MEMORANDUM

DATE: 12/01/2017

TO: City of La Crosse – Engineering Department
Attn: Yuri Nasonovs

FROM: Kris Roppe

SUBJECT: Garden Terrace Multifamily Apartments - Stormwater Management

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This stormwater management memo has been prepared to accompany the submitted plans and stormwater calculations for the proposed multifamily apartments located at 733 Kane Street. The project will consist of the construction of a 44 unit apartment building, construction of asphalt pavement, concrete driveway, concrete walk, retaining walls, utilities, erosion control, stormwater management, and landscaping. A project location map is provided on Sheet C0-10 in the submitted plan set.

A geotechnical Report was prepared by Braun Intertec, Inc. Soil evaluations indicate that the infiltration rate within 5' of the bottom of the bio-infiltration basin is 0.5 inches/hour based on the requirements of Wisconsin DNR Conservation Practice Standard 1002.

Design Standards

Stormwater management plans and calculations have been prepared to meet the requirements of the City of La Crosse Municipal Code 115-517. The proposed site is over 20,000 SF therefore stormwater management will be required to provide treatment from parking areas and infiltration of the 2-year storm event. The disturbed area for the project is over one acre therefore it will require a Wisconsin DNR WPDES permit and meet the requirements of NR 151.

Stormwater Management Facilities

An underground infiltration system has been designed to meet the stormwater management requirements of the Multifamily Design Standards. The proposed site has been separated into 2 sub-watersheds. Watersheds DA-consist of the building and parking areas which will drain to the proposed underground infiltration system on site. The underground system is designed with an isolator row to remove sediment and pre-treat runoff from the parking areas. The system has capacity to infiltrate a 2-year storm event. DA-2 consists of the landscaped area and the sidewalk around the perimeter of the apartment building. The proposed watersheds, ground cover, and stormwater management facilities are provided on Sheet C1-20 in the enclosures.

Calculation summary

In conjunction with the plans for the multifamily apartment project, calculations were performed for the proposed drainage conditions. Water quantity calculations were completed using hydraulic models developed by utilizing the design data and the HydroCAD Version 10.00-19 computer modeling system. This was used to provide sizing and analysis for the proposed bio-infiltration basins. Hydrographs for existing and proposed scenarios were generated and routed through these models using the Atlas-14 rainfall distribution. The 2-year and 100-year 24-hour design storm events were analyzed for this project. The HydroCAD calculations for the proposed conditions are included in the enclosures. The calculations show that the basins contain the 2-year runoff event and safely convey the 100-year 24 hour design storm event without overtopping meeting the City requirements.

Water quality calculations were completed by utilizing the design data and the WinSLAMM Version 10.2 computer modeling system. This was used to provide analysis of the reduction in total suspended solids for the stormwater management system. Results show a reduction of 95.42% of the total suspend solids from impervious surfaces for the proposed site conditions using suitable parameters for the La Crosse area when compared to no controls. The WinSLAMM model shows that the proposed conditions meet the requirements of NR 151.122 to reduce total

suspended solids by 80% compared to no controls. The WinSLAMM Output Report with screenshots of the input parameters can be found in the enclosures.

A maintenance agreement with the City will be required for the permanent stormwater management facilities on site. A draft agreement can be found in the enclosures.

Enclosures:

Garden Terrace – Multifamily Apartment Plans – December 01, 2017
Braun Intertec, Inc. Geotechnical Report
Proposed HydroCAD Report
WinSLAMM Report
Draft Maintenance Agreement

LOCATION MAP

SCALE IN FEET

0 100 200

PROJECT
ADDRESS / LOCATION:
733 KANE STREET
LA CROSSE, WI 54603

SECTION/TOWNSHIP/RANGE
SEC 29 / TWP 16 / R 7

LA CROSSE, WISCONSIN

PROJECT GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE CONTRACT DOCUMENTS, WHICH INCLUDE, BUT ARE NOT LIMITED TO, THE OWNER - CONTRACTOR AGREEMENT, THE PROJECT MANUAL (WHICH INCLUDES GENERAL SUPPLEMENTARY CONDITIONS AND SPECIFICATIONS), DRAWINGS OF ALL DISCIPLINES AND ALL ADDENDA, MODIFICATIONS AND CLARIFICATIONS ISSUED BY THE ARCHITECT/ENGINEER.
2. CONTRACT DOCUMENTS SHALL BE ISSUED TO ALL SUBCONTRACTORS BY THE GENERAL CONTRACTOR IN COMPLETE SETS IN ORDER TO ACHIEVE THE FULL EXTENT AND COMPLETE COORDINATION OF ALL WORK.
3. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
4. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
5. DETAILS SHOWN ARE INTENDED TO BE INDICATIVE OF THE PROFILES AND TYPE OF DETAILING REQUIRED THROUGHOUT THE WORK. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO DETAILS SHOWN. WHERE SPECIFIC DIMENSIONS, DETAILS OR DESIGN INTENT CANNOT BE DETERMINED, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
6. ALL MANUFACTURED ARTICLES, MATERIALS AND EQUIPMENT SHALL BE APPLIED, INSTALLED, CONNECTED, ERECTED, CLEANED AND CONDITIONED ACCORDING TO MANUFACTURERS' INSTRUCTIONS. IN CASE OF DISCREPANCIES BETWEEN MANUFACTURERS' INSTRUCTIONS AND THE CONTRACT DOCUMENTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
7. ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.
8. THE LOCATION AND TYPE OF ALL INPLACE UTILITIES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY AND ARE ACCURATE AND COMPLETE TO THE BEST OF THE KNOWLEDGE OF I & S GROUP, INC. (ISG). NO WARRANTY OR GUARANTEE IS IMPLIED. THE CONTRACTOR SHALL VERIFY THE SIZES, LOCATIONS AND ELEVATIONS OF ALL INPLACE UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
9. THE CONTRACTOR IS TO CONTACT "DIGGER'S HOTLINE" FOR UTILITY LOCATIONS, MINIMUM 3 BUSINESS DAYS PRIOR TO ANY EXCAVATION / CONSTRUCTION (811 OR 1-800-242-8511).

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

SPECIFICATIONS REFERENCE

ALL CONSTRUCTION SHALL COMPLY WITH THE CITY OF LA CROSSE STANDARD SPECIFICATIONS, CURRENT EDITION, WISDOT STANDARD SPECIFICATIONS, 2017 EDITION, WISDOT CONSTRUCTION AND MATERIALS MANUAL, CURRENT EDITION, WISCONSIN DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES STATE PLUMBING CODE, CURRENT EDITION, AND STANDARD SPECIFICATION FOR SEWER & WATER CONSTRUCTION IN WISCONSIN, 6th EDITION, UNLESS DIRECTED OTHERWISE.

PROJECT DATUM

HORIZONTAL COORDINATES HAVE BEEN REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT (NAD83(2011)) ON THE LA CROSSE COUNTY COORDINATE SYSTEM, IN U.S. SURVEY FEET.

TOPOGRAPHIC SURVEY

THIS PROJECT'S TOPOGRAPHIC SURVEY CONSISTS OF DATA COLLECTED ON 9/16, 1/17, & 11/17 BY ISG.

B.M. ELEVATION = 644.08
TOP NUT OF FIRE HYDRANT LOCATED ON THE NORTHEAST CORNER OF THE INTERSECTION OF KANE ST AND HAGAR ST

LEGEND

EXISTING

- CITY LIMITS
- SECTION LINE
- QUARTER SECTION LINE
- RIGHT OF WAY LINE
- PROPERTY / LOTLINE
- EASEMENT LINE
- ACCESS CONTROL
- W — WATER EDGE
- WET — WETLAND BOUNDARY
- WETLAND / MARSH
- FENCE LINE
- CULVERT
- STORM SEWER
- SANITARY SEWER
- SANITARY SEWER FORCEMAIN
- W — WATER
- G — GAS
- OE — OVERHEAD ELECTRIC
- UE — UNDERGROUND ELECTRIC
- UT — UNDERGROUND TELEPHONE
- UTV — UNDERGROUND TV
- OHL — OVERHEAD UTILITY
- UTL — UNDERGROUND UTILITY
- FBO — UNDERGROUND FIBER OPTIC
- 990 — CONTOUR (MAJOR)
- 989 — CONTOUR (MINOR)
- DECIDUOUS TREE
- CONIFEROUS TREE
- TREE LINE
- MANHOLE/STRUCTURE
- CATCH BASIN
- HYDRANT
- VALVE
- CURB STOP
- POWER POLE
- UTILITY PEDESTAL / CABINET

PROPOSED

- LOT LINE
- RIGHT OF WAY
- EASEMENT
- CULVERT
- STORM SEWER
- STORM SEWER (PIPE WIDTH)
- SANITARY SEWER
- SANITARY SEWER (PIPE WIDTH)
- W — WATER
- G — GAS
- OE — OVERHEAD ELECTRIC
- UE — UNDERGROUND ELECTRIC
- UTV — UNDERGROUND TV
- 1015 — CONTOUR
- MANHOLE
- CATCH BASIN
- HYDRANT
- VALVE

CIVIL SHEET INDEX

Sheet List Table

Engberg Anderson ARCHITECTS
MILWAUKEE | MADISON | TUSCON | CHICAGO

ISG

Garden Terrace - Townhomes

733 Kane Street
La Crosse, WI 54603

Owner
Impact Seven
2961 Decker Drive
Rice Lake, WI 54868

PROJECT NUMBER 17-19647

ISSUED FOR:
CITY REVIEW SET 12/01/17

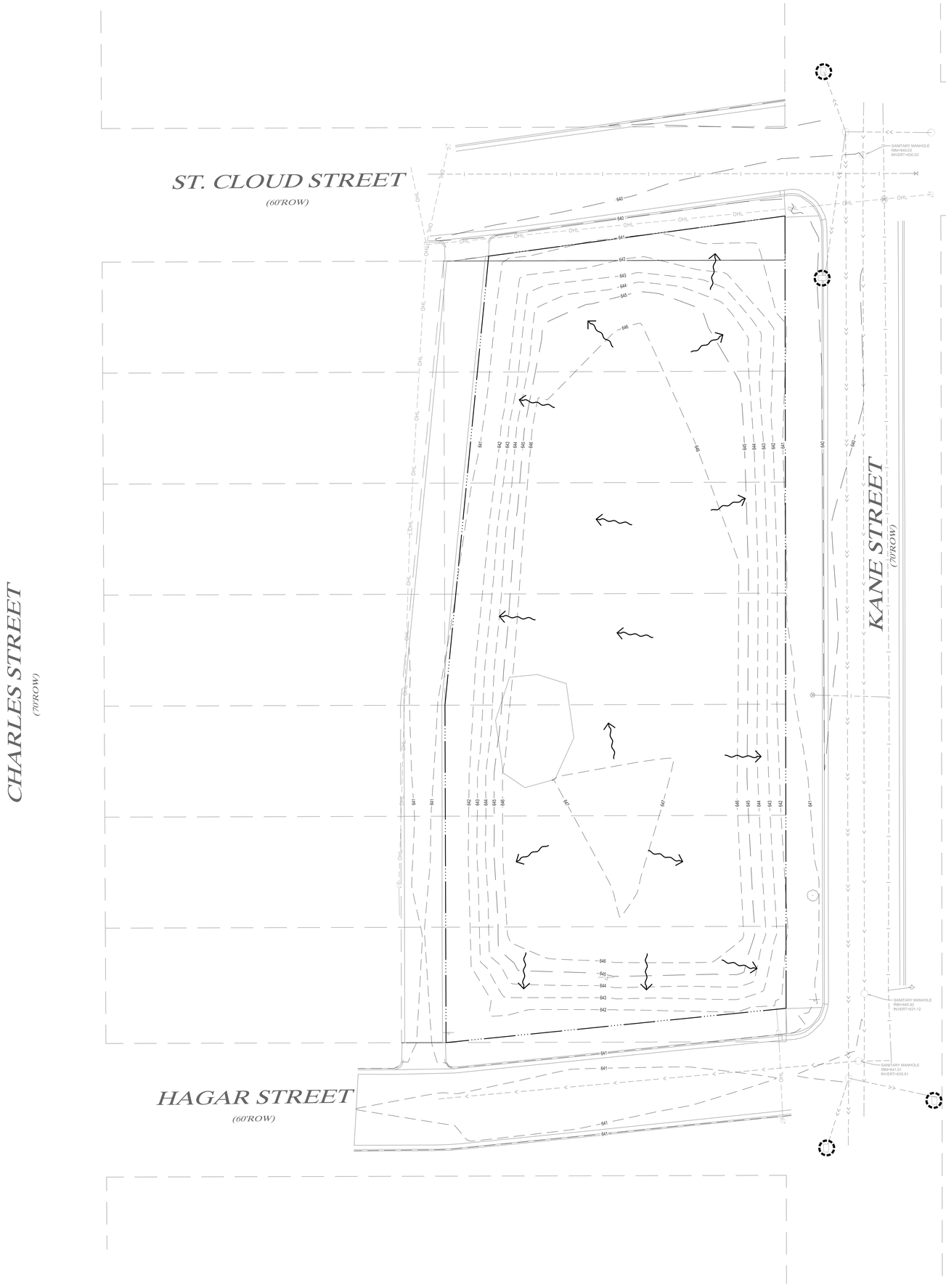
REVISION FOR:
NO. DESCRIPTION DATE

GARDEN TERRACE
MULTIFAMILY APARTMENTS -
KANE ST

DRAWN BY CLF
CHECKED BY KBR

SITE DATA

C0-10



EROSION CONTROL LEGEND

SYMBOL	DESCRIPTION	UNITS	QUANTITY
	EXISTING STORM DRAIN INLET PROTECTION	EACH	4
	EXISTING DRAINAGE ARROW		
101	EXISTING CONTOUR (MINOR INTERVAL)		
100	EXISTING CONTOUR (MAJOR INTERVAL)		

QUANTITIES ARE FOR INFORMATIONAL PURPOSES TO MEET THE REQUIREMENTS OF THE CONSTRUCTION STORMWATER PERMIT. NO GUARANTEE IS MADE TO THE ACTUAL QUANTITIES REQUIRED.

THE QUANTITIES SHOWN ARE TOTAL FOR THE ENTIRE PROJECT NOT SPECIFIC TO THIS SHEET.

SEE SITE RESTORATION PLAN FOR FINAL TURF ESTABLISHMENT

NOTE: EROSION CONTROL PLAN COVERAGE INCLUDES ELECTRIC, GAS, TELEPHONE, AND CABLE INSTALLATION. EACH COMPANY OR THEIR SUBCONTRACTOR IS RESPONSIBLE TO FOLLOW THE REQUIREMENTS OF THIS EROSION CONTROL PLAN INCLUDING PROVIDING THEIR OWN RESTORATION IF INSTALLATION OCCURS AFTER PRIMARY INSTALLATION OF SEEDING/SODDING/MULCHING DURING CONSTRUCTION OF EACH UTILITY.

N

0 20 40
SCALE IN FEET

Engberg Anderson ARCHITECTS
MILWAUKEE | MADISON | TUSCON | CHICAGO

ISG

Garden Terrace - Multifamily Apartments

733 Kane Street
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Impact Seven
2961 Decker Drive
Rice Lake, WI 54868

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MULTIFAMILY APARTMENTS -
KANE ST

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CHECKED BY KBR

EROSION CONTROL PLAN
(EXISTING CONDITIONS)

C1-10

EROSION CONTROL LEGEND

SYMBOL	DESCRIPTION	UNITS	QUANTITY
PC	*PERIMETER CONTROL	LF	1000
	EXISTING STORM DRAIN INLET PROTECTION	EACH	4
	PROPOSED STORM DRAIN INLET PROTECTION	EACH	2
	BIO-ROLL	LF	50
	STABILIZED CONSTRUCTION EXIT	EACH	1
	EXISTING DRAINAGE ARROW		
	PROPOSED DRAINAGE ARROW		
-101-	EXISTING CONTOUR (MINOR INTERVAL)		
-100-	EXISTING CONTOUR (MAJOR INTERVAL)		
101	PROPOSED CONTOUR (MINOR INTERVAL)		
100	PROPOSED CONTOUR (MAJOR INTERVAL)		

PERIMETER CONTROL CAN BE SILT FENCE, BIO-ROLL OR WOOD MULCH.

