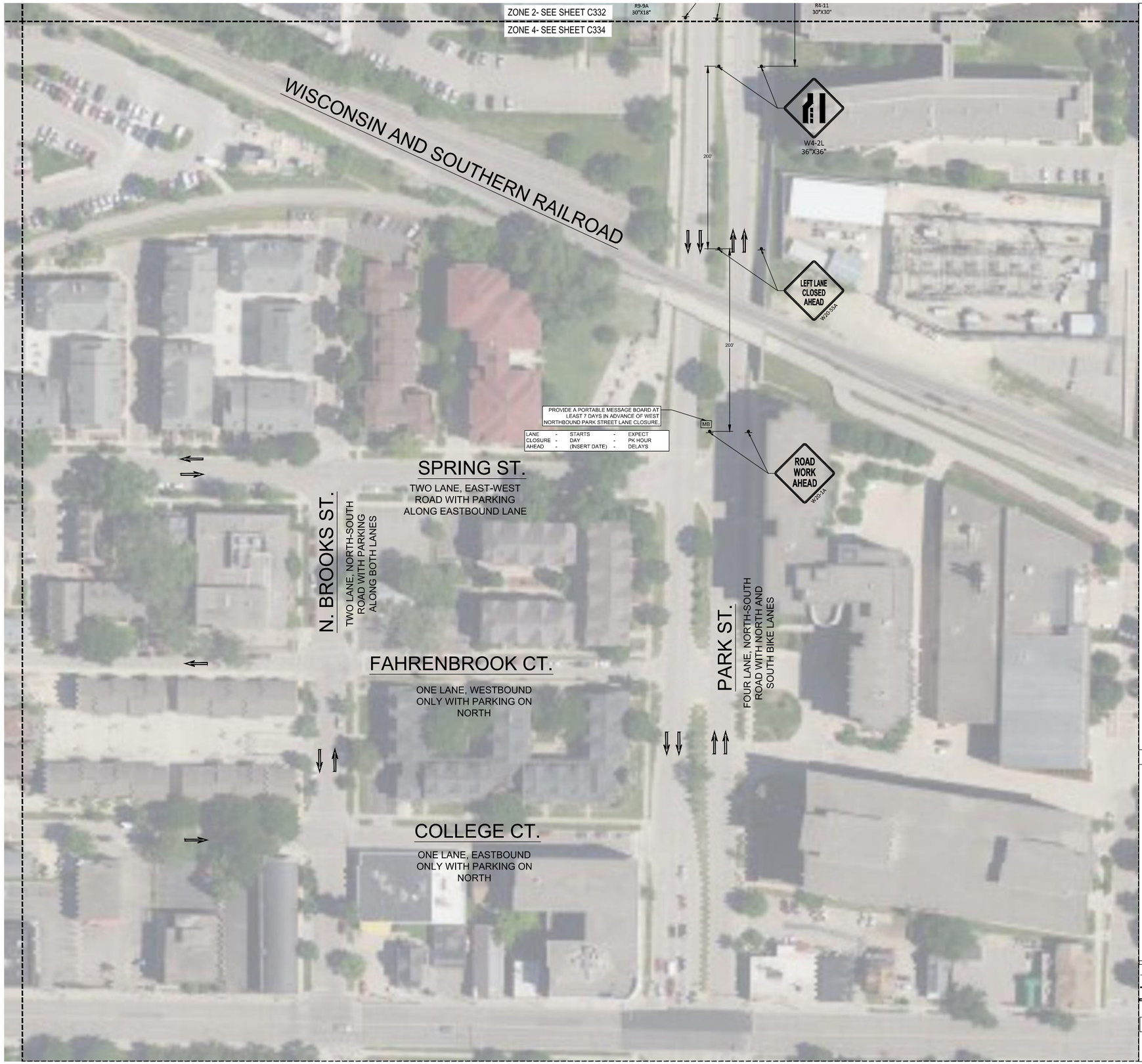
Date Issued	04/21/2023
Sheet Number	C333



Scale: 0 20 40 80
Scale: 1" = 40'

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SITE TRAFFIC CONTROL PLAN UTILITY PART B - ZONE 4 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale: 0' 10' 20' 40' 60'

DFD Number	20K1G-01
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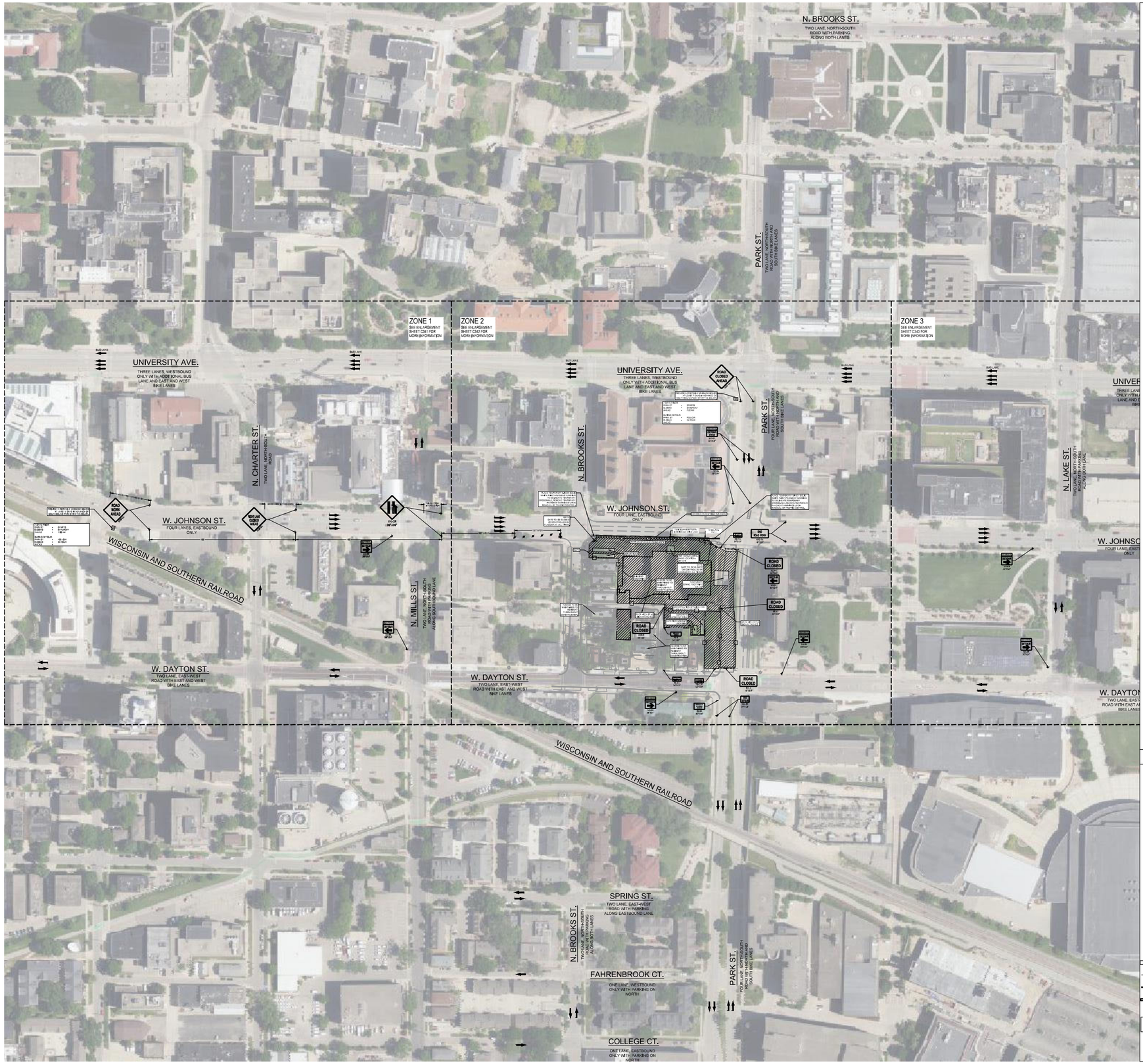
Sheet Number	C334



LEGEND

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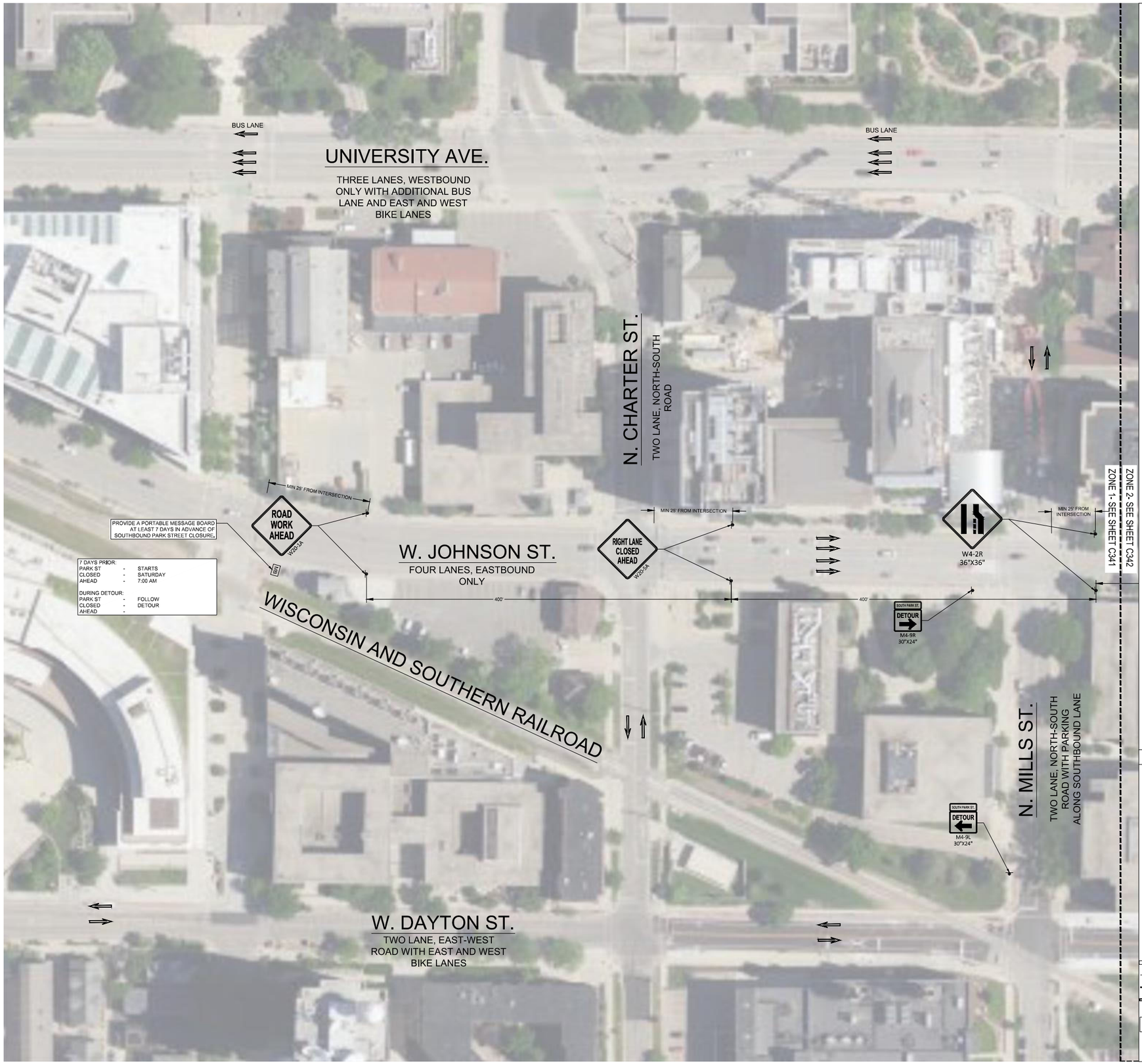
SITE TRAFFIC CONTROL PLAN PARK ST. CLOSURE - OVERALL

Revisions:

No.	Date:	Description:

Graphic Scale	0 25 50 100 150
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C340



Scale: 0 20 40 80
Scale: 1" = 40'

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SITE TRAFFIC CONTROL PLAN PARK ST. CLOSURE – ZONE 1 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0' 10' 20' 40' 60'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C341

Scale: 0 20 40 80
Scale: 1" = 40'

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SITE TRAFFIC CONTROL PLAN PARK ST. CLOSURE - ZONE 2 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale: 0' 10' 20' 40' 60'

DFD Number	20K1G-01
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Date Issued	04/21/2023
Sheet Number	C342

Scale: 0 20 40 80
Scale: 1" = 40'

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SITE TRAFFIC CONTROL PLAN PARK ST CLOSURE - ZONE 3 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0 10' 20' 40' 60'
DFD Number	20K1G-01
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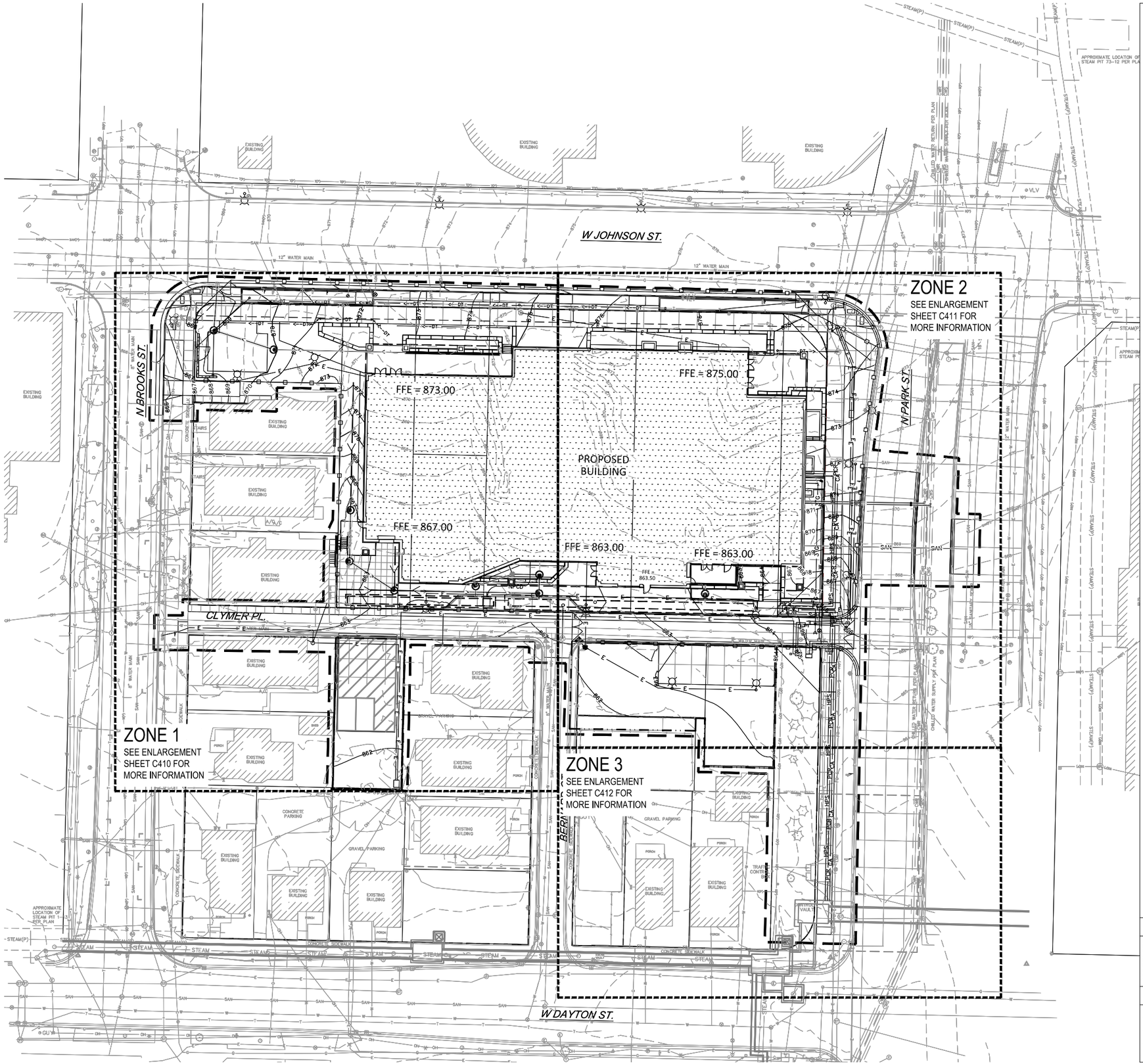
Sheet Number	C343



Scale: 0 10 20 40
Scale: 1" = 20'

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KEY INDEX

- PROJECT LIMITS
- 869 – EXISTING CONTOUR MINOR
- 870 – EXISTING CONTOUR MAJOR
- 869 PROPOSED CONTOUR MINOR
- 870 PROPOSED CONTOUR MAJOR

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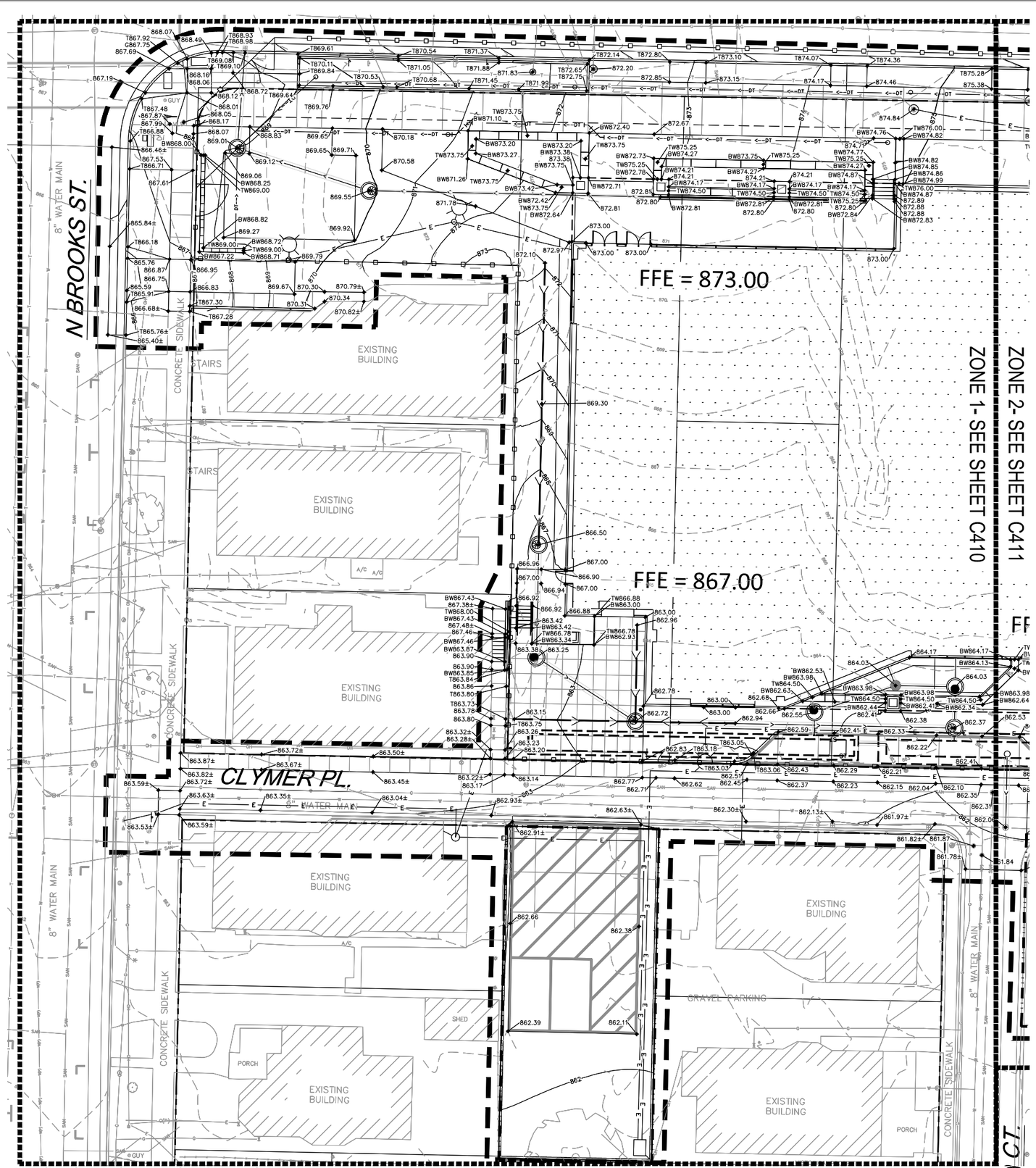
SITE GRADING PLAN – OVERALL

Revisions:

No.	Date:	Description:

Graphic Scale: 0 5 10 20 30

DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C400



1 SITE GRADING PLAN - ZONE 1 ENLARGEMENT
SCALE: 1"=10'-0"

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Scale: 0 5 10 20
Scale: 1" = 10'

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KEY INDEX

- PROJECT LIMITS
- 869 – EXISTING CONTOUR MINOR
- 870 – EXISTING CONTOUR MAJOR
- 869 PROPOSED CONTOUR MINOR
- 870 PROPOSED CONTOUR MAJOR
- 870.00 PROPOSED SPOT GRADE
- 870.0± MATCH EXISTING GRADE
- T870.00 PROPOSED TOP OF CURB GRADE. REFER TO SITE LAYOUT PLANS FOR MORE INFORMATION. GUTTER IS 6" BELOW TOP OF CURB UNLESS OTHERWISE NOTED.
- T870.0± MATCH EXISTING TOP OF CURB GRADE
- TW870.00 PROPOSED TOP OF WALL
- BW870.00 PROPOSED BOTTOM OF WALL

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SITE GRADING PLAN – ZONE 1 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale	0' 2.5' 5' 10' 15'
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Date Issued	04/21/2023
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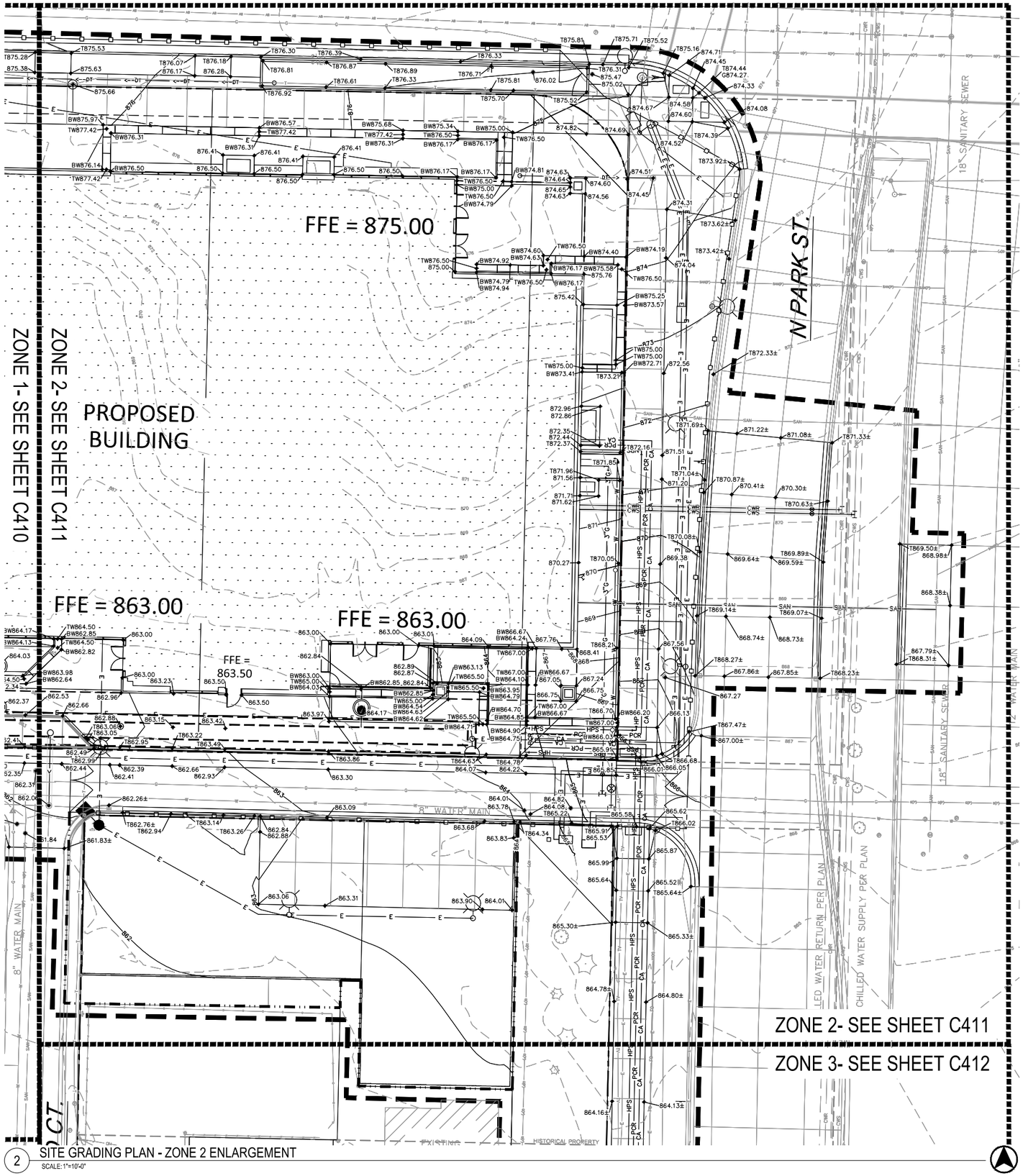

2 SITE GRADING PLAN - ZONE 2 ENLARGEMENT
SCALE: 1"=10'-0"

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Scale: 0 5 10 20
Scale: 1" = 10'

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SITE GRADING PLAN – ZONE 2 ENLARGEMENT

Revisions:		
No.	Date:	Description:

Graphic Scale:	0 2.5 5 10 15
DFD Number	20K1G-01
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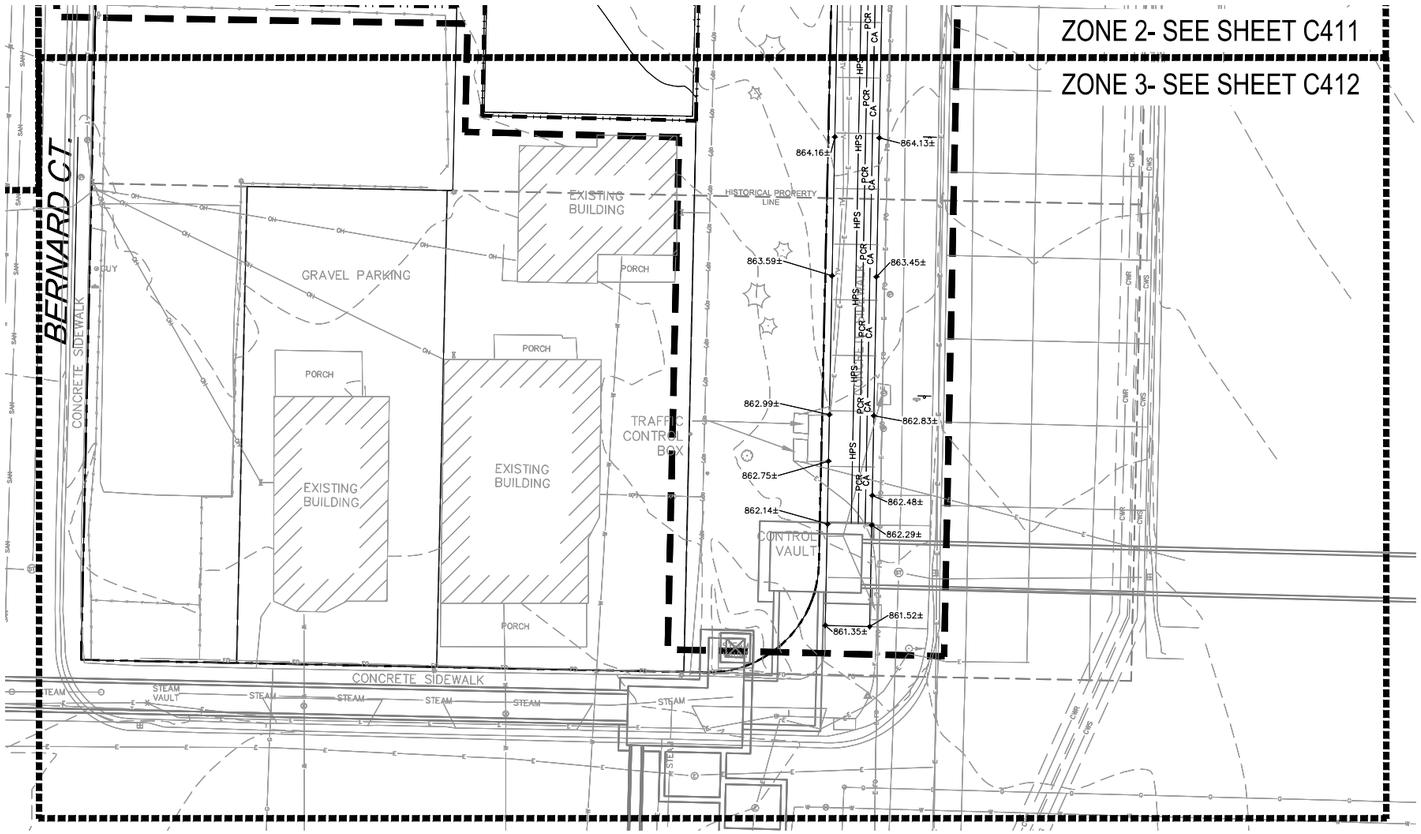
Sheet Number	C411



3 SITE GRADING PLAN - ZONE 3 ENLARGEMENT
SCALE: 1"=10'-0"

Scale: 0 5 10 20
Scale: 1" = 10'

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NEW ACADEMIC BUILDING
LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE GRADING PLAN – ZONE 3 ENLARGEMENT

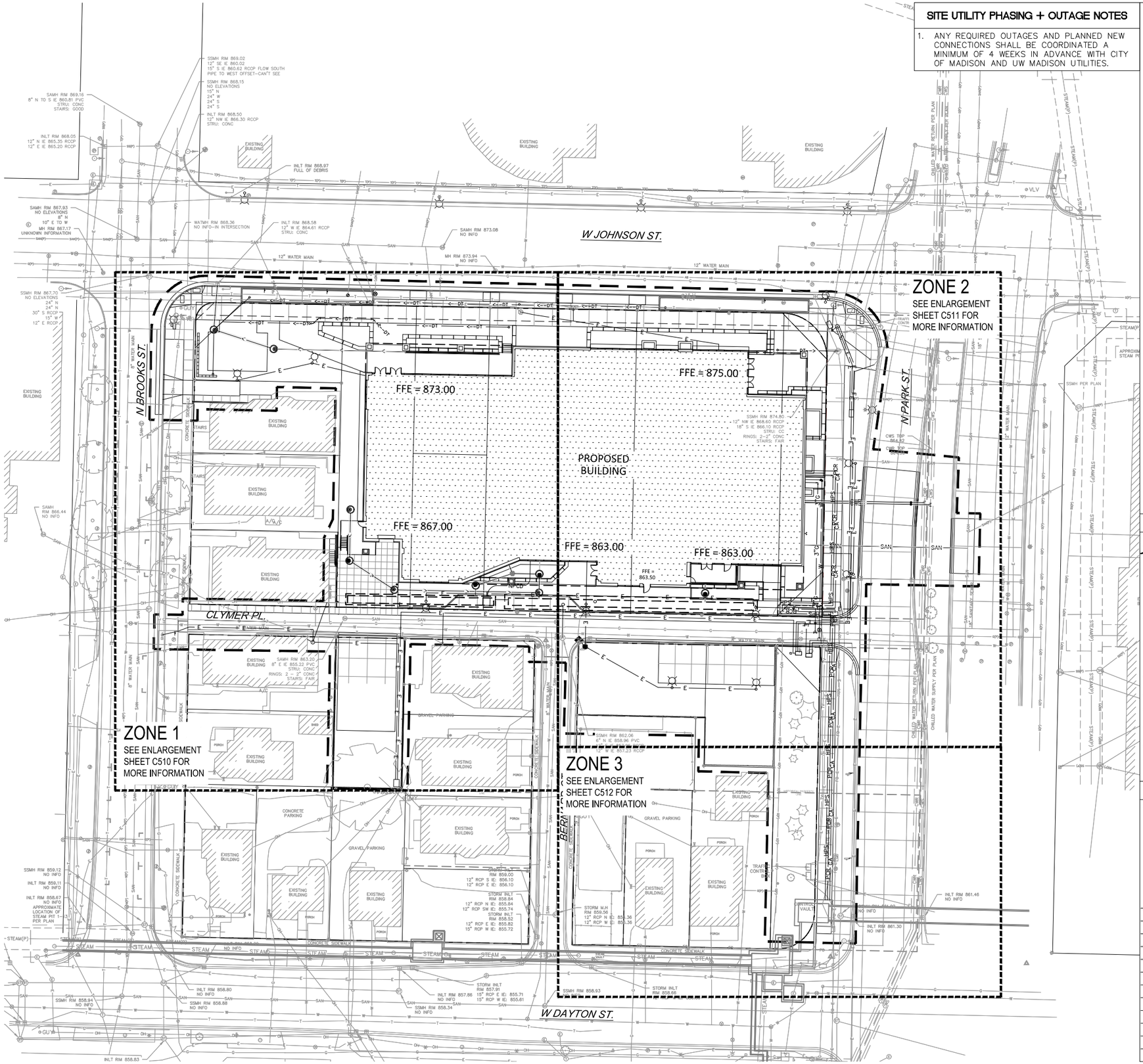
Revisions:

No.	Date:	Description:

Graphic Scale	0' 2.5' 5' 10' 15'
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C412

SITE UTILITY PHASING + OUTAGE NOTES

1. ANY REQUIRED OUTAGES AND PLANNED NEW CONNECTIONS SHALL BE COORDINATED A MINIMUM OF 4 WEEKS IN ADVANCE WITH CITY OF MADISON AND UW MADISON UTILITIES.



UTILITY NOTES

CAUTION

KNOWN UTILITY AND POTENTIAL CONFLICTS EXIST WITH EXISTING UNDERGROUND UTILITIES. PRIOR TO UTILITY INSTALLATION, CONTRACTOR TO EXCAVATE AND EXPOSE EXISTING UTILITIES, VERIFY LOCATIONS AND ELEVATIONS, AND CONTACT ENGINEER IF CONFLICTS EXIST WITH PROPOSED CONSTRUCTION AND EXISTING UNDERGROUND UTILITIES..

