VILLAGE OF WINDSOR
BOARD RESOLUTION 2019-21

APPROVAL OF A CERTIFIED SURVEY MAP FOR PROPERTY LOCATED AT THE SOUTHEAST INTERSECTION OF WINDSOR ROAD AND NORTH TOWNE ROAD, FURTHER DESCRIBED AS LOTS 1 & 2 OF CERTIFIED SURVEY MAP 14307 IN THE VILLAGE OF WINDSOR, DANE COUNTY

WHEREAS, Forward Development Group, LLC (the "Petitioner") has requested approval of a Certified Survey Map to divide land into two (2) lots and two (2) outlots; and

WHEREAS, the Petitioner has further requested rescission of Plan Commission Resolution 2018-13 and Village Board Resolution 2018-57 approvals in deference to the revised Certified Survey Map; and

WHEREAS, the Petitioner obtained approval of the revised Certified Survey Map request in Plan Commission Resolution 2019-04; and

WHEREAS, the Village Director of Planning / Zoning Administrator has reviewed the Petitioner's request and prepared a Staff Report dated March 28, 2019 recommending approval, subject to certain conditions specified in the Staff Report; and

WHEREAS, following review of information presented at the Plan Commission meeting, Public Hearing, Village Board meeting and the Staff Report, the Village Board approves the Certified Survey Map request, subject to the conditions specified in the Staff Report and as set forth herein.

NOW, THEREFORE, BE IT RESOLVED by the Village Board of the Village of Windsor as follows:

The Village of Windsor Board **Approves** of the Certified Survey Map request for Forward Development Group, LLC located on Lot 1 and Lot 2 of Certified Survey Map No. 14307, subject to the following conditions:

1. The Village Board hereby rescinds approval of Village Board Resolution 2018-57.
2. The Petitioner shall address the technical comments set forth in the Village Staff Comments section of the Staff Report to the satisfaction of the Village Director of Planning / Zoning Administrator and Village Engineer.
3. The Petitioner shall prepare and record an access easement agreement, for Lot 1 and Lot 2, in a form approved by the Village Attorney.
4. The access easement shall comply with the requirements of Chapter 42, *Roads, Paths and Other Public Rights-of-Way,* of the Windsor Code of Ordinances.
5. The Petitioner shall obtain approval of an Erosion & Sedimentation Control Plan and Stormwater Management Plan by the Village of Windsor and Dane County Land & Water Resources. The Petitioner shall comply with any and all recommendations by the Village of Windsor and Dane County Land & Water Resources prior to the start of construction.

6. The Petitioner shall promptly reimburse the Village of Windsor for all costs and expenses incurred by Windsor in connection with the review and approval of the Certified Survey Map request, including, but not limited to, the cost of professional services incurred by the Village of Windsor for the review and preparation of required documents, attendance at meetings or other related professional services.
7. The Village of Windsor Board's recommendation of the Certified Survey Map request expires one hundred-eighty (180) days from the date of adoption of this Resolution. Time is of the essence. If the Petitioner encounters an unforeseen development delay, as determined by the Zoning Administrator, the Zoning Administrator is authorized to extend the one hundred-eighty (180) day expiration, one time, up to an additional one hundred-twenty (120) days. If the Petitioner has not complied with all of the conditions prior to expiration, the approval shall be null and void and the matter will need to be resubmitted to the Village for review as an initial application.

The above and foregoing Resolution was duly adopted at a meeting of the Village Board of the Village of Windsor held on April 4, 2019, by a vote of 3 in favor and 0 opposed.

VILLAGE OF WINDSOR

Robert E. Wipperfurth

Robert E. Wipperfurth, President

Attested by:

Christine Capstran

Christine Capstran, Village Clerk

INCORPORATED BY REFERENCE:
Staff Report
Plan Commission Resolution 2019-04
Village Board Resolution 2018-57

V1

Windsor
Growing Forward

To:	Village of Windsor Board
Cc:	Robert Wipperfurth, Tina Butteris, Christine Capstran, William Cole
From:	Amy Anderson Schweppe, Jamie Rybarczyk
Rpt Date:	March 28, 2019
Mtg Date:	April 04, 2019
Submtl Date:	February 11, 2019
Aprvl Date:	May 12, 2019
Re:	Windsor Crossing (Commercial Node) – Certified Survey Map Request

BACKGROUND:

Petitioner: Forward Development Group, LLC

Property Owner: Windsor Crossing, LLC & Windsor Community Development Authority

Location / Address: Lot 1 & Lot 2, Certified Survey Map No 14307

Taxkey Number: 196/0910-294-8445-1 & 196/0910-294-8420-1

Area: 11.98 acres

Existing Zoning: C-1, Limited Commercial District

Proposed Zoning: NA

Future Land Use: Neighborhood Mixed Use

REQUEST:

The Petitioner is requesting discussion and action by the Village Board for a Certified Survey Map subdividing Lot 1 and Lot 2 of Certified Survey Map 14307. The request consists of two action items:

1. Rescind Plan Commission Resolution 2018-13 and Village Board Resolution 2018-57 approvals; and
2. Approval of a revised Certified Survey Map including private access and utility easements.

See Exhibit A for additional information regarding the Petitioner's request.

OVERVIEW:

The revised Certified Survey Map consists of two lots for commercial end users and two outlots. Lot 1 is planned for the Summit Credit Union that was reviewed and approved by the Village of Windsor in 2018. Lot 2 is planned for undetermined commercial user(s). Outlot 2 provides

access to the planned Village Center and surrounding end users to be constructed on Outlot 1. Access to Lots 1 and 2 are provided by an access easement along the eastern border of each lot.

VILLAGE STAFF COMMENTS:

The Planning, Zoning and Development Department provides the Village Board with the following **planning, zoning and development** comment(s):

1. *Village of Windsor Code of Ordinances: Chapter 38 Planning and Development*

   The Certified Survey Map shall address the following technical comments:

   a. The final Certified Survey Map must be signed, sealed and dated by the professional surveyor.

   b. There is some text underneath the Surveyor's stamp on sheet 4 of 7 that should be deleted.

   c. The ATC electric transmission line easement shown on sheet 4 of 7 should be shown with bearings and distances to enable the plotting of said easement.

   d. The access easement and the utility easement on sheet 5 of 7 should include the document numbers and some dimensions to enable the plotting of said easements.

   e. The consent of Mortgagee on sheet 6 of 7 includes the consent of dedication, this should be removed if no dedication is involved.

   f. The Corporate Owner Certificate should have Jamie Rybarczyk as the Executive Director of the Community Development Authority.

   g. The Village of Windsor Approval Certificate should have Christine Capstran as Village Clerk.

The Engineering Department provides the Village Board with the following **engineering** comment(s):

1. General Comments: Forward Development Group submitted various items for review to allow for the development of the first phase of the Windsor Crossing Village Center project. Plans and submittals have February, 2019 dates.

   Major items submitted included, various CSM and easement documents, Utility Plans, Soils Report, and Stormwater Management Plan.

   The Engineering Department will request opinions of probable project costs for all components of the project, including roads, water supply, sanitary sewer, storm sewer, and erosion control.

2. CSM and Easement Documents: The Engineering Department reviewed the CSM and Easement documents for overall general intent and have no objections with the proposed changes that vacate the roads and create easements for utilities.

3. Utility Plans: The Utility plans have been modified per the Engineering Department's latest round of reviews. The Engineering Department has no objections to the plans or general layout. Please note the following:

   a. The Village Engineer has been changed from Kevin Richardson to Jerry Groth.

b. The hydrant at Station 10+47.75 and the proposed tree are too close. Suggest moving the hydrant or tree for additional separation.

c. Provide chimney seals, hydrant flags, and other materials as denoted in the Windsor Utility Specifications.

d. Obtain DNR and MMSD approvals for water and sanitary sewer.

4. Soils Report: The soils report is from 2007. The Engineering Department understands that the report is for reference and is acceptable.

5. Stormwater Management Plan: Stormwater will be routed to existing basins developed for the Village Center. As such a detailed review of the report is not warranted.

   The Petitioner shall submit the Stormwater Management Plan to Dane County along with obtaining Erosion Control permits.

The DeForest Windsor Fire & EMS District provides the Village Board with the following **fire and emergency services** comment(s):

1. The DeForest Windsor Fire & EMS District has no objections to the Certified Survey Map.

VILLAGE POLICY COMMENTS/CONCERNS:

The Village Staff provides the Village Board with the following policy comments/concerns that require further discussion and action:

1. The Petitioner shall prepare an access easement agreement, for Lot 1 and Lot 2, in a form approved by the Village Attorney.

VILLAGE PLAN COMMISSION RECOMMENDATION:

On March 14, 2019 the Village Plan Commission recommended to the Village Board approval of the Certified Survey Map request for Forward Development Group, LLC located on Lot 1 and Lot 2 of Certified Survey Map No. 14307, by Plan Commission Resolution 2019-04.

Exhibit B provides the unofficial meeting minutes for the Village Plan Commission regarding the Petitioner's request.

VILLAGE STAFF RECOMMENDATION:

Depending on confirmation by the Village of Windsor Board of the above described comments, the Village of Windsor Board may take the following action:

The Village of Windsor Board **Approves** of the Certified Survey Map request for Forward Development Group, LLC located on Lot 1 and Lot 2 of Certified Survey Map No. 14307, subject to the following conditions:

1. The Village Board hereby rescinds approval of Village Board Resolution 2018-57, conditioned upon Village Board approval of the revised Certified Survey Map.

2. The Petitioner shall address the technical comments set forth in the Village Staff Comments section of the Staff Report to the satisfaction of the Village Director of Planning / Zoning Administrator and Village Engineer.

3. The Petitioner shall prepare and record an access easement agreement, for Lot 1 and Lot 2, in a form approved by the Village Attorney.
4. The access easement shall comply with the requirements of Chapter 42, *Roads, Paths and Other Public Rights-of-Way*, of the Windsor Code of Ordinances.
5. The Petitioner shall obtain approval of an Erosion & Sedimentation Control Plan and Stormwater Management Plan by the Village of Windsor and Dane County Land & Water Resources. The Petitioner shall comply with any and all recommendations by the Village of Windsor and Dane County Land & Water Resources prior to the start of construction.
6. The Petitioner shall promptly reimburse the Village of Windsor for all costs and expenses incurred by Windsor in connection with the review and approval of the Certified Survey Map request, including, but not limited to, the cost of professional services incurred by the Village of Windsor for the review and preparation of required documents, attendance at meetings or other related professional services.
7. The Village of Windsor Board's recommendation of the Certified Survey Map request expires one hundred-eighty (180) days from the date of adoption of this Resolution. Time is of the essence. If the Petitioner encounters an unforeseen development delay, as determined by the Zoning Administrator, the Zoning Administrator is authorized to extend the one hundred-eighty (180) day expiration, one time, up to an additional one hundred-twenty (120) days. If the Petitioner has not complied with all of the conditions prior to expiration, the approval shall be null and void and the matter will need to be resubmitted to the Village for review as an initial application.

LOCATION MAP:

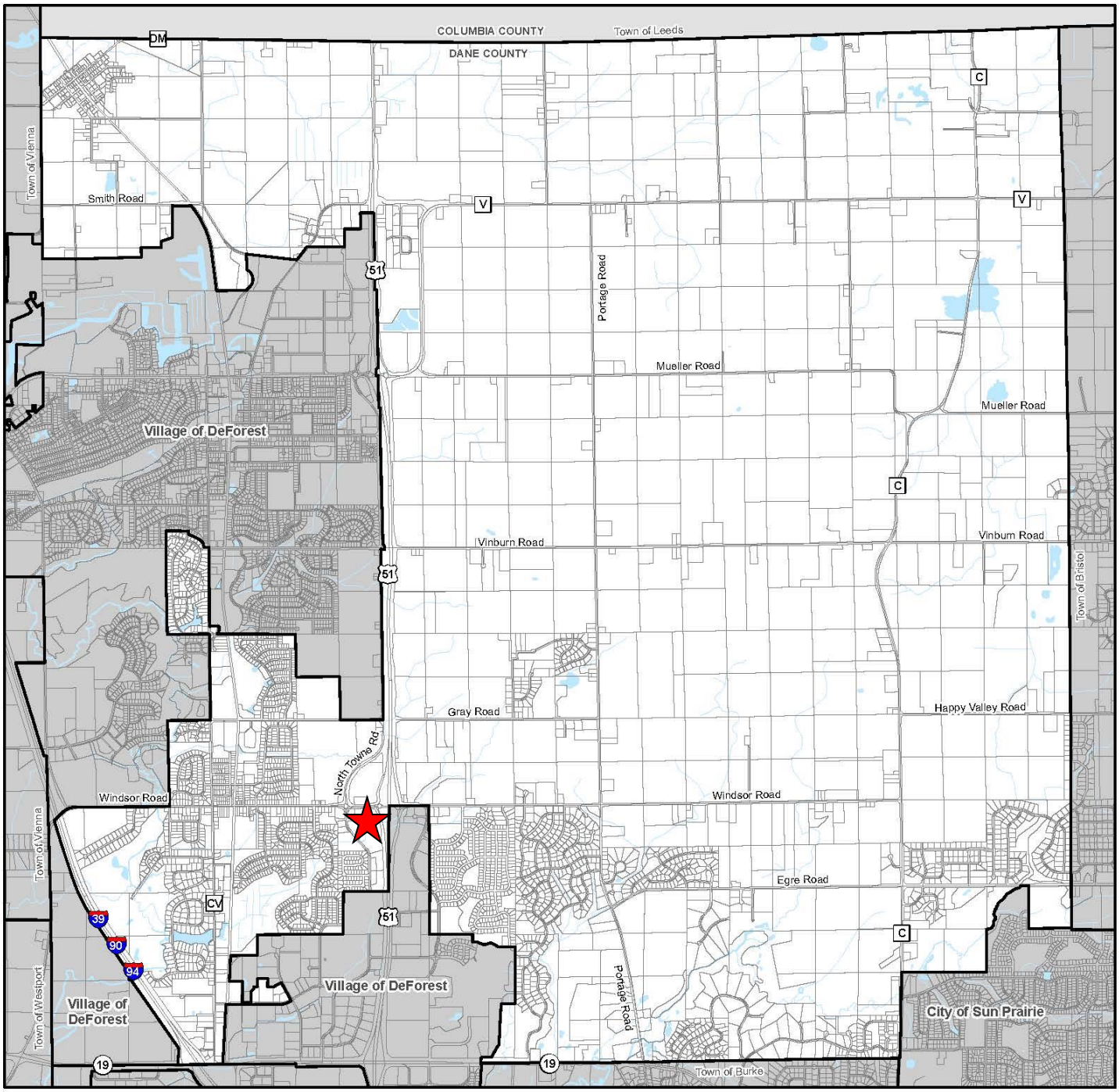


EXHIBIT:

A. Petitioner Application

B. Village Plan Commission Meeting Minutes (Unofficial) of March 14, 2019

Village of Windsor

Certified Survey Map Review

Certified Survey Map Application Form

The Village of Windsor Plan Commission typically meets on the second Thursday of every month at 6:00 p.m., and the Village Board typically reviews planning issues on the first Thursday of every month at 5:00 p.m. (or as otherwise scheduled) at the Windsor Municipal Building, 4084 Mueller Road. Applicants must submit an application for a Certified Survey Map no less than 30 days prior to the next regularly scheduled Plan Commission meeting.

The application shall: 1) be on forms made available from the Village and accompanied by the required fee and review escrow, and 2) include an electronic/digital pdf copy of all submitted drawings and supplementary data.

The applicant is responsible for adhering to all requirements of Village ordinances, regulations, plans, and policies. This form shall not be deemed a substitute for the applicant's thorough reading and understanding of applicable Village ordinances, regulations, plans, and policies.

Process for Review and Approval

1) Consultation meeting with Village Staff (Optional)

2) Submittal (at least 30 days prior to next plan commission meeting) of application form, application fee, review escrow, and CSM with supplementary materials as described above

3) Staff review of application materials for compliance with requirements

4) Plan Commission review, public hearing, and recommendation

5) Village Board review, public hearing, and action

6) Subdivider shall record the CSM with the Dane County Register of Deeds within 30 days of approval by Village Board and any other approving agencies, and provide a copy of executed documents to Village Clerk

Technical Requirements of CSM

The CSM shall show correctly on its face all the information required by Wis. Statute 236.34, and shall meet all the surveying and monumenting requirements of Wis. Statute 236.15. In addition, the applicant shall submit the following documents which shall be considered to be incorporated with and made part of the CSM:

	Item	Applicant
1	Deed Restrictions	n/a
2	Joint Maintenance Agreements	Will be provided in future

3	All certificates required by Wis. Stat. 236.34	X
4	Final Street Plan	Phase I improvement plans included in application
5	Final Stormwater Management Plan	Phase I SWMP included in application
6	Final Erosion and Sedimentation Control Plan	Refer to C4.0
7	Soil and Subsurface Investigation Report	Refer to existing soil reports dated November 27, 2007
5	Traffic Control Plan	Will provide additional information if required
8	Water and Sewer Plans	Phase I improvement plans included in application
9	Opinion of Probable Cost	Will provide additional information if required
10	Additional Plans or Information	
11	Owner's and Mortgagee's certificates for Street Dedication	See proposed street vacation and easement

Checklist Legend:	
✓	submitted completely
N/S	not submitted
N/A	not applicable to project
W	waived for reasons to be described in staff report
P	submittal pending, material must be submitted prior to meeting as requested by staff
A	submittal pending, material required as condition for approval

Date Complete Application Submitted: _____

VILLAGE OF WINDSOR

General Information and Application for Development, Land Division, Site Plan and Zoning

The Village of Windsor Plan Commission typically meets on the Second Thursday of every month at 5:00 p.m., and the Windsor Village Board typically reviews planning issues on the First Thursday of every month at 5:00 p.m. (or as otherwise scheduled) at the Village Hall, 4084 Mueller Road. Applicants must submit a complete application and materials no less than 30 days prior to the next regularly scheduled Plan Commission meeting.

Requested Action:

_____ Rezone	_____ Concept Plan	_____ Site Plan Review
_____ Conditional Use Permit	_____ Preliminary Plat	_____ Final Plat
_____ Variance	X Certified Survey Map	_____ Other _____

Other Agencies that may need to be addressed (staff will provide direction):

_____ Dane County
_____ City of Sun Prairie
_____ Village of DeForest
_____ Token Creek Conservancy Committee or Windsor Parks Commission
_____ Capital Area Regional Plan Commission (CARPC)
_____ Wisconsin Department of Transportation (DOT)
_____ Wisconsin Department of Natural Resources (DNR)

Project Location:

Windsor Crossing, SE of Windsor Rd and North Towne Rd

Parcel Number(s)

0910-294-8445-1 and 0910-294-8420-1

Current Zoning Classification:

C-1

Applicant Statement (Must be signed prior to the time the Application is reviewed by staff).

I have reviewed and understand the Village of Windsor subdivision ordinance, site plan review ordinance and applicable zoning ordinance as they relate to technical specifications, required submittal information, and standards for approval relating to this request and those standards governing the Village's recommendations and decisions.

I understand an administrative fee will be assessed for review of my project by the Village and its consultants, and that payment in full is required as a condition for approval. Consultant fees are invoiced and paid separately by the applicant in additional to any application fees.

2-11-19

Applicant Signature Date

Fees and Review Escrow Paid Yes ___ No ___ Receipt # _____

Contact Information

Applicant:

Name: Forward Development Group, LLC (FDG) - Ron Henshue
Address: 161 Horizon Drive Ste 101A
City, State, Zip: Verona, WI 53593
Phone Number(s): (608)848-9050
Cell Phone(s):
Email Address(es): rjh@forwarddevgroup.com

Surveyor:

Name: JSD Professional Services, Inc. (Todd Buhr)
Address: 161 Horizon Drive Ste 101
City, State, Zip: Verona, WI 53593
Phone Number(s): (608)848-5060
Cell Phone(s):
Email Address(es): todd.buhr@jsdinc.com

Attorney:

Name:
Address:
City, State, Zip:
Phone Number(s):
Cell Phone(s):
Email Address(es):

Owner:

Name: Forward Development Group, LLC (FDG) and Village of Windsor CDA
Address: 161 Horizon Drive Ste 101A
City, State, Zip: Verona, WI 53593
Phone Number(s): (608)848-9050
Cell Phone(s):
Email Address(es): rjh@forwarddevgroup.com

Engineer:

Name: JSD Professional Services, Inc. (Bill Dunlop)
Address: 161 Horizon Drive Ste 101
City, State, Zip: Verona, WI 53593
Phone Number(s): (608)848-5060
Cell Phone(s):
Email Address(es): bill.dunlop@jsdinc.com

JSD Professional Services, Inc.
• Engineers • Surveyors • Planners
VERONA | WAUKESHA | KENOSHA | APPLETON | WESTON

Memorandum

www.jsdinc.com

To:	Amy Anderson-Schweppe and Jamie Rybarczyk
From:	Kevin Yeska, JSD Professional Services, Inc.
Re:	Letter of Intent – Village Center CSM and Phase 1 Improvement Plans
JSD Project #:	18-8515
Date:	February 11, 2019
cc:	Ron Henshue and Konner Kearney (FDG); Dave Jenkins, Bill Dunlop, John Krebs, Todd Buhr (JSD)

This letter of intent has been prepared for the proposed redivsion of vacated Webster Court, Lots 1 and Lot 2 of CSM 14307 in Windsor Crossing. On behalf of Forward Development Group (FDG) we are requesting approval of a 4-lot CSM to modify Lot 1 and create one (1) new developable lot, an Outlot for a private access drive, and an Outlot for future subdivision.

The proposed CSM lots comprise Phase 1 of the Windsor Crossing Village Center. A Phase I Improvements plan set and Phase 1 stormwater management plan is included in this application for review.

FDG intends to develop Lot 1 of the proposed CSM for use by Summit Credit Union; the lot has been sized to be appropriate for this proposed use. Lot 2 will be occupied by commercial mixed use (retail and/or office), as part of future development proposals.

As proposed, Lots 1 and 2 will be accessed via Private Street A (shown as Outlot 2) and via a shared access easement. Public sewer and water utilities would be contained in an easement.

We anticipate the recording process following this order for the attached exhibits:

- **Step 1**
  - Exhibit "*South Half of Vacated Webster Court*" recorded
    - Said 0.192-acre parcel to be transferred back to FDG by Village of Windsor CDA via quit claim dead
    - Record quit claim deed with the description and exhibit map as attachments

- **Step 2**
  - Exhibit "*Additional Land Purchase Exhibit*" recorded
    - Record quit claim deed with the description and exhibit map as attachments
    - Additional lands purchased by FDG

- **Step 3**
  - Exhibit "*Utility Easement*" exhibit recorded with the description and exhibit map as attachmetnts
  - Exhibit "*Access Easement*" exhibit recorded with the description and exhibit map as attachmetnts

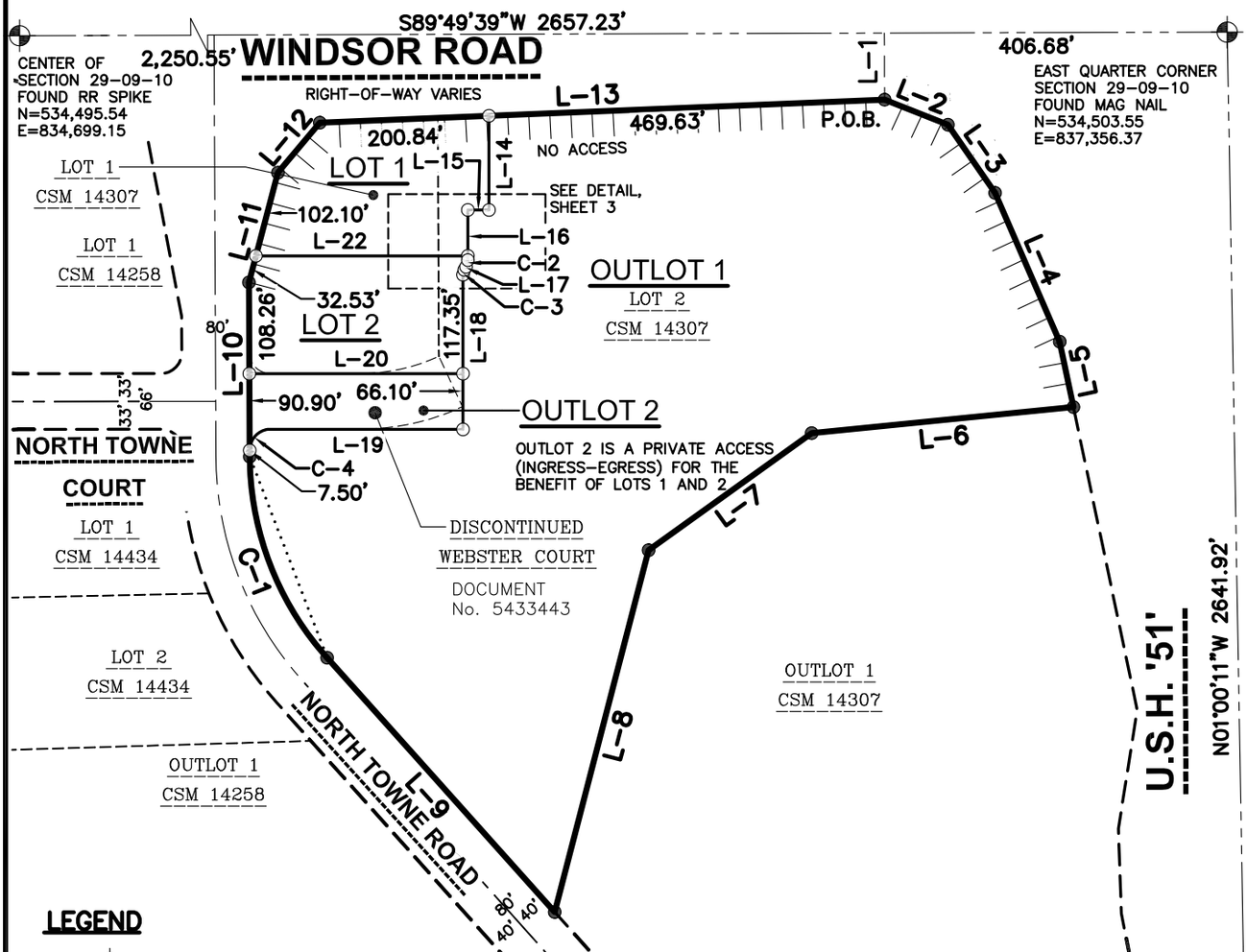
- **Step 4**
  - Final CSM recorded with Utility Easement and Access Easement document recording information shown graphically on the maps

We request the opportunity to obtain Village review and approval of the land transfers, easement creations, CSM and Phase I Improvement Plans at the March 14th Plan Commission meeting, with final approvals desired at the April 4th Village Board meeting.

PRELIMINARY

CERTIFIED SURVEY MAP NO. _____

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN



LEGEND

- GOVERNMENT CORNER
- 3/4" REBAR FOUND
- 3/4" x 24" REBAR SET (1.50 LBS/LF)
- PLAT BOUNDARY
- CHORD LINE
- CENTERLINE
- RIGHT-OF-WAY LINE
- PLATTED LOT LINE
- SECTION LINE
- EASEMENT LINE
- NO ACCESS PER T.P.P No. 6020-02-21-4.03 AMENDMENT No. 1

LOT AREA TABLE

LOT	AREA (S.F.)	ACREAGE
1	38,810	0.891
2	35,393	0.813
O.L.–1	430,921	9.893
O.L.–2	16,867	0.387
TOTAL	521,991	11.984

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON NOVEMBER 16–20, 2015.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, (DANE COUNTY). THE EAST LINE OF THE SOUTHEAST QUARTER OF SECTION 29–09–10, BEARS N01°00'11"W.
3. SEE SHEET 2 FOR LINE AND CURVE TABLES.
4. SEE SHEET 4 FOR EASEMENTS.

WISCONSIN
JOHN KREBS
S-1878
McFARLAND, WISCONSIN
LAND SURVEYOR

north
0 100' 200'
SCALE: 1" = 200'

SOUTHEAST CORNER SECTION 29–09–10 FOUND CUT CROSS N=531,862.03 E=837,402.62

PREPARED BY:	PREPARED FOR:			
JSD Professional Services, Inc. • Engineers • Surveyors • Planners 161 HORIZON DRIVE, SUITE 101 VERONA, WISCONSIN 53593 PHONE: (608)848-5060	WINDSOR CROSSING, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593 COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR	PROJECT NO: 18–8515 FILE NO: FIELDBOOK/PG: – SHEET NO: 1 of 7	SURVEYED BY: ZMR DRAWN BY: JK CHECKED BY: TJB APPROVED BY: TJB	VOL. _____ PAGE _____ DOC. NO. _____ C.S.M. NO. _____

File: I:\2018\188515\DWG\188515 P-CSM.dwg Layout: Sheet 1 User: jk Plotted: Feb 11, 2019 - 3:45pm

PRELIMINARY

CERTIFIED SURVEY MAP NO. _____

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN

LINE AND CURVE TABLES

LINE TABLE

LINE	BEARING	DISTANCE
L–1	S00°10'21"E	78.95'
L–2	S68°23'57"E	80.78'
L–3	S34°40'40"E	98.32'
L–4	S23°27'38"E	192.30'
L–5	S11°53'47"E	79.27'
L–6	S84°19'17"W	311.98'
L–7	S54°20'02"W	238.12'
L–8	S14°32'45"W	443.34'

LINE TABLE

LINE	BEARING	DISTANCE
L–9	N41°50'00"W	404.79'
L–10	N00°16'00"W	206.66'
L–11	N14°48'08"E	134.63'
L–12	N40°00'46"E	77.30'
L–13	N87°39'46"E	670.47'
L–14	S00°00'00"E	111.68'
L–15	N90°00'00"W	25.12'
L–16	S00°00'00"E	59.43'

LINE TABLE

LINE	BEARING	DISTANCE
L–17	S30°00'00"W	4.17'
L–18	S00°00'00"E	183.45'
L–19	N90°00'00"W	231.90'
L–20	S90°00'00"E	253.38'
L–21	S00°00'00"E	5.00'
L–22	N90°00'00"E	251.34'
L–23	S00°00'00"E	54.43'

CURVE TABLE

CURVE	ARC LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD	TANGENT IN	TANGENT OUT
C–1	261.17'	360.00'	41°34'00"	N21°03'00"W	255.48'	N41°50'00"W	N00°16'00"W
C–2	8.38'	16.00'	30°00'00"	S15°00'00"W	8.28'	S00°00'00"W	S30°00'00"W
C–3	6.02'	11.50'	30°00'00"	S15°00'00"W	5.95'	S30°00'00"W	S00°00'00"W
C–4	35.42'	25.00'	81°10'54"	S40°19'29"W	32.53'	S80°54'56"W	S00°15'58"E

LEGAL DESCRIPTION

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN.

CONTAINING 521,991 SQUARE FEET OR 11.984 ACRES.

SURVEYOR'S CERTIFICATE

I, JOHN KREBS, PROFESSIONAL LAND SURVEYOR S–1878, DO HEREBY CERTIFY THAT BY DIRECTION OF COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR AND WINDSOR CROSSING, LLC, I HAVE SURVEYED, DIVIDED, AND MAPPED THE LANDS DESCRIBED HEREON AND THAT THE MAP IS A CORRECT REPRESENTATION IN ACCORDANCE WITH THE INFORMATION PROVIDED. I FURTHER CERTIFY THAT THIS CERTIFIED SURVEY MAP IS IN FULL COMPLIANCE WITH CHAPTER 236.34 OF THE WISCONSIN STATUTES AND THE SUBDIVISION REGULATIONS OF THE VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN.

WISCONSIN
JOHN
KREBS
S–1878
McFARLAND,
WISCONSIN
LAND SURVEYOR

_____ _____

JOHN KREBS, S–1878 DATE
PROFESSIONAL LAND SURVEYOR

PREPARED BY:	PREPARED FOR:				
JSD Professional Services, Inc. • Engineers • Surveyors • Planners 161 HORIZON DRIVE, SUITE 101 VERONA, WISCONSIN 53593 PHONE: (608)848–5060	WINDSOR CROSSING, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593 COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR	PROJECT NO: 18–8515 FILE NO: _____ FIELDBOOK/PG: – SHEET NO: 2 of 7	SURVEYED BY: ZMR DRAWN BY: JK CHECKED BY: TJB APPROVED BY: TJB	VOL. _____ PAGE _____ DOC. NO. _____ C.S.M. NO. _____	

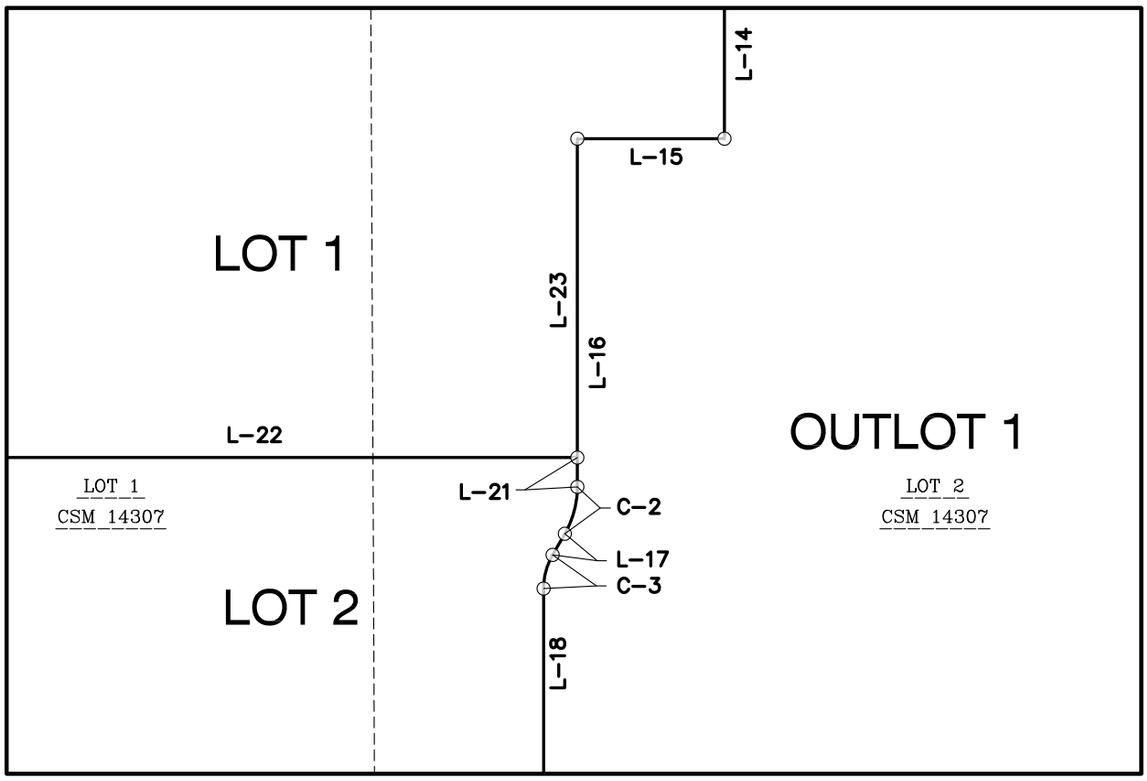
File: I:\2018\188515\DWG\188515 P–CSM.dwg Layout: Sheet 2 User: jk Plotted: Feb 11, 2019 – 3:44pm

PRELIMINARY

CERTIFIED SURVEY MAP NO. _____

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN

DETAIL



LEGEND

- GOVERNMENT CORNER
- 3/4" REBAR FOUND
- 3/4" x 24" REBAR SET (1.50 LBS/LF)
- PLAT BOUNDARY
- CHORD LINE
- CENTERLINE
- RIGHT–OF–WAY LINE
- PLATTED LOT LINE
- SECTION LINE
- EASEMENT LINE
- NO ACCESS PER T.P.P No. 6020–02–21–4.03 AMENDMENT No. 1

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON NOVEMBER 16–20, 2015.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, (DANE COUNTY). THE EAST LINE OF THE SOUTHEAST QUARTER OF SECTION 2909–10, BEARS N01°00'11"W.
3. SEE SHEET 2 FOR LINE AND CURVE TABLES.
4. SEE SHEET 4 FOR EASEMENTS.

WISCONSIN
JOHN KREBS
S–1878
McFARLAND, WISCONSIN
LAND SURVEYOR

north

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

PREPARED BY:	PREPARED FOR:				
JSD Professional Services, Inc. • Engineers • Surveyors • Planners 161 HORIZON DRIVE, SUITE 101 VERONA, WISCONSIN 53593 PHONE: (608)848–5060	WINDSOR CROSSING, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593 COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR	PROJECT NO: 18–8515 FILE NO: FIELDBOOK/PG: – SHEET NO: 3 of 7	SURVEYED BY: ZMR DRAWN BY: JK CHECKED BY: TJB APPROVED BY: TJB	VOL. _____ PAGE _____ DOC. NO. _____ C.S.M. NO. _____	

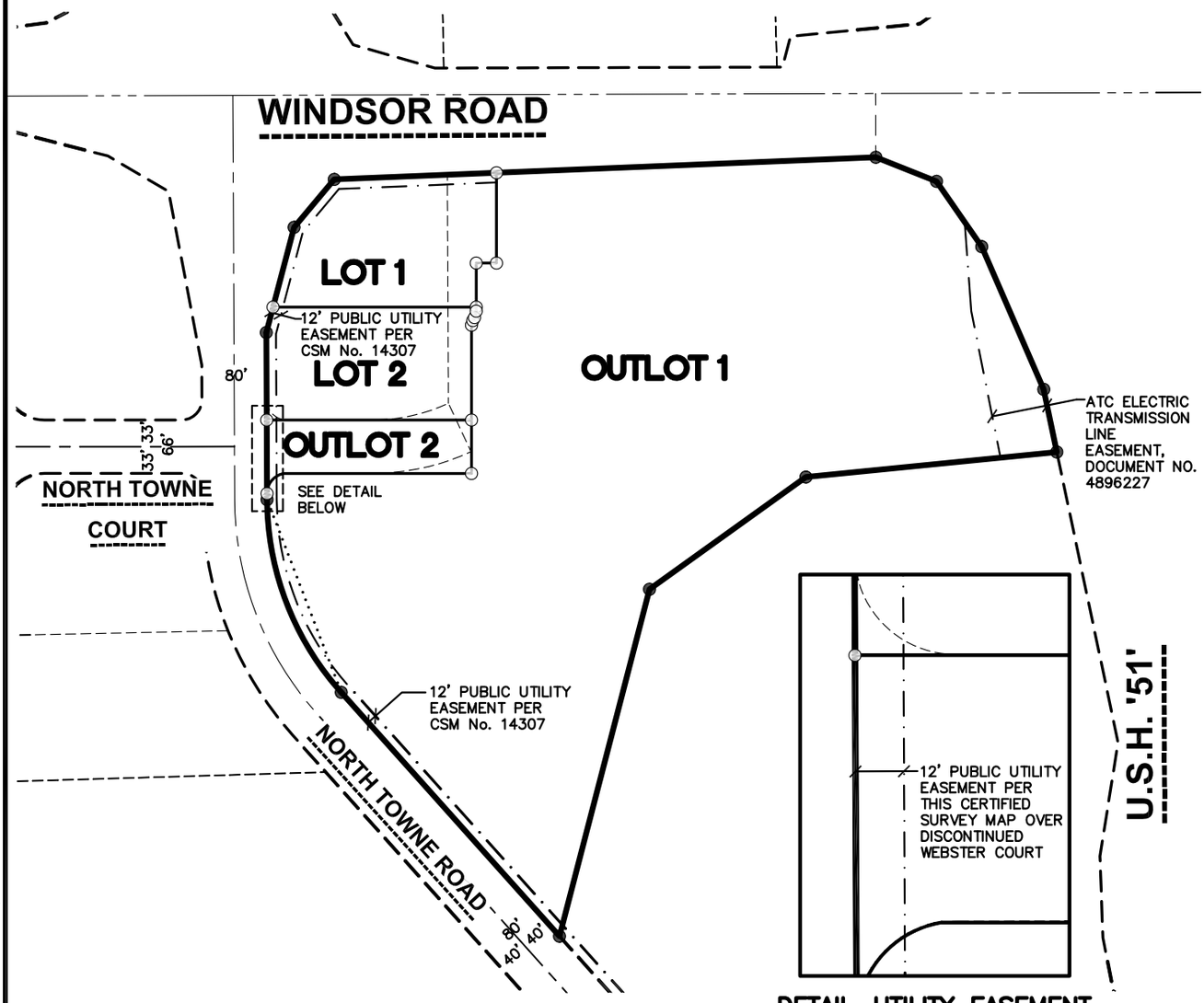
File: I:\2018\188515\DWG\188515 P–CSM.dwg Layout: Sheet 3 User: jk Plotted: Feb 11, 2019 – 3:43pm

PRELIMINARY

CERTIFIED SURVEY MAP NO. _____

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN

EASEMENTS



DETAIL–UTILITY EASEMENT
SCALE 1" = 40'

LEGEND

- GOVERNMENT CORNER
- 3/4" REBAR FOUND
- 3/4" x 24" REBAR SET (1.50 LBS/LF)
- PLAT BOUNDARY
- CHORD LINE
- CENTERLINE
- RIGHT–OF–WAY LINE
- PLATTED LOT LINE
- SECTION LINE
- EASEMENT LINE

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON NOVEMBER 16–20, 2015.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, (DANE COUNTY). THE EAST LINE OF THE SOUTHEAST QUARTER OF SECTION 29–09–10, BEARS N01°00'11"W.

WISCONSIN
JOHN KREBS
S–1878
McFARLAND, WISCONSIN
LAND SURVEYOR

0 100' 200'
SCALE: 1" = 200'

north

PREPARED BY:	PREPARED FOR:				
JSD Professional Services, Inc. • Engineers • Surveyors • Planners 161 HORIZON DRIVE, SUITE 101 VERONA, WISCONSIN 53593 PHONE: (608)848–5060	WINDSOR CROSSING, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593 COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR	PROJECT NO: 18–8515 FILE NO: FIELDBOOK/PG: – SHEET NO: 4 of 7	SURVEYED BY: ZMR DRAWN BY: JK CHECKED BY: TJB APPROVED BY: TJB	VOL. _____ PAGE _____ DOC. NO. _____ C.S.M. NO. _____	

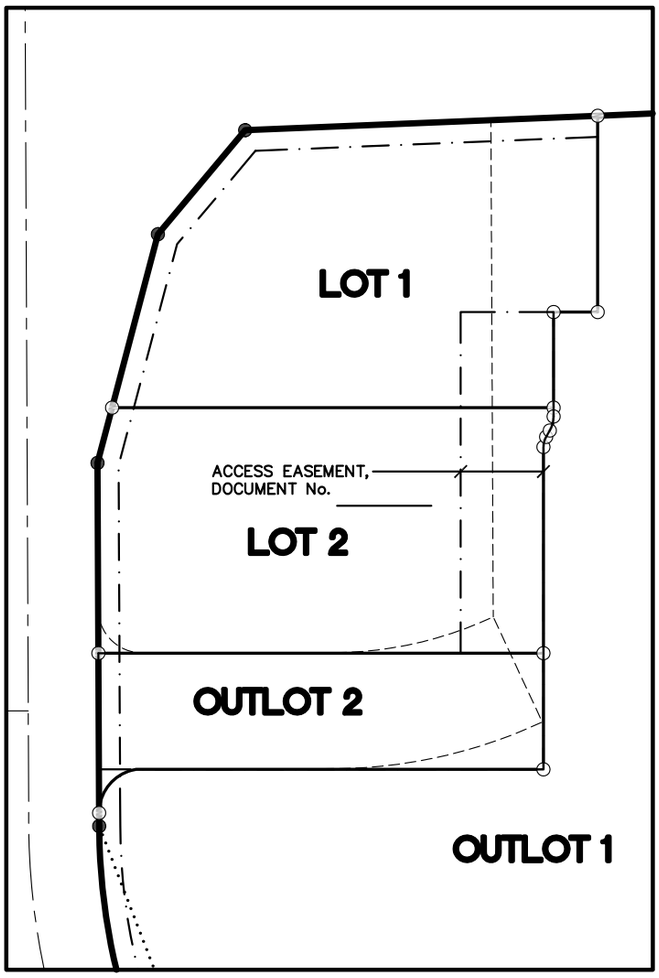
File: I:\2018\188515\DWG\188515 P–CSM.dwg Layout: Sheet 4 User: jk Plotted: Feb 11, 2019 – 3:42pm

PRELIMINARY

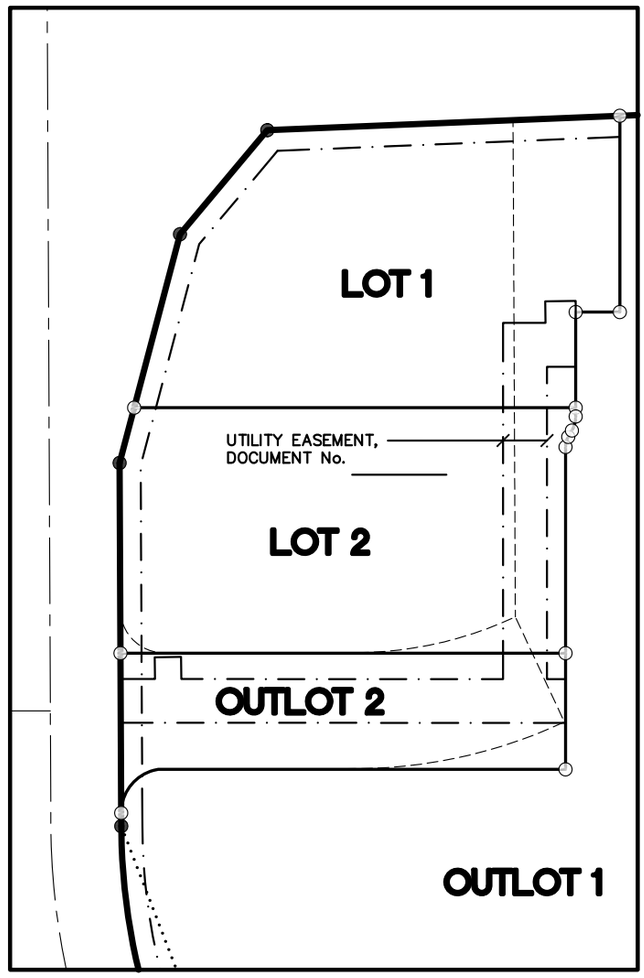
CERTIFIED SURVEY MAP NO. _____

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN

EASEMENTS



ACCESS EASEMENT
SCALE 1" = 100'



UTILITY EASEMENT
SCALE 1" = 100'

LEGEND

- GOVERNMENT CORNER
- 3/4" REBAR FOUND
- 3/4" x 24" REBAR SET (1.50 LBS/LF)
- PLAT BOUNDARY
- CHORD LINE
- CENTERLINE
- RIGHT–OF–WAY LINE
- PLATTED LOT LINE
- SECTION LINE
- EASEMENT LINE

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON NOVEMBER 16–20, 2015.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, (DANE COUNTY). THE EAST LINE OF THE SOUTHEAST QUARTER OF SECTION 29–09–10, BEARS N01°00'11"W.

WISCONSIN
JOHN KREBS
S–1878
McFARLAND, WISCONSIN
LAND SURVEYOR

0 50' 100'
SCALE: 1" = 100'

north

PREPARED BY:	PREPARED FOR:				
JSD Professional Services, Inc. • Engineers • Surveyors • Planners 161 HORIZON DRIVE, SUITE 101 VERONA, WISCONSIN 53593 PHONE: (608)848–5060	WINDSOR CROSSING, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593 COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR	PROJECT NO: 18–8515 FILE NO: _____ FIELDBOOK/PG: – SHEET NO: 5 of 7	SURVEYED BY: ZMR DRAWN BY: JK CHECKED BY: TJB APPROVED BY: TJB	VOL. _____ PAGE _____ DOC. NO. _____ C.S.M. NO. _____	

File: I:\2018\188515\DWG\188515 P–CSM.dwg Layout: Sheet 5 User: jk Plotted: Feb 11, 2019 – 3:24pm

PRELIMINARY

CERTIFIED SURVEY MAP NO. _____

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN

CORPORATE OWNER'S CERTIFICATE

WINDSOR CROSSING, LLC, AS OWNER, DOES HEREBY CERTIFY THAT SAID CORPORATION HAS CAUSED THE LAND DESCRIBED ON THIS CERTIFIED SURVEY MAP TO BE SURVEYED, DIVIDED AND MAPPED AS REPRESENTED HEREON. SAID CORPORATION FURTHER CERTIFIES THAT THIS CERTIFIED SURVEY MAP IS REQUIRED BY S.236.34, WISCONSIN STATUTES TO BE SUBMITTED TO THE VILLAGE OF WINDSOR FOR APPROVAL.

IN WITNESS WHEREOF, THE SAID WINDSOR CROSSING, LLC, HAS CAUSED THESE PRESENTS TO BE SIGNED BY ITS REPRESENTATIVE THIS _____DAY OF _____, 2019.

WINDSOR CROSSING, LLC,

BY: _____

DAVE M. JENKINS, MANAGER

STATE OF WISCONSIN) SS
DANE COUNTY) SS

PERSONALLY CAME BEFORE ME THIS____DAY OF_____, 2019, THE ABOVE NAMED DAVE M. JENKINS OF THE ABOVE WINDSOR CROSSING, LLC, TO ME KNOWN TO BE THE PERSON WHO EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED THE SAME.

_____ _____
NOTARY PUBLIC, DANE COUNTY, WISCONSIN MY COMMISSION EXPIRES

CONSENT OF MORTGAGEE FOR LOT 1, CSM 14307

I, McFARLAND STATE BANK, MORTGAGEE OF THE ABOVE DESCRIBED LAND, DO HEREBY CONSENT TO THE SURVEYING, DIVIDING, MAPPING AND DEDICATION OF THE LAND DESCRIBED ON THIS PLAT, AND I DO HEREBY CONSENT TO THE ABOVE CERTIFICATE OF WINDSOR CROSSING, LLC, OWNER.

WITNESS THE HAND AND SEAL OF McFARLAND STATE BANK, MORTGAGEE, THIS _____DAY OF _____, 2019.

_____
MORTGAGEE

_____
(PRINT NAME AND TITLE)

STATE OF WISCONSIN) SS
DANE COUNTY) SS

PERSONALLY CAME BEFORE ME THIS____DAY OF_____, 2019, THE ABOVE NAMED , TO ME KNOWN TO BE THE PERSON WHO EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED THE SAME.

_____ _____
NOTARY PUBLIC, DANE COUNTY, WISCONSIN MY COMMISSION EXPIRES

WISCONSIN
JOHN
KREBS
S–1878
McFARLAND,
WISCONSIN
LAND SURVEYOR

PREPARED BY:	PREPARED FOR:				
JSD Professional Services, Inc. • Engineers • Surveyors • Planners 161 HORIZON DRIVE, SUITE 101 VERONA, WISCONSIN 53593 PHONE: (608)848–5060	WINDSOR CROSSING, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593 COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR	PROJECT NO: 18–8515 FILE NO: _____ FIELDBOOK/PG: – SHEET NO: 6 of 7	SURVEYED BY: ZMR DRAWN BY: JK CHECKED BY: TJB APPROVED BY: TJB	VOL. _____ PAGE _____ DOC. NO. _____ C.S.M. NO. _____	

File: I:\2018\188515\DWG\188515 P–CSM.dwg Layout: Sheet 6 User: jk Plotted: Feb 11, 2019 – 3:24pm

PRELIMINARY

CERTIFIED SURVEY MAP NO. _____

LOTS 1 AND 2, CERTIFIED SURVEY MAP No. 14307, RECORDED IN VOLUME 97 OF CERTIFIED SURVEY MAPS, PAGES 240–245, AS DOCUMENT No. 5255803 AND DISCONTINUED WEBSTER COURT PER DOCUMENT No. 5433443, LOCATED IN THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN

CORPORATE OWNER'S CERTIFICATE

COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR, AS OWNER, DOES HEREBY CERTIFY THAT SAID CORPORATION HAS CAUSED THE LAND DESCRIBED ON THIS CERTIFIED SURVEY MAP TO BE SURVEYED, DIVIDED AND MAPPED AS REPRESENTED HEREON. SAID CORPORATION FURTHER CERTIFIES THAT THIS CERTIFIED SURVEY MAP IS REQUIRED BY S.236.34, WISCONSIN STATUTES TO BE SUBMITTED TO THE VILLAGE OF WINDSOR FOR APPROVAL.

IN WITNESS WHEREOF, THE SAID COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR HAS CAUSED THESE PRESENTS TO BE SIGNED BY ITS REPRESENTATIVES THIS _____DAY OF _____, 2019.

COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR

BY: _____

KEVIN W. RICHARDSON
EXECUTIVE DIRECTOR

STATE OF WISCONSIN) SS
DANE COUNTY) SS

PERSONALLY CAME BEFORE ME THIS____DAY OF_____, 2019, THE ABOVE NAMED REPRESENTATIVE OF THE ABOVE NAMED COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR, TO ME KNOWN TO BE THE PERSON WHO EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED THE SAME.

_____ _____
NOTARY PUBLIC, DANE COUNTY, WISCONSIN MY COMMISSION EXPIRES

VILLAGE OF WINDSOR PLAN COMMISSION APPROVAL

APPROVED FOR RECORDING PER VILLAGE OF WINDSOR PLAN COMMISSION ACTION OF_____,2019.

_____ _____

AMY ANDERSON–SCHWEPPE, DATE
DIRECTOR OF PLANNING & DEVELOPMENT,

VILLAGE OF WINDSOR APPROVAL CERTIFICATE

RESOLVED THAT THIS CERTIFIED SURVEY MAP, WHICH HAS BEEN DULY FILED FOR THE APPROVAL OF THE VILLAGE OF WINDSOR BOARD, BE AND THE SAME IS HEREBY APPROVED AND THE DEDICATIONS, IF ANY DESIGNATED HEREON, ARE HEREBY ACKNOWLEDGED AND ACCEPTED BY THE VILLAGE OF WINDSOR.

I HEREBY CERTIFY THAT THE ABOVE IS A TRUE AND CORRECT COPY OF A RESOLUTION ADOPTED BY THE VILLAGE OF WINDSOR ON THIS_____DAY OF_____, 2019.

_____

TINA BUTTERIS,
DEPUTY VILLAGE CLERK,
VILLAGE OF WINDSOR

WISCONSIN
JOHN
KREBS
S–1878
McFARLAND,
WISCONSIN
LAND SURVEYOR

OFFICE OF THE REGISTER OF DEEDS

_____*COUNTY, WISCONSIN*

*RECEIVED FOR RECORD*_____,

*20*____ *AT*_____*O'CLOCK*_____*M AS*

DOCUMENT # _____

IN VOL. _____ *OF CERTIFIED SURVEY*

MAPS ON PAGE(S) _____ .

_____
REGISTER OF DEEDS

PREPARED BY:	PREPARED FOR:		
JSD Professional Services, Inc. • Engineers • Surveyors • Planners 161 HORIZON DR., STE. 101 VERONA, WISCONSIN 53593 PHONE: (608)848–5060	WINDSOR CROSSING, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593 COMMUNITY DEVELOPMENT AUTHORITY OF THE VILLAGE OF WINDSOR	PROJECT NO: 18–8515 FILE NO: _____ FIELDBOOK/PG: – SHEET NO: 7 of 7	SURVEYED BY: ZMR DRAWN BY: JK CHECKED BY: TJB APPROVED BY: TJB

File: I:\2018\188515\DWG\188515 P–CSM.dwg Layout: Sheet 7 User: jk Plotted: Feb 11, 2019 – 3:23pm

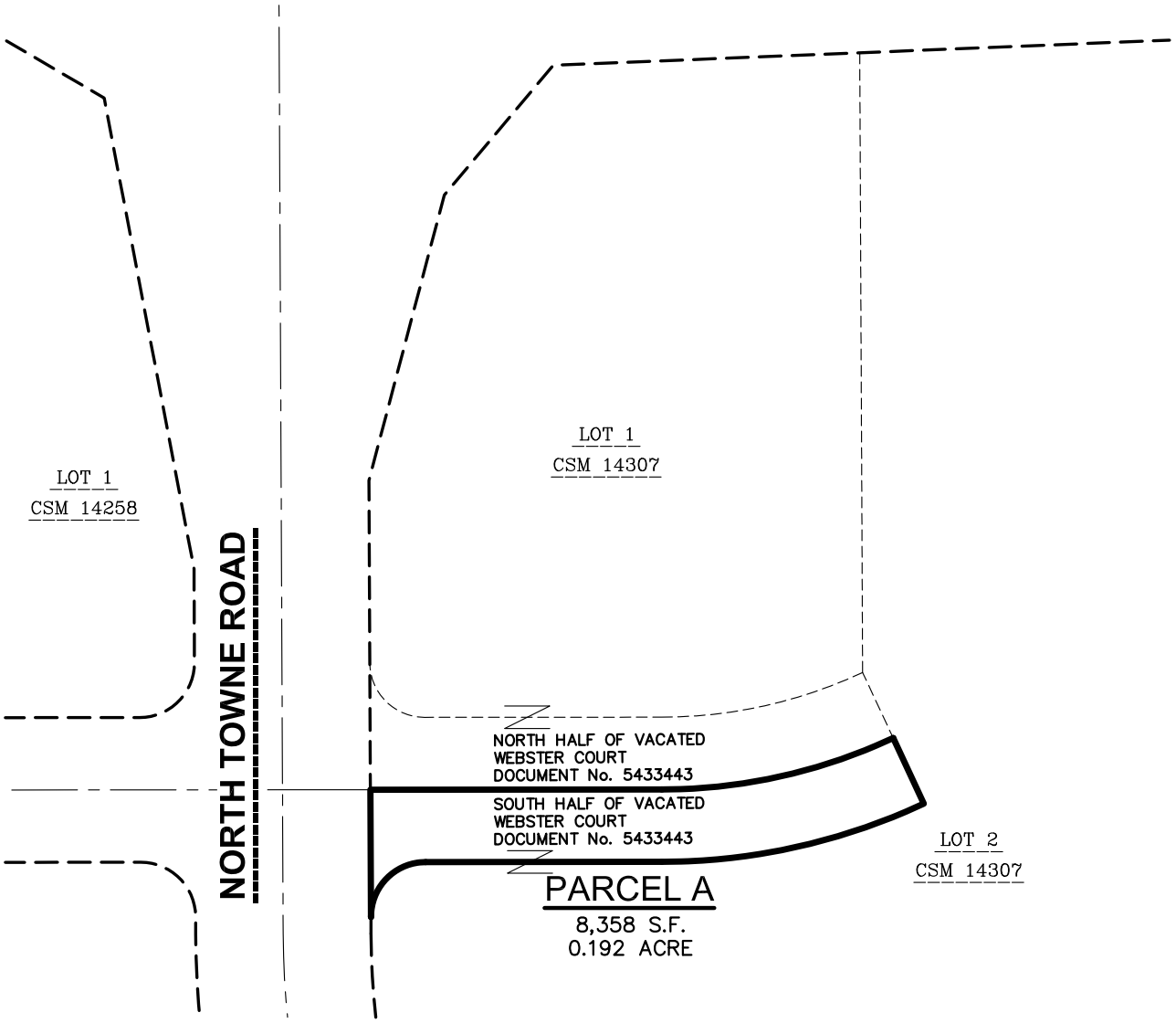
Forward Development Group, LLC
161 Horizon Drive, Suite 101A
Verona, WI 53593

SOUTH HALF OF VACATED WEBSTER COURT
Parcel Description

South Half of Vacated Webster Court, Document No. 5433443, located in the Northeast Quarter of the Southeast Quarter of Section 29, Township 09 North, Range 10 East, Village of Windsor, Dane County, Wisconsin.

Said parcel contains 8,358 square feet or 0.192 acres.

161 Horizon Drive, Suite 101 • Verona, WI 53593 • Phone: 608.848.5060 • Fax: 608.848.2255



LEGEND

- VACATION BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY LINE
- PLATTED LOT LINE

north

0 40' 80'

SCALE: 1" = 80'

JSD Professional Services, Inc.
Engineers • Surveyors • Planners
MADISON REGIONAL OFFICE
161 HORIZON COURT
VERONA, WISCONSIN 53593
(608)848-5060 PHONE | (608)848-2255 FAX
www.jsdinc.com

PROJECT:	SHEET TITLE:	JSD PROJECT NUMBER:	SHEET NUMBER:
FORWARD DEVELOPMENT GROUP, LLC 161 HORIZON DRIVE, SUITE 101A VERONA, WI 53593	**SOUTH HALF OF VACATED WEBSTER COURT**	18-8515 DRAWN BY: JK CHECKED BY: TJB DATE: JAN. 29, 2019	1

File: I:\2018\188515\DWG\Exhibits\188515 Exhibit South Half (Webster Ct).dwg Layout: Discontinuance-1 User: jk Plotted: Jan 29, 2019 - 12:41pm

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

VERONA | WAUKESHA | KENOSHA | APPLETON | WESTON

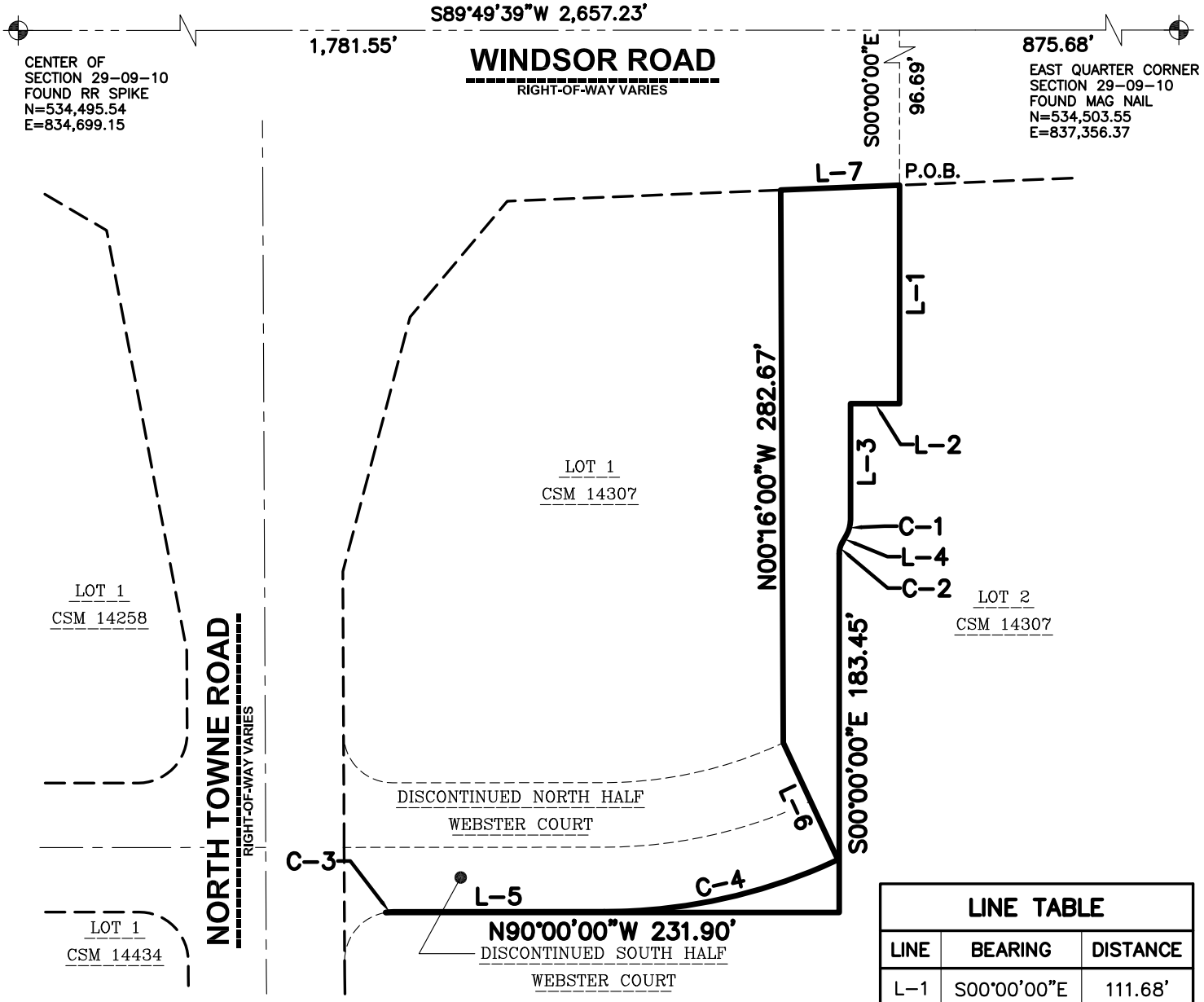
Forward Development Group
161 Horizon Drive, Suite 101A
Verona, WI 53593

ADDITIONAL LANDS
Legal Description

Part of Lot 2, Certified Survey Map No. 14307, Recorded in Volume 97 of Certified Survey Maps, Pages 240-245, as Document No. 5255803, located in the Northeast Quarter of the Southeast Quarter of Section 29, Township 09 North, Range 10 East, Village of Windsor, Dane County, Wisconsin, more particularly described as follows:

Commencing at the East Quarter Corner of Section 29, aforesaid; thence South 89 degrees 49 minutes 39 seconds West along the North line of the Southeast Quarter, aforesaid, a distance of 875.68 feet; thence South 00 degrees 00 minutes 00 seconds East, 96.69 feet to a point on the South right-of-way line of Windsor Road, also being the Point of Beginning; thence continuing South 00 degrees 00 minutes 00 seconds East, 111.68 feet; thence North 90 degrees 00 minutes 00 seconds West, 25.12 feet; thence South 00 degrees 00 minutes 00 seconds East, 59.43 feet to a point of curve; thence Southwesterly 8.38 feet along an arc of a curve to the right, having a radius of 16.00 feet, the chord bears South 15 degrees 00 minutes 00 seconds West, 8.28 feet; thence South 30 degrees 00 minutes 00 seconds West, 4.17 feet to a point of curve; thence Southwesterly 6.02 feet along an arc of a curve to the left, having a radius of 11.50 feet, the chord bears South 15 degrees 00 minutes 00 seconds West, 5.95 feet; thence South 00 degrees 00 minutes 00 seconds East, 183.45 feet; thence North 90 degrees 00 minutes 00 seconds West, 231.90 feet to a point on the curving right-of-way line of discontinued Webster Court; thence Northeasterly along said line, 3.95 feet along an arc of a curve to the right, having a radius of 25.00 feet, the chord bears North 85 degrees 26 minutes 12 seconds East, 3.94 feet; thence North 89 degrees 57 minutes 27 seconds East along said line, 107.79 feet to a point of curve; thence Northeasterly 123.42 feet along an arc of a curve to the left, having a radius of 283.00 feet, the chord bears North 77 degrees 27 minutes 49 seconds East, 122.45 feet to the East end of discontinued Webster Court; thence North 25 degrees 01 minutes 49 seconds West along said line, 66.00 feet to the Southeast corner of Lot 1, Certified Survey Map No. 14307, aforesaid; thence North 00 degrees 16 minutes 00 seconds West along the East line of Lot 1, Certified Survey Map No. 14307 a distance of 282.67 feet to the South right-of-way line of Windsor Road; thence North 87 degrees 40 minutes 02 seconds East along said line, 60.84 feet to the Point of Beginning.

Said parcel contains 14,129 square feet or 0.324 acres.



CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	CHORD	CHORD BEARING
C-1	8.38'	16.00'	30°00'00"	8.28'	S15°00'00"W
C-2	6.02'	11.50'	30°00'00"	5.95'	S15°00'00"W
C-3	3.95'	25.00'	9°02'31"	3.94'	N85°26'12"E
C-4	123.42'	283.00'	24°59'17"	122.45'	N77°27'49"E

LINE TABLE

LINE	BEARING	DISTANCE
L-1	S00°00'00"E	111.68'
L-2	N90°00'00"W	25.12'
L-3	S00°00'00"E	59.43'
L-4	S30°00'00"W	4.17'
L-5	N89°57'27"E	107.79'
L-6	N25°01'49"W	66.00'
L-7	N87°40'02"E	60.84'

LEGEND

- GOVERNMENT CORNER
- PARCEL BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY LINE
- PLATTED LOT LINE
- SECTION LINE

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON NOVEMBER 16-20, 2015.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, (DANE COUNTY). THE NORTH LINE OF THE SOUTHEAST QUARTER OF SECTION 29, BEARS S89°49'39"W.

north

0 40' 80'

SCALE: 1" = 80'

JSD Professional Services, Inc.
Engineers • Surveyors • Planners
MADISON REGIONAL OFFICE
161 HORIZON COURT
VERONA, WISCONSIN 53593
(608)848-5060 PHONE | (608)848-2255 FAX
www.jsdinc.com

PROJECT:
FORWARD DEVELOPMENT GROUP, LLC
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

SHEET TITLE:
ADDITIONAL LAND PURCHASE EXHIBIT

JSD PROJECT NUMBER: 18-8515
DRAWN BY: ZMR
CHECKED BY: TJB
DATE: FEB. 11, 2019
SHEET NUMBER: 1

File: I:\2018\188515\DWG\Exhibits\188515 Exhibit Additional Lands (02-08-19).dwg Layout: Additional Land User: jk Plotted: Feb 11, 2019 - 1:22pm

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

VERONA | WAUKESHA | KENOSHA | APPLETON | WESTON

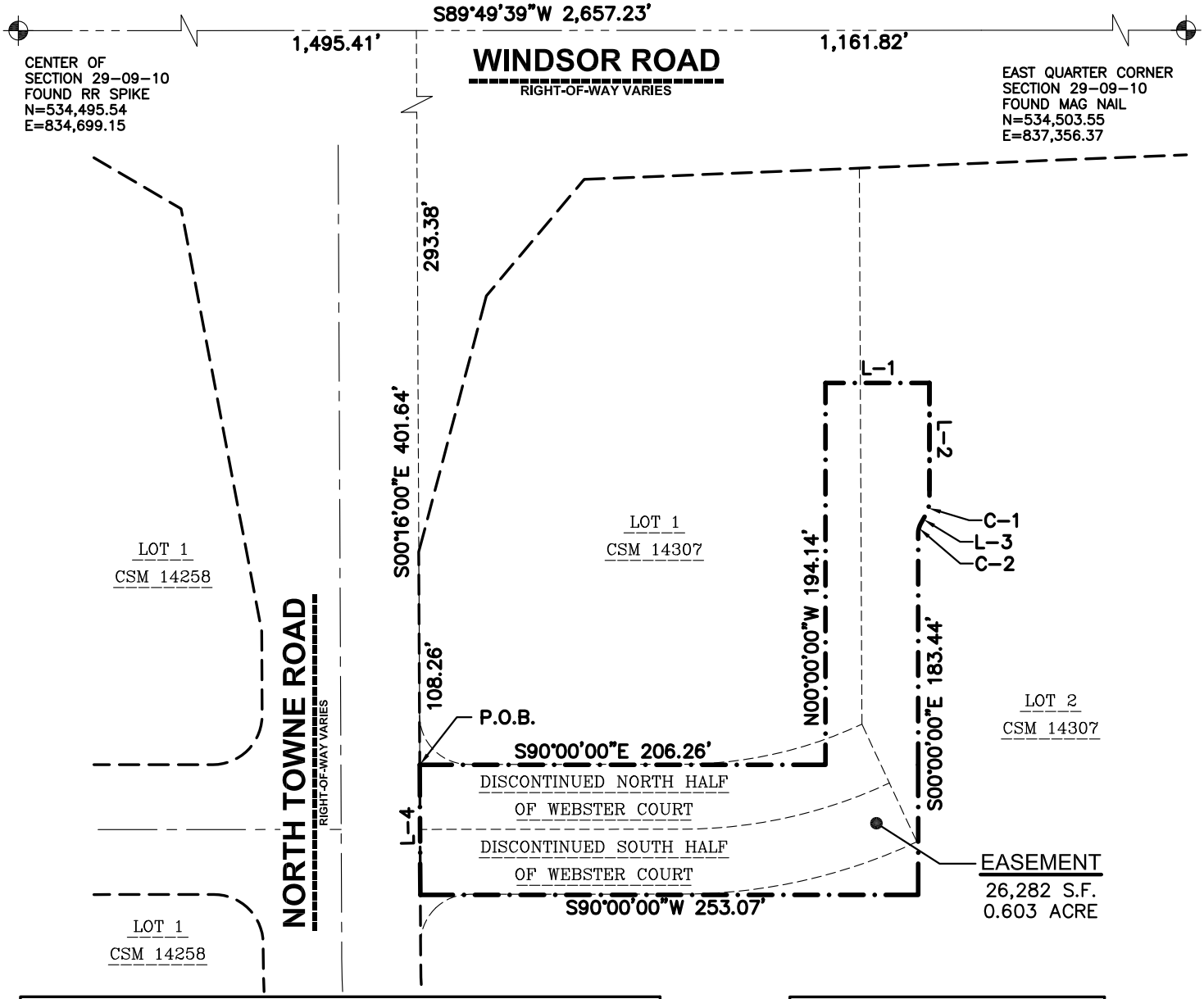
Forward Development Group
161 Horizon Drive, Suite 101A
Verona, WI 53593

LEGAL DESCRIPTION
Access Easement

Part of Lots 1 and 2, and part of discontinued North half of Webster Court, and part of discontinued South half of Webster Court, Certified Survey Map No. 14307, Recorded in Volume 97 of Certified Survey Maps, Pages 240-245, as Document No. 5255803, located in the Northeast Quarter of the Southeast Quarter of Section 29, Township 09 North, Range 10 East, Village of Windsor, Dane County, Wisconsin, more particularly described as follows:

Commencing at the East Quarter Corner of Section 29, aforesaid; thence South 89 degrees 49 minutes 39 seconds East along the North line of the Southeast Quarter, aforesaid, a distance of 1,161.82 feet; thence South 00 degrees 16 minutes 00 seconds East, 401.64 feet to a point on the East right-of-way line of North Towne Road, also being the Point of Beginning; thence South 90 degrees 00 minutes 00 seconds East, 206.26; thence North 00 degrees 00 minutes 00 seconds West, 194.14 feet; thence North 90 degrees 00 minutes 00 seconds East, 52.89 feet; thence South 00 degrees 00 minutes 00 seconds East, 59.43 feet to a point of curve; thence Southwesterly, 8.38 feet along an arc of a curve to the right, having a radius of 16.00 feet, the chord bears South 15 degrees 00 minutes 00 seconds West, 8.28 feet; thence South 30 degrees 00 minutes 00 seconds West, 4.17 feet to a point of curve; thence Southwesterly, 6.02 feet along an arc of a curve to the left, having a radius of 11.50 feet, the chord bears South 15 degrees 00 minutes 00 seconds West, 5.95 feet; thence South 00 degrees 00 minutes 00 seconds East, 183.44 feet; thence North 90 degrees 00 minutes 00 seconds West, 253.07 feet to the Easterly right-of-way line of North Towne Road; thence North 00 degrees 16 minutes 00 seconds West along said right-of-way line, 66.10 feet to the Point of Beginning.

Said parcel contains 26,282 square feet or 0.603 acres.



CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	CHORD	CHORD BEARING
C-1	8.38'	16.00'	30°00'00"	8.28'	S15°00'00"W
C-2	6.02'	11.50'	30°00'00"	5.95'	S15°00'00"W

LINE TABLE

LINE	BEARING	DISTANCE
L-1	N90°00'00"E	52.89'
L-2	S00°00'00"E	59.43'
L-3	S30°00'00"W	4.17'
L-4	N00°16'00"W	66.10'

LEGEND

- GOVERNMENT CORNER
- EASEMENT LINE
- CENTERLINE
- RIGHT-OF-WAY LINE
- PLATTED LOT LINE
- SECTION LINE

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON NOVEMBER 16-20, 2015.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, (DANE COUNTY). THE NORTH LINE OF THE SOUTHEAST QUARTER OF SECTION 29, BEARS S89°49'39"W.

north

0 40' 80'

SCALE: 1" = 80'

JSD Professional Services, Inc.
Engineers • Surveyors • Planners
MADISON REGIONAL OFFICE
161 HORIZON COURT
VERONA, WISCONSIN 53593
(608)848-5060 PHONE | (608)848-2255 FAX
www.jsdinc.com

PROJECT:
FORWARD DEVELOPMENT GROUP, LLC
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

SHEET TITLE:
ACCESS EASEMENT

JSD PROJECT NUMBER: 18-8515
DRAWN BY: ZMR
CHECKED BY: TJB
DATE: FEB. 11, 2019

SHEET NUMBER: 1

File: I:\2018\188515\DWG\Exhibits\188515 Exhibit Easement (02-08-19).dwg Layout: Combined Access (2) User: jk Plotted: Feb 11, 2019 - 10:33am

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

VERONA | WAUKESHA | KENOSHA | APPLETON | WESTON

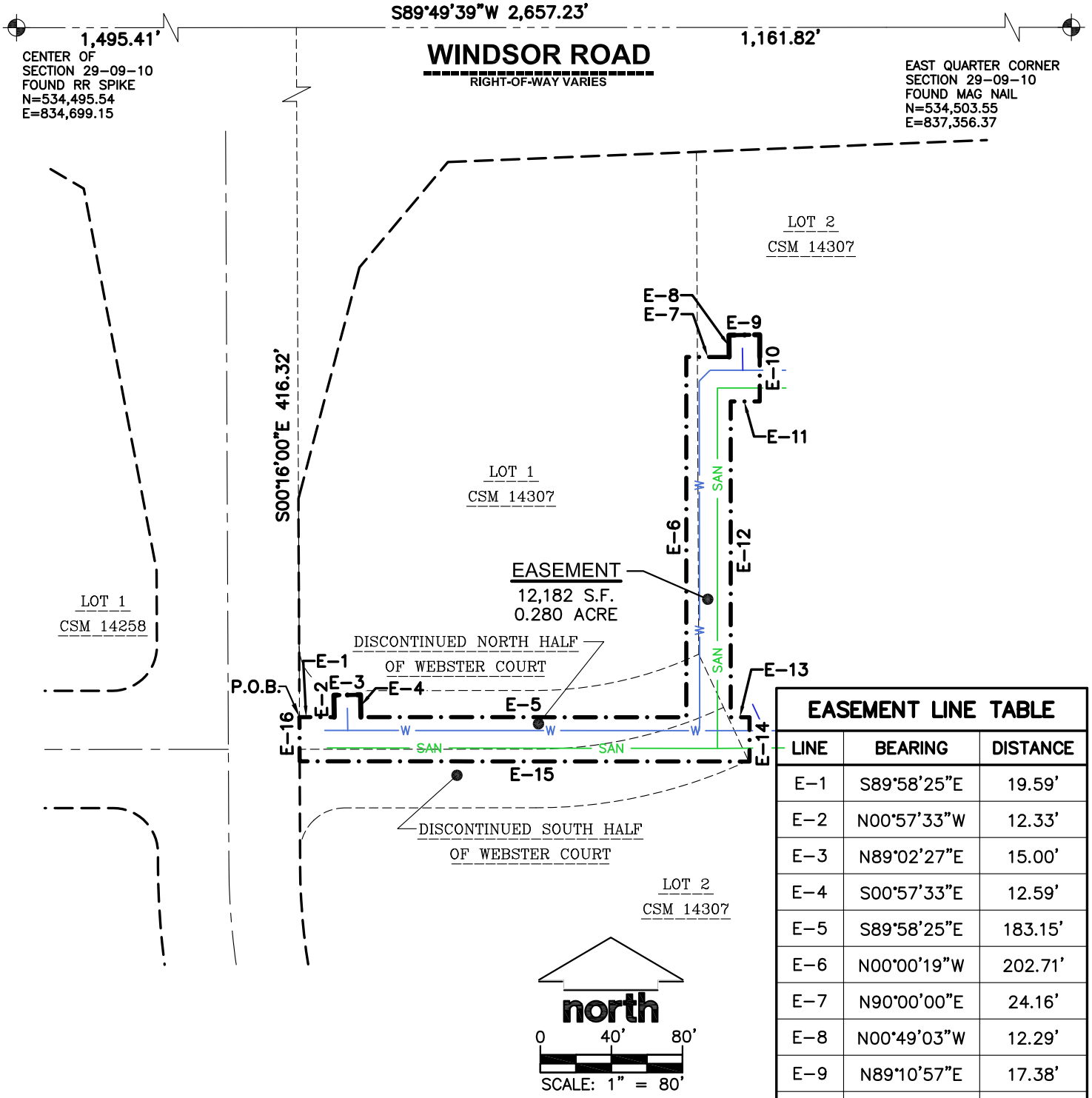
Forward Development Group
161 Horizon Drive, Suite 101A
Verona, WI 53593

UTILITY EASEMENT
Legal Description

Part of Lots 1 and 2, and part of Discontinued North half of Webster Court, and part of Discontinued South half of Webster Court, Certified Survey Map No. 14307, Recorded in Volume 97 of Certified Survey Maps, Pages 240-245, as Document No. 5255803, located in the Northeast Quarter of the Southeast Quarter of Section 29, Township 09 North, Range 10 East, Village of Windsor, Dane County, Wisconsin, more particularly described as follows:

Commencing at the East Quarter Corner of Section 29, aforesaid; thence South 89 degrees 49 minutes 39 seconds West along the North line of the Southeast Quarter, aforesaid, a distance of 1,161.82 feet; thence South 00 degrees 16 minutes 00 seconds East, 416.32 feet to a point on the East right-of-way line of North Towne Road, also being the Point of Beginning; thence South 89 degrees 58 minutes 25 seconds East, 19.59 feet; thence North 00 degrees 57 minutes 33 seconds West, 12.33 feet; thence North 89 degrees 02 minutes 27 seconds East, 15.00 feet; thence South 00 degrees 57 minutes 33 seconds East, 12.59 feet; thence South 89 degrees 58 minutes 25 seconds East, 183.15 feet; thence North 00 degrees 00 minutes 19 seconds West, 202.71 feet; thence North 90 degrees 00 minutes 00 seconds East, 24.16 feet; thence North 00 degrees 49 minutes 03 seconds West, 12.29 feet; thence North 89 degrees 10 minutes 57 seconds East, 17.38 feet; thence South 00 degrees 00 minutes 00 seconds East, 37.54 feet; thence North 90 degrees 00 minutes 00 seconds West, 16.36 feet; thence South 00 degrees 00 minutes 19 seconds East, 177.72 feet; thence South 89 degrees 58 minutes 25 seconds East, 10.57 feet; thence South 00 degrees 00 minutes 00 seconds East, 24.90 feet; thence North 89 degrees 58 minutes 25 seconds West, 253.20 feet to a point on the Easterly right-of-way line of North Towne Road; thence North 00 degrees 16 minutes 00 seconds West along said right-of-way line, 24.88 feet to the Point of Beginning.

Said easement contains 12,182 square feet or 0.280 acres.



EASEMENT LINE TABLE

LINE	BEARING	DISTANCE
E-1	S89°58'25"E	19.59'
E-2	N00°57'33"W	12.33'
E-3	N89°02'27"E	15.00'
E-4	S00°57'33"E	12.59'
E-5	S89°58'25"E	183.15'
E-6	N00°00'19"W	202.71'
E-7	N90°00'00"E	24.16'
E-8	N00°49'03"W	12.29'
E-9	N89°10'57"E	17.38'
E-10	S00°00'00"E	37.54'
E-11	N90°00'00"W	16.36'
E-12	S00°00'19"E	177.72'
E-13	S89°58'25"E	10.57'
E-14	S00°00'00"E	24.88'
E-15	N89°58'25"W	253.20'
E-16	N00°16'00"W	24.88'

LEGEND

- GOVERNMENT CORNER
- EASEMENT LINE
- CENTERLINE
- RIGHT-OF-WAY LINE
- PLATTED LOT LINE
- SECTION LINE

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON NOVEMBER 16-20, 2015.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM, (DANE COUNTY). THE NORTH LINE OF THE SOUTHEAST QUARTER OF SECTION 29, BEARS S89°49'39"W.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners
MADISON REGIONAL OFFICE
161 HORIZON COURT
VERONA, WISCONSIN 53593
(608)848-5060 PHONE | (608)848-2255 FAX
www.jsdinc.com

PROJECT:
FORWARD DEVELOPMENT GROUP, LLC
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

SHEET TITLE:
UTILITY EASEMENT

JSD PROJECT NUMBER: 18-8515
DRAWN BY: ZMR
CHECKED BY: TJB
DATE: JAN. 11, 2019
SHEET NUMBER: 1

File: I:\2018\188515\DWG\Exhibits\188515 Exhibit Easement (02-08-19).dwg Layout: Utility User: jk Plotted: Feb 11, 2019 - 12:31pm

WINDSOR CROSSING
VILLAGE CENTER, PHASE I

VILLAGE OF WINDSOR, WISCONSIN

NE 1/4, SE 1/4, SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST

DRAWING INDEX

C0.0	TITLE SHEET
C1.0	EXISTING CONDITIONS SURVEY
C2.0	OVERALL SITE PLAN
C3.0	PHASE 1 SITE PLAN
C4.0	GRADING & EROSION CONTROL PLAN
C5.0	DETAILED GRADING
C6.0	UTILITY PLAN

PLAN AND PROFILES

SANITARY AND WATER PLAN & PROFILES

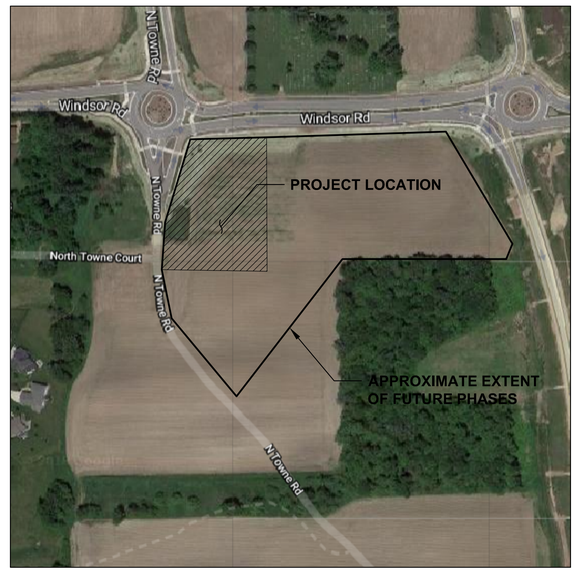
C7.0	PRIVATE STREET A - STA: 9+00 TO 14+50
C7.1	PRIVATE STREET B - STA: 19+75 TO 20+85
	PRIVATE STREET C - STA: 29+40 TO 31+90

PAVING AND STORM PLAN & PROFILES

C8.0	PRIVATE STREET B - STA: 19+00 TO 24+50

DETAILS

C9.0	CONSTRUCTION DETAILS
C9.1	CONSTRUCTION DETAILS
C9.2	TYPICAL SECTIONS



PROJECT AREA

NOT TO SCALE

north

PROJECT INFORMATION

OWNER

CONTACT: FORWARD DEVELOPMENT GROUP
DENNIS STEINKRAUS
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593
P: (608) 848-9050
djs@forwarddevgroup.com

CONSULTING ENGINEER

CONTACT: JSD PROFESSIONAL SERVICES
BILL DUNLOP, P.E.
161 HORIZON DRIVE, SUITE 101
VERONA, WI 53593
P: (608) 848-5060
bill.dunlop@jsdinc.com

MUNICIPAL CONTACTS

VILLAGE OF WINDSOR ENGINEER

CONTACT: KEVIN RICHARDSON
4084 MUELLER ROAD
DEFOREST, WI 53532
P: (608) 888-0066
KEVIN@WINDSORWI.GOV

VILLAGE OF WINDSOR UTILITIES

CONTACT: JEFF BARTOSIAK
6716 PARK STREET
WINDSOR, WI 53598
P: (608) 888-0011
JEFF@WINDSORWI.GOV

UTILITY CONTACTS

GAS

CONTACT: MADISON GAS AND ELECTRIC
SHAUN ENDRES
P.O. BOX 1231
MADISON, WI 53701-1231
P: (608) 252-7224
SENDRES@MGE.COM

COMMUNICATIONS

CONTACT: CENTURY LINK
STEVEN BISHOP
P: (608) 355-7501
STEVEN.BISHOP@CENTURYLINK.COM

CABLE TV

CONTACT: CHARTER COMMUNICATIONS
MIGUEL DEL MORAL
2701 DANIELS STREET
MADISON, WI 53718
P: (608) 209-4817
MIGUELDELMORAL@CHARTER.COM

ELECTRIC

CONTACT: ALLIANT ENERGY
JIM JOHNSRUD
6462 BLANCHAR'S CROSSING
WINDSOR, WI 53598
P: (608) 842-1704
JIMJOHNSRUD@ALLIANTENERGY.COM

DIGGERS HOTLINE
Toll Free (800) 242-8511

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING
VILLAGE CENTER
PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
C0.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Title & Details.dwg Layout: TITLESHEET User: cgroenier Plotted: Feb 08, 2019 - 1:19pm Xref's:

EXISTING CONDITIONS MAP

LOT'S 1 AND 2, CERTIFIED SURVEY MAP No. 14307, LOCATED IN PART OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER AND THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN.

LEGEND

- ¾" REBAR FOUND
- CONTROL POINT
- SOIL BORING
- SANITARY MANHOLE
- WATER OR GAS VALVE
- HYDRANT
- STORM MANHOLE
- CURB INLET
- LIGHT POLE
- PARCEL BOUNDARY
- RIGHT-OF-WAY LINE
- CENTERLINE
- CHORD LINE
- PLATTED LOT LINE
- EASEMENT LINE
- CONCRETE CURB & GUTTER
- SAN — SANITARY SEWER
- W — WATER LINE
- ST — STORM SEWER
- G — NATURAL GAS
- E — UNDERGROUND ELECTRIC
- 930 — INDEX CONTOUR
- 931 — INTERMEDIATE CONTOUR
- x 931.29 — SPOT ELEVATION
- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- DISCONTINUED MAPPED PIPE LINE

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON SEPTEMBER 27, 2016.
2. BEARINGS FOR THIS SURVEY AND MAP ARE BASED ON THE WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), DANE COUNTY. THE NORTH LINE OF THE SOUTHEAST QUARTER BEARS S89°49'39"W.
3. ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). REFERENCE BENCHMARK IS A FOUND REBAR SET BY D'ONOFRIO KOTTKE AND ASSOCIATES, INC. ON WINDSOR ROAD. ELEVATION = 941.83'
4. CONTOUR INTERVAL IS ONE FOOT.
5. SUBSURFACE UTILITIES AND FEATURES SHOWN ON THIS MAP HAVE BEEN APPROXIMATED BY LOCATING SURFICIAL FEATURES AND APPURTENANCES, LOCATING DIGGERS HOTLINE FIELD MARKINGS AND BY REFERENCE TO UTILITY RECORDS AND MAPS. DIGGER'S HOTLINE TICKET No. 20183216024, 20183216047, 20183216086, 20183216117, 20183216172, 20183216981 AND 2403832, WITH A CLEAR DATE OF AUGUST 15, 2018.
6. UTILITY COMPANIES CONTACTED THRU DIGGERS HOTLINE:
   VILLAGE OF WINDSOR
   MADISON GAS AND ELECTRIC COMPANY
   CHARTER COMMUNICATIONS
   TDS METROCOM
   DOT SOUTHWEST REGION-MADISON
   WINDSOR UTILITY DISTRICT #1
   ALLIANT ENERGY (ELECTRIC AND GAS)
   CENTURYLINK
   VILLAGE OF DEFOREST
7. BEFORE EXCAVATION, APPROPRIATE UTILITY COMPANIES SHOULD BE CONTACTED. FOR EXACT LOCATION OF UNDERGROUND UTILITIES, CONTACT DIGGERS HOTLINE, AT 1.800.242.8511.
8. JSD PROFESSIONAL SERVICES, INC. DOES NOT GUARANTEE THAT THE BENCHMARK ELEVATIONS LISTED ON THIS MAP HAVE NOT BEEN DISTURBED SINCE THE DATE OF THIS SURVEY AND SHOULD BE VERIFIED BEFORE BEING UTILIZED.
9. SITE PLAN RECORDS WERE REQUESTED FROM THE VILLAGE OF WINDSOR. NO RECORDS WERE SUPPLIED FOR THIS SITE.
10. ROADWAY UTILITIES ARE SHOWN PER SUPPLIED RECORD DRAWINGS LOCATES AND FIELD MEASUREMENTS.

SANITARY SEWER MANHOLES

STRUCT. ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
SAN-14	931.11	E	914.31	8"	PVC
		W	914.36	8"	PVC
		S	914.23	8"	PVC
SAN-13	925.77	N	913.28	8"	PVC
		SE	913.20	8"	PVC
SAN-12	924.75	NW	912.67	8"	PVC
		NE	912.75	6"	PVC
		SW	912.75	6"	PVC
		SE	912.62	8"	PVC
SAN-11	924.11	NW	911.95	8"	PVC
		SE	911.92	8"	PVC
SAN-10	926.05	NW	910.17	8"	PVC
		SE	910.13	8"	PVC

STORM SEWER INLETS

INLET ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
INL-11.3	930.32	E	925.87	18"	RCP
		W	925.79	18	RCP
INL-9.2	923.83	NE	920.08	15"	RCP
		SW	919.98	15"	RCP
INL-7.2A	922.25	SE	919.10	12"	RCP
INL-7.2B	922.29	NW	919.10	12"	RCP
		SW	919.09	15"	RCP

STORM SEWER MANHOLES

STRUCT. ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
CB-7	922.64	NE	918.39	15"	RCP
		SW	918.44	15"	RCP
		NW	918.19	24"	RCP
CB-8	923.20	SE	916.89	24"	RCP
		SW	915.80	36"	RCP
		NW	915.80	36"	RCP
CB-9	924.30	SE	917.92	36"	RCP
		SW	919.77	12"	RCP
		NE	919.52	15"	RCP
		NW	917.92	36"	RCP
CB-10	924.30	SE	919.35	36"	RCP
		SW	920.07	15"	RCP
		N	919.63	30"	RCP
CB-11	924.30	S	924.01	30"	RCP
		E	924.01	18"	RCP
		W	924.01	18"	RCP

BENCHMARKS

BENCH MARK	ELEVATION	DESCRIPTION
BM-1	920.31	CHISLED SQUARE ON BOX CULVERT HEAD WALL
BM-2	925.16	M.A.G. NAIL IN SIDEWALK ON EAST SIDE OF NORTH TOWNE ROAD

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

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

CLIENT:
FORWARD DEVELOPMENT GROUP LLC

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

DIGGERS HOTLINE
Toll Free (800) 242-8511

PROJECT:
WINDSOR CROSSING VILLAGE CENTER

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WISCONSIN

PLAN MODIFICATIONS:

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

Design/Drawn: JK
Approved: TJB

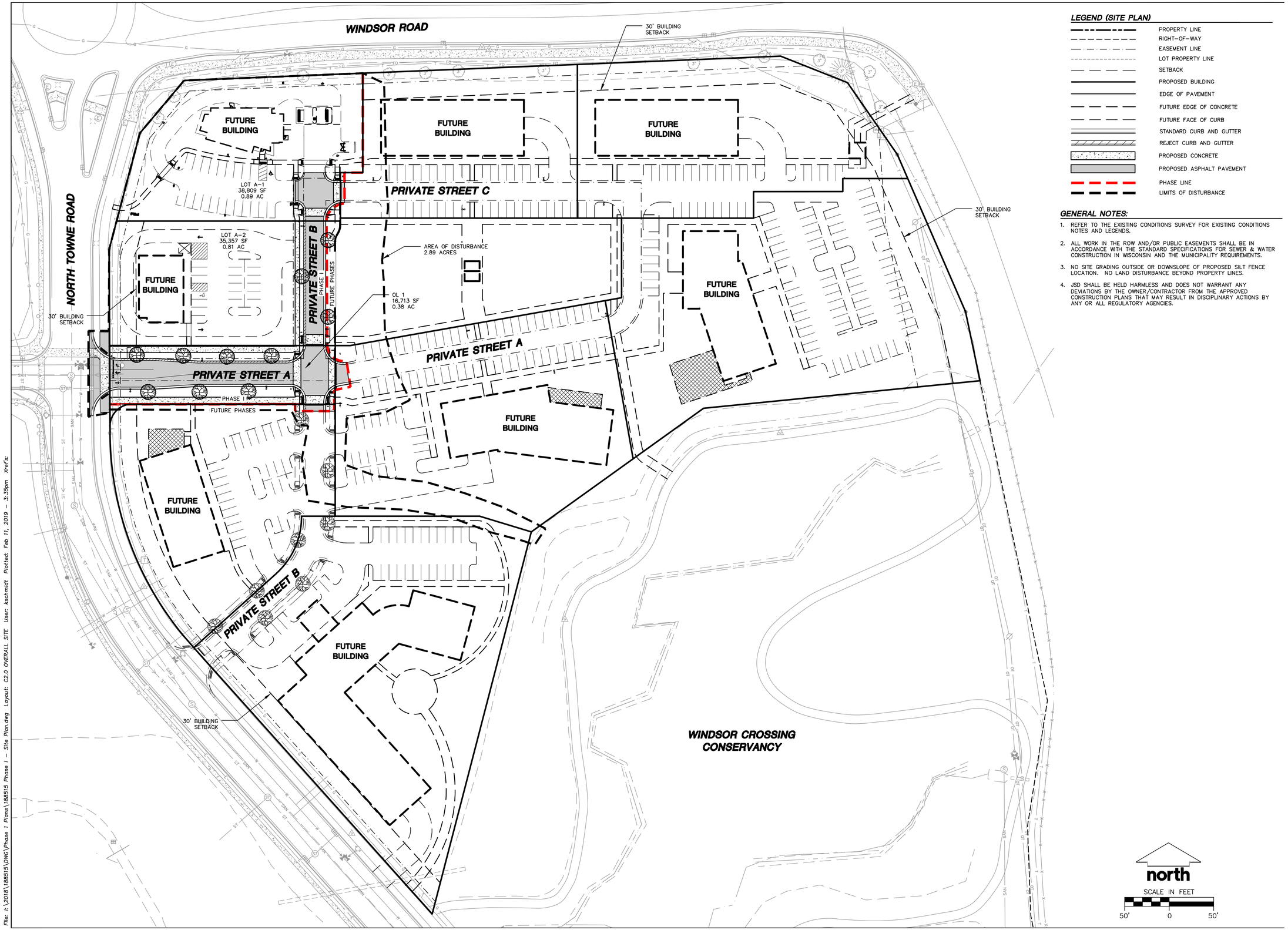
SHEET TITLE:
EXISTING CONDITIONS MAP

SHEET NUMBER:
C 1.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\XREF\188515 Excon(City Center).dwg Layout: Excon User: kyeska Plotted: Feb 11, 2019 - 3:40pm Xref's:



LEGEND (SITE PLAN)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- SETBACK
- PROPOSED BUILDING
- EDGE OF PAVEMENT
- FUTURE EDGE OF CONCRETE
- FUTURE FACE OF CURB
- STANDARD CURB AND GUTTER
- REJECT CURB AND GUTTER
- PROPOSED CONCRETE
- PROPOSED ASPHALT PAVEMENT
- PHASE LINE
- LIMITS OF DISTURBANCE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

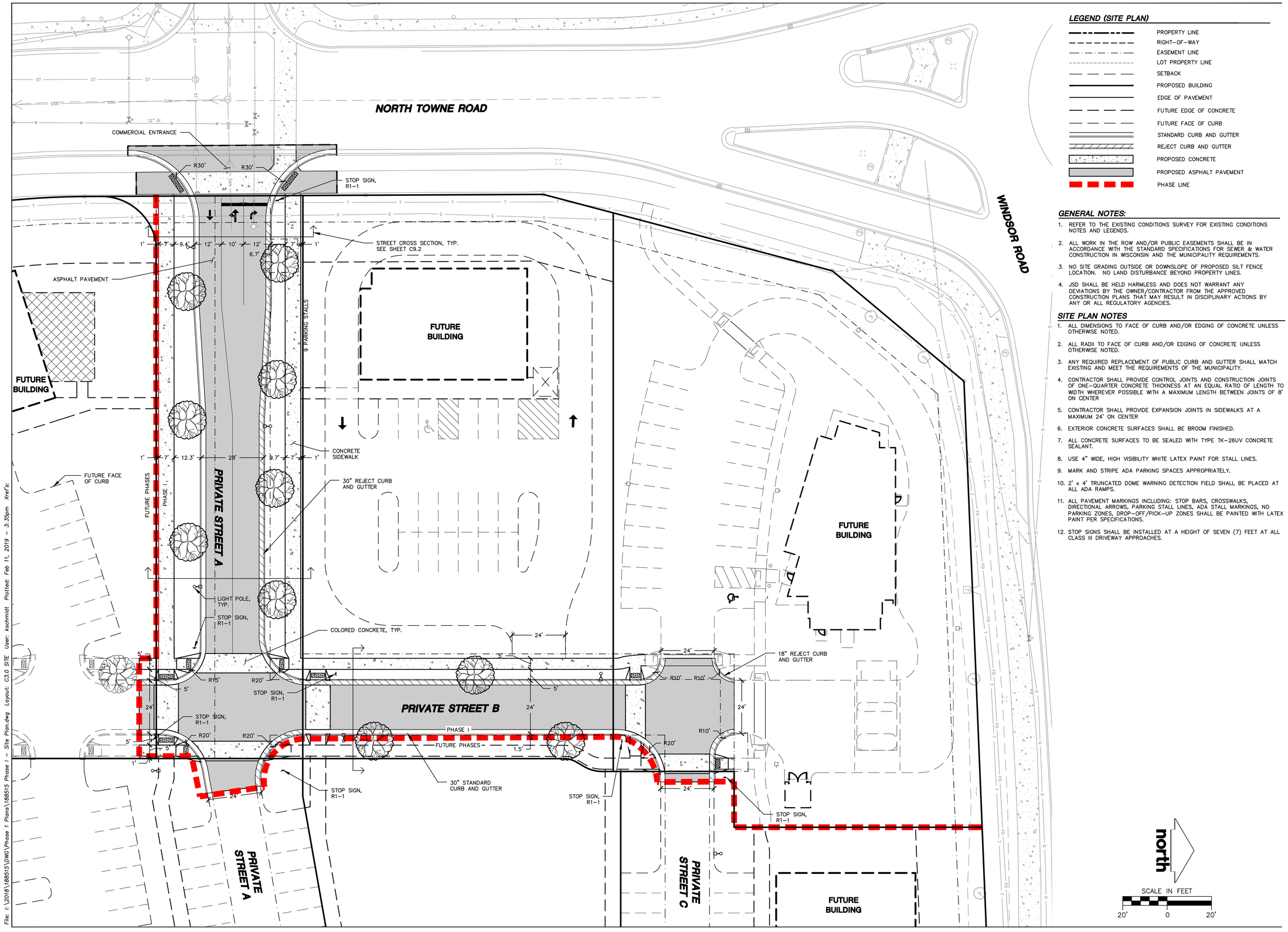
SHEET TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
C2.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Site Plan.dwg Layout: C2.0 OVERALL SITE User: kschmidt Plotted: Feb 11, 2019 - 3:35pm Xref's:



LEGEND (SITE PLAN)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- SETBACK
- PROPOSED BUILDING
- EDGE OF PAVEMENT
- FUTURE EDGE OF CONCRETE
- FUTURE FACE OF CURB
- STANDARD CURB AND GUTTER
- REJECT CURB AND GUTTER
- PROPOSED CONCRETE
- PROPOSED ASPHALT PAVEMENT
- PHASE LINE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

SITE PLAN NOTES

1. ALL DIMENSIONS TO FACE OF CURB AND/OR EDGING OF CONCRETE UNLESS OTHERWISE NOTED.
2. ALL RADII TO FACE OF CURB AND/OR EDGING OF CONCRETE UNLESS OTHERWISE NOTED.
3. ANY REQUIRED REPLACEMENT OF PUBLIC CURB AND GUTTER SHALL MATCH EXISTING AND MEET THE REQUIREMENTS OF THE MUNICIPALITY.
4. CONTRACTOR SHALL PROVIDE CONTROL JOINTS AND CONSTRUCTION JOINTS OF ONE-QUARTER CONCRETE THICKNESS AT AN EQUAL RATIO OF LENGTH TO WIDTH WHEREVER POSSIBLE WITH A MAXIMUM LENGTH BETWEEN JOINTS OF 8' ON CENTER
5. CONTRACTOR SHALL PROVIDE EXPANSION JOINTS IN SIDEWALKS AT A MAXIMUM 24' ON CENTER
6. EXTERIOR CONCRETE SURFACES SHALL BE BROOM FINISHED.
7. ALL CONCRETE SURFACES TO BE SEALED WITH TYPE TK-26UV CONCRETE SEALANT.
8. USE 4" WIDE, HIGH VISIBILITY WHITE LATEX PAINT FOR STALL LINES.
9. MARK AND STRIPE ADA PARKING SPACES APPROPRIATELY.
10. 2' x 4' TRUNCATED DOME WARNING DETECTION FIELD SHALL BE PLACED AT ALL ADA RAMPS.
11. ALL PAVEMENT MARKINGS INCLUDING: STOP BARS, CROSSWALKS, DIRECTIONAL ARROWS, PARKING STALL LINES, ADA STALL MARKINGS, NO PARKING ZONES, DROP-OFF/PICK-UP ZONES SHALL BE PAINTED WITH LATEX PAINT PER SPECIFICATIONS.
12. STOP SIGNS SHALL BE INSTALLED AT A HEIGHT OF SEVEN (7) FEET AT ALL CLASS III DRIVEWAY APPROACHES.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

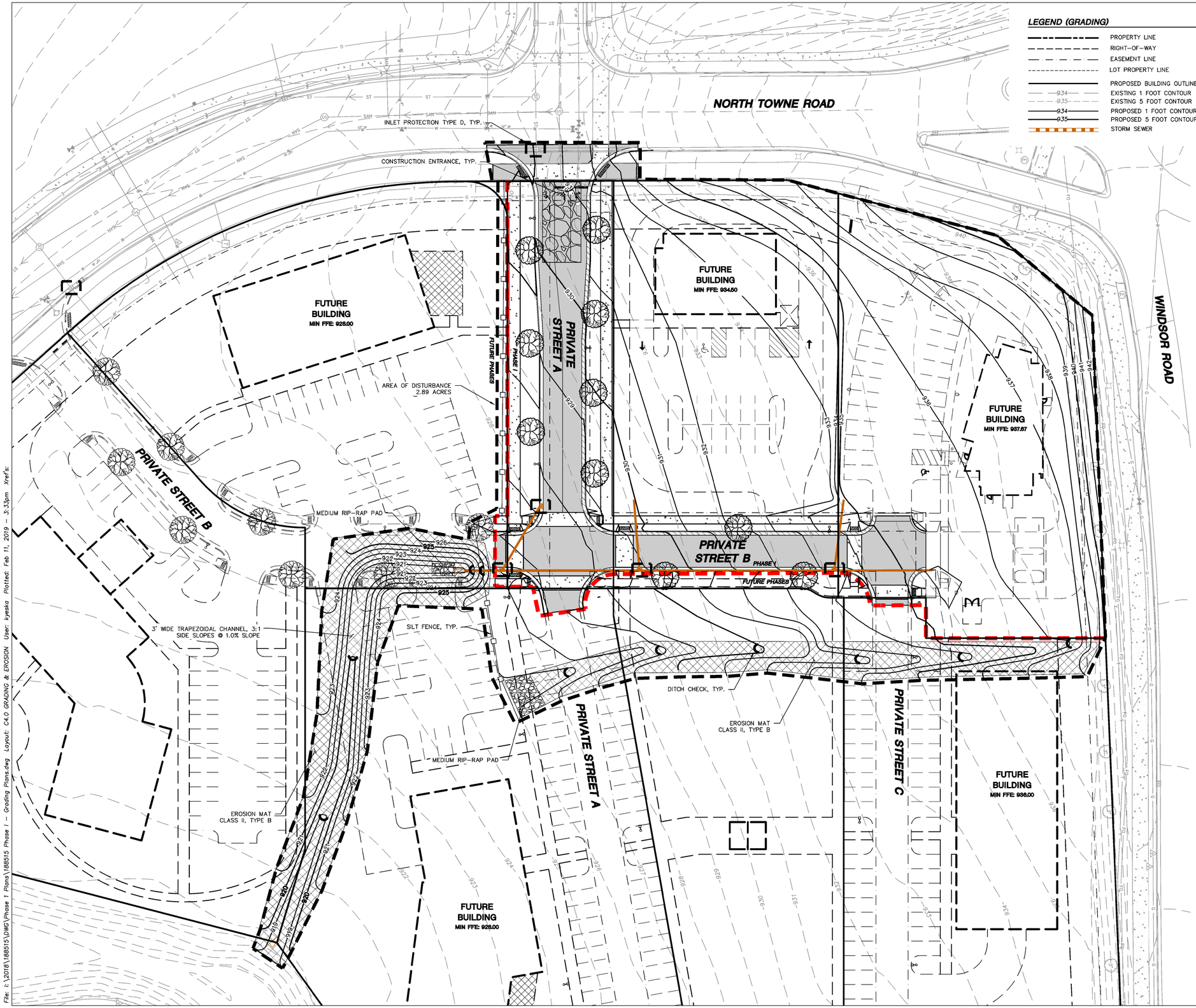
SHEET TITLE:
PHASE I SITE PLAN

SHEET NUMBER:
C3.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Site Plan.dwg Layout: C3.0 SITE User: kschmidt Plotted: Feb 11, 2019 - 3:35pm Xref's:



File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Grading Plans.dwg Layout: C4.0 GRADING & EROSION User: kyeska Plotted: Feb 11, 2019 - 3:33pm Xref's:

LEGEND (GRADING)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- PROPOSED BUILDING OUTLINE
- 934 — EXISTING 1 FOOT CONTOUR
- 935 — EXISTING 5 FOOT CONTOUR
- 934 — PROPOSED 1 FOOT CONTOUR
- 935 — PROPOSED 5 FOOT CONTOUR
- STORM SEWER
- 934.20 FG — SPOT ELEVATION
  - EP – EDGE OF PAVEMENT
  - FG – FINISH GRADE
  - EC – EDGE OF CONCRETE
  - SW – EDGE OF SIDEWALK
  - TW – TOP OF WALL
  - BW – BOTTOM OF WALL
  - RIM – RIM ELEVATION
  - ± – MATCH TO EXISTING
- GRADE BREAK
- PHASE LINE
- LIMITS OF DISTURBANCE
- E-MAT – CLASS II, TYPE B
- CONSTRUCTION ENTRANCE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES UNLESS WITHIN A TEMPORARY CONSTRUCTION AND/OR GRADING EASEMENT.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

GRADING AND SEEDING NOTES

1. ALL DISTURBED AREAS SHALL BE SODDED AND/OR SEEDED AND MULCHED IMMEDIATELY FOLLOWING GRADING ACTIVITIES. SOD/SEED MIX TO BE IN ACCORDANCE WITH LANDSCAPE PLAN.
2. ALL PROPOSED GRADES SHOWN ARE FINISHED GRADES. CONTRACTOR SHALL VERIFY ALL GRADES, MAKE SURE ALL AREAS DRAIN PROPERLY AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT ADJACENT PROPERTIES WITH SILT FENCING FOR EROSION CONTROL UNTIL CONSTRUCTION IS COMPLETED AND NOTICE OF TERMINATION FILED.
4. CONTRACTOR SHALL CHISEL-PLOW OR DEEP TILL WITH DOUBLE TINES ALL STORMWATER MANAGEMENT FACILITIES JUST PRIOR TO SODDING AND/OR SEEDING AND MULCHING TO PROMOTE INFILTRATION.
5. CONTRACTOR SHALL WATER ALL NEWLY SODDED/SEEDED AREAS DURING THE SUMMER MONTHS WHENEVER THERE IS A 7 DAY LAPSE WITH NO SIGNIFICANT RAINFALL.
6. CONTRACTOR TO DEEP TILL ALL COMPACTED PERVIOUS SURFACES PRIOR TO SODDING AND/OR SEEDING AND MULCHING.
7. THE CONTRACTOR SHALL NOTIFY THE CITY OF MADISON TWO (2) WORKING DAYS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.
8. IF GRADING ACTIVITIES STOP ON ANY PORTION OF LAND FOR 14 OR MORE CALENDAR DAYS, THE AREA IN QUESTION MUST BE TEMPORARILY STABILIZED.
9. ALL SLOPES 20% OR GREATER SHALL BE TEMPORARY SEEDED, MULCHED, OR OTHER MEANS OF COVER PLACED ON THEM WITHIN 2 WEEKS OF DISTURBANCE.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

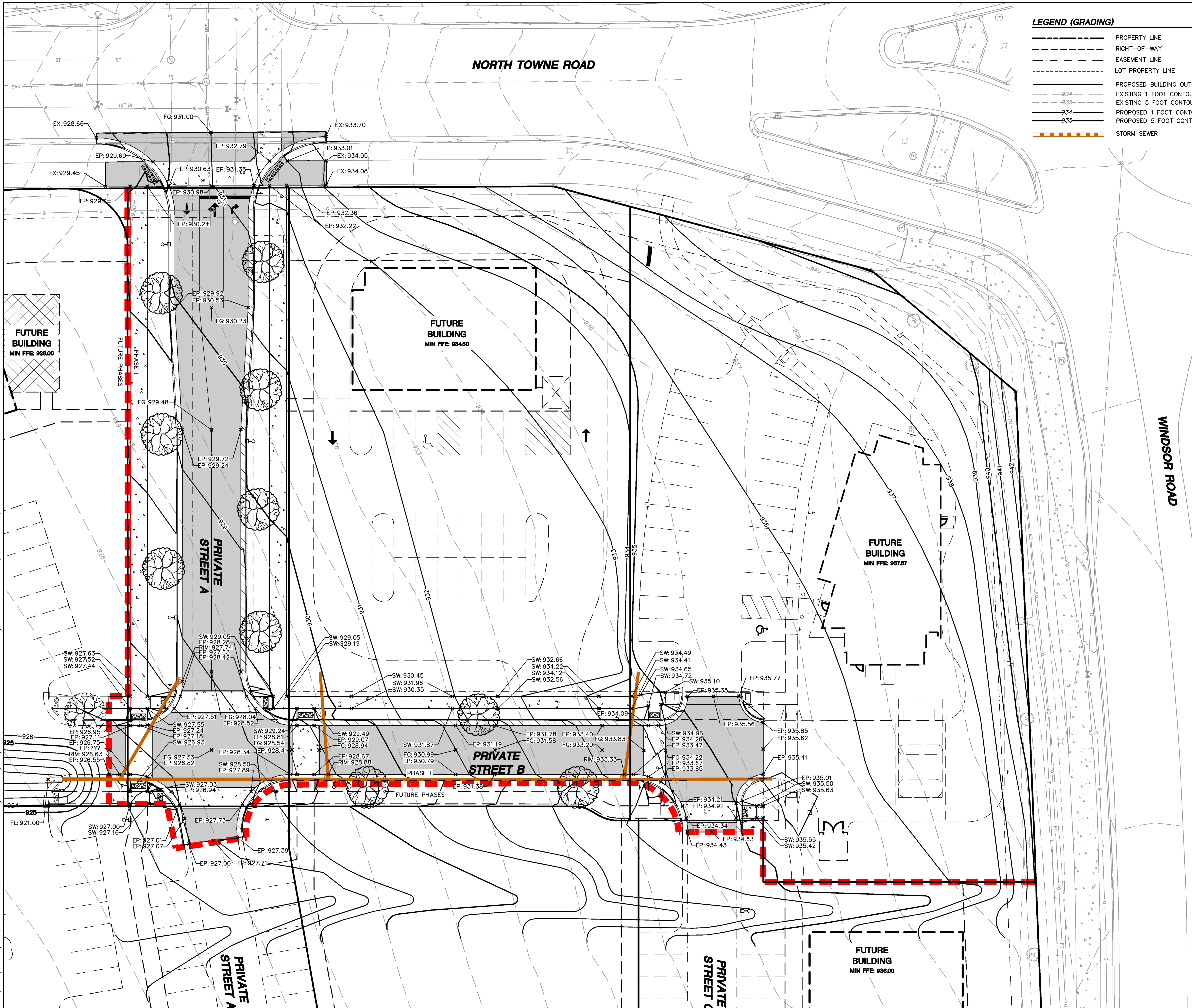
Design/Drawn: CLH/CHG
Approved: WHD

SHEET TITLE:
GRADING & EROSION CONTROL PLAN

SHEET NUMBER:
C4.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.



LEGEND (GRADING)

	PROPERTY LINE
	RIGHT–OF–WAY
	EASEMENT LINE
	LOT PROPERTY LINE
	PROPOSED BUILDING OUTLINE
934	EXISTING 1 FOOT CONTOUR
935	EXISTING 5 FOOT CONTOUR
934	PROPOSED 1 FOOT CONTOUR
935	PROPOSED 5 FOOT CONTOUR
	STORM SEWER
934.20 FG	SPOT ELEVATION EP – EDGE OF PAVEMENT FG – FINISH GRADE EC – EDGE OF CONCRETE SW – EDGE OF SIDEWALK TW – TOP OF WALL BW – BOTTOM OF WALL RIM – RIM ELEVATION ± – MATCH TO EXISTING
	GRADE BREAK
	PHASE LINE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES UNLESS WITHIN A TEMPORARY CONSTRUCTION AND/OR GRADING EASEMENT.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

GRADING AND SEEDING NOTES

1. ALL DISTURBED AREAS SHALL BE SODDED AND/OR SEEDED AND MULCHED IMMEDIATELY FOLLOWING GRADING ACTIVITIES. SOD/SEED MIX TO BE IN ACCORDANCE WITH LANDSCAPE PLAN.
2. ALL PROPOSED GRADES SHOWN ARE FINISHED GRADES. CONTRACTOR SHALL VERIFY ALL GRADES, MAKE SURE ALL AREAS DRAIN PROPERLY AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT ADJACENT PROPERTIES WITH SILT FENCING FOR EROSION CONTROL UNTIL CONSTRUCTION IS COMPLETED AND NOTICE OF TERMINATION FILED.
4. CONTRACTOR SHALL CHISEL–PLOW OR DEEP TILL WITH DOUBLE TINES ALL STORMWATER MANAGEMENT FACILITIES JUST PRIOR TO SODDING AND/OR SEEDING AND MULCHING TO PROMOTE INFILTRATION.
5. CONTRACTOR SHALL WATER ALL NEWLY SODDED/SEEDED AREAS DURING THE SUMMER MONTHS WHENEVER THERE IS A 7 DAY LAPSE WITH NO SIGNIFICANT RAINFALL.
6. CONTRACTOR TO DEEP TILL ALL COMPACTED PERVIOUS SURFACES PRIOR TO SODDING AND/OR SEEDING AND MULCHING.
7. THE CONTRACTOR SHALL NOTIFY THE CITY OF MADISON TWO (2) WORKING DAYS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.
8. IF GRADING ACTIVITIES STOP ON ANY PORTION OF LAND FOR 14 OR MORE CALENDAR DAYS, THE AREA IN QUESTION MUST BE TEMPORARILY STABILIZED.
9. ALL SLOPES 20% OR GREATER SHALL BE TEMPORARY SEEDED, MULCHED, OR OTHER MEANS OF COVER PLACED ON THEM WITHIN 2 WEEKS OF DISTURBANCE.

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

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

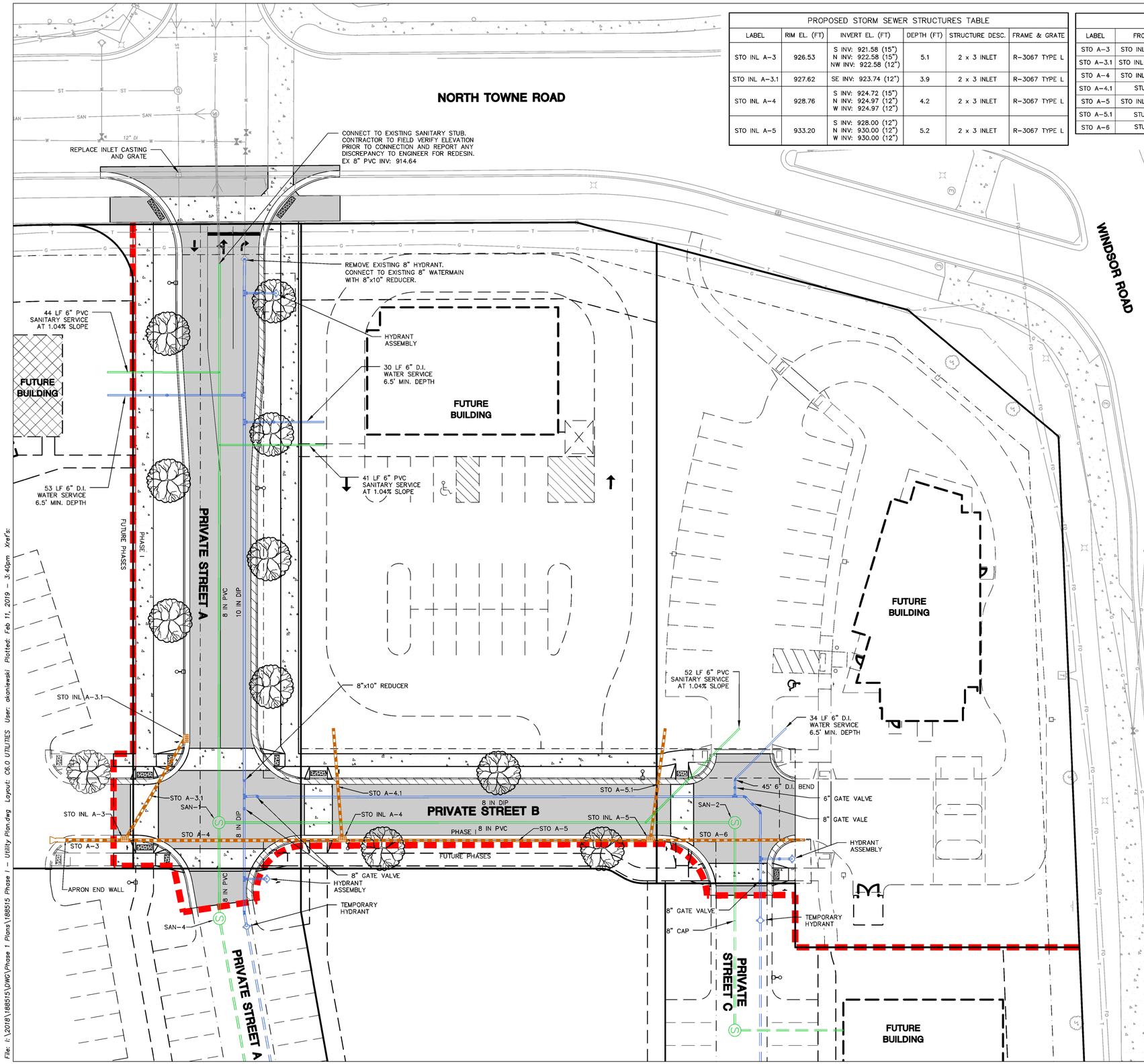
SHEET TITLE:
DETAILED GRADING PLAN

SHEET NUMBER:
C5.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I – Grading Plans.dwg Layout: C5.0 DETAILED GRADING User: kyeska Plotted: Feb 11, 2019 – 3:35pm Xref's:



File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Utility Plan.dwg Layout: C6.0 UTILITIES User: akaniewski Plotted: Feb 11, 2019 - 3:40pm Xref's:

PROPOSED STORM SEWER STRUCTURES TABLE

LABEL	RIM EL. (FT)	INVERT EL. (FT)	DEPTH (FT)	STRUCTURE DESC.	FRAME & GRATE
STO INL A-3	926.53	S INV: 921.58 (15") N INV: 922.58 (15") NW INV: 922.58 (12")	5.1	2 x 3 INLET	R-3067 TYPE L
STO INL A-3.1	927.62	SE INV: 923.74 (12")	3.9	2 x 3 INLET	R-3067 TYPE L
STO INL A-4	928.76	S INV: 924.72 (15") N INV: 924.97 (12") W INV: 924.97 (12")	4.2	2 x 3 INLET	R-3067 TYPE L
STO INL A-5	933.20	S INV: 928.00 (12") N INV: 930.00 (12") W INV: 930.00 (12")	5.2	2 x 3 INLET	R-3067 TYPE L

PROPOSED STORM SEWER PIPES TABLE

LABEL	FROM	TO	LENGTH	INVERT EL. (FT)	DISCHARGE EL. (FT)	SLOPE	SIZE & MATERIAL
STO A-3	STO INL A-3	FES A	23'	921.58	921.00	2.50%	15 IN RCP
STO A-3.1	STO INL A-3.1	STO INL A-3	47'	923.74	922.58	2.50%	12 IN RCP
STO A-4	STO INL A-4	STO INL A-3	85'	924.72	922.58	2.50%	15 IN RCP
STO A-4.1	STUB	STO INL A-4	44'	926.07	924.97	2.50%	12 IN RCP
STO A-5	STO INL A-5	STO INL A-4	121'	928.00	924.97	2.50%	12 IN RCP
STO A-5.1	STUB	STO INL A-5	44'	930.89	930.00	2.00%	12 IN RCP
STO A-6	STUB	STO INL A-5	61'	931.52	930.00	2.50%	12 IN RCP

PROPOSED SANITARY SEWER STRUCTURES TABLE

LABEL	RIM EL. (FT)	INVERT EL. (FT)	DEPTH (FT)	STRUCTURE DESC.	FRAME & GRATE
SAN-1	927.41	W INV: 915.52 (8") E INV: 915.62 (8") N INV: 916.52 (8")	11.9	48 IN MH	R-1550 SOLID LID
SAN-2	934.79	S INV: 921.59 (8") E INV: 922.59 (8")	13.2	48 IN MH	R-1550 SOLID LID
SAN-4	927.12	W INV: 915.77 (8") E INV: 915.87 (8")	11.4	48 IN MH	R-1550 SOLID LID

LEGEND (UTILITIES)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- FUTURE BUILDING OUTLINE
- SANITARY SEWER
- WATERMAIN
- STORM SEWER
- FUTURE SANITARY SEWER
- FUTURE WATERMAIN

north

SCALE IN FEET

20' 0 20'

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

UTILITY NOTES:

1. IF ANY ERRORS, DISCREPANCIES, OR OMISSIONS WITHIN THE PLAN BECOME APPARENT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION SO THAT CLARIFICATION OR REDESIGN MAY OCCUR.
2. LENGTHS OF ALL UTILITIES ARE TO CENTER OF STRUCTURES OR FITTINGS AND MAY VARY SLIGHTLY FROM PLAN. LENGTHS SHALL BE VERIFIED IN THE FIELD DURING CONSTRUCTION.
3. THE CONTRACTOR SHALL INSTALL A PEDESTRIAN FENCE AROUND ALL EXCAVATIONS TO BE LEFT OPEN OVER NIGHT AS REQUIRED.
4. THE PROPOSED IMPROVEMENTS MUST BE CONSTRUCTED IN ACCORDANCE WITH ENGINEERING PLANS DESIGNED TO MEET ORDINANCES AND REQUIREMENTS OF THE MUNICIPALITY AND WISDOT, WDSPS, AND WDNR.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR:
   - EXAMINING ALL SITE CONDITIONS RELATIVE TO THE CONDITIONS INDICATED ON THE ENGINEERING DRAWINGS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER AND RESOLVED PRIOR TO THE START OF CONSTRUCTION.
   - OBTAINING ALL PERMITS INCLUDING PERMIT COSTS, TAP FEES, METER DEPOSITS, BONDS, AND ALL OTHER FEES REQUIRED FOR PROPOSED WORK TO OBTAIN OCCUPANCY.
   - VERIFYING UTILITY ELEVATIONS AND NOTIFYING ENGINEER OF ANY DISCREPANCY. NO WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS RESOLVED.
   - NOTIFYING ALL UTILITIES PRIOR TO THE INSTALLATION OF ANY UNDERGROUND IMPROVEMENTS.
   - NOTIFYING THE DESIGN ENGINEER AND MUNICIPALITY 48 HOURS PRIOR TO THE START OF CONSTRUCTION TO ARRANGE FOR APPROPRIATE CONSTRUCTION OBSERVATION.
7. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE ENGINEER WITH AS-BUILT CONDITIONS OF THE DESIGNATED IMPROVEMENTS IN ORDER THAT THE APPROPRIATE DRAWINGS CAN BE PREPARED, IF REQUIRED. ANY CHANGES TO THE DRAWINGS OR ADDITIONAL ITEMS MUST BE REPORTED TO THE ENGINEER AS WORK PROGRESSES.
8. THE PRIME CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL CONSTRUCTION WITH OTHER CONTRACTORS INVOLVED WITH CONSTRUCTION OF THE PROPOSED DEVELOPMENT AND FOR REPORTING ANY ERRORS OR DISCREPANCIES BETWEEN THESE PLANS AND PLANS PREPARED BY OTHERS.
9. ANY SANITARY SEWER, SANITARY SEWER SERVICES, WATER MAIN, WATER SERVICES, STORM SEWER, OR OTHER UTILITIES, WHICH ARE DAMAGED BY THE CONTRACTORS, SHALL BE REPAIRED TO THE OWNER'S SATISFACTION AT THE CONTRACTOR'S EXPENSE.
10. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY DURING THE CONSTRUCTION OF IMPROVEMENTS.
11. CONTRACTOR SHALL CONTACT THE LOCAL MUNICIPALITY PUBLIC WORKS DEPARTMENT A MINIMUM OF 48 HOURS BEFORE CONNECTING TO PUBLIC UTILITIES. CONTRACTOR TO VERIFY SIZE AND DEPTH OF EXISTING UTILITY SERVICES AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONNECTING.
12. CONTRACTOR MUST CONTACT AND IS REQUIRED TO NOTIFY THE LOCAL MUNICIPALITY WATER UTILITY 48 HOURS IN ADVANCE OF CONNECTING TO THE PUBLIC UTILITY.
13. ALL PRIVATE SANITARY BUILDING PIPE AND TUBING SHALL CONFORM TO SPS 384.30-2.
14. ALL PRIVATE STORM BUILDING PIPE AND TUBING SHALL CONFORM TO SPS 384.30-3.
15. ALL PRIVATE PIPE AND TUBING FOR WATER SERVICE SHALL CONFORM TO SPS 384.30-4.
16. ALL PRIVATE STORM PIPE SHALL CONFORM TO SPS 382.40(8)(B)4.A.
17. ALL PRIVATE PIPE SHALL BE INSTALLED PER SPS 382.40-8 INCLUDING AT LEAST 8' OF HORIZONTAL DISTANCE BETWEEN WATER PIPING AND SANITARY SEWER FROM CENTER OF PIPE TO CENTER OF PIPE AND 6' OF SEPARATION BETWEEN STORM SEWER AND WATER PIPING.
18. ALL LOCATIONS WHERE STORM SEWER AND WATER MAIN ARE CROSSING AND LESS THAN 3 FEET OF VERTICAL/HORIZONTAL SEPARATION IS PROVIDED, WATER MAIN SHALL BE INSULATED PER STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN LATEST EDITION. INSULATION SHALL CREATE A "BOX" ENCLOSING THE TOP AND SIDES OF WATER MAIN.
19. MARK WATER, SANITARY, AND STORM WITH A 4"X4" PAINTED WOOD POSTS. WATER SHALL BE PAINTED BLUE AND SANITARY AND STORM SHALL BE PAINTED GREEN.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

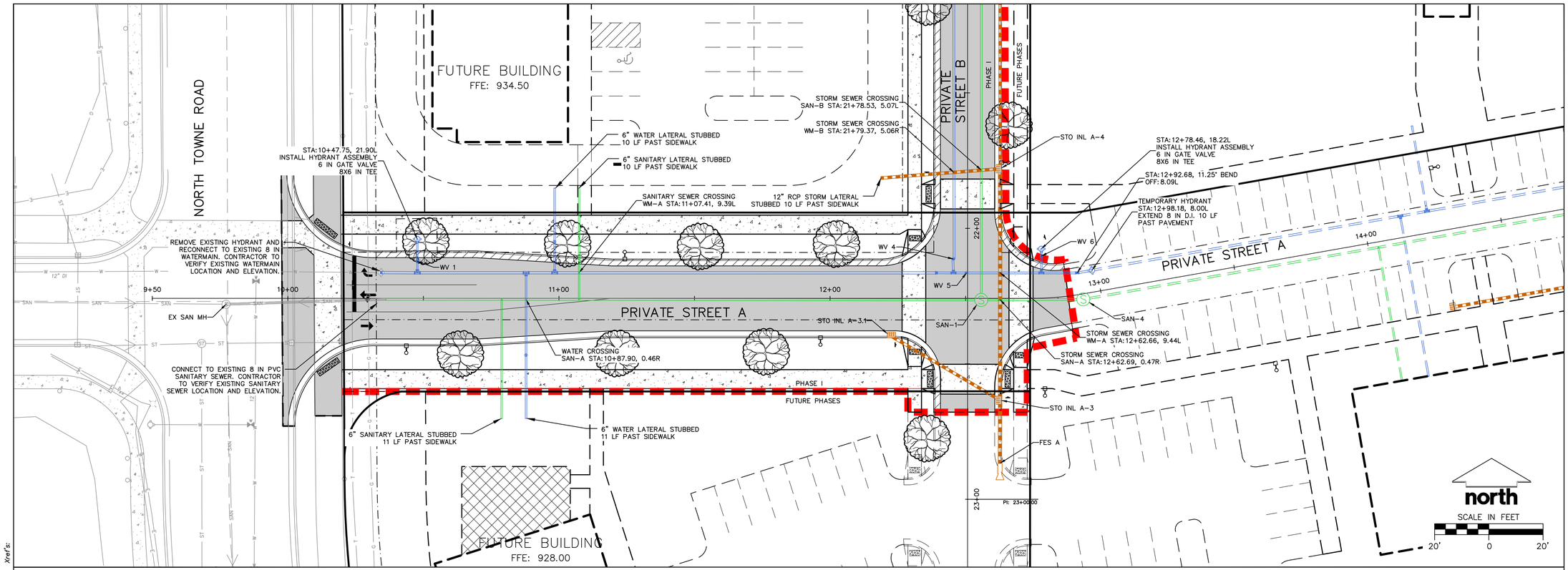
Design/Drawn: CLH/CHG
Approved: WHD

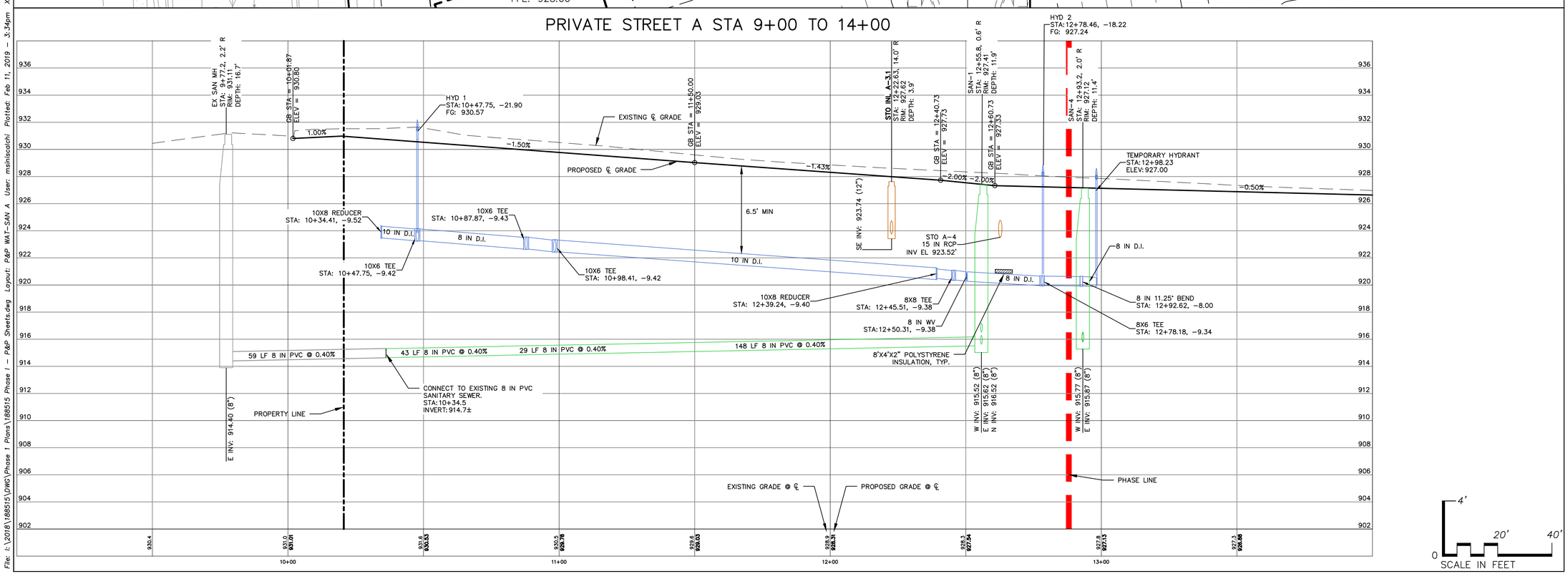
SHEET TITLE:
UTILITY PLAN

SHEET NUMBER:
C6.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.





File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - P&P Sheets.dwg Layout: P&P WAT-SAN A User: mainiscalchi Plotted: Feb 11, 2019 - 3:34pm Xref's:

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

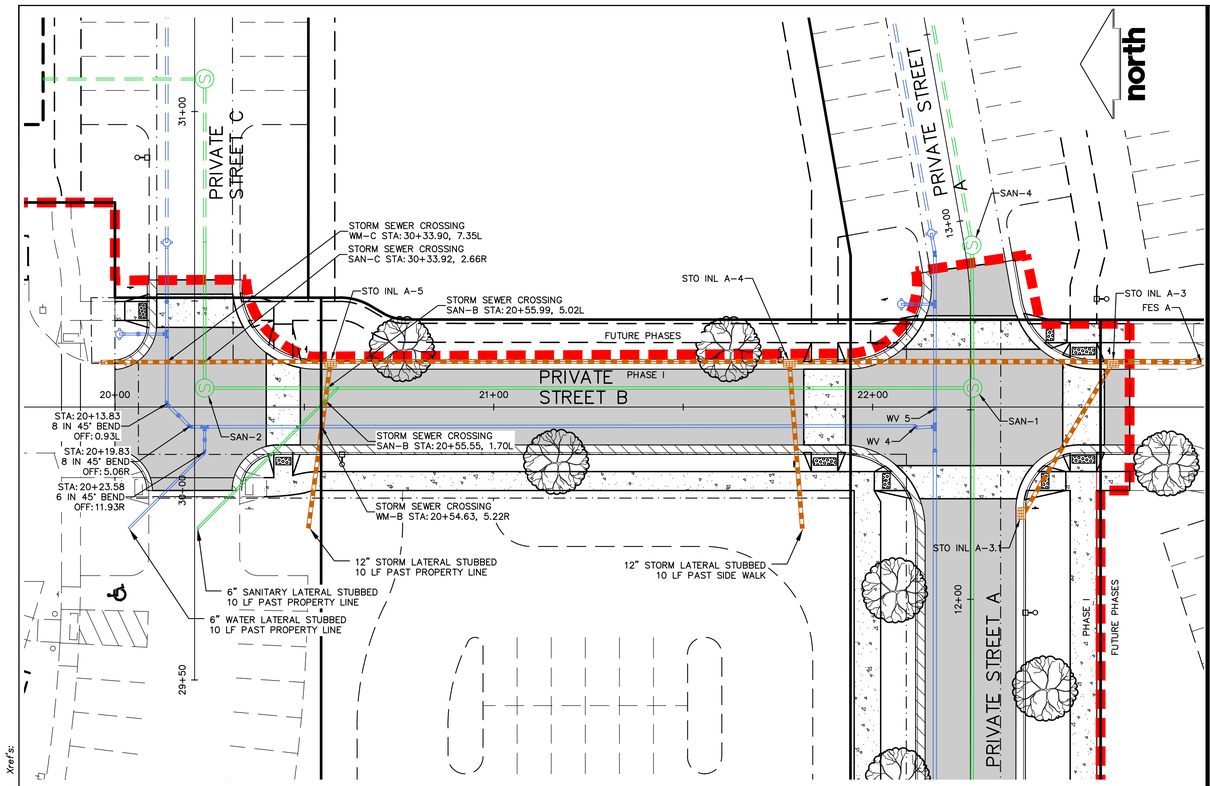
Design/Drawn: CHG/CHG
Approved: WHD

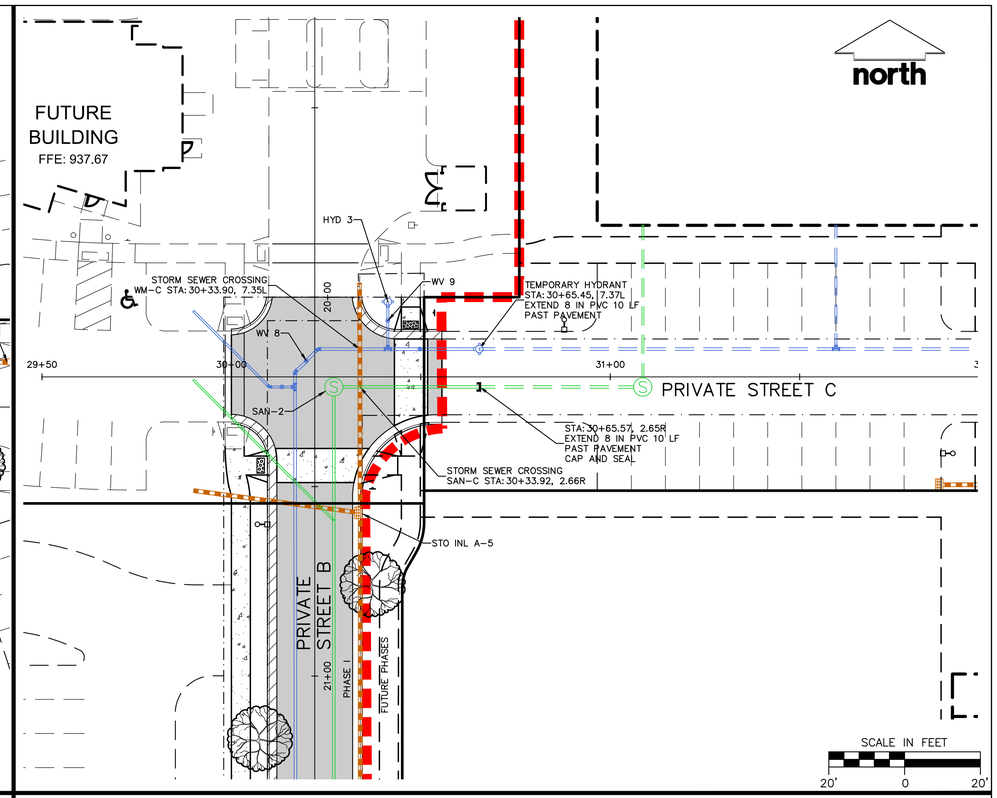
SHEET TITLE:
SANITARY & WATER P&P PRIVATE STREET A STA: 9+00 TO 14+00

SHEET NUMBER:
C7.0

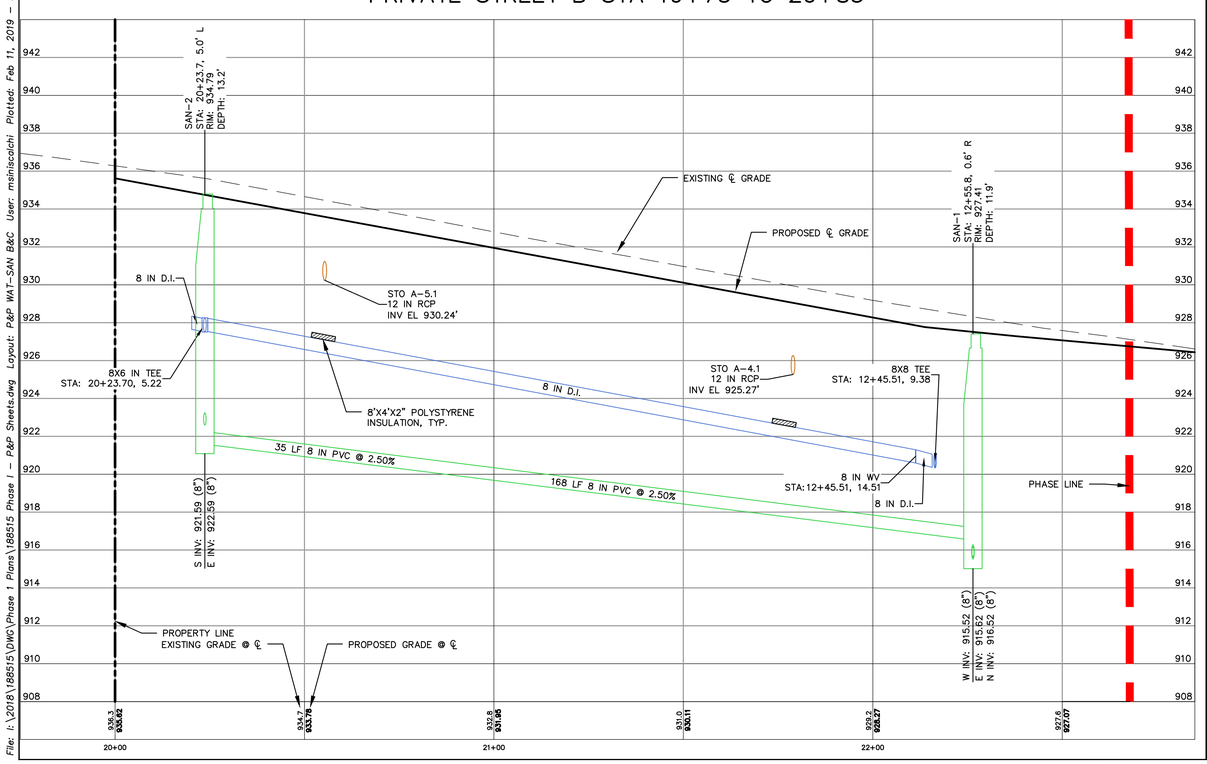
JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

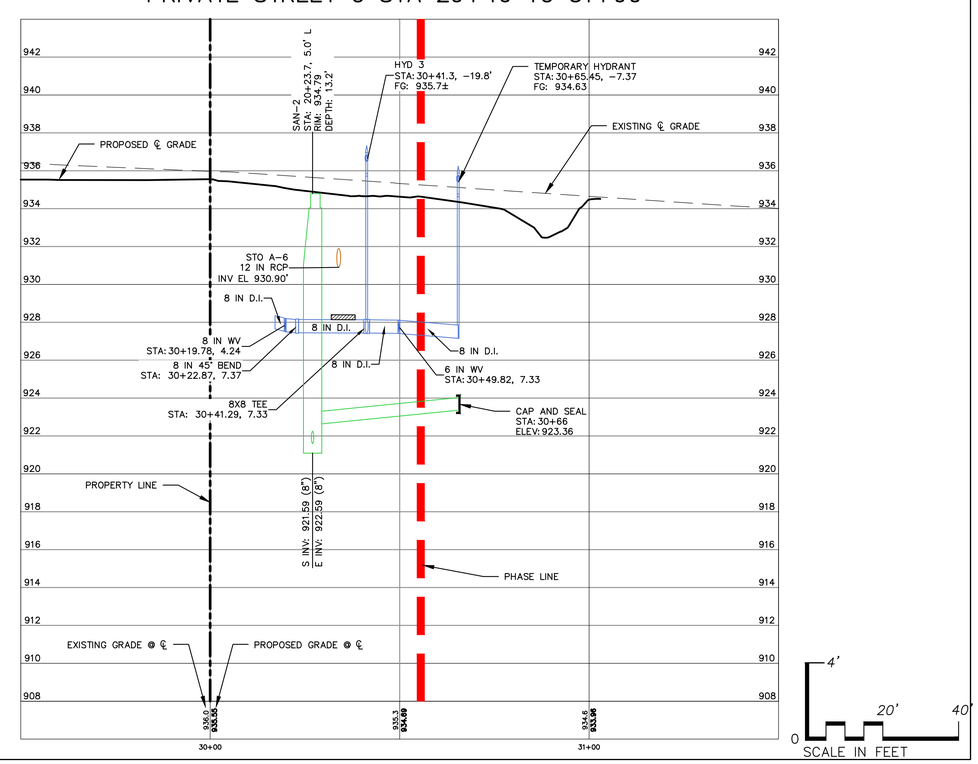




PRIVATE STREET B STA 19+75 TO 20+85



PRIVATE STREET C STA 29+40 TO 31+90



File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - P&P Sheets.dwg Layout: P&P WAT-SAN B&C User: mainiscalchi Plotted: Feb 11, 2019 - 3:35pm Xref's:

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

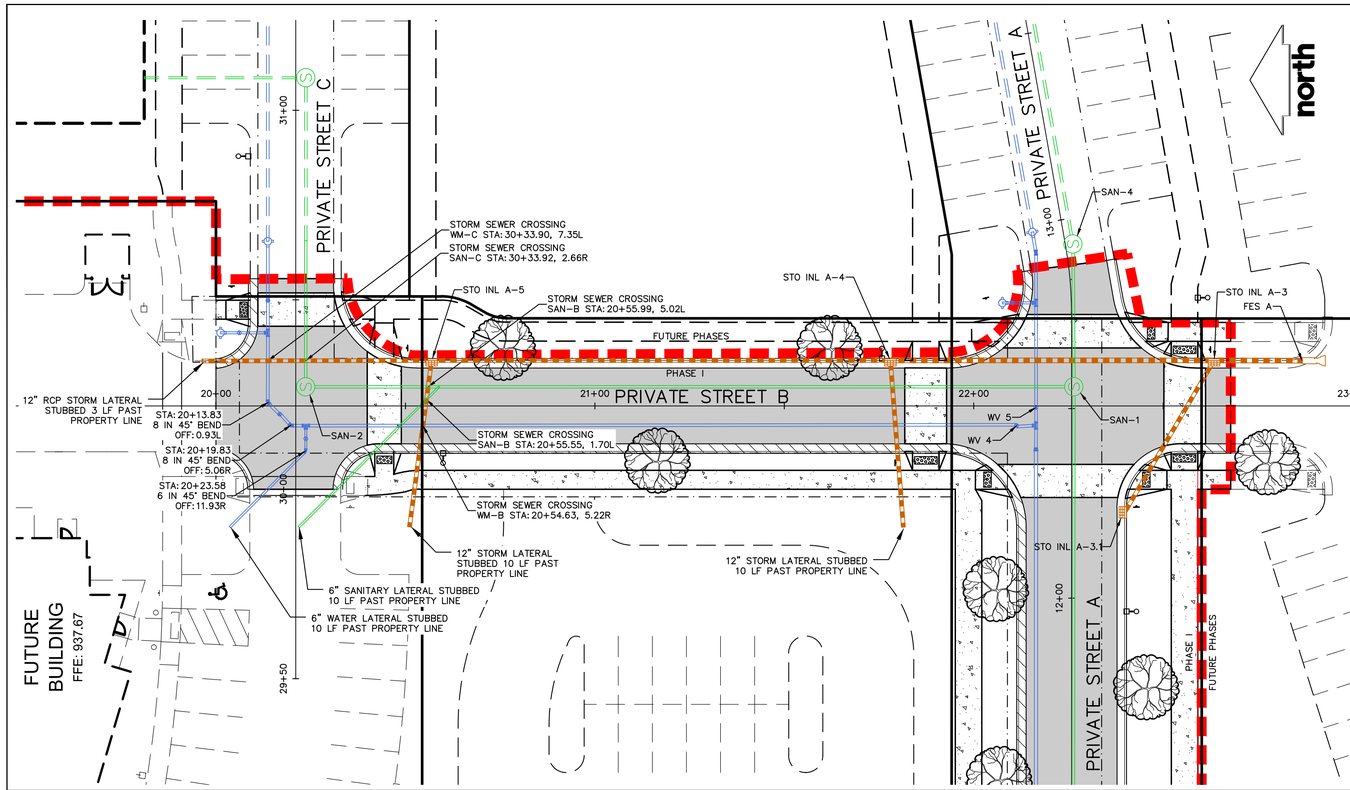
Design/Drawn: CHS/CMG
Approved: WHD

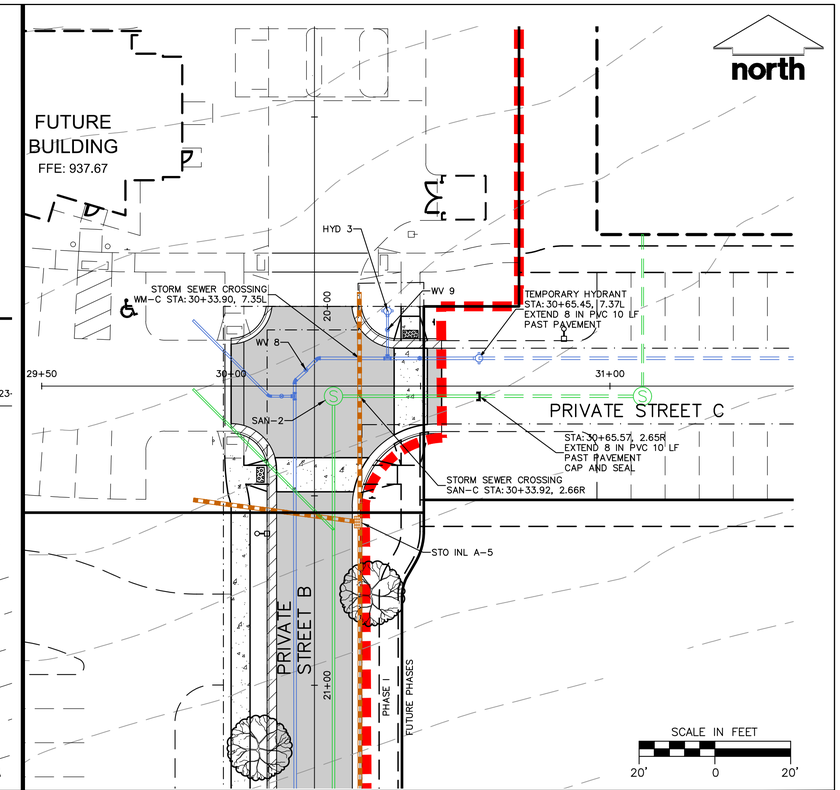
SHEET TITLE:
SANITARY & WATER P&P
PRIVATE STREET B
STA: 19+75 TO 20+85
PRIVATE STREET C
STA: 29+40 TO 31+90

SHEET NUMBER:
C7.1

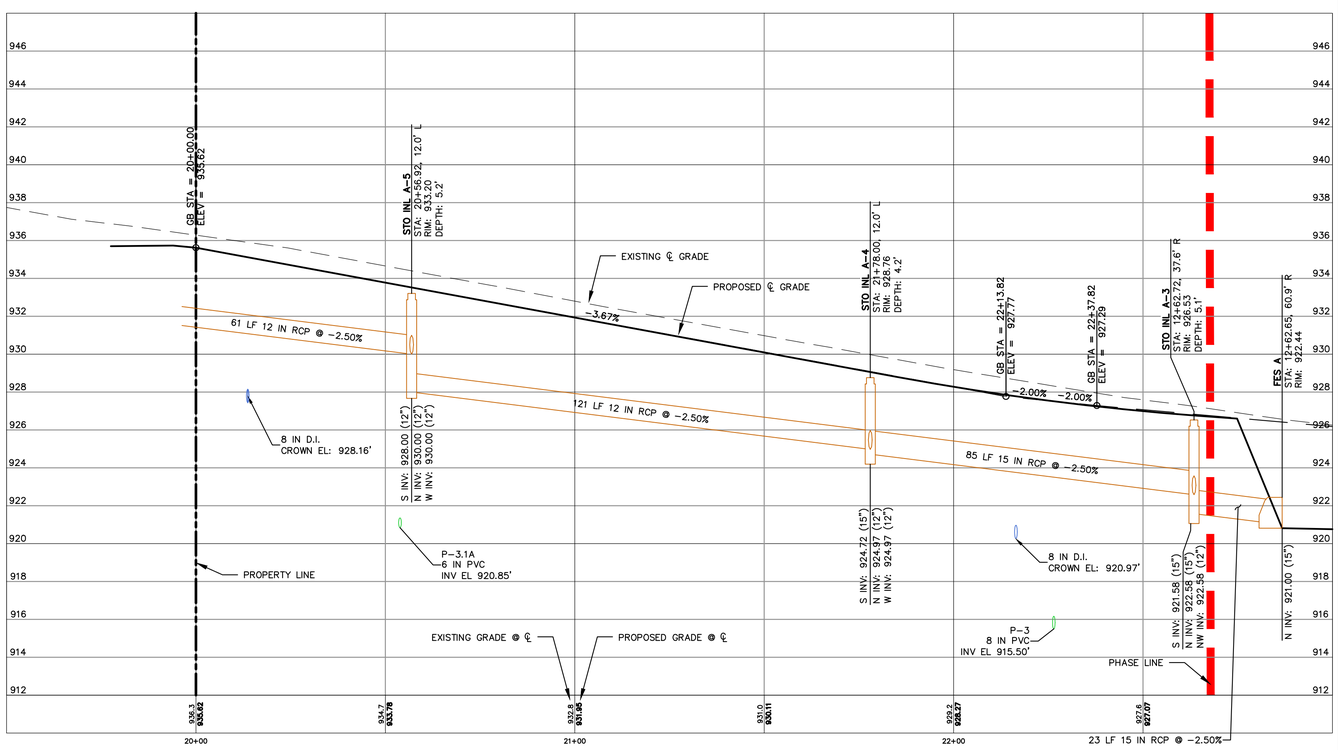
JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

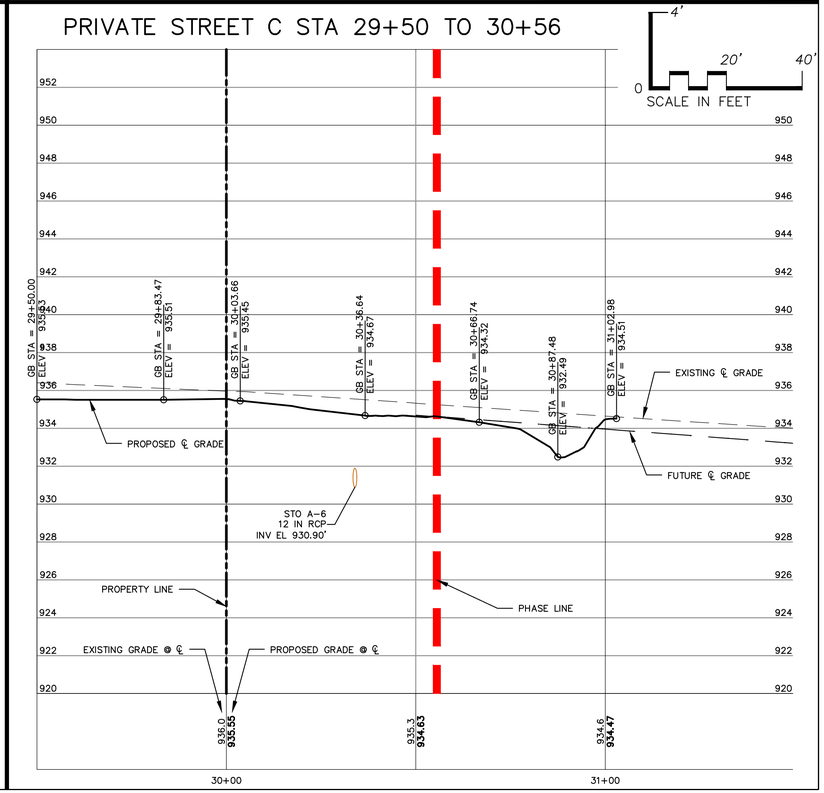




PRIVATE STREET B STA 19+50 TO 23+00



PRIVATE STREET C STA 29+50 TO 30+56



JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CHS/DLG
Approved: WHD

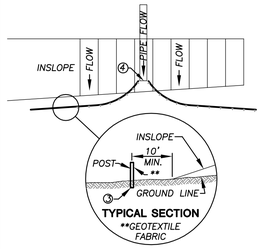
SHEET TITLE:
STORM SEWER & PAVING P&P PRIVATE STREET B & C
STA: 19+50 TO 23+00
STA: 29+50 TO 31+50

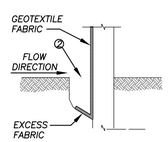
SHEET NUMBER:
C8.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

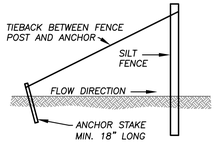
File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - P&P Sheets.dwg Layout: P&P STM User: marinscalchi Plotted: Feb 11, 2019 - 3:36pm Xref's:



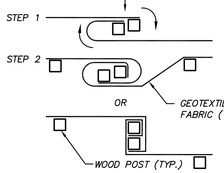


NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

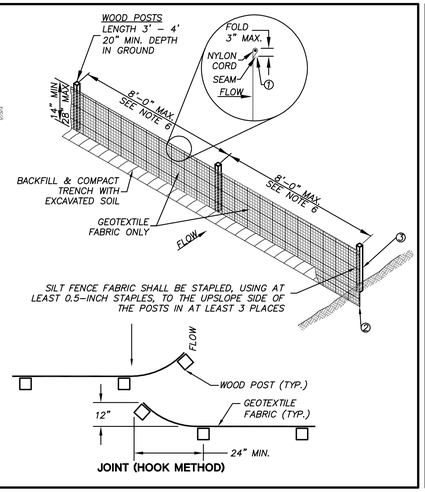
TRENCH DETAIL



SILT FENCE TIE BACK
(WHEN ADDITIONAL SUPPORT REQUIRED)



JOINT (TWIST METHOD)



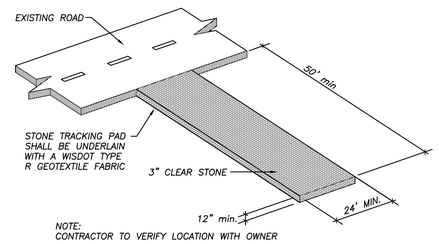
JOINT (HOOK METHOD)

SILT FENCE

N.T.S.

SILT FENCE ALONG SLOPES & OUTFALLS

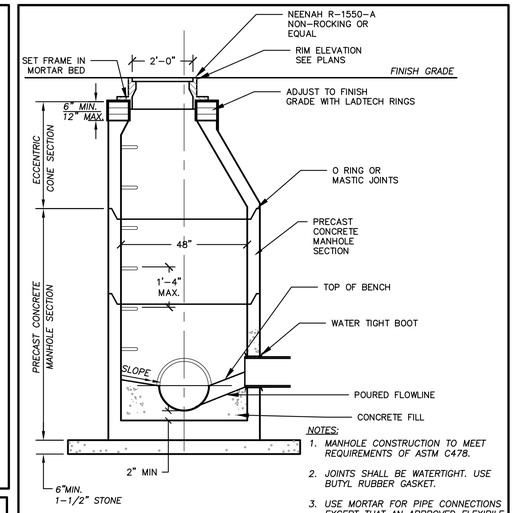
1. SILT FENCE SHALL BE ANCHORED BY SPREADING AT LEAST 8 INCHES OF FABRIC IN A 4" WIDE AND 6" DEEP TRENCH OR 6 INCH DEEP V-TRENCH ON THE UPSLOPE SIDE OF THE FENCE. TRENCHES SHALL NOT BE EXCAVATED WIDER OR DEEPER THAN NECESSARY FOR PROPER INSTALLATION.
2. FOLD MATERIAL TO FIT TRENCH AND BACKFILL AND COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" x 1 1/8" OF DRIED OAK OR HICKORY.
4. SILT FENCE TO EXTEND ABOVE THE TOP OF PIPE.
5. SILT FENCE CONSTRUCTION AND GEOTEXTILE FABRIC SHALL CONFORM TO WDNR TECHNICAL STANDARD 1056.
6. POST SPACING SHALL BE SELECTED BASED ON GEOTEXTILE FABRIC (8'-0" FOR WOVEN & 3'-0" FOR NON-WOVEN)



NOTE:
CONTRACTOR TO VERIFY LOCATION WITH OWNER

CONSTRUCTION ENTRANCE

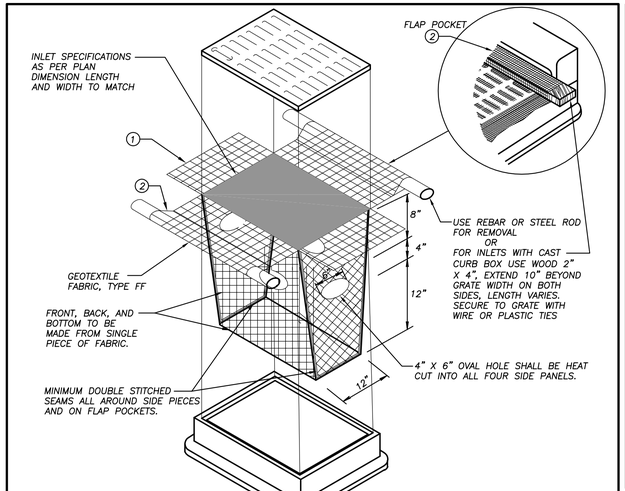
N.T.S.



SANITARY MANHOLE

N.T.S.

NOTES:
1. MANHOLE CONSTRUCTION TO MEET REQUIREMENTS OF ASTM C478.
2. JOINTS SHALL BE WATERTIGHT. USE BUTYL RUBBER GASKET.
3. USE MORTAR FOR PIPE CONNECTIONS EXCEPT THAT AN APPROVED FLEXIBILE WATERTIGHT PIPE TO MANHOLE SEAL IS REQUIRED FOR ALL FLEXIBLE SANITARY SEWER CONNECTIONS.
4. ALL MANHOLES SHALL HAVE RUBBER CHIMNEY BOOT SEALS.



GENERAL NOTES

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

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, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

② FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.

INSTALLATION NOTES

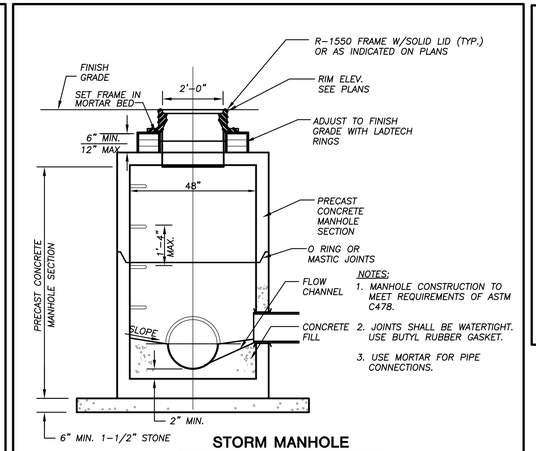
DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" 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 SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

INLET PROTECTION, TYPE D

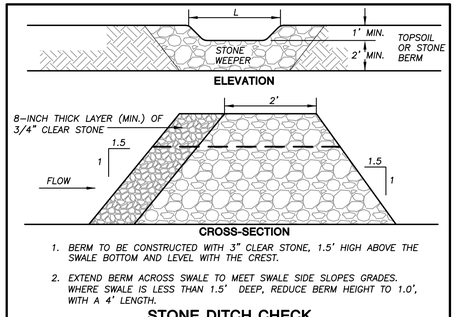
N.T.S.



NOTES:
1. MANHOLE CONSTRUCTION TO MEET REQUIREMENTS OF ASTM C478.
2. JOINTS SHALL BE WATERTIGHT. USE BUTYL RUBBER GASKET.
3. USE MORTAR FOR PIPE CONNECTIONS.

STORM MANHOLE

N.T.S.



1. BERM TO BE CONSTRUCTED WITH 3" CLEAR STONE, 1.5' HIGH ABOVE THE SWALE BOTTOM AND LEVEL WITH THE CREST.
2. EXTEND BERM ACROSS SWALE TO MEET SWALE SIDE SLOPES GRADES. WHERE SWALE IS LESS THAN 1.5' DEEP, REDUCE BERM HEIGHT TO 1.0', WITH A 4' LENGTH.

STONE DITCH CHECK

N.T.S.

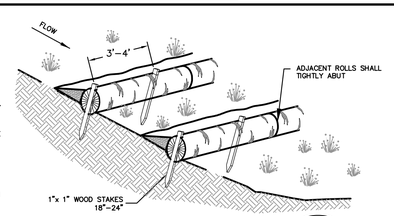
DETAIL A NOTES:

INSTALLATION:
WHEN INSTALLING RUNNING LENGTHS OF WATTLES, BUTT THE SECOND WATTLE TIGHTLY AGAINST THE FIRST, DO NOT OVERLAP THE ENDS. STAKE THE WATTLES AT EACH END AND FOUR FOOT ON CENTER. FOR EXAMPLE:

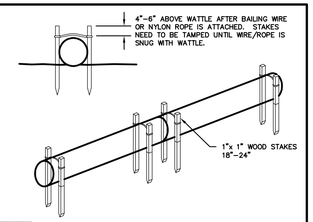
A 25 FOOT WATTLE USES 6 STAKES
A 20 FOOT WATTLE USES 5 STAKES
A 12 FOOT WATTLE USES 4 STAKES

STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE WATTLE. LEAVING 2 - - 3 INCHES OF THE STAKE PROTRUDING ABOVE THE WATTLE. A HEAVY SEDIMENT LOAD WILL TEND TO PICK THE WATTLE UP AND COULD PULL IT OFF THE STAKES IF THEY ARE DRIVEN DOWN TOO LOW. IT MAY BE NECESSARY TO MAKE A HOLE IN THE WATTLE WITH A PICK END OF YOUR MADDOX IN ORDER TO GET THE STAKE THROUGH THE STRAW. WHEN STRAW WATTLES ARE USED FOR FLAT GROUND APPLICATIONS, DRIVE THE STAKES STRAIGHT DOWN; WHEN INSTALLING WATTLES ON SLOPES, DRIVE THE STAKES PERPENDICULAR TO THE SLOPE.

DRIVE THE FIRST END STAKE OF THE SECOND WATTLE AT AN ANGLE TOWARD THE FIRST WATTLE IN ORDER TO HELP ABUT THEM TIGHTLY TOGETHER. IF YOU HAVE DIFFICULTY OF DRIVING THE STAKE INTO EXTREMELY HARD OR ROCKY SLOPES, A PILOT BAR MAY BE NEEDED TO BEGIN THE STAKE HOLE.



WATTLES - DETAIL A (W1)



GENERAL WATTLE INSTALLATION NOTES:

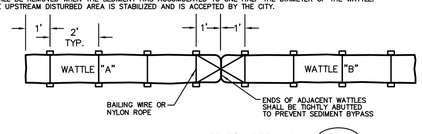
1. THE LOCATION AND LENGTH OF WATTLE IS DEPENDENT ON THE CONDITIONS OF EACH SITE.
2. WATTLES SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
3. WATTLES SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
4. NOT FOR USE IN CONCENTRATED FLOW AREAS.
5. THE WATTLES SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF TWO (2) INCHES.
6. WATTLES SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS.
7. ON SLOPES, WATTLES SHOULD BE INSTALLED ON CONTOUR WITH A SLIGHT DOWNWARD ANGLE AT THE END OF THE ROW IN ORDER TO PREVENT PONDING AT THE MID SECTION.

RUNNING LENGTHS OF WATTLES SHOULD BE ABUTTED FIRMLY TO ENSURE NO LEAKAGE AT THE ABUTMENTS.

8. SPACING FOR SLOPE INSTALLATIONS SHOULD BE:
   - 1:1 SLOPES = 15 FEET APART
   - 2:1 SLOPES = 30 FEET APART
   - 3:1 SLOPES = 45 FEET APART
   - 4:1 SLOPES = 60 FEET APART, ETC.
9. STAKING: USE WOOD STAKES TO SECURE THE WATTLES. 1/2" TO 5/8" REBAR IS ALSO ACCEPTABLE. BE SURE TO USE A STAKE THAT IS LONG ENOUGH TO PROTRUDE SEVERAL INCHES ABOVE THE WATTLE: 18" IS A GOOD LENGTH FOR HARD, ROCKY SOIL. FOR SOFT LOAMY SOIL USE A 24" STAKE.

WATTLE MAINTENANCE NOTES:

1. THE CONTRACTOR SHALL INSPECT WATTLES EVERY TWO WEEKS AND AFTER ANY SIGNIFICANT STORM EVENT AND MAKE REPAIRS OR REMOVE SEDIMENT ACCUMULATED BEHIND WATTLE AS NECESSARY.
2. SEDIMENT ACCUMULATED BEHIND WATTLE SHALL BE REMOVED WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF THE DIAMETER OF THE WATTLE.
3. WATTLES SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND IS ACCEPTED BY THE CITY.



WATTLES - DETAIL B (W2)

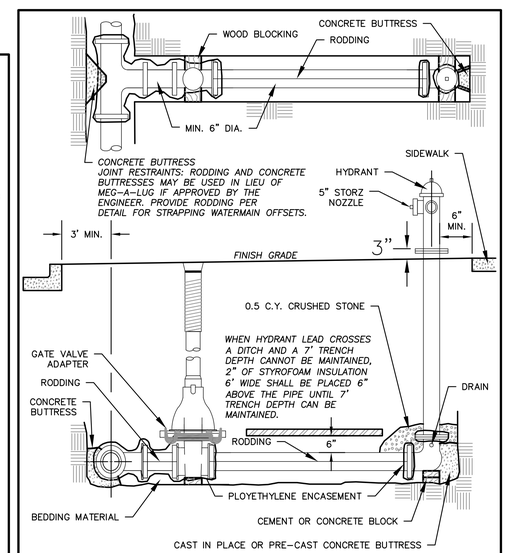
DETAIL B NOTES:

INSTALLATION:
STAKES SHOULD BE DRIVEN ACROSS FROM EACH OTHER AND ON EACH SIDE OF THE WATTLE. LEAVING 4"-6" OF STAKE PROTRUDING ABOVE THE WATTLE. BAILING WIRE OR NYLON ROPE SHOULD BE TIED TO THE STAKES ACROSS THE WATTLE. STAKES SHOULD THEN BE DRIVEN UNTIL THE BAILING WIRE OR NYLON ROPE IS SUFFICIENTLY SNUG TO THE WATTLE.

WHEN INSTALLING RUNNING LENGTHS OF WATTLES, TO PREVENT SHIFTING, BUTT THE SECOND WATTLE TIGHTLY AGAINST THE FIRST. DO NOT OVERLAP THE ENDS. STAKES SHOULD BE DRIVEN 1 FT. FROM END, ACROSS FROM AND ON EACH SIDE OF WATTLE LEAVING 4"-6" OF STAKE PROTRUDING ABOVE THE WATTLE. BAILING WIRE OR NYLON ROPE SHOULD BE TIED TO STAKES IN AN HOUR GLASS FORMATION (FRONT TO BACK OF WATTLE "A", ACROSS TO FRONT OF WATTLE "B", ACROSS TO BACK AND BACK TO FRONT OF WATTLE "A"). STAKES SHOULD THEN BE DRIVEN IN UNTIL BAILING WIRE OR NYLON ROPE IS SUFFICIENTLY SNUG TO THE WATTLE.

EROSION WATTLE

N.T.S.



TYPICAL HYDRANT AND VALVE

N.T.S.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

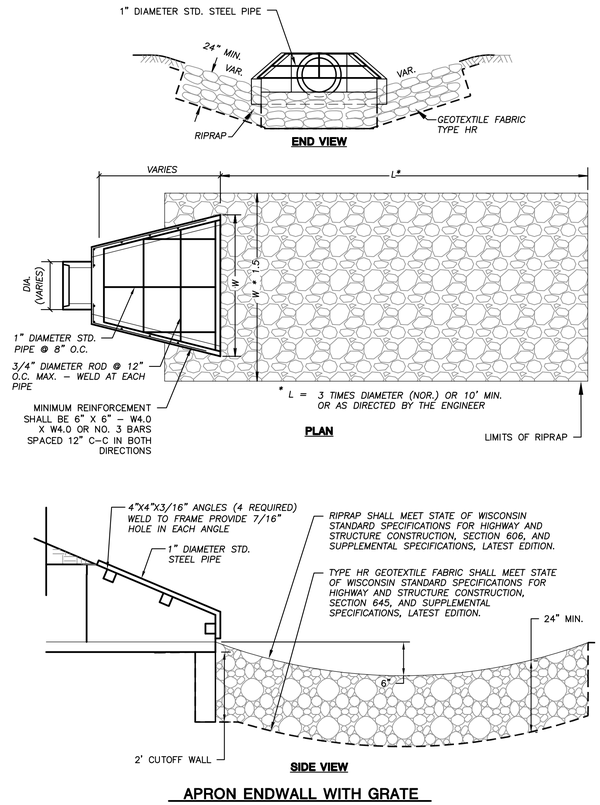
SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
C9.0

JSD PROJECT NO: 18-8515

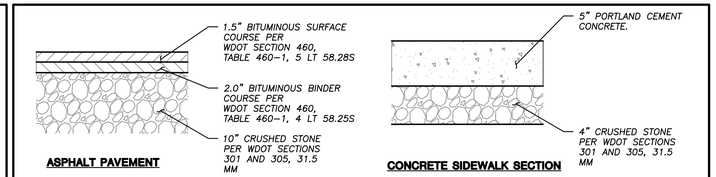
THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase 1 - Title & Details.dwg Layout: C9.0 DETAILS User: cgroenier Plotted: Feb 08, 2019 - 12:56pm Xref's:



APRON ENDWALL WITH GRATE

N.T.S.

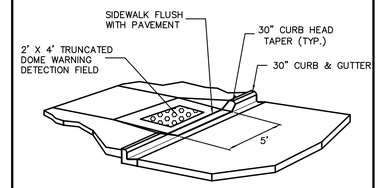


NOTES:

1. REFER TO GEOTECHNICAL REPORT BY XXXX FOR ADDITIONAL INFORMATION. IF THERE ARE ANY DISCREPANCIES BETWEEN THIS DETAIL AND GEOTECHNICAL REPORT, THE GEOTECHNICAL REPORT SHALL GOVERN.
2. WSDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, INCLUDING SUPPLEMENTAL SPECIFICATIONS, BUT EXCLUDING LIMITATIONS IN SECTION 460.3.2 RESTRICTING LAYER THICKNESS BY AGGREGATE SIZE.
3. COMPACTION REQUIREMENTS:
   – BITUMINOUS CONCRETE: REFER TO SECTION 460–3.
   – BASE COURSE: REFER TO SECTION 301.3.4.2, STANDARD COMPACTION
4. CONCRETE PADS SHALL HAVE A WIRE REINFORCEMENT MESH (W6X6, 2.9X2.9) FOR CRACK CONTROL.

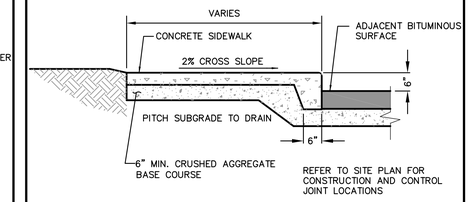
PAVEMENT SECTIONS

N.T.S.



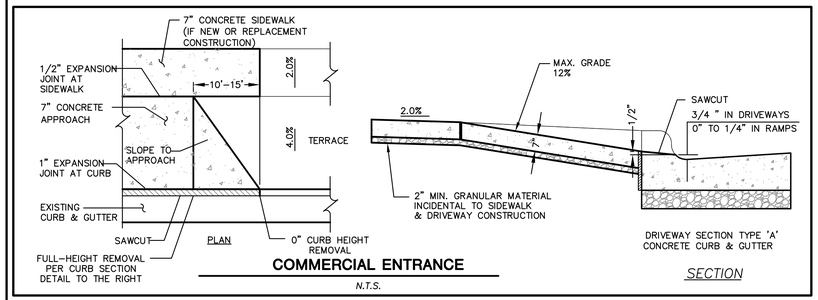
CONCRETE ADA RAMP

N.T.S.



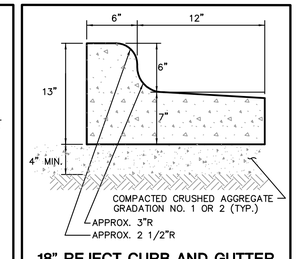
THICKENED EDGE SIDEWALK

N.T.S.



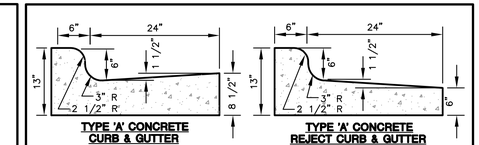
COMMERCIAL ENTRANCE

N.T.S.



18" REJECT CURB AND GUTTER

N.T.S.



GENERAL NOTES:

1. LATERAL CONTRACTION JOINTS SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 15' NOR LESS THAN 6' IN LENGTH. THE JOINTS SHALL BE A MINIMUM OF 3" IN DEPTH.

2. 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 A ONE PIECE ASPHALTIC MATERIAL HAVING THE SAME DIMENSIONS AS CURB & GUTTER AT THAT STATION AND BE 1/2" THICK.

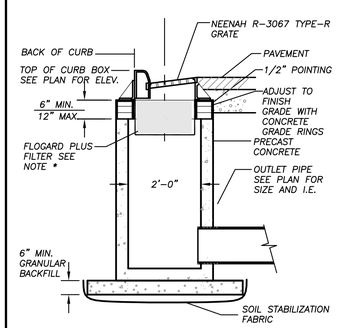
3. IN ALL CASES, CONCRETE CURB & GUTTER SHALL BE PLACED ON THOROUGHLY COMPACTED CRUSHED STONE.

30" CONCRETE CURB AND GUTTER

N.T.S.

ADA PARKING STALL SIGN

N.T.S.



* INSTALL FLOGARD PLUS CATCH BASIN FILTER INSERT AS MANUFACTURED BY KRISTAR ENTERPRISES, INC. OR EQUIVALENT. FILTER SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS, RECOMMENDATIONS AND SPECIFICATIONS DETAIL INFORMATION REGARDING MAINTENANCE AND FILTER REPLACEMENT CAN BE FOUND AT WWW.KRISTAR.COM OR BY CALLING KRISTAR INDUSTRIES AT (800) 579–8819.

CURB INLET

N.T.S.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

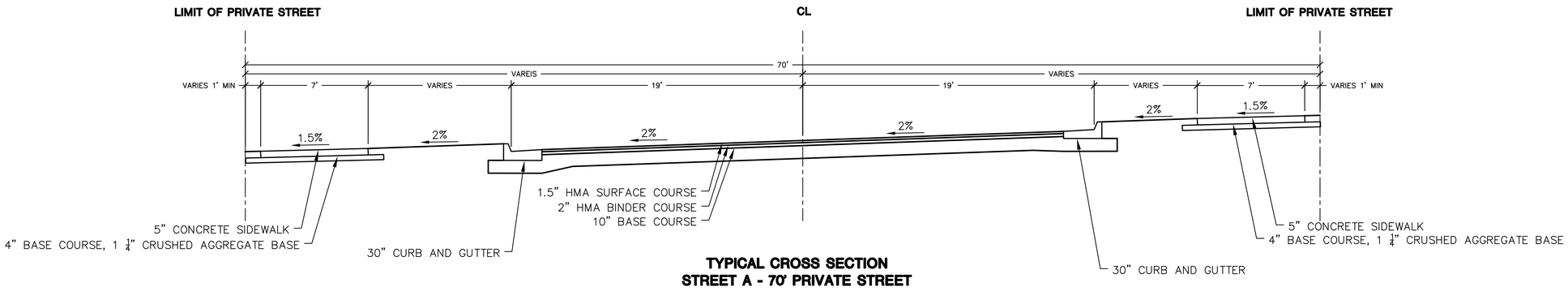
SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
C9.1

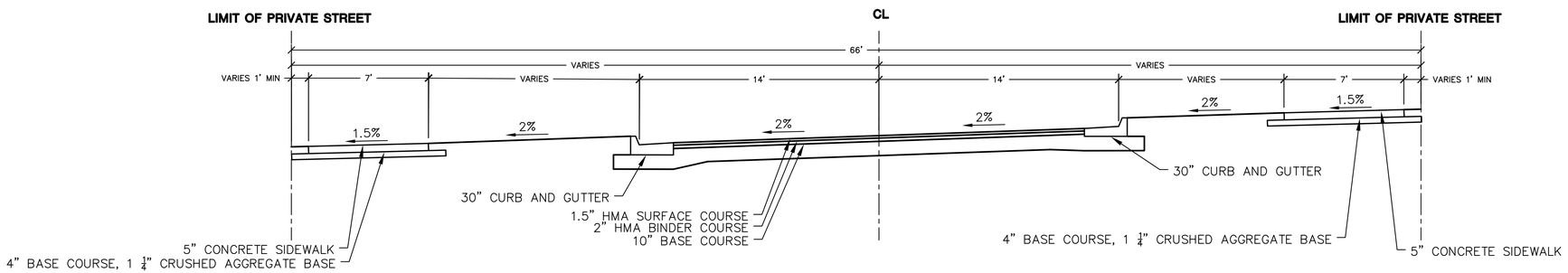
JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

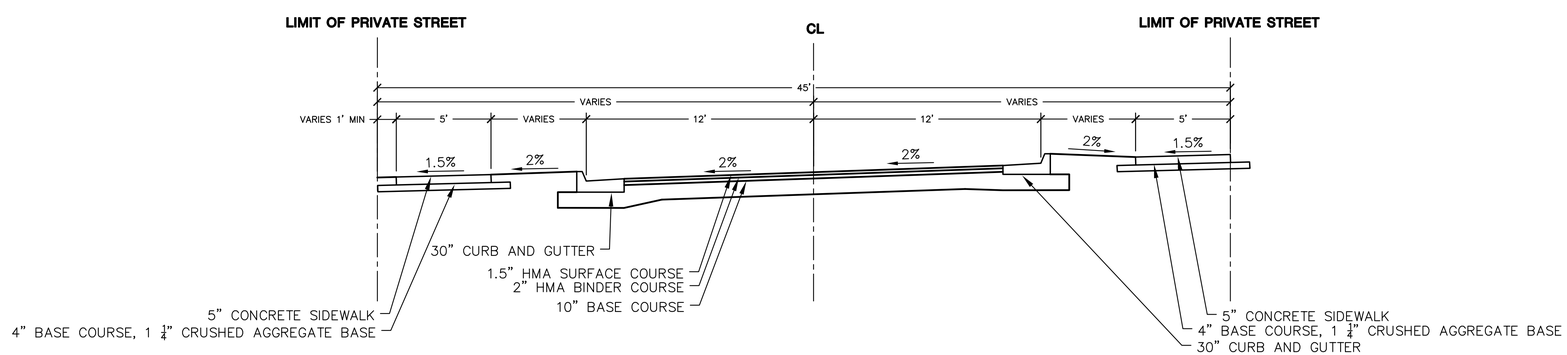
File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I – Title & Details.dwg Layout: C9.1 DETAILS User: cgroenier Plotted: Feb 08, 2019 – 12:55pm Xref's:



TYPICAL CROSS SECTION
STREET A - 70' PRIVATE STREET



TYPICAL CROSS SECTION
STREET A - 66' PRIVATE STREET



TYPICAL CROSS SECTION
STREET B & C - 45' PRIVATE STREET

NOTES:

1. BASE SHALL BE 6" OF 3" BREAKER RUN AGGREGATE WITH 4" OF 1¼" DENSE AGGREGATE BASE OVER IT.
2. HMA PAVEMENT SHALL BE PER WISDOT STANDARD SPECIFICATIONS SECTION 460 AS FOLLOWS;
   BINDER 4LT 58.28S
   SURFACE 5LT 58.28S
3. AGGREGATE SHALL BE PLACED ON A PREPARED SUBGRADE FOLLOWING PASSING PROOF ROLL.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

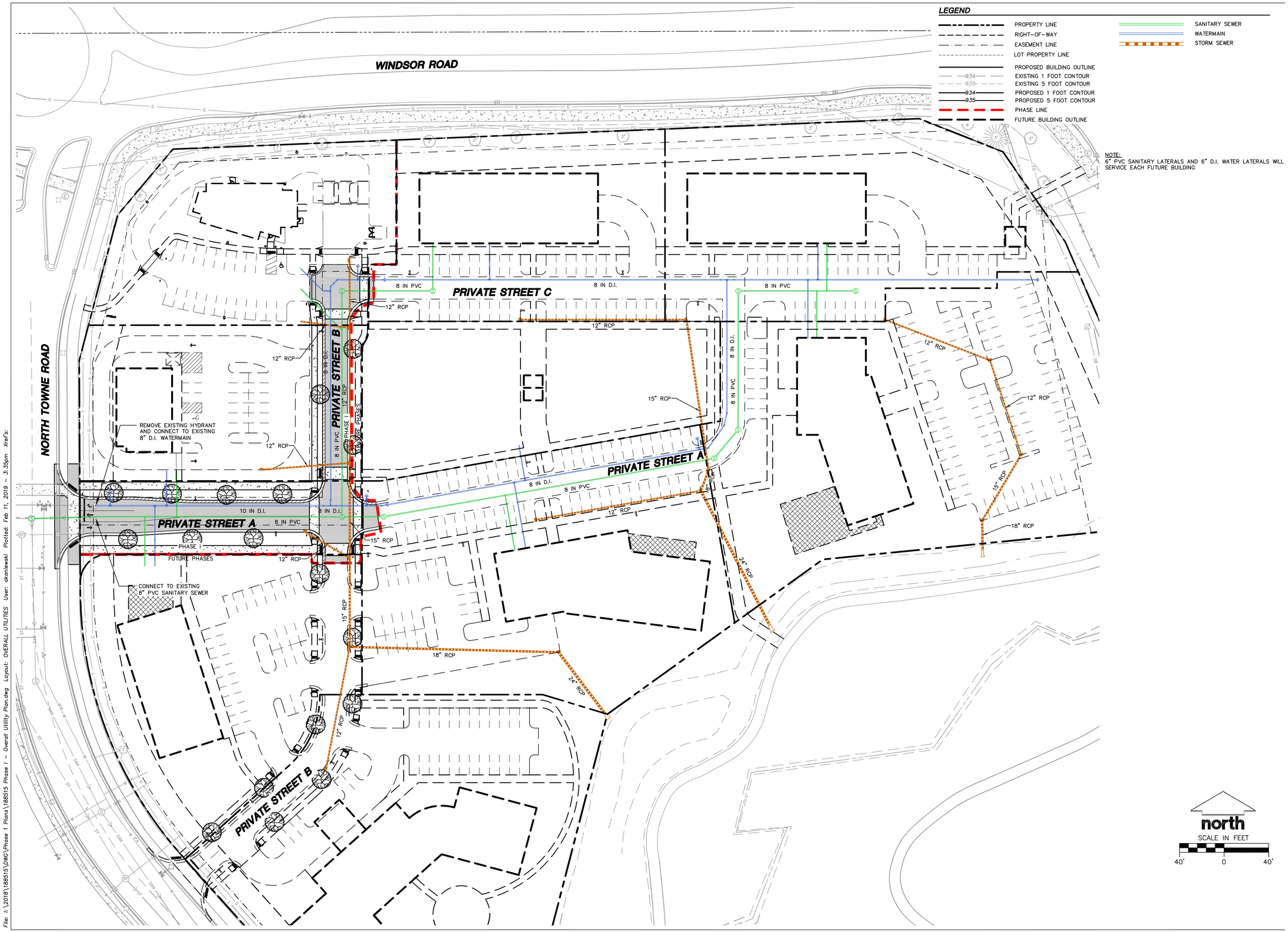
SHEET TITLE:
TYPICAL SECTIONS

SHEET NUMBER:
C9.2

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Title & Details.dwg Layout: C9.2 TYPICAL SECTIONS User: cgroenier Plotted: Feb 08, 2019 - 12:54pm Xrefs:



File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Overall Utility Plan.dwg Layout: OVERALL UTILITIES User: akaniewski Plotted: Feb 11, 2019 - 3:35pm Xref's:

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

SHEET TITLE:
OVERALL UTILITY PLAN

SHEET NUMBER:
C4.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

November 27, 2007
C07422

Mr. Bill Suick
D'Onofrio Kottke & Associates
7530 Westward Way
Madison, WI 53717

Re: Preliminary Geotechnical Exploration
Windsor Crossing Development
USH 51 & Windsor Road
Windsor, Wisconsin

Dear Mr. Suick:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the subsurface exploration program for the above-referenced project. The purpose of this preliminary program was to evaluate the subsurface conditions at the site and to provide preliminary geotechnical recommendations regarding site development, building, pavement and utility design/construction, along with infiltration potential. Two copies of this report are submitted for your use, and additional copies can be provided upon request.

PROJECT DESCRIPTION

We understand that a residential and commercial development is planned for an approximately 82-acre site on the southwest corner of USH 51 and Windsor Road in the Town of Windsor, Wisconsin. It is located in the NE ¼, NW ¼, SW ¼, and SE ¼ of the SE ¼ of Section 29, T7N, R10E, Town of Windsor, Dane County, Wisconsin. In addition to new buildings, the development will include new streets and utilities, as well as probable infiltration and/or detention basins. Preliminary site plans and grades were not available at the time of this report, but some cutting and filling using on-site materials is anticipated. We understand that the infiltration features will likely be constructed in the northwest portion of the site.

SITE CONDITIONS

The site is basically rectangular and measures about 1500 ft east-west and 2700 ft north-south. The site is predominantly farmland that is bisected by two drainageways that drain toward the west. Buildings are also is present in the site's northern portion along the parcel's edges. Corn and soybeans were recently harvested over the majority of the site outside of the drainageways. Two concentrated groups of trees were also noted in the northern portion of the parcel.

2921 Perry Street, Madison WI 53713
Telephone: 608/288-4100
FAX: 608/288-7887

The United States Geological Survey (USGS) 7.5 minute series quadrangle for the area reveals high points exist at the site's southeast corner at EL 968' and at the site's northeast corner at EL 940' ±. The low point on the site is at the west-central edge of the property where the drainage swale exits the parcel at approximately EL 912'.

SUBSURFACE CONDITIONS

Subsurface conditions on the site were explored by drilling 20 Standard Penetration Test (SPT) borings to a planned depth of 15 ft below existing site grades at locations selected by D'Onofrio Kottke & Associates (DKA). DKA also surveyed their actual locations and elevations. Several of the borings terminated at a depth about 1 ft shallower than the planned depth due to sampler refusal on probable less weathered sandstone bedrock. Boring No. 15 also terminated at a depth of only 9 ft within presumed well cemented sandstone. The borings were drilled to: (1) gather data across the site, in a generalized grid pattern; and (2) explore the various soil types identified by soil mapping. According to the USDA *Soil Survey of Dane County, Wisconsin,* the dominant soils series across the site are Plano silt loam (PnB, PnC2) and Ringwood silt loam (RnB). These soils formed on glaciated uplands and are moderately well to well draining. Additional soil types were present in the northern portion of the site identified as Radford silt loam (RaA), Griswold loam (GwC), St. Charles silt loam (ScB) and Elburn silt loam (EfB). The Griswold and St. Charles series are considered moderately well to well draining and are present on glaciated uplands, while the Radford and Elburn series are present in glaciated stream valleys/channels/drainageways and considered somewhat poorly draining.

The soil borings were conducted by Badger State Drilling (under subcontract to CGC) on November 18, 2007 using two truck-mounted D-120 rotary drill rigs equipped with hollow stem augers. The specific procedures used for drilling and sampling are described in Appendix A. The boring locations are shown in plan on the Soil Boring Location Map presented in Appendix B.

Overall, with several exceptions, the subsurface profile at the boring locations was quite similar and can be described in general terms by the following strata (in descending order):

- 8 to 20 in. of ***topsoil***; followed by
- 2.5 to 7 ft of stiff to very stiff ***silty to lean clay*** with various amounts of sand (except in Boring 12, where this layer was not observed); followed by
- Medium dense to very dense ***sand*** strata with various amounts of silt, clay and gravel and/or very dense ***highly weathered sandstone*** that basically is a sand with varying amounts of silt,

etc. to the maximum depths explored. Split-spoon sampler refusal occurred in several areas (along with auger refusal in Boring 15) where the weathered sandstone was observed which in our opinion identifies probable greater cementation and associated increasing competency of the bedrock.

As exceptions, the clays in several borings were soft to medium stiff (e.g., Boring 14 near 4 ft), the sands graded to loose in several areas (e.g., Boring 18 near 7 ft) and the sands contained a greater clay content in some areas (e.g., Boring 12 near 2 ft).

Groundwater was only detected in Boring 19 during or shortly after drilling. Water levels can be expected to fluctuate based on seasonal variations in precipitation, infiltration, etc. A more detailed description of the site soil and groundwater conditions is presented on the boring logs contained in Appendix B.

DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration, it is our opinion that the site is suitable for construction and that the structures can be supported by conventional spread footing foundations. However, some stabilization of soil in drainageways should be expected prior to filling activities due to the possibility of softer soils in those areas. Bedrock removal may also be necessary for deeper utility installation. Our preliminary recommendations for site preparation, as well as foundation, floor slab, below-grade wall, pavement and utility design/construction, along with infiltration potential, are presented in the following subsections. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

1. Site Preparation

We recommend that topsoil and vegetation be stripped in areas to receive fill where building and roadway construction is planned. The topsoil should be stripped to at least 5 ft beyond the construction limits. The topsoil should be stockpiled on-site for re-use as fill in landscape areas. Topsoil thicknesses across the site vary and could be even thicker than measured due to past farming activities. Tree roots should also be removed in proposed construction areas. We anticipate that existing building demolition will also occur in conjunction with topsoil stripping. We suggest building elements be removed in their entirety to not interfere with future construction.

The exposed soils after topsoil removal are expected to consist of natural clay in most locations, with sand subgrades in some areas. The exposed soils in fill areas or at finished design grades should be proof-rolled with a heavy piece of construction equipment (i.e., a loaded scraper or tri-axle truck) to check for soft/yielding areas. If soft/yielding areas exist, they should be undercut/removed. Granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557) should be used to re-establish subgrade levels. As an alternative, the soft/yielding subgrade soils could be stabilized using breaker rock that is compacted until no deflection is noted. Special attention should be given to drainageways where soils may be softer due to water flowing in the swales during storm events. Fill placement to establish site grades may then proceed. Fill/backfill should be placed in accordance with the Recommended Compacted Fill Specifications presented in Appendix D.

We recommend using granular soils as fill in building areas, as these soils are generally easier to place and compact compared to silts and clays, particularly in adverse weather conditions. Silts and clays can be used in landscaping and pavement areas, but some moisture conditioning should be expected, which could delay construction progress. The fill should be placed early in the construction sequence, to allow for as much consolidation to occur before beginning building construction. This will be evaluated further once site development details become available. Note that if deep cuts are planned near Boring 15 where auger refusal occurred, bedrock removal using a ripping tooth on a dozer may be needed. Refer to Appendix E for additional details. We anticipate the majority of weathered bedrock will be removable using conventional scrapers/push dozer techniques due to its highly weathered condition, but better cemented layers may be encountered with depth requiring special removal measures. This can be studied further by digging test pits in cut areas to observe the rippability of the rock.

2. Foundation Design

Depending on the final site grades, the foundations for the buildings will generally bear within native sand or clay soils (some of which is weathered bedrock) or perhaps compacted granular fill. The following preliminary parameters should be used for foundation design:

- Maximum allowable bearing pressure: 2,500 psf
- Minimum foundation widths:
  - Continuous wall footings: 18 in.
  - Column pad footings: 30 in.
- Minimum depths for footings requiring frost protection: 4 ft

Undercutting below footing grade will be required if clayey soils with pocket penetrometer readings (an estimate of the clay's unconfined compressive strength) of less than about 1.25 ton/sq ft or looser sand/silt soils are encountered at or slightly below footing grade. Where undercutting is required, the base of the undercut excavations should be widened beyond the footing edges at least 0.5 ft for each foot of undercut depth for stress distribution purposes. We recommend that granular backfill be placed and compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557). As an alternative, breaker rock or clear stone can be implemented that is compacted in 1-ft lifts until deflection ceases. An allowance should be established for undercutting/replacement in the very soft soil areas, particularly where 0.5 TSF clay exists that likely will require 1-ft of stone (at a minimum) to establish a working mat.

We recommend that granular footing subgrade soils be compacted with a large vibratory plate and clay soils be compacted with a jumping jack prior to concrete placement to densify soils loosened during the excavation process. Also, we recommend that a smooth-edge backhoe bucket be used for footing excavations. Provided the foundation design/construction recommendations discussed above are followed, we estimate that total and differential settlements should not exceed 1.0 and 0.5 in., respectively. Additional details can be provided after final grading plans and building locations are established. Also note that greater bearing pressures are possible as foundations bear deeper into sands that become denser with depth, with those determinations to be made on a case by case basis.

3. Site Seismic Classification

In our opinion, the average soil/rock properties in the upper 100 ft of the site (based on blow count N-values generally ranging from 15 to 50 blows per foot) can be characterized as a stiff soil profile. This characterization would place the site in Site Class D for seismic design according to the International Building Code (see Table 1615.1.1).

4. Floor Slab Design

In our opinion, the floor slabs for the buildings can be supported on natural sand, silt or clay soils or compacted granular fill, and a subgrade modulus of 125 pci should be used for design. Prior to slab construction, the subgrades should be recompacted to densify soils that may become disturbed or loosened during construction activities. The design subgrade modulus is based on a recompacted subgrade such that non-yielding conditions are developed. To serve as a capillary break, the final 4 to 6 in. of soil placed below the slabs should consist of imported, well-graded sand or gravel with no more than 5 percent by weight passing the No. 200 U.S. standard sieve. To further minimize the potential for moisture migration, a plastic vapor barrier should also be utilized. At a minimum, the slabs should be isolated from building walls/columns using a compressible filler, and the design should include an adequate number of isolation and contraction joints.

5. Below-Grade Walls

We anticipate that basement walls will be laterally restrained by the floor slab and ground-level framing. Therefore, *at-rest lateral earth pressures* should be used during design. To minimize the development of such pressures, granular backfill should be placed within 4 to 6 ft of the walls. We recommend that perimeter drainage systems be installed to intercept potential surface water infiltration and that the granular backfill placed behind the walls be continuously connected to this system. (Some groundwater may also need to be intercepted for construction near drainageways.) The perimeter drainage system should be sloped to drain to a sump pit or, if feasible, should "daylight" down slope. To impede the inflow of surface moisture, the final 2 ft of backfill placed along the basement walls should consist of a clayey fill cap or other semi-impermeable material such as asphaltic or concrete pavement. The clay cap or pavement should be graded in a manner which promotes positive drainage away from the walls. Recommended perimeter drain details are attached to this report in Appendix F.

Before placing wall backfill, the exterior walls should be damp-proofed with a spray-applied or mopped-on rubber or bituminous sealer. Compaction of the backfill within 4 to 6 ft of the walls should be performed with lightweight compaction equipment. The granular backfill should be compacted to a minimum of 90% modified Proctor (ASTM D1557) following Appendix D guidelines.

Walls constructed in accordance with the above recommendations may be designed for an equivalent fluid pressure of 55 psf per foot of depth. The basement wall design should also take into account surcharge effects that could be applied during or after construction

6. Roadway Pavement Design

The clay soils encountered below the topsoil across most of the site will control the pavement design. Standard earthwork-related techniques that should be used during roadway construction after stripping include proof-rolling, undercutting/stabilization and compaction control of fill/backfill as discussed in the Site Preparation section of this report.

The following parameters should be used to develop the design pavement section:

AASTHO classification	A-6/A-7
Frost group index	F-3
Design group index	12
Soil support value	4.2
Subgrade modulus, k (pci)	150
Estimated percent shrinkage	20 - 30
Estimated CBR value	2 - 5

Assuming traffic volumes up to 500 cars and 5 trucks per day per design lane (i.e., a medium traffic classification), a typical pavement design per WDOT Standard Specifications is 1.5-in. bituminous surface, 2.5-in. bituminous binder and 10-in. compacted aggregate base course. Pavements without daily bus traffic or lower automobile volumes can be designed for 1.5 in. surface, 1.5 in. binder and 8 in. base course. Alternative pavement designs for different traffic count data are also acceptable providing they are based on the given design parameters. Because of the potential for soft to medium stiff clays/silts at or below subgrade levels, an adequate allowance for undercutting and stabilization should be included in the budget for this development. It has been our experience that clay or silt soils with pocket penetrometer readings of less than approximately 1.5 TSF are likely to require undercutting after proof-rolling as described above.

7. Utility Construction

Based on the available soil and groundwater information, it appears that utility construction can proceed using traditional open cut methods. Dewatering will likely not be required. It is expected that excavation sidewalls will be sloped back for relatively shallow installations (i.e., less than 4 ft in depth) and that a trench shield and/or internal bracing will be used for deeper excavations. The following are our recommendations regarding trench excavation, dewatering, and backfilling:

- Excavation: Open cuts should be sloped and/or braced in accordance with OSHA guidelines. Slopes of 1H:1V or flatter through the on-site silt and clay soils and 1.5H:1V or flatter in the sand soils are expected to be at least temporarily stable. Temporary bracing should be designed by a registered professional engineer.

- Rock Removal: As mentioned above, split-spoon and/or auger refusal was encountered in several borings on probable weathered to increasingly competent sandstone bedrock. The depth to bedrock is variable across the site, and a series of test pits can be dug across the site to better characterize the nature and depth of the bedrock. Excavations to the depth of spoon refusal can likely be accomplished using standard earth moving equipment. Excavations below the level of spoon refusal may require special rock removal techniques (i.e., chipping with a backhoe-mounted rock hammer). Refer to Appendix E, which contains rock excavation considerations.

- Dewatering: Based on observations made during the field exploration, groundwater infiltration into shallow excavations is not expected to be a problem. However, deeper excavations in some areas of the site may require dewatering with pumps operating from filtered sump pits during wet seasons (see Construction Considerations section below).

- Backfilling - Excavation backfilling may proceed using the following guidelines:

  - Both silty/clayey and sandy excavation spoils may be used to backfill the utility trenches above the pipe and associated granular bedding material. However, we recommend that sand soils be used as backfill because they are relatively easy to place and compact in most weather conditions. Backfilling with silty/clayey soils is generally not recommended because they will likely require some moisture conditioning prior to placement and compaction, which could delay construction progress. Granular soils with cobbles and boulders should not be used in direct contact with utility lines.

  - Backfill material should be placed in accordance with Appendix D guidelines or applicable municipal requirements.

  - Compaction recommendations:
    - Depths greater than 3 ft below grade: 90% modified Proctor (ASTM D1557)
    - Final 3 ft: 95% modified Proctor

8. Storm Water Infiltration Potential

We understand that storm water infiltration or detention areas are planned in the central and northwest areas of the site (i.e., Borings 5 through 11). The shallow soils encountered in these borings below the surficial topsoil generally consisted of clay over deeper sands and apparent weathered sandstone bedrock. Some of the clays (typically around 48- to 60-in. depths in Borings 5, 7 and 9) contained minor to significant mottling, which suggests seasonal or past saturation. Note that mottling (i.e., redoximorphic features) is considered a limiting layer to storm water infiltration. The following parameters should be considered for design of infiltration features:

- Infiltration Potential: The following infiltration parameters were estimated using Table 2 of the WDNR Conservation Practice Standard 1002, *Site Evaluation for Storm Water Infiltration*. The estimated infiltration rates are as follows:

– Silty clay loam	0.04 in./hr
– Sandy clay loam	0.11 in./hr
– Silt loam	0.13 in./hr
– Sandy loam	0.5 in./hr
– Loamy sand	1.63 in./hr
– Sand	3.6 in./hr

Note that the infiltration rates should be considered very approximate. The Wisconsin Department of Commerce Soil Evaluation Report forms for Borings 5 through 11 are contained in Appendix G.

- Groundwater: Groundwater was not encountered in the borings during or shortly after drilling. However, mottling was noticeable in some of the clays, as discussed above, which suggests seasonal or past saturation. Note that the mottling (i.e., redoximorphic features) is considered a limiting layer to storm water infiltration. Groundwater levels can be expected to fluctuate, as previously discussed.

- Bedrock: Apparent weathered sandstone bedrock was encountered in Borings 7 through 11 at depths of 96 to 171 in. below existing grades. The bedrock depth should be expected to vary across the site. Minimum separation distances are typically required below the bottom of infiltration areas and bedrock.

Based on the presence of redoximorphic features in portions of the shallow clays, some areas of this site (around Borings 5, 7 and 9) do not appear suitable for infiltrating a significant quantity of storm water. However, sandy soils were encountered below the clay soils in the remaining areas of the site that appear suitable infiltrating storm water. Soils at the bottom of the infiltration areas should be verified during construction.

During construction of the proposed building and related site work, appropriate erosion control should be provided to prevent eroded soil from contaminating the infiltration areas. Where appropriate, the basin design should include pretreatment to remove fine-grained soils (silt/clay) from storm water prior to entering the infiltration area. Additionally, a regular maintenance plan should be developed to remove silt/clay soils that may accumulate in the bottom of the infiltration basin over time. Failure to adequately control fine-grained soils from entering the infiltration area or failure to regularly remove fine-grained soils that accumulate at the base of the infiltration basin will likely cause the basin to fail. Refer to WDNR Conservation Practice Standard 1002 and NR 151 *Runoff Management* for additional information.

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:

- Earthwork construction during the early spring or late fall 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.

- If the construction schedule requires that construction proceed during adverse weather, typically encountered during fall through spring, the budget should include a contingency for undercutting disturbed soils.

- To the extent practical, traffic should be avoided on prepared subgrades to minimize further disturbance.

- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards.

- Based on observations made during the field exploration, groundwater infiltration into excavations is not expected to be a problem except near drainageways. However, water accumulating at the base of the building or utility excavations as a result of precipitation or seepage should be quickly removed using pumps operating from filtered sump pits if drawdowns of about 2 ft or less are needed. Greater drawdowns will require well points.

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 proceeds in accordance with our recommendations, the following operations should be monitored by CGC:

- Proof-rolling within roadway areas;
- Fill/backfill placement and compaction;
- Foundation excavation; and
- Concrete placement.

CGC, Inc.

FOLLOW-UP EXPLORATION PROGRAMS

The exploration program described in this report is preliminary in nature and is not intended to provide sufficient detail on subsurface conditions for each individual structure. Follow-up exploration by test pits or borings is recommended in the future. We can provide specific recommendations and a proposal for the additional exploration at the appropriate time.

* * * * *

It has been a pleasure to serve you on this project. We look forward to continuing our project involvement by providing construction testing services during the construction phase of the project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

Michael N Schultz

Michael N. Schultz, P.E.
Principal/Consulting Professional

William W Wuellner/MNS

William W. Wuellner, P.E.
Senior Geotechnical Engineer

Encl: Appendix A - Field Exploration
Appendix B - Boring Location Map
Logs of Test Borings (20)
Log of Test Boring-General Notes
Unified Soil Classification System
Appendix C - Document Qualifications
Appendix D - Recommended Compacted Fill Specifications
Appendix E - Rock Excavation Considerations
Appendix F - Perimeter Drain Details
Appendix G - Wisconsin Department of Commerce Soil Evaluation Forms

APPENDIX A

SUBSURFACE EXPLORATION

APPENDIX A

SUBSURFACE EXPLORATION

A total of 20 Standard Penetration Test (SPT) borings were drilled to planned depths of 15 ft below existing site grades at locations selected and field located by DKA. DKA also surveyed the ground surface elevations at the boring locations. Several of the borings terminated at depths slightly shallower than the planned depth due to spoon refusal on probable less weathered sandstone bedrock. Another boring (B-15) was terminated at 9 ft due to auger refusal. The soil borings were conducted by Badger State Drilling (under subcontract to CGC) on November 13, 2007 using two D-120 rotary drill rigs equipped with hollow-stem augers. The specific procedures used for drilling and sampling are described in Appendix A. The boring locations are shown in plan on the Soil Boring Location Map presented in Appendix B.

In each SPT boring, soil samples were obtained at 2.5 foot intervals to a depth of 10 ft and at 2.5 ft to 5 ft intervals thereafter. The soil samples were obtained in general accordance with specifications for standard penetration testing, ASTM D1586. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures between Samples

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

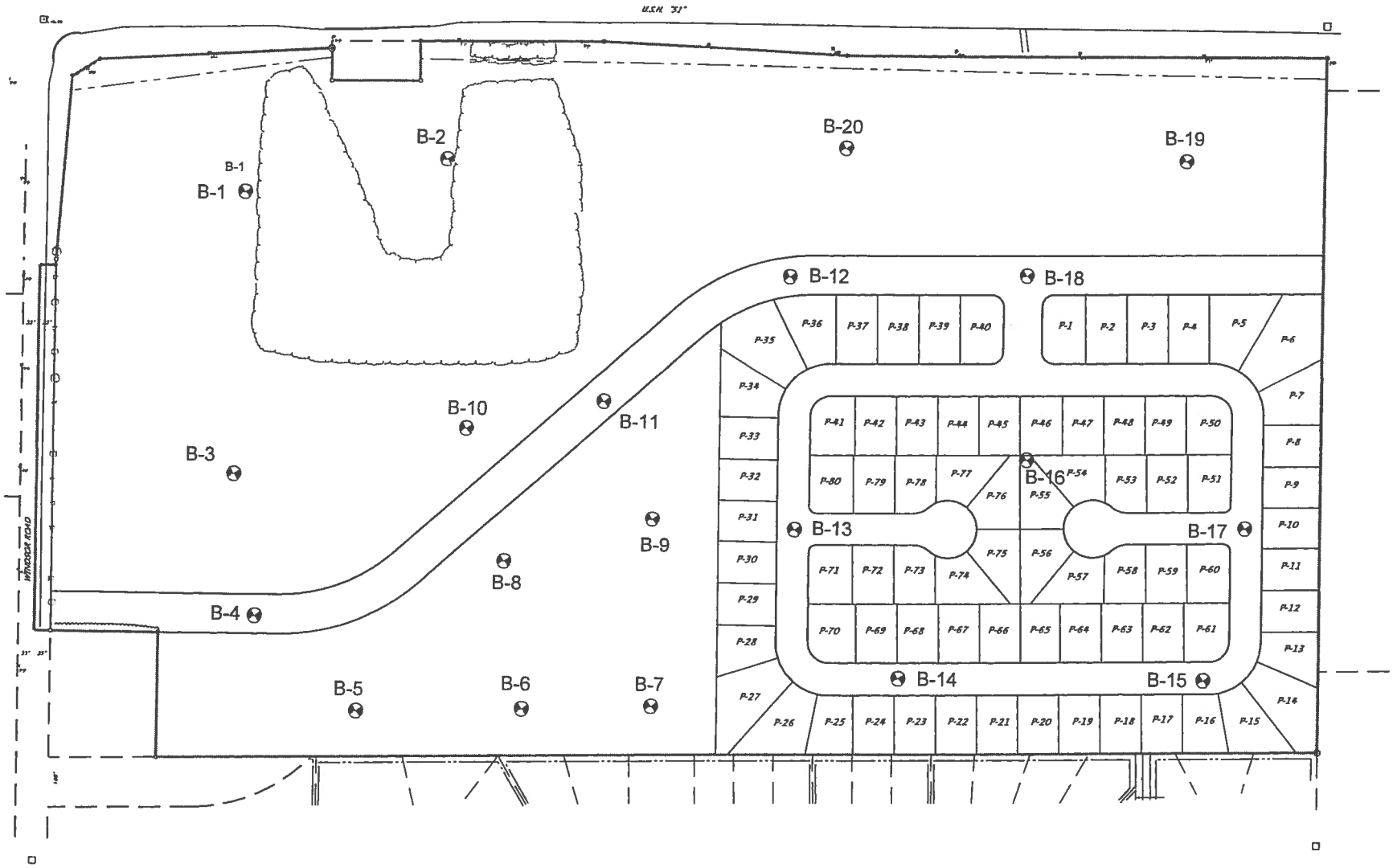
2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D1586)

   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. Recovered samples are first classified as to texture by the driller.

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 environmental site assessment activities is beyond 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 boreholes were backfilled in accordance with 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 and a description of the Unified Soil Classification System are presented in Appendix B.

APPENDIX B

BORING LOCATION MAP
LOGS OF TEST BORINGS (20)
LOG OF TEST BORING-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



Legend

Denotes Soil Boring Location and Number

SCALE: 1" = 100'

File 06-07-131

Notes

1. Soil borings conducted by Badger State Drilling in November 2007.
2. Base map provided by D'Onofrio Kottke.
3. Boring locations are approximate.

Date: 11/07	CGC, Inc.	**SOIL BORING LOCATION MAP** **Windsor Crossing Development** **USH 51 & Windsor Road** **Windsor, Wisconsin**
Job No.		

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 1
Surface Elevation (ft) 926.4
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	8		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.25)	24.9			
2		14	M	29	5	Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
3		14	M	48		Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP)					
4		16	M	40	10						
5		6	M	50/1"	15	Very Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
						End Boring at 14'1"					
					20	Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 2
Surface Elevation (ft) 922.8
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						10 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		12	M	5		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)				
2		16	M	12	5		(1.5)	27.6			
3		8	M	68		Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
4		18	M	24	10	Medium Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP)					
5		5	M	50/1"	15	Very Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone) White Sandstone in Very Tip of Spoon					
					20	End Boring at 14'1"					

Borehole backfilled with bentonite chips

WATER LEVEL OBSERVATIONS

While Drilling ∇ NW Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ∇
Depth to Cave in _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 3
Surface Elevation (ft) 932.7
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	7		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.5)				
2		18	M	9	5	Stiff, Reddish-Brown Sandy Lean CLAY (CL)	(1.5)				
3		16	M	19		Medium Dense, Pinkish-Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
4		18	M	23	10						
5		16	M	50/3"		Very Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
					15	End Boring at 14'3"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 4
Surface Elevation (ft) 927.2
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						14 in. Black Silty Clay TOPSOIL (OL)					
1		12	M	5		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)	24.5			
2		18	M	6	5		(2.0)				
3		14	M	16		Stiff, Reddish-Brown Sandy Lean CLAY (CL)	(1.5)				
4		10	M	65	10	Very Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
5		16	M	58	15						
					20	End Boring at 15 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 5
Surface Elevation (ft) 919.1
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						14 in. Black Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		14	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)				
2		16	M	10	5	USDA: 10YR 4/4 Silty Clay Loam	(1.5)				
3		18	M	12		Medium Dense, Brown Fine to Medium Clayey SAND, Some Gravel (SC) USDA: 10YR 3/3 Sandy Clay Loam					
4		14	M	21	10	Medium Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
						7.5YR 4/4 Sandy Loam					
5		12	M	28	15						
						End Boring at 15 ft					
					20	Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 6
Surface Elevation (ft) 914.5
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	7		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL) USDA: 10YR 4/4 Silty Clay Loam	(2.0)				
2		14	M	8	5	Medium Stiff, Brown Silty CLAY, Trace Sand (CL-ML) USDA: 10YR 4/4 Silty Clay Loam	(0.75)	23.3			
3		18	M	48		Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP) USDA: 10YR 5/3 Very Gravelly Sand					
4		16	M	22	10	Medium Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM) USDA: 10YR 6/4 Sandy Loam					
5		12	M	50/3"	15	Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM) USDA: 10YR 5/3 Loamy Sand					
					20	End Boring at 14'3"					

Borehole backfilled with bentonite chips

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 7
Surface Elevation (ft) 912.8
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						20 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		18	M	9		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		16	M	13			(1.5)				
					5						
3		15	M	41		Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM) USDA: 10YR 5/3 Very Gravelly Loamy Sand					
4		12	M	79		Very Dense, Pinkish-White Fine to Medium SAND, Trace to Little Silt, Some Gravel (SP/SP-SM) (Highly Weathered Sandstone)					
					10	USDA: 7.5YR 7/3 Gravelly Sand (Weathered Sandstone)					
5		6	M	50/1"							
					15	End Boring at 14'1"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 8
Surface Elevation (ft) 916.4
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						12 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		14	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.5)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		18	M	16			(1.5)				
					5						
						Medium Dense to Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
3		16	M	26							
						USDA: 10YR 5/4 Sandy Loam					
4		14	M	32							
					10						
						Very Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP)					
5		8	M	50/4"		USDA: 10YR 7/4 Loamy Sand					
					15	End Boring at 14'4"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 9
Surface Elevation (ft) 917.5
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						9 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	5		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		16	M	7			(1.5)	24.1			
					5						
3		14	M	46		Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
						USDA: 10YR 6/4 Very Gravelly Loamy Sand					
4		12	M	68		Very Dense, White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone)					
					10	USDA: 10YR 7/2 Sand (Weathered Sandstone)					
5		6	M	79/6"							
						End Boring at 14 ft					
					15	Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 10
Surface Elevation (ft) 918.9
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						10 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.25)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		18	M	17			(1.5)				
					5						
3		16	M	32		Medium Dense to Very Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
						USDA: 10YR 6/4 Very Gravelly Loamy Sand					
4		14	M	14							
					10						
5		8	M	50/3"		White Sandstone in Tip of Spoon					
						End Boring at 14'3"					
					15	Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 11
Surface Elevation (ft) 919.7
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						9 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.5)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		12	M	6			(1.5)				
					5						
3		18	M	19		Medium Dense, Light Brown to White Fine SAND, Little to Some Silt, Trace Gravel (SP-SM/SM) (Highly Weathered Sandstone) USDA: 10YR 5/4 Loamy Sand					
4		4	M	50/4"		Very Dense, White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone)					
					10	USDA: 10YR 7/1 Sand (Weathered Sandstone Bedrock)					
5		3	M	50/3"							
					15	End Boring at 14'3"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 12
Surface Elevation (ft) 937.2
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		18	M	6		Loose, Brown Silty to Clayey SAND (SM/SC)		15.2			
2		16	M	12	5	Medium Dense, Reddish-Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
3		14	M	28							
4		16	M	24	10						
5		18	M	43	15	Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
					20	End Boring at 15 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling
Time After Drilling 3 hrs
Depth to Water NW ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 13
Surface Elevation (ft) 921.7
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						11 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	7		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.75)				
2		18	M	5			(1.75)				
					5	Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
3		18	M	27							
4		16	M	68/ 11"		Very Dense, Light Brown to White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone)					
					10						
5		3	M	50/3"							
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 14
Surface Elevation (ft) 917.6
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						10 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	6		Soft to Medium Stiff, Brown Silty to Lean CLAY, Some Sand (CL-ML/CL)	(2.5)				
2		18	M	6			(0.5)	20.0			
					5	Medium Dense, Brown Fine SAND, Some Silt (SM)					
3		18	M	13							
4		16	M	47		Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
					10						
5		0	M	75		Very Dense, White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone) (Assumed-No Recovery)					
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 15
Surface Elevation (ft) 921.9
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						11 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	7		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.75)	23.7			
2		14	M	6			(1.5)				
					5	Loose, Brown Silty to Clayey SAND (SM/SC)					
3		8	M	10							
					10	End Boring/Auger Refusal at 9 ft Borehole backfilled with bentonite chips					
					15						
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 16
Surface Elevation (ft) 929.7
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						12 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		18	M	7		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.75)				
2		18	M	8	5	Soft, Brown Silty CLAY, Trace Sand (CL-ML)	(0.25)	27.2			
3		16	M	16		Medium Dense to Very Dense, Reddish-Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
4		18	M	24	10						
5		16	M	71	15						
					20	End Boring at 15 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling
Time After Drilling 3 hrs
Depth to Water NW ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 17
Surface Elevation (ft) 930.3
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						12 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		12	M	6		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.5)				
2		16	M	5	5		(1.25)				
3		16	M	7		Loose to Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
4		16	M	15	10						
5		16	M	83		Very Dense, Light Brown to White Fine SAND, Little to Some Silt, Trace Gravel (SP-SM/SM) (Highly Weathered Sandstone)					
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW — Upon Completion of Drilling
Time After Drilling — 3 hrs
Depth to Water — NW ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 18
Surface Elevation (ft) 939.3
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						10 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	6		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.75)				
2		18	M	4	5		(1.25)				
3		18	M	10		Loose to Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
4		16	M	16	10						
						Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
5		16	M	46	15						
						End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 19
Surface Elevation (ft) 947.0
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						13 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		10	M	5		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.25)	26.5			
2		18	M	23		Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
					5						
3		16	M	13		Medium Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
4		16	M	17							
					10						
						Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
5		18	M	47							
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling
Time After Drilling 3 hrs
Depth to Water 11' ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 20
Surface Elevation (ft) 957.5
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						11 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		10	M	8		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.25)				
2		16	M	10	5	Loose to Medium Dense, Reddish-Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
3		18	M	10							
4		16	M	11	10						
						Medium Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
5		16	M	18	15						
						End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW — Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

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	3/4" to 3"	3/4" to 3"
Fine	4.76 mm to 3/4"	#4 to 3/4"
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 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 Designator
RB--Rock Bit
FT--Fish Tail
DC--Drove Casing
C--Casing: Size 2 1/2", 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" Diameter Split-Barrel Sample
2ST--2" Diameter Thin-Walled Tube Sample
3ST--3" Diameter Thin-Walled Tube Sample
PT--3" Diameter 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_u--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--Caved and Wet
CM--Caved and Moist

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

UNIFIED SOIL CLASSIFICATION SYSTEM

COARSE-GRAINED SOILS

(More than half of material is larger than No. 200 seive size.)

GRAVELS More than half of coarse fraction larger than No. 4 sieve size	**Clean Gravels** (Little or no 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 (Appreciable amount of fines)	
	GM^{d}_{u}	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS More than half of coarse fraction smaller than No. 4 sieve size	**Clean Sands** (Little or no fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with Fines (Appreciable amount of fines)	
	SM^{d}_{u}	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures

FINE-GRAINED SOILS

(More than half of material is smaller than No. 200 sieve.)

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 greater than 50%	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

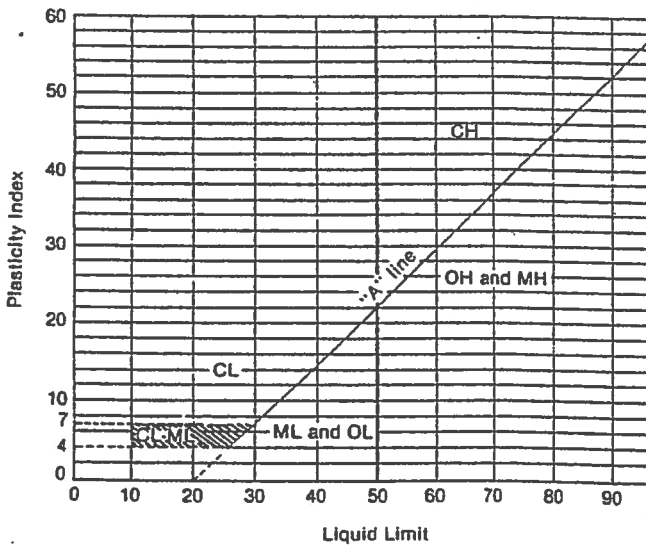
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits 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 limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched 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 per cent ..... GW, GP, SW, SP
More than 12 per cent ..... GM, GC, SM, SC
5 to 12 per cent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



For classification of fine-grained soils and fine fraction of coarse-grained soils.

Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols.

Equation of A-line: $PI = 0.73\ (LL - 20)$

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

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, due in large measure to programs and publications of ASFE/The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

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

A CGC geotechnical report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult CGC's geotechnical engineers to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless CGC indicates otherwise, your geotechnical engineering report should not be used:

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

CGC geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geotechnical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances, actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact. For this reason, most experienced owners retain their geotechnical consultants through the construction stage, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time. Speak with CGC's geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. CGC's geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

CGC geotechnical reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, CGC's geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by CGC engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. These logs should not under any circumstances be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-to-frequent result. To minimize the likelihood of boring log misinterpretation, give contractors ready access to the complete geotechnical engineering report prepared or authorized for their use. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, CGC geotechnical engineers have developed model clauses for use in written transmittals. These are not exculpatory clauses designed to foist our geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where our geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. CGC's geotechnical engineers will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

CGC's geotechnical engineers will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

APPENDIX D

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX D

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

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. The rock, boulders or concrete pieces should contain finer material to fill in void spaces between the larger material.

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 a 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 1.

Table 1
Compaction Guidelines

Area	Percent Compaction+ Clay/Silt	Sand/Gravel
Within 10 feet of building lines		
• Footing bearing soils	93-95	95
• Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab & thicker fill zones	92	95
Beyond 10 feet 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:

+ Based on Modified Proctor (ASTM D 1557)

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.

APPENDIX E

ROCK EXCAVATION CONSIDERATIONS

APPENDIX E

ROCK EXCAVATION CONSIDERATIONS

In order to minimize probable "rock" excavation expenses during construction, we suggest that project specifications incorporate the following:

A. It is assumed that all excavations to levels and dimensions required by the Contract Documents are earth excavation. Earth excavation includes removal and disposal of all materials encountered except rock/sound bedrock which is defined as natural materials which:

   1. Cannot be excavated with a minimum 3/4 cubic yard capacity backhoe without drilling and blasting;

   2. Cannot be economically removed with a one-tooth ripper on a D8 cat (or equivalent);

   3. Requires the use of special equipment such as a pneumatic hammer;

   4. Requires the use of explosives (after obtaining written permission of the owner).

B. Examples of material classified as rock are boulders 1/2 cubic yard or more in volume, bedrock, rock in ledges, and rockhard cementitious aggregate deposits.

C. Do not proceed with rock excavation work until architect, engineer and/or testing firm (i.e., CGC) has taken the necessary measures to determine quantity of rock excavation required to complete the work. Measurements will be taken after properly stripped of earth by the contractor. Contractor will be paid the difference between the cost of rock and earth excavation based on an agreed upon unit price established prior to starting rock excavation.

A statement should also be included in the specifications to the effect that: "Stated models of earth excavation equipment are merely for purposes of defining the various excavation categories and are not intended to indicate the brand or type of equipment that is to be used."

APPENDIX E

ROCK EXCAVATION CONSIDERATIONS

In order to minimize probable "rock" excavation expenses during construction, we suggest that project specifications incorporate the following:

A. It is assumed that all excavations to levels and dimensions required by the Contract Documents are earth excavation. Earth excavation includes removal and disposal of all materials encountered except rock/sound bedrock which is defined as natural materials which:

1. Cannot be excavated with a minimum 3/4 cubic yard capacity backhoe without drilling and blasting;

2. Cannot be economically removed with a one-tooth ripper on a D8 cat (or equivalent);

3. Requires the use of special equipment such as a pneumatic hammer;

4. Requires the use of explosives (after obtaining written permission of the owner).

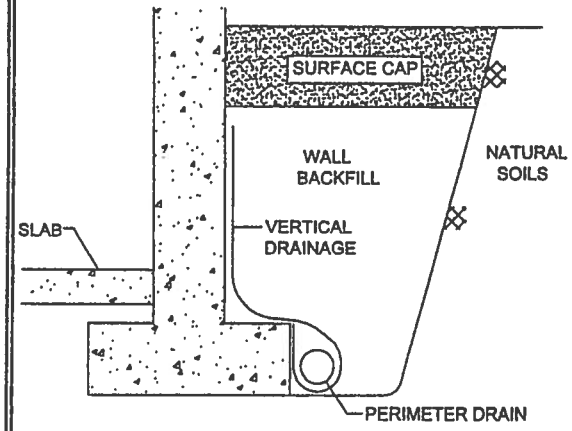
B. Examples of material classified as rock are boulders 1/2 cubic yard or more in volume, bedrock, rock in ledges, and rockhard cementitious aggregate deposits.

C. Do not proceed with rock excavation work until architect, engineer and/or testing firm (i.e., CGC) has taken the necessary measures to determine quantity of rock excavation required to complete the work. Measurements will be taken after properly stripped of earth by the contractor. Contractor will be paid the difference between the cost of rock and earth excavation based on an agreed upon unit price established prior to starting rock excavation.

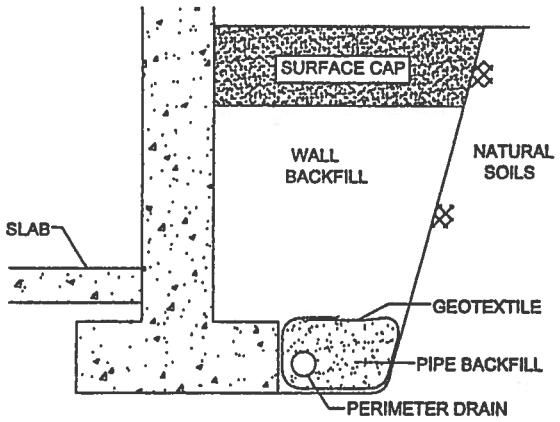
A statement should also be included in the specifications to the effect that: "Stated models of earth excavation equipment are merely for purposes of defining the various excavation categories and are not intended to indicate the brand or type of equipment that is to be used."

APPENDIX F

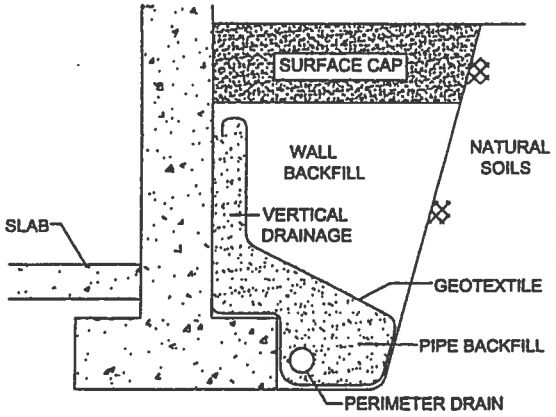
PERIMETER DRAIN DETAILS



ALTERNATE NO. 1



ALTERNATE NO. 2



ALTERNATE NO. 3

DRAINAGE SYSTEM COMPONENTS

Component	Alternate No. 1	Alternate No. 2	Alternate No. 3
Surface Cap	1 to 2 ft. of clayey soils. Minimum 1 ft. thick if overlain by pavement	Refer to Alternate No. 1	Refer to Alternate No. 1
Vertical Drainage	3-dimesional drainage geocomposite hydraulically connected to perimeter drain.	Relatively Free-draining granular soils with P200 (% fines) ≤12%.	Minimum 6-in. wide zone of free-draining granualr soils with P200 ≤5% hydraulically connected to perimeter drain. Provide geotextile as required (see note 10).
Perimeter Drain	Perforated pipe encapsulated in geocomposite.	Perforated pipe surrounded by free-draining granular pipe backfill with P200≤5%. Provide geotextile as required (See Note 10).	Refer to Alternate No. 2
Wall Backfill	Excavation spoils or imported materials (granular soils preferred).	Relatively Free-draining granular soils with P200≤12%.	Refer to Alternate No. 1

CGC, Inc.

Typical Perimeter Drain Detail

General Notes

1. This system's primary function is to intercept infiltrating surface water. These Alternates are not appropriate for use in situations of high groundwater (i.e., cases where the water table approaches floor slab elevation).

2. Grade surface cap to slope away from structure.

3. Exterior surface of walls below grade should be damp-proofed.

4. A plastic vapor barrier should be installed below the slab.

5. Recommended types of drain pipes:

Specification	Description
ASTM D2729	Polyvinyl Chloride (PVC) Drain Pipe
ASTM F405	Corrugated Polyethylene Drain Pipe
ASTM D2852	Styrene-Rubber Plastic Drain Pipe
AASHTO M136	Corrugated Metal Underdrain Pipe

6. Minimum slope of drain pipes should be 2 in. per 100 lin ft.

7. Place drain pipe below basement floor level and orient the perforations toward the bottom.

8. Clean-outs should be provided to service the pipe.

9. Collected field water should be discharged to a sump, storm sewer or drainage field.

10. The geotextile for Alternative Nos. 2 and 3 may be eliminated if filter requirements are satisfied between the wall and pipe backfill, as well as between backfill materials and natural soils.

11. Pipe backfill materials should satisfy filter requirements for the slot width or hole diameter of the perforated pipe.

12. Care should be taken during backfilling not to damage the integrity of the system. For compaction requirements, refer to geotechnical report.

13. Pipe, geotextile, and geocomposite should be installed according to manufacturer specifications.

CGC, Inc.	Typical Perimeter Drain Detail General Notes

APPENDIX G

WISCONSIN DEPARTMENT OF COMMERCE - SOIL EVALUATION FORMS (6)

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), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

Please print all information.

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

County: DANE
Parcel I.D.: 0910294800 40
Reviewed by: | Date:

Property Owner	Property Location
COMMUNITY DEVELOPMENT AUTHORITY OF TN OF WINDSOR	Govt. Lot SE 1/4 SE 1/4 S 29 T 09 N R 10 (E) or) W
Property Owner's Mailing Address: 4084 MUELLER RD	Lot # / Block # / Subd. Name or CSM#
City: DEFOREST | State: WI | Zip Code: 53532 | Phone Number: ( )	☐ City ☐ Village ☒ Town — WINDSOR | Nearest Road: WINDSOR RD

Drainage area _____ ☐ sq. ft. ☐ acres
Optional:
Test Site Suitable for (check all that apply)
☐ Irrigation ☐ Bioretention 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) _____

Obs. # 5 ☒ Boring ☐ Pit — Ground surface elev. 919.1 ft. — Depth to limiting factor 48 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-14	10YR 2/1	None	SiL	1msbk	mfr	cs	<5	0.13
2	14-72	10YR 4/4	C2d 10YR 6/6	SiCL	1msbk	mfi	gs	<5	0.04
3	72-102	10YR 3/3	None	SCL	0m	mfr	gs	10-15	0.11
4	102-180	7.5YR 4/4	None	SL	1fsbk	mvfr		10-15	0.5

Obs. # 6 ☒ Boring ☐ Pit — Ground surface elev. 914.5 ft. — Depth to limiting factor >171 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-8	10YR 2/1	None	SiL	1msbk	mfr	cs	<5	0.13
2	8-42	10YR 4/4	None	SiCL	1fsbk	mfi	gs	<5	0.04
3	42-72	10YR 4/3	None	SCL	0m	mvfr	gs	<5	0.11
4	72-102	10YR 5/3	None	VGRS	0sg	ml	gs	20-30	3.6+
5	102-150	10YR 6/4	None	SL	1fsbk	mvfr	gs	15-20	0.5
6	150-171	10YR 5/3	None	LS	0sg	ml		15-20	1.63

CST/PSS Name (Please Print)	Signature	CST/PSS Number
DAVID STAAB	David Staab	1042602
Address	**Date Evaluation Conducted**	**Telephone Number**
3911 MINERAL POINT ROAD MADISON 53705	11/26/07	608/288-4100

Property Owner WINDSOR Parcel ID # 091029480040 Page 2 of 4

7 Obs. # ☒ Boring ☐ Pit Ground surface elev. 912.8 ft. Depth to limiting factor 48 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-20	10YR 2/1	None	SiL	1fsbk	mfr	cs	<5	0.13
2	20-66	10YR 4/3	C2f 10YR 6/6	SiCL	2fsbk	mfr	gs	<5	0.04
3	66-96	10YR 5/3	None	VGRLS	0sg	ml	gs	20-30	1.63+
4	96-169	7.5YR 7/3	None	GRS*	0sg	ml		15-25	—
		* APPARENT WEATHERED SANDSTONE							

8 Obs. # ☒ Boring ☐ Pit Ground surface elev. 916.4 ft. Depth to limiting factor >172 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-12	10YR 2/1	None	SiL	1fsbk	mfr	cs	<5	0.13
2	12-66	10YR 3/4	None	SiCL	1fsbk	mfi	gs	<5	0.04
3	66-156	10YR 5/4	None	SL	0sg	ml	gs	15-25	0.5
4	156-172	10YR 7/4	None	LS	0sg	ml		15-25	1.63+

Test Results and/or Summary Comments

The Department of Commerce is an equal opportunity service provider and employer. If you need assistance to access services or need material in an alternate format, please contact the department at 608-266-3151 or TTY 608-264-8777.

Property Owner WINDSOR Parcel ID # 09102948 0040 Page 3 of 4

9 Obs. # ☒ Boring ☐ Pit Ground surface elev. 917.5 ft. Depth to limiting factor 48 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-9	10YR 2/1	None	SiL	lfsbk	mfr	cs	<5	0.13
2	9-72	10YR 4/3	f2f 10YR 6/6	SiCL	lfsbk	mfi	gs	<5	0.04
3	72-102	10YR 6/4	None.	VGRLS	0sg	ml	gs	20-30	1.63+
4	102-168	10YR 7/2	None	VGRS*	0sg	ml		15-25	-
		* APPARENT WEATHERED SANDSTONE							

10 Obs. # ☒ Boring ☐ Pit Ground surface elev. 918.9 ft. Depth to limiting factor 171 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-10	10YR 2/1	None	SiL	lfsbk	mfr	cs	<5	0.13
2	10-72	10YR 4/3	None	SiCL	lfsbk	mfi	gs	<5	0.04
3	72-171	10YR 6/4	None	VGRLS	0sg	ml		20-30	1.63+
		* APPARENT WEATHERED SANDSTONE NEAR 171 in.							

Test Results and/or Summary Comments

The Department of Commerce is an equal opportunity service provider and employer. If you need assistance to access services or need material in an alternate format, please contact the department at 608-266-3151 or TTY 608-264-8777.

Property Owner WINDSOR Parcel ID # 09102948 0040 Page 4 of 4

11 Obs. # ☒ Boring ☐ Pit Ground surface elev. 919.7 ft. Depth to limiting factor 90 in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-9	10YR 2/1	None	SiL	lfsbk	mfr	cs	<5	0.13
2	9-72	10YR 4/3	None	SiCL	lfsbk	mfi	gs	<5	0.04
3	72-90	10YR 5/4	None	LS	Osg	ml	gs	10-20	1.63
4	90-171	10YR 7/1	None	S*	Osg	ml		5-15	–
		*APPARENT WEATHERED SANDSTONE BEDROCK							

☐ Obs. # ☐ Boring ☐ Pit Ground surface elev. _____ ft. Depth to limiting factor _____ in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr

Test Results and/or Summary Comments

The Department of Commerce is an equal opportunity service provider and employer. If you need assistance to access services or need material in an alternate format, please contact the department at 608-266-3151 or TTY 608-264-8777.

Stormwater Management Plan Report

Windsor Crossing Village Center Phase 1

Windsor, WI

www.JSDinc.com

Planning & Development

Site/Civil Engineering

Transportation Engineering

Structural Engineering

Water Resources

Landscape Architecture

Surveying & Mapping

Construction Management

Prepared for:

Forward Development Group
161 Horizon Drive, Suite 101A
Madison, WI 53718

JSD Project No. 18-8515

August 13, 2018
Revised February 11, 2019

Prepared by:

JSD Professional Services, Inc.

• Engineers • Surveyors • Planners

Memorandum

www.jsdinc.com

To:	Village of Windsor
From:	Corey Huhta P.E. C.F.M, JSD Professional Services, Inc
Re:	Windsor Crossing Village Center Phase 1
JSD Project #:	18-8515
Date:	August 13,2018 - Revised February 11, 2019
cc:	Ron Henshue (FDG), Bill Dunlop P.E. (JSD)

This technical memorandum shall serve as the stormwater management design report for Windsor Crossing Village Center Phase 1 in the Village of Windsor, Dane County, Wisconsin. The guidelines and regulations used for stormwater management include the following:

- Wisconsin Administrative Code Chapter NR151;
- Chapter 14 of the Dane County Code of Ordinances; and
- Chapter 50 of the Village of Windsor.

Windsor Crossing Village Center Phase 1 is a proposed 2.3-acre commercial development containing a roadway and corresponding utilities for future buildings and future extensions of the roadway. Mass grading for lots 1 and 2 will also be performed during the construction of the road. The site is south of Windsor Street, east of North Towne Road within the Windsor Crossing development. The property is currently undeveloped and zoned limited commercial (C-1). The development consists of 21,447 square feet of impervious surfaces and 2.89 acres of disturbed area. Refer to Exhibit A for proposed development plans.

Stormwater Management Goals

Peak flow reduction and total sediment removal (TSS) are provided on a regional level by level per stormwater management report prepared by D'Onofrio, Kottke & Associates, Inc. as revised March 18, 2015. Refer to Exhibit F for the 2015 Windsor Crossing stormwater management report. On-site stormwater requirements include the following:

- Remove oil and grease from the first 0.5 inches of runoff from the asphalt areas
- Connect on-site storm runoff to the existing storm water management pond south of the property

Oil and grease control is required for asphalt areas where the potential for pollution by oil and grease exists. Oil and grease removal will be accomplished in the inlets. FloGard catch basin insert filters or equivalent have been specified for the inlets to treat low-to-moderate oil and grease loading.

The storm sewer system will capture stormwater from the asphalt area as well as future stormwater from lots 1 and 2. The storm sewer consists of a total of approximately 426 feet before discharging south of the lot where it will surface flow to the basin to the south. For further information, please refer to the pipe sizing and pipe cover calculations within Exhibit B. On-site storm sewer will be privately owned and maintained. Refer to maintenance agreement in Exhibit C. Refer to Exhibit D for the stormwater and erosion control option of probable costs.

Erosion Control Measures

All perimeter erosion control measures will be installed prior to any land disturbing activities. This includes a construction entrance, silt fence, and inlet protection. During construction, all sedimentation and erosion control

items will be maintained for maximum effectiveness. The stone construction entrance will have the stone replaced when the existing stone is no longer effective. Sediment trapped by the silt fence will be removed when sediment levels reach a depth of approximately one foot.

All pervious areas disturbed during construction will be restored with a minimum of six inches of topsoil, fertilizer, seed, and mulch within seven days of final grading. The seed shall be a mixture in accordance with Dane County standards and placed at a minimum rate of 5 lbs per 1,000 sf or as is suggested by the mix or manufacturer. The seed mixture shall be applied on all disturbed areas, excluding impervious areas. Fertilizer shall be applied per the results of soil tests.

All runoff during construction shall be directed to flow through the sedimentation control measures shown on the erosion control plan. Erosion control measures have been designed to prevent gully and bank erosion, limit the soil loss rate to a maximum of 5 tons per acre annually, and regulate soil transportation within the boundaries of the project site. Refer to the Universal Soil Loss Equation for Construction Sites within Exhibit E for soil loss rate information.

The stormwater management and erosion controls for the Windsor Crossing Village Center Phase 1 have been designed in accordance to the development standards for Village of Windsor, Dane County, Wisconsin and WDNR standards.

Attachments:

Exhibit A: Proposed Development Plans
Exhibit B: Storm Sewer Sizing
Exhibit C: Stormwater Maintenance Agreement
Exhibit D: Stormwater and Erosion Control Cost Estimate
Exhibit E: Universal Soil Loss Rate Information
Exhibit F: 2015 Windsor Crossing Stormwater Management Report

EXHIBIT A

PROPOSED DEVELOPMENT PLANS

WINDSOR CROSSING
VILLAGE CENTER, PHASE I

VILLAGE OF WINDSOR, WISCONSIN

NE 1/4, SE 1/4, SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST

DRAWING INDEX

C0.0	TITLE SHEET
C1.0	EXISTING CONDITIONS SURVEY
C2.0	OVERALL SITE PLAN
C3.0	PHASE 1 SITE PLAN
C4.0	GRADING & EROSION CONTROL PLAN
C5.0	DETAILED GRADING
C6.0	UTILITY PLAN

PLAN AND PROFILES

SANITARY AND WATER PLAN & PROFILES

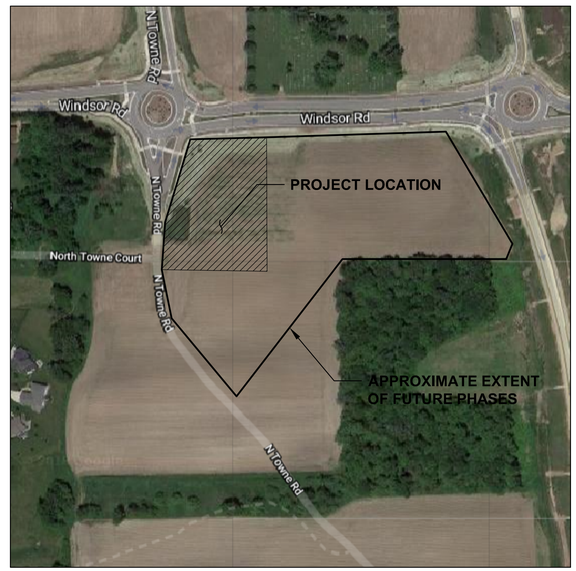
C7.0	PRIVATE STREET A - STA: 9+00 TO 14+50
C7.1	PRIVATE STREET B - STA: 19+75 TO 20+85
	PRIVATE STREET C - STA: 29+40 TO 31+90

PAVING AND STORM PLAN & PROFILES

C8.0	PRIVATE STREET B - STA: 19+00 TO 24+50

DETAILS

C9.0	CONSTRUCTION DETAILS
C9.1	CONSTRUCTION DETAILS
C9.2	TYPICAL SECTIONS



PROJECT AREA

NOT TO SCALE

north

PROJECT INFORMATION

OWNER

CONTACT: FORWARD DEVELOPMENT GROUP
DENNIS STEINKRAUS
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593
P: (608) 848-9050
djs@forwarddevgroup.com

CONSULTING ENGINEER

CONTACT: JSD PROFESSIONAL SERVICES
BILL DUNLOP, P.E.
161 HORIZON DRIVE, SUITE 101
VERONA, WI 53593
P: (608) 848-5060
bill.dunlop@jsdinc.com

MUNICIPAL CONTACTS

VILLAGE OF WINDSOR ENGINEER

CONTACT: KEVIN RICHARDSON
4084 MUELLER ROAD
DEFOREST, WI 53532
P: (608) 888-0066
KEVIN@WINDSORWI.GOV

VILLAGE OF WINDSOR UTILITIES

CONTACT: JEFF BARTOSIAK
6716 PARK STREET
WINDSOR, WI 53598
P: (608) 888-0011
JEFF@WINDSORWI.GOV

UTILITY CONTACTS

GAS

CONTACT: MADISON GAS AND ELECTRIC
SHAUN ENDRES
P.O. BOX 1231
MADISON, WI 53701-1231
P: (608) 252-7224
SENDRES@MGE.COM

COMMUNICATIONS

CONTACT: CENTURY LINK
STEVEN BISHOP
P: (608) 355-7501
STEVEN.BISHOP@CENTURYLINK.COM

CABLE TV

CONTACT: CHARTER COMMUNICATIONS
MIGUEL DEL MORAL
2701 DANIELS STREET
MADISON, WI 53718
P: (608) 209-4817
MIGUELDELMORAL@CHARTER.COM

ELECTRIC

CONTACT: ALLIANT ENERGY
JIM JOHNSRUD
6462 BLANCHAR'S CROSSING
WINDSOR, WI 53598
P: (608) 842-1704
JIMJOHNSRUD@ALLIANTENERGY.COM

DIGGERS HOTLINE
Toll Free (800) 242-8511

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING
VILLAGE CENTER
PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
C0.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Title & Details.dwg Layout: TITLESHEET User: cgroenier Plotted: Feb 08, 2019 - 1:19pm Xref's:

EXISTING CONDITIONS MAP

LOT'S 1 AND 2, CERTIFIED SURVEY MAP No. 14307, LOCATED IN PART OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER AND THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 29, TOWNSHIP 09 NORTH, RANGE 10 EAST, VILLAGE OF WINDSOR, DANE COUNTY, WISCONSIN.

LEGEND

- ¾" REBAR FOUND
- CONTROL POINT
- SOIL BORING
- SANITARY MANHOLE
- WATER OR GAS VALVE
- HYDRANT
- STORM MANHOLE
- CURB INLET
- LIGHT POLE
- PARCEL BOUNDARY
- RIGHT-OF-WAY LINE
- CENTERLINE
- CHORD LINE
- PLATTED LOT LINE
- EASEMENT LINE
- CONCRETE CURB & GUTTER
- SAN — SANITARY SEWER
- W — WATER LINE
- ST — STORM SEWER
- G — NATURAL GAS
- E — UNDERGROUND ELECTRIC
- 930 — INDEX CONTOUR
- 931 — INTERMEDIATE CONTOUR
- x 931.29 — SPOT ELEVATION
- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- DISCONTINUED MAPPED PIPE LINE

NOTES

1. FIELD WORK PERFORMED BY JSD PROFESSIONAL SERVICES, INC. ON SEPTEMBER 27, 2016.
2. BEARINGS FOR THIS SURVEY AND MAP ARE BASED ON THE WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), DANE COUNTY. THE NORTH LINE OF THE SOUTHEAST QUARTER BEARS S89°49'39"W.
3. ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). REFERENCE BENCHMARK IS A FOUND REBAR SET BY D'ONOFRIO KOTTKE AND ASSOCIATES, INC. ON WINDSOR ROAD. ELEVATION = 941.83'
4. CONTOUR INTERVAL IS ONE FOOT.
5. SUBSURFACE UTILITIES AND FEATURES SHOWN ON THIS MAP HAVE BEEN APPROXIMATED BY LOCATING SURFICIAL FEATURES AND APPURTENANCES, LOCATING DIGGERS HOTLINE FIELD MARKINGS AND BY REFERENCE TO UTILITY RECORDS AND MAPS. DIGGER'S HOTLINE TICKET No. 20183216024, 20183216047, 20183216086, 20183216117, 20183216172, 20183216981 AND 2403832, WITH A CLEAR DATE OF AUGUST 15, 2018.
6. UTILITY COMPANIES CONTACTED THRU DIGGERS HOTLINE:
   VILLAGE OF WINDSOR
   MADISON GAS AND ELECTRIC COMPANY
   CHARTER COMMUNICATIONS
   TDS METROCOM
   DOT SOUTHWEST REGION-MADISON
   WINDSOR UTILITY DISTRICT #1
   ALLIANT ENERGY (ELECTRIC AND GAS)
   CENTURYLINK
   VILLAGE OF DEFOREST
7. BEFORE EXCAVATION, APPROPRIATE UTILITY COMPANIES SHOULD BE CONTACTED. FOR EXACT LOCATION OF UNDERGROUND UTILITIES, CONTACT DIGGERS HOTLINE, AT 1.800.242.8511.
8. JSD PROFESSIONAL SERVICES, INC. DOES NOT GUARANTEE THAT THE BENCHMARK ELEVATIONS LISTED ON THIS MAP HAVE NOT BEEN DISTURBED SINCE THE DATE OF THIS SURVEY AND SHOULD BE VERIFIED BEFORE BEING UTILIZED.
9. SITE PLAN RECORDS WERE REQUESTED FROM THE VILLAGE OF WINDSOR. NO RECORDS WERE SUPPLIED FOR THIS SITE.
10. ROADWAY UTILITIES ARE SHOWN PER SUPPLIED RECORD DRAWINGS LOCATES AND FIELD MEASUREMENTS.

SANITARY SEWER MANHOLES

STRUCT. ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
SAN-14	931.11	E	914.31	8"	PVC
		W	914.36	8"	PVC
		S	914.23	8"	PVC
SAN-13	925.77	N	913.28	8"	PVC
		SE	913.20	8"	PVC
SAN-12	924.75	NW	912.67	8"	PVC
		NE	912.75	6"	PVC
		SW	912.75	6"	PVC
		SE	912.62	8"	PVC
SAN-11	924.11	NW	911.95	8"	PVC
		SE	911.92	8"	PVC
SAN-10	926.05	NW	910.17	8"	PVC
		SE	910.13	8"	PVC

STORM SEWER INLETS

INLET ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
INL-11.3	930.32	E	925.87	18"	RCP
		W	925.79	18	RCP
INL-9.2	923.83	NE	920.08	15"	RCP
		SW	919.98	15"	RCP
INL-7.2A	922.25	SE	919.10	12"	RCP
INL-7.2B	922.29	NW	919.10	12"	RCP
		SW	919.09	15"	RCP

STORM SEWER MANHOLES

STRUCT. ID	RIM ELEVATION	INVERT	ELEVATION	PIPE SIZE	PIPE TYPE
CB-7	922.64	NE	918.39	15"	RCP
		SW	918.44	15"	RCP
		NW	918.19	24"	RCP
CB-8	923.20	SE	916.89	24"	RCP
		SW	915.80	36"	RCP
		NW	915.80	36"	RCP
CB-9	924.30	SE	917.92	36"	RCP
		SW	919.77	12"	RCP
		NE	919.52	15"	RCP
		NW	917.92	36"	RCP
CB-10	924.30	SE	919.35	36"	RCP
		SW	920.07	15"	RCP
		N	919.63	30"	RCP
CB-11	924.30	S	924.01	30"	RCP
		E	924.01	18"	RCP
		W	924.01	18"	RCP

BENCHMARKS

BENCH MARK	ELEVATION	DESCRIPTION
BM-1	920.31	CHISELED SQUARE ON BOX CULVERT HEAD WALL
BM-2	925.16	M.A.G. NAIL IN SIDEWALK ON EAST SIDE OF NORTH TOWNE ROAD

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

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION » TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FORWARD DEVELOPMENT GROUP LLC

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

DIGGERS HOTLINE
Toll Free (800) 242-8511

PROJECT:
WINDSOR CROSSING VILLAGE CENTER

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WISCONSIN

PLAN MODIFICATIONS:

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

Design/Drawn: J.
Approved: TJB

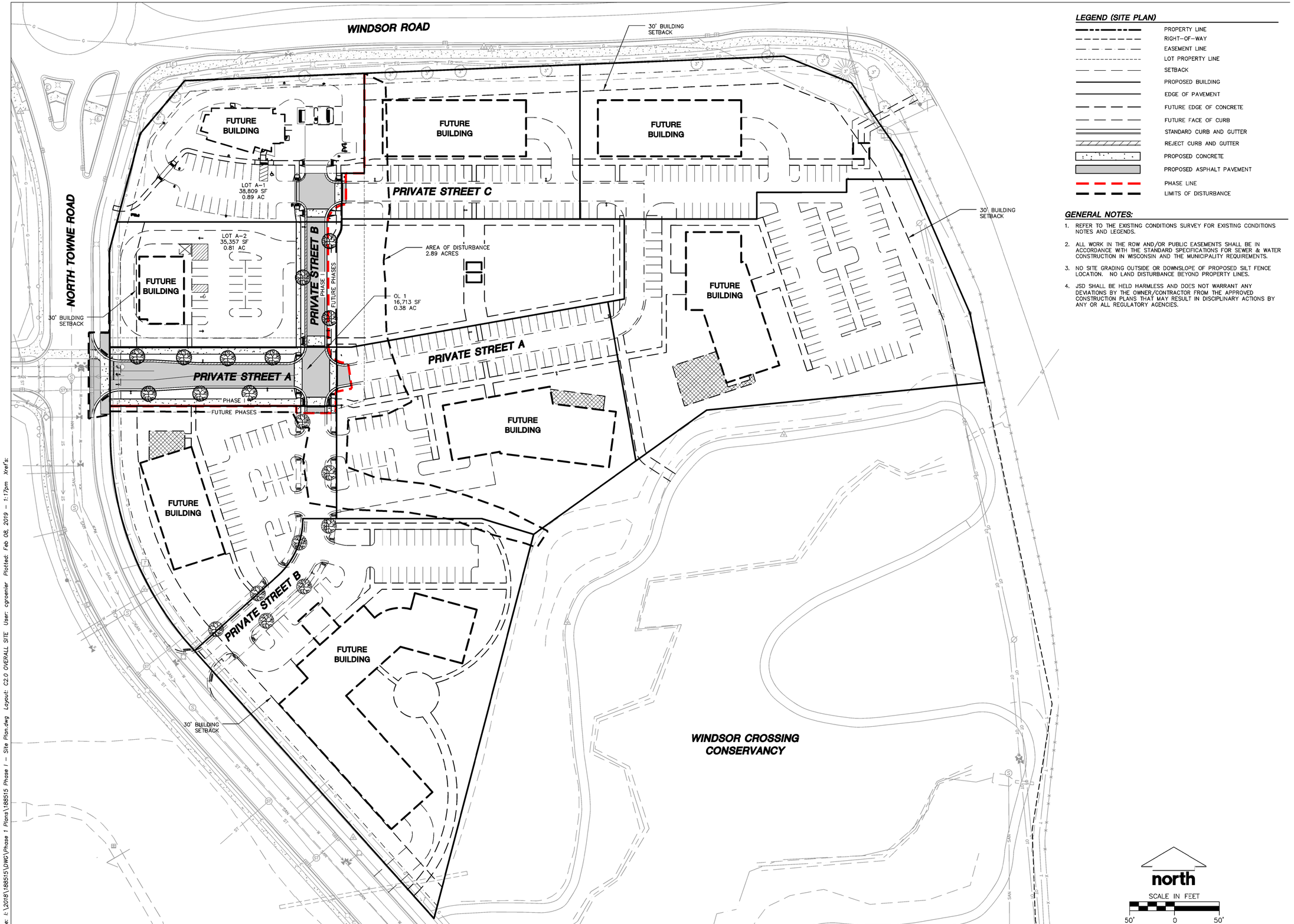
SHEET TITLE:
EXISTING CONDITIONS MAP

SHEET NUMBER:
C 1.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\XREF\188515 Excon(City Center).dwg Layout: Excon User: jk Plotted: Aug 10, 2018 - 7:50am Xref's:



File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Site Plan.dwg Layout: C2.0 OVERALL SITE User: cgroenier Plotted: Feb 08, 2019 - 1:17pm Xrefs:

LEGEND (SITE PLAN)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- SETBACK
- PROPOSED BUILDING
- EDGE OF PAVEMENT
- FUTURE EDGE OF CONCRETE
- FUTURE FACE OF CURB
- STANDARD CURB AND GUTTER
- REJECT CURB AND GUTTER
- PROPOSED CONCRETE
- PROPOSED ASPHALT PAVEMENT
- PHASE LINE
- LIMITS OF DISTURBANCE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

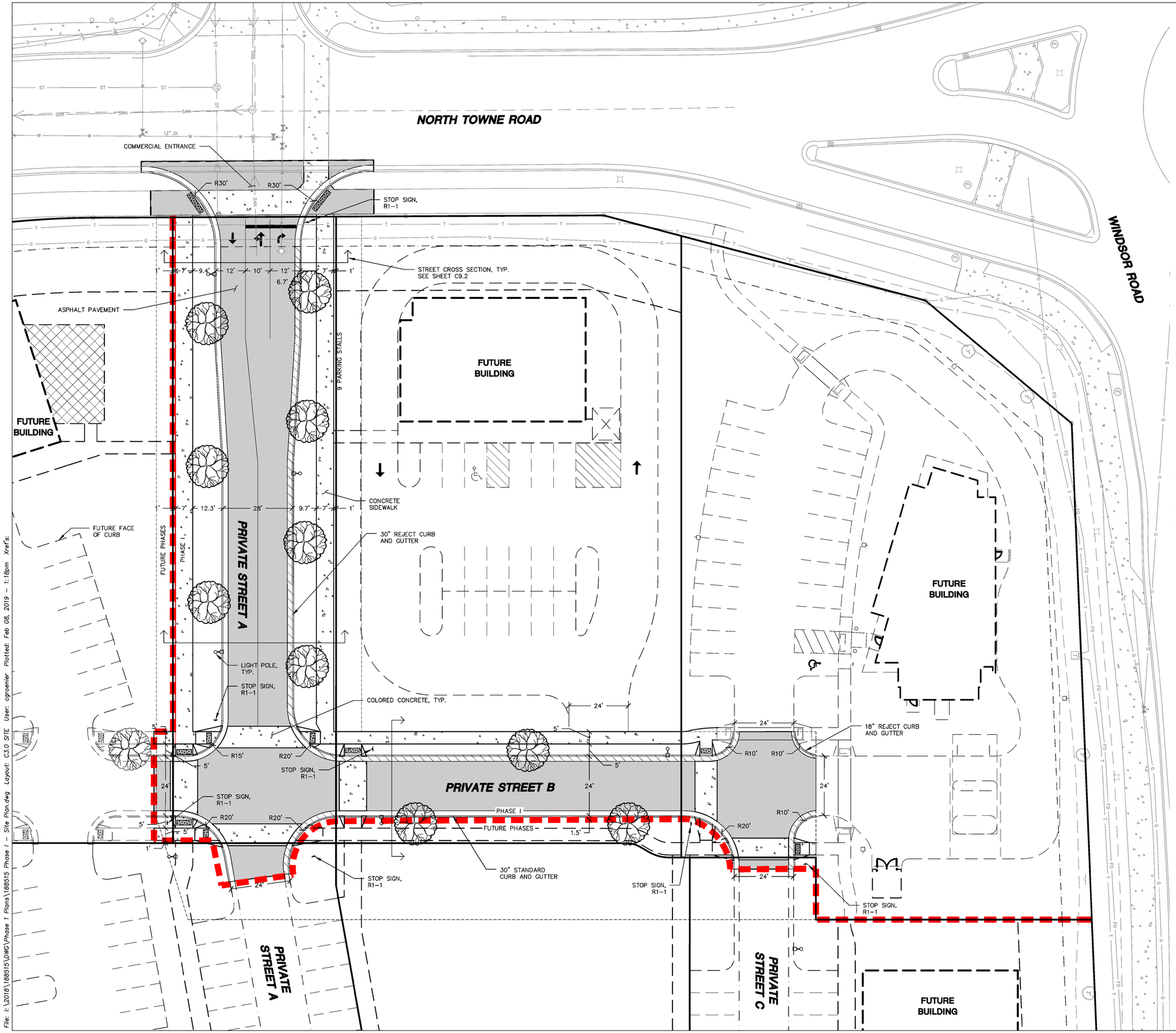
Design/Drawn: CLH/CHG
Approved: WHD

SHEET TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
C2.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.



LEGEND (SITE PLAN)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- SETBACK
- PROPOSED BUILDING
- EDGE OF PAVEMENT
- FUTURE EDGE OF CONCRETE
- FUTURE FACE OF CURB
- STANDARD CURB AND GUTTER
- REJECT CURB AND GUTTER
- PROPOSED CONCRETE
- PROPOSED ASPHALT PAVEMENT
- PHASE LINE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

SITE PLAN NOTES

1. ALL DIMENSIONS TO FACE OF CURB AND/OR EDGING OF CONCRETE UNLESS OTHERWISE NOTED.
2. ALL RADII TO FACE OF CURB AND/OR EDGING OF CONCRETE UNLESS OTHERWISE NOTED.
3. ANY REQUIRED REPLACEMENT OF PUBLIC CURB AND GUTTER SHALL MATCH EXISTING AND MEET THE REQUIREMENTS OF THE MUNICIPALITY.
4. CONTRACTOR SHALL PROVIDE CONTROL JOINTS AND CONSTRUCTION JOINTS OF ONE-QUARTER CONCRETE THICKNESS AT AN EQUAL RATIO OF LENGTH TO WIDTH WHEREVER POSSIBLE WITH A MAXIMUM LENGTH BETWEEN JOINTS OF 8' ON CENTER
5. CONTRACTOR SHALL PROVIDE EXPANSION JOINTS IN SIDEWALKS AT A MAXIMUM 24' ON CENTER
6. EXTERIOR CONCRETE SURFACES SHALL BE BROOM FINISHED.
7. ALL CONCRETE SURFACES TO BE SEALED WITH TYPE TK-26UV CONCRETE SEALANT.
8. USE 4" WIDE, HIGH VISIBILITY WHITE LATEX PAINT FOR STALL LINES.
9. MARK AND STRIPE ADA PARKING SPACES APPROPRIATELY.
10. 2' x 4' TRUNCATED DOME WARNING DETECTION FIELD SHALL BE PLACED AT ALL ADA RAMPS.
11. ALL PAVEMENT MARKINGS INCLUDING: STOP BARS, CROSSWALKS, DIRECTIONAL ARROWS, PARKING STALL LINES, ADA STALL MARKINGS, NO PARKING ZONES, DROP-OFF/PICK-UP ZONES SHALL BE PAINTED WITH LATEX PAINT PER SPECIFICATIONS.
12. STOP SIGNS SHALL BE INSTALLED AT A HEIGHT OF SEVEN (7) FEET AT ALL CLASS III DRIVEWAY APPROACHES.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

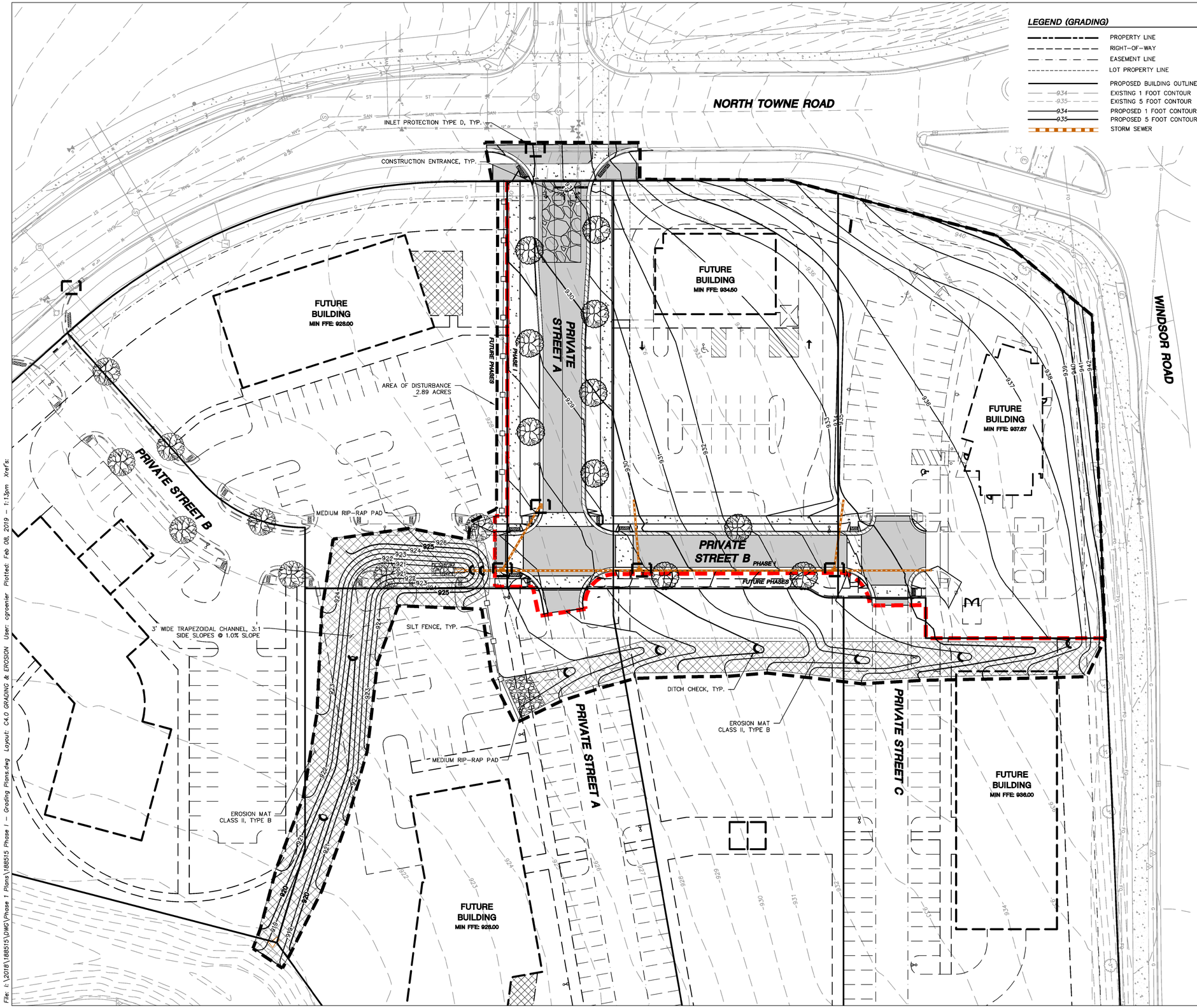
SHEET TITLE:
PHASE I SITE PLAN

SHEET NUMBER:
C3.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Site Plan.dwg Layout: C3.0 SITE User: cgroenier Plotted: Feb 08, 2019 - 1:18pm Xref's:



LEGEND (GRADING)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- PROPOSED BUILDING OUTLINE
- 934 — EXISTING 1 FOOT CONTOUR
- 935 — EXISTING 5 FOOT CONTOUR
- 934 — PROPOSED 1 FOOT CONTOUR
- 935 — PROPOSED 5 FOOT CONTOUR
- STORM SEWER
- 934.20 FG — SPOT ELEVATION
  - EP – EDGE OF PAVEMENT
  - FG – FINISH GRADE
  - EC – EDGE OF CONCRETE
  - SW – EDGE OF SIDEWALK
  - TW – TOP OF WALL
  - BW – BOTTOM OF WALL
  - RIM – RIM ELEVATION
  - ± – MATCH TO EXISTING
- GRADE BREAK
- PHASE LINE
- LIMITS OF DISTURBANCE
- E-MAT – CLASS II, TYPE B
- CONSTRUCTION ENTRANCE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES UNLESS WITHIN A TEMPORARY CONSTRUCTION AND/OR GRADING EASEMENT.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

GRADING AND SEEDING NOTES

1. ALL DISTURBED AREAS SHALL BE SODDED AND/OR SEEDED AND MULCHED IMMEDIATELY FOLLOWING GRADING ACTIVITIES. SOD/SEED MIX TO BE IN ACCORDANCE WITH LANDSCAPE PLAN.
2. ALL PROPOSED GRADES SHOWN ARE FINISHED GRADES. CONTRACTOR SHALL VERIFY ALL GRADES, MAKE SURE ALL AREAS DRAIN PROPERLY AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT ADJACENT PROPERTIES WITH SILT FENCING FOR EROSION CONTROL UNTIL CONSTRUCTION IS COMPLETED AND NOTICE OF TERMINATION FILED.
4. CONTRACTOR SHALL CHISEL-PLOW OR DEEP TILL WITH DOUBLE TINES ALL STORMWATER MANAGEMENT FACILITIES JUST PRIOR TO SODDING AND/OR SEEDING AND MULCHING TO PROMOTE INFILTRATION.
5. CONTRACTOR SHALL WATER ALL NEWLY SODDED/SEEDED AREAS DURING THE SUMMER MONTHS WHENEVER THERE IS A 7 DAY LAPSE WITH NO SIGNIFICANT RAINFALL.
6. CONTRACTOR TO DEEP TILL ALL COMPACTED PERVIOUS SURFACES PRIOR TO SODDING AND/OR SEEDING AND MULCHING.
7. THE CONTRACTOR SHALL NOTIFY THE CITY OF MADISON TWO (2) WORKING DAYS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.
8. IF GRADING ACTIVITIES STOP ON ANY PORTION OF LAND FOR 14 OR MORE CALENDAR DAYS, THE AREA IN QUESTION MUST BE TEMPORARILY STABILIZED.
9. ALL SLOPES 20% OR GREATER SHALL BE TEMPORARY SEEDED, MULCHED, OR OTHER MEANS OF COVER PLACED ON THEM WITHIN 2 WEEKS OF DISTURBANCE.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

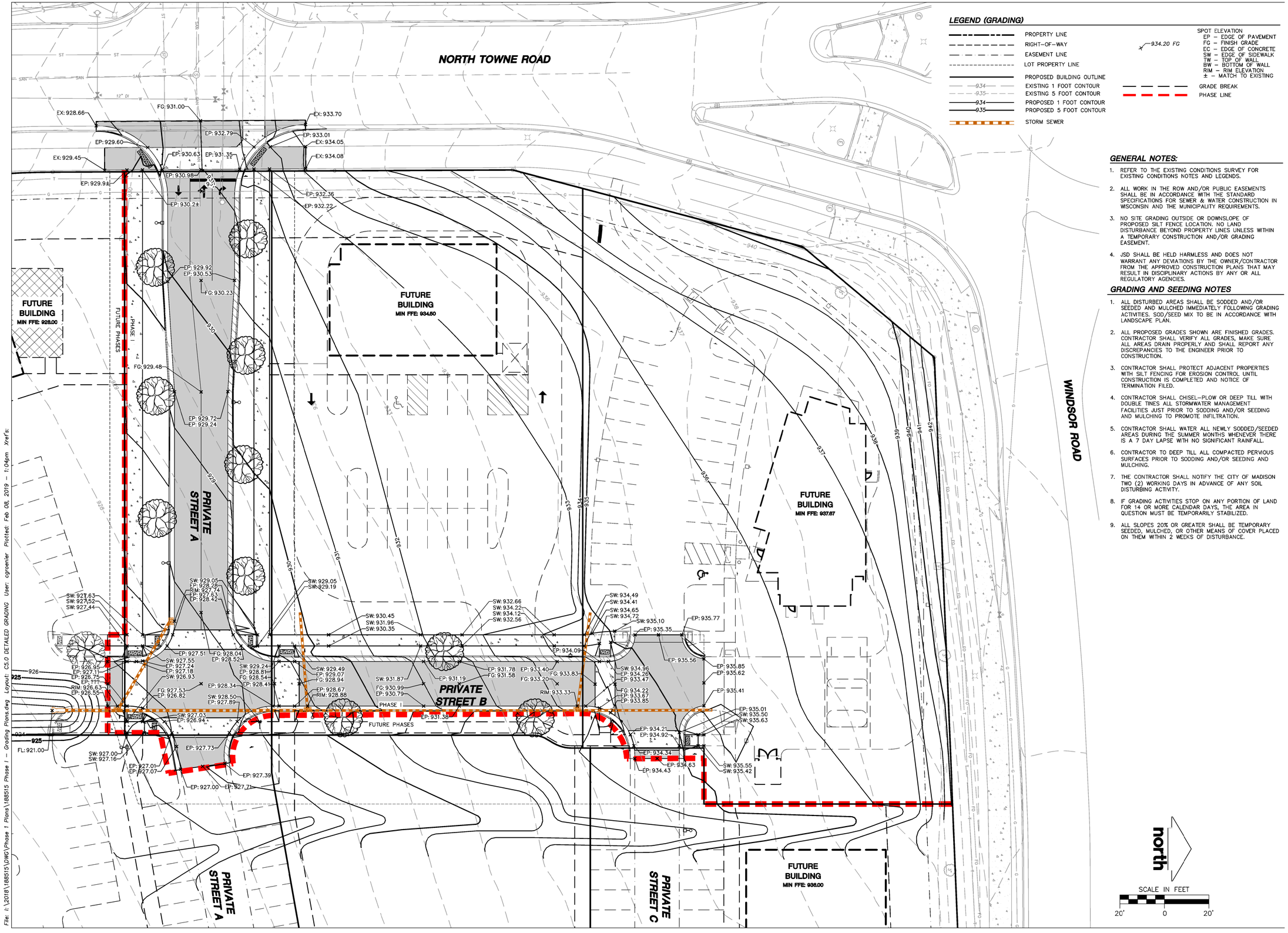
SHEET TITLE:
GRADING & EROSION CONTROL PLAN

SHEET NUMBER:
C4.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Grading Plans.dwg Layout: C4.0 GRADING & EROSION User: cgroenier Plotted: Feb 08, 2019 - 1:13pm Xref's:



LEGEND (GRADING)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- PROPOSED BUILDING OUTLINE
- 934 — EXISTING 1 FOOT CONTOUR
- 935 — EXISTING 5 FOOT CONTOUR
- 934 — PROPOSED 1 FOOT CONTOUR
- 935 — PROPOSED 5 FOOT CONTOUR
- STORM SEWER
- 934.20 FG — SPOT ELEVATION
  - EP – EDGE OF PAVEMENT
  - FG – FINISH GRADE
  - EC – EDGE OF CONCRETE
  - SW – EDGE OF SIDEWALK
  - TW – TOP OF WALL
  - BW – BOTTOM OF WALL
  - RIM – RIM ELEVATION
  - ± – MATCH TO EXISTING
- GRADE BREAK
- PHASE LINE

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES UNLESS WITHIN A TEMPORARY CONSTRUCTION AND/OR GRADING EASEMENT.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

GRADING AND SEEDING NOTES

1. ALL DISTURBED AREAS SHALL BE SODDED AND/OR SEEDED AND MULCHED IMMEDIATELY FOLLOWING GRADING ACTIVITIES. SOD/SEED MIX TO BE IN ACCORDANCE WITH LANDSCAPE PLAN.
2. ALL PROPOSED GRADES SHOWN ARE FINISHED GRADES. CONTRACTOR SHALL VERIFY ALL GRADES, MAKE SURE ALL AREAS DRAIN PROPERLY AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT ADJACENT PROPERTIES WITH SILT FENCING FOR EROSION CONTROL UNTIL CONSTRUCTION IS COMPLETED AND NOTICE OF TERMINATION FILED.
4. CONTRACTOR SHALL CHISEL-PLOW OR DEEP TILL WITH DOUBLE TINES ALL STORMWATER MANAGEMENT FACILITIES JUST PRIOR TO SODDING AND/OR SEEDING AND MULCHING TO PROMOTE INFILTRATION.
5. CONTRACTOR SHALL WATER ALL NEWLY SODDED/SEEDED AREAS DURING THE SUMMER MONTHS WHENEVER THERE IS A 7 DAY LAPSE WITH NO SIGNIFICANT RAINFALL.
6. CONTRACTOR TO DEEP TILL ALL COMPACTED PERVIOUS SURFACES PRIOR TO SODDING AND/OR SEEDING AND MULCHING.
7. THE CONTRACTOR SHALL NOTIFY THE CITY OF MADISON TWO (2) WORKING DAYS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.
8. IF GRADING ACTIVITIES STOP ON ANY PORTION OF LAND FOR 14 OR MORE CALENDAR DAYS, THE AREA IN QUESTION MUST BE TEMPORARILY STABILIZED.
9. ALL SLOPES 20% OR GREATER SHALL BE TEMPORARY SEEDED, MULCHED, OR OTHER MEANS OF COVER PLACED ON THEM WITHIN 2 WEEKS OF DISTURBANCE.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION » TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

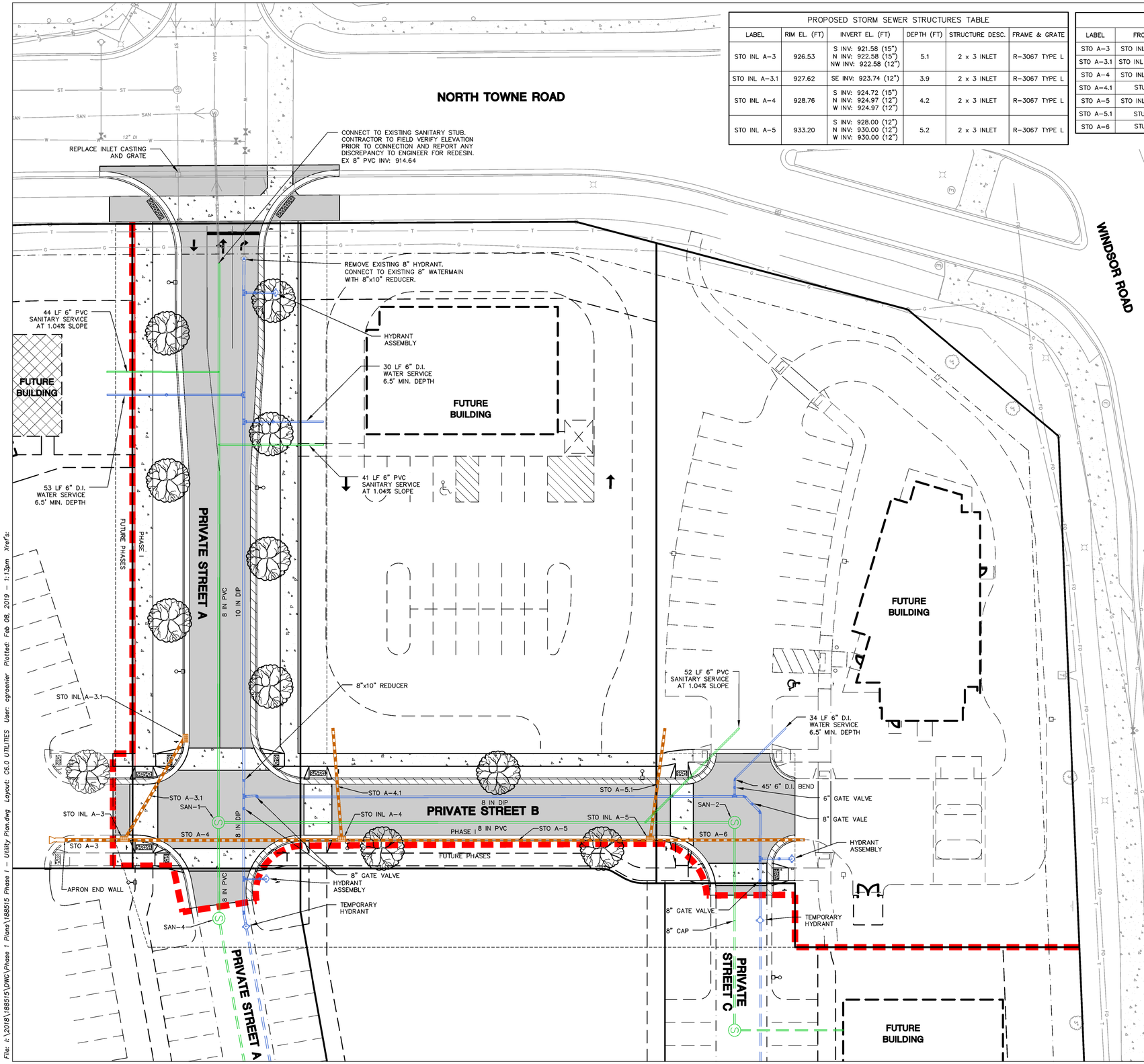
SHEET TITLE:
DETAILED GRADING PLAN

SHEET NUMBER:
C5.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Grading Plans.dwg Layout: C5.0 DETAILED GRADING User: cgroenier Plotted: Feb 08, 2019 - 1:04pm Xref's:



File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Utility Plan.dwg Layout: C6.0 UTILITIES User: cgroenier Plotted: Feb 08, 2019 - 1:13pm Xref's:

PROPOSED STORM SEWER STRUCTURES TABLE

LABEL	RIM EL. (FT)	INVERT EL. (FT)	DEPTH (FT)	STRUCTURE DESC.	FRAME & GRATE
STO INL A-3	926.53	S INV: 921.58 (15") N INV: 922.58 (15") NW INV: 922.58 (12")	5.1	2 x 3 INLET	R-3067 TYPE L
STO INL A-3.1	927.62	SE INV: 923.74 (12")	3.9	2 x 3 INLET	R-3067 TYPE L
STO INL A-4	928.76	S INV: 924.72 (15") N INV: 924.97 (12") W INV: 924.97 (12")	4.2	2 x 3 INLET	R-3067 TYPE L
STO INL A-5	933.20	S INV: 928.00 (12") N INV: 930.00 (12") W INV: 930.00 (12")	5.2	2 x 3 INLET	R-3067 TYPE L

PROPOSED STORM SEWER PIPES TABLE

LABEL	FROM	TO	LENGTH	INVERT EL. (FT)	DISCHARGE EL. (FT)	SLOPE	SIZE & MATERIAL
STO A-3	STO INL A-3	FES A	23'	921.58	921.00	2.50%	15 IN RCP
STO A-3.1	STO INL A-3.1	STO INL A-3	47'	923.74	922.58	2.50%	12 IN RCP
STO A-4	STO INL A-4	STO INL A-3	85'	924.72	922.58	2.50%	15 IN RCP
STO A-4.1	STUB	STO INL A-4	44'	926.07	924.97	2.50%	12 IN RCP
STO A-5	STO INL A-5	STO INL A-4	121'	928.00	924.97	2.50%	12 IN RCP
STO A-5.1	STUB	STO INL A-5	44'	930.89	930.00	2.00%	12 IN RCP
STO A-6	STUB	STO INL A-5	61'	931.52	930.00	2.50%	12 IN RCP

PROPOSED SANITARY SEWER STRUCTURES TABLE

LABEL	RIM EL. (FT)	INVERT EL. (FT)	DEPTH (FT)	STRUCTURE DESC.	FRAME & GRATE
SAN-1	927.41	W INV: 915.52 (8") E INV: 915.62 (8") N INV: 916.52 (8")	11.9	48 IN MH	R-1550 SOLID LID
SAN-2	934.79	S INV: 921.59 (8") E INV: 922.59 (8")	13.2	48 IN MH	R-1550 SOLID LID
SAN-4	927.12	W INV: 915.77 (8") E INV: 915.87 (8")	11.4	48 IN MH	R-1550 SOLID LID

LEGEND (UTILITIES)

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT LINE
- LOT PROPERTY LINE
- FUTURE BUILDING OUTLINE
- SANITARY SEWER
- WATERMAIN
- STORM SEWER
- FUTURE SANITARY SEWER
- FUTURE WATERMAIN

north

SCALE IN FEET

20' 0 20'

GENERAL NOTES:

1. REFER TO THE EXISTING CONDITIONS SURVEY FOR EXISTING CONDITIONS NOTES AND LEGENDS.
2. ALL WORK IN THE ROW AND/OR PUBLIC EASEMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN AND THE MUNICIPALITY REQUIREMENTS.
3. NO SITE GRADING OUTSIDE OR DOWNSLOPE OF PROPOSED SILT FENCE LOCATION. NO LAND DISTURBANCE BEYOND PROPERTY LINES.
4. JSD SHALL BE HELD HARMLESS AND DOES NOT WARRANT ANY DEVIATIONS BY THE OWNER/CONTRACTOR FROM THE APPROVED CONSTRUCTION PLANS THAT MAY RESULT IN DISCIPLINARY ACTIONS BY ANY OR ALL REGULATORY AGENCIES.

UTILITY NOTES:

1. IF ANY ERRORS, DISCREPANCIES, OR OMISSIONS WITHIN THE PLAN BECOME APPARENT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION SO THAT CLARIFICATION OR REDESIGN MAY OCCUR.
2. LENGTHS OF ALL UTILITIES ARE TO CENTER OF STRUCTURES OR FITTINGS AND MAY VARY SLIGHTLY FROM PLAN. LENGTHS SHALL BE VERIFIED IN THE FIELD DURING CONSTRUCTION.
3. THE CONTRACTOR SHALL INSTALL A PEDESTRIAN FENCE AROUND ALL EXCAVATIONS TO BE LEFT OPEN OVER NIGHT AS REQUIRED.
4. THE PROPOSED IMPROVEMENTS MUST BE CONSTRUCTED IN ACCORDANCE WITH ENGINEERING PLANS DESIGNED TO MEET ORDINANCES AND REQUIREMENTS OF THE MUNICIPALITY AND WISDOT, WDSPS, AND WDNR.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR:
   - EXAMINING ALL SITE CONDITIONS RELATIVE TO THE CONDITIONS INDICATED ON THE ENGINEERING DRAWINGS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER AND RESOLVED PRIOR TO THE START OF CONSTRUCTION.
   - OBTAINING ALL PERMITS INCLUDING PERMIT COSTS, TAP FEES, METER DEPOSITS, BONDS, AND ALL OTHER FEES REQUIRED FOR PROPOSED WORK TO OBTAIN OCCUPANCY.
   - VERIFYING UTILITY ELEVATIONS AND NOTIFYING ENGINEER OF ANY DISCREPANCY. NO WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS RESOLVED.
   - NOTIFYING ALL UTILITIES PRIOR TO THE INSTALLATION OF ANY UNDERGROUND IMPROVEMENTS.
   - NOTIFYING THE DESIGN ENGINEER AND MUNICIPALITY 48 HOURS PRIOR TO THE START OF CONSTRUCTION TO ARRANGE FOR APPROPRIATE CONSTRUCTION OBSERVATION.
7. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE ENGINEER WITH AS-BUILT CONDITIONS OF THE DESIGNATED IMPROVEMENTS IN ORDER THAT THE APPROPRIATE DRAWINGS CAN BE PREPARED, IF REQUIRED. ANY CHANGES TO THE DRAWINGS OR ADDITIONAL ITEMS MUST BE REPORTED TO THE ENGINEER AS WORK PROGRESSES.
8. THE PRIME CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL CONSTRUCTION WITH OTHER CONTRACTORS INVOLVED WITH CONSTRUCTION OF THE PROPOSED DEVELOPMENT AND FOR REPORTING ANY ERRORS OR DISCREPANCIES BETWEEN THESE PLANS AND PLANS PREPARED BY OTHERS.
9. ANY SANITARY SEWER, SANITARY SEWER SERVICES, WATER MAIN, WATER SERVICES, STORM SEWER, OR OTHER UTILITIES, WHICH ARE DAMAGED BY THE CONTRACTORS, SHALL BE REPAIRED TO THE OWNER'S SATISFACTION AT THE CONTRACTOR'S EXPENSE.
10. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY DURING THE CONSTRUCTION OF IMPROVEMENTS.
11. CONTRACTOR SHALL CONTACT THE LOCAL MUNICIPALITY PUBLIC WORKS DEPARTMENT A MINIMUM OF 48 HOURS BEFORE CONNECTING TO PUBLIC UTILITIES. CONTRACTOR TO VERIFY SIZE AND DEPTH OF EXISTING UTILITY SERVICES AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONNECTING.
12. CONTRACTOR MUST CONTACT AND IS REQUIRED TO NOTIFY THE LOCAL MUNICIPALITY WATER UTILITY 48 HOURS IN ADVANCE OF CONNECTING TO THE PUBLIC UTILITY.
13. ALL PRIVATE SANITARY BUILDING PIPE AND TUBING SHALL CONFORM TO SPS 384.30-2.
14. ALL PRIVATE STORM BUILDING PIPE AND TUBING SHALL CONFORM TO SPS 384.30-3.
15. ALL PRIVATE PIPE AND TUBING FOR WATER SERVICE SHALL CONFORM TO SPS 384.30-4.
16. ALL PRIVATE STORM PIPE SHALL CONFORM TO SPS 382.40(8)(B)4.A.
17. ALL PRIVATE PIPE SHALL BE INSTALLED PER SPS 382.40-8 INCLUDING AT LEAST 8' OF HORIZONTAL DISTANCE BETWEEN WATER PIPING AND SANITARY SEWER FROM CENTER OF PIPE TO CENTER OF PIPE AND 6' OF SEPARATION BETWEEN STORM SEWER AND WATER PIPING.
18. ALL LOCATIONS WHERE STORM SEWER AND WATER MAIN ARE CROSSING AND LESS THAN 3 FEET OF VERTICAL/HORIZONTAL SEPARATION IS PROVIDED, WATER MAIN SHALL BE INSULATED PER STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN LATEST EDITION. INSULATION SHALL CREATE A "BOX" ENCLOSING THE TOP AND SIDES OF WATER MAIN.
19. MARK WATER, SANITARY, AND STORM WITH A 4"X4" PAINTED WOOD POSTS. WATER SHALL BE PAINTED BLUE AND SANITARY AND STORM SHALL BE PAINTED GREEN.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

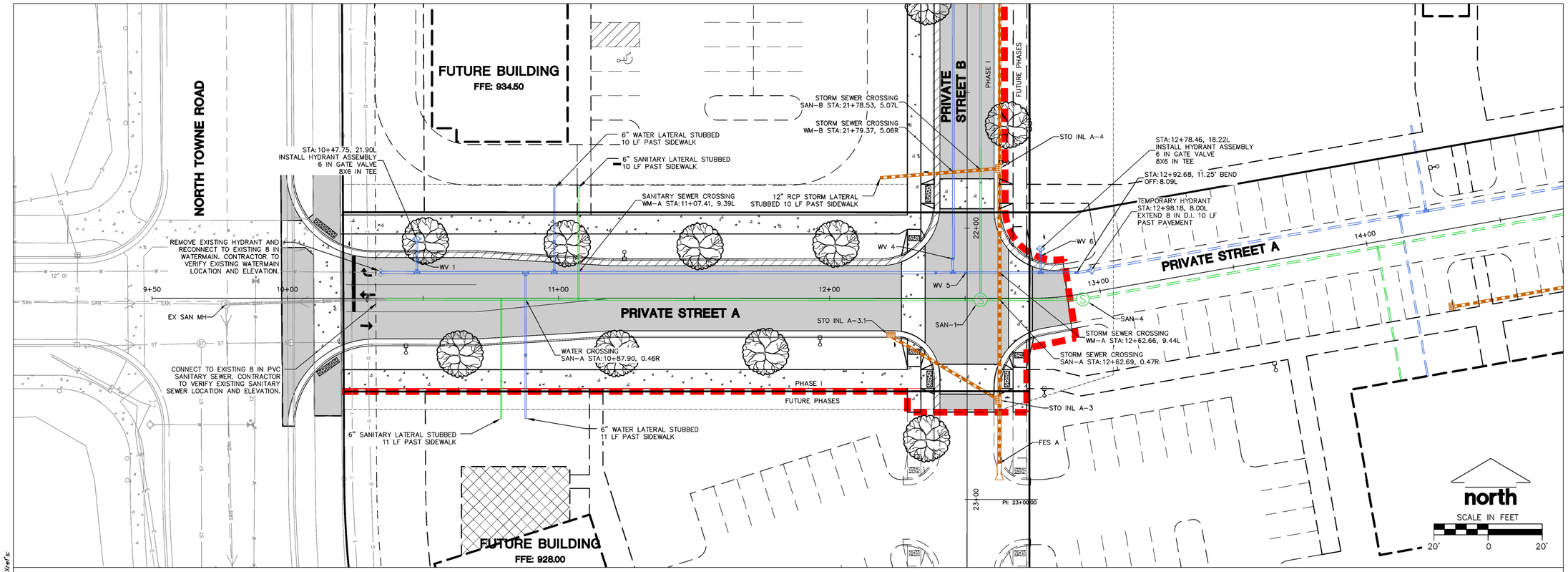
Design/Drawn: CLH/CHG
Approved: WHD

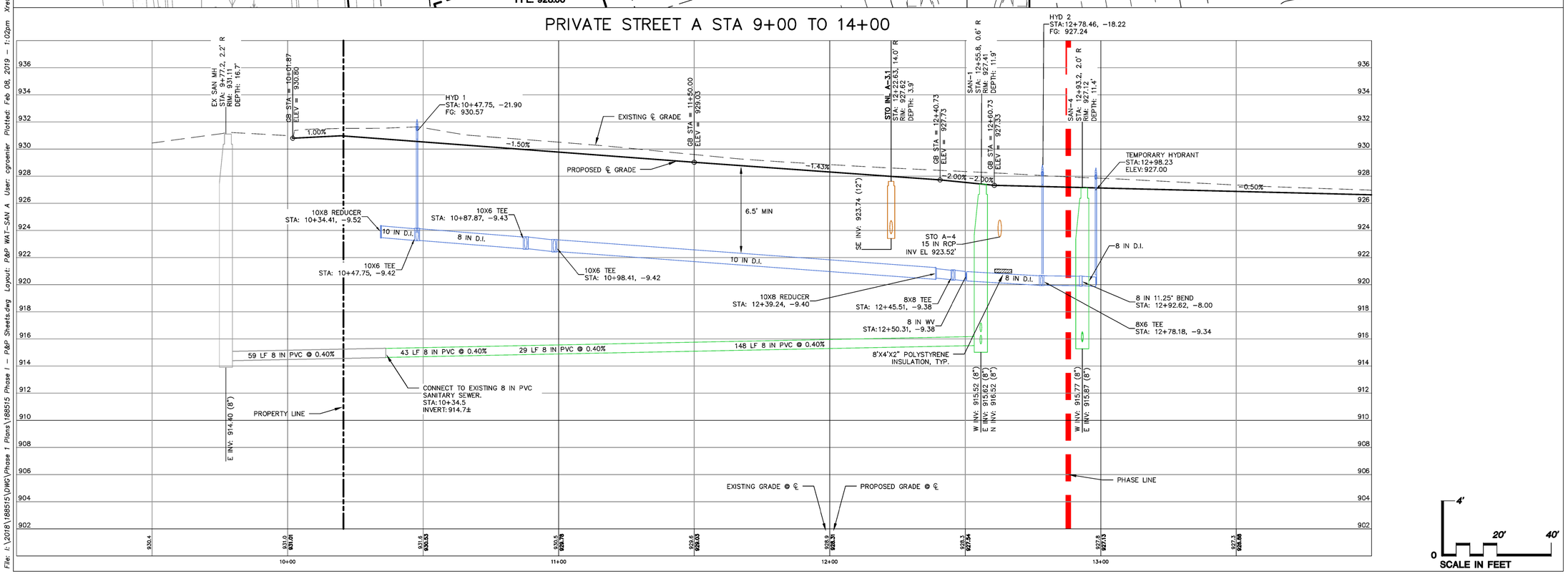
SHEET TITLE:
UTILITY PLAN

SHEET NUMBER:
C6.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.





File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - P&P Sheets.dwg Layout: P&P WAT-SAN A User: cgroenier Plotted: Feb 08, 2019 - 1:02pm Xref's:

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT
FOR CONSTRUCTION

PROJECT:
**WINDSOR CROSSING
VILLAGE CENTER
PHASE I**

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

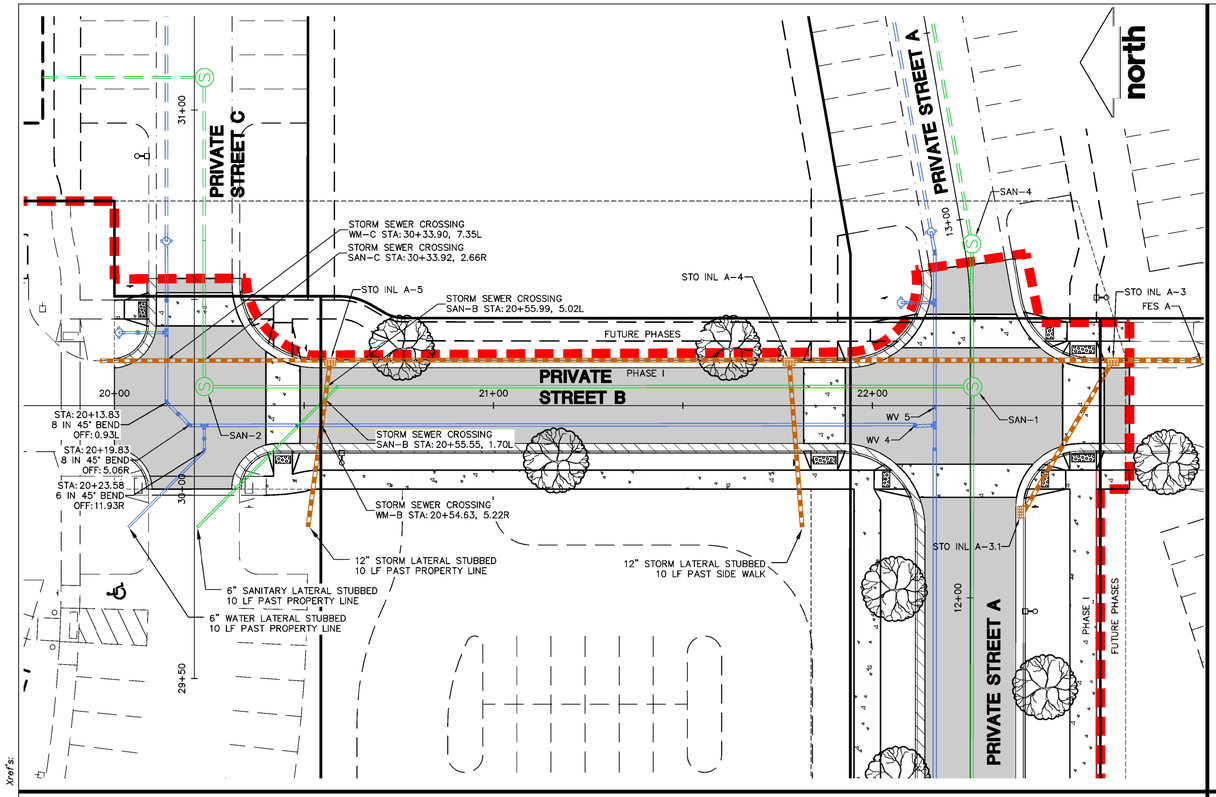
Design/Drawn: CHG/CDHG
Approved: WHD

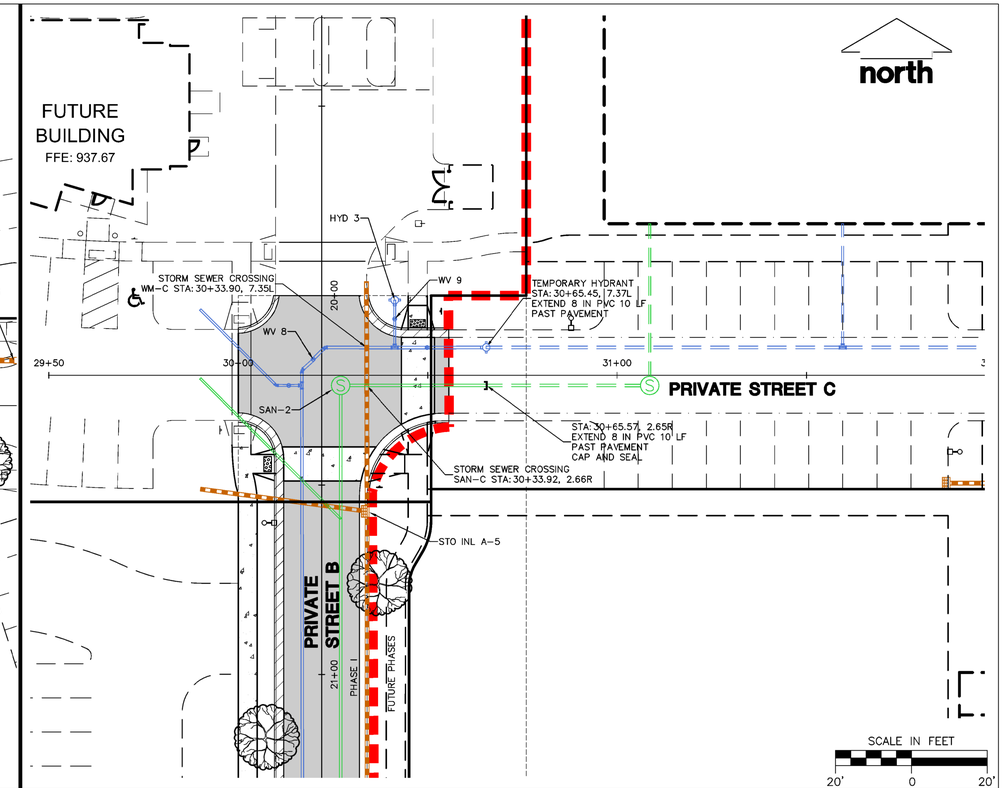
SHEET TITLE:
**SANITARY & WATER P&P
PRIVATE STREET A
STA: 9+00 TO 14+00**

SHEET NUMBER:
C7.0

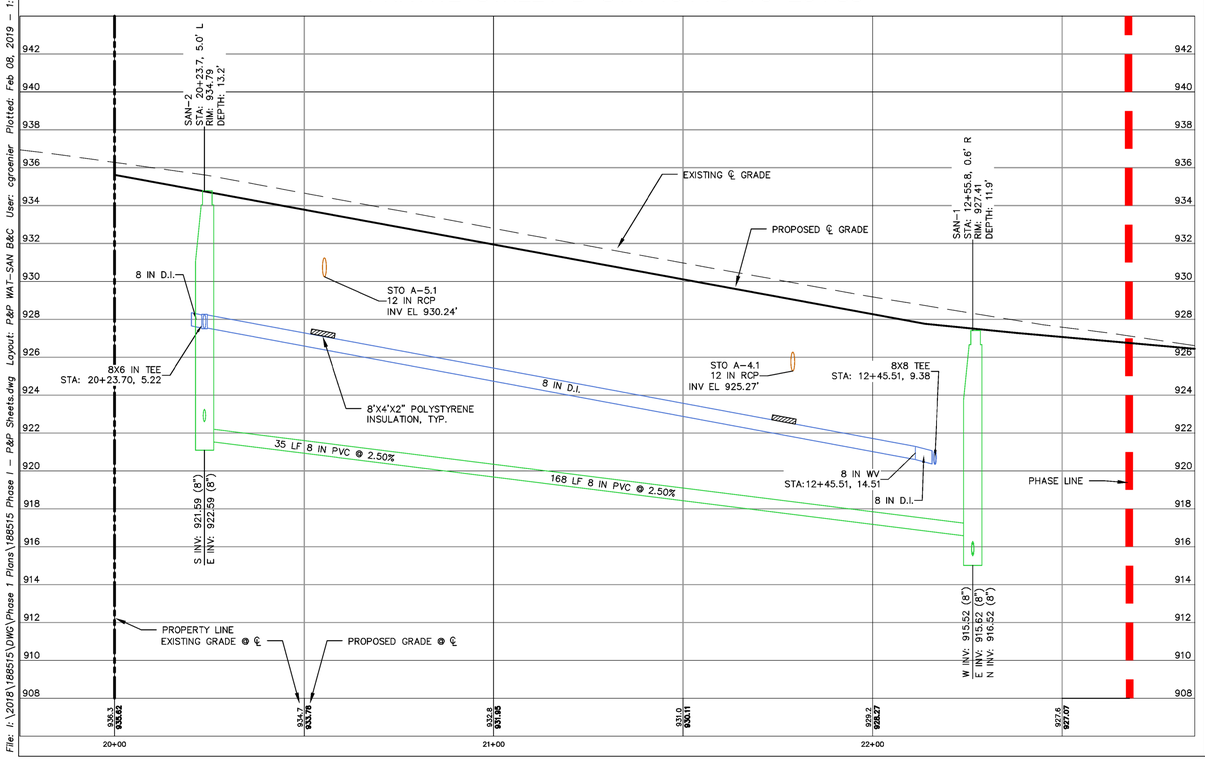
JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

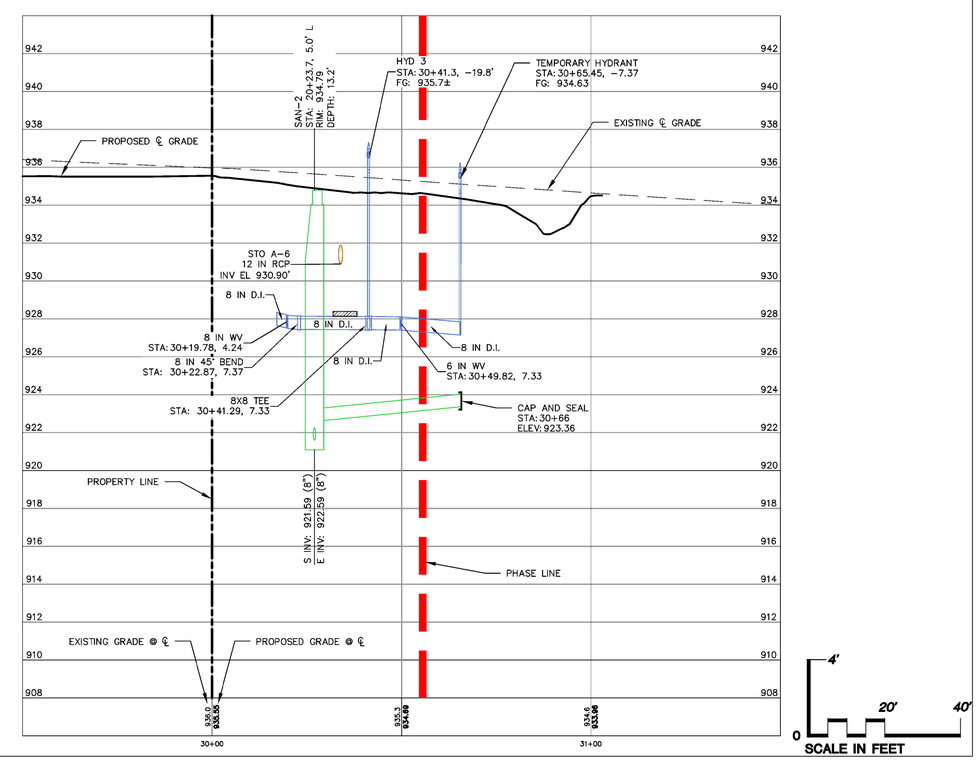




PRIVATE STREET B STA 19+75 TO 20+85



PRIVATE STREET C STA 29+40 TO 31+90



JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CHG/CHG
Approved: WHD

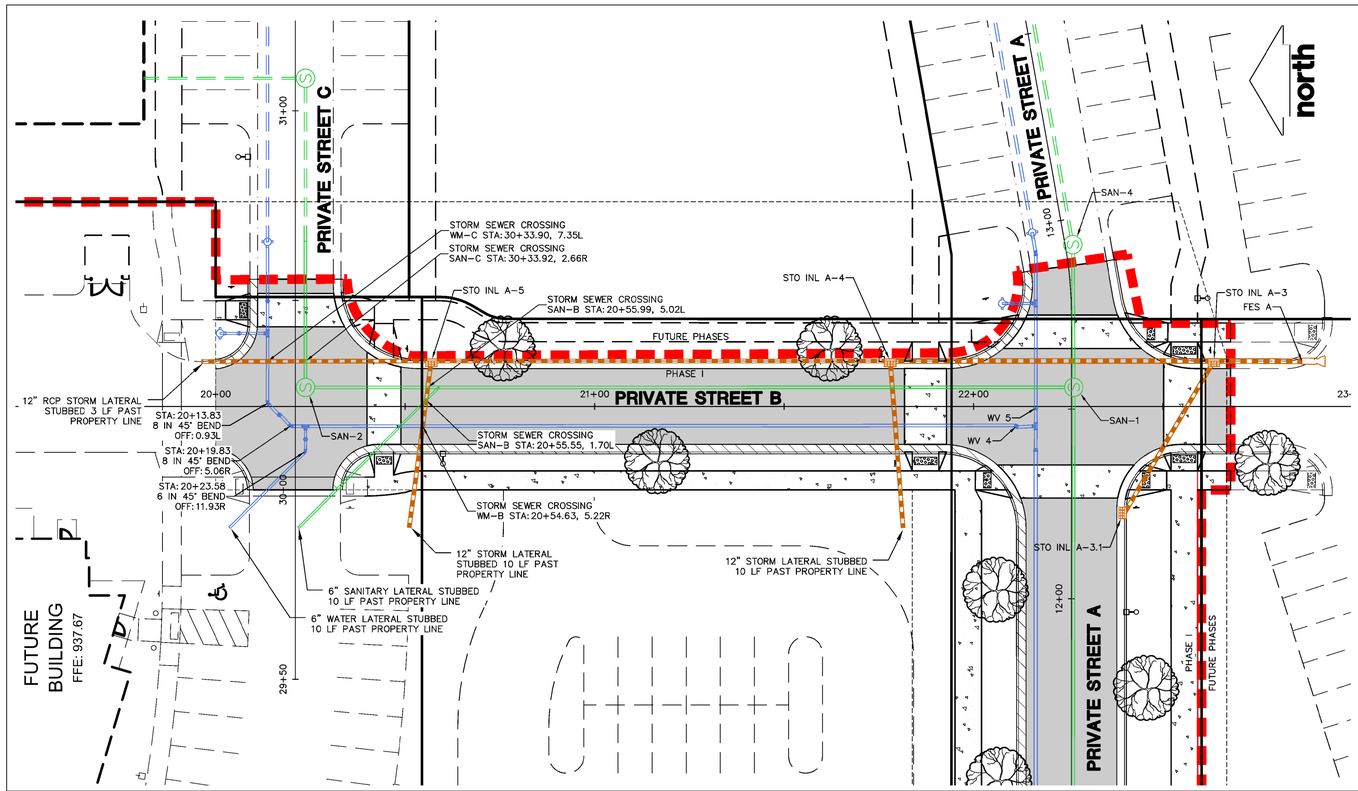
SHEET TITLE:
SANITARY & WATER P&P
PRIVATE STREET B
STA: 19+75 TO 20+85
PRIVATE STREET C
STA: 29+40 TO 31+90

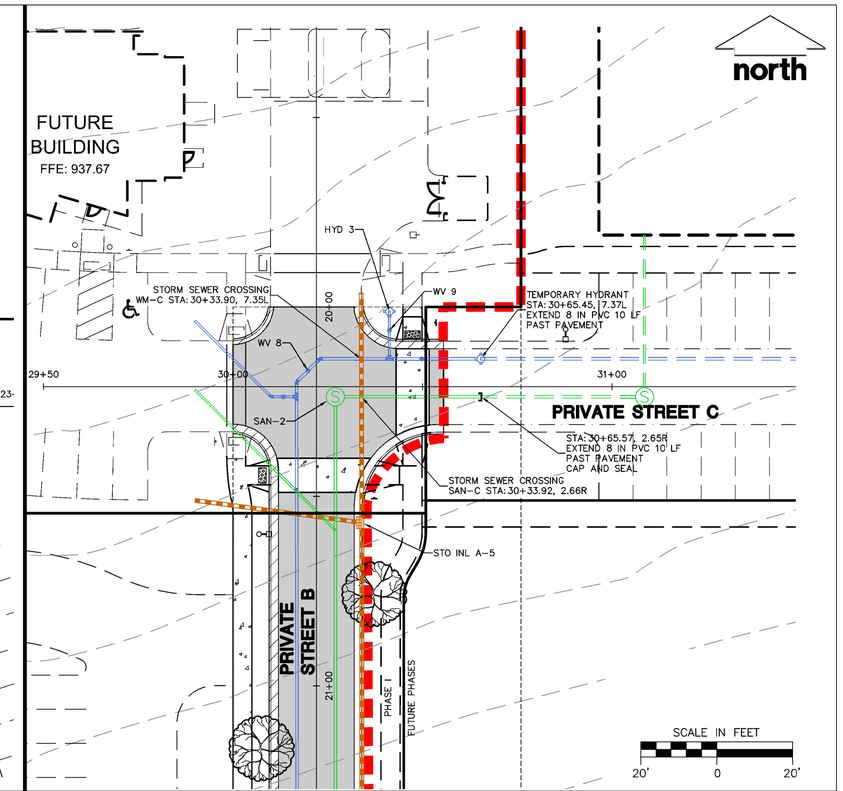
SHEET NUMBER:
C7.1

JSD PROJECT NO: 18-8515

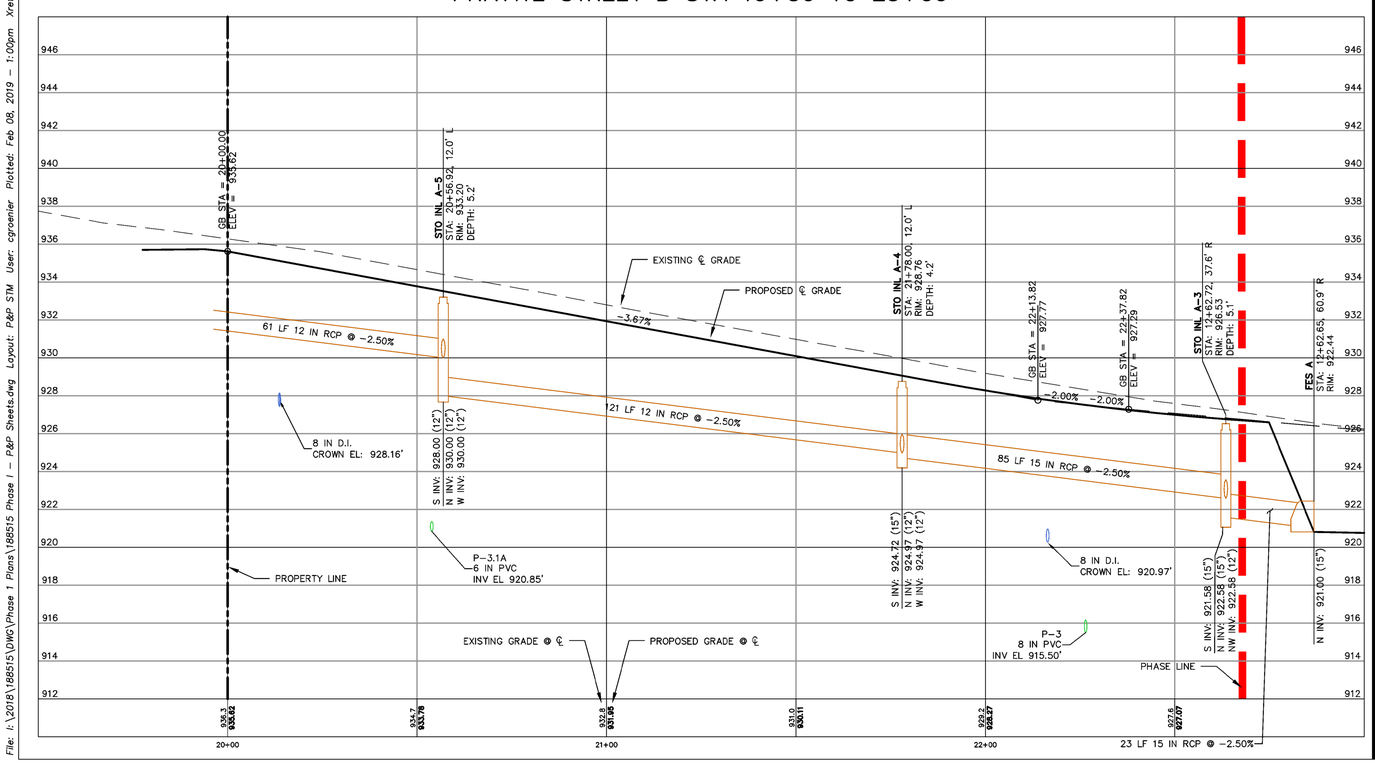
THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\18515\DWG\Phase 1 Plans\18515 Phase I - P&P Sheets.dwg Layout: P&P WAT-SAN B&C User: cgroenier Plotted: Feb 08, 2019 - 1:01pm Xref's:

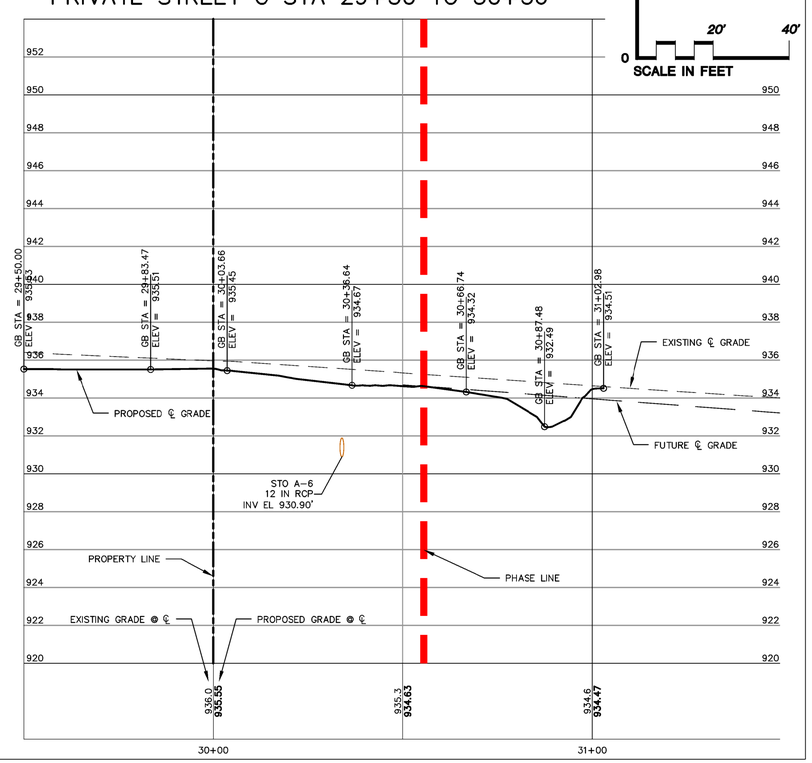




PRIVATE STREET B STA 19+50 TO 23+00



PRIVATE STREET C STA 29+50 TO 30+56



JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CHG/CHB
Approved: WHD

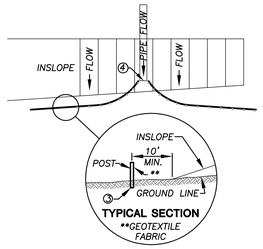
SHEET TITLE:
STORM SEWER & PAVING P&P PRIVATE STREET B & C
STA: 19+50 TO 23+00
STA: 29+50 TO 31+50

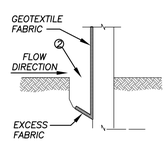
SHEET NUMBER:
C8.0

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

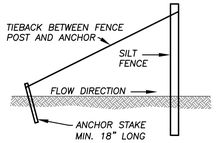
File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - P&P Sheets.dwg Layout: P&P STM User: cgroenier Plotted: Feb 08, 2019 - 1:00pm Xref's:



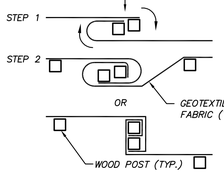


NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

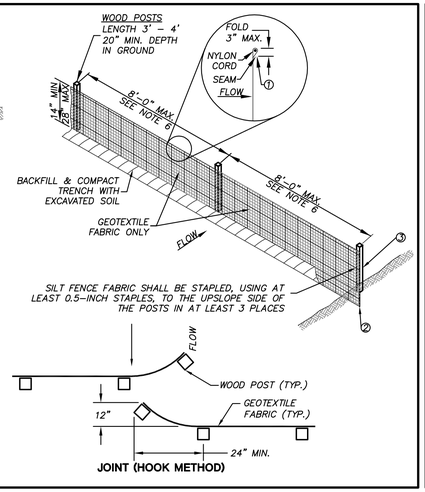
TRENCH DETAIL



SILT FENCE TIE BACK
(WHEN ADDITIONAL SUPPORT REQUIRED)



JOINT (TWIST METHOD)



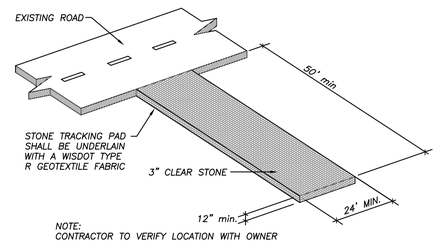
JOINT (HOOK METHOD)

SILT FENCE

N.T.S.

SILT FENCE ALONG SLOPES & OUTFALLS

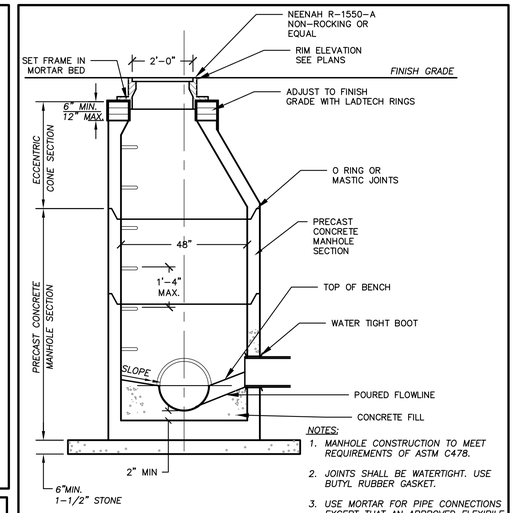
1. SILT FENCE SHALL BE ANCHORED BY SPREADING AT LEAST 8 INCHES OF FABRIC IN A 4" WIDE AND 6" DEEP TRENCH OR 6 INCH DEEP V-TRENCH ON THE UPSLOPE SIDE OF THE FENCE. TRENCHES SHALL NOT BE EXCAVATED WIDER OR DEEPER THAN NECESSARY FOR PROPER INSTALLATION.
2. FOLD MATERIAL TO FIT TRENCH AND BACKFILL AND COMPACT TRENCH WITH EXCAVATED SOIL.
3. WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" x 1 1/8" OF DRIED OAK OR HICKORY.
4. SILT FENCE TO EXTEND ABOVE THE TOP OF PIPE.
5. SILT FENCE CONSTRUCTION AND GEOTEXTILE FABRIC SHALL CONFORM TO WDNR TECHNICAL STANDARD 1056.
6. POST SPACING SHALL BE SELECTED BASED ON GEOTEXTILE FABRIC (8'-0" FOR WOVEN & 3'-0" FOR NON-WOVEN)



NOTE:
CONTRACTOR TO VERIFY LOCATION WITH OWNER

CONSTRUCTION ENTRANCE

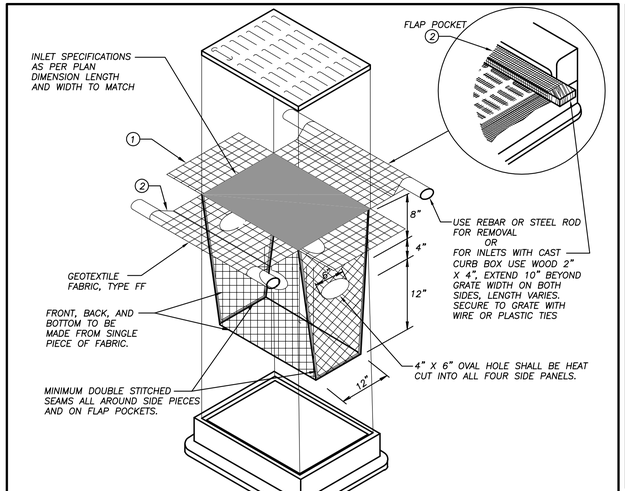
N.T.S.



SANITARY MANHOLE

N.T.S.

NOTES:
1. MANHOLE CONSTRUCTION TO MEET REQUIREMENTS OF ASTM C478.
2. JOINTS SHALL BE WATERTIGHT. USE BUTYL RUBBER GASKET.
3. USE MORTAR FOR PIPE CONNECTIONS EXCEPT THAT AN APPROVED FLEXIBILE WATERTIGHT PIPE TO MANHOLE SEAL IS REQUIRED FOR ALL FLEXIBLE SANITARY SEWER CONNECTIONS.
4. ALL MANHOLES SHALL HAVE RUBBER CHIMNEY BOOT SEALS.



GENERAL NOTES

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

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, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

② FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.

INSTALLATION NOTES

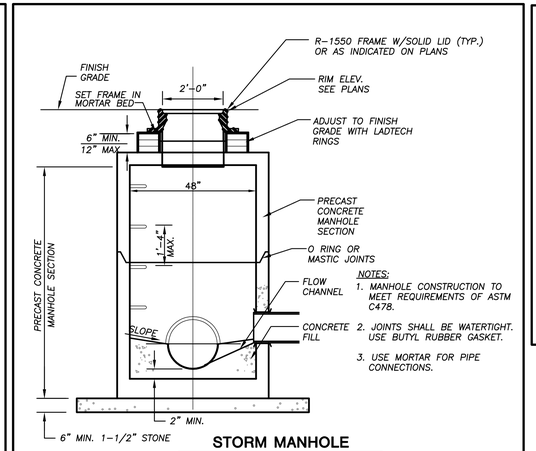
DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" 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 SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

INLET PROTECTION, TYPE D

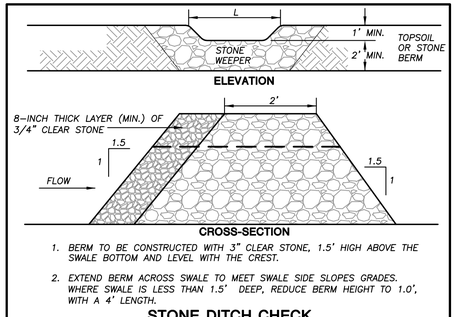
N.T.S.



NOTES:
1. MANHOLE CONSTRUCTION TO MEET REQUIREMENTS OF ASTM C478.
2. JOINTS SHALL BE WATERTIGHT. USE BUTYL RUBBER GASKET.
3. USE MORTAR FOR PIPE CONNECTIONS.

STORM MANHOLE

N.T.S.



1. BERM TO BE CONSTRUCTED WITH 3" CLEAR STONE, 1.5' HIGH ABOVE THE SWALE BOTTOM AND LEVEL WITH THE CREST.
2. EXTEND BERM ACROSS SWALE TO MEET SWALE SIDE SLOPES GRADES. WHERE SWALE IS LESS THAN 1.5' DEEP, REDUCE BERM HEIGHT TO 1.0', WITH A 4' LENGTH.

STONE DITCH CHECK

N.T.S.

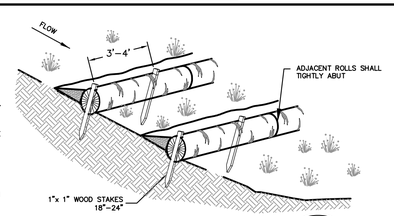
DETAIL A NOTES:

INSTALLATION:
WHEN INSTALLING RUNNING LENGTHS OF WATTLES, BUTT THE SECOND WATTLE TIGHTLY AGAINST THE FIRST, DO NOT OVERLAP THE ENDS. STAKE THE WATTLES AT EACH END AND FOUR FOOT ON CENTER. FOR EXAMPLE:

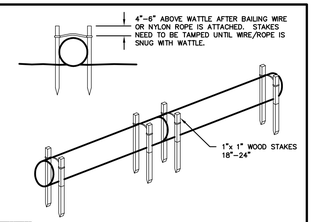
A 25 FOOT WATTLE USES 6 STAKES
A 20 FOOT WATTLE USES 5 STAKES
A 12 FOOT WATTLE USES 4 STAKES

STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE WATTLE. LEAVING 2 - - 3 INCHES OF THE STAKE PROTRUDING ABOVE THE WATTLE. A HEAVY SEDIMENT LOAD WILL TEND TO PICK THE WATTLE UP AND COULD PULL IT OFF THE STAKES IF THEY ARE DRIVEN DOWN TOO LOW. IT MAY BE NECESSARY TO MAKE A HOLE IN THE WATTLE WITH A PICK END OF YOUR MADDOX IN ORDER TO GET THE STAKE THROUGH THE STRAW. WHEN STRAW WATTLES ARE USED FOR FLAT GROUND APPLICATIONS, DRIVE THE STAKES STRAIGHT DOWN; WHEN INSTALLING WATTLES ON SLOPES, DRIVE THE STAKES PERPENDICULAR TO THE SLOPE.

DRIVE THE FIRST END STAKE OF THE SECOND WATTLE AT AN ANGLE TOWARD THE FIRST WATTLE IN ORDER TO HELP ABUT THEM TIGHTLY TOGETHER. IF YOU HAVE DIFFICULTY OF DRIVING THE STAKE INTO EXTREMELY HARD OR ROCKY SLOPES, A PILOT BAR MAY BE NEEDED TO BEGIN THE STAKE HOLE.



WATTLES - DETAIL A (W1)



GENERAL WATTLE INSTALLATION NOTES:

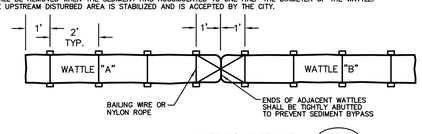
1. THE LOCATION AND LENGTH OF WATTLE IS DEPENDENT ON THE CONDITIONS OF EACH SITE.
2. WATTLES SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
3. WATTLES SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
4. NOT FOR USE IN CONCENTRATED FLOW AREAS.
5. THE WATTLES SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF TWO (2) INCHES.
6. WATTLES SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS.
7. ON SLOPES, WATTLES SHOULD BE INSTALLED ON CONTOUR WITH A SLIGHT DOWNWARD ANGLE AT THE END OF THE ROW IN ORDER TO PREVENT PONDING AT THE MID SECTION.

RUNNING LENGTHS OF WATTLES SHOULD BE ABUTTED FIRMLY TO ENSURE NO LEAKAGE AT THE ABUTMENTS.

8. SPACING FOR SLOPE INSTALLATIONS SHOULD BE:
   - 1:1 SLOPES = 15 FEET APART
   - 2:1 SLOPES = 30 FEET APART
   - 3:1 SLOPES = 45 FEET APART
   - 4:1 SLOPES = 60 FEET APART, ETC.
9. STAKING: USE WOOD STAKES TO SECURE THE WATTLES. 1/2" TO 5/8" REBAR IS ALSO ACCEPTABLE. BE SURE TO USE A STAKE THAT IS LONG ENOUGH TO PROTRUDE SEVERAL INCHES ABOVE THE WATTLE: 18" IS A GOOD LENGTH FOR HARD, ROCKY SOIL. FOR SOFT LOAMY SOIL USE A 24" STAKE.

WATTLE MAINTENANCE NOTES:

1. THE CONTRACTOR SHALL INSPECT WATTLES EVERY TWO WEEKS AND AFTER ANY SIGNIFICANT STORM EVENT AND MAKE REPAIRS OR REMOVE SEDIMENT ACCUMULATED BEHIND WATTLE AS NECESSARY.
2. SEDIMENT ACCUMULATED BEHIND WATTLE SHALL BE REMOVED WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF THE DIAMETER OF THE WATTLE.
3. WATTLES SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND IS ACCEPTED BY THE CITY.



WATTLES - DETAIL B (W2)

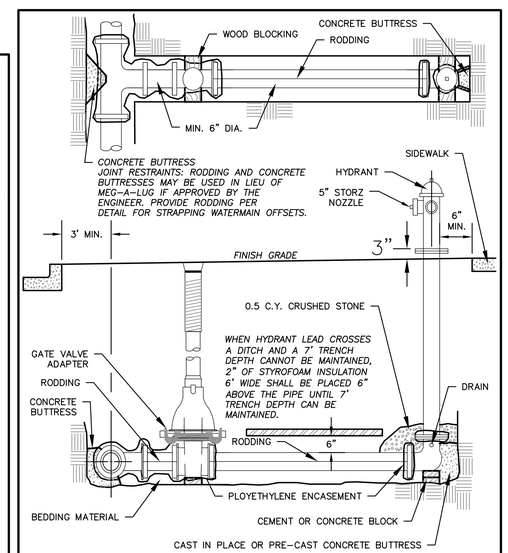
DETAIL B NOTES:

INSTALLATION:
STAKES SHOULD BE DRIVEN ACROSS FROM EACH OTHER AND ON EACH SIDE OF THE WATTLE. LEAVING 4"-6" OF STAKE PROTRUDING ABOVE THE WATTLE. BAILING WIRE OR NYLON ROPE SHOULD BE TIED TO THE STAKES ACROSS THE WATTLE. STAKES SHOULD THEN BE DRIVEN UNTIL THE BAILING WIRE OR NYLON ROPE IS SUFFICIENTLY SNUG TO THE WATTLE.

WHEN INSTALLING RUNNING LENGTHS OF WATTLES, TO PREVENT SHIFTING, BUTT THE SECOND WATTLE TIGHTLY AGAINST THE FIRST. DO NOT OVERLAP THE ENDS. STAKES SHOULD BE DRIVEN 1 FT. FROM END, ACROSS FROM AND ON EACH SIDE OF WATTLE LEAVING 4"-6" OF STAKE PROTRUDING ABOVE THE WATTLE. BAILING WIRE OR NYLON ROPE SHOULD BE TIED TO STAKES IN AN HOUR GLASS FORMATION (FRONT TO BACK OF WATTLE "A", ACROSS TO FRONT OF WATTLE "B", ACROSS TO BACK AND BACK TO FRONT OF WATTLE "A"). STAKES SHOULD THEN BE DRIVEN IN UNTIL BAILING WIRE OR NYLON ROPE IS SUFFICIENTLY SNUG TO THE WATTLE.

EROSION WATTLE

N.T.S.



TYPICAL HYDRANT AND VALVE

N.T.S.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

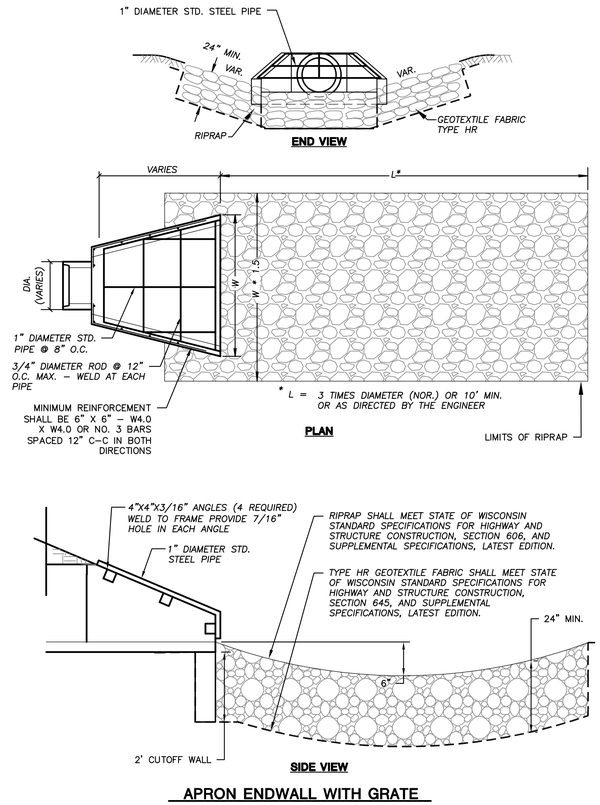
SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
C9.0

JSD PROJECT NO: 18-8515

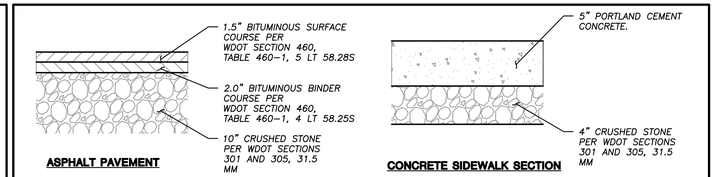
THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase 1 - Title & Details.dwg Layout: C9.0 DETAILS User: cgroenier Plotted: Feb 08, 2019 - 12:56pm Xref's:



APRON ENDWALL WITH GRATE

N.T.S.

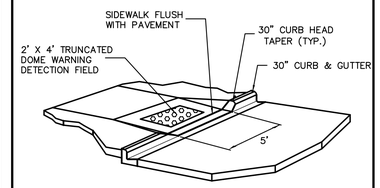


NOTES:

1. REFER TO GEOTECHNICAL REPORT BY XXXX FOR ADDITIONAL INFORMATION. IF THERE ARE ANY DISCREPANCIES BETWEEN THIS DETAIL AND GEOTECHNICAL REPORT, THE GEOTECHNICAL REPORT SHALL GOVERN.
2. WSDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, INCLUDING SUPPLEMENTAL SPECIFICATIONS, BUT EXCLUDING LIMITATIONS IN SECTION 460.3.2 RESTRICTING LAYER THICKNESS BY AGGREGATE SIZE.
3. COMPACTION REQUIREMENTS:
   – BITUMINOUS CONCRETE: REFER TO SECTION 460–3.
   – BASE COURSE: REFER TO SECTION 301.3.4.2, STANDARD COMPACTION
4. CONCRETE PADS SHALL HAVE A WIRE REINFORCEMENT MESH (W6X6, 2.9X2.9) FOR CRACK CONTROL.

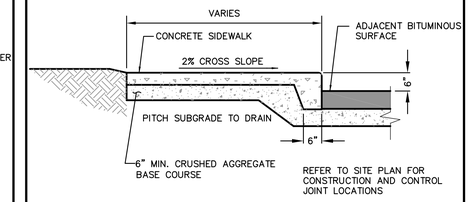
PAVEMENT SECTIONS

N.T.S.



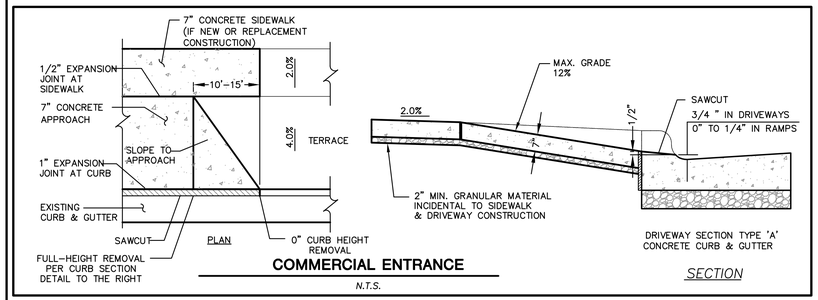
CONCRETE ADA RAMP

N.T.S.



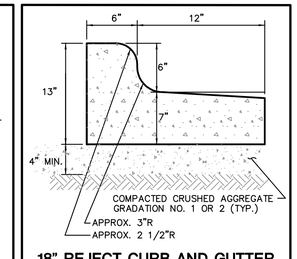
THICKENED EDGE SIDEWALK

N.T.S.



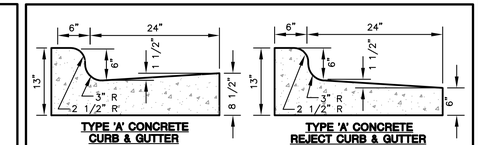
COMMERCIAL ENTRANCE

N.T.S.



18" REJECT CURB AND GUTTER

N.T.S.



GENERAL NOTES:

1. LATERAL CONTRACTION JOINTS SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 15' NOR LESS THAN 6' IN LENGTH. THE JOINTS SHALL BE A MINIMUM OF 3" IN DEPTH.

2. 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 A ONE PIECE ASPHALTIC MATERIAL HAVING THE SAME DIMENSIONS AS CURB & GUTTER AT THAT STATION AND BE 1/2" THICK.

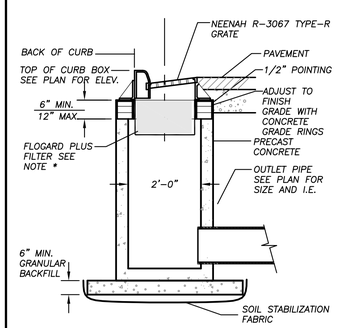
3. IN ALL CASES, CONCRETE CURB & GUTTER SHALL BE PLACED ON THOROUGHLY COMPACTED CRUSHED STONE.

30" CONCRETE CURB AND GUTTER

N.T.S.

ADA PARKING STALL SIGN

N.T.S.



* INSTALL FLOGARD PLUS CATCH BASIN FILTER INSERT AS MANUFACTURED BY KRISTAR ENTERPRISES, INC. OR EQUIVALENT. FILTER SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS, RECOMMENDATIONS AND SPECIFICATIONS DETAIL INFORMATION REGARDING MAINTENANCE AND FILTER REPLACEMENT CAN BE FOUND AT WWW.KRISTAR.COM OR BY CALLING KRISTAR INDUSTRIES AT (800) 579–8819.

CURB INLET

N.T.S.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:

FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

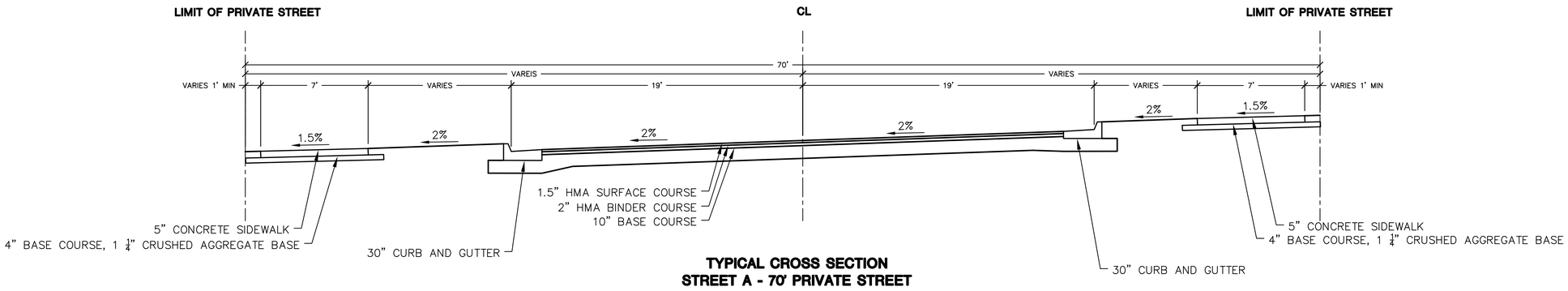
SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
C9.1

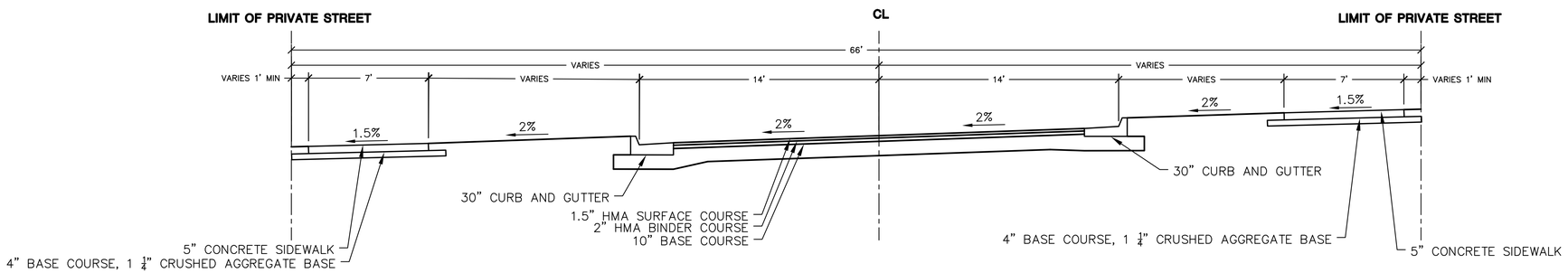
JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

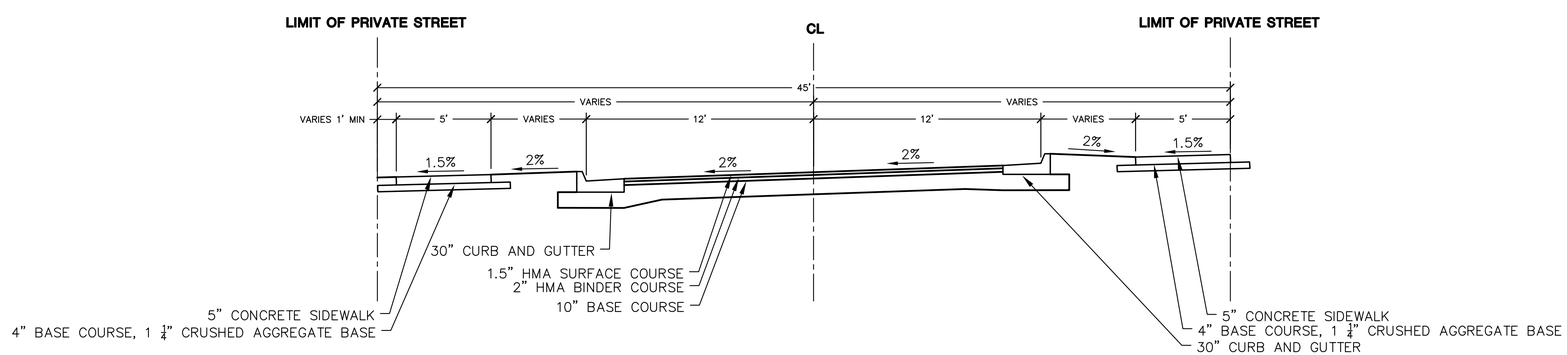
File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I – Title & Details.dwg Layout: C9.1 DETAILS User: cgroenier Plotted: Feb 08, 2019 – 12:55pm Xref's:



TYPICAL CROSS SECTION
STREET A - 70' PRIVATE STREET



TYPICAL CROSS SECTION
STREET A - 66' PRIVATE STREET



TYPICAL CROSS SECTION
STREET B & C - 45' PRIVATE STREET

NOTES:

1. BASE SHALL BE 6" OF 3" BREAKER RUN AGGREGATE WITH 4" OF 1¼" DENSE AGGREGATE BASE OVER IT.
2. HMA PAVEMENT SHALL BE PER WISDOT STANDARD SPECIFICATIONS SECTION 460 AS FOLLOWS;
   BINDER 4LT 58.28S
   SURFACE 5LT 58.28S
3. AGGREGATE SHALL BE PLACED ON A PREPARED SUBGRADE FOLLOWING PASSING PROOF ROLL.

JSD Professional Services, Inc.
Engineers • Surveyors • Planners

CREATE THE VISION TELL THE STORY

MADISON | MILWAUKEE
KENOSHA | APPLETON | WAUSAU

MADISON REGIONAL OFFICE
161 HORIZON DRIVE, SUITE 101
VERONA, WISCONSIN 53593
P. 608.848.5060

CLIENT:
FDG

CLIENT ADDRESS:
161 HORIZON DRIVE, SUITE 101A
VERONA, WI 53593

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT:
WINDSOR CROSSING VILLAGE CENTER PHASE I

PROJECT LOCATION:
VILLAGE OF WINDSOR
DANE COUNTY, WI

PLAN MODIFICATIONS:

#	Date:	Description:
1	08/13/2018	SIP PLAN SUBMITTAL
2	02/11/2019	SIP RESUBMITTAL
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Design/Drawn: CLH/CHG
Approved: WHD

SHEET TITLE:
TYPICAL SECTIONS

SHEET NUMBER:
C9.2

JSD PROJECT NO: 18-8515

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

File: I:\2018\188515\DWG\Phase 1 Plans\188515 Phase I - Title & Details.dwg Layout: C9.2 TYPICAL SECTIONS User: cgroenier Plotted: Feb 08, 2019 - 12:54pm Xrefs:

EXHIBIT B

STORM SEWER SIZING

Project Name: Windsor Crossing Village Center- Phase 1
Date: 02/11/19 DESIGN STORM 10
Title: Storm Sewer Sizing

Black - manually entered in the cell
Green - calculation performed
Blue - referenced from another source
Orange - Overide

STORM SEWER SIZING CALCULATIONS (SYSTEM A)

PIPE	Pipe Run From	Pipe Run To	Length (ft.)	Pipe Diameter (inches)	Slope (%)	Pipe Material	Mannings (n)	Pipe Area (sq. ft.)	Hydraulic Radius (ft.)	DA	Drainage Areas Imp. (acres)	Drainage Areas Perv. (acres)	Drainage Areas Total (acres)	Runoff Coef. C	Upstream End (Y/N)	Area x C Increment	Area x C Total	Time of Conc. To Structure (min.)	Time of Conc. Pipe (min.)	Rainfall Intensity (in/hr)	Design Storm Event	Total Runoff (cfs)	Design Capacity (cfs)	Percent Full (%)
STO A Trunk																								
STO A-6	STO INL A-6	STO INL A-5	60.62	12	2.50	RCP	0.012	0.79	0.25	INL 6	0.345	0.061	0.405	0.59	Y	0.24	0.24	6.0	0.13	6.60	10	1.59	6.12	25.9%
STO A-5	STO INL A-5	STO INL A-4	121.08	12	2.50	RCP	0.012	0.79	0.25	LAT INL 5	0.328	0.058	0.386	0.59	N	0.23	0.47	6.1	0.26	6.60	10	3.10	6.12	50.6%
STO A-4	STO INL A-4	STO INL A-3	85.43	15	2.50	RCP	0.012	1.23	0.31	LAT INL 4	0.727	0.128	0.856	0.59	N	0.51	0.98	6.4	0.16	6.60	10	6.44	11.09	58.1%
STO A-3	STO INL A-3	STO FES A	23.27	15	2.50	RCP	0.012	1.23	0.31	LAT INL 3	0.437	0.077	0.514	0.59	N	0.30	1.28	6.5	0.04	6.16	10	7.89	11.09	71.1%
LAT STO A-5.1																								
STO A-5.1	STO INL A-5.1	STO INL A-5	57.00	12	2.00	RCP	0.012	0.79	0.25	INL 5.1	0.245	0.043	0.289	0.59	Y	0.17	0.17	6.0	0.14	6.60	10	1.13	5.47	20.6%
LAT STO A-4.1																								
STO A-4.1	STO INL A-4.1	STO INL A-4	79.56	12	2.50	RCP	0.012	0.79	0.25	INL 4.1	0.607	0.107	0.714	0.59	Y	0.42	0.42	6.0	0.17	6.60	10	2.79	6.12	45.6%
LAT STO A-3.1																								
STO A-3.1	STO INL A-3.1	STO INL A-3	46.52	12	2.50	RCP	0.012	0.79	0.25	INL 3.1	0.375	0.066	0.442	0.59	Y	0.26	0.26	6.0	0.10	6.60	10	1.73	6.12	28.2%

POST-DEVELOPMENT DRAINAGE AREA CALCULATIONS													
Area No.	Total Area (sf)	Total Area (ac)	Total Perv (ac)(15%)	Total Imp (ac)(85%)	Runoff Coeff.	CA	Tc (min)	I2 (in/hr)	Q2 (cfs)	I10 (in/hr)	Q10 (cfs)	I100 (in/hr)	Q100 (cfs)
STO A TRUNK LINE													
INL 6	17660	0.41	0.06	0.34	0.59	0.24	6	0.00	0.00	6.60	1.59	9.99	2.40
INL 5	4265	0.10	0.01	0.08	0.59	0.06	6	0.00	0.00	6.60	0.38	9.99	0.58
INL 5.1	12569	0.29	0.04	0.25	0.59	0.17	6	0.00	0.00	6.60	1.13	9.99	1.71
LAT INL 5	16834	0.39	0.06	0.33	0.59	0.23	6	0.00	0.00	6.60	1.51	9.99	2.29
INL 4	6184	0.14	0.02	0.12	0.59	0.08	6	0.00	0.00	6.60	0.56	9.99	0.84
INL 4.1	31082	0.71	0.11	0.61	0.59	0.42	6	0.00	0.00	6.60	2.79	9.99	4.22
LAT INL 4	37266	0.86	0.13	0.73	0.59	0.51	6	0.00	0.00	6.60	3.35	9.99	5.06
INL 3	3176	0.07	0.01	0.06	0.59	0.04	6	0.00	0.00	6.60	0.29	9.99	0.43
INL 3.1	19234	0.44	0.07	0.38	0.59	0.26	6	0.00	0.00	6.60	1.73	9.99	2.61
LAT INL 3	22410	0.51	0.08	0.44	0.59	0.30	6	0.00	0.00	6.60	2.01	9.99	3.05

Black - manually entered in the cell
Green - calculation performed
Blue - referenced from another source

NOAA Atlas 14 Dane County Intensities (from IDF Curve)

Tc (min)	10	100
6	6.60	9.99
7	6.16	9.31
8	5.80	8.76
9	5.50	8.31
10	5.25	7.92
11	5.00	7.54
12	4.79	7.22
13	4.60	6.93
14	4.43	6.67
15	4.28	6.44
16	4.14	6.23
17	4.01	6.04
18	3.90	5.87
19	3.79	5.71
20	3.69	5.56
21	3.60	5.42
22	3.52	5.30
23	3.44	5.18
24	3.36	5.07
24	3.36	5.07
25	3.29	4.96
26	3.23	4.86
27	3.17	4.77
28	3.11	4.68
29	3.05	4.60
30	3.00	4.52
31	2.94	4.44
32	2.88	4.36
33	2.83	4.28
34	2.78	4.21
35	2.73	4.14
36	2.69	4.08

EXHIBIT C

STORMWATER MAINTENANCE AGREEMENT

AGREEMENT FOR MAINTENANCE OF STORMWATER MANAGEMENT MEASURES

This space is reserved for recording data

Return to:
Dane County Land & Water Resources
5201 Fen Oak Dr., Rm. 208
Madison, Wisconsin 53718

Parcel Number(s):

RECITALS:

A. Windsor Crossing LLC, is*(are)* the owner*(s)* of property in the Village of Windsor, County of Dane, State of Wisconsin, more particularly described on Exhibit A attached hereto ("Property").

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

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

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

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

3. Term/Termination. The term of this Agreement shall commence on the date that this Agreement is recorded with the Register of Deeds Office for 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 County and all of the then-owners of the Property.

4. Miscellaneous.

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

   If to Owner: Forward Development Group, LLC
   161 Horizon Drive, 101A
   Verona, WI 53593

If to County: Dane County Land & Water Resources Department
Water Resource Engineering Division
5201 Fen Oak Drive, Room 208
Madison, WI 53718

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

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

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

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

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

X_____
Water Resource Engineering Division Staff Signature

_____
Print or type name

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

_____
Notary Public

Print or type name: _____

My Commission Expires:_____

X_____
Owner Signature

_____
Print or type name

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

_____
Notary Public

Print or type name: _____

My Commission Expires:_____

DRAFTED BY: Matt Saunders E.I.T.
Corey Huhta P.E, C.F.M.
JSD Professional Services
161 Horizon Drive, Suite 101
Verona, WI 53593

EXHIBIT A

LEGAL DESCRIPTION

Outlot 2, Certified Survey Map No. 14307, Located in the Northeast Quarter of The Southeast Quarter of Section 29, Township 09 North, Range 10 East, Village of Windsor, Dane County, Wisconsin

EXHIBIT B

INSPECTION, MAINTENANCE, & PROHIBITIONS

All components of the stormwater system shall be inspected at least quarterly. Repairs will be made whenever the performance of a stormwater control device is compromised as described below. Owner shall maintain records of all inspection and maintenance activities.

Oil and Grease Filters

The Owner shall install and maintain a FloGard + Plus Catch Basin Insert as distributed by OldCastle Precast with Imbiber Beads or approved equivalent. Said insert shall include a means of indicating the remaining capacity of the filter. Said insert is installed for mitigation and control of sediment and/or oil and grease in the stormwater runoff. Installation and maintenance shall be in accordance with the manufacturer's guidelines, attached, which, at minimum shall be four (4) inspections per year and one (1) filter replacement per year or as necessary based on the color change of the Imbiber Beads. More specifically, debris shall be removed and filter medium is to be replaced any time the filter medium appears to be 50% coated with oil or grease. The Imbiber Beads shall be replaced when the color has changed as defined by the manufacturer. Owner shall maintain records of inspections, cleaning and replacement of the device or components of the device all in accordance with Chapter 50 of the Village of Windsor Code of Ordinances.

Detailed information regarding maintenance and filter replacement can be found on the Internet at www.oldcastleprecast.com or by calling OldCastle Precast (888) 965-3227.

Storm Sewer System

The owner shall maintain all components of the storm sewer system located onsite. Installation and maintenance shall be in accordance with the manufacturer's guidelines. At a minimum the storm sewer system shall be inspected annually and cleaned as needed to maintain design capacity. Any alterations to approved storm sewer system shall be approved by Village Engineer. Owner shall maintain records of inspections, cleaning and replacement of the storm sewer system all in accordance with Chapter 50 of the Village of Windsor Code of Ordinances.

EXHIBIT D

STORMWATER AND EROSION CONTROL COST ESTIMATE

Preliminary Opinion of Probable Construction Costs

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

Project *Windosor Crossing Village Center - Phase I*
Location *Windsor, Wisconsin*

JSD Project No. *18-8515*
Date: *2/11/2019*
Prepared For: *Forward Development Group*

No.	Item	Quantity	Unit	Unit Cost	Amount
Storm Sewer And Erosion Control Improvements					
Erosion Control					
1	Silt Fence	339	LF	$ 2.00	$ 678.00
2	Stone Tracking Pad	1	EA	$ 750.00	$ 750.00
3	Stone Ditch Check	9	EA	$ 65.00	$ 585.00
4	Rip-Rap w/ Geotextile Fabric	54	SY	$ 15.00	$ 810.00
5	Inlet Protection	5	EA	$ 100.00	$ 500.00
6	Class II, Type B Erosion Matting	2,095	SY	$ 3.00	$ 6,285.00
				Subtotal =	**$ 9,608.00**
Earthwork					
7	Seed/Mulch	1.00	AC	$ 1,200.00	**$ 1,200.00**
				Subtotal =	**$ 1,200.00**
Underground Utilities					
Storm Sewer 8	Storm Sewer - 15" RCP Pipe	109	LF	$ 50.00	$ 5,450.00
9	Storm Sewer - 12" RCP Pipe	317	LF	$ 30.00	$ 9,510.00
10	Storm Sewer - 15" RCP Apron Endwall w/ Gate	1	EA	$ 800.00	$ 800.00
11	2'x3' Storm Inlet	4	EA	$ 1,500.00	$ 6,000.00
12	Oil and Grease Filter	4	EA	$ 500.00	$ 2,000.00
				Subtotal =	**$ 23,760.00**
				Estimated Costs =	$ 34,568.00
				110% Estimated Costs=	**$ 38,024.80**

Note: All unit costs reflect delivered and installed.
(1) Granular trench backfill and compaction considered incidental to utility construction.

EXHIBIT E

UNIVERSAL SOIL LOSS RATE INFORMATION

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Version 2.0 (06-29-2017)

YEAR 1

Developer:

Project: Windsor Crossing Village Center Phase 1

Date: 08/10/18

County: Dane

Version 1.0

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Bare Ground	04/01/19	06/06/19	18.9%	150	Silt Loam	0.43	3.8%	240	0.53	1.00	6.4	1.053	Silt Fence	4.1
Seed with Mulch or Er	06/06/19	08/06/19	43.4%	150	Silt Loam	0.43	3.8%	240	0.53	0.10	1.5	1.053	Silt Fence	0.9
End	08/06/19	-----	-----	-----	-------	-----			-----	------	-----	0.000	Silt Fence	0.0
		-----	-----	-----	-------	-----			-----	-----	-----	0.000	Silt Fence	0.0
		-----	-----	-----	-------	-----			-----	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----			-----	-----	-----	0.000		0.0
										TOTAL	**7.9**		**TOTAL**	**5.0**
													% Reduction Required	**0%**

Notes:

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

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

Recommended Permanent Seeding Dates:

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

Designed By:	MSS
Date	8/10/2018

EXHIBIT F

2015 WINDSOR CROSSING STORMWATER MANAGEMENT REPORT

WINDSOR CROSSING
WINDSOR ROAD & HWY 51
TOWN OF WINDSOR, WISCONSIN

STORM WATER MANAGEMENT & EROSION CONTROL REPORT

PREPARED FOR

Town of Windsor
4084 Mueller Road
Deforest, WI 53532

January 22, 2015
Revised: March 18, 2015

PREPARED BY
D'Onofrio, Kottke & Associates, Inc.
7530 Westward Way
Madison, Wisconsin 53717

FN: 14-01-100

TABLE OF CONTENTS

Introduction ..... Page 3
Standards & Results ..... Page 4
Erosion Control Measures ..... Page 5
Storm Water Management Measures ..... Page 6
Conclusions ..... Page 7

EXHIBITS

1. Site Location Map
2. Site Soils Map
3. Drainage Plan
4. Aerial Photo
5. USGS Map
6. Grading and Erosion Control Plan
7. Detention/Infiltration Basin Details

APPENDICES

A. Pond Sediment Settling Efficiency Calculations
B. Infiltration Calculations
C. Existing Hydrocad Output
D. Proposed Hydrocad Output
E. Soils Information

INTRODUCTION

The intent of this report is to provide details on how the proposed Windsor Crossing plat will be developed so that it is constructed in accordance with applicable stormwater and erosion control standards.

The proposed development is an approximately 85.6 acre plat located in the Town of Windsor, Dane County, Wisconsin. The site is located on the west side of US Hwy 51 and just south of Windsor road in the SE ¼ of Section 29, Township 09N, Range 10E. The site is also bordered by undeveloped lands to the south and Wolf Hollow residential development to west. A project location map can be found in Exhibit #1.

The existing layout of the site consists mostly of undeveloped agricultural lands along with tree covered areas. There are also two channels on the site that meet and combine into one flowing from east to the west across the site. Surrounding some of the channel areas there is also area that has been defined as wetland. The majority of the surface water from this site drains to the channel area and offsite to the west. Along with site runoff, some offsite water from the east also utilizes the existing channel. This water is routed to the site through culverts under Hwy 51 and ultimately off of the site to the west. In proposed conditions the site was broken up into four drainage areas. This was done to treat stormwater on the site for peak flow, sediment, and infiltration requirements prior to leaving the site. This proposed design includes of four wet detention basins and three infiltration basins. The soil conditions on site consist of hydrologic soil group type B soils. A site soils map can be found in Exhibit #2.

The proposed site improvements for this project will require land disturbing activity in excess of one acre and the future cumulative addition of 20,000 square feet of impervious surface area. Therefore according to the Town of Windsor, Dane County, Capital Area Regional Planning Commission and the State of Wisconsin ordinances, the site requires erosion control & stormwater management approval and permits.

STANDARDS & RESULTS

The proposed development requires the following erosion control and storm water management performance standards.

Sediment Control

Standard: For new construction, design practices to retain soil particles greater than (5) microns on the site (eighty percent (80%) reduction) resulting from a one year, 24-hr storm event prior to infiltration basins and capture 80% of TSS for storms up to and including the 5 year event prior to leaving the site

Design Results: Stokes law was used for modeling the sediment load reduction for this site. Sediment from this site will be reduced by routing the stormwater runoff into proposed wet detention basins prior to entering the infiltration basin. The wet detention basins were designed to settle out the 5 micron particle for the 1-yr, 24-hour storm event, reducing sediment by 80% prior to entering the infiltration basins. The detention basin and infiltration basins were designed to work as two chamber combined systems after filtering out the sediment from the 1 yr. storm event. These basins are designed to reduce the sediment by 80% for the 5-yr, 24-hour storm event prior to leaving the site See Appendix A for Pond Settling Efficiency Calculations

Runoff Rate Control

Standard: For new development sites, storm water management practices shall be designed and implemented to maintain post-development peak runoff discharge rates at predevelopment rates for all storm events up to and including the 100 yr. – 24hr event.

Design Results: According to the USDA site soil survey of Dane County the site soil conditions consist of type B soils. The site soil map can be viewed in Exhibit #2. The existing and proposed runoff curve numbers used for this development are as follows:

Description	CN
Predeveloped Fields	68
Predeveloped Woods	55
(38% Impervious)	83
(65% Impervious)	90
(85% Impervious)	94
Developed Vegetated	75
Impervious	98

The proposed detention basin system will maintain the existing peak runoff rates through the 100yr–24hr storm events. The peak flow comparison chart for the site can be found in the stormwater management measures section of this report and the HydroCAD output can be found within Appendix C.

Infiltration

Standards: For new developments, design practices to infiltrate sufficient runoff volume so the post-development infiltration volume shall be at least 90% of the predevelopment infiltration volume. Also fully mitigate the groundwater quantity impacts of the development. This includes anticipated domestic usage within the development.

Design Results: The proposed developed site was designed to meet infiltration requirements by routing stormwater from the site into three infiltration basins designed to mitigate the groundwater quantity impacts from the development prior to leaving the site. 80% Sediment reduction for 1yr-24hr storm event will occur in the proposed wet detention basins prior to entering the designed infiltration basins. The infiltration basins were designed utilizing RECARGA and the design calculations can be found in the appendix

EROSION CONTROL MEASURES

The initial land disturbing activity will be to install erosion control measures including silt fence, check dams, inlet protection and a stone construction entrance. All sedimentation and erosion control items will be maintained for maximum effectiveness. The stone construction entrance will have its stone replaced when the existing stone is no longer effective. Sediment trapped by the silt fence, check dams and inlet protection will be removed when it reaches a depth of approximately one-half foot. In the event mud is tracked off site, the public streets will be cleaned at the of each working day

All areas disturbed during construction, except for impervious, will be restored with a minimum of six inches of topsoil, fertilizer, seed, and mulch within seven days of final grading. The sites plantings and seed shall be per the landscape plan or mixture 40 if not noted, in accordance with Section 630 of Wisconsin Department of Transportation Specification. Seed mixture #40 shall be applied at the rate of five pounds per one-thousand square feet. Annual Ryegrass shall be added to the grass seed mixtures at a rate of 1 1/2lbs per 1000 sqft. Fertilizer shall be at a rate recommended by a soil test. The infiltration areas shall be planted with native species tolerant of fluctuating water conditions.

At the completion of construction and after final restoration has been established the erosion control practices shall be removed.

STORM WATER MANAGEMENT MEASURES

The proposed plat was broken up into four drainage areas that will be routed to the detention and infiltration basin treatment systems. These basins were designed to meet peak flow, sediment and infiltration requirements for the site. The stormwater facilities within this project will be public and maintained by the Town of Windsor.

Stokes Law was used to perform the sediment control calculations for the proposed basins. Appendix A contains the calculation results. The stormwater management system will provide 80% sediment removal for the 5yr – 24hr storm event prior to leaving the site.

HydoCAD Stormwater Modeling System software has been used to analyze stormwater runoff characteristics for the development. HydroCad uses the TR-55 methodology for determining peak discharge rates. A model was created showing the runoff from the project in existing, proposed conditions. The four drainage areas were designed to utilize combination wet detention basin and infiltration basin system prior to entering the existing channel and leaving the site in proposed conditions. The wet detention chamber will limit flow into the infiltration basin chamber for the 1yr-24hr storm event to remove sediment before entering the infiltration basin. During larger storms the separation berm between the two chambers will be overtopped and the two chambers will act as one detention basin to limit peak flow from the site. The detention basin was modeled dynamically to better represent the elevations of the two chambers working together. See below for the proposed peak flow comparison chart.

The infiltration basins were designed to meet the County and State requirement of 90% of the predevelopment infiltration volume in developed conditions. The infiltration basins were also designed to fully mitigate the groundwater quantity impacts of the development. This includes anticipated domestic usage within the development.

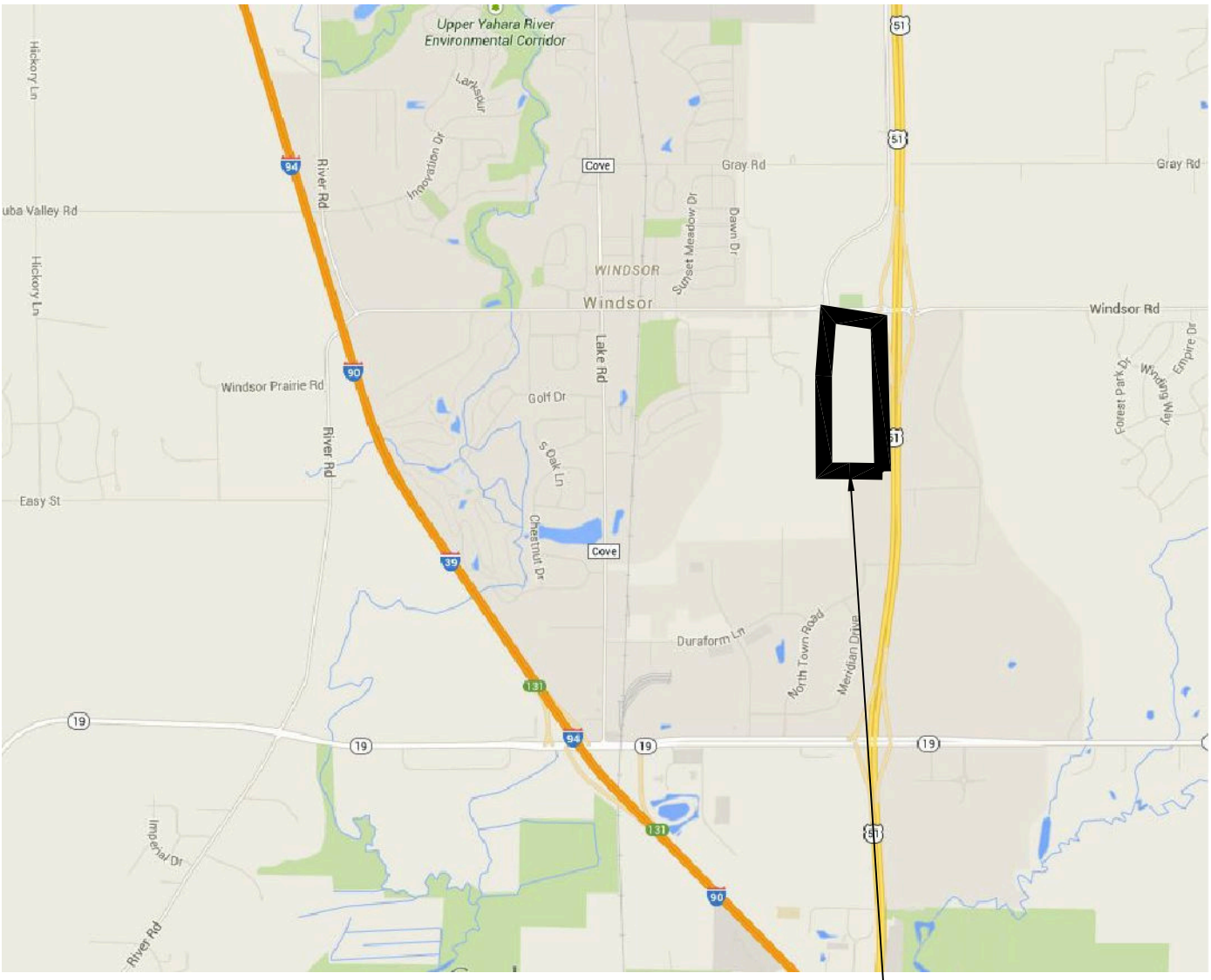
PEAK FLOW COMPARISION CHART

WINDSOR CROSSING - 24-HR STORM EVENT (PEAK FLOW IN CFS)-PEAK FLOW COMPARISION CHART					
	1YR	2YR	5yr	10YR	100YR
EXISTING TOTAL FLOW OFFSITE	36.68	66.78	140.57	219.85	479.37
NORTHEAST DETENTION BASIN	5.49	6.65	8.47	9.89	19.02
NORTHWEST DETENTION BASIN	1.69	1.91	3.00	4.23	33.20
NORTH INFILTRATION BASIN	0.00	0.00	0.00	0.00	2.16
SOUTHEAST DETENTION BASIN	1.77	2.16	3.90	13.85	77.25
SOUTHEAST INFILTRATION BASIN	0.00	0.00	0.48	1.91	13.90
SOUTHWEST DETENTION BASIN	1.56	2.19	5.31	22.39	115.46
SOUTHWEST INFILTRATION BASIN	0.00	0.23	1.59	2.53	18.52
PROPOSED TOTAL FLOW OFFISTE	18.43	35.19	78.08	118.39	307.40

CONCLUSIONS

As the results indicate the storm water system and erosion control for the proposed development meets the Town of Windsor, Capital Area Regional Planning Commission, Dane County and State of Wisconsin requirements and ordinances.

EXHIBITS



PROJECT LOCATION

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

LOCATION MAP

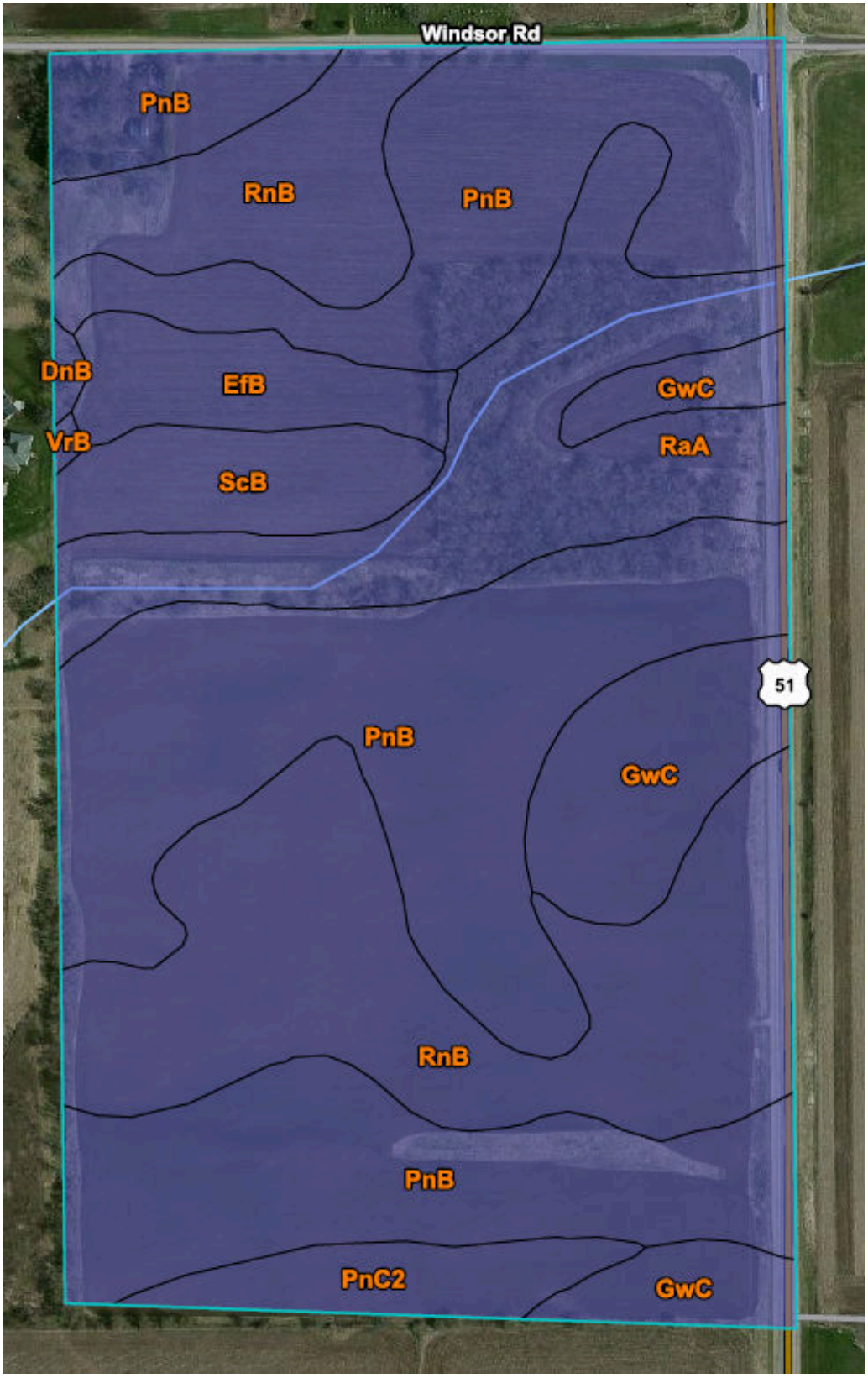
WINDSOR CROSSING

TOWN OF WINDSOR, WISCONSIN

DRAWN BY: GVP

EXHIBIT 1

File: U:\User\1401100\SWMP\1401100 SWMP.dwg location Plotted: Jan 22, 2015 - 4:53pm



D'ONOFRIO KOTTKE AND ASSOCIATES, INC.

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

SOILS MAP

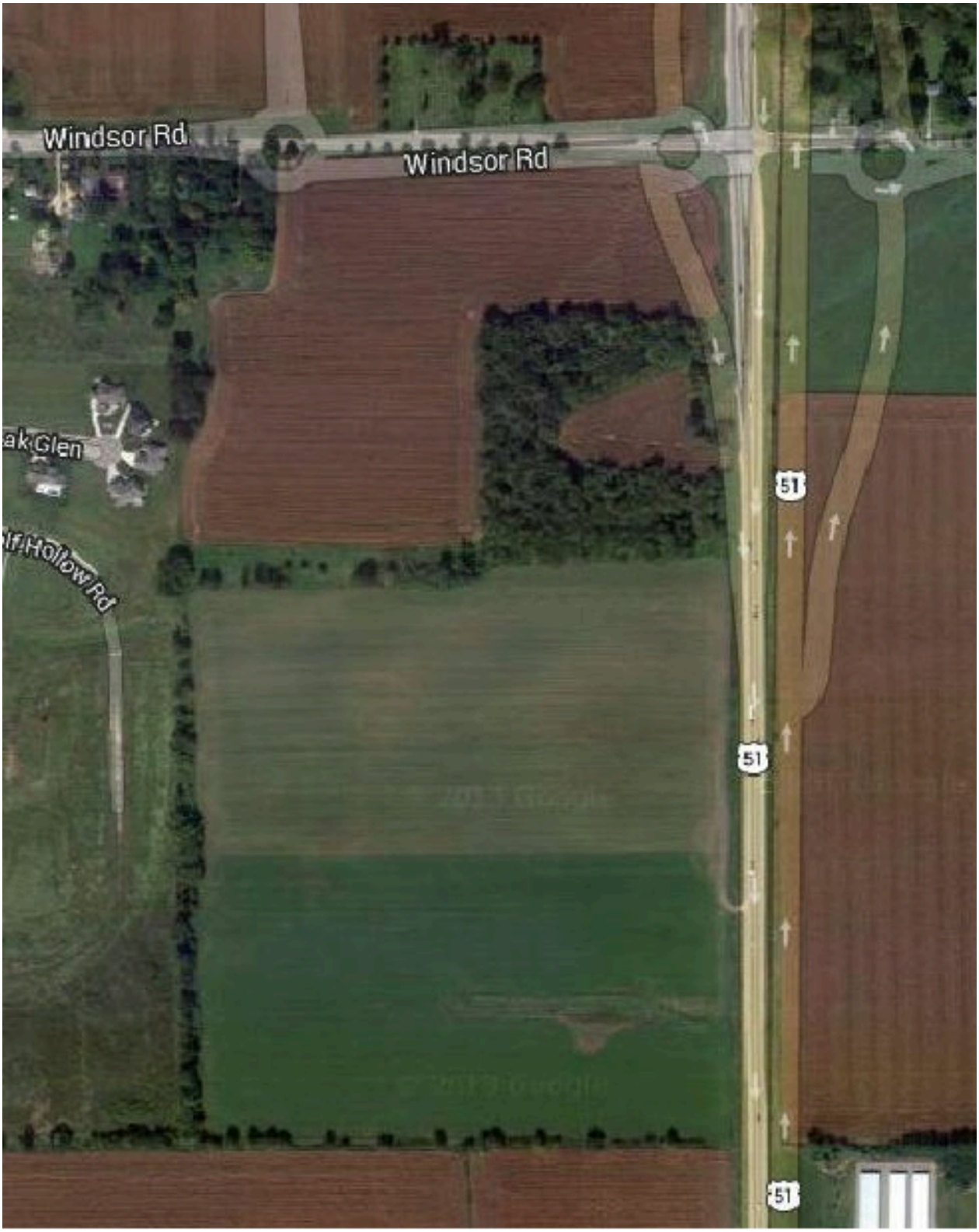
WINDSOR CROSSING

TOWN OF WINDSOR, WISCONSIN

DRAWN BY: GVP

EXHIBIT 2

File: U:\User\1401100\SWMP\1401100 SWMP.dwg soils map Plotted: Jan 22, 2015 - 4:53pm



D'ONOFRIO KOTTKE AND ASSOCIATES, INC.

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

AERIAL PHOTO

WINDSOR CROSSING

TOWN OF WINDSOR, WISCONSIN

DRAWN BY: GVP

EXHIBIT 4

File: U:\User\1401100\SWMP\1401100 SWMP.dwg aerial Plotted: Jan 22, 2015 - 4:54pm

PROPOSED NORTHEAST DETENTION BASIN

TOP OF POND BERM - 920.00, AREA = 41,540 SQFT
TOP OF WET POND/OUTLET - 915.00, AREA = 20,208 SQFT
BOTTOM OF WET POND - 909.00

OUTLET STRUCTURES:
48" CULVERT ROUTED TO SOUTHEAST DETENTION BASIN @ 915.00
60' OVERFLOW WEIR ROUTED TO CHANNEL @ 919.50

PROTECT EXISTING WETLAND

PROPOSED SOUTHEAST INFILTRATION BASIN

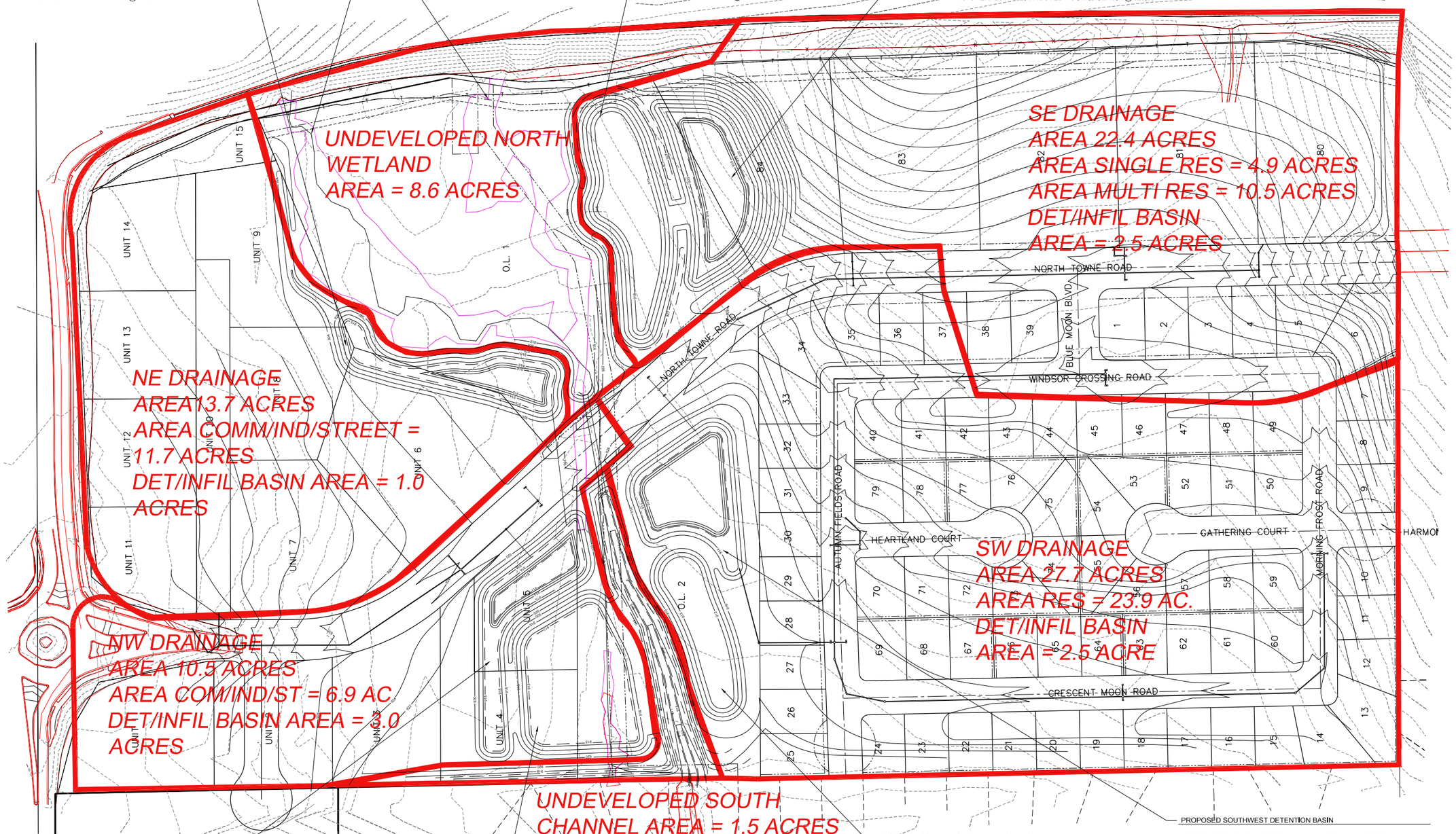
28,500 SQFT @ 918.00
66,652 SQFT (TOP OF BERM) 927.00

OUTLET STRUCTURES:
24" CULVERT @ 920.00
100' OVERFLOW WEIR @ 926.00

PROPOSED SOUTHEAST DETENTION BASIN

TOP OF POND BERM - 927.00, AREA = 56,982 SQFT
TOP OF WET POND/OUTLET - 920.00, AREA = 31,247 SQFT
BOTTOM OF WET POND - 914.00

OUTLET STRUCTURES:
8" CULVERT ROUTED TO INFILTRATION BASIN @ 920.00
8" CULVERT ROUTED TO INFILTRATION BASIN @922.60
40' OVERFLOW WEIR ROUTED TO INFILT. BASIN @ 923.80



PROPOSED NORTHWEST DETENTION BASIN

TOP OF POND BERM - 920.00, AREA = 47,665 SQFT
TOP OF WET POND/OUTLET - 915.00, AREA = 24,548 SQFT
BOTTOM OF WET POND - 909.00

OUTLET STRUCTURES:
8" CULVERT ROUTED TO INFILTRATION BASIN @ 915.00
10" CULVERT ROUTED TO INFILTRATION BASIN @ 917.50
30' OVERFLOW WEIR ROUTED TO INFILT. BASIN @ 918.50

PROPOSED SOUTHWEST INFILTRATION BASIN

45,000 SQFT @ 913.00
70,600 SQFT (TOP OF BERM) 920.00

OUTLET STRUCTURES:
24" CULVERT @ 915.00
200' OVERFLOW WEIR @ 917.00

PROPOSED SOUTHWEST INFILTRATION BASIN

18,000 SQFT @ 912.00
36,500 SQFT (TOP OF BERM) 918.00

OUTLET STRUCTURES:
24" CULVERT @ 914.00
50' OVERFLOW WEIR @ 917.00

PROPOSED SOUTHWEST DETENTION BASIN

TOP OF POND BERM - 918.00, AREA = 47,384 SQFT
TOP OF WET POND/OUTLET - 914.00, AREA = 33,570 SQFT
BOTTOM OF WET POND - 908.00

OUTLET STRUCTURES:
8" CULVERT ROUTED TO INFILTRATION BASIN @ 914.00
8" CULVERT ROUTED TO INFILTRATION BASIN @ 916.00
80' OVERFLOW WEIR ROUTED TO INFILT. BASIN @ 917.00

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

STORMWATER DRAINAGE PLAN

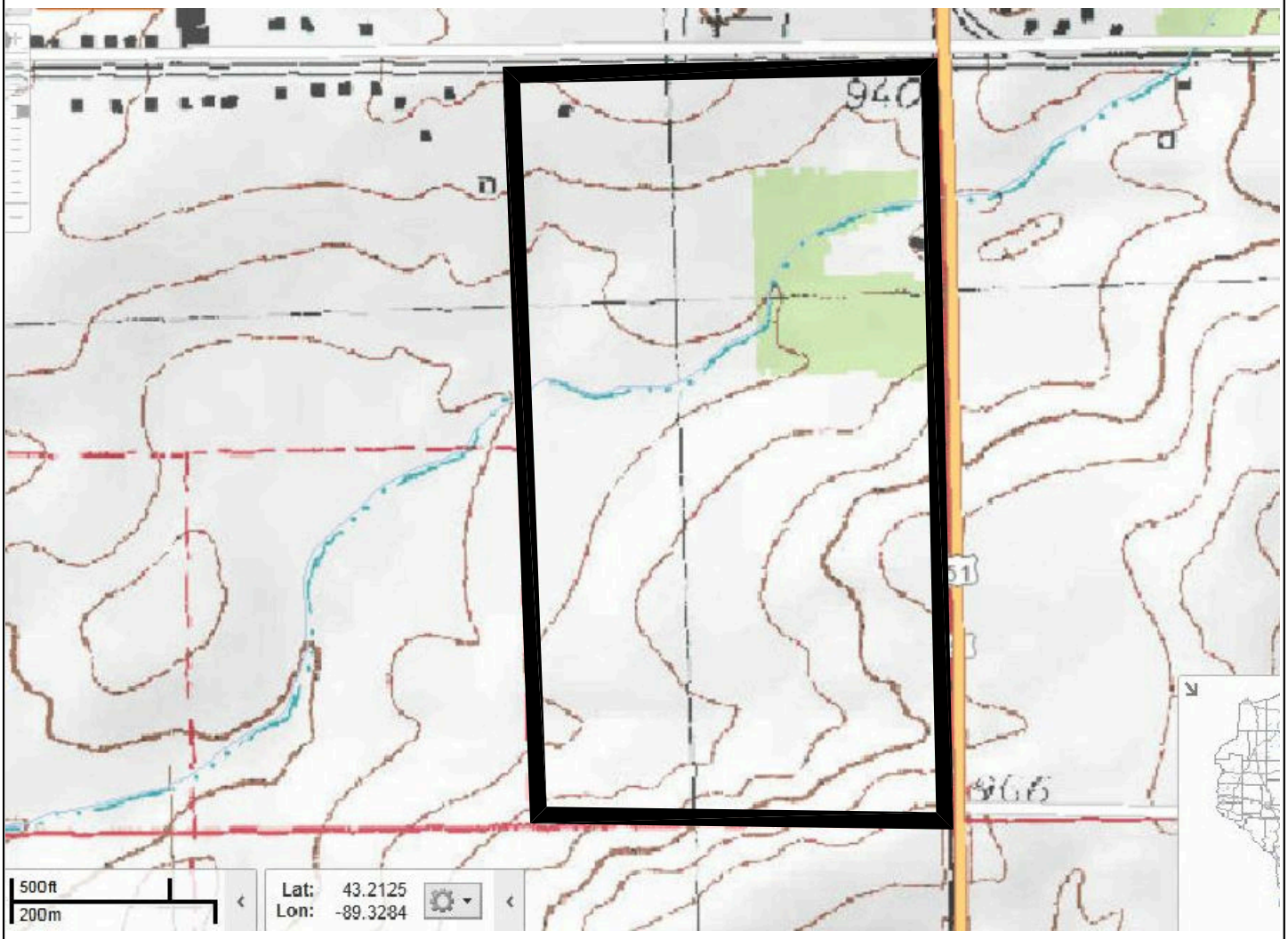
WINDSOR CROSSING

TOWN OF WINDSOR, DANE COUNTY, WISCONSIN

NOT FOR CONSTRUCTION

DATE: 01-22-15
REVISED:

DRAWN BY: GVP
FN: 14-01-100
Sheet Number:
EXHIBIT 3



D'ONOFRIO KOTTKE AND ASSOCIATES, INC.

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

USGS MAP

WINDSOR CROSSING

TOWN OF WINDSOR, WISCONSIN

DRAWN BY: GVP

EXHIBIT 5

File: U:\User\1401100\SWMP\1401100 SWMP.dwg USGS Plotted: Jan 22, 2015 - 4:54pm

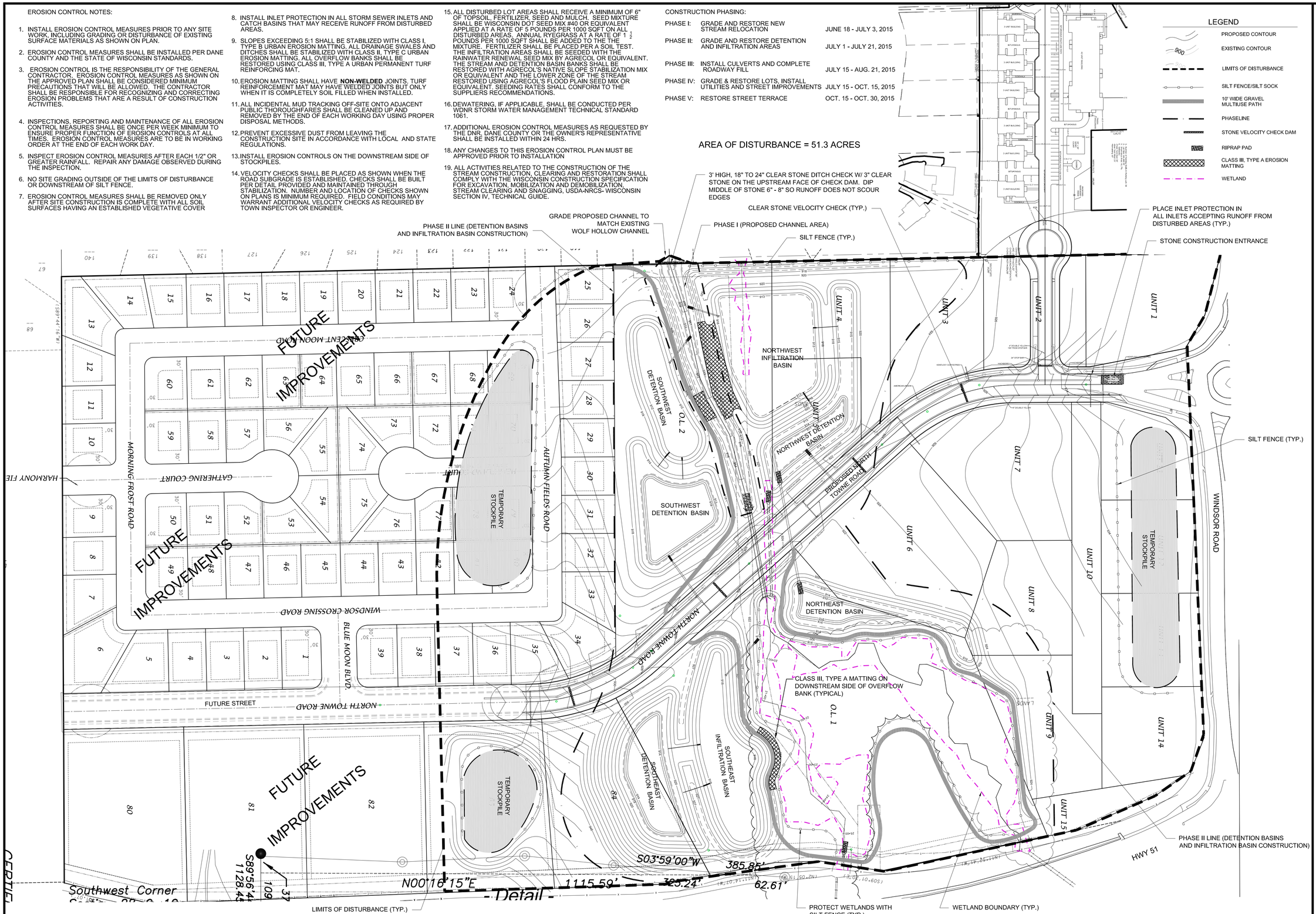
EROSION CONTROL NOTES:

1. INSTALL EROSION CONTROL MEASURES PRIOR TO ANY SITE WORK, INCLUDING GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIALS AS SHOWN ON PLAN.
2. EROSION CONTROL MEASURES SHALL BE INSTALLED PER DANE COUNTY AND THE STATE OF WISCONSIN STANDARDS.
3. EROSION CONTROL IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. EROSION CONTROL MEASURES AS SHOWN ON THE APPROVED PLAN SHALL BE CONSIDERED MINIMUM PRECAUTIONS THAT WILL BE ALLOWED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECOGNIZING AND CORRECTING EROSION PROBLEMS THAT ARE A RESULT OF CONSTRUCTION ACTIVITIES.
4. INSPECTIONS, REPORTING AND MAINTENANCE OF ALL EROSION CONTROL MEASURES SHALL BE ONCE PER WEEK MINIMUM TO ENSURE PROPER FUNCTION OF EROSION CONTROLS AT ALL TIMES. EROSION CONTROL MEASURES ARE TO BE IN WORKING ORDER AT THE END OF EACH WORK DAY.
5. INSPECT EROSION CONTROL MEASURES AFTER EACH 1/2" OR GREATER RAINFALL. REPAIR ANY DAMAGE OBSERVED DURING THE INSPECTION.
6. NO SITE GRADING OUTSIDE OF THE LIMITS OF DISTURBANCE OR DOWNSTREAM OF SILT FENCE.
7. EROSION CONTROL MEASURES SHALL BE REMOVED ONLY AFTER SITE CONSTRUCTION IS COMPLETE WITH ALL SOIL SURFACES HAVING AN ESTABLISHED VEGETATIVE COVER
8. INSTALL INLET PROTECTION IN ALL STORM SEWER INLETS AND CATCH BASINS THAT MAY RECEIVE RUNOFF FROM DISTURBED AREAS.
9. SLOPES EXCEEDING 5:1 SHALL BE STABILIZED WITH CLASS I, TYPE B URBAN EROSION MATTING. ALL DRAINAGE SWALES AND DITCHES SHALL BE STABILIZED WITH CLASS II, TYPE C URBAN EROSION MATTING. ALL OVERFLOW BANKS SHALL BE RESTORED USING CLASS III, TYPE A URBAN PERMANENT TURF REINFORCING MAT.
10. EROSION MATTING SHALL HAVE **NON-WELDED** JOINTS. TURF REINFORCEMENT MAT MAY HAVE WELDED JOINTS BUT ONLY WHEN IT IS COMPLETELY SOIL FILLED WHEN INSTALLED.
11. ALL INCIDENTAL MUD TRACKING OFF-SITE ONTO ADJACENT PUBLIC THOROUGHFARES SHALL BE CLEANED UP AND REMOVED BY THE END OF EACH WORKING DAY USING PROPER DISPOSAL METHODS.
12. PREVENT EXCESSIVE DUST FROM LEAVING THE CONSTRUCTION SITE IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
13. INSTALL EROSION CONTROLS ON THE DOWNSTREAM SIDE OF STOCKPILES.
14. VELOCITY CHECKS SHALL BE PLACED AS SHOWN WHEN THE ROAD SUBGRADE IS ESTABLISHED. CHECKS SHALL BE BUILT PER DETAIL PROVIDED AND MAINTAINED THROUGH STABILIZATION. NUMBER AND LOCATION OF CHECKS SHOWN ON PLANS IS MINIMUM REQUIRED. FIELD CONDITIONS MAY WARRANT ADDITIONAL VELOCITY CHECKS AS REQUIRED BY TOWN INSPECTOR OR ENGINEER.
15. ALL DISTURBED LOT AREAS SHALL RECEIVE A MINIMUM OF 6" OF TOPSOIL. FERTILIZER, SEED AND MULCH. SEED MIXTURE SHALL BE WISCONSIN DOT SEED MIX #40 OR EQUIVALENT APPLIED AT A RATE OF 5 POUNDS PER 1000 SQFT ON ALL DISTURBED AREAS. ANNUAL RYEGRASS AT A RATE OF 1 $\frac{1}{2}$ POUNDS PER 1000 SQFT SHALL BE ADDED TO THE THE MIXTURE. FERTILIZER SHALL BE PLACED PER A SOIL TEST. THE INFILTRATION AREAS SHALL BE SEEDED WITH THE RAINWATER RENEWAL SEED MIX BY AGRECOL OR EQUIVALENT. THE STREAM AND DETENTION BASIN BANKS SHALL BE RESTORED WITH AGRECOL'S NATIVE SLOPE STABILIZATION MIX OR EQUIVALENT AND THE LOWER ZONE OF THE STREAM RESTORED USING AGRECOL'S FLOOD PLAIN SEED MIX OR EQUIVALENT. SEEDING RATES SHALL CONFORM TO THE SUPPLIERS RECOMMENDATIONS.
16. DEWATERING, IF APPLICABLE, SHALL BE CONDUCTED PER WDNR STORM WATER MANAGEMENT TECHNICAL STANDARD 1061.
17. ADDITIONAL EROSION CONTROL MEASURES AS REQUESTED BY THE DNR, DANE COUNTY OR THE OWNER'S REPRESENTATIVE SHALL BE INSTALLED WITHIN 24 HRS.
18. ANY CHANGES TO THIS EROSION CONTROL PLAN MUST BE APPROVED PRIOR TO INSTALLATION
19. ALL ACTIVITIES RELATED TO THE CONSTRUCTION OF THE STREAM CONSTRUCTION, CLEARING AND RESTORATION SHALL COMPLY WITH THE WISCONSIN CONSTRUCTION SPECIFICATION FOR EXCAVATION, MOBILIZATION AND DEMOBILIZATION, STREAM CLEARING AND SNAGGING, USDA-NRCS- WISCONSIN SECTION IV, TECHNICAL GUIDE.

CONSTRUCTION PHASING:

PHASE I:	GRADE AND RESTORE NEW STREAM RELOCATION	JUNE 18 - JULY 3, 2015
PHASE II:	GRADE AND RESTORE DETENTION AND INFILTRATION AREAS	JULY 1 - JULY 21, 2015
PHASE III:	INSTALL CULVERTS AND COMPLETE ROADWAY FILL	JULY 15 - AUG. 21, 2015
PHASE IV:	GRADE & RESTORE LOTS, INSTALL UTILITIES AND STREET IMPROVEMENTS	JULY 15 - OCT. 15, 2015
PHASE V:	RESTORE STREET TERRACE	OCT. 15 - OCT. 30, 2015

AREA OF DISTURBANCE = 51.3 ACRES



D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

GRADING AND EROSION CONTROL PLAN

WINDSOR CROSSING

TOWN OF WINDSOR, DANE COUNTY, WISCONSIN

0 100'

DATE: 05/13/15

REVISED:

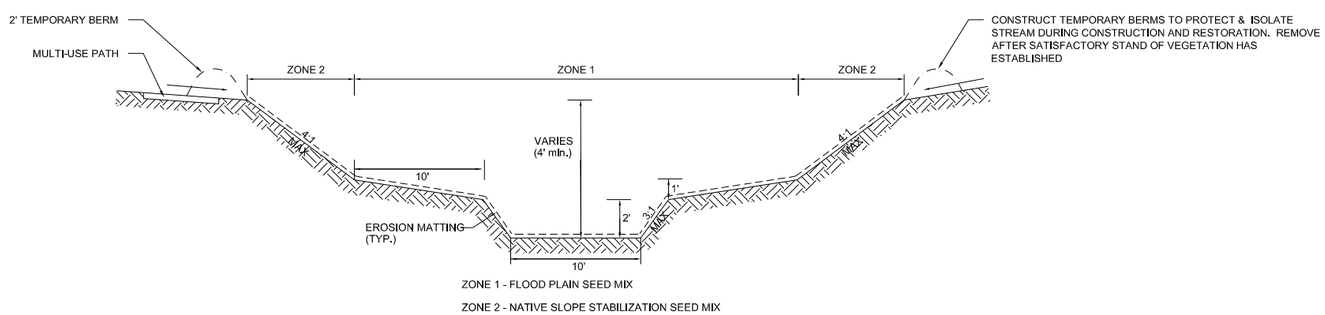
DRAWN BY: GVP

FN: 14-01-100

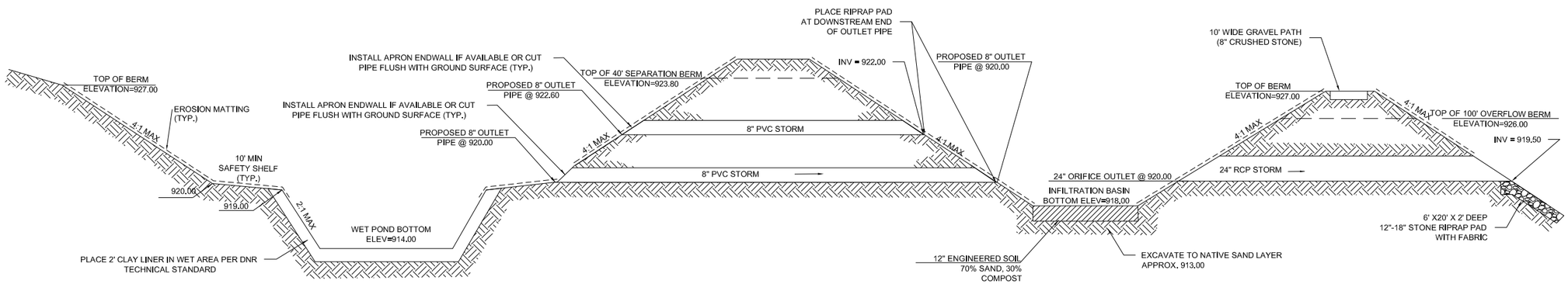
Sheet Number:

EXHIBIT 6

File: U:\User\1401100\Drawings\1401100 Base.dwg gecp Plotted: May 13, 2015 - 4:49pm

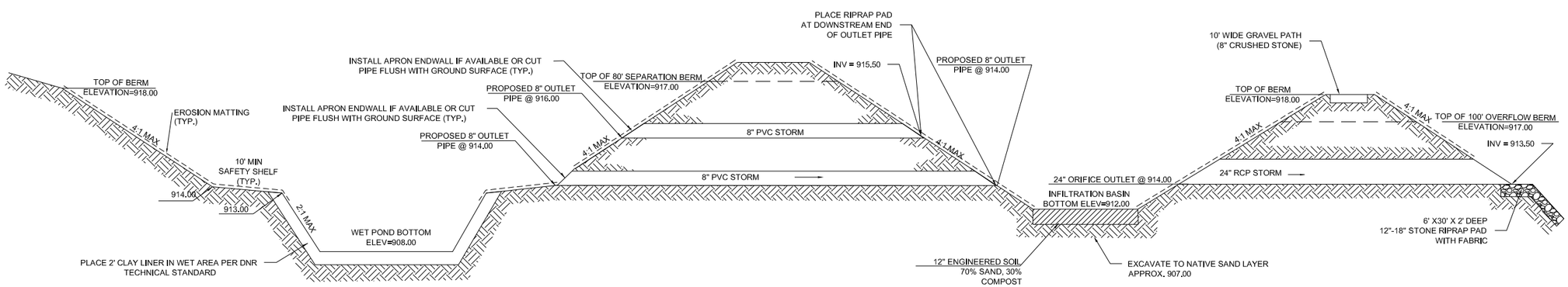


PHASE I STREAM SECTION
WEST OF CULVERT UNDER NORTH TOWNE ROAD
NOT TO SCALE



PROFILE VIEW

PROPOSED SOUTHEAST WET DETENTION/INFILTRATION BASIN DETAIL
NOT TO SCALE



PROFILE VIEW

PROPOSED SOUTHWEST WET DETENTION/INFILTRATION BASIN DETAIL
NOT TO SCALE

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

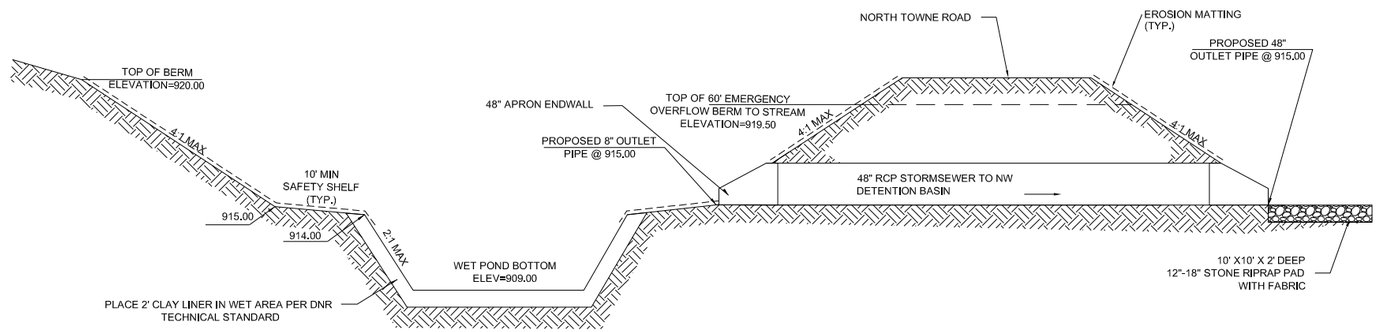
DETENTION BASIN DETAILS

WINDSOR CROSSING
GRADING AND EROSION CONTROL PLANS

TOWN OF WINDSOR, DANE COUNTY, WISCONSIN

DATE: 01-21-15
REVISED:

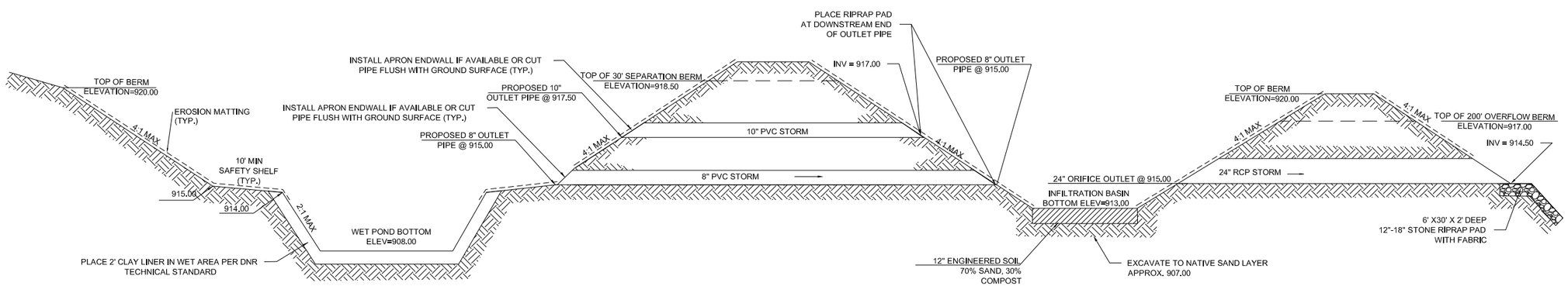
DRAWN BY: GVP
FN: 14-01-100
Sheet Number:
EXHIBIT 7A



PROFILE VIEW

PROPOSED NORTHEAST WET DETENTION BASIN DETAIL

NOT TO SCALE



PROFILE VIEW

PROPOSED NORTHWEST WET DETENTION/INFILTRATION BASIN DETAIL

NOT TO SCALE

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

DETENTION BASIN DETAILS

WINDSOR CROSSING
GRADING AND EROSION CONTROL PLANS

TOWN OF WINDSOR, DANE COUNTY, WISCONSIN

DATE: 01-21-15

REVISED:

DRAWN BY: GVP

FN: 14-01-100

Sheet Number:

EXHIBIT 7B

APPENDIX A

POND SEDIMENT SETTLING EFFICIENCY CALCULATIONS

NORTHWEST DETENTION BASIN
SEDIMENTATION POND SETTLING EFFICIENCY CALCULATIONS

The runoff volume, peak discharge, and peak elevation are based on a 1-year -24hr storm event prior to entering the infiltration basin

Settling Calculations:

Settling Time = (Runoff Volume) / (Peak Discharge)

59,673 cuft / 1.69 cfs = 35,309 sec

Settling Distance = Peak Elevation - Outfall Invert

917.05 feet – 915.00 feet =2.05 feet

Settling Velocity = (Settling Distance) / (Settling Time)

2.05 feet / 39,309 sec = 0.000058

There will be no runoff leaving the combination basin for this drainage are in the 5y – 24hr storm event therefore no sediment will be leaving the site for this storm event

According to Stokes Law with a specific gravity of 2.65 and 20 C, a 5 micron diameter particle will settle to the pond bottom at the calculated Settling Velocity. A pond that traps a 5 micron diameter particle is expected to be more than the 80% efficiency required.