QUANTITIES ARE FOR INFORMATIONAL PURPOSES TO MEET THE REQUIREMENTS OF THE CONSTRUCTION STORMWATER PERMIT. NO GUARANTEE IS MADE TO THE ACTUAL QUANTITIES REQUIRED.

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NOTE: EROSION CONTROL PLAN COVERAGE INCLUDES ELECTRIC, GAS, TELEPHONE, AND CABLE INSTALLATION. EACH COMPANY OR THEIR SUBCONTRACTOR IS RESPONSIBLE TO FOLLOW THE REQUIREMENTS OF THIS EROSION CONTROL PLAN INCLUDING PROVIDING THEIR OWN RESTORATION IF INSTALLATION OCCURS AFTER PRIMARY INSTALLATION OF SEEDING/SODDING/MULCHING DURING CONSTRUCTION OF EACH UTILITY.

N

0 20 40
SCALE IN FEET

Engberg Anderson ARCHITECTS
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ISG

Garden Terrace - Multifamily Apartments

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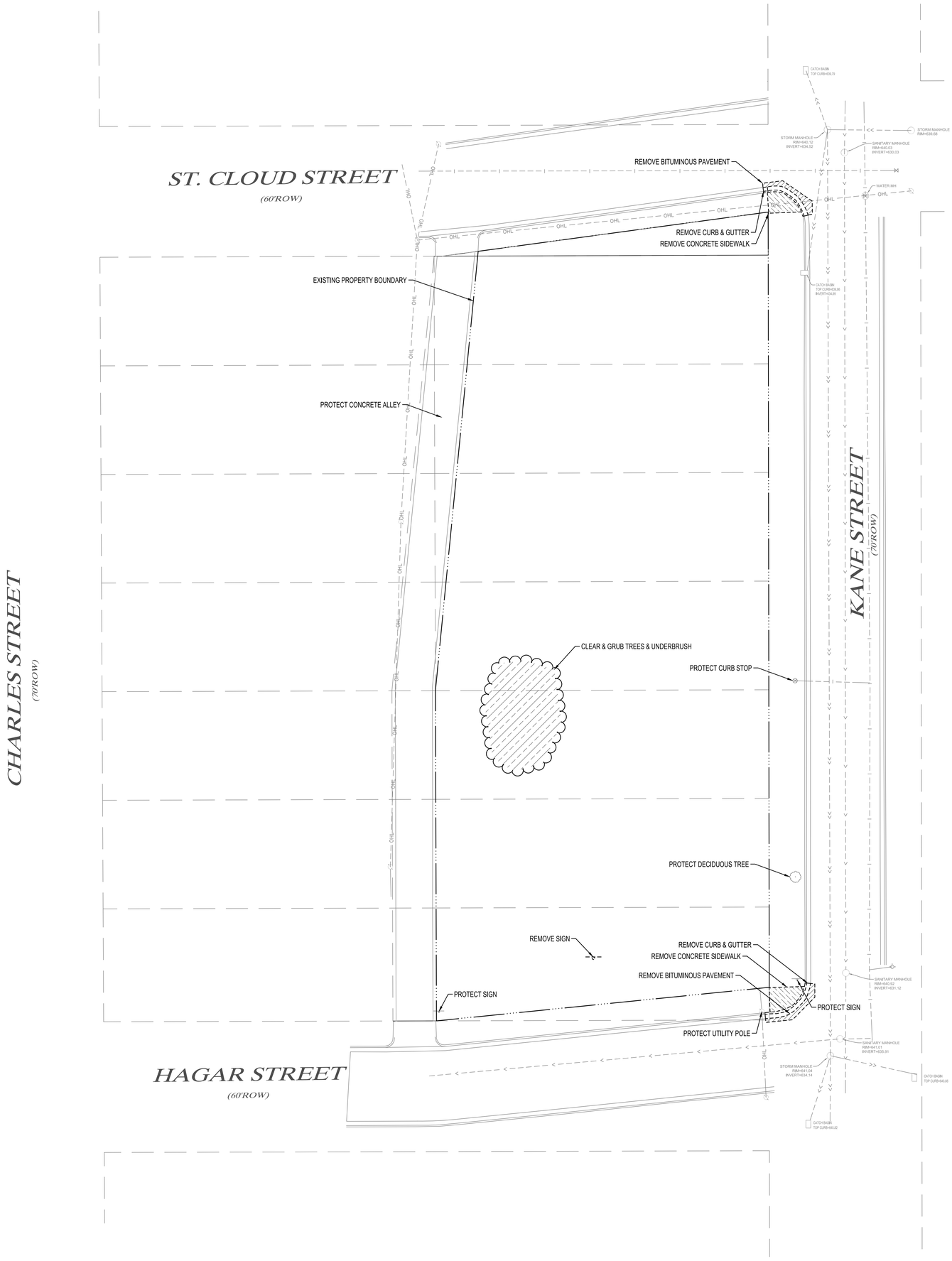
GARDEN TERRACE
MULTIFAMILY APARTMENTS -
KANE ST

DRAWN BY CLF
CHECKED BY KBR

EROSION CONTROL PLAN
(PROPOSED CONDITIONS)

C1-20



REMOVAL LEGEND

SYMBOL	DESCRIPTION
	REMOVE BITUMINOUS PAVEMENT
	REMOVE CONCRETE SIDEWALK
	CLEAR & GRUB TREES & UNDERBRUSH

CONTRACTOR SHALL VERIFY EXISTING PAVEMENT SECTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

PAVEMENT REMOVALS SHALL INCLUDE FULL DEPTH SAWCUT & SECTION REMOVAL.

N

0 20 40
SCALE IN FEET

Engberg Anderson ARCHITECTS

MILWAUKEE | MADISON | TUSCON | CHICAGO

ISG

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KANE ST

DRAWN BY CLF
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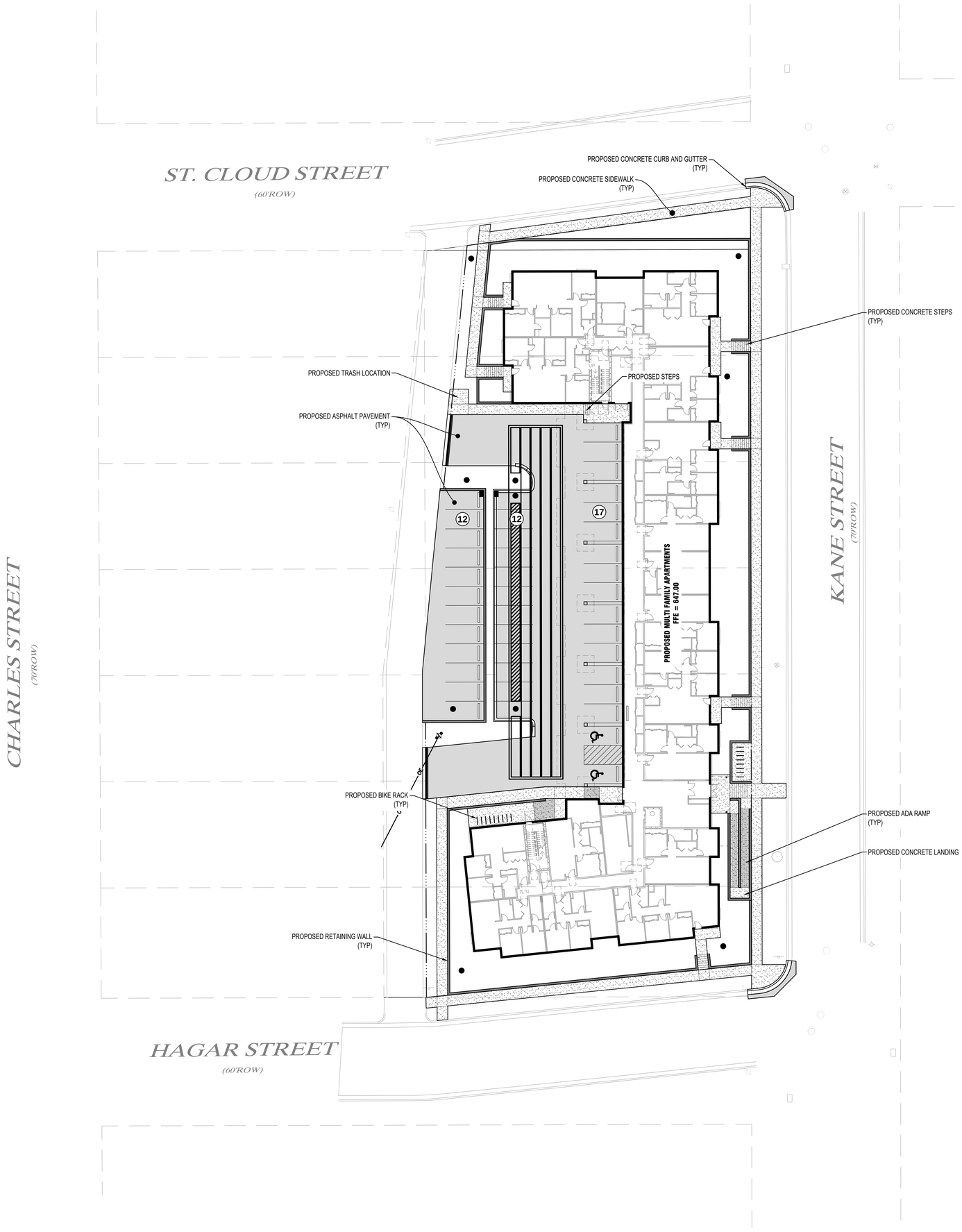
EXISTING SITE &
REMOVAL PLAN

C2-10



PAVEMENT LEGEND	
SYMBOL	DESCRIPTION
	ASPHALT PAVEMENT
	CONCRETE PAVEMENT
	CONCRETE SIDEWALK

N

0 20 40
SCALE IN FEET

Engberg Anderson ARCHITECTS
MILWAUKEE | MADISON | TUSCON | CHICAGO

ISG

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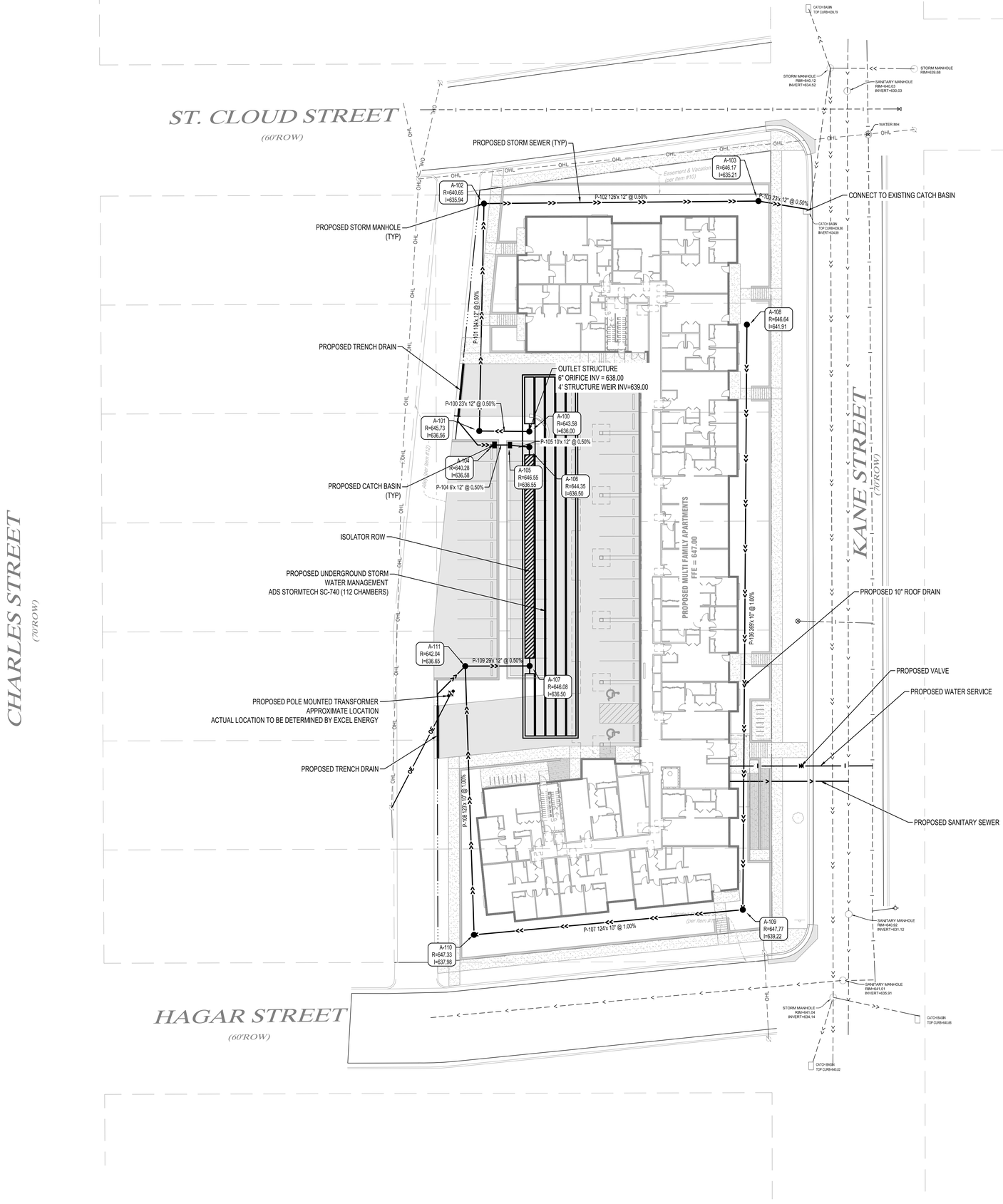
GARDEN TERRACE
MULTIFAMILY APARTMENTS -
KANE ST

DRAWN BY CLF
CHECKED BY KBR

PROPOSED SITE PLAN

C3-10



UTILITY LEGEND

EXISTING		PROPOSED
>>	STORM DRAIN	>>
>	SANITARY SEWER	>
I>	SANITARY SEWER FORCEMAIN	I>
I	WATER MAIN	I
G	GAS	G
OE	OVERHEAD ELECTRIC	OE
UE	UNDERGROUND ELECTRIC	UE
UT	UNDERGROUND TELEPHONE	UT
UTV	UNDERGROUND TV	
OHL	OVERHEAD UTILITY	
UTL	UNDERGROUND UTILITY	
FBO	FIBER OPTIC	