1. PER PROJECT SPECIFICATIONS AND THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, THE POINT OF COMMENCEMENT FOR THE LAYING OF SEWER PIPE SHALL BE AT THE LOWEST POINT IN THE PROPOSED SEWER LINE. THE PIPE SHALL BE LAID WITH THE BELL END OF THE BELL AND SPIGOT PIPE, OR WITH THE RECEIVING GROOVE END OF THE TONGUE AND GROOVE PIPE, POINTING UPGRADE. WHEN A NEW SEWER IS TO BE CONNECTED TO AN EXISTING SEWER NOT TERMINATING IN A MANHOLE, THE CONTRACTOR SHALL UNCOVER THE EXISTING SEWER TO ALLOW ANY ADJUSTMENTS IN LINE AND GRADE TO BE MADE BEFORE PIPE IS LAID.
2. THE UNDERGROUND AND OVERHEAD UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN PART, UPON INFORMATION FURNISHED BY UTILITY COMPANIES, LOCAL MUNICIPALITY, PROPERTY OWNER, AND DIGGERS HOTLINE. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED NOR CERTIFIED TO.
3. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS SHALL APPLY FOR AND OBTAIN ALL THEIR REQUIRED PERMITS AND APPROVALS PRIOR TO THE START OF THEIR WORK. CONSULT WITH AND OBTAIN FROM ENGINEER COPIES OF ENGINEERING DESIGN APPROVAL PERMITS, INCLUDING BUT NOT LIMITED TO MDNR, STATE OR LOCAL PLUMBING, WDOT, COUNTY, AND STORM WATER MANAGEMENT.
4. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS SHALL CONTACT DIGGER'S HOTLINE TO ALLOW THEM SUFFICIENT TIME TO LOCATE EXISTING UTILITIES PRIOR TO COMMENCEMENT OF WORK.
5. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR COORDINATING THEIR WORK WITH ALL OTHER CONTRACTORS.
6. FOR ALL WORK, GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR REVIEWING BID DOCUMENTS, VERIFYING THE VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES WITHIN THE PROJECT LIMITS.
7. GENERAL CONTRACTOR SHALL MAINTAIN ANY EXISTING DRAINAGE PATTERNS ONCE STRUCTURES ARE REMOVED UNTIL THE PROPOSED STRUCTURES ARE FULLY INSTALLED AND OPERATIONAL.
8. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR RESTORING ALL AREAS DISTURBED DURING UTILITY INSTALLATIONS TO EXISTING CONDITIONS AT COMPLETION OF INSTALLATION UNLESS OTHERWISE SHOWN ON PLANS. RESTORATION SHALL BE OF AT LEAST EQUAL QUALITY AND/OR WORKMANSHIP TO THAT WHICH WAS DAMAGED UNLESS SPECIFICALLY REQUIRED OTHERWISE BY PLANS OR SPECIFICATIONS. THE COST FOR SAID RESTORATION SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

KEY INDEX

- PROJECT LIMITS
- STORM MANHOLE (7 / C805)
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- TEE
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- 3"G — 3" GAS LINE. COORDINATE THE EXCAVATION FOR UNDERGROUND GAS LATERAL AND LOCATION WITH MGAE. SEE SHEET M005.

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SITE UTILITY PLAN – OVERALL

Revisions:

No.	Date:	Description:

Graphic Scale: 0 5' 10' 20' 30'

DFD Number: 20K1G-01

Set Type: FR

Date Issued: 04/21/2023

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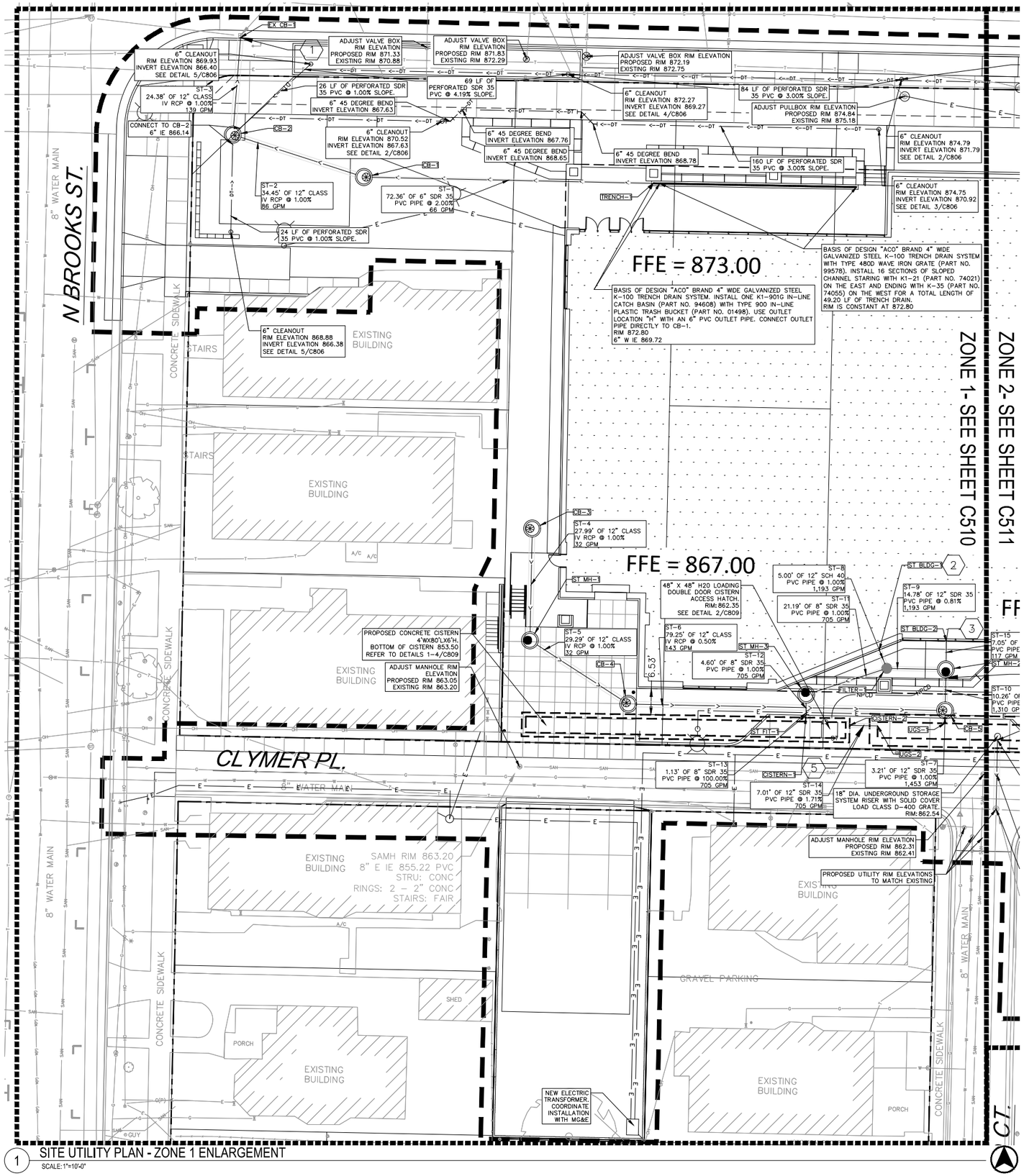

1 SITE UTILITY PLAN - ZONE 1 ENLARGEMENT
SCALE: 1"=10'-0"

SITE UTILITY PHASING + OUTAGE NOTES

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Scale: 0 5 10 20
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UTILITY NOTES

EXISTING UTILITIES

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10.

R/S BORA

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SITE UTILITY PLAN – ZONE 1 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale: 0' 2.5' 5' 10' 15'
DFD Number: 20K1G-01
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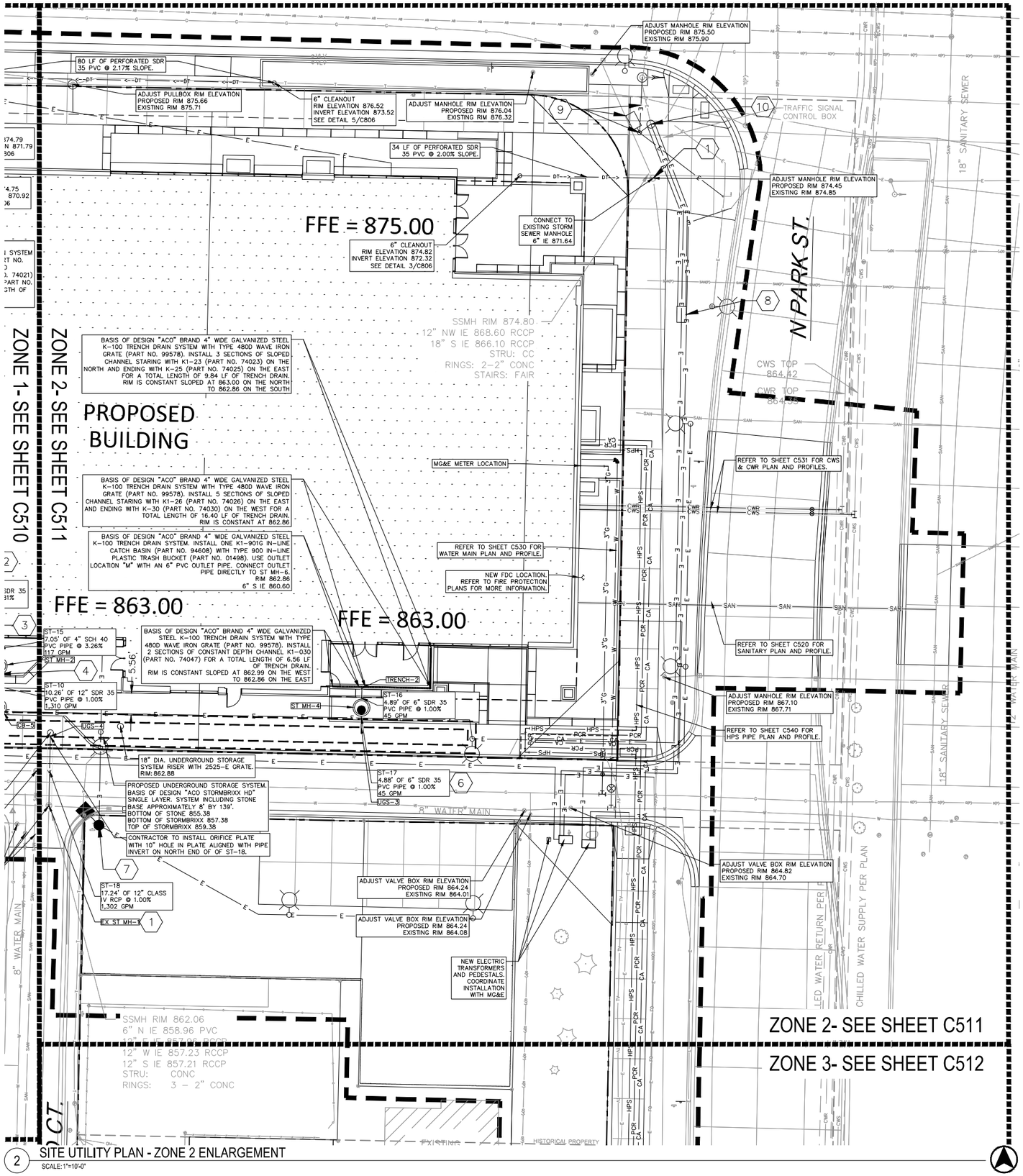
Date Issued: 04/21/2023
Sheet Number: C510



2 SITE UTILITY PLAN - ZONE 2 ENLARGEMENT
SCALE: 1"=10'-0"

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SITE UTILITY PLAN - ZONE 2 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale: 0' 2.5' 5' 10' 15'
DFD Number: 20K1G-01
Set Type: FR
Date Issued: 04/21/2023
Sheet Number: C511

STORM SEWER STRUCTURE TABLE					
STRUCTURE NAME:	TYPE (FRAME AND GRATE):	RIM ELEVATION:	PIPES IN:	PIPES OUT	BOTTOM:
CB-1	42" DIAMETER (R-2502-D)	869.55	ST-1, 6" E IE = 868.27	ST-2, 12" W IE = 865.39	863.89
CB-2	42" DIAMETER (R-2502-D)	869.01	DT, 6" NE IE = 866.14 DT, 6" S IE = 866.14 ST-2, 12" E IE = 865.05	ST-3, 12" N IE = 864.95	863.45
CB-3	42" DIAMETER (R-2561)	866.50	N/A	ST-4, 12" S IE = 859.68	858.18
CB-4	42" DIAMETER (R-2502-D)	862.72	ST-5, 12" NW IE = 859.01	ST-6, 12" E IE = 858.91	857.41
CB-5	42" DIAMETER (R-2502-D)	862.37	ST-6, 12" W IE = 858.51 ST-10, 12" N IE = 858.51	ST-7, 12" S IE = 858.41	858.41
CISTERN-1	N/A	N/A	ST-13, 8" N IE = 858.84	N/A	N/A
CISTERN-2	N/A	N/A	N/A	ST-14, 12" E IE = 858.50	N/A
EX CB-1	N/A	N/A	ST-3, 12" S IE = 864.71	EX ST, 12" W IE = 864.61±	N/A
EX ST MH-1	N/A	N/A	EX ST, 12" E IE = 857.96± EX ST, 12" W IE = 857.23± ST-18, 12" N IE = 857.21	EX ST, 12" S IE = 857.21±	857.21±
FILTER-1	28" STORMWATER-FILTER BASIS OF DESIGN "VORTEX FINE FILETER WFF 300 SHORT VERSION W/ BASEPLATE"	864.03	ST-8, 12" N IE = 861.45	ST-9, 12" E IE = 858.83 ST-11, 8" W IE = 860.33	858.83
ST BLDG-1	N/A	N/A	N/A	ST-8, 12" S IE = 861.50	N/A
ST BLDG-2	N/A	N/A	N/A	ST-15, 4" S IE = 859.50	N/A
ST FIT-1	8" VERTICAL 45 DEGREE BEND	N/A	ST-12, 8" N IE = 859.97	ST-13, 8" S IE = 859.97	N/A
ST MH-1	42" DIAMETER (R-1550 WITH "STORM")	863.25	ST-4, 12" N IE = 859.40	ST-5, 12" SE IE = 859.30	859.30
ST MH-2	42" DIAMETER (R-1550 WITH "STORM")	864.03	ST-9, 12" W IE = 858.71 ST-15, 4" N IE = 859.27	ST-10, 12" S IE = 858.61	858.61
ST MH-3	42" DIAMETER (R-1550 WITH "STORM")	862.55	ST-11, 8" E IE = 860.12	ST-12, 8" S IE = 860.02	860.02
ST MH-4	42" DIAMETER (R-1550 WITH "STORM")	864.17	ST-16, 6" N IE = 860.55	ST-17, 6" S IE = 858.93	858.93
TRENCH-1	N/A	N/A	N/A	ST-1, 6" W IE = 869.72	N/A
TRENCH-2	N/A	N/A	N/A	ST-16, 6" S IE = 860.60	N/A
UGS-1	N/A	N/A	ST-7, 12" N IE = 858.38	N/A	N/A
UGS-2	N/A	N/A	ST-14, 12" W IE = 858.38	N/A	N/A
UGS-3	N/A	N/A	ST-17, 6" N IE = 858.88	N/A	N/A
UGS-4	N/A	N/A	N/A	ST-18, 12" S IE = 857.38	N/A

3 SITE UTILITY PLAN - ZONE 3 ENLARGEMENT
SCALE: 1"=10'-0"

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- STORM MANHOLE (7/C805)
- STORM CATCH BASIN WITH CURB BOX FRAME & GRATE (1/C806)
- TEE
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- 3"G — 3" GAS LINE. COORDINATE THE EXCAVATION FOR UNDERGROUND GAS LATERAL AND LOCATION WITH MG&E. SEE SHEET M005.
- (1) SITE UTILITY CONTRACTOR TO CONNECT PROPOSED STORM SEWER TO EXISTING STORM STRUCTURE. CONTRACTOR TO FIELD VERIFY EXACT SIZE, DEPTH, AND LOCATION OF EXISTING STORM STRUCTURE PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF CONFLICTS ARISE.
- (2) SITE UTILITY CONTRACTOR TO PROVIDE CONTINUATION OF 12" PVC STORM SEWER LATERAL AT THE INSIDE OF THE BUILDING WALL. VERIFY EXACT LOCATION AND INVERT IN FIELD.
- (3) SITE UTILITY CONTRACTOR TO PROVIDE CONTINUATION OF 4" PVC STORM SEWER LATERAL AT THE INSIDE OF THE BUILDING WALL. VERIFY EXACT LOCATION AND INVERT IN FIELD.
- (4) SITE UTILITY CONTRACTOR TO INSTALL BACKFLOW PREVENTER ON ST-10 SOUTH OF ST MH-2.
- (5) SITE UTILITY CONTRACTOR TO INSTALL BACKFLOW PREVENTER ON ST-14 EAST OF CISTERN-2.
- (6) SITE UTILITY CONTRACTOR TO INSTALL BACKFLOW PREVENTER ON ST-19 SOUTH OF ST MH-2.
- (7) NEW ELECTRIC POLE WITH SALVAGED LIGHT FIXTURE. COORDINATE WITH ELECTRICAL CONTRACTOR. REFER TO E005 ELECTRICAL SITE PLAN FOR MORE INFORMATION.
- (8) RELOCATED TRAFFIC CONTROL BOX LOCATION.
- (9) TEMPORARY TRAFFIC CONTROL BOX AND TEMPORARY WOOD POLE WITH OVERHEAD WIRES LOCATION. TEMPORARY TRAFFIC CONTROL BOX TO REMAIN UNTIL TRAFFIC CONTROL BOX AT PROPOSED LOCATION IS INSTALLED AND OPERATIONAL. INSTALL TYPE 7 HAND HOLE OVER EXISTING TRAFFIC CONTROL BOX LOCATION. CONTRACTOR TO COORDINATE WITH MG&E.
- (10)

R/S BORA

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232 N. PARK ST.
MADISON, WI 53715

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LEVY HALL
UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

SITE UTILITY PLAN – ZONE 3 ENLARGEMENT

Revisions:

No.	Date:	Description:

Graphic Scale: 0' 2.5' 5' 10' 15'
DFD Number: 20K1G-01
Set Type: FR
Date Issued: 04/21/2023
Sheet Number: C512

UTILITY NOTES

CAUTION — KNOWN UTILITY AND POTENTIAL CONFLICT EXIST WITH EXISTING UNDERGROUND UTILITIES. PRIOR TO UTILITY INSTALLATION, CONTRACTOR TO EXCAVATE AND EXPOSE EXISTING UTILITIES, VERIFY LOCATIONS AND ELEVATIONS, AND CONTACT ENGINEER IF CONFLICTS EXIST WITH PROPOSED CONSTRUCTION AND EXISTING UNDERGROUND UTILITIES.

1. PER PROJECT SPECIFICATIONS AND THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, THE POINT OF COMMENCEMENT FOR THE LAYING OF SEWER PIPE SHALL BE AT THE LOWEST POINT IN THE PROPOSED SEWER LINE. THE PIPE SHALL BE LAID WITH THE BELL END OF THE BELL AND SPIGOT PIPE, OR WITH THE RECEIVING GROOVE END OF THE TONGUE AND GROOVE PIPE, POINTING UPGRADE. WHEN A NEW SEWER IS TO BE CONNECTED TO AN EXISTING SEWER NOT TERMINATING IN A MANHOLE, THE CONTRACTOR SHALL UNCOVER THE EXISTING SEWER TO ALLOW ANY ADJUSTMENTS IN LINE AND GRADE TO BE MADE BEFORE PIPE IS LAID.
2. THE UNDERGROUND AND OVERHEAD UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN PART, UPON INFORMATION FURNISHED BY UTILITY COMPANIES, LOCAL MUNICIPALITY, PROPERTY OWNER, AND DIGGERS HOTLINE. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED NOR CERTIFIED TO.
3. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS SHALL APPLY FOR AND OBTAIN ALL THEIR REQUIRED PERMITS AND APPROVALS PRIOR TO THE START OF THEIR WORK. CONSULT WITH AND OBTAIN FROM ENGINEER COPIES OF ENGINEERING DESIGN APPROVAL PERMITS, INCLUDING BUT NOT LIMITED TO WDNR, STATE OR LOCAL PLUMBING, WDOT, COUNTY, AND STORM WATER MANAGEMENT.
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5. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR COORDINATING THEIR WORK WITH ALL OTHER CONTRACTORS.
6. FOR ALL WORK, GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR REVIEWING BID DOCUMENTS, VERIFYING THE VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES WITHIN THE PROJECT LIMITS.
7. GENERAL CONTRACTOR SHALL MAINTAIN ANY EXISTING DRAINAGE PATTERNS ONCE STRUCTURES ARE REMOVED UNTIL THE PROPOSED STRUCTURES ARE FULLY INSTALLED AND OPERATIONAL.
8. GENERAL CONTRACTOR OR THEIR SUB CONTRACTORS ARE RESPONSIBLE FOR RESTORING ALL AREAS DISTURBED DURING UTILITY INSTALLATIONS TO EXISTING CONDITIONS AT COMPLETION OF INSTALLATION UNLESS OTHERWISE SHOWN ON PLANS. RESTORATION SHALL BE OF AT LEAST EQUAL QUALITY AND/OR WORKMANSHIP TO THAT WHICH WAS DAMAGED UNLESS SPECIFICALLY REQUIRED OTHERWISE BY PLANS OR SPECIFICATIONS. THE COST FOR SAID RESTORATION SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

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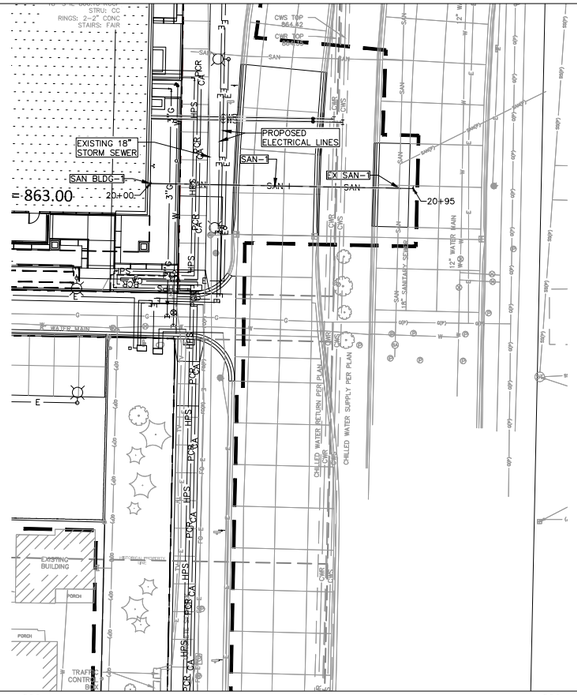

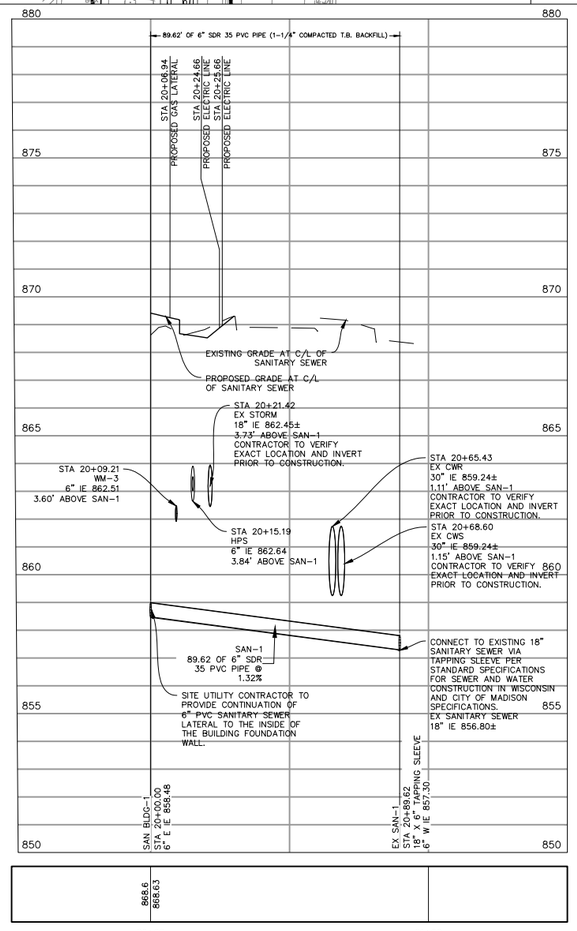

SITE UTILITY PHASING + OUTAGE NOTES

1. ANY REQUIRED OUTAGES AND PLANNED NEW CONNECTIONS SHALL BE CONDUCTED A MINIMUM OF 4 WEEKS IN ADVANCE WITH CITY OF MADISON AND UW MADISON UTILITIES.

N

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SITE PLAN & PROFILE – SANITARY LATERAL

Revisions:

No.	Date:	Description:

Graphic Scale	VARIES
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C520

UTILITY NOTES

CAUTION — KNOWN UTILITY AND POTENTIAL CONFLICT EXIST WITH EXISTING UNDERGROUND UTILITIES. PRIOR TO UTILITY INSTALLATION, CONTRACTOR TO EXCAVATE AND EXPOSE EXISTING UTILITIES, VERIFY LOCATIONS AND ELEVATIONS, AND CONTACT ENGINEER IF CONFLICTS EXIST WITH PROPOSED CONSTRUCTION AND EXISTING UNDERGROUND UTILITIES.

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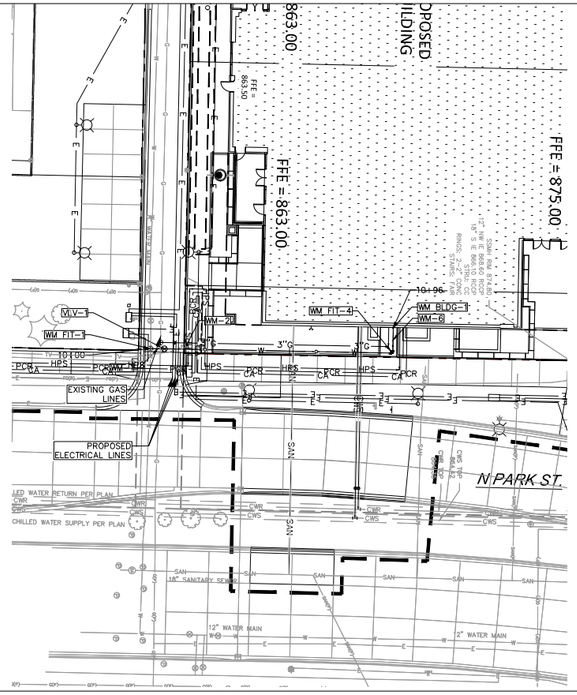

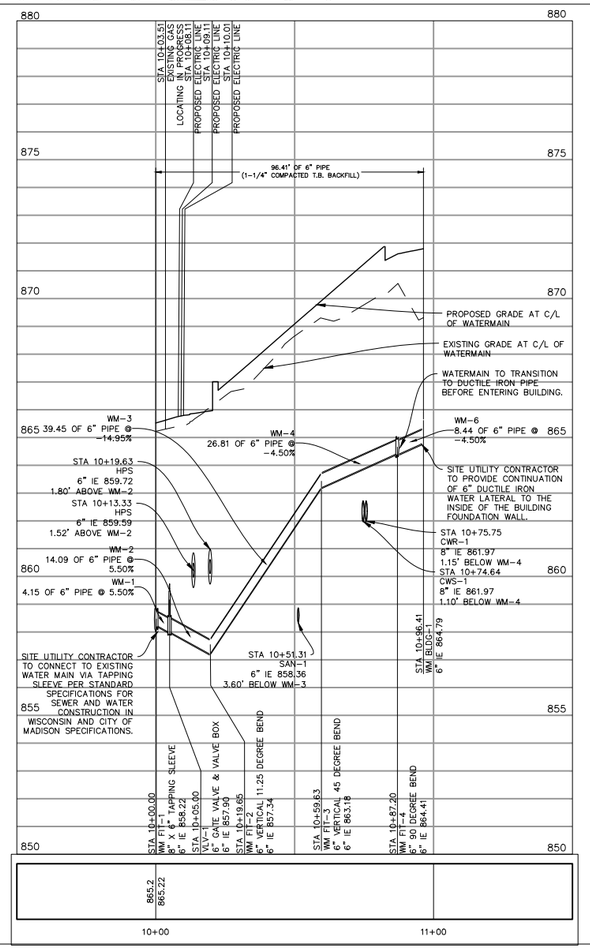

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Scale: 0 10 20 40

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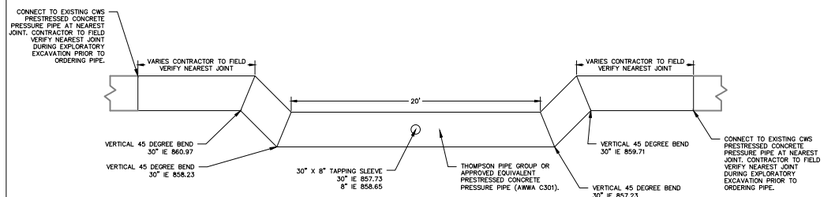
SITE PLAN & PROFILE – WATER MAIN LATERAL

Revisions:

No.	Date:	Description:

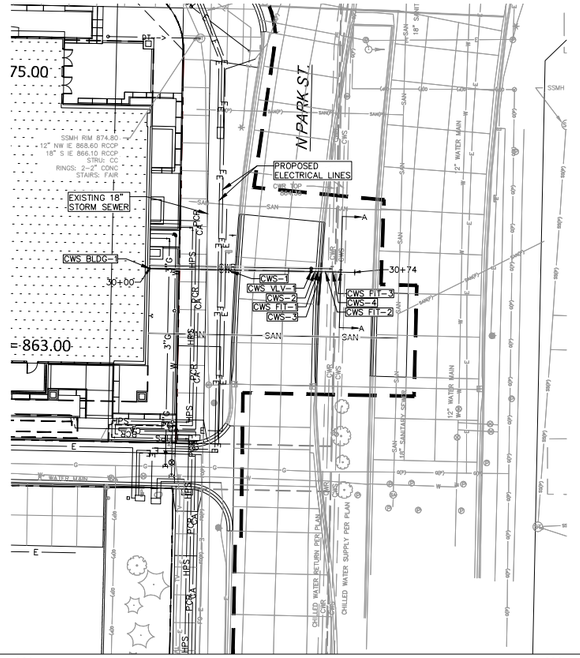
Graphic Scale	VARIES
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C530



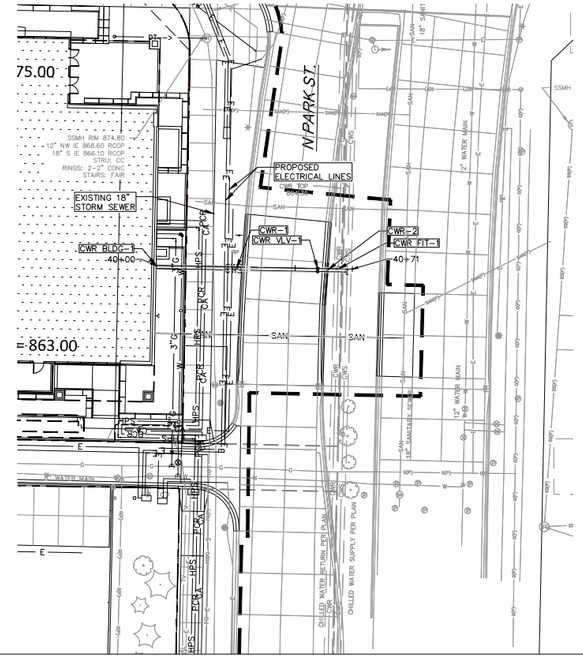
SECTION A–A

1 / C531 CWS MAINLINE PIPE SECTION
N.T.S.

CHILLED WATER SUPPLY



CHILLED WATER RETURN



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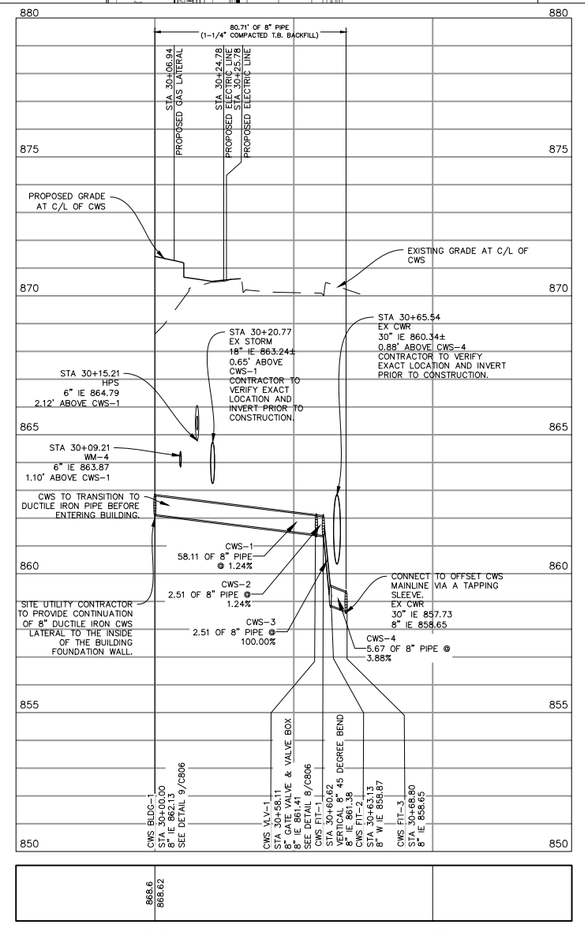

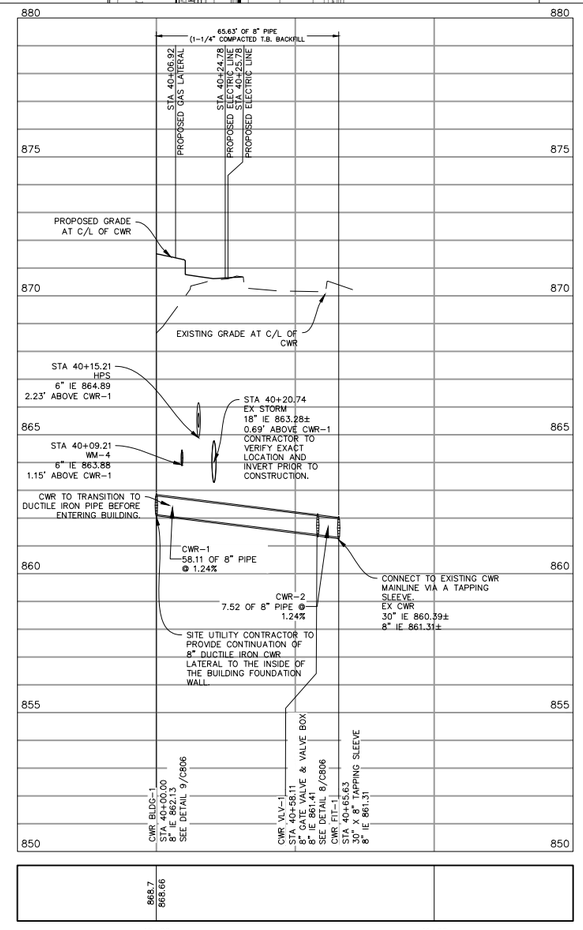

UTILITY NOTES

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Scale: 0 10 20 40

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SITE UTILITY PHASING + OUTAGE NOTES

1. CONTRACTOR TO PERFORM EXPLORATORY EXCAVATION PHASE (DURING SUMMER MONTHS) TO FIND NEAREST JOINTS IN 30" CWS MAIN TO ORDER CUSTOM PIPE TO OFFSET MAIN PIPE 2.5' BELOW EXISTING INVERT. FOLLOWING EXPLORATORY PHASE, CONTRACTOR TO RESTORE AREA TO EXISTING CONDITIONS.
2. AFTER ARRIVAL OF PIPE, CONTRACTOR TO INSTALL NEW OFFSET PIPE AND NEW 8" LATERALS IN THE LATE FALL, WINTER, OR EARLY SPRING MONTHS (NOT DURING THE PEAK COOLING SEASON). CONTRACTOR TO COORDINATE TIMING WITH UW FACILITIES.
3. CWR AND CWS MAINS TO BE VALVED OFF AND ISOLATED PRIOR TO INSTALLATION OF NEW OFFSET PIPE.
4. SERVICE TO VILAS AND GRAINGER HALLS SHALL BE MAINTAINED AS MUCH AS POSSIBLE.
5. FOLLOWING INSTALLATION OF NEW PIPE, CONTRACTOR TO RESTORE AREA TO PROPOSED CONDITIONS PER CITY STANDARDS.
6. IN LATE SPRING/EARLY SUMMER MONTHS FOLLOWING PIPE INSTALLATION, CITY OF MADISON WILL INSPECT FINAL RESTORATION TO CONFIRM ACCEPTANCE WITH CITY STANDARDS. CONTRACTOR SHALL CORRECT ANY RESTORATION ISSUES NEEDED FOR CITY ACCEPTANCE.
7. ANY REQUIRED OUTAGES AND PLANNED NEW CONNECTIONS SHALL BE COORDINATED A MINIMUM OF 4 WEEKS IN ADVANCE WITH CITY OF MADISON AND UW MADISON UTILITIES.

