YMCA – Camp Kici Yapi CUP Application Revisions
February 6th, 2019

For more than 100 years, the YMCA’s camp programs have helped youth and families build confidence and develop friendships while growing as leaders. Our day camps offer an enriching, safe experience with caring counselors who allow campers the freedom to be themselves while providing supervised, meaningful, outdoor experiences.

The YMCA has an opportunity to continue its camp programming in Scott County through the acquisition of a 220-acre natural landscape in New Market Township. After several years of searching for a new location for Day Camp Kici Yapi, located in Prior Lake, we found this park like setting, with clean lakes, offers the perfect location to relocate the camp.

After two neighborhood meetings, feedback from the community, and several discussions with New Market Township Supervisors, the YMCA recognized that our request for expanded program offerings made defining the broader day camp program difficult. With this in mind, the YMCA respectfully requests the County accept the following changes to our CUP Application, which removes all Phase Two programs and facilities from the request. The revised application will reduce the perceived impact the day camp will have on the neighbors and the surrounding community.

Maintained in the request, the YMCA will assure that all day camp programs are based on supervised access and all children enrolled in the day camp program will always be under the watchful eyes of trained counselors. It should also be noted that when reviewing the traffic impact of the proposed day camp, the average trip counts from CSAH 62 and Zane Ave. will be roughly 52% of that generated by a 20-home housing development. Additionally, the YMCA will limit access to the property from 230th street. Traffic accessing the property from 230th would total less than that generated by the two existing homes today; approximately 25% less.

The YMCA Camp Kici Yapi provides affordable, healthy, environmentally friendly programs that promote fun, safe, outdoor activities for youth and families in Scott County. We hope you find these changes acceptable and will recommend approval of the YMCA’s Conditional Use Permit.

Please reference the list below for a more detailed breakdown of the revisions contained in this package. See also the attached table laying out the day camp schedule.

Thank you.
The list below represents the revisions made to the original CUP Application submitted 12/31/18.

- **Project Overview & Architectural Package**
  - All Phase II programming and buildings have been removed from the package.
    - Lazy river
    - Farm-to-table building, gardens, and kitchen
    - Enhanced camping experience (yurts & cabins)

- **Horse Management Plan**
  - Clarification and detail regarding manure management, contracted services, and general horse operations was added.
  - MPCA registration form submitted to the MPCA and attached to this package for reference.

- **Stormwater Report**
  - Stormwater report containing the Resource Management Plan information has been added to the submission. This document was inadvertently omitted from the original submission package.

- **Civil Engineering Drawings**
  - Additional detail has been provided for the following items within the Civil drawings.
    - YMCA entrance & Zane Avenue design.
    - 240th St. E (Hwy 62) turn lane design.
    - Horse area stockpile location, clarification of building use, and location of well.
  - All Phase II programming and architectural elements have been removed.
<table>
<thead>
<tr>
<th>Day / Program / Location</th>
<th>Time of Day / Year</th>
<th>Participants / Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year-round</td>
<td></td>
<td></td>
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<tr>
<td>North side driveway - 230th</td>
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<tr>
<td>Single family caretakers home</td>
<td>Typical trips throughout day</td>
<td>1 family</td>
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<td>Summer (June / July/ Aug)</td>
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<td>Monday - Friday</td>
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<td></td>
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<tr>
<td>North side driveway - 230th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office - administration</td>
<td>7:30 am to 5:00 pm</td>
<td>5-10 staff</td>
</tr>
<tr>
<td>CSAH 62 to Zane Ave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buses - morning drop-off</td>
<td>9:00 to 9:30 - buses drop and leave</td>
<td>500 total campers per week 14 - 15 buses</td>
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<tr>
<td>Parent's - morning drop-off</td>
<td>9:00 to 9:30 - cars drop and leave</td>
<td>20 cars - campers included in above count</td>
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<tr>
<td>Staff</td>
<td>Arrive between 7:30 - 8:30</td>
<td>25 cars - staff will carpool or ride on school buses</td>
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<tr>
<td>Buses - afternoon pick-up</td>
<td>Arrive 3:30 - 4:00, leave at 4:00</td>
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</tr>
<tr>
<td>Parent's - afternoon pick-up</td>
<td>3:45 - 4:45 pm</td>
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</tr>
<tr>
<td>Staff</td>
<td>Leave between 4:00 - 4:30</td>
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<tr>
<td>Camp Family Nights</td>
<td>6:00 - 7:30 pm</td>
<td>70 cars - 250 to 300 participants</td>
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<tr>
<td>Programmed Community Use</td>
<td>4:30 - 7:30 pm</td>
<td>40 cars - 80 to 100 participants</td>
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<tr>
<td>Saturday and Sunday</td>
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<tr>
<td>Community Use</td>
<td>10:00 am - 6:00 pm</td>
<td>80 cars - 160 to 200 participants throughout day</td>
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<tr>
<td>Fall / Winter / Spring</td>
<td></td>
<td></td>
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<tr>
<td>North side driveway - 230th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office - admin / meetings</td>
<td>7:30 am to 5:00 pm (2-3 days per week)</td>
<td>5-10 staff (2-3 days per week)</td>
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<tr>
<td>CSAH 62 to Zane Ave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programmed Community Use</td>
<td>Morning to evening depending on daylight</td>
<td>30 cars - Averaging 60 to 80 participants, averaging 5 days per week</td>
</tr>
</tbody>
</table>
Land Use Permit Application
Scott County Community Development
200 Fourth Avenue West, Shakopee, MN 55379
Phone: (952) 496-8475 Fax: (952) 496-8496
www.co.scott.mn.us

Applicant’s Name
YMCA of the Greater Twin Cities

Telephone Home 651.210.3794

Address (Street, City, State, ZIP)
651 Nicollet Mall Suite 500

E-mail amanda.novak@ymcamin.org

Fax

Property Owner’s Name (If different from above)
Stephen Kavouras
Telephone Home 9524616073

Address (Street, City, State, ZIP)
8535 230th Street, New Market Township

E-mail stephenkavouras@gmail.com

Project Address
8535 230th Street, New Market Township

Total Acreage
220.

Parcel Identification Number(s)

Present Zoning District
RR-1

Complete Legal Description(s) (Not abbreviated description from tax statement. Attached separate sheet, if necessary.)

The following described real property located in Scott County, Minnesota:

The Northeast Quarter of the Southeast Quarter, and the Northwest Corner of the Northeast Quarter, and the North Half of the North Half of the Northeast Quarter of the Northeast Quarter, and
The Northeast Quarter of the Southeast Quarter of the Northwest Quarter, and the North Half of the North Half of the Northeast Quarter of the Northwest Quarter, and
The Northeast Quarter of the Southeast Quarter of the Northwest Quarter, and the South Half of the East Half of the South Half of the Northeast Quarter of the Northwest Quarter, and
The South Half of the East Half of the South Half of the Northeast Quarter of the Northwest Quarter, and
The Northeast Quarter of the Southeast Quarter of the Northwest Quarter, and

Description of Request (Attach separate sheet, if necessary. If subdivision, include proposed name, number of lots and zoning district.)

Conditional Use Permit within an RR-1 zoning district

Type of Request(s): Check all that apply

Administrative Permit/Cert. of Compliance
Administrative Subdivision
Comp Plan Amendment + Escrow
Conditional Use Permit + Escrow
Conditional Use Permit Transfer
DRT 1 Meeting
DRT 2 Meeting/Concept Review + Escrow
Final Plat + Escrow
Home Occupation Permit

Interim Use Permit + Escrow
Interim Use Permit Transfer
Ordinance Amendment + Escrow
Preliminary Plat + Escrow
PUD Final Plan
PUD General Plan
Rezoning (Map Amendment) + Escrow
Sign Permit
Variance or Appeal + Escrow

Other

- Please see County Fee Schedule for the appropriate fees. All fees must be received before an application will be deemed complete.
- Minimum escrow amount required is $1,000.

<table>
<thead>
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<th>File/Permit #:</th>
<th>Office Use Only</th>
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<tbody>
<tr>
<td>Non-Administrative Permit</td>
<td>Date App. Received:</td>
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<tr>
<td>Administrative Permit</td>
<td>Setbacks: Road:</td>
</tr>
<tr>
<td></td>
<td>Side: Rear:</td>
</tr>
</tbody>
</table>
Escrow Deposit:

An escrow deposit is required to cover costs incurred from staff and consultants directly related to processing the application. This escrow deposit and the Developer's social security number or company federal identification number will be collected prior to scheduling review(s) of your application. These costs are normally related to review of the application by Scott County (e.g. Community Development Department, Highway Department, Attorney's Office, and Soil and Water Conservation District). The Township Board may also require an escrow deposit. Please contact the Town Clerk to determine whether an escrow will be required for your project.

You will receive a statement of account approximately monthly. If the deposit is depleted before review of the application is concluded, you will be asked to make an additional deposit. In all cases, bills must be current before final action on your application is taken by the County Board.

There will be no credit given in cases where requests are withdrawn, determined to be premature, or denied. We make every attempt to keep costs down. It is important that completed documents, plans, and designs be furnished by you and your consultants in a timely fashion in order to accomplish this. Incomplete submittals result in time consuming report writing and increased review time.

Please contact the Scott County Planning Department at (952) 496-8475 if there are unanswered questions or if you're unsure how to proceed. We will strive to process your application as quickly as possible and assist you in every way we can.

15-Day Review for Complete Application:

Submittal by the application deadline (refer to corresponding application checklist) does not guarantee that the application will be accepted for the desired Planning Commission/Board of Adjustment hearing. Under state law, Scott County has 15 business days to determine whether an application is complete. If the application is found to be incomplete, the Planning department will send written notice within those 15 business days to the applicant indicating the deficiencies.

I understand that all County incurred professional fees and expenses associated with the processing of this request are the responsibility of the property owner and/or applicant and should be promptly paid. If payment is not received from the applicant, the property owner acknowledges and agrees to be responsible for the unpaid fee balance either by direct payment or a special assessment against the subject property.

I hereby certify that all data contained herein as well as all supporting data are true and correct to the best of my knowledge. I certify that I am familiar with all application fees and other associated costs, and also with the procedural requirements of the Scott County Zoning and Subdivision Ordinances and other applicable ordinances.

I hereby authorize the Community Development Division Director or authorized agent to enter upon property subject to this application to gather information pertinent to this request.

Applicant(s) Signature(s): __________________________ Date: 12/20/18

____________________________ Date: __________

Owner(s) Signature(s): __________________________ Date: 12/20/18

____________________________ Date: __________
Legal Description

Conditional Use Permit Submission – 2018/12/21

The following described real property situated in Scott County, Minnesota:

Parcel 1:

The Northeast Quarter of the Northwest Quarter; and the Southeast Quarter of the Northwest Quarter; and the North Three-fourths of the Northeast Quarter of the Southwest Quarter; and that part of the Southwest Quarter of the Northeast Quarter described as follows:

Beginning at the Northwest corner of the Southwest Quarter of the Northeast Quarter, thence Easterly along the North line of the said Southwest Quarter of the Northeast Quarter a distance of 330 feet, thence Southerly to the South line of the said Southwest Quarter of the Northeast Quarter to a point 330 feet Easterly of the Southwest corner of the said Southwest Quarter of the Northeast Quarter, thence West to the Southwest corner of said Southwest Quarter of the Northeast Quarter, thence North to the point of beginning;

and that part of the Southeast Quarter described as follows:

Beginning at the Northwest corner of the Southeast Quarter, thence East along the North line of the said Southeast Quarter a distance of 330 feet, thence South to the South line of the North Half of the North Half of the said Southeast Quarter to a point 330 feet East of the Southwest corner of the North Half of the North Half of said Southeast Quarter; thence West to the said Southwest corner of the North Half of the North Half of the said Southeast Quarter; thence North to the point of beginning; All situated in Section 9, Township 113, Range 21.

Parcel 2:

The Northwest Quarter of the Northwest Quarter of the Southwest Quarter;

The Southwest Quarter of the Southwest Quarter of the Northwest Quarter;

The Southeast Quarter of the Southwest Quarter of the Northwest Quarter, except the Easterly 495 feet of the Southerly 269.95 feet thereof;

The Northeast Quarter of the Northwest Quarter of the Southwest Quarter, except the Easterly 495 feet thereof;

All situated in Section 9, Township 113, Range 21;
Written Explanation of Proposal

Conditional Use Permit Submission – 2018/12/21

The YMCA is seeking a Conditional Use Permit from Scott County for the 220 acre site at 8535 230th Street, New Market Township. The current zoning of the property is for RR-1/RR-1C and the project proposed is for a Day Camp. The current YMCA day camp of Camp Kici Yapi is being relocated to increase access and programs for more families in the south metro area. This relocation will allow the YMCA to integrate and engage the local community into an array of programs and services that will appeal to many. From gardening to cooking classes; arts and humanities; walking; biking; hiking; paddle boarding; canoeing and horseback riding.

1. The use will not create an excessive burden on public facilities and utilities which serve or are proposed to serve the area.

The use of the day camp will not create excessive burden on the public facilities and utilities serving the area. Much of the program is focused on outdoor activities and many of the structures serving the camp are indoor/outdoor spaces that are unconditioned (i.e. outdoor pavilions). For the structures that contain restrooms/bathing facilities, there will be Individual Sewage Treatment Systems (labeled as “septic areas”) as shown on the site plan. The ISTS will comply with Scott County’s Ordinance No.4 Water Wells and are shown on the site plan in the approximate quantity and location. Both underground and overhead electric lines will be added to the property and tie into the existing power lines adjacent to Zane Avenue.

2. The use will be sufficiently compatible with, or separated by sufficient distance from, or screened from adjacent agricultural or residential land uses so that there will be no deterrence to the use or development of adjacent land and uses.

The use of the day camp is compatible with the surrounding residential and agricultural uses. Any required setbacks from the property lines will be followed for
each structure. In addition to any required setbacks the existing natural characteristics of the property, which is a mix of deciduous and coniferous trees, will further create buffers and screening to neighboring properties.

3. Each structure or improvement is so designed and constructed that it is not unsightly in appearance to the extent that it will hinder the orderly and harmonious development of the district wherein proposed.

The appearance of the structures is being designed to be harmonious with the surrounding residential and agricultural uses. See the “Architectural Approach” sheet that outlines our approach to design, construction and material use for all of the structures.

4. The use is consistent with the purposes of the Ordinance and the purposes of the zoning district in which the applicant intends to locate the proposed use.

The property is currently part of the RR-1 and RR-1C zoning districts (the vast majority of the property is in RR-1). The proposed use of the YMCA day camp falls under the “Private campground/day park” use that is permitted on a Conditional Use per Scott County’s Zoning Ordinance Chapter 20, Table 20-4 “General Zoning District Provisions”.

5. The use is not in conflict with the Comprehensive Plan of Scott County.

According to the 2030 & 2040 draft plans the property is to remain a Rural Residential Reserve and part of the County Defined Natural Area Corridor. All the prominent natural features of the site are maintained (wetlands, ponds, tree cover, etc.) The site’s use of a day camp will have far less impact on these natural areas than a housing development would. There will be less impervious area added, less overall structure footprints, and there will be no use of lawn chemicals.
6. *Adequate measures have been taken to provide ingress and egress so designed as to minimize traffic congestion, provide adequate access to public roads and provide sufficient on-site parking.*

The main access for the property is proposed to be from Zane Avenue to the south property line. This access will utilize an existing 66’ easement to create a new driveway off of Zane Avenue. Zane Avenue will be improved with asphalt and follow the New Market Township design details. Zane is accessed from 240th street which is a paved county road. The majority of traffic will come from the east direction of 240th street. A right turn lane has been added to 240th per the direction from Scott County planning. The two existing access road/drives off of 230th street will only be used very minimally and intermittently. The northern portion of the property will have limited uses. The drives and access points will be maintained in order to use in emergency situations or for dropping off equipment with standard vehicles (ex. Archery equipment via a pick-up truck).

7. *Adequate water supply, individual sewage treatment system facilities, erosion control and stormwater management are provided in accordance with applicable standards.*

There will be approximately 3 new wells installed for the camp. The locations will be spaced appropriately from the septic fields, wetlands, and manure storage area. The depth and size of the wells will be determined by the well driller after the final sizing of the buildings and rest rooms are known. There are also at least 2 wells active on the site.

Two separate test pit locations have been investigated for placement of individual sewage treatment facilities. The primary and replacement drain field locations are shown within areas that are adequate to handle to proposed sanitary loads with a mound system.
Temporary and permanent erosion control measures have been incorporated into the design and grading plans for the site. A Low Impact Design (LID) approach to stormwater management was followed. No curb and gutter is proposed for the project and limited storm piping for conveyance through culverts under the roads and drives was used. Rate control measures were also incorporated to reduce the runoff to pre-developed conditions.

8. All buildings/structures must meet the intent of the State Building Code and/or fire codes.

All buildings are being designed to meet the intent of the Minnesota State Building Code and Fire Codes. See the “Architectural Approach” sheet that outlines our approach to design, construction and material use for all structures.
CONDITIONAL USE PERMIT (CUP) APPLICATION: SUBMISSION MATERIALS PACKAGE

LIST OF ITEMS INCLUDED IN PACKAGE (ALL ITEMS IN BOLD EXPLICITLY REQUIRED IN CUP CHECKLIST)

- Land Use Permit Application

- **Application & Recording Fee** (paid with 12/31/2018 submission)

- **Township meeting schedule**
  - Public Outreach Open House (scheduled immediately before New Market Township Meeting, 5:30p Nov 8th, 2018)
  - Public Outreach Meeting December 5th
  - Township Meeting January 8th, 2019 letter of conditions review
  - Township Meeting February 5th, 2019

- **Complete Legal Description and Parcel Addresses** (8 1/2 x 11 attachment)

- **Written Explanation of Proposal** (8 1/2 x 11 attachment)

- **Nuisance Mitigation Plan** (8 1/2 x 11 attachment)

- **Horse Management Plan** (8 1/2 x 11 attachment)

- **Traffic Analysis** (8 1/2 x 11 attachment)

- **Sewage Design** (24 x 36 sheets)

- **Civil Drawing Package** (24 x 36 sheets)
  - Certificate of Survey or Detailed Site Plan
  - Grading, drainage, and erosion control plan or resource management plan
  - Screening/landscaping plan
  - Lighting plan and photometric plan

- **Wetland Delineation Report** (24 x 36 sheets)

- **Project Overview & Architectural Package** (11 x 17 sheets)
  - CUP Index
  - Project Introduction
  - Proposed Program
  - Architectural Approach - Elevations and Floor Plans of proposed buildings
  - Existing Building Information

pg 1
pg 2-5
pg 6-8
pg 9-24
pg 25-28
INTRODUCTION TO PROJECT: CONTEXT MAP IMMEDIATE CONTEXT

8535 230th St. E, New Market Township:
- Approximately 30 miles south of Minneapolis off of 35W
- 221.8 acres (10 separate parcels)
- Scott County
- Vermillion River Watershed District

Scott County Zoning of Site Parcels:
- RR-1 Rural Residential Reserve District
- RR-1C Rural Residential Reserve Cluster District

8535 230th St. E, New Market Township:
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INTRODUCTION TO PROJECT: MAIN ENTRY
EXISTING CONDITIONS + REQUESTS

As part of the project, the YMCA will add an entrance to the property off of Zane Avenue. The following is proposed:

• On week days, during summer, there will be between 14-15 school buses, and roughly 20 camper families dropping off campers in the morning, and picking them up in the afternoon. There will also be community participant visitors on evenings and weekends throughout the year. To support this traffic, the YMCA is proposing that Zane Ave becomes a bituminous road to support camper traffic. The YMCA was directed by the New Market Township to use CSAH 62 to Zane as the primary access point. The annual trips generated by this development would be roughly half the trips expected for a 20 home development.