NOTE:
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

N

0 20 40
SCALE IN FEET

Engberg Anderson ARCHITECTS
MILWAUKEE | MADISON | TUSCON | CHICAGO

ISG

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GARDEN TERRACE
MULTIFAMILY APARTMENTS -
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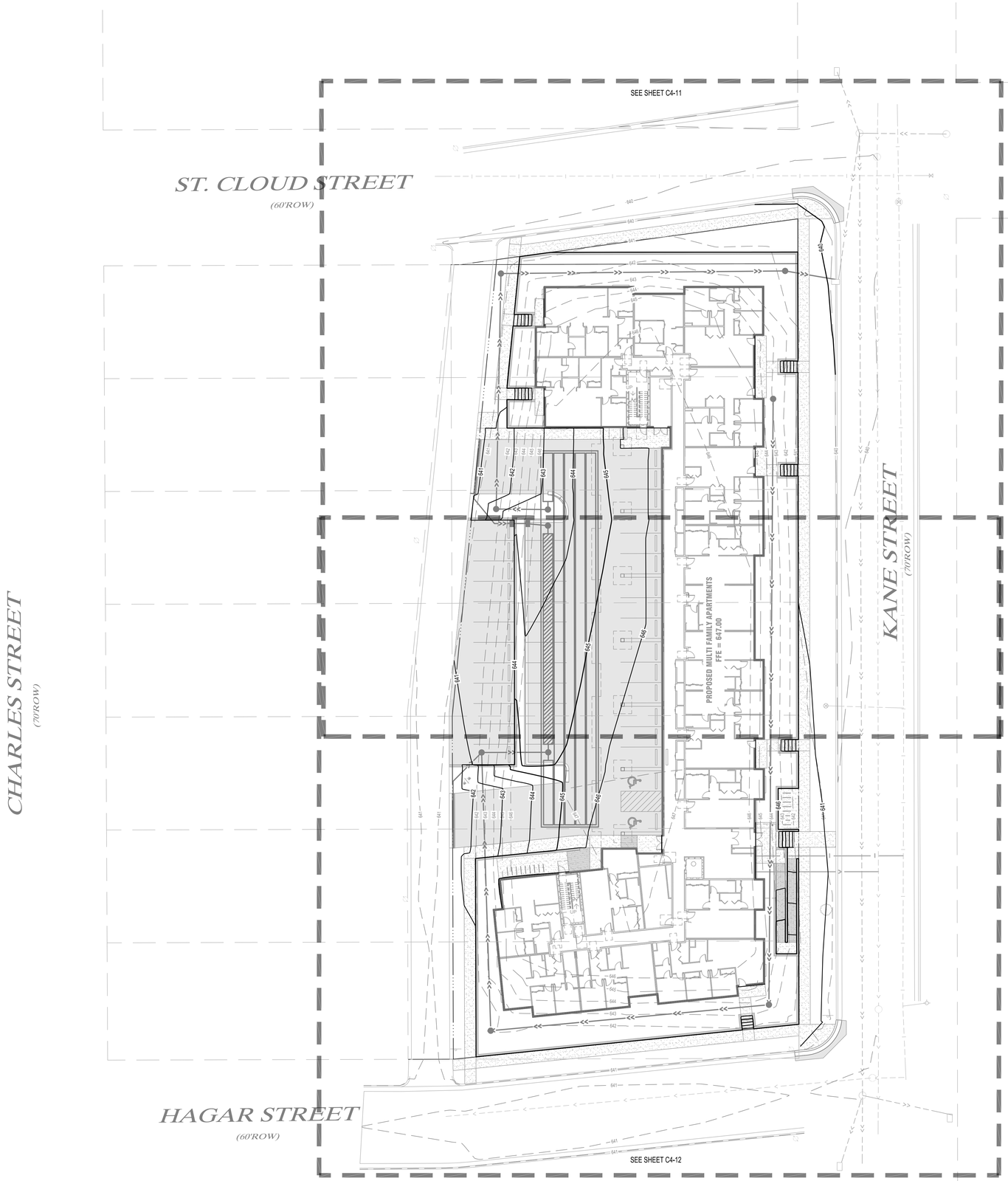
PROPOSED SITY UTILITY PLAN

C3-30



GRADING LEGEND

101	EXISTING CONTOUR (MINOR INTERVAL)
100	EXISTING CONTOUR (MAJOR INTERVAL)
101	PROPOSED CONTOUR (MINOR INTERVAL)
100	PROPOSED CONTOUR (MAJOR INTERVAL)
XXX.XX	PROPOSED SPOT ELEVATION
XXX.XX	PROPOSED TOP BACK OF CURB SPOT ELEVATION
XXX.XX / XXX.XX	PROPOSED TOP & BOTTOM ELEVATION
-X.X%	SURFACE GRADE / DIRECTION

GENERAL GRADING NOTES

EXCAVATED MATERIAL SHALL BE COMPACTED TO 100% PROCTOR DENSITY FOR THE UPPER 3', AND 95% PROCTOR DENSITY BELOW 3' IN ALL BUILDING PADS. REFER TO THE QUALITY COMPACTION METHOD IN ALL OTHER AREAS.

PROPOSED CONTOURS SHOW FINISHED GRADE ELEVATIONS. BUILDING PAD AND PAVEMENT HOLD DOWNS ARE NOT INCLUDED.

N

0 20 40
SCALE IN FEET

Engberg Anderson ARCHITECTS

MILWAUKEE | MADISON | TUSCON | CHICAGO

ISG

Garden Terrace - Multifamily Apartments

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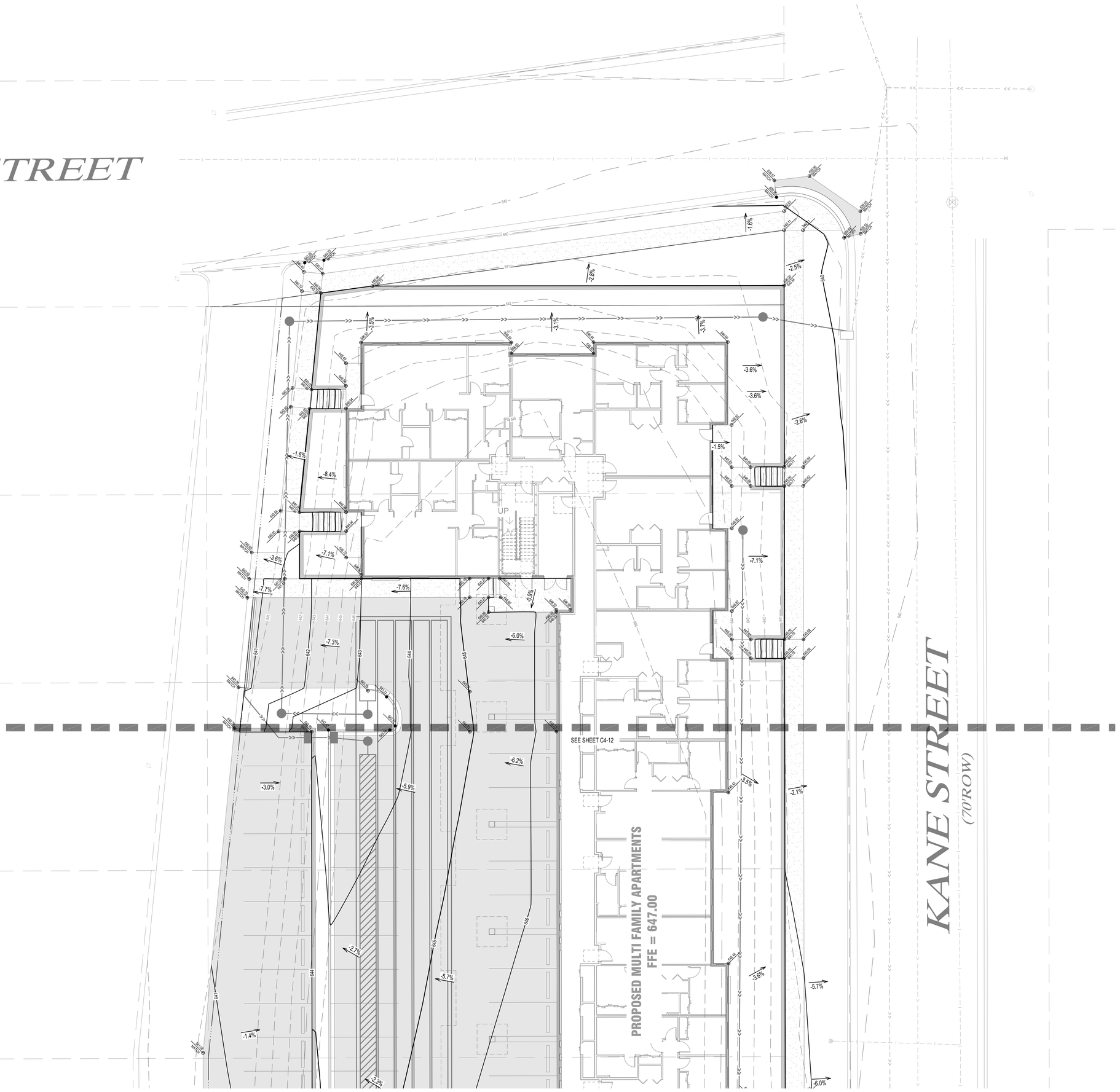
GARDEN TERRACE
MULTIFAMILY APARTMENTS -
KANE ST

DRAWN BY CLF
CHECKED BY KBR

OVERALL GRADING PLAN

C4-10

'TREET



GRADING LEGEND

101	EXISTING CONTOUR (MINOR INTERVAL)
100	EXISTING CONTOUR (MAJOR INTERVAL)
101	PROPOSED CONTOUR (MINOR INTERVAL)
100	PROPOSED CONTOUR (MAJOR INTERVAL)
XXX.XX	PROPOSED SPOT ELEVATION
XXX.XX	PROPOSED TOP BACK OF CURB SPOT ELEVATION
TOP XXX.XX BOT XXX.XX	PROPOSED TOP & BOTTOM ELEVATION
-X.X%	SURFACE GRADE / DIRECTION

GENERAL GRADING NOTES

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N

0 20 40
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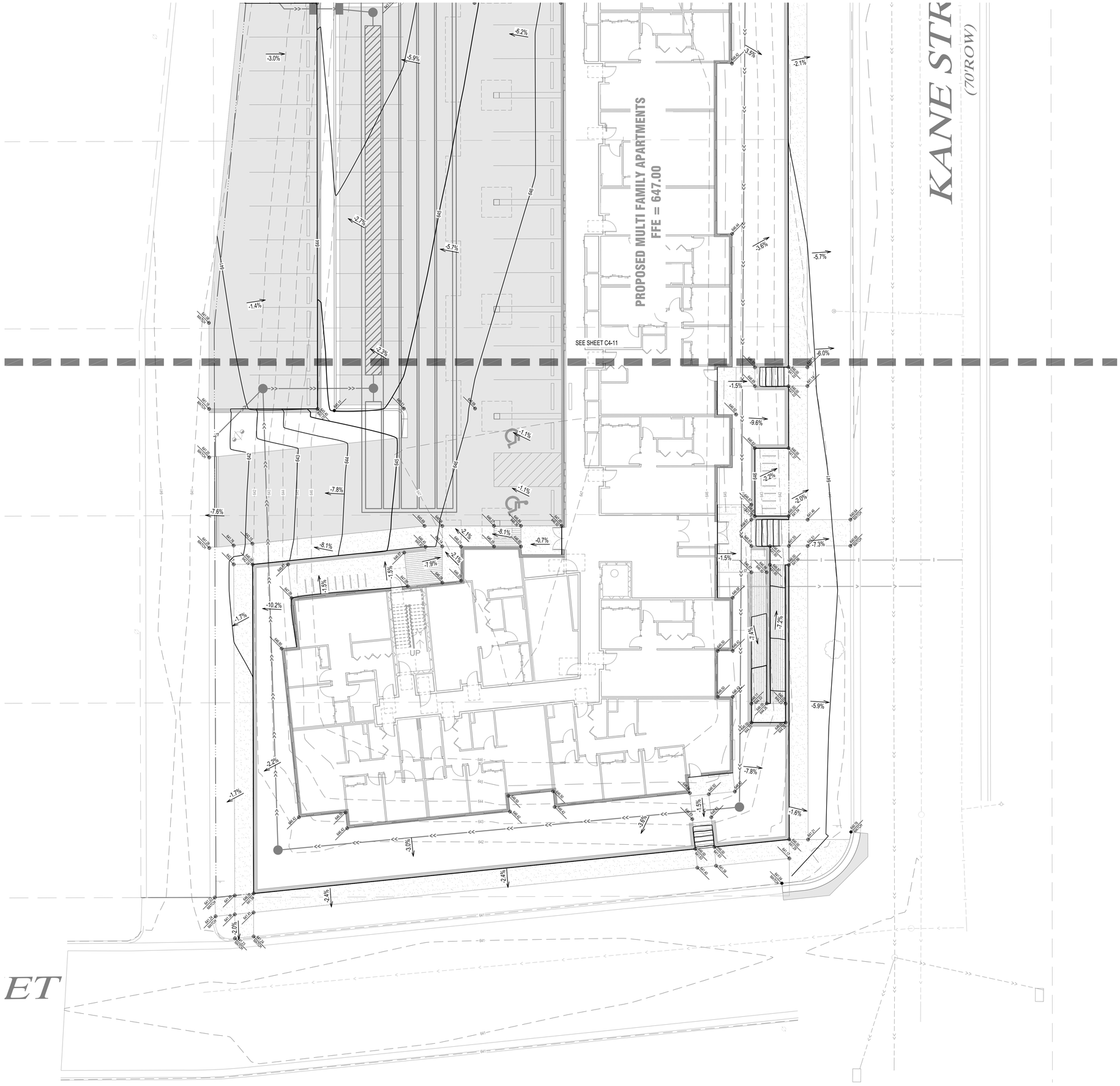
DETAILED GRADING PLAN

C4-11



GRADING LEGEND

101	EXISTING CONTOUR (MINOR INTERVAL)
100	EXISTING CONTOUR (MAJOR INTERVAL)
101	PROPOSED CONTOUR (MINOR INTERVAL)
100	PROPOSED CONTOUR (MAJOR INTERVAL)
000.00	PROPOSED SPOT ELEVATION
000.00	PROPOSED TOP BACK OF CURB SPOT ELEVATION
TOP 000.00 BOT 000.00	PROPOSED TOP & BOTTOM ELEVATION
-X.X%	SURFACE GRADE / DIRECTION

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SCALE IN FEET

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GARDEN TERRACE
MULTIFAMILY APARTMENTS -
KANE ST

DRAWN BY CLF
CHECKED BY KBR

DETAILED GRADING PLAN

C4-12

Braun Intertec Corporation
2309 Palace Street
La Crosse, WI 54603

Phone: 608.781.7277
Fax: 608.781.7279
Web: braunintertec.com

November 2, 2017 Project B1710414

Ms. Kristine Giornalista
Impact Seven
642 West North Avenue
Milwaukee, Wisconsin 53212
Email: kristine.giornalista@impactseven.org

Re: Proposed Stormwater Evaluation
Kane Street – Saint James Street Multifamily Development
733 Kane Street and 1109 Saint James Street
La Crosse, Wisconsin

Dear Ms. Giornalista:

This letter is a summary of our Stormwater Evaluation for the proposed Kane Street – Saint James Street Multifamily Development stormwater infiltration systems to be located at 733 Kane Street and 1109 Saint James Street in La Crosse, Wisconsin.

Soil Profile

We drilled three borings to a depth of 20 feet and collected continuous samples using a GeoProbe. One boring was performed at the Saint James Street property, and was labeled GP-1, and two GeoProbe borings were performed at the Kane Street property, and were labeled GP-2 and GP-3. These exploration locations are shown on the attached boring location sketches. The GeoProbe borings at the Saint James Street property are composed of topsoil over alluvial sand soils. At the Kane Street property, the site is composed of topsoil fill over undocumented fill and alluvial sand soils. The topsoil and topsoil fill consisted of sandy clay loam that was dark brown in color. The undocumented fill consisted of sandy clay loam and fine-grained loamy sand that was dark brown to brown in color. The alluvial sand soils consisted of fine-grained loamy sand and fine- to medium-grained sand that was brown to light brown in color and contained mottling at depths of 5 to 5 ½ feet that was orange and red in color.