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SITE PLAN & PROFILE – CHILLED WATER RETURN & SUPPLY LATERAL

Revisions:

No.	Date:	Description:

Graphic Scale	VARIES
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C531

UTILITY NOTES

CAUTION

KNOWN UTILITY AND POTENTIAL CONFLICT EXIST WITH EXISTING UNDERGROUND UTILITIES. PRIOR TO UTILITY INSTALLATION, CONTRACTOR TO EXCAVATE AND EXPOSE EXISTING UTILITIES, VERIFY LOCATIONS AND ELEVATIONS, AND CONTACT ENGINEER IF CONFLICTS EXIST WITH PROPOSED CONSTRUCTION AND EXISTING UNDERGROUND UTILITIES.

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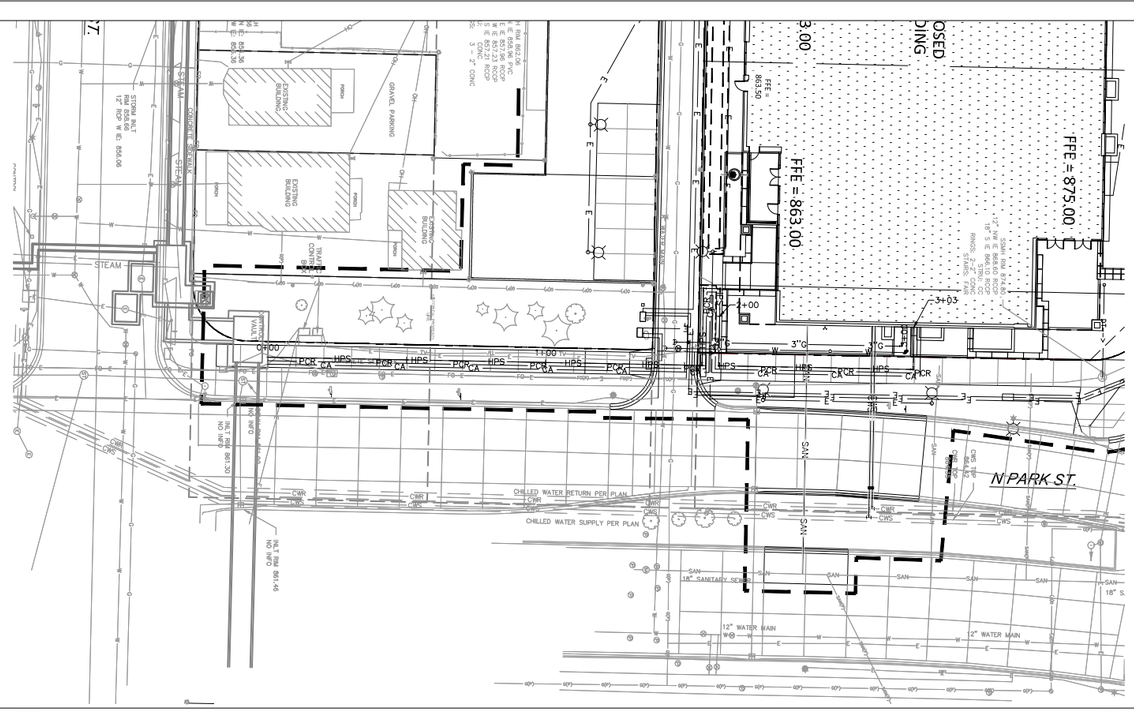
- E — ELECTRIC LINE. COORDINATE THE EXCAVATION FOR UNDERGROUND ELECTRIC CONDUITS AND LOCATIONS WITH THE ELECTRICAL CONTRACTOR. SEE SHEET E005.
- 3"G — 3" GAS LINE. COORDINATE THE EXCAVATION FOR UNDERGROUND GAS LATERAL AND LOCATION WITH MG&E. SEE SHEET M005.



SITE UTILITY PHASING + OUTAGE NOTES

1. ISOLATION OF THERMAL UTILITIES IN EXISTING STEAM PIT 3-13 FOR THE INSTALLATION OF NEW CONNECTIONS AND VALVES MUST BE COMPLETED WITHIN A PERIOD OF 24-48 HOURS DURING THE LATE SPRING OR EARLY SUMMER OF 2024.
2. ANY REQUIRED OUTAGES AND PLANNED NEW CONNECTIONS SHALL BE COORDINATED A MINIMUM OF 4 WEEKS IN ADVANCE WITH CITY OF MADISON AND UW MADISON UTILITIES.
3. CONTRACTOR SHALL SUBMIT ENGINEERED SHOP DRAWINGS FOR HPS FOR APPROVAL.
4. STEAM AND CONDENSATE PIPING, MATERIALS AND INSTALLATION PER SPECIFICATION DIVISION 23 BY MECHANICAL CONTRACTOR. EXCAVATION AND BACKFILL AND RESTORATION PER SPECIFICATION DIVISION 31 BY GENERAL PRIME CONTRACTOR.
5. INVERT OF HPS MEASURED AT THE INVERT OF THE JACKET.
6. SEE DETAILS 6&7/C806 FOR TRENCH CROSS SECTION AND HPS ANCHOR.

Scale: 0 10 20 40

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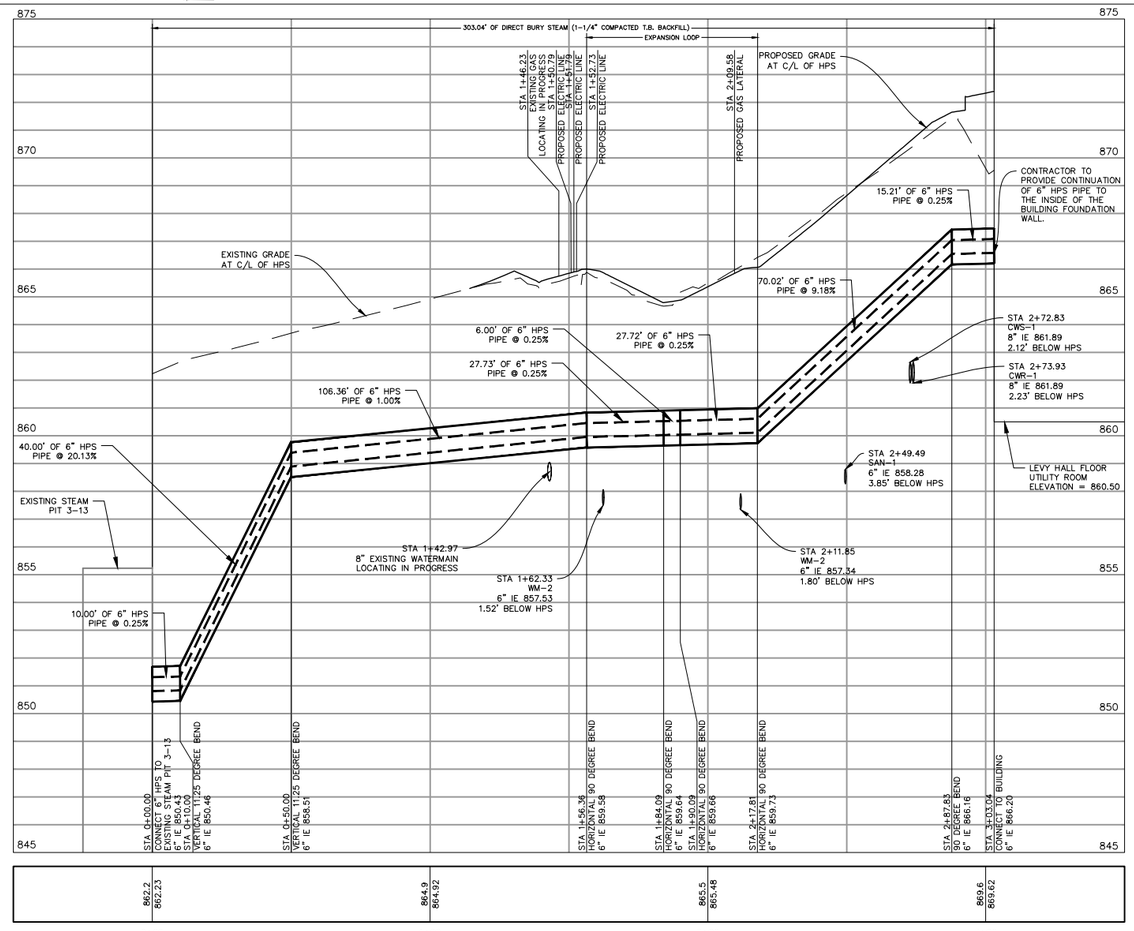
www.DiggersHotline.com



Scale: 1" = 20' HOR.
1" = 2' VERT.

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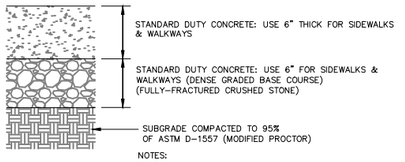
MADISON, WISCONSIN

SITE PLAN & PROFILE - HPS

Revisions:

No.	Date:	Description:

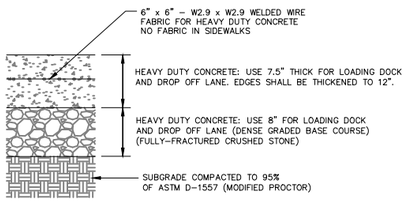
Graphic Scale	VARIES
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C540



NOTES:

DUE TO EXISTING FILL, SILT, AND CLAY PRESENT, UNDERCUTTING OR STABILIZATION MAY BE REQUIRED TO ESTABLISH FIRM AND PAVEMENT SUBGRADES. WHERE UNSUITABLE SOILS ARE ENCOUNTERED, A MINIMUM OF 12 IN. OF UNDERCUTTING SHOULD OCCUR WITH REPLACEMENT OF 12 IN. OF ADDITIONAL COARSE AGGREGATE OVER BIAXIAL GEOGRID. CONTRACTOR TO INCLUDE CONTINGENCY FOR SUBGRADE UNDERCUTTING/STABILIZATION.

1 C804 **UW STANDARD DUTY CONCRETE**
N.T.S.

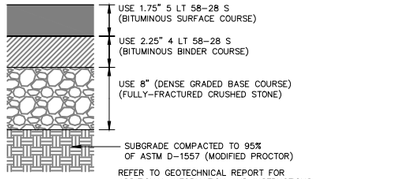


NOTES:

1. DUE TO EXISTING FILL, SILT, AND CLAY PRESENT, UNDERCUTTING OR STABILIZATION MAY BE REQUIRED TO ESTABLISH FIRM AND PAVEMENT SUBGRADES. WHERE UNSUITABLE SOILS ARE ENCOUNTERED, A MINIMUM OF 12 IN. OF UNDERCUTTING SHOULD OCCUR WITH REPLACEMENT OF 12 IN. OF ADDITIONAL COARSE AGGREGATE OVER BIAXIAL GEOGRID. CONTRACTOR TO INCLUDE CONTINGENCY FOR SUBGRADE UNDERCUTTING/STABILIZATION.

2. DROP OFF LANE CONCRETE TO BE COLORED DARK GRAY PER SPEC. 32 13 13 – CONCRETE PAVING.

2 C804 **UW HEAVY DUTY CONCRETE**
N.T.S.



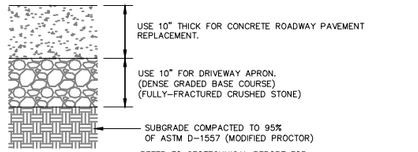
REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION AND INSTRUCTIONS

NOTES:

1. DUE TO EXISTING FILL, SILT, AND CLAY PRESENT, UNDERCUTTING OR STABILIZATION MAY BE REQUIRED TO ESTABLISH FIRM AND PAVEMENT SUBGRADES. WHERE UNSUITABLE SOILS ARE ENCOUNTERED, A MINIMUM OF 12 IN. OF UNDERCUTTING SHOULD OCCUR WITH REPLACEMENT OF 12 IN. OF ADDITIONAL COARSE AGGREGATE OVER BIAXIAL GEOGRID. CONTRACTOR TO INCLUDE CONTINGENCY FOR SUBGRADE UNDERCUTTING/STABILIZATION.

2. PAVEMENT REPLACEMENT IN CLYMER PL. TO FOLLOW UW ASPHALTIC CONCRETE SECTION.

3 C804 **UW ASPHALTIC CONCRETE PAVEMENT**
N.T.S.

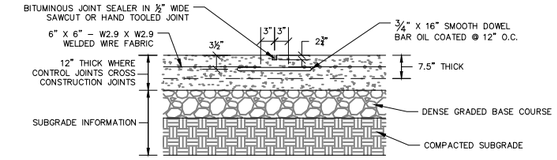


REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION AND INSTRUCTIONS

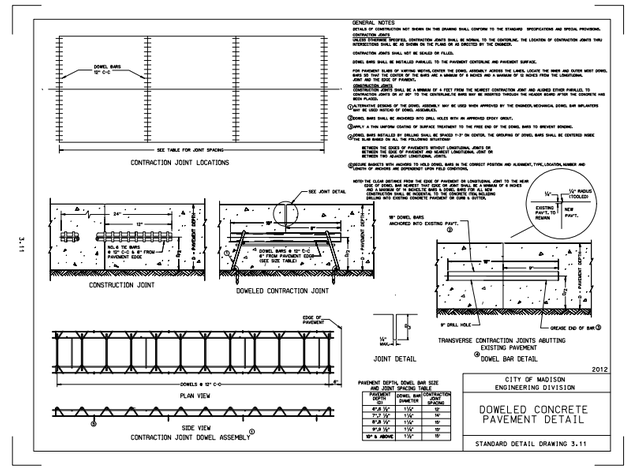
NOTES:

DUE TO EXISTING FILL, SILT, AND CLAY PRESENT, UNDERCUTTING OR STABILIZATION MAY BE REQUIRED TO ESTABLISH FIRM AND PAVEMENT SUBGRADES. WHERE UNSUITABLE SOILS ARE ENCOUNTERED, A MINIMUM OF 12 IN. OF UNDERCUTTING SHOULD OCCUR WITH REPLACEMENT OF 12 IN. OF ADDITIONAL COARSE AGGREGATE OVER BIAXIAL GEOGRID. CONTRACTOR TO INCLUDE CONTINGENCY FOR SUBGRADE UNDERCUTTING/STABILIZATION.

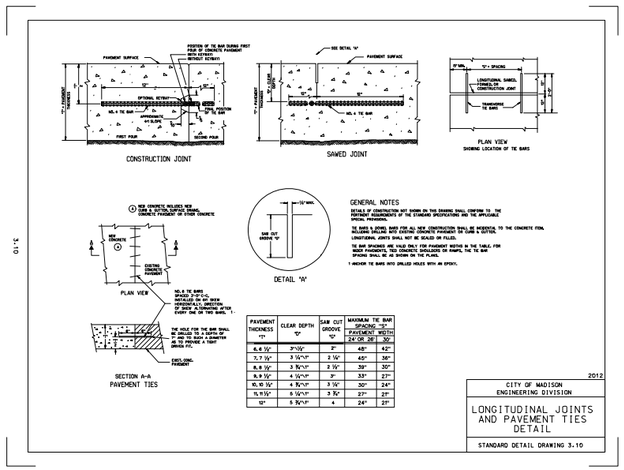
4 C804 **CITY OF MADISON CONCRETE SIDEWALK/SLAB**
N.T.S. (ONLY FOR WORK IN ROW)



5 C804 **UW CONTROL & CONSTRUCTION JOINT DETAILS**
N.T.S.

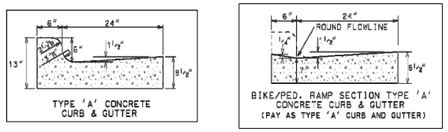


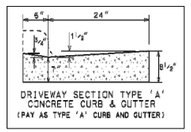
6 C804 **DOWELED CONCRETE PAVEMENT DETAIL**
N.T.S. (CITY OF MADISON ROW ONLY)

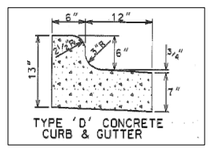


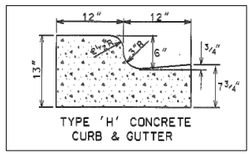
PAVEMENT THICKNESS "T"	CLEAR DEPTH "D"	SAW CUT GROOVE "G"	MAXIMUM TIE BAR SPACING "S" PAVEMENT WIDTH 24'-0" OR 28'	30'
6, 6 ½"	3"-0½"	3"	48"	42"
7, 7 ½"	3 ½"-1"	2 ½"	45"	36"
8, 8 ½"	3 ½"-1"	2 ½"	39"	30"
9, 9 ½"	4 ½"-1"	3"	33"	27"
10, 10 ½"	4 ½"-1"	3 ½"	30"	24"
11, 11½"	5 ½"-1"	3 ½"	27"	21"
12"	5 ½"-1"	4	24"	21"

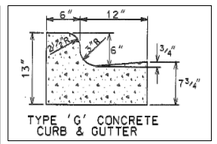
7 C804 **LONGITUDINAL JOINTS AND PAVEMENT TIES DETAIL**
N.T.S. (CITY OF MADISON ROW ONLY)











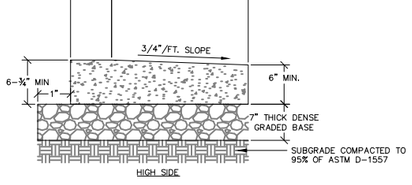
GENERAL NOTES:

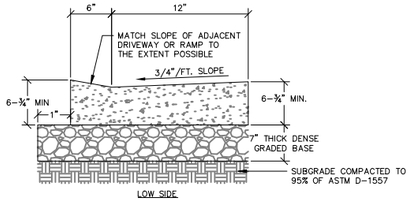
LATERAL CONTRACTION JOINTS SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 16', NOR LESS THAN 6' IN LENGTH. THE JOINTS SHALL BE A MINIMUM OF 3" IN DEPTH

EXPANSION JOINTS SHALL BE PLACED TRANSVERSELY AT RADIUS POINTS ON CURVES OF RADIUS 200' OR LESS, AND AT ANGLE POINTS; OR AS DIRECTED BY THE ENGINEER. THE EXPANSION JOINT SHALL BE ONE PIECE ASPHALTIC MATERIAL HAVING THE SAME DIMENSIONS AS CURB & GUTTER AT THAT STATION AND BE ½" THICK.

IN ALL CASES, CONCRETE CURB & GUTTER SHALL BE PLACED ON THOROUGHLY COMPACTED CRUSHED STONE

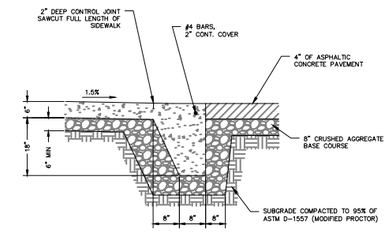
8 C804 **CITY OF MADISON CURB AND GUTTER DETAILS**
N.T.S.

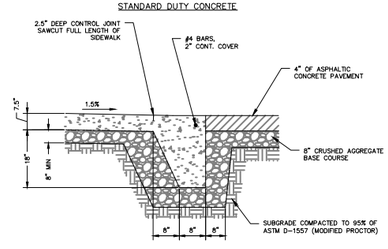




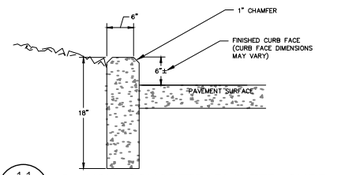
*CURB HEIGHT MAY VARY. SEE SITE GRADING PLAN FOR EXACT CURB HEIGHTS. CONTACT ENGINEER WITH ANY QUESTIONS THAT ARISE. PROVIDE CONSTRUCTION JOINTS BETWEEN 10-FEET AND 300-FEET.

9 C804 **18-INCH DEPRESSED CONCRETE CURB & GUTTER**
N.T.S.

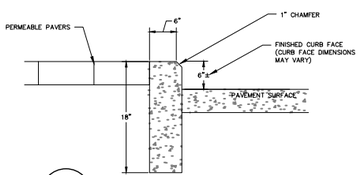




10 C804 **CONCRETE SIDEWALK WITH DEPRESSED INTEGRAL CURB**
N.T.S.



11 C804 **6-INCH CONCRETE PLANTER CURB**
N.T.S.



12 C804 **6-INCH CONCRETE CURB**
N.T.S.

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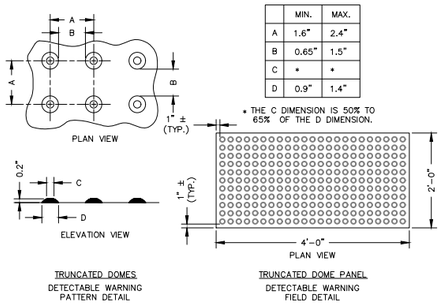
SITE DETAILS

Revisions:

No.	Date:	Description:

Graphic Scale	NOT TO SCALE
DFD Number	20K1G-01
Set Type	FR
Date Issued	04/21/2023
Sheet Number	C804



	MIN.	MAX.
A	1.6"	2.4"
B	0.65"	1.5"
C	*	*
D	0.9"	1.4"

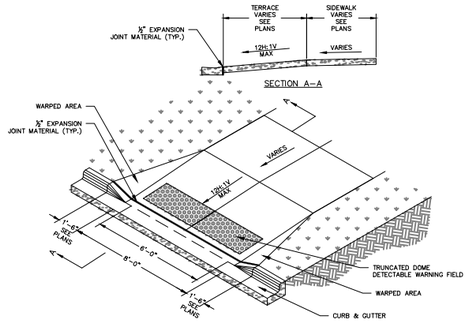
TRUNCATED DOMES
DETECTABLE WARNING PATTERN DETAIL

TRUNCATED DOME PANEL
DETECTABLE WARNING FIELD DETAIL

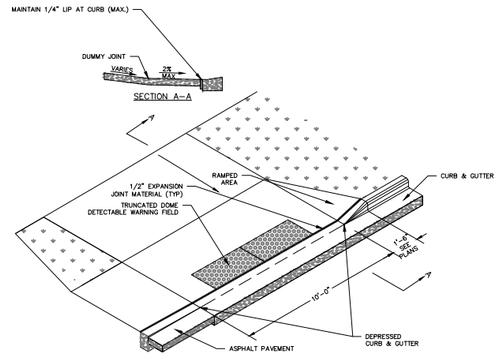
GENERAL NOTES

TRUNCATED DOME DETECTABLE WARNING FIELD SHALL CONSIST OF CAST IRON PLATES WITH NO COLOR; SUCH AS THOSE MANUFACTURED BY NEENAH FOUNDRY. PLATES SHOULD WEATHER TO A RUST COLOR OVER TIME. IF 24"x48" PLATES ARE NOT AVAILABLE, TWO 24"x24" PLATES SHALL BE USED. THE DETECTABLE WARNING FIELD SHALL BE LOCATED SO THAT IT IS CENTERED IN THE CURB RAMP WITH THE EDGE NEAREST THE BACK OF CURB A MINIMUM OF 6" AND A MAXIMUM OF 8" AWAY FROM THE BACK OF CURB. IN LOCATIONS WHERE THE RAMP IS SKEWED TO THE CURB, THE DETECTABLE WARNING FIELD IS TO RUN PERPENDICULAR TO THE DIRECTION OF TRAVEL, WITH THE EDGE NEAREST THE BACK OF CURB 4" AWAY FROM THE BACK OF CURB.

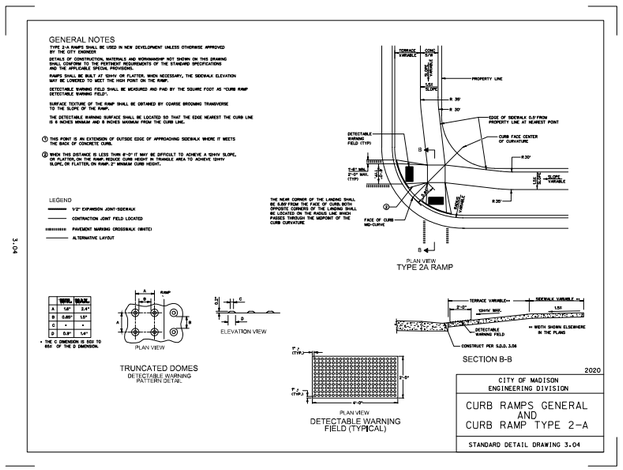
1 / C805 CAST IRON TRUNCATED DOME DETECTABLE WARNING FIELD
N.T.S.



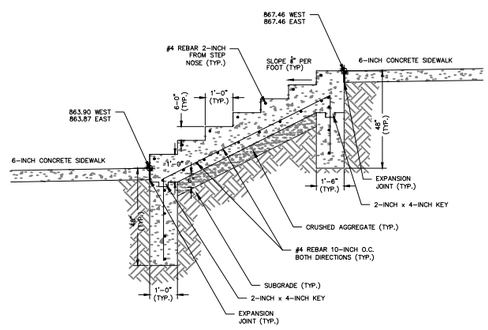
2 / C805 ACCESSIBILITY RAMP DETAIL WITH STAMPED CONCRETE TRUNCATED DOME DETECTABLE WARNING FIELD
N.T.S.



3 / C805 ACCESSIBILITY RAMP DETAIL WITH STAMPED CONCRETE TRUNCATED DOME DETECTABLE WARNING FIELD
N.T.S.

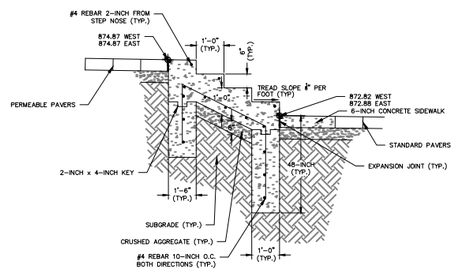


4 / C805 CITY OF MADISON TYPE 2-A CURB RAMP
N.T.S.



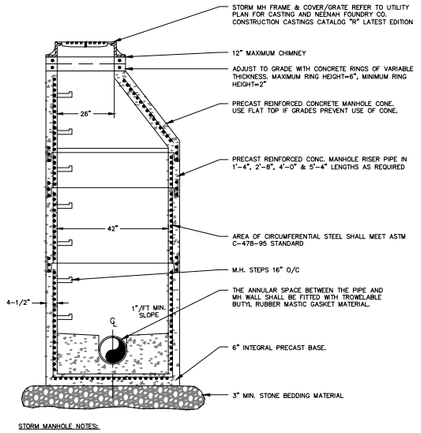
NOTES:
1) RISER HEIGHTS MUST BE UNIFORM

5 / C805 SECTION OF CONCRETE STAIRS SOUTHWEST
N.T.S.



NOTES:
1) RISER HEIGHTS MUST BE UNIFORM

6 / C805 SECTION OF CONCRETE STAIRS NORTH
N.T.S.



STORM MANHOLE NOTES:

1.) PRECAST CONCRETE ADJUSTING RINGS TO BE REINFORCED WITH ONE HOOP OF STEEL CENTERED WITHIN THE RING. WHERE NECESSARY, RINGS SHALL BE GROOVED TO RECEIVE STEP.

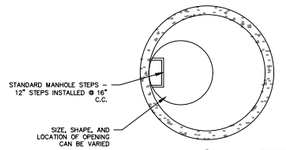
2.) CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO DESIGNATION C-478 REQUIREMENTS OF ASTM SPECIFICATIONS.

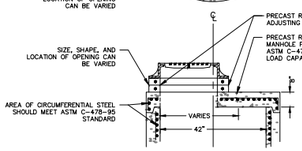
3.) JOINTS SHALL BE WATERTIGHT AND SHALL BE MADE USING RUBBER GASKETS OR BUTYL RUBBER MASTIC MATERIAL.

4.) 3" MIN. BEDDING MATERIAL REQUIRED UNDER MANHOLE BASE AND BACKFILLED STRUCTURE WITH GRANULAR BACKFILL MATERIAL.

5.) SEE STANDARD SPECIFICATIONS, FILE NO. 12 FOR PRECAST MANHOLE AND FILE NO. 13 FOR MANHOLE INVERTS, INCLUDING INVERTS OF LATERAL SEWERS THAT CONNECT DIRECTLY TO MANHOLES.

7 / C805 STORM MANHOLE DETAIL
N.T.S.

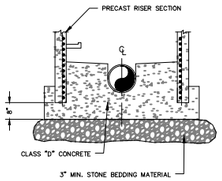




FLAT MANHOLE TOP OPTION

NOTE: USE ONLY WHEN LACK OF COVER PREVENTS USE OF CONE MANHOLE

8 / C805 OPTIONAL FLAT TOP MANHOLE WITH ROUND FRAME & COVER
N.T.S.



9 / C805 OPTIONAL POURED MANHOLE BASE FOR MANHOLES
N.T.S.

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SITE DETAILS

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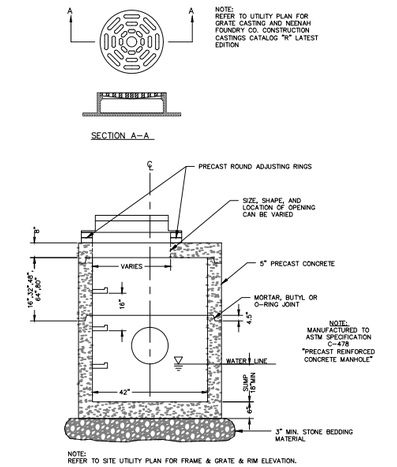
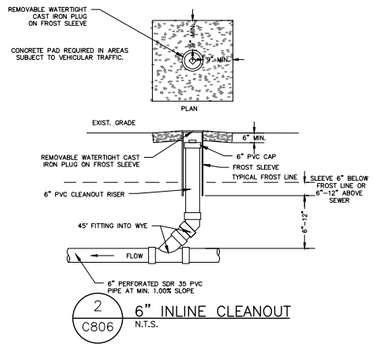
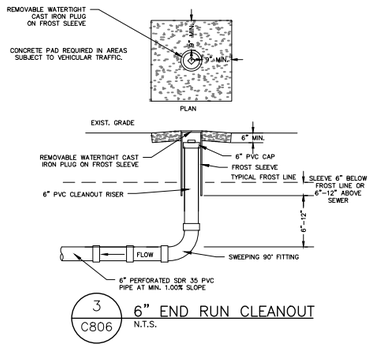


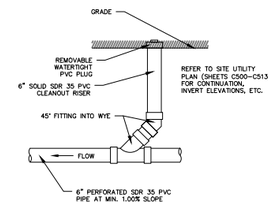
1 C806 42-INCH DIAMETER STORM CATCH BASIN WITH ROUND FRAME & GRATE
N.T.S.



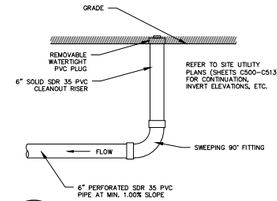
2 C806 6" INLINE CLEANOUT
N.T.S.



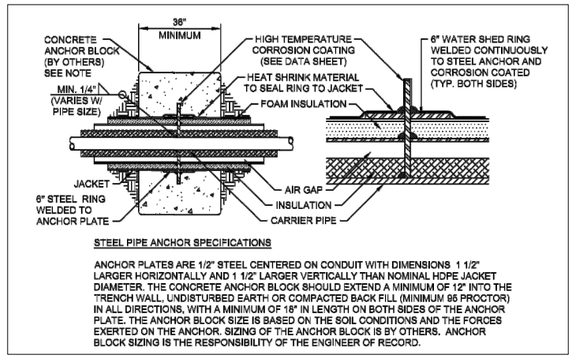
3 C806 6" END RUN CLEANOUT
N.T.S.



4 C806 STORM SEWER INLINE 6" CLEANOUT
N.T.S.



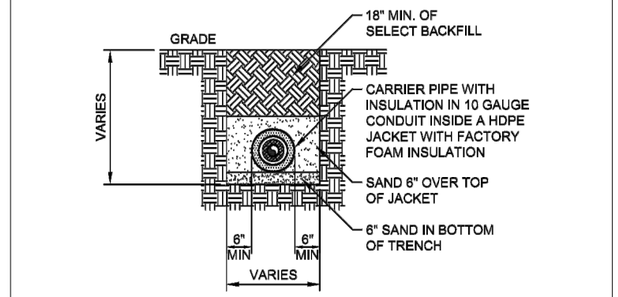
5 C806 STORM SEWER END RUN 6" CLEANOUT
N.T.S.



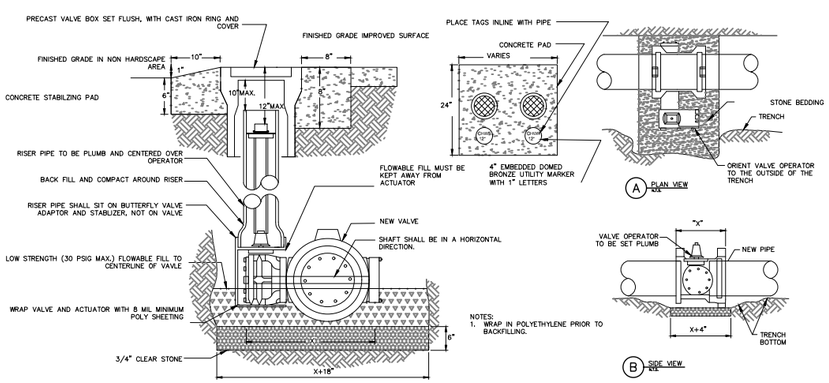
STEEL PIPE ANCHOR SPECIFICATIONS

ANCHOR PLATES ARE 1/2" STEEL CENTERED ON CONDUIT WITH DIMENSIONS 1 1/2" LARGER HORIZONTALLY AND 1 1/2" LARGER VERTICALLY THAN NOMINAL HDPE JACKET DIAMETER. THE CONCRETE ANCHOR BLOCK SHOULD EXTEND A MINIMUM OF 12" INTO THE TRENCH WALL. UNDISTURBED EARTH OR COMPACTED BACK FILL (MINIMUM 95 PROCTOR) IN ALL DIRECTIONS, WITH A MINIMUM OF 18" IN LENGTH ON BOTH SIDES OF THE ANCHOR PLATE. THE ANCHOR BLOCK SIZE IS BASED ON THE SOIL CONDITIONS AND THE FORCES EXERTED ON THE ANCHOR. SIZING OF THE ANCHOR BLOCK IS BY OTHERS. ANCHOR BLOCK SIZING IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD.