• Access to service the horse program will be from Zane. We will have 72 horses on site during the summer, with 10 of these horses staying through the remainder of the year. The 62 seasonal horses will be hauled in to camp in May and will be hauled out in September. The YMCA will not board horses for private use. Periodic services vehicles to provide feed, vet care, and manage manure are expected throughout the year, but drop considerably through the fall, winter, and spring.

• The north entrance off of 230th Street will remain the same and allow access to the two homes on that part of the property. One of the homes will be used as a home for the caretaker’s family, the other home will be used as office space to support the camp program. This change in use will not change the nature of this entrance with trip counts less than what would be expected for the existing two homes. There will be no bus access from this side of the property and only common residential service vehicles.
**PROPOSED MAIN ENTRY: EXISTING CONDITIONS + REQUESTS**

Narrative of Zane Avenue Access proposed solution:

The YMCA will develop a right turn lane on west bound CSAH 62 to exit on to Zane Ave and will provide a 24 foot wide bituminous road connecting CSAH 62 to the proposed subject property. The road alignment follows the Prescriptive Easement of Zane Ave and the 33 foot Right of Way. As the bituminous road reaches the 66’ roadway easement, the camp driveway will hook to the east and proceed north as a private driveway, leaving the public portion of Zane Ave as it continues to the north along its current path.

The alignment of utilities may be adjusted to avoid the expanded width of Zane Ave but will remain with the current roadway easement.

Reference Civil drawings for more information.
PROGRAM MATRIX: TOTAL PLANNED PROGRAM

**a** WELCOME + ENTRY

- Check-in/parking
- Covered camp pavilion (bench seating for kids)
- Includes (2) unisex restrooms
- Flexible to allow for rainy day activities
- Office space
- Camp store
- Rental shop (serves both summer and winter)
- Parking
  - 152 cars; area includes bus staging
  - Bus drop-off/pick-up

**b** AMPHITHEATER + SINGING HILL

- Amphitheater seating

**c** POOL + SPLASH PAD

- Locker room facilities
  - Lockers (150 per gender)
  - Showers (6 per gender)
  - Toilets (4 per gender)
  - Sink space
  - Changing rooms (10 per gender)
- Multi-purpose room
- Rainy day space + dining hall
- Warming house in the winter
- Splash pad
- Pool
- Slides

**d** WEEBEE (PRESCHOOL PLAY AREA)

- Play park/play houses
- Shaded area
- Miscellaneous activities (music maker, games, nature hut, etc)
- Arts & crafts
- Target activity

**e** HORSES

- Barn (10 full time horses; up to 62 rental horses)
- Riding rings or arena
- Pasture (10+ acres)
- Grain silos (relocate existing)
- Hay storage
- Tack room
- Miscellaneous storage
- Restrooms
- Trails - throughout property

**f** VERTICAL ADVENTURES

- Climbing wall (beginner + advanced)
- High ropes course + zip line
- Kici challenge
- Big swing
- Storage (shed)

**g** SURVIVAL SKILLS

- Archery courses
- Sling shot
- Fire building
- Storage (shed)

**h** S.T.E.A.M. (SCIENCE, TECHNOLOGY, ENGINEERING, ART, MATHEMATICS)

- Utilize existing pole barn
- Shop equipment
- Art equipment (pottery wheels, dark room, easels, etc)
- Open, flexible studio
- Lake front storage barn in summer
- Biology barn (reuse existing horse barn)
- Classroom with equipment
- Nature center
- Trails + lookout points (throughout property)

**i** LAKE FRONT

- Swimming beach
- Dock
- Swimming platform
- Boating (non-motor boats)
- Dock
- Storage racks
- Changing rooms + restrooms
  - 2 restrooms + 10 changing rooms per gender
- Winter Storage (converted to Arts & Crafts in summer)

**j** STAFF/TRAINING RESOURCES

- Utilize existing house
- Office/workspaces
- Break spaces
- First aid/nurses space
- Training rooms (junior leadership training, member retreats)
- Caretaker's house (utilize existing cabin)
- Storage facilities (throughout property)

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**BUFFALO RUN & CAMP KICI YAPI**

CUP Application

February 06, 2019
The YMCA is requesting CUP approval for the overall approach to the site and operations of a day camp.

Currently the YMCA operates YMCA Camp Kici Yapi in Prior Lake, along with nine other day camps throughout the Twin City area. The goal of this project is to relocate Camp Kici Yapi to the proposed site, and improve camp offerings in order to broaden the experiences of the campers.

Similar to other YMCA day camps, the community will be invited to take advantage of all the great activities camp has to offer. Some programs will require participants to be registered, others will have scheduled program times. Community programs will be offered during the summer from 4:30pm – 7:30pm, Monday through Friday, and 10:00am – 6:00pm Saturday and Sunday. During the fall, winter and spring, community programs will be offered throughout the day, ending at dusk.

Examples of supervised community programmed activities include:

- Swimming, and swim lessons
- Canoeing/Kayaking
- Fishing
- Hiking/cross country skiing
- Rope Course
- Ice Skating
- Sledding

The following pages describe the proposed locations, program use, and architectural features to be included in the day camp.
ARCHITECTURAL APPROACH: NEW SITE STRUCTURES

SIZE & STRUCTURE - BUILDING CODE OVERVIEW

One story structures
   No height to exceed 40’ (max allowed by Type VB buildings)

Building areas range from 1,000 - 6,100 sf. (New construction)
   No Area to exceed that allowed by its Occupancy and Type VB building

Buildings fall into the following Occupancies:
   Assembly, Education, Storage and Utility/Misc

No requirement of fire sprinklers for any building due to limiting number of
stories, area, height and seperation of buildings.

BUILDING CONSTRUCTION

Most of the structures will be:
   - wood frame construction (dimensional lumber & engineered wood)
   - masonry (CMU) wall construction.
   - simple steel frames construction

Foundations:
   - Frost Footings (perimeter and post)
   - No basements
   - Open Air buildings will be slab on grade with post footings

MATERIALITY (EXTERIOR)

Metal Siding & Metal Roofing
Fiber Cement Panels
CMU walls
Exposed Engineered Wood trusses and frames (Glulams)
PROGRAM MATRIX: WELCOME + ENTRY + PARKING

**PROGRAM ELEMENTS**

Check-in
- Covered pavilion (bench seating for kids)
  - Includes (2) unisex restrooms
  - Flexible to allow for rainy day activities
Office space
Camp Store
Rental Shop (serves both summer and winter)

**ARCHITECTURAL NARRATIVE**

Open Air Pavilion: (3,400 sf)
- slab on grade, timber post & beam construction,
  - metal pitched roof
- untempered, CMU enclosed toilet facilities
Entry Building (Office, Store, Rental) (1,250 sf)
- Wood Frame Construction envelope
- Window units,
- Tempered, fully insulated

**FLOOR PLAN**

**ELEVATION**

**SITE PLAN**

**SITE KEY PLAN**
PROGRAM MATRIX: WELCOME + ENTRY + PARKING

WELCOME + ENTRY

PROGRAM ELEMENTS
Check-in/parking
- Parking
  - 152 cars
  - Bus drop-off/pick-up
  - Car drop-off/pick-up

ARCHITECTURAL NARRATIVE
Combination of asphalt and Class 5 surfaces
PROGRAM MATRIX: AMPHITHEATER + SINGING HILL

AMPHITHEATER + SINGING HILL

PROGRAM ELEMENTS
Amphitheater seating

ARCHITECTURAL NARRATIVE
Open Air Amphitheater:
- Seating area: Wood benches built into the hill
- Stage area: Raised wood stage, deck construction w/wood post on conc post footing
- Overhead fabric shading to be added in the future

FLOOR PLAN

SECTION
PROGRAM MATRIX: POOL + SPLASH PAD

PROGRAM ELEMENTS

- Locker room facilities
  - Lockers (150 per gender)
  - Showers (6 per gender)
  - Toilets (4 per gender)
  - Sink space
  - Changing rooms (10 per gender)
- Multi-purpose room
  - Rainy day space + dining hall in the summer
  - Warming house in the winter
- Splash pad
- Pool
- Slides
ARCHITECTURAL NARRATIVE

Locker Room Building (3,440 sf total)
- Slab on Grade w/frost footings
- CMU wall construction w/ pitched metal roof over wood trusses
- Insulated & heated(winter) building
- Pool Mechanical Room
- Split into two volumes

Multi-purpose Building (5,480 sf total)

Poolside shade structure over patio
- Tensile shade cloth sails & steel tube supports

Outdoor in-ground pool
- Poured concrete pool & deck
- Premanufactured slides & splash pad accessories
PROGRAM MATRIX: "WEEBEE" - PRESCHOOL PLAY AREA

"WEEBEE" - PLAY AREA

PROGRAM ELEMENTS
- Play park/play houses
- Shaded area
- Playfield
- Miscellaneous activities (music maker, games, nature hut, etc)
- Arts & crafts
- Target activity

ARCHITECTURAL NARRATIVE
- Picnic Pavilion: (1,750 sf)
  - Timber structure w/metal or shade cloth roof
  - Slab on grade w/post footings for structure
- Play structures
  - Pre-manufactured play structures

FLOOR PLAN

ELEVATION
PROGRAM MATRIX: HORSES

PROGRAM ELEMENTS

Horse Stables
- (10 full time horses, rental horses)
  Tack room

Seasonal Horse Shelter (50 - 62 seasonal horses)
- used as indoor riding area when horses are out to pasture

Demonstration Barn
  Demonstration Space
  Tack Room
  Restrooms

Bulk Feed Storage Silos (relocate existing)

Hay storage shelter

Pasture (10+ acres)

Paddock

Trails - throughout property

Reference feedlot registration form for additional information.
  - Adheres to all state regulations.
**ARCHITECTURAL NARRATIVE**

**Horse Stables** (4,000 sf)
- Timber or steel structure with metal siding
- Slab on grade with frost footings
- Tempered and fully insulated
- Pitched roof with metal roofing

**Relocated Galvanized Metal Feed Bins** (2)

**Horse Shelter & Indoor Riding** (6,100 sf)
- Three-sided structure
- Glulam or steel structure with metal siding
- Slab on grade with frost footings or post footings
- Pitched Roof with metal roofing

**Hay Storage Shelter**
- Three-sided structure
- Dimensional lumber or steel structure with metal siding
- Slab on grade with frost footings or post footings
- Pitched roof with metal roofing

**Demonstration Barn** (1,700 sf)
- Timber or steel structure with metal siding
- Slab on grade with frost footings
- Tempered and fully insulated
PROGRAM MATRIX: VERTICAL ADVENTURES

VERTICAL ADVENTURES

PROGRAM ELEMENTS

Climbing wall (beginner + advanced)
High ropes course + zip line
Kici Challenge - team building
Big Swing
Storage (shed)

ARCHITECTURAL NARRATIVE

Storage Shed (250 sf)
-Premanufactured storage shed

Climbing Walls
-Custom or premanufactured wood armatures for climbing grip attachments & rope tie-offs

Ropes Course
-Cables/Ropes tied between trees and self-supported steel supports
**PROGRAM MATRIX: OUTDOOR/NATURE SKILLS**

**SURVIVAL SKILLS**

**PROGRAM ELEMENTS**
- Archery courses
- Sling shot
- Fire building skills
- Storage (shed)

**ARCHITECTURAL NARRATIVE**
- Target Sports
  - natural and man-made targets
- Fire Rings
  - steel fire rings
- Locked Storage
  - storage shed

**SITE PLAN**

**SITE KEY PLAN**
PROGRAM MATRIX: S.T.E.A.M. (SCIENCE, TECHNOLOGY, ARTS, MATHEMATICS)

PROGRAM ELEMENTS

Utilize existing pole barn
- Shop equipment
- Art equipment (pottery wheels, dark room, easels, etc)
- Open, flexible studio

Lake front storage barn in summer

Biology barn (reuse existing horse barn)
- Classroom with equipment
- Nature center

Trails & lookout points (throughout property)

ARCHITECTURAL NARRATIVE

Existing pole barn (8,625 sf)
- Pole shed construction, metal siding & roof
- Slab on grade
- Fully insulated

Lake front storage barn (see Lake Front for building info)

Existing Horse barn - Biology barn (3,450 sf)
- Pole shed construction, asphalt roof
- Dirt Floor
- Uninsulated
**PROGRAM MATRIX: LAKE FRONT**

**SITE PLAN**

- **PROGRAM ELEMENTS**
  - Swimming beach
  - Dock
  - Swimming platform
  - Boating Area
  - Dock
  - Non-motorized boats
  - Storage racks
  - Changing rooms + restrooms
    - 2 restrooms + 10 changing rooms per gender
  - Winter Storage (converted to Arts & Crafts in summer)
  - Rainy day shelter in summer

**ARCHITECTURAL NARRATIVE**

- Lake front storage barn (2,900 sf)
  - Pole Shed Construction, metal siding/roofing
  - Not winterized
  - Large Garage Door

- Changing Rooms + Restrooms (1,200 sf)
  - CMU wall construction w/truss roof & metal roofing
  - Slab on grade w/frost footings

**FLOOR PLANS**

**ELEVATIONS**

**SITE KEY PLAN**

**BUFFALO RUN & CAMP KICI YAPI**

CUP Application
**PROGRAM MATRIX: BIG HILL**

**SITE PLAN**

**PROGRAM ELEMENTS**
Giant slides
Sledding in Winter

**ARCHITECTURAL NARRATIVE**
Premanufactured slide elements
Site built slide, materials tbd
**PROGRAM MATRIX: OPEN PLAY FIELDS**

**OPEN PLAY FIELDS**

**PROGRAM ELEMENTS**

Located throughout property

Picnic pavilions for shade

**ARCHITECTURAL NARRATIVE**

Picnic Pavillion (near lakes) (2,875 sf)
- slab on grade, timber frame construction, metal pitched roof

Picnic Pavillion (near lakes) (2,875 sf)
- slab on grade, timber frame construction, metal pitched roof
PROGRAM MATRIX: STAFF/TRAINING RESOURCES

STAFF/TRAINING RESOURCES

PROGRAM ELEMENTS

Utilize existing house
- Office/workspaces
- Break spaces
- First aid/nurses space
- Training rooms (junior leadership training, community retreats)
- Caretaker’s house (utilize existing cabin)
- Storage facilities (throughout property)

ARCHITECTURAL NARRATIVE

Existing Main House (9,200 sf)
- Interior renovation of existing space
- Typical wood frame construction w/concrete foundation

Existing Caretaker’s Cottage (2,300 sf)
- Interior renovation of existing space
- Log construction w/CMU construction

SITE PLAN

CARETAKER’S HOUSE
MAIN HOUSE
8535 230TH ST E

SITE KEY PLAN
230TH STREET E.

BUFFALO RUN & CAMP KICI YAPI
CUP Application
February 06, 2019
EXISTING STRUCTURES: MAIN RESIDENCE

SQUARE FOOTAGE:
- Total living area: 9,400 sf
- Attached Garage (4 stalls): 1,280 sf

OVERALL CONDITION:
- Good - Interior space, exterior facade
- Fair - Exterior Deck, Gazebo, Tennis court

FEATURES:
- 7 fireplaces, generator
- Outdoor gazebo, tennis court (fair), man-made water fall, dock

PROPOSED USES:
- Camp staff resources, nurses station, meeting and training space.
- One garage stall for maintenance vehicle parking
EXISTING STRUCTURES: EQUIPMENT SHED

SQUARE FOOTAGE:
- Main floor: 6,077 sf
- Upper Level/Loft: 2,077 sf
- Total: 8,154 sf

OVERALL CONDITION:
- Excellent - Interior space, exterior facade

FEATURES:
- Zoned, in-floor heat, Fully Insulated
- Four bay doors w/operators (one large 14’ door)

PROPOSED USES:
- Workshop Space/Maker’s Space for different crafts (woodworking, art, etc); community education classes
**EXISTING STRUCTURES: Cottage**

- **GRAVEL ROAD TO MAIN GATE**

**SQUARE FOOTAGE:**
- Main floor and full basement: 2,254 gsf
- Upstairs enclosed loft room: 198 sf
- Open loft: 50 sf
- Total: 2,502 sf

**OVERALL CONDITION:**
- Fair - Water Damage, basement unfinished, old windows

**FEATURES:**
- Large Field Stone Fireplace
- Log construction
- Loft

**PROPOSED USE:**
- Caretaker Cottage
EXISTING STRUCTURES: BARNs

SQUARE FOOTAGE:
- Barn 1 (outside dimensions 40 x 72): 2,880 sf
- Barn 2 (outside dimensions 40x56): 2,240 sf

OVERALL CONDITION:
Fair

FEATURES:
- Barn 1: Pole building with dirt floor
- Barn 2: Pole building with concrete floor, finished ceiling/walls
- adjacent fenced pasture area

PROPOSED USES:
- Barn 1: Classrooms, nature center
- Barn 2: Storage
  - Maintenance vehicle storage
Nuisance Mitigation Plan
Conditional Use Permit Submission – 2018/12/31

The YMCA is planning to develop a YMCA camp with outdoor and indoor activities on a 220-acre parcel location at 8535 230th Street, New Market Township. The plan below addresses the topics laid out in the Scott County Zoning Ordinance document, Chapter 4-6 “Nuisance Standards”.

1. **Air Pollution:**
Camp activities will not generate any type of air pollution and will comply with all Minnesota Pollution Control Agency rules and regulations.

2. **The emission of odor by any use:**
The camp is not involved in any activities beyond permitted agricultural uses that will generate problematic odors. Horses will be kept on site and a manure management plan will follow current Best Management Practices to limit the odors associated with those animals. Additionally, the day campers will occasionally cook over small campfires during the lunch hour – however, the size of the property and location of camp fires will allow any smoke to dissipate before it reaches the boundaries of the camp.

3. **Emission of noise:**
During the day, there will be the sound of youth enjoying themselves as they participate in outdoor activities. There will not be any type of general camp announcement system apart from an emergency alert system. An amphitheater will have an amplification system and will follow current Best Management Practices as well as adhere to all ordinances governing noise with the goal of having no amplified noise loud enough to be heard from the property line.
4. **Bulk Storage (Liquid):**
The only bulk liquid storage tanks present onsite will be for liquid propane use for heating. The tanks will be leased or owned and placed in accordance with the MPCA regulations and Minnesota State Building code.

5. **Hazardous Materials:**
Chlorine will be the only potentially hazardous material and will be used to chlorinate the pool. The chlorine storage cabinet/closet will be located and constructed to comply with local and state building codes. There will be no release of chlorine or pool water in quantities that could be deemed detrimental to public health or the environment.

6. **Solid Waste:**
The YMCA will not create any amount or sort of solid waste to require the use of specialized containers beyond the typical dumpster type. There will be no solid waste facilities on site as defined by the Scott County Solid Waste Management Ordinance.

7. **Waste:**
The YMCA will not generate any waste material as described in the Scott County Adopted Zoning Ordinance document Chapter 4-6-7. Nor will the YMCA accumulate or store such waste on the property. Any and all deceased animals associated with camp activities (horses) will be contracted out per the submitted Horse Management Plan.

8. **Radiation Emission**
There will be no activates that will emit radioactivity.
9. **Electrical Emission**

There will be no activities that will emit electrical emissions.

10. **Commercial, industrial, institutional refuse and recyclable materials and equipment.**

All garbage and recyclable materials will be collected at regular and reasonable intervals and brought to a commercial dumpster centrally located on the property and easily accessible by collection trucks. All dumpsters and bins will be located and sited so as to be screened from neighbors and the public right-of-way as described in the Scott County Adopted Zoning Ordinance document. Commercial garbage collection will be done weekly (more often if needed) to keep the site clean of all garbage and recycle materials.
Horse Management Plan

Conditional Use Permit Submission – 2018/12/31
Conditional Use Permit Update – 2019/02/06

The YMCA is planning to develop a YMCA camp with outdoor and indoor activities on a 220-acre parcel located at 8535 230th Street, New Market Township. A major component of the YMCA’s operations is the onsite Horse Program. The below Horse Management Plan describes the management and operations of the program as it pertains to the acceptable and proper practices laid out by the Scott County Soil & Water Conservation District and other applicable regulations.