Groundwater was observed at depths of 8 to 16 feet as the GeoProbe borings were advanced. These depths correspond to elevation 628 ½ to 630 ½. Seasonal and annual fluctuations of groundwater should be anticipated.

Stormwater Infiltration

Infiltration rates for the soils we encountered in our GeoProbe borings were determined by referencing Table 2 in the Wisconsin Department of Natural Resources (DNR) Stormwater Infiltration Technical Standard 1002, dated February 2004. These infiltration rates represent the long-term infiltration capacity of a practice and not the capacity of the soils in their natural state. Field testing, such as with a double-ring infiltrometer (ASTM D3385), may indicate that a higher infiltration rate can be used. However, we suggest adjusting field test rates by the appropriate correction factor, as provided in the Wisconsin DNR

Stormwater Infiltration Technical Standard 1002 or as allowed by the local watershed. We suggest consulting the Wisconsin DNR Stormwater Infiltration Technical Standard 1002 for stormwater design.

Fine-grained soils (silts and clays), topsoil, organic matter, or debris that mixes into or washes onto the soil will lower the permeability. Organic matter, debris, and silt washed into the system after construction can fill the soil pores and reduce permeability over time. Proper maintenance is important for long-term performance of infiltration systems. This stormwater evaluation does not constitute a review of site suitability for stormwater infiltration or evaluate the potential impacts, if any, from infiltration of large amounts of stormwater.

Morphological Evaluation

In general, the alluvial soils are well suited for infiltration of stormwater. The soil mottling and groundwater, however, should be considered limiting layers.

Infiltration rates in natural soils are variable based on soil type, moisture content, void space between soil particles and discontinuities in the soil structure. Discontinuities generally are not present in disturbed or compacted soils, such as existing fills, because void space between soil particles may have been reduced form compaction efforts.

Double-Ring Infiltrometer Testing

Braun Intertec provides design infiltration rates using a Double-Ring Infiltrometer test as required by the Wisconsin Department of Natural Resources for Technical Standard 1002. Please contact us for additional information and pricing for these services.

Remarks

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made. If you have any questions about this letter, please contact Brandon Wright or Ben Sullivan at 608.781.7277 or by email at bwright@braunintertec.com or bsullivan@braunintertec.com.

Sincerely,
BRAUN INTERTEC CORPORATION

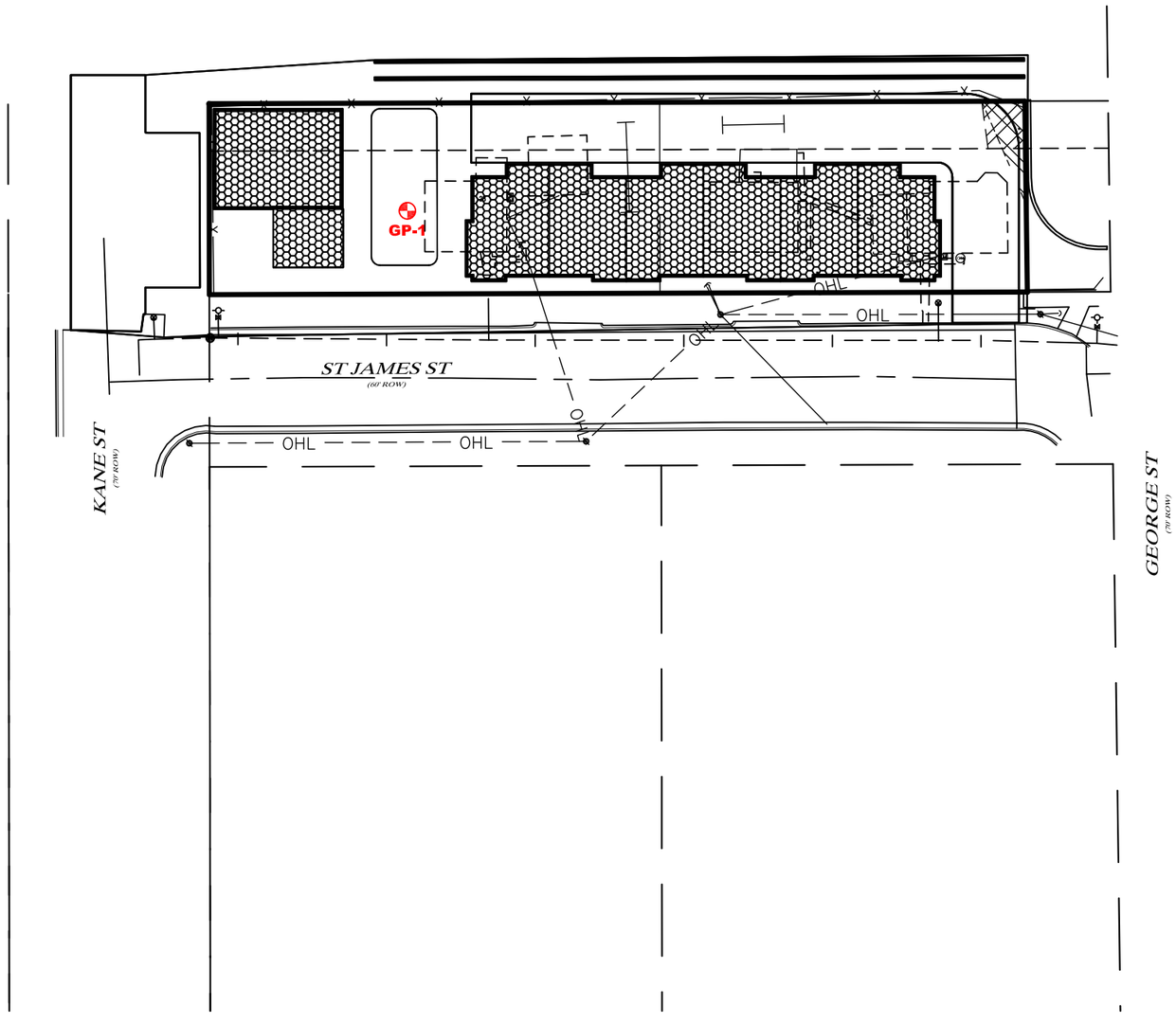
Benjamin R. Sullivan, EIT
Certified Soil Tester
License Number: 1324025
November 2, 2017

Brandon K. Wright, PE
Senior Engineer

Cc: Kristopher Roppe with I & S Group, Inc.; kris.roppe@is-grp.com

Attachments:
GeoProbe Boring Location Sketches
Wisconsin DNR – Soil Evaluation Forms

BRAUN INTERTEC



DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

25' 0 50'

SCALE: 1" = 50'

BRAUN INTERTEC
The Science You Build On.

11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Drawing Information

Project No: B1710414

Drawing No: B1710414

Drawn By:	LAO
Date Drawn:	11/1/17
Checked By:	BS
Last Modified:	11/1/17

Project Information

Stormwater Evaluation

Kane Street - St. James Multifamily Development

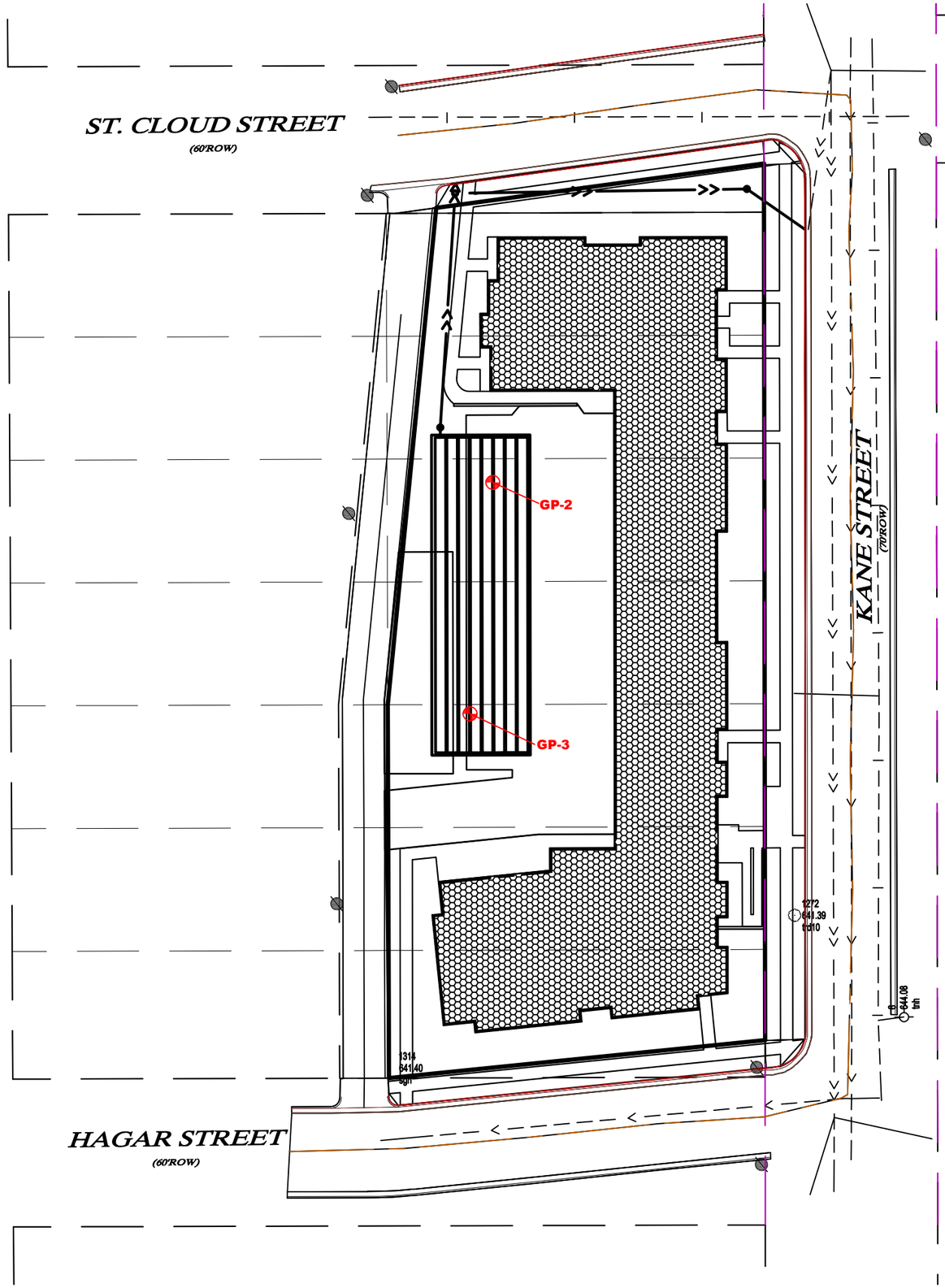
1109 St. James Street

La Crosse, Wisconsin

GeoProbe Boring Location Sketch

Figure 1

F:\2017\B1710414.dwg,James,11/1/2017 5:37:21 PM



DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

25' 0 50'

SCALE: 1" = 50'

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Drawn By:	LAO
Date Drawn:	11/1/17
Checked By:	BS
Last Modified:	11/1/17

Project Information

Stormwater Evaluation

Kane Street - St. James Multifamily Development

733 Kane Street

La Crosse, Wisconsin

GeoProbe Boring Location Sketch

Figure 2

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Wisconsin Department of Commerce
Division of Safety and Buildings

SOIL EVALUATION – STORM

in accordance with Comm. 82.365 & 85, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direct and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

County: La Crosse
Parcel I.D.: 17-10069-60
Reviewed by: | Date:

Please print all information

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

Property Owner	Property Location
Impact Seven	Gov. Lot: SE1/4 NW1/4 S 29 T 16N R 07
Property Owner's Mailing Address: 2961 Decker Drive	Lot #: Block #: Subd. Name or CSM#:
City: Rice Lake | State: WI | Zip Code: 54868 | Phone Number: (800) 685-9353	☒ City ☐ Village ☐ Town: La Crosse | Nearest Road: Saint James Street

Drainage Area _____ ☐ sq. ft. ☐ acres

Optional:

Test Site Suitable for (Check all that apply)

☐ Irrigation ☐ Bio-retention trench ☐ Trench(es)
☐ Rain Garden ☐ Grassed swale ☐ Reuse
☐ Infiltration Trench ☐ SDS (>15' wide) ☒ Other

Hydraulic Application Test Method:

☒ Morphological Evaluation
☐ Double-Ring Infiltrometer
☐ Other (specify)

GP-1 Obs. #

☒ Boring
☐ Test Pit

Ground Surface Elev. 638.5 Ft. Depth to limiting factor 67 in.

Horizon	Depth (in.)	Dominate Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr.
O	0 - 3	10YR 2.5/1	NONE	scl	2.f.gr.	mfr	c	0	0.11
E	3 - 67	10YR 3/3	NONE	f.sl	1.f.gr.	mvfr	g	5	0.50
B	67 - 79	10YR 4/3	c.m.d. 5YR 3/3	f.ls	0.f.gr.	ml	c	5	0.50
C	79 - 144	10YR 5/4	NONE	f.s	0.f.gr.	ml	g	0	0.50
C	144 - 240	10YR 5/3	NONE	m.s	0.m.gr.	ml	c	0	3.60

CST/PSS Name (Please Print)	Signature	CST/PSS Number
Benjamin R. Sullivan	Ben Sullivan	1324025
Address	**Date Evaluation Conducted**	**Telephone Number**
2309 Palace Street, La Crosse, Wisconsin 54601	October 25, 2017	608.781.7277

SOIL EVALUATION – STORM

in accordance with Comm. 82.365 & 85, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direct and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

County: La Crosse
Parcel I.D.: 17-10068-100
Reviewed by: | Date:

Please print all information

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

Property Owner	Property Location
Impact Seven	Gov. Lot: SE1/4 NW1/4 S 29 T 16N R 07
Property Owner's Mailing Address: 2961 Decker Drive	Lot #: Block #: Subd. Name or CSM#:
City: Rice Lake | State: WI | Zip Code: 54868 | Phone Number: (800) 685-9353	☒ City ☐ Village ☐ Town: La Crosse | Nearest Road: Kane Street

Drainage Area _____ ☐ sq. ft. ☐ acres

Optional:

Test Site Suitable for (Check all that apply)

☐ Irrigation ☐ Bio-retention trench ☐ Trench(es)
☐ Rain Garden ☐ Grassed swale ☐ Reuse
☐ Infiltration Trench ☐ SDS (>15' wide) ☒ Other

Hydraulic Application Test Method:

☒ Morphological Evaluation
☐ Double-Ring Infiltrometer
☐ Other (specify)

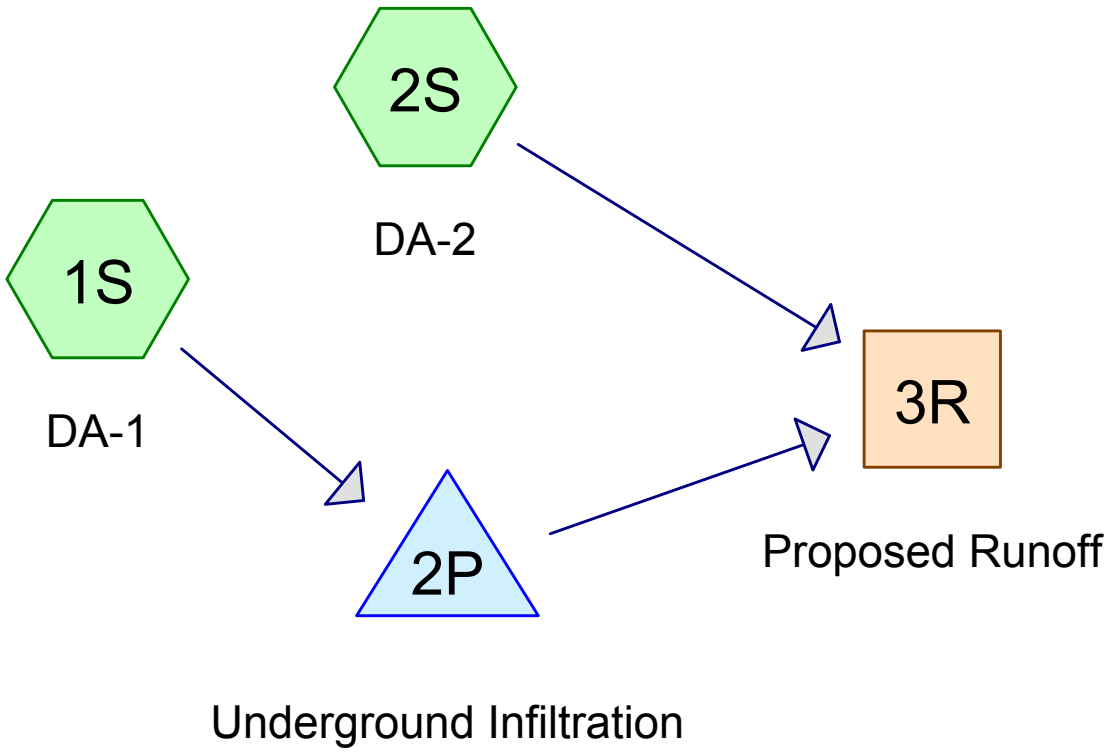
GP-2 Obs. # ☒ Boring ☐ Test Pit Ground Surface Elev. 645.4 Ft. Depth to limiting factor 192 in.

