CITY OF ROCKVILLE

City Hall 229 Broadway Street East PO Box 93 Rockville, MN 56369

Planning/Zoning Commission Meeting

Tuesday, December 5, 2017 - 6:00 p.m.

City Hall – 229 Broadway Street East

AGENDA

1. **Roll Call**
2. **Approval Of Agenda/Amendments**
3. **Approval Of November 7, 2017 Meeting Minutes**
4. **Public Hearing – Irene Schneider Trust and Jonathan M. Schneider – Preliminary Plat, Rezone and Setback Variance**
5. **Public Hearing – Ordinance 2017-87 - Amending Section 14, Subdivision 9**
6. **Review James & Jacqueline Voigt Developer Agreement**
7. **November's Building Permits**
8. **Other Business**
   a) Next Meeting Tuesday January 2, 2018, 6:00 P.M.
9. **Adjournment**

*This agenda has been prepared to provide information regarding an upcoming meeting of the Rockville City Planning Commission. This document does not claim to be complete and is subject to change.

MINUTES OF THE REGULAR PLANNING AND ZONING COMMISSION MEETING
Tuesday, November 7, 2017, 6:00 p.m. – Rockville Fire Hall

Item 1) Roll Call - The meeting was called to order by Chair Bill Becker. Roll call was taken and the following members were present: Brian Herberg, Dave Meyer, Tom Molitor, and Jerry Tippelt.
Staff present: City Administrator, Martin Bode.
Others present were various members of the public.

Item 2) Approval of Agenda/Amendments

Request to add:
Item 8) Other Business
b) Section 14, Subdivision 9
c) Annexation of Property

Motion by Meyer, second by Herberg, to approve the agenda as amended. Motion carried unanimously.

Item 3) Approval of August 1, 2017 Meeting Minutes

Motion by Herberg, second by Molitor, to approve the August 1, 2017 meeting minutes as presented. Motion carried unanimously.

Item 4) Public Hearing - Daniel & Theresa Dullinger – Exceed 20% Impervious Surface

STAFF REPORT
Re: Variance Request
Owners: Daniel & Theresa Dullinger
Property Address: 11193 Hubert Lane
Parcel No. 76.42189.0038

Variance requested:
1. To exceed the 20 percent impervious surface requirement in a Shoreland Overlay District on Grand Lake, a General Development Lake.

Relevant:
1. Construct 30 x 30 addition.
2. Property contains 24,626 square feet more or less.
3. 15% is 3,694 sf
4. 20% is 4,925 sf
5. 25% is 6,157 sf
6. Proposed is 5,894 sf (23.9%).
7. 13 notices of public hearing were sent out.

Recommendation:
1. Consider approval with stipulation of installation of a rain garden for mitigation of 2,200 sf of run off.

No one from the public appeared.

Motion by Herberg, second by Molitor, to close the Public Hearing at 6:03 p.m. Motion carried unanimously.

The Planning Commission held a brief discussion.

Motion by Herberg, second by Meyer, to approve the Daniel & Theresa Dullinger Variance Request of 23.9% Impervious Surface with the Installation of a Rain Garden. Motion carried unanimously.

Item 5) Public Hearing – James and Jacqueline Voigt – Preliminary/Final Plat & Rezone

STAFF REPORT
RE: Subdivide Property, Preliminary and Final Plat and Rezone
Parcel No. 76.41601.0620 and 76.41600.0415 - Section 11, Township 123, Range 029
Owner: James and Jacqueline Voigt
Property Address: 25614 Pleasant Road
Plat known as: Pleasant Estates Plat 3

Request:
1. Preliminary and Final Plat approval of seventeen (17), 1 acre +/- outlots.
2. Rezone outlots from Ag-40 to R-1.
3. Developers agreement.

Relevant Information:
1. Property is zoned A-40.
2. There are seventeen (17), 1 acre +/- outlots being proposed to be sub-divided.
3. Purpose is to offer the adjacent non-riparian property owners the opportunity purchase outlots that are adjacent to their properties.
4. Concept Plan was reviewed by Planning Commission and Council in April of 2017.
5. 50 public hearing notices were mailed out.
6. Is consistent with the City's Comprehensive Plan.

Recommendation:
Consider Approval of:
1. Preliminary and Final Plat.
2. Rezone outlots from Ag-40 to R-1.
3. Developers agreement.

Larry Schroeder, requested an explanation of Ag-40 and R-1. Administrator Bode explained the difference of Agriculture-40 (minimum of 40 acres) and Residential-1 (less than 5 acres). Mr. Schroeder expressed his concern over losing farmland to future housing development(s).

Motion by Herberg, second by Meyer, to close the Public Hearing at 6:09 p.m. Motion carried unanimously.

Brief discussion was held by the Planning Commission.

Motion by Tippelt, second by Meyer, to approve the Preliminary and Final Plat and the Rezone from Ag-40 to R-1. Motion carried unanimously.

Item 6) Zoning Ordinance Review Committee

Planning Commission discussed the newly created Ordinance Review Taskforce Committee consisting of four categories; residential, business/industrial, agriculture, and shoreland. Each member was asked to choose one category and will participate in the review of the City's current ordinances.

Item 7) August-September-October Building Permits
The August, September, and October Building Permits reports were reviewed by the Planning Commission members.

Item 8) Other Business

a. Next meeting, Tuesday, December 5, 2017 at 6:00 p.m.

b. Section 14, Subdivision 9

Discussion was held on non-conforming uses, non-conforming lots, and non-conforming structures. Administrator Bode requested permission from the Planning Commission to authorize a Public Hearing to review and consider amending this zoning ordinance at the December 5, 2017 meeting. Permission granted.

c. Annexation of Property

Discussion was held regarding the annexation of Harstad and Yanta property from St. Joseph Township into the City of Rockville.

Item 9) Adjournment

ADJOURNMENT – ***Motion by Herberg, second by Meyer, to adjourn the meeting at 6:42 p.m. Motion carried unanimously.***

Respectfully submitted,

Martin M. Bode
Zoning Administrator

IRENE T. SCHNEIDER TRUST and JONATHAN M. SCHNEIDER STAFF REPORT
DECEMBER 5, 2017

RE: PROPERTY SUBDIVISION/PRELIMANARY PLAT, VARIANCE AND REZONE
Parcel I.D.No. 76.42170.0051 and 76.42170.0050 - Section 25, Township 123, Range 029

Owner: Irene Schneider Trust and Jonathan Schneider
Property Address: 7788 County Road 41
Plat know as: Schneider Farm

REQUEST

1. Preliminary Plat approval of fourteen (14) new lots and one (1) existing.
2. Rezone lots from Ag-40 to R-R and Amend the City's Future Land Use Map
3. Variance to the side yard setback from 50' to 20' on all lots

RELEVANT INFORMATION

1. Property is zoned Ag-40.
2. There are fourteen (14), new lots being proposed to be sub-divided.
3. Purpose is residential development.
4. Not conducive to long-term agriculture use; wooded area, rock outcroppings and marginal soils.
5. Concept Plan was reviewed by Planning Commission and Council in April of 2017.
6. 15 Public Hearing notices were mailed out
7. Developers Agreement will be drafted prior to Final Plat

RECOMMENDATION

Consider Approval of:

1. Preliminary Plat
2. Rezone lots from Ag-40 to R-R
3. Variance of side yard setback from 50' to 20' in an R-R zoning district
4. Developers Agreement - Pending

Submitted by:
Martin M. Bode
Zoning Administrator

CITY OF ROCKVILLE

229 Broadway Street East
P.O. Box 93
Rockville MN 56369

Phone 320-251-5836 Fax 320-240-9620

Duane Willenbring, Mayor
Vince Schaefer, Councilor
Don Simon, Councilor
Richard Tallman, Councilor
Jerry Tippelt, Councilor

Martin M. Bode, City Administrator
Judy Neu, Finance/Billing Clerk/Admin Asst
Nick Waldbillig, Public Works Director
Gene Van Havermaet Maintenance/Mechanic
Debbie Weber, Administrative Assistant

Rockville City is an equal opportunity provider and employer

NOTICE OF PUBLIC HEARING
CITY OF ROCKVILLE

Notice is hereby given that the Rockville Planning Commission will hold a public hearing on **Tuesday, December 5, 2017 at approximately 6:00 p.m. at: Rockville City Hall, 229 Broadway Street East** to consider the request of Irene T. Schneider Trust and Jonathan M. Schneider to rezone and subdivide their property. The legal description is Lots 1 and 2 of Block 1, Schneider Terrace, Parcel No. 76.42170.0051 & 76.42170.0050 Stearns County, Minnesota.

The request is rezone from A-40 to RR and Preliminary Plat to subdivide 104.64 +/- acres.

All persons attending the hearing and wishing to address the Planning Commission will have an opportunity to do so. Those not able to be present at this meeting should submit their opinions in writing to the Rockville City Administrator/Clerk, P.O. Box 93, Rockville, MN, 56369 prior to the hearing, or be present at the public hearing.

Martin M. Bode
Administrator/Clerk

Publish 11/21/17
Cold Spring Record

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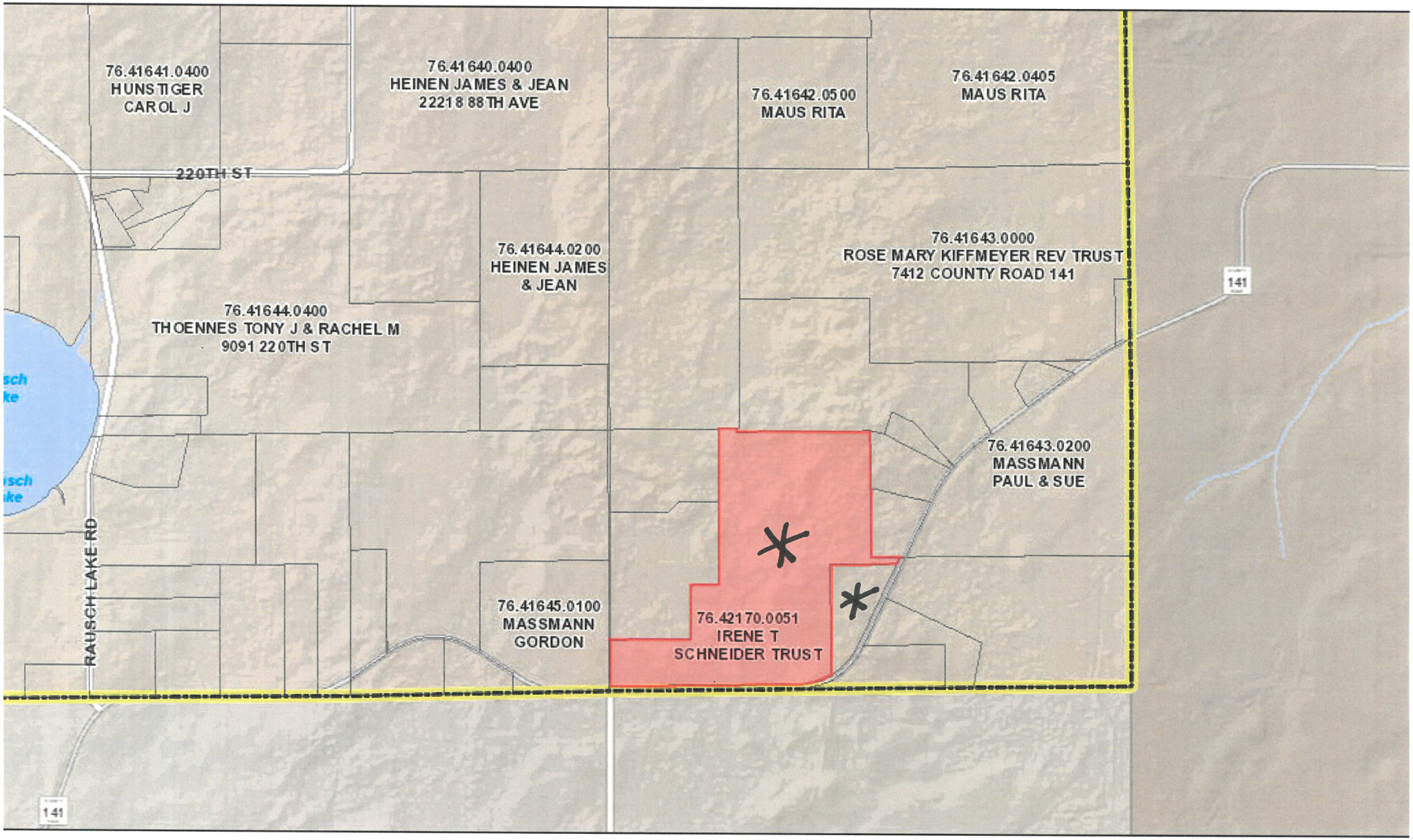
To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, room 326-w, Whitten Building, 1400 Independence Ave, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice & tdd). USDA is an equal opportunity provider and employer.

SEH SmartConnect Map



ovember 20, 2017

Parcels

Municipal Boundaries

1:16,000

0 0.125 0.25 0.5 mi

0 0.2 0.4 0.8 km

SEH

SEH SmartConnect

STEPHEN J & SHARON A TORBORG	BOX 344	ST CLOUD MN 56302-0344
GARY A & LOUISE M MOHS	7676 COUNTY ROAD 141	KIMBALL MN 55353
STUART T REIF	7674 COUNTY ROAD 141	KIMBALL MN 55353
WILLIAM J YACKLEY	8286 COUNTY ROAD 141	KIMBALL MN 55353
KEVIN M & CYNTIA LOMMEL	7632 COUNTY ROAD 141	KIMBALL MN 55353
KEVIN L & ROBBIN J VOIGT	7819 COUNTY RD 141	KIMBALL MN 55353-9717
RANDY ROY LOMMEL	8282 COUNTY ROAD 141	KIMBALL MN 55353-9717
GORDON MASSMANN	19627 COUNTY ROAD 8	KIMBALL MN 55353
NATHAN & SARA LOMMEL	7783 COUNTY RD 141	KIMBALL MN 55353
LLOYD D & CHERYL A LOMMEL	7682 COUNTY ROAD 141	KIMBALL MN 55353
ROBERT L & JULIE SCHMELZER	7725 COUNTY ROAD 141	KIMBALL MN 55353
PAUL & SUE MASSMANN	7468 COUNTY ROAD 141	KIMBALL MN 55353-9716
IRENE T SCHNEIDER TRUST	15302 150TH ST	WATKINS MN 55389
JONATHAN M SCHNEIDER	7788 COUNTY ROAD 141	KIMBALL MN 55353
STEARNS CO HIGHWAY	PO BOX 246	ST CLOUD MN 56302

15 Notices

STATE OF MINNESOTA)
)ss.
COUNTY OF STEARNS)

AFFIDAVIT OF SERVICE

Debbie Weber, being duly sworn, on oath says that at the City of Rockville in said County and State, on the **20th** day of **November, 2017**, he/she served the annexed Notice on **see attachment**, the person therein named, personally, by then and there handing to and leaving with him/her a true and correct copy of said Notice.

Debbie R Weber

Signature

Subscribed and sworn to before me this 20 day of November, 2017.

Martin M. Bode

Notary Public Signature

MARTIN M. BODE
NOTARY PUBLIC - MINNESOTA
My Commission Expires Jan. 31, 2020

Notary Public Stamp

Building a Better World
for All of Us®

MEMORANDUM

TO: Mr. Martin Bode

FROM: Dave Blommel, PE

DATE: November 20, 2017

RE: Schneider Farm Plat
SEH No. ROCKV G28 14.00

I have reviewed the preliminary engineering drawings and preliminary plat for the Schneider Farm.

Preliminary Plat:

- Access to lots 8, 9, and 10 are proposed from CSAH 141. Approval of access is at the discretion of Stearns County.
- Significant wetlands are located on most of the lots created. Will individual landowners be monitored to prevent wetland fill during home building?
- Adequacy of the proposed septic sites has not been reviewed.

Preliminary Engineering Drawings:

- Long term maintenance of ponds needs to be addressed.
- Wet Detention Pond #1 provides concentrated flow to the county ditch. Stearns County should be consulted to confirm adequacy of ditch to support such flows.
- Wet Detention Pond #2 does not have dedicated access for long term maintenance.
- The parcel lies outside of the Sauk River Watershed District, NPDES permit requirements will apply.
- Typical section does not show required geotextile fabric.
- Pond 2 does not show erosion protection / energy dissipation for water entering the pond from the ditches.

Storm Calculations:

- The provided calculations show a net reduction in peak runoff when compared to existing.
- The existing runoff is tabulated as a single area, so individual proposed subcatchments cannot be compared to existing.
- Small amounts of impervious are not being directed to ponding (mainly the back half of house pads). This is common and just being noted here.

dwb/mrb
p:\pt\r\rockv\common\general numbers\g28 schneider farm\1-genl\14-corr\m city preliminary plat review - 112017.docx

mbode@rockvillecity.org

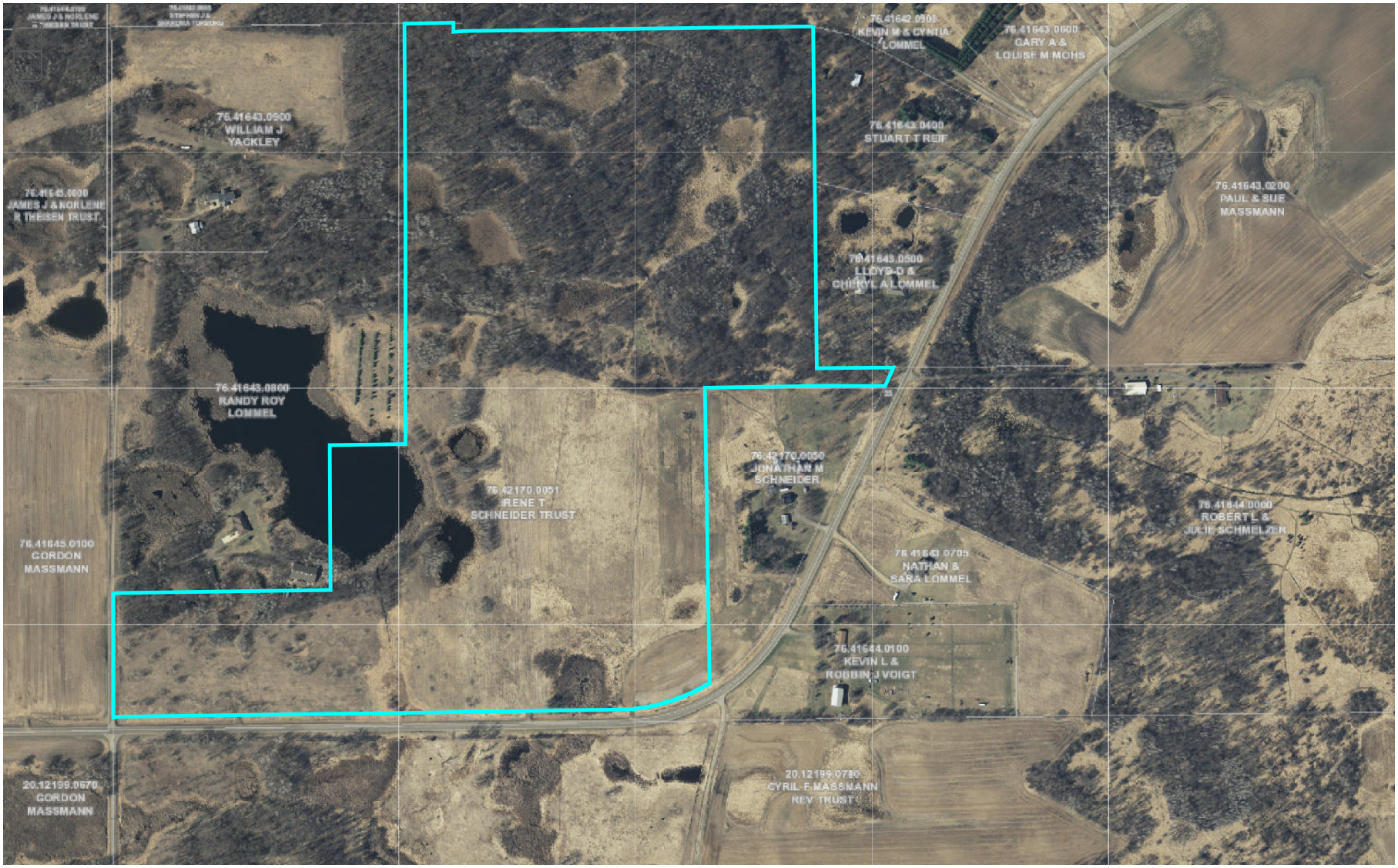
From: Dan Kron <dan@omalley-kron.com>
Sent: Monday, November 06, 2017 1:59 PM
To: Marty Bode; mwschneider49@gmail.com
Cc: Brian Schultz; Clint Jordahl
Subject: Schneider Farm
Attachments: 2017-70PP.pdf; 2017-70PP Legal.docx

Hi Marty,

Attached is a copy of the preliminary plat drawing and legal description for the Schneider Farm plat. Couple of things I wanted to bring to your attention:

-The cul-de-sac is proposed to line up with an existing driveway across the road. We plan to use the existing approach for a shared access on Lots 8 & 9 (along shared lot line) and use the existing approach for the access to Lot 10 (southeast corner of lot). I am not sure Mike has already talked with Stearns County about these items.
-We are showing a side yard setback of 20 feet on this plan.
-The wetland delineation and septic sites are shown per Clint Jordahl, Granite City Environmental. The wetland delineation report has been submitted to Stearns County for approval.
-Brian Schultz, Schultz Engineering, will be sending the engineering plans. I am showing the two drainage ponds he shows on his plan and drainage and utility easements on my plat: easterly side of Lot 15 and southerly side of Lot 12.
-We have a name of Scenic View Court for the road name. If that needs to be changed please just let me know.

Dan Kron
370 Chapel Hill Road, Suite 105
Cold Spring, MN 56320
320-685-5905 office
320-333-0741 cell



- Search
- Layers
- Draw/ Measure
-
- Legend

Login

DataLink © WSB & Associates 2013

Close

Select Mail Recipient:

Owner Resident Both

- Print

Title

8.5 x 11 Portrait

- 8.5 x 11 Portrait
- 8.5 x 11 Landscape
- 11 x 17 Portrait
- 11 x 17 Landscape
- Image (jpeg)

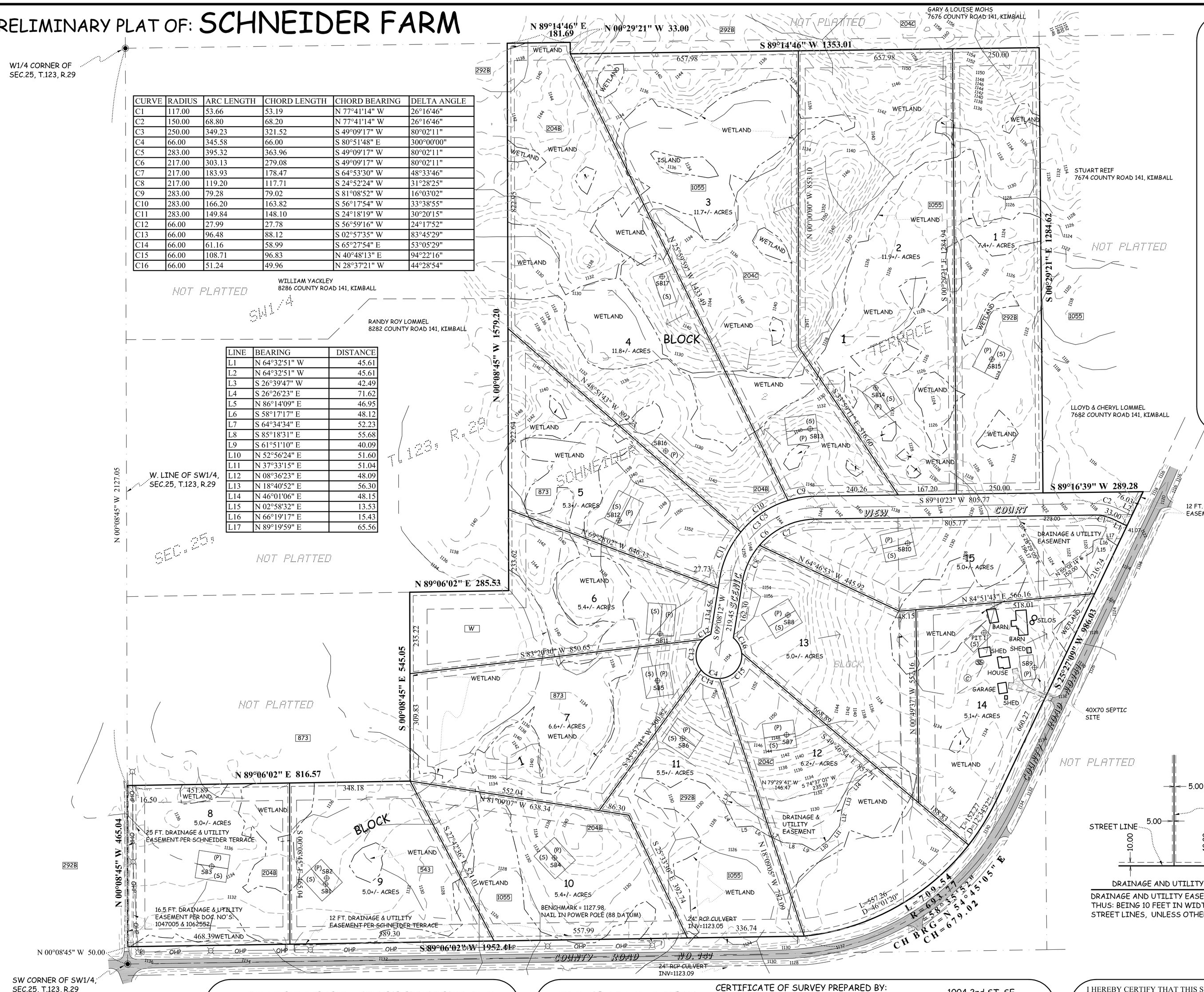
Show Legend

- Show Legend
- Show Property Info
- Map Only

Preview Print

Documents

PRELIMINARY PLAT OF: SCHNEIDER FARM



CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	117.00	53.66	53.19	N 77°41'14" W	26°16'46"
C2	150.00	68.80	68.20	N 77°41'14" W	26°16'46"
C3	250.00	349.23	321.52	S 49°09'17" W	80°02'11"
C4	66.00	345.58	66.00	S 80°51'48" E	300°00'00"
C5	283.00	395.32	363.96	S 49°09'17" W	80°02'11"
C6	217.00	303.13	279.08	S 49°09'17" W	80°02'11"
C7	217.00	183.93	178.47	S 64°53'30" W	48°33'46"
C8	217.00	119.20	117.71	S 24°52'24" W	31°28'25"
C9	283.00	79.28	79.02	S 81°08'52" W	16°03'02"
C10	283.00	166.20	163.82	S 56°17'54" W	33°38'55"
C11	283.00	149.84	148.10	S 24°18'19" W	30°20'15"
C12	66.00	27.99	27.78	S 56°59'16" W	24°17'52"
C13	66.00	96.48	88.12	S 02°57'35" W	83°45'29"
C14	66.00	61.16	58.99	S 65°27'54" E	53°05'29"
C15	66.00	108.71	96.83	N 40°48'13" E	94°22'16"
C16	66.00	51.24	49.96	N 28°37'21" W	44°28'54"

LINE	BEARING	DISTANCE
L1	N 64°32'51" W	45.61
L2	N 64°32'51" W	45.61
L3	S 26°39'47" W	42.49
L4	S 26°26'23" E	71.62
L5	N 86°14'09" E	46.95
L6	S 58°17'17" E	48.12
L7	S 64°34'34" E	52.23
L8	S 85°18'31" E	55.68
L9	S 61°51'10" E	40.09
L10	N 52°56'24" E	51.60
L11	N 37°33'15" E	51.04
L12	N 08°36'23" E	48.09
L13	N 18°40'52" E	56.30
L14	N 46°01'06" E	48.15
L15	N 02°58'32" E	13.53
L16	N 66°19'17" E	15.43
L17	N 89°19'59" E	65.56

LEGAL DESCRIPTION

Lots 1 and 2, Block 1, SCHNEIDER TERRACE, according to the recorded plat thereof, Stearns County, Minnesota.