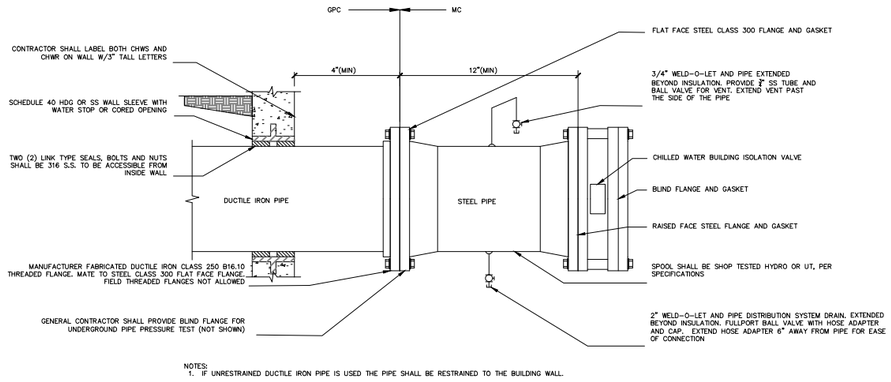
6 C806 HPS ANCHOR
N.T.S.



7 C806 HPS TYPICAL TRENCH SECTION
N.T.S.



8 C806 CHILLED WATER BUTTERFLY VALVE INSULATION
N.T.S.



9 C806 CHILLED WATER WALL PENETRATION
N.T.S.

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UNIVERSITY OF WISCONSIN - MADISON
MADISON, WISCONSIN

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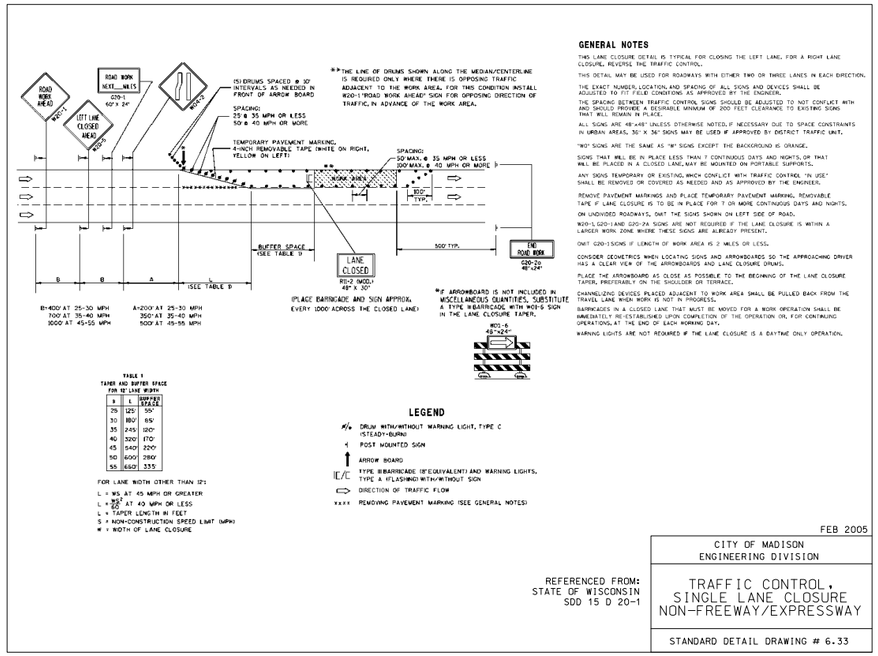


**THE LINE OF DRUMS SHOWN ALONG THE MEDIAN/CENTERLINE IS REQUIRED ONLY WHERE THERE IS OPPOSING TRAFFIC ADJACENT TO THE WORK AREA. FOR THIS CONDITION INSTALL W20-1 'ROAD WORK AHEAD' SIGN FOR OPPOSING DIRECTION OF TRAFFIC, IN ADVANCE OF THE WORK AREA.

TABLE 1
TAPER AND BUFFER SPACE FOR 12' LANE WIDTH

S	L TAPER	BUFFER SPACE
25	125'	50'
30	180'	65'
35	245'	100'
40	320'	170'
45	540'	220'
50	600'	280'
55	660'	335'

FOR LANE WIDTH OTHER THAN 12':
L = WS AT 45 MPH OR GREATER
$L = \frac{WS^2}{60}$ AT 40 MPH OR LESS
L = TAPER LENGTH IN FEET
S = NON-CONSTRUCTION SPEED LIMIT (MPH)
W = WIDTH OF LANE CLOSURE

GENERAL NOTES

THIS LANE CLOSURE DETAIL IS TYPICAL FOR CLOSING THE LEFT LANE, FOR A RIGHT LANE CLOSURE, REVERSE THE TRAFFIC CONTROL.

THIS DETAIL MAY BE USED FOR ROADWAYS WITH EITHER TWO OR THREE LANES IN EACH DIRECTION.

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

'W01' SIGNS ARE THE SAME AS 'W' SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL 'IN USE' SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

REMOVE PAVEMENT MARKINGS AND PLACE TEMPORARY PAVEMENT MARKING, REMOVABLE TAPE IF LANE CLOSURE IS TO BE IN PLACE FOR 7 OR MORE CONTINUOUS DAYS AND NIGHTS.

ON UNDIVIDED ROADWAYS, OMIT THE SIGNS SHOWN ON LEFT SIDE OF ROAD.

W20-1, G20-1 AND G20-2A SIGNS ARE NOT REQUIRED IF THE LANE CLOSURE IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT.

OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS.

CONSIDER GEOMETRICS WHEN LOCATING SIGNS AND ARROWBOARDS SO THE APPROACHING DRIVER HAS A CLEAR VIEW OF THE ARROWBOARDS AND LANE CLOSURE DRUMS.

PLACE THE ARROWBOARD AS CLOSE AS POSSIBLE TO THE BEGINNING OF THE LANE CLOSURE TAPER, PREFERABLY ON THE SHOULDER OR TERRACE.

CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

BARRICADES IN A CLOSED LANE THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

LEGEND

- DRUM WITH/WITHOUT WARNING LIGHT, TYPE C (STEADY-BURN)
- POST MOUNTED SIGN
- ARROW BOARD
- TYPE III BARRICADE (F'EQUIVALENT) AND WARNING LIGHTS, TYPE A FLASHING WITH/WITHOUT SIGN
- DIRECTION OF TRAFFIC FLOW
- xxxx REMOVING PAVEMENT MARKING (SEE GENERAL NOTES)

FEB 2005

CITY OF MADISON
ENGINEERING DIVISION

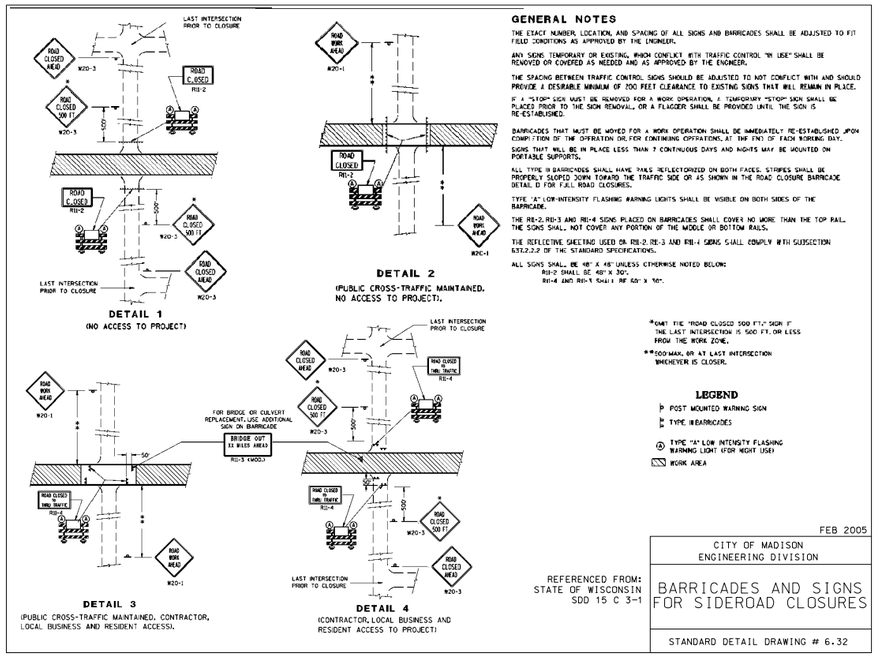
TRAFFIC CONTROL, SINGLE LANE CLOSURE NON-FREEWAY/EXPRESSWAY

STANDARD DETAIL DRAWING # 6.33

REFERENCED FROM:
STATE OF WISCONSIN
SDD 15 D 20-1

6.33

1 / C807 TRAFFIC CONTROL SINGLE LANE CLOSURE NON-FREEWAY/EXPRESSWAY
N.T.S.



GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND BARRICADES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL 'IN USE' SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS RE-ESTABLISHED.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ALL TYPE III BARRICADES SHALL HAVE RAILS RETROREFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL D FOR FULL ROAD CLOSURES.

TYPE 'A' LOW-INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R8-2, R8-3 AND R8-4 SIGNS PLACED ON BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE OR BOTTOM RAILS.

THE REFLECTIVE SHEETING USED ON R8-2, R8-3 AND R8-4 SIGNS SHALL COMPLY WITH SUBSECTION 637.2.2.2 OF THE STANDARD SPECIFICATIONS.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:
R8-2 SHALL BE 48" X 30".
R8-4 AND R8-4 SHALL BE 60" X 30".

*OMIT THE 'ROAD CLOSED 500 FT.' SIGN IF THE LAST INTERSECTION IS 500 FT. OR LESS FROM THE WORK ZONE.

**500 MAX. OR AT LAST INTERSECTION WHICHEVER IS CLOSER.

LEGEND

- POST MOUNTED WARNING SIGN
- TYPE III BARRICADES
- TYPE 'A' LOW INTENSITY FLASHING WARNING LIGHT (FOR NIGHT USE)
- WORK AREA

FEB 2005

CITY OF MADISON
ENGINEERING DIVISION

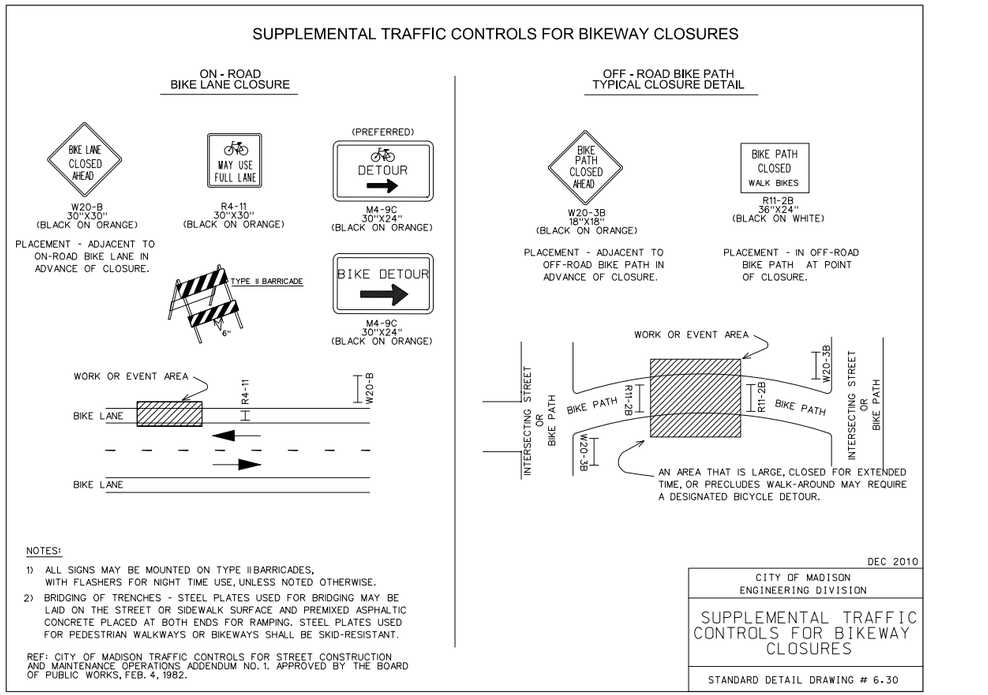
BARRICADES AND SIGNS FOR SIDEROAD CLOSURES

STANDARD DETAIL DRAWING # 6.32

REFERENCED FROM:
STATE OF WISCONSIN
SDD 15 C 3-1

6.32

2 / C807 BARRICADES AND SIGNS FOR SIDEROAD CLOSURES
N.T.S.



NOTES:

1) ALL SIGNS MAY BE MOUNTED ON TYPE II BARRICADES, WITH FLASHERS FOR NIGHT TIME USE, UNLESS NOTED OTHERWISE.
2) BRIDGING OF TRENCHES - STEEL PLATES USED FOR BRIDGING MAY BE LAID ON THE STREET OR SIDEWALK SURFACE AND PREMIXED ASPHALTIC CONCRETE PLACED AT BOTH ENDS FOR RAMPING. STEEL PLATES USED FOR PEDESTRIAN WALKWAYS OR BIKEWAYS SHALL BE SKID-RESISTANT.

REF: CITY OF MADISON TRAFFIC CONTROLS FOR STREET CONSTRUCTION AND MAINTENANCE OPERATIONS ADDENDUM NO. 1. APPROVED BY THE BOARD OF PUBLIC WORKS, FEB. 4, 1982.

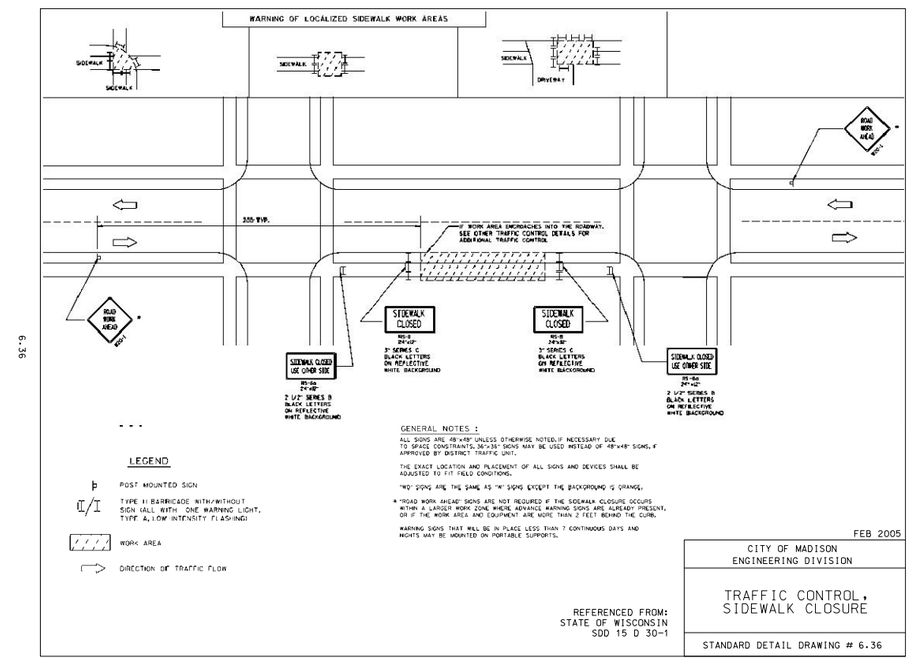
DEC 2010

CITY OF MADISON
ENGINEERING DIVISION

SUPPLEMENTAL TRAFFIC CONTROLS FOR BIKEWAY CLOSURES

STANDARD DETAIL DRAWING # 6.30

3 / C807 SUPPLEMENTAL TRAFFIC CONTROLS FOR BIKEWAY CLOSURES
N.T.S.



FEB 2005

CITY OF MADISON
ENGINEERING DIVISION

TRAFFIC CONTROL, SIDEWALK CLOSURE

STANDARD DETAIL DRAWING # 6.36

REFERENCED FROM:
STATE OF WISCONSIN
SDD 15 D 30-1

6.36

4 / C807 TRAFFIC CONTROL SIDEWALK CLOSURE
N.T.S.

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MADISON, WI 53715

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MADISON, WISCONSIN

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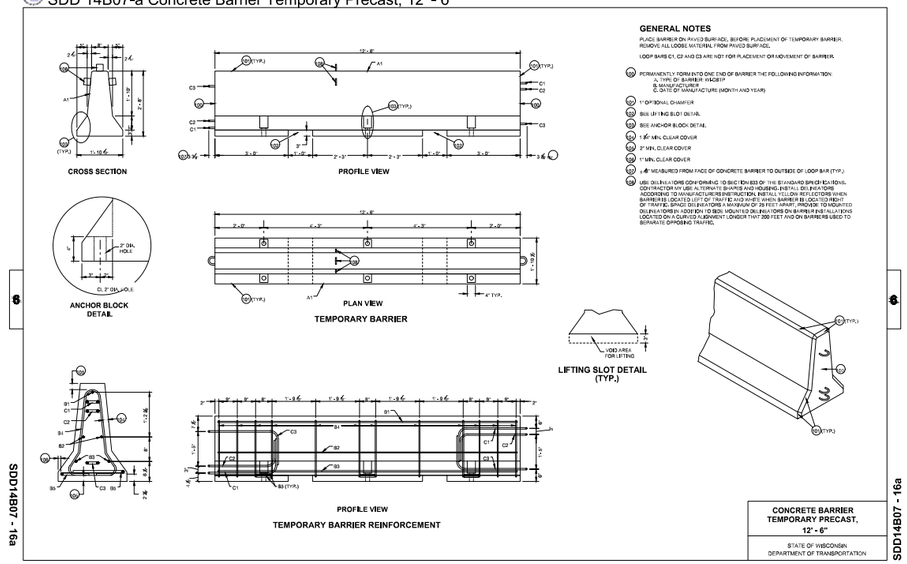
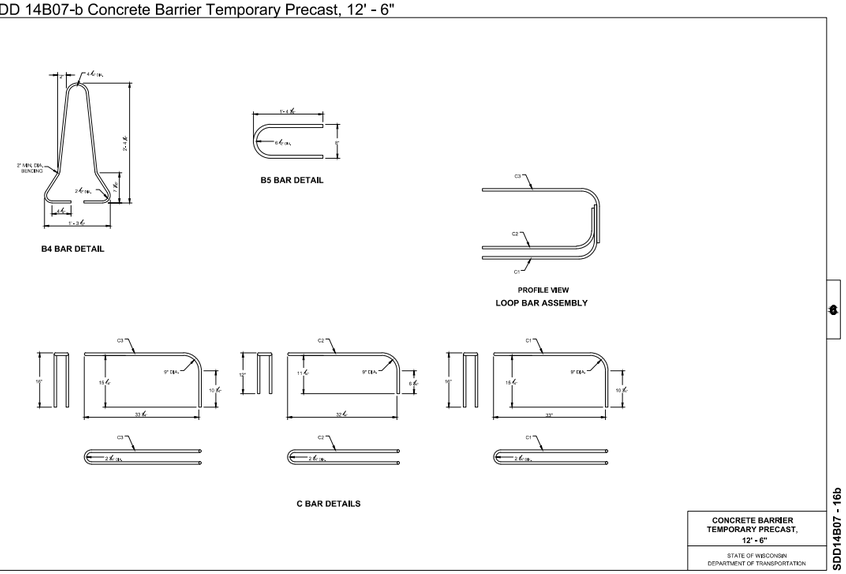
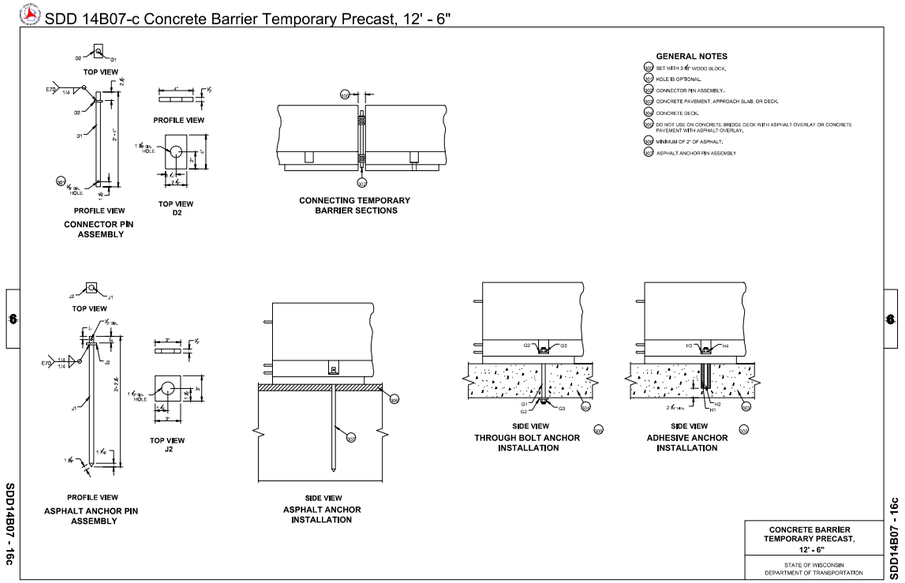
SDD 14B07-a Concrete Barrier Temporary Precast, 12' - 6"



SDD 14B07-b Concrete Barrier Temporary Precast, 12' - 6"



SDD 14B07-c Concrete Barrier Temporary Precast, 12' - 6"



1 / C808 CONCRETE BARRIER TEMPORARY PRECAST, 12'–6"
N.T.S.

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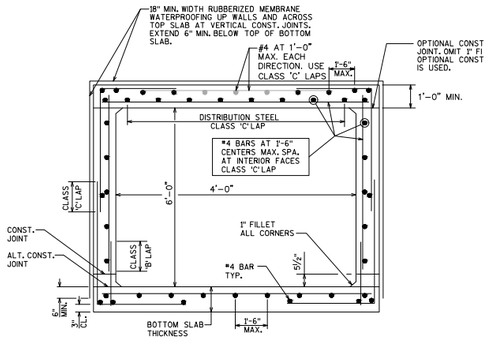
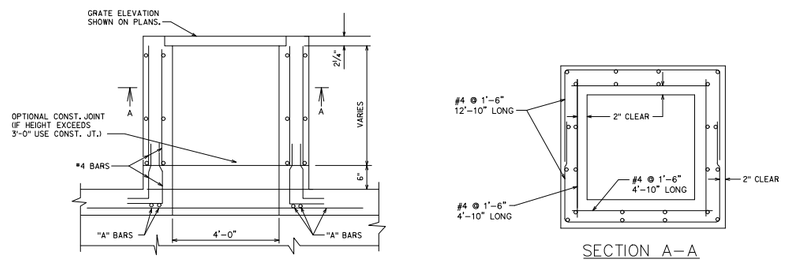
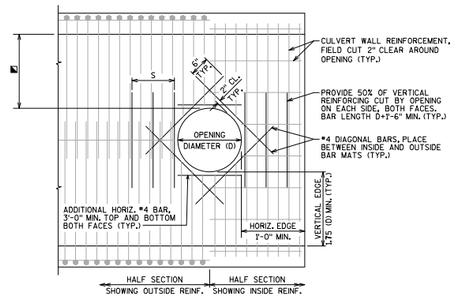


1 / C809 CISTERN CROSS SECTION
N.T.S.

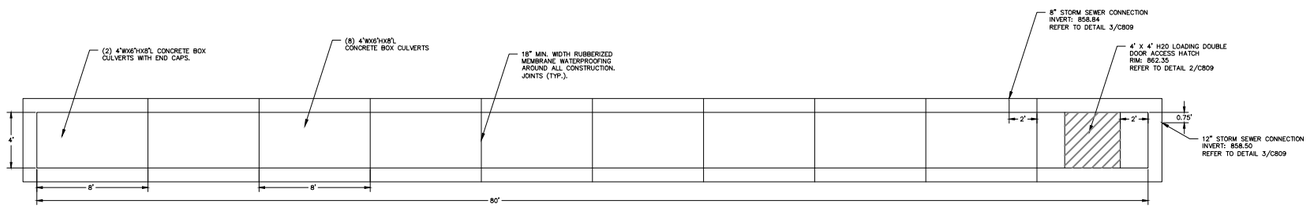


2 / C809 CISTERN ACCESS HATCH RISER
N.T.S.



ELEVATION
WHEN D ≤ 1'-6" S = 1'-6"
WHEN D > 1'-6" S = 1'-6" MIN, D MAX

3 / C809 CISTERN PIPE CONNECTIONS
N.T.S.



NOTES:

1) CONTRACTOR TO SUBMIT ENGINEERED SHOP DRAWINGS OF CISTERN STAMPED BY A STRUCTURAL P.E. LICENSED IN THE STATE OF WISCONSIN.

4 / C809 CISTERN JOINTING DETAIL
N.T.S.

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Appendix G

Storm Sewer Sizing Calculations

Storm Sewer Computation Sheet - UW Levy Hall(10-Year Storm Event)

Structure		Length (ft)	Drainage Area "A" (Acres)		Runoff Coefficient "C"	"A" x "C"		Flow Time (min)			Velocity (fps)		Rainfall Intensity "I" (in/hr)	Q(cfs)=CIA	Total Runoff (Q)	GPM	Diameter Pipe (in)	Slope of Sewer (ft/ft)	Manning's (n)	Capacity Full (cfs)	Design Flow (Q)	Design Check
From	To		Increment	Total		Increment	Total	To Upper End	In Section	Total	Flowing Full	Design Flow										
TRENCH-1	CB-1	72.4	0.03	0.03	0.76	0.02	0.02	6.00	0.29	6.29	5.27	4.21	6.65	0.15	0.15	65.53	6	0.0200	0.0100	1.03	0.15	OK
CB-1	CB-2	34.4	0.02	0.02	0.30	0.01	0.01	6.29	0.16	6.44	4.55	3.64	6.59	0.05	0.19	85.85	12	0.0100	0.0130	3.56	0.19	OK
CB-2	EX CB-1	24.4	0.02	0.02	0.76	0.02	0.02	6.44	0.11	6.56	4.55	3.64	6.55	0.12	0.31	138.64	12	0.0100	0.0130	3.56	0.31	OK
CB-3	ST MH-1	28.0	0.04	0.04	0.27	0.01	0.01	6.00	0.13	6.13	4.55	3.64	6.71	0.07	0.07	31.73	12	0.0100	0.0130	3.56	0.07	OK
ST MH-1	CB-4	29.3	0.00	0.00	0.00	0.00	0.00	6.13	0.13	6.26	4.55	3.64	6.66	0.00	0.07	31.73	12	0.0100	0.0130	3.56	0.07	OK
CB-4	CB-5	79.3	0.04	0.04	0.89	0.04	0.04	6.26	0.51	6.78	3.22	2.57	6.46	0.25	0.32	142.22	12	0.0050	0.0130	2.52	0.32	OK
ST BLDG-1	FILTER-1	5.0	0.00	0.00	0.00	0.00	0.00	6.00	0.02	6.02	5.91	4.73	6.75	0.00	2.66	1193.00	12	0.0100	0.0100	4.63	2.66	OK
FILTER-1	ST MH-2	14.8	0.00	0.00	0.00	0.00	0.00	6.02	0.05	6.07	5.91	4.73	6.73	0.00	2.66	1193.00	12	0.0100	0.0100	4.63	2.66	OK
ST BLDG-2	ST MH-2	7.1	0.00	0.00	0.00	0.00	0.00	6.00	0.03	6.03	5.13	4.11	6.75	0.00	0.26	117.00	4	0.0326	0.0100	0.45	0.26	OK
ST MH-2	CB-5	10.3	0.00	0.00	0.00	0.00	0.00	6.07	0.04	6.11	5.32	4.26	6.72	0.00	2.92	1310.00	12	0.0081	0.0100	4.17	2.92	OK
CB-5	UGS-1	3.2	0.00	0.00	0.00	0.00	0.00	6.78	0.01	6.79	5.91	4.73	6.46	0.00	3.24	1452.22	12	0.0100	0.0100	4.63	3.24	OK
FILTER-1	ST MH-3	21.2	0.00	0.00	0.00	0.00	0.00	6.02	0.10	6.12	4.51	3.61	6.72	0.00	1.57	704.62	8	0.0100	0.0100	1.57	1.57	OK
ST MH-3	ST FIT-1	4.6	0.00	0.00	0.00	0.00	0.00	6.12	0.02	6.14	4.51	3.61	6.71	0.00	1.57	704.62	8	0.0100	0.0100	1.57	1.57	OK
ST FIT-1	CISTERN-1	1.1	0.00	0.00	0.00	0.00	0.00	6.14	0.00	6.14	45.13	36.10	6.71	0.00	1.57	704.62	8	1.0000	0.0100	15.71	1.57	OK
CISTERN-2	UGS-2	7.0	0.00	0.00	0.00	0.00	0.00	6.00	0.02	6.02	7.73	6.19	6.75	0.00	1.57	704.62	12	0.0171	0.0100	6.06	1.57	OK
TRENCH-2	ST MH-4	4.9	0.02	0.02	0.90	0.01	0.01	6.00	0.03	6.03	3.73	2.98	6.75	0.10	0.10	44.62	6	0.0100	0.0100	0.73	0.10	OK
ST MH-4	UGS-3	4.9	0.00	0.00	0.00	0.00	0.00	6.03	0.03	6.05	3.73	2.98	6.74	0.00	0.10	44.62	6	0.0100	0.0100	0.73	0.10	OK
UGS-4	EX ST MH-1	17.2	0.00	0.00	0.00	0.00	0.00	6.00	0.08	6.08	4.55	3.64	6.73	0.00	2.66	1193.81	12	0.0100	0.0130	3.56	2.66	OK

Storm Sewer Computation Sheet - UW Levy Hall(100-Year Storm Event)

Structure		Length (ft)	Drainage Area "A" (Acres)		Runoff Coefficient "C"	"A" x "C"		Flow Time (min)			Velocity (fps)		Rainfall Intensity "I" (in/hr)	Q(cfs)=CIA	Total Runoff (Q)	GPM	Diameter Pipe (in)	Slope of Sewer (ft/ft)	Manning's (n)	Capacity Full (cfs)	Design Flow (Q)	Design Check
From	To		Increment	Total		Increment	Total	To Upper End	In Section	Total	Flowing Full	Design Flow										
TRENCH-1	CB-1	72.4	0.03	0.03	0.76	0.02	0.02	6.00	0.29	6.29	5.27	4.21	10.06	0.22	0.22	99.17	6	0.0200	0.0100	1.03	0.22	OK
CB-1	CB-2	34.4	0.02	0.02	0.30	0.01	0.01	6.29	0.16	6.44	4.55	3.64	9.97	0.07	0.29	129.91	12	0.0100	0.0130	3.56	0.29	OK
CB-2	EX CB-1	24.4	0.02	0.02	0.76	0.02	0.02	6.44	0.11	6.56	4.55	3.64	9.91	0.18	0.47	209.80	12	0.0100	0.0130	3.56	0.47	OK
CB-3	ST MH-1	28.0	0.04	0.04	0.27	0.01	0.01	6.00	0.13	6.13	4.55	3.64	10.15	0.11	0.11	48.01	12	0.0100	0.0130	3.56	0.11	OK
ST MH-1	CB-4	30.9	0.00	0.00	0.00	0.00	0.00	6.13	0.14	6.27	4.55	3.64	10.07	0.00	0.11	48.01	12	0.0100	0.0130	3.56	0.11	OK
CB-4	CB-5	70.1	0.04	0.04	0.89	0.04	0.04	6.27	0.45	6.72	3.22	2.57	9.81	0.37	0.48	215.72	12	0.0050	0.0130	2.52	0.48	OK
ST BLDG-1	FILTER-1	5.0	0.00	0.00	0.00	0.00	0.00	6.00	0.02	6.02	5.91	4.73	10.22	0.00	2.66	1193.00	12	0.0100	0.0100	4.63	2.66	OK
FILTER-1	ST MH-2	14.8	0.00	0.00	0.00	0.00	0.00	6.02	0.05	6.07	5.91	4.73	10.19	0.00	2.66	1193.00	12	0.0100	0.0100	4.63	2.66	OK
ST BLDG-2	ST MH-2	7.1	0.00	0.00	0.00	0.00	0.00	6.00	0.03	6.03	5.13	4.11	10.21	0.00	0.26	117.00	4	0.0326	0.0100	0.45	0.26	OK
ST MH-2	CB-5	10.3	0.00	0.00	0.00	0.00	0.00	6.07	0.04	6.11	5.32	4.26	10.17	0.00	2.92	1310.00	12	0.0081	0.0100	4.17	2.92	OK
CB-5	UGS-1	3.2	0.00	0.00	0.00	0.00	0.00	6.72	0.01	6.73	5.91	4.73	9.80	0.00	3.40	1525.72	12	0.0100	0.0100	4.63	3.40	OK
FILTER-1	ST MH-3	21.2	0.00	0.00	0.00	0.00	0.00	6.02	0.10	6.12	4.51	3.61	10.16	0.00	1.57	704.62	8	0.0100	0.0100	1.57	1.57	OK
ST MH-3	ST FIT-1	4.6	0.00	0.00	0.00	0.00	0.00	6.12	0.02	6.14	4.51	3.61	10.15	0.00	1.57	704.62	8	0.0100	0.0100	1.57	1.57	OK
ST FIT-1	CISTERN-1	1.1	0.00	0.00	0.00	0.00	0.00	6.14	0.00	6.14	45.13	36.10	10.15	0.00	1.57	704.62	8	1.0000	0.0100	15.71	1.57	OK
CISTERN-2	UGS-2	7.0	0.00	0.00	0.00	0.00	0.00	6.00	0.02	6.02	7.73	6.19	10.22	0.00	1.57	704.62	12	0.0171	0.0100	6.06	1.57	OK
TRENCH-2	ST MH-4	4.9	0.02	0.02	0.90	0.01	0.01	6.00	0.03	6.03	3.73	2.98	10.21	0.15	0.15	67.52	6	0.0100	0.0100	0.73	0.15	OK
ST MH-4	UGS-3	4.9	0.00	0.00	0.00	0.00	0.00	6.03	0.03	6.05	3.73	2.98	10.20	0.00	0.15	67.52	6	0.0100	0.0100	0.73	0.15	OK

Appendix H

Inlet Sizing Calculations

INLET CAPACITY - TRENCH-1

FOR

20K1G UW LEVY HALL

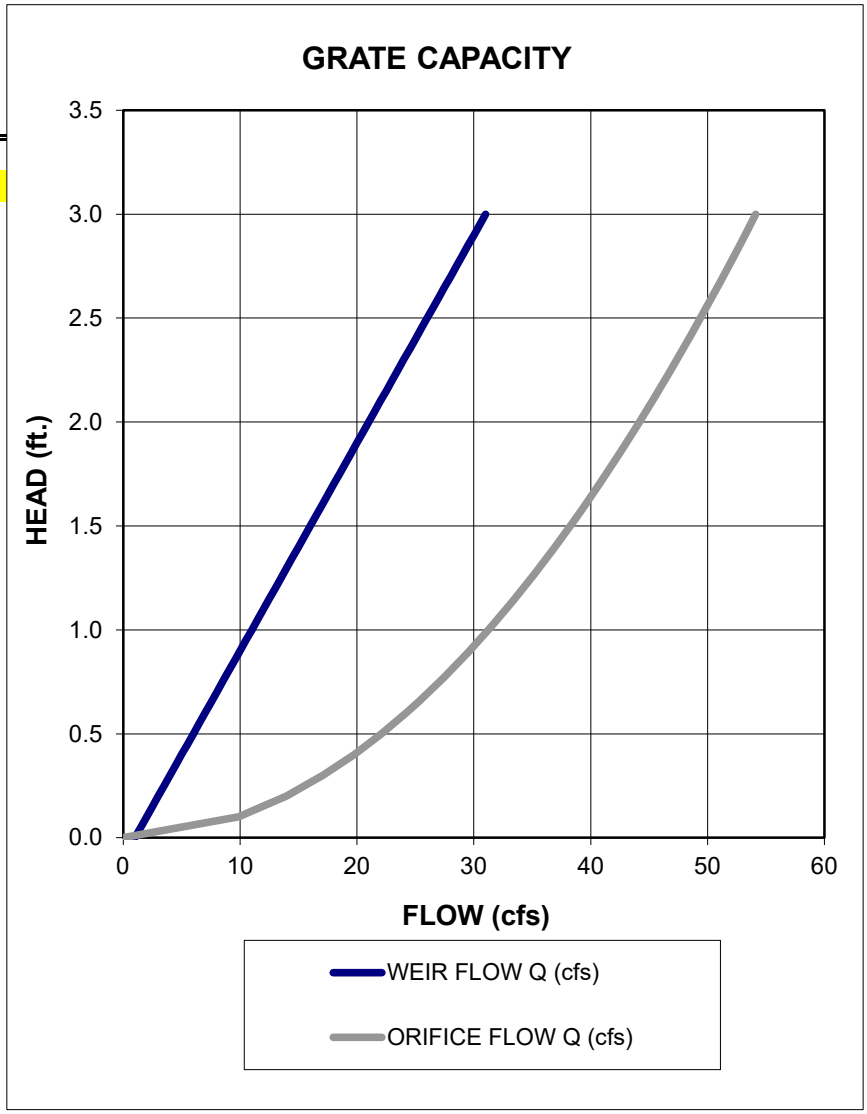
Flow to TRENCH-1 Resulting from 100-Year Storm Event: 0.22 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 5.35 **cfs**

Inlet is large enough for the 100-year storm event

ACCO GRATE NUMBER: TYPE 480D-IRON
INLET LENGTH OR PERIMETER: 50.84 ft.
GRATE OPEN END AREA: 5.8125 sf.

HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	5.35	9.88
0.2	15.14	13.97
0.3	27.82	17.11
0.4	42.83	19.75
0.5	59.86	22.08
0.6	78.68	24.19
0.7	99.15	26.13
0.8	121.14	27.94
0.9	144.55	29.63
1.0	169.30	31.23
1.1	195.32	32.76
1.2	222.55	34.21
1.3	250.94	35.61
1.4	280.44	36.96
1.5	311.02	38.25
1.6	342.63	39.51
1.7	375.25	40.72
1.8	408.84	41.90
1.9	443.38	43.05
2.0	478.84	44.17
2.1	515.20	45.26
2.2	552.44	46.33
2.3	590.53	47.37
2.4	629.46	48.39
2.5	669.21	49.38
2.6	709.76	50.36
2.7	751.10	51.32
2.8	793.21	52.26
2.9	836.08	53.19
3.0	879.69	54.10



Weir flow controls until a head of 0.184 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

INLET CAPACITY - TRENCH-2

FOR

20K1G UW LEVY HALL

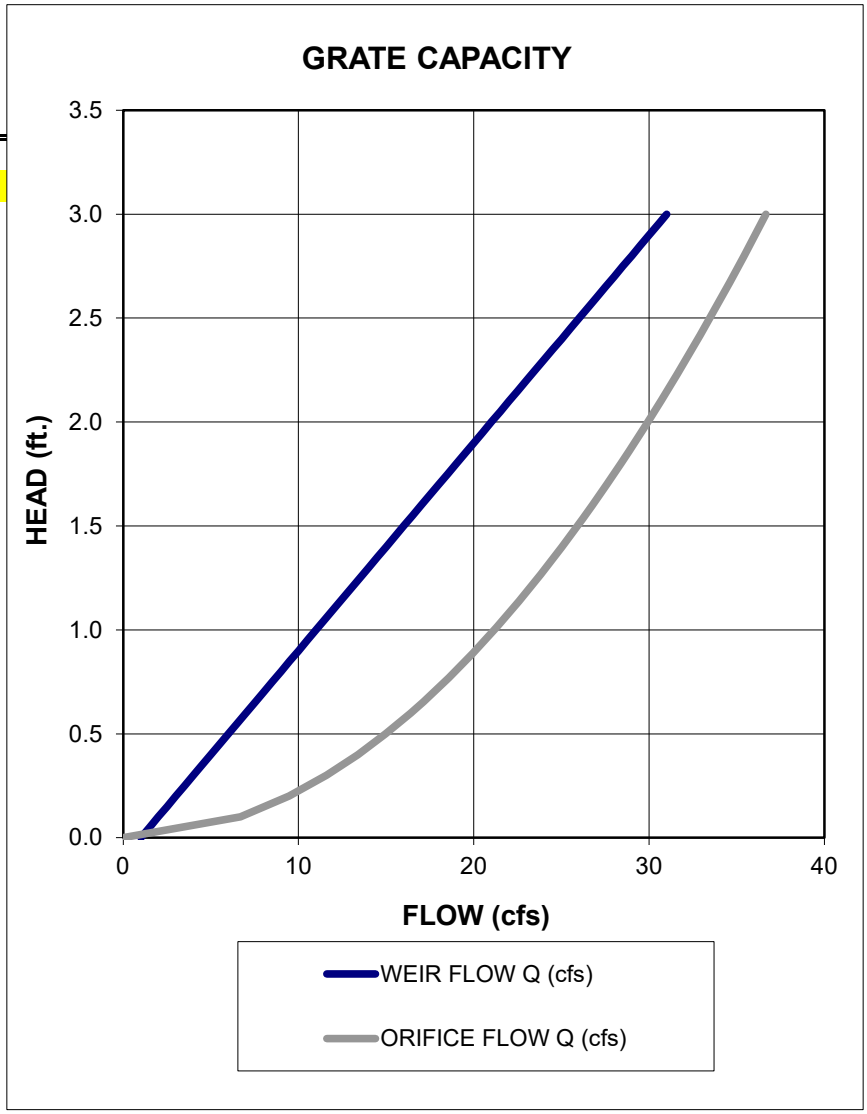
Flow to TRENCH-2 Resulting from 100-Year Storm Event: 0.15 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 3.63 **cfs**

Inlet is large enough for the 100-year storm event

ACCO GRATE NUMBER: TYPE 480D-IRON
INLET LENGTH OR PERIMETER: 34.44 **ft.**
GRATE OPEN END AREA: 3.9375 **sf.**

HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	3.63	6.69
0.2	10.26	9.46
0.3	18.84	11.59
0.4	29.01	13.38
0.5	40.55	14.96
0.6	53.30	16.39
0.7	67.17	17.70
0.8	82.06	18.92
0.9	97.92	20.07
1.0	114.69	21.16
1.1	132.31	22.19
1.2	150.76	23.18
1.3	169.99	24.12
1.4	189.98	25.03
1.5	210.69	25.91
1.6	232.11	26.76
1.7	254.20	27.59
1.8	276.96	28.39
1.9	300.36	29.16
2.0	324.38	29.92
2.1	349.01	30.66
2.2	374.23	31.38
2.3	400.04	32.09
2.4	426.41	32.78
2.5	453.33	33.45
2.6	480.80	34.12
2.7	508.81	34.77
2.8	537.33	35.40
2.9	566.38	36.03
3.0	595.92	36.65



Weir flow controls until a head of 0.184 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

INLET CAPACITY - CATCH BASIN-1

FOR

20K1G UW LEVY HALL

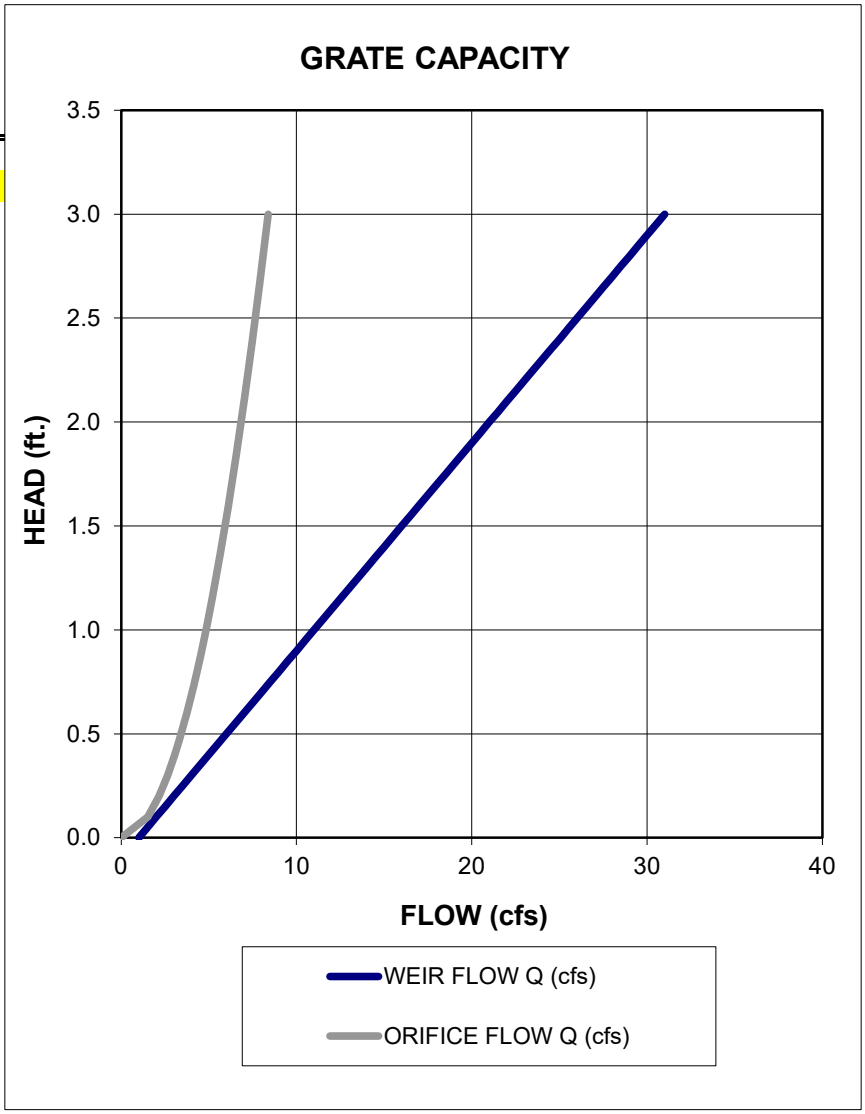
Flow to CB-1 Resulting from 100-Year Storm Event: 0.07 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 0.63 **cfs**

Inlet is large enough for the 100-year storm event

NEENAH GRATE NUMBER: R-2502-D
INLET LENGTH OR PERIMETER: 6 ft.
GRATE OPEN END AREA: 0.9 sf.

HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	0.63	1.53
0.2	1.79	2.16
0.3	3.28	2.65
0.4	5.05	3.06
0.5	7.06	3.42
0.6	9.29	3.75
0.7	11.70	4.05
0.8	14.30	4.33
0.9	17.06	4.59
1.0	19.98	4.84
1.1	23.05	5.07
1.2	26.26	5.30
1.3	29.61	5.51
1.4	33.10	5.72
1.5	36.71	5.92
1.6	40.44	6.12
1.7	44.29	6.31
1.8	48.25	6.49
1.9	52.33	6.67
2.0	56.51	6.84
2.1	60.80	7.01
2.2	65.20	7.17
2.3	69.69	7.33
2.4	74.29	7.49
2.5	78.98	7.65
2.6	83.76	7.80
2.7	88.64	7.95
2.8	93.61	8.09
2.9	98.67	8.24
3.0	103.82	8.38



Weir flow controls until a head of 0.242 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

INLET CAPACITY - CATCH BASIN-2

FOR

20K1G UW LEVY HALL

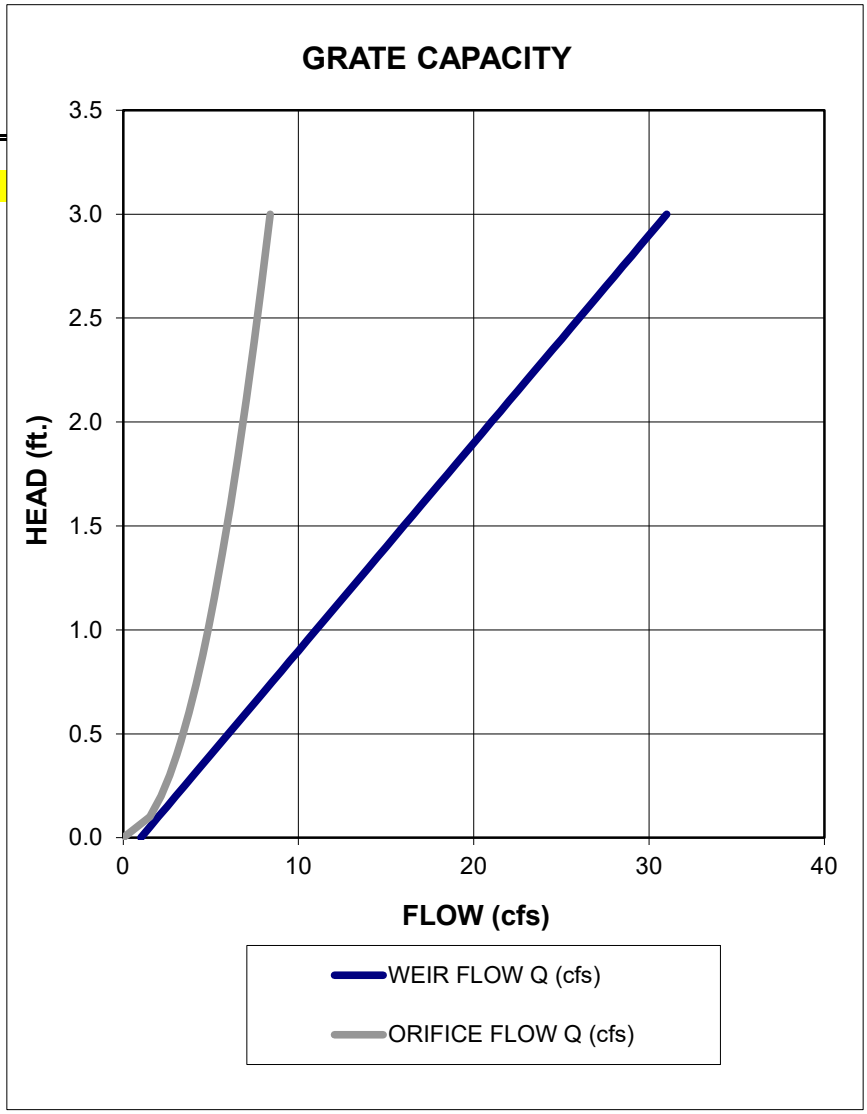
Flow to CB-2 Resulting from 100-Year Storm Event: 0.18 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 0.63 **cfs**

Inlet is large enough for the 100-year storm event

NEENAH GRATE NUMBER: R-2502-D
INLET LENGTH OR PERIMETER: 6 ft.
GRATE OPEN END AREA: 0.9 sf.

HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	0.63	1.53
0.2	1.79	2.16
0.3	3.28	2.65
0.4	5.05	3.06
0.5	7.06	3.42
0.6	9.29	3.75
0.7	11.70	4.05
0.8	14.30	4.33
0.9	17.06	4.59
1.0	19.98	4.84
1.1	23.05	5.07
1.2	26.26	5.30
1.3	29.61	5.51
1.4	33.10	5.72
1.5	36.71	5.92
1.6	40.44	6.12
1.7	44.29	6.31
1.8	48.25	6.49
1.9	52.33	6.67
2.0	56.51	6.84
2.1	60.80	7.01
2.2	65.20	7.17
2.3	69.69	7.33
2.4	74.29	7.49
2.5	78.98	7.65
2.6	83.76	7.80
2.7	88.64	7.95
2.8	93.61	8.09
2.9	98.67	8.24
3.0	103.82	8.38



Weir flow controls until a head of 0.242 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

INLET CAPACITY - CATCH BASIN-3

FOR

20K1G UW LEVY HALL

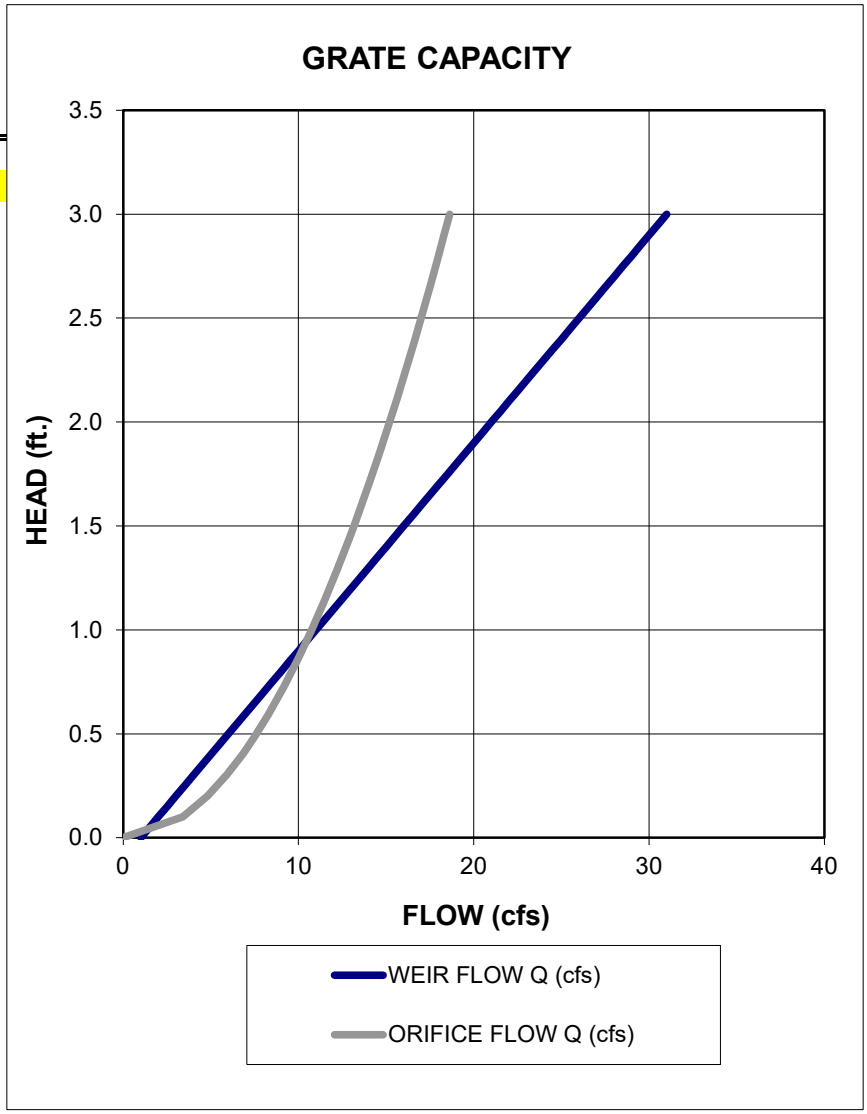
Flow to CB-3 Resulting from 100-Year Storm Event: 0.11 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 0.71 **cfs**

Inlet is large enough for the 100-year storm event

NEENAH GRATE NUMBER: R-2561
INLET LENGTH OR PERIMETER: 6.7 **ft.**
GRATE OPEN END AREA: 2 **sf.**

HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	0.71	3.40
0.2	2.00	4.81
0.3	3.67	5.89
0.4	5.64	6.80
0.5	7.89	7.60
0.6	10.37	8.32
0.7	13.07	8.99
0.8	15.96	9.61
0.9	19.05	10.20
1.0	22.31	10.75
1.1	25.74	11.27
1.2	29.33	11.77
1.3	33.07	12.25
1.4	36.96	12.72
1.5	40.99	13.16
1.6	45.15	13.59
1.7	49.45	14.01
1.8	53.88	14.42
1.9	58.43	14.81
2.0	63.11	15.20
2.1	67.90	15.57
2.2	72.80	15.94
2.3	77.82	16.30
2.4	82.95	16.65
2.5	88.19	16.99
2.6	93.54	17.33
2.7	98.98	17.66
2.8	104.53	17.98
2.9	110.18	18.30
3.0	115.93	18.61



Weir flow controls until a head of 0.482 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

INLET CAPACITY - CATCH BASIN-4

FOR

20K1G UW LEVY HALL

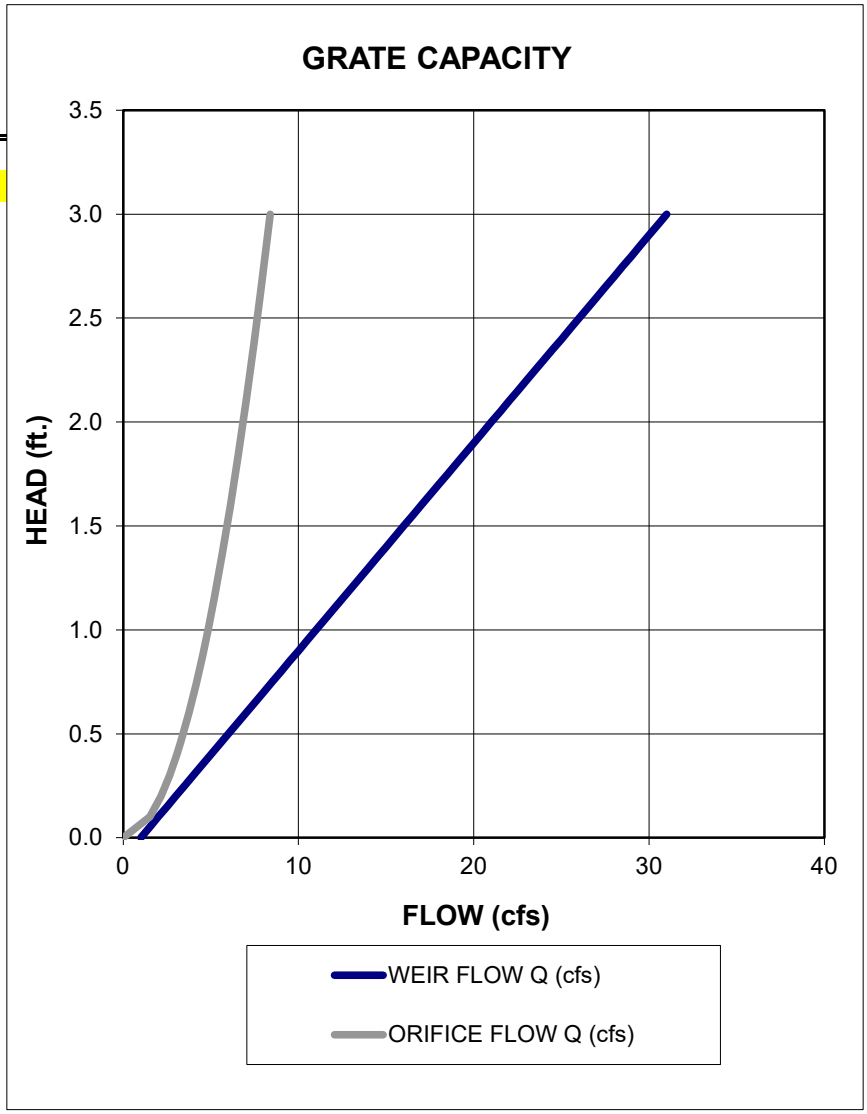
Flow to CB-4 Resulting from 100-Year Storm Event: 0.37 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 0.63 **cfs**

Inlet is large enough for the 100-year storm event

NEENAH GRATE NUMBER: R-2502-D
INLET LENGTH OR PERIMETER: 6 ft.
GRATE OPEN END AREA: 0.9 sf.

HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	0.63	1.53
0.2	1.79	2.16
0.3	3.28	2.65
0.4	5.05	3.06
0.5	7.06	3.42
0.6	9.29	3.75
0.7	11.70	4.05
0.8	14.30	4.33
0.9	17.06	4.59
1.0	19.98	4.84
1.1	23.05	5.07
1.2	26.26	5.30
1.3	29.61	5.51
1.4	33.10	5.72
1.5	36.71	5.92
1.6	40.44	6.12
1.7	44.29	6.31
1.8	48.25	6.49
1.9	52.33	6.67
2.0	56.51	6.84
2.1	60.80	7.01
2.2	65.20	7.17
2.3	69.69	7.33
2.4	74.29	7.49
2.5	78.98	7.65
2.6	83.76	7.80
2.7	88.64	7.95
2.8	93.61	8.09
2.9	98.67	8.24
3.0	103.82	8.38



Weir flow controls until a head of 0.242 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

INLET CAPACITY - CATCH BASIN-5

FOR

20K1G UW LEVY HALL

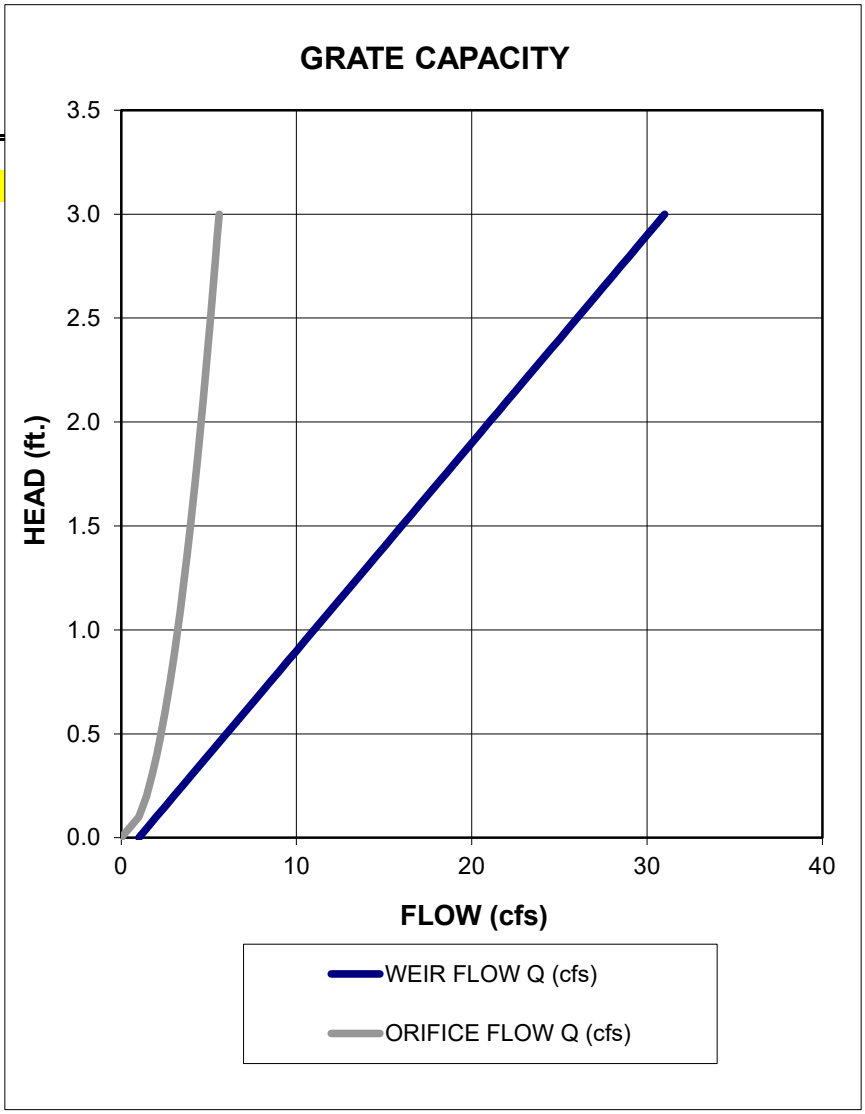
Flow to CB-5 Resulting from 100-Year Storm Event: 0.00 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 0.49 **cfs**

Inlet is large enough for the 100-year storm event

NYLOPLAST GRATE NUMBER: R-2502-D
INLET LENGTH OR PERIMETER: 4.7 **ft.**
GRATE OPEN END AREA: 0.6 **sf.**

HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	0.49	1.02
0.2	1.40	1.44
0.3	2.57	1.77
0.4	3.96	2.04
0.5	5.53	2.28
0.6	7.27	2.50
0.7	9.17	2.70
0.8	11.20	2.88
0.9	13.36	3.06
1.0	15.65	3.22
1.1	18.06	3.38
1.2	20.57	3.53
1.3	23.20	3.68
1.4	25.93	3.81
1.5	28.75	3.95
1.6	31.68	4.08
1.7	34.69	4.20
1.8	37.80	4.33
1.9	40.99	4.44
2.0	44.27	4.56
2.1	47.63	4.67
2.2	51.07	4.78
2.3	54.59	4.89
2.4	58.19	4.99
2.5	61.87	5.10
2.6	65.61	5.20
2.7	69.44	5.30
2.8	73.33	5.39
2.9	77.29	5.49
3.0	81.32	5.58



Weir flow controls until a head of 0.206 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

INLET CAPACITY - CATCH BASIN-6

FOR

20K1G UW LEVY HALL

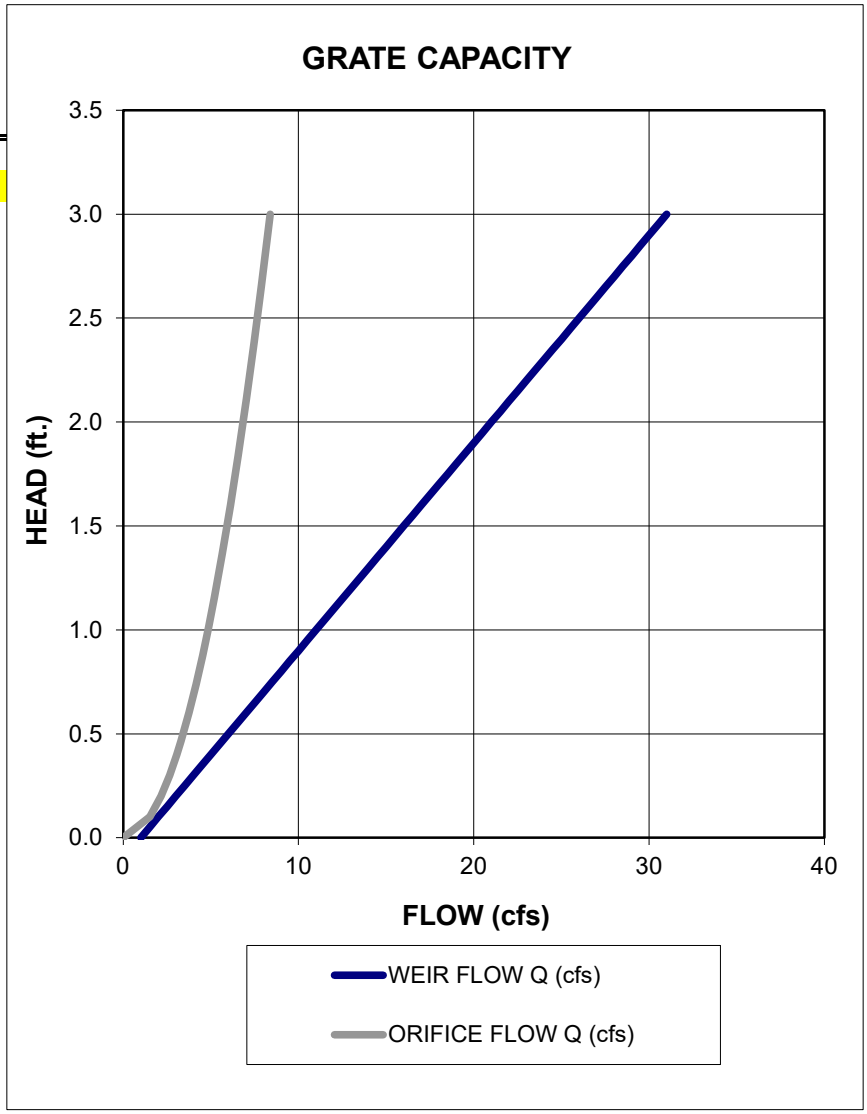
Flow to CB-6 Resulting from 100-Year Storm Event: 0.15 **cfs** (See 100-Year Storm Sewer Sizing Calcs)

Per the Table below, assuming a ponded height of 0.10 ft, the inlet grate has a max. capacity of 0.63 **cfs**

Inlet is large enough for the 100-year storm event

NYLOPLAST GRATE NUMBER: R-2502-D
INLET LENGTH OR PERIMETER: 6 ft.
GRATE OPEN END AREA: 0.9 sf.

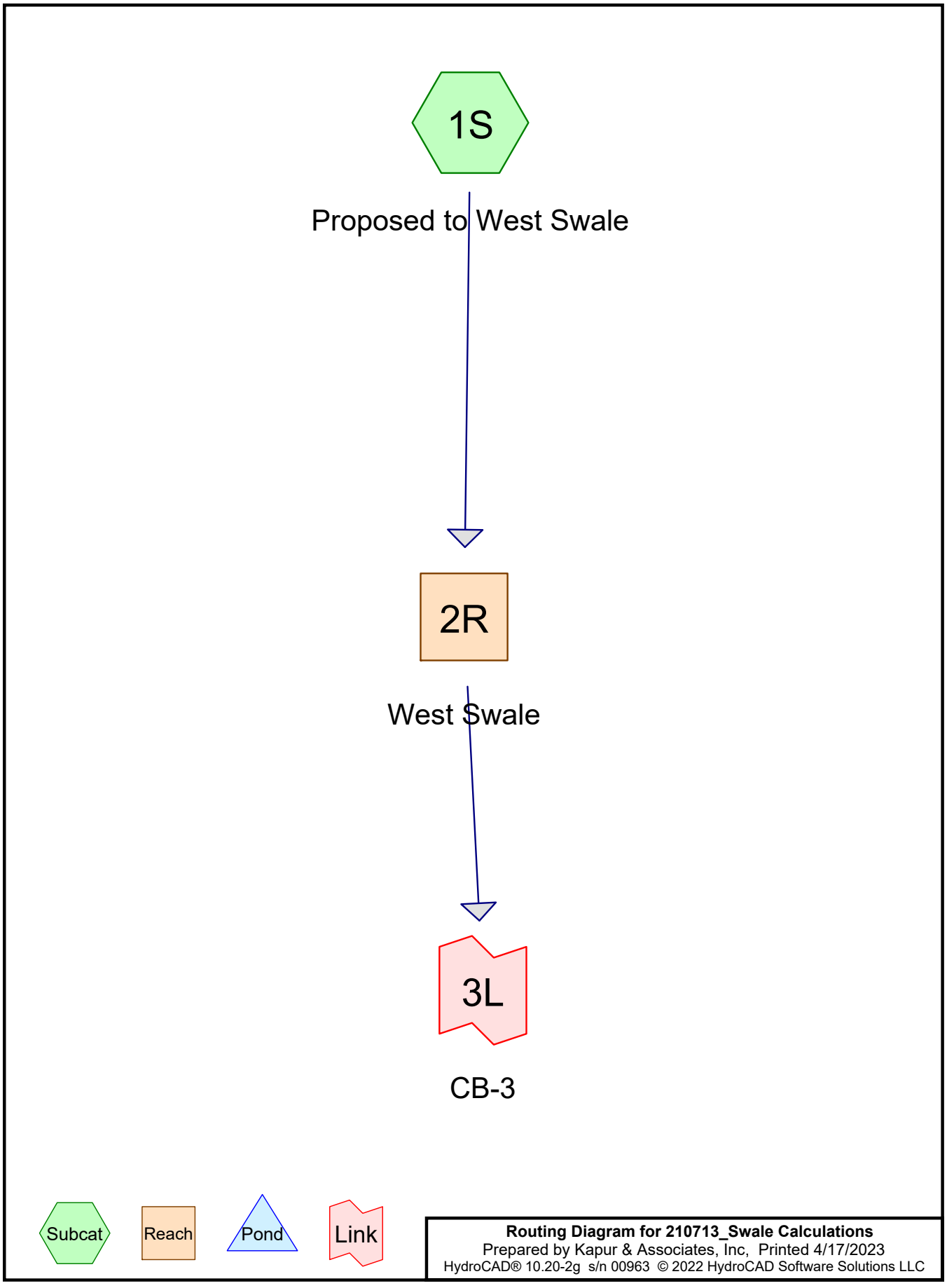
HEAD H (ft.)	WEIR FLOW Q (cfs)	ORIFICE FLOW Q (cfs)
0.0	0.00	0.00
0.1	0.63	1.53
0.2	1.79	2.16
0.3	3.28	2.65
0.4	5.05	3.06
0.5	7.06	3.42
0.6	9.29	3.75
0.7	11.70	4.05
0.8	14.30	4.33
0.9	17.06	4.59
1.0	19.98	4.84
1.1	23.05	5.07
1.2	26.26	5.30
1.3	29.61	5.51
1.4	33.10	5.72
1.5	36.71	5.92
1.6	40.44	6.12
1.7	44.29	6.31
1.8	48.25	6.49
1.9	52.33	6.67
2.0	56.51	6.84
2.1	60.80	7.01
2.2	65.20	7.17
2.3	69.69	7.33
2.4	74.29	7.49
2.5	78.98	7.65
2.6	83.76	7.80
2.7	88.64	7.95
2.8	93.61	8.09
2.9	98.67	8.24
3.0	103.82	8.38



Weir flow controls until a head of 0.242 feet is reached, where orifce flow takes over and controls. The flow at this transition is less efficient than what is indicated by either the weir or orifice flow equations. A flow of 20% less than the equated flow is a conservative estimate.