Horizon	Depth (in.)	Dominate Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr.
FILL	0 - 4	10YR 3/2	NONE	scl	2.f.gr.	mfr	g	0	0.11
FILL	4 - 114	10YR 3/3	NONE	f.sl	1.f.gr.	mvfr	g	10	0.50
E	114 - 122	10YR 3/2	NONE	f.ls	0.f.gr.	ml	c	0	0.50
B	122 - 132	7.5YR 3/2	NONE	f.s	0.f.gr.	ml	g	0	0.50
C	132 - 204	10YR 4/3	NONE	m.s	0.m.gr.	ml	g	20	3.60
C	204 - 240	10YR 5/3	NONE	f.s	0.f.gr.	ml	g	5	0.50

GP-3 Obs. # ☒ Boring ☐ Test Pit Ground Surface Elev. 640.6 Ft. Depth to limiting factor 60 in.

Horizon	Depth (in.)	Dominate Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr.
FILL	0 - 6	10YR 3/2	NONE	scl	2.f.gr.	mfr	g	0	0.11
FILL	6 - 48	10YR 4/2	NONE	scl	2.f.gr.	mfr	g	5	0.11
O	48 - 60	10YR 3/2	NONE	f.sl	1.f.gr.	mvfr	c	0	0.50
B	60 - 114	10YR 4/3	c.m.d. 5YR 3/3	f.ls	0.f.gr.	ml	g	20	0.50
C	114 - 192	10YR 5/4	NONE	f.s	0.f.gr.	ml	g	0	0.50
C	192 - 240	10YR 5/3	NONE	m.s	0.m.gr.	ml	g	10	3.60

CST/PSS Name (Please Print)	Signature	CST/PSS Number
Benjamin R. Sullivan	Ben Sullivan	1324025
Address	**Date Evaluation Conducted**	**Telephone Number**
2309 Palace Street, La Crosse, Wisconsin 54601	October 25, 2017	608.781.7277



Subcat Reach Pond Link

Routing Diagram for 19647 Proposed Conditions Kane
Prepared by ISG, Printed 11/30/2017

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.286	39	>75% Grass cover, Good, HSG A (1S, 2S)
0.439	98	Paved parking, HSG A (1S, 2S)
0.495	98	Roofs, HSG A (1S)
1.220	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.220	HSG A	1S, 2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.220		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.286	0.000	0.000	0.000	0.000	0.286	>75% Grass cover, Good	1S, 2S
0.439	0.000	0.000	0.000	0.000	0.439	Paved parking	1S, 2S
0.495	0.000	0.000	0.000	0.000	0.495	Roofs	1S
1.220	**0.000**	**0.000**	**0.000**	**0.000**	**1.220**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: DA-1 Runoff Area=38,741 sf 96.50% Impervious Runoff Depth>2.56"
Tc=5.0 min CN=96 Runoff=3.86 cfs 0.190 af

Subcatchment2S: DA-2 Runoff Area=14,390 sf 22.90% Impervious Runoff Depth>0.15"
Tc=5.0 min CN=53 Runoff=0.02 cfs 0.004 af

Reach 3R: Proposed Runoff Inflow=0.02 cfs 0.005 af
Outflow=0.02 cfs 0.005 af

Pond 2P: Underground Infiltration Peak Elev=638.03' Storage=0.136 af Inflow=3.86 cfs 0.190 af
Discarded=0.05 cfs 0.067 af Primary=0.00 cfs 0.001 af Outflow=0.05 cfs 0.067 af

Total Runoff Area = 1.220 ac Runoff Volume = 0.194 af Average Runoff Depth = 1.91"
23.43% Pervious = 0.286 ac 76.57% Impervious = 0.934 ac

Summary for Subcatchment 1S: DA-1

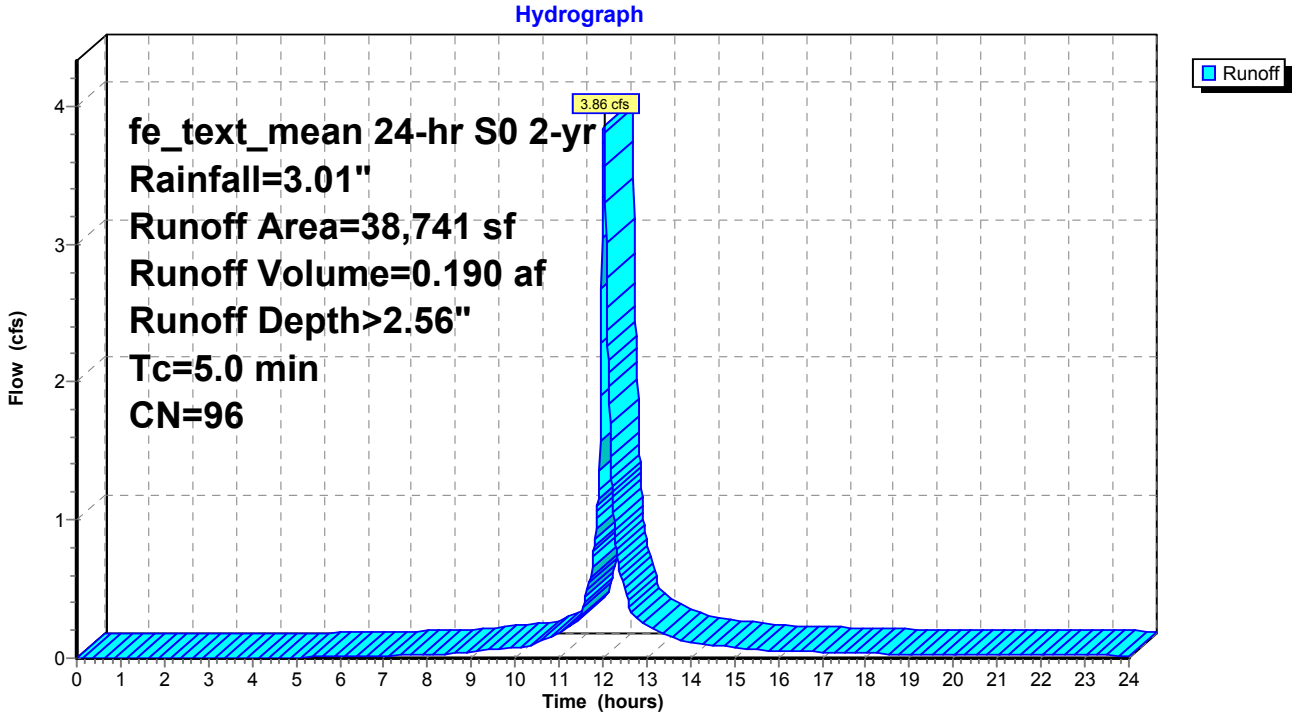
Runoff = 3.86 cfs @ 12.03 hrs, Volume= 0.190 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
fe_text_mean 24-hr S0 2-yr Rainfall=3.01"

Area (sf)	CN	Description
1,355	39	>75% Grass cover, Good, HSG A
21,574	98	Roofs, HSG A
15,812	98	Paved parking, HSG A
38,741	96	Weighted Average
1,355		3.50% Pervious Area
37,386		96.50% Impervious Area

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

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

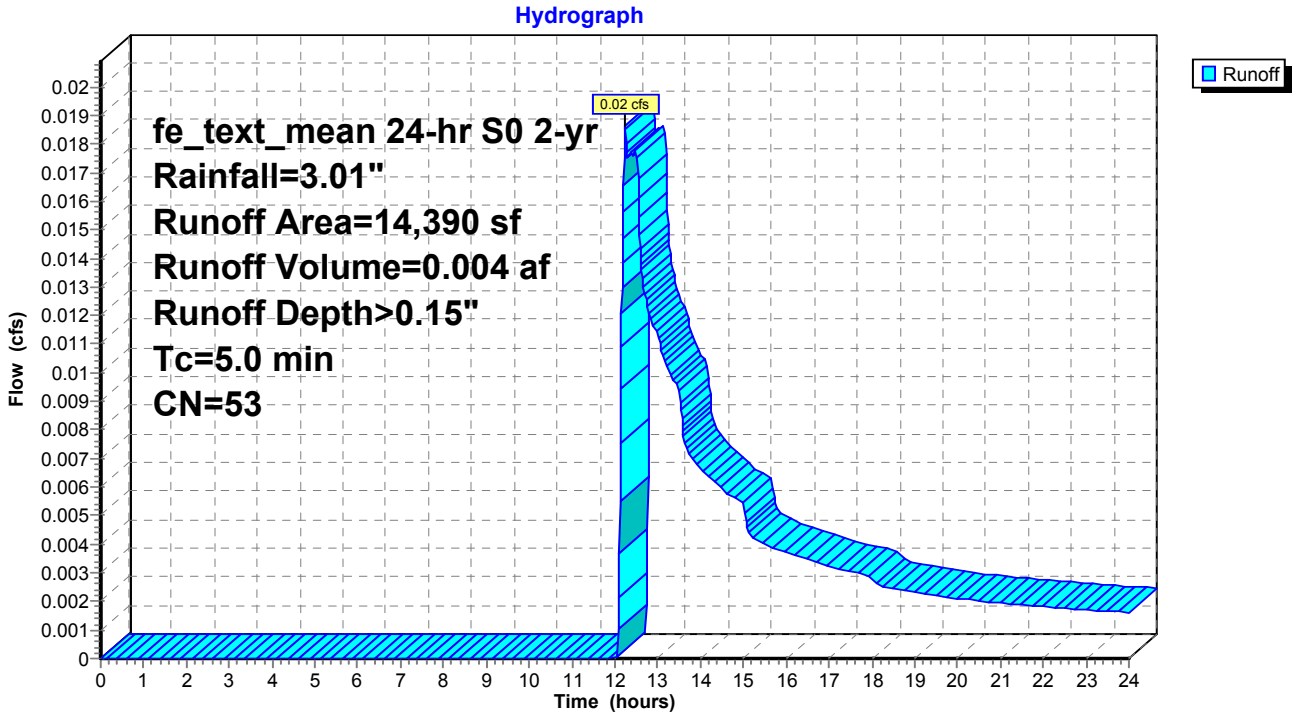
Runoff = 0.02 cfs @ 12.25 hrs, Volume= 0.004 af, Depth> 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
fe_text_mean 24-hr S0 2-yr Rainfall=3.01"

Area (sf)	CN	Description
11,095	39	>75% Grass cover, Good, HSG A
3,295	98	Paved parking, HSG A
14,390	53	Weighted Average
11,095		77.10% Pervious Area
3,295		22.90% Impervious Area

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

Subcatchment 2S: DA-2

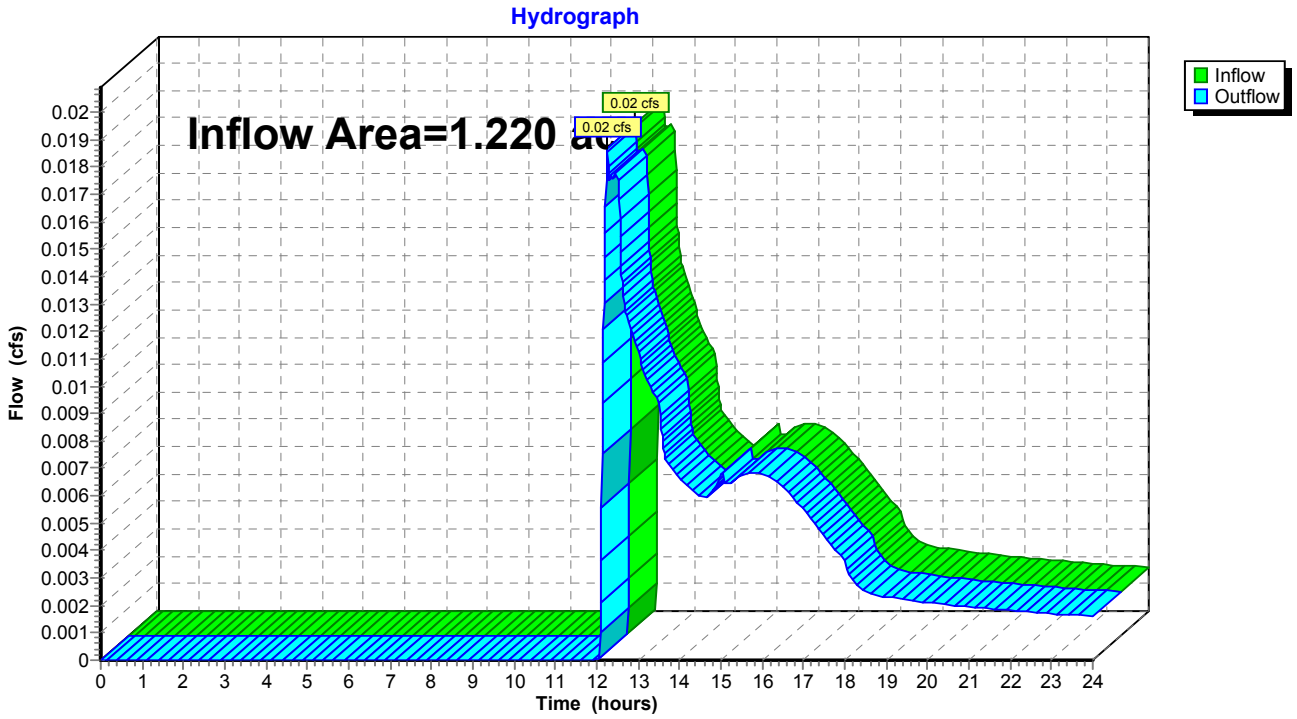


Summary for Reach 3R: Proposed Runoff

Inflow Area = 1.220 ac, 76.57% Impervious, Inflow Depth > 0.05" for 2-yr event
Inflow = 0.02 cfs @ 12.25 hrs, Volume= 0.005 af
Outflow = 0.02 cfs @ 12.25 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 3R: Proposed Runoff



Summary for Pond 2P: Underground Infiltration

Inflow Area = 0.889 ac, 96.50% Impervious, Inflow Depth > 2.56" for 2-yr event
Inflow = 3.86 cfs @ 12.03 hrs, Volume= 0.190 af
Outflow = 0.05 cfs @ 16.05 hrs, Volume= 0.067 af, Atten= 99%, Lag= 241.4 min
Discarded = 0.05 cfs @ 10.39 hrs, Volume= 0.067 af
Primary = 0.00 cfs @ 16.05 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 638.03' @ 16.05 hrs Surf.Area= 0.097 ac Storage= 0.136 af

Plug-Flow detention time= 281.6 min calculated for 0.067 af (35% of inflow)
Center-of-Mass det. time= 173.2 min (939.9 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	636.00'	0.086 af	**25.25'W x 166.20'L x 3.50'H Field A** 0.337 af Overall - 0.122 af Embedded = 0.216 af x 40.0% Voids
#2A	636.50'	0.122 af	**ADS_StormTech SC-740** x 115 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 5 rows
#3	636.00'	0.001 af	**4.00'D x 5.00'H Vertical Cone/Cylinder**
		0.209 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	638.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	636.00'	**0.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	639.00'	**4.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.05 cfs @ 10.39 hrs HW=636.07' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 16.05 hrs HW=638.03' TW=0.00' (Dynamic Tailwater)
├**1=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.60 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Underground Infiltration - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 (ADS StormTech® SC-740 without end caps)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
Row Length Adjustment= +0.44' x 6.45 sf x 5 rows

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

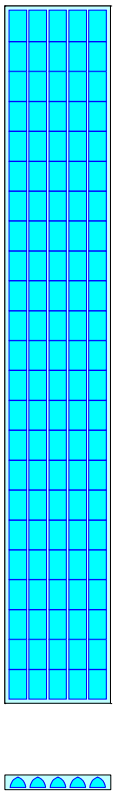
23 Chambers/Row x 7.12' Long +0.44' Row Adjustment = 164.20' Row Length +12.0" End Stone x 2 = 166.20' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

115 Chambers x 45.9 cf +0.44' Row Adjustment x 6.45 sf x 5 Rows = 5,297.2 cf Chamber Storage

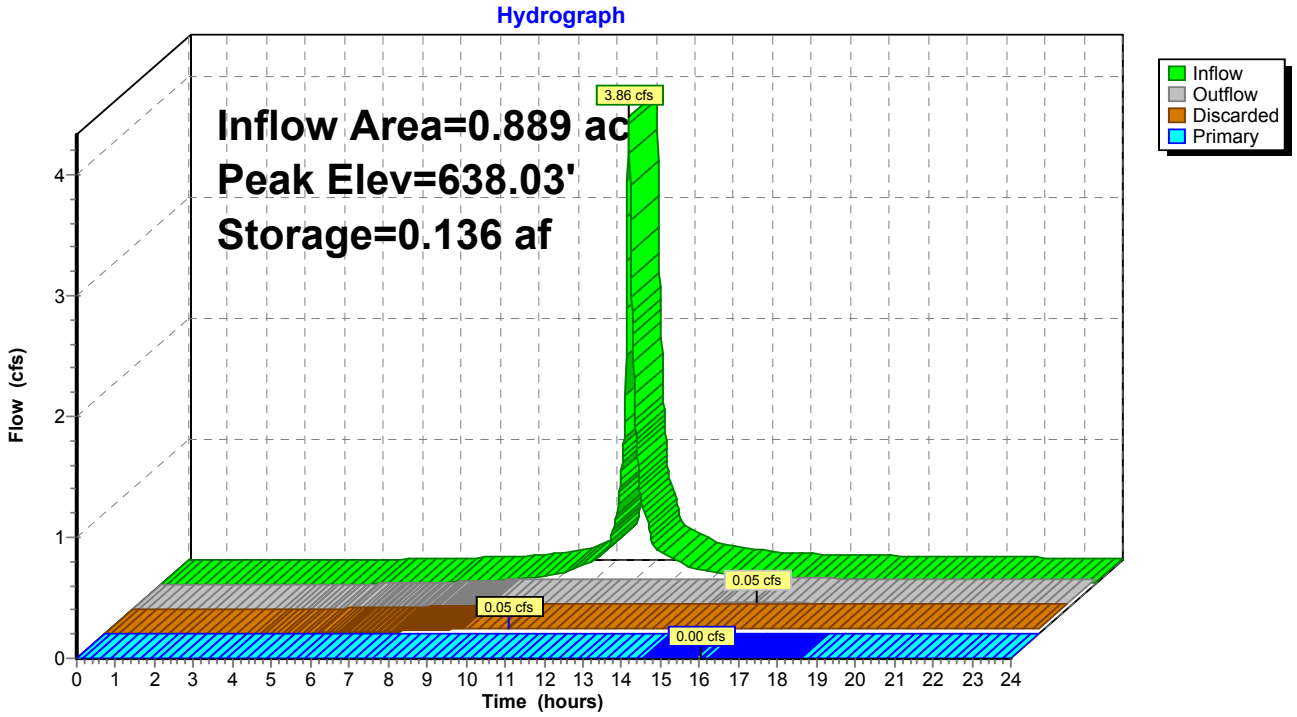
14,687.8 cf Field - 5,297.2 cf Chambers = 9,390.5 cf Stone x 40.0% Voids = 3,756.2 cf Stone Storage

Chamber Storage + Stone Storage = 9,053.5 cf = 0.208 af
Overall Storage Efficiency = 61.6%
Overall System Size = 166.20' x 25.25' x 3.50'

115 Chambers
544.0 cy Field
347.8 cy Stone



Pond 2P: Underground Infiltration



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: DA-1 Runoff Area=38,741 sf 96.50% Impervious Runoff Depth>7.07"
Tc=5.0 min CN=96 Runoff=8.81 cfs 0.524 af

Subcatchment2S: DA-2 Runoff Area=14,390 sf 22.90% Impervious Runoff Depth>2.28"
Tc=5.0 min CN=53 Runoff=1.07 cfs 0.063 af

Reach 3R: Proposed Runoff Inflow=8.77 cfs 0.367 af
Outflow=8.77 cfs 0.367 af

Pond 2P: Underground Infiltration Peak Elev=639.66' Storage=0.209 af Inflow=8.81 cfs 0.524 af
Discarded=0.05 cfs 0.083 af Primary=7.86 cfs 0.304 af Outflow=7.91 cfs 0.387 af

Total Runoff Area = 1.220 ac Runoff Volume = 0.587 af Average Runoff Depth = 5.77"
23.43% Pervious = 0.286 ac 76.57% Impervious = 0.934 ac

Summary for Subcatchment 1S: DA-1

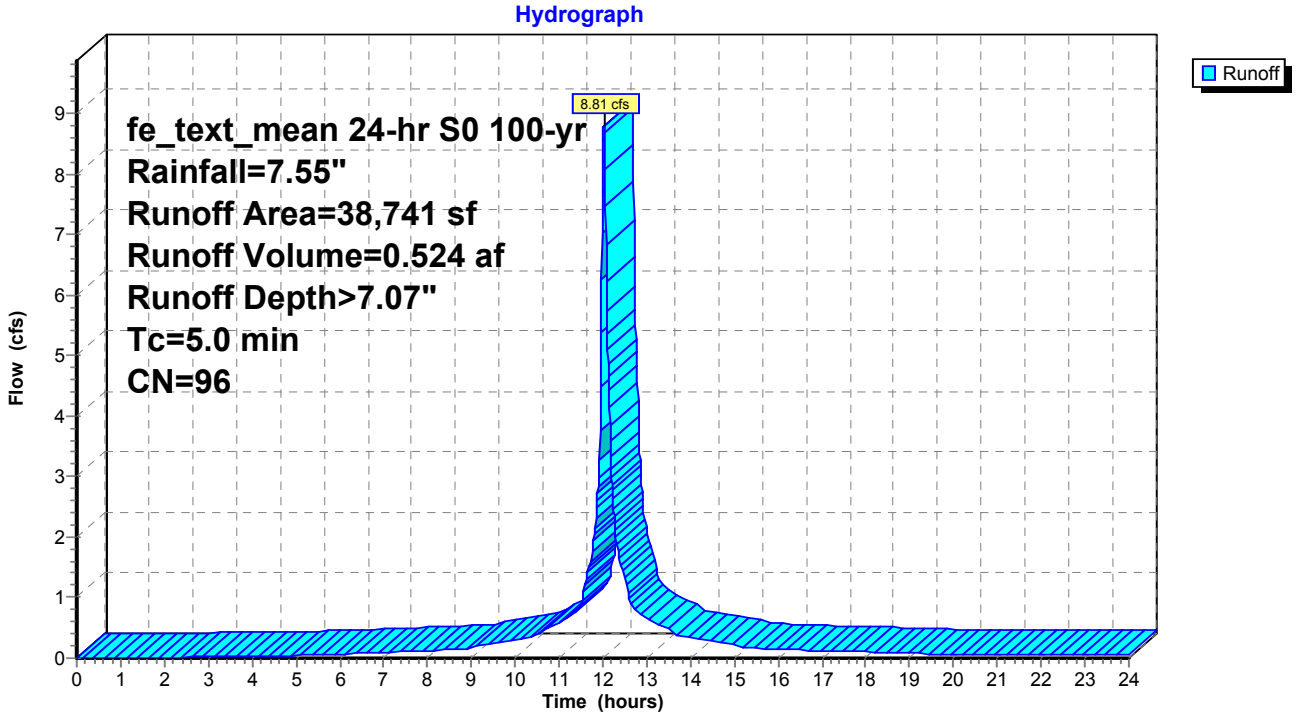
Runoff = 8.81 cfs @ 12.03 hrs, Volume= 0.524 af, Depth> 7.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
fe_text_mean 24-hr S0 100-yr Rainfall=7.55"

Area (sf)	CN	Description
1,355	39	>75% Grass cover, Good, HSG A
21,574	98	Roofs, HSG A
15,812	98	Paved parking, HSG A
38,741	96	Weighted Average
1,355		3.50% Pervious Area
37,386		96.50% Impervious Area

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

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

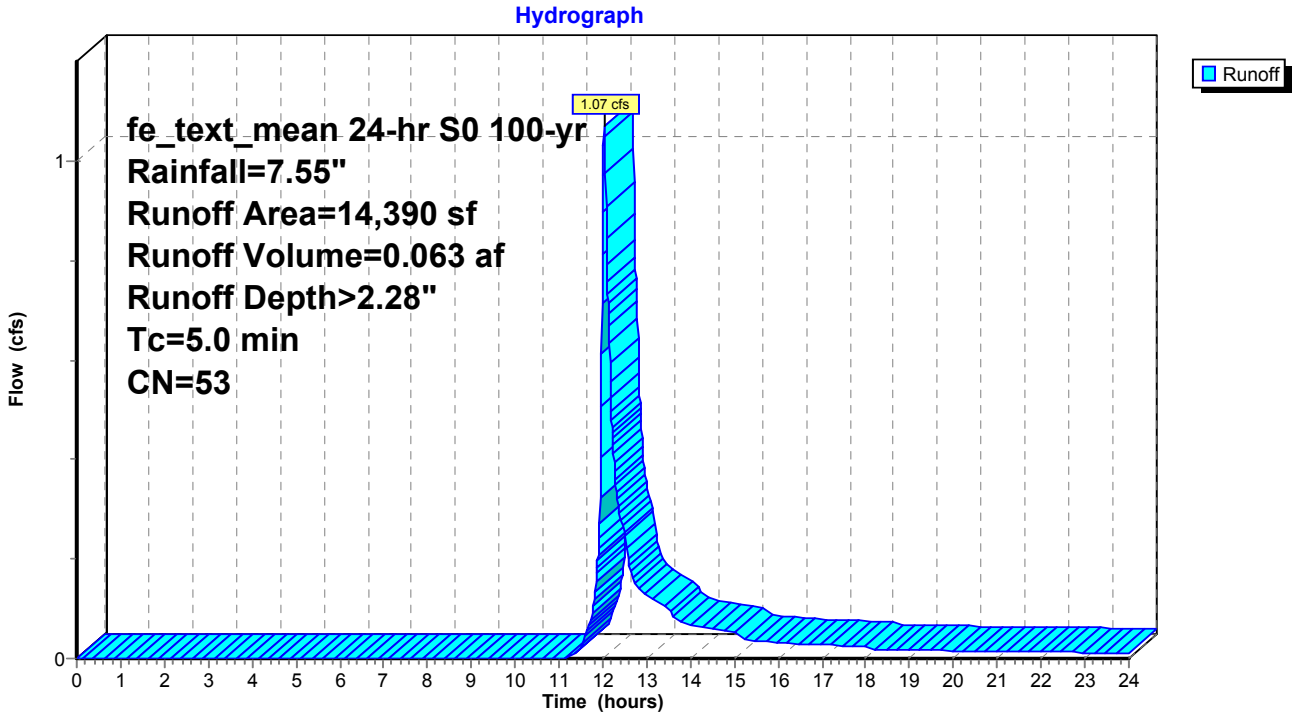
Runoff = 1.07 cfs @ 12.04 hrs, Volume= 0.063 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
fe_text_mean 24-hr S0 100-yr Rainfall=7.55"

Area (sf)	CN	Description
11,095	39	>75% Grass cover, Good, HSG A
3,295	98	Paved parking, HSG A
14,390	53	Weighted Average
11,095		77.10% Pervious Area
3,295		22.90% Impervious Area

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

Subcatchment 2S: DA-2

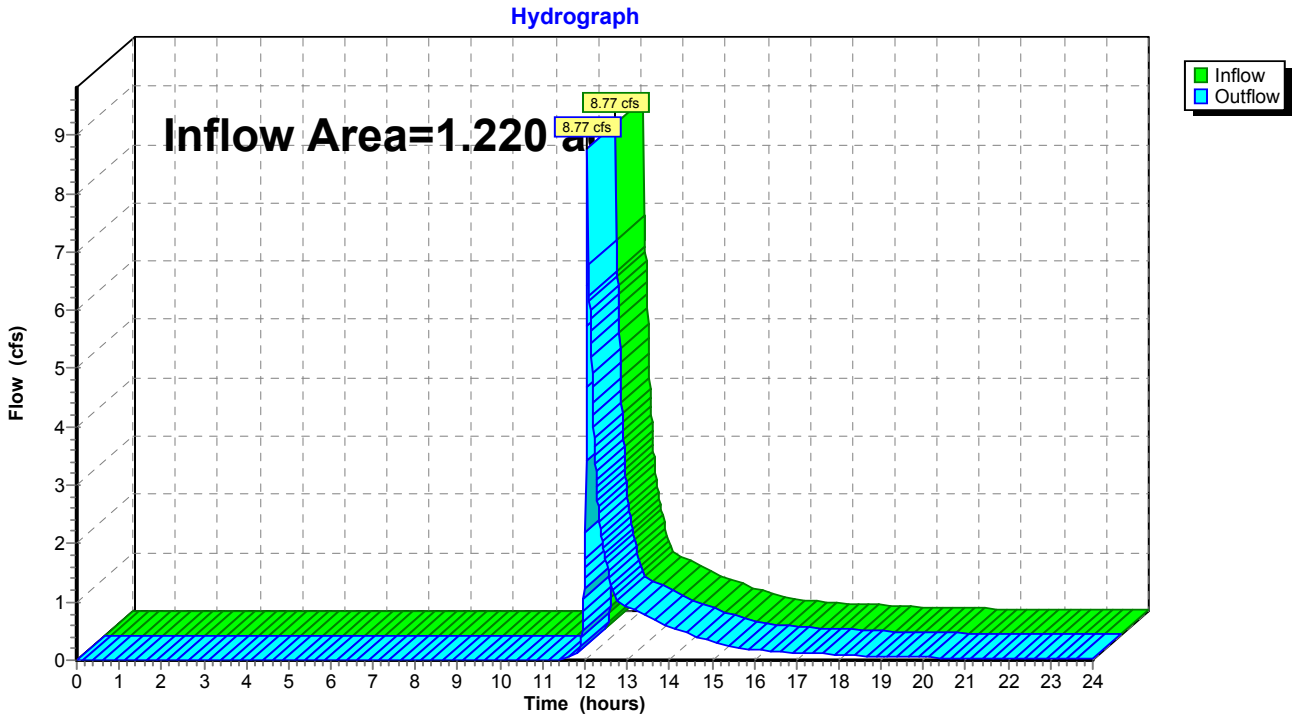


Summary for Reach 3R: Proposed Runoff

Inflow Area = 1.220 ac, 76.57% Impervious, Inflow Depth > 3.61" for 100-yr event
Inflow = 8.77 cfs @ 12.07 hrs, Volume= 0.367 af
Outflow = 8.77 cfs @ 12.07 hrs, Volume= 0.367 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach 3R: Proposed Runoff



Summary for Pond 2P: Underground Infiltration

Inflow Area = 0.889 ac, 96.50% Impervious, Inflow Depth > 7.07" for 100-yr event
Inflow = 8.81 cfs @ 12.03 hrs, Volume= 0.524 af
Outflow = 7.91 cfs @ 12.07 hrs, Volume= 0.387 af, Atten= 10%, Lag= 2.6 min
Discarded = 0.05 cfs @ 6.77 hrs, Volume= 0.083 af
Primary = 7.86 cfs @ 12.07 hrs, Volume= 0.304 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 639.66' @ 12.07 hrs Surf.Area= 0.097 ac Storage= 0.209 af

Plug-Flow detention time= 139.7 min calculated for 0.387 af (74% of inflow)
Center-of-Mass det. time= 65.5 min (814.3 - 748.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	636.00'	0.086 af	**25.25'W x 166.20'L x 3.50'H Field A** 0.337 af Overall - 0.122 af Embedded = 0.216 af x 40.0% Voids
#2A	636.50'	0.122 af	**ADS_StormTech SC-740** x 115 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 5 rows
#3	636.00'	0.001 af	**4.00'D x 5.00'H Vertical Cone/Cylinder**
		0.209 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	638.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	636.00'	**0.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	639.00'	**4.0' long x 3.50' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.05 cfs @ 6.77 hrs HW=636.07' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=7.84 cfs @ 12.07 hrs HW=639.66' TW=0.00' (Dynamic Tailwater)
├**1=Orifice/Grate** (Orifice Controls 1.12 cfs @ 5.71 fps)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 6.72 cfs @ 2.65 fps)

Pond 2P: Underground Infiltration - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 (ADS StormTech® SC-740 without end caps)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
Row Length Adjustment= +0.44' x 6.45 sf x 5 rows

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

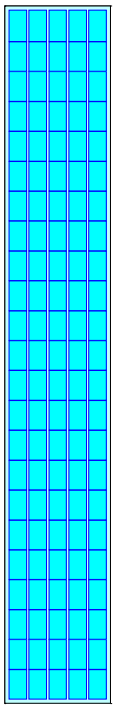
23 Chambers/Row x 7.12' Long +0.44' Row Adjustment = 164.20' Row Length +12.0" End Stone x 2 = 166.20' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

115 Chambers x 45.9 cf +0.44' Row Adjustment x 6.45 sf x 5 Rows = 5,297.2 cf Chamber Storage

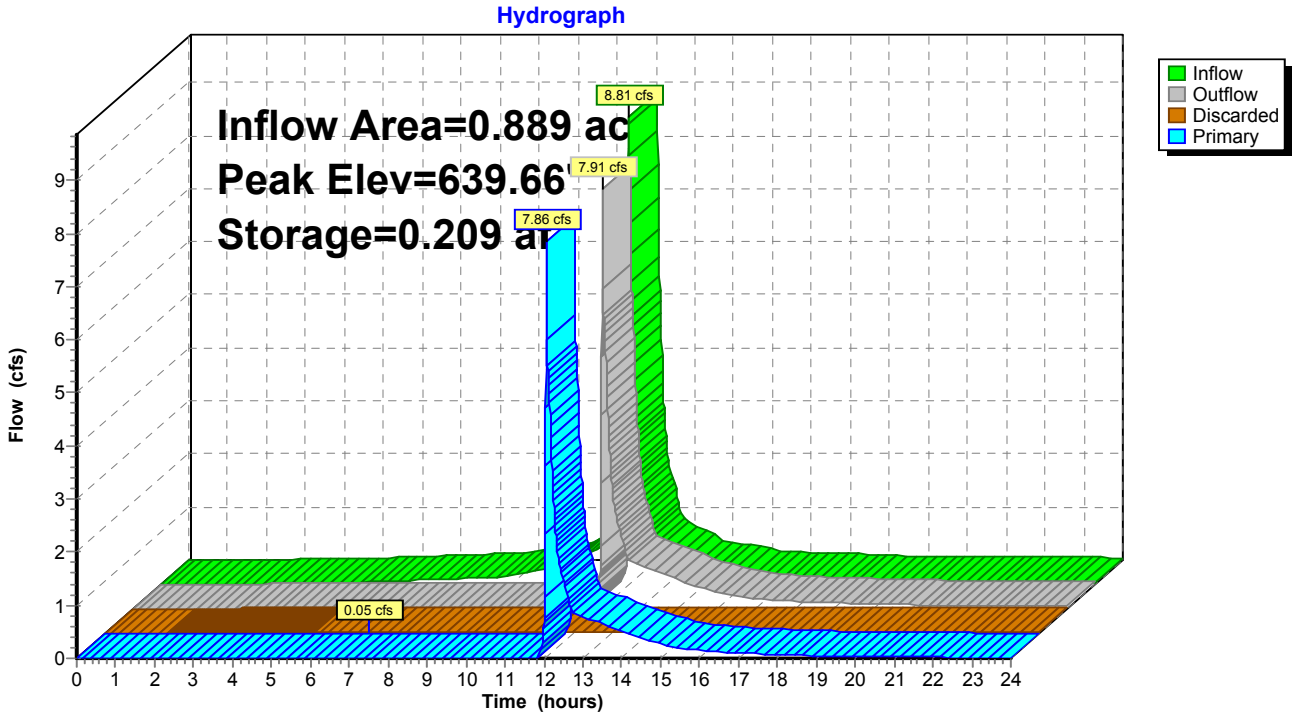
14,687.8 cf Field - 5,297.2 cf Chambers = 9,390.5 cf Stone x 40.0% Voids = 3,756.2 cf Stone Storage

Chamber Storage + Stone Storage = 9,053.5 cf = 0.208 af
Overall Storage Efficiency = 61.6%
Overall System Size = 166.20' x 25.25' x 3.50'

115 Chambers
544.0 cy Field
347.8 cy Stone



Pond 2P: Underground Infiltration



Data file name: S:\Projects\19000 PROJ\19600-19699\19647 Kane St - St James St ALTA-CSM-La Crosse WI\19647 Civil-Survey\Civil Calcs\WinSLAMM\19647 Proposed Conditions.mdb
WinSLAMM Version 10.2.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Minneapolis MN 1959.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_Res and Other Urban Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban 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\WI_Res and Other Urban 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: 01/02/59 Study period ending date: 12/28/59
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 11-30-2017 Time: 17:37:54
Site information:

LU# 1 - Residential: DA-1 Total area (ac): 0.889
1 - Roofs 1: 0.495 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.330 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.033 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.031 ac. Moderately Compacted Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Biofilter CP# 1 (DS) - Underground Infiltration
1. Top area (square feet) = 2260
2. Bottom aea (square feet) = 2260
3. Depth (ft): 4
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8

16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 4
2. Weir crest width (ft): 0.5
3. Height of datum to bottom of weir opening: 3.5

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 0.833
2. Pipe invert elevation above datum (ft): 2
3. Number of surface pipe outlets: 1

SLAMM for Windows Version 10.2.1

Data file name: S:\Projects\19000 PROJ\19600-19699\19647 Kane St - St James St ALTA-CSM-La Crosse WI\19647 Civil-Survey\Civil Calcs\WinSLAMM\19647 Proposed Conditions.mdb
Data file description:
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Minneapolis MN 1959.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_Res and Other Urban Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban 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\WI_Res and Other Urban Dec06.std
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/02/59 Model Run End Date: 12/28/59
Date of run: 11-30-2017 Time of run: 17:38:03
Total Area Modeled (acres): 0.889
Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	63710	-	72.29	287.5	-
Outfall Total with Controls:	2809	95.59%	75.11	13.17	95.42%
Annualized Total After Outfall Controls:	2848			13.36	

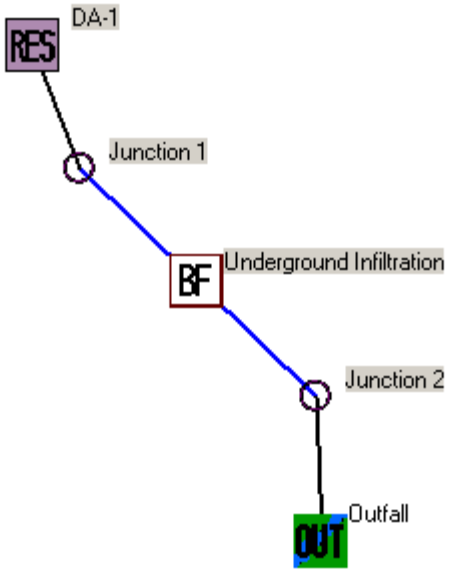


Figure 1. Model Overview

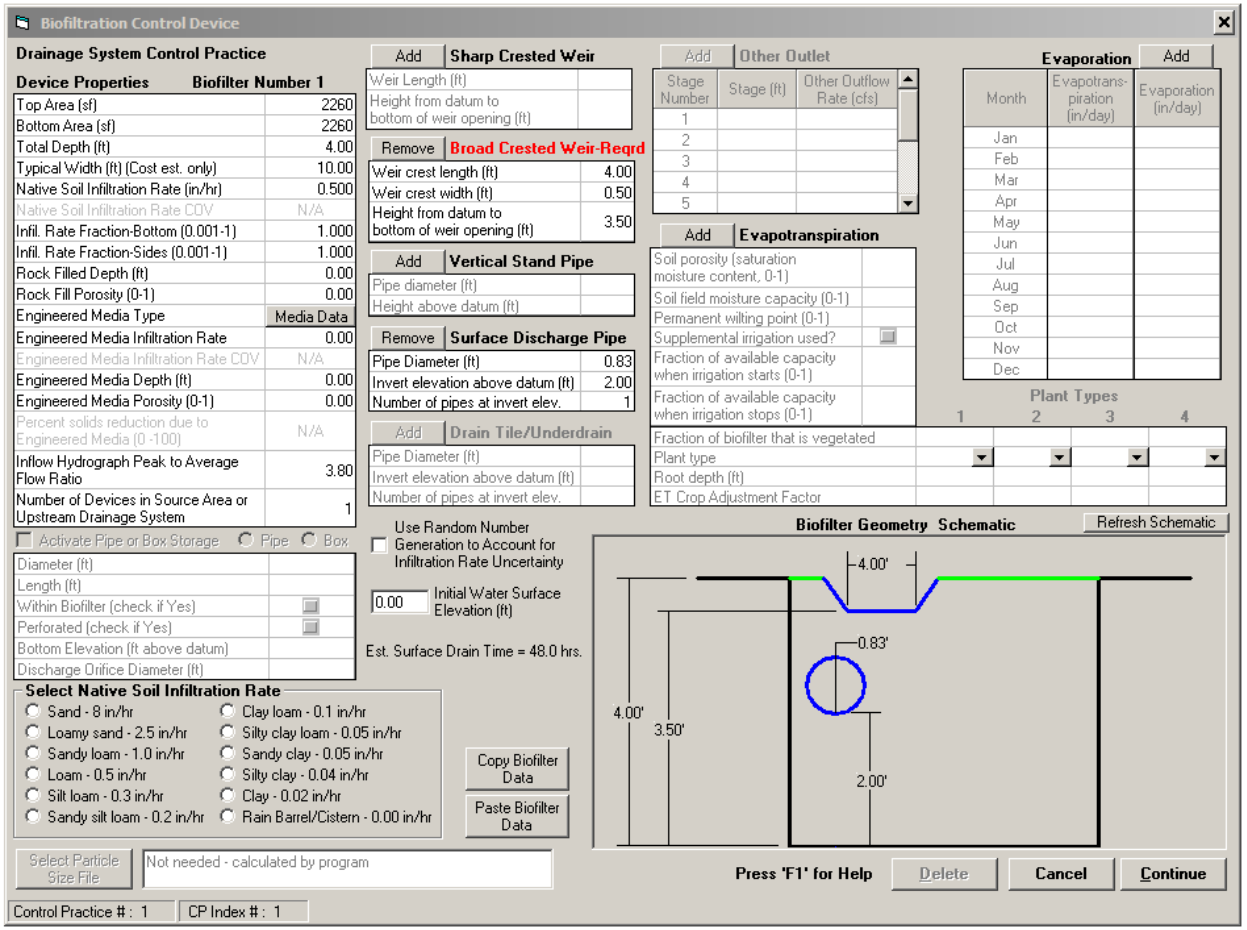


Figure 2. Underground Infiltration System

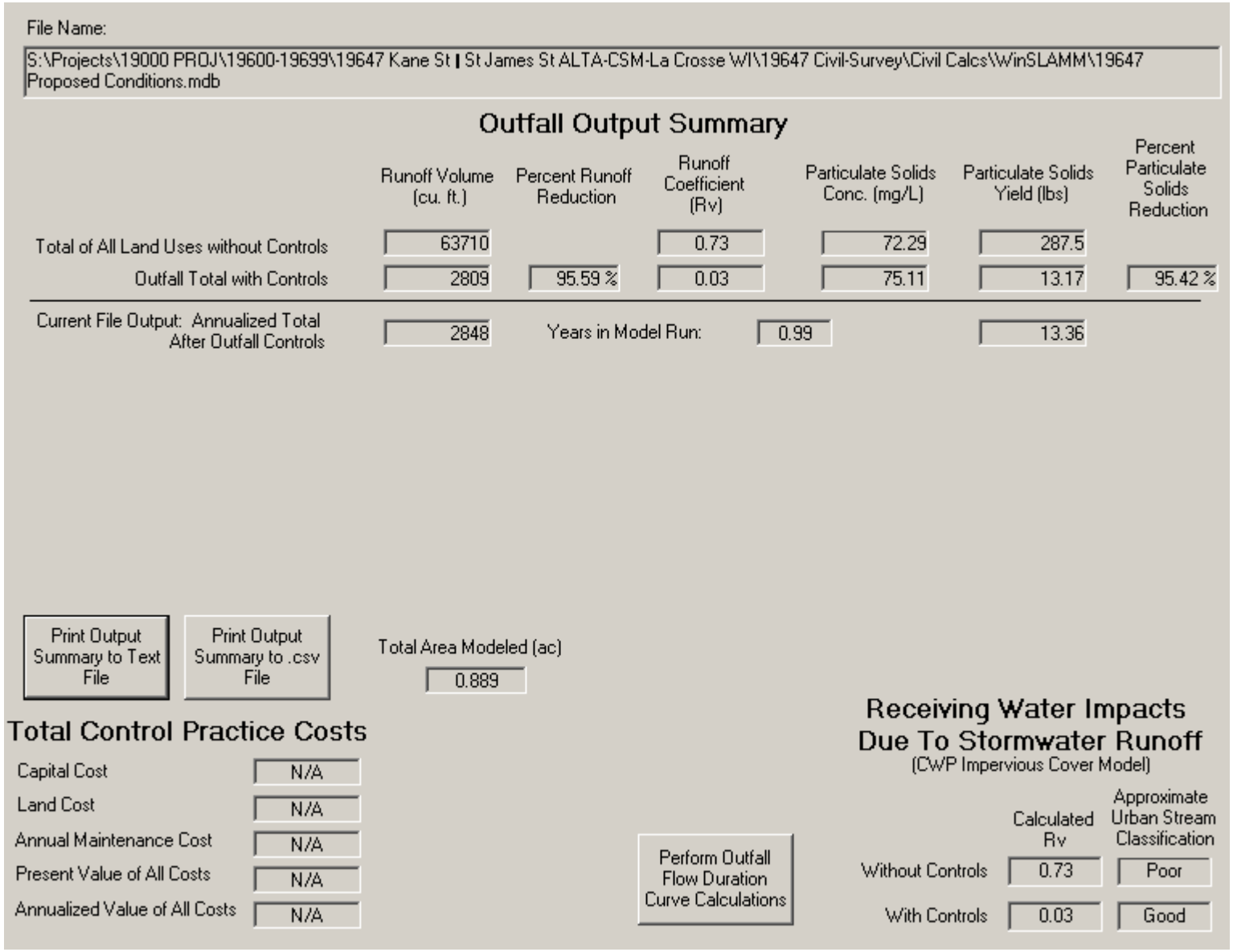


Figure 3. Output Summary

BMP Inspection Schedule and Checklist

ISG

Stormwater Maintenance Schedule and Inspection List

Facility ID: Garden Terrace Multifamily Apartments

Location: La Crosse, WI

GPS Coordinates: Lat: 43.835230 Long: -91.241421

Inspector(s):

Date:

Time:

Party/Department Responsible for Maintenance:

Contact(s):

Phone Number(s):

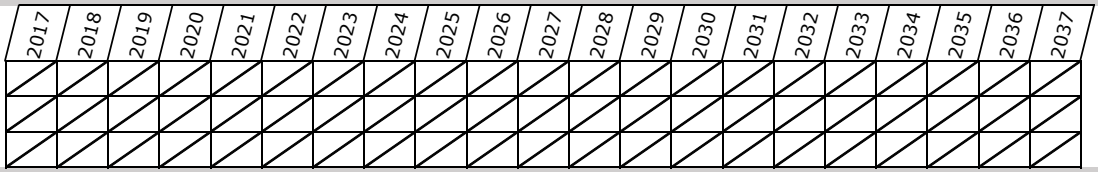
Email:

Mailing Address:

BMP Inspection Schedule and Checklist

A. Inlets
1 = Good Condition
2 = Acceptable, Item on Watch
3 = Item Requires Maintenance Within the Year
4 = Failed Item, Requires Immediate Maintenance

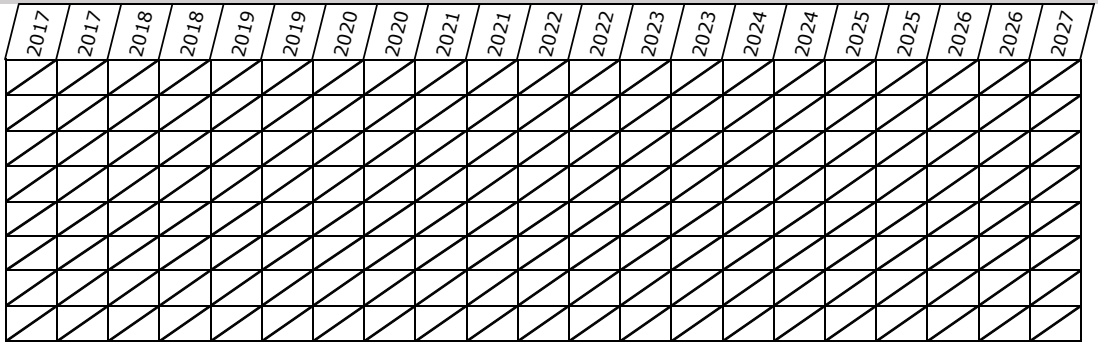
Note: All items associated with Pretreatment shall be inspected twice a year.
Once in early Spring and once in late Fall.



1. Inlets provide stable conveyance into facility
2. Excessive trash/debris/sediment accumulation at inlet
3. Evidence of erosion at/around inlet

B. Underground Infiltration System
1 = Good Condition
2 = Acceptable, Item on Watch
3 = Item Requires Maintenance Within the Year
4 = Failed Item, Requires Immediate Maintenance

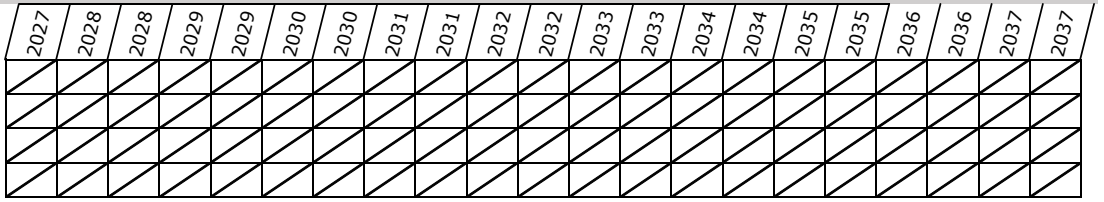
Note: All items associated with the Facility shall be inspected quarterly or as otherwise noted.



1. Maintenance access to facility
2. Excessive sediment accumulation
3. Standing water observed in basin over 2 days after rainfall
4. Is there evidence of pollution entering pond? Y/N. Where?
5. Outlets
   a. Maintenance access to outlet
   b. Outlet condition
   d. Trash/debris accumulation (Remove as quickly as possible)

B. Underground Infiltration System
1 = Good Condition
2 = Acceptable, Item on Watch
3 = Item Requires Maintenance Within the Year
4 = Failed Item, Requires Immediate Maintenance

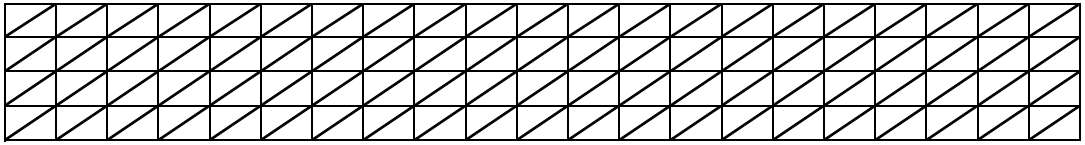
Note: All items associated with the Facility shall be inspected quarterly or as otherwise noted.



1. Maintenance access to facility
2. Excessive sediment accumulation
3. Standing water observed in basin over 2 days after rainfall
4. Is there evidence of pollution entering pond? Y/N. Where?

BMP Inspection Schedule and Checklist

5. Outlets
   a. Maintenance access to outlet
   b. Outlet condition
   d. Trash/debris accumulation (Remove as quickly as possible)



BMP Inspection Schedule and Checklist

C. Outlets
1 = Good Condition
2 = Acceptable, Item on Watch
3 = Item Requires Maintenance Within the Year
4 = Failed Item, Requires Immediate Maintenance

Note: All items associated with Outlets shall be inspected twice a year.
Once in the early Spring and once in late Fall.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1. Outlets provide stable conveyance from facility																					
2. Excessive trash/debris/sediment accumulation at outlet																					
3. Evidence of erosion at/around outlet																					

D. Miscellaneous
1 = Good Condition
2 = Acceptable, Item on Watch
3 = Item Requires Maintenance Within the Year
4 = Failed Item, Requires Immediate Maintenance

Note: All miscellaneous items shall be inspected annually or as otherwise noted.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1. Complaints from local residents																					
2. Pest problems																					
4. Adequate safety signage																					

BMP Inspection Schedule and Checklist

Inspector's Summary

BMP Inspection Schedule and Checklist

Photographs	
Photo ID	Description
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	

Sketch of Facility

Post-Construction Stormwater Management Maintenance Plan

Garden Terrace Multifamily Apartments – La Crosse, Wisconsin

This document will provide direction for performing an inspection and any necessary maintenance of stormwater management practices. It is the responsibility of the property owner to perform the inspections of the stormwater management practices and to perform maintenance as needed. This maintenance plan provides a map of the site which identifies all applicable maintenance areas.

The Inspection Process

Below are the inspection checklists to be completed on a scheduled interval stated on each checklist by the property owner or an assigned subcontractor. Refer to the Site Map for item identification.

Perform Necessary Maintenance

After performing the inspection process, any required maintenance must be performed by the property owner or an assigned subcontractor within 30 calendar days.

During inspections, if 3 inches or more sediment is observed on the bottom of the isolator row, maintenance should be performed. Maintenance shall include jetting and vacuuming the accumulated sediment according to manufacturer recommendations. If standing water is observed in the underground infiltration system greater than 48 hours after a storm event, the system may have become clogged. Refer to manufacturer recommendations for further maintenance requirements to repair the system. Outlet structure and pipe shall be cleaned annually (at a minimum) and as needed to remove trash/debris and sediment to provide proper conveyance from the underground infiltration system. All removed material shall be properly disposed in a landfill in accordance with state and local laws.

All removed sediment must be disposed of according to applicable regulations.

It is assumed that maintenance will consist of a combination of labor and equipment use to accomplish tasks ranging from sediment removal to trash cleanup.

Record Keeping

It is the responsibility of the property owner to maintain accurate inspection and maintenance records. Inspection and maintenance records shall be kept on site and made available to the City of La Crosse upon request.

Annual Compliance Reporting

The City may request an annual report by which the property owner has up to 30 days to fulfill the request by the City.

City Inspection and Maintenance

If at any point the property owner falls behind on the required inspections or maintenance, the City will perform an inspection at the cost of the property owner after sending a notice. If emergency maintenance is required and deemed necessary by the City, the City will perform the necessary maintenance at the property owner's cost.

Post-Construction Stormwater Management Maintenance Agreement

This Maintenance Agreement is made this _____ day of _____, by and between: _____, hereinafter referred to as "Grantor" and the City of La Crosse hereinafter referred to as the "Grantee".

WITNESSETH

WHEREAS, the "Grantee" is authorized to regulate and control disposition of storm and surface waters within the City of La Crosse as set forth by the City of La Crosse, Wisconsin code of ordinances; and

WHEREAS, the Grantor is the owner of the certain tract or parcel of land more particularly described as:

MC CONNELL & WHITTLESEY ADDN PRT LOTS 8, 9, 10, 11 & 14 & ALL LOTS 12 & 13 BLOCK 10 & PRT VAC ST CLOUD ST BEING PRT SE-NW BEG SW COR LOT 14 ON N R/W LN HAGAR ST & E R/W LN 20FT ALLEY NLY ALG E R/W LN 151.61FT TO SW COR LOT 11 ALG E R/W LN NELY 202.64FT TO S R/W LN ST CLOUD ST DESC IN V759 P191 WHICH VAC A PORTION OF ST CLOUD ST R/W ELY ALG S R/W LN TO INTER W R/W LN KANE ST SLY ALG W R/W LN 19.79FT TO NE COR LOT 8 SLY ALG W R/W LN TO INTER N R/W LN HAGAR ST OPENED IN V1044 P827 WLY ALG N R/W LN 153.53FT TO POB

such property being hereinafter referred to as "the property."

WHEREAS, the Grantor desires to construct certain improvements on the property which will alter existing storm and surface water conditions on the property and adjacent lands; and

WHEREAS, in order to accommodate and regulate these anticipated changes in existing storm and surface water flow conditions, the Grantor, its successors and assigns, desire to build and maintain at their expense a storm and surface water management facility and system more specifically described as underground infiltration system as shown on the construction documents and specifications labeled GARDEN TERRACE MULTIFAMILY APARTMENTS - LA CROSSE, WI and dated _____, copies of which are attached here to as Exhibit A; and

WHEREAS, the Grantee has reviewed and approved these plans subject to execution of this agreement.

NOW THEREFORE, in consideration of the benefit received by the Grantor, its heirs and assigns, and as a result of the City of La Crosse's approval of its plans, the Grantor, its successors and assigns, with full authority to execute this Maintenance Agreement hereby covenants with the City of La Crosse as follows:

1. Grantor, its successors and assigns shall construct and perpetually maintain, at its sole expense, the above referenced storm and surface water management facility and system in strict accordance with the plan approval granted by the City of La Crosse.
2. Grantor, its successors and assigns shall, at its sole expense, make such changes or modifications to the storm and surface water management facility and system as may, at the City of La Crosse's discretion, and within its lawful regulatory authority, be determined necessary to ensure that the facility and system are properly maintained and continues to operate as designed and approved.
3. The City of La Crosse, its agents, employees and contractors shall have the perpetual right of ingress and egress over the Property to inspect the storm and surface water management facility and system to ensure that the system is being properly maintained and is continuing to perform in an adequate manner.
4. The Grantor, its successors and assigns agree that should it fail to correct any defects in the above described facility and system within ten days from the issuance of written notice, or shall fail to maintain the facility in accordance with the approved design standards and in accordance with the law and applicable

regulations, or in the event of an emergency as determined by the City of La Crosse in its sole discretion, the City of La Crosse is authorized to enter the Property to make all repairs, and to perform all maintenance, construction and reconstruction the City of La Crosse deems necessary. The City of La Crosse shall assess the Grantor, its successors or assigns for the cost of the work and applicable penalties per City of La Crosse ordinances. Said assessment shall be a lien against all properties described within this Maintenance Agreement and may be placed on the property tax bills of said properties and collected as ordinary taxes by the City of La Crosse.

5. Grantor, its successors and assigns shall indemnify, hold harmless and defend the City of La Crosse from and against any and all claims, demands, suits, liabilities, losses, damages and payments, including attorney fees claimed or made against the City of La Crosse that are alleged or proven to result or arise from the failure of Grantor or Grantor's successors or assigns to comply with the terms and conditions of the Maintenance Agreement.
6. The Covenants contained herein shall run with the land and the Grantor, its successors and assigns further agree whenever the Property shall be held, sold and conveyed, it shall be subject to the covenants, stipulations, agreements and provisions of this Agreement, which shall apply to, bind all present and subsequent owners of the Property described herein, provided, however, that the Grantor and its successors and assigns shall have no further liability under this Maintenance Agreement after such party has transferred its fee simple interest in the Property, except for any obligations that occurred during such party's period of ownership.
7. The provisions of this Maintenance Agreement shall be severable and if any phase, clause, sentence, or provision is declared unconstitutional, or the applicability to the Grantor, its successors and assigns is held invalid, the remainder of this Agreement shall not be affected thereby.
8. The Maintenance Agreement shall be recorded with the La Crosse City Recorder's Office at the Grantor's expense.
9. In the event that the City of La Crosse shall determine in its sole discretion at any future time that this Maintenance Agreement is no longer required, then the City of La Crosse and the Grantor or its successors or assigns, shall execute a release of this Maintenance Agreement, which the Grantor, its successors and assigns shall record, in the La Crosse City Recorder's Office at its expense.

IN WITNESS THEREOF, the Grantor has executed this Maintenance Agreement
On the _____ day of _____.

By Officer or Authorized Agent:_____

Title:_____

Date:_____

State of Wisconsin:
City of La Crosse:

To with: The foregoing instrument was acknowledged before me this _____ day of _____,
by _____

Notary Public

My Commission Expires:_____

Exhibit A