SETBACKS:
(Per City of Rockville)
Front = 30' from Right of Way (City Road)
= 50' from Right of Way (C.R. No. 141)
Side = 20' from property line
Rear = 50' from property line
Accessory Building = 5'

-Total plat area = 104.65+/- ACRES
-Existing zoning is R-R District
-Existing use grasslands, woods, wetlands and one single family home
-Proposed use is single family residence
-Existing vegetation is 35% wetlands, 35% grassland and 30% wooded
-Indicates surface drainage arrow = ⟶
-Existing soils: 873
292B - Alstad sandy loam, 1 to 4% slopes
204B - Cushing sandy loam, 2 to 8% slopes
873 - Prebish-Nokay complex
543 - Markey muck
1055 - Histosols and Haplaquoils, ponded
W - Water
204C - Cushing sandy loam, 8 to 15% slopes

-Septic Sites located per Granite City Environmental, LLC (320) 253-5411

(P) = 40X90 Primary Septic Site
(S) = 40x90 Secondary Septic Site
⊕ = Soil Boring
SB1

NOTE: Lot 14, Block 1 shows a 40x70 Primary and Secondary Septic Site. The secondary septic site was done by Watab Inc. on 7-11-07.

NOTE: All wetlands shown on subject property have been delineated by Granite City Environmental (320) -2535411.

150 0 75 150 300
SCALE IN FEET

Legend
- INDICATES IRON MONUMENT PLACED
- INDICATES IRON MONUMENT FOUND
- INDICATES STEARNS COUNTY CAST IRON MONUMENT
- OHP — INDICATES OVERHEAD POWER LINE
- INDICATES DELINEATED WETLAND
- INDICATES SEPTIC MANHOLE
- INDICATES SEPTIC CLEANOUT
- INDICATES CABLE PEDESTSAL
- INDICATES POWER POLE
- SB1 — INDICATES SOIL BORING
- INDICATES GRAVEL SURFACE
- INDICATES BITUMINOUS SURFACE

5.00 LOT LINE
5.00 STREET LINE
10.00 10.00
DRAINAGE AND UTILITY EASEMENTS

DRAINAGE AND UTILITY EASEMENTS ARE SHOWN THUS: BEING 10 FEET IN WIDTH AND ADJOINING STREET LINES, UNLESS OTHERWISE SHOWN.

CERTIFICATE OF SURVEY PREPARED FOR:
MIKE SCHNEIDER

JOB NO:2017-70
FILE NAME:2017-70PP.DWG
LOCATION:25-123-29

NOTE: THIS SURVEY IS INTENDED ONLY FOR THE BENEFIT OF THE PARTY TO WHOM IT WAS PREPARED FOR AND SHOULD NOT BE RELIED UPON BY ANY OTHER PARTY OR FOR ANY OTHER PURPOSE WITHOUT FIRST CONTACTING THE SURVEYOR WHO DEVELOPED AND MADE THIS DRAWING. UNAUTHORIZED REPRODUCTION OF THIS DOCUMENT IS PROHIBITED .

370 CHAPEL HILL RD., SUITE 105
COLD SPRING,MN 56320
PH. 320-685-5905
FAX 320-685-3056

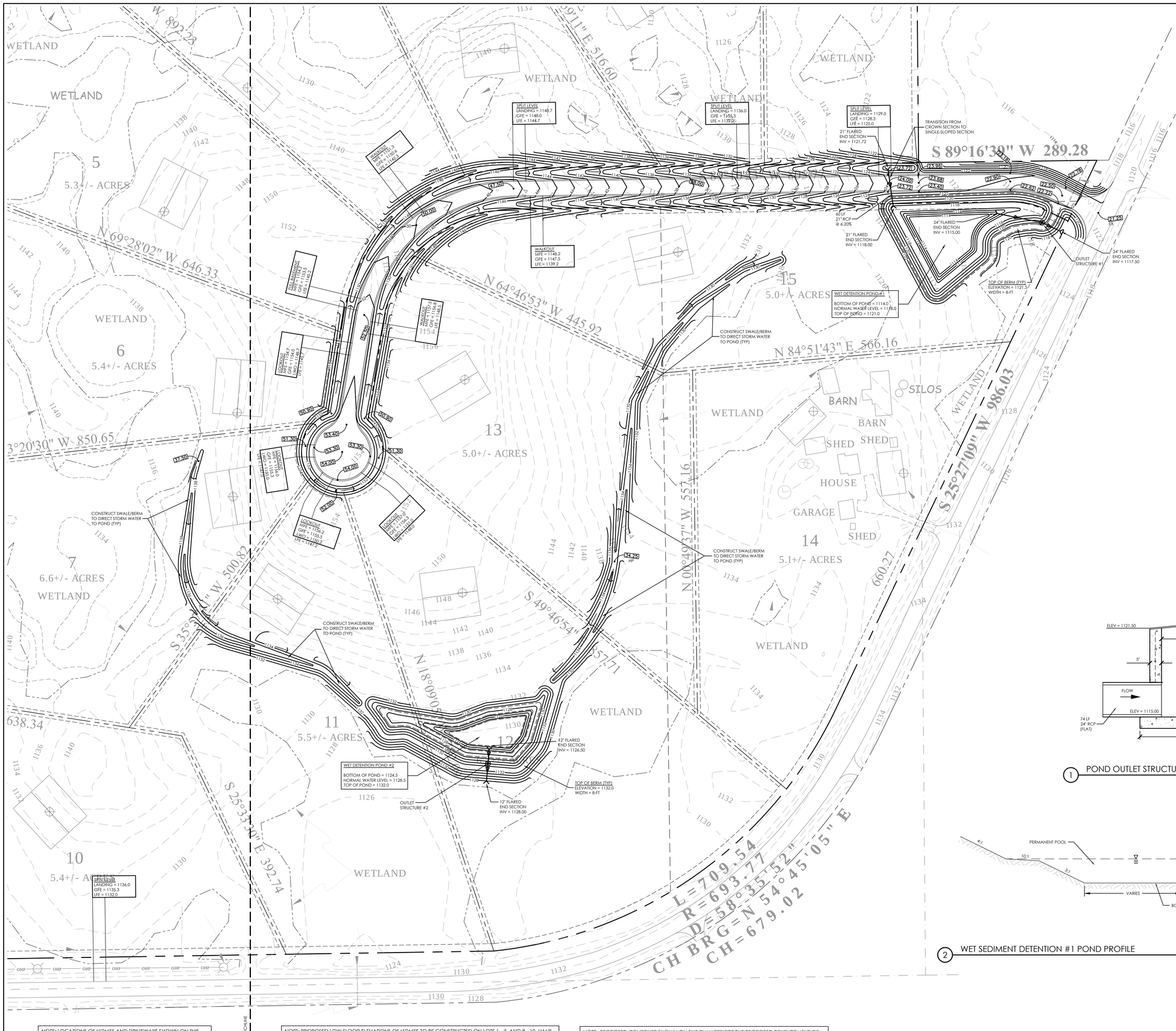
CERTIFICATE OF SURVEY PREPARED BY:
O'MALLEY & KRON LAND SURVEYORS, INC.

1004 2nd ST. SE
WILLMAR,MN 56201
PH. 320-235-4012
FAX 320-685-3056

I HEREBY CERTIFY THAT THIS SURVEY, PLAN OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

_____ DATE: 10-20-2017
DANIEL M. KRON
MINNESOTA REGISTRATION NO. 42621

SHEET 1 OF 1



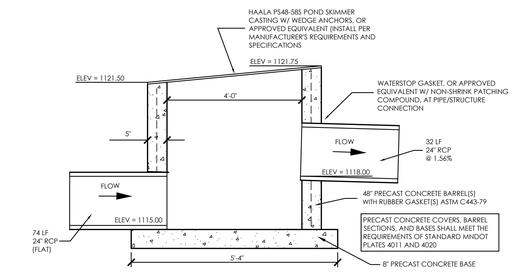
NOTE: LOCATIONS OF HOMES AND DRIVEWAYS SHOWN ON THIS PLAN ARE CONCEPTUAL. ACTUAL LOCATIONS AND ELEVATIONS OF STRUCTURES AND DRIVEWAYS SHALL BE DETERMINED AT THE TIME EACH INDIVIDUAL LOT IS DEVELOPED BY THE HOMEOWNER.

NOTE: PROPOSED LOW FLOOR ELEVATIONS OF HOMES TO BE CONSTRUCTED ON LOTS 1 - 3, AND 8 - 10, HAVE BEEN DETERMINED BASED ON POSSIBLE EXPOSURE TO GROUNDWATER FROM NEARBY WETLANDS. INDIVIDUAL HOME OWNERS AND/OR BUILDERS SHALL PERFORM THOROUGH SOIL AND GROUNDWATER INVESTIGATIONS IN THE VICINITY OF PROPOSED STRUCTURES TO JUSTIFY ANY PROPOSEDS LOWER FLOOR ELEVATIONS.

NOTE: PROPOSED CONTOURS SHOWN ON THIS PLAN REFLECT THE PROPOSED DEVELOPMENT OF THE SITE FOR LOT PLATTING PURPOSES AND IN ADVANCE OF HOME CONSTRUCTION. CONSTRUCTION OF INDIVIDUAL HOMES MAY ALTER SOME OF THE PROPOSED CONTOURS ON THIS PLAN, WHILE MAINTAINING THE PROPOSED DRAINAGE PATTERNS AND STORM WATER BMPS.

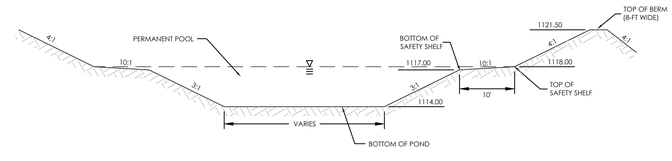
GRADING PLAN

0 60 120 180



1 POND OUTLET STRUCTURE #1

NTS



2 WET SEDIMENT DETENTION #1 POND PROFILE

NTS

PRELIMINARY - NOT FOR CONSTRUCTION

PRELIMINARY PLAT DOCUMENTS 11/06/2017

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed Engineer under the laws of the State of Minnesota

Brian D. Schultz, PE

Date: 11/06/2017

License No.: 43129

SCHULTZ ENGINEERING & SITE DESIGN

19 South Riverside Avenue
Suite 230
Sartell, MN 56377

Ph: (320) 339-0569
Fx: (866) 633-1830
schultzeng@live.com

www.schultzengineeringdesign.com

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		

SCHNEIDER FARM

ROCKVILLE, MN

PROJECT NUMBER: 17054

SCALE: 1"=60'

N

17054-Grading.dwg

3 WET SEDIMENT DETENTION #2 POND PROFILE

NTS

4 POND OUTLET STRUCTURE #2

NTS

NOTE: PROPOSED LOW FLOOR ELEVATIONS OF HOMES TO BE CONSTRUCTED ON LOTS 1 - 3, AND 8 - 10, HAVE BEEN DETERMINED BASED ON POSSIBLE EXPOSURE TO GROUNDWATER FROM NEARBY WETLANDS. INDIVIDUAL HOME OWNERS AND/OR BUILDERS SHALL PERFORM THOROUGH SOIL AND GROUNDWATER INVESTIGATIONS IN THE VICINITY OF PROPOSED STRUCTURES TO JUSTIFY ANY PROPOSEDS LOWER FLOOR ELEVATIONS.

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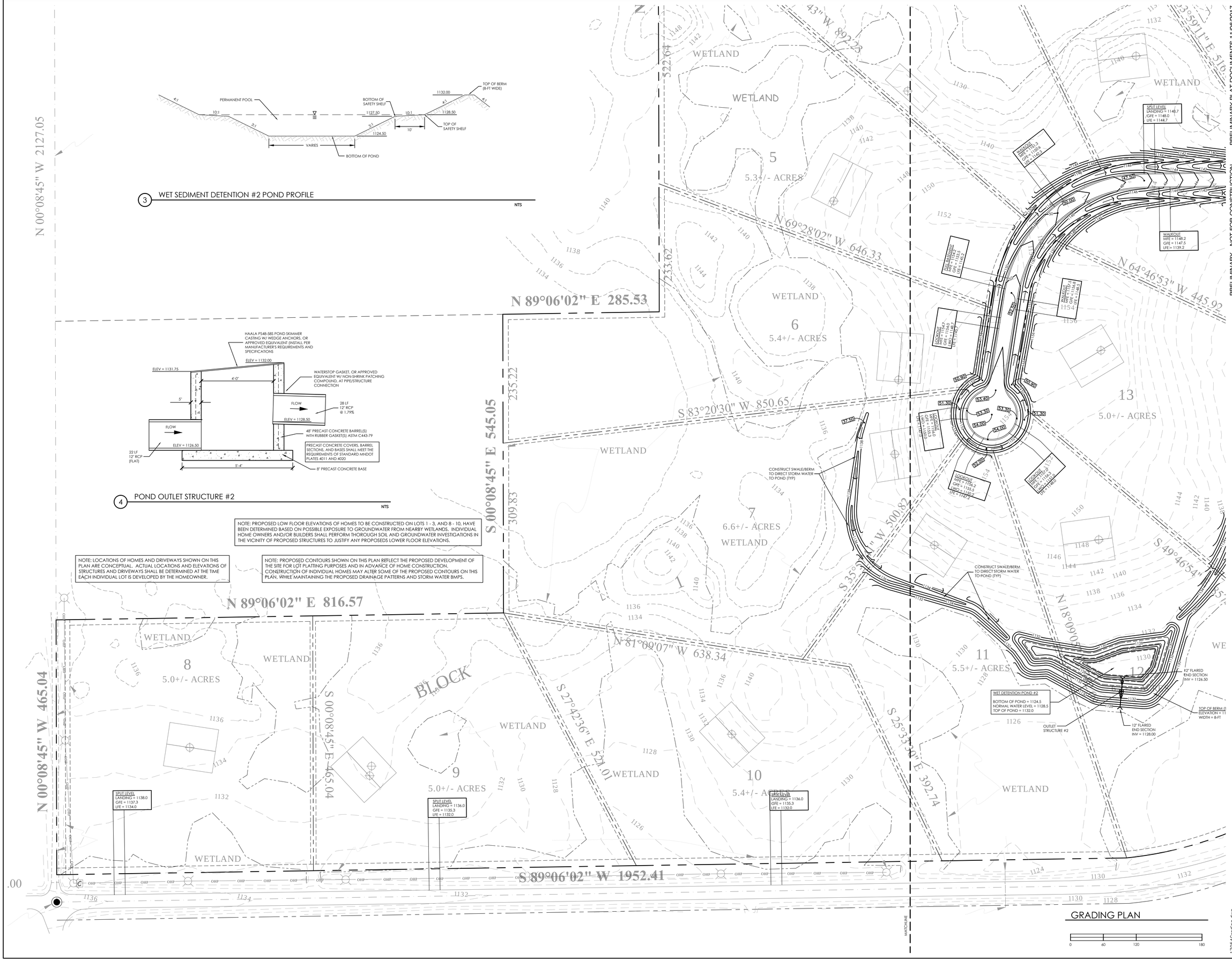


GRADING PLAN

0 60 120 180

PRELIMINARY PLAT DOCUMENTS 11/06/2017

PRELIMINARY - NOT FOR CONSTRUCTION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed Engineer under the laws of the State of Minnesota.

Brian D. Schultz, PE

Date: 11/06/2017

License No.: 43129

SCHULTZ ENGINEERING & SITE DESIGN

19 South Riverside Avenue
Suite 230
Sartell, MN 56377

Ph: (320) 339-0569
Fx: (866) 633-1830
schultzeng@live.com

www.schultzengineeringdesign.com

REVISIONS		
NO.	DATE	DESCRIPTION
1		
2		
3		
4		

SCHNEIDER FARM

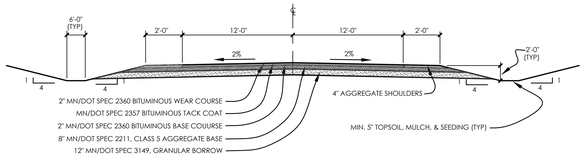
ROCKVILLE, MN

PROJECT NUMBER: 17054

SCALE: 1"=60'

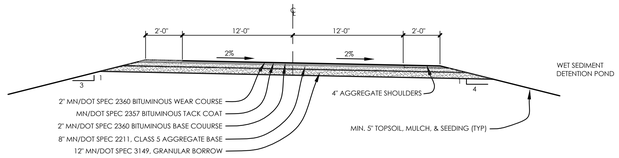
17054Grading.dwg

C2 OF 5



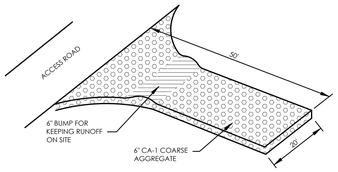
1 TYPICAL STREET SECTION (CROWN)

NTS



2 TYPICAL STREET SECTION (SINGLE-SLOPE)

NTS

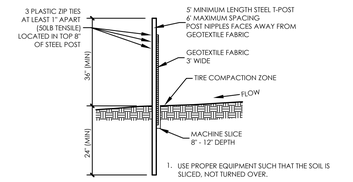


1. THE ROCK ENTRANCE SHALL BE CONSTRUCTED PRIOR TO THE START OF GRADING OPERATIONS.
2. THE ENTRANCE SHALL BE GRADED SUCH THAT POSITIVE DRAINAGE DURING CONSTRUCTION IS PROVIDED.
3. THE ENTRANCE SHALL BE MAINTAINED IN SUCH A CONDITION SUCH THAT IT PREVENTS MUD TRACKING OFF SITE. ADDITIONAL ROCK OR REPLACEMENT OF THE ENTRANCE MAY BE REQUIRED PERIODICALLY IF MUD STARTS TO TRACK OFF SITE.
4. THE ROCK ENTRANCE MAY BE REMOVED JUST PRIOR TO THE PLACEMENT OF AGGREGATE BASE.

NOTE: PLACING FILTER FABRIC UNDER THE ROCK ENTRANCE MAY REDUCE THE AMOUNT OF MAINTENANCE IT WOULD REQUIRE.

3 TEMPORARY ROCK CONSTRUCTION ENTRANCE

NTS

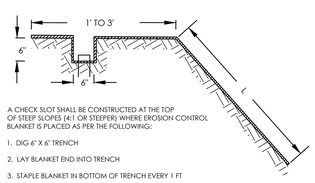


1. USE PROPER EQUIPMENT SUCH THAT THE SOIL IS SLICED, NOT TURNED OVER.
2. AFTER SILT FENCE INSTALLATION, COMPACT THE SOIL IMMEDIATELY NEXT TO THE GEOTEXTILE BY DRIVING OVER IT WITH A TRACTOR TIRE AT LEAST TWICE

MATERIALS PER MNDOT 3886
INSTALLATION PER MNDOT 2573.3C1

4 SILT FENCE (MACHINE SLICED)

NTS

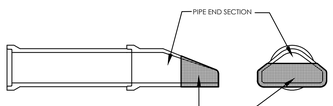


A CHECK SLOT SHALL BE CONSTRUCTED AT THE TOP OF STEEP SLOPES (4:1 OR STEEPER) WHERE EROSION CONTROL BLANKET IS PLACED AS PER THE FOLLOWING:

1. DIG 6" X 6" TRENCH
2. LAY BLANKET END INTO TRENCH
3. STAPLE BLANKET IN BOTTOM OF TRENCH EVERY 1 FT
4. BACKFILL TRENCH WITH SOIL AND COMPACT
5. IF SLOPE LENGTH (L) IS GREATER THAN 100 FT DIG A CHECK SLOT 1/3 FROM THE BOTTOM OF THE SLOPE AND STAPLE THE BLANKET IN AS IN THE TOP TRENCH.

5 EROSION CONTROL BLANKET

NTS

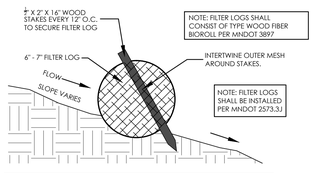


* GEOTEXTILE FABRIC SHALL BE WRAPPED FROM THE BOTTOM OF THE PIPE TO ½ THE DIAMETER OF THE PIPE

END SECTION SHALL BE WRAPPED TIGHTLY WITH SILT FENCE GEOTEXTILE FABRIC (MNDOT SPEC. 3886)

6 CULVERT INLET PROTECTION

NTS



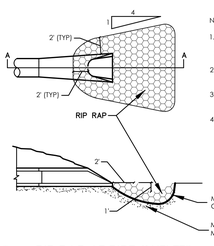
NOTES:

1) STAKES SHALL BE DRIVEN INTO GROUND AT AN ANGLE OF 45° WITH THE TOP OF THE STAKE POINTING UPSTREAM

2) ENDS OF MULTIPLE LOGS SHALL BE OVERLAPPED A MINIMUM OF 6" WITH BOTH ENDS STAKED

7 FILTER LOG DITCH CHECK

NTS



NOTES:

1. RIP RAP SHALL MEET THE REQUIREMENTS OF MNDOT SPEC. 3601
2. SEE PLANS FOR CLASS OF RIP RAP
3. D=PIPE DIAMETER IN FEET (SEE PLANS)
4. OUTLETS ON STEEP SLOPES SHALL BE PROVIDED WITH RIP RAP FROM THE OUTLET TO THE TOE OF THE SLOPE.

8 RIP RAP AT PIPE OUTLETS

NTS

PROJECT INFORMATION

Project Description

This project will consist of the construction of a new residential subdivision, which will include fifteen (15) single family home lots, as well as a public road with an approximate total length of 1,500 LF. Storm water management for this project will consist of two (2) wet sediment detention ponds.

Impervious Surface Tabulation

Anticipated Disturbed Area	7.2 acres*
Existing Impervious Area	0.0 acres
Proposed Impervious Area	2.5 acres**
Net Impervious Area Increase	2.5 acres

* Includes anticipated disturbed area of both public improvements and individual home lots. It is assumed that the yards of the individual lots will eventually be disturbed so as to establish grass lawn areas, as each lot is developed. It is unlikely that all yard areas will be disturbed at the same time.

** The fifteen (15) undeveloped lots were assumed to have an average of 5,000 SF of new impervious surfacing (each) upon completion of ultimate development. This includes the principal home, driveways, and accessory building(s)

Permanent Site Drainage

Soil borings completed at the site indicate site subsoils consist of clayey sands and clays, which are not considered conducive to infiltration per the MN Storm Water Manual. For this reason, site drainage will be routed to one of two wet sediment detention ponds via surface drainage and ditch flow to be constructed on-site. The ponds will be provided with a permanent volume (dead storage) equal to or exceeding 1,800 cubic feet per acre draining to the pond, and a water quality volume equal to 1" of the impervious area draining to the pond. The outlets will be sized such that the discharge of the water quality volume will not exceed 5.66 cfs per acre of pond surface area. Skimmer structures to control floatables have been included as well.

The ponds have also been designed such that the overall proposed site runoff and pond discharge rates do not exceed pre-developed runoff rates for the 2, 10, and 100-year storm events. See storm water calculation report for associated calculations.

Receiving Surface Waters

The following surface waters could receive storm water runoff from this project, and are within 1 mile of the project site:

Surface Water	Type of Surface Water	Impaired Water?	Special Water?	USEPA Approved TMDL for Impaired Water?	Comments
Downstream wetlands	Wetland	No	No		
Luxemburg Creek	Creek	No	Yes		Trout Stream

SEDIMENT AND OTHER POLLUTANTS

This SWPPP has been designed mainly to provide erosion and sediment control of naturally occuring soils at this site (ie: sands, loams, and clays). Although this SWPPP does address pollution prevention of other man-made materials, it is assumed that these materials will consist of materials from existing structures and pavements to be demolished, or debris and chemicals (ie: fuels, new paints, etc.) resulting from new construction.

There are no known solid wastes or hazardous materials buried below grade at this site. If such wastes or hazard materials are discovered during construction, the SWPPP Coordinator (described below) will be responsible for notifying the Engineer. This SWPPP will then be revised to address he presence and disposal of these additional pollutants

EROSION PREVENTION AND SEDIMENT CONTROL RESPONSIBILITIES

SWPPP Design Engineer and Qualifications

Design Engineer	Brian J. Schultz, PE
Training Course	Design of SWPPP Recert.
Training Entity	University of Minnesota
Instructor	John Chapman
Dates of Training Course	Feb 15, 2017
Total Training Hours	5.5

* "Design of SWPPP" is a recertification course offered by the University of Minnesota. The Engineer's certification for "Design of SWPPP" is current, and will expire May 31, 2020. Certification documentation is on file at the Engineer's office and a copy can be provided upon request.