Appendix I

Swale Calculations



Routing Diagram for 210713_Swale Calculations
Prepared by Kapur & Associates, Inc, Printed 4/17/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	MSE 24-hr	4	Default	24.00	1	2.49	2
2	2-year	MSE 24-hr	4	Default	24.00	1	2.84	2
3	5-year	MSE 24-hr	4	Default	24.00	1	3.45	2
4	10-year	MSE 24-hr	4	Default	24.00	1	4.09	2
5	100-year	MSE 24-hr	4	Default	24.00	1	6.66	2
6	200-year	MSE 24-hr	4	Default	24.00	1	7.53	2
7	500-year	MSE 24-hr	4	Default	24.00	1	8.94	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
1,525	86	<50% Grass cover, Poor, HSG C (1S)
171	98	Sidewalk, HSG C (1S)
1,696	**87**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
1,696	HSG C	1S
0	HSG D	
0	Other	
1,696		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subc Num
0	0	1,525	0	0	1,525	<50% Grass cover, Poor	
0	0	171	0	0	171	Sidewalk	
0	**0**	**1,696**	**0**	**0**	**1,696**	**TOTAL AREA**	

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment 1S: Proposed to West Swale Runoff Area=1,696 sf 10.08% Impervious Runoff Depth=1.30"
Tc=6.0 min CN=87 Runoff=0.08 cfs 184 cf

Reach 2R: West Swale Avg. Flow Depth=0.06' Max Vel=1.75 fps Inflow=0.08 cfs 184 cf
n=0.022 L=70.0' S=0.0800 '/' Capacity=10.96 cfs Outflow=0.08 cfs 184 cf

Link 3L: CB-3 Inflow=0.08 cfs 184 cf
Primary=0.08 cfs 184 cf

Total Runoff Area = 1,696 sf Runoff Volume = 184 cf Average Runoff Depth = 1.30"
89.92% Pervious = 1,525 sf 10.08% Impervious = 171 sf

Summary for Subcatchment 1S: Proposed to West Swale

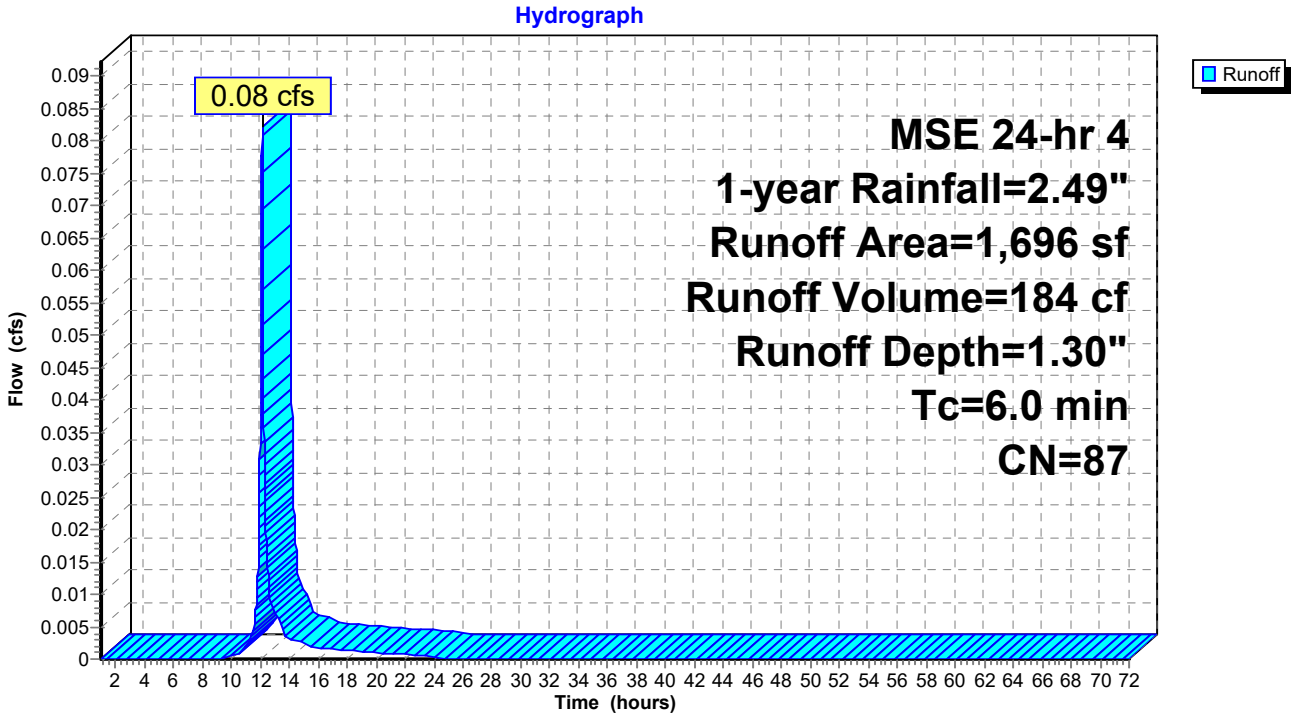
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 184 cf, Depth= 1.30"
Routed to Reach 2R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 1-year Rainfall=2.49"

	Area (sf)	CN	Description
*	171	98	Sidewalk, HSG C
	1,525	86	<50% Grass cover, Poor, HSG C
	1,696	87	Weighted Average
	1,525		89.92% Pervious Area
	171		10.08% Impervious Area

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

Subcatchment 1S: Proposed to West Swale



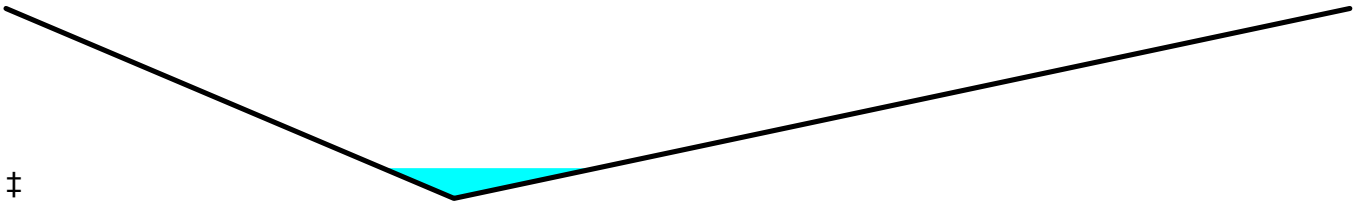
Summary for Reach 2R: West Swale

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 1.30" for 1-year event
Inflow = 0.08 cfs @ 12.13 hrs, Volume= 184 cf
Outflow = 0.08 cfs @ 12.14 hrs, Volume= 184 cf, Atten= 1%, Lag= 0.5 min
Routed to Link 3L : CB-3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.75 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 1.7 min

Peak Storage= 3 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 1.67'
Bank-Full Depth= 0.35' Flow Area= 1.8 sf, Capacity= 10.96 cfs

0.00' x 0.35' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 20.0 '/' Top Width= 10.50'
Length= 70.0' Slope= 0.0800 '/'
Inlet Invert= 872.10', Outlet Invert= 866.50'



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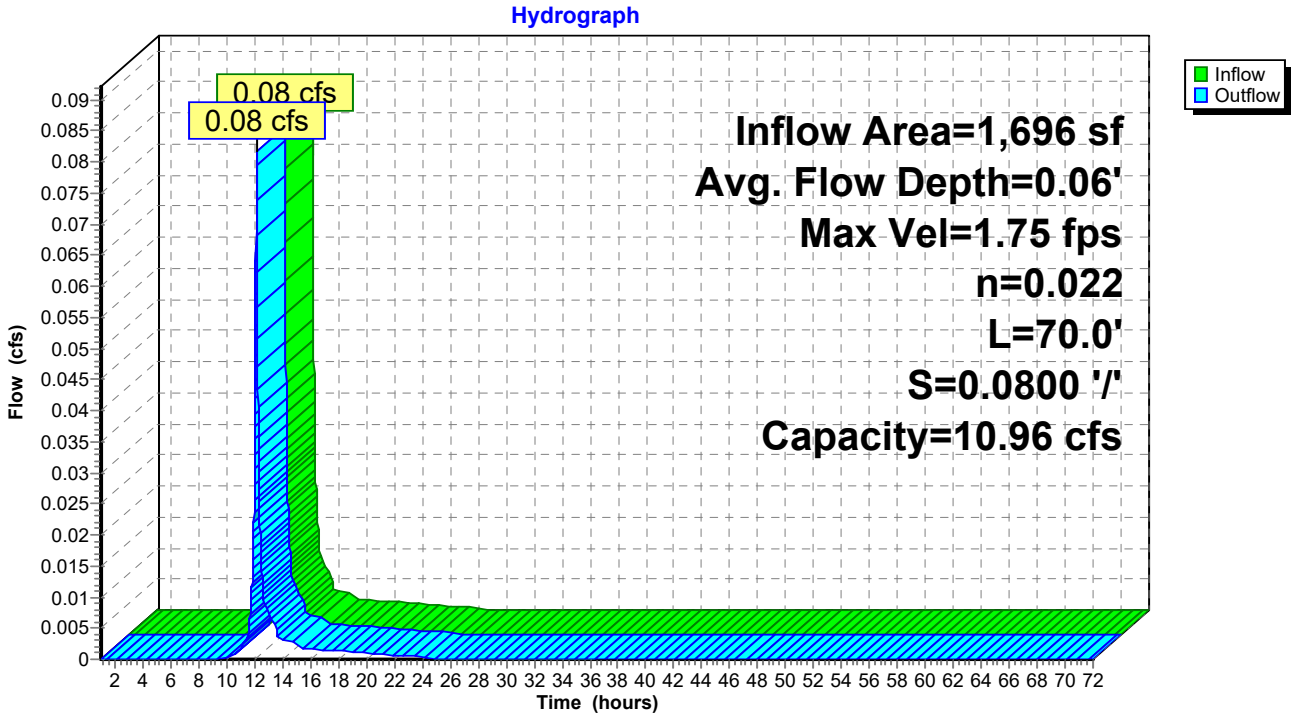
Reach 2R: West Swale

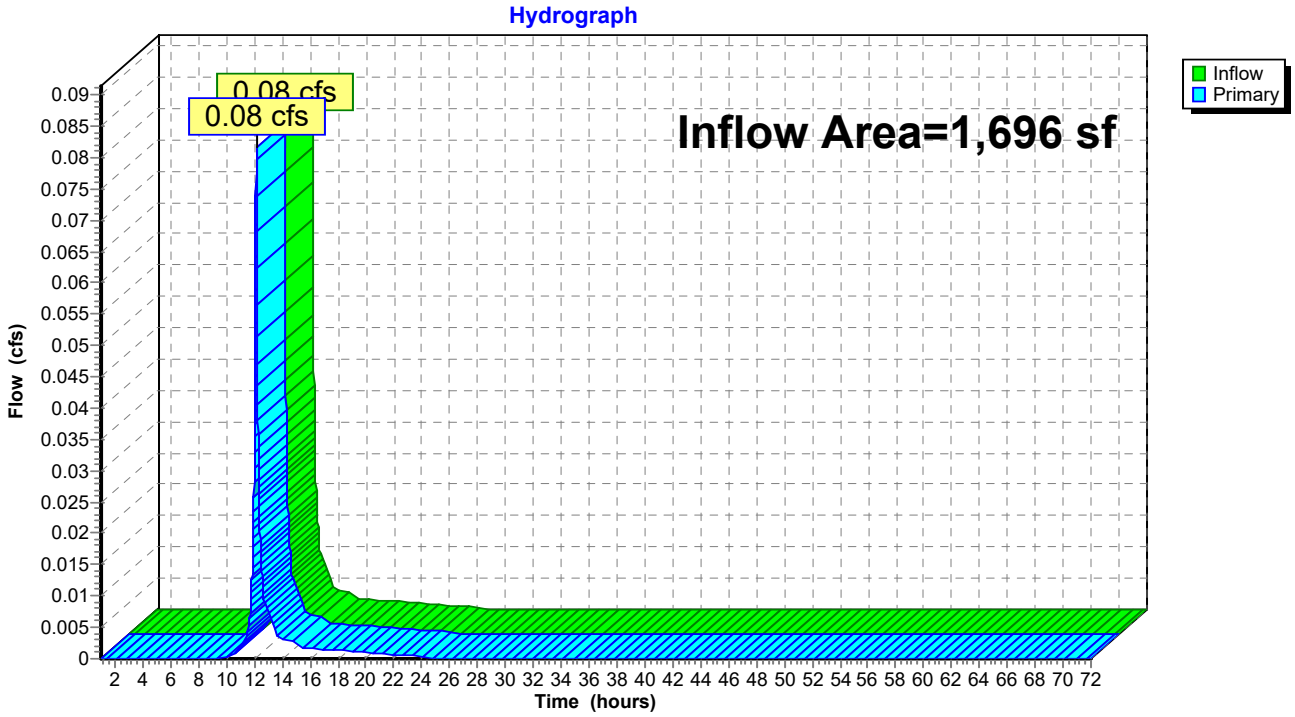


Summary for Link 3L: CB-3

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 1.30" for 1-year event
Inflow = 0.08 cfs @ 12.14 hrs, Volume= 184 cf
Primary = 0.08 cfs @ 12.14 hrs, Volume= 184 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link 3L: CB-3



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment 1S: Proposed to West Swale Runoff Area=1,696 sf 10.08% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=87 Runoff=0.10 cfs 226 cf

Reach 2R: West Swale Avg. Flow Depth=0.06' Max Vel=1.84 fps Inflow=0.10 cfs 226 cf
n=0.022 L=70.0' S=0.0800 '/' Capacity=10.96 cfs Outflow=0.10 cfs 226 cf

Link 3L: CB-3 Inflow=0.10 cfs 226 cf
Primary=0.10 cfs 226 cf

Total Runoff Area = 1,696 sf Runoff Volume = 226 cf Average Runoff Depth = 1.60"
89.92% Pervious = 1,525 sf 10.08% Impervious = 171 sf

Summary for Subcatchment 1S: Proposed to West Swale

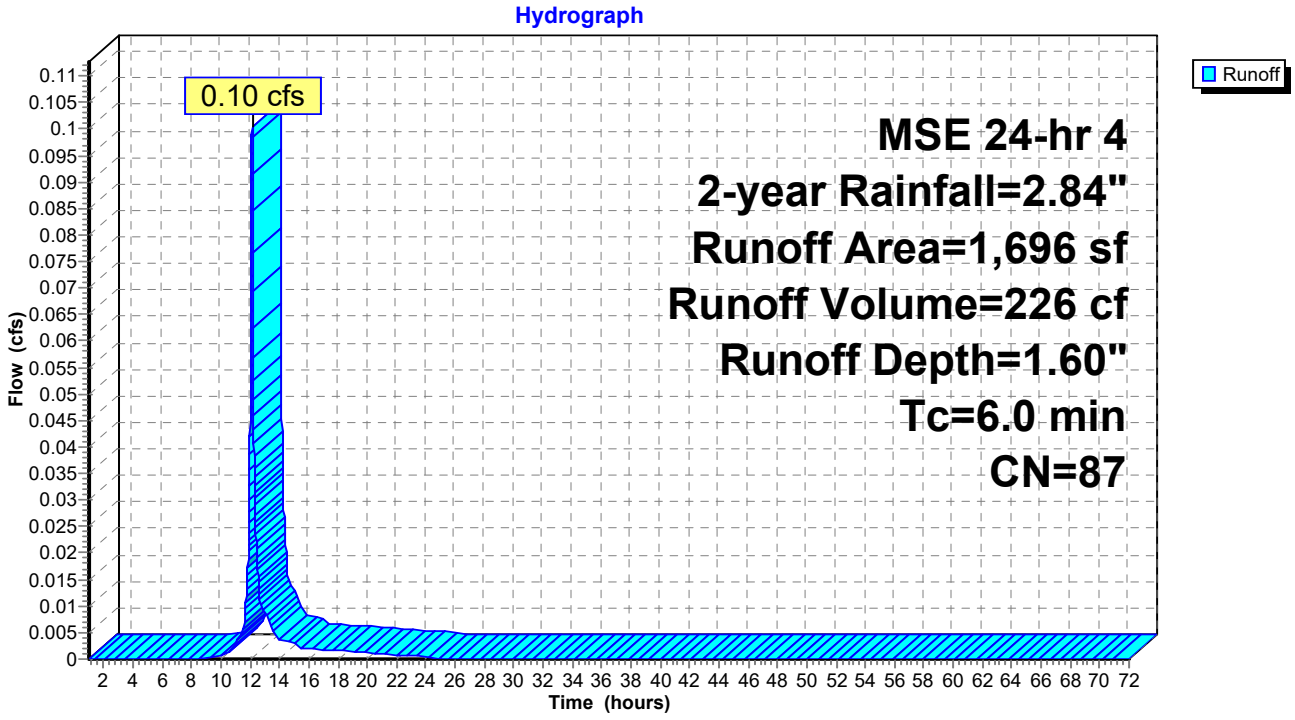
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 226 cf, Depth= 1.60"
Routed to Reach 2R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 2-year Rainfall=2.84"

	Area (sf)	CN	Description
*	171	98	Sidewalk, HSG C
	1,525	86	<50% Grass cover, Poor, HSG C
	1,696	87	Weighted Average
	1,525		89.92% Pervious Area
	171		10.08% Impervious Area

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

Subcatchment 1S: Proposed to West Swale



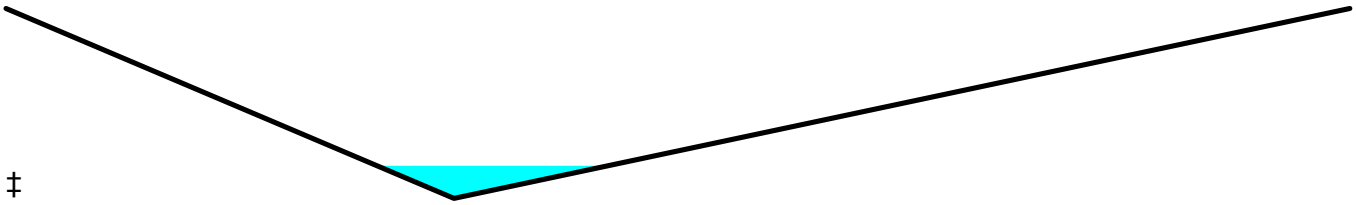
Summary for Reach 2R: West Swale

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 1.60" for 2-year event
Inflow = 0.10 cfs @ 12.13 hrs, Volume= 226 cf
Outflow = 0.10 cfs @ 12.14 hrs, Volume= 226 cf, Atten= 1%, Lag= 0.4 min
Routed to Link 3L : CB-3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.84 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 1.7 min

Peak Storage= 4 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 1.80'
Bank-Full Depth= 0.35' Flow Area= 1.8 sf, Capacity= 10.96 cfs

0.00' x 0.35' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 20.0 '/' Top Width= 10.50'
Length= 70.0' Slope= 0.0800 '/'
Inlet Invert= 872.10', Outlet Invert= 866.50'



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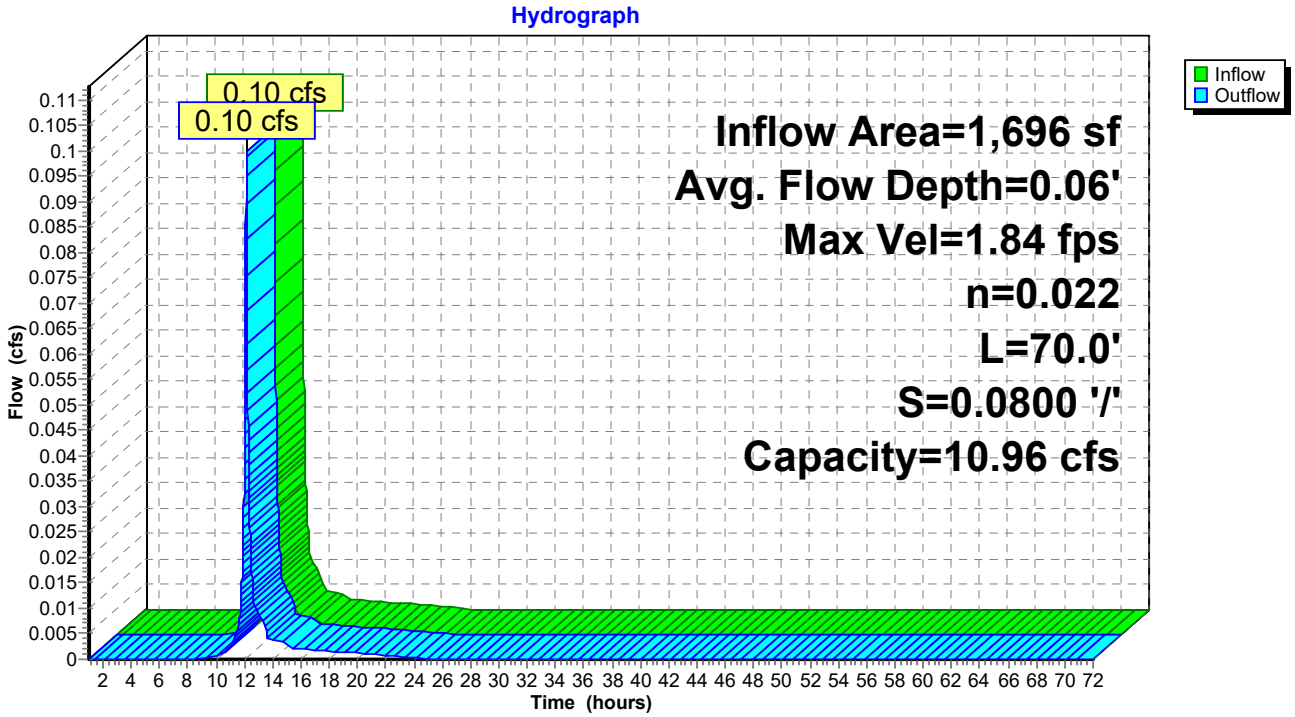
Reach 2R: West Swale

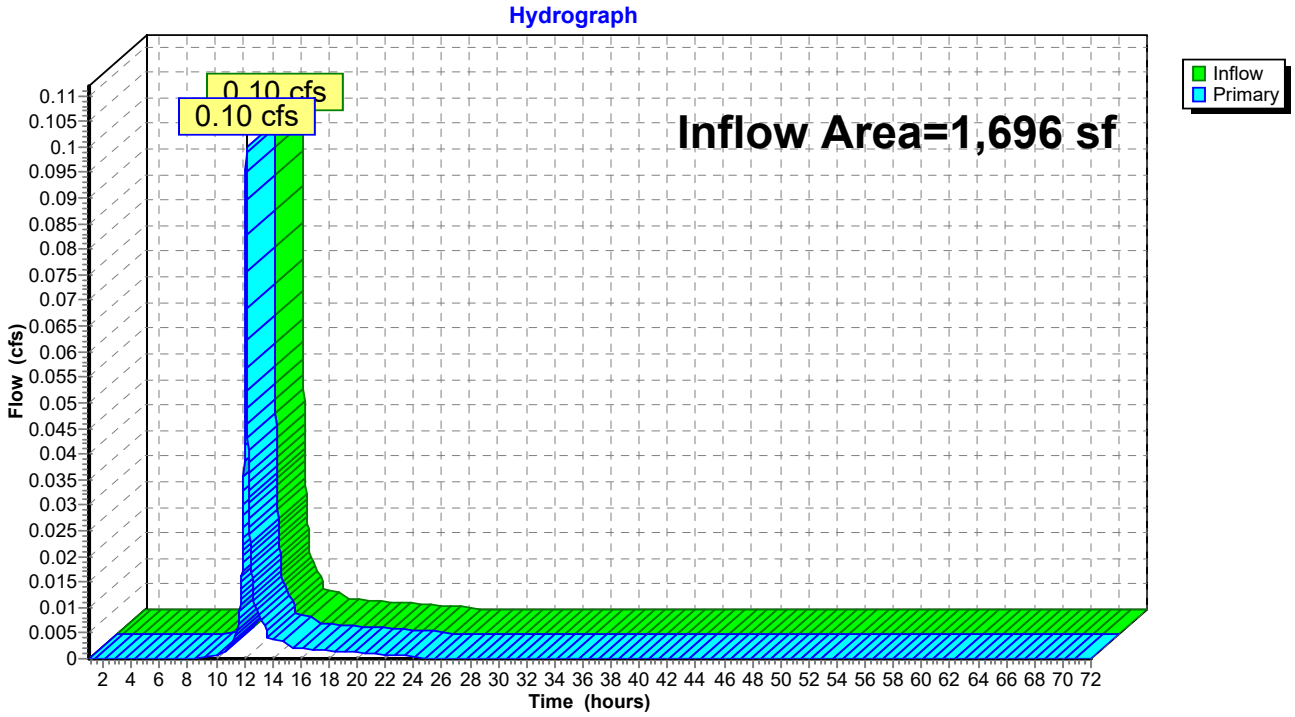


Summary for Link 3L: CB-3

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 1.60" for 2-year event
Inflow = 0.10 cfs @ 12.14 hrs, Volume= 226 cf
Primary = 0.10 cfs @ 12.14 hrs, Volume= 226 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link 3L: CB-3



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment 1S: Proposed to West Swale Runoff Area=1,696 sf 10.08% Impervious Runoff Depth=2.14"
Tc=6.0 min CN=87 Runoff=0.13 cfs 302 cf

Reach 2R: West Swale Avg. Flow Depth=0.07' Max Vel=1.98 fps Inflow=0.13 cfs 302 cf
n=0.022 L=70.0' S=0.0800 '/' Capacity=10.96 cfs Outflow=0.13 cfs 302 cf

Link 3L: CB-3 Inflow=0.13 cfs 302 cf
Primary=0.13 cfs 302 cf

Total Runoff Area = 1,696 sf Runoff Volume = 302 cf Average Runoff Depth = 2.14"
89.92% Pervious = 1,525 sf 10.08% Impervious = 171 sf

Summary for Subcatchment 1S: Proposed to West Swale

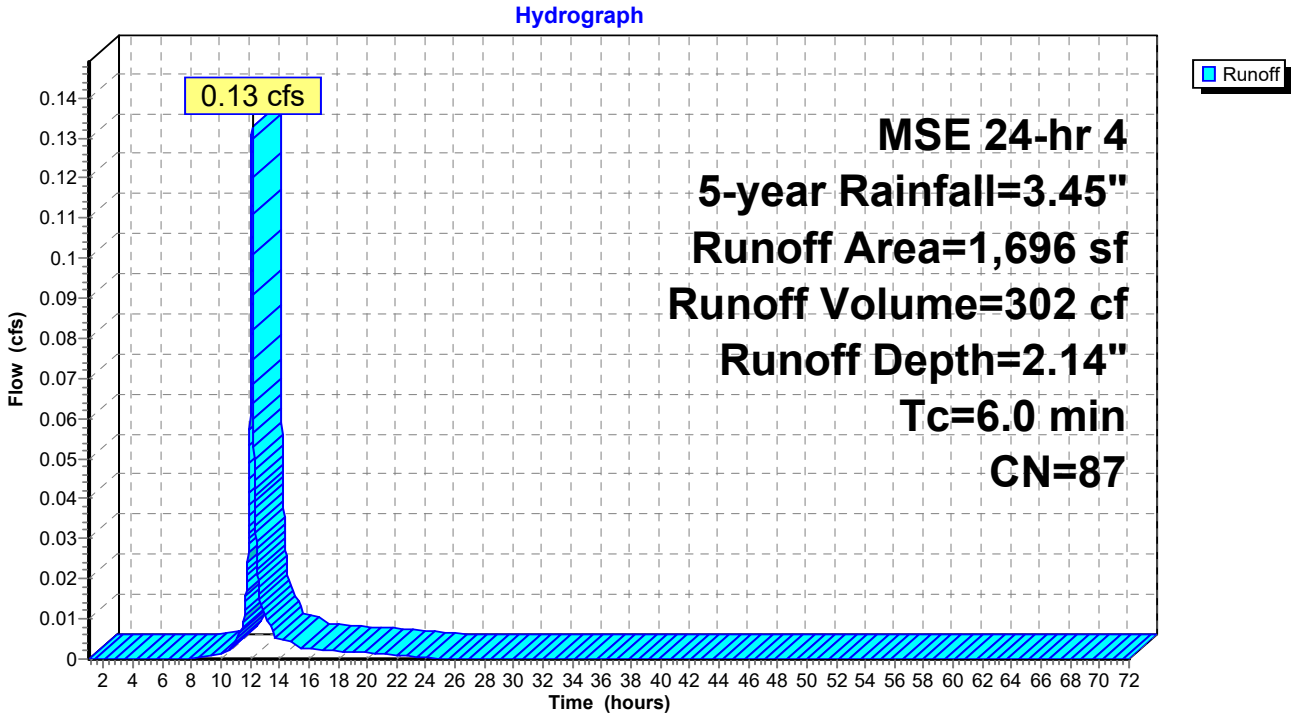
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 302 cf, Depth= 2.14"
Routed to Reach 2R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 5-year Rainfall=3.45"

	Area (sf)	CN	Description
*	171	98	Sidewalk, HSG C
	1,525	86	<50% Grass cover, Poor, HSG C
	1,696	87	Weighted Average
	1,525		89.92% Pervious Area
	171		10.08% Impervious Area

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

Subcatchment 1S: Proposed to West Swale



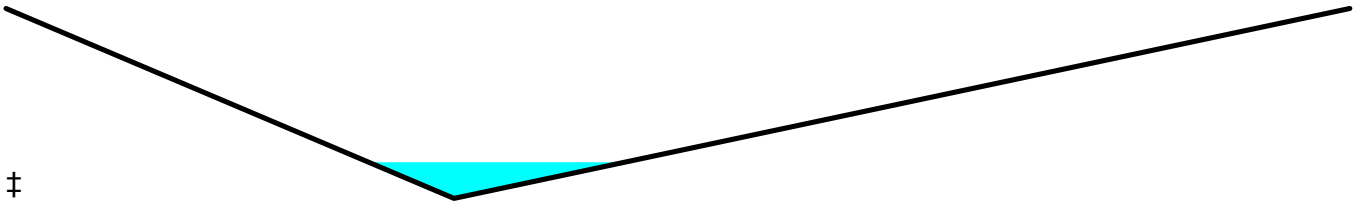
Summary for Reach 2R: West Swale

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 2.14" for 5-year event
Inflow = 0.13 cfs @ 12.13 hrs, Volume= 302 cf
Outflow = 0.13 cfs @ 12.14 hrs, Volume= 302 cf, Atten= 1%, Lag= 0.4 min
Routed to Link 3L : CB-3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.98 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 1.6 min

Peak Storage= 5 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 2.00'
Bank-Full Depth= 0.35' Flow Area= 1.8 sf, Capacity= 10.96 cfs

0.00' x 0.35' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 20.0 '/' Top Width= 10.50'
Length= 70.0' Slope= 0.0800 '/'
Inlet Invert= 872.10', Outlet Invert= 866.50'



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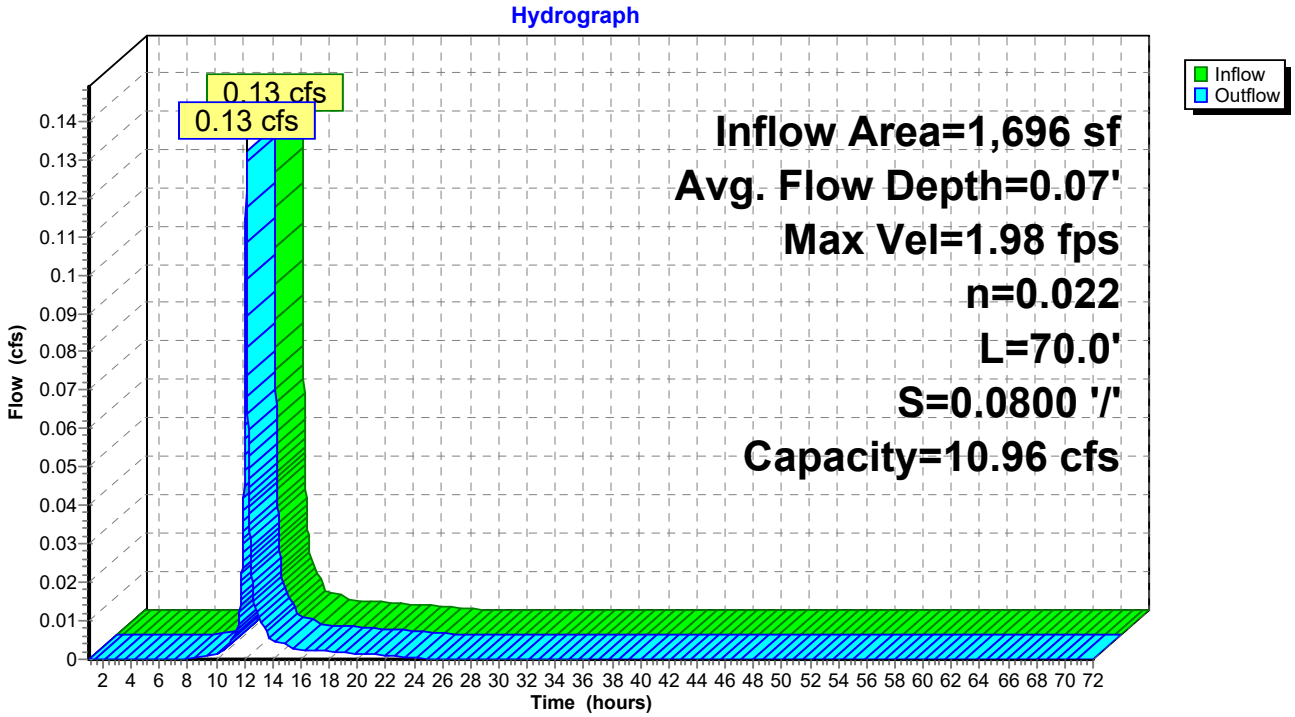
Reach 2R: West Swale