1. Location of YMCA Horse Program Operations:
The Horse program will reside in a location that is generally north and west of the main entry area of the camp. This area presents a more open and level area suitable to equine operations and buildings. Specific location and layout of Horse Program components can be found in the CUP submission documents, including Civil Engineering drawings. Should the equine operation be deemed such, the proposed location satisfies the requirements laid out in the Scott County Zoning Ordinance Chapter 9-4 requiring new feedlot operations to be located one mile or more from a city boundary or existing public sewer or water. Additionally the location is not in the Floodplain District.

2. Type & Number of Animals:
The number of horses on site will vary by season. There will be 10 horses that live onsite year-round. During the peak season of June through August (12 weeks) up to 62 additional horses may join the permanent herd. The maximum number of animals during the peak of the season (June through August) will be 72. All calculations and
designs are derived from the peak number as it presents a “worst-case-scenario” even though throughout the rest of the year the horse numbers will be significantly lower.

3. Animal Waste:
Manure will be proactively managed through multiple daily trail and barn pickups. Manure will be collected and deposited in a designated stockpile. The stockpile location will be constructed per the best practices laid out in the Minnesota Pollution Control Agency's Manure Stockpile Guidelines and state and local regulations. This includes the use of a compacted clay or a concrete base. It is also anticipated that the stockpile site will be enclosed on three sides to more fully contain the waste as well as provide easier clearing by machinery. Specific siting of the stockpile can be found on sheet C400 and C405 of the Civil Engineer’s drawings as submitted as part of this package. Required distances to wetlands and private wells are adhered to and illustrated on the site plan.

The stockpile is to be cleared out through a contracted service multiple times a year dependent on animal capacity and seasonal operations. It is anticipated that the YMCA will contract all manure handling services through NBW Horse Farm Services (320-395-2890). Pasture lands will be scraped of manure in early fall and hauled away through the contracted service as stated above. Should the YMCA make a change in service providers it is understood that the SWCD will be notified of the change in order to update their files.

All manure will be collected and transported offsite, there is to be no on-site land application or spreading of manure.

4. Odor and Insect Control:
Proactive strategies will be employed to minimize odor and insect activity based on available best practices and current practices used by the YMCA. Manure will be managed as describe above to mitigate any odors. Insect control strategies will include
current YMCA practices which include the use of fly wipes for horses and insect control strips.

5. Disposal of Dead, Dying, or Diseased Animals:
The removal of any dead, dying, or diseased animals will be contracted through the existing service provider for the YMCA; Leroy Job Trucking (612-245-6085).

6. Productive Acreage of the Property:
During peak season the proposed operation and property do not meet the Maximum Animal Unit Density guidelines as described in the County Zoning Ordinance (chapter 9-2-3 par. 2). Therefore, the YMCA is seeking approval via conditional use permit submitted for County review. However, during the “off season” the available acreage meets the animal unit guidelines for productive acreage as described in Chapter 9-2-3 paragraph 1. The YMCA has submitted the appropriate registration form to the MPCA for registration as a feedlot. A copy of the MPCA registration form is attached for record.

7. Annual Review:
It is understood that Horse Program operations are subject to annual review and failure to comply with the conditions set out by the County can result in the revocation of permit to operate.
Feedlot registration form

Feedlot Program

Doc Type: Feedlot Registration

Instructions: Minn. R. ch. 7020 requires most owners of livestock operations to provide information requested in this form to the Minnesota Pollution Control Agency (MPCA) at least once in a four-year cycle, unless a permit application has been made. Feedlots with a National Pollutant Discharge Elimination System (NPDES) or State Disposal System (SDS) permit cannot use this form to document change of name or ownership.

Submittal Instructions:
For feedlots located in a delegated county: Send this form to your County Feedlot Officer
For feedlots not located in a delegated county:
- After signing this form, scan and email it to FeedlotSubmittal.pca@state.mn.us.
- If submission via email is not possible, you can mail this form to: Attn: Feedlot Master File Staff, Minnesota Pollution Control Agency, 18 Wood Lake Drive SE, Rochester, Minnesota, 55904.

Facility name and address □ The information below reflects a change to the name of an existing registered facility.

Facility name: CAMP KICI YAPI
Facility Address: 8535 230th STREET EAST
City: LAKEVILLE
Phone: 612 371 8733
Email: greg.hanks@ymcamn.org

Registration number:
Parcel ID number: 089090471
Zip code: 55044

Ownership information □ The information below reflects a change of ownership of an existing registered facility.

Feedlot owner □ Same as feedlot name and address
Name: SOUTHDALE YMCA (ATTN: GREG HANKS)
Address: 7355 YORK AVE. SO.
City: EDINA
Phone: 952-835-3331
Email: greg.hanks@ymcamn.org

Contact person □ Same as feedlot owner information
Name:
Address:
City:
Phone:
Email:

State:
Zip:

Facility locational information

County: SCOTT
City/Township: NEW MARKET TOWNSHIP

<table>
<thead>
<tr>
<th>Township (26-71 or 101-168)</th>
<th>Range (1-61)</th>
<th>Section (1-36)</th>
<th>¼ Section (NW, NE, SW, SE)</th>
<th>¼ of ¼ Section (NW, NE, SW, SE)</th>
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<td>113</td>
<td>21</td>
<td>9</td>
<td>NW 1/4</td>
<td>SW 1/4</td>
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</tbody>
</table>

Any surface waters or tile intakes within 1,000 feet of the facility? (If Yes, indicate types below)

□ Lake/Pond larger than 25 acres □ Wetland □ Drainage ditch □ River/Stream/Creek □ Tile intake

Is any part of the facility within 300 feet of a river/stream?

□ Yes □ No

Any part of the facility located within a delineated flood plain (100 year flood)?

□ Yes □ No

Any part of the facility located within designated shoreland?

□ Yes □ No

Any part of the facility within 300 feet of a known sinkhole?

□ Yes □ No

Facility operations information (indicate components that are currently part of your livestock or poultry operation)

Animals on pasture for part of the year

□ Yes □ No

Open lots (dirt, concrete, other) that are designed as animal holding areas

□ Yes □ No

Buildings that are designed for animal confinement or as animal holding areas

□ Yes □ No

If yes to either above, what is the shortest distance from an animal holding area to a well? (including unused or unsealed wells) 105 feet

□ Yes □ No

A liquid manure storage structure

□ Yes □ No

A manure stockpile (solid manure storage area)

□ Yes □ No

If yes to either above, what is the shortest distance from a manure storage area to a well? (including unused or unsealed wells) 318 feet

□ Yes □ No

If you closed a liquid manure storage area or permanent manure stockpile since your last registration, complete the following:

Date closed: □ Liquid storage □ Solid storage

Date closed: □ Liquid storage □ Solid storage
Number of animals at the facility

If you currently do not maintain animals at the site, list the date that you last had animals (mm/dd/yyyy): 1/1

Enter in column C the maximum number of animals that you have maintained (standing herd or flock size) at the facility at any
given time in the past five years.

Then calculate the animal units in column D by multiplying the value in column C by the value in column B.

<table>
<thead>
<tr>
<th>Animal type</th>
<th>Animal unit factor</th>
<th>Maximum number (head) maintained at anytime in past 5 years</th>
<th>Animal Units</th>
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<tbody>
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<td>Dairy – mature cow <em>(milked or dry)</em> over 1,000 lbs.</td>
<td>1.4</td>
<td></td>
<td></td>
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<tr>
<td>Dairy – mature cow <em>(milked or dry)</em> under 1,000 lbs.</td>
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<tr>
<td>Dairy – heifer</td>
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<td></td>
</tr>
<tr>
<td>Dairy – calf</td>
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<td></td>
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<tr>
<td>Beef – slaughter steer or stock cow</td>
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<td></td>
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<tr>
<td>Beef – feeder cattle <em>(stucker or backrounding)</em> or heifer</td>
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<tr>
<td>Beef – cow and calf pair</td>
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<td>Beef – calf</td>
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<tr>
<td>Veal – calf</td>
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<tr>
<td>Swine – over 300 pounds</td>
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<tr>
<td>Swine – between 55 and 300 pounds</td>
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<tr>
<td>Swine – under 55 pounds <em>(and separated from sow)</em></td>
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<td>Sheep or lamb</td>
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<td>Chickens – all sizes with liquid manure system</td>
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<td>Chickens – broiler 5 lbs. and over – dry manure system</td>
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<td></td>
</tr>
<tr>
<td>Chickens – broiler under 5 lbs. – dry manure system</td>
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<tr>
<td>Chickens – layers 5 lbs. and over – dry manure system</td>
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<td></td>
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<tr>
<td>Chickens – layers under 5 lbs. – dry manure system</td>
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<tr>
<td>Turkeys – over 5 lbs.</td>
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<tr>
<td>Turkeys – under 5 lbs.</td>
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<tr>
<td>Ducks – dry manure system</td>
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<tr>
<td>Ducks – liquid manure system</td>
<td>0.01</td>
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<tr>
<td>Other animals <em>(not listed above – specify in space below)</em>:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| | | | Total AU |
| | | | 72 |

Signature (person completing the form) and Submittal

Print name: Greg Hanks
Signature: [Signature]
Title: Executive Director – Southdale YMA
Date: 1/31/19
SITE DEVELOPMENT PLANS
FOR
CAMP BUFFALO RUN
NEW MARKET TOWNSHIP, SCOTT COUNTY, MN

NOTES:
1. CONTRACTOR SHALL CONFIRM THAT THE EXISTING CONDITIONS FOR THE SITE MATCH WHAT IS SHOWN ON THE DRAWINGS INCLUDED PRIOR TO CONSTRUCTION.
2. RESPONSIBILITY TO MEASURE AND CALL ALL UTILITIES IN THE VICINITY.
3. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR SPECIFICATIONS MUST BE COMPLETED PRIOR TO ANNOUNCED BUILDING POSSESSION DATE.
4. EROSION CONTROL AND FINAL GRADING MUST BE COMPLETED BY THE MILESTONE DATE IN PROJECT DOCUMENTS.
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the guidance of Kimley-Horn and Associates, Inc. and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
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EROSION CONTROL NOTES

1. Upon implementation and installation of the following areas: trailer, parking, laydown, porta-potty, wheel wash, concrete washout, fuel location as they occur throughout the construction process.

2. The contractor shall maintain all erosion control measures, including the removal of silt in front of silt fences during the duration of the contract.

3. All erosion control measures shall be installed and maintained in accordance with the plans and specifications.

4. Erosion control measures shall be installed prior to construction.

5. The contractor shall maintain all erosion control measures, including the removal of silt in front of silt fences during the duration of the contract.

6. The contractor shall maintain all erosion control measures, including the removal of silt in front of silt fences during the duration of the contract.

7. The contractor shall maintain all erosion control measures, including the removal of silt in front of silt fences during the duration of the contract.

8. The contractor shall maintain all erosion control measures, including the removal of silt in front of silt fences during the duration of the contract.

9. The contractor shall maintain all erosion control measures, including the removal of silt in front of silt fences during the duration of the contract.

10. The contractor shall maintain all erosion control measures, including the removal of silt in front of silt fences during the duration of the contract.

SEQUENCE OF CONSTRUCTION:

1. Start construction of the building pad and structures.

2. Construct and stabilize diversions and temporary sediment traps.

3. Prepare temporary parking and storage area.

4. Add rough grade to establish proposed drainage patterns.

5. Install temporary erosion control measures before the start of site grading.

6. Install temporary erosion control measures before the start of site grading.

7. Install temporary erosion control measures before the start of site grading.

8. Install temporary erosion control measures before the start of site grading.

9. Install temporary erosion control measures before the start of site grading.

10. Install temporary erosion control measures before the start of site grading.

SWPPP UPDATES AND AMENDMENTS

1. Construction for water quality management plans and control measures must be reviewed by the engineer.

2. Add temporary erosion control measures before the start of site grading.

3. Add temporary erosion control measures before the start of site grading.

4. Add temporary erosion control measures before the start of site grading.

5. Add temporary erosion control measures before the start of site grading.

6. Add temporary erosion control measures before the start of site grading.

7. Add temporary erosion control measures before the start of site grading.

8. Add temporary erosion control measures before the start of site grading.

9. Add temporary erosion control measures before the start of site grading.

10. Add temporary erosion control measures before the start of site grading.
C. THE SITE STORM DRAIN SYSTEM OR DISCHARGED OFF-SITE.

THE PERMITTED PROJECT AREA:

LOCAL RAINFALL INTENSITIES WERE CONSIDERED WHEN DEVELOPING BMP’S.

FROM MUST BEST

PHASE.

PROVIDED BY THE CEC.

PERMITTED PROJECT AREA LIMITS OF DISTURBANCE.

PERFORM APPROACHES THAT UTILIZE READILY AVAILABLE EXPERTISE, MATERIAL, AND EQUIPMENT.

ALL OPEN AIR PAVILION, POOL FACILITIES, AND PICNIC PAVILLION, CHANGIN ROOMS, RESTROOMS, TRAILS CONNECT SITE ELEMENTS. IMPROVING ZANE ELOEMENT FROM A GRAVEL ROAD TO A

BE

SUPPLY

SHOULD THE SITE BE IMPAIRED, CONSTRUCTION (BMP’S) ARE LOCATED WITHIN THE ST. PAUL, MN 55114

NATIONAL HISTORIC PRESERVATION ACT (NHPA), AND LEGAL REQUIREMENTS.

TO ENHANCE CONSTRUCTION Sites AND CLEANUP

DEBRIS OR MATERIALS AND TO REUSE OR RECLAIM MATERIALS.

GOVERNMENTAL REGULATIONS WHEREVER SUCH MATERIALS, OR ANY CONSTRUCTION MATERIALS, ARE TO BE DISCARDED.

MAY BE REMOVED AND STORED IN THE OWNERSHIP OF THE CONTRACTOR, WITH THE RIGHT TO RECLAIM SUCH MATERIALS AT A LATER DATE.

GAME OF THE SITE WORKS CONSTRUCTION ACTIVITIES, PERMANENTLY SHOULDN’T BE DISCARDING.Materials, including but not limited to, Silt Fences, Grasses, Spoils, Soils, Bricks, and Wastes, MUST BE STORED ON THE SITE IN A MANNER THAT IS CONSISTENT WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

ALL OPEN AIR CONSTRUCTION ACTIVITIES Must BE DISCUSSED WITH A NEIGHBORING PROPERTY OWNER PRIOR TO BEGUN.

FROM OPEN AIR CONSTRUCTION ACTIVITIES.

GAS CAPS, OR ANY COMBINATION THEREOF, TO BE DISCARDED.

ALL MATERIALS WITHIN THE PREMISES ARE TO BE STORED IN A MANNER THAT IS CONSISTENT WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THE CONTRACTOR WILL SUBMIT A REQUEST FOR INFORMATION TO THE CEC, AND CONSTRUCTION PERMIT APPROVAL MUST BE OBTAINED PRIOR TO THE PERFORMANCE OF THE FOLLOWING:

1. ANY HAZARDOUS MATERIAL HANDLING, STORAGE, TRANSPORTATION, OR DISPOSAL.

2. INFILL, EROSION CONTROL, OR SEDIMENT CONTROL DEVICES.

3. ANY HAZARDOUS MATERIALS IN WORK ZONES, INCLUDING, BUT NOT LIMITED TO, PETROLEUM,危险

THE CONTRACTOR MAY REQUEST ADDITIONAL BORING, WITHOUT CONSTRUCTION APPROVAL OR CONSTRUCTION PERMIT, TO OBTAIN ADDITIONAL INFORMATION.

ONCE CONSTRUCTION IS COMPLETE, REQUEST TO THE CEC, AND CONSTRUCTION PERMIT APPROVAL MUST BE OBTAINED PRIOR TO THE PERFORMANCE OF THE FOLLOWING:

1. ANY HAZARDOUS MATERIAL HANDLING, STORAGE, TRANSPORTATION, OR DISPOSAL.

2. TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES.

3. ANY HAZARDOUS MATERIALS IN WORK ZONES, INCLUDING, BUT NOT LIMITED TO, PETROLEUM, HAZARDOUS Wastes.

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STAFF TRAINING

C505

PASTURE

7.7 AC

PASTURE

C507

MANURE STORAGE

LONG TERM

HORSE SHELTER /

FFE=1094.0

6,000 S.F.

BINS

FFE=1095.0

FFE=1095.0

HAY

STABLES

3,000 S.F.

HORSE

T

FFE=1095.50

1,500 S.F.

BARN

DEMONSTRATION

1+00

3+00

4+00

11+00

W

14+00

D

32+00

16+00

12+00

SEE CH 62 RIGHT TURN LANE PLANS

27+00

DROP-OFF

SCHOOL

BUS

SKILLS

S.T.E.A.M.

PARENT

PARENT

NO PARKING

ZONE

OPEN AIR PAVILION

OPEN AIR PAVILION

ENTRY BUILDING

ENTRY BUILDING

FFE=1081.00

FFE=1081.00

2 3 0 T H   S T R E E T   E A S T

ADVENTURES

AMPHITHEATURE

VERTICAL

PLAY FIELDS /

MULTI-PURPOSE

X,XXX S.F.

W

GATHERING SPACE

PATIO

PATIO

FACILITIES

X,XXX S.F.

POOL

WEE BEE

VILAGE

SLIDES

PLAY FIELDS /

PLAY FIELDS /

PICNIC AREA

PICNIC AREA

W

FFE=1113.00

X,XXX S.F.

PAVILION

STORAGE

WALKING BRIDGE

DOCK

PLAY FIELDS /

PLAY FIELDS /

PICNIC AREA

PICNIC AREA

W

FFE=1113.00

X,XXX S.F.

PAVILION

STORAGE

WALKING BRIDGE

DOCK

PLAY FIELDS /

PLAY FIELDS /

PICNIC AREA

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FFE=1113.00

X,XXX S.F.

PAVILION

STORAGE

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X,XXX S.F.

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DOCK

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PLAY FIELDS /

PICNIC AREA

PICNIC AREA

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FFE=1113.00

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DOCK

PLAY FIELDS /

PLAY FIELDS /

PICNIC AREA

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PLAY FIELDS /

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PICNIC AREA

PICNIC AREA

W

FFE=1113.00

X,XXX S.F.

PAVILION

STORAGE

WALKING BRIDGE

DOCK

PLAY FIELDS /

PLAY FIELDS /

PICNIC AREA

PICNIC AREA

W

FFE=1113.00

X,XXX S.F.
LEGEND

- PROPERTY LINE
- CENTERLINE CENTER
- PROPERTY CENTER LINE (RIGHT EXIST)
- PROPERTY CENTER LINE (LEFT EXIST)
- PROPERTY CENTER LINE (RIGHT NON-EXIST)
- PROPERTY CENTER LINE (LEFT NON-EXIST)
- PROPOSED ELEVATION OF CURB AT CURB LINE
- PROPOSED ELEVATION OF CURB AT STREET LINE
- PROPOSED ELEVATION OF CURB AT STREET CURB
- PROPOSED EXISTING ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- PROPOSED GUTTER ELEVATION
- PROPOSED LOW POINT ELEVATION
- PROPOSED SPOT ELEVATION
- PROPOSED STORM SEWER
- PROPOSED RIPRAP
- PROPOSED FLARED END SECTION
- PROPOSED STORM SEWER CLEANOUT
- PROPOSED STORM SEWER SLOPE
- PROPOSED STORM SEWER MANHOLE (ROUND INLET CASTING)
- PROPOSED STORM SEWER MANHOLE (SOLID CASTING)
- PROPOSED STORM MANHOLE (ROUND INLET CASTING)
- PROPOSED STORM MANHOLE (SOLID CASTING)
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPERTY LINE
- NORTH
- S.T.E.A.M.

C507

MATCHLINE - SEE SHEET CON

MATCHLINE - SEE SHEET CON

S.T.E.A.M.

GRADING PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY CAMP BUFFALO ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL SHEET NUMBER DATE

KIMLEY-HORN AND ASSOCIATES, INC. © RESPONSE TO COMMENT

DESIGNED BY RAH / DLE 2550 UNIVERSITY AVENUE WEST, SUITE 238N, ST. PAUL, MN 55114

DRAWN BY RAH / DLE 12/21/2018

CHECKED BY DANIEL L. ELENBAAS, P.E. 02/06/2019

MN LIC. NO.

CUP SET 02/06/2019

NEW MARKET TOWNSHIP MINNESOTA.

WWW.KIMLEY-HORN.COM

RAH

RAH

RAH

RAH

RAH

RAH / DLE

RAH / DLE

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RAH / DLE

RAH / DLE
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FUTURE SANITARY AND SEPTIC TO BE DESIGNED BY OTHERS. APPROXIMATE LOCATION OF SANITARY FORCE MAIN LINES.

FUTURE WATER SERVICES AND WELL TO BE DESIGNED BY OTHERS. APPROXIMATE LOCATION OF WATER SERVICE AND WELL SHOWN.
SANITARY AND SEPTIC TO BE DESIGNED BY OTHERS.

APPROXIMATE LOCATION OF SANITARY SEWER LINES AND SEPTIC AREA.

WATER SERVICES AND WELL TO BE DESIGNED BY OTHERS.

APPROXIMATE LOCATION OF WATER SERVICE AND WELL SHOWN.

CHANGING ROOMS / RESTROOMS 1,200 S.F.

BOAT LAUNCH

WALKING BRIDGE

PRIMARY SEPTIC AREA 5,000 S.F.

S.T.E.A.M.

STAFF TRAINING / RESOURCES

DOCK

FFE=1070.50

MATCHLINE - SEE SHEET C610

MATCHLINE - SEE SHEET C606

MATCHLINE - SEE SHEET C607
FILTRATION BASIN NOTES:

1. INSTALLATION INVOLVING: SOIL, DRAINTILE, AGGREGATE, FILTER FABRIC, AND EROSION INCORPORATE/RIP SOIL MEDIA MIX INTO THE LOOSENED UNDERLYING SOILS A MINIMUM FROST RIPPER TO DEEPLY LOOSEN SUB-SOILS TO A MINIMUM DEPTH OF 24", BEFORE BACK-FILLING WITH SOIL MEDIA MIX. UPON PLACEMENT OF SOIL MEDIA MIX, PLACEMENT, AND TO VERIFY THAT EXPECTED SUB-SOIL INFILTRATION RATES WILL BE CONTROLLED.

2. OVER-EXCAVATION WILL BE OCCURRING, TO INSPECT PRIOR TO SOIL MEDIA SEGREGATION.

3. CONTRACTOR IS TO NOT COMPACT FILTRATION BASINS.

4. CONTRACTOR IS TO NOT COMPACT FILTRATION BASINS.

5. TOP OF BASIN: 1055.00

6. DRAINTILE IE: 1050.00

7. OF SAND: 1052.0

8. FILTER FABRIC.

9. INSTALLATION INVOLVING: SOIL, DRAINTILE, AGGREGATE, FILTER FABRIC, AND EROSION INCORPORATE/RIP SOIL MEDIA MIX INTO THE LOOSENED UNDERLYING SOILS A MINIMUM FROST RIPPER TO DEEPLY LOOSEN SUB-SOILS TO A MINIMUM DEPTH OF 24", BEFORE BACK-FILLING WITH SOIL MEDIA MIX. UPON PLACEMENT OF SOIL MEDIA MIX, PLACEMENT, AND TO VERIFY THAT EXPECTED SUB-SOIL INFILTRATION RATES WILL BE CONTROLLED.

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11. CONTRACTOR IS TO NOT COMPACT FILTRATION BASINS.

12. CONTRACTOR IS TO NOT COMPACT FILTRATION BASINS.

13. FILTER FABRIC.

14. INSTALLATION INVOLVING: SOIL, DRAINTILE, AGGREGATE, FILTER FABRIC, AND EROSION INCORPORATE/RIP SOIL MEDIA MIX INTO THE LOOSENED UNDERLYING SOILS A MINIMUM FROST RIPPER TO DEEPLY LOOSEN SUB-SOILS TO A MINIMUM DEPTH OF 24", BEFORE BACK-FILLING WITH SOIL MEDIA MIX. UPON PLACEMENT OF SOIL MEDIA MIX, PLACEMENT, AND TO VERIFY THAT EXPECTED SUB-SOIL INFILTRATION RATES WILL BE CONTROLLED.

15. OVER-EXCAVATION WILL BE OCCURRING, TO INSPECT PRIOR TO SOIL MEDIA SEGREGATION.

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18. FILTER FABRIC.

19. INSTALLATION INVOLVING: SOIL, DRAINTILE, AGGREGATE, FILTER FABRIC, AND EROSION INCORPORATE/RIP SOIL MEDIA MIX INTO THE LOOSENED UNDERLYING SOILS A MINIMUM FROST RIPPER TO DEEPLY LOOSEN SUB-SOILS TO A MINIMUM DEPTH OF 24", BEFORE BACK-FILLING WITH SOIL MEDIA MIX. UPON PLACEMENT OF SOIL MEDIA MIX, PLACEMENT, AND TO VERIFY THAT EXPECTED SUB-SOIL INFILTRATION RATES WILL BE CONTROLLED.

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22. CONTRACTOR IS TO NOT COMPACT FILTRATION BASINS.

23. FILTER FABRIC.

24. INSTALLATION INVOLVING: SOIL, DRAINTILE, AGGREGATE, FILTER FABRIC, AND EROSION INCORPORATE/RIP SOIL MEDIA MIX INTO THE LOOSENED UNDERLYING SOILS A MINIMUM FROST RIPPER TO DEEPLY LOOSEN SUB-SOILS TO A MINIMUM DEPTH OF 24", BEFORE BACK-FILLING WITH SOIL MEDIA MIX. UPON PLACEMENT OF SOIL MEDIA MIX, PLACEMENT, AND TO VERIFY THAT EXPECTED SUB-SOIL INFILTRATION RATES WILL BE CONTROLLED.

25. OVER-EXCAVATION WILL BE OCCURRING, TO INSPECT PRIOR TO SOIL MEDIA SEGREGATION.

26. CONTRACTOR IS TO NOT COMPACT FILTRATION BASINS.
### Landscaping Key

<table>
<thead>
<tr>
<th>Botanical Name</th>
<th>Common Name</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picea abies</td>
<td>Norway Spruce</td>
<td>NWS</td>
</tr>
<tr>
<td>Pinus strobus</td>
<td>White Pine</td>
<td>WHP</td>
</tr>
<tr>
<td>Malus ioensis <code>Prairie Rose</code></td>
<td>Prairie Rose Crabapple</td>
<td>PRC</td>
</tr>
<tr>
<td>Populus tremuloides</td>
<td>Quaking Aspen Clump</td>
<td>QUC</td>
</tr>
<tr>
<td>Betula nigra</td>
<td>River Birch Multi-Trunk</td>
<td>RVB</td>
</tr>
<tr>
<td>Acer rubrum <code>Northwood</code></td>
<td>Northwood Maple</td>
<td>NWM</td>
</tr>
<tr>
<td>Quercus rubra</td>
<td>Red Oak</td>
<td>RDO</td>
</tr>
<tr>
<td>Diervilla lonicera</td>
<td>Dwarf Bush Honeysuckle</td>
<td>DBH</td>
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</tbody>
</table>

### Plant Key

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<td>Northwood Maple</td>
</tr>
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</table>

### Landscape Legend

- Existing Deciduous Tree (Typ.)
- Existing Coniferous Tree (Typ.)
- Edger (Typ.)
- Approximate Limits of Seeds, Seeds All Disturbed Areas (Typ.)
- Existing Vegetation Edge (To Remain) (Typ.)
- Coniferous Trees (Typ.)
- Ornamental Trees (Typ.)
- Overstory Trees (Typ.)
- Deciduous Shrubs (Typ.)
LANDSCAPE LEGEND

EXISTING DECIDUOUS TREE (TYP.)
EXISTING CONIFEROUS TREE (TYP.)
EDGER (TYP.)
APPROXIMATE LIMITS OF SEED, SEED ALL DISTURBED AREAS (TYP.)
EXISTING VEGETATION EDGE (TO REMAIN) (TYP.)

CONIFEROUS TREES

<table>
<thead>
<tr>
<th>CODE</th>
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</tr>
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<tbody>
<tr>
<td>NWS</td>
<td>PICEA ABIES</td>
<td>NORWAY SPRUCE</td>
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<td>WHP</td>
<td>PINUS STROBUS</td>
<td>WHITE PINE</td>
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ORNAMENTAL TREES

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<tbody>
<tr>
<td>PRC</td>
<td>MALUS IOENSIS <code>PRAIRIE ROSE</code></td>
<td>PRAIRIE ROSE CRABAPPLE</td>
</tr>
<tr>
<td>QUC</td>
<td>POPULUS TREMULOIDES</td>
<td>QUAKING ASPEN CLUMP</td>
</tr>
<tr>
<td>RVB</td>
<td>BETULA NIGRA</td>
<td>RIVER BIRCH MULTI-TRUNK</td>
</tr>
</tbody>
</table>

OVERSTORY TREES

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>NWM</td>
<td>ACER RUBRUM <code>NORTHWOOD</code></td>
<td>NORTHWOOD MAPLE</td>
</tr>
<tr>
<td>RDO</td>
<td>QUERCUS RUBRA</td>
<td>RED OAK</td>
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DECIDUOUS SHRUBS

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<td>DIERVILLA LONICERA</td>
<td>DWARF BUSH HONEYSUCKLE</td>
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<tr>
<td>QUC</td>
<td>QUERCUS RUBRA</td>
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Giant Slide + Sledding Hill
Swimming Beach
Play Fields / Picnic Area
Vertiical Adventures
DOUBLE SHREDDED HARDWOOD MULCH

SCARIFY SIDES AND BOTTOM OF HOLE

PLUMB AND BACKFILL WITH PLANTING SOIL

SLIT REMOVED BURLAP AT 6" INTERVALS

PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.

SCARIFY SIDES AND BOTTOM OF HOLE.

PROCEED WITH CORRECTIVE PRUNING OF TOP AND ROOT.

SET PLANT ON UNDISTURBED NATIVE SOIL OR TURF.- IF USED.

INSTALL PLANT SO THE ROOT FLARE IS AT OR UP TO 2" ABOVE THE FINISHED GRADE WITH BURLAP AND WIRE BASKET, (IF USED), INTACT.

SLIT REMOVED BURLAP AT 6" INTERVALS.

BACKFILL TO WITHIN APPROXIMATELY 12" OF THE TOP OF THE ROOTBALL, THEN WATER PLANT.

REMOVE THE TOP 1/3 OF THE BASKET OR THE TOP TWO HORIZONTAL RINGS WHICHEVER IS GREATER. REMOVE OR CORRECT STEM GIRDLING ROOTS.

PLUMB AND BACKFILL WITH PLANTING SOIL.

WATER THOROUGHLY WITHIN 2 HOURS TO SETTLE PLANTS AND FILL VOIDS.

BACK FILL VOIDS AND WATER SECOND TIME.

PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.

MIX IN 3-4" OF ORGANIC COMPOST.
CONSTRUCTION PLAN FOR GRADING, AGGREGATE BASE, BITUMINOUS SURFACING, UTILITY IMPROVEMENTS, AND LANDSCAPING.
SITE PLAN NOTES

1. CONTRACTOR MUST PROVIDE CERTIFIED DOCUMENTATION OF PASSING DENSITY IN COMPLIANCE WITH MNDOT SPECIFICATION TO THE SCOTT COUNTY HIGHWAY ENGINEER PRIOR TO COMMENCING WITH THE NEXT PHASE OF CONSTRUCTION.

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27. CONTRACTOR MUST PROVIDE CERTIFIED DOCUMENTATION OF PASSING DENSITY IN COMPLIANCE WITH MNDOT SPECIFICATION TO THE SCOTT COUNTY HIGHWAY ENGINEER PRIOR TO COMMENCING WITH THE NEXT PHASE OF CONSTRUCTION.
This project is a right turn lane located along CH 62 at Zane Avenue in New Market Township in Scott County.

The planned scope of the project includes:
- The addition of a right turn lane with accompanying ditch and culvert.

The total site area is 6.68 acres, which includes an increase of 0.17 acres of impervious area.

Special and improved waters
- This project is not located within one mile of special and improved waters.
- The ultimate receiving water from the ditch is the Credit River located west of the project site. The Credit River is a delisted stream according to the Minnesota 303(d) list within Scott County.
- The ultimate receiving water from the east pond outlet is Dean's Lake located north of the project site. Dean's Lake is a delisted water according to the Minnesota Pollution Control Authority's improved waters.

There are no known or proposed discharges to calcareous fens on this project.

SWPPP training
- The project SWPPP was prepared by personnel that are certified in the design of construction SWPPPs. The contractor is responsible for providing a certified erosion control supervisor that is responsible for overseeing the implementation of the SWPPP. The contractor must provide proof of certification at the preconstruction meeting and will not be allowed to commence work until proof of certification has been provided to the project engineer.

Erosion control supervisor
- In accordance with SPEC. 2033.1A, the contractor will provide a certified erosion control supervisor in good standing who is knowledgeable and experienced in the application of erosion prevention and sediment control best management practices.
- The erosion control supervisor will work with the project engineer to: implement the SWPPP after the construction, inspection, maintenance and of the erosion prevention and sediment control BMPs before, during and after construction, until the notice of termination (NOT) has been filed with the MPCA.
- The erosion control supervisor is responsible for complying with all the inspection and maintenance requirements stated in the SWPPP permit that applies. Inspections of the entire construction site will occur at a minimum of once every seven days during active construction and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours. The erosion control supervisor will thoroughly inspect all erosion prevention and sediment control BMPs to ensure integrity and effectiveness of each BMP. All inspections and maintenance conducted during construction must be recorded in writing and these records must be retained with the SWPPP. Inspection reports must be submitted to the project engineer in a format that meets or exceeds the project engineer's expectations. Records of each inspection shall include:
  - A. Date and time of inspections.
  - B. Name of personnel conducting inspections.
  - C. Findings of inspections, including recommendations for corrective actions.
  - D. Corrective actions taken including dates, times, and party completing maintenance activities.
  - E. Date and amount of all rainfall events greater than 0.5 inch in 24 hours.
  - F. Documents and changes made to the SWPPP.

Soil types
- A soil analysis was done by Braun Intertec and is detailed in their report dated July 31, 2014. The primary geology in the project area is clayey sand, silty sand and poorly graded sand.

Modifications to existing conditions/drainage patterns
- The project area consists of the rural section drainage of CH 62. This project will keep existing drainage patterns very similar as ditch sections will be moved north and culverts will be removed and replaced to accommodate a right turn lane. Existing drainage conditions will be maintained.

Sequence of major construction activities:
- 1. Metal the construction entrance.
- 2. Install inlet protection on all existing inlets.
- 3. Install all other temporary erosion and sediment controls such as silt fence, biorolls, rip rap, etc.
- 4. Clear and grise the site, remove pavement and curb.
- 5. Excavate ponds.
- 6. Install underground utility improvements.
- 7. Complete site grading and construct curb and gutter.
- 10. Strips and grades the site of temporary erosion and sediment control measures.

Temporary sediment control is included on sheet 6 of the CH 62 right turn lane plans.

Stormwater Pollution Prevention Plan (SWPPP) Narrative

Erosion prevention and sediment control quantities tab:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total proposed net change in impervious surface area:</td>
<td>0.68 acres</td>
</tr>
<tr>
<td>Total existing impervious surface area:</td>
<td>2.23 acres</td>
</tr>
<tr>
<td>Total proposed impervious surface area:</td>
<td>2.91 acres</td>
</tr>
</tbody>
</table>

General SWPPP notes for right turn lane:
- The project is proposed to comply with all aspects of the right turn lane construction stormwater permit at all times. If the notice of termination (NOT) has been filed with the MPCA, the contractor will develop a chain of command with all operators on the site that will ensure that the SWPPP will be implemented and stay in effect until the construction project is complete. The entire site has undergone final stabilization, and a notice of termination (NOT) has been submitted to the MPCA.
- The contractor will prepare a written, not oral, weekly schedule of proposed erosion control activities for the project engineer's approval as per Minnesota Pollution Control Agency (MPCA) Guidance.
- The contractor will prepare and submit a site plan for the engineer's approval. All site plans must be submitted to the engineer for review. The contractor shall submit a site plan before commencing work on a site plan. The contractor shall submit a site plan to the engineer, and the site plan must be approved by the engineer. The contractor will not be allowed to commence work on a site plan until approval is granted.
- The contractor will prepare a written, not oral, weekly schedule of proposed erosion control activities for the project engineer's approval. The schedule shall include:
  - A. Contract work dates.
  - B. Name of personnel conducting inspections.
  - C. Findings of inspections, including recommendations for corrective actions.
  - D. Corrective actions taken including dates, times, and party completing maintenance activities.
  - E. Date and amount of all rainfall events greater than 0.5 inch in 24 hours.
  - F. Documents and changes made to the SWPPP.

Site plans:
- The contractor will prepare and submit a site plan for the engineer's approval as per Minnesota Pollution Control Agency (MPCA) Guidance. The site plan shall include:
  - A. Contract work dates.
  - B. Name of personnel conducting inspections.
  - C. Findings of inspections, including recommendations for corrective actions.
  - D. Corrective actions taken including dates, times, and party completing maintenance activities.
  - E. Date and amount of all rainfall events greater than 0.5 inch in 24 hours.
  - F. Documents and changes made to the SWPPP.

General notes:
- The contractor will prepare and submit a site plan for the engineer's approval. All site plans must be submitted to the engineer for review. The contractor shall submit a site plan before commencing work on a site plan. The contractor shall submit a site plan to the engineer, and the site plan must be approved by the engineer. The contractor will not be allowed to commence work on a site plan until approval is granted.

Contact information:
- MINNESOTA POLLUTION CONTROL AGENCY
- CONSTRUCTION STORMWATER PERMIT PROGRAM
- 305 AVENUE SOUTH
- 520 LAFAYETTE ROAD NORTH
- ST. PAUL, MN 55104-3904
- (651) 296-6300
- (651) 296-3864

City project:
- COUNTY PROJECT

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE
STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (CONT)

WATER RESOURCES NOTES

THESE NOTES ALONG WITH THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE ARE INTENDED TO GIVE INFORMATION ON CRITICAL DRAINAGE FEATURES, NATURAL RESOURCES AND CONTRACTOR OPERATIONS THAT MAY IMPACT DRAINAGE AND NATURAL RESOURCES.

1. THE SIZE AND ELEVATION OF STORM SEWER PIPES, INLETS PERMEABLE DITCH BLOCKS AND OVERFLOW DEVICES HAVE BEEN SPECIFICALLY DESIGNED TO CONFORM TO MINNESOTA DESIGN STANDARDS, MINNESOTA POLLUTION CONTROL AGENCY (MPCA), AND WATERSHED DISTRICT PERMIT REQUIREMENTS. THE DESIGN COMPUTATIONS ARE ON FILE WITH SCOTT COUNTY. CHANGING THE DIRECTION OF FLOW FROM WHAT IS SHOWN ON THE PLANS MAY CAUSE PROBLEMS OFF THE PROJECT AND COULD MEAN THE PROJECT IS OUT OF COMPLIANCE WITH APPROVED DRAINAGE PERMITS. ANY CHANGES TO THE SOIL, ELEVATION OR DIRECTION OF FLOW OF THE DRAINAGE SYSTEM MUST BE APPROVED BY THE WATER RESOURCES DESIGNER.

2. THE FOLLOWING PERMITS APPLY TO THIS PROJECT:
   A. NPDES - THE PERMIT APPLICATION FORM HAS BEEN COMPLETED AND APPROVED BY MNDOT. THE CONTRACTOR IS RESPONSIBLE FOR COMPLETING THE REST OF THE FORM AND SUBMITTING TO THE MPCA PRIOR TO COMMENCING WORK ON SITE.

3. WITHIN AREAS WHERE BIO-INFILTRATION TRENCHES, PERMEABLE DITCH BLOCKS, FILTRATION BASINS, INFILTRATION BASINS AND DRY PONDS ARE CONSTRUCTED, ONLY TRACKED VEHICLES MAY BE USED. WHEELED VEHICLES ARE PROHIBITED FROM THESE AREAS IN ORDER TO LIMIT THE COMPACTION OF THE EXISTING AND INSTALLED ENGINEERED SOILS. EXTRA CARE SHOULD BE TAKEN TO AVOID DISCHARGE OF CONSTRUCTION SEDIMENT TO THESE DRAINAGE FEATURES. IN THE EVENT THAT SEDIMENT IS DISCHARGED ONTO THE EXISTING SOILS PRECEDING PLACEMENT OF ENGINEERED SOILS OR ONTO THE SURFACE OF ENGINEERED SOILS, THE DAMAGED AREAS WILL BE REPLACED WITH ENGINEERED SOILS. IF THESE AREAS BECOME COMPACTED, THE CONTRACTOR WILL SUBSTITUTE THE BASIN, INSTALL ADDITIONAL ENGINEERED SOILS, OR USE OTHER METHODS RECOMMENDED BY THE ENGINEER AT NO COST TO SCOTT COUNTY. THE CONTRACTOR WILL THEN VERIFY USING A DOUBLE RING INFILTROMETER THAT THE BASIN WILL FUNCTION AS DESIGNED.

4. ALL DISTURBED GREEN SPACES SHALL BE SUBSOILED IN ACCORDANCE WITH SPECIFICATION 2105.3.H. ALL SUBSOILING SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
**STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (CON’T)**

6. Chemicals must be kept in a secure storage area when not in use. Chemical storage containers must have secondary containment when being used or stored on the project site. Chemical spills of any kind, oil, fuel, fertilizer, etc., must be cleaned up and removed from the construction site immediately. The contractor must not use a total of 5 gallons of material on the construction site at any one time. If any hazardous material is to be used, it must be done in accordance with the regulations set forth by the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA).

7. WHENEVER POSSIBLE, VEHICLE REFUELING AND MAINTENANCE SHOULD NOT BE PERFORMED ON THE CONSTRUCTION SITE. HOWEVER, ANY VEHICLE REFUELING OR MAINTENANCE THAT MUST TAKE PLACE ON THE CONSTRUCTION SITE MUST HAVE PREVIOUSLY ADOPTED SPILL PREVENTION CONTROLS IN PLACE PRIOR TO COMMENCING WORK.

8. BIVERTAL INLET PROTECTION DEVICES AND STORM SEWER INLET CONTROL DEVICES SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE AND SHALL BE REMOVED PRIOR TO STORM WATER DISCHARGE. PRIOR TO STORM WATER DISCHARGE, THE CONTRACTOR SHALL INSTALL A SUITABLE ALTERNATIVE AT NO COST TO THE PROJECT OWNER.

11. BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.

12. SEED CAMOUFLAGE MATERIALS MUST BE PLACED AT ALL TIMES WITH THE APPROPRIATE INLET PROTECTION FOR EACH SPECIFIC PHASE OF CONSTRUCTION. INLET PROTECTION DEVICES MAY NEED TO BE PLACED MULTIPLE TIMES IN THE SAME LOCATION OVER THE LIFE OF THE PROJECT. INLET PROTECTION DEVICES WILL BE REPLACED IF THEY ARE DAMAGED. ALL INLET PROTECTION DEVICES SHALL BE PLACED IN GOOD FUNCTIONAL CONDITION AT ALL TIMES. IF THE PROJECT ENGINEER DEEMS AN INLET PROTECTION DEVICE TO BE NONFUNCTIONAL, INＨIBILITY CONTINUOUSLY AND PERMANENTLY, ITshall be removed until it is repaired to the satisfaction of the project engineer. Failure to maintain the inlets in a functional condition for a period of 72 hours, whichever is greater, shall result in the assessment of a penalty on the project.

13. CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT CONCRETE DUST, PARTIcles, DRAIN OUT SURFACE PLANTING WASTE AND OTHER CONCRETE WASTES FROM LEAVING SCOTT COUNTY RIGHT-OF-WAY. EXISTING OR FUTURE VEGETATED AREAS OR ENTERING OR DISTURBING A DRAINAGE SYSTEM INCLUDING INLETS AND CURB FLOWrians.

14. DITCHES AND EXPOSED SOILS MUST BE KEPT IN AN EVEN-ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES AND BLANKETS.

15. ALL EXPOSED SOIL AREAS MUST BE Temporarily OR PERMANENTLY stabilized NO MORE THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY ceased. IN MANY INSTANCES, THIS REQUIREMENT WILL RESULT IN MORE THAN ONEerus DURING THE CONSTRUCTION PERIOD, AS THE STABILIZATION IS NOT REFLECTED IN THE USE OF THE AREA FOR CONSTRUCTION ACTIVITIES.
DISCUSS REQUIRED FOLLOWING REFLECT AN EMERGENCY SITUATION TO PREVENT SEDIMENT DISCHARGE OR PROTECT WATER QUALITY;

PROJECT 1+00 TO STA. 113+50

CONSTRUCTION PLAN

RIGHT TURN LANE
CH 62
STUDIO BV

ITEMS MUST BE SIGNED AND STAMPED BY THE ENGINEER OF RECORD FOR THE PROJECT.

ENGINEERED ENGINEER FROM RESPONSE AND THE OF

FROM A TANK TRUCK TO ALL CONSTRUCTION AREAS.

THAT DRAWINGS ARE REVISED AND/OR DATED, SIGNED, MEASURES

IT MEAN THE CONTRACTOR SHALL APPLY WATER IF BLOWING DUST BECOMES A NUISANCE, THE CONTRACTOR SHALL APPLY WATER

THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED ONTO

THE REMOVAL OF SILT IN FRONT OF SILT FENCES DURING THE DURATION OF THE

THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES, INCLUDING

NOTIFY GC HOWEVER, THE GENERAL CONTRACTOR MUST SUBMIT A REQUEST FOR INFORMATION (RFI) TO THE

THE CONTRACTOR SHALL CONSTRUCT DRAINAGE BASINS PRIOR TO SITE GRADING.

THE CONTRACTOR SHALL INSTALL SILT FENCE.

CONSTRUCT AND STABILIZE DIVERSIONS AND TEMPORARY SEDIMENT TRAPS.

PIT (1) AND INSTALL SILT FENCE.

BMP AND EROSION CONTROL INSTALLATION SEQUENCE SHALL BE AS FOLLOWS:

INSTALLATION, INSTALLATION, INSTALLATION,

THE SEQUENCE OF CONSTRUCTION:

6. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE (1), CONCRETE WASHOUT AND MATERIAL STORAGE CONTAINERS, SOLID WASTE CONTAINERS, ETC.,

5. PREPARE TEMPORARY PARKING AND STORAGE AREA.

4. MODIFY THE SWPPP IMPLEMENTATION SEQUENCE; OR

3. PERFORM ANY ACTIONS OR IN ANY MANNER THAT IS CONTRARY TO THE SWPPP.

2. MODIFYING THE SWPPP

1. AMENDING THE SWPPP."
SUBSURFACE DRAIN, WIDENED PAVEMENT DESIGN WITH PAVEMENT EDGE DRAIN

NOTES:
1. SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS.
2. PERMEABLE BASE SHOULD OVERLAP PAVEMENT MAXIMUM AMOUNT PERMITTED BY STRUCTURAL DESIGN BUT BOTTOM SHOULD NOT BE ABOVE THE BOTTOM OF INPLACE PAVEMENT.
3. AS REQUIRED BY DESIGN STANDARDS.
4. PAB - PERMEABLE ASPHALT STABILIZED BASE.
5. OASB - OPEN GRADED AGGREGATE BASE.
6. DRAIN SHALL BE PAVEMENT EDGE DRAIN TYPE. AFTER COMPACTION, FINE FILTER AGGREGATE IN DRAIN SHALL EXTEND AT LEAST 4" ABOVE THE BOTTOM OF THE FUTURE PERMEABLE AGGREGATE BASE.
7. PERMEABLE AGGREGATE MAY BE DELETED IF CLASS 5 OR 6 BASE EXISTS.
8. DRAIN PIPE SHOULD BE A MINIMUM OF 3" BELOW BASE/SUBGRADE INTERFACE OR A MINIMUM OF 8", WHICHEVER IS DEEPER.

SUBSURFACE DRAIN, PERMEABLE BASE & DRAIN USED WITH PASSRC

NOTES:
1. PASSRC - PERMEABLE ASPHALT STABILIZED STRESS RELIEF COURSE.
2. SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS.
3. WIDTH AS NEEDED TO SUPPORT PAVEMENT TRACK.
4. PERMEABLE BASE TO BE HEAPED 2" ABOVE TOP OF PASSRC AFTER COMPACTION.
5. INTERCEPTOR DRAINS TYPICALLY USED AT THIS LOCATION.
6. IF THE BITUMINOUS SHOULDER REMAINS INPLACE, THE PASSRC AND SHOULDER CAN BE REMOVED BY MILLING, TRENCHING, OR OTHER METHOD. PROVIDE THE REMAINING BITUMINOUS SHOULDER IS NOT DISTURBED/DEPLACED.

REVISED 8-6-2014
STANDARD PLAN 5-297.432 1 OF 1
STATE PROJ. NO. 070-616-032, 166-020-018 C.P. XX-XX SHEET NO 12 OF 27 SHEETS
TYPICAL SECTION (OPTION NO. 1) ①

TYPICAL SECTION (OPTION NO. 2) ②

SUBSURFACE DRAIN, SUBCUT DRAIN TYPE

NOTES:
① MAY NEED TO BE MODIFIED FOR SPECIFIC PROJECTS. SEE SPECIAL PROVISIONS FOR MATERIAL AND CONSTRUCTION DETAILS. OPTION NO. 2 MAY ONLY BE USED WHEN PIPE IS TO BE PLACED BY MACHINE TRENCHING.
② GRANULAR SELECT GRANULAR OR SELECT GRANULAR MODIFIED, AS SHOWN IN DESIGN RECOMMENDATION LETTER ③.
SHEET NOT USED
STUDIO BV
CH 62
RIGHT TURN LANE
CONSTRUCTION PLAN
AND PROFILE
STA. 113+50 TO STA. 125+00

INSET A - BITUMINOUS TURN LANE

2" HOTMIX TYPE SP 12.5 BITUMINOUS MEASURE COURSE (3,C)
- SPEC. 2360 MN DESIGNATION SPK2310C

2" HOTMIX TYPE SP 12.5 BITUMINOUS MEASURE COURSE (3,C)
- SPEC. 2360 MN DESIGNATION SPK2310C

3" HOTMIX TYPE SP 12.0 NON MEASURING COURSE (3,6)
- SPEC. 2360 MN DESIGNATION SPK2320B

12" CLASS B AGGREGATE BASE = SPEC. 2211

24" DECKS CRANULAR ENCAPSULATION

GEO-TEXTILE FABRIC
APPROVED SUBGRADE
12.20.2018

Kimley-Horn
Att: Dan Elenbaas
767 N. Eustis St.
Suite 100
St. Paul, MN 55114

RE: Buffalo Run YMCA Camp
Scott County PID 089090410 & 089090515

Dan,

Enclosed please find submittals relative to the identification of septic system sites for the YMCA Buffalo Run project, as required for their Conditional Use Permit application.

On November 27th 2018, I evaluated 2 separate areas on the property for septic system suitability. 3 pits were dug in each area; see the enclosed soil observation logs. Site #1, located in an upland pasture area, is 20,000 sq. ft.. Site #2, closer to one of the ponds, is 5,000 sq. ft.. Both areas were found to be typical for the area, and will be suitable for the construction of Type I sewage treatment systems (above-grade, mound-type).

As the project moves forward, we can assist with development of a design more specific to the proposed use. The information contained in this submittal should meet the requirements of Scott County for this phase of the project.

If you have any questions or concerns, please contact me at your convenience.

Best regards,

Tim Haeg
Advanced Designer
Watab Inc.
MPCA Lic. 2116
Scott County, Minnesota

HaB—Hayden loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2vvfl
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Hayden and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hayden

Setting
Landform: Ground moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile
Ap - 0 to 9 inches: loam
E - 9 to 13 inches: loam
BE - 13 to 18 inches: clay loam
Bt - 18 to 43 inches: clay loam
C - 43 to 79 inches: loam

Properties and qualities
Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
   Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 39 to 51 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C  
Ecological site: Loamy Upland Forests (F103XY025MN)  
Forage suitability group: Sloping Upland, Acid (G103XS006MN)  
Hydric soil rating: No

Minor Components

Le sueur
Percent of map unit: 10 percent  
Landform: Ground moraines  
Landform position (two-dimensional): Footslope  
Landform position (three-dimensional): Dip  
Down-slope shape: Concave  
Across-slope shape: Linear  
Ecological site: Loamy Upland Savannas (R103XY020MN)  
Hydric soil rating: No

Glencoe
Percent of map unit: 5 percent  
Landform: Depressions  
Down-slope shape: Concave  
Across-slope shape: Concave  
Ecological site: Depressional Marsh (R103XY015MN)  
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Scott County, Minnesota  
Survey Area Data: Version 14, Sep 12, 2018
New Construction

Septic Site Identification

Project:

Buffalo Run YMCA Camp

Location:

8261 230th St E, Lakeville MN 55044
089090410 & 089090515
Scott County
New Market Township
S9/T113/R21

Notes:

Potential septic site identification for Conditional Use Permit application.
Have a nice day.
## Soil Observation Log

<table>
<thead>
<tr>
<th>Observation #</th>
<th>1</th>
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<tbody>
<tr>
<td>Elevation:</td>
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<tr>
<td>Method:</td>
<td>Exposed Pit</td>
</tr>
<tr>
<td>Vegetation:</td>
<td>Upland Grass</td>
</tr>
<tr>
<td>Depth to Restrictive:</td>
<td>18</td>
</tr>
<tr>
<td>Restrictive Elevation:</td>
<td>1104.50</td>
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<tr>
<td>Landscape:</td>
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<table>
<thead>
<tr>
<th>ELEV. (ft.)</th>
<th>DEPTH (in.)</th>
<th>SUBSTRATE</th>
<th>REDOX / INDICATOR</th>
<th>SOIL</th>
<th>% ROCK</th>
<th>SOIL STRUCTURE</th>
<th>H2O</th>
<th>SHAPE - GRADE - CONSISTENCE</th>
<th>H2O</th>
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<tr>
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<td>Moderate</td>
<td>Friable</td>
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<tr>
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<tr>
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<td>Blocky</td>
<td>Moderate</td>
<td>Friable</td>
<td>wet</td>
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</tbody>
</table>

### Comments:
Elevations are approximate until surveyed.
3" frost in ground.

### Certification:
I certify that these data are the findings of a certified, licensed professional and representative of the proposed work area.

Watab Inc. MPCA Lic. 2116

11/27/2018
## Soil Observation Log

<table>
<thead>
<tr>
<th>Observation #</th>
<th>Elevation</th>
<th>Method</th>
<th>Vegetation</th>
<th>Depth to Restrictive</th>
<th>Restrictive Elevation</th>
<th>Landscape</th>
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<tbody>
<tr>
<td>2</td>
<td>1107.00</td>
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<td>Upland Grass</td>
<td>21</td>
<td>1105.25</td>
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<table>
<thead>
<tr>
<th>ELEV.</th>
<th>DEPTH</th>
<th>SUBSTRATE</th>
<th>REDOX / INDICATOR</th>
<th>SOIL</th>
<th>TEXTURE</th>
<th>%</th>
<th>SOIL STRUCTURE</th>
<th>H2O</th>
<th>SHAPE - GRADE - CONSISTENCE</th>
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<tr>
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<tr>
<td>1105.25</td>
<td>21</td>
<td>10YR</td>
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<td>Clay Loam</td>
<td>&lt;35</td>
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<tr>
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<tr>
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<td>1102.33</td>
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<td>wet</td>
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</table>

Comments: Elevations are approximate until surveyed. 5" frost in ground.

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Date: 11/27/2018
<table>
<thead>
<tr>
<th>Observation #</th>
<th>Elevation:</th>
<th>Depth to Restrictive:</th>
<th>Restrictive Elevation:</th>
<th>Method:</th>
<th>Vegetation:</th>
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<tr>
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<table>
<thead>
<tr>
<th>Elevations (ft.)</th>
<th>Depth (in.)</th>
<th>Substrate</th>
<th>Redox / Indicator</th>
<th>Soil Texture</th>
<th>% Rock</th>
<th>Soil Structure</th>
<th>Shape - Grade - Consistency</th>
<th>H₂O</th>
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<tr>
<td>1101.58</td>
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</table>

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<th>Landscape</th>
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<tr>
<th>ELEV. (ft.)</th>
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<th>SOIL STRUCTURE</th>
<th>H2O</th>
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<td>1070.17</td>
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Watab Inc. MPCA Lic. 2116
Date: 11/27/2018
### Soil Observation Log

**Observation #:** 5  
**Elevation:** 1072.00  
**Method:** Exposed Pit  
**Depth to Restrictive:** 41  
**Restrictive Elevation:** 1068.58  
**Vegetation:** Upland Grass  
**Landscape:** Backslope

<table>
<thead>
<tr>
<th>ELEV. (ft.)</th>
<th>DEPTH (in.)</th>
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<th>REDOX / INDICATOR</th>
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<th>H2O Y/N</th>
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<td>Fine Sandy Loam</td>
<td>&lt;35</td>
<td>Blocky</td>
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<td>Blocky</td>
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<td>Friable N</td>
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<td>1070.50</td>
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<tr>
<td>1069.17</td>
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<th>Elevation</th>
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<td>1071.83</td>
<td>Exposed Pit</td>
<td>Upland Grass</td>
<td>Backslope</td>
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<td>Moderate</td>
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<td>7.5YR 6/2 &amp; 5/6</td>
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<td>Moderate</td>
<td>Friable</td>
<td>Wet</td>
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Watab Inc. MPCA Lic. 2116

11/27/2018 Date
Textures:  
- C Clay  
- SiC Silty Clay  
- SC Sandy Clay  
- CL Clay Loam  
- SiCL Silty Clay Loam  
- SCL Sandy Clay Loam  
- Si Silt  
- SiL Silt Loam  
- L Loam  
- SL Sandy Loam*  
- LS Loamy Sand*  
- S Sand*

*Sand Modifiers:  
- Co Coarse  
- M Medium  
- F Fine  
- VF Very Fine

Topsoil Indicator(s) of Saturation:  
- T1. Wetland Vegetation  
- T2. Depressional Landscape  
- T3. Organic texture or organic modifiers  
- T4. N 2.5/0 color  
- T5. Redox features in topsoil  
- T6. Hydraulic indicators

Subsoil Indicator(s) of Saturation:  
- S1. Distinct gray or red redox features  
- S2. Depleted matrix (value >/=4 and chroma </=2)  
- S3. 5Y chroma </=3  
- S4. 7.5 YR or redder faint redox concentrations or redox depletions

Shape:  
- Granular The peds are approximately spherical or polyhedral and are commonly found in topsoil. These are the small, rounded peds that hang onto roots when soil is turned over.  
- Platy The peds are flat and plate like. They are oriented horizontally and are usually overlapping. Platy structure is commonly found in forested areas just below the leaf litter or shallow topsoil.  
- Blocky The peds are block-like or polyhedral, and are bounded by flat or slightly rounded surface that are castings of the faces of surrounding peds. Blocky structure is commonly found in the lower topsoil and subsoil.  
- Prismatic Flat or slightly rounded vertical faces bound the individual peds. Peds are distinctly longer vertically, and faces are typically casts or molds of adjoining peds. Prismatic structure is commonly found in the lower subsoil.  
- Single Grain The structure found in a sandy soil. The individual particles are not held together.

Grade:  
- Loose No peds, sandy soil  
- Weak Poorly formed, indistinct peds, barely observable in place  
- Moderate Well formed, distinct peds, moderately durable and evident, but not distinct in undisturbed soil  
- Strong Durable peds that are quite evident in un-displaced soil, adhere weakly to one another, withstand displacement, and become separated when soil is disturbed  
- Massive No observable aggregates, or no orderly arrangement of natural lines of weakness

Consistence:  
- Loose Intact specimen not available  
- Friable Slight force between fingers  
- Firm Moderate force between fingers  
- Extremely Firm Moderate force between hands or slight foot pressure  
- Rigid Foot pressure

Slope Shape:  
Slope shape is described in two directions: up and down slope (perpendicular to the contour), and across slope (along the horizontal contour); e.g. Linear, Convex or LV'.
**LOG OF BORING**

**Braun Project B1810446.00**  
**GEOTECHNICAL EVALUATION**  
**YMCA Buffalo Run and Camp Kici Yapi**  
**8501 230th Street East**  
**New Market, Minnesota**

<table>
<thead>
<tr>
<th>Elevation (feet)</th>
<th>Depth (feet)</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1080.4</td>
<td>0.0</td>
<td><strong>AGG</strong> POORLY GRADED GRAVEL, fine-grained, with fine-to medium-grained Sand, brown, moist.</td>
</tr>
<tr>
<td>1079.4</td>
<td>1.0</td>
<td><strong>CL</strong> SANDY LEAN CLAY, trace Gravel, brown, moist, medium. (Glacial Till)</td>
</tr>
<tr>
<td>1074.4</td>
<td>6.0</td>
<td>END OF BORING. Water not observed with 4 1/2 feet of hollow-stem auger in the ground. Boring then backfilled.</td>
</tr>
</tbody>
</table>

**DRILLER:** J. Tatro  
**METHOD:** 3 1/4" HSA, Autohammer  
**DATE:**  
**SCALE:** 1" = 4'

**BORING:** ST-1  
**LOCATION:** N: 152675.496  E: 491938.654. See attached sketch.
<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
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<tbody>
<tr>
<td>1074.3</td>
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<tr>
<td>1072.3</td>
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<td>CL</td>
<td>SANDY LEAN CLAY, trace Gravel, brown, moist, soft to stiff. (Glacial Till)</td>
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<tr>
<td>1067.3</td>
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<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, trace Gravel, brown, moist, medium dense. (Glacial Till)</td>
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<td>1059.8</td>
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<td>END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground. Boring then backfilled.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LOCATION: N: 151422.283 E: 490914.578. See attached sketch.
**LOG OF BORING**

**Braun Project B1810446.00**  
**GEOTECHNICAL EVALUATION**  
YMCA Buffalo Run and Camp Kici Yapi  
8501 230th Street East  
New Market, Minnesota

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1072.9</td>
<td>0.0</td>
<td>TS</td>
<td>LEAN CLAY, roots, black, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1071.6</td>
<td>1.3</td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, Gravel, brown, moist, loose to medium dense. (Glacial Till)</td>
<td>5</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>1061.4</td>
<td>11.5</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, Gravel, gray, moist, medium dense to dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1058.4</td>
<td>14.5</td>
<td></td>
<td>END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LOCATION:** N: 151355.519  E: 491243.512. See attached sketch.

**DRILLER:** J. Tatro  
**METHOD:** 3 1/4" HSA, Autohammer  
**DATE:** 10/19/18  
**SCALE:** 1" = 4'

---

See Descriptive Terminology sheet for explanation of abbreviations.

Braun Intertec Corporation

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<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1071.2</td>
<td>0.0</td>
<td>TS</td>
<td>LEAN CLAY, roots, black, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1069.5</td>
<td>1.7</td>
<td>SC-SM</td>
<td>SILTY CLAYEY SAND, fine- to medium-grained, Gravel, brown, moist, loose to dense. (Glacial Till)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14.5</td>
<td></td>
<td>Gray at 13.5 feet.</td>
<td>37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

END OF BORING.

Water not observed with 13 feet of hollow-stem auger in the ground.

Boring then backfilled.
<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1065.6</td>
<td>0.0</td>
<td>TS</td>
<td>LEAN CLAY, roots, black, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1063.8</td>
<td>1.8</td>
<td>CL</td>
<td>SANDY LEAN CLAY, Gravel, brown and gray, moist, medium to very stiff. (Glacial Till)</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1054.6</td>
<td>11.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, gravel, gray, moist, medium dense. (Glacial Till)</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1051.1</td>
<td>14.5</td>
<td></td>
<td>END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground.</td>
<td>29</td>
<td></td>
<td>Boring then backfilled.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1091.7</td>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1090.7</td>
<td>1.0</td>
<td>TS</td>
<td>CLAYEY SAND, fine- to medium-grained, roots, dark brown, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, lenses of Silt, brown, moist, loose to medium dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1078.7</td>
<td>13.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1077.2</td>
<td>14.5</td>
<td>CL-ML</td>
<td>SILTY CLAY, Sand, gray, moist, stiff. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground. Boring then backfilled.
# LOG OF BORING

**Braun Project B1810446.00**  
**GEOTECHNICAL EVALUATION**  
YMCA Buffalo Run and Camp Kici Yapi  
8501 230th Street East  
New Market, Minnesota

**DRILLER:** J. Tatro  
**METHOD:** 3 1/4" HSA, Autohammer  
**DATE:** 10/24/18  
**SCALE:** 1" = 4'  

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
</table>
| 1093.3    | 0.0        | TS          | SILTY SAND, fine-grained, roots, dark brown, moist.  
(Topsoil) |     |    |                |
| 1092.8    | 0.5        | SC          | CLAYEY SAND, fine-grained, trace roots, trace Gravel, brown, moist, loose.  
(Glacial Till) | 6   |    |                |
| 1089.3    | 4.0        | SP          | POORLY GRADED SAND, fine- to medium-grained, medium dense.  
(Glacial Till) | 11  |    |                |
| 1086.3    | 7.0        | CL          | SANDY LEAN CLAY, Gravel, gray, moist, soft.  
(Glacial Till) | 4   |    |                |
| 1084.3    | 9.0        | SC          | CLAYEY SAND, fine-grained, Gravel, gray, moist, loose to medium dense.  
(Glacial Till) | 8   |    |                |
| 1080.3    | 13.0       | CL-ML       | SILTY CLAY, trace Sand, gray, moist, stiff.  
(Glacial Till) | 11  |    |                |
| 1078.8    | 14.5       |             | END OF BORING.  
Water not observed with 13 feet of hollow-stem auger in the ground.  
Boring then backfilled. |     |    |                |

(See Descriptive Terminology sheet for explanation of abbreviations)
<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1093.7</td>
<td>0.0</td>
<td>TS CL</td>
<td>SILTY SAND, fine-grained, roots, dark brown, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1087.2</td>
<td>6.5</td>
<td>ML CL</td>
<td>SANDY SILT, Clay lenses, brown and gray, moist, medium. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1084.7</td>
<td>9.0</td>
<td></td>
<td>SANDY LEAN CLAY, Gravel, Silt lenses, gray, moist, medium to very stiff. (Glacial Till)</td>
<td>5</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>1079.2</td>
<td>14.5</td>
<td></td>
<td>END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground. Boring then backfilled.</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# LOG OF BORING

**BORING:** ST-9  
**LOCATION:** N: 150580.015  E: 490188.514. See attached sketch.

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1096.2</td>
<td>0.0</td>
<td>TSS</td>
<td>LEAN CLAY, roots, dark brown, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1095.2</td>
<td>1.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, trace Gravel, brown, moist, loose to medium dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1087.2</td>
<td>9.0</td>
<td>SM</td>
<td>SILTY SAND, fine- to medium-grained, trace Gravel, brown, moist, medium dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1083.2</td>
<td>13.0</td>
<td>ML</td>
<td>SANDY SILT, Sand lenses, trace Gravel, gray, moist, stiff. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1081.7     | 14.5       |             | END OF BORING  
Water not observed with 13 feet of hollow stem auger in the ground.  
Boring then backfilled. |     |    |                |

**DATE:** 10/24/18  
**METHOD:** 3 1/4" HSA, Autohammer  
**DRILLER:** J. Tatro  
**SCALE:** 1" = 4'
<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1095.8</td>
<td>0.0</td>
<td>TS</td>
<td>CLAYEY SAND, fine-grained, roots, dark brown, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1094.8</td>
<td>1.0</td>
<td>CL</td>
<td>SANDY LEAN CLAY, Gravel, brown, moist, medium. (Glacial Till)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1091.8</td>
<td>4.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, Gravel, Silt lenses, brown, moist, medium dense. (Glacial Till)</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1082.3</td>
<td>13.5</td>
<td>CL</td>
<td>SANDY LEAN CLAY, trace Gravel, brown and gray, moist, very stiff. (Glacial Till)</td>
<td>19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground. Boring then backfilled.
<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1095.8</td>
<td>0.0</td>
<td>TS</td>
<td>CLAYEY SAND, fine-grained, roots, dark brown, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1084.8</td>
<td>11.0</td>
<td>ML</td>
<td>SANDY SILT, brown, moist, very stiff. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1082.8</td>
<td>13.0</td>
<td>SP</td>
<td>POORLY GRADED SAND, fine-grained, layer of Silt, brown, moist, medium dense. (Glacial Outwash)</td>
<td></td>
<td></td>
<td>END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground. Boring then backfilled.</td>
</tr>
</tbody>
</table>

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**Braun Project B1810446.00**  
**GEOTECHNICAL EVALUATION**  
**YMCA Buffalo Run and Camp Kici Yapi**  
**8501 230th Street East**  
**New Market, Minnesota**

**BORING:**  
**ST-12**

**LOCATION:** N: 150439.950  E: 490276.194. See attached sketch.

**DRILLER:** J. Tatro  
**METHOD:** 3 1/4" HSA, Autohammer  
**DATE:** 10/19/18  
**SCALE:** 1" = 4'

### LOG OF BORING

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1096.4</td>
<td>0.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, roots, dark brown, moist. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1096.1</td>
<td>0.3</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, brown, moist, loose to medium dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1089.4</td>
<td>7.0</td>
<td>ML</td>
<td>SANDY SILT, brown and gray, moist, stiff. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1087.4</td>
<td>9.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, Gravel, brown and gray, moist, medium dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1081.9</td>
<td>14.5</td>
<td></td>
<td>END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground. Boring then backfilled.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(See Descriptive Terminology sheet for explanation of abbreviations)
**LOG OF BORING**

**Braun Project B1810446.00**  
**GEOTECHNICAL EVALUATION**  
**YMCA Buffalo Run and Camp Kici Yapi**  
**8501 230th Street East**  
**New Market, Minnesota**

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1092.1</td>
<td>0.0</td>
<td>CL</td>
<td>LEAN CLAY, roots, dark brown, moist.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1091.8</td>
<td>0.3</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, Gravel, brown, moist, medium dense. (Glacial Till)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1086.1</td>
<td>6.0</td>
<td></td>
<td>END OF BORING.</td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

**LOCATION:** N: 150382.461 E: 490399.940. See attached sketch.

**DATE:** 10/19/18  
**SCALE:** 1" = 4'

**METHOD:** 3 1/4" HSA, Autohammer  

**DRILLER:** J. Tatro  

**Tests or Notes:**  
Water not observed with 4 1/2 feet of hollow-stem auger in the ground.  
Boring then backfilled.
<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1090.6</td>
<td>0.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, roots, dark brown, moist.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1090.3</td>
<td>0.3</td>
<td>SC</td>
<td>CLAYEY SAND, fine-to medium-grained, Gravel, brown, moist, medium dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1084.6</td>
<td>6.0</td>
<td></td>
<td>END OF BORING. Water not observed with 4 1/2 feet of hollow-stem auger in the ground. Boring then backfilled.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DATE: 10/19/18  SCALE: 1" = 4'
**LOG OF BORING**

**Braun Project B1810446.00**  
**GEOTECHNICAL EVALUATION**  
**YMCA Buffalo Run and Camp Kici Yapi**  
**8501 230th Street East**  
**New Market, Minnesota**

**BORING:**  
**ST-15**

**LOCATION:**  
N: 149596.933  E: 490413.205.  See attached sketch.

**DRILLER:**  
J. Tatro  
**METHOD:**  
3 1/4" HSA, Autohammer  
**DATE:**  
10/24/18  
**SCALE:**  
1" = 4'

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1063.5</td>
<td>0.0</td>
<td>TS</td>
<td>LEAN CLAY, roots, black, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1061.6</td>
<td>1.9</td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, Gravel, brown and gray, moist, loose. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1057.5     | 6.0        |             | END OF BORING.  
Water not observed with 4 1/2 feet of hollow-stem auger in the ground.  
Boring then backfilled. |     |    |                |
**Description of Materials (ASTM D2488 or D2487)**

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1072.3</td>
<td>0.0</td>
<td>CL</td>
<td>LEAN CLAY, roots, dark brown, moist.</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, Gravel, brown, moist, loose to medium dense. (Glacial Till)</td>
</tr>
<tr>
<td>1066.3</td>
<td>6.0</td>
<td></td>
<td>END OF BORING.</td>
</tr>
</tbody>
</table>

**Tests or Notes**

Water not observed with 4 1/2 feet of hollow-stem auger in the ground.

Boring then backfilled.
## LOG OF BORING

**Borings:** ST-17  
**Location:** N: 149697.124  E: 490693.613. See attached sketch.

**Driller:** J. Tatro  
**Method:** 3 1/4" HSA, Autohammer  
**Date:** 10/24/18  
**Scale:** 1" = 4'

### Description of Materials

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1082.9</td>
<td>0.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, roots, dark brown, moist.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1082.5</td>
<td>0.4</td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, Gravel, Silt lenses, brown, moist, medium dense. (Glacial Till)</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1080.4</td>
<td>14.5</td>
<td></td>
<td>END OF BORING. Water not observed with 13 feet of hollow-stem auger in the ground.</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boring then backfilled.</td>
<td>14</td>
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(See Descriptive Terminology sheet for explanation of abbreviations)
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<th>Depth feet</th>
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<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
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<tbody>
<tr>
<td>1085.6</td>
<td>0.0</td>
<td>TS</td>
<td>CLAY SAND, fine- to medium-grained, roots, dark brown, moist. (Topsoil)</td>
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<tr>
<td>1081.6</td>
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<td>SILT SAND, fine- to medium-grained, Gravel, brown, moist, loose. (Glacial Till)</td>
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<tr>
<td>1071.1</td>
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<td>SANDY LEAN CLAY, Gravel, Sand lenses, brown, moist, stiff to very stiff. (Glacial Till)</td>
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</table>

END OF BORING.

Water not observed with 13 feet of hollow-stem auger in the ground.
**Boring Log**

**Boring:** ST-19

**Location:** N: 149645.139  E: 490812.791. See attached sketch.

**Driller:** J. Tatro  
**Method:** 3 1/4" HSA, Autohammer  
**Date:** 10/26/18  
**Scale:** 1" = 4’

<table>
<thead>
<tr>
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<th>Depth feet</th>
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<th>WL</th>
<th>Tests or Notes</th>
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<tr>
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<td>TS 1/2</td>
<td>SANDY LEAN CLAY, roots, dark brown, moist.</td>
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<tr>
<td></td>
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<td>SC</td>
<td>(Topsoil)</td>
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<td></td>
<td>CLAYEY SAND,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>fine- to medium-grained, Silt lenses,</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Gravel, brown, moist, medium dense.</td>
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<td>(Glacial Till)</td>
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<td>1072.2</td>
<td>14.5</td>
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<td>END OF BORING</td>
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(See Descriptive Terminology sheet for explanation of abbreviations)
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<th>Tests or Notes</th>
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<tr>
<td>1098.7</td>
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<td>TS</td>
<td>SILTY SAND, fine-grained, dark brown, moist. (Topsoil)</td>
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<tr>
<td>1097.4</td>
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<td>Tests or Notes</td>
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<tr>
<td>1098.3</td>
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<td>TS CL</td>
<td>SANDY LEAN CLAY, roots, dark brown, moist. (Topsoil)</td>
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<td></td>
<td></td>
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<tr>
<td>1094.6</td>
<td>9.0</td>
<td>SC CL</td>
<td>CLAYEY SAND, fine-grained, Gravel, brown, moist, medium dense. (Glacial Till)</td>
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<tr>
<td>1086.6</td>
<td>12.0</td>
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<tr>
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Location: N: 149496.370 E: 490982.528. See attached sketch.
**LOCATION:** N: 149558.442  EL 491075.290. See attached sketch.

**METHOD:** 3 1/4” HSA, Autohammer

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<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
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<tbody>
<tr>
<td>1099.7</td>
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<td>LEAN CLAY, roots, black, moist. (Topsoil)</td>
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<tr>
<td>1096.0</td>
<td>4.0</td>
<td>CL</td>
<td>SANDY LEAN CLAY, dark brown and brown, moist, medium. (Glacial Till)</td>
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<tr>
<td>1085.5</td>
<td>14.5</td>
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<td>LEAN CLAY, Silt and Sand lenses, brown and gray, moist, medium to stiff. (Glacial Till)</td>
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**END OF BORING.**
<table>
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<tr>
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<tr>
<td>1090.9</td>
<td>7.0</td>
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<tr>
<td>1088.9</td>
<td>9.0</td>
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<td>1086.4</td>
<td>11.5</td>
<td>CL-ML</td>
<td>SILTY CLAY, gray, moist, medium. (Glacial Till)</td>
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<td>1076.9</td>
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<td>SANDY LEAN CLAY, Gravel, brown, moist, medium dense. (Glacial Till)</td>
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**END OF BORING.**

Water not observed with 19 1/2 feet of hollow-stem auger in the ground.

Boring then backfilled with bentonite grout.
<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
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<td>SANDY LEAN CLAY, roots, dark brown, moist.</td>
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<tr>
<td>1096.5</td>
<td>1.5</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, Gravel, brown and dark brown, moist, loose. (Glacial Till)</td>
<td></td>
<td>9</td>
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</tr>
<tr>
<td>1094.0</td>
<td>4.0</td>
<td>CL-ML</td>
<td>SILTY CLAY, Sand, trace Gravel, brown, moist, soft to very stiff. (Glacial Till)</td>
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<td>SP</td>
<td>POORLY GRADED SAND, fine- to medium-grained, Cobble and rocks at 13 1/2 feet, brown, dry, dense to very dense. (Glacial Outwash)</td>
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<tr>
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<td>SILTY SAND, fine- to medium-grained, Gravel, brown, moist, medium dense. (Glacial Outwash)</td>
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<td>WL</td>
<td>Tests or Notes</td>
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<tr>
<td>1106.9</td>
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<tr>
<td>1105.6</td>
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<tr>
<td>1092.4</td>
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<td>8/19/16</td>
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<td>WL</td>
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<td>1112.2</td>
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<td>CLAYEY SAND, fine- to medium-grained, Gravel, brown, moist, medium dense. (Glacial Till)</td>
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<tr>
<td>1099.5</td>
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<td>WL</td>
<td>Tests or Notes</td>
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<tr>
<td>1098.1</td>
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<td>LEAN CLAY, with Sand, roots, dark brown, moist.</td>
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<tr>
<td>1097.1</td>
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<tr>
<td>1094.1</td>
<td>4.0</td>
<td>SM</td>
<td>SILTY SAND, fine- to medium-grained, Gravel, brown and light brown, dry to moist, medium dense to very dense. (Glacial Till)</td>
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<td>CLAYEY SAND, fine- to medium-grained, with Gravel, brown, moist, medium dense. (Glacial Till)</td>
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<td>27</td>
<td>20</td>
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Water not observed with 19 1/2 feet of hollow-stem auger in the ground.

Boring then backfilled with bentonite grout.
**LOCATION:** N: 149268.016  E: 491188.366. See attached sketch.

**DATE:** 10/25/18  

**METHOD:** 3 1/4" HSA, Autohammer

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
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</thead>
<tbody>
<tr>
<td>1093.5</td>
<td>0.0</td>
<td>TS</td>
<td>LEAN CLAY, roots, black, moist. (Topsoil)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1092.0</td>
<td>1.5</td>
<td>CL</td>
<td>LEAN CLAY, dark brown, moist, stiff. (Glacial Till)</td>
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<tr>
<td>1086.5</td>
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<td>SANDY SILT, lenses of Sand and Clay, brown, moist, stiff to very stiff. (Glacial Till)</td>
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<td></td>
</tr>
<tr>
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<td></td>
<td>END OF BORING. Water not observed with 19 1/2 feet of hollow-stem auger in the ground. Boring then backfilled with bentonite grout.</td>
<td></td>
<td></td>
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**Boring:** ST-28

**Scale:** 1" = 4'
**LOG OF BORING**

**Braun Project B1810446.00**  
GEOTECHNICAL EVALUATION  
YMCA Buffalo Run and Camp Kici Yapi  
8501 230th Street East  
New Market, Minnesota

<table>
<thead>
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<th>Depth feet</th>
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<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1076.0</td>
<td>0.3</td>
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<td>CLAYEY SAND, fine-grained, roots, dark brown, moist. SANDY LEAN CLAY, brown, moist, medium. (Glacial Till)</td>
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| 1070.3     | 6.0        |             | END OF BORING.  
Water not observed with 4 1/2 feet of hollow-stem auger in the ground.  
Boring then backfilled. |     |    |                |


DATE: 10/25/18  
SCALE: 1” = 4’
<table>
<thead>
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<th>Depth feet</th>
<th>ASTM Symbol</th>
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<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
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<tr>
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<tr>
<td></td>
<td></td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, Gravel, brown, moist, very loose to loose. (Glacial Till)</td>
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END OF BORING.

Water not observed with 4 1/2 feet of hollow-stem auger in the ground.

Boring then backfilled.
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<th>Depth feet</th>
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<th>Tests or Notes</th>
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<tr>
<td>1066.7</td>
<td>0.3</td>
<td></td>
<td>(Topsoil)</td>
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<td>11</td>
<td></td>
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<tr>
<td>1061.0</td>
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<td></td>
<td>CLAYEY SAND, fine-grained, Gravel, brown, moist, medium dense.</td>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**END OF BORING.**

Water not observed with 4 1/2 feet of hollow-stem auger in the ground.

Boring then backfilled.
**LOG OF BORING**

Braun Project B1810446.00  
GEOTECHNICAL EVALUATION  
YMCA Buffalo Run and Camp Kici Yapi  
8501 230th Street East  
New Market, Minnesota

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1048.2</td>
<td>0.0</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, roots, dark brown, moist.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1047.1</td>
<td>1.1</td>
<td>SC</td>
<td>CLAYEY SAND, fine- to medium-grained, Gravel, brown, moist, loose to medium dense. (Glacial Till)</td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1042.2     | 6.0        |             | END OF BORING.  
Water not observed with 4 1/2 feet of hollow-stem auger in the ground.  
Boring then backfilled. | 13  |    |                |

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
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</thead>
<tbody>
<tr>
<td>1049.0</td>
<td>0.0</td>
<td>AGG</td>
<td>POORLY GRADED GRAVEL, fine-grained, with fine- to medium-grained Sand, brown, moist.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1048.4</td>
<td>0.6</td>
<td>SM</td>
<td>SILTY SAND, fine-grained, trace Gravel, lenses of Silt and Clay, brown, moist, loose to medium dense. (Glacial Till)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

END OF BORING.

Water not observed with 4 1/2 feet of hollow-stem auger in the ground.

Boring then backfilled.
**LOG OF BORING**

**Boring:** ST-34  
**Location:** N: 148245.921  E: 490318.855. See attached sketch.

<table>
<thead>
<tr>
<th>Elev. feet</th>
<th>Depth feet</th>
<th>ASTM Symbol</th>
<th>Description of Materials (ASTM D2488 or D2487)</th>
<th>BPF</th>
<th>WL</th>
<th>Tests or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1047.0</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1046.0</td>
<td>1.0</td>
<td>AGG</td>
<td>POORELY GRADED GRAVEL, fine-grained, with fine-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>to medium-grained Sand, brown, moist.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1043.0</td>
<td>4.0</td>
<td>FILL</td>
<td>FILL: Sandy Silt, slightly organic, gray and brown,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>moist.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1039.5</td>
<td>7.5</td>
<td>OL</td>
<td>ORGANIC CLAY, trace Sand, black, moist, medium.</td>
<td></td>
<td></td>
<td>(Swamp Deposit)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Swamp Deposit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1036.0</td>
<td>11.0</td>
<td>CL</td>
<td>SANDY LEAN CLAY, trace Gravel, brown, moist, very</td>
<td></td>
<td></td>
<td>(Glacial Till)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>stiff.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>END OF BORING.</td>
<td></td>
<td></td>
<td>Water not observed with 9 1/2 feet of hollow-stem auger in the ground.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boring then backfilled.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elev. feet</td>
<td>Depth feet</td>
<td>ASTM Symbol</td>
<td>Description of Materials (ASTM D2488 or D2487)</td>
<td>BPF</td>
<td>WL</td>
<td>Tests or Notes</td>
</tr>
<tr>
<td>-----------</td>
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</tr>
<tr>
<td>1060.0</td>
<td>0.0</td>
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<td>SILTY GRAVEL, fine-grained, brown.</td>
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<td>12</td>
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<tr>
<td>1059.4</td>
<td>0.6</td>
<td>SC</td>
<td>CLAYEY SAND, fine-grained, trace Gravel, brown, moist, medium dense. (Glacial Till)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1056.0</td>
<td>4.0</td>
<td>SM</td>
<td>SILTY SAND, fine-to medium-grained, trace Gravel, trace Clay, brown, moist, medium dense. (Glacial Till)</td>
<td></td>
<td>19</td>
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</tr>
<tr>
<td>1054.0</td>
<td>6.0</td>
<td></td>
<td>END OF BORING.</td>
<td></td>
<td></td>
<td>Water not observed with 4 1/2 feet of hollow-stem auger in the ground. Boring then backfilled.</td>
</tr>
</tbody>
</table>

LOCATION: N: 147836.005 E: 490309.613. See attached sketch.
Soil Map—Scott County, Minnesota
(Camp Buffalo Run)

MAP LEGEND

Area of Interest (AOI)

Soils

Soil Map Unit Polygons
Soil Map Unit Lines
Soil Map Unit Points

Special Point Features
Blowout
Borrow Pit
Clay Spot
Closed Depression
Gravel Pit
Gravelly Spot
Landfill
Lava Flow
Marsh or swamp
Mine or Quarry
Miscellaneous Water
Perennial Water
Rock Outcrop
Saline Spot
Sandy Spot
Severely Eroded Spot
Sinkhole
Slide or Slip
Sodic Spot

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background
Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Scott County, Minnesota
Survey Area Data: Version 14, Sep 12, 2018

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

Date(s) aerial images were photographed: Jul 1, 2013—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
### Map Unit Legend

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ga</td>
<td>Glencoe silty clay loam, 0 to 1 percent slopes</td>
<td>5.7</td>
<td>3.5%</td>
</tr>
<tr>
<td>HaB</td>
<td>Hayden loam, 2 to 6 percent slopes</td>
<td>16.3</td>
<td>9.8%</td>
</tr>
<tr>
<td>HaC</td>
<td>Hayden loam, 6 to 10 percent slopes</td>
<td>2.7</td>
<td>1.6%</td>
</tr>
<tr>
<td>HaC2</td>
<td>Hayden loam, 6 to 10 percent slopes, moderately eroded</td>
<td>5.5</td>
<td>3.3%</td>
</tr>
<tr>
<td>HaD</td>
<td>Hayden loam, 10 to 22 percent slopes</td>
<td>13.9</td>
<td>8.3%</td>
</tr>
<tr>
<td>HaD2</td>
<td>Hayden loam, 10 to 22 percent slopes, moderately eroded</td>
<td>11.4</td>
<td>6.9%</td>
</tr>
<tr>
<td>HaE2</td>
<td>Hayden loam, 18 to 25 percent slopes</td>
<td>44.9</td>
<td>27.0%</td>
</tr>
<tr>
<td>HaF2</td>
<td>Hayden loam, 22 to 40 percent slopes</td>
<td>6.2</td>
<td>3.7%</td>
</tr>
<tr>
<td>HbD2</td>
<td>Hayden sandy loam, 12 to 18 percent slopes, moderately eroded</td>
<td>0.3</td>
<td>0.2%</td>
</tr>
<tr>
<td>HbE2</td>
<td>Hayden sandy loam, 18 to 25 percent slopes</td>
<td>11.0</td>
<td>6.6%</td>
</tr>
<tr>
<td>HbE3</td>
<td>Hayden sandy clay loam, 18 to 25 percent slopes</td>
<td>13.1</td>
<td>7.9%</td>
</tr>
<tr>
<td>HcD3</td>
<td>Hayden soils, 12 to 18 percent slopes, severely eroded</td>
<td>2.9</td>
<td>1.7%</td>
</tr>
<tr>
<td>HcE3</td>
<td>Hayden soils, 18 to 25 percent slopes</td>
<td>1.3</td>
<td>0.8%</td>
</tr>
<tr>
<td>Ma</td>
<td>Marsh</td>
<td>2.7</td>
<td>1.6%</td>
</tr>
<tr>
<td>PbA</td>
<td>Houghton muck, 0 to 1 percent slopes</td>
<td>27.1</td>
<td>16.3%</td>
</tr>
<tr>
<td>Sb</td>
<td>Steep land, Hayden-Lester materials</td>
<td>1.1</td>
<td>0.7%</td>
</tr>
<tr>
<td>TcB</td>
<td>Terril loam, 2 to 6 percent slopes</td>
<td>0.3</td>
<td>0.2%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td><strong>166.4</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Aquifer Assessment (MN)

The "Aquifer Assessment (MN)" interpretation is associated with the preliminary evaluation of large individual sewage treatment systems to predict aquifer vulnerability and the potential risk of nitrogen impacting the aquifer. Large individual sewage treatment systems are defined as having flow greater than 2500 gallons per day by the Minnesota Rule Chapter 7080.2150. Regulatory requirements for large individual sewage treatment systems are provided in Minnesota Rule Chapter 7080.1500. Minnesota Rule Chapter 4725.0100 Subp. 21 provides a definition of the term "aquifer." The soil interpretation predicts the presence or absence of a protective layer above an aquifer and the risk of nitrate movement through the soil into a possible surficial aquifer. Soils are considered sensitive to the impact of nitrogen on an aquifer if they contain coarse USDA textures in the bottom horizon, if they have bedrock within the profile, or if they are organic (Histosols). MN statute 103H.005 provides a definition of "sensitive area". The "Aquifer Assessment (MN)" sensitivity rating and the Class V sensitivity rating of the Minnesota Department of Health are used in the Minnesota Pollution Control Agency’s Level I Nitrogen Impacts to Aquifers Determination Worksheet—protective layer determination. The aquifer assessment sensitivity rating is also used in Minnesota for nutrient management planning.

Soils are assigned to rating classes ("sensitive" or "not sensitive") based on their degree of risk. A rating class of "sensitive" indicates the presence of a surficial aquifer and sensitivity to nitrate movement through the soil into the aquifer.

Report—Aquifer Assessment (MN)

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. A rating class of "sensitive" indicates the presence of a surficial aquifer and sensitivity to nitrate movement through the soil into the aquifer.]

<table>
<thead>
<tr>
<th>Aquifer Assessment (MN)—Scott County, Minnesota</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Map symbol and soil name</strong></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Rating class and limiting features</strong></td>
</tr>
<tr>
<td>Ga—Glencoe silty clay loam, 0 to 1 percent slopes</td>
</tr>
<tr>
<td>Glencoe</td>
</tr>
<tr>
<td>HaB—Hayden loam, 2 to 6 percent slopes</td>
</tr>
<tr>
<td>Hayden</td>
</tr>
<tr>
<td>HaC—Hayden loam, 6 to 10 percent slopes</td>
</tr>
<tr>
<td>Hayden</td>
</tr>
<tr>
<td>HaC2—Hayden loam, 6 to 10 percent slopes, moderately eroded</td>
</tr>
<tr>
<td>Hayden, moderately eroded</td>
</tr>
<tr>
<td>HaD—Hayden loam, 10 to 22 percent slopes</td>
</tr>
<tr>
<td>Hayden</td>
</tr>
</tbody>
</table>
### Aquifer Assessment (MN)–Scott County, Minnesota

<table>
<thead>
<tr>
<th>Map symbol and soil name</th>
<th>Pct. of map unit</th>
<th>Sensitivity of surficial aquifer to nitrogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>HaD2—Hayden loam, 10 to 22 percent slopes, moderately eroded</td>
<td>85</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden, moderately eroded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HaE2—Hayden loam, 18 to 25 percent slopes</td>
<td>85</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden, moderately eroded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HaF2—Hayden loam, 22 to 40 percent slopes</td>
<td>90</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden</td>
<td></td>
<td></td>
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<tr>
<td>HbD2—Hayden sandy loam, 12 to 18 percent slopes, moderately eroded</td>
<td>85</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden, moderately eroded</td>
<td></td>
<td></td>
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<tr>
<td>HbE2—Hayden sandy loam, 18 to 25 percent slopes</td>
<td>85</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden, moderately eroded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbE3—Hayden sandy clay loam, 18 to 25 percent slopes</td>
<td>85</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden, severely eroded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HcD3—Hayden soils, 12 to 18 percent slopes, severely eroded</td>
<td>85</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden, severely eroded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HcE3—Hayden soils, 18 to 25 percent slopes</td>
<td>85</td>
<td>Not sensitive</td>
</tr>
<tr>
<td>Hayden, severely eroded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ma—Marsh</td>
<td>100</td>
<td>Sensitive</td>
</tr>
<tr>
<td>Marsh</td>
<td></td>
<td>Organic soil</td>
</tr>
<tr>
<td>PbA—Houghton muck, 0 to 1 percent slopes</td>
<td>70</td>
<td>Sensitive</td>
</tr>
<tr>
<td>Houghton, drained</td>
<td></td>
<td>Organic soil</td>
</tr>
<tr>
<td>Sb—Steep land, Hayden-Lester materials</td>
<td>100</td>
<td>Not rated</td>
</tr>
<tr>
<td>Steep land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TcB—Terril loam, 2 to 6 percent slopes</td>
<td>80</td>
<td>Not sensitive</td>
</tr>
</tbody>
</table>

**Data Source Information**

Soil Survey Area: Scott County, Minnesota  
Survey Area Data: Version 14, Sep 12, 2018
Resource Management Plan

Camp Buffalo Run
New Market, MN

Township of New Market

Prepared for:
YMCA of the Greater Twin Cities
651 Nicollet Mall, #500
Minneapolis, MN 55402

Prepared by:
Kimley-Horn
767 Eustis Street, Suite 100
St. Paul, MN 55114
Contact: Dan Elenbaas, P.E.

Prepared on: February 27, 2019
Introduction

YMCA of the Greater Twin Cities is developing a former farmstead into an outdoor orientated Youth Camp. The site is 222 acres and is a mixture of woods and pasture land. There are multiple wetlands on the subject property. Most of these wetlands are completely contained on the site. YMCA is proposing to construct multiple buildings, walking paths, surface parking lot, and a long gravel road that winds through the site. The total approximate area of added imperviousness to the site is 165,000 square feet. New market Township and Scott County require that Low Impact Design be implemented for all storm water features and that rate control for the 2, 10, and 100 year storm be met.

Kimley-Horn has analyzed the drainage conditions of the Site and provides computations for applicable requirements in this report. All calculations, hydrographs, and drainage area maps are provided in the appendix of this report.

1.0. Pre-development Conditions

The site is approximately 222 acres of steeply sloping terrain. The southern portion of the site sheet flows to the properties to the south where the water is eventually picked up into large wetlands. This portion is predominately range land/ meadow with a high point of a 1107 elevation and a low point of a 1045 elevation. The middle and northern portion of the site is more wooded and sheet flows into existing wetlands and surface waters located throughout the site. These wetlands are very large self-contained bodies of water that provide rate control for a majority of the site.

2.0. Post-development Conditions

The proposed development maintains the existing drainage patterns to the best extent possible. The southern portion of the site will be treated for water quality and rate control by a series of filtration basins and dry detention basins. The southwest portion of the site will drain towards the proposed Zane avenue ditch and then be picked up by a culvert located underneath Zane Avenue and then discharge naturally into the wetlands located to the west. The natural overland flow will provide the water quality before entering the wetland the wetland itself will provide the rate control.
3.0. Rate Attenuation Summary

An area of focus (where most construction activity will occur) was taken out of the total area to better model the site using hydrocad. This area is part of the southern portion of the property and is approximately 19.93 acres and 135,000 SF of impervious surface. Rate control for the rest of the site will be met through the existing wetlands that are completely contained within the site as stated above. See Drainage Maps in the appendices for area of focus and off site drainage.

Existing:

In the existing condition, this area of focus is split up into two different catchments. Both areas sheet flow to south but were split up into a southeast portion and southwest portion. The southwest portion is approximately 11.4 acres and drains towards the existing Zane Avenue Ditch system. The southwest portion, which is approximately 9.04 acres, drains into an undefined swale. Due to this portion of the property being pasture, the dense grass material was chosen to determine time of concentration.

Proposed:

The proposed plan has the Southeast site split into a series of filtration basins and detention basins to handle rate control and provide water quality. Filtration basins will be located within the school bus and parent drop off circles, and within the islands of the parking lot. These will then discharge into a dry-basin that is located adjacent to Zane Avenue. The filtration basins will be lined with 6” drain tile two feet below the basin bottom. This drain tile will then daylight into the Zane Avenue Basins. The basins were designed to be completely contained for the 2-year storm and will overflow in the larger storm events. The Zane avenue detention-basins are strictly to handle the rate control of the site. These basins will be connected to each other with a series of culverts that are located 0.5 feet above the basin bottoms. The ultimate discharge point is then matched in the post condition in the SW corner of the site.
For the Southwest portion of the focus area, the drainage patterns have been slightly changed to reduce the amount of area draining towards the SE portion of the site. Although a small amount of imperviousness was added, the overall area draining towards the discharge point has been reduced by about 0.15 acres. See table 2 below for the rate control reduction.

<table>
<thead>
<tr>
<th>Table 1 - Southwest Drainage Area Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Pre-Development Rate (10.9 Acres)</td>
</tr>
<tr>
<td>2-Year (2.82”)</td>
</tr>
<tr>
<td>7.48 cfs</td>
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<tr>
<td></td>
</tr>
<tr>
<td>10-Year (4.18”)</td>
</tr>
<tr>
<td>15.71 cfs</td>
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<tr>
<td></td>
</tr>
<tr>
<td>100-Year (7.29”)</td>
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<tr>
<td>36.82 cfs</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Post-Development Rate (11.05 Acres)</td>
</tr>
<tr>
<td>2-Year (2.82”)</td>
</tr>
<tr>
<td>5.60 cfs</td>
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<tr>
<td></td>
</tr>
<tr>
<td>10-Year (4.18”)</td>
</tr>
<tr>
<td>10.80 cfs</td>
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<tr>
<td></td>
</tr>
<tr>
<td>100-Year (7.29”)</td>
</tr>
<tr>
<td>37.0 cfs</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2 - South East Drainage Area Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Pre-Development Rate (9.04 Acres)</td>
</tr>
<tr>
<td>2-Year (2.82”)</td>
</tr>
<tr>
<td>6.06 cfs</td>
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</tr>
<tr>
<td>10-Year (4.18”)</td>
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<tr>
<td>12.74 cfs</td>
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<td></td>
</tr>
<tr>
<td>100-Year (7.29”)</td>
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<tr>
<td>29.88 cfs</td>
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</tr>
<tr>
<td>Post-Development Rate (8.875 Acres)</td>
</tr>
<tr>
<td>2-Year (2.82”)</td>
</tr>
<tr>
<td>5.95 cfs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>10-Year (4.18”)</td>
</tr>
<tr>
<td>12.51 cfs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>100-Year (7.29”)</td>
</tr>
<tr>
<td>29.34 cfs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3 - Total Drainage Area Summary (19.93 Acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Development Rate</td>
</tr>
<tr>
<td>2-Year (2.82”)</td>
</tr>
<tr>
<td>13.53 cfs</td>
</tr>
<tr>
<td>10-Year (4.18”)</td>
</tr>
<tr>
<td>28.44 cfs</td>
</tr>
<tr>
<td>100-Year (7.29”)</td>
</tr>
<tr>
<td>66.55 cfs</td>
</tr>
<tr>
<td>Post-Development Rate</td>
</tr>
<tr>
<td>2-Year (2.82”)</td>
</tr>
<tr>
<td>11.20 cfs</td>
</tr>
<tr>
<td>10-Year (4.18”)</td>
</tr>
<tr>
<td>23.15 cfs</td>
</tr>
<tr>
<td>100-Year (7.29”)</td>
</tr>
<tr>
<td>58.81 cfs</td>
</tr>
</tbody>
</table>

**4.0 Volume Control Summary**

According to the Scott County Zoning ordinance, Infiltration practices for control of stormwater runoff volume shall be capable of infiltrating a volume of runoff equivalent to the depth of one (1) inch of runoff over the area of all new impervious surfaces within the development within forty-eight (48) hours. This condition may be waived for sites with predominately Type C and D soils, or where a shallow water table prevents construction of infiltration systems, provided the following conditions are met:

(1) Credits and site design practices to minimize the creation of connected impervious surfaces are used to the extent practical.

(2) Underdrains are used to promote filtration instead of infiltration.
A strategic design to separate imperviousness was used to the best extent possible. Due to the predominately D soils on site, filtration is being proposed to meet these requirements. A majority of the site will be filtered by a series of filtration basins in the southwest corner of the site. The Horse stable area will drain to a smaller filtration basin located in the northwest corner of the site. All of walking paths discharge into completely contained wetlands on site. The filtration basins in the southwest corner of the site will be oversized to make up for the walking path areas and Zane avenue. Drain tile will be placed 2’ below the bottom of the basins with filtration media located above to allow for adequate drainage in 48 hours. The total newly created impervious on site is 229,920 square feet.

New Development required volume control = 1.0” x 210,948 sf x (1/12”) = 19,160 cubic feet

Zane Ave. and turn lane required volume control = 1.0” x 31,562 sf x (1/12”) = 2,630 cubic feet

The required runoff volume control is provided by on-site filtration through the following best management practices:

<table>
<thead>
<tr>
<th>BMP</th>
<th>Hydrologic Soil Group*</th>
<th>Allowable Filtration Rate</th>
<th>Allowable Ponding Depth</th>
<th>Basin BTM</th>
<th>100-Yr HWL (FT)</th>
<th>Filtration Volume (CF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtration Basin A</td>
<td>N/A</td>
<td>0.8 in/hr</td>
<td>3.2’</td>
<td>1068.0</td>
<td>1070.15</td>
<td>8,586</td>
</tr>
<tr>
<td>Filtration Basin B</td>
<td>N/A</td>
<td>0.8 in/hr</td>
<td>3.2’</td>
<td>1071.0</td>
<td>1073.14</td>
<td>5,251</td>
</tr>
<tr>
<td>Filtration Basin C1</td>
<td>N/A</td>
<td>0.8 in/hr</td>
<td>3.2’</td>
<td>1069.0</td>
<td>1070.04</td>
<td>1,090</td>
</tr>
<tr>
<td>Filtration Basin C2</td>
<td>N/A</td>
<td>0.8 in/hr</td>
<td>3.2’</td>
<td>1067.0</td>
<td>1068.05</td>
<td>1,090</td>
</tr>
<tr>
<td>Filtration Basin E</td>
<td>N/A</td>
<td>0.8 in/hr</td>
<td>3.2’</td>
<td>1054.0</td>
<td>1057.14</td>
<td>13,517</td>
</tr>
<tr>
<td>Filtration Basin G</td>
<td>N/A</td>
<td>0.8 in/hr</td>
<td>3.2’</td>
<td>1052.0</td>
<td>1054.33</td>
<td>2,904</td>
</tr>
<tr>
<td>Zane Avenue Ditch Filtration</td>
<td>N/A</td>
<td>0.8 in/hr</td>
<td>2.0’</td>
<td>1044.0</td>
<td>1045.18</td>
<td>3,644</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>36,082</td>
</tr>
</tbody>
</table>

*Soil Type per Geotechnical Borings

Total volume control provided **36,082 cubic feet**
Table 4- BMP Summary

<table>
<thead>
<tr>
<th>BMP</th>
<th>Basin BTM</th>
<th>Basin Overflow</th>
<th>Outlet INV</th>
<th>Outlet Size</th>
<th>Storage Volume (CF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtration Basin A</td>
<td>1068.00</td>
<td>1071.00</td>
<td>1066.00</td>
<td>6&quot; D.T.</td>
<td>13,266</td>
</tr>
<tr>
<td>Filtration Basin B</td>
<td>1071.00</td>
<td>1073.00</td>
<td>1069.00</td>
<td>6&quot; D.T.</td>
<td>3,633</td>
</tr>
<tr>
<td>Filtration Basin C</td>
<td>1074.00</td>
<td>1076.00</td>
<td>1072.00</td>
<td>6&quot; D.T.</td>
<td>5,150</td>
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<tr>
<td>Detention Basin D</td>
<td>1065.00</td>
<td>1069.00</td>
<td>1065.50</td>
<td>12&quot; Culvert</td>
<td>13,100</td>
</tr>
<tr>
<td>Detention Basin E</td>
<td>1054.00</td>
<td>1057.00</td>
<td>1054.50</td>
<td>12&quot; Culvert</td>
<td>13,225</td>
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<tr>
<td>Detention Basin F</td>
<td>1045.00</td>
<td>1048.00</td>
<td>1045.50</td>
<td>12&quot; Culvert</td>
<td>12,188</td>
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<tr>
<td>Filtration Basin G</td>
<td>1052.00</td>
<td>1053.50</td>
<td>1050.00</td>
<td>6&quot; D.T.</td>
<td>3,012</td>
</tr>
<tr>
<td>Zane Ave Ditch Filtration</td>
<td>1044.00</td>
<td>1045.33</td>
<td>1044.50</td>
<td>12&quot; Culvert</td>
<td>3,644</td>
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<tr>
<td>Total Storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>67,218</td>
</tr>
</tbody>
</table>

5.0 Downstream Analysis

There are 2 downstream discharge points for the roadway work that were analyzed at the 2 culvert outlets. The rate for the 2, 10, and 100 year events have been controlled by the proposed BMPs. The ultimate path of the stormwater leads back through the proposed property to the large wetland within the Credit River watershed.

6.0 Conclusion

Given the difficult terrain of the site, a low impact design plan was implemented to achieve the rate control requirements and provide water quality before discharging off-site.
Exhibits
Appendices
Routing Diagram for Existing Drainage
HydroCAD® 10.00-22 s/n 09843 © 2018 HydroCAD Software Solutions LLC
**Area Listing (all nodes)**

<table>
<thead>
<tr>
<th>Area</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>220.425</strong></td>
<td>78</td>
<td><strong>TOTAL AREA</strong></td>
</tr>
</tbody>
</table>
### Soil Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>Soil Group</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>HSG A</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG B</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG C</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td><strong>220.425</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
</tbody>
</table>
**Ground Covers (all nodes)**

<table>
<thead>
<tr>
<th>HSG-A (acres)</th>
<th>HSG-B (acres)</th>
<th>HSG-C (acres)</th>
<th>HSG-D (acres)</th>
<th>Other (acres)</th>
<th>Total (acres)</th>
<th>Ground Cover</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>217.485</td>
<td>0.000</td>
<td>217.485</td>
<td>Meadow, non-grazed</td>
<td>1S, 2S, 3S, 11S, 12S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S</td>
</tr>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>2.941</td>
<td>0.000</td>
<td>2.941</td>
<td>Paved parking</td>
<td>11S, 12S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S</td>
</tr>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>220.425</td>
<td>0.000</td>
<td>220.425</td>
<td>TOTAL AREA</td>
<td></td>
</tr>
</tbody>
</table>
### Existing Drainage

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Direction</th>
<th>Flow Length</th>
<th>Slope</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff Area</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>Runoff Depth</th>
<th>Runoff Depth</th>
<th>Runoff Depth</th>
<th>Runoff Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1S: DD TO SOUTHEAST</td>
<td>Runoff Area=393,708 sf</td>
<td>0.00% Impervious</td>
<td>Runoff Depth&gt;0.72&quot;</td>
<td>Flow Length=300'</td>
<td>Tc=45.1 min</td>
<td>CN=78</td>
<td>Runoff=4.58 cfs</td>
<td>0.544 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2S: DD TO SOUTHWEST</td>
<td>Runoff Area=340,424 sf</td>
<td>0.00% Impervious</td>
<td>Runoff Depth&gt;0.72&quot;</td>
<td>Flow Length=550'</td>
<td>Tc=44.7 min</td>
<td>CN=78</td>
<td>Runoff=3.99 cfs</td>
<td>0.470 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3S: DD TO SOUTHWEST</td>
<td>Runoff Area=134,017 sf</td>
<td>0.00% Impervious</td>
<td>Runoff Depth&gt;0.72&quot;</td>
<td>Flow Length=500'</td>
<td>Tc=40.1 min</td>
<td>CN=78</td>
<td>Runoff=1.68 cfs</td>
<td>0.185 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11S: TO WETLAND</td>
<td>Runoff Area=230,474 sf</td>
<td>7.39% Impervious</td>
<td>Runoff Depth&gt;0.78&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=79</td>
<td>Runoff=7.47 cfs</td>
<td>0.344 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12S: HORSE BARNS</td>
<td>Runoff Area=96,048 sf</td>
<td>14.59% Impervious</td>
<td>Runoff Depth&gt;0.88&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=81</td>
<td>Runoff=3.54 cfs</td>
<td>0.162 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19S: TO WETLAND</td>
<td>Runoff Area=94,094 sf</td>
<td>6.50% Impervious</td>
<td>Runoff Depth&gt;0.78&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=79</td>
<td>Runoff=3.05 cfs</td>
<td>0.140 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20S: TO WETLAND</td>
<td>Runoff Area=202,427 sf</td>
<td>4.92% Impervious</td>
<td>Runoff Depth&gt;0.78&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=79</td>
<td>Runoff=6.56 cfs</td>
<td>0.302 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21S: TO WETLAND</td>
<td>Runoff Area=503,672 sf</td>
<td>1.85% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=15.26 cfs</td>
<td>0.705 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22S: TO WETLAND</td>
<td>Runoff Area=315,367 sf</td>
<td>0.42% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=9.55 cfs</td>
<td>0.442 af</td>
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</tr>
<tr>
<td>23S: TO WETLAND</td>
<td>Runoff Area=432,028 sf</td>
<td>0.84% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=13.09 cfs</td>
<td>0.605 af</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>24S: TO WETLAND</td>
<td>Runoff Area=528,021 sf</td>
<td>1.80% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=15.99 cfs</td>
<td>0.740 af</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25S: TO WETLAND</td>
<td>Runoff Area=493,166 sf</td>
<td>0.38% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=14.94 cfs</td>
<td>0.691 af</td>
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<tr>
<td>26S: TO WETLAND</td>
<td>Runoff Area=249,494 sf</td>
<td>2.55% Impervious</td>
<td>Runoff Depth&gt;0.78&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=79</td>
<td>Runoff=8.09 cfs</td>
<td>0.372 af</td>
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<tr>
<td>27S: TO WETLAND</td>
<td>Runoff Area=1,860,073 sf</td>
<td>2.54% Impervious</td>
<td>Runoff Depth&gt;0.78&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=79</td>
<td>Runoff=60.32 cfs</td>
<td>2.775 af</td>
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<tr>
<td>28S: TO WETLAND</td>
<td>Runoff Area=143,740 sf</td>
<td>1.17% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=4.35 cfs</td>
<td>0.201 af</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29S: TO WETLAND</td>
<td>Runoff Area=395,477 sf</td>
<td>0.00% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=11.98 cfs</td>
<td>0.554 af</td>
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<td></td>
</tr>
<tr>
<td>Subcatchment 30S: TO WETLAND</td>
<td>Runoff Area=3,189,501 sf</td>
<td>0.00% Impervious</td>
<td>Runoff Depth&gt;0.73&quot;</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tc=7.0 min</td>
<td>CN=78</td>
<td>Runoff=96.60 cfs 4.468 af</td>
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</table>

Reach 1R: TOTAL

<table>
<thead>
<tr>
<th>Inflow=10.21 cfs</th>
<th>1.199 af</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outflow=10.21 cfs</td>
<td>1.199 af</td>
</tr>
</tbody>
</table>

Reach 2R: SOUTHEAST

<table>
<thead>
<tr>
<th>Inflow=4.58 cfs</th>
<th>0.544 af</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outflow=4.58 cfs</td>
<td>0.544 af</td>
</tr>
</tbody>
</table>

Reach 3R: SOUTHWEST

<table>
<thead>
<tr>
<th>Inflow=5.64 cfs</th>
<th>0.655 af</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outflow=5.64 cfs</td>
<td>0.655 af</td>
</tr>
</tbody>
</table>

**Total Runoff Area = 220.425 ac**  **Runoff Volume = 13.700 af**  **Average Runoff Depth = 0.75"**

98.67% Pervious = 217.485 ac  1.33% Impervious = 2.941 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 4.58 cfs @ 12.68 hrs, Volume= 0.544 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>393,708</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>393,708</td>
<td>100.00% Pervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.1</td>
<td>300</td>
<td>0.0400</td>
<td>0.11</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 1S: DD TO SOUTHEAST

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=393,708 sf
Runoff Volume=0.544 af
Runoff Depth>0.72"
Flow Length=300'
Slope=0.0400 '/'
Tc=45.1 min
CN=78
Summary for Subcatchment 2S: DD TO SOUTHWEST

Runoff = 3.99 cfs @ 12.67 hrs, Volume= 0.470 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>340,424</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>340,424</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>22.7</td>
<td>300</td>
<td>0.0800</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
<tr>
<td>22.0</td>
<td>250</td>
<td>0.0600</td>
<td>0.19</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

| 44.7     | 550           | Total        |                   |               |                                      |

Subcatchment 2S: DD TO SOUTHWEST

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=340,424 sf
Runoff Volume=0.470 af
Runoff Depth>0.72"
Flow Length=550'
Tc=44.7 min
CN=78
Summary for Subcatchment 3S: DD TO SOUTHWEST

Runoff = 1.68 cfs @ 12.60 hrs, Volume= 0.185 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>134,017</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>134,017</td>
<td>100.00%</td>
<td>Pervious Area</td>
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</tbody>
</table>

<table>
<thead>
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<th>Tc (min)</th>
<th>Length (feet)</th>
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<th>Capacity (cfs)</th>
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<tbody>
<tr>
<td>23.3</td>
<td>300</td>
<td>0.0750</td>
<td>0.21</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
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<tr>
<td>16.8</td>
<td>200</td>
<td>0.0750</td>
<td>0.20</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

40.1 500 Total

Subcatchment 3S: DD TO SOUTHWEST

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=134,017 sf
Runoff Volume=0.185 af
Runoff Depth>0.72"
Flow Length=500'
Slope=0.0750 '/'
Tc=40.1 min
CN=78
Summary for Subcatchment 11S: TO WETLAND

Runoff = 7.47 cfs @ 12.15 hrs, Volume= 0.344 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,039</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>213,435</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>213,435</td>
<td></td>
<td>92.61% Pervious Area</td>
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<tr>
<td>17,039</td>
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<td>7.39% Impervious Area</td>
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<table>
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<th>Tc (min)</th>
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<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 11S: TO WETLAND

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=230,474 sf
Runoff Volume=0.344 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 3.54 cfs @ 12.15 hrs, Volume= 0.162 af, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,013</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>96,048</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>82,035</td>
<td></td>
<td>85.41% Pervious Area</td>
</tr>
<tr>
<td>14,013</td>
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<td>14.59% Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
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<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 12S: HORSE BARNS

Hydrograph

MSE 24-hr 3  
1-Year Rainfall=2.48"
Runoff Area=96,048 sf  
Runoff Volume=0.162 af  
Runoff Depth>0.88"
Tc=7.0 min  
CN=81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 3.05 cfs @ 12.15 hrs, Volume= 0.140 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,114</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>87,980</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
<td></td>
<td>93.50% Pervious Area</td>
</tr>
<tr>
<td>6,114</td>
<td></td>
<td>6.50% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 19S: TO WETLAND

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=94,094 sf
Runoff Volume=0.140 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 20S: TO WETLAND

Runoff = 6.56 cfs @ 12.15 hrs, Volume= 0.302 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,960</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>192,467</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>202,427</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>192,467</td>
<td>95.08%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>9,960</td>
<td>4.92%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

Tc=7.0 min

Subcatchment 20S: TO WETLAND

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=202,427 sf
Runoff Volume=0.302 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 21S: TO WETLAND

Runoff = 15.26 cfs @ 12.15 hrs, Volume= 0.705 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,337</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>494,335</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>494,335</td>
<td></td>
<td>98.15% Pervious Area</td>
</tr>
<tr>
<td>9,337</td>
<td></td>
<td>1.85% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 21S: TO WETLAND

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=503,672 sf
Runoff Volume=0.705 af
Runoff Depth>0.73"
Tc=7.0 min
CN=78

Hydrograph
Summary for Subcatchment 22S: TO WETLAND

Runoff = 9.55 cfs @ 12.15 hrs, Volume = 0.442 af, Depth > 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48"

### Area (sf) CN Description

<table>
<thead>
<tr>
<th>Area</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,310</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>314,057</td>
<td>99.58%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>1,310</td>
<td>0.42%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

### Tc, Length, Slope, Velocity, Capacity, Description

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

**Subcatchment 22S: TO WETLAND**

**Hydrograph**

- MSE 24-hr 3
- 1-Year Rainfall = 2.48"
- Runoff Area = 315,367 sf
- Runoff Volume = 0.442 af
- Runoff Depth > 0.73"
- Tc = 7.0 min
- CN = 78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 13.09 cfs @ 12.15 hrs, Volume