SWPPP Coordinator and Qualifications

The Contractor shall provide an individual who shall serve as the SWPPP Coordinator for this project. The SWPPP coordinator shall oversee the implementation of this SWPPP, as well as the necessary inspections (described below) of erosion prevention and sediment control BMPs. The SWPPP Coordinator shall also oversee the installation, maintenance, and repair of the BMP's to be completed in accordance with this SWPPP. The SWPPP Coordinator shall be responsible for the items listed above during the period from the start of the project to the establishment of final stabilization. During this period, the SWPPP Coordinator, or their assigned, qualified (see below) representative shall be available for an on-site inspection within 72 hours upon request by the MPCA.

It shall be the Contractor's responsibility to complete the table below, which will identify the SWPPP Coordinator and that person's qualifications. This person shall acknowledge that he/she has been assigned to serve as SWPPP Coordinator and will be overseeing the items listed in this section, by providing their signature in the space below. Please note that this SWPPP will not be considered complete if the table below is not filled in.

* Typically, the identity of the SWPPP Coordinator is unknown until the project is awarded. The SWPPP Coordinator may be identified at the project's Preconstruction Conference.

SWPPP Coordinator	
Company Name	
Office Phone #	
Cell Phone #	
Training Course	
Training Entity	
Instructor	
Dates of Training Course	
Total Training Hours	

I, _____, hereby
[Printed Name]
acknowledge that I will be serving as SWPPP Coordinator for this project and will be responsible for overseeing the items identified in this section.

_____
(Signature)

_____
(Date)

The SWPPP Coordinator may assign other personnel to supervise or perform the duties listed above. However, in completing the duties listed above, at least one person shall be trained in erosion prevention and sediment control as related to that particular part of the SWPPP.

If the SWPPP Coordinator chooses to delegate some of the duties and responsibilities listed above to other personnel, a list of the personnel, as well as their qualifications, shall be kept with and shall become part of this SWPPP. The qualifications shall be documented in a manner similar to the table shown above. A copy of this list shall be provided to the Engineer.

Once the project has been completed and accepted by the Owner, and Final Stabilization has been established and "Notice of Termination" submitedto the MPCA, the Owner assumes responsibility for the long term maintenance of the storm water management system.

The SWPPP Coordinator shall be responsible for ensuring that the Contractor properly disposes of the temporary erosion and sediments control measures within 30 days after site stabilization is achieved or after the temporary measures are no longer needed.

Record Retention

The SWPPP and associated records shall be stored and maintained by an employee or representative of the Owner for 3 years after the submission of the Notice of Termination (NOT) Responsibility for overseeing the records will be transferred to another employee or representative should the current personnel become uninvolved with the project or Owner. These records shall include the following:

1). The final SWPPP

2). Any other stormwater related permits required for the project

3). Records of all inspection and maintenance conducted during construction

4). All permanent operation and maintenance agreements that have been implemented, including all right-of-way, contracts, covenants and other binding requirements regarding perpetual maintenance

5). All required calculations for design of the temporary and permanent Stormwater Management Systems.

BMP INSPECTIONS

Inspection Frequency

The SWPPP Coordinator shall inspect, or designate someone else who is qualified to inspect (see above), the construction site erosion prevention and sediment control BMPs per the following time frames:

1). Once every 7 days

2). Within 24 hours of a rain event (1/2" or greater over 24 hours)

Inspections shall be conducted per the time frames listed above with the following exceptions:

1). Where parts of the construction site have permanent cover, but work remains on other parts of the site, inspections of areas with permanent cover may be reduced to once per month

2). Where construction sites have permanent cover on all exposed soil areas and no construction activity is occuring anywhere on the site, the site must be inspected for a period of 12 months (inspections may be suspended during frozen ground conditions). Following the 12th month of permanent cover with no construction activity, inspections may be terminated until construction activity is once again initiated or sooner if notified in writing by the MPCA.

3). Where work has been suspended due to frozen ground conditions, the required inspections and maintenance schedule must begin within 24 hours after runoff occurs at the site or prior to resuming construction, whichever occurs first.

Inspection Records

The SWPPP Coordinator shall maintain inspection records during construction. These must be recorded in writing within 24 hours of the inspection and/or maintenance activity. The inspection records shall include the following:

1). Date and time of inspections

2). Name of person(s) conducting inspection

3). Findings of inspections, including recommendations for corrective actions

4). Corrective actions taken (including dates, times, and party completing maintenance activities)

5). Date and amount of any rainfall events greater than 1/2" in 24 hours
a). The Contractor shall install and maintain a rain gauge at the construction site in order to verify rainfall amounts.

6). If any discharge is observed to be occuring during the inspection, a record of all points of the property from which there is a discharge must be made, and the discharge shall be described (i.e., color, odor, floating, settled, or suspended solids, foam, oil sheen, and other obvious indicators of pollutants) and photographed.

7). Documentation of any changes to the SWPPP made during construction
a). If the SWPPP coordinator observes that a BMP fails on a regular basis and believes that it is ineffective, it shall be his/her responsibility to notify the Engineer of such deficiencies. The Engineer may then amend the SWPPP (see "Amending the SWPPP")

Note: Copies of all inspection records shall be submitted to the Engineer.

AMENDING THE SWPPP

During the construction of this project it may become necessary to amend this SWPPP. Should the responsibility of installing, inspecting and maintaining the erosion and sediment control devices and techniques described in this SWPPP be transferred from the current Contractor to another Contractor, or from the current Contractor to the Owner, this SWPPP shall be updated accordingly. The Owner will also be required to complete an "Permit Modification Form".

Should it be determined, during construction, by the SWPPP Coordinator, Engineer, or Regulatory Officials that deficiencies in this SWPPP exist, or if significant changes are made to the design/scope of this project that impact erosion prevention and sediment control, the Engineer shall be notified immediately. The Engineer will then review potential deficiencies and/or significant changes to project design/scope, and make necessary changes to the SWPPP.

After changes are made to the SWPPP, the Engineer will issue the necessary documentation, reflecting the changes, to the owner and to the SWPPP Coordinator. The SWPPP Coordinator shall be responsible to make sure that this documentation is added to the on-site SWPPP copy and that the changes described in the documentation is implemented on-site.

EROSION PREVENTION AND SEDIMENT CONTROL BMPS

Standards and References

Materials and construction methods of all BMPs included in this SWPPP shall be as per the Minnesota Department of Transportation (MNDOT) Standard Specifications for Construction, latest edition. The Contractor and SWPPP Coordinator shall obtain a current copy of MNDOT's Standard Specifications for Construction and familiarize themselves with the specification sections applicable to this SWPPP, as there are several BMPs that specifically reference these sections.

The Contractor and SWPPP Coordinator shall be expected to be familiar with the applicable MNDOT specification sections during construction. No additional compensation will be paid to the Contractor for additional work due to unfamiliarity with these specification sections.

Undisturbed Areas

If shown on the plan, the Contractor shall delineate areas that are not to be disturbed on the site. This may be done with flags, stakes, signs, silt fence, etc., and shall be completed prior to the start of any grading operations. Regardless of the delineation method the Contractor chooses to use, the Contractor must communicate to his/her personnel and subcontractors that these areas are not to be disturbed and construction equipment (including trucks and personal vehicles) shall not be allowed in these areas.

The Contractor shall minimize compaction and preserve topsoil as much as possible at the site. In pervious ("green") areas that are not essential to the construction of the project, the Contractor shall avoid construction traffic and maintain the existing condition of these areas.

Temporary and Permanent Stabilization

All exposed soil areas (including stockpiles) shall be provided with temporary or permanent cover within 7 days of construction activity temporarily or permanently ceasing in that portion of the site. Temporary or permanent drainage ditches or swales, which drain off-site or to a surface water, and are within 200 lineal feet of the property line or surface water shall be provided with temporary or permanent cover within 24 hours of construction. Placement of temporary or permanent cover shall be initiated immediately upon suspension or completion of excavation operations.

Temporary Cover:

If the Contractor chooses to halt grading operations in a portion of the site (or the whole site) for a period exceeding 7 days, and grading operations (rough or finish grading) in the affected areas has not yet been completed, temporary cover shall be placed. Affected areas consisting of drainage ditches or swales connected to, and within, 200 lineal feet of a property line or surface water shall be provided with temporary cover within 24 hours of connection. Depending on the Contractor's schedule, the temporary cover shall consist of one of the following BMPs:

1). Discanchored Mulch

a). Discanchored mulch may be used in an area of the site (or the whole site) if the Contractor is halting grading operations for a period that is relatively short, but exceeds 7 days.

b). The mulch shall be Type 3 per MNDOT Spec. 3882

c). An adequate quantity of mulch shall be evenly distributed to achieve 90% coverage of the exposed soils.

d). Mulch shall be placed as per MNDOT 2575.3C.

e). All mulch shall be disc anchored as per MNDOT 2575.3D. Prior to the placement and discanchoring of the mulch, the soils shall be loosened and the area smooth-rough graded per MNDOT 2574.

f). Any areas that are exposed as a result of wind action after the initial mulch placement shall be covered with additional mulch to maintain 90% coverage.

2). Temporary Seeding with Mulch

a). Temporary seeding with mulch may be used in areas of the site (or the whole site) if the Contractor is halting grading operations for a period that is relatively long. Although mulch still needs to be applied as described above, once the temporary seeding/turf is established, the mulch will no longer need to be maintained. The temporary seeding/turf will require very little maintenance.

b). Prior to the sowing of temporary seed, the soils shall be loosened and the area smooth-rough graded per MNDOT 2574.

c). Contractor shall utilize Seed Mixes 21-111, 21-112, or 21-113 per MNDOT Spec. 3876 for temporary seeding.

d). Temporary seeding shall be sown per MNDOT Spec. 2575.3B.

e). Once temporary seeding has been sown, mulch shall be placed over the area as described above.

Permanent Cover:

Upon completion of finish grading and/or placement of topsoil, initiation of the placement of permanent cover shall begin immediately over all exposed areas. This includes areas designated for impervious surfacing (ie: buildings, pavements/gravel bases, sidewalks, etc.). Where the construction schedule will not allow for the placement of the permanent impervious surfacing within 7 days of the completion of finish grading, temporary cover shall be provided in these areas, as described above, until the permanent impervious surfacing can be constructed. Affected areas consisting of drainage ditches or swales connected to, and within, 200 lineal feet of a property line or surface water, shall be provided with permanent cover within 24 hours of connection.

Areas designated for permanent turf establishment shall be provided with one or more of the following BMPs (see plan):

1). Permanent Seeding with Mulch

a). Unless otherwise noted on the plans, all areas designated for turf establishment shall be provided with permanent seeding.

b). In addition to the plan included as part of this SWPPP, the Contractor shall verify if a Landscaping Plan has been included in the plans by the Architect. If a Landscape Architect has specified higher quality permanent cover (ie: sod, hydroseeding, etc.), the Contractor shall provide this permanent cover in lieu of the permanent seeding specified in this SWPPP.

c). Prior to the sowing of permanent seed, the soils shall be loosened and the area smooth-rough graded per MNDOT 2574.

d). Contractor shall utilize Seed Mix 25-131 per MNDOT Spec. 3876 for permanent seeding.

e). Permanent seeding shall be sown per MNDOT Spec. 2575.3B.

f). Once permanent seeding has been sown, mulch shall be placed over the area as described above (under Temporary Cover), unless noted otherwise.

2). Erosion Control Blanket

a). Erosion control blanket shall be placed in areas as shown on the plan included in this SWPPP. These areas shall still be provided with permanent seeding, as described above, beneath the erosion control blanket.

b). Erosion control blanket shall meet the requirements indicated in MNDOT Spec. 3885. See plan for category(s) of erosion control blanket.

c). Erosion control blanket shall be installed as per MNDOT Spec. 2575.3G2.

d). Erosion control blanket specified in drainage ditches and swales connected to, and within 200 lineal feet, of a property line or surface water shall be installed within 24 hours of the completion of finish grading (including permanent seeding).

3). Riprap

a). Riprap shall be placed in areas as shown on the plan included in this SWPPP.

b). All riprap shall be underlain with Type 4 geotextile fabric. The fabric shall meet the requirements of MNDOT Spec. 3733 and shall be installed as per MNDOT Spec. 2511.3B2.

c). Riprap materials shall meet the requirements of MNDOT Spec. 3601, and shall be Class 3, unless noted otherwise on the plans.

d). Riprap shall be considered "Random Riprap" and shall be placed as per MNDOT Spec. 2511.

e). Although it is permitted for the riprap to be placed with machinery, it will be necessary for the Contractor to hand place some of the riprap in order to provide a dense, well-keyed layer of stones with the least practical quantity of void space.

f). The minimum thickness of the riprap shall be 18 inches, unless otherwise noted on the plans.

g). Riprap designated at the end of pipe outlets shall be placed within 24 hours of installation of the pipe outlet end section.

h). Riprap specified in drainage ditches and swales connected to, and within 200 lineal feet, of a property line or surface water shall be installed within 24 hours of the completion of finish grading.

Sediment Control

The following sediment control BMPs shall be implemented as part of this project:

1). Silt Fence

a). Silt fence shall be installed at the locations shown on the plan included in this SWPPP.

b). Silt fence shall be machine sliced and materials shall meet the requirements of MNDOT Spec. 3886.

c). Silt fence shall be installed as per MNDOT Spec. 2573.3B2.

d). Silt fence shall be installed prior to any upgradient grading operations, and shall remain in place and maintained adequately until upgradient areas achieve Final Stabilization (see below)

e). Silt fence shall be repaired or replaced if damaged during, or after, rain events, or if accumulated sediment on the upstream side of the fence reaches 1/3 of the height of the fence. Repair or replacement of silt fence shall be completed within 24 hours of discovery.

f). Portions of silt fence may be removed to accommodate short-term activities, such as vehicle passage. Short-term activities shall be completed as quickly as possible, and new silt fence installed immediately after completion of the short-term activity. If rainfall is imminent or forecasted in the near future, new silt shall be installed regardless of if the short term activity has been completed or not. The Contractor is advised to schedule short term activities during dry weather as much as practicable. No additional compensation will be paid due to additional silt fence associated with short-term activities.

g). Temporary soil stockpiles shall be placed on the site in areas upgradient from silt fence. Where the Contractor chooses to place temporary soil stockpiles outside designated silt fenced areas, the stockpiles shall be surrounded by additional silt fence. Under no circumstances shall temporary soil stockpiles be placed over surface waters, curb and gutter, catch basins, culvert inlets or outlets, or ditches.

2). Catch Basin Protection

a). WIMCO Road Drain protection devices, as manufactured by WIMCO, shall be used for catch basin protection on this project. WIMCO can be contacted at (952)-233-3055, and their web page is www.roaddrain.com.

b). "Road Drain Top Slab" devices shall be installed at all catch basin locations immediately after placement of the catch basin structures. "Road Drain Top Slab" devices shall remain in place and be adequately maintained until permanent surfacing is constructed (ie: curb and gutter, pavements, and/or gravel surfacing). In areas designated for turf establishment, "Road Drain Top Slab" devices shall remain in place until Final Stabilization of all upgradient areas is established.

c). Upon construction of the permanent surfacing, the "Road Drain Top Slab" devices shall be replaced with the WIMCO product specified on the plans. The WIMCO devices shall remain in place until Final Stabilization of all upgradient areas has been established.

d). The contractor shall install and maintain the catch basin protection devices as per the manufacturer's instructions and specifications.

3). Culvert Inlet Protection

a). Culvert inlet protection shall be provided at all culvert inlet locations immediately after construction of the culvert. See plan included in this SWPPP for culvert inlet locations.

b). Culvert inlet protection shall consist of geotextile fabric wrapped around, and completely covering the inlet end section. The geotextile fabric shall be the same fabric used in silt fence applications and meet the requirements of MNDOT Spec. 3886.

c). The culvert inlet protection shall remain in place and adequately maintained until Final Stabilization of all upgradient areas has been established.

d). Culvert inlet protection shall be repaired or replaced if damaged during, or after, rain events, or if accumulated sediment reaches 1/2 of the diameter of the culvert pipe. Repair or replacement of culvert inlet protection shall be completed within 24 hours of discovery.

4). Temporary Rock Construction Entrance

a). Temporary rock construction entrances shall be installed at the locations shown on the plan included in this SWPPP. See detail for temporary rock entrance design.

b). If the Contractor chooses to access the site from locations other than where temporary rock entrances are specified on the plans, additional temporary rock entrances shall be placed at these locations, as well.

c). Temporary rock entrance shall be constructed prior to the start of grading operations, and shall remain in place and be adequately maintained until Final Stabilization has been established.

d). Temporary rock entrances shall be maintained in such a manner that the entrances prevent sediment tracking onto adjacent streets. If a temporary rock entrance is found to be ineffective, it shall be replaced or improved within 24 hours of discovery.

e). The Contractor has the option to place Type 4 geotextile fabric beneath the temporary rock entrance. The fabric may extend the life of the entrance as it will reduce rock "sinking" into the underlying soils. If the Contractor chooses to use fabric, it should meet the requirements of MNDOT Spec. 3733 and shall be installed as per MNDOT Spec. 2511.3B2.

f). If sediment tracking from the site is discovered on adjacent streets, the sediment shall be removed with a street sweeper or other approved method within 24 hours of discovery. This shall be done throughout construction of the project. This sediment may be returned and graded over exposed areas of the site, or disposed of off site per MPCA requirements.

The City may order street sweeping to be performed at the Contractor's or Owner's expense if City staff find that construction activities are resulting in sediment or debris being tracked onto City streets.

5). Filter Logs

a). Filter logs shall be installed at the locations shown on the plan included in this SWPPP.

b). Filter logs shall consist of Type Wood Fiber biorolls and meet the requirements of MNDOT Spec. 3897.

c). Filter logs shall be installed as per MNDOT Spec. 2573.3F.

d). Filter logs shall be installed immediately after placement of erosion control blanket.

e). Filter logs shall remain in place for the life of the project, and shall be allowed to degrade naturally.

Dewatering

If dewatering of sandy subsoils is required for this project, the pump discharge shall be treated prior to discharge off-site or into a surface water. Treatment of discharge shall be achieved with the use of a "Dandy Dewatering Bag" (or approved equivalent), as manufactured by Dandy Products,Inc. Dandy Products, Inc. can be contacted at (877) 307-0141, and their web page is www.dandyproducts.com. The "Dandy Dewatering Bag" shall be installed, utilized, and maintained per the manufacturer's instructions and specifications.

Once dewatering water has been treated, it may be discharged off-site or to a surface water. The discharge shall be visually checked to ensure that it is relatively clean and not visibly different from any receiving waters. If discharge is noticeably "dirty", the Engineer shall be contacted as additional treatment methods may be necessary.

Adequate erosion control shall be provided at the point of discharge if it is located in an area with exposed soils or established turf. This erosion control may consist of temporarily placed rip rap, or other approved energy dissipation measures. The type of erosion control measure shall be at the Contractor's discretion, depending on the location of the dewatering discharge and the unique site characteristics. The erosion control measures shall be effective and shall be maintained adequately such that no erosion occurs at the point of discharge.

Pollution Prevention Management

Solid waste accumulated during construction, including collected sediment, construction materials, floating debris, construction debris, paper, plastics, and other solid wastes shall be disposed of in accordance with MPCA disposal requirements:

1). Building products that have the potential to leach pollutants shall be maintained under cover (e.g., plastic sheeting or temporary roofs) to prevent the discharge of pollutants or protected by a similarly effective means designed to minimize contact with storm water.

2). Pesticides, herbicides, insecticides, fertilizers, treatment chemicals, and landscape materials shall be maintained under cover (e.g., plastic sheeting or temporary roofs) to prevent the discharge of pollutants or protected by similarly effective means designed to minimize contact with stormwater.

3). Hazardous materials, toxic waste, (including oil, diesel fuel, gasoline, hydraulic fluids, paint solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids) shall be properly stored in sealed containers to prevent spills, leaks or other discharge. Restricted access storage areas shall be provided to prevent vandalism. Storage and disposal of hazardous waste or hazardous materials shall be in compliance with Minn. R. ch. 7045 including secondary containment as applicable.

4). Solid waste shall be stored, collected and disposed of properly in compliance with Minn. R. ch. 7035.

5). Portable toilets shall be positioned so that they are secure and will not be tipped or knocked over. Sanitary waste must be disposed of properly in accordance with Minn. R. ch. 7041.

The Contractor shall take steps to prevent the discharge of spilled or leaked chemicals, including fuel, from any area where chemicals or fuel will be loaded or unloaded including the use of drip pans or absorbents unless infeasible. The Contractor shall conduct fueling in a contained area unless infeasible. The Contractor shall ensure adequate supplies are available at all times to clean up discharged materials and that an appropriate disposal method is available for recovered spilled materials. The Contractor shall report and clean up spills immediately as required by Minn. Stat. § 115.061, using dry clean up measures where possible.

If the Contractor washes the exterior of vehicles or equipment on the project site, washing shall be limited to a defined area of the site. Runoff from the washing area shall be contained in a sediment basin or other similarly effective controls and waste from the washing activity shall be properly disposed of. The Contractor shall properly use and store soaps, detergents, or solvents. No engine degreasing shall be allowed on site.

The Contractor shall provide effective containment for all liquid and solid wastes generated by washout operations (concrete, stucco, paint, form release oils, curing compounds and other construction materials) related to the construction activity. The liquid and solid washout wastes shall not contact the ground, and the containment shall be designed so that it does not result in runoff from the washout operations or areas. Liquid and solid washout wastes shall be disposed of properly and in compliance with MPCA rules. A sign must be installed adjacent to each washout facility that requires site personnel to utilize the proper facilities for disposal of concrete and other washout wastes.

FINAL STABILIZATION

Final Stabilization shall be considered established once the following requirements have been achieved:

1). All soil disturbing activities at the site have been completed and all soils are stabilized by a uniform perennial vegetative cover with a density of 70 percent of its expected final growth density over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions.

2). The permanent storm water management system is constructed, and is operating as designed. Temporary or permanent sedimentation basins that are to be used as permanent water quality management basins have been cleaned of any accumulated sediment. All sediment has been removed from conveyance systems and ditches are stabilized with permanent cover.

3). All temporary synthetic and structural erosion prevention and sediment control BMPs have been removed from the project site. BMPs designed to decompose on site may be left in place.

ADDITIONAL COMMENTS

The Contractor is solely responsible for the cleanup of any wetlands, rivers, streams, lakes, reservoirs, other waters of the State (as defined by the MPCA's General Storm Water Permit), ground or roadway surfaces or other property damaged by construction activity related to this project.

Besides the NPDES permit (MPCA General Storm Water Permit), the Contractor shall also obtain all other necessary local government permits related to erosion and sediment control, if applicable (ie: Watershed District, County Soil and Water Conservation District, MNDOT, etc.).

This SWPPP is intended to provide a plan for addressing the erosion prevention and storm water management issues associated with this project. It is to be used in conjunction with the project plans, specifications, and the MPCA General Storm Water Permit. In addition to the SWPPP, the Owner, Contractor, and SWPPP Coordinator shall familiarize themselves with the actual requirements indicated in the MPCA General Storm Water Permit itself and are responsible for compliance with the permit's terms, requirements, and conditions. The Engineer can provide a copy of the permit upon request.

SWPPP - NOTES & DETAILS

PRELIMINARY PLAT DOCUMENTS 11/06/2017

PRELIMINARY - NOT FOR CONSTRUCTION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed Engineer under the laws of the state of Minnesota

Brian J. Schultz, PE

Date: 11/06/2017

License No.: 43129

SCHULTZ ENGINEERING & SITE DESIGN
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schultzeng@live.com
www.schultzengineeringdesign.com

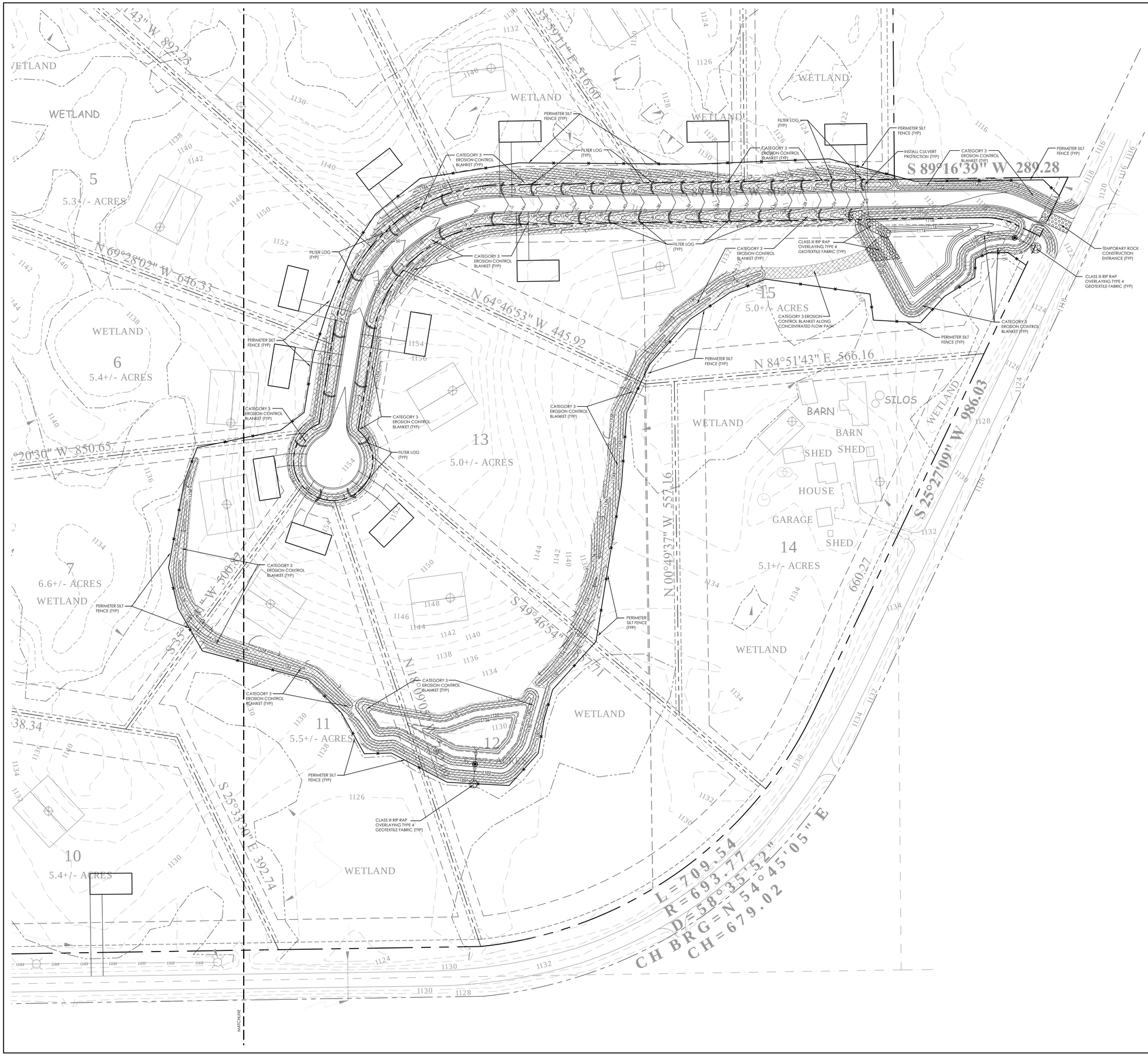
REVISIONS		
NO.	DATE	DESCRIPTION
1		
2		
3		
4		

SCHNEIDER FARM

ROCKVILLE, MN

PROJECT NUMBER: 17054

17054-SWPPP - NOTES.dwg



SWPPP - PLAN VIEW

0 60 120 180

PRELIMINARY - NOT FOR CONSTRUCTION

PRELIMINARY PLAT DOCUMENTS 11/06/2017

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REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		

SCHNEIDER FARM

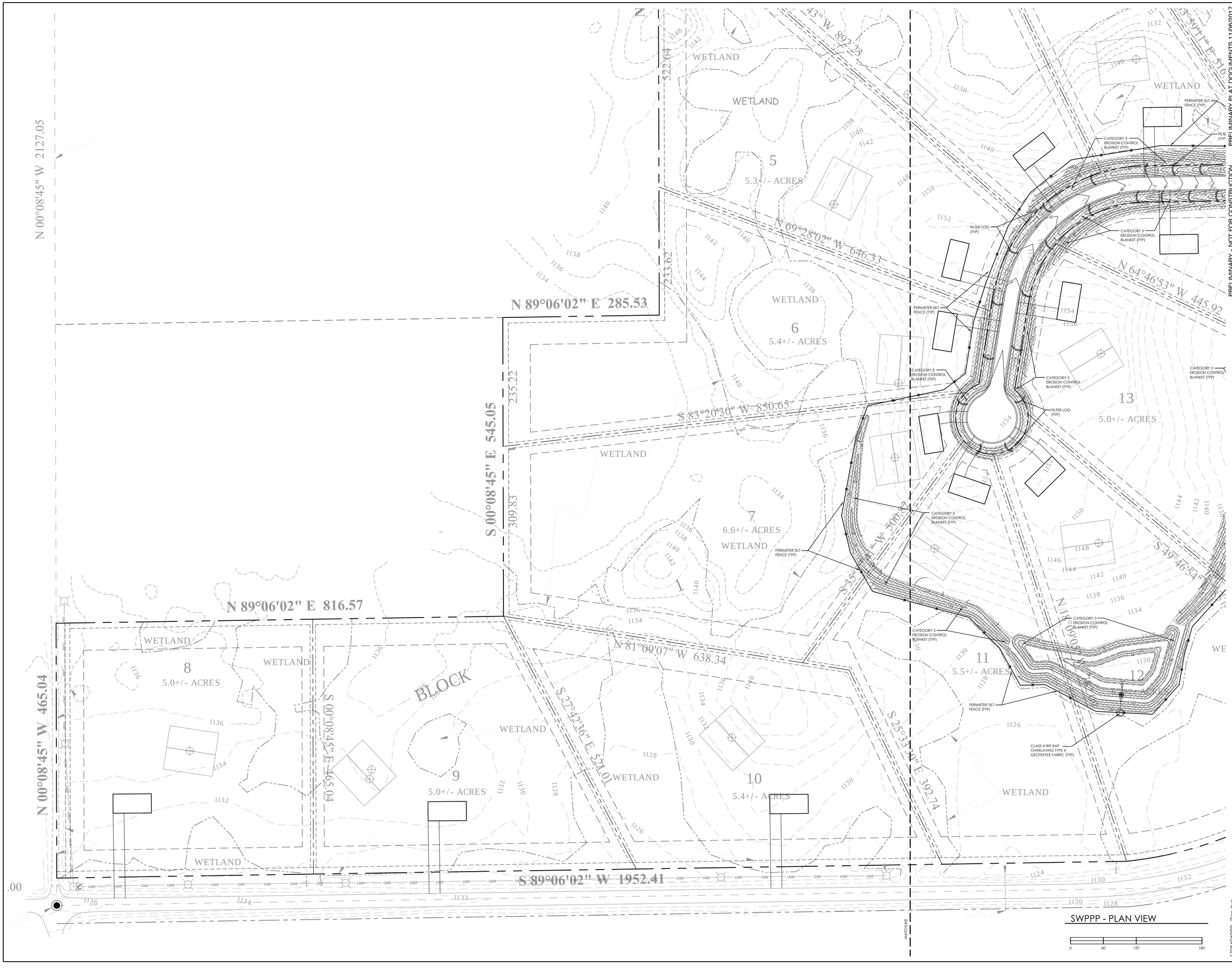
ROCKVILLE, MN

PROJECT NUMBER: 17054

SCALE: 1"=60'

N

17054-SWPPP - Plan.dwg



SWPPP - PLAN VIEW

PRELIMINARY PLAT DOCUMENTS 11/06/2017

PRELIMINARY - NOT FOR CONSTRUCTION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed Engineer under the laws of the state of Minnesota

Brian J. Schultz, PE

Date: 11/06/2017

License No.: 43129

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REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		

SCHNEIDER FARM

ROCKVILLE, MN

PROJECT NUMBER: 17054

SCALE: 1"=60'

17054-SWPPP - Plan.dwg

STORM WATER CALCULATIONS

SCHNEIDER FARM

ROCKVILLE, MINNESOTA

PROJECT NUMBER: 17054

SCHULTZ ENGINEERING & SITE DESIGN

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www.schultzengineeringdesign.com

REVISIONS		
NO.	DATE	DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Brian J. Schultz

DATE: 11/13/2017 REG. NO.: 43129

STORM WATER SUMMARY

The proposed project is designed so that storm water runoff from proposed streets, as well as the majority of proposed impervious surfacing from residential lot development, drains to one of two proposed wet sedimentation detention ponds via surface and ditch drainage to be constructed on-site. Collectively, the ponds and associated outlets have been designed such that total discharge from the ponds, and portions of the site not directed to ponding areas, is limited to pre-developed runoff rates for the 2, 10 and 100-year 24-hour storm events.

As described further below, the subsoils at the site consist of clayey sands and clays, which are not conducive to infiltration. For this reason, wet sedimentation detention ponds are proposed for storm water management.

Due to existing topography, proximity to adjacent wetlands, the above mentioned clay soils, and lot layout, proposed impervious surfacing was directed to proposed ponds to the maximum extent practicable. It was not practical to direct all impervious surfacing from individual lots to proposed pond areas. Due to the clayey soils, private infiltration basins/rain gardens located on individual lots was not possible either.

It should be noted that the anticipated impervious surface area, not directed to proposed ponds, totals less than 1 acre. The amount of proposed impervious surface not directed to proposed ponding areas relative to the size of their associated lots is very small. It is our opinion that adequate storm water treatment from these impervious areas will occur via surface flow over vegetated areas prior to discharge into significant waters.

The site drainage has been modeled for the 24-hour - 2, 10 and 100-year storm events. Our calculations assume that the 2-year storm event in this area of Rockville would be approximately 2.69 inches, the 10-year event would be 3.97 inches, and the 100-year event would be 6.51 inches, based on current NOAA Atlas 14 rainfall data. We have utilized HydroCAD software to generate hydraulic calculations, as shown on the following pages.

Existing Soils

Based on soil borings and geotechnical report completed by Chosen Valley Testing (CVT), dated 11/03/2017, the soils encountered at the site predominantly consisted of approximately 4 to 16-inches of clayey sand topsoil (SC) overlying clayey sands (SC) and lean clays with variable amounts of sand (CL).

Based on the report, the surficial soils at the site were assumed to consist predominantly of Hydrologic Soil Group (HSG) "C" soils for the purposes of calculating subcatchment (drainage area) runoff.

As clayey sands and lean clays were encountered at the project site, it was determined that infiltrating storm water BMPs were not practical for this project due to the lack of adequate infiltrating capacity with these soils, based on the MN Storm

Water Manual. For this reason wet sediment detention ponds are proposed to serve the storm water management needs of the proposed project.

Ground Water

Based on the above referenced soil borings and geotechnical report, ground water is assumed to exist at variable elevations within sand lenses located in the clayey subsoils, and is likely perched.

Water Quality

As indicated above, existing clayey subsoils at the project site preclude the use of infiltrating storm water BMPs. Two wet sediment detention ponds are proposed for this project.

The proposed detention pond has been designed per MPCA NPDES Permit requirements, as listed below:

- Dead (or permanent) storage of at least 1800 cubic feet per acre that drains to the pond
- The pond's permanent storage volume must reach a minimum depth of at least 3 feet and must have no depth greater than 10 feet. The basin must be configured such that scour or resuspension of solids is minimized.
- Water quality volume is 1" of runoff off new and redeveloped impervious surfaces.
- Discharge rate of water quality volume does not exceed 5.66 cubic feet per second per acre of surface area of the pond (wet extended detention).

The pond will be provided with a skimmer structure outlet, which will also be designed to provide rate control.

POND WATER QUALITY						
Pond	**Required Dead Storage (1,800 cf/acre)**	**Provided Dead Storage (cf)**	**Required Water Quality Storage (1" runoff from impervious surfaces)**	**Provided Water Quality Storage (cf)**	**Maximum Discharge for 1" Water Quality Rain Event (5.66 cfs / acre draining to pond)**	**Calculated Discharge (cfs)**
POND1	25,740	40,000	6,856	77,600	2.24	0.23
POND2	8,640	26,800	1,232	63,500	1.71	0.02

Existing Drainage

The existing site consists of one drainage area (EXIST), which drains to the adjacent Stearns County Road 141 right-of-way. EXIST includes the proposed construction area, as well as contributing watershed. This drainage area has the following calculated runoffs from 2, 10 and 100-year storm events:

EXISTING DRAINAGE			
Drainage Area	**2-Year Runoff (cfs)**	**10-Year Runoff (cfs)**	**100-Year Runoff (cfs)**
EXIST	28.08	66.36	155.95

Proposed Drainage

The proposed site consists of four drainage areas (DA). DA1A and DA1B drain to proposed Wet Sedimentation Detention Pond #1 (POND1). DA2 drains to POND2. DA3 drains directly into the Stearns County Road 141 right-of-way. The proposed drainage areas have the following calculated runoffs from 2, 10 and 100-year storm events:

PROPOSED DRAINAGE			
Drainage Area	**2-Year Runoff (cfs)**	**10-Year Runoff (cfs)**	**100-Year Runoff (cfs)**
DA1A	3.42	6.48	12.93
DA1B	10.45	23.16	52.01
DA2	4.33	9.60	21.67
DA3	17.95	42.47	99.67

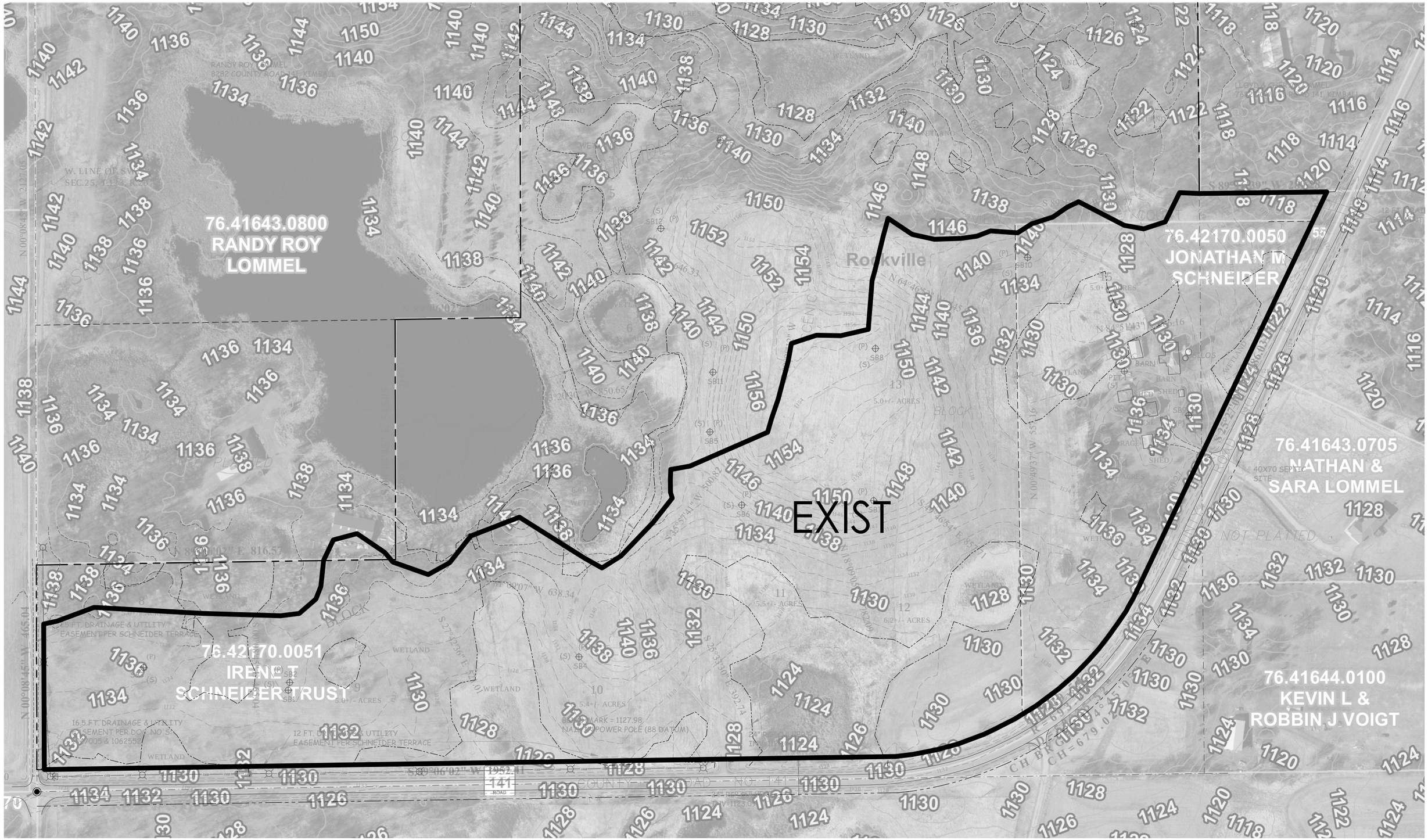
Collectively, the ponds have been designed such that total discharge from the ponds, and portions of the site not directed to ponding areas, is limited to pre-developed runoff rates. The ponds have been provided with skimmer structure outlets, which also provide rate control. Data relating to the performance of the ponds during 2, 10 and 100-year storm events is shown in the tables below:

WET SEDIMENTATION DETENTION POND DATA (POND1)	
Bottom of Pond	1,114.00
Normal Water Level	1,118.00
Top of Pond	1,121.50
2-year Peak Water Level	1,118.92
2-year Peak Outflow (cfs)	4.58
10-year Peak Water Level	1,119.71
10-year Peak Outflow (cfs)	12.19
100-year Peak Water Level	1,121.44
100-year Peak Discharge (cfs)	23.63

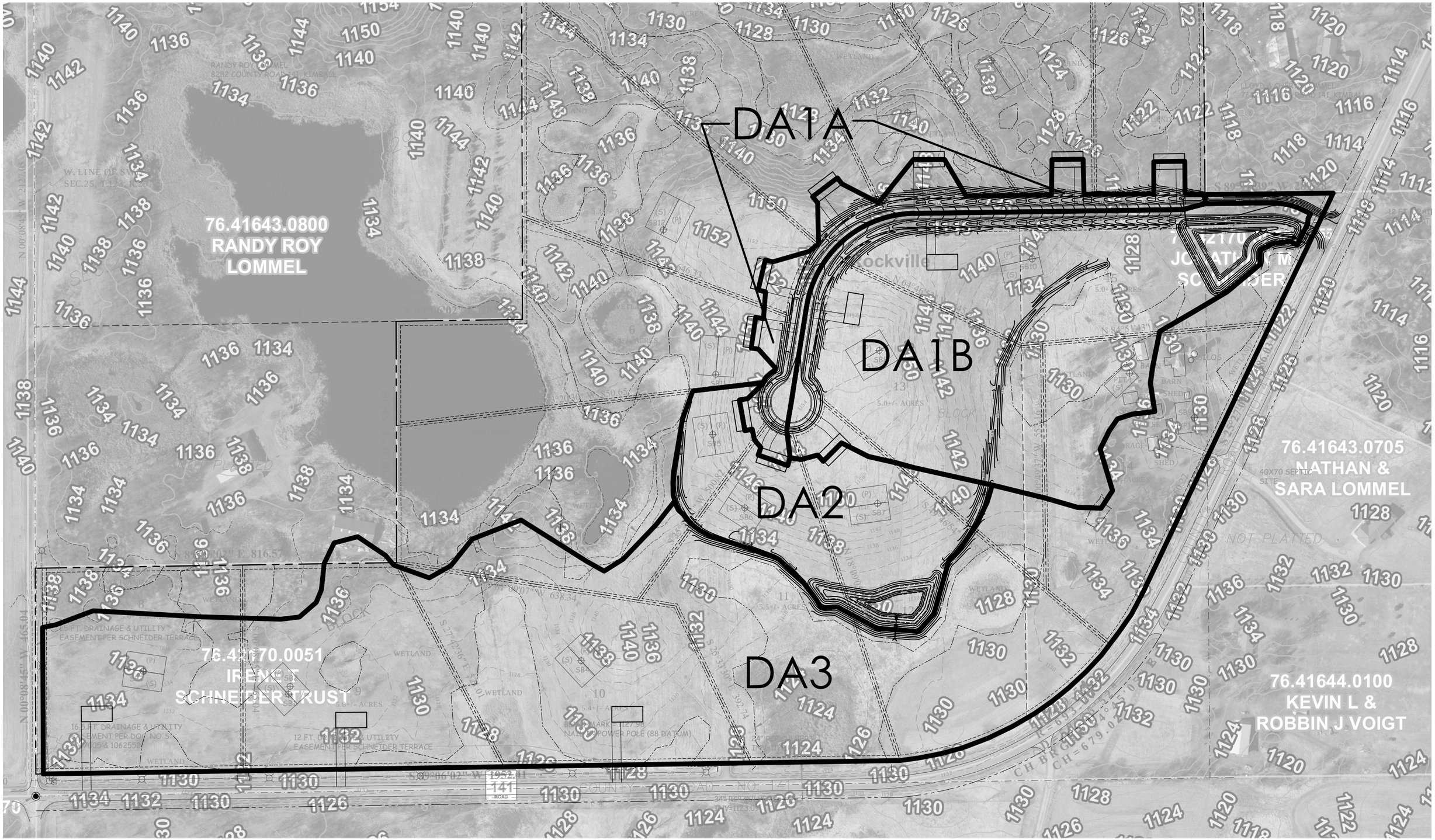
WET SEDIMENTATION DETENTION POND DATA (POND2)	
Bottom of Pond	1,124.50
Normal Water Level	1,128.50
Top of Pond	1,132.00
2-year Peak Water Level	1,128.96
2-year Peak Outflow (cfs)	0.81
10-year Peak Water Level	1,129.41
10-year Peak Outflow (cfs)	2.44
100-year Peak Water Level	1,130.48
100-year Peak Discharge (cfs)	4.61

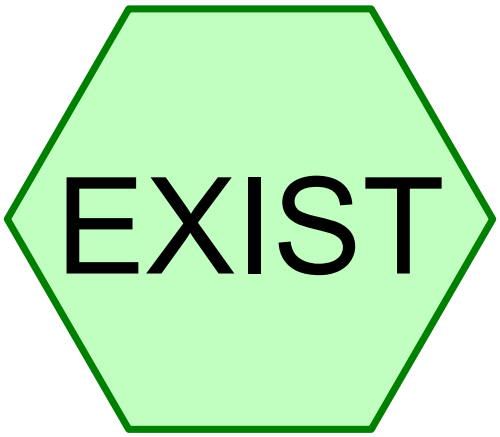
RUNOFF RATE COMPARISON (Discharge to County Road #141)		
Storm Event	**Existing Runoff (EXIST)**	**Proposed Runoff (POND1 & POND2 Discharges + DA3)**
2-Year	28.08	23.34
10-Year	66.36	57.10
100-Year	155.95	127.91

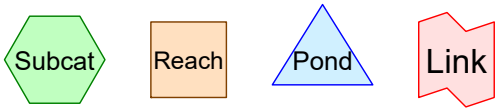
EXISTING DRAINAGE



PROPOSED DRAINAGE







Routing Diagram for 2-Year Existing
Prepared by Schultz Engineering and Site Design, Printed 11/13/2017
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
44.000	74	Pasture/grassland/range, Good, HSG C (EXIST)
0.210	98	Paved parking, HSG C (EXIST)
2.070	70	Woods, Good, HSG C (EXIST)
46.280	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
46.280	HSG C	EXIST
0.000	HSG D	
0.000	Other	
46.280		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	44.000	0.000	0.000	44.000	Pasture/grassland/range, Good	EXIST
0.000	0.000	0.210	0.000	0.000	0.210	Paved parking	EXIST
0.000	0.000	2.070	0.000	0.000	2.070	Woods, Good	EXIST
0.000	**0.000**	**46.280**	**0.000**	**0.000**	**46.280**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EXIST: Runoff Area=46.280 ac 0.45% Impervious Runoff Depth>0.72"
Flow Length=1,000' Tc=27.9 min CN=74 Runoff=28.08 cfs 2.761 af

Total Runoff Area = 46.280 ac Runoff Volume = 2.761 af Average Runoff Depth = 0.72"
99.55% Pervious = 46.070 ac 0.45% Impervious = 0.210 ac

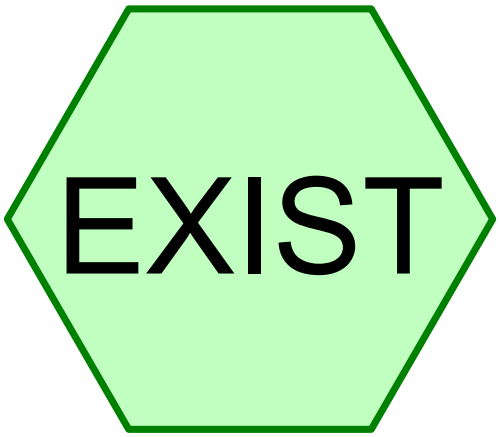
Summary for Subcatchment EXIST:

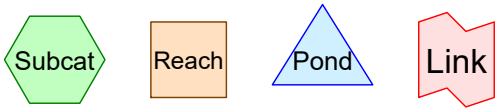
Runoff = 28.08 cfs @ 12.44 hrs, Volume= 2.761 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=2.69"

Area (ac)	CN	Description
0.210	98	Paved parking, HSG C
2.070	70	Woods, Good, HSG C
44.000	74	Pasture/grassland/range, Good, HSG C
46.280	74	Weighted Average
46.070		99.55% Pervious Area
0.210		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	150	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
1.7	300	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.8	250	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.9	300	0.0300	2.60		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
27.9	1,000	Total			





Routing Diagram for 10-Year Existing
Prepared by Schultz Engineering and Site Design, Printed 11/13/2017
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
44.000	74	Pasture/grassland/range, Good, HSG C (EXIST)
0.210	98	Paved parking, HSG C (EXIST)
2.070	70	Woods, Good, HSG C (EXIST)
46.280	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
46.280	HSG C	EXIST
0.000	HSG D	
0.000	Other	
46.280		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	44.000	0.000	0.000	44.000	Pasture/grassland/range, Good	EXIST
0.000	0.000	0.210	0.000	0.000	0.210	Paved parking	EXIST
0.000	0.000	2.070	0.000	0.000	2.070	Woods, Good	EXIST
0.000	**0.000**	**46.280**	**0.000**	**0.000**	**46.280**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EXIST: Runoff Area=46.280 ac 0.45% Impervious Runoff Depth>1.57"
Flow Length=1,000' Tc=27.9 min CN=74 Runoff=66.36 cfs 6.058 af

Total Runoff Area = 46.280 ac Runoff Volume = 6.058 af Average Runoff Depth = 1.57"
99.55% Pervious = 46.070 ac 0.45% Impervious = 0.210 ac

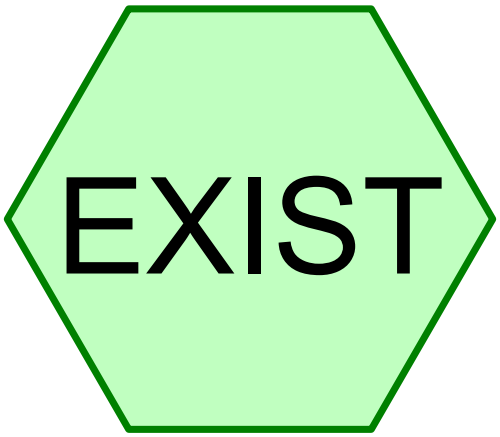
Summary for Subcatchment EXIST:

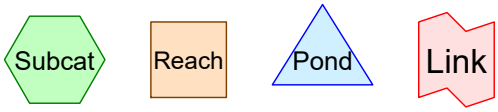
Runoff = 66.36 cfs @ 12.42 hrs, Volume= 6.058 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=3.97"

Area (ac)	CN	Description
0.210	98	Paved parking, HSG C
2.070	70	Woods, Good, HSG C
44.000	74	Pasture/grassland/range, Good, HSG C
46.280	74	Weighted Average
46.070		99.55% Pervious Area
0.210		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	150	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
1.7	300	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.8	250	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.9	300	0.0300	2.60		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
27.9	1,000	Total			





Routing Diagram for 100-Year Existing
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
44.000	74	Pasture/grassland/range, Good, HSG C (EXIST)
0.210	98	Paved parking, HSG C (EXIST)
2.070	70	Woods, Good, HSG C (EXIST)
46.280	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
46.280	HSG C	EXIST
0.000	HSG D	
0.000	Other	
46.280		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	44.000	0.000	0.000	44.000	Pasture/grassland/range, Good	EXIST
0.000	0.000	0.210	0.000	0.000	0.210	Paved parking	EXIST
0.000	0.000	2.070	0.000	0.000	2.070	Woods, Good	EXIST
0.000	**0.000**	**46.280**	**0.000**	**0.000**	**46.280**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EXIST: Runoff Area=46.280 ac 0.45% Impervious Runoff Depth>3.61"
Flow Length=1,000' Tc=27.9 min CN=74 Runoff=155.95 cfs 13.927 af

Total Runoff Area = 46.280 ac Runoff Volume = 13.927 af Average Runoff Depth = 3.61"
99.55% Pervious = 46.070 ac 0.45% Impervious = 0.210 ac

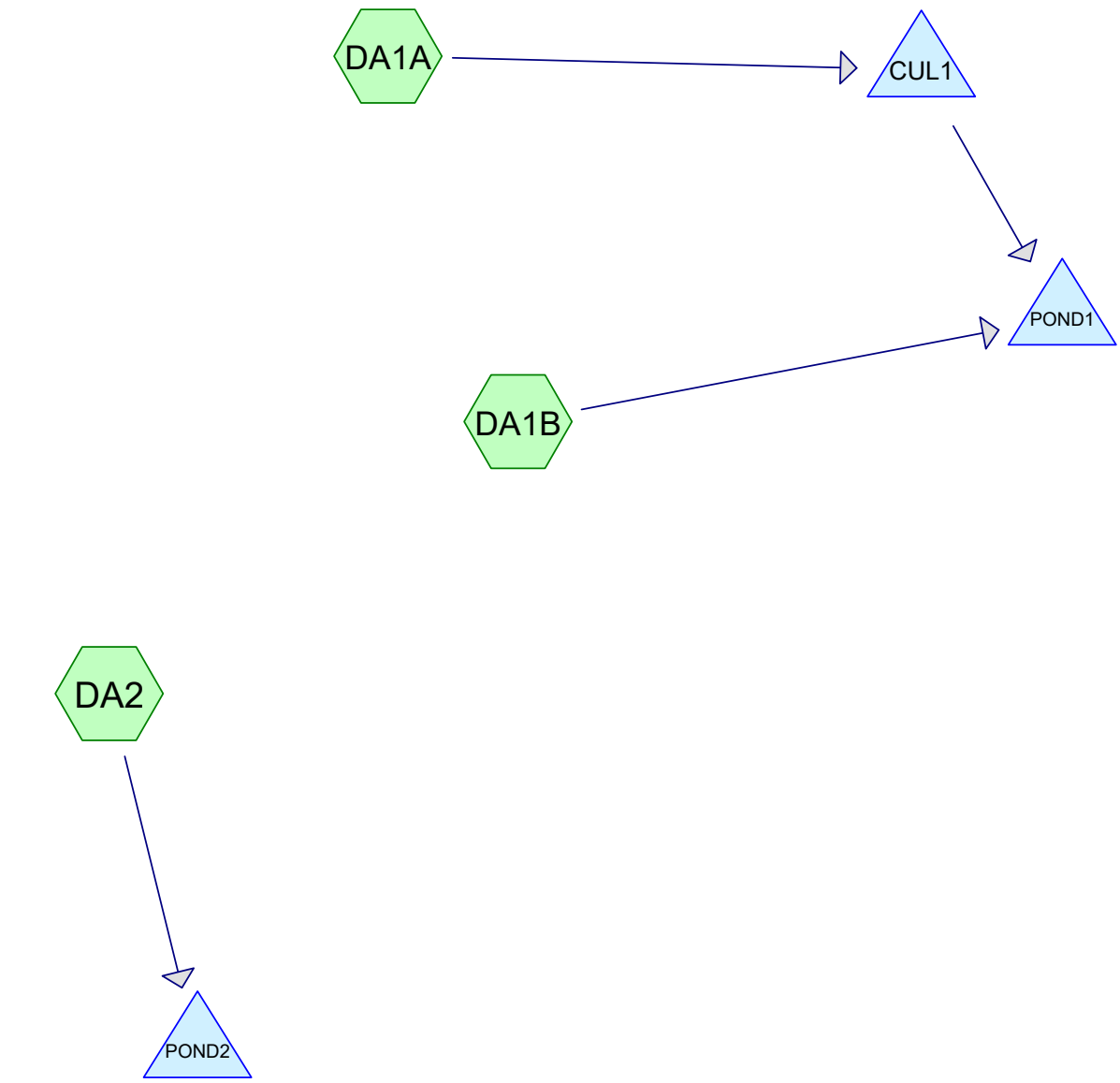
Summary for Subcatchment EXIST:

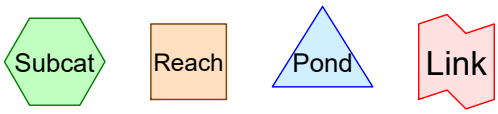
Runoff = 155.95 cfs @ 12.40 hrs, Volume= 13.927 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=6.51"

Area (ac)	CN	Description
0.210	98	Paved parking, HSG C
2.070	70	Woods, Good, HSG C
44.000	74	Pasture/grassland/range, Good, HSG C
46.280	74	Weighted Average
46.070		99.55% Pervious Area
0.210		0.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	150	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
1.7	300	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.8	250	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.9	300	0.0300	2.60		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
27.9	1,000	Total			





Routing Diagram for 1-Inch Proposed
Prepared by Schultz Engineering and Site Design, Printed 11/14/2017
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.230	98	Paved parking, HSG C (DA1A, DA1B, DA2)
2.230	**98**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.230	HSG C	DA1A, DA1B, DA2
0.000	HSG D	
0.000	Other	
2.230		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.230	0.000	0.000	2.230	Paved parking	DA1A, DA1B, DA2
0.000	**0.000**	**2.230**	**0.000**	**0.000**	**2.230**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	CUL1	1,121.72	1,118.00	60.0	0.0620	0.013	21.0	0.0	0.0
2	POND1	1,118.00	1,117.50	32.0	0.0156	0.013	24.0	0.0	0.0
3	POND2	1,128.50	1,128.00	28.0	0.0179	0.013	12.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1A: Runoff Area=0.920 ac 100.00% Impervious Runoff Depth>0.79"
Tc=0.0 min CN=98 Runoff=1.40 cfs 0.061 af

Subcatchment DA1B: Runoff Area=0.970 ac 100.00% Impervious Runoff Depth>0.79"
Tc=0.0 min CN=98 Runoff=1.48 cfs 0.064 af

Subcatchment DA2: Runoff Area=0.340 ac 100.00% Impervious Runoff Depth>0.79"
Tc=0.0 min CN=98 Runoff=0.52 cfs 0.022 af

Pond CUL1: Peak Elev=1,122.20' Storage=0.003 af Inflow=1.40 cfs 0.061 af
21.0" Round Culvert n=0.013 L=60.0' S=0.0620 '/' Outflow=1.27 cfs 0.061 af

Pond POND1: Peak Elev=1,118.19' Storage=0.077 af Inflow=2.73 cfs 0.125 af
24.0" Round Culvert n=0.013 L=32.0' S=0.0156 '/' Outflow=0.23 cfs 0.098 af

Pond POND2: Peak Elev=1,128.55' Storage=0.015 af Inflow=0.52 cfs 0.022 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0179 '/' Outflow=0.02 cfs 0.017 af

Total Runoff Area = 2.230 ac Runoff Volume = 0.147 af Average Runoff Depth = 0.79"
0.00% Pervious = 0.000 ac 100.00% Impervious = 2.230 ac

Summary for Subcatchment DA1A:

Runoff = 1.40 cfs @ 12.05 hrs, Volume= 0.061 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=1.00"

Area (ac)	CN	Description
0.920	98	Paved parking, HSG C
0.920		100.00% Impervious Area

Summary for Subcatchment DA1B:

Runoff = 1.48 cfs @ 12.05 hrs, Volume= 0.064 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=1.00"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG C
0.970		100.00% Impervious Area

Summary for Subcatchment DA2:

Runoff = 0.52 cfs @ 12.05 hrs, Volume= 0.022 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=1.00"

Area (ac)	CN	Description
0.340	98	Paved parking, HSG C
0.340		100.00% Impervious Area

Summary for Pond CUL1:

Inflow Area = 0.920 ac,100.00% Impervious, Inflow Depth > 0.79"
Inflow = 1.40 cfs @ 12.05 hrs, Volume= 0.061 af
Outflow = 1.27 cfs @ 12.06 hrs, Volume= 0.061 af, Atten= 10%, Lag= 1.1 min
Primary = 1.27 cfs @ 12.06 hrs, Volume= 0.061 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,122.20' @ 12.06 hrs Surf.Area= 0.010 ac Storage= 0.003 af

Plug-Flow detention time= 2.7 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (772.3 - 769.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,121.72'	0.037 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,121.72	0.001	0.000	0.000
1,123.00	0.024	0.016	0.016
1,123.72	0.035	0.021	0.037

Device	Routing	Invert	Outlet Devices
#1	Primary	1,121.72'	**21.0" Round Culvert** L= 60.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,121.72' / 1,118.00' S= 0.0620 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf

Primary OutFlow Max=1.22 cfs @ 12.06 hrs HW=1,122.19' TW=1,121.44' (Fixed TW Elev= 1,121.44')
└─**1=Culvert** (Inlet Controls 1.22 cfs @ 2.34 fps)

Summary for Pond POND1:

Inflow Area = 1.890 ac,100.00% Impervious, Inflow Depth > 0.79"
Inflow = 2.73 cfs @ 12.05 hrs, Volume= 0.125 af
Outflow = 0.23 cfs @ 12.59 hrs, Volume= 0.098 af, Atten= 92%, Lag= 32.1 min
Primary = 0.23 cfs @ 12.59 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,118.19' @ 12.59 hrs Surf.Area= 0.409 ac Storage= 0.077 af

Plug-Flow detention time= 240.7 min calculated for 0.097 af (78% of inflow)
Center-of-Mass det. time= 180.6 min (951.6 - 771.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,118.00'	1.783 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,118.00	0.397	0.000	0.000
1,119.00	0.459	0.428	0.428
1,120.00	0.524	0.491	0.919
1,121.00	0.593	0.559	1.478
1,121.50	0.628	0.305	1.783

Device	Routing	Invert	Outlet Devices
#1	Primary	1,118.00'	**24.0" Round Culvert** L= 32.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,118.00' / 1,117.50' S= 0.0156 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=0.23 cfs @ 12.59 hrs HW=1,118.19' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.23 cfs @ 1.49 fps)

Summary for Pond POND2:

Inflow Area = 0.340 ac,100.00% Impervious, Inflow Depth > 0.79"
Inflow = 0.52 cfs @ 12.05 hrs, Volume= 0.022 af
Outflow = 0.02 cfs @ 13.24 hrs, Volume= 0.017 af, Atten= 95%, Lag= 71.6 min
Primary = 0.02 cfs @ 13.24 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,128.55' @ 13.24 hrs Surf.Area= 0.306 ac Storage= 0.015 af

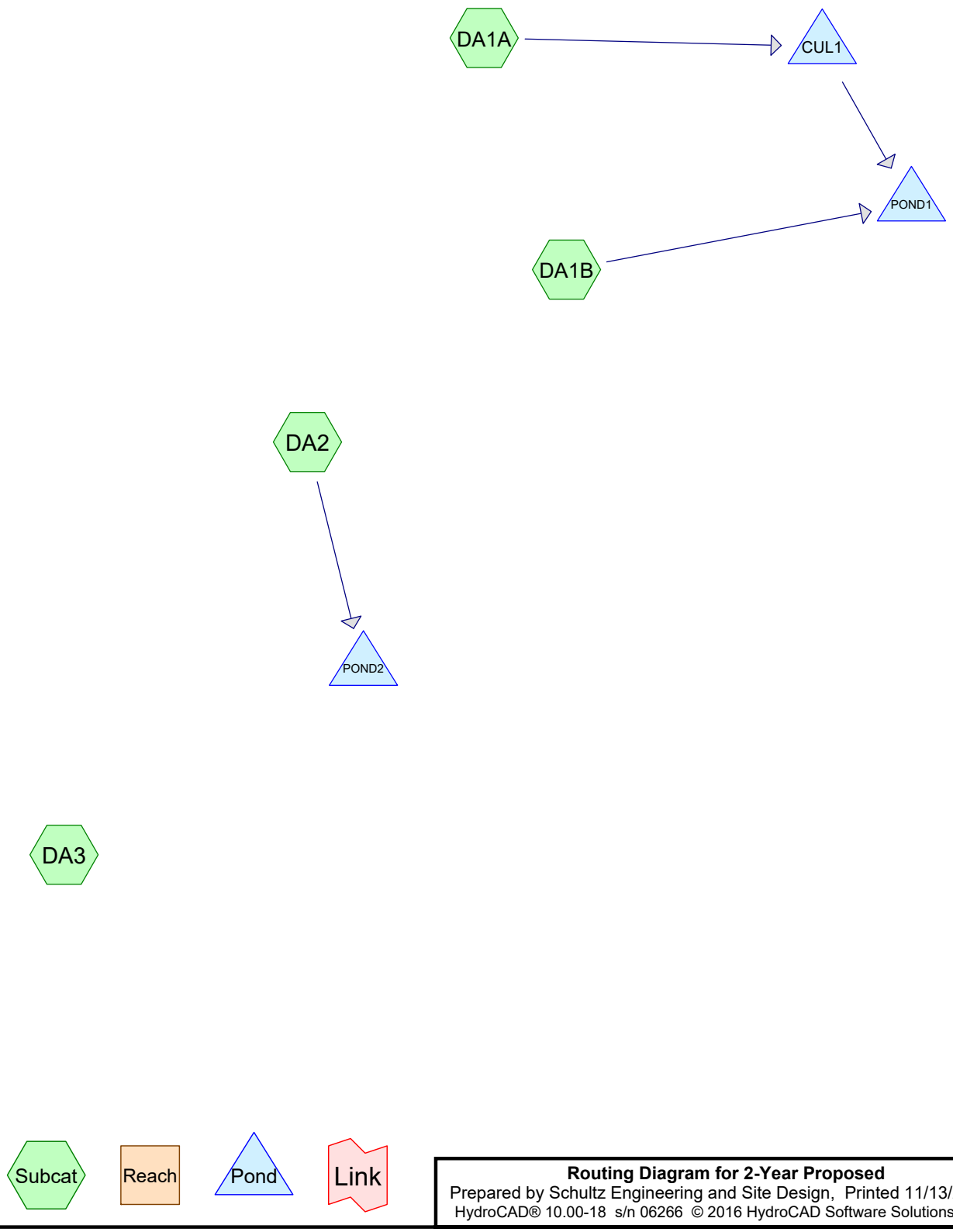
Plug-Flow detention time= 297.8 min calculated for 0.017 af (76% of inflow)
Center-of-Mass det. time= 235.8 min (1,005.7 - 769.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,128.50'	5.758 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,128.50	0.303	0.000	0.000
1,129.00	0.333	0.159	0.159
1,130.00	0.398	0.365	0.525
1,131.00	0.466	0.432	0.956
1,132.00	0.537	0.501	1.458
1,140.00	0.538	4.300	5.758

Device	Routing	Invert	Outlet Devices
#1	Primary	1,128.50'	**12.0" Round Culvert** L= 28.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,128.50' / 1,128.00' S= 0.0179 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 13.24 hrs HW=1,128.55' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.01 cfs @ 0.75 fps)



Routing Diagram for 2-Year Proposed
Prepared by Schultz Engineering and Site Design, Printed 11/13/2017
HydroCAD® 10.00-18 s/n 06266 © 2016 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
41.480	74	>75% Grass cover, Good, HSG C (DA1A, DA1B, DA2, DA3)
2.730	98	Paved parking, HSG C (DA1A, DA1B, DA2, DA3)
2.070	70	Woods, Good, HSG C (DA3)
46.280	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
46.280	HSG C	DA1A, DA1B, DA2, DA3
0.000	HSG D	
0.000	Other	
46.280		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	41.480	0.000	0.000	41.480	>75% Grass cover, Good	DA1A, DA1B, DA2, DA3
0.000	0.000	2.730	0.000	0.000	2.730	Paved parking	DA1A, DA1B, DA2, DA3
0.000	0.000	2.070	0.000	0.000	2.070	Woods, Good	DA3
0.000	**0.000**	**46.280**	**0.000**	**0.000**	**46.280**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	CUL1	1,121.72	1,118.00	60.0	0.0620	0.013	21.0	0.0	0.0
2	POND1	1,118.00	1,117.50	32.0	0.0156	0.013	24.0	0.0	0.0
3	POND2	1,128.50	1,128.00	28.0	0.0179	0.013	12.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1A: Runoff Area=2.480 ac 37.10% Impervious Runoff Depth>1.20"
Flow Length=1,230' Tc=18.6 min CN=83 Runoff=3.42 cfs 0.248 af

Subcatchment DA1B: Runoff Area=11.780 ac 8.23% Impervious Runoff Depth>0.81"
Flow Length=1,230' Tc=18.6 min CN=76 Runoff=10.45 cfs 0.796 af

Subcatchment DA2: Runoff Area=4.800 ac 7.08% Impervious Runoff Depth>0.81"
Flow Length=345' Tc=17.9 min CN=76 Runoff=4.33 cfs 0.324 af

Subcatchment DA3: Runoff Area=27.220 ac 1.84% Impervious Runoff Depth>0.72"
Flow Length=650' Tc=24.2 min CN=74 Runoff=17.95 cfs 1.625 af

Pond CUL1: Peak Elev=1,122.54' Storage=0.007 af Inflow=3.42 cfs 0.248 af
21.0" Round Culvert n=0.013 L=60.0' S=0.0620 '/' Outflow=3.38 cfs 0.248 af

Pond POND1: Peak Elev=1,118.92' Storage=0.392 af Inflow=13.83 cfs 1.044 af
24.0" Round Culvert n=0.013 L=32.0' S=0.0156 '/' Outflow=4.58 cfs 0.976 af

Pond POND2: Peak Elev=1,128.96' Storage=0.146 af Inflow=4.33 cfs 0.324 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0179 '/' Outflow=0.81 cfs 0.286 af

Total Runoff Area = 46.280 ac Runoff Volume = 2.993 af Average Runoff Depth = 0.78"
94.10% Pervious = 43.550 ac 5.90% Impervious = 2.730 ac

Summary for Subcatchment DA1A:

Runoff = 3.42 cfs @ 12.29 hrs, Volume= 0.248 af, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=2.69"

Area (ac)	CN	Description
0.920	98	Paved parking, HSG C
1.560	74	>75% Grass cover, Good, HSG C
2.480	83	Weighted Average
1.560		62.90% Pervious Area
0.920		37.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	40	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
5.3	340	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.1	550	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.6	1,230	Total			

Summary for Subcatchment DA1B:

Runoff = 10.45 cfs @ 12.30 hrs, Volume= 0.796 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=2.69"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG C
10.810	74	>75% Grass cover, Good, HSG C
11.780	76	Weighted Average
10.810		91.77% Pervious Area
0.970		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	40	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
5.3	340	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.1	550	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.6	1,230	Total			

Summary for Subcatchment DA2:

Runoff = 4.33 cfs @ 12.29 hrs, Volume= 0.324 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=2.69"

Area (ac)	CN	Description
0.340	98	Paved parking, HSG C
4.460	74	>75% Grass cover, Good, HSG C
4.800	76	Weighted Average
4.460		92.92% Pervious Area
0.340		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	125	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
0.9	220	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.9	345	Total			

Summary for Subcatchment DA3:

Runoff = 17.95 cfs @ 12.38 hrs, Volume= 1.625 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=2.69"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG C
2.070	70	Woods, Good, HSG C
24.650	74	>75% Grass cover, Good, HSG C
27.220	74	Weighted Average
26.720		98.16% Pervious Area
0.500		1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	150	0.0250	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
4.5	500	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
24.2	650	Total			

Summary for Pond CUL1:

Inflow Area = 2.480 ac, 37.10% Impervious, Inflow Depth > 1.20"
Inflow = 3.42 cfs @ 12.29 hrs, Volume= 0.248 af
Outflow = 3.38 cfs @ 12.31 hrs, Volume= 0.248 af, Atten= 1%, Lag= 1.6 min
Primary = 3.38 cfs @ 12.31 hrs, Volume= 0.248 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,122.54' @ 12.31 hrs Surf.Area= 0.016 ac Storage= 0.007 af

Plug-Flow detention time= 1.8 min calculated for 0.247 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (825.8 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,121.72'	0.037 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,121.72	0.001	0.000	0.000
1,123.00	0.024	0.016	0.016
1,123.72	0.035	0.021	0.037

Device	Routing	Invert	Outlet Devices
#1	Primary	1,121.72'	**21.0" Round Culvert** L= 60.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,121.72' / 1,118.00' S= 0.0620 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf

Primary OutFlow Max=3.35 cfs @ 12.31 hrs HW=1,122.53' TW=1,121.44' (Fixed TW Elev= 1,121.44')
└─**1=Culvert** (Inlet Controls 3.35 cfs @ 3.07 fps)

Summary for Pond POND1:

Inflow Area = 14.260 ac, 13.25% Impervious, Inflow Depth > 0.88"
Inflow = 13.83 cfs @ 12.31 hrs, Volume= 1.044 af
Outflow = 4.58 cfs @ 12.72 hrs, Volume= 0.976 af, Atten= 67%, Lag= 24.9 min
Primary = 4.58 cfs @ 12.72 hrs, Volume= 0.976 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,118.92' @ 12.72 hrs Surf.Area= 0.454 ac Storage= 0.392 af

Plug-Flow detention time= 98.7 min calculated for 0.976 af (93% of inflow)
Center-of-Mass det. time= 67.7 min (906.1 - 838.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,118.00'	1.783 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,118.00	0.397	0.000	0.000
1,119.00	0.459	0.428	0.428
1,120.00	0.524	0.491	0.919
1,121.00	0.593	0.559	1.478
1,121.50	0.628	0.305	1.783

Device	Routing	Invert	Outlet Devices
#1	Primary	1,118.00'	**24.0" Round Culvert** L= 32.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,118.00' / 1,117.50' S= 0.0156 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=4.58 cfs @ 12.72 hrs HW=1,118.92' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.58 cfs @ 4.77 fps)

Summary for Pond POND2:

Inflow Area = 4.800 ac, 7.08% Impervious, Inflow Depth > 0.81"
Inflow = 4.33 cfs @ 12.29 hrs, Volume= 0.324 af
Outflow = 0.81 cfs @ 13.02 hrs, Volume= 0.286 af, Atten= 81%, Lag= 43.4 min
Primary = 0.81 cfs @ 13.02 hrs, Volume= 0.286 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,128.96' @ 13.02 hrs Surf.Area= 0.331 ac Storage= 0.146 af

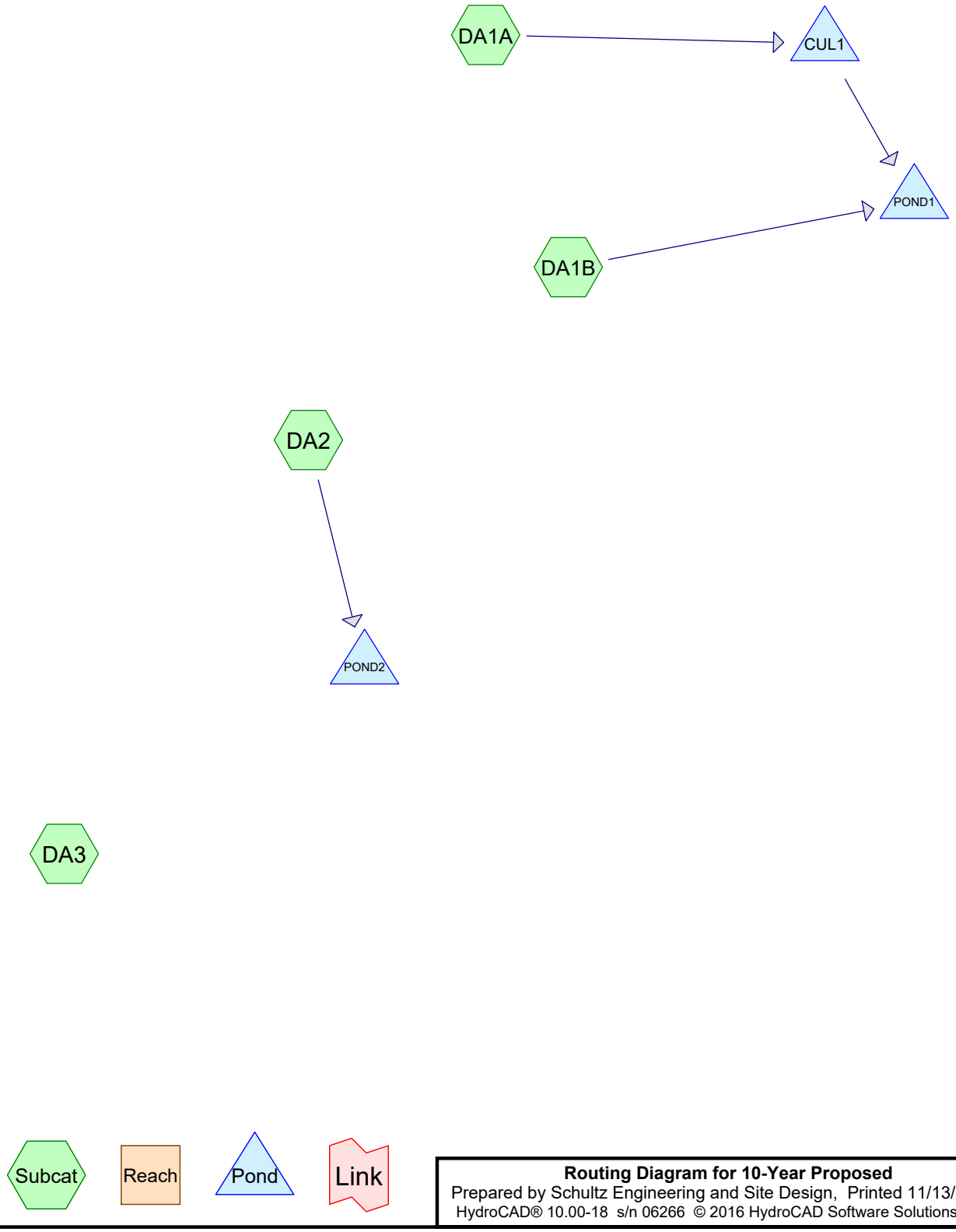
Plug-Flow detention time= 159.8 min calculated for 0.286 af (88% of inflow)
Center-of-Mass det. time= 110.0 min (951.7 - 841.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,128.50'	5.758 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,128.50	0.303	0.000	0.000
1,129.00	0.333	0.159	0.159
1,130.00	0.398	0.365	0.525
1,131.00	0.466	0.432	0.956
1,132.00	0.537	0.501	1.458
1,140.00	0.538	4.300	5.758