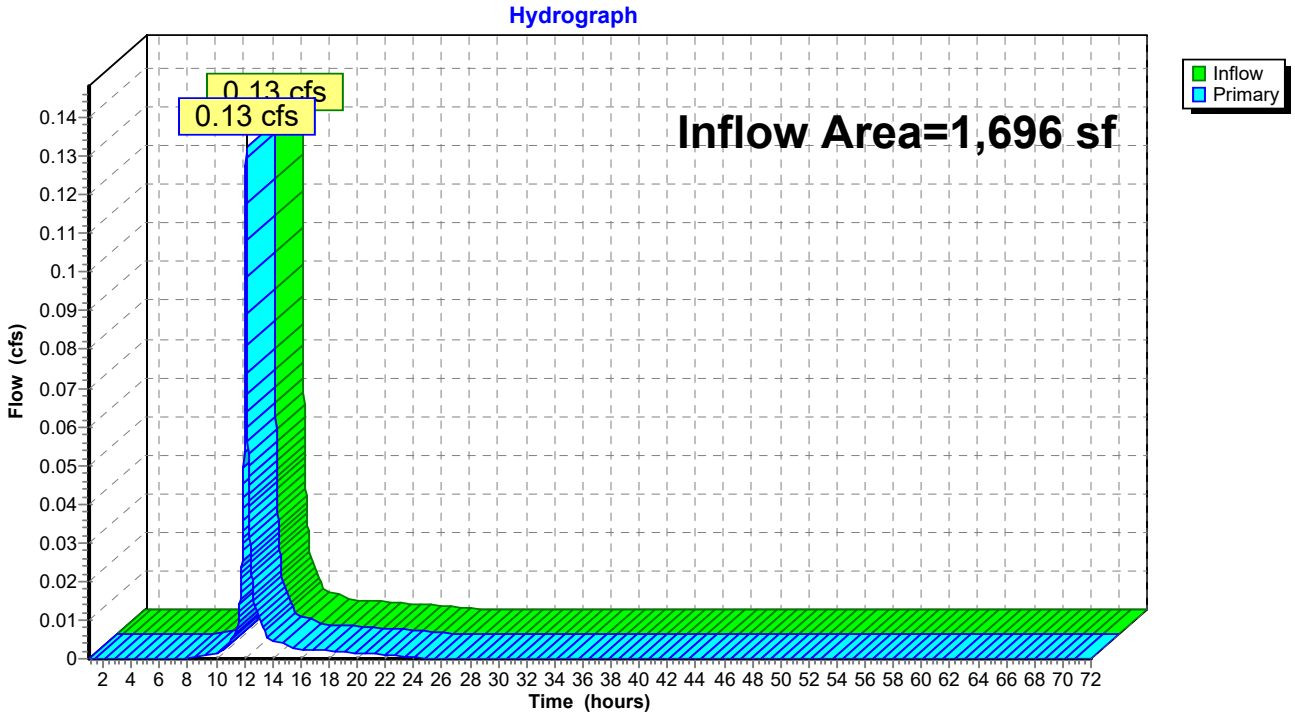


Summary for Link 3L: CB-3

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 2.14" for 5-year event
Inflow = 0.13 cfs @ 12.14 hrs, Volume= 302 cf
Primary = 0.13 cfs @ 12.14 hrs, Volume= 302 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link 3L: CB-3



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment 1S: Proposed to West Swale Runoff Area=1,696 sf 10.08% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=87 Runoff=0.17 cfs 384 cf

Reach 2R: West Swale Avg. Flow Depth=0.07' Max Vel=2.10 fps Inflow=0.17 cfs 384 cf
n=0.022 L=70.0' S=0.0800 '/' Capacity=10.96 cfs Outflow=0.17 cfs 384 cf

Link 3L: CB-3 Inflow=0.17 cfs 384 cf
Primary=0.17 cfs 384 cf

Total Runoff Area = 1,696 sf Runoff Volume = 384 cf Average Runoff Depth = 2.72"
89.92% Pervious = 1,525 sf 10.08% Impervious = 171 sf

Summary for Subcatchment 1S: Proposed to West Swale

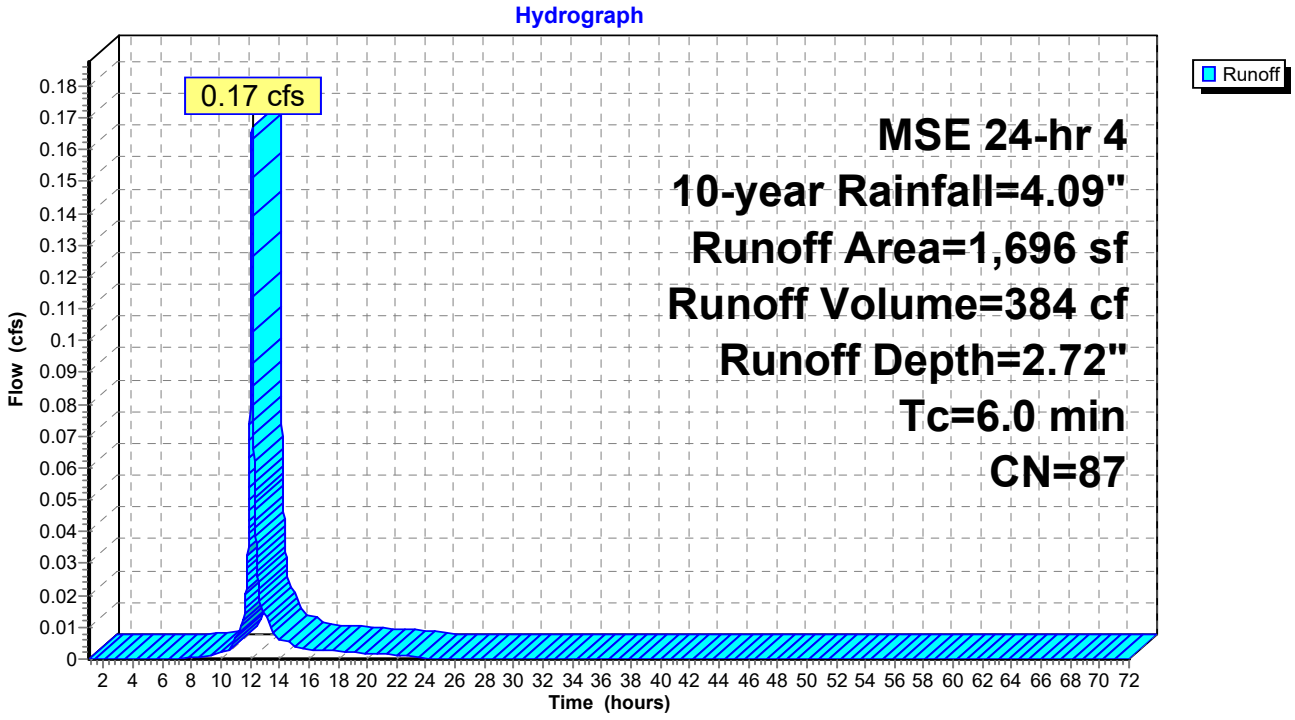
Runoff = 0.17 cfs @ 12.13 hrs, Volume= 384 cf, Depth= 2.72"
Routed to Reach 2R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 10-year Rainfall=4.09"

	Area (sf)	CN	Description
*	171	98	Sidewalk, HSG C
	1,525	86	<50% Grass cover, Poor, HSG C
	1,696	87	Weighted Average
	1,525		89.92% Pervious Area
	171		10.08% Impervious Area

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

Subcatchment 1S: Proposed to West Swale



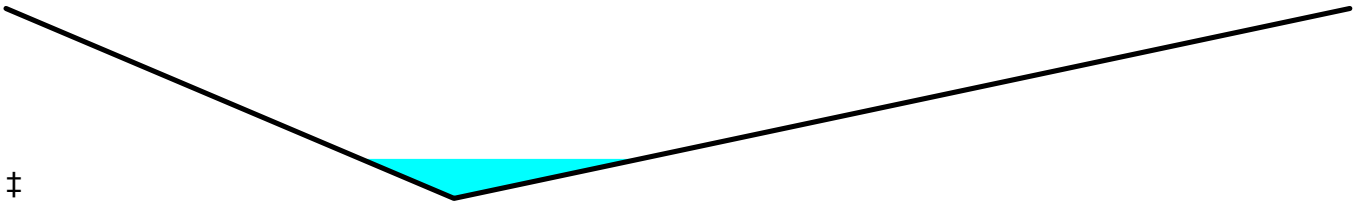
Summary for Reach 2R: West Swale

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 2.72" for 10-year event
Inflow = 0.17 cfs @ 12.13 hrs, Volume= 384 cf
Outflow = 0.17 cfs @ 12.14 hrs, Volume= 384 cf, Atten= 1%, Lag= 0.4 min
Routed to Link 3L : CB-3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.10 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 1.5 min

Peak Storage= 6 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 2.18'
Bank-Full Depth= 0.35' Flow Area= 1.8 sf, Capacity= 10.96 cfs

0.00' x 0.35' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 20.0 '/' Top Width= 10.50'
Length= 70.0' Slope= 0.0800 '/'
Inlet Invert= 872.10', Outlet Invert= 866.50'



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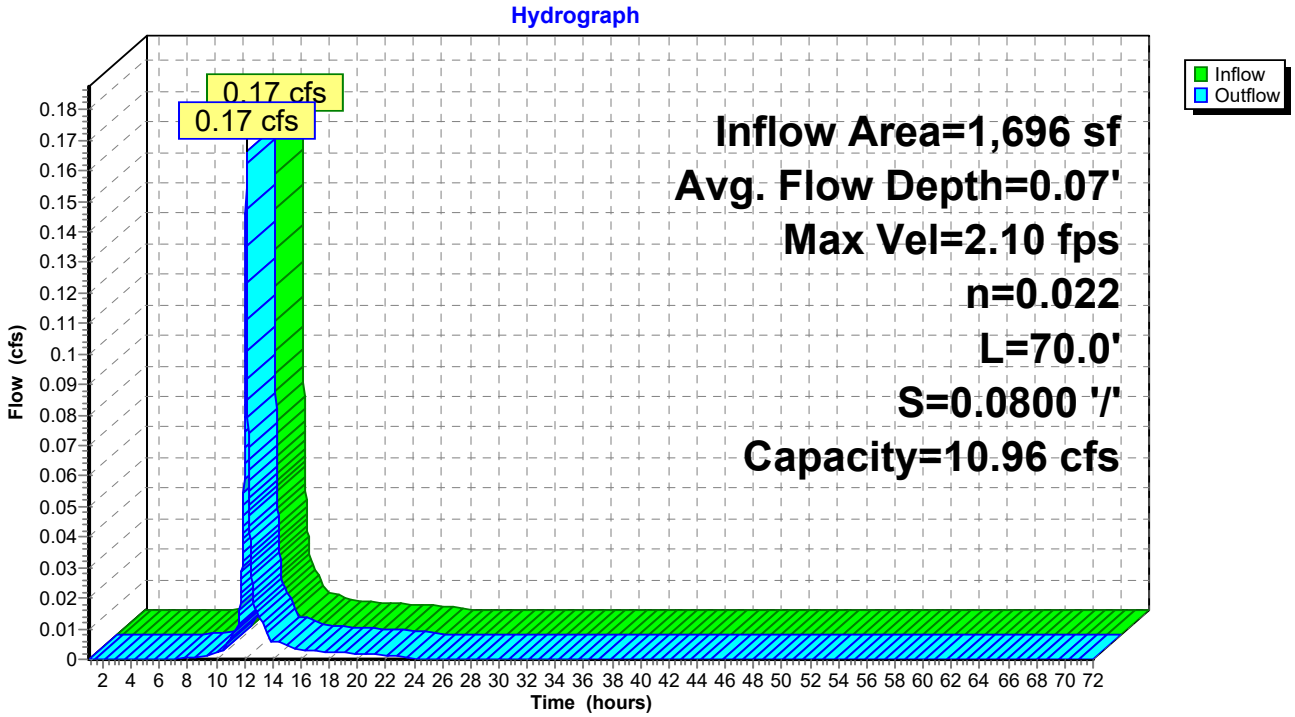
Reach 2R: West Swale

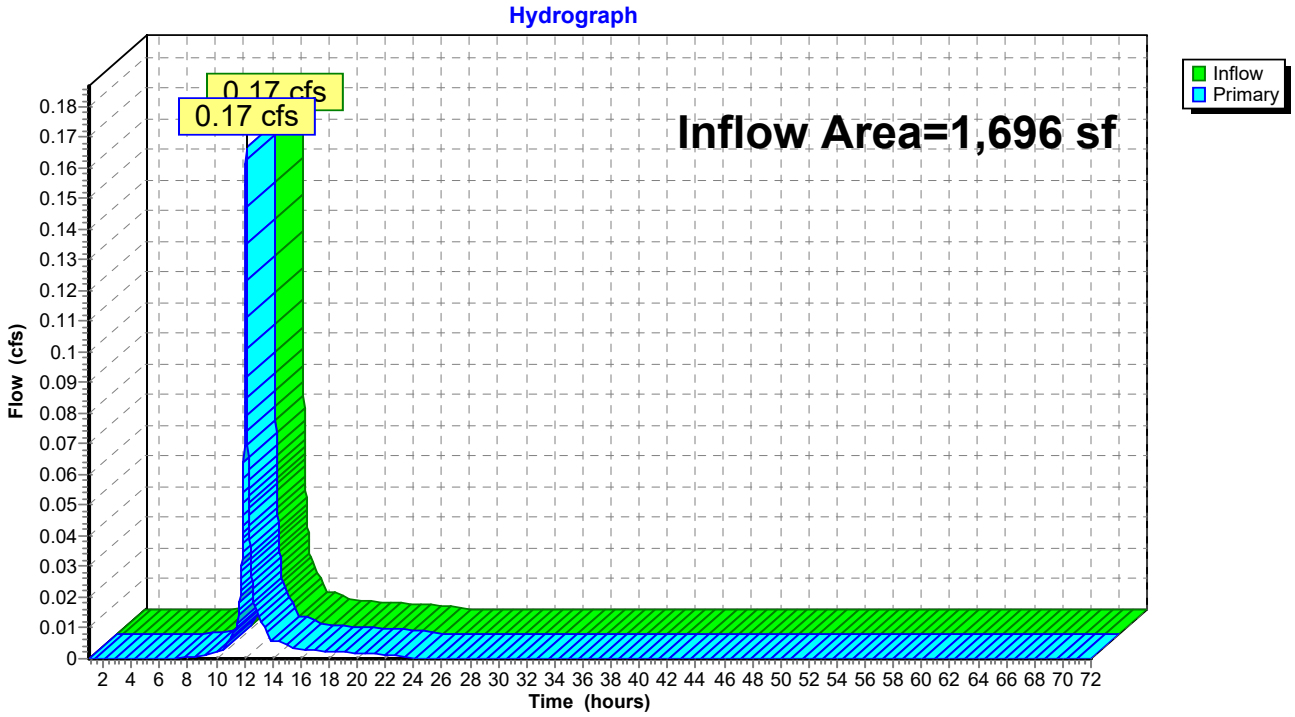


Summary for Link 3L: CB-3

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 2.72" for 10-year event
Inflow = 0.17 cfs @ 12.14 hrs, Volume= 384 cf
Primary = 0.17 cfs @ 12.14 hrs, Volume= 384 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link 3L: CB-3



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment 1S: Proposed to West Swale Runoff Area=1,696 sf 10.08% Impervious Runoff Depth=5.15"
Tc=6.0 min CN=87 Runoff=0.31 cfs 728 cf

Reach 2R: West Swale Avg. Flow Depth=0.09' Max Vel=2.44 fps Inflow=0.31 cfs 728 cf
n=0.022 L=70.0' S=0.0800 '/' Capacity=10.96 cfs Outflow=0.30 cfs 728 cf

Link 3L: CB-3 Inflow=0.30 cfs 728 cf
Primary=0.30 cfs 728 cf

Total Runoff Area = 1,696 sf Runoff Volume = 728 cf Average Runoff Depth = 5.15"
89.92% Pervious = 1,525 sf 10.08% Impervious = 171 sf

Summary for Subcatchment 1S: Proposed to West Swale

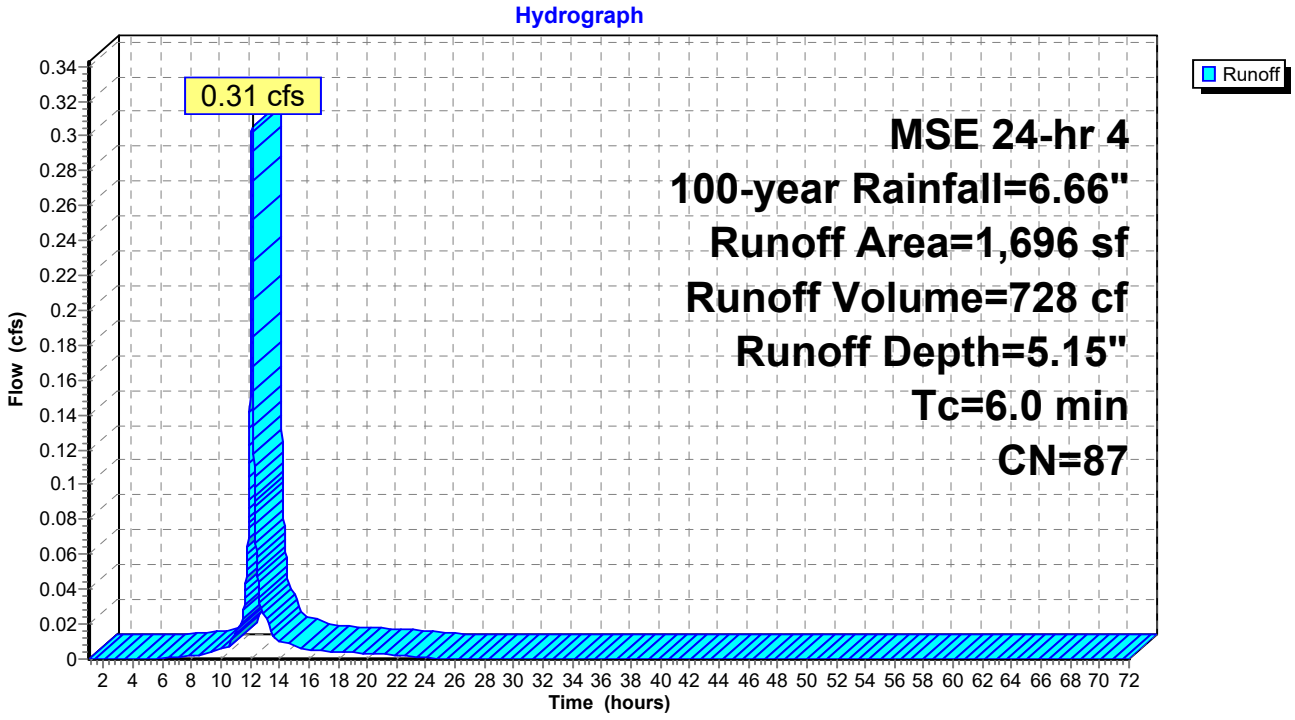
Runoff = 0.31 cfs @ 12.13 hrs, Volume= 728 cf, Depth= 5.15"
Routed to Reach 2R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 100-year Rainfall=6.66"

	Area (sf)	CN	Description
*	171	98	Sidewalk, HSG C
	1,525	86	<50% Grass cover, Poor, HSG C
	1,696	87	Weighted Average
	1,525		89.92% Pervious Area
	171		10.08% Impervious Area

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

Subcatchment 1S: Proposed to West Swale



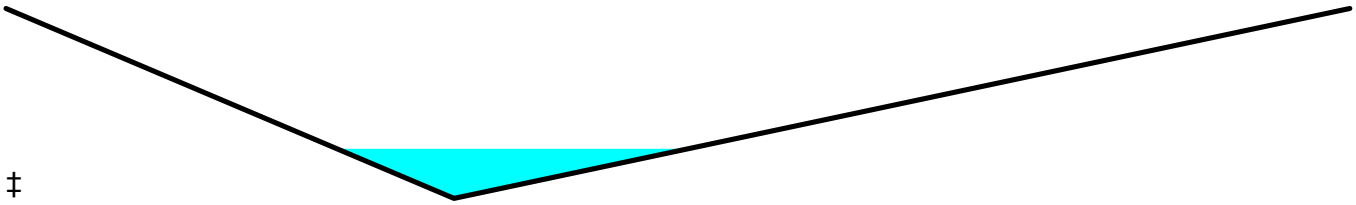
Summary for Reach 2R: West Swale

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 5.15" for 100-year event
Inflow = 0.31 cfs @ 12.13 hrs, Volume= 728 cf
Outflow = 0.30 cfs @ 12.14 hrs, Volume= 728 cf, Atten= 0%, Lag= 0.4 min
Routed to Link 3L : CB-3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 1.3 min

Peak Storage= 9 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 2.74'
Bank-Full Depth= 0.35' Flow Area= 1.8 sf, Capacity= 10.96 cfs

0.00' x 0.35' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 20.0 '/' Top Width= 10.50'
Length= 70.0' Slope= 0.0800 '/'
Inlet Invert= 872.10', Outlet Invert= 866.50'



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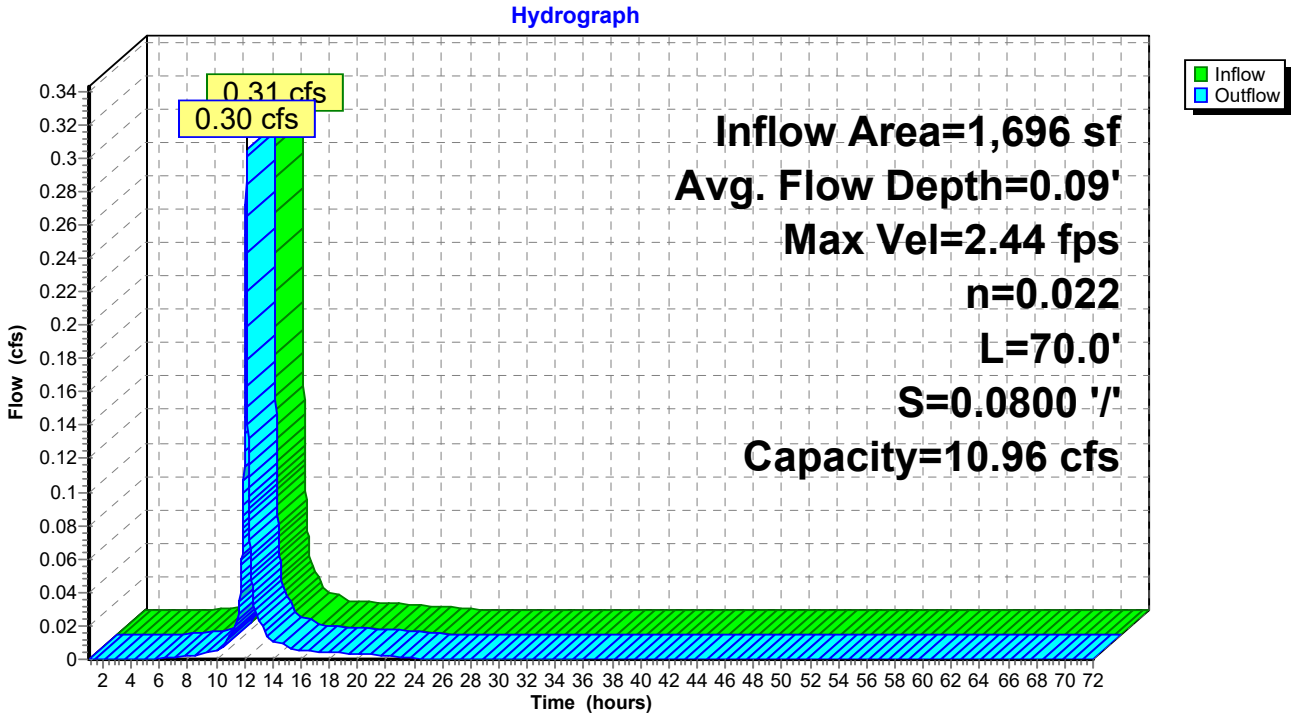
Reach 2R: West Swale

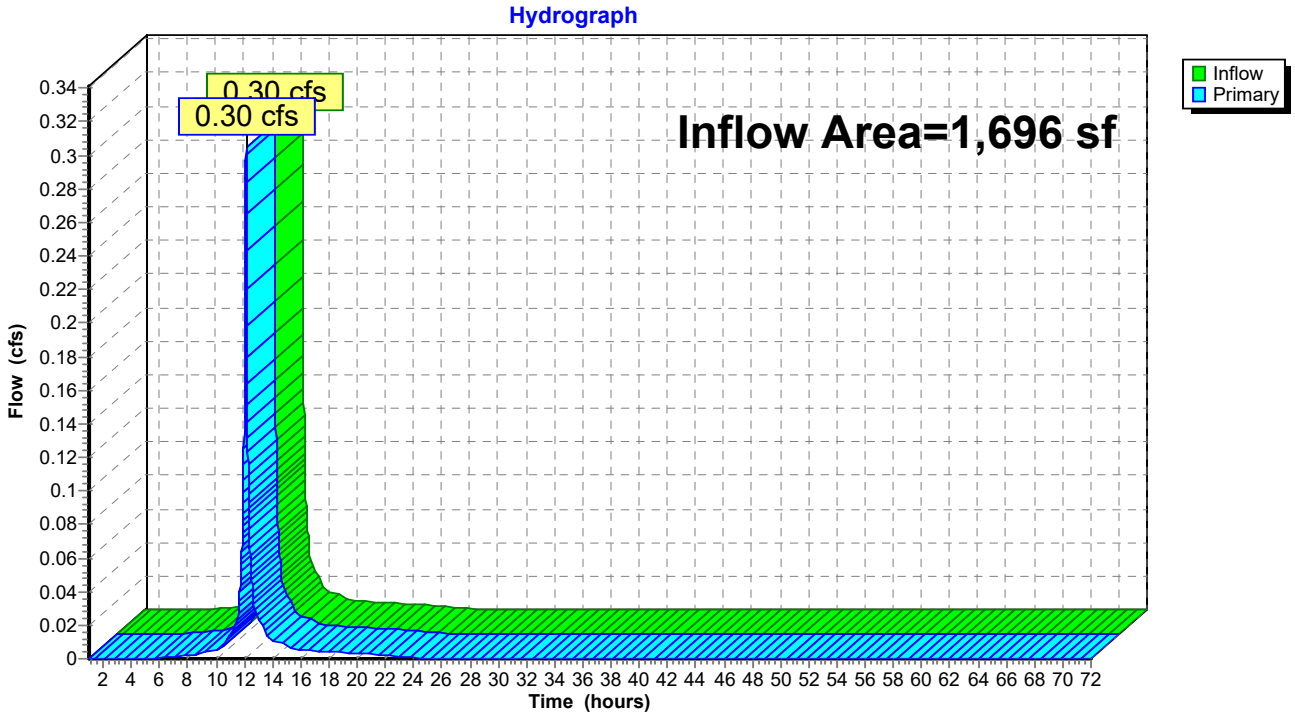


Summary for Link 3L: CB-3

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 5.15" for 100-year event
Inflow = 0.30 cfs @ 12.14 hrs, Volume= 728 cf
Primary = 0.30 cfs @ 12.14 hrs, Volume= 728 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link 3L: CB-3



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment 1S: Proposed to West Swale Runoff Area=1,696 sf 10.08% Impervious Runoff Depth=5.99"
Tc=6.0 min CN=87 Runoff=0.35 cfs 847 cf

Reach 2R: West Swale Avg. Flow Depth=0.10' Max Vel=2.52 fps Inflow=0.35 cfs 847 cf
n=0.022 L=70.0' S=0.0800 '/' Capacity=10.96 cfs Outflow=0.35 cfs 847 cf

Link 3L: CB-3 Inflow=0.35 cfs 847 cf
Primary=0.35 cfs 847 cf

Total Runoff Area = 1,696 sf Runoff Volume = 847 cf Average Runoff Depth = 5.99"
89.92% Pervious = 1,525 sf 10.08% Impervious = 171 sf

Summary for Subcatchment 1S: Proposed to West Swale

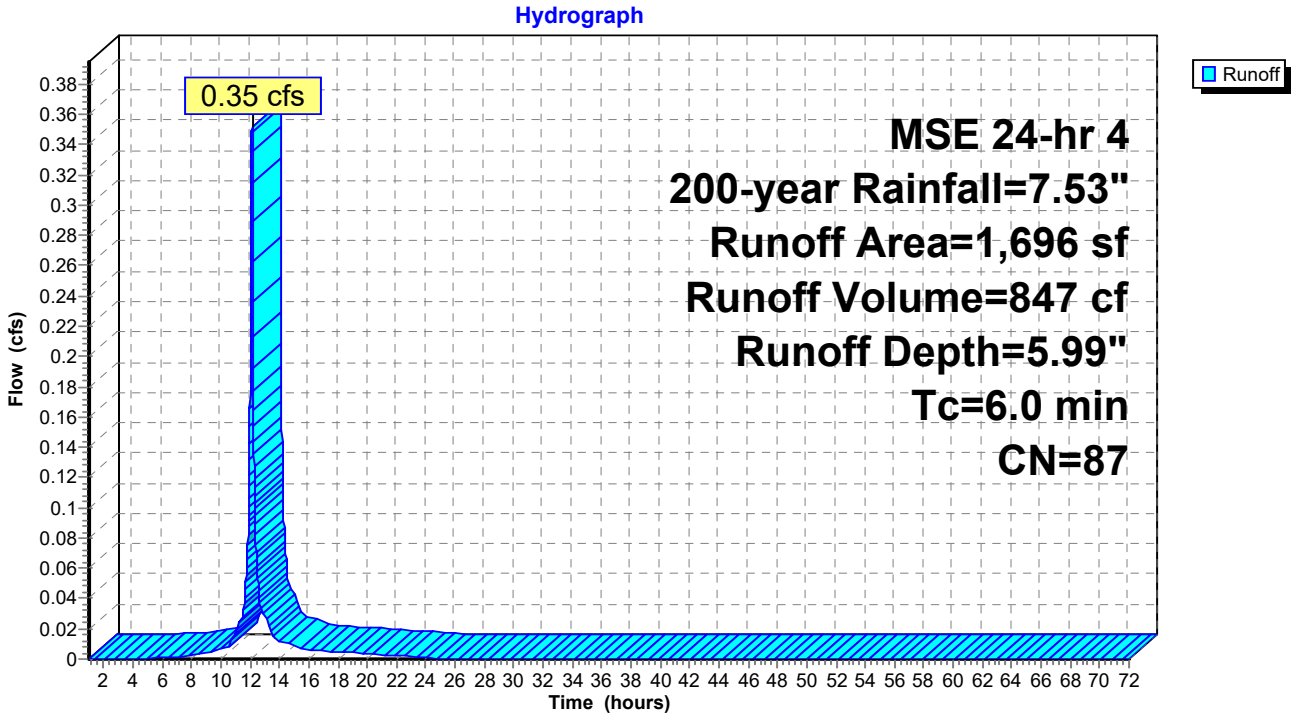
Runoff = 0.35 cfs @ 12.13 hrs, Volume= 847 cf, Depth= 5.99"
Routed to Reach 2R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 200-year Rainfall=7.53"

	Area (sf)	CN	Description
*	171	98	Sidewalk, HSG C
	1,525	86	<50% Grass cover, Poor, HSG C
	1,696	87	Weighted Average
	1,525		89.92% Pervious Area
	171		10.08% Impervious Area

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

Subcatchment 1S: Proposed to West Swale



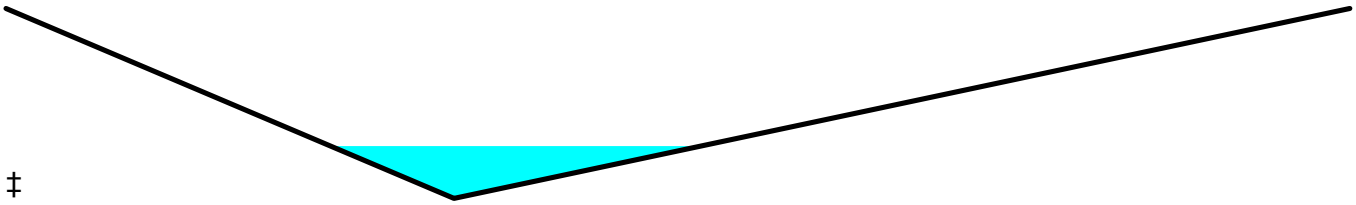
Summary for Reach 2R: West Swale

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 5.99" for 200-year event
Inflow = 0.35 cfs @ 12.13 hrs, Volume= 847 cf
Outflow = 0.35 cfs @ 12.14 hrs, Volume= 847 cf, Atten= 0%, Lag= 0.3 min
Routed to Link 3L : CB-3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.52 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 1.3 min

Peak Storage= 10 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 2.89'
Bank-Full Depth= 0.35' Flow Area= 1.8 sf, Capacity= 10.96 cfs

0.00' x 0.35' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 20.0 '/' Top Width= 10.50'
Length= 70.0' Slope= 0.0800 '/'
Inlet Invert= 872.10', Outlet Invert= 866.50'