SOUTHEAST DETENTION BASIN
SEDIMENTATION POND SETTLING EFFICIENCY CALCULATIONS

The runoff volume, peak discharge, and peak elevation are based on a 1-year-24hr storm event prior to entering the infiltration area.

Settling Calculations:

Settling Time = (Runoff Volume) / (Peak Discharge)

70,727 cuft / 1.77 cfs = 39,959 sec

Settling Distance = Peak Elevation - Outfall Invert

922.04 feet – 920.00 feet =2.04 feet

Settling Velocity = (Settling Distance) / (Settling Time)

2.04 feet / 39,959 sec = 0.000051

The runoff volume, peak discharge, and peak elevation are based on a 5-year-24hr storm event prior to leaving the drainage area through the combination basin.

Settling Calculations:

Settling Time = (Runoff Volume) / (Peak Discharge)

76,068 cuft / 0.48 cfs = 158,475 sec

Settling Distance = Peak Elevation - Outfall Invert

920.28 feet – 918.00 feet =2.28 feet

Settling Velocity = (Settling Distance) / (Settling Time)

2.28 feet / 158,475 sec = 0.000014

According to Stokes Law with a specific gravity of 2.65 and 20 C, a 5 micron diameter particle will settle to the pond bottom at the calculated Settling Velocity. A pond that traps a 5 micron diameter particle is expected to be more than the 80% efficiency required.

SOUTHWEST DETENTION BASIN
SEDIMENTATION POND SETTLING EFFICIENCY CALCULATIONS

The runoff volume, peak discharge, and peak elevation are based on a 1-year-24hr storm event prior to entering the infiltration basin.

Settling Calculations:

Settling Time = (Runoff Volume) / (Peak Discharge)

67,513 cuft / 1.56 cfs = 43,278 sec

Settling Distance = Peak Elevation - Outfall Invert

915.84 feet – 914.00 feet =1.84 feet

Settling Velocity = (Settling Distance) / (Settling Time)

1.84 feet / 43,278 sec = 0.000043

The runoff volume, peak discharge, and peak elevation are based on a 5-year-24hr storm event prior to leaving the drainage area through the combination basin.

Settling Calculations:

Settling Time = (Runoff Volume) / (Peak Discharge)

55,410 cuft / 1.59 cfs = 34,849 sec

Settling Distance = Peak Elevation - Outfall Invert

914.53 feet – 912.00 feet =2.53 feet

Settling Velocity = (Settling Distance) / (Settling Time)

2.53 feet / 34,849 sec = 0.000072

According to Stokes Law with a specific gravity of 2.65 and 20 C, a 5 micron diameter particle will settle to the pond bottom at the calculated Settling Velocity. A pond that traps a 5 micron diameter particle is expected to be more than the 80% efficiency required.

APPENDIX B

INFILTRATION CALCULATIONS

NORTHWEST & NORTHEAST COMBINED DRAINAGE BASIN RECHARGE DESIGN

The following was designed to meet requirements set by CARPC to match predevelopment recharge + recharge water usage for the site in postdevelopment conditions.

Existing Site Recharge

9.7 inches from county recharge maps

Northwest & Northeast Drainage Mitigation Calculations

Mitigation of predevelopment groundwater recharge that will be drawn down for domestic use per CARPC requirement: (1000 gal/ac/day for commercial & 50 gal/per person/day for residential)

Total Drainage Area = 24.2 acres

Commercial Property Area = 14.6 acres

Residential Property Area = 0 acres

Impervious Area = 81% Total

Commercial Property Estimated Usage = 14.6 acres x 1000 gal/ac/day = 14,600 gal/day
(Remaining drainage area consists of ponds & right of way)

Commercial Property Estimated Usage Volume in a Year = 14,600 gal/day x 365 days = 5,329,000 gal

Usage Converted from Gallons of Water to cubic inches = (231 cubic inches in gallon of water) = 5,329,000 gal * 231 cubic inches = 1,230,999,000 cubic inches

Total Drainage Area Converted from Acres to Square Inches = 24.2 acres = 151,798,495 square inches

Usage Converted to Recharge Depth Required Within the Drainage Area =
1,230,999,000 cubic inches/151,798,495 sqin = 8.1 inches

Total Recharge Required to Meet Requirements

Total Recharge Required on Site = Existing Recharge + Water Usage = 9.7 in + 8.1 in = 17.8" of Recharge Required Within This Drainage Area

Postdevelopment Recharge Design

Rt = P x Rsite

Rt = Calculated Tributary Recharge Depth

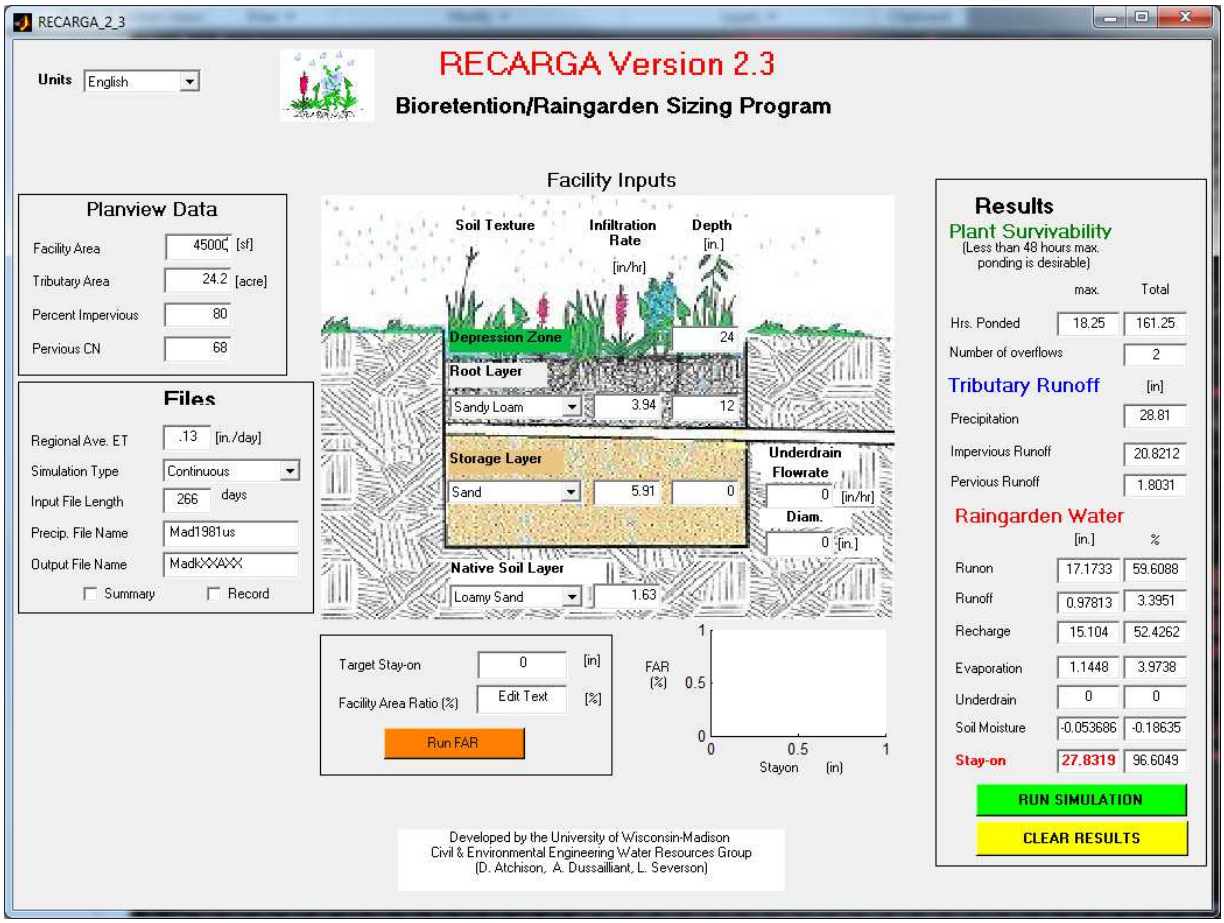
P = Percent Pervious

Rsite = 9.7 in/yr (Design Recharge Rate Provided by CARPC for Site)

Rt = 0.20 x 9.7 in/yr = 1.9"

Recharge required within infiltration basin = Total Recharge Required – Rt = 17.8 in – 1.9 in = **14.9 in**
(See next page for basin design to meet 14.9 in of recharge required within basin)

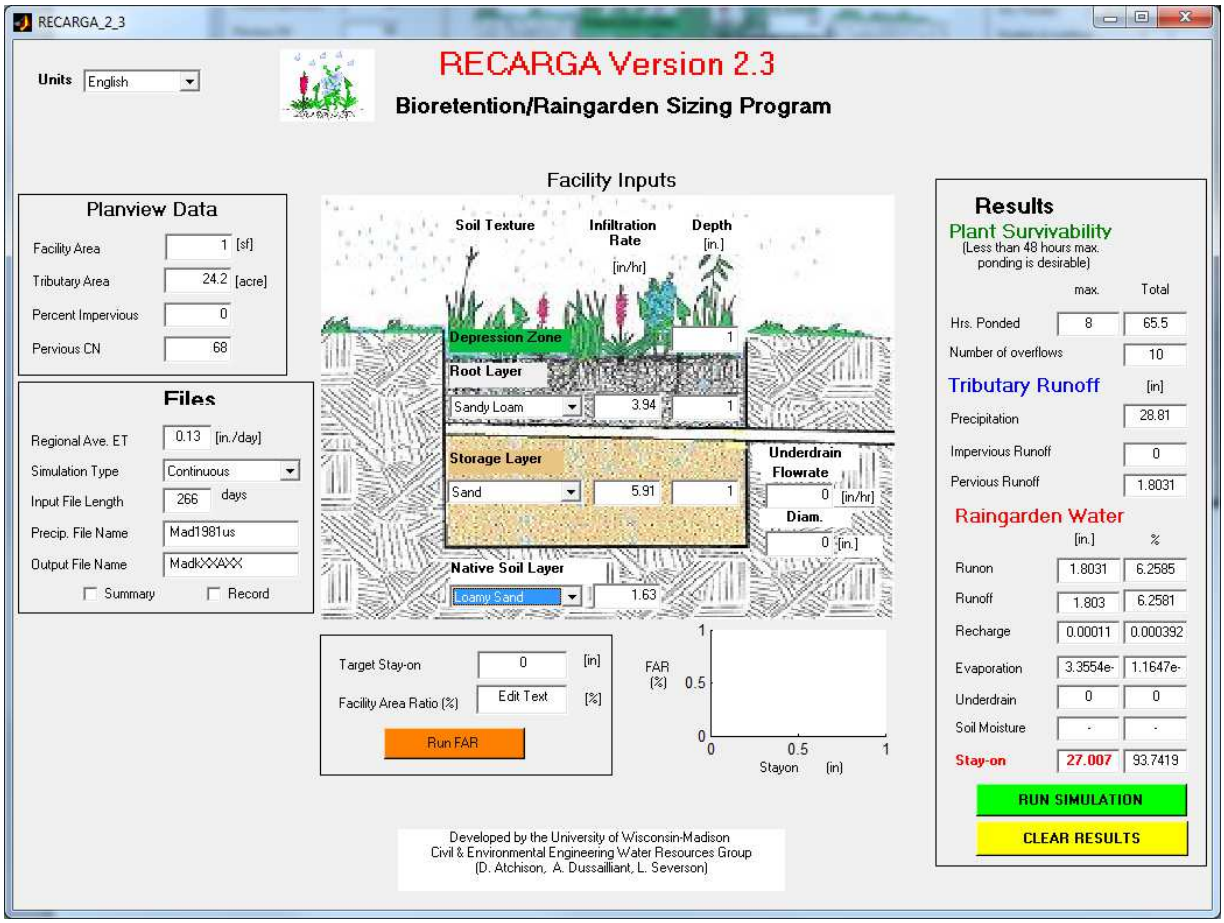
RECARGA RECHARGE CALCULATIONS FOR SOUTHWEST BASIN



With the addition of a 45,000 sqft infiltration basin the drainage area meets the recharge requirement of 14.9 inches.

NORTHWEST & NORTHEAST COMBINED DRAINAGE BASINS 90% EXISTING STAYON DESIGN CHECK

Predevelopment NW & NE Drainage Area Stayon



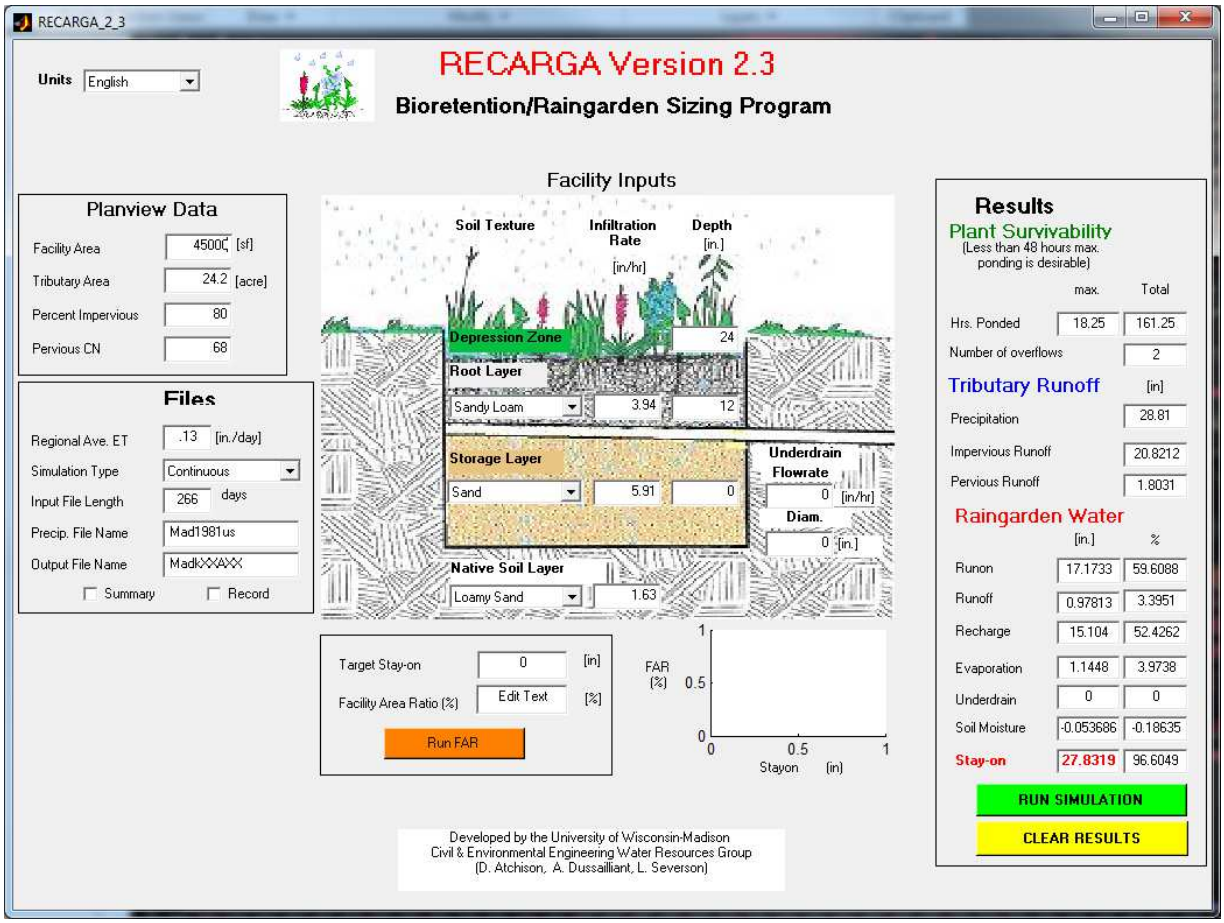
In predevelopment conditions the site has a stayon of 27.0”

90% of 27.0” = 24.3”

24.3” of stayon is required in postdevelopment conditions

Developed NW & NE Drainage Area Stayon Design

In postdevelopment designed conditions the site attains a stayon depth of 27.83 inches which exceeds the 24.3" stayon requirement.



SOUTHEAST DRAINAGE BASIN RECHARGE DESIGN

The following was designed to meet requirements set by CARPC to match predevelopment recharge + recharge water usage for the site in postdevelopment conditions.

Existing Site Recharge

9.7 inches from county recharge maps

Southeast Drainage Mitigation Calculations

Mitigation of predevelopment groundwater recharge that will be drawn down for domestic use per CARPC requirement: (1000 gal/ac/day for commercial & 50 gal/per person/day for residential (Assumed 2.1 people per lot))

Total Drainage Area = 22.4 acres

Commercial Property Area = 0 acres

Single Family Residential Property Lots = 8 (2.1 people/lot)

Multifamily Lots =10.5 acres (16.5 people/acre)

Total Residents = 174

Impervious Area = 56% Total

Residential Property Estimated Usage = 174 people x 50 = 8,700 gal/day
(Remaining drainage area consists of ponds & right of way)

Drainage Area Estimated Usage Volume in a Year = 8,700 gal/day x 365 days = 3,175,500 gal

Usage Converted from Gallons of Water to cubic inches = (231 cubic inches in gallon of water) = 3,175,500 gal * 231 cubic inches = 733,540,500 cubic inches

Total Drainage Area Converted from Acres to Square Inches = 22.40 acres = 140,507,698 square inches

Usage Converted to Recharge Depth Required Within the Drainage Area =
733,540,500 cubic in inches/140,507,698 sqin = 5.2 inches

Total Recharge Required to Meet Requirements

Total Recharge Required on Site = Existing Recharge + Water Usage = 9.7 in + 5.2 in = 14.9" of Recharge Required Within This Drainage Area

Postdevelopment Recharge Design

Rt = P x Rsite

Rt = Calculated Tributary Recharge Depth

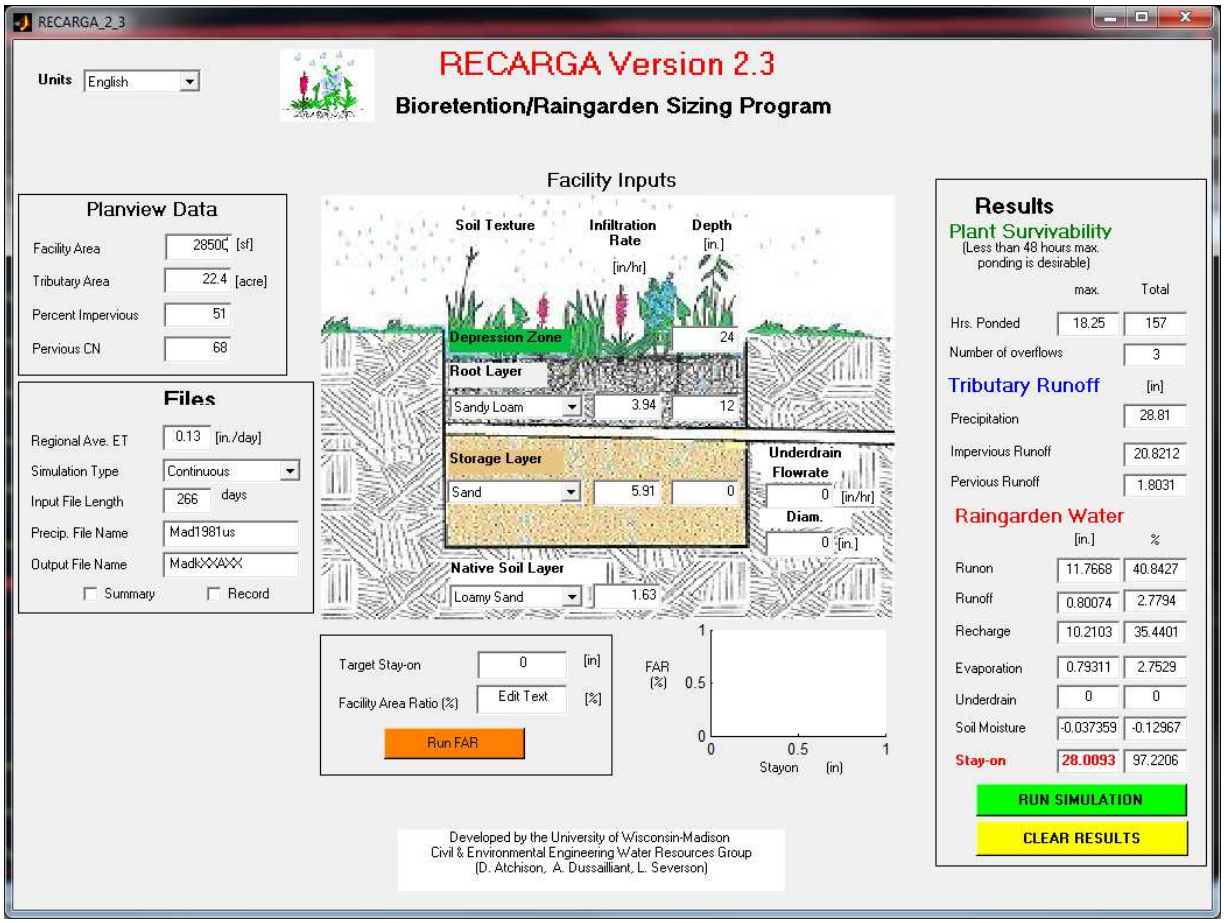
P = Percent Pervious

Rsite = 9.7 in/yr (Design Recharge Rate Provided by CARPC for Site)

Rt = 0.49 x 9.7 in/yr =4.7"

Recharge required within infiltration basin = Total Recharge Required – Rt = 14.9 in – 4.7 in = **10.2 in**
(See next page for basin design to meet 10.2 in of recharge required within basin)

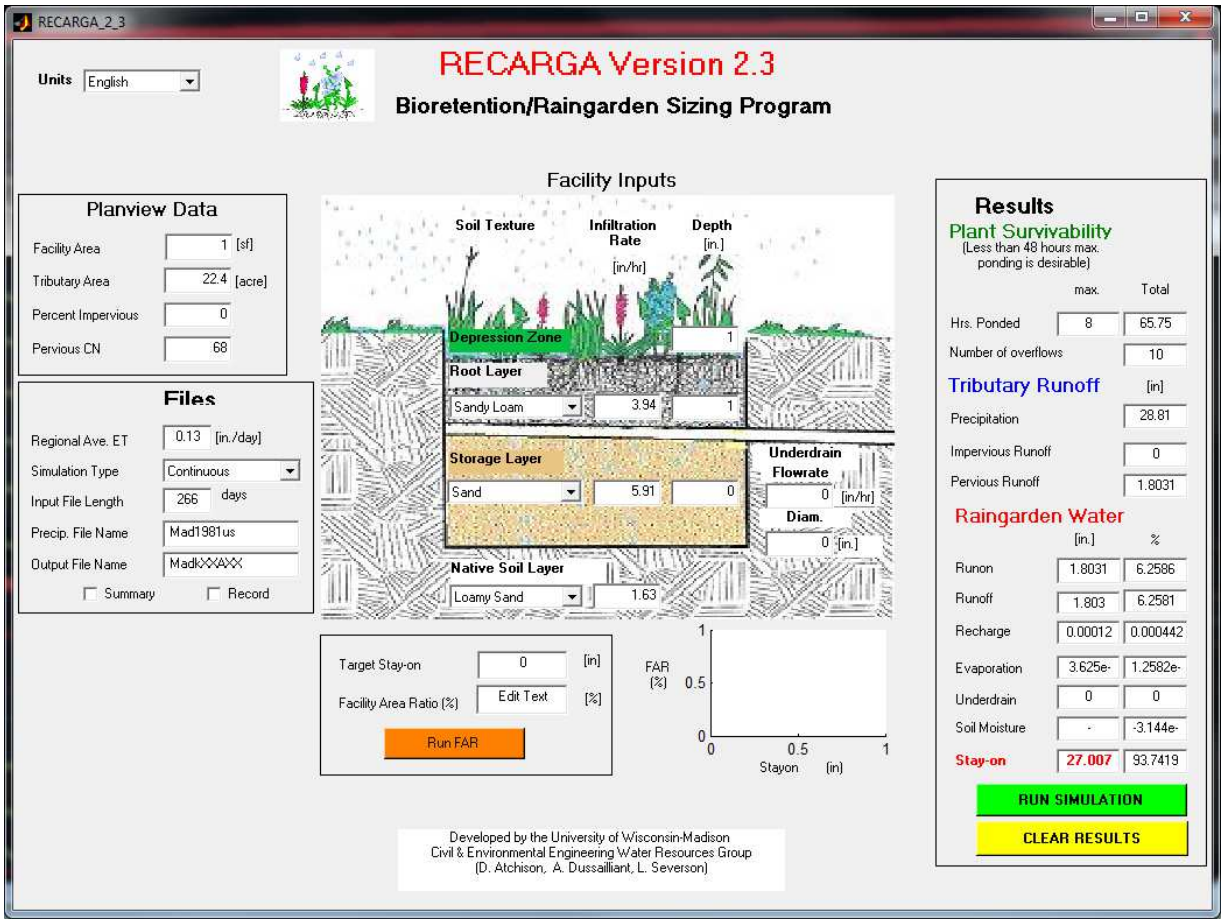
RECARGA RECHARGE CALCULATIONS FOR SOUTHEAST BASIN



With the addition of a 28,500 sqft infiltration basin the drainage area meets the recharge requirement of 10.2 inches.

SOUTHEAST DRAINAGE BASIN 90% EXISTING STAYON DESIGN CHECK

Predevelopment SE Drainage Area Stayon



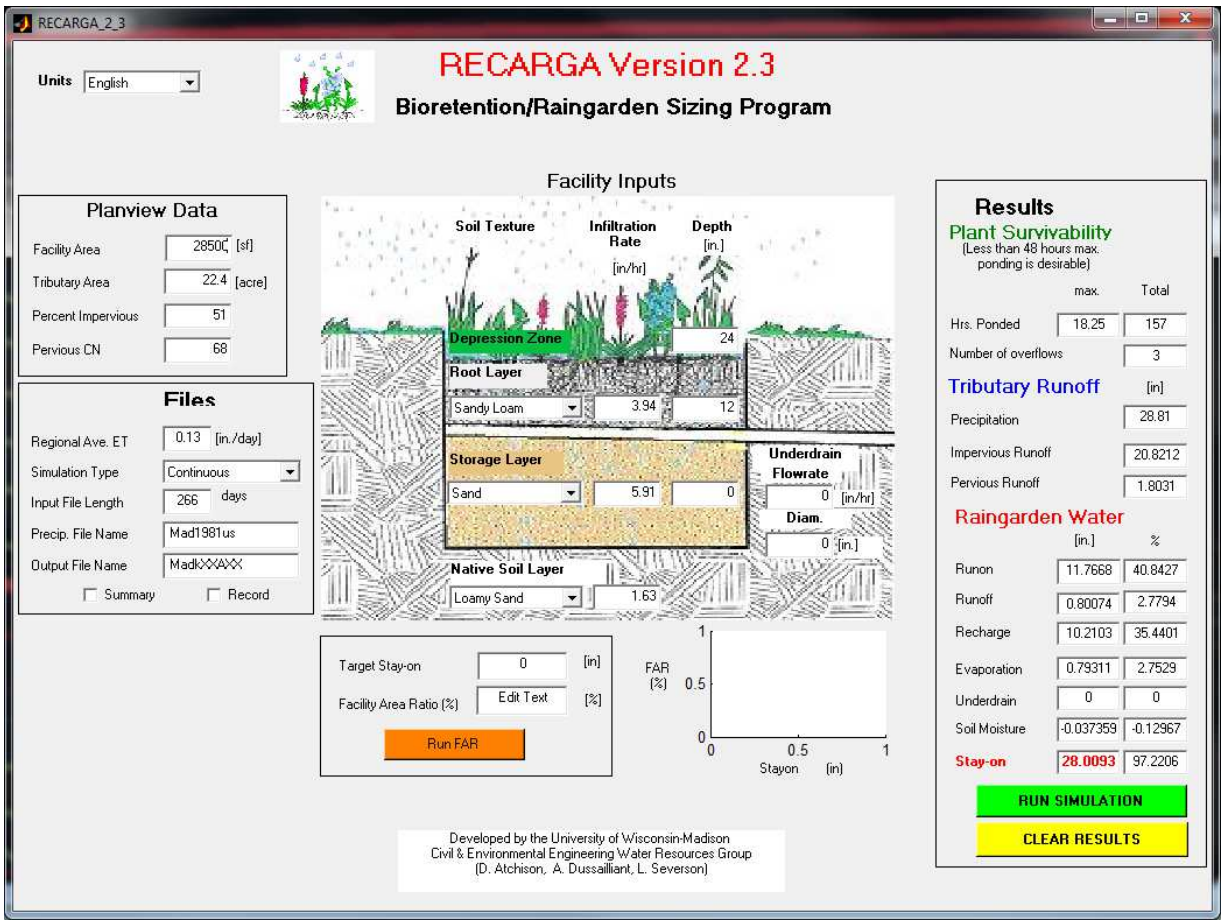
In predevelopment conditions the site has a stayon of 27.0”

90% of 27.0” = 24.3”

24.3” of stayon is required in postdevelopment conditions

Developed SE Drainage Area Stayon Design

In postdevelopment designed conditions the site attains a stayon depth of 28.0 inches which meets the 24.3" stayon requirement



SOUTHWEST DRAINAGE BASIN RECHARGE DESIGN

The following was designed to meet requirements set by CARPC to match predevelopment recharge + recharge water usage for the site in postdevelopment conditions.

Existing Site Recharge

9.7 inches from county recharge maps

Southwest Drainage Mitigation Calculations

Mitigation of predevelopment groundwater recharge that will be drawn down for domestic use per CARPC requirement: (1000 gal/ac/day for commercial & 50 gal/per person/day for residential (Assumed 2.1 people per lot))

Total Drainage Area = 27.7 acres

Commercial Property Area = 0 acres

Residential Property Lots = 71

Impervious Area = 42% Total

Residential Property Estimated Usage = 71 lots x 2.1 people x 50 = 7,455 gal/day

Drainage Area Estimated Usage Volume in a Year = 7,455 gal/day x 365 days = 2,721,075 gal

Usage Converted from Gallons of Water to cubic inches = (231 cubic inches in gallon of water) = 2,721,075 gal * 231 cubic inches = 628,568,325 cubic inches

Total Drainage Area Converted from Acres to Square Inches = 27.7 acres = 173,752,823 square inches

Usage Converted to Recharge Depth Required Within the Drainage Area = 628,568,325 cubic inches/173,752,823 sqin = 3.6 inches

Total Recharge Required to Meet Requirements

Total Recharge Required on Site = Existing Recharge + Water Usage = 9.7 in + 3.6 in = 13.3 in. of Recharge Required Within This Drainage Area

Postdevelopment Recharge Design

Rt = P x Rsite

Rt = Calculated Tributary Recharge Depth

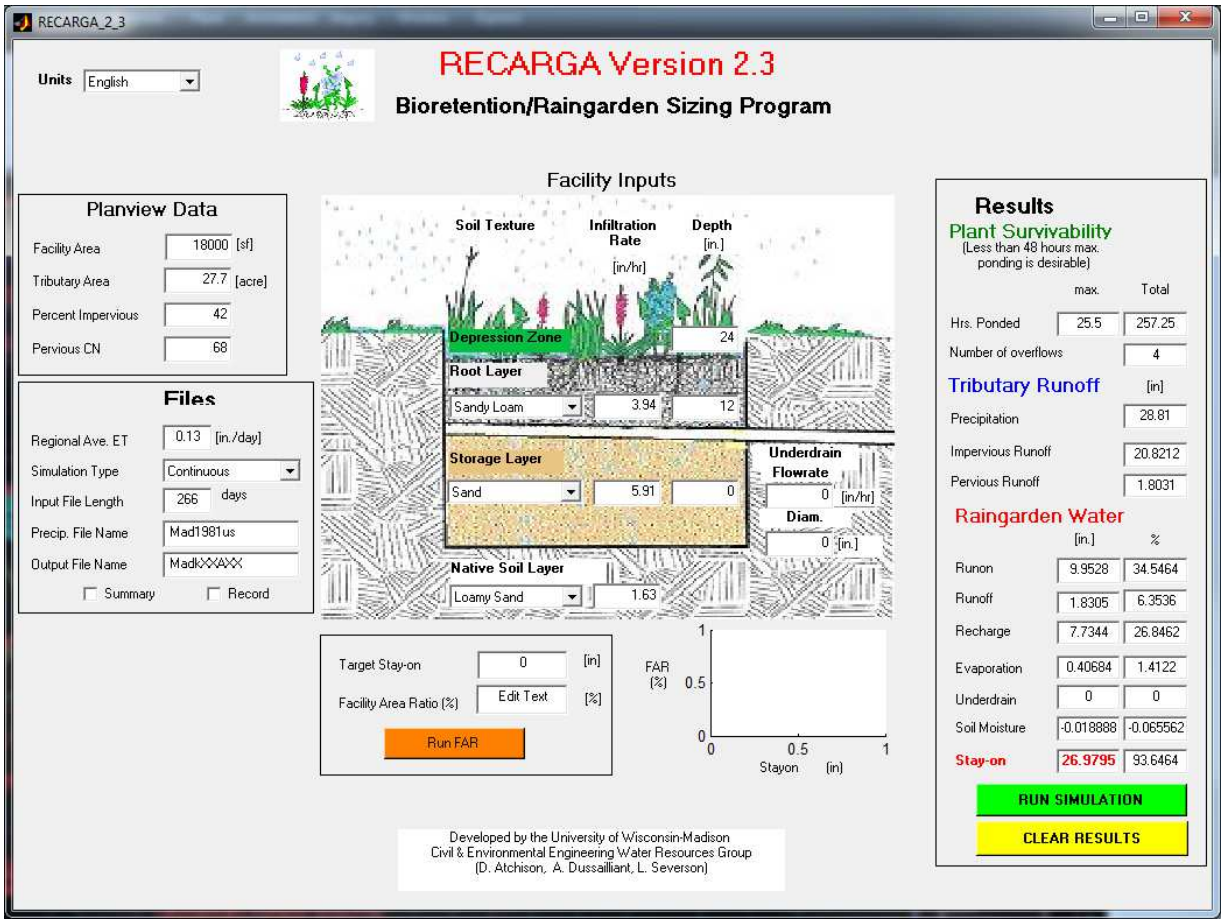
P = Percent Pervious

Rsite = 9.7 in/yr (Design Recharge Rate Provided by CARPC for Site)

Rt = 0.58 x 9.7 in/yr = 5.6"

Recharge required within infiltration basin = Total Recharge Required – Rt = 13.3 in – 5.6 in = **7.7 in**
(See next page for basin design to meet 7.7 in of recharge required within basin)

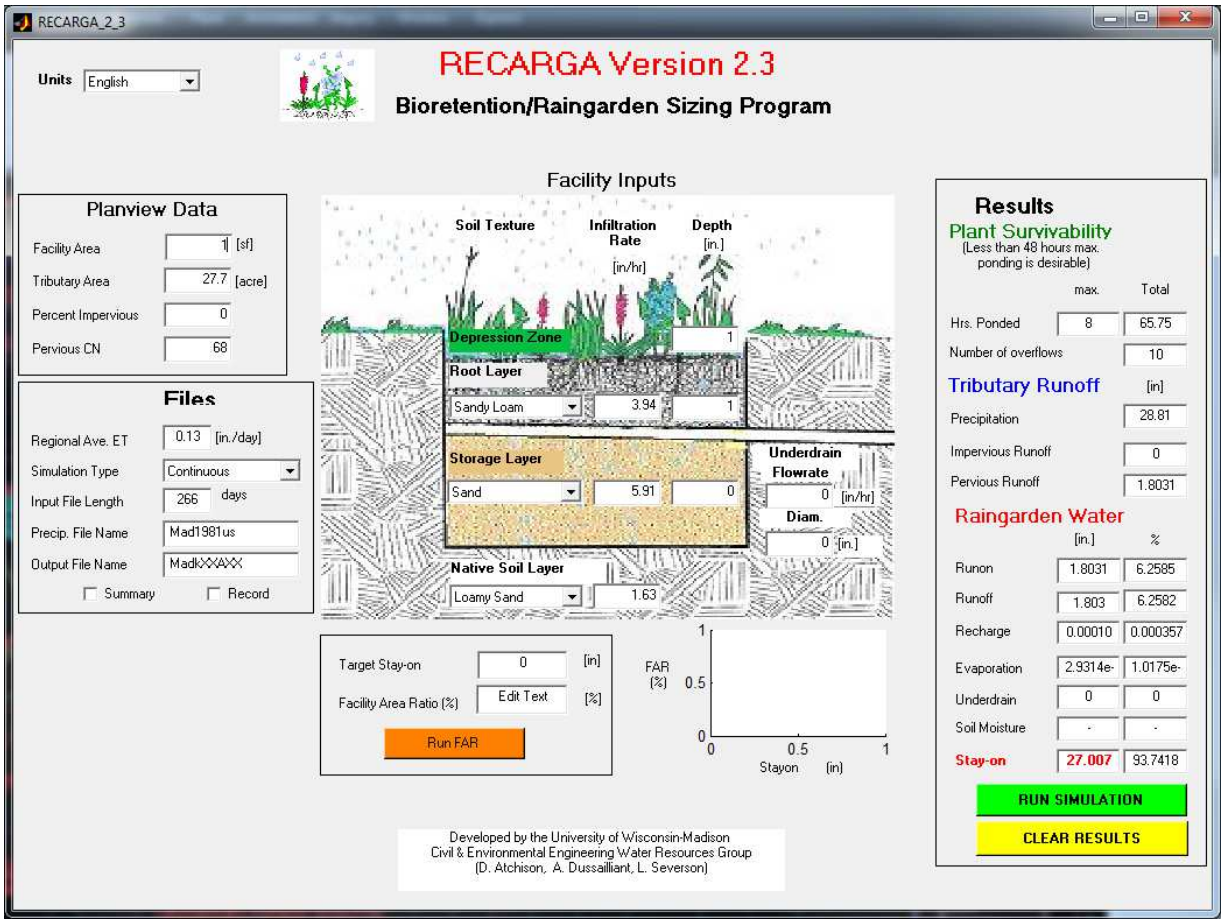
RECARGA RECHARGE CALCULATIONS FOR SOUTHWEST BASIN



With the addition of an 18,000 sqft infiltration basin the drainage area meets the recharge requirement of 7.7 inches.

SOUTHWEST DRAINAGE BASIN 90% OF EXISTING STAYON DESIGN CHECK

Predevelopment SW Drainage Area Stayon



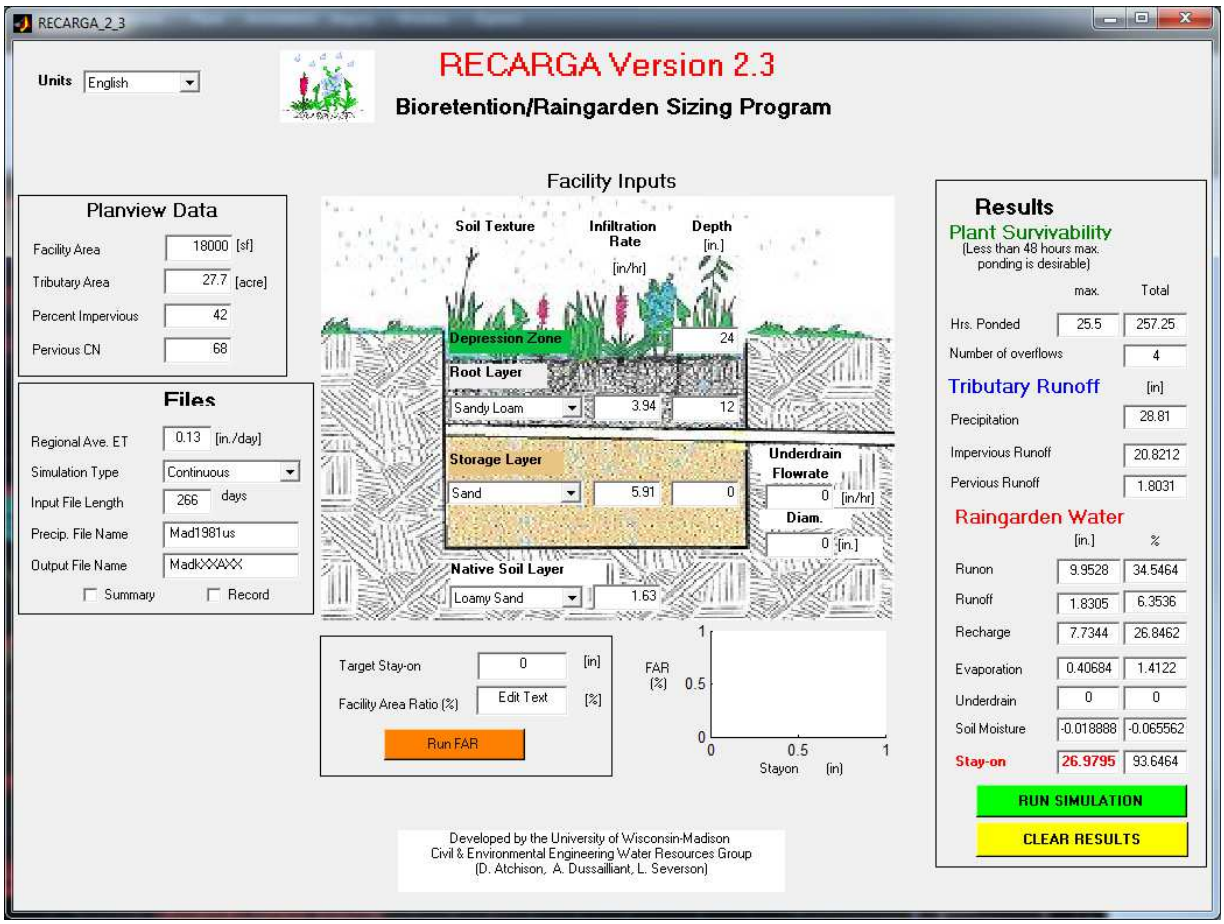
In predevelopment conditions the site has a stayon of 27.0”

90% of 27.0” = 24.3”

24.3” of stayon is required in postdevelopment conditions

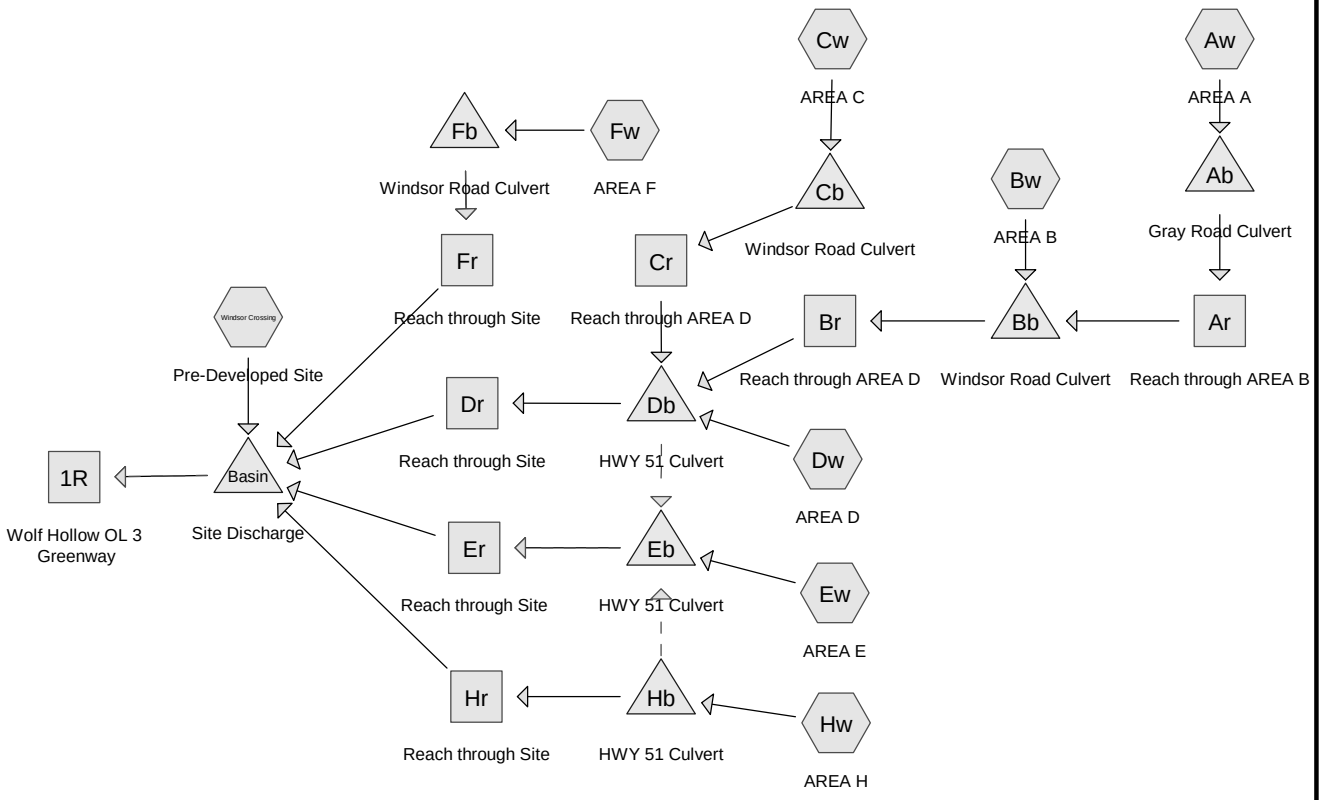
Developed SW Drainage Area Stayon Design

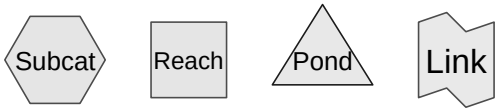
In postdevelopment designed conditions the site attains a stayon depth of 27.0 inches which exceeds the 24.3" stayon requirement



APPENDIX C

EXISTING HYDROCAD OUTPUT





Routing Diagram for Drainage Study (Pre-Developed)
Prepared by {enter your company name here}, Printed 3/19/2015
HydroCAD® 10.00-12 s/n 02063 © 2014 HydroCAD Software Solutions LLC

Summary for Subcatchment Aw: AREA A

Runoff = 43.93 cfs @ 12.35 hrs, Volume= 5.023 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	23.000	68	
	23.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	300	0.0200	0.18		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
9.2	700	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.1	400	0.0200	5.96	155.09	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=2.00' Z= 4.0 '/' Top.W=21.00' n= 0.040
37.7	1,400	Total			

Summary for Subcatchment Bw: AREA B

Runoff = 381.59 cfs @ 12.33 hrs, Volume= 41.933 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	192.000	68	
	192.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.8	300	0.0400	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
6.5	700	0.0400	1.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
8.2	3,000	0.0100	6.11	1,099.29	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=4.00' Z= 10.0 '/' Top.W=85.00' n= 0.040
35.5	4,000	Total			

Summary for Subcatchment Cw: AREA C

Runoff = 14.32 cfs @ 12.18 hrs, Volume= 1.201 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	5.500	68	
	5.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.8	300	0.0400	0.24		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
2.8	400	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.6	700	Total			

Summary for Subcatchment Dw: AREA D

Runoff = 194.52 cfs @ 12.20 hrs, Volume= 17.254 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	79.000	68	
	79.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	300	0.0600	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.90"
3.1	1,100	0.0200	5.97	149.36	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=2.50' Z= 4.0 '/' Top.W=20.00' n= 0.040
6.7	3,000	0.0150	7.48	1,346.35	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=4.00' Z= 10.0 '/' Top.W=85.00' n= 0.040
25.8	4,400	Total			

Summary for Subcatchment Ew: AREA E

Runoff = 82.25 cfs @ 12.17 hrs, Volume= 6.770 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	31.000	68	
	31.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.6	300	0.0460	0.25		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
1.9	200	0.0400	1.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.4	950	0.0350	11.43	2,056.58	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=4.00' Z= 10.0 '/' Top.W=85.00' n= 0.040
22.9	1,450	Total			

Summary for Subcatchment Fw: AREA F

Runoff = 50.00 cfs @ 12.29 hrs, Volume= 5.242 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	24.000	68	
	24.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.9	300	0.0230	0.19		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
7.3	550	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.2	850	Total			

Summary for Subcatchment Hw: AREA H

Runoff = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	15.000	68	
	15.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	300	0.0200	0.18		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
9.8	650	0.0150	1.10		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
37.2	950	Total			

Summary for Subcatchment Windsor Crossing: Pre-Developed Site

Runoff = 133.83 cfs @ 12.47 hrs, Volume= 17.795 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
*	77.900	68	On-Site Fields
	6.500	55	Woods, Good, HSG B
	84.400	67	Weighted Average
	84.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	300	0.0200	0.18		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
16.9	1,000	0.0120	0.99		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.9	500	0.0050	4.46	892.04	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=4.00' Z= 10.0 '/' Top.W=90.00' n= 0.040
46.2	1,800	Total			

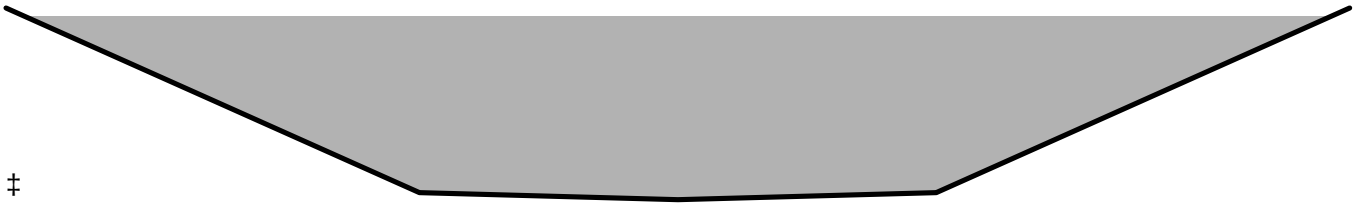
Summary for Reach 1R: Wolf Hollow OL 3 Greenway

Inflow Area = 453.900 ac, 0.00% Impervious, Inflow Depth > 2.60" for 100-yr event
Inflow = 479.54 cfs @ 12.39 hrs, Volume= 98.250 af
Outflow = 479.37 cfs @ 12.40 hrs, Volume= 98.248 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.68 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 1.8 min

Peak Storage= 13,621 cf @ 12.40 hrs
Average Depth at Peak Storage= 3.98'
Bank-Full Depth= 4.15' Flow Area= 109.1 sf, Capacity= 523.07 cfs

Custom cross-section, Length= 133.0' Slope= 0.0025 '/' (101 Elevation Intervals)
Constant n= 0.030 Earth, grassed & winding
Inlet Invert= 905.29', Outlet Invert= 904.96'



‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-19.50	4.15	0.00
-7.50	0.15	4.00
0.00	0.00	4.15
7.50	0.15	4.00
19.50	4.15	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.15	1.1	15.0	150	0.49
4.15	109.1	40.3	14,514	523.07

Summary for Reach Ar: Reach through AREA B

Inflow Area = 23.000 ac, 0.00% Impervious, Inflow Depth > 2.60" for 100-yr event
Inflow = 21.74 cfs @ 12.75 hrs, Volume= 4.982 af
Outflow = 17.22 cfs @ 13.21 hrs, Volume= 4.975 af, Atten= 21%, Lag= 27.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.09 fps, Min. Travel Time= 30.3 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 100.2 min

Peak Storage= 31,343 cf @ 13.21 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 309.45 cfs

20.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 36.00'
Length= 3,800.0' Slope= 0.0125 '/'
Inlet Invert= 993.40', Outlet Invert= 945.90'

‡

Summary for Reach Br: Reach through AREA D

Inflow Area = 215.000 ac, 0.00% Impervious, Inflow Depth > 2.61" for 100-yr event
Inflow = 192.94 cfs @ 12.72 hrs, Volume= 46.754 af
Outflow = 192.37 cfs @ 12.75 hrs, Volume= 46.748 af, Atten= 0%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.12 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 9.9 min

Peak Storage= 30,072 cf @ 12.75 hrs
Average Depth at Peak Storage= 1.46'
Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 342.50 cfs

20.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 36.00'
Length= 800.0' Slope= 0.0153 '/'
Inlet Invert= 945.25', Outlet Invert= 933.00'

‡

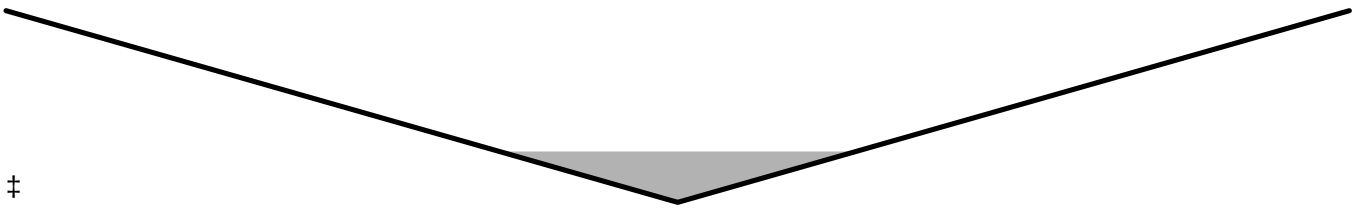
Summary for Reach Cr: Reach through AREA D

Inflow Area = 5.500 ac, 0.00% Impervious, Inflow Depth > 2.58" for 100-yr event
Inflow = 4.58 cfs @ 12.58 hrs, Volume= 1.181 af
Outflow = 4.56 cfs @ 12.62 hrs, Volume= 1.181 af, Atten= 0%, Lag= 2.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 7.1 min

Peak Storage= 792 cf @ 12.62 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.50' Flow Area= 25.0 sf, Capacity= 156.97 cfs

0.00' x 2.50' deep channel, n= 0.040
Side Slope Z-value= 4.0 '/' Top Width= 20.00'
Length= 450.0' Slope= 0.0221 '/'
Inlet Invert= 942.94', Outlet Invert= 933.00'



‡

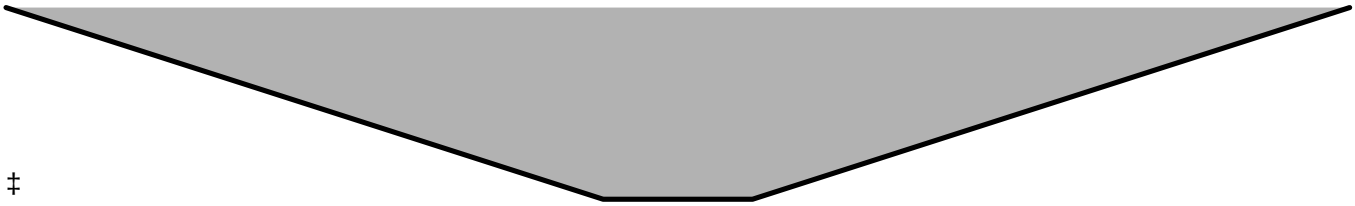
Summary for Reach Dr: Reach through Site

Inflow Area = 299.500 ac, 0.00% Impervious, Inflow Depth > 2.61" for 100-yr event
Inflow = 254.78 cfs @ 12.26 hrs, Volume= 65.179 af
Outflow = 244.15 cfs @ 12.75 hrs, Volume= 65.167 af, Atten= 4%, Lag= 29.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 8.4 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 23.9 min

Peak Storage= 123,296 cf @ 12.75 hrs
Average Depth at Peak Storage= 2.41'
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 163.50 cfs

5.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 1,800.0' Slope= 0.0068 '/'
Inlet Invert= 925.19', Outlet Invert= 913.00'



‡

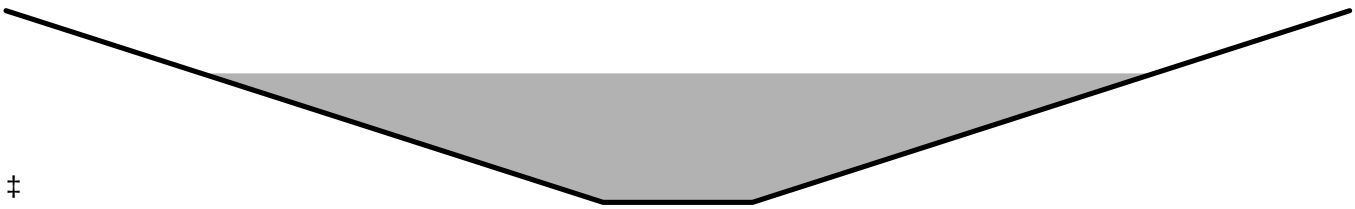
Summary for Reach Er: Reach through Site

Inflow Area = 31.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 82.25 cfs @ 12.17 hrs, Volume= 6.770 af
Outflow = 66.36 cfs @ 12.28 hrs, Volume= 6.770 af, Atten= 19%, Lag= 7.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.68 fps, Min. Travel Time= 10.6 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 41.6 min

Peak Storage= 42,160 cf @ 12.28 hrs
Average Depth at Peak Storage= 1.34'
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 169.68 cfs

5.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 1,700.0' Slope= 0.0073 '/'
Inlet Invert= 925.40', Outlet Invert= 913.00'



‡

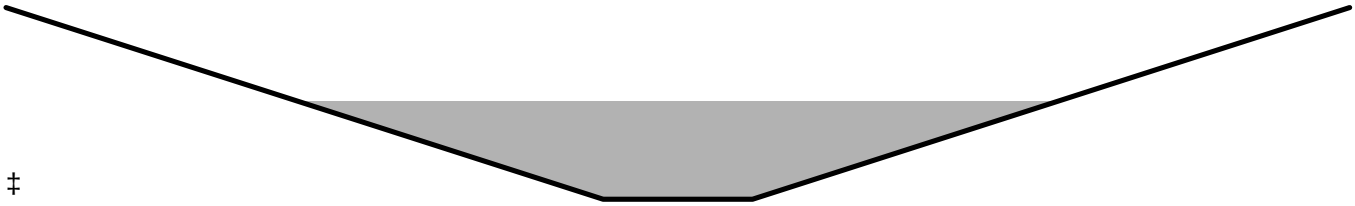
Summary for Reach Fr: Reach through Site

Inflow Area = 24.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 50.00 cfs @ 12.29 hrs, Volume= 5.242 af
Outflow = 40.30 cfs @ 12.46 hrs, Volume= 5.242 af, Atten= 19%, Lag= 10.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.58 fps, Min. Travel Time= 14.2 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 54.2 min

Peak Storage= 34,431 cf @ 12.46 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 191.27 cfs

5.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 2,200.0' Slope= 0.0093 '/'
Inlet Invert= 933.39', Outlet Invert= 913.00'



‡

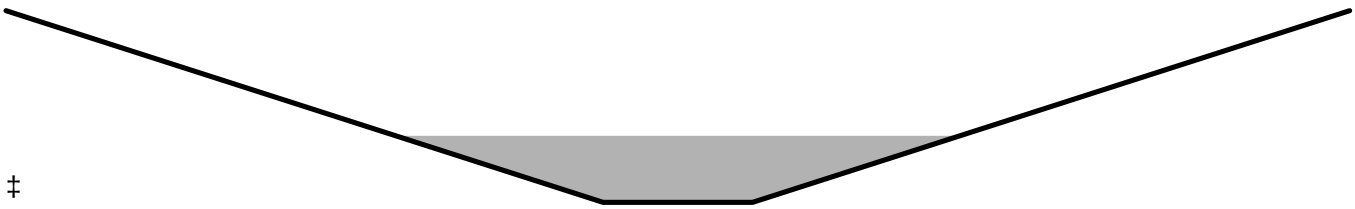
Summary for Reach Hr: Reach through Site

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af
Outflow = 26.06 cfs @ 12.47 hrs, Volume= 3.276 af, Atten= 10%, Lag= 7.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.13 fps, Min. Travel Time= 9.6 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 30.4 min

Peak Storage= 14,984 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 290.08 cfs

5.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 45.00'
Length= 1,800.0' Slope= 0.0213 '/'
Inlet Invert= 951.37', Outlet Invert= 913.00'



‡

Summary for Pond Ab: Gray Road Culvert

Inflow Area = 23.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 43.93 cfs @ 12.35 hrs, Volume= 5.023 af
Outflow = 21.74 cfs @ 12.75 hrs, Volume= 4.982 af, Atten= 51%, Lag= 24.1 min
Primary = 21.74 cfs @ 12.75 hrs, Volume= 4.982 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 996.56' @ 12.75 hrs Surf.Area= 0.626 ac Storage= 1.565 af

Plug-Flow detention time= 107.2 min calculated for 4.980 af (99% of inflow)
Center-of-Mass det. time= 102.9 min (972.0 - 869.1)

Volume	Invert	Avail.Storage	Storage Description
#1	995.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
995.00	0.000	0.000	0.000
1,000.00	2.000	5.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	995.00'	**30.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 995.00' / 993.80' S= 0.0300 '/' Cc= 0.900 n= 0.024, Flow Area= 4.91 sf
#2	Primary	995.00'	**30.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 995.00' / 993.80' S= 0.0300 '/' Cc= 0.900 n= 0.024, Flow Area= 4.91 sf

Primary OutFlow Max=21.73 cfs @ 12.75 hrs HW=996.56' TW=993.70' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 10.87 cfs @ 3.36 fps)
└─**2=Culvert** (Inlet Controls 10.87 cfs @ 3.36 fps)

Summary for Pond Basin: Site Discharge

Inflow Area = 453.900 ac, 0.00% Impervious, Inflow Depth > 2.60" for 100-yr event
Inflow = 479.54 cfs @ 12.39 hrs, Volume= 98.250 af
Primary = 479.54 cfs @ 12.39 hrs, Volume= 98.250 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Summary for Pond Bb: Windsor Road Culvert

Inflow Area = 215.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 382.34 cfs @ 12.33 hrs, Volume= 46.908 af
Outflow = 192.94 cfs @ 12.72 hrs, Volume= 46.754 af, Atten= 50%, Lag= 23.3 min
Primary = 192.94 cfs @ 12.72 hrs, Volume= 46.754 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 950.80' @ 12.72 hrs Surf.Area= 5.305 ac Storage= 12.873 af

Plug-Flow detention time= 74.3 min calculated for 46.732 af (100% of inflow)
Center-of-Mass det. time= 70.8 min (954.3 - 883.6)

Volume	Invert	Avail.Storage	Storage Description
#1	946.00'	13.850 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
946.00	0.000	0.000	0.000
949.00	3.300	4.950	4.950
950.00	4.500	3.900	8.850
951.00	5.500	5.000	13.850

Device	Routing	Invert	Outlet Devices
#1	Primary	946.00'	**36.0" Round Culvert** L= 37.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 946.00' / 945.25' S= 0.0203 '/' Cc= 0.900 n= 0.024, Flow Area= 7.07 sf
#2	Primary	946.00'	**36.0" Round Culvert** L= 37.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 946.00' / 945.25' S= 0.0203 '/' Cc= 0.900 n= 0.024, Flow Area= 7.07 sf
#3	Primary	950.00'	**50.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=192.93 cfs @ 12.72 hrs HW=950.80' TW=946.70' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 48.84 cfs @ 6.91 fps)
- **2=Culvert** (Inlet Controls 48.84 cfs @ 6.91 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 95.24 cfs @ 2.37 fps)

Summary for Pond Cb: Windsor Road Culvert

Inflow Area =	5.500 ac,	0.00% Impervious,	Inflow Depth =	2.62"	for 100-yr event
Inflow =	14.32 cfs @	12.18 hrs,	Volume=	1.201 af	
Outflow =	4.58 cfs @	12.58 hrs,	Volume=	1.181 af,	Atten= 68%, Lag= 24.0 min
Primary =	4.58 cfs @	12.58 hrs,	Volume=	1.181 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 945.90' @ 12.58 hrs Surf.Area= 0.301 ac Storage= 0.451 af

Plug-Flow detention time= 148.3 min calculated for 1.181 af (98% of inflow)
Center-of-Mass det. time= 138.4 min (994.4 - 856.0)

Volume	Invert	Avail.Storage	Storage Description
#1	945.00'	1.500 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.00	0.000	0.000	0.000
948.00	1.000	1.500	1.500

Device	Routing	Invert	Outlet Devices
#1	Primary	945.00'	**36.0" Round Culvert** L= 103.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 945.00' / 942.94' S= 0.0200 '/' Cc= 0.900 n= 0.024, Flow Area= 7.07 sf

Primary OutFlow Max=4.58 cfs @ 12.58 hrs HW=945.90' TW=943.60' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.58 cfs @ 2.55 fps)

Summary for Pond Db: HWY 51 Culvert

Inflow Area = 299.500 ac, 0.00% Impervious, Inflow Depth > 2.61" for 100-yr event
Inflow = 256.27 cfs @ 12.24 hrs, Volume= 65.183 af
Outflow = 254.78 cfs @ 12.26 hrs, Volume= 65.179 af, Atten= 1%, Lag= 1.0 min
Primary = 254.78 cfs @ 12.26 hrs, Volume= 65.179 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 933.01' @ 12.26 hrs Surf.Area= 0.007 ac Storage= 0.014 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (932.7 - 932.7)

Volume	Invert	Avail.Storage	Storage Description
#1	933.00'	22.000 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
933.00	0.000	0.000	0.000
937.00	5.000	10.000	10.000
939.00	7.000	12.000	22.000

Device	Routing	Invert	Outlet Devices
#1	Primary	926.47'	**48.0" Round Culvert** L= 108.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.47' / 925.19' S= 0.0119 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Primary	926.47'	**48.0" Round Culvert** L= 106.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 926.47' / 925.34' S= 0.0107 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#3	Secondary	928.00'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=257.72 cfs @ 12.26 hrs HW=933.01' TW=927.40' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 128.86 cfs @ 10.25 fps)
└─**2=Culvert** (Inlet Controls 128.86 cfs @ 10.25 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=933.00' TW=934.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond Eb: HWY 51 Culvert

Inflow Area =	31.000 ac,	0.00% Impervious,	Inflow Depth =	2.62"	for 100-yr event
Inflow =	82.25 cfs @	12.17 hrs,	Volume=	6.770 af	
Outflow =	82.25 cfs @	12.17 hrs,	Volume=	6.770 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.69 cfs @	12.17 hrs,	Volume=	0.139 af	
Secondary =	80.56 cfs @	12.17 hrs,	Volume=	6.632 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 934.00' @ 5.00 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (855.3 - 855.3)

Volume	Invert	Avail.Storage	Storage Description
#1	934.00'	4.000 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
934.00	0.000	0.000	0.000
938.00	2.000	4.000	4.000

Device	Routing	Invert	Outlet Devices
#1	Primary	925.84'	**24.0" Round Culvert** L= 72.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 925.84' / 925.40' S= 0.0061 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	928.00'	**50.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 12.17 hrs HW=934.00' TW=926.63' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.00 cfs of 40.48 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 12.17 hrs HW=934.00' TW=926.63' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Passes 0.00 cfs of 1,932.65 cfs potential flow)

Summary for Pond Fb: Windsor Road Culvert

Inflow Area = 24.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 50.00 cfs @ 12.29 hrs, Volume= 5.242 af
Outflow = 50.00 cfs @ 12.29 hrs, Volume= 5.242 af, Atten= 0%, Lag= 0.0 min
Primary = 13.48 cfs @ 12.29 hrs, Volume= 1.414 af
Secondary = 36.51 cfs @ 12.29 hrs, Volume= 3.828 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 939.00' @ 12.29 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (864.9 - 864.9)

Volume	Invert	Avail.Storage	Storage Description
#1	939.00'	2.000 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
939.00	0.000	0.000	0.000
942.00	0.750	1.125	1.125
943.00	1.000	0.875	2.000

Device	Routing	Invert	Outlet Devices
#1	Primary	935.54'	**24.0" Round Culvert** L= 119.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 935.54' / 933.39' S= 0.0181 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Secondary	938.50'	**50.0' long x 40.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=17.63 cfs @ 12.29 hrs HW=939.00' TW=934.31' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 17.63 cfs @ 5.61 fps)

Secondary OutFlow Max=47.73 cfs @ 12.29 hrs HW=939.00' TW=934.31' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 47.73 cfs @ 1.91 fps)

Summary for Pond Hb: HWY 51 Culvert

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af
Outflow = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af, Atten= 0%, Lag= 0.0 min
Primary = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 959.00' @ 12.35 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (868.6 - 868.6)

Volume	Invert	Avail.Storage	Storage Description
#1	959.00'	5.400 af	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.00	0.000	0.000	0.000
960.00	0.200	0.100	0.100
965.00	1.000	3.000	3.100
967.00	1.300	2.300	5.400

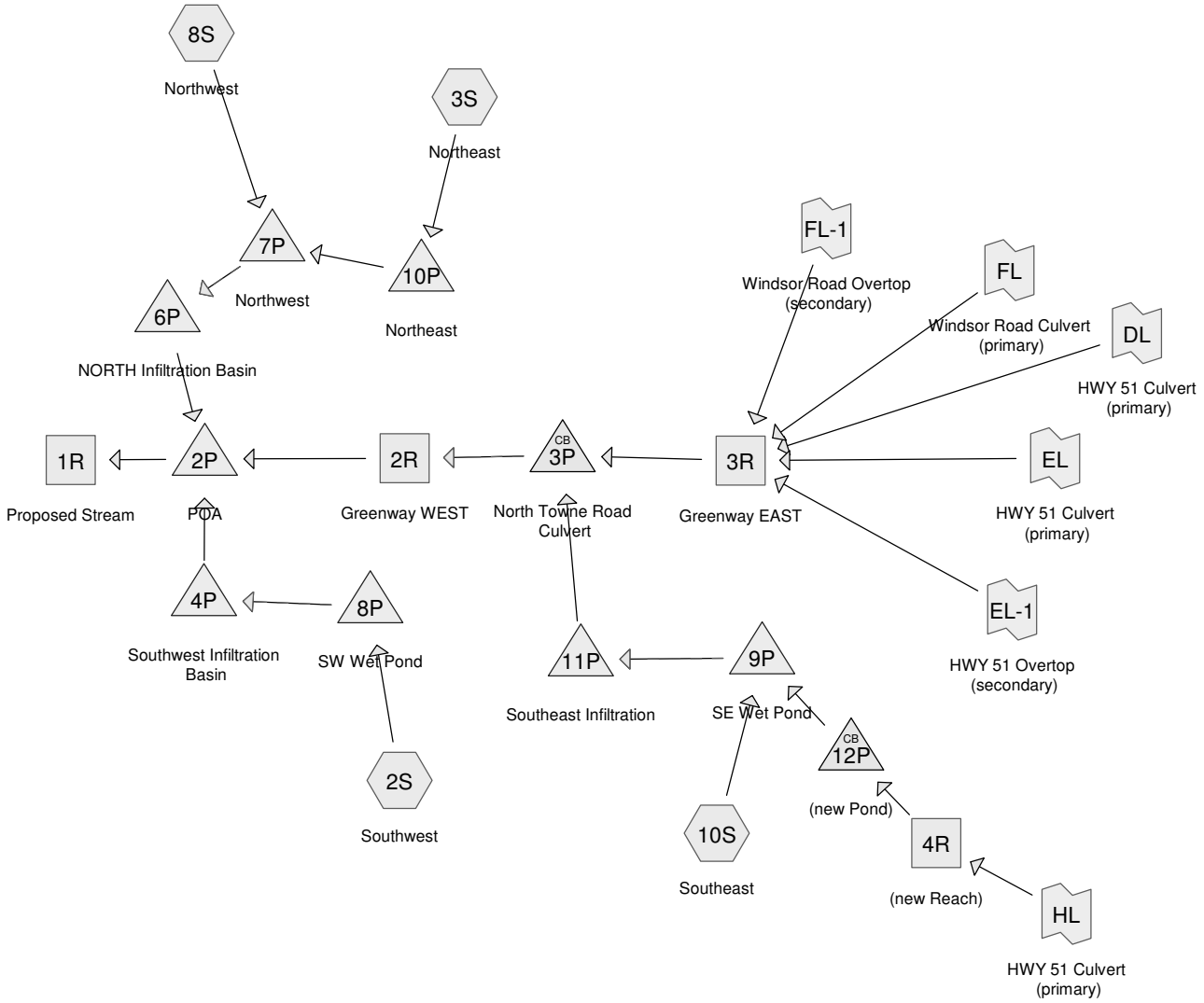
Device	Routing	Invert	Outlet Devices
#1	Primary	956.15'	**36.0" Round Culvert** L= 122.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 956.15' / 951.37' S= 0.0392 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf
#2	Secondary	964.00'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=49.84 cfs @ 12.35 hrs HW=959.00' TW=952.03' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 49.84 cfs @ 7.18 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=959.00' TW=934.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

APPENDIX D

PROPOSED HYDROCAD OUTPUT



Subcat Reach Pond Link

Routing Diagram for Drainage Study (Developed)
Prepared by {enter your company name here}, Printed 1/22/2015
HydroCAD® 10.00-12 s/n 02063 © 2014 HydroCAD Software Solutions LLC

Summary for Subcatchment 2S: Southwest

Runoff = 37.23 cfs @ 12.10 hrs, Volume= 2.576 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
	23.900	83	1/4 acre lots, 38% imp, HSG C
	1.300	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	27.700	84	Weighted Average
	16.118		58.19% Pervious Area
	11.582		41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.1	150	0.0130	47.04	677.39	**Channel Flow, Curb & Gutter** Area= 14.4 sf Perim= 2.1' r= 6.86' n= 0.013
2.0	1,000	0.0130	8.21	25.79	**Pipe Channel, Storm Sewer** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
17.1	1,250	Total			

Summary for Subcatchment 3S: Northeast

Runoff = 24.20 cfs @ 12.16 hrs, Volume= 2.031 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
	11.700	94	Urban commercial, 85% imp, HSG C
	1.000	74	>75% Grass cover, Good, HSG C
*	1.000	98	Basin Area
	13.700	93	Weighted Average
	2.755		20.11% Pervious Area
	10.945		79.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.90"
2.0	270	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.7	600	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.7	970	Total			

Summary for Subcatchment 8S: Northwest

Runoff = 19.99 cfs @ 12.15 hrs, Volume= 1.635 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
	6.900	94	Urban commercial, 85% imp, HSG C
*	3.000	98	Basin Area
	0.600	74	>75% Grass cover, Good, HSG C
	10.500	94	Weighted Average
	1.635		15.57% Pervious Area
	8.865		84.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
7.4	1,100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
22.4	1,200	Total			

Summary for Subcatchment 10S: Southeast

Runoff = 36.31 cfs @ 12.07 hrs, Volume= 2.321 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
	4.900	83	1/4 acre lots, 38% imp, HSG C
	10.500	90	1/8 acre lots, 65% imp, HSG C
	4.500	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	22.400	86	Weighted Average
	11.213		50.06% Pervious Area
	11.187		49.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0800	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.5	130	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.2	380	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	1,900	0.0100	9.05	44.44	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012

14.8 2,510 Total

Summary for Reach 1R: Proposed Stream

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 0.30" for 1-yr event
Inflow = 18.44 cfs @ 13.68 hrs, Volume= 11.189 af
Outflow = 18.43 cfs @ 13.71 hrs, Volume= 11.186 af, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.06 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 7.4 min

Peak Storage= 3,616 cf @ 13.71 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 4.00' Flow Area= 98.0 sf, Capacity= 789.03 cfs

Custom cross-section, Length= 600.0' Slope= 0.0100 '/'
Constant n= 0.030 Earth, grassed & winding
Inlet Invert= 914.75', Outlet Invert= 908.75'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-23.00	4.00	0.00
-19.00	3.00	1.00
-9.00	2.00	2.00
-5.00	0.00	4.00
0.00	0.00	4.00
5.00	0.00	4.00
9.00	2.00	2.00
19.00	3.00	1.00
23.00	4.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
2.00	28.0	18.9	16,800	179.96
3.00	56.0	39.0	33,600	352.78
4.00	98.0	47.3	58,800	789.03

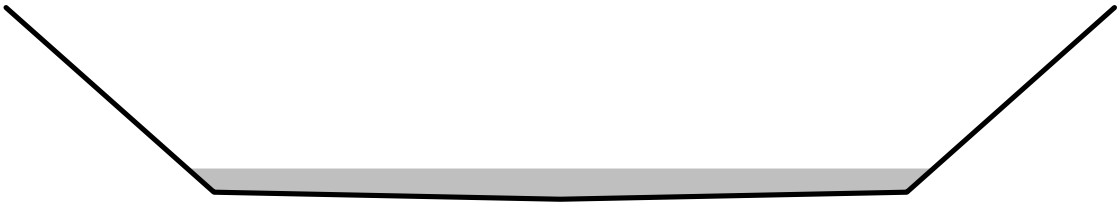
Summary for Reach 2R: Greenway WEST

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 0.34" for 1-yr event
Inflow = 18.45 cfs @ 13.61 hrs, Volume= 11.194 af
Outflow = 18.44 cfs @ 13.68 hrs, Volume= 11.189 af, Atten= 0%, Lag= 3.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.02 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 13.2 min

Peak Storage= 6,391 cf @ 13.68 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 4.15' Flow Area= 79.1 sf, Capacity= 485.93 cfs

Custom cross-section, Length= 700.0' Slope= 0.0050 '/' (101 Elevation Intervals)
Constant n= 0.035
Inlet Invert= 909.50', Outlet Invert= 906.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-12.00	4.15	0.00
-7.50	0.15	4.00
0.00	0.00	4.15
7.50	0.15	4.00
12.00	4.15	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.15	1.1	15.0	788	0.60
4.15	79.1	27.0	55,388	485.93

Summary for Reach 3R: Greenway EAST

Inflow Area = 354.500 ac, 0.00% Impervious, Inflow Depth > 0.38" for 1-yr event
Inflow = 33.22 cfs @ 12.25 hrs, Volume= 11.255 af
Outflow = 18.45 cfs @ 13.61 hrs, Volume= 11.194 af, Atten= 44%, Lag= 81.7 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.35 fps, Min. Travel Time= 52.9 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 122.8 min

Peak Storage= 58,519 cf @ 13.61 hrs
Average Depth at Peak Storage= 0.99'
Bank-Full Depth= 5.00' Flow Area= 350.0 sf, Capacity= 315.57 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0075 '/'
Constant n= 0.350
Inlet Invert= 924.00', Outlet Invert= 915.74'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-45.00	5.00	0.00
-25.00	0.00	5.00
0.00	0.00	5.00
25.00	0.00	5.00
45.00	5.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	50.0	0	0.00
5.00	350.0	91.2	385,000	315.57

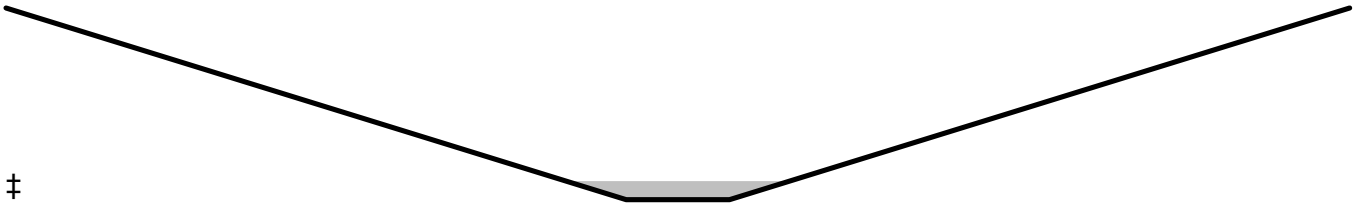
Summary for Reach 4R: (new Reach)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.39" for 1-yr event
Inflow = 2.96 cfs @ 12.43 hrs, Volume= 0.485 af
Outflow = 2.95 cfs @ 12.45 hrs, Volume= 0.485 af, Atten= 1%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.17 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 4.4 min

Peak Storage= 381 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 507.65 cfs

2.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 410.0' Slope= 0.0326 '/'
Inlet Invert= 951.37', Outlet Invert= 938.00'



‡

Summary for Pond 2P: POA

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 0.30" for 1-yr event
Inflow = 18.44 cfs @ 13.68 hrs, Volume= 11.189 af
Primary = 18.44 cfs @ 13.68 hrs, Volume= 11.189 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Summary for Pond 3P: North Towne Road Culvert

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 0.34" for 1-yr event
Inflow = 18.45 cfs @ 13.61 hrs, Volume= 11.194 af
Outflow = 18.45 cfs @ 13.61 hrs, Volume= 11.194 af, Atten= 0%, Lag= 0.0 min
Primary = 18.45 cfs @ 13.61 hrs, Volume= 11.194 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 916.49' @ 13.61 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	915.72'	**96.0" W x 48.0" H Box Culvert** L= 200.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 915.72' / 914.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 32.00 sf
#2	Secondary	925.00'	**50.0' long x 80.0' breadth Overtop Street** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=18.45 cfs @ 13.61 hrs HW=916.49' TW=910.16' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 18.45 cfs @ 3.01 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=915.72' TW=909.50' (Dynamic Tailwater)
└**2=Overtop Street** (Controls 0.00 cfs)

Summary for Pond 4P: Southwest Infiltration Basin

Inflow Area = 27.700 ac, 41.81% Impervious, Inflow Depth > 1.01" for 1-yr event
Inflow = 1.56 cfs @ 15.17 hrs, Volume= 2.339 af
Outflow = 0.86 cfs @ 27.84 hrs, Volume= 2.339 af, Atten= 45%, Lag= 760.3 min
Discarded = 0.86 cfs @ 27.84 hrs, Volume= 2.339 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 913.52' @ 27.84 hrs Surf.Area= 22,697 sf Storage= 30,998 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 396.4 min (1,788.9 - 1,392.5)

Volume	Invert	Avail.Storage	Storage Description
#1	912.00'	163,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
912.00	18,000	0	0
918.00	36,500	163,500	163,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	912.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	917.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Primary	914.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 914.00' / 913.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.86 cfs @ 27.84 hrs HW=913.52' (Free Discharge)
└─**1=Infiltration** (Controls 0.86 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=912.00' TW=0.00' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond 6P: NORTH Infiltration Basin

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 1.56" for 1-yr event			
Inflow =	1.69 cfs @	15.39 hrs, Volume=	3.152 af	
Outflow =	1.69 cfs @	15.48 hrs, Volume=	3.152 af, Atten= 0%, Lag= 5.6 min	
Discarded =	1.69 cfs @	15.48 hrs, Volume=	3.152 af	
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 913.00' @ 15.48 hrs Surf.Area= 45,001 sf Storage= 7 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (1,517.3 - 1,517.3)

Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	404,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.00	45,000	0	0
920.00	70,600	404,600	404,600

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	**200.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	913.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	915.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 914.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=1.70 cfs @ 15.48 hrs HW=913.00' (Free Discharge)
└─**2=Infiltration** (Controls 1.70 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=913.00' TW=0.00' (Dynamic Tailwater)
├─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond 7P: Northwest

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 1.70" for 1-yr event			
Inflow =	24.09 cfs @	12.17 hrs, Volume=	3.433 af	
Outflow =	1.69 cfs @	15.39 hrs, Volume=	3.152 af, Atten= 93%, Lag= 193.2 min	
Primary =	1.69 cfs @	15.39 hrs, Volume=	3.152 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.05' @ 15.39 hrs Surf.Area= 33,768 sf Storage= 59,673 cf

Plug-Flow detention time= 522.4 min calculated for 3.151 af (92% of inflow)
Center-of-Mass det. time= 409.6 min (1,517.3 - 1,107.7)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	179,626 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	24,548	0	0
916.00	28,970	26,759	26,759
918.00	38,116	67,086	93,845
920.00	47,665	85,781	179,626

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900

			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	917.50'	**10.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 917.50' / 917.00' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.55 sf
#3	Secondary	918.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.69 cfs @ 15.39 hrs HW=917.05' TW=913.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.69 cfs @ 4.84 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=915.00' TW=913.00' (Dynamic Tailwater)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: SW Wet Pond

Inflow Area =	27.700 ac,	41.81% Impervious,	Inflow Depth =	1.12"	for 1-yr event
Inflow =	37.23 cfs @	12.10 hrs,	Volume=	2.576 af	
Outflow =	1.56 cfs @	15.17 hrs,	Volume=	2.339 af,	Atten= 96%, Lag= 184.2 min
Primary =	1.56 cfs @	15.17 hrs,	Volume=	2.339 af	
Secondary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 915.84' @ 15.17 hrs Surf.Area= 39,744 sf Storage= 67,513 cf

Plug-Flow detention time= 591.1 min calculated for 2.338 af (91% of inflow)
Center-of-Mass det. time= 544.0 min (1,392.5 - 848.5)

Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	161,504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
914.00	33,570	0	0
916.00	40,275	73,845	73,845
918.00	47,384	87,659	161,504

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 914.00' / 914.00' S= 0.0000 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	916.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 916.00' / 915.50' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#3	Secondary	917.00'	**80.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.56 cfs @ 15.17 hrs HW=915.84' TW=912.45' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.56 cfs @ 4.46 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=914.00' TW=912.00' (Dynamic Tailwater)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: SE Wet Pond

Inflow Area =	37.400 ac, 29.91% Impervious, Inflow Depth = 0.90" for 1-yr event				
Inflow =	36.65 cfs @	12.07 hrs,	Volume=	2.806 af	
Outflow =	1.77 cfs @	15.19 hrs,	Volume=	2.600 af,	Atten= 95%, Lag= 187.0 min
Primary =	1.77 cfs @	15.19 hrs,	Volume=	2.600 af	
Secondary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 922.04' @ 15.19 hrs Surf.Area= 38,202 sf Storage= 70,727 cf

Plug-Flow detention time= 555.4 min calculated for 2.600 af (93% of inflow)
Center-of-Mass det. time= 515.7 min (1,371.6 - 855.9)

Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	306,033 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
920.00	31,247	0	0
922.00	38,067	69,314	69,314
924.00	45,332	83,399	152,713
926.00	52,998	98,330	251,043
927.00	56,982	54,990	306,033

Device	Routing	Invert	Outlet Devices
#1	Primary	920.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 920.00' S= 0.0000 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Secondary	922.60'	**8.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.60' / 922.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Secondary	923.80'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.77 cfs @ 15.19 hrs HW=922.04' TW=918.22' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.77 cfs @ 5.07 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=920.00' TW=918.00' (Dynamic Tailwater)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Northeast

Inflow Area = 13.700 ac, 79.89% Impervious, Inflow Depth = 1.78" for 1-yr event
Inflow = 24.20 cfs @ 12.16 hrs, Volume= 2.031 af
Outflow = 5.49 cfs @ 12.30 hrs, Volume= 1.797 af, Atten= 77%, Lag= 8.2 min
Primary = 5.49 cfs @ 12.30 hrs, Volume= 1.797 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.05' @ 15.40 hrs Surf.Area= 28,703 sf Storage= 50,073 cf

Plug-Flow detention time= 622.6 min calculated for 1.797 af (88% of inflow)
Center-of-Mass det. time= 565.8 min (1,380.6 - 814.8)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	153,466 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	20,208	0	0
916.00	24,273	22,241	22,241
918.00	32,706	56,979	79,220
920.00	41,540	74,246	153,466

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**48.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Primary	919.50'	**60.0' long x 80.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.47 cfs @ 12.30 hrs HW=916.51' TW=916.42' (Dynamic Tailwater)
├─**1=Culvert** (Outlet Controls 4.47 cfs @ 1.54 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: Southeast Infiltration

Inflow Area = 37.400 ac, 29.91% Impervious, Inflow Depth > 0.83" for 1-yr event
Inflow = 1.77 cfs @ 15.19 hrs, Volume= 2.600 af
Outflow = 1.19 cfs @ 25.92 hrs, Volume= 2.600 af, Atten= 33%, Lag= 644.1 min
Discarded = 1.19 cfs @ 25.92 hrs, Volume= 2.600 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 918.72' @ 25.92 hrs Surf.Area= 31,564 sf Storage= 21,704 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 183.1 min (1,554.7 - 1,371.6)

Volume	Invert	Avail.Storage	Storage Description
#1	918.00'	428,184 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.00	28,500	0	0
927.00	66,652	428,184	428,184

Device	Routing	Invert	Outlet Devices
#1	Discarded	918.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	920.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 919.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	926.00'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.19 cfs @ 25.92 hrs HW=918.72' (Free Discharge)
└─**1=Infiltration** (Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=918.00' TW=915.72' (Dynamic Tailwater)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: (new Pond)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.39" for 1-yr event
Inflow = 2.95 cfs @ 12.45 hrs, Volume= 0.485 af
Outflow = 2.95 cfs @ 12.45 hrs, Volume= 0.485 af, Atten= 0%, Lag= 0.0 min
Primary = 2.95 cfs @ 12.45 hrs, Volume= 0.485 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 938.58' @ 12.45 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	938.00'	**48.0" Round Culvert** L= 1,100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 938.00' / 920.00' S= 0.0164 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Primary OutFlow Max=2.94 cfs @ 12.45 hrs HW=938.58' TW=921.60' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.94 cfs @ 2.60 fps)

Summary for Link DL: HWY 51 Culvert (primary)

Inflow Area = 299.500 ac, 0.00% Impervious, Inflow Depth > 0.38" for 1-yr event
Inflow = 20.30 cfs @ 12.25 hrs, Volume= 9.477 af
Primary = 20.30 cfs @ 12.25 hrs, Volume= 9.477 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

1-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Db.hce

Summary for Link EL: HWY 51 Culvert (primary)

Inflow Area = 31.000 ac, 0.00% Impervious, Inflow Depth = 0.01" for 1-yr event
Inflow = 0.18 cfs @ 12.21 hrs, Volume= 0.021 af
Primary = 0.18 cfs @ 12.21 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

1-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link EL-1: HWY 51 Overtop (secondary)

Inflow = 8.45 cfs @ 12.21 hrs, Volume= 0.981 af
Primary = 8.45 cfs @ 12.21 hrs, Volume= 0.981 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

1-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link FL: Windsor Road Culvert (primary)

Inflow Area = 24.000 ac, 0.00% Impervious, Inflow Depth = 0.10" for 1-yr event
Inflow = 1.39 cfs @ 12.36 hrs, Volume= 0.209 af
Primary = 1.39 cfs @ 12.36 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

1-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link FL-1: Windsor Road Overtop (secondary)

Inflow = 3.76 cfs @ 12.36 hrs, Volume= 0.567 af
Primary = 3.76 cfs @ 12.36 hrs, Volume= 0.567 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

1-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link HL: HWY 51 Culvert (primary)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.39" for 1-yr event
Inflow = 2.96 cfs @ 12.43 hrs, Volume= 0.485 af
Primary = 2.96 cfs @ 12.43 hrs, Volume= 0.485 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

1-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Hb.hce

Summary for Subcatchment 2S: Southwest

Runoff = 48.10 cfs @ 12.10 hrs, Volume= 3.311 af, Depth= 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-yr Rainfall=2.90"

	Area (ac)	CN	Description
	23.900	83	1/4 acre lots, 38% imp, HSG C
	1.300	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	27.700	84	Weighted Average
	16.118		58.19% Pervious Area
	11.582		41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.1	150	0.0130	47.04	677.39	**Channel Flow, Curb & Gutter** Area= 14.4 sf Perim= 2.1' r= 6.86' n= 0.013
2.0	1,000	0.0130	8.21	25.79	**Pipe Channel, Storm Sewer** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
17.1	1,250	Total			

Summary for Subcatchment 3S: Northeast

Runoff = 29.15 cfs @ 12.16 hrs, Volume= 2.464 af, Depth> 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-yr Rainfall=2.90"

	Area (ac)	CN	Description
	11.700	94	Urban commercial, 85% imp, HSG C
	1.000	74	>75% Grass cover, Good, HSG C
*	1.000	98	Basin Area
	13.700	93	Weighted Average
	2.755		20.11% Pervious Area
	10.945		79.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.90"
2.0	270	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.7	600	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.7	970	Total			

Summary for Subcatchment 8S: Northwest

Runoff = 23.90 cfs @ 12.15 hrs, Volume= 1.970 af, Depth> 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-yr Rainfall=2.90"

	Area (ac)	CN	Description
	6.900	94	Urban commercial, 85% imp, HSG C
*	3.000	98	Basin Area
	0.600	74	>75% Grass cover, Good, HSG C
	10.500	94	Weighted Average
	1.635		15.57% Pervious Area
	8.865		84.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
7.4	1,100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
22.4	1,200	Total			

Summary for Subcatchment 10S: Southeast

Runoff = 46.06 cfs @ 12.07 hrs, Volume= 2.944 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 2-yr Rainfall=2.90"

	Area (ac)	CN	Description
	4.900	83	1/4 acre lots, 38% imp, HSG C
	10.500	90	1/8 acre lots, 65% imp, HSG C
	4.500	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	22.400	86	Weighted Average
	11.213		50.06% Pervious Area
	11.187		49.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0800	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.5	130	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.2	380	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	1,900	0.0100	9.05	44.44	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012

14.8 2,510 Total

Summary for Reach 1R: Proposed Stream

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 0.46" for 2-yr event
Inflow = 35.20 cfs @ 13.29 hrs, Volume= 16.838 af
Outflow = 35.19 cfs @ 13.32 hrs, Volume= 16.835 af, Atten= 0%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.83 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 6.6 min

Peak Storage= 5,518 cf @ 13.32 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 4.00' Flow Area= 98.0 sf, Capacity= 789.03 cfs

Custom cross-section, Length= 600.0' Slope= 0.0100 '/'
Constant n= 0.030 Earth, grassed & winding
Inlet Invert= 914.75', Outlet Invert= 908.75'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-23.00	4.00	0.00
-19.00	3.00	1.00
-9.00	2.00	2.00
-5.00	0.00	4.00
0.00	0.00	4.00
5.00	0.00	4.00
9.00	2.00	2.00
19.00	3.00	1.00
23.00	4.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
2.00	28.0	18.9	16,800	179.96
3.00	56.0	39.0	33,600	352.78
4.00	98.0	47.3	58,800	789.03

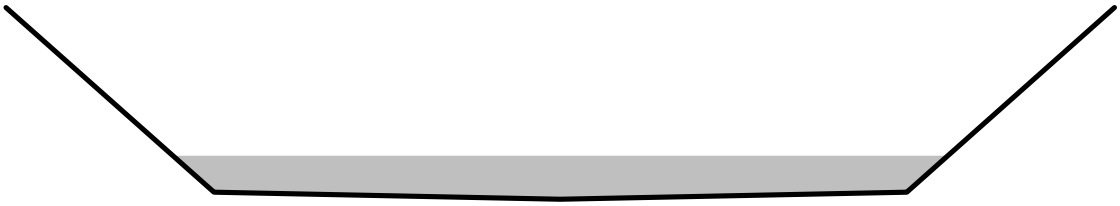
Summary for Reach 2R: Greenway WEST

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 0.51" for 2-yr event
Inflow = 35.24 cfs @ 13.24 hrs, Volume= 16.736 af
Outflow = 35.20 cfs @ 13.29 hrs, Volume= 16.730 af, Atten= 0%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.56 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 11.8 min

Peak Storage= 9,608 cf @ 13.29 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 4.15' Flow Area= 79.1 sf, Capacity= 485.93 cfs

Custom cross-section, Length= 700.0' Slope= 0.0050 '/' (101 Elevation Intervals)
Constant n= 0.035
Inlet Invert= 909.50', Outlet Invert= 906.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-12.00	4.15	0.00
-7.50	0.15	4.00
0.00	0.00	4.15
7.50	0.15	4.00
12.00	4.15	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.15	1.1	15.0	788	0.60
4.15	79.1	27.0	55,388	485.93

Summary for Reach 3R: Greenway EAST

Inflow Area = 354.500 ac, 0.00% Impervious, Inflow Depth > 0.57" for 2-yr event
Inflow = 56.63 cfs @ 12.24 hrs, Volume= 16.798 af
Outflow = 35.24 cfs @ 13.24 hrs, Volume= 16.736 af, Atten= 38%, Lag= 60.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.44 fps, Min. Travel Time= 41.8 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 110.1 min

Peak Storage= 88,470 cf @ 13.24 hrs
Average Depth at Peak Storage= 1.44'
Bank-Full Depth= 5.00' Flow Area= 350.0 sf, Capacity= 315.57 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0075 '/'
Constant n= 0.350
Inlet Invert= 924.00', Outlet Invert= 915.74'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-45.00	5.00	0.00
-25.00	0.00	5.00
0.00	0.00	5.00
25.00	0.00	5.00
45.00	5.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	50.0	0	0.00
5.00	350.0	91.2	385,000	315.57

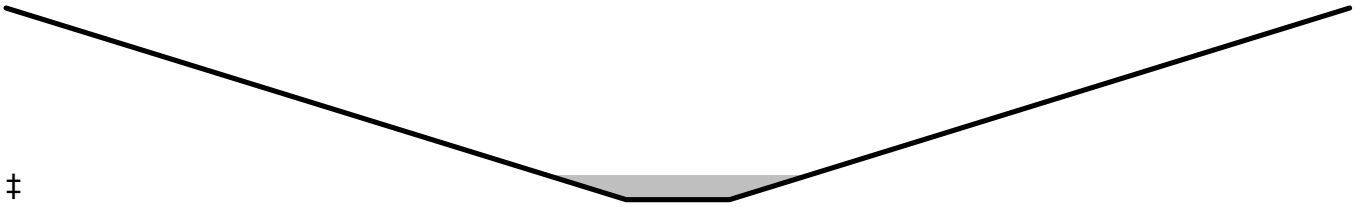
Summary for Reach 4R: (new Reach)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.58" for 2-yr event
Inflow = 5.01 cfs @ 12.40 hrs, Volume= 0.720 af
Outflow = 4.99 cfs @ 12.42 hrs, Volume= 0.720 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.67 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.72 fps, Avg. Travel Time= 4.0 min

Peak Storage= 557 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 507.65 cfs

2.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 410.0' Slope= 0.0326 '/'
Inlet Invert= 951.37', Outlet Invert= 938.00'



‡

Summary for Pond 2P: POA

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 0.46" for 2-yr event
Inflow = 35.20 cfs @ 13.29 hrs, Volume= 16.838 af
Primary = 35.20 cfs @ 13.29 hrs, Volume= 16.838 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Summary for Pond 3P: North Towne Road Culvert

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 0.51" for 2-yr event
Inflow = 35.24 cfs @ 13.24 hrs, Volume= 16.736 af
Outflow = 35.24 cfs @ 13.24 hrs, Volume= 16.736 af, Atten= 0%, Lag= 0.0 min
Primary = 35.24 cfs @ 13.24 hrs, Volume= 16.736 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 916.90' @ 13.24 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	915.72'	**96.0" W x 48.0" H Box Culvert** L= 200.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 915.72' / 914.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 32.00 sf
#2	Secondary	925.00'	**50.0' long x 80.0' breadth Overtop Street** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=35.24 cfs @ 13.24 hrs HW=916.90' TW=910.44' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 35.24 cfs @ 3.73 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=915.72' TW=909.50' (Dynamic Tailwater)
└**2=Overtop Street** (Controls 0.00 cfs)

Summary for Pond 4P: Southwest Infiltration Basin

Inflow Area = 27.700 ac, 41.81% Impervious, Inflow Depth > 1.32" for 2-yr event
Inflow = 2.19 cfs @ 14.50 hrs, Volume= 3.046 af
Outflow = 1.17 cfs @ 27.65 hrs, Volume= 2.686 af, Atten= 47%, Lag= 788.8 min
Discarded = 0.94 cfs @ 27.65 hrs, Volume= 2.578 af
Primary = 0.23 cfs @ 27.65 hrs, Volume= 0.107 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 914.20' @ 27.65 hrs Surf.Area= 24,770 sf Storage= 46,958 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 406.1 min (1,802.6 - 1,396.5)

Volume	Invert	Avail.Storage	Storage Description
#1	912.00'	163,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
912.00	18,000	0	0
918.00	36,500	163,500	163,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	912.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	917.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Primary	914.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 914.00' / 913.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.94 cfs @ 27.65 hrs HW=914.20' (Free Discharge)
└─**1=Infiltration** (Controls 0.94 cfs)

Primary OutFlow Max=0.23 cfs @ 27.65 hrs HW=914.20' TW=0.00' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 0.23 cfs @ 2.21 fps)

Summary for Pond 6P: NORTH Infiltration Basin

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 1.89" for 2-yr event			
Inflow =	1.91 cfs @	15.56 hrs, Volume=	3.811 af	
Outflow =	1.72 cfs @	23.92 hrs, Volume=	3.811 af, Atten= 10%, Lag= 501.7 min	
Discarded =	1.72 cfs @	23.92 hrs, Volume=	3.811 af	
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 913.12' @ 23.92 hrs Surf.Area= 45,453 sf Storage= 5,605 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 24.0 min (1,573.0 - 1,549.0)

Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	404,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.00	45,000	0	0
920.00	70,600	404,600	404,600

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	**200.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	913.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	915.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 914.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=1.72 cfs @ 23.92 hrs HW=913.12' (Free Discharge)
└─**2=Infiltration** (Controls 1.72 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=913.00' TW=0.00' (Dynamic Tailwater)
├─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond 7P: Northwest

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 2.06" for 2-yr event			
Inflow =	29.28 cfs @	12.17 hrs, Volume=	4.151 af	
Outflow =	1.91 cfs @	15.56 hrs, Volume=	3.811 af, Atten= 93%, Lag= 203.5 min	
Primary =	1.91 cfs @	15.56 hrs, Volume=	3.811 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.44' @ 15.56 hrs Surf.Area= 35,537 sf Storage= 73,077 cf

Plug-Flow detention time= 546.3 min calculated for 3.811 af (92% of inflow)
Center-of-Mass det. time= 430.6 min (1,549.0 - 1,118.4)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	179,626 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	24,548	0	0
916.00	28,970	26,759	26,759
918.00	38,116	67,086	93,845
920.00	47,665	85,781	179,626

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900

			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	917.50'	**10.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 917.50' / 917.00' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.55 sf
#3	Secondary	918.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.91 cfs @ 15.56 hrs HW=917.44' TW=913.04' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.91 cfs @ 5.48 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=915.00' TW=913.00' (Dynamic Tailwater)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: SW Wet Pond

Inflow Area =	27.700 ac, 41.81% Impervious, Inflow Depth = 1.43" for 2-yr event				
Inflow =	48.10 cfs @	12.10 hrs,	Volume=	3.311 af	
Outflow =	2.19 cfs @	14.50 hrs,	Volume=	3.046 af,	Atten= 95%, Lag= 144.3 min
Primary =	1.85 cfs @	14.50 hrs,	Volume=	2.929 af	
Secondary =	0.34 cfs @	14.50 hrs,	Volume=	0.117 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 916.33' @ 14.50 hrs Surf.Area= 41,450 sf Storage= 87,359 cf

Plug-Flow detention time= 597.3 min calculated for 3.044 af (92% of inflow)
Center-of-Mass det. time= 555.2 min (1,396.5 - 841.3)

Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	161,504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
914.00	33,570	0	0
916.00	40,275	73,845	73,845
918.00	47,384	87,659	161,504

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 914.00' / 914.00' S= 0.0000 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	916.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 916.00' / 915.50' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#3	Secondary	917.00'	**80.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.85 cfs @ 14.50 hrs HW=916.33' TW=912.57' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.85 cfs @ 5.31 fps)

Secondary OutFlow Max=0.34 cfs @ 14.50 hrs HW=916.33' TW=912.57' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 0.34 cfs @ 1.96 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: SE Wet Pond

Inflow Area =	37.400 ac, 29.91% Impervious, Inflow Depth = 1.18" for 2-yr event				
Inflow =	46.99 cfs @	12.07 hrs,	Volume=	3.664 af	
Outflow =	2.16 cfs @	15.35 hrs,	Volume=	3.424 af,	Atten= 95%, Lag= 196.4 min
Primary =	2.14 cfs @	15.35 hrs,	Volume=	3.422 af	
Secondary =	0.02 cfs @	15.35 hrs,	Volume=	0.002 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 922.67' @ 15.35 hrs Surf.Area= 40,493 sf Storage= 95,552 cf

Plug-Flow detention time= 595.2 min calculated for 3.422 af (93% of inflow)
Center-of-Mass det. time= 559.7 min (1,409.2 - 849.5)

Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	306,033 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
920.00	31,247	0	0
922.00	38,067	69,314	69,314
924.00	45,332	83,399	152,713
926.00	52,998	98,330	251,043
927.00	56,982	54,990	306,033

Device	Routing	Invert	Outlet Devices
#1	Primary	920.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 920.00' S= 0.0000 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Secondary	922.60'	**8.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.60' / 922.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Secondary	923.80'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.14 cfs @ 15.35 hrs HW=922.67' TW=918.37' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.14 cfs @ 6.13 fps)

Secondary OutFlow Max=0.02 cfs @ 15.35 hrs HW=922.67' TW=918.37' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 0.02 cfs @ 1.25 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Northeast

Inflow Area = 13.700 ac, 79.89% Impervious, Inflow Depth > 2.16" for 2-yr event
Inflow = 29.15 cfs @ 12.16 hrs, Volume= 2.464 af
Outflow = 6.65 cfs @ 12.27 hrs, Volume= 2.181 af, Atten= 77%, Lag= 6.7 min
Primary = 6.65 cfs @ 12.27 hrs, Volume= 2.181 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.44' @ 15.58 hrs Surf.Area= 30,333 sf Storage= 61,481 cf

Plug-Flow detention time= 650.1 min calculated for 2.180 af (88% of inflow)
Center-of-Mass det. time= 594.0 min (1,403.4 - 809.5)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	153,466 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	20,208	0	0
916.00	24,273	22,241	22,241
918.00	32,706	56,979	79,220
920.00	41,540	74,246	153,466

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**48.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Primary	919.50'	**60.0' long x 80.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.96 cfs @ 12.27 hrs HW=916.73' TW=916.66' (Dynamic Tailwater)
├─**1=Culvert** (Outlet Controls 4.96 cfs @ 1.41 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: Southeast Infiltration

Inflow Area = 37.400 ac, 29.91% Impervious, Inflow Depth > 1.10" for 2-yr event
Inflow = 2.16 cfs @ 15.35 hrs, Volume= 3.424 af
Outflow = 1.28 cfs @ 28.71 hrs, Volume= 3.424 af, Atten= 40%, Lag= 801.8 min
Discarded = 1.28 cfs @ 28.71 hrs, Volume= 3.424 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 919.29' @ 28.71 hrs Surf.Area= 33,951 sf Storage= 40,151 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 337.0 min (1,746.2 - 1,409.2)

Volume	Invert	Avail.Storage	Storage Description
#1	918.00'	428,184 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.00	28,500	0	0
927.00	66,652	428,184	428,184

Device	Routing	Invert	Outlet Devices
#1	Discarded	918.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	920.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 919.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	926.00'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.28 cfs @ 28.71 hrs HW=919.29' (Free Discharge)
└─**1=Infiltration** (Controls 1.28 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=918.00' TW=915.72' (Dynamic Tailwater)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: (new Pond)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.58" for 2-yr event
Inflow = 4.99 cfs @ 12.42 hrs, Volume= 0.720 af
Outflow = 4.99 cfs @ 12.42 hrs, Volume= 0.720 af, Atten= 0%, Lag= 0.0 min
Primary = 4.99 cfs @ 12.42 hrs, Volume= 0.720 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 938.76' @ 12.42 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	938.00'	**48.0" Round Culvert** L= 1,100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 938.00' / 920.00' S= 0.0164 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Primary OutFlow Max=4.99 cfs @ 12.42 hrs HW=938.76' TW=922.05' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 4.99 cfs @ 2.98 fps)

Summary for Link DL: HWY 51 Culvert (primary)

Inflow Area = 299.500 ac, 0.00% Impervious, Inflow Depth > 0.57" for 2-yr event
Inflow = 34.63 cfs @ 12.24 hrs, Volume= 14.159 af
Primary = 34.63 cfs @ 12.24 hrs, Volume= 14.159 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

2-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Db.hce

Summary for Link EL: HWY 51 Culvert (primary)

Inflow Area = 31.000 ac, 0.00% Impervious, Inflow Depth = 0.01" for 2-yr event
Inflow = 0.30 cfs @ 12.20 hrs, Volume= 0.031 af
Primary = 0.30 cfs @ 12.20 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

2-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link EL-1: HWY 51 Overtop (secondary)

Inflow = 14.36 cfs @ 12.20 hrs, Volume= 1.457 af
Primary = 14.36 cfs @ 12.20 hrs, Volume= 1.457 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

2-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link FL: Windsor Road Culvert (primary)

Inflow Area = 24.000 ac, 0.00% Impervious, Inflow Depth = 0.16" for 2-yr event
Inflow = 2.35 cfs @ 12.35 hrs, Volume= 0.311 af
Primary = 2.35 cfs @ 12.35 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

2-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link FL-1: Windsor Road Overtop (secondary)

Inflow = 6.36 cfs @ 12.35 hrs, Volume= 0.841 af
Primary = 6.36 cfs @ 12.35 hrs, Volume= 0.841 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

2-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link HL: HWY 51 Culvert (primary)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.58" for 2-yr event
Inflow = 5.01 cfs @ 12.40 hrs, Volume= 0.720 af
Primary = 5.01 cfs @ 12.40 hrs, Volume= 0.720 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

2-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Hb.hce

Summary for Subcatchment 2S: Southwest

Runoff = 67.89 cfs @ 12.09 hrs, Volume= 4.668 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 5-yr Rainfall=3.60"

	Area (ac)	CN	Description
	23.900	83	1/4 acre lots, 38% imp, HSG C
	1.300	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	27.700	84	Weighted Average
	16.118		58.19% Pervious Area
	11.582		41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.1	150	0.0130	47.04	677.39	**Channel Flow, Curb & Gutter** Area= 14.4 sf Perim= 2.1' r= 6.86' n= 0.013
2.0	1,000	0.0130	8.21	25.79	**Pipe Channel, Storm Sewer** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
17.1	1,250	Total			

Summary for Subcatchment 3S: Northeast

Runoff = 37.80 cfs @ 12.16 hrs, Volume= 3.228 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 5-yr Rainfall=3.60"

	Area (ac)	CN	Description
	11.700	94	Urban commercial, 85% imp, HSG C
	1.000	74	>75% Grass cover, Good, HSG C
*	1.000	98	Basin Area
	13.700	93	Weighted Average
	2.755		20.11% Pervious Area
	10.945		79.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.90"
2.0	270	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.7	600	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.7	970	Total			

Summary for Subcatchment 8S: Northwest

Runoff = 30.71 cfs @ 12.14 hrs, Volume= 2.559 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 5-yr Rainfall=3.60"

	Area (ac)	CN	Description
	6.900	94	Urban commercial, 85% imp, HSG C
*	3.000	98	Basin Area
	0.600	74	>75% Grass cover, Good, HSG C
	10.500	94	Weighted Average
	1.635		15.57% Pervious Area
	8.865		84.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
7.4	1,100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
22.4	1,200	Total			

Summary for Subcatchment 10S: Southeast

Runoff = 63.60 cfs @ 12.07 hrs, Volume= 4.083 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 5-yr Rainfall=3.60"

	Area (ac)	CN	Description
	4.900	83	1/4 acre lots, 38% imp, HSG C
	10.500	90	1/8 acre lots, 65% imp, HSG C
	4.500	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	22.400	86	Weighted Average
	11.213		50.06% Pervious Area
	11.187		49.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0800	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.5	130	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.2	380	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	1,900	0.0100	9.05	44.44	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012

14.8 2,510 Total

Summary for Reach 1R: Proposed Stream

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 0.80" for 5-yr event
Inflow = 78.11 cfs @ 13.00 hrs, Volume= 29.570 af
Outflow = 78.08 cfs @ 13.02 hrs, Volume= 29.567 af, Atten= 0%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.97 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 5.6 min

Peak Storage= 9,421 cf @ 13.02 hrs
Average Depth at Peak Storage= 1.26'
Bank-Full Depth= 4.00' Flow Area= 98.0 sf, Capacity= 789.03 cfs

Custom cross-section, Length= 600.0' Slope= 0.0100 '/'
Constant n= 0.030 Earth, grassed & winding
Inlet Invert= 914.75', Outlet Invert= 908.75'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-23.00	4.00	0.00
-19.00	3.00	1.00
-9.00	2.00	2.00
-5.00	0.00	4.00
0.00	0.00	4.00
5.00	0.00	4.00
9.00	2.00	2.00
19.00	3.00	1.00
23.00	4.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
2.00	28.0	18.9	16,800	179.96
3.00	56.0	39.0	33,600	352.78
4.00	98.0	47.3	58,800	789.03

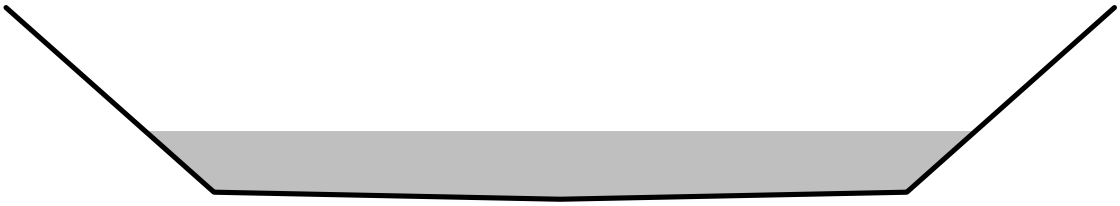
Summary for Reach 2R: Greenway WEST

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 0.87" for 5-yr event
Inflow = 78.19 cfs @ 12.96 hrs, Volume= 28.405 af
Outflow = 78.11 cfs @ 13.00 hrs, Volume= 28.399 af, Atten= 0%, Lag= 2.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.41 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 10.2 min

Peak Storage= 16,054 cf @ 13.00 hrs
Average Depth at Peak Storage= 1.47'
Bank-Full Depth= 4.15' Flow Area= 79.1 sf, Capacity= 485.93 cfs

Custom cross-section, Length= 700.0' Slope= 0.0050 '/' (101 Elevation Intervals)
Constant n= 0.035
Inlet Invert= 909.50', Outlet Invert= 906.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-12.00	4.15	0.00
-7.50	0.15	4.00
0.00	0.00	4.15
7.50	0.15	4.00
12.00	4.15	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.15	1.1	15.0	788	0.60
4.15	79.1	27.0	55,388	485.93

Summary for Reach 3R: Greenway EAST

Inflow Area = 354.500 ac, 0.00% Impervious, Inflow Depth > 0.95" for 5-yr event
Inflow = 108.07 cfs @ 12.24 hrs, Volume= 28.140 af
Outflow = 78.19 cfs @ 12.96 hrs, Volume= 28.076 af, Atten= 28%, Lag= 43.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.58 fps, Min. Travel Time= 31.8 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 96.4 min

Peak Storage= 148,958 cf @ 12.96 hrs
Average Depth at Peak Storage= 2.29'
Bank-Full Depth= 5.00' Flow Area= 350.0 sf, Capacity= 315.57 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0075 '/'
Constant n= 0.350
Inlet Invert= 924.00', Outlet Invert= 915.74'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-45.00	5.00	0.00
-25.00	0.00	5.00
0.00	0.00	5.00
25.00	0.00	5.00
45.00	5.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	50.0	0	0.00
5.00	350.0	91.2	385,000	315.57

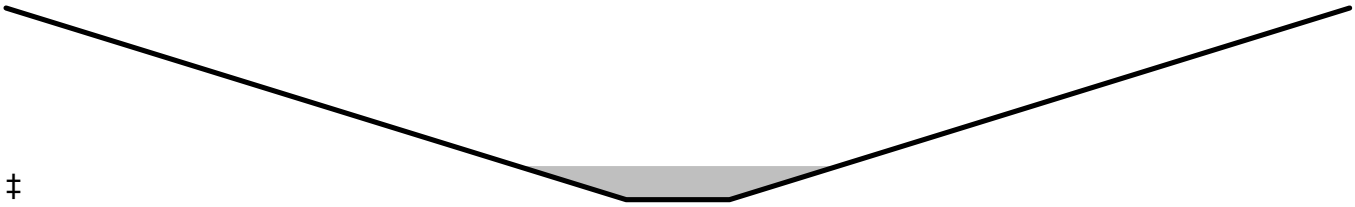
Summary for Reach 4R: (new Reach)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.96" for 5-yr event
Inflow = 9.46 cfs @ 12.36 hrs, Volume= 1.200 af
Outflow = 9.42 cfs @ 12.39 hrs, Volume= 1.200 af, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.36 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.95 fps, Avg. Travel Time= 3.5 min

Peak Storage= 885 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 507.65 cfs

2.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 410.0' Slope= 0.0326 '/'
Inlet Invert= 951.37', Outlet Invert= 938.00'



‡

Summary for Pond 2P: POA

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 0.80" for 5-yr event
Inflow = 78.11 cfs @ 13.00 hrs, Volume= 29.570 af
Primary = 78.11 cfs @ 13.00 hrs, Volume= 29.570 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Summary for Pond 3P: North Towne Road Culvert

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 0.87" for 5-yr event
Inflow = 78.19 cfs @ 12.96 hrs, Volume= 28.405 af
Outflow = 78.19 cfs @ 12.96 hrs, Volume= 28.405 af, Atten= 0%, Lag= 0.0 min
Primary = 78.19 cfs @ 12.96 hrs, Volume= 28.405 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.73' @ 12.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	915.72'	**96.0" W x 48.0" H Box Culvert** L= 200.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 915.72' / 914.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 32.00 sf
#2	Secondary	925.00'	**50.0' long x 80.0' breadth Overtop Street** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=78.19 cfs @ 12.96 hrs HW=917.73' TW=910.97' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 78.19 cfs @ 4.87 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=915.72' TW=909.50' (Dynamic Tailwater)
└**2=Overtop Street** (Controls 0.00 cfs)

Summary for Pond 4P: Southwest Infiltration Basin

Inflow Area = 27.700 ac, 41.81% Impervious, Inflow Depth > 1.90" for 5-yr event
Inflow = 5.31 cfs @ 13.18 hrs, Volume= 4.375 af
Outflow = 2.57 cfs @ 19.47 hrs, Volume= 3.891 af, Atten= 52%, Lag= 377.4 min
Discarded = 0.98 cfs @ 19.47 hrs, Volume= 2.720 af
Primary = 1.59 cfs @ 19.47 hrs, Volume= 1.171 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 914.53' @ 19.47 hrs Surf.Area= 25,801 sf Storage= 55,410 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 333.6 min (1,662.4 - 1,328.7)

Volume	Invert	Avail.Storage	Storage Description
#1	912.00'	163,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
912.00	18,000	0	0
918.00	36,500	163,500	163,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	912.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	917.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Primary	914.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 914.00' / 913.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.98 cfs @ 19.47 hrs HW=914.53' (Free Discharge)
└─**1=Infiltration** (Controls 0.98 cfs)

Primary OutFlow Max=1.59 cfs @ 19.47 hrs HW=914.53' TW=0.00' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 1.59 cfs @ 3.59 fps)

Summary for Pond 6P: NORTH Infiltration Basin

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 2.48" for 5-yr event			
Inflow =	3.00 cfs @	14.58 hrs, Volume=	4.993 af	
Outflow =	1.80 cfs @	27.09 hrs, Volume=	4.992 af, Atten= 40%, Lag= 750.9 min	
Discarded =	1.80 cfs @	27.09 hrs, Volume=	4.992 af	
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 913.70' @ 27.09 hrs Surf.Area= 47,570 sf Storage= 32,530 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 195.2 min (1,723.5 - 1,528.3)

Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	404,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.00	45,000	0	0
920.00	70,600	404,600	404,600

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	**200.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	913.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	915.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 914.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=1.80 cfs @ 27.09 hrs HW=913.70' (Free Discharge)
└─**2=Infiltration** (Controls 1.80 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=913.00' TW=0.00' (Dynamic Tailwater)
├─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond 7P: Northwest

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 2.69" for 5-yr event			
Inflow =	38.16 cfs @	12.16 hrs, Volume=	5.426 af	
Outflow =	3.00 cfs @	14.58 hrs, Volume=	4.993 af, Atten= 92%, Lag= 144.9 min	
Primary =	2.19 cfs @	14.58 hrs, Volume=	4.602 af	
Secondary =	0.81 cfs @	14.58 hrs, Volume=	0.391 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 918.00' @ 14.58 hrs Surf.Area= 38,096 sf Storage= 93,677 cf

Plug-Flow detention time= 536.7 min calculated for 4.990 af (92% of inflow)
Center-of-Mass det. time= 421.2 min (1,528.3 - 1,107.2)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	179,626 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	24,548	0	0
916.00	28,970	26,759	26,759
918.00	38,116	67,086	93,845
920.00	47,665	85,781	179,626

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900

			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	917.50'	**10.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 917.50' / 917.00' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.55 sf
#3	Secondary	918.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.19 cfs @ 14.58 hrs HW=918.00' TW=913.18' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.19 cfs @ 6.29 fps)

Secondary OutFlow Max=0.81 cfs @ 14.58 hrs HW=918.00' TW=913.18' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 0.81 cfs @ 3.44 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: SW Wet Pond

Inflow Area =	27.700 ac, 41.81% Impervious, Inflow Depth = 2.02" for 5-yr event			
Inflow =	67.89 cfs @	12.09 hrs, Volume=	4.668 af	
Outflow =	5.31 cfs @	13.18 hrs, Volume=	4.375 af, Atten= 92%, Lag= 65.1 min	
Primary =	2.22 cfs @	13.18 hrs, Volume=	3.491 af	
Secondary =	3.10 cfs @	13.18 hrs, Volume=	0.884 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.04' @ 13.18 hrs Surf.Area= 43,981 sf Storage= 117,766 cf

Plug-Flow detention time= 531.5 min calculated for 4.373 af (94% of inflow)
Center-of-Mass det. time= 497.3 min (1,328.7 - 831.4)

Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	161,504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
914.00	33,570	0	0
916.00	40,275	73,845	73,845
918.00	47,384	87,659	161,504

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 914.00' / 914.00' S= 0.0000 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	916.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 916.00' / 915.50' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#3	Secondary	917.00'	**80.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.22 cfs @ 13.18 hrs HW=917.04' TW=912.59' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.22 cfs @ 6.35 fps)

Secondary OutFlow Max=3.10 cfs @ 13.18 hrs HW=917.04' TW=912.59' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.35 cfs @ 3.85 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 1.75 cfs @ 0.51 fps)

Summary for Pond 9P: SE Wet Pond

Inflow Area =	37.400 ac, 29.91% Impervious, Inflow Depth = 1.69" for 5-yr event				
Inflow =	66.27 cfs @	12.07 hrs,	Volume=	5.282 af	
Outflow =	3.90 cfs @	14.19 hrs,	Volume=	5.002 af,	Atten= 94%, Lag= 126.9 min
Primary =	2.59 cfs @	14.19 hrs,	Volume=	4.282 af	
Secondary =	1.31 cfs @	14.19 hrs,	Volume=	0.720 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 923.60' @ 14.19 hrs Surf.Area= 43,870 sf Storage= 134,756 cf

Plug-Flow detention time= 559.8 min calculated for 5.002 af (95% of inflow)
Center-of-Mass det. time= 529.8 min (1,370.5 - 840.7)

Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	306,033 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
920.00	31,247	0	0
922.00	38,067	69,314	69,314
924.00	45,332	83,399	152,713
926.00	52,998	98,330	251,043
927.00	56,982	54,990	306,033

Device	Routing	Invert	Outlet Devices
#1	Primary	920.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 920.00' S= 0.0000 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Secondary	922.60'	**8.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.60' / 922.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Secondary	923.80'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.59 cfs @ 14.19 hrs HW=923.60' TW=918.59' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.59 cfs @ 7.42 fps)

Secondary OutFlow Max=1.31 cfs @ 14.19 hrs HW=923.60' TW=918.59' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.31 cfs @ 3.75 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Northeast

Inflow Area = 13.700 ac, 79.89% Impervious, Inflow Depth > 2.83" for 5-yr event
Inflow = 37.80 cfs @ 12.16 hrs, Volume= 3.228 af
Outflow = 8.47 cfs @ 12.24 hrs, Volume= 2.867 af, Atten= 78%, Lag= 4.9 min
Primary = 8.47 cfs @ 12.24 hrs, Volume= 2.867 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 918.00' @ 14.59 hrs Surf.Area= 32,694 sf Storage= 79,129 cf

Plug-Flow detention time= 637.3 min calculated for 2.867 af (89% of inflow)
Center-of-Mass det. time= 581.7 min (1,384.2 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	153,466 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	20,208	0	0
916.00	24,273	22,241	22,241
918.00	32,706	56,979	79,220
920.00	41,540	74,246	153,466

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**48.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Primary	919.50'	**60.0' long x 80.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.08 cfs @ 12.24 hrs HW=917.09' TW=917.05' (Dynamic Tailwater)
├─**1=Culvert** (Outlet Controls 5.08 cfs @ 1.11 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: Southeast Infiltration

Inflow Area = 37.400 ac, 29.91% Impervious, Inflow Depth > 1.60" for 5-yr event
Inflow = 3.90 cfs @ 14.19 hrs, Volume= 5.002 af
Outflow = 1.92 cfs @ 26.06 hrs, Volume= 4.377 af, Atten= 51%, Lag= 712.6 min
Discarded = 1.44 cfs @ 26.06 hrs, Volume= 4.049 af
Primary = 0.48 cfs @ 26.06 hrs, Volume= 0.328 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 920.28' @ 26.06 hrs Surf.Area= 38,173 sf Storage= 76,068 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 413.9 min (1,784.4 - 1,370.5)

Volume	Invert	Avail.Storage	Storage Description
#1	918.00'	428,184 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.00	28,500	0	0
927.00	66,652	428,184	428,184

Device	Routing	Invert	Outlet Devices
#1	Discarded	918.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	920.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 919.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	926.00'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.44 cfs @ 26.06 hrs HW=920.28' (Free Discharge)
└─**1=Infiltration** (Controls 1.44 cfs)

Primary OutFlow Max=0.48 cfs @ 26.06 hrs HW=920.28' TW=916.04' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 0.48 cfs @ 2.68 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: (new Pond)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.96" for 5-yr event
Inflow = 9.42 cfs @ 12.39 hrs, Volume= 1.200 af
Outflow = 9.42 cfs @ 12.39 hrs, Volume= 1.200 af, Atten= 0%, Lag= 0.0 min
Primary = 9.42 cfs @ 12.39 hrs, Volume= 1.200 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 939.06' @ 12.39 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	938.00'	**48.0" Round Culvert** L= 1,100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 938.00' / 920.00' S= 0.0164 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Primary OutFlow Max=9.41 cfs @ 12.39 hrs HW=939.06' TW=922.86' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 9.41 cfs @ 3.51 fps)

Summary for Link DL: HWY 51 Culvert (primary)

Inflow Area = 299.500 ac, 0.00% Impervious, Inflow Depth > 0.95" for 5-yr event
Inflow = 73.25 cfs @ 12.69 hrs, Volume= 23.741 af
Primary = 73.25 cfs @ 12.69 hrs, Volume= 23.741 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

5-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Db.hce

Summary for Link EL: HWY 51 Culvert (primary)

Inflow Area = 31.000 ac, 0.00% Impervious, Inflow Depth = 0.02" for 5-yr event
Inflow = 0.56 cfs @ 12.18 hrs, Volume= 0.051 af
Primary = 0.56 cfs @ 12.18 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

5-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link EL-1: HWY 51 Overtop (secondary)

Inflow = 26.84 cfs @ 12.18 hrs, Volume= 2.429 af
Primary = 26.84 cfs @ 12.18 hrs, Volume= 2.429 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

5-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link FL: Windsor Road Culvert (primary)

Inflow Area = 24.000 ac, 0.00% Impervious, Inflow Depth = 0.26" for 5-yr event
Inflow = 4.41 cfs @ 12.32 hrs, Volume= 0.518 af
Primary = 4.41 cfs @ 12.32 hrs, Volume= 0.518 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

5-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link FL-1: Windsor Road Overtop (secondary)

Inflow = 11.95 cfs @ 12.32 hrs, Volume= 1.402 af
Primary = 11.95 cfs @ 12.32 hrs, Volume= 1.402 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

5-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link HL: HWY 51 Culvert (primary)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 0.96" for 5-yr event
Inflow = 9.46 cfs @ 12.36 hrs, Volume= 1.200 af
Primary = 9.46 cfs @ 12.36 hrs, Volume= 1.200 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

5-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Hb.hce

Summary for Subcatchment 2S: Southwest

Runoff = 85.31 cfs @ 12.09 hrs, Volume= 5.882 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-yr Rainfall=4.20"

	Area (ac)	CN	Description
	23.900	83	1/4 acre lots, 38% imp, HSG C
	1.300	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	27.700	84	Weighted Average
	16.118		58.19% Pervious Area
	11.582		41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.1	150	0.0130	47.04	677.39	**Channel Flow, Curb & Gutter** Area= 14.4 sf Perim= 2.1' r= 6.86' n= 0.013
2.0	1,000	0.0130	8.21	25.79	**Pipe Channel, Storm Sewer** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
17.1	1,250	Total			

Summary for Subcatchment 3S: Northeast

Runoff = 45.18 cfs @ 12.16 hrs, Volume= 3.888 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-yr Rainfall=4.20"

	Area (ac)	CN	Description
	11.700	94	Urban commercial, 85% imp, HSG C
	1.000	74	>75% Grass cover, Good, HSG C
*	1.000	98	Basin Area
	13.700	93	Weighted Average
	2.755		20.11% Pervious Area
	10.945		79.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.90"
2.0	270	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.7	600	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.7	970	Total			

Summary for Subcatchment 8S: Northwest

Runoff = 36.52 cfs @ 12.14 hrs, Volume= 3.065 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-yr Rainfall=4.20"

	Area (ac)	CN	Description
	6.900	94	Urban commercial, 85% imp, HSG C
*	3.000	98	Basin Area
	0.600	74	>75% Grass cover, Good, HSG C
	10.500	94	Weighted Average
	1.635		15.57% Pervious Area
	8.865		84.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
7.4	1,100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
22.4	1,200	Total			

Summary for Subcatchment 10S: Southeast

Runoff = 78.88 cfs @ 12.07 hrs, Volume= 5.093 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 10-yr Rainfall=4.20"

	Area (ac)	CN	Description
	4.900	83	1/4 acre lots, 38% imp, HSG C
	10.500	90	1/8 acre lots, 65% imp, HSG C
	4.500	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	22.400	86	Weighted Average
	11.213		50.06% Pervious Area
	11.187		49.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0800	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.5	130	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.2	380	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	1,900	0.0100	9.05	44.44	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012

14.8 2,510 Total

Summary for Reach 1R: Proposed Stream

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 1.16" for 10-yr event
Inflow = 118.45 cfs @ 12.77 hrs, Volume= 42.876 af
Outflow = 118.39 cfs @ 12.79 hrs, Volume= 42.873 af, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.66 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.95 fps, Avg. Travel Time= 5.1 min

Peak Storage= 12,541 cf @ 12.79 hrs
Average Depth at Peak Storage= 1.59'
Bank-Full Depth= 4.00' Flow Area= 98.0 sf, Capacity= 789.03 cfs

Custom cross-section, Length= 600.0' Slope= 0.0100 '/'
Constant n= 0.030 Earth, grassed & winding
Inlet Invert= 914.75', Outlet Invert= 908.75'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-23.00	4.00	0.00
-19.00	3.00	1.00
-9.00	2.00	2.00
-5.00	0.00	4.00
0.00	0.00	4.00
5.00	0.00	4.00
9.00	2.00	2.00
19.00	3.00	1.00
23.00	4.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
2.00	28.0	18.9	16,800	179.96
3.00	56.0	39.0	33,600	352.78
4.00	98.0	47.3	58,800	789.03

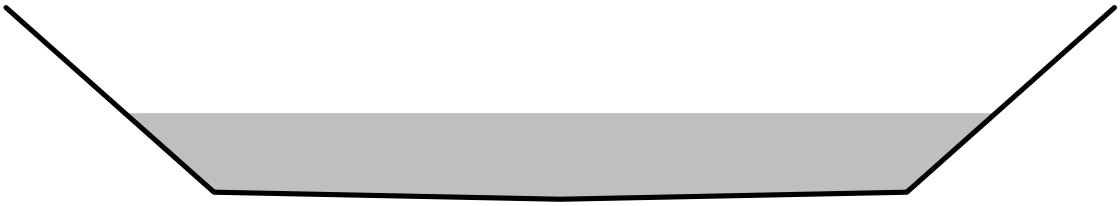
Summary for Reach 2R: Greenway WEST

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 1.24" for 10-yr event
Inflow = 118.61 cfs @ 12.74 hrs, Volume= 40.628 af
Outflow = 118.45 cfs @ 12.77 hrs, Volume= 40.622 af, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.93 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 9.3 min

Peak Storage= 21,116 cf @ 12.77 hrs
Average Depth at Peak Storage= 1.87'
Bank-Full Depth= 4.15' Flow Area= 79.1 sf, Capacity= 485.93 cfs

Custom cross-section, Length= 700.0' Slope= 0.0050 '/' (101 Elevation Intervals)
Constant n= 0.035
Inlet Invert= 909.50', Outlet Invert= 906.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-12.00	4.15	0.00
-7.50	0.15	4.00
0.00	0.00	4.15
7.50	0.15	4.00
12.00	4.15	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.15	1.1	15.0	788	0.60
4.15	79.1	27.0	55,388	485.93

Summary for Reach 3R: Greenway EAST

Inflow Area = 354.500 ac, 0.00% Impervious, Inflow Depth > 1.33" for 10-yr event
Inflow = 164.41 cfs @ 12.25 hrs, Volume= 39.169 af
Outflow = 118.61 cfs @ 12.74 hrs, Volume= 39.104 af, Atten= 28%, Lag= 29.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.66 fps, Min. Travel Time= 27.7 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 89.1 min

Peak Storage= 196,780 cf @ 12.74 hrs
Average Depth at Peak Storage= 2.90'
Bank-Full Depth= 5.00' Flow Area= 350.0 sf, Capacity= 315.57 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0075 '/'
Constant n= 0.350
Inlet Invert= 924.00', Outlet Invert= 915.74'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-45.00	5.00	0.00
-25.00	0.00	5.00
0.00	0.00	5.00
25.00	0.00	5.00
45.00	5.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	50.0	0	0.00
5.00	350.0	91.2	385,000	315.57

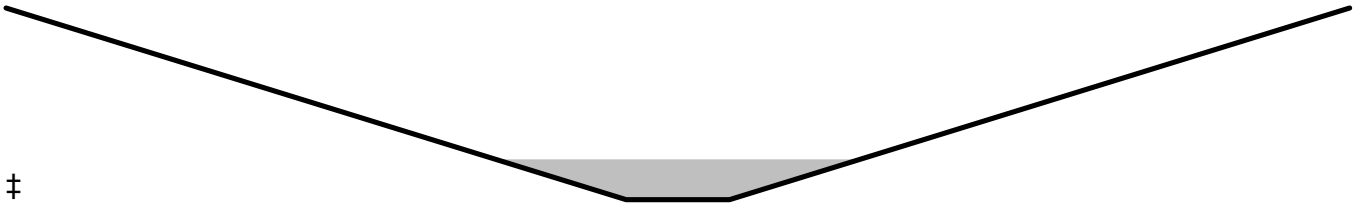
Summary for Reach 4R: (new Reach)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 1.33" for 10-yr event
Inflow = 13.85 cfs @ 12.36 hrs, Volume= 1.667 af
Outflow = 13.79 cfs @ 12.38 hrs, Volume= 1.667 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.83 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 2.09 fps, Avg. Travel Time= 3.3 min

Peak Storage= 1,171 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 507.65 cfs

2.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 410.0' Slope= 0.0326 '/'
Inlet Invert= 951.37', Outlet Invert= 938.00'



‡

Summary for Pond 2P: POA

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 1.16" for 10-yr event
Inflow = 118.45 cfs @ 12.77 hrs, Volume= 42.876 af
Primary = 118.45 cfs @ 12.77 hrs, Volume= 42.876 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Summary for Pond 3P: North Towne Road Culvert

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 1.24" for 10-yr event
Inflow = 118.61 cfs @ 12.74 hrs, Volume= 40.628 af
Outflow = 118.61 cfs @ 12.74 hrs, Volume= 40.628 af, Atten= 0%, Lag= 0.0 min
Primary = 118.61 cfs @ 12.74 hrs, Volume= 40.628 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 918.45' @ 12.74 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	915.72'	**96.0" W x 48.0" H Box Culvert** L= 200.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 915.72' / 914.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 32.00 sf
#2	Secondary	925.00'	**50.0' long x 80.0' breadth Overtop Street** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=118.60 cfs @ 12.74 hrs HW=918.45' TW=911.36' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 118.60 cfs @ 7.25 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=915.72' TW=909.50' (Dynamic Tailwater)
└**2=Overtop Street** (Controls 0.00 cfs)

Summary for Pond 4P: Southwest Infiltration Basin

Inflow Area = 27.700 ac, 41.81% Impervious, Inflow Depth > 2.42" for 10-yr event
Inflow = 24.68 cfs @ 12.40 hrs, Volume= 5.579 af
Outflow = 3.53 cfs @ 15.00 hrs, Volume= 5.057 af, Atten= 86%, Lag= 156.4 min
Discarded = 0.99 cfs @ 15.00 hrs, Volume= 2.802 af
Primary = 2.53 cfs @ 15.00 hrs, Volume= 2.255 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 914.68' @ 15.00 hrs Surf.Area= 26,275 sf Storage= 59,416 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 279.6 min (1,519.2 - 1,239.6)

Volume	Invert	Avail.Storage	Storage Description
#1	912.00'	163,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
912.00	18,000	0	0
918.00	36,500	163,500	163,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	912.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	917.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Primary	914.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 914.00' / 913.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.99 cfs @ 15.00 hrs HW=914.68' (Free Discharge)
└─**1=Infiltration** (Controls 0.99 cfs)

Primary OutFlow Max=2.53 cfs @ 15.00 hrs HW=914.68' TW=0.00' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 2.53 cfs @ 3.98 fps)

Summary for Pond 6P: NORTH Infiltration Basin

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 3.01" for 10-yr event			
Inflow =	4.23 cfs @	14.08 hrs, Volume=	6.073 af	
Outflow =	1.89 cfs @	27.09 hrs, Volume=	5.584 af, Atten= 55%, Lag= 780.8 min	
Discarded =	1.89 cfs @	27.09 hrs, Volume=	5.584 af	
Primary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 914.40' @ 27.09 hrs Surf.Area= 50,124 sf Storage= 66,635 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 309.9 min (1,781.7 - 1,471.9)

Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	404,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.00	45,000	0	0
920.00	70,600	404,600	404,600

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	**200.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	913.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	915.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 914.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=1.89 cfs @ 27.09 hrs HW=914.40' (Free Discharge)
└─**2=Infiltration** (Controls 1.89 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=913.00' TW=0.00' (Dynamic Tailwater)
├─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond 7P: Northwest

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 3.25" for 10-yr event			
Inflow =	45.59 cfs @	12.16 hrs, Volume=	6.552 af	
Outflow =	4.23 cfs @	14.08 hrs, Volume=	6.073 af, Atten= 91%, Lag= 115.1 min	
Primary =	2.38 cfs @	14.08 hrs, Volume=	4.979 af	
Secondary =	1.84 cfs @	14.08 hrs, Volume=	1.094 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 918.41' @ 14.08 hrs Surf.Area= 40,074 sf Storage= 109,881 cf

Plug-Flow detention time= 495.8 min calculated for 6.070 af (93% of inflow)
Center-of-Mass det. time= 388.5 min (1,471.9 - 1,083.4)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	179,626 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	24,548	0	0
916.00	28,970	26,759	26,759
918.00	38,116	67,086	93,845
920.00	47,665	85,781	179,626

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900

			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	917.50'	**10.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 917.50' / 917.00' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.55 sf
#3	Secondary	918.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.38 cfs @ 14.08 hrs HW=918.41' TW=913.31' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.38 cfs @ 6.82 fps)

Secondary OutFlow Max=1.84 cfs @ 14.08 hrs HW=918.41' TW=913.31' (Dynamic Tailwater)
├─**2=Culvert** (Inlet Controls 1.84 cfs @ 3.38 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: SW Wet Pond

Inflow Area =	27.700 ac, 41.81% Impervious, Inflow Depth = 2.55" for 10-yr event			
Inflow =	85.31 cfs @	12.09 hrs, Volume=	5.882 af	
Outflow =	24.68 cfs @	12.40 hrs, Volume=	5.579 af, Atten= 71%, Lag= 18.2 min	
Primary =	2.30 cfs @	12.40 hrs, Volume=	3.661 af	
Secondary =	22.39 cfs @	12.40 hrs, Volume=	1.918 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.22' @ 12.40 hrs Surf.Area= 44,619 sf Storage= 125,718 cf

Plug-Flow detention time= 443.5 min calculated for 5.576 af (95% of inflow)
Center-of-Mass det. time= 414.8 min (1,239.6 - 824.9)

Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	161,504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
914.00	33,570	0	0
916.00	40,275	73,845	73,845
918.00	47,384	87,659	161,504

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 914.00' / 914.00' S= 0.0000 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	916.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 916.00' / 915.50' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#3	Secondary	917.00'	**80.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.30 cfs @ 12.40 hrs HW=917.22' TW=912.58' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.30 cfs @ 6.58 fps)

Secondary OutFlow Max=22.36 cfs @ 12.40 hrs HW=917.22' TW=912.58' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.48 cfs @ 4.23 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 20.88 cfs @ 1.18 fps)

Summary for Pond 9P: SE Wet Pond

Inflow Area =	37.400 ac, 29.91% Impervious, Inflow Depth = 2.17" for 10-yr event				
Inflow =	83.54 cfs @	12.07 hrs,	Volume=	6.759 af	
Outflow =	13.85 cfs @	12.81 hrs,	Volume=	6.461 af,	Atten= 83%, Lag= 44.0 min
Primary =	2.77 cfs @	12.81 hrs,	Volume=	4.630 af	
Secondary =	11.08 cfs @	12.81 hrs,	Volume=	1.831 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 924.01' @ 12.81 hrs Surf.Area= 45,366 sf Storage= 153,109 cf

Plug-Flow detention time= 486.1 min calculated for 6.458 af (96% of inflow)
Center-of-Mass det. time= 461.1 min (1,295.9 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	306,033 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
920.00	31,247	0	0
922.00	38,067	69,314	69,314
924.00	45,332	83,399	152,713
926.00	52,998	98,330	251,043
927.00	56,982	54,990	306,033

Device	Routing	Invert	Outlet Devices
#1	Primary	920.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 920.00' S= 0.0000 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Secondary	922.60'	**8.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.60' / 922.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Secondary	923.80'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.77 cfs @ 12.81 hrs HW=924.01' TW=918.48' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.77 cfs @ 7.92 fps)

Secondary OutFlow Max=11.08 cfs @ 12.81 hrs HW=924.01' TW=918.48' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.57 cfs @ 4.51 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 9.51 cfs @ 1.14 fps)

Summary for Pond 10P: Northeast

Inflow Area =	13.700 ac, 79.89% Impervious, Inflow Depth > 3.41" for 10-yr event				
Inflow =	45.18 cfs @	12.16 hrs,	Volume=	3.888 af	
Outflow =	9.89 cfs @	12.22 hrs,	Volume=	3.487 af,	Atten= 78%, Lag= 3.8 min
Primary =	9.89 cfs @	12.22 hrs,	Volume=	3.487 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 918.41' @ 14.09 hrs Surf.Area= 34,528 sf Storage= 93,088 cf

Plug-Flow detention time= 592.2 min calculated for 3.485 af (90% of inflow)
Center-of-Mass det. time= 540.4 min (1,338.6 - 798.2)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	153,466 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	20,208	0	0
916.00	24,273	22,241	22,241
918.00	32,706	56,979	79,220
920.00	41,540	74,246	153,466

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**48.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Primary	919.50'	**60.0' long x 80.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.30 cfs @ 12.22 hrs HW=917.38' TW=917.36' (Dynamic Tailwater)
├─**1=Culvert** (Outlet Controls 4.30 cfs @ 0.79 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: Southeast Infiltration

Inflow Area =	37.400 ac, 29.91% Impervious, Inflow Depth > 2.07" for 10-yr event				
Inflow =	13.85 cfs @	12.81 hrs,	Volume=	6.461 af	
Outflow =	3.40 cfs @	20.15 hrs,	Volume=	5.737 af,	Atten= 75%, Lag= 440.9 min
Discarded =	1.49 cfs @	20.15 hrs,	Volume=	4.213 af	
Primary =	1.91 cfs @	20.15 hrs,	Volume=	1.524 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 920.59' @ 20.15 hrs Surf.Area= 39,458 sf Storage= 87,838 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 371.4 min (1,667.3 - 1,295.9)

Volume	Invert	Avail.Storage	Storage Description
#1	918.00'	428,184 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.00	28,500	0	0
927.00	66,652	428,184	428,184

Device	Routing	Invert	Outlet Devices
#1	Discarded	918.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	920.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 919.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	926.00'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.49 cfs @ 20.15 hrs HW=920.59' (Free Discharge)
└─**1=Infiltration** (Controls 1.49 cfs)

Primary OutFlow Max=1.91 cfs @ 20.15 hrs HW=920.59' TW=916.48' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.91 cfs @ 3.74 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: (new Pond)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 1.33" for 10-yr event
Inflow = 13.79 cfs @ 12.38 hrs, Volume= 1.667 af
Outflow = 13.79 cfs @ 12.38 hrs, Volume= 1.667 af, Atten= 0%, Lag= 0.0 min
Primary = 13.79 cfs @ 12.38 hrs, Volume= 1.667 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 939.30' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	938.00'	**48.0" Round Culvert** L= 1,100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 938.00' / 920.00' S= 0.0164 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Primary OutFlow Max=13.78 cfs @ 12.38 hrs HW=939.30' TW=923.56' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 13.78 cfs @ 3.88 fps)

Summary for Link DL: HWY 51 Culvert (primary)

Inflow Area = 299.500 ac, 0.00% Impervious, Inflow Depth > 1.32" for 10-yr event
Inflow = 110.94 cfs @ 12.46 hrs, Volume= 33.058 af
Primary = 110.94 cfs @ 12.46 hrs, Volume= 33.058 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

10-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Db.hce

Summary for Link EL: HWY 51 Culvert (primary)

Inflow Area = 31.000 ac, 0.00% Impervious, Inflow Depth = 0.03" for 10-yr event
Inflow = 0.82 cfs @ 12.18 hrs, Volume= 0.071 af
Primary = 0.82 cfs @ 12.18 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

10-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link EL-1: HWY 51 Overtop (secondary)

Inflow = 39.01 cfs @ 12.18 hrs, Volume= 3.374 af
Primary = 39.01 cfs @ 12.18 hrs, Volume= 3.374 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

10-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link FL: Windsor Road Culvert (primary)

Inflow Area = 24.000 ac, 0.00% Impervious, Inflow Depth = 0.36" for 10-yr event
Inflow = 6.45 cfs @ 12.30 hrs, Volume= 0.719 af
Primary = 6.45 cfs @ 12.30 hrs, Volume= 0.719 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

10-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link FL-1: Windsor Road Overtop (secondary)

Inflow = 17.46 cfs @ 12.30 hrs, Volume= 1.948 af
Primary = 17.46 cfs @ 12.30 hrs, Volume= 1.948 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

10-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link HL: HWY 51 Culvert (primary)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 1.33" for 10-yr event
Inflow = 13.85 cfs @ 12.36 hrs, Volume= 1.667 af
Primary = 13.85 cfs @ 12.36 hrs, Volume= 1.667 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

10-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Hb.hce

Summary for Subcatchment 2S: Southwest

Runoff = 138.55 cfs @ 12.09 hrs, Volume= 9.687 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
	23.900	83	1/4 acre lots, 38% imp, HSG C
	1.300	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	27.700	84	Weighted Average
	16.118		58.19% Pervious Area
	11.582		41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.1	150	0.0130	47.04	677.39	**Channel Flow, Curb & Gutter** Area= 14.4 sf Perim= 2.1' r= 6.86' n= 0.013
2.0	1,000	0.0130	8.21	25.79	**Pipe Channel, Storm Sewer** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
17.1	1,250	Total			

Summary for Subcatchment 3S: Northeast

Runoff = 67.12 cfs @ 12.15 hrs, Volume= 5.872 af, Depth> 5.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
	11.700	94	Urban commercial, 85% imp, HSG C
	1.000	74	>75% Grass cover, Good, HSG C
*	1.000	98	Basin Area
	13.700	93	Weighted Average
	2.755		20.11% Pervious Area
	10.945		79.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 2.90"
2.0	270	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.7	600	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.7	970	Total			

Summary for Subcatchment 8S: Northwest

Runoff = 53.77 cfs @ 12.14 hrs, Volume= 4.586 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
	6.900	94	Urban commercial, 85% imp, HSG C
*	3.000	98	Basin Area
	0.600	74	>75% Grass cover, Good, HSG C
	10.500	94	Weighted Average
	1.635		15.57% Pervious Area
	8.865		84.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
7.4	1,100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
22.4	1,200	Total			

Summary for Subcatchment 10S: Southeast

Runoff = 125.11 cfs @ 12.06 hrs, Volume= 8.230 af, Depth> 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Type II 24-hr 100-yr Rainfall=6.00"

	Area (ac)	CN	Description
	4.900	83	1/4 acre lots, 38% imp, HSG C
	10.500	90	1/8 acre lots, 65% imp, HSG C
	4.500	74	>75% Grass cover, Good, HSG C
*	2.500	98	Basin Area
	22.400	86	Weighted Average
	11.213		50.06% Pervious Area
	11.187		49.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0800	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.5	130	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.2	380	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	1,900	0.0100	9.05	44.44	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012

14.8 2,510 Total

Summary for Reach 1R: Proposed Stream

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 2.45" for 100-yr event
Inflow = 307.49 cfs @ 12.79 hrs, Volume= 90.672 af
Outflow = 307.40 cfs @ 12.80 hrs, Volume= 90.669 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 6.41 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 4.4 min

Peak Storage= 29,785 cf @ 12.80 hrs
Average Depth at Peak Storage= 2.82'
Bank-Full Depth= 4.00' Flow Area= 98.0 sf, Capacity= 789.03 cfs

Custom cross-section, Length= 600.0' Slope= 0.0100 '/'
Constant n= 0.030 Earth, grassed & winding
Inlet Invert= 914.75', Outlet Invert= 908.75'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-23.00	4.00	0.00
-19.00	3.00	1.00
-9.00	2.00	2.00
-5.00	0.00	4.00
0.00	0.00	4.00
5.00	0.00	4.00
9.00	2.00	2.00
19.00	3.00	1.00
23.00	4.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
2.00	28.0	18.9	16,800	179.96
3.00	56.0	39.0	33,600	352.78
4.00	98.0	47.3	58,800	789.03

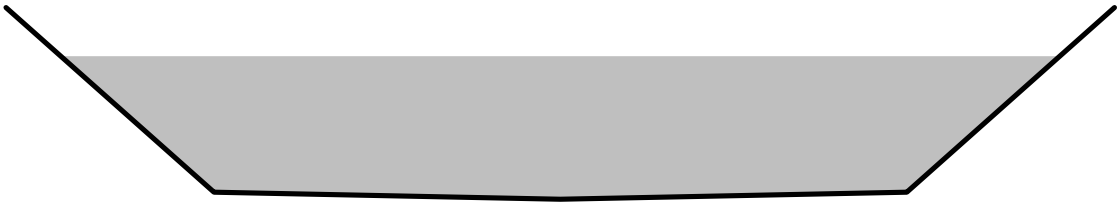
Summary for Reach 2R: Greenway WEST

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 2.54" for 100-yr event
Inflow = 290.58 cfs @ 12.69 hrs, Volume= 82.948 af
Outflow = 289.01 cfs @ 12.79 hrs, Volume= 82.942 af, Atten= 1%, Lag= 5.7 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.24 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 7.8 min

Peak Storage= 38,581 cf @ 12.79 hrs
Average Depth at Peak Storage= 3.10'
Bank-Full Depth= 4.15' Flow Area= 79.1 sf, Capacity= 485.93 cfs

Custom cross-section, Length= 700.0' Slope= 0.0050 '/' (101 Elevation Intervals)
Constant n= 0.035
Inlet Invert= 909.50', Outlet Invert= 906.00'



Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-12.00	4.15	0.00
-7.50	0.15	4.00
0.00	0.00	4.15
7.50	0.15	4.00
12.00	4.15	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.15	1.1	15.0	788	0.60
4.15	79.1	27.0	55,388	485.93

Summary for Reach 3R: Greenway EAST

Inflow Area = 354.500 ac, 0.00% Impervious, Inflow Depth > 2.61" for 100-yr event
Inflow = 377.93 cfs @ 12.23 hrs, Volume= 77.191 af
Outflow = 285.07 cfs @ 12.72 hrs, Volume= 77.123 af, Atten= 25%, Lag= 29.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.87 fps, Min. Travel Time= 21.0 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 75.9 min

Peak Storage= 358,667 cf @ 12.72 hrs
Average Depth at Peak Storage= 4.73'
Bank-Full Depth= 5.00' Flow Area= 350.0 sf, Capacity= 315.57 cfs

Custom cross-section, Length= 1,100.0' Slope= 0.0075 '/'
Constant n= 0.350
Inlet Invert= 924.00', Outlet Invert= 915.74'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
-45.00	5.00	0.00
-25.00	0.00	5.00
0.00	0.00	5.00
25.00	0.00	5.00
45.00	5.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	50.0	0	0.00
5.00	350.0	91.2	385,000	315.57

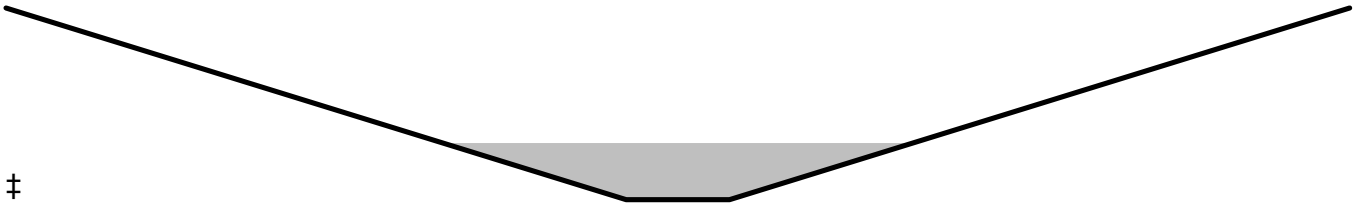
Summary for Reach 4R: (new Reach)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af
Outflow = 28.84 cfs @ 12.36 hrs, Volume= 3.276 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.85 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 2.8 min

Peak Storage= 2,021 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 507.65 cfs

2.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 4.0 '/' Top Width= 26.00'
Length= 410.0' Slope= 0.0326 '/'
Inlet Invert= 951.37', Outlet Invert= 938.00'



‡

Summary for Pond 2P: POA

Inflow Area = 443.800 ac, 9.59% Impervious, Inflow Depth > 2.45" for 100-yr event
Inflow = 307.49 cfs @ 12.79 hrs, Volume= 90.672 af
Primary = 307.49 cfs @ 12.79 hrs, Volume= 90.672 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Summary for Pond 3P: North Towne Road Culvert

Inflow Area = 391.900 ac, 2.85% Impervious, Inflow Depth > 2.54" for 100-yr event
Inflow = 290.58 cfs @ 12.69 hrs, Volume= 82.948 af
Outflow = 290.58 cfs @ 12.69 hrs, Volume= 82.948 af, Atten= 0%, Lag= 0.0 min
Primary = 290.58 cfs @ 12.69 hrs, Volume= 82.948 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 921.40' @ 12.71 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	915.72'	**96.0" W x 48.0" H Box Culvert** L= 200.0' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 915.72' / 914.72' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 32.00 sf
#2	Secondary	925.00'	**50.0' long x 80.0' breadth Overtop Street** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=285.36 cfs @ 12.69 hrs HW=921.28' TW=912.60' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 285.36 cfs @ 8.92 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=915.72' TW=909.50' (Dynamic Tailwater)
└**2=Overtop Street** (Controls 0.00 cfs)

Summary for Pond 4P: Southwest Infiltration Basin

Inflow Area = 27.700 ac, 41.81% Impervious, Inflow Depth > 4.05" for 100-yr event
Inflow = 115.46 cfs @ 12.17 hrs, Volume= 9.360 af
Outflow = 19.73 cfs @ 12.72 hrs, Volume= 8.760 af, Atten= 83%, Lag= 33.1 min
Discarded = 1.21 cfs @ 12.72 hrs, Volume= 2.953 af
Primary = 18.52 cfs @ 12.72 hrs, Volume= 5.807 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 916.53' @ 12.72 hrs Surf.Area= 31,968 sf Storage= 113,186 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 170.2 min (1,262.4 - 1,092.2)

Volume	Invert	Avail.Storage	Storage Description
#1	912.00'	163,500 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
912.00	18,000	0	0
918.00	36,500	163,500	163,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	912.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	917.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Primary	914.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 914.00' / 913.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=1.21 cfs @ 12.72 hrs HW=916.53' (Free Discharge)
└─**1=Infiltration** (Controls 1.21 cfs)

Primary OutFlow Max=18.52 cfs @ 12.72 hrs HW=916.53' TW=0.00' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 18.52 cfs @ 6.01 fps)

Summary for Pond 6P: NORTH Infiltration Basin

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 4.70" for 100-yr event			
Inflow =	33.20 cfs @	12.55 hrs, Volume=	9.482 af	
Outflow =	4.23 cfs @	17.86 hrs, Volume=	8.069 af, Atten= 87%, Lag= 318.3 min	
Discarded =	2.07 cfs @	17.86 hrs, Volume=	6.146 af	
Primary =	2.16 cfs @	17.86 hrs, Volume=	1.923 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 915.63' @ 17.86 hrs Surf.Area= 54,604 sf Storage= 130,786 cf

Plug-Flow detention time= 544.2 min calculated for 8.065 af (85% of inflow)
Center-of-Mass det. time= 351.9 min (1,629.6 - 1,277.6)

Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	404,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.00	45,000	0	0
920.00	70,600	404,600	404,600

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	**200.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	913.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	915.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 914.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=2.07 cfs @ 17.86 hrs HW=915.63' (Free Discharge)
└─**2=Infiltration** (Controls 2.07 cfs)

Primary OutFlow Max=2.16 cfs @ 17.86 hrs HW=915.63' TW=0.00' (Dynamic Tailwater)
├─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 2.16 cfs @ 3.84 fps)

Summary for Pond 7P: Northwest

Inflow Area =	24.200 ac, 81.86% Impervious, Inflow Depth > 4.97" for 100-yr event			
Inflow =	67.16 cfs @	12.15 hrs, Volume=	10.014 af	
Outflow =	33.20 cfs @	12.55 hrs, Volume=	9.482 af, Atten= 51%, Lag= 23.9 min	
Primary =	2.62 cfs @	12.55 hrs, Volume=	5.428 af	
Secondary =	30.58 cfs @	12.55 hrs, Volume=	4.055 af	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 919.00' @ 12.55 hrs Surf.Area= 42,893 sf Storage= 134,369 cf

Plug-Flow detention time= 357.3 min calculated for 9.477 af (95% of inflow)
Center-of-Mass det. time= 276.4 min (1,277.6 - 1,001.2)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	179,626 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	24,548	0	0
916.00	28,970	26,759	26,759
918.00	38,116	67,086	93,845
920.00	47,665	85,781	179,626

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900

			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	917.50'	**10.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 917.50' / 917.00' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.55 sf
#3	Secondary	918.50'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.62 cfs @ 12.55 hrs HW=919.00' TW=913.55' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.62 cfs @ 7.52 fps)

Secondary OutFlow Max=30.56 cfs @ 12.55 hrs HW=919.00' TW=913.55' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 2.64 cfs @ 4.84 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 27.92 cfs @ 1.86 fps)

Summary for Pond 8P: SW Wet Pond

Inflow Area = 27.700 ac, 41.81% Impervious, Inflow Depth = 4.20" for 100-yr event
Inflow = 138.55 cfs @ 12.09 hrs, Volume= 9.687 af
Outflow = 115.46 cfs @ 12.17 hrs, Volume= 9.360 af, Atten= 17%, Lag= 4.9 min
Primary = 2.48 cfs @ 12.17 hrs, Volume= 3.892 af
Secondary = 112.98 cfs @ 12.17 hrs, Volume= 5.467 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 917.64' @ 12.17 hrs Surf.Area= 46,114 sf Storage= 144,805 cf

Plug-Flow detention time= 301.8 min calculated for 9.360 af (97% of inflow)
Center-of-Mass det. time= 281.6 min (1,092.2 - 810.7)

Volume	Invert	Avail.Storage	Storage Description
#1	914.00'	161,504 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
914.00	33,570	0	0
916.00	40,275	73,845	73,845
918.00	47,384	87,659	161,504

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 914.00' / 914.00' S= 0.0000 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#2	Secondary	916.00'	**8.0" Round Culvert**
			L= 50.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 916.00' / 915.50' S= 0.0100 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.35 sf
#3	Secondary	917.00'	**80.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.48 cfs @ 12.17 hrs HW=917.64' TW=913.80' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.48 cfs @ 7.10 fps)

Secondary OutFlow Max=112.58 cfs @ 12.17 hrs HW=917.64' TW=913.80' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.75 cfs @ 5.00 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 110.83 cfs @ 2.16 fps)

Summary for Pond 9P: SE Wet Pond

Inflow Area = 37.400 ac, 29.91% Impervious, Inflow Depth > 3.69" for 100-yr event
Inflow = 137.06 cfs @ 12.07 hrs, Volume= 11.506 af
Outflow = 77.25 cfs @ 12.26 hrs, Volume= 11.174 af, Atten= 44%, Lag= 11.1 min
Primary = 2.99 cfs @ 12.26 hrs, Volume= 5.028 af
Secondary = 74.27 cfs @ 12.26 hrs, Volume= 6.146 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 924.57' @ 12.26 hrs Surf.Area= 47,507 sf Storage= 179,057 cf

Plug-Flow detention time= 324.8 min calculated for 11.174 af (97% of inflow)
Center-of-Mass det. time= 307.4 min (1,129.5 - 822.1)

Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	306,033 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
920.00	31,247	0	0
922.00	38,067	69,314	69,314
924.00	45,332	83,399	152,713
926.00	52,998	98,330	251,043
927.00	56,982	54,990	306,033

Device	Routing	Invert	Outlet Devices
#1	Primary	920.00'	**8.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 920.00' S= 0.0000 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf
#2	Secondary	922.60'	**8.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 922.60' / 922.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Secondary	923.80'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.99 cfs @ 12.26 hrs HW=924.57' TW=919.09' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.99 cfs @ 8.56 fps)

Secondary OutFlow Max=74.21 cfs @ 12.26 hrs HW=924.57' TW=919.09' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 1.87 cfs @ 5.36 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 72.34 cfs @ 2.36 fps)

Summary for Pond 10P: Northeast

Inflow Area = 13.700 ac, 79.89% Impervious, Inflow Depth > 5.14" for 100-yr event
Inflow = 67.12 cfs @ 12.15 hrs, Volume= 5.872 af
Outflow = 19.02 cfs @ 12.55 hrs, Volume= 5.428 af, Atten= 72%, Lag= 23.9 min
Primary = 19.02 cfs @ 12.55 hrs, Volume= 5.428 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 919.10' @ 12.57 hrs Surf.Area= 37,561 sf Storage= 117,836 cf

Plug-Flow detention time= 434.2 min calculated for 5.425 af (92% of inflow)
Center-of-Mass det. time= 393.3 min (1,183.2 - 790.0)

Volume	Invert	Avail.Storage	Storage Description
#1	915.00'	153,466 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.00	20,208	0	0
916.00	24,273	22,241	22,241
918.00	32,706	56,979	79,220
920.00	41,540	74,246	153,466

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**48.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 915.00' / 915.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Primary	919.50'	**60.0' long x 80.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=18.95 cfs @ 12.55 hrs HW=919.10' TW=919.00' (Dynamic Tailwater)
├─**1=Culvert** (Inlet Controls 18.95 cfs @ 1.51 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: Southeast Infiltration

Inflow Area = 37.400 ac, 29.91% Impervious, Inflow Depth > 3.59" for 100-yr event
Inflow = 77.25 cfs @ 12.26 hrs, Volume= 11.174 af
Outflow = 15.61 cfs @ 13.31 hrs, Volume= 10.304 af, Atten= 80%, Lag= 63.1 min
Discarded = 1.71 cfs @ 13.31 hrs, Volume= 4.478 af
Primary = 13.90 cfs @ 13.31 hrs, Volume= 5.826 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 921.95' @ 13.31 hrs Surf.Area= 45,235 sf Storage= 145,545 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 235.0 min (1,364.5 - 1,129.5)

Volume	Invert	Avail.Storage	Storage Description
#1	918.00'	428,184 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.00	28,500	0	0
927.00	66,652	428,184	428,184

Device	Routing	Invert	Outlet Devices
#1	Discarded	918.00'	**1.630 in/hr Infiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	920.00'	**24.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 920.00' / 919.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	926.00'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.71 cfs @ 13.31 hrs HW=921.95' (Free Discharge)
└─**1=Infiltration** (Controls 1.71 cfs)

Primary OutFlow Max=13.90 cfs @ 13.31 hrs HW=921.95' TW=920.16' (Dynamic Tailwater)
├─**2=Culvert** (Barrel Controls 13.90 cfs @ 5.65 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: (new Pond)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 28.84 cfs @ 12.36 hrs, Volume= 3.276 af
Outflow = 28.84 cfs @ 12.36 hrs, Volume= 3.276 af, Atten= 0%, Lag= 0.0 min
Primary = 28.84 cfs @ 12.36 hrs, Volume= 3.276 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs
Peak Elev= 939.95' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	938.00'	**48.0" Round Culvert** L= 1,100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 938.00' / 920.00' S= 0.0164 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Primary OutFlow Max=28.84 cfs @ 12.36 hrs HW=939.95' TW=924.51' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 28.84 cfs @ 4.75 fps)

Summary for Link DL: HWY 51 Culvert (primary)

Inflow Area = 299.500 ac, 0.00% Impervious, Inflow Depth > 2.61" for 100-yr event
Inflow = 254.78 cfs @ 12.26 hrs, Volume= 65.179 af
Primary = 254.78 cfs @ 12.26 hrs, Volume= 65.179 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

100-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Db.hce

Summary for Link EL: HWY 51 Culvert (primary)

Inflow Area = 31.000 ac, 0.00% Impervious, Inflow Depth = 0.05" for 100-yr event
Inflow = 1.69 cfs @ 12.17 hrs, Volume= 0.139 af
Primary = 1.69 cfs @ 12.17 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

100-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link EL-1: HWY 51 Overtop (secondary)

Inflow = 80.56 cfs @ 12.17 hrs, Volume= 6.632 af
Primary = 80.56 cfs @ 12.17 hrs, Volume= 6.632 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

100-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Eb.hce

Summary for Link FL: Windsor Road Culvert (primary)

Inflow Area = 24.000 ac, 0.00% Impervious, Inflow Depth = 0.71" for 100-yr event
Inflow = 13.48 cfs @ 12.29 hrs, Volume= 1.414 af
Primary = 13.48 cfs @ 12.29 hrs, Volume= 1.414 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

100-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link FL-1: Windsor Road Overtop (secondary)

Inflow = 36.51 cfs @ 12.29 hrs, Volume= 3.828 af
Primary = 36.51 cfs @ 12.29 hrs, Volume= 3.828 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

100-yr Secondary Outflow Imported from Drainage Study (Pre-Developed)~Pond Fb.hce

Summary for Link HL: HWY 51 Culvert (primary)

Inflow Area = 15.000 ac, 0.00% Impervious, Inflow Depth = 2.62" for 100-yr event
Inflow = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af
Primary = 28.90 cfs @ 12.35 hrs, Volume= 3.276 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.02 hrs

100-yr Primary Outflow Imported from Drainage Study (Pre-Developed)~Pond Hb.hce

APPENDIX E

SOILS INFORMATION

CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

November 27, 2007
C07422

Mr. Bill Suick
D'Onofrio Kottke & Associates
7530 Westward Way
Madison, WI 53717

Re: Preliminary Geotechnical Exploration
Windsor Crossing Development
USH 51 & Windsor Road
Windsor, Wisconsin

Dear Mr. Suick:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the subsurface exploration program for the above-referenced project. The purpose of this preliminary program was to evaluate the subsurface conditions at the site and to provide preliminary geotechnical recommendations regarding site development, building, pavement and utility design/construction, along with infiltration potential. Two copies of this report are submitted for your use, and additional copies can be provided upon request.

PROJECT DESCRIPTION

We understand that a residential and commercial development is planned for an approximately 82-acre site on the southwest corner of USH 51 and Windsor Road in the Town of Windsor, Wisconsin. It is located in the NE ¼, NW ¼, SW ¼, and SE ¼ of the SE ¼ of Section 29, T7N, R10E, Town of Windsor, Dane County, Wisconsin. In addition to new buildings, the development will include new streets and utilities, as well as probable infiltration and/or detention basins. Preliminary site plans and grades were not available at the time of this report, but some cutting and filling using on-site materials is anticipated. We understand that the infiltration features will likely be constructed in the northwest portion of the site.

SITE CONDITIONS

The site is basically rectangular and measures about 1500 ft east-west and 2700 ft north-south. The site is predominantly farmland that is bisected by two drainageways that drain toward the west. Buildings are also is present in the site's northern portion along the parcel's edges. Corn and soybeans were recently harvested over the majority of the site outside of the drainageways. Two concentrated groups of trees were also noted in the northern portion of the parcel.

2921 Perry Street, Madison WI 53713
Telephone: 608/288-4100
FAX: 608/288-7887

The United States Geological Survey (USGS) 7.5 minute series quadrangle for the area reveals high points exist at the site's southeast corner at EL 968' and at the site's northeast corner at EL 940' ±. The low point on the site is at the west-central edge of the property where the drainage swale exits the parcel at approximately EL 912'.

SUBSURFACE CONDITIONS

Subsurface conditions on the site were explored by drilling 20 Standard Penetration Test (SPT) borings to a planned depth of 15 ft below existing site grades at locations selected by D'Onofrio Kottke & Associates (DKA). DKA also surveyed their actual locations and elevations. Several of the borings terminated at a depth about 1 ft shallower than the planned depth due to sampler refusal on probable less weathered sandstone bedrock. Boring No. 15 also terminated at a depth of only 9 ft within presumed well cemented sandstone. The borings were drilled to: (1) gather data across the site, in a generalized grid pattern; and (2) explore the various soil types identified by soil mapping. According to the USDA *Soil Survey of Dane County, Wisconsin,* the dominant soils series across the site are Plano silt loam (PnB, PnC2) and Ringwood silt loam (RnB). These soils formed on glaciated uplands and are moderately well to well draining. Additional soil types were present in the northern portion of the site identified as Radford silt loam (RaA), Griswold loam (GwC), St. Charles silt loam (ScB) and Elburn silt loam (EfB). The Griswold and St. Charles series are considered moderately well to well draining and are present on glaciated uplands, while the Radford and Elburn series are present in glaciated stream valleys/channels/drainageways and considered somewhat poorly draining.

The soil borings were conducted by Badger State Drilling (under subcontract to CGC) on November 18, 2007 using two truck-mounted D-120 rotary drill rigs equipped with hollow stem augers. The specific procedures used for drilling and sampling are described in Appendix A. The boring locations are shown in plan on the Soil Boring Location Map presented in Appendix B.

Overall, with several exceptions, the subsurface profile at the boring locations was quite similar and can be described in general terms by the following strata (in descending order):

- 8 to 20 in. of ***topsoil***; followed by
- 2.5 to 7 ft of stiff to very stiff ***silty to lean clay*** with various amounts of sand (except in Boring 12, where this layer was not observed); followed by
- Medium dense to very dense ***sand*** strata with various amounts of silt, clay and gravel and/or very dense ***highly weathered sandstone*** that basically is a sand with varying amounts of silt,

etc. to the maximum depths explored. Split-spoon sampler refusal occurred in several areas (along with auger refusal in Boring 15) where the weathered sandstone was observed which in our opinion identifies probable greater cementation and associated increasing competency of the bedrock.

As exceptions, the clays in several borings were soft to medium stiff (e.g., Boring 14 near 4 ft), the sands graded to loose in several areas (e.g., Boring 18 near 7 ft) and the sands contained a greater clay content in some areas (e.g., Boring 12 near 2 ft).

Groundwater was only detected in Boring 19 during or shortly after drilling. Water levels can be expected to fluctuate based on seasonal variations in precipitation, infiltration, etc. A more detailed description of the site soil and groundwater conditions is presented on the boring logs contained in Appendix B.

DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration, it is our opinion that the site is suitable for construction and that the structures can be supported by conventional spread footing foundations. However, some stabilization of soil in drainageways should be expected prior to filling activities due to the possibility of softer soils in those areas. Bedrock removal may also be necessary for deeper utility installation. Our preliminary recommendations for site preparation, as well as foundation, floor slab, below-grade wall, pavement and utility design/construction, along with infiltration potential, are presented in the following subsections. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

1. Site Preparation

We recommend that topsoil and vegetation be stripped in areas to receive fill where building and roadway construction is planned. The topsoil should be stripped to at least 5 ft beyond the construction limits. The topsoil should be stockpiled on-site for re-use as fill in landscape areas. Topsoil thicknesses across the site vary and could be even thicker than measured due to past farming activities. Tree roots should also be removed in proposed construction areas. We anticipate that existing building demolition will also occur in conjunction with topsoil stripping. We suggest building elements be removed in their entirety to not interfere with future construction.

The exposed soils after topsoil removal are expected to consist of natural clay in most locations, with sand subgrades in some areas. The exposed soils in fill areas or at finished design grades should be proof-rolled with a heavy piece of construction equipment (i.e., a loaded scraper or tri-axle truck) to check for soft/yielding areas. If soft/yielding areas exist, they should be undercut/removed. Granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557) should be used to re-establish subgrade levels. As an alternative, the soft/yielding subgrade soils could be stabilized using breaker rock that is compacted until no deflection is noted. Special attention should be given to drainageways where soils may be softer due to water flowing in the swales during storm events. Fill placement to establish site grades may then proceed. Fill/backfill should be placed in accordance with the Recommended Compacted Fill Specifications presented in Appendix D.

We recommend using granular soils as fill in building areas, as these soils are generally easier to place and compact compared to silts and clays, particularly in adverse weather conditions. Silts and clays can be used in landscaping and pavement areas, but some moisture conditioning should be expected, which could delay construction progress. The fill should be placed early in the construction sequence, to allow for as much consolidation to occur before beginning building construction. This will be evaluated further once site development details become available. Note that if deep cuts are planned near Boring 15 where auger refusal occurred, bedrock removal using a ripping tooth on a dozer may be needed. Refer to Appendix E for additional details. We anticipate the majority of weathered bedrock will be removable using conventional scrapers/push dozer techniques due to its highly weathered condition, but better cemented layers may be encountered with depth requiring special removal measures. This can be studied further by digging test pits in cut areas to observe the rippability of the rock.

2. Foundation Design

Depending on the final site grades, the foundations for the buildings will generally bear within native sand or clay soils (some of which is weathered bedrock) or perhaps compacted granular fill. The following preliminary parameters should be used for foundation design:

- Maximum allowable bearing pressure: 2,500 psf
- Minimum foundation widths:
  - Continuous wall footings: 18 in.
  - Column pad footings: 30 in.
- Minimum depths for footings requiring frost protection: 4 ft

Undercutting below footing grade will be required if clayey soils with pocket penetrometer readings (an estimate of the clay's unconfined compressive strength) of less than about 1.25 ton/sq ft or looser sand/silt soils are encountered at or slightly below footing grade. Where undercutting is required, the base of the undercut excavations should be widened beyond the footing edges at least 0.5 ft for each foot of undercut depth for stress distribution purposes. We recommend that granular backfill be placed and compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557). As an alternative, breaker rock or clear stone can be implemented that is compacted in 1-ft lifts until deflection ceases. An allowance should be established for undercutting/replacement in the very soft soil areas, particularly where 0.5 TSF clay exists that likely will require 1-ft of stone (at a minimum) to establish a working mat.

We recommend that granular footing subgrade soils be compacted with a large vibratory plate and clay soils be compacted with a jumping jack prior to concrete placement to densify soils loosened during the excavation process. Also, we recommend that a smooth-edge backhoe bucket be used for footing excavations. Provided the foundation design/construction recommendations discussed above are followed, we estimate that total and differential settlements should not exceed 1.0 and 0.5 in., respectively. Additional details can be provided after final grading plans and building locations are established. Also note that greater bearing pressures are possible as foundations bear deeper into sands that become denser with depth, with those determinations to be made on a case by case basis.

3. Site Seismic Classification

In our opinion, the average soil/rock properties in the upper 100 ft of the site (based on blow count N-values generally ranging from 15 to 50 blows per foot) can be characterized as a stiff soil profile. This characterization would place the site in Site Class D for seismic design according to the International Building Code (see Table 1615.1.1).

4. Floor Slab Design

In our opinion, the floor slabs for the buildings can be supported on natural sand, silt or clay soils or compacted granular fill, and a subgrade modulus of 125 pci should be used for design. Prior to slab construction, the subgrades should be recompacted to densify soils that may become disturbed or loosened during construction activities. The design subgrade modulus is based on a recompacted subgrade such that non-yielding conditions are developed. To serve as a capillary break, the final 4 to 6 in. of soil placed below the slabs should consist of imported, well-graded sand or gravel with no more than 5 percent by weight passing the No. 200 U.S. standard sieve. To further minimize the potential for moisture migration, a plastic vapor barrier should also be utilized. At a minimum, the slabs should be isolated from building walls/columns using a compressible filler, and the design should include an adequate number of isolation and contraction joints.

5. Below-Grade Walls

We anticipate that basement walls will be laterally restrained by the floor slab and ground-level framing. Therefore, *at-rest lateral earth pressures* should be used during design. To minimize the development of such pressures, granular backfill should be placed within 4 to 6 ft of the walls. We recommend that perimeter drainage systems be installed to intercept potential surface water infiltration and that the granular backfill placed behind the walls be continuously connected to this system. (Some groundwater may also need to be intercepted for construction near drainageways.) The perimeter drainage system should be sloped to drain to a sump pit or, if feasible, should "daylight" down slope. To impede the inflow of surface moisture, the final 2 ft of backfill placed along the basement walls should consist of a clayey fill cap or other semi-impermeable material such as asphaltic or concrete pavement. The clay cap or pavement should be graded in a manner which promotes positive drainage away from the walls. Recommended perimeter drain details are attached to this report in Appendix F.

Before placing wall backfill, the exterior walls should be damp-proofed with a spray-applied or mopped-on rubber or bituminous sealer. Compaction of the backfill within 4 to 6 ft of the walls should be performed with lightweight compaction equipment. The granular backfill should be compacted to a minimum of 90% modified Proctor (ASTM D1557) following Appendix D guidelines.

Walls constructed in accordance with the above recommendations may be designed for an equivalent fluid pressure of 55 psf per foot of depth. The basement wall design should also take into account surcharge effects that could be applied during or after construction

6. Roadway Pavement Design

The clay soils encountered below the topsoil across most of the site will control the pavement design. Standard earthwork-related techniques that should be used during roadway construction after stripping include proof-rolling, undercutting/stabilization and compaction control of fill/backfill as discussed in the Site Preparation section of this report.

The following parameters should be used to develop the design pavement section:

AASTHO classification	A-6/A-7
Frost group index	F-3
Design group index	12
Soil support value	4.2
Subgrade modulus, k (pci)	150
Estimated percent shrinkage	20 - 30
Estimated CBR value	2 - 5

Assuming traffic volumes up to 500 cars and 5 trucks per day per design lane (i.e., a medium traffic classification), a typical pavement design per WDOT Standard Specifications is 1.5-in. bituminous surface, 2.5-in. bituminous binder and 10-in. compacted aggregate base course. Pavements without daily bus traffic or lower automobile volumes can be designed for 1.5 in. surface, 1.5 in. binder and 8 in. base course. Alternative pavement designs for different traffic count data are also acceptable providing they are based on the given design parameters. Because of the potential for soft to medium stiff clays/silts at or below subgrade levels, an adequate allowance for undercutting and stabilization should be included in the budget for this development. It has been our experience that clay or silt soils with pocket penetrometer readings of less than approximately 1.5 TSF are likely to require undercutting after proof-rolling as described above.

7. Utility Construction

Based on the available soil and groundwater information, it appears that utility construction can proceed using traditional open cut methods. Dewatering will likely not be required. It is expected that excavation sidewalls will be sloped back for relatively shallow installations (i.e., less than 4 ft in depth) and that a trench shield and/or internal bracing will be used for deeper excavations. The following are our recommendations regarding trench excavation, dewatering, and backfilling:

- Excavation: Open cuts should be sloped and/or braced in accordance with OSHA guidelines. Slopes of 1H:1V or flatter through the on-site silt and clay soils and 1.5H:1V or flatter in the sand soils are expected to be at least temporarily stable. Temporary bracing should be designed by a registered professional engineer.

- Rock Removal: As mentioned above, split-spoon and/or auger refusal was encountered in several borings on probable weathered to increasingly competent sandstone bedrock. The depth to bedrock is variable across the site, and a series of test pits can be dug across the site to better characterize the nature and depth of the bedrock. Excavations to the depth of spoon refusal can likely be accomplished using standard earth moving equipment. Excavations below the level of spoon refusal may require special rock removal techniques (i.e., chipping with a backhoe-mounted rock hammer). Refer to Appendix E, which contains rock excavation considerations.

- Dewatering: Based on observations made during the field exploration, groundwater infiltration into shallow excavations is not expected to be a problem. However, deeper excavations in some areas of the site may require dewatering with pumps operating from filtered sump pits during wet seasons (see Construction Considerations section below).

- Backfilling - Excavation backfilling may proceed using the following guidelines:

  - Both silty/clayey and sandy excavation spoils may be used to backfill the utility trenches above the pipe and associated granular bedding material. However, we recommend that sand soils be used as backfill because they are relatively easy to place and compact in most weather conditions. Backfilling with silty/clayey soils is generally not recommended because they will likely require some moisture conditioning prior to placement and compaction, which could delay construction progress. Granular soils with cobbles and boulders should not be used in direct contact with utility lines.

  - Backfill material should be placed in accordance with Appendix D guidelines or applicable municipal requirements.

  - Compaction recommendations:
    - Depths greater than 3 ft below grade: 90% modified Proctor (ASTM D1557)
    - Final 3 ft: 95% modified Proctor

8. Storm Water Infiltration Potential

We understand that storm water infiltration or detention areas are planned in the central and northwest areas of the site (i.e., Borings 5 through 11). The shallow soils encountered in these borings below the surficial topsoil generally consisted of clay over deeper sands and apparent weathered sandstone bedrock. Some of the clays (typically around 48- to 60-in. depths in Borings 5, 7 and 9) contained minor to significant mottling, which suggests seasonal or past saturation. Note that mottling (i.e., redoximorphic features) is considered a limiting layer to storm water infiltration. The following parameters should be considered for design of infiltration features:

- Infiltration Potential: The following infiltration parameters were estimated using Table 2 of the WDNR Conservation Practice Standard 1002, *Site Evaluation for Storm Water Infiltration*. The estimated infiltration rates are as follows:

– Silty clay loam	0.04 in./hr
– Sandy clay loam	0.11 in./hr
– Silt loam	0.13 in./hr
– Sandy loam	0.5 in./hr
– Loamy sand	1.63 in./hr
– Sand	3.6 in./hr

Note that the infiltration rates should be considered very approximate. The Wisconsin Department of Commerce Soil Evaluation Report forms for Borings 5 through 11 are contained in Appendix G.

- Groundwater: Groundwater was not encountered in the borings during or shortly after drilling. However, mottling was noticeable in some of the clays, as discussed above, which suggests seasonal or past saturation. Note that the mottling (i.e., redoximorphic features) is considered a limiting layer to storm water infiltration. Groundwater levels can be expected to fluctuate, as previously discussed.

- Bedrock: Apparent weathered sandstone bedrock was encountered in Borings 7 through 11 at depths of 96 to 171 in. below existing grades. The bedrock depth should be expected to vary across the site. Minimum separation distances are typically required below the bottom of infiltration areas and bedrock.

Based on the presence of redoximorphic features in portions of the shallow clays, some areas of this site (around Borings 5, 7 and 9) do not appear suitable for infiltrating a significant quantity of storm water. However, sandy soils were encountered below the clay soils in the remaining areas of the site that appear suitable infiltrating storm water. Soils at the bottom of the infiltration areas should be verified during construction.

During construction of the proposed building and related site work, appropriate erosion control should be provided to prevent eroded soil from contaminating the infiltration areas. Where appropriate, the basin design should include pretreatment to remove fine-grained soils (silt/clay) from storm water prior to entering the infiltration area. Additionally, a regular maintenance plan should be developed to remove silt/clay soils that may accumulate in the bottom of the infiltration basin over time. Failure to adequately control fine-grained soils from entering the infiltration area or failure to regularly remove fine-grained soils that accumulate at the base of the infiltration basin will likely cause the basin to fail. Refer to WDNR Conservation Practice Standard 1002 and NR 151 *Runoff Management* for additional information.

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:

- Earthwork construction during the early spring or late fall 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.

- If the construction schedule requires that construction proceed during adverse weather, typically encountered during fall through spring, the budget should include a contingency for undercutting disturbed soils.

- To the extent practical, traffic should be avoided on prepared subgrades to minimize further disturbance.

- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards.

- Based on observations made during the field exploration, groundwater infiltration into excavations is not expected to be a problem except near drainageways. However, water accumulating at the base of the building or utility excavations as a result of precipitation or seepage should be quickly removed using pumps operating from filtered sump pits if drawdowns of about 2 ft or less are needed. Greater drawdowns will require well points.

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 proceeds in accordance with our recommendations, the following operations should be monitored by CGC:

- Proof-rolling within roadway areas;
- Fill/backfill placement and compaction;
- Foundation excavation; and
- Concrete placement.

CGC, Inc.

FOLLOW-UP EXPLORATION PROGRAMS

The exploration program described in this report is preliminary in nature and is not intended to provide sufficient detail on subsurface conditions for each individual structure. Follow-up exploration by test pits or borings is recommended in the future. We can provide specific recommendations and a proposal for the additional exploration at the appropriate time.

* * * * *

It has been a pleasure to serve you on this project. We look forward to continuing our project involvement by providing construction testing services during the construction phase of the project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

Michael N Schultz

Michael N. Schultz, P.E.
Principal/Consulting Professional

William W Wuellner/MNS

William W. Wuellner, P.E.
Senior Geotechnical Engineer

Encl: Appendix A - Field Exploration
Appendix B - Boring Location Map
Logs of Test Borings (20)
Log of Test Boring-General Notes
Unified Soil Classification System
Appendix C - Document Qualifications
Appendix D - Recommended Compacted Fill Specifications
Appendix E - Rock Excavation Considerations
Appendix F - Perimeter Drain Details
Appendix G - Wisconsin Department of Commerce Soil Evaluation Forms

APPENDIX A

SUBSURFACE EXPLORATION

APPENDIX A

SUBSURFACE EXPLORATION

A total of 20 Standard Penetration Test (SPT) borings were drilled to planned depths of 15 ft below existing site grades at locations selected and field located by DKA. DKA also surveyed the ground surface elevations at the boring locations. Several of the borings terminated at depths slightly shallower than the planned depth due to spoon refusal on probable less weathered sandstone bedrock. Another boring (B-15) was terminated at 9 ft due to auger refusal. The soil borings were conducted by Badger State Drilling (under subcontract to CGC) on November 13, 2007 using two D-120 rotary drill rigs equipped with hollow-stem augers. The specific procedures used for drilling and sampling are described in Appendix A. The boring locations are shown in plan on the Soil Boring Location Map presented in Appendix B.

In each SPT boring, soil samples were obtained at 2.5 foot intervals to a depth of 10 ft and at 2.5 ft to 5 ft intervals thereafter. The soil samples were obtained in general accordance with specifications for standard penetration testing, ASTM D1586. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures between Samples

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

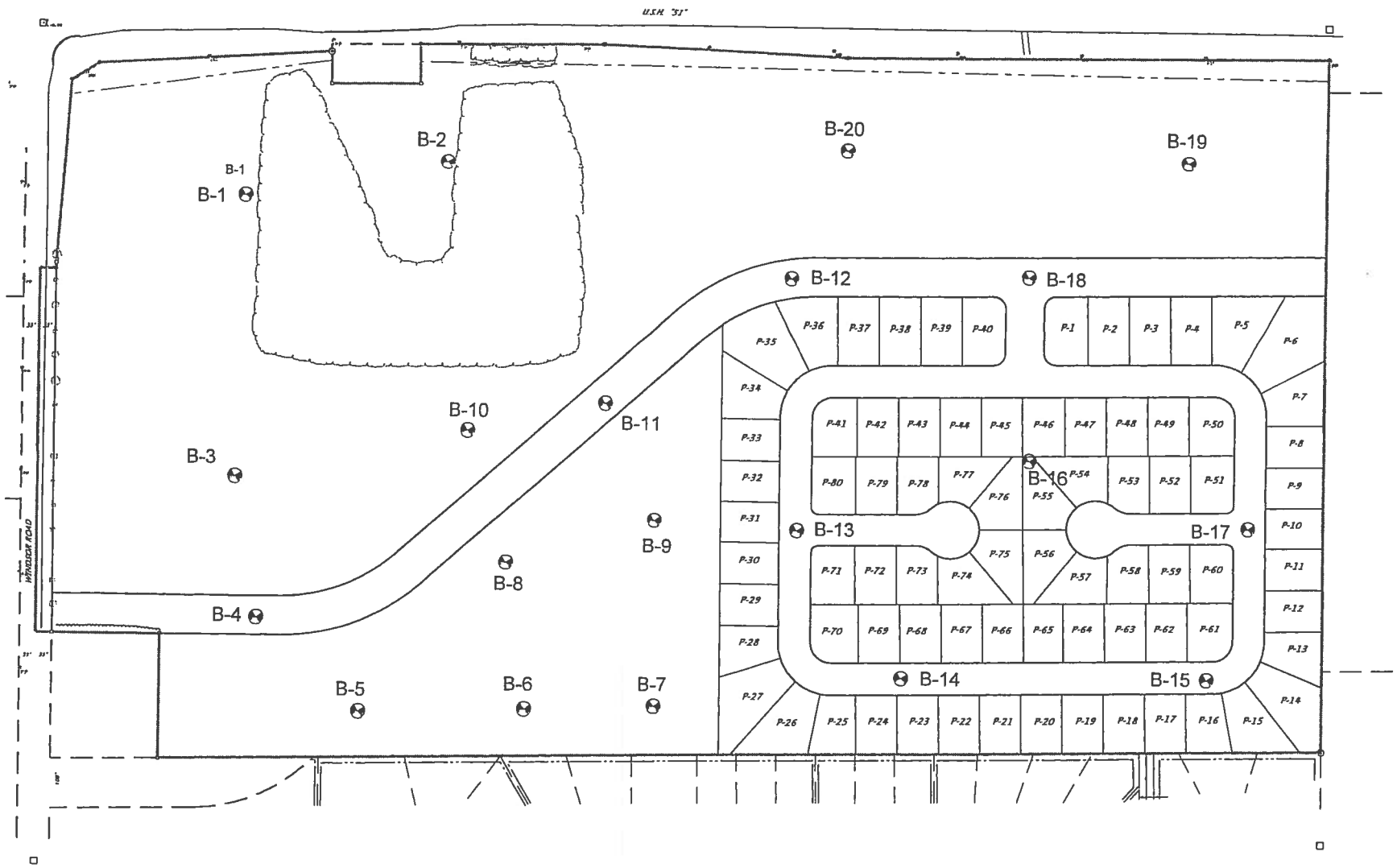
2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D1586)

   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. Recovered samples are first classified as to texture by the driller.

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 environmental site assessment activities is beyond 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 boreholes were backfilled in accordance with 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 and a description of the Unified Soil Classification System are presented in Appendix B.

APPENDIX B

BORING LOCATION MAP
LOGS OF TEST BORINGS (20)
LOG OF TEST BORING-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



Legend

Denotes Soil Boring Location and Number

SCALE: 1" = 100'

FN: 06-07-131

Notes

1. Soil borings conducted by Badger State Drilling in November 2007.
2. Base map provided by D'Onofrio Kottke.
3. Boring locations are approximate.

Date: 11/07	CGC, Inc.	**SOIL BORING LOCATION MAP**
Job No. C07422		**Windsor Crossing Development**
		USH 51 & Windsor Road
		Windsor, Wisconsin

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 1
Surface Elevation (ft) 926.4
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	8		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.25)	24.9			
2		14	M	29	5	Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
3		14	M	48		Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP)					
4		16	M	40	10						
5		6	M	50/1"		Very Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
					15	End Boring at 14'1"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

LOG OF TEST BORING

CGC Inc.

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 2
Surface Elevation (ft) 922.8
Job No. C07422
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. Dark Brown Silty Clay TOPSOIL (OL)					
1		12	M	5		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)				
2		16	M	12	5		(1.5)	27.6			
3		8	M	68		Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
4		18	M	24	10	Medium Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP)					
5		5	M	50/1"	15	Very Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone) White Sandstone in Very Tip of Spoon					
					20	End Boring at 14'1"					

Borehole backfilled with bentonite chips

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 3
Surface Elevation (ft) 932.7
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	7		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.5)				
2		18	M	9	5	Stiff, Reddish-Brown Sandy Lean CLAY (CL)	(1.5)				
3		16	M	19		Medium Dense, Pinkish-Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
4		18	M	23	10						
5		16	M	50/3"		Very Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
					15	End Boring at 14'3"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 4
Surface Elevation (ft) 927.2
Job No. C07422
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
						14 in. Black Silty Clay TOPSOIL (OL)					
1		12	M	5		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)	24.5			
2		18	M	6	5		(2.0)				
3		14	M	16		Stiff, Reddish-Brown Sandy Lean CLAY (CL)	(1.5)				
4		10	M	65	10	Very Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
5		16	M	58	15						
					20	End Boring at 15 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 5
Surface Elevation (ft) 919.1
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						14 in. Black Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		14	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)				
						USDA: 10YR 4/4 Silty Clay Loam					
2		16	M	10			(1.5)				
					5						
3		18	M	12		Medium Dense, Brown Fine to Medium Clayey SAND, Some Gravel (SC) USDA: 10YR 3/3 Sandy Clay Loam					
4		14	M	21		Medium Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
					10	7.5YR 4/4 Sandy Loam					
5		12	M	28							
					15	End Boring at 15 ft					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 6
Surface Elevation (ft) 914.5
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	7		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL) USDA: 10YR 4/4 Silty Clay Loam	(2.0)				
2		14	M	8	5	Medium Stiff, Brown Silty CLAY, Trace Sand (CL-ML) USDA: 10YR 4/4 Silty Clay Loam	(0.75)	23.3			
3		18	M	48		Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP) USDA: 10YR 5/3 Very Gravelly Sand					
4		16	M	22	10	Medium Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM) USDA: 10YR 6/4 Sandy Loam					
5		12	M	50/3"		Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM) USDA: 10YR 5/3 Loamy Sand					
					15	End Boring at 14'3"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 7
Surface Elevation (ft) 912.8
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						20 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		18	M	9		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL) USDA: 10YR 4/3 Silty Clay Loam	(2.0)				
2		16	M	13	5		(1.5)				
3		15	M	41		Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM) USDA: 10YR 5/3 Very Gravelly Loamy Sand					
4		12	M	79	10	Very Dense, Pinkish-White Fine to Medium SAND, Trace to Little Silt, Some Gravel (SP/SP-SM) (Highly Weathered Sandstone) USDA: 7.5YR 7/3 Gravelly Sand (Weathered Sandstone)					
5		6	M	50/1"	15	End Boring at 14'1" Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 8
Surface Elevation (ft) 916.4
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						12 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		14	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.5)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		18	M	16			(1.5)				
					5						
						Medium Dense to Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
3		16	M	26							
						USDA: 10YR 5/4 Sandy Loam					
4		14	M	32							
					10						
						Very Dense, Light Brown Fine to Medium SAND, Trace Silt, Some Gravel, Scattered Cobbles (SP) USDA: 10YR 7/4 Loamy Sand					
5		8	M	50/4"							
					15	End Boring at 14'4"					
						Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 9
Surface Elevation (ft) 917.5
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						9 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	5		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.0)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		16	M	7			(1.5)	24.1			
					5						
3		14	M	46		Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
						USDA: 10YR 6/4 Very Gravelly Loamy Sand					
4		12	M	68		Very Dense, White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone)					
					10	USDA: 10YR 7/2 Sand (Weathered Sandstone)					
5		6	M	79/6"							
						End Boring at 14 ft					
					15	Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 10
Surface Elevation (ft) 918.9
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						10 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.25)				
						USDA: 10YR 4/3 Silty Clay Loam					
2		18	M	17			(1.5)				
					5						
3		16	M	32		Medium Dense to Very Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
						USDA: 10YR 6/4 Very Gravelly Loamy Sand					
4		14	M	14							
					10						
5		8	M	50/3"		White Sandstone in Tip of Spoon					
						End Boring at 14'3"					
					15	Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 11
Surface Elevation (ft) 919.7
Job No. C07422
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
						9 in. Dark Brown Silty Clay TOPSOIL (OL) USDA: 10YR 2/1 Silt Loam					
1		16	M	6		Stiff to Very Stiff, Brown Lean CLAY, Trace Sand (CL) USDA: 10YR 4/3 Silty Clay Loam	(2.5)				
2		12	M	6	5		(1.5)				
3		18	M	19		Medium Dense, Light Brown to White Fine SAND, Little to Some Silt, Trace Gravel (SP-SM/SM) (Highly Weathered Sandstone) USDA: 10YR 5/4 Loamy Sand					
4		4	M	50/4"	10	Very Dense, White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone) USDA: 10YR 7/1 Sand (Weathered Sandstone Bedrock)					
5		3	M	50/3"	15	End Boring at 14'3" Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief SE Rig D-120
Logger SE Editor MNS
Drill Method 4" FA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 12
Surface Elevation (ft) 937.2
Job No. C07422
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. Dark Brown Silty Clay TOPSOIL (OL)					
1		18	M	6		Loose, Brown Silty to Clayey SAND (SM/SC)		15.2			
2		16	M	12	5	Medium Dense, Reddish-Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
3		14	M	28							
4		16	M	24	10						
						Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
5		18	M	43	15						
						End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling
Time After Drilling 3 hrs
Depth to Water NW ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 13
Surface Elevation (ft) 921.7
Job No. C07422
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
						11 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	7		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.75)				
2		18	M	5			(1.75)				
					5	Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
3		18	M	27							
4		16	M	68/ 11"		Very Dense, Light Brown to White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone)					
					10						
5		3	M	50/3"							
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 14
Surface Elevation (ft) 917.6
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						10 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	6		Soft to Medium Stiff, Brown Silty to Lean CLAY, Some Sand (CL-ML/CL)	(2.5)				
2		18	M	6			(0.5)	20.0			
					5	Medium Dense, Brown Fine SAND, Some Silt (SM)					
3		18	M	13							
4		16	M	47		Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
					10						
5		0	M	75		Very Dense, White Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Highly Weathered Sandstone) (Assumed-No Recovery)					
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 15
Surface Elevation (ft) 921.9
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						11 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	7		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.75)	23.7			
2		14	M	6			(1.5)				
					5	Loose, Brown Silty to Clayey SAND (SM/SC)					
3		8	M	10							
						End Boring/Auger Refusal at 9 ft					
					10	Borehole backfilled with bentonite chips					
					15						
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling
Time After Drilling 3 hrs
Depth to Water NW ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 16
Surface Elevation (ft) 929.7
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						12 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		18	M	7		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.75)				
2		18	M	8	5	Soft, Brown Silty CLAY, Trace Sand (CL-ML)	(0.25)	27.2			
3		16	M	16		Medium Dense to Very Dense, Reddish-Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
4		18	M	24	10						
5		16	M	71	15						
					20	End Boring at 15 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 17
Surface Elevation (ft) 930.3
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						12 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		12	M	6		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.5)				
2		16	M	5	5		(1.25)				
3		16	M	7		Loose to Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
4		16	M	15	10						
5		16	M	83		Very Dense, Light Brown to White Fine SAND, Little to Some Silt, Trace Gravel (SP-SM/SM) (Highly Weathered Sandstone)					
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW
Upon Completion of Drilling
Time After Drilling 3 hrs
Depth to Water NW ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 18
Surface Elevation (ft) 939.3
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						10 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		16	M	6		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.75)				
2		18	M	4	5		(1.25)				
3		18	M	10		Loose to Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
4		16	M	16	10						
5		16	M	46	15	Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
					20	End Boring at 15 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 19
Surface Elevation (ft) 947.0
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						13 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		10	M	5		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.25)	26.5			
2		18	M	23		Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt, Little to Some Gravel (SP/SP-SM)					
					5						
3		16	M	13		Medium Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles (SP-SM/SM)					
4		16	M	17							
					10						
5		18	M	47		Dense, Light Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling
Time After Drilling 3 hrs
Depth to Water 11' ▼
Depth to Cave in

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Windsor Crossing Development
USH 51 & Windsor Road
Location: Windsor, Wisconsin

Boring No. 20
Surface Elevation (ft) 957.5
Job No. C07422
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	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						11 in. Dark Brown Silty Clay TOPSOIL (OL)					
1		10	M	8		Very Stiff, Brown Lean CLAY, Trace Sand (CL)	(2.25)				
2		16	M	10	5	Loose to Medium Dense, Reddish-Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
3		18	M	10							
4		16	M	11	10						
5		16	M	18	15	Medium Dense, Reddish-Brown to White Fine to Medium SAND, Some Silt, Little to Some Gravel (SM) (Highly Weathered Sandstone)					
					20	End Boring at 15 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ 3 hrs
Depth to Water _____ _____ _____ NW ▼
Depth to Cave in _____ _____ _____ _____

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

GENERAL NOTES

Start 11/13/07 End 11/13/07
Driller Badger Chief MA Rig D-120
Logger BR Editor MNS
Drill Method 4 1/4" HSA

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	3/4" to 3"	3/4" to 3"
Fine	4.76 mm to 3/4"	#4 to 3/4"
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 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 Designator
RB--Rock Bit
FT--Fish Tail
DC--Drove Casing
C--Casing: Size 2 1/2", 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" Diameter Split-Barrel Sample
2ST--2" Diameter Thin-Walled Tube Sample
3ST--3" Diameter Thin-Walled Tube Sample
PT--3" Diameter 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_p--Penetrometer Reading, tons/sq. ft.
q_u--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--Caved 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.

UNIFIED SOIL CLASSIFICATION SYSTEM

COARSE-GRAINED SOILS

(More than half of material is larger than No. 200 seive size.)

GRAVELS — More than half of coarse fraction larger than No. 4 sieve size

Clean Gravels (Little or no 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 (Appreciable amount of fines)

GM^{d}_{u}	Silty gravels, gravel-sand-silt mixtures
GC	Clayey gravels, gravel-sand-clay mixtures

SANDS — More than half of coarse fraction smaller than No. 4 sieve size

Clean Sands (Little or no fines)

SW	Well-graded sands, gravelly sands, little or no fines
SP	Poorly graded sands, gravelly sands, little or no fines

Sands with Fines (Appreciable amount of fines)

SM^{d}_{u}	Silty sands, sand-silt mixtures
SC	Clayey sands, sand-clay mixtures

FINE-GRAINED SOILS

(More than half of material is smaller than No. 200 sieve.)

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 greater than 50%

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

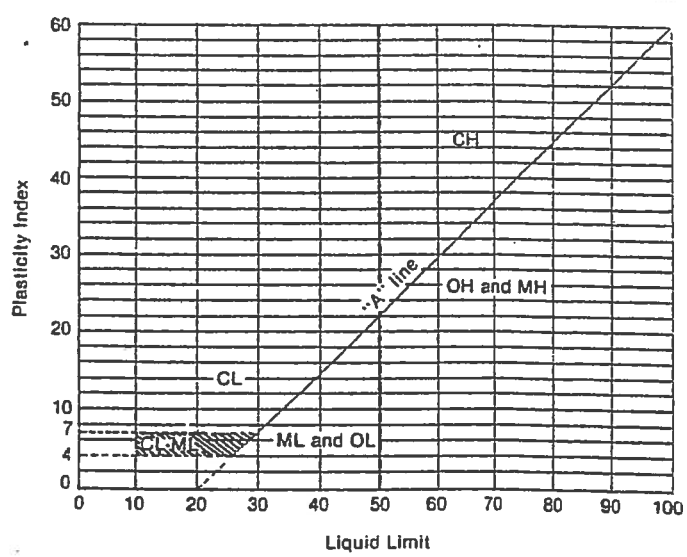
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits 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 limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched 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 per cent ..... GW, GP, SW, SP
More than 12 per cent ..... GM, GC, SM, SC
5 to 12 per cent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



For classification of fine-grained soils and fine fraction of coarse-grained soils.

Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols.

Equation of A-line: PI = 0.73 (LL - 20)

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

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, due in large measure to programs and publications of ASFE/The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

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

A CGC geotechnical report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult CGC's geotechnical engineers to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless CGC indicates otherwise, your geotechnical engineering report should not be used:

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

CGC geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geotechnical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances, actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact. For this reason, most experienced owners retain their geotechnical consultants through the construction stage, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time. Speak with CGC's geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. CGC's geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

CGC geotechnical reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, CGC's geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by CGC engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. These logs should not under any circumstances be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-to-frequent result. To minimize the likelihood of boring log misinterpretation, give contractors ready access to the complete geotechnical engineering report prepared or authorized for their use. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, CGC geotechnical engineers have developed model clauses for use in written transmittals. These are not exculpatory clauses designed to foist our geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where our geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. CGC's geotechnical engineers will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

CGC's geotechnical engineers will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

APPENDIX D

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX D

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

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. The rock, boulders or concrete pieces should contain finer material to fill in void spaces between the larger material.

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 a 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 1.

Table 1
Compaction Guidelines

Area	Percent Compaction+ Clay/Silt	Sand/Gravel
Within 10 feet of building lines		
• Footing bearing soils	93-95	95
• Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab & thicker fill zones	92	95
Beyond 10 feet 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:

+ Based on Modified Proctor (ASTM D 1557)

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.

APPENDIX E

ROCK EXCAVATION CONSIDERATIONS

APPENDIX E

ROCK EXCAVATION CONSIDERATIONS

In order to minimize probable "rock" excavation expenses during construction, we suggest that project specifications incorporate the following:

A. It is assumed that all excavations to levels and dimensions required by the Contract Documents are earth excavation. Earth excavation includes removal and disposal of all materials encountered except rock/sound bedrock which is defined as natural materials which:

1. Cannot be excavated with a minimum 3/4 cubic yard capacity backhoe without drilling and blasting;

2. Cannot be economically removed with a one-tooth ripper on a D8 cat (or equivalent);

3. Requires the use of special equipment such as a pneumatic hammer;

4. Requires the use of explosives (after obtaining written permission of the owner).

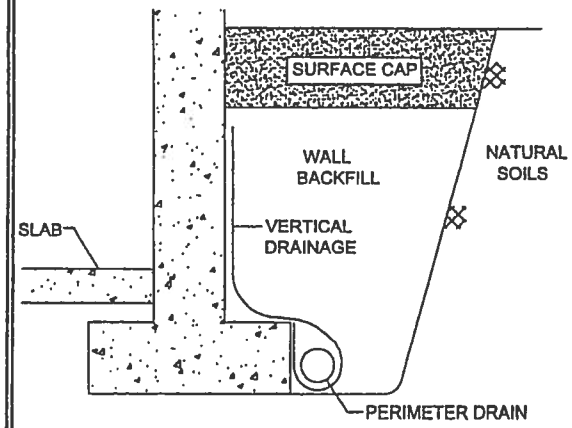
B. Examples of material classified as rock are boulders 1/2 cubic yard or more in volume, bedrock, rock in ledges, and rockhard cementitious aggregate deposits.

C. Do not proceed with rock excavation work until architect, engineer and/or testing firm (i.e., CGC) has taken the necessary measures to determine quantity of rock excavation required to complete the work. Measurements will be taken after properly stripped of earth by the contractor. Contractor will be paid the difference between the cost of rock and earth excavation based on an agreed upon unit price established prior to starting rock excavation.

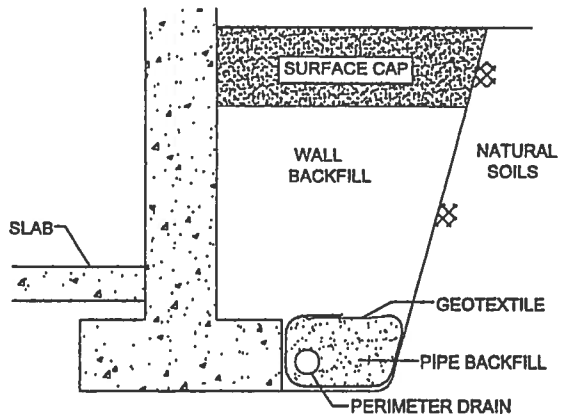
A statement should also be included in the specifications to the effect that: "Stated models of earth excavation equipment are merely for purposes of defining the various excavation categories and are not intended to indicate the brand or type of equipment that is to be used."

APPENDIX F

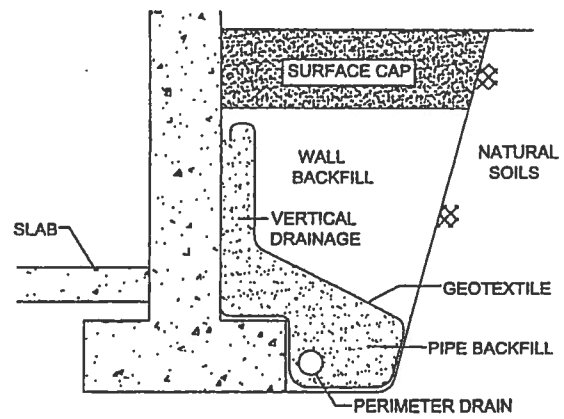
PERIMETER DRAIN DETAILS



ALTERNATE NO. 1



ALTERNATE NO. 2



ALTERNATE NO. 3

DRAINAGE SYSTEM COMPONENTS

Component	Alternate No. 1	Alternate No. 2	Alternate No. 3
Surface Cap	1 to 2 ft. of clayey soils. Minimum 1 ft. thick if overlain by pavement	Refer to Alternate No. 1	Refer to Alternate No. 1
Vertical Drainage	3-dimesional drainage geocomposite hydraulically connected to perimeter drain.	Relatively Free-draining granular soils with P200 (% fines) ≤12%.	Minimum 6-in. wide zone of free-draining granualr soils with P200 ≤5% hydraulically connected to perimeter drain. Provide geotextile as required (see note 10).
Perimeter Drain	Perforated pipe encapsulated in geocomposite.	Perforated pipe surrounded by free-draining granular pipe backfill with P200≤5%. Provide geotextile as required (See Note 10).	Refer to Alternate No. 2
Wall Backfill	Excavation spoils or imported materials (granular soils preferred).	Relatively Free-draining granular soils with P200≤12%.	Refer to Alternate No. 1

CGC, Inc.

Typical Perimeter Drain Detail

General Notes

1. This system's primary function is to intercept infiltrating surface water. These Alternates are not appropriate for use in situations of high groundwater (i.e., cases where the water table approaches floor slab elevation).

2. Grade surface cap to slope away from structure.

3. Exterior surface of walls below grade should be damp-proofed.

4. A plastic vapor barrier should be installed below the slab.

5. Recommended types of drain pipes:

Specification	Description
ASTM D2729	Polyvinyl Chloride (PVC) Drain Pipe
ASTM F405	Corrugated Polyethylene Drain Pipe
ASTM D2852	Styrene-Rubber Plastic Drain Pipe
AASHTO M136	Corrugated Metal Underdrain Pipe

6. Minimum slope of drain pipes should be 2 in. per 100 lin ft.

7. Place drain pipe below basement floor level and orient the perforations toward the bottom.

8. Clean-outs should be provided to service the pipe.

9. Collected field water should be discharged to a sump, storm sewer or drainage field.

10. The geotextile for Alternative Nos. 2 and 3 may be eliminated if filter requirements are satisfied between the wall and pipe backfill, as well as between backfill materials and natural soils.

11. Pipe backfill materials should satisfy filter requirements for the slot width or hole diameter of the perforated pipe.

12. Care should be taken during backfilling not to damage the integrity of the system. For compaction requirements, refer to geotechnical report.

13. Pipe, geotextile, and geocomposite should be installed according to manufacturer specifications.

CGC, Inc.	Typical Perimeter Drain Detail General Notes

APPENDIX G

WISCONSIN DEPARTMENT OF COMMERCE - SOIL EVALUATION FORMS (6)

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), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

Please print all information.

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

County: DANE

Parcel I.D.: 0910294800 40

Reviewed by: | Date:

Property Owner	Property Location
COMMUNITY DEVELOPMENT AUTHORITY OF TN OF WINDSOR	Govt. Lot SE 1/4 SE 1/4 S 29 T 09 N R 10 (E) or W
Property Owner's Mailing Address: 4084 MUELLER RD	Lot # / Block # / Subd. Name or CSM#:
City: DEFOREST State: WI Zip Code: 53532 Phone Number: ( )	☐ City ☐ Village ☒ Town — Nearest Road: WINDSOR RD
	Town: WINDSOR

Drainage area _____ ☐ sq. ft. ☐ acres

Optional:

Test Site Suitable for (check all that apply)

☐ Irrigation ☐ Bioretention 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) _____

Obs. # 5 ☒ Boring ☐ Pit — Ground surface elev. 919.1 ft. — Depth to limiting factor 48 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-14	10YR 2/1	None	SiL	1msbk	mfr	cs	<5	0.13
2	14-72	10YR 4/4	C2d 10YR 6/6	SiCL	1msbk	mfi	gs	<5	0.04
3	72-102	10YR 3/3	None	SCL	0m	mfr	gs	10-15	0.11
4	102-180	7.5YR 4/4	None	SL	1fsbk	mvfr		10-15	0.5

Obs. # 6 ☒ Boring ☐ Pit — Ground surface elev. 914.5 ft. — Depth to limiting factor >171 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-8	10YR 2/1	None	SiL	1msbk	mfr	cs	<5	0.13
2	8-42	10YR 4/4	None	SiCL	1fsbk	mfi	gs	<5	0.04
3	42-72	10YR 4/3	None	SCL	0m	mvfr	gs	<5	0.11
4	72-102	10YR 5/3	None	VGRS	0sg	ml	gs	20-30	3.6+
5	102-150	10YR 6/4	None	SL	1fsbk	mvfr	gs	15-20	0.5
6	150-171	10YR 5/3	None	LS	0sg	ml		15-20	1.63

CST/PSS Name (Please Print)	Signature	CST/PSS Number
DAVID STAAB	David Staab	1042602
Address	**Date Evaluation Conducted**	**Telephone Number**
3911 MINERAL POINT ROAD MADISON 53705	11/26/07	608/288-4100

Property Owner WINDSOR Parcel ID # 09102948 0040 Page 2 of 4

7 Obs. # ☒ Boring ☐ Pit Ground surface elev. 912.8 ft. Depth to limiting factor 48 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-20	10YR 2/1	None	SiL	1fsbk	mfr	cs	<5	0.13
2	20-66	10YR 4/3	C2f 10YR 6/6	SiCL	2fsbk	mfr	gs	<5	0.04
3	66-96	10YR 5/3	None	VGRLS	0sg	ml	gs	20-30	1.63+
4	96-169	7.5YR 7/3	None	GRS*	0sg	ml		15-25	—
		* APPARENT WEATHERED SANDSTONE							

8 Obs. # ☒ Boring ☐ Pit Ground surface elev. 916.4 ft. Depth to limiting factor >172 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-12	10YR 2/1	None	SiL	1fsbk	mfr	cs	<5	0.13
2	12-66	10YR 3/4	None	SiCL	1fsbk	mfi	gs	<5	0.04
3	66-156	10YR 5/4	None	SL	0sg	ml	gs	15-25	0.5
4	156-172	10YR 7/4	None	LS	0sg	ml		15-25	1.63+

Test Results and/or Summary Comments

The Department of Commerce is an equal opportunity service provider and employer. If you need assistance to access services or need material in an alternate format, please contact the department at 608-266-3151 or TTY 608-264-8777.

Property Owner WINDSOR Parcel ID # 09102949 80040 Page 3 of 4

9 Obs. # ☒ Boring ☐ Pit Ground surface elev. 917.5 ft. Depth to limiting factor 48 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-9	10YR 2/1	None	SiL	1fsbk	mfr	cs	<5	0.13
2	9-72	10YR 4/3	f2f 10YR 6/6	SiCL	1fsbk	mfi	gs	<5	0.04
3	72-102	10YR 6/4	None.	VGRLS	0sg	ml	gs	20-30	1.63+
4	102-168	10YR 7/2	None	VGRS*	0sg	ml		15-25	-
		* APPARENT WEATHERED SANDSTONE							

10 Obs. # ☒ Boring ☐ Pit Ground surface elev. 918.9 ft. Depth to limiting factor 171 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-10	10YR 2/1	None	SiL	1fsbk	mfr	cs	<5	0.13
2	10-72	10YR 4/3	None	SiCL	1fsbk	mfi	gs	<5	0.04
3	72-171	10YR 6/4	None	VGRLS	0sg	ml		20-30	1.63+
		* APPARENT WEATHERED SANDSTONE NEAR 171 in.							

Test Results and/or Summary Comments

The Department of Commerce is an equal opportunity service provider and employer. If you need assistance to access services or need material in an alternate format, please contact the department at 608-266-3151 or TTY 608-264-8777.

Property Owner WINDSOR Parcel ID # 09102948 0040 Page 4 of 4

11 Obs. # ☒ Boring ☐ Pit Ground surface elev. 919.7 ft. Depth to limiting factor 90 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-9	10YR 2/1	None	SiL	lfsbk	mfr	cs	<5	0.13
2	9-72	10YR 4/3	None	SiCL	lfsbk	mfi	gs	<5	0.04
3	72-90	10YR 5/4	None	LS	0sg	ml	gs	10-20	1.63
4	90-171	10YR 7/1	None	S*	0sg	ml		5-15	–
		*APPARENT WEATHERED SANDSTONE BEDROCK							

☐ Obs. # ☐ Boring ☐ Pit Ground surface elev. _____ ft. Depth to limiting factor _____ in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr

Test Results and/or Summary Comments

The Department of Commerce is an equal opportunity service provider and employer. If you need assistance to access services or need material in an alternate format, please contact the department at 608-266-3151 or TTY 608-264-8777.

Madison Regional Office
161 Horizon Drive, Suite 101
Verona, WI 53593
Phone: 608.848.5060
Fax: 608.848.2255

Milwaukee Regional Office
N22 W22931 Nancys Ct. Suite 3
Waukesha, WI 53186
Phone: 262.513.0666
Fax: 262.513.1232

Kenosha Regional Office
6520 67th Street
Kenosha, WI 53142
Phone: 262.925.8367
Fax: 262.925.8362

Fox Valley Regional Office
3215 West Lawrence Street, Suite 6
Appleton, WI 54913
Phone: 920-733-2800
Fax: 920-733-2801

Wausau Regional Office
7402 Stone Ridge Drive, Suite 4
Weston, WI 54476
Phone: 715-298-6330
Fax: 715-298-6326

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

www.jsdinc.com

VILLAGE OF WINDSOR

PLAN COMMISSION MEETING

Minutes

March 14, 2019

1. CALL MEETING TO ORDER AND ROLL CALL.

Meeting convened by Chairperson Wipperfurth at 5:00 p.m. Commissioners present: Dave Gaustad, Jeff Heisig, Tim Lange, Bill LeGore, Brad Mueller, and Bob Wipperfurth. Kay Hoffman had an excused absence.

Others present: Director of Planning and Development Amy Anderson Schweppe, Village Deputy Administrator/Director of Economic Development Jamie Rybarczyk, and Village Attorney Bill Cole.

2. RECITATION OF THE PLEDGE OF ALLEGIANCE.

The flag pledge was led by Commissioner Heisig.

3. ANNOUNCEMENTS.

Chairperson Wipperfurth stated, because of the weather-related events (flooding), he may have to take a phone call and step out of the meeting. Commissioner LeGore would take over during that time.

4. APPEARANCES BEFORE THE PLAN COMMISSION.

None.

5. MINUTES FROM FEBRUARY 13, 2019.

A motion was made by Commissioner Heisig, seconded by Commissioner Gaustad, to approve the Minutes of February 13, 2019, as presented. Motion carried with a 6-0 vote.

6. PUBLIC HEARING.

Chairperson Wipperfurth read the following public hearing notices.

DRAFT

He advised that each would start with a staff report. If anyone in the audience had any comments, they could raise their hand if they had filled out a Public Comment Sign-Up Sheet. This will happen during the public hearing. When the public hearing is closed, there will no longer be any public comment.

6.a. Alan Buchner Requests A Certified Survey Map And Rezone From A1-EX Exclusive Agriculture District To A-2 Agriculture District In Order To Combine Four Lots Into Three Lots At 3804 Vinburn Road, DeForest, WI.

Chairperson Wipperfurth opened the public hearing at 5:04 p.m.

Director of Planning and Zoning Anderson Schweppe advised that the Petitioner received approval for a certified survey map request by the Plan Commission on November 8, 2018, and the Village Board on December 6, 2018. Following the village approvals, a member of the Buchner Revocable Trust, Warren J. and Donna M., passed requiring a need to revise the approved certified survey map. As a result, the Petitioner is requesting approval of a three-lot certified survey map.

Lots 1 and 2 are owned by the Buchner Rev Tr, Warren J & Donna M. Each lot has one (1) eligible residential split. The Petitioner intends to combine Lots 1 and 2 by Certified Survey Map, split off the existing farm residence and agricultural buildings, and deed restrict the new Lots 2 and 3 from further development. The new Lot 2 will be rezoned from A1-EX, Exclusive Agriculture District to A-2(4), Agriculture District. Since the existing farm residence and agricultural buildings existed prior to 1993, the split does not count against the density requirement. The new Lot 3 will remain zoned A1-EX, Exclusive Agriculture District. In addition, the Petitioner intends to transfer the two (2) eligible residential splits to the East Property.

Lots 3 and 4 are owned by Buchner Rev Tr, Alan Buchner Rev Tr, Lyle & Laurie. Each lot has one (1) eligible residential split. Similarly, the Petitioner intends to combine Lots 3 and 4 by Certified Survey Map and deed restrict the new Lot 1 from further development. A small portion of the new Lot 1 will be rezoned from A1-EX, Exclusive Agriculture District, to A-2(2), Agriculture District. The Petitioner also intends to transfer one (1) eligible residential split to the East Property and retain one (1) eligible residential split on the West Property for the new Lot 1.

Lot 1 is owned by the Buchner Rev Tr, Alan. The Petitioner intends to transfer the three (3) eligible residential splits from the West property to the East property currently with one (1) eligible residential split, to achieve a total of four (4) eligible residential splits for the development of single-family home sites.

The village staff provided the following comments:

1. The Certified Survey Map request is consistent with the requirements of Chapter 38 Planning and Development. The Surveying Department has no objections to the Certified Survey Map.

DRAFT

2. Lots 1, 2, and 3 are consistent with the A1-EX, Exclusive Agriculture District; A-2 (2) Agriculture District; and A-2(4) Agriculture District.

3. The Certified Survey Map and Rezone are consistent with the goals, objectives, and policies of the Village of Windsor Comprehensive Plan: 2035.

4. The Village Engineer had no objections to the Certified Survey Map.

5. The DeForest Windsor Fire & EMS had no objections to the Certified Survey Map.

Director of Planning and Zoning Anderson Schweppe added that the village of Windsor shall waive requirements for payment of Fees in Lieu of Parkland and Fees for Initial Improvements of Parkland because Lots 3 and 4 (to be combined) existed prior to adoption of the Park Fee Ordinances, and the proposed lots exclude all residential developable rights.

The village staff provided recommended conditions if action were to be taken by the Plan Commission.

Chairperson Wipperfurth closed the public hearing at 5:08 p.m.

6.b. Forward Development Group Requests A Certified Survey Map In Order To Create 4 Lots At The NE 1/4 Of The SE 1/4 Of Section 25 Further Described As The Southeast Corner Of Windsor Road And North Towne Road.

Chairperson Wipperfurth opened the public hearing at 5:09 p.m.

Director of Planning and Zoning Anderson Schweppe advised that the Petitioner is requesting discussion and action by the village Plan Commission for a certified survey map subdividing Lot 1 and Lot 2 of Certified Survey Map 143047. The request consists of two action items: (1) rescind Plan Commission Resolution 2018-13 and Village Board Resolution 2018-57 approvals; and (2) approval of a revised certified survey map including private access and utility easements.

The revised certified survey map consists of two lots for commercial end users and two outlots. Lot 1 is planned for the Summit Credit Union that was reviewed and approved by the village of Windsor in 2018. Lot 2 is planned for undetermined commercial user(s). Outlot 2 provides access to the planned Village Center and surrounding end users to be constructed on Outlot 1. Access to Lots 1 and 2 is provided by an access easement along the eastern border of each lot.

There were some minor comments by the Planning, Zoning and Development Department and the Engineering Department.

The DeForest Windsor Fire & EMS District had no objections to the certified survey map.

DRAFT

The Petitioner shall prepare an access easement agreement for Lot 1 and Lot 2 in a form approved by the Village Attorney.

The village staff provided recommended conditions if action were to be taken by the Plan Commission.

Chairperson Wipperfurth closed the public hearing at 5:11 p.m.

6.c. Karen Schultz (dba Paradise Paws Camp & Resort) Requests A Rezone From A-3 Agriculture District To C-1 Commercial District, A Conditional Use Permit For A Kennel And Boarding Facility, And Site Plan Review For A Doggie Daycare Business Located At The NW Corner Of Pederson Crossing Boulevard And Reardon Road.

Chairperson Wipperfurth opened the public hearing at 5:12 p.m.

Director of Planning and Zoning Anderson Schweppe advised that the Petitioner is requesting discussion and action by the village of Windsor Plan Commission for a Rezone, Conditional Use Permit, and Site Plan Review for a dog and cat boarding kennel, grooming, and training facility.

The property is located at the northwest intersection of Pederson Crossing Boulevard and Reardon Road. The Petitioner requests a rezone of the subject property from A-3, Agriculture District, to the C-1, Limited Commercial District, along with a Conditional Use Permit in order to operate a dog and cat boarding kennel, grooming, and training facility on the subject property. The facility will operate both during the day hours and house overnight kenneling. Some retail services including valet pick-up/drop-off, grooming, and a bakery will be provided. The business is designed to accommodate up to 115 dogs a day with 50-80 overnight kenneled dogs.

The development review application includes:

1. 6,160 square feet building (including covered porch).
2. 20 parking stalls with one designated handicap accessible stall.
3. Trash enclosure adjacent to the parking lot (northeast corner of building).
4. Stormwater management basin adjacent to Reardon Road.
5. 3-5 full time employees, 3-5 part time employees (one employee per 20 dogs).
6. Hours of operation: M-F 6:30 a.m. to 6:00 p.m.; Saturday 7:00 a.m. to 6:00 p.m.; Sunday 4:30 p.m. to 6:00 pm; with extended hours for "Special Camp."
7. Secure entry.

Regarding Chapter 10 of Windsor's Buildings and Building Regulations, it is consistent.

The Petitioner is requesting a rezone of the subject property from A-3, Agriculture Zoning District, to C-1, Limited Commercial District, in addition to approval of a conditional use permit for the facility. The Development Review Application is consistent with the requirements of the C-1, Limited Commercial District.

DRAFT

Director of Planning and Zoning Anderson Schweppe discussed the questions asked and responses regarding the conditional use permit.

The rezone, conditional use permit, and site plan review are consistent with the Neighborhood Mixed Use land use category.

The Village Engineering Department had some minor comments.

The DeForest Windsor Fire & EMS District had no objections to the rezone, conditional use permit, and site plan review.

It was noted that the Petitioner did not submit an Erosion & Sedimentation Control Plan and Stormwater Management Plan with the development review application. Approval of the Rezone, Conditional Use Permit, and Site Plan Review shall be conditioned on the Petitioner obtaining approval of the Erosion & Sedimentation Control Plan and Stormwater Management Plan by the village of Windsor and the Dane County Land and Water Resources. The Petitioner shall comply with any and all recommendations by the village of Windsor and Dane County Land & Water Resources prior to the start of construction.

The village staff provided recommended conditions if action were to be taken by the Plan Commission, one of which was the Petitioner is limited to boarding a total maximum of 100 dogs and cats during the stated hours of operation, and a total maximum of 50 dogs and cats boarded for overnight care.

Chairperson Wipperfurth advised that the Petitioner, Karen Schultz, was present.

Petitioner Karen Schultz indicated she hoped to bring a new business to town. She has a passion for working with dogs. This would be a service to the community that is not readily available locally. She discussed doggie daycare. This will be primarily indoors. Dogs want to be where the people are. From 12:00 p.m. to 1:30 or 2:00 p.m., it would be nap time. Barking is something she cares about personally. Ideally she will not have dogs with special needs, aggression, or dogs that have problems. Body language is more important than the breed. One has to learn dog behavior.

The kennel will offer a home-like environment -- soothing, and calm. She will offer kennel-free boarding. As long as a dog is there, there will be staff. Anytime there is a dog overnight, there will be staff.

Chairperson Wipperfurth read three e-mails into the record. (1) From Jay P. Horner and Marsha L. Horner, 1425 Royal View Drive, who were opposed; (2) From Stephen and Lory Foy, 4131 Royal View Drive, who were opposed; and (3) From Scott W. and Jennifer Estness (of which he read the summary), who were opposed. They also mentioned their concern about dogs digging under the fence and escaping.

DRAFT

Bryan Riesing, 4132 Royal View Drive, had several questions. What part of the process are we in? Will the Plan Commission be voting on this?

Chairperson Wipperfurth responded that this is a public hearing. The Plan Commission is able to take action. It can vote it up, vote it down, or hold it in abeyance. He added that the Petitioner Karen Schultz came to previous Plan Commission and Village Board meetings for information only. That was a publicly noticed agenda.

Mr. Riesing asked if the Plan Commission could delay this. He did not know that his neighborhood fully understood this and today is when a decision will be made.

Chairperson Wipperfurth respectfully disagreed from a public standpoint. Notices were sent out. If there were a delay, it would be because the Plan Commission is seeking other information. He added that, when Karen Schultz contacted Windsor, he encouraged her to go door to door.

Mr. Riesing stated the times Ms. Schultz stated were shorter times to pick up the dogs. He did not understand the hours of operation.

Petitioner responded that Sunday is for pick-up. There would be no daycare. The dogs will be watched and monitored.

Mr. Riesing appreciated the plan and the time and effort put into it. He was concerned about the noise aspect. Once it is there, there is no going back. His house is three houses from where this will be located. His ability to enjoy his time out in his yard could be affected, and that is why he is in opposition.

Tom and Sue Ersner, 4128 Royal View Drive, indicated they opposed the application; but they did not want to speak. They has concerns that their property values would go down. They were very concerned about noise both day and night. Was this a seven-day-a-week, 24-hours-a-day business? Mr. Ersner was also concerned about odor.

Petitioner Schultz responded she has addressed odors. She will have a professional pet waste removal business come and remove pet waste. This will be enclosed.

She will be implementing the right tools to keep the dogs happy. This is a conditional use permit and she must abide by it. She will do what she says she will do.

Chris Bartine, 4114 Royal View Drive, has a concern with barking dogs. He also had a concern with the driveway coming out Royal View. There is a school bus stop. He has a concern with the children.

Petitioner responded she is going to have a privacy fence. The majority of the dogs will be indoors. There will not be 100 dogs outside at one time. Dogs will be rotated out.

DRAFT

Pete Read, 711 Lois Drive, Sun Prairie, the architect and builder, went over the placement of trees and berms.

Andrew Sloan, 4133 Golden Wheat Run, was concerned about the long-term viability of this business and what if it does not succeed. He Googled kennels, and there were 20 in the northeast area of Madison. If they do not succeed in three to four years, there will be a building. How was this location chosen? Could they have looked somewhere else?

Petitioner responded that the building is designed to compliment the area. There is a wait to get into existing doggie daycares for the ones that have a very good reputation. She expected to hit capacity quickly. It will not be a public nuisance.

Pete Read explained the facility. There were discussions last summer, and they did turn the building 90 degrees to work better. The dogs will back to the industrial area when they are out. This is a transitional area. The whole purpose was to create zoning that might be a buffer. They tried to consolidate the plan and reduce the amount of disturbed area. The berm helps fulfill the landscape requirements. The kennel would be the noisiest. It will have nine-inch thick insulated walls. The kennel will be an insulated area.

He discussed Waggin' Tails in Fitchburg, next to Quivey's Grove where people are outside in a tent in the summer. The two businesses are perfectly compatible. When he visited Camp K9, he did not hear anything. There are fences right by the parking. It was a peaceful area.

There would be no way for dogs to escape from the proposed kennel. There is no way out except for two doorways. One will not see dogs except when people drop them off and pick them up.

Greg Schultz lives in the Bear Tree area. He discussed dogs barking. There is stimulation in the area from deer and coyotes.

Petitioner responded she is not cutting corners. There will be privacy berms. Security and safety for the dogs and people are her number one concern. She will make it so dogs cannot go over the fence. There will be a six-foot privacy fence. There will be staff outside with the dogs.

Mr. Riesing added he appreciates the effort and stated he made a significant investment in his home. He is concerned that it may not turn out right.

Commissioner Lange had a question for the architect and builder about the kind of sound material and insulation being used.

Mr. Read responded that it would be an acoustical steel panel, such as would be used in an auto shop or gymnasiums. It dampens reverberation. There would be fiberglass above the ceiling. The walls would be nine-inch cavities filled with fiberglass.

Commissioner Lange also questioned the number of parking spaces. When did they think most of the animals would be taken in?

DRAFT

Petitioner responded between 7:00 a.m. and 7:45 a.m. Pick-up would be between 4:00 p.m. and 5:30 p.m.

Commissioner Lange asked, with 100 vehicles and employees using parking, where would the overflow parking go?

Petitioner responded that people dropping off are not staying. Everything would be taken care of on-line.

Commissioner Lange was concerned if there are 20 or 30 cars coming at the same time.

Petitioner has never seen it when there has been more than three or four cars at one time.

Commissioner Lange asked if there was an option to double the size of parking.

Mr. Read responded that 16 was suggested, and they have 20 parking spaces. It would be similar to a child daycare.

Commissioner Mueller indicated he had a dog and may be biased. He has been to a number of facilities like this. It can be done the right way or the wrong way. He liked that Petitioner Schultz was addressing peoples' issues.

Mr. Read indicated the structure was placed as far as possible to get it away from the main intersection of Pederson Crossing and Reardon Road. There were also drainage issues.

Commissioner Mueller liked the idea of having a plan for additional parking if needed.

Mr. Read explained the expansion areas.

Commissioner Mueller added that it is hard boarding dogs at holiday time.

Petitioner Schultz stated she would like to have events for the kids in the neighborhood.

Commissioner Gaustad had a question regarding rescue dogs.

Petitioner responded that this would not be a rescue shelter.

Commissioner LeGore stated Petitioner was involved in a multi-state rescue but that is separate. Will the dogs be brought in when they are being staged?

Petitioner indicated that the rescue is handled by volunteers. This is not a shelter.

Commissioner LeGore asked what could be done to mitigate barking.

DRAFT

Petitioner responded they could use verbal correction, ultrasonic devices that only dogs can hear, water bottles, or citronella collars. Everything will be videotaped. She will have an open-door policy but would like to keep it to a minimum with people coming and going so as not to bother the other dogs.

Commissioner Heisig noted that the application indicated dogs and cats.

Petitioner Schultz responded she is a dog enthusiast. There will be separate rooms for cats. Her whole goal is to cater to dogs. She doesn't focus on cats.

Chairperson Wipperfurth closed the public hearing at 6:30 p.m.

7. OLD BUSINESS.

None.

8. NEW BUSINESS.

8.a. Alan Buchner Requests A Certified Survey Map And Rezone From A1-EX Exclusive Agriculture District To A-2 Agriculture District In Order To Combine Four Lots Into Three Lots At 3804 Vinburn Road, DeForest, WI.

A motion was made by Commissioner Gaustad, seconded by Commissioner Heisig, to approve Resolution 2019-03, Recommending Approval Of A Certified Survey Map, Rezone And Transfer Of Development Rights For Property Located At 3804 Vinburn Road, DeForest, WI In The Village Of Windsor, Dane County. Motion carried with a 6-0 vote.

8.b. Forward Development Group Requests A Certified Survey Map In Order To Create 4 Lots At The NE 1/4 Of The SE 1/4 Of Section 25 Further Described As The Southeast Corner Of Windsor Road And North Towne Road.

A motion was made by Commissioner Lange, seconded by Commissioner LeGore, to approve Resolution 2019-04, Recommending Approval Of A Certified Survey Map For Property Located At The Southeast Intersection Of Windsor Road And North Towne Road, Further Described As Lots 1 & 2 Of Certified Survey Map 14307 In The Village Of Windsor, Dane County. Motion carried with a 6-0 vote.

8.c. Karen Schultz (d/b/a Paradise Paws Camp & Resort) Requests A Rezone From A-3 Agriculture District To C-1 Commercial District, A Conditional Use Permit For A Kennel And Boarding Facility, And Site Plan Review For A Doggie Day Care Business Located At The NW Corner Of Pederson Crossing Boulevard And Reardon Road.

DRAFT

Chairperson Wipperfurth indicated he had held his questions.

He had a question for Attorney Cole regarding the CUP. He has heard some concerns if there is no follow-through on what has been presented to the Village Board. Can the Village Board go back in six months or two years to bring this into full compliance?

Attorney Cole responded the CUP could sunset in 12 months to allow further review. If an issue comes up in that year that no one disputes, the Village Board can add another condition at that time. This is problematic for the applicant. Having something open could be problematic.

Village Deputy Administrator/Director of Economic Development Rybarczyk added that the village could give a 24-hour notice that a representative of the village of Windsor would inspect the property. Windsor can set something up quarterly and have it reviewed to make sure there is compliance.

Chairperson Wipperfurth asked about the outdoor fence with chain link and panels unable to be seen through. The panels leach out and can be seen through. Does the Petitioner have a plan to plant arbor vitae so dogs cannot see out?

Petitioner answered that she would like a fence with large pine trees.

Chairperson Wipperfurth stated that arbor vitae is faster-growing.

Village Deputy Administrator/Director of Economic Development Rybarczyk added that was one point that staff has written down. What has been shown does not show plantings. The Petitioner would need to detail that out or provide a final detail to the Village Board so it will know what it is getting.

Chairperson Wipperfurth indicated that, per Windsor's Ordinance, there are certain breeds of dogs that are not allowed.

Petitioner said she would object to that.

Petitioner responded she would like that open to discusson regarding, *i.e.*, pit bulls. She does not want dangerous dogs at her facility. The goal is to educate people. She took a poll and asked about bites. Less than 5 percent knew someone or had been bitten by a dog. She does not want to prohibit dogs.

Chairperson Wipperfurth added that the problem is that this is an actual Ordinance.

Director of Planning and Zoning Anderson Schweppe stated there could be a separate enclosure and a sign that says "dangerous dogs."

DRAFT

Attorney Cole said if the Ordinance allows it under certain conditions this would not preclude this. It would have to comply with the Ordinance.

Regarding the number of dogs, staff was recommending 100.

Petitioner Schultz recommends 150 dogs.

Chairperson Wipperfurth had an idea. If it is capped at 100 dogs for now and she proves herself to the neighborhood, could she come back and ask for a higher number?

Attorney Cole responded yes. A higher number could be offered, and the village has the ability to reduce it.

The Petitioner discussed fencing.

She could get away with a little less dogs. The number she wants would be 140 between the daycare and kenneling.

Windsor recommended 100. Why?

Village Deputy Administrator/Director of Economic Development Rybarczyk responded there was some confusion on the application and gave the reasons why this number was chosen. Windsor must look at the worst-case scenario.

Chairperson Wipperfurth asked Petitioner whether she planned on buying the whole lot to the north.

Petitioner responded – all of it or the entire triangle. She would want the ability to expand to the north.

Commissioner LeGore had a question regarding the maximum number of dogs. A total maximum of 100, 50 overnight. Windsor would have the purview to amend that.

Petitioner indicated there would be 23 to 24 kennels. The kennel-free dogs would be participating in daycare. She cannot imagine 150 overnight dogs. She thought 75 to 100 dogs overnight.

Commissioner Mueller asked what is the maximum number of dogs that would be there.

Petitioner responded 150, which would include overnight. She would have movable fencing inside.

Village Deputy Administrator/Director of Economic Development Rybarczyk added that staff is proposing 50 overnight.

DRAFT

Petitioner stated the dogs will not be routinely let outdoors at night.

Commissioner Mueller heard that during the day there could be up to 150 dogs. What is the ceiling for overnight?

Petitioner answered 100 overnight. She would not be able to accommodate 150 overnight.

Chairperson Wipperfurth indicated Petitioner has done her research. She must prove herself. He would agree with 150 but not 100 during the night. Petitioner must prove herself. She can come back to amend the CUP if she is successful.

Commissioner LeGore stated 150 and 50 at night. He thought the indoor concept and building envelope are responsibly built. He was leery about escalating overnight.

Petitioner Schultz asked whether the village would allow 75 at night or even 65 for holidays.

Chairperson Wipperfurth asked what were "holidays."

Petitioner responded the typical holidays.

Chairperson Wipperfurth suggested 150 and 50 at night. If Petitioner proves herself, she can come back.

Village Deputy Administrator/Director of Economic Development Rybarczyk indicated the village could limit it to 150 but have a condition that dogs cannot be outside between 9:30 p.m. and 6:00 a.m. when they must be inside.

Commissioner Gaustad indicated he had dogs and that he would be comfortable with 65.

Commissioner Heisig put the limit at 150. When you start spreading it out you are going to get more noise. The facility is set for the staff level. It cannot exceed 150 during the day.

Chairperson Wipperfurth stated this is an acknowledgment that this is next to a residential neighborhood and finding a compromise.

Petitioner stated she was looking at a rotation after daycare hours.

Chairperson Wipperfurth stated the outstanding issues: (1) number of dogs; (2) further plantings around the fenced-in areas around the runs; (3) proposed additional parking.

Commissioner Lange would like to see an additional 10 parking places and parking for employees.

Mr. Read responded that they have included five parking places for employees.

DRAFT

Village Deputy Administrator/Director of Economic Development Rybarczyk added that Petitioner has met the number of parking spaces based on the plan submitted.

Chairperson Wipperfurth indicated that additional plantings be subject to approval of staff.

Village Deputy Administrator/Director of Economic Development Rybarczyk indicated that all details should be available to the Village Board.

Attorney Cole responded that would be a better approach.

Village Deputy Administrator/Director of Economic Development Rybarczyk added that the type of fence and type of plantings need to be articulated. He would like a drawing.

Chairperson Wipperfurth agreed with the person who said the fence should be buried underground.

Chairperson Wipperfurth said this comes down to numbers. He was comfortable with 100. He is hearing the Petitioner say more. He would go to 150 during the day and a maximum of 50 at night as a starting point with the ability to come back and adjust it up.

Petitioner asked how long before she could come back and ask for more. She can try to balance it out at 150 during the day and 50 at night.

Commissioner Heisig questioned the need for a stop sign coming out of the business.

Village Deputy Administrator/Director of Economic Development Rybarczyk indicated there typically is no sign.

Attorney Cole added that the village could require a private traffic signal.

Commissioner Mueller felt a divided-road sign would be better. Or a wrong-way sign was suggested.

Chairperson Wipperfurth added there could be a condition that the appropriate signage be developed and given to the village prior to the next Board meeting.

A motion was made by Commissioner LeGore, seconded by Commissioner Gaustad, to approve Resolution 2019-05, Recommending Conditional Approval Of The Rezone, Conditional Use Permit And Site Plan Review For Paradise Paws Located At The Northwest Corner Of Pederson Crossing Boulevard And Reardon Road, In The Village Of Windsor, subject to the following conditions. The maximum number of dogs during the day would be 150. The maximum number of dogs at night would be 50. A vegetation and private fencing plan be detailed out prior to the Village Board meeting. There be development of appropriate traffic signage. Attorney Cole added burial of fencing, which Commissioner LeGore added to his motion.

DRAFT

Petitioner Schultz commented that, if you bury a small amount of fence, it will not matter.

It was suggested that the Petitioner come up with a containment system and provide it to the Village Board.

Commissioner LeGore amended his motion to include this point.

Commissioner Heisig asked where the number 50 came from. It seemed to be an arbitrary number.

Chairperson Wipperfurth responded that it recognized that it was next to a neighborhood. Petitioner has the ability to come back to amend that amount if the noise is contained. It would be more problematic if it was allowed at 150, 24/7.

Mr. Read added that they will limit how many can be outside at night at one time.

Chairperson Mueller asked how one would enforce how many would be outside at one time. He did not know how feasible that would be.

Motion carried with a 5-1 vote, with Commissioner Heisig voting "no."

This will be on the April 4 Village Board agenda.

9. ADJOURNMENT.

At 7:25 p.m., a motion was made by Commissioner Lange, seconded by Commissioner Mueller, to adjourn the Plan Commission meeting. Motion carried with a 6-0 vote.

Respectfully submitted,

Ellen G. Teed

Ellen G. Teed
Recording Secretary

DRAFT