Device	Routing	Invert	Outlet Devices
#1	Primary	1,128.50'	**12.0" Round Culvert** L= 28.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,128.50' / 1,128.00' S= 0.0179 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 13.02 hrs HW=1,128.96' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.81 cfs @ 2.31 fps)



Routing Diagram for 10-Year Proposed
Prepared by Schultz Engineering and Site Design, Printed 11/13/2017
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
41.480	74	>75% Grass cover, Good, HSG C (DA1A, DA1B, DA2, DA3)
2.730	98	Paved parking, HSG C (DA1A, DA1B, DA2, DA3)
2.070	70	Woods, Good, HSG C (DA3)
46.280	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
46.280	HSG C	DA1A, DA1B, DA2, DA3
0.000	HSG D	
0.000	Other	
46.280		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	41.480	0.000	0.000	41.480	>75% Grass cover, Good	DA1A, DA1B, DA2, DA3
0.000	0.000	2.730	0.000	0.000	2.730	Paved parking	DA1A, DA1B, DA2, DA3
0.000	0.000	2.070	0.000	0.000	2.070	Woods, Good	DA3
0.000	**0.000**	**46.280**	**0.000**	**0.000**	**46.280**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	CUL1	1,121.72	1,118.00	60.0	0.0620	0.013	21.0	0.0	0.0
2	POND1	1,118.00	1,117.50	32.0	0.0156	0.013	24.0	0.0	0.0
3	POND2	1,128.50	1,128.00	28.0	0.0179	0.013	12.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1A: Runoff Area=2.480 ac 37.10% Impervious Runoff Depth>2.26"
Flow Length=1,230' Tc=18.6 min CN=83 Runoff=6.48 cfs 0.467 af

Subcatchment DA1B: Runoff Area=11.780 ac 8.23% Impervious Runoff Depth>1.71"
Flow Length=1,230' Tc=18.6 min CN=76 Runoff=23.16 cfs 1.682 af

Subcatchment DA2: Runoff Area=4.800 ac 7.08% Impervious Runoff Depth>1.71"
Flow Length=345' Tc=17.9 min CN=76 Runoff=9.60 cfs 0.685 af

Subcatchment DA3: Runoff Area=27.220 ac 1.84% Impervious Runoff Depth>1.57"
Flow Length=650' Tc=24.2 min CN=74 Runoff=42.47 cfs 3.564 af

Pond CUL1: Peak Elev=1,122.90' Storage=0.014 af Inflow=6.48 cfs 0.467 af
21.0" Round Culvert n=0.013 L=60.0' S=0.0620 '/' Outflow=6.37 cfs 0.466 af

Pond POND1: Peak Elev=1,119.71' Storage=0.772 af Inflow=29.48 cfs 2.148 af
24.0" Round Culvert n=0.013 L=32.0' S=0.0156 '/' Outflow=12.19 cfs 2.062 af

Pond POND2: Peak Elev=1,129.41' Storage=0.301 af Inflow=9.60 cfs 0.685 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0179 '/' Outflow=2.44 cfs 0.637 af

Total Runoff Area = 46.280 ac Runoff Volume = 6.398 af Average Runoff Depth = 1.66"
94.10% Pervious = 43.550 ac 5.90% Impervious = 2.730 ac

Summary for Subcatchment DA1A:

Runoff = 6.48 cfs @ 12.28 hrs, Volume= 0.467 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=3.97"

Area (ac)	CN	Description
0.920	98	Paved parking, HSG C
1.560	74	>75% Grass cover, Good, HSG C
2.480	83	Weighted Average
1.560		62.90% Pervious Area
0.920		37.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	40	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
5.3	340	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.1	550	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.6	1,230	Total			

Summary for Subcatchment DA1B:

Runoff = 23.16 cfs @ 12.29 hrs, Volume= 1.682 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=3.97"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG C
10.810	74	>75% Grass cover, Good, HSG C
11.780	76	Weighted Average
10.810		91.77% Pervious Area
0.970		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	40	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
5.3	340	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.1	550	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.6	1,230	Total			

Summary for Subcatchment DA2:

Runoff = 9.60 cfs @ 12.28 hrs, Volume= 0.685 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=3.97"

Area (ac)	CN	Description
0.340	98	Paved parking, HSG C
4.460	74	>75% Grass cover, Good, HSG C
4.800	76	Weighted Average
4.460		92.92% Pervious Area
0.340		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	125	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
0.9	220	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.9	345	Total			

Summary for Subcatchment DA3:

Runoff = 42.47 cfs @ 12.36 hrs, Volume= 3.564 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=3.97"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG C
2.070	70	Woods, Good, HSG C
24.650	74	>75% Grass cover, Good, HSG C
27.220	74	Weighted Average
26.720		98.16% Pervious Area
0.500		1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	150	0.0250	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
4.5	500	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
24.2	650	Total			

Summary for Pond CUL1:

Inflow Area = 2.480 ac, 37.10% Impervious, Inflow Depth > 2.26"
Inflow = 6.48 cfs @ 12.28 hrs, Volume= 0.467 af
Outflow = 6.37 cfs @ 12.31 hrs, Volume= 0.466 af, Atten= 2%, Lag= 1.9 min
Primary = 6.37 cfs @ 12.31 hrs, Volume= 0.466 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,122.90' @ 12.31 hrs Surf.Area= 0.022 ac Storage= 0.014 af

Plug-Flow detention time= 1.7 min calculated for 0.465 af (100% of inflow)
Center-of-Mass det. time= 1.5 min (812.9 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,121.72'	0.037 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,121.72	0.001	0.000	0.000
1,123.00	0.024	0.016	0.016
1,123.72	0.035	0.021	0.037

Device	Routing	Invert	Outlet Devices
#1	Primary	1,121.72'	**21.0" Round Culvert** L= 60.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,121.72' / 1,118.00' S= 0.0620 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf

Primary OutFlow Max=6.31 cfs @ 12.31 hrs HW=1,122.89' TW=1,121.44' (Fixed TW Elev= 1,121.44')
└─**1=Culvert** (Inlet Controls 6.31 cfs @ 3.69 fps)

Summary for Pond POND1:

Inflow Area = 14.260 ac, 13.25% Impervious, Inflow Depth > 1.81"
Inflow = 29.48 cfs @ 12.29 hrs, Volume= 2.148 af
Outflow = 12.19 cfs @ 12.62 hrs, Volume= 2.062 af, Atten= 59%, Lag= 19.2 min
Primary = 12.19 cfs @ 12.62 hrs, Volume= 2.062 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,119.71' @ 12.62 hrs Surf.Area= 0.505 ac Storage= 0.772 af

Plug-Flow detention time= 72.5 min calculated for 2.058 af (96% of inflow)
Center-of-Mass det. time= 52.3 min (875.3 - 823.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,118.00'	1.783 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,118.00	0.397	0.000	0.000
1,119.00	0.459	0.428	0.428
1,120.00	0.524	0.491	0.919
1,121.00	0.593	0.559	1.478
1,121.50	0.628	0.305	1.783

Device	Routing	Invert	Outlet Devices
#1	Primary	1,118.00'	**24.0" Round Culvert** L= 32.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,118.00' / 1,117.50' S= 0.0156 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=12.17 cfs @ 12.62 hrs HW=1,119.71' (Free Discharge)
└**1=Culvert** (Barrel Controls 12.17 cfs @ 5.71 fps)

Summary for Pond POND2:

Inflow Area = 4.800 ac, 7.08% Impervious, Inflow Depth > 1.71"
Inflow = 9.60 cfs @ 12.28 hrs, Volume= 0.685 af
Outflow = 2.44 cfs @ 12.76 hrs, Volume= 0.637 af, Atten= 75%, Lag= 28.7 min
Primary = 2.44 cfs @ 12.76 hrs, Volume= 0.637 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,129.41' @ 12.76 hrs Surf.Area= 0.360 ac Storage= 0.301 af

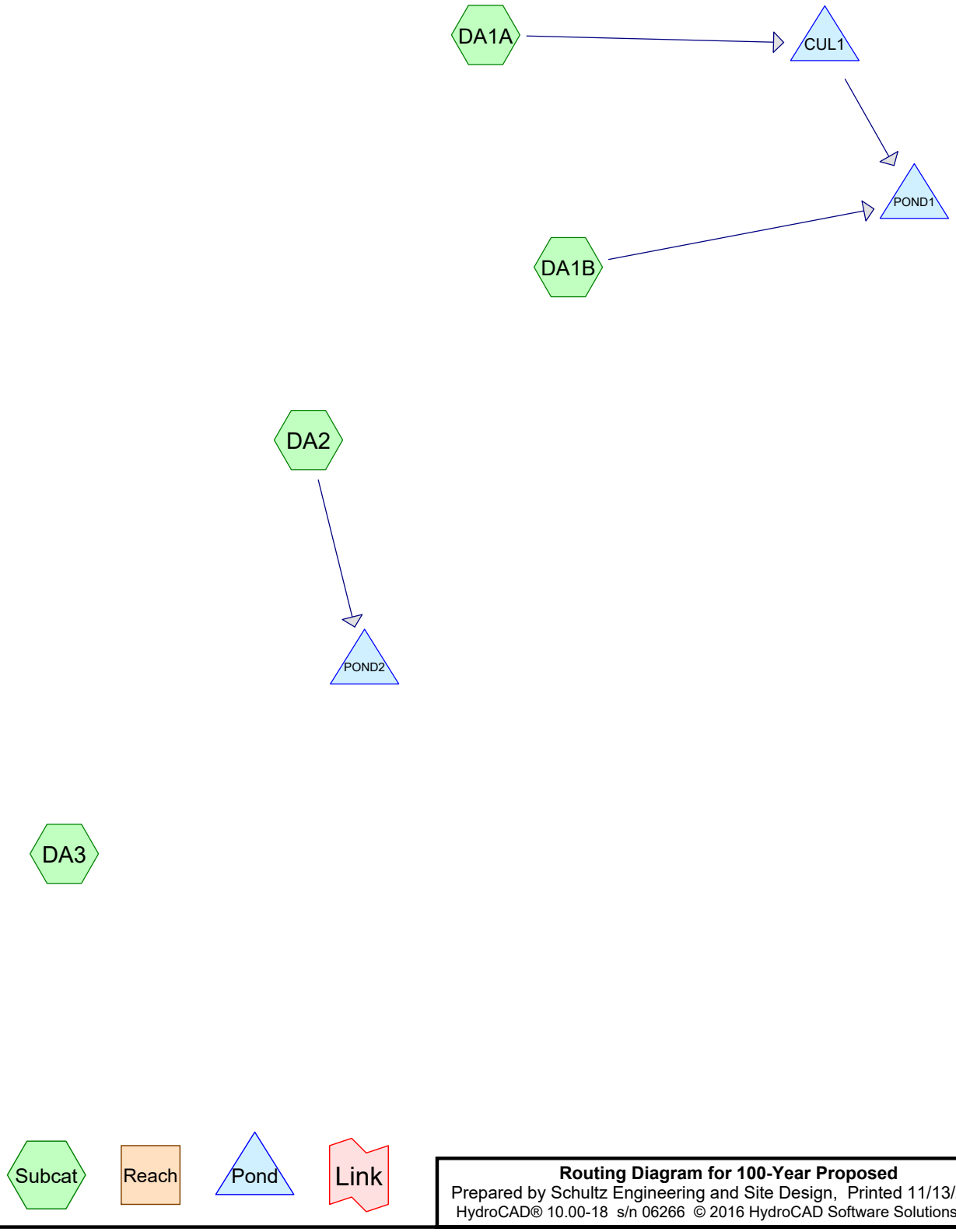
Plug-Flow detention time= 118.8 min calculated for 0.635 af (93% of inflow)
Center-of-Mass det. time= 86.0 min (911.2 - 825.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,128.50'	5.758 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,128.50	0.303	0.000	0.000
1,129.00	0.333	0.159	0.159
1,130.00	0.398	0.365	0.525
1,131.00	0.466	0.432	0.956
1,132.00	0.537	0.501	1.458
1,140.00	0.538	4.300	5.758

Device	Routing	Invert	Outlet Devices
#1	Primary	1,128.50'	**12.0" Round Culvert** L= 28.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,128.50' / 1,128.00' S= 0.0179 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.44 cfs @ 12.76 hrs HW=1,129.41' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.44 cfs @ 3.25 fps)



Routing Diagram for 100-Year Proposed
Prepared by Schultz Engineering and Site Design, Printed 11/13/2017
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
41.480	74	>75% Grass cover, Good, HSG C (DA1A, DA1B, DA2, DA3)
2.730	98	Paved parking, HSG C (DA1A, DA1B, DA2, DA3)
2.070	70	Woods, Good, HSG C (DA3)
46.280	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
46.280	HSG C	DA1A, DA1B, DA2, DA3
0.000	HSG D	
0.000	Other	
46.280		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	41.480	0.000	0.000	41.480	>75% Grass cover, Good	DA1A, DA1B, DA2, DA3
0.000	0.000	2.730	0.000	0.000	2.730	Paved parking	DA1A, DA1B, DA2, DA3
0.000	0.000	2.070	0.000	0.000	2.070	Woods, Good	DA3
0.000	**0.000**	**46.280**	**0.000**	**0.000**	**46.280**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	CUL1	1,121.72	1,118.00	60.0	0.0620	0.013	21.0	0.0	0.0
2	POND1	1,118.00	1,117.50	32.0	0.0156	0.013	24.0	0.0	0.0
3	POND2	1,128.50	1,128.00	28.0	0.0179	0.013	12.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1A: Runoff Area=2.480 ac 37.10% Impervious Runoff Depth>4.56"
Flow Length=1,230' Tc=18.6 min CN=83 Runoff=12.93 cfs 0.943 af

Subcatchment DA1B: Runoff Area=11.780 ac 8.23% Impervious Runoff Depth>3.82"
Flow Length=1,230' Tc=18.6 min CN=76 Runoff=52.01 cfs 3.750 af

Subcatchment DA2: Runoff Area=4.800 ac 7.08% Impervious Runoff Depth>3.82"
Flow Length=345' Tc=17.9 min CN=76 Runoff=21.67 cfs 1.528 af

Subcatchment DA3: Runoff Area=27.220 ac 1.84% Impervious Runoff Depth>3.61"
Flow Length=650' Tc=24.2 min CN=74 Runoff=99.67 cfs 8.194 af

Pond CUL1: Peak Elev=1,123.69' Storage=0.036 af Inflow=12.93 cfs 0.943 af
21.0" Round Culvert n=0.013 L=60.0' S=0.0620 '/' Outflow=12.11 cfs 0.943 af

Pond POND1: Peak Elev=1,121.44' Storage=1.746 af Inflow=63.76 cfs 4.692 af
24.0" Round Culvert n=0.013 L=32.0' S=0.0156 '/' Outflow=23.63 cfs 4.580 af

Pond POND2: Peak Elev=1,130.48' Storage=0.726 af Inflow=21.67 cfs 1.528 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0179 '/' Outflow=4.61 cfs 1.463 af

Total Runoff Area = 46.280 ac Runoff Volume = 14.415 af Average Runoff Depth = 3.74"
94.10% Pervious = 43.550 ac 5.90% Impervious = 2.730 ac

Summary for Subcatchment DA1A:

Runoff = 12.93 cfs @ 12.27 hrs, Volume= 0.943 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=6.51"

Area (ac)	CN	Description
0.920	98	Paved parking, HSG C
1.560	74	>75% Grass cover, Good, HSG C
2.480	83	Weighted Average
1.560		62.90% Pervious Area
0.920		37.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	40	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
5.3	340	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.1	550	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.6	1,230	Total			

Summary for Subcatchment DA1B:

Runoff = 52.01 cfs @ 12.28 hrs, Volume= 3.750 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=6.51"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG C
10.810	74	>75% Grass cover, Good, HSG C
11.780	76	Weighted Average
10.810		91.77% Pervious Area
0.970		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	40	0.0200	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
5.3	340	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.1	550	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.6	1,230	Total			

Summary for Subcatchment DA2:

Runoff = 21.67 cfs @ 12.27 hrs, Volume= 1.528 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=6.51"

Area (ac)	CN	Description
0.340	98	Paved parking, HSG C
4.460	74	>75% Grass cover, Good, HSG C
4.800	76	Weighted Average
4.460		92.92% Pervious Area
0.340		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.0	125	0.0250	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
0.9	220	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.9	345	Total			

Summary for Subcatchment DA3:

Runoff = 99.67 cfs @ 12.35 hrs, Volume= 8.194 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Rainfall=6.51"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG C
2.070	70	Woods, Good, HSG C
24.650	74	>75% Grass cover, Good, HSG C
27.220	74	Weighted Average
26.720		98.16% Pervious Area
0.500		1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	150	0.0250	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.69"
4.5	500	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
24.2	650	Total			

Summary for Pond CUL1:

Inflow Area = 2.480 ac, 37.10% Impervious, Inflow Depth > 4.56"
Inflow = 12.93 cfs @ 12.27 hrs, Volume= 0.943 af
Outflow = 12.11 cfs @ 12.33 hrs, Volume= 0.943 af, Atten= 6%, Lag= 3.4 min
Primary = 12.11 cfs @ 12.33 hrs, Volume= 0.943 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,123.69' @ 12.33 hrs Surf.Area= 0.035 ac Storage= 0.036 af

Plug-Flow detention time= 1.8 min calculated for 0.941 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (799.1 - 797.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,121.72'	0.037 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,121.72	0.001	0.000	0.000
1,123.00	0.024	0.016	0.016
1,123.72	0.035	0.021	0.037

Device	Routing	Invert	Outlet Devices
#1	Primary	1,121.72'	**21.0" Round Culvert** L= 60.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,121.72' / 1,118.00' S= 0.0620 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf

Primary OutFlow Max=12.02 cfs @ 12.33 hrs HW=1,123.67' TW=1,121.44' (Fixed TW Elev= 1,121.44')
└─**1=Culvert** (Inlet Controls 12.02 cfs @ 5.00 fps)

Summary for Pond POND1:

Inflow Area = 14.260 ac, 13.25% Impervious, Inflow Depth > 3.95"
Inflow = 63.76 cfs @ 12.29 hrs, Volume= 4.692 af
Outflow = 23.63 cfs @ 12.63 hrs, Volume= 4.580 af, Atten= 63%, Lag= 20.6 min
Primary = 23.63 cfs @ 12.63 hrs, Volume= 4.580 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,121.44' @ 12.63 hrs Surf.Area= 0.624 ac Storage= 1.746 af

Plug-Flow detention time= 61.1 min calculated for 4.580 af (98% of inflow)
Center-of-Mass det. time= 48.0 min (855.4 - 807.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,118.00'	1.783 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,118.00	0.397	0.000	0.000
1,119.00	0.459	0.428	0.428
1,120.00	0.524	0.491	0.919
1,121.00	0.593	0.559	1.478
1,121.50	0.628	0.305	1.783

Device	Routing	Invert	Outlet Devices
#1	Primary	1,118.00'	**24.0" Round Culvert** L= 32.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,118.00' / 1,117.50' S= 0.0156 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=23.62 cfs @ 12.63 hrs HW=1,121.44' (Free Discharge)
└**1=Culvert** (Inlet Controls 23.62 cfs @ 7.52 fps)

Summary for Pond POND2:

Inflow Area = 4.800 ac, 7.08% Impervious, Inflow Depth > 3.82"
Inflow = 21.67 cfs @ 12.27 hrs, Volume= 1.528 af
Outflow = 4.61 cfs @ 12.78 hrs, Volume= 1.463 af, Atten= 79%, Lag= 30.8 min
Primary = 4.61 cfs @ 12.78 hrs, Volume= 1.463 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,130.48' @ 12.78 hrs Surf.Area= 0.431 ac Storage= 0.726 af

Plug-Flow detention time= 109.2 min calculated for 1.460 af (96% of inflow)
Center-of-Mass det. time= 87.9 min (896.8 - 808.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,128.50'	5.758 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,128.50	0.303	0.000	0.000
1,129.00	0.333	0.159	0.159
1,130.00	0.398	0.365	0.525
1,131.00	0.466	0.432	0.956
1,132.00	0.537	0.501	1.458
1,140.00	0.538	4.300	5.758

Device	Routing	Invert	Outlet Devices
#1	Primary	1,128.50'	**12.0" Round Culvert** L= 28.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,128.50' / 1,128.00' S= 0.0179 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.61 cfs @ 12.78 hrs HW=1,130.48' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.61 cfs @ 5.87 fps)

Chosen Valley Testing

Design Phase Geotechnical Evaluation:

Schneider Farms
Co Rd 141
Rockville, Minnesota

Prepared for:

Brian Schultz, PE
Schultz Engineering & Site Design

November 3, 2017
CVT Project: 12319.17.MNS

Chosen Valley Testing, Inc.

Geotechnical Engineering and Testing, 414 37th Ave N, St. Cloud, Minnesota 56303 (320) 744-3500 fax (320) 393-3445

Phone: 1-320-774-3500 Fax: 1-320-393-3554 Email: stcloud@chosenvalleytesting.com

Brian Schultz, PE
Schultz Engineering and Site Design
18 South Riverside Ave
Suite 230
Sartell, MN 5637

November 3, 2017

Re: Design Phase Geotechnical Evaluation
Schneider Farm
Co Rd 141
Rockville, MN
CVT Project #12319.17.MNS

Dear Mr. Schultz,

As authorized, we have completed the geotechnical evaluation for the proposed housing development in Rockville, Minnesota. This letter briefly summarizes the findings in the attached report.

Summary of Boring Results

At the surface, the borings typically encountered less than ½ foot to 1 ½ feet of topsoil. The topsoil primarily consisted of dark brown to black clayey sand.

Beneath the topsoil, the soil borings encountered variable granular soils ranging from lean clay in the western boring to sandy lean clay and clayey sands in the eastern road and pond borings. The western Boring terminated at the planned depth of about 15 feet in clayey silt. The remaining borings terminated in either clayey sand or sandy lean clay.

Free water was observed in one of the pond borings at 5 ½ feet below the surface or at about elevation of 1123 ½ on the established datum. The source of the moisture was not clear as the samples in that boring did not appear to be overly wet.

Summary of Analysis and Recommendations

Based on the borings, the site is dominated by glacial till consisting of sandy lean clay or clayey sand. These materials are mostly considered suitable for support of roadways and utilities. The notable exception is the silt material, which has much poorer support qualities and would ideally be removed from the upper part of the subgrade and might have to be partially removed from below piping.

From an infiltration standpoint, the glacial till deposits which dominated at both of the pond area borings have extremely poor permeabilities are not recommended as an infiltrating medium

Remarks

We appreciate the opportunity to serve you. The attached report provides more details of our analysis. If you have any questions about our report, please feel free to contact us at (320) 774-3500.

Sincerely,
Chosen Valley Testing, Inc.

Hannah Fischer
Graduate Engineer

Colby T. Verdegan, PE
Sr. Geotechnical/Materials Engineer

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BORING LOCATION SKETCH

LOG OF BORING # 1-7

LEGEND TO SOIL DESCRIPTION

Design Phase Geotechnical Evaluation
Proposed Schneider Farm Housing Development
Co Rd 141
Rockville, Minnesota

CVT Project Number: 12319.17.MNS
Date: November 2, 2017

A. Introduction

The intent of this report is to present our results to the client in the same logical sequence that led us to arrive at the opinions and recommendations expressed. Since our services must often be completed before the design, assumptions are sometimes needed to prepare a proper evaluation and to analyze the data. A complete and thorough review of this entire document, including the assumptions and the appendices, should be undertaken immediately upon receipt.

A.1. Purpose

This geotechnical report was prepared to aid in the design and construction of the proposed housing development in Rockville, Minnesota. Our services were authorized by Mr. Brian Schultz of Schultz Engineering.

A.2. Scope

To obtain data for analysis, a total of seven, 15-foot deep penetration test borings were performed for the proposed development. Our engineering scope consisted of geotechnical recommendations for streets and utilities and estimated infiltration rates for a proposed pond.

A.3. Boring Locations and Elevations

The boring locations were selected by the civil consultant. Due to site access some of the borings were offset. The Boring Location Sketch in the Appendix shows the approximate boring locations as drilled. Ground surface elevations were estimated based on a topographic survey of the site provided by the client, and should be considered approximate.

A.4. Geologic Background

A geotechnical report is based on subsurface data collected for the specific structure or problem. Available geologic data from the region can help interpretation of the data and is briefly summarized in this section.

Geologic maps suggest that the natural soils in the area are primarily glacial till. Bedrock is expected to be more than 100 feet below the surface and is not a consideration for this project.

B. Subsurface Data

Methods: All eleven of the borings were performed using penetration test procedures (Method of Test D1586 of the American Society for Testing and Materials). This procedure allows for the extraction of intact soil specimen from deep

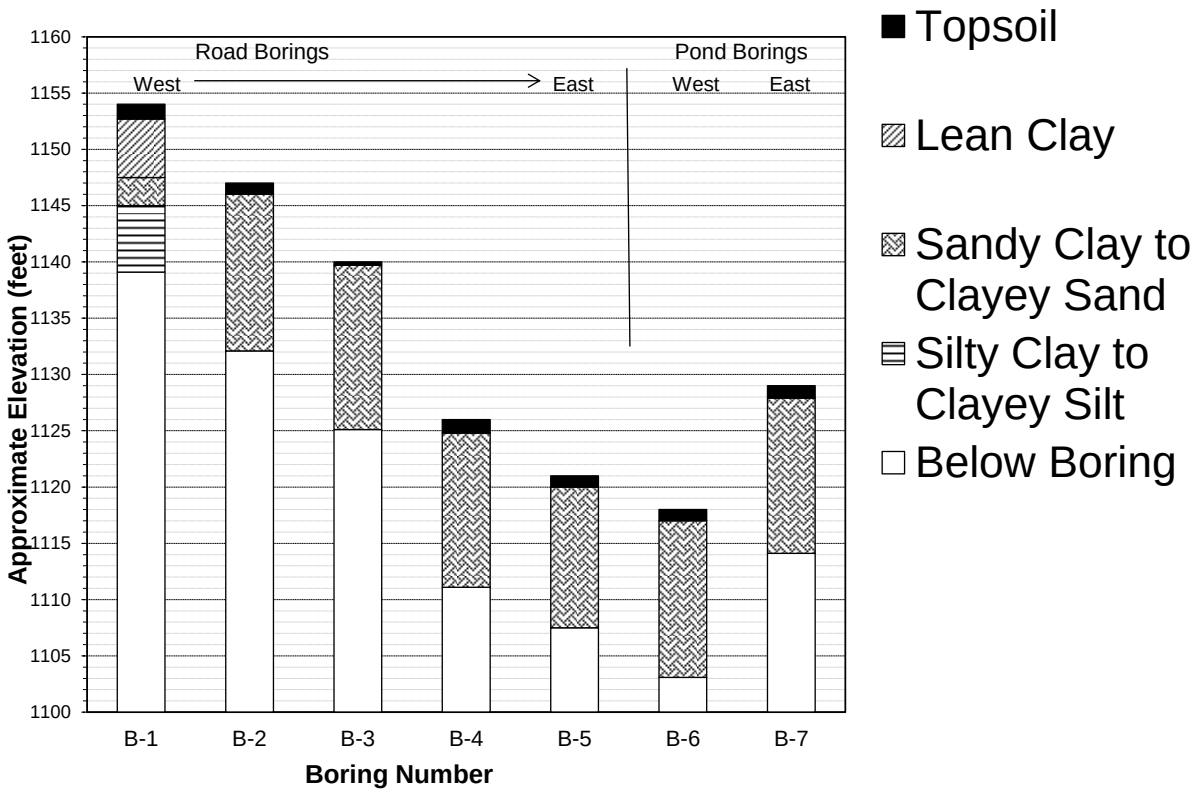
in the ground. With this method, a hollow-stem auger is drilled to the desired sampling depth. A 2-inch OD sampling tube is then screwed onto the end of a sampling rod, inserted through the hole in the auger's tip, and then driven into the soil with a 140-pound hammer dropped repeatedly from a height of 30 inches above the sampling rod. The sampler is driven 18-inches into the soil, unless the material is too hard. The samples are generally taken at 2½ to 5-foot intervals. The core of soil obtained is classified and logged by the driller and a representative portion is then sealed in a jar and delivered to the soils engineer for review.

B.1. Stratification

At the surface, the borings typically encountered less than ½ foot to 1 ½ feet of topsoil. The topsoil primarily consisted of dark brown to black clayey sand.

Beneath the topsoil, the soil borings encountered variable granular soils ranging from lean clay in the western boring to sandy lean clay and clayey sands in the eastern road and pond borings. The western Boring terminated at the planned depth of about 15 feet in clayey silt. The remaining borings terminated in either clayey sand or sandy lean clay.

For the reader's convenience, the boring data have been summarized in the following cross section. For more detailed information, please refer to the Log of Boring sheets in the Appendix.



B.2. Penetration Test Results

The number of blows needed for the hammer to advance the penetration test sampler is an indicator of soil characteristics. The number of blows to advance the sampler 1 foot is called the penetration resistance or "N"-value. The results tend to be more meaningful for natural mineral soils, than for fill soils. In fill soils, compaction tests are more meaningful.

Penetration resistance values (N-values) ranged from 7 to 16 Blows per Foot (BPF) were recorded in the lean clays and silts indicating they were medium to very stiff. Blow counts for the sandy lean clay ranged from 9 to 16 BPF, indicating they were medium to very stiff. In the clayey sands blow counts ranged from 7 to 77 BPF, indicating they were loose to very dense, but mostly medium dense.

A key to the descriptors used to qualify the relative density of soil (such as *soft, stiff, loose,* and *dense*) can be found on the Legend to Soil Description in the Appendix.

B.3. Groundwater Data

During the drilling operation, the drillers may note the presence of moisture on the sampling instrument, in the cuttings, or within the boreholes. These observations are recorded on the boring logs. The water level may vary with weather; time of year and other factors and the presence or absence of water during the drilling is subject to interpretation and is not always conclusive.

Free water was observed in one of the boring, B-07 at 5 ½ feet below the surface or at about elevation 1123 ½ on the established datum. The source of the moisture was not clear as the samples in that boring did not appear to be overly wet. We would expect groundwater levels to fluctuate similarly to nearby lakes and rivers, along with local weather patterns.

C. Design Information

Each structure has a different loading configuration and intensity, different grades, and different structural and performance tolerances. Therefore, the geotechnical exploration will be construed differently from one structure to another. If the initial structure should change design, we should be engaged to review these conditions with respect to the prevailing soil conditions. Without the opportunity to review any such changes, the recommendations may no longer be valid or appropriate.

Final grades were not available at the time of writing this report. Because of the rolling topography, for purpose of analysis, we assumed on the order of 5 feet of cutting or filling would be required, and maybe more. The pavements are expected to support car traffic with occasional truck or delivery vehicles.

D. Analysis

Based on the borings, the site is dominated by glacial till consisting of sandy lean clay or clayey sand. These materials are mostly considered suitable for support of roadways and utilities. The notable exception is the silt material at the base of the western borings, which has much poorer support qualities and would ideally be removed from the upper part of the subgrade (if encountered) and might have to be partially removed from below piping.

From an infiltration standpoint, the glacial till deposits which dominated at both of the pond area borings have extremely poor permeabilities are not recommended as an infiltrating medium. The remainder of the report provides more details of our recommendations.

E. Mass Grading of Roadway Alignment

E.1. Stripping

We recommend stripping the topsoil from below all paved areas. In paved areas which require 3 feet of fill or more to attain top-of-subgrade, it should be adequate to strip the rootzone.

In addition to removing topsoil, we also recommend removing any silt material from at least the upper 2 feet of the roadway subgrade. These soils are extremely sensitive to moisture, and traffic and are highly frost susceptible as well.

E.2. Filling, Scarification and Compaction

Where new fill is needed in paved areas, it should ideally consist of a uniform soil type similar to the near-surface soils already present – which ranged from lean clay to sandy lean clay to clayey sand. In areas where the natural soils will be within 2 feet of top of subgrade, we recommend thoroughly scarifying and compacting the near surface soils before placing fill or paving materials. Some of this might be accomplished during utility installation.

If a higher quality subgrade is desired, a layer of clean sands or gravel could be placed at the top of the subgrade. If this is done, the surface receiving this material should be sloped to drain out from below the pavements, into a ditch or approved drainage receptacle.

Fill placed in the upper 3 feet of the subgrade should be compacted to at least 100% of its maximum standard Proctor density. Below 3 feet, compaction to 95% is recommended.

F. Utility Recommendations

F.1. Groundwater/Dewatering

Water was observed in one boring. If water is encountered, it should be removed before placing piping. We would expect sump pits would likely be adequate to control any moisture in the excavations, if encountered.

F.2. General Support

Based on assumed utility embedment depths of around 4 to 8 feet, utilities are expected to bear on materials ranging from clays to clayey sands. Most of these deposits are expected to provide good support for utilities. The silt materials tend to be rather sensitive and might become unstable during construction. In that event, they should be partially removed and replaced with a protective layer of clean sand or gravel.

Utilities should not bear directly on any cobbles or boulders, to avoid potential point loads on the pipes. We recommend removing such materials to a depth of at least 4 to 6 inches below pipes, to allow placement of a layer of clean sand or gravel between the pipes and the rock materials.

F.3. Sidewall Stability

The contractors performing the work will need to slope or shore the excavations as need to provide safe conditions for laying pipes. The dominant soils would be expected to classify as Type C materials as defined by OSHA.

F.4. Filling and Compacting

We assume that the onsite materials will be used as backfill above the pipe zone. Any oversized materials (if present) should be kept at least ½ to 1 foot away from the pipes. Soils placed as backfill should be compacted to 100% of their standard Proctor density (ASTM D 698) in the upper 3 feet if below paved areas, and to 95% below that depth. Compaction to 90% is usually sufficient in green areas.

G. Pavements

G.1. Subgrade

After grading, the completed subgrade is expected to consist of mixed clays or clayey sands. The completed pavement subgrade should be able to pass a test roll. Areas not passing the test roll should be reworked and stabilized with additional aggregate base or other means, as needed to pass the test roll.

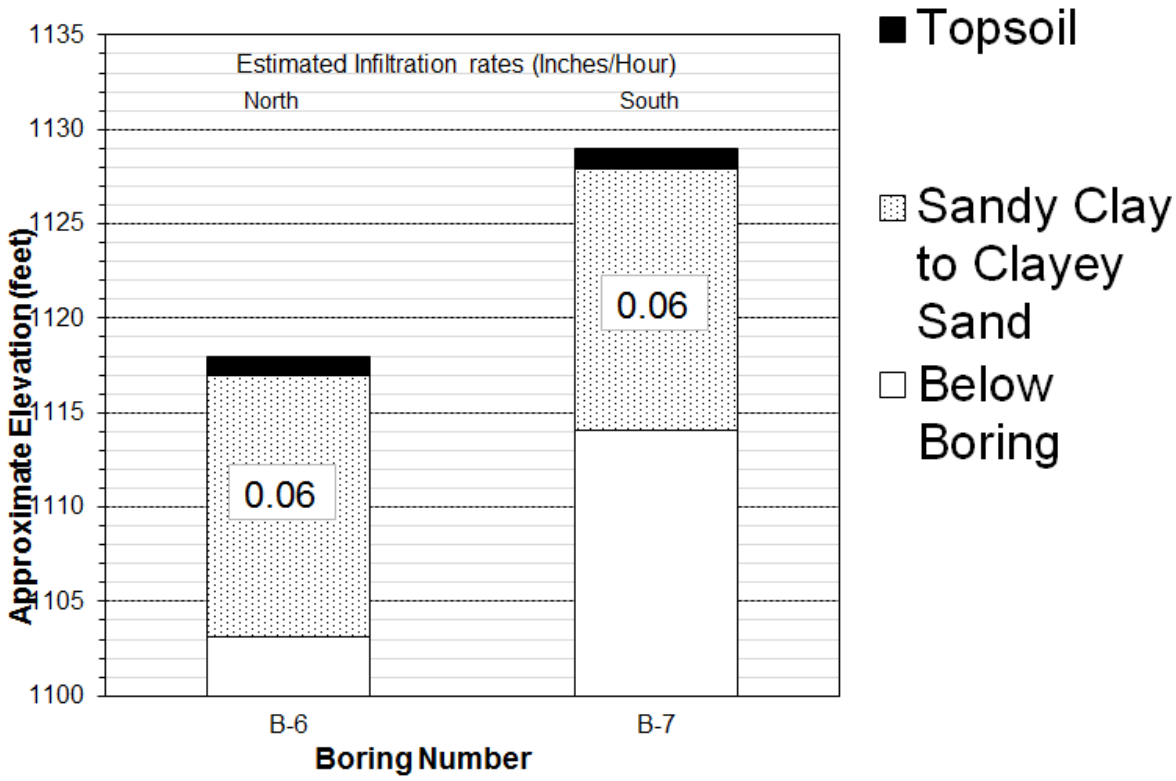
G.2. Pavement Design

Based on the expected subgrade conditions, we recommend using an assumed R-value of no more than 25 for the design of pavements. In the absence of traffic loading data, we suggest a flexible pavement section consisting of 8 inches of aggregate base and 3 ½ inches of bituminous.

The above pavement sections assume that the subgrade has been sufficiently moisture conditioned and compacted to pass a test roll. Observation of the test roll should be documented by qualified geotechnical personnel. The necessity of scarifying and recompacting the subgrade would be determined by the test roll.

H. Estimated Infiltration

Infiltration rates for the various soil layers were estimated based on presumptive values from the MPCA Stormwater Manual in consideration of soil classification. The estimated rates for each layer are summarized graphically on the table following this paragraph.



As can be seen, the dominant soils in both borings have very low permeability values. Obviously, soils conditions are extremely variable at the site, and this should also be considered.

I. Construction Testing and Documentation

I.1. Excavation

Stripping can likely be performed with a variety of equipment, provided the soils are not too wet. The deep excavations will require the use of a backhoe. A backhoe with a smooth lipped bucket is recommended to limit disturbance of the natural bearing soils.

I.2. Cold Weather

If the excavation occurs during freezing temperatures, good winter construction practices should be used. Frozen fill should be thawed before placing and filling should not be placed on frozen ground. Slab areas should be completely thawed prior to placing concrete.

I.3. Construction Testing and Documentation

The bottom of the excavations should be evaluated and documented by qualified personnel to assess the soils at bearing depth. Any fill placed should be evaluated for conformance to the project gradation recommendations and should be tested for compaction. If filling proceeds during periods of freezing weather, full-time testing should be considered to help confirm that imported fill is thawed prior to and

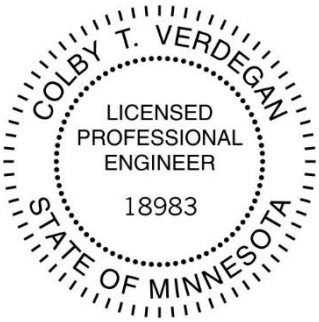
during compaction, and that all snow has been removed before placement of the fill.

Although our firm offers testing services relating to civil and structural components of the structure (such as concrete testing, reinforcement observations, etc.), specification of such services are beyond our work scope and the designer should be consulted as to such requirements.

J. Level of Care

The services provided for this project have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area, under similar budget and time constraints. This is our professional responsibility. No other warranty, expressed or implied, is made.

K. Certification

	I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly registered engineer under the laws of the State of Minnesota. Colby T. Verdegan, PE Geotechnical Engineer Registration Number 18983 Date: November 3, 2017

Appendix

Boring Location Sketch

Log of Boring # 1-7

Legend to Soil Description

C V T

Chosen Valley Testing, Inc.

Legend

⊙ Boring Locations

Boring Location Sketch

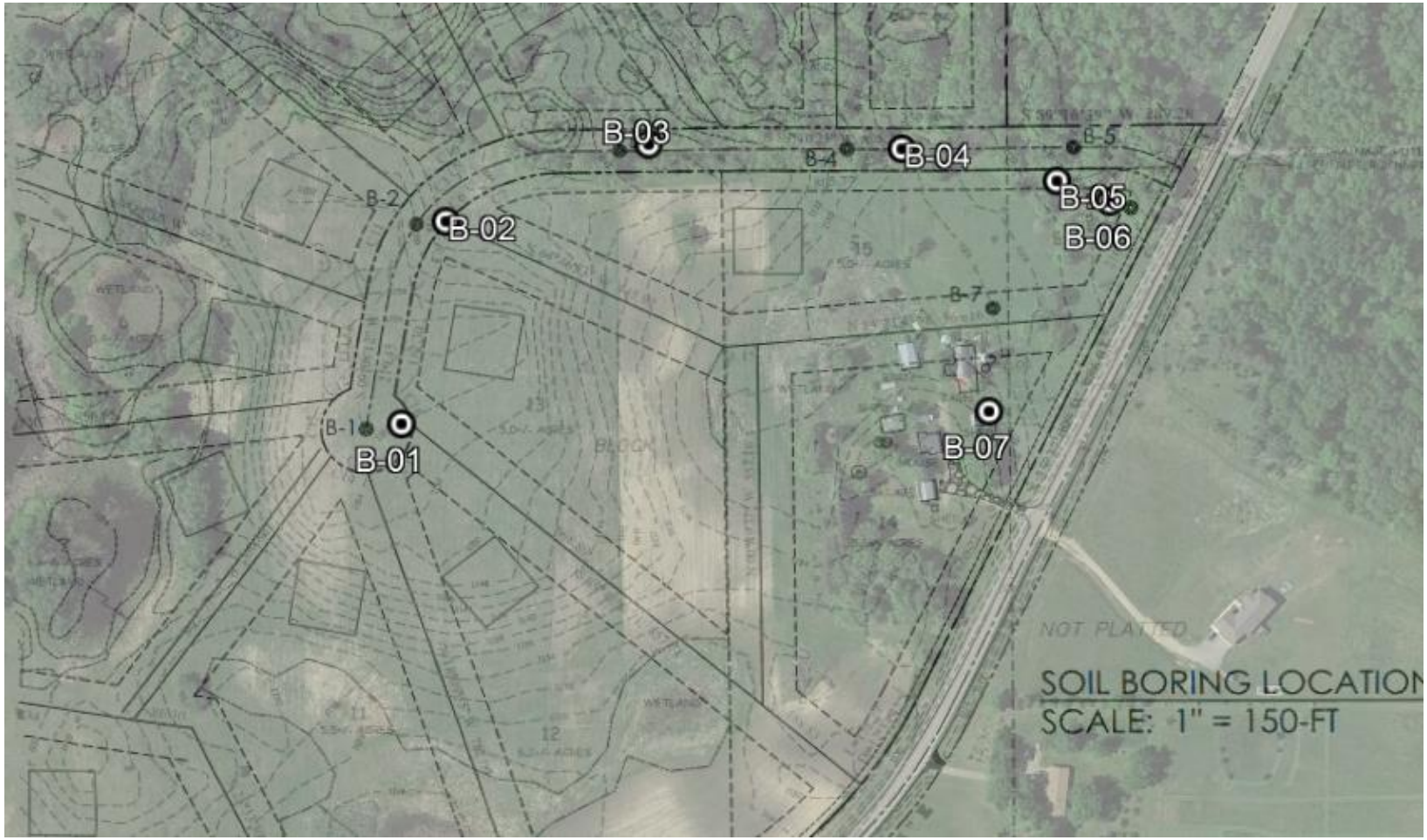
Proposed Schneider Farm Development

Co Rd 141

Rockville, Minnesota

12319.17.MNS

N



LOG OF BORING

CHOSEN VALLEY TESTING

Chosen Valley Testing, Inc.

PROJECT: 12319.17.MNS Design Phase Geotechnical Evaluations Proposed Road Co Rd 141 Rockville, Minnesota	BORING: **B-01** LOCATION: See attched sketch. DATE: 10/19/2017 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1154.0	0.0	OL	**TOPSOIL**, Slightly Organic Clayey Sand, fine-to-medium grained, trace Roots, dark brown, wet.			
1152.7	1.3	CL	**LEAN CLAY**, brown, wet, stiff. (Glacio-Fluvium)	13		PP=1.5 tsf MC=15%
				13		PP=1.25 tsf MC=17%
1147.5	6.5	SC	**CLAYEY SAND**, fine-to-medium grained, trace Gravel, brown, wet, very stiff. (Glacial Till)	16		MC=14%
1145.0	9.0	CL	**SILTY CLAY**, brown, wet, stiff. (Glacio-Fluvium)	10		MC=20%
1142.5	11.5	ML	**CLAYEY SILT**, brown, wet, medium to very stiff. (Glacio-Fluvium)	7		MC=23%
1139.1	14.9			16		MC=21%
			End boring. Water was not observed. Boring sealed upon completion.			

CVT STANDARD 12319.17.MNS (ROCKVILLE SCHULTZ).GPJ LOG A GNNN06.GDT 02/11/17

LOG OF BORING

CHOSEN VALLEY TESTING

Chosen Valley Testing, Inc.

PROJECT: 12319.17.MNS Design Phase Geotechnical Evaluations Proposed Road Co Rd 141 Rockville, Minnesota	BORING: **B-02** LOCATION: See attched sketch. DATE: 10/19/2017 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1147.0	0.0	OL	**TOPSOIL**, Slightly Organic Clayey Sand, fine-to-medium grained, trace Roots, dark brown, wet.			
1146.0	1.0	CL	**SANDY LEAN CLAY**, trace Gravel, brown, wet, stiff. (Glacial Till)	11		MC=12%
1143.0	4.0	SC	**CLAYEY SAND**, fine-to-medium trace Gravel, brown, wet, loose to medium dense. (Glacial Till)	11		MC=11%
				23		MC=8%
				14		MC=8%
				9		MC=10%
1132.1	14.9			13		MC=11%
			End boring. Water was not observed. Boring sealed upon completion.			

CVT STANDARD 12319.17.MNS (ROCKVILLE SCHULTZ).GPJ LOG A GNNN06.GDT 02/11/17

LOG OF BORING

CHOSEN VALLEY TESTING

Chosen Valley Testing, Inc.

PROJECT: 12319.17.MNS Design Phase Geotechnical Evaluations Proposed Road Co Rd 141 Rockville, Minnesota	BORING: **B-03** LOCATION: See attched sketch. DATE: 10/19/2017 SCALE: 1" = 3'

Elev. 1140.0	Depth 0.0	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1139.7	0.3	OL	**TOPSOIL**, Slightly Organic Clayey Sand, fine-to-medium grained, trace Roots, dark brown, wet.			
		CL	**SANDY LEAN CLAY**, trace Gravel, brown, wet, medium. (Glacial Till)			
				10		PP=2.25 tsf MC=12%
1136.0	4.0					
		SC	**CLAYEY SAND**, fine-to-medium grained, trace Gravel, brown, wet, medium dense to dense. (Glacial Till)			
				21		MC=9%
				22		MC=8%
				24		MC=8%
				28		MC=8%
				31		MC=10%
1125.1	14.9					
			End boring. Water was not observed. Boring sealed upon completion.			

CVT STANDARD 12319.17.MNS (ROCKVILLE SCHULTZ).GPJ LOG A GNNN06.GDT 02/11/17

LOG OF BORING

CHOSEN VALLEY TESTING

Chosen Valley Testing, Inc.

PROJECT: 12319.17.MNS Design Phase Geotechnical Evaluations Proposed Road Co Rd 141 Rockville, Minnesota	BORING: **B-04** LOCATION: See attched sketch. DATE: 10/19/2017 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1126.0	0.0	OL	**TOPSOIL**, Slightly Organic Clayey Sand, fine-to-medium grained, trace Roots, dark brown, wet.			
1124.8	1.2	CL	**SANDY LEAN CLAY**, trace Gravel, brown, wet, stiff. (Glacial Till)			
				9		PP=2 tsf MC=13%
				9		PP=1 tsf MC=13%
1119.5	6.5	SC	**CLAYEY SAND**, fine-to-medium grained, trace Gravel, brown, wet, medium dense to dense. (Glacial Till)			
				16		MC=11%
				37		MC=12%
				26		MC=11%
				27		
1111.1	14.9		End boring. Water was not observed. Boring sealed upon completion.			

CVT STANDARD 12319.17.MNS (ROCKVILLE SCHULTZ).GPJ LOG A GNNN06.GDT 02/11/17

LOG OF BORING

CHOSEN VALLEY TESTING

Chosen Valley Testing, Inc.

PROJECT: 12319.17.MNS Design Phase Geotechnical Evaluations Proposed Road Co Rd 141 Rockville, Minnesota	BORING: **B-05** LOCATION: See attched sketch. DATE: 10/19/2017 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1121.0	0.0	OL	**TOPSOIL**, Slightly Organic Clayey Sand, fine-to-medium grained, trace Roots, dark brown, wet.			
1120.0	1.0	CL	**SANDY LEAN CLAY**, trace Gravel, brown, wet, stiff. (Glacial Till)	10		Minimal sample returned due to cobble or gravel obstruction. Stratification interpreted from cuttings taken from the auger. MC=15%
1117.0	4.0	SC	**CLAYEY SAND**, fine-to-medium grained, trace Gravel, brown, wet, medium dense to very dense. (Glacial Till)	16		MC=10%
				18		MC=9%
				73		MC=11%
				77		MC=10%
1107.5	13.5		Boring terminated early due to auger refusal. Water was not observed. Boring sealed upon completion.			

CVT STANDARD 12319.17.MNS (ROCKVILLE SCHULTZ).GPJ LOG A GNNN06.GDT 02/11/17

LOG OF BORING

CHOSEN VALLEY TESTING

Chosen Valley Testing, Inc.

PROJECT: 12319.17.MNS Design Phase Geotechnical Evaluations Proposed Road Co Rd 141 Rockville, Minnesota	BORING: **B-06** LOCATION: See attched sketch. DATE: 10/19/2017 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1118.0	0.0	OL	**TOPSOIL**, Slightly Organic Clayey Sand, fine-to-medium grained, trace Roots, dark brown, wet.			
1117.0	1.0	SC	**CLAYEY SAND**, fine-to-medium grained, trace Gravel, brown, wet, loose to very dense. (Glacial Till)			
				11		MC=11%
				9		MC=11%
				8		Minimal sample returned due to cobble or gravel obstruction. Stratification interpreted from cuttings taken from the auger. MC=11%
				39		MC=12%
						MC=10%
				40		
1103.1	14.9		End boring. Water was not observed. Boring sealed upon completion.			

CVT STANDARD 12319.17.MNS (ROCKVILLE SCHULTZ).GPJ LOG A GNNN06.GDT 02/11/17

LOG OF BORING

CHOSEN VALLEY TESTING

Chosen Valley Testing, Inc.

PROJECT: 12319.17.MNS Design Phase Geotechnical Evaluations Proposed Road Co Rd 141 Rockville, Minnesota	BORING: **B-07** LOCATION: See attched sketch. DATE: 10/19/2017 SCALE: 1" = 3'

Elev.	Depth	USCS Symbol	Description of Materials (ASTM D 2487/2488)	BPF	WL	Tests and Notes
1129.0	0.0	OL	**TOPSOIL**, Slightly Organic Clayey Sand, fine-to-medium grained, trace Roots, dark brown, wet.			
1127.9	1.1	SC	**CLAYEY SAND**, fine-to-medium grained, trace Gravel, brown, wet, loose to medium dense. (Glacial Till)			
				10		MC=11%
				7	▼	MC=9%
				8		MC=11%
				28		MC=12%
1117.5	11.5	CL	**SANDY LEAN CLAY**, trace Gravel, brown, wet, stiff to very stiff. (Glacial Till)			
				12		PP=2 tsf MC=11%
				16		PP=1.5 tsf MC=10%
1114.1	14.9		Boring terminated due to auger refusal. Water was observed at 5 1/2 after auger removal. Boring sealed upon completion.			

CVT STANDARD 12319.17.MNS (ROCKVILLE SCHULTZ).GPJ LOG A GNNN06.GDT 02/11/17

CITY OF ROCKVILLE
APPLICATION FOR PRELIMINARY PLAT

PLATTING FEE: ___1-3 Lots $300 ___4-10 Lots $500
X 11-40 Lots $1500 ___Over 40 Lots $5000

PLEASE NOTE: ANY COSTS (i.e. LEGAL, ENGINEERING, ADMINISTRATIVE, ETC) INCURRED OVER AND ABOVE THE APPLICATION FEE ARE THE RESPONIBILITY OF THE PETITIONER

Date of Pre-Application Meeting: _____

Date Application Submitted: _____ Parcel # 76.42170.0051 76.42170.0050

Name of Plat SCHNEIDER FARM Plat File # _____

Plat Location: Section 25 Township 123 Range 29

Legal Description LOTS 1 & 2 BLOCK 1 SCHNEIDER TERRACE

Land is presently zoned A-40 Zone Requested RR Total Amount of land involved: Acres 105.88

Owners Name SCHNEIDER FAMILY Phone (320) 267-4292
First Name Middle Initial Last Name
Address 453 · 135th AVE. FOLEY MN. 56329 Email: mwschneider49@gmail.com

Developers Name MIKE SCHNEIDER Phone (320) 267-4292

Address 453 · 135th AVE FOLEY MN. 56329

Surveyors Name D'MALLEY & KROK Phone 685-5905 Fax 685-3056

Address 370 CHAPEL HILL RD. SUITE 105 Email: _____

The following must be submitted with the preliminary plat:
___ Septic System Site Evaluations
___ Wetland Delineation & Report
___ Grading plan for streets located within the plat boundary
___ Proof of ownership (copy of tax statement or deed)
___ Required fee as noted above

X [signature]
X Karen Schlangen
X [signature]

Required Information
Five (5) 24"x 36" and (15) 11"x17" copies of the preliminary plat, plus any additional copies deemed necessary.

Mike Schneider (320) 267-4292 Date Nov 6, 2017
Signature of person submitting plat

Complete Application date _____

R# _____ Preliminary Plat Fee Check # 1384 Date 11/06/17 101.41000.34103 $ 1500.00 Permit # _____
Preliminary Plat Application.forms.wp

PAID
NOV 06 2017

14 New Lots
Parkland 1200 x 14 = 16,800 No charge for Jonathans Lot

CITY OF ROCKVILLE
APPLICATION FOR VARIANCE REQUEST: Fee $200
RECORDING FEE $ 46.00 (PER DOCUMENT)
Need separate checks: 1 for variance request & 1 for recording fee(s)

Need a Copy of Deed

PLEASE NOTE: ANY COSTS (i.e. LEGAL, ENGINEERING, ADMINISTRATIVE, STEARNS COUNTY FEES, ETC) INCURRED OVER AND ABOVE THE APPLICATION FEE ARE THE RESPONIBILITY OF THE PETITIONER

PROPERTY LOCATION/ADDRESS: Lot 1 & 2 Block 1 Schneider Terrace

LEGAL DESCRIPTION: _____ PARCEL#: 76.42170.0051 76.42170.0050 ZONING: RK

EXPLANATION OF REQUEST: 50 ft sideyard setback to 20 ft

Provide Individual property owner names/addresses within 350 feet or nearest 10 property owners, whichever is greatest.

If replacing an existing structure, what will be done with the old structure? N/A

Has a variance request been made previously on this property? No If yes, when? _____

PROPERTY OWNER:

Irene T. Schneider Trust

Name (Print): Jonathan M Schneider Phone: _____
First Name Middle Initial Last Name

Address: _____

Signature (required): _____ Date: _____

*Signature of property owner shall serve as acknowledgement and authorization of this request.

APPLICANT: SAME

Name (Print): _____ Phone: _____

Address: _____

Signature (required): _____ Date: _____

(I hereby certify that I have read the above information and I agree with the terms).

STAFF USE ONLY:

Permit# _____

R# _____ Variance Application Fee Check # _____ Date _____ 101.41000.34103 $200.00

R# _____ Reimb. for Invoice Check# _____ Date _____ 101.41000-34102 $46.00

CITY OF ROCKVILLE

REQUEST TO CHANGE ZONING DISTRICT

The information on this form must be typed or printed legibly. State law requires that a public hearing must be held to rezone property. The applicant **must** attend the public hearing to discuss the request, which will be held before the Planning Commission. The Planning Commission shall make a report to the City Council upon any application for rezoning and shall recommend to the City Council ($^3/_4$ vote required) whatever action it deems advisable. The Planning Commission meeting is held the 2nd Tuesday of each month at 6:00 p.m. The City Council meetings at which zoning issues will be considered are held on the 3rd Wednesday of each month at 6:00 p.m.

Owner's Name: Irene T Schneider Trust & Jonatha M. Schneider

Applicant's Name: Same

Property Address: _____

Phone: _____

Presently Zoned: R.R from A-40 **Requested Zoning:** Residential Development

The Applicant must provide a legal description (from abstract/deed) for the property. The City will not be responsible for utilizing an incorrect legal description. This information is required to make sure that maps are properly updated, and that the project that follows the rezoning conforms to the Zoning Ordinance. Please write the legal description here; if it is lengthy, you may attach on a separate sheet (in this case write "*see attached sheet*").

Attached

Do not check the boxes on this form; *the section listed below must be completed by the Zoning Administrator.* The Zoning Administrator will check "yes" if the applicant has met that specific requirement or there is an unusual reason that the requirement does not apply (in which case the reason must be noted in the space provided).

YES	NO	#	Item
☐	☐	1.	**Fee Paid.** The Applicant must submit payment for the rezoning application fee of **$200.00** prior to processing this application. Once the notice has been sent to the *Cold Spring Record*, the fee is non-refundable.
☑	☐	2.	**Site Plan.** A site plan of the *proposed* use of the property *after* the property has been rezoned must be submitted with this application. The site plan must be neatly drawn **to scale**; grid paper is available at City Hall if needed. Be sure to draw, label and show dimensions for:
☐	☑	3.	**Floodplain or Shoreland District.** The Zoning Ordinance requires that staff shall determine whether or not the property is located within either the Floodplain or Shoreland District. If so, there are likely additional restrictions that apply. Indicate below whether the property lies within either of these districts after you've consulted with City staff. If so, a copy of the notice of public hearing must be sent to the Commissioner of Natural Resources.

___ All Buildings ___ North Directional Arrow ___ Streets
___ Alleys ___ Sidewalks ___ Property Lines
___ Lot Dimensions ___ Driveways & all Curb Cuts ___ Decks
___ Wells ___ Utility Sheds ___ Easements

___ Yes ___ No Is the property located within a Floodplain District?

___ Yes ___ No Is the property located within a Shoreland District?

☑ ☐ 4. **Legal description.** The applicant must provide an electronic copy of an accurate legal description to the Zoning Administrator. This should be accomplished by E-mailing the legal description in Microsoft Word format to mbode@rockvillecity.org

☑ ☐ 5. **Hearing Date.** The date of the Public Hearing will generally be scheduled for the Planning Commission meeting nearest the date that the application is submitted if possible. That date may be impacted by other factors, however. The applicant should be notified of the *probable* date of the hearing at the time that the application is submitted.

12-5-17 Public Hearing and Planning Commission meeting date.

12-13-17 City Council meeting date ($^3/_4$ vote required).

☐ ☐ 6. **Narrative.** The applicant must provide a written explanation of the purpose for requesting the rezoning. The narrative should explain **in detail** what action will be taken with the property once the property has been rezoned. Be sure to include arguments why approving the request is a good idea for the *community*. Please write the narrative here; if it is lengthy, you may attach on a separate sheet (in this case write "See attached sheet").

Signature of Applicant: _____ Date: 11-17-17

Staff use only.

Planning Commission Decision: _____ Date: _____

City Council Decision: _____ Date: _____

Comments:

Lots 1 and 2, Block 1, SCHNEIDER TERRACE, according to the recorded plat thereof, Stearns County, Minnesota.

NOTICE OF PUBLIC HEARING
CITY OF ROCKVILLE

Notice is hereby given that the City of Rockville Planning Commission will hold a public hearing **on Tuesday, December 5, 2017, at approximately 6:00 p.m. at the Rockville City Hall, 229 Broadway Street East** to consider adoption of:

ORDINANCE NO. 2017-87 – Revisions to Zoning Ordinance Section 14; Non-Conforming Uses, subd.9; Expansion of Structures.

(A complete copy of the ordinance is available for viewing in the office of the Administrator/Clerk)

All persons attending the hearing and wishing to address the Planning Commission will have an opportunity to do so. Those not able to be present at this meeting may submit their opinions in writing to the Rockville City Administrator, P.O. Box 93, Rockville, MN 56369 prior to the hearing.

Martin M. Bode
Administrator/Clerk

Publish 11/21/17
Cold Spring Record

In Accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. (Not all prohibited bases apply to all programs).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Ave, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice & TDD). USDA is an equal opportunity provider and employer."

ORDINANCE NO. 2017-87

ORDINANCE AMENDING SECTION 14, SUBDIVISION 9 OF THE CITY OF ROCKVILLE ZONING CODE

WHEREAS, the City Council of the City of Rockville adopted official zoning controls ("Zoning Code") pursuant to the authority granted in Minnesota Statutes, Chapter 462 in April 2003 which replaced all pre-existing official controls; and

WHEREAS, the City Council has previously amended the Zoning Code by Ordinance Numbers 2003-06, 2004-18, 2004-19, 2004-20, 2004-25, 2004-26, 2006-30, 2007-40, 2007-41, 2007-42, 2007-43, 2007-44, 2008-45, 2008-46, 2008-47, 2008-49, 2008-50, 2008-51 and 2008-53; 2009-58, 2009-61, 2009-62, 2009-63, 2010-64, 2011-69, 2011-70, 2011-73, 2012-74, 2012-76, 2014-82, 2015-84, 2016-85, and 2017-86; and

WHEREAS, the City Council has the authority pursuant to Minnesota Statutes, Chapter 462 to amend the official zoning controls; and

WHEREAS, the City Council has been made aware of a recent court ruling where the court applied Section 14, Subdivision 9 of the Zoning Code in a manner that was not intended by the City; and

WHEREAS, the City Council desires to amend the Zoning Code to clearly reflect that Section 14, Subdivision 9 was not intended to require that lawful, nonconforming lots of record in existence when the Zoning Code was enacted in 2003 be brought into dimensional conformity with the building lot area, lot width, lot depth, or lot frontage requirements in the Zoning Code as a condition of expanding, enlarging, or reconstructing a structure on such a lot; and

WHEREAS, a public hearing was held on December 5, 2017 before the City Planning Commission, and members of the public were given an opportunity to comment on the proposed Amendment.

NOW, THEREFORE, THE CITY COUNCIL DOES HEREBY ORDAIN TO AMEND THE ROCKVILLE ZONING CODE AS FOLLOWS:

SECTION 14: NON-CONFORMING USES, Subdivision 9: EXPANSION OF STRUCTURE is amended to read as follows:

Subdivision 9: EXPANSION OF STRUCTURE

> No structure existing at this Ordinance's adoption may be expanded, enlarged, or reconstructed to increase its floor area by twenty-five percent (25%) or more without bringing the site into compliance with this Ordinance's requirements, including but not limited to businesses and industrial properties providing sufficient parking for the entire building, paving the parking lot area if not previously paved, providing fencing as may be required by this Ordinance, and providing screening for refuse storage. <u>The term "site" as used in this Subdivision does not include a legal, non-conforming lot of record in existence when this Code was adopted, and this Subdivision does not apply to a situation where a structure on such a legal, non-conforming lot is being expanded, enlarged or reconstructed to increase the structure's floor area by twenty-five percent (25%) or more.</u>

EFFECTIVE DATE: This ordinance shall become effective upon its passage and publication in the official newspaper.

Dated this 13th day of December, 2017

ATTEST:

_____	_____
Martin M. Bode	**Duane Willenbring**
City Administrator/Clerk	**Mayor**

Published: Cold Spring Record
_____, 2017

DEVELOPMENT AGREEMENT
(Pleasant Estates Plat 3)

THIS AGREEMENT is made effective this 13 day of December, 2017, between the **CITY OF ROCKVILLE**, a Minnesota municipal corporation (hereinafter called the "City"); and **JAMES VOIGT AND JACQUELINE VOIGT**, married to each other (hereinafter called the "Developer").

RECITALS:

A. The City is the fee owner of the property legally described on the attached **Exhibit A** (the "Property").

B. The Developer proposes to plat 17 outlots ("Outlots") from land legally described in **Exhibit A**. The Outlots are located behind existing platted lots so that the Outlots may be conveyed and attached to the existing platted lots. The proposal requires rezoning of the land proposed for the Outlots from Agricultural A-40 to Residential R-1.

C. Developer has submitted a preliminary plat ("Preliminary Plat") attached as **Exhibit B** and a final plat ("Final Plat") attached as **Exhibit C** (collectively the "Plat").

D. As a condition of the platting and rezoning, the City requires that Developer enter into this Agreement.

E. This Agreement shall be recorded with the Stearns County Recorder.

AGREEMENT:

NOW, THEREFORE, in consideration of the agreements contained herein, the parties agree as follows:

1. SUBDIVISION ORDINANCE COMPLIANCE. Section 7 of the City of Rockville subdivision ordinance imposes certain design standards for the subdivision of land. The unique nature of the Plat requires clarification of the applicability of several subdivisions of Section 7:

a. *Subdivision 2 Sidewalks and Trails*. Due to the purpose of the Plat for the expansion of existing platted residential lots, no new sidewalks are required.

b. *Subdivision 3 Grading Plan*. No new building sites or streets are proposed so a grading plan is not required.

c. *Subdivision 4 Easements*. Given the proximity to existing platted lots with varying utility easements, the Plat mimics existing drainage and utility easements to the extent possible. If multiple Outlots are attached to an existing platted lot, it is an anticipated that the vacation of some drainage and utility easements may be necessary in the future.

2. ATTACHMENT REQUIRED. Developer may not convey any of the Outlots unless they are attached to an existing, adjacent platted lot. A declaration of restriction, substantially similar in form to **Exhibit D**, must be recorded against any conveyed Outlot and the receiving platted lot. Multiple Outlots may be attached to a platted lot as long as the Outlots and platted lot are all adjacent and contiguous.

3. NON-BUILDING PURPOSES. The Outlots are being platted for non-building purposes. No Outlot may be built upon until it is either replatted or attached to an existing, adjacent platted lot. Upon attachment, only one residential dwelling is permitted per platted lot, regardless of the number of attached Outlots. Accessory structures may be placed on attached Outlots in accordance with the R-1 zoning district standards; a principal structure is required before an accessory structure may be constructed.

4. REZONING. An Outlot must be rezoned to R-1 Single Family Residential prior to attachment of any Outlot to an existing, adjacent platted lot.

5. MODIFIED SETBACKS. Due to (1) the potential for multiple Outlots to be attached to a single platted lot that could extend behind neighboring parcels; and (2) increased lots sizes through attachment may allow large accessory structures, a modified setback requirement for accessory structures is necessary. All accessory structures must be setback 25 feet from the rear lot line of any platted lot under different ownership. (For example, if Outlot L and M are attached to Lot 7, Block 2 Pleasant Estates, then any accessory structure on Outlot M must be setback 25 feet from the rear lot line of Lot 8, Block 2 Pleasant Estates.)

6. CITY COSTS. The Developer shall pay all costs incurred by it or the City, including, but not limited to, legal, planning, engineering, and inspection expenses, in connection with the development, review of construction plans and documents, the preparation of this Agreement, and any other required agreements.

7. ENFORCEMENT. Developer shall reimburse the City for costs incurred in the enforcement of this Agreement, including reasonable engineering and attorneys' fees.

8. TIME OF PAYMENT. Developer shall pay in full all bills submitted by the City for obligations incurred under this Agreement within 30 days of submission to Developer. Failure to remit payment within 30 days shall constitute a default of this Agreement.

9. INDEMNIFICATION. Anything to the contrary herein notwithstanding, the City and Council, its officers, agents, employees, and representatives shall not be liable or responsible in any manner to the Developer, contractor or subcontractors, materialmen, laborers, or to any other person or persons whomsoever, for any claims, demands, damages, actions, or causes of action of any kind or character whatsoever arising out of or by reason of the execution of this Agreement. Developer further agrees to indemnify, defend, and hold the City, its officers, engineers, agents and employees harmless from all such claims, demands, damages, actions, or causes of action, and all costs, disbursements, and expenses including attorneys' fees resulting from such claims.

10. DEFAULT AND REMEDIES. If Developer fails in any way to perform or observe any covenant, condition, or obligation contained in this Agreement or any other agreement between Developer and the City relating to the Property, Developer agrees that the City may do any, all, or any combination of the following: (i) halt all further approvals; (ii) seek injunctive relief; (iii) terminate this Agreement and all of the obligations contained herein without terminating Developer's obligation to reimburse the City for costs it has incurred with regard to this Agreement or the Property; (iv) suspend any work or improvement on the Property by issuing a stop work order; and (v) take any other action at law or in equity which may be available to the City.

11. ASSIGNMENT. This Agreement may not be assigned by Developer except upon obtaining the express written consent of the City; such approval shall not be unreasonably withheld. This Agreement shall run with the Property and will be binding on and enforceable by and against the parties, their successors, legal representatives and assigns.

12. RINKE NOONAN REPRESENTS CITY. Rinke Noonan represents the City in negotiation and drafting of this Agreement. Developer is hereby advised to seek independent representation from a law firm other than Rinke Noonan to review and advise Developer as to the terms and ramifications of this Agreement.

[Remainder of page left intentionally blank.]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date above.

CITY OF ROCKVILLE

By _____
Duane Willenbring, Its Mayor

ATTEST:

By_____
Martin M. Bode, Its Administrator

DEVELOPER

_____
James Voigt

_____
Jacqueline Voigt

STATE OF MINNESOTA)
) SS
COUNTY OF STEARNS)

On this _____ day of December, 2017, before me, a Notary Public for this County, personally appeared Duane Willenbring, to me personally known, who, being by me duly sworn did say that he is the Mayor of the City of Rockville, a Minnesota municipal corporation, named in the foregoing instrument, and that said instrument was signed on behalf of said corporation by authority of its City Council and acknowledged said instrument to be the free act and deed of said corporation.

_____
Notary Public

STATE OF MINNESOTA)
) SS
COUNTY OF STEARNS)

On this _____ day of December, 2017, before me, a Notary Public for this County, personally appeared Martin M. Bode, to me personally known, who, being by me duly sworn did say that he is the City Administrator of the City of Rockville, a Minnesota municipal corporation, named in the foregoing instrument, and that said instrument was signed on behalf of said corporation by authority of its City Council and acknowledged said instrument to be the free act and deed of said corporation.

_____
Notary Public

STATE OF MINNESOTA)
) SS
COUNTY OF STEARNS)

On this ____ day of December, 2017, before me, a Notary Public for this County, personally appeared James Voigt, married to Jacqueline Voigt, who I know to be the person described in the foregoing instrument, and who acknowledged that he executed that instrument as his free act and deed.

_____
Notary Public

STATE OF MINNESOTA)
) SS
COUNTY OF STEARNS)

On this ____ day of December, 2017, before me, a Notary Public for this County, personally appeared Jacqueline Voigt, married to James Voigt, who I know to be the person described in the foregoing instrument, and who acknowledged that she executed that instrument as her free act and deed.

_____
Notary Public

THIS INSTRUMENT DRAFTED BY:
Rinke Noonan (AAR)
1015 W. St. Germain St., Suite 300
P.O. Box 1497
St. Cloud, MN 56302-1497
(320) 251-6700
File No. 16642-0089

EXHIBIT A

(Legal Description of the Property)

EXHIBIT B

(Preliminary Plat)

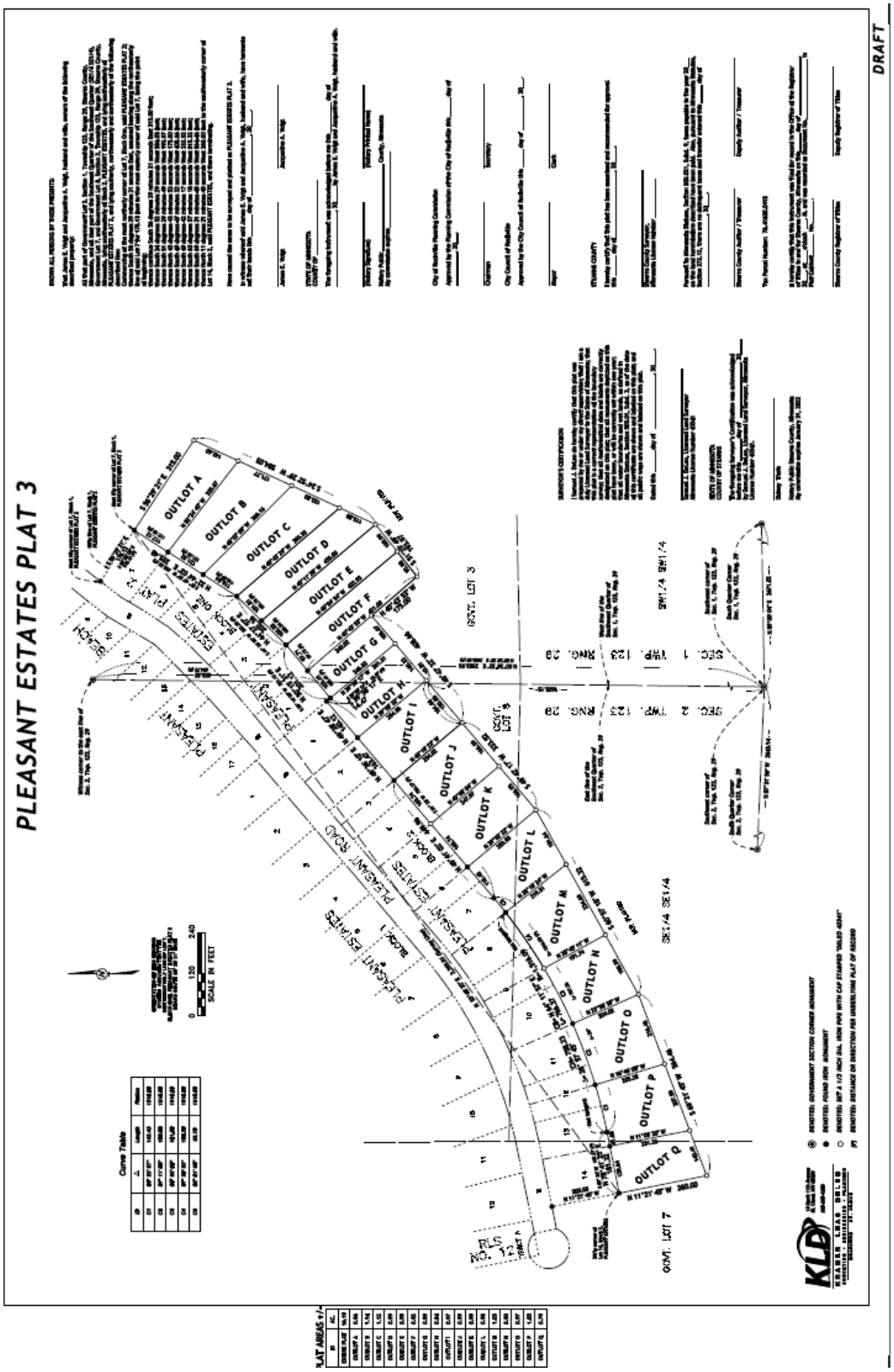


EXHIBIT C

(Final Plat)

EXHIBIT D

(Declaration of Restriction)

DECLARATION OF RESTRICTION

THIS Declaration of Restrictions is made this ____ day of _____, 20__, by <**Declarants**>, married to each other (collectively "Declarants").

WHEREAS, Declarants are the fee owners of property ("Declarants' Property") legally described as <insert legal description>;

WHEREAS, Declarants have purchased additional property legally described as Outlot __, Pleasant Estates Plat 3 ("Outlot"), which is a vacant lot adjacent to the Declarants' Property and subject to a Development Agreement recorded as Document No. <__> with the Stearns County Recorder;

WHEREAS, the Development Agreement requires the Outlot to be permanently attached to the Declarants' Property upon conveyance.

NOW, THEREFORE, the Declarants make the following declaration of restriction to combine the Outlot to the Declarants' Property. The restrictions described below shall run with the land and shall be binding on all parties and all persons claiming under them:

1. Declarants' Property and the Outlot shall be considered one property for the purposes of resale and Declarants' Property and the Outlot shall not be conveyed independently unless approved by the City of Rockville.

2. This Declaration shall be recorded with the Stearns County Recorder and may be enforced by the City of Rockville.

IN WITNESS WHEREOF, the Declarants have executed this Declaration.

DECLARANT	DECLARANT
_____	_____
<name>	**<name>**

Building Permits: November 2017

Parcel #	REASON	ADDRESS	DATE	PERMIT #	Valuation	Permit $	Review	SSC	Fees
76.41950.0003	Siding	540 Othmar Ln	11/3/2017	2017-00094	NA	$ 25.00		$ 1.00	$ 26.00
76.41950.0003	Window Replacement	540 Othmar Ln	11/3/2017	2017-00095	NA	$ 25.00		$ 1.00	$ 26.00
76.41626.0200	Furnace & AC	10251 Co Rd 47	11/7/2017	2017-00096	NA	$ 40.00		$ 1.00	$ 41.00
76.42144.0014	Furnace	8501 White Oak Rd	11/27/2017	2017-00097	NA	$ 40.00		$ 1.00	$ 41.00
76.41650.0600	Fire Alarm	21614 Co Rd 8	11/6/2017	2017-00111	$ 3,500.00	$ 38.50	$ 25.03	$ 1.75	$ 65.28
76.41603.0400	Gas Fireplace	25822 Lake Rd	11/22/2017	2017-00112	NA	$ 75.00		$ 1.00	$ 76.00
76.42170.0006	New Wood Furnace	25830 80Th Ave	11/27/2017	2017-00113	NA	$ 75.00		$ 1.00	$ 76.00