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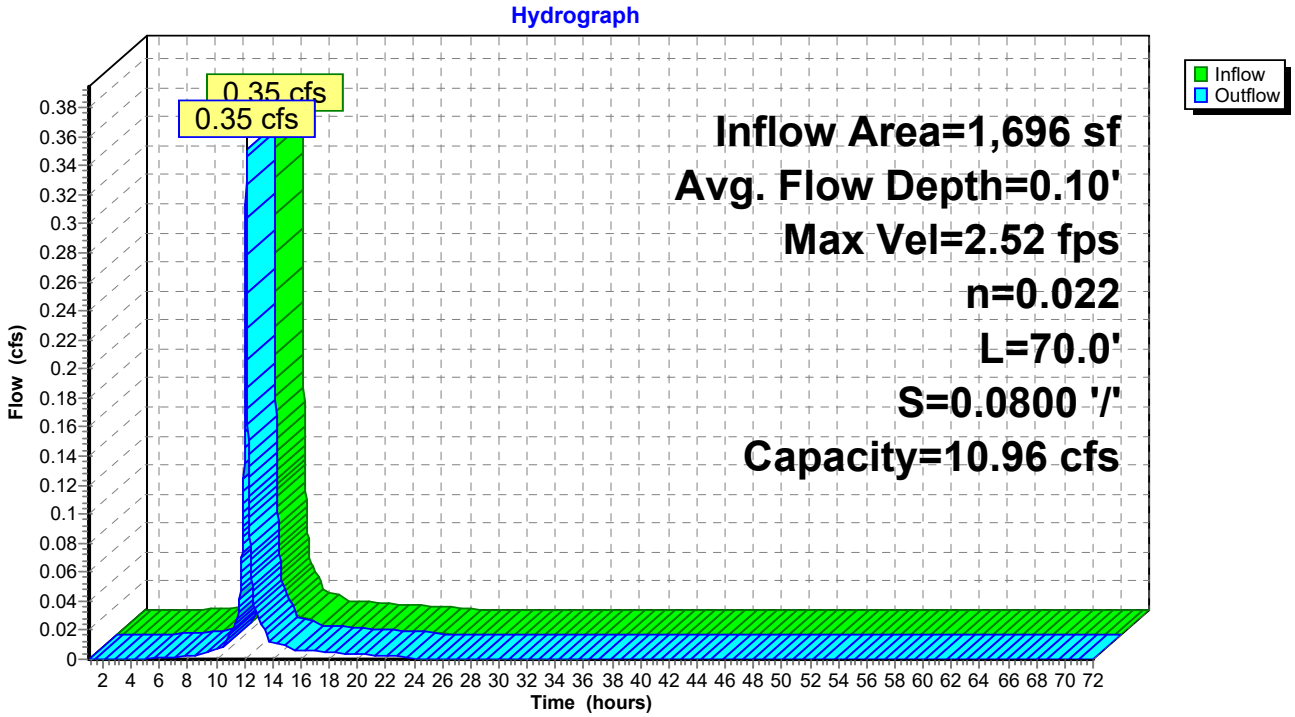
Reach 2R: West Swale

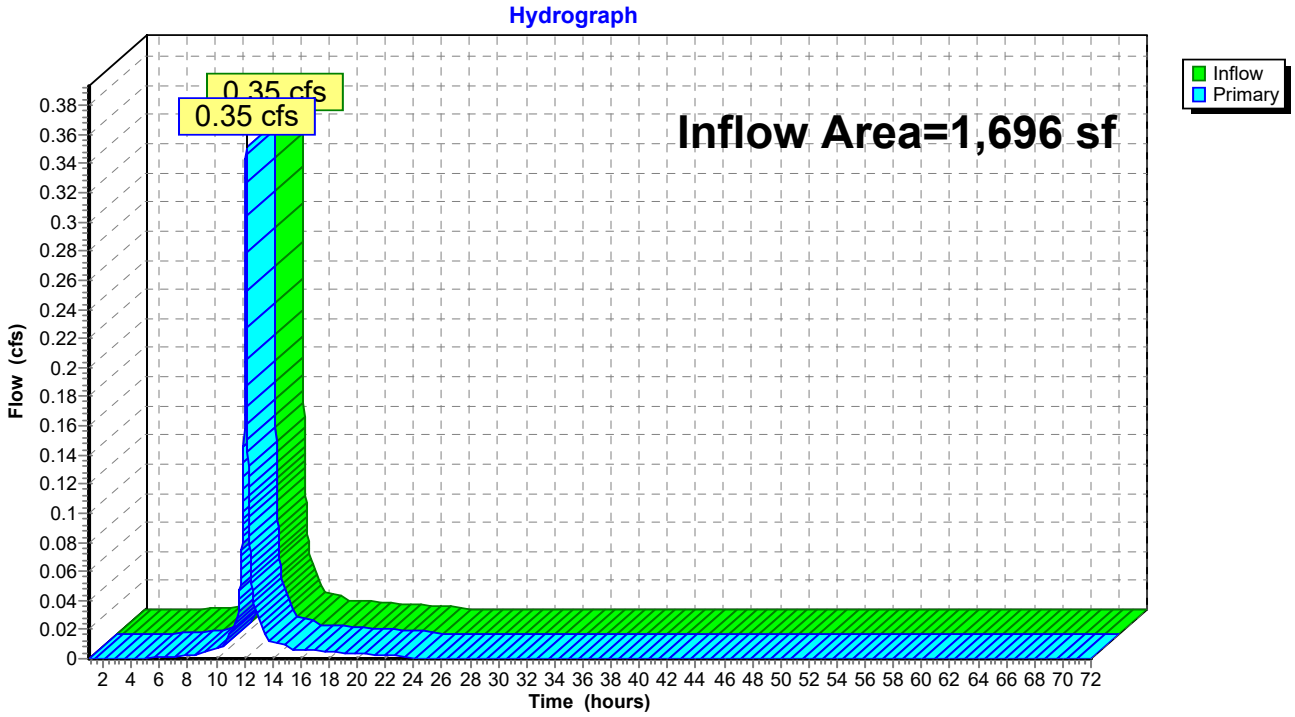


Summary for Link 3L: CB-3

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 5.99" for 200-year event
Inflow = 0.35 cfs @ 12.14 hrs, Volume= 847 cf
Primary = 0.35 cfs @ 12.14 hrs, Volume= 847 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link 3L: CB-3



Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 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

Subcatchment 1S: Proposed to West Swale Runoff Area=1,696 sf 10.08% Impervious Runoff Depth=7.37"
Tc=6.0 min CN=87 Runoff=0.43 cfs 1,041 cf

Reach 2R: West Swale Avg. Flow Depth=0.10' Max Vel=2.65 fps Inflow=0.43 cfs 1,041 cf
n=0.022 L=70.0' S=0.0800 '/' Capacity=10.96 cfs Outflow=0.43 cfs 1,041 cf

Link 3L: CB-3 Inflow=0.43 cfs 1,041 cf
Primary=0.43 cfs 1,041 cf

Total Runoff Area = 1,696 sf Runoff Volume = 1,041 cf Average Runoff Depth = 7.37"
89.92% Pervious = 1,525 sf 10.08% Impervious = 171 sf

Summary for Subcatchment 1S: Proposed to West Swale

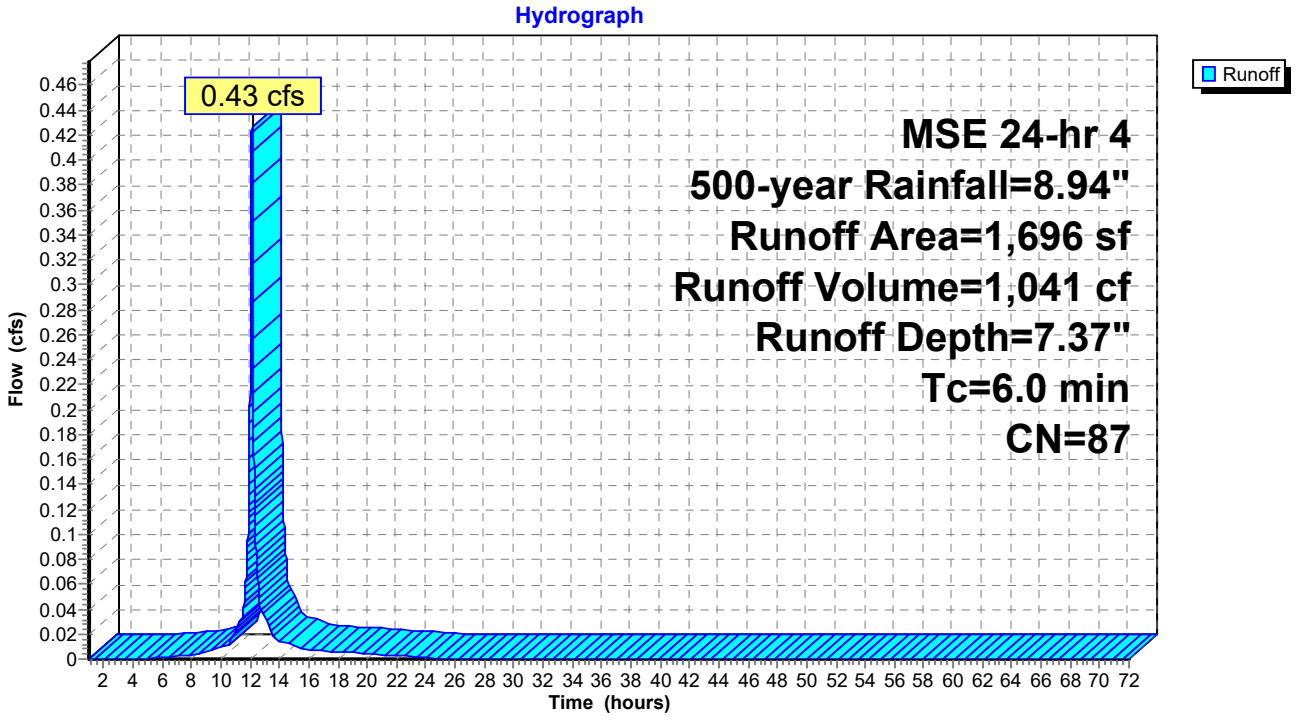
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 1,041 cf, Depth= 7.37"
Routed to Reach 2R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 4 500-year Rainfall=8.94"

	Area (sf)	CN	Description
*	171	98	Sidewalk, HSG C
	1,525	86	<50% Grass cover, Poor, HSG C
	1,696	87	Weighted Average
	1,525		89.92% Pervious Area
	171		10.08% Impervious Area

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

Subcatchment 1S: Proposed to West Swale



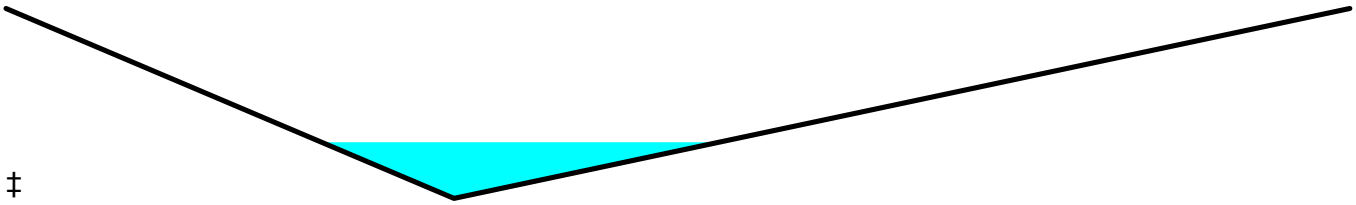
Summary for Reach 2R: West Swale

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 7.37" for 500-year event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 1,041 cf
Outflow = 0.43 cfs @ 12.14 hrs, Volume= 1,041 cf, Atten= 0%, Lag= 0.3 min
Routed to Link 3L : CB-3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.65 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 1.2 min

Peak Storage= 11 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 3.11'
Bank-Full Depth= 0.35' Flow Area= 1.8 sf, Capacity= 10.96 cfs

0.00' x 0.35' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 20.0 '/' Top Width= 10.50'
Length= 70.0' Slope= 0.0800 '/'
Inlet Invert= 872.10', Outlet Invert= 866.50'



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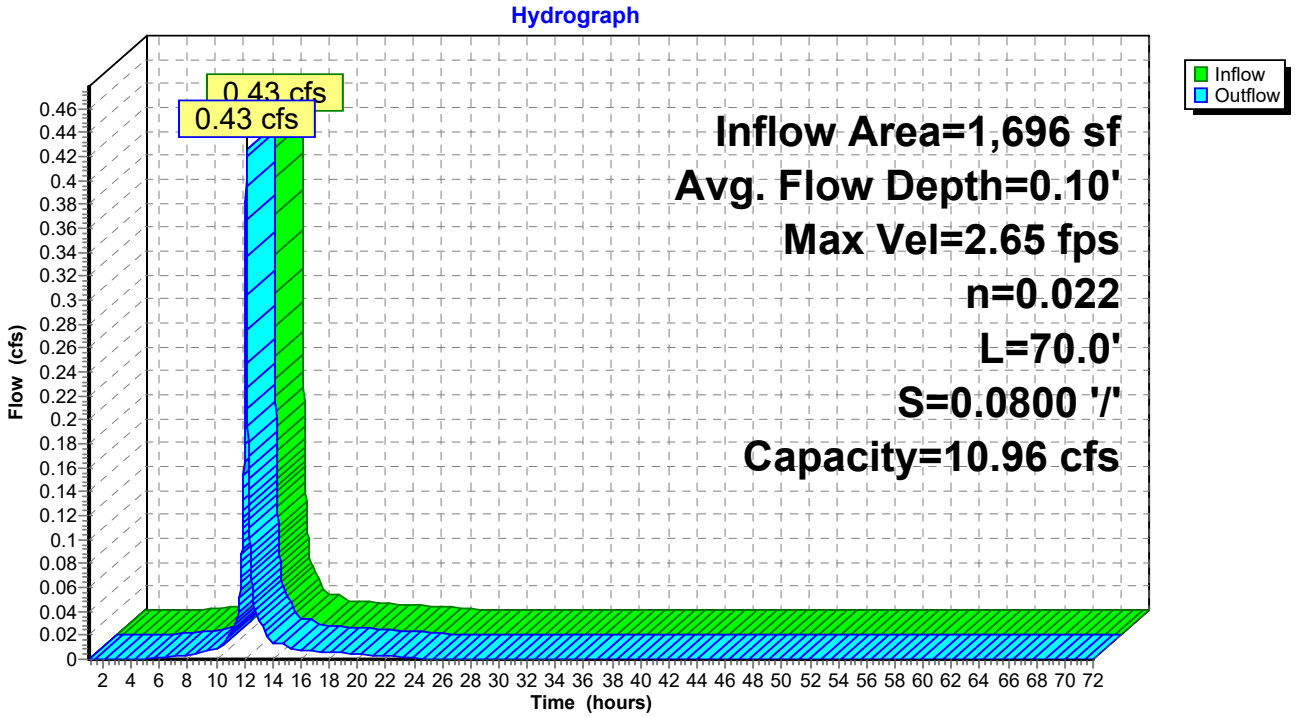
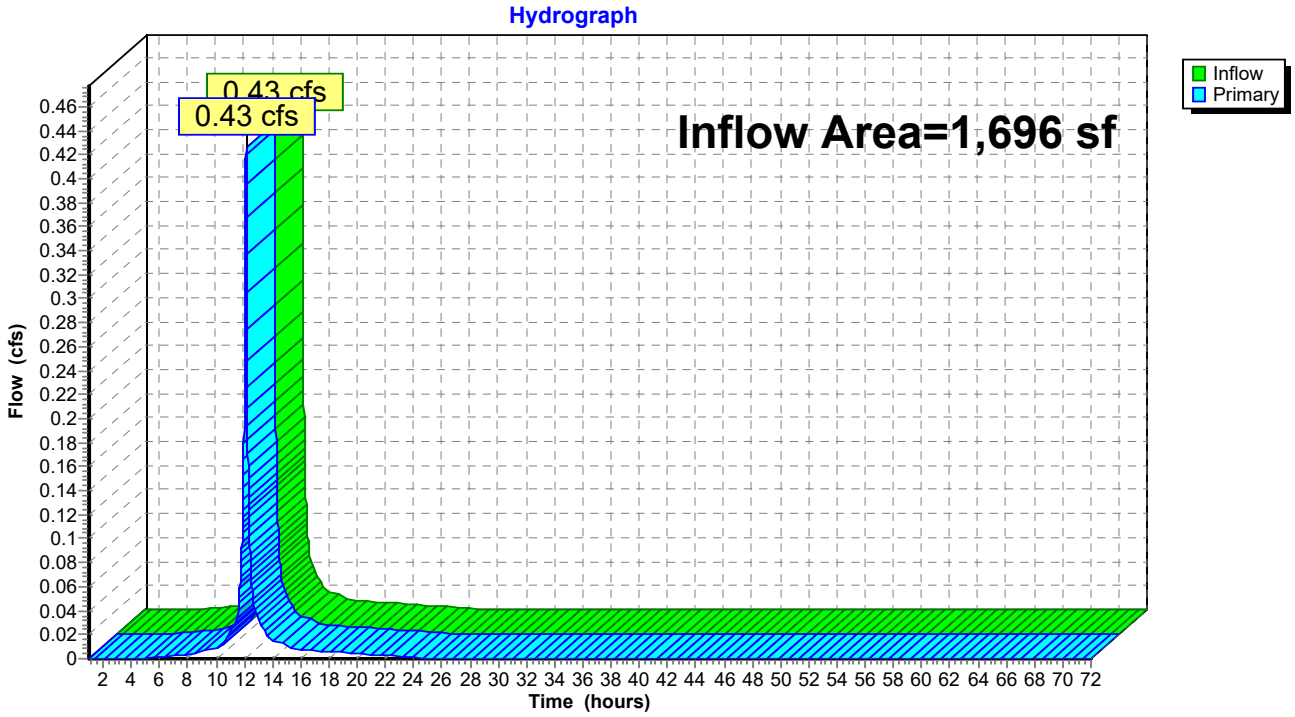


Summary for Link 3L: CB-3

Inflow Area = 1,696 sf, 10.08% Impervious, Inflow Depth = 7.37" for 500-year event
Inflow = 0.43 cfs @ 12.14 hrs, Volume= 1,041 cf
Primary = 0.43 cfs @ 12.14 hrs, Volume= 1,041 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Link 3L: CB-3



Appendix J

Green Infrastructure Calculations

Green Infrastructure Detention Volume Calculations

1) Impervious/Pervious Area

Land Type	Area (SF)
Roofs	23760
Pavement	1627
Sidewalk	4924
Green Roof	7797
Permeable Pavers	4688
Grass/Landscaping	4551
SWMP Total	47347
Total Proposed Impervious	42796
Total Proposed Pervious	4551

2) Required Detention Volume

Required Volume (CF)	1712	1/2" multiplied Net Impervious

3) Green Infrastructure Volume

(per Fresh Coast Guardians and MMSD)

Green Infrastruction	Unit Detention Volume	Unit	Quantity	Detention Volume (Gallons)	Detention Volume (Cubic Feet)
Bioswale	7.5	Gallons Per Square Foot	0	0	0
Cistern		Capacity of Cistern	1	14363	1920
Green Roof	1	Gallons Per Square Foot	7797	7797	1042
Native Landscaping	0.4	Gallons Per Square Foot	0	0	0
Porous Pavement	3	Gallons Per Square Foot	4688	14064	1880
Rain Garden	4.4	Gallons Per Square Foot	0	0	0
Tree	28	Gallons Per Tree	0	0	0
Underground Detention	1	Gallons Per Tree	1	24177	3232

Provided Detention Volume (CF)	8075

Does this Meet Requirement?	**YES**

Convervatively assuming permeable paver and green roof to be impervious areas

Appendix K

Operation and Maintenance Agreement

DECLARATION OF CONDITIONS, COVENANTS AND RESTRICTIONS FOR MAINTENANCE OF STORMWATER MANAGEMENT MEASURES

This space is reserved for recording data

Return to:

City Engineering Division
Rm. 115, City-County Building
Madison, Wisconsin

Tax Parcel No.: 251-____-___-____-_

RECITALS:

A. University of Wisconsin, Madison, is the owner of the property situated in City of Madison, Dane County, Wisconsin, more particularly described on Exhibit A attached hereto ("Property").

B. Owner desires to construct buildings and/or parking facilities on the Property in accordance with certain plans and specifications approved by the City.

C. The City requires Owner to record this Declaration 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 City the rights set forth below.

NOW, THEREFORE, in consideration of the declarations 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 the approved plans on file with the City Engineer. 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, and pursuant to the Maintenance Provisions attached hereto as Exhibit B.

2. Easement to City. If Owner fails to maintain the stormwater management measures as required in Section 1, then City shall have the right, after providing Owner with written notice of the maintenance issue ("Maintenance Notice") and thirty (30) days to comply with the City's maintenance request, to enter the Property in order to conduct the maintenance specified in the Maintenance Notice. City 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 City 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 charge in accordance with Section 66.0627, Wis. Stats. and Section 4.09 of the Madison General Ordinances.

3. Term/Termination. The term of this Agreement shall commence on the date that this Agreement is filed of record with the Register of Deeds Office for Dane 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 Dane County, Wisconsin, a written instrument of termination signed by the City 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 City: City Engineering Division
Room 115, City County Building
210 Martin Luther King Jr. Blvd.
Madison, WI 53703-3342
Attention: City Engineer

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.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20_____.

_____ _____

STATE OF WISCONSIN)
COUNTY OF DANE) SS

Personally came before me this _____ day of _____, 20_____, the above named _____, to me known to be the person(s) who executed the foregoing instrument and acknowledged the same.

_____
NOTARY PUBLIC

My Commission Expires:_____

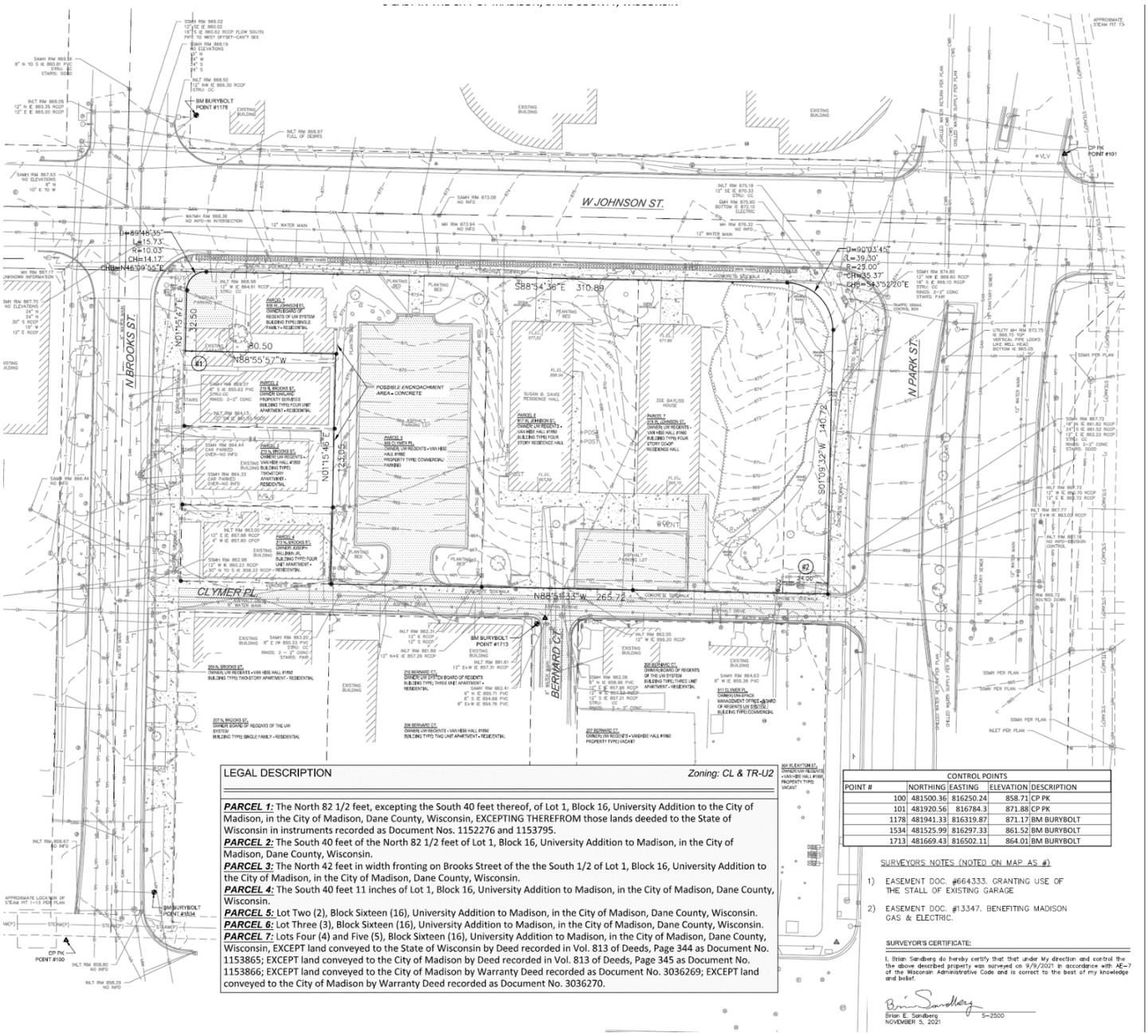
Drafted by: City Engineering Division
Rm. 115, City-County Building
Madison, Wisconsin

MD:mah

EXHIBIT A

Legal Description

All of lots 2 and 3 and part of lots 1, 4, and 5, Block 16 University addition to Madison, located in the NW ¼ of the NW ¼ of Section 23, Township 7 North, Range 9 East, City of Madison, Dane County, Wisconsin.



LEGAL DESCRIPTION — *Zoning: CL & TR-U2*

PARCEL 1: The North 82 1/2 feet, excepting the South 40 feet thereof, of Lot 1, Block 16, University Addition to the City of Madison, in the City of Madison, Dane County, Wisconsin, EXCEPTING THEREFROM those lands deeded to the State of Wisconsin in instruments recorded as Document Nos. 1152276 and 1153795.

PARCEL 2: The South 40 feet of the North 82 1/2 feet of Lot 1, Block 16, University Addition to Madison, in the City of Madison, Dane County, Wisconsin.

PARCEL 3: The North 42 feet in width fronting on Brooks Street of the the South 1/2 of Lot 1, Block 16, University Addition to the City of Madison, in the City of Madison, Dane County, Wisconsin.

PARCEL 4: The South 40 feet 11 inches of Lot 1, Block 16, University Addition to Madison, in the City of Madison, Dane County, Wisconsin.

PARCEL 5: Lot Two (2), Block Sixteen (16), University Addition to Madison, in the City of Madison, Dane County, Wisconsin.

PARCEL 6: Lot Three (3), Block Sixteen (16), University Addition to Madison, in the City of Madison, Dane County, Wisconsin.

PARCEL 7: Lots Four (4) and Five (5), Block Sixteen (16), University Addition to Madison, in the City of Madison, Dane County, Wisconsin, EXCEPT land conveyed to the State of Wisconsin by Deed recorded in Vol. 813 of Deeds, Page 344 as Document No. 1153865; EXCEPT land conveyed to the City of Madison by Deed recorded in Vol. 813 of Deeds, Page 345 as Document No. 1153866; EXCEPT land conveyed to the City of Madison by Warranty Deed recorded as Document No. 3036269; EXCEPT land conveyed to the City of Madison by Warranty Deed recorded as Document No. 3036270.

CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	481500.36	816250.24	858.71	CP PK
101	481920.56	816784.3	871.88	CP PK
1178	481941.33	816319.87	871.17	BM BURYBOLT
1534	481525.99	816297.33	861.52	BM BURYBOLT
1713	481669.43	816502.11	864.01	BM BURYBOLT

SURVEYORS NOTES (NOTED ON MAP AS #)

1) EASEMENT DOC. #664333. GRANTING USE OF THE STALL OF EXISTING GARAGE

2) EASEMENT DOC. #13347. BENEFITING MADISON GAS & ELECTRIC.

SURVEYOR'S CERTIFICATE:

I, Brian Sandberg do hereby certify that that under My direction and control the the above described property was surveyed on 9/9/2021 in accordance with AE-7 of the Wisconsin Administrative Code and is correct to the best of my knowledge and belief.

Brian E. Sandberg S-2500
NOVEMBER 5, 2021

EXHIBIT B
Maintenance Provisions

An initial installation certification (as-built) stamped by a P.E. registered in the state of Wisconsin shall be submitted to the City Engineer upon completion of construction. The as-built shall be of sufficient detail to show the system is functioning as designed. A statement by the certifying P.E. along with a drawing and digital photographs will suffice.

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. Any alterations to the approved storm sewer shall be approved by the City Engineer.

At a minimum, the storm sewer system shall be inspected annually and cleaned as needed to maintain design capacity.

Owner shall maintain records of inspections, cleaning and replacement of the storm sewer system all in accordance with Chapter 37 of the Madison General Ordinances.

Catch Basin Sumps

Catch basin or inlet sump floors shall be constructed to a minimum of three (3) feet below the outlet pipe invert elevation.

ROUTINE MAINTENANCE

A. Inspections

1. Inspections of the catch basins shall be completed per the time intervals indicated on the attached "Catch Basin Operation, Inspection, and Maintenance Report Form" or after significant rainfall events.

2. The inspections should be completed during wet weather conditions to determine if the catch basins are functioning properly.

3. Inspection priorities shall be as follows:

(a) Inspect catch basins, manholes, endwalls, pipes for debris and sediment accumulation, blockages, obstructions, missing grates and covers, erosion at or around structures to ensure system is working properly

4. Documentation of the inspections should be completed using the attached "Catch Basin Operation, Inspection, and Maintenance Report Form" and filed. Documentation should include as a minimum:

(a) Inspectors name, affiliation and professional credentials if applicable.

(b) Date, time and weather conditions.

(c) Approximate rainfall total over a 24-hour period if applicable.

(d) Catch basin and storm sewer system condition.

(e) Sediment depth within the catch basins, manholes, endwalls, and curb and gutter.

(f) Identification of potential structural failures and repair needs.

(g) Repair recommendations.

B. Sediment, Debris and Litter Removal.

1. Sediment accumulation should be monitored at least once a month.

2. Debris and litter removal from the catch basins shall be completed at least once a month.

3. Catch basin sumps more than 50% full should be cleaned and have the sediment removed.

NON-ROUTINE MAINTENANCE

A. Structural Repairs and Replacement.

1. Annual inspection of the catch basins will disclose any potential structural problems. If structural problems appear, repair or replace the structures and pipes.

The Owner shall maintain records of inspections, any survey data and cleaning schedules all in accord with Chapter 37 of the Madison General Ordinances.

Catch Basin Operation, Inspection, and Maintenance Report Form

Project: _____

Location: _____

Date: _____

Time: _____

Weather: _____

Inspector: _____

Maintenance Item	Satisfactory / Unsatisfactory	Comments	
1. Debris and Sedimentation Accumulation (Monthly)			
1. Clean of sediment and debris (e.g. mulch, leaves, trash, etc.)			
2. No indication of excessive sediment buildup			
3. Other (specify)			
2. Catch Basin Structures and Pipes (Annual, After Major Storms)			
1. Clean of debris and obstructions			
2. Not an excessive sediment buildup in catch basins, manholes, endwalls. Sumps not more than 50% full			
3. No evidence of any blockages			
4. Good condition, no need for repair			
5. No missing grates or covers			
6. No evidence of erosion at or around structures			
7. Other (specify)			

Underground Storage System

The owner shall maintain the performance of the underground storage system. Following construction, an initial inspection should be completed to determine the locations and sizes of the clean outs and risers and the depth of the inverts. This initial installation certification (as-built) shall be stamped by a P.E. registered in the state of Wisconsin. The as-built shall be of sufficient detail to show the system was constructed and is functioning as designed.

Regular inspections shall be completed at a minimum of once per year, typically in spring. This information will be used to determine the sediment build up within the system. Annual inspections should include the following:

1) Locate the riser sections and cleanouts of the retention/detention system. The riser will typically be 24" in diameter or larger.
2) Remove the lid from a riser.
3) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be permitted to enter the retention/detention System.
4) Inspect each manifold, all laterals, and outlet pipes for sediment build up, obstructions, or other problems. Obstructions should be removed at this time.
5) If measured sediment build up is 1-foot or more, cleaning should be performed at the earliest opportunity. A thorough cleaning of the system (manifolds and laterals) shall be performed by either manual methods or by a vacuum truck.
6) All material removed from the system is considered hazardous waste and should be disposed of properly.

EXHIBIT A-3

Permeable Pavers Operation, Inspection, and Maintenance Standards

I. ROUTINE MAINTENANCE

A. Inspections

1. Inspections of the permeable pavers shall be completed per the time intervals indicated on the attached “Permeable Pavers Operation, Inspection, and Maintenance Report Form” or after significant rainfall events.
2. The inspections should be completed during wet weather conditions to determine if the permeable pavers are functioning properly.
3. Inspection priorities shall be as follows:
   a) Pavement Condition – Inspect permeable pavement surfaces for settlement, deformation or cracking
   b) Surface Infiltration – Inspect permeable pavement surfaces for sedimentation or evidence of ponding
   c) Drainage – Inspect observation wells 72 hours after a rain event of 0.5 inches or greater to verify that the aggregate storage reservoir is draining down effectively
   d) Outfalls – Inspect underdrain outfall locations for obstructions and erosion
   e) Run-on Areas – Inspect run-on areas for adequate cover and stability
4. Documentation of the inspections should be completed using the attached “Permeable Pavers Operation, Inspection, and Maintenance Report Form” and filed. Documentation should include as a minimum:
   a) Inspectors name, affiliation and professional credentials if applicable.
   b) Date, time and weather conditions.
   c) Approximate rainfall total over a 24-hour period if applicable.
   d) Catch basin and storm sewer system condition.
   e) Sediment depth within the catch basins, manholes, endwalls, permeable pavers and curb and gutter.
   f) Identification of potential structural failures and repair needs.
   g) Repair recommendations.

B. Sediment, Debris and Litter Removal.

1. Sediment accumulation should be monitored at least once a month.
2. Trash and debris should be removed from the permeable paver areas when needed.
3. Clean the pavement surface using industry recommended methods, such as regenerative air or vacuum sweeping, at least twice per year in accordance with Section V.G.

C. Block Repair

1. Blocks may crack or become damaged as a result of snow plots or other natural causes. Individual blocks can be replaced by hammering out the broken block. A new block can be dropped into the void of the removed block and tamped into place using a rubber mallet.

2. Repair any settlement, deformation or cracking that are significant enough to adversely impact the water quality function of the system.

D. Drainage Performance

1. The permeable paver areas are intended to function by allowing storm water to infiltrate through the joints/space between blocks and be stored in the aggregate layer before flowing through the underdrain. The underdrain discharges to inlet structures.
2. Over time, the drainage performance of the permeable paver areas may decrease for a variety of reasons. If water is ponding in the permeable paver area during and after rainfall events, it is an indication that they are no longer performing as designed and corrective actions should be taken.
3. Repair and/or replant eroding run-on areas.
4. Replenish the joint aggregate in accordance with industry recommendations
5. If necessary, remediate the system by extracting accumulate debris and aggregate from the joints using a vacuum and re-filling he joints with new aggregate.

II. NON-ROUTINE MAINTENANCE

A. Structural Repairs and Replacement.

1. Annual inspection of the permeable pavers will disclose any potential structural problems. If structural problems appear, repair or replace the structures and pipes.

III. RESPONSIBLE PARTY & FINANCIAL FUNDING

A. The responsible party for the operation, inspection, and maintenance of the permeable pavers has been designated in the Storm Water Management Practice Maintenance Agreement.

B. The responsible party shall establish a perpetual maintenance fund to ensure that the pavement is properly inspected, maintained, and repaired.

EXHIBIT B-3
Permeable Pavers Operation, Inspection, and Maintenance Report Form

Project: _____

Location: _____

Date: _____

Time: _____

Weather: _____

Inspector: _____

Maintenance Item	Satisfactory / Unsatisfactory	Comments
1. Debris and Sedimentation Accumulation (Monthly)		
1. Clean of sediment and debris (e.g. mulch, leaves, trash, etc.)		
2. No indication of excessive sediment buildup		
3. Other (specify)		
2. Permeable Pavers, Structures and Pipes (Semi-Annual, After Major Storms)		
1. Clean of debris and obstructions		
2. Not an excessive sediment buildup in catch basins, manholes, permeable pavers, endwalls. Sumps not more than 50% full		
3. No evidence of any blockages		
4. Good condition, no need for repair		
5. No missing grates or covers		
6. No evidence of erosion at or around structures		
7. Other (specify)		

Comments:

Actions to be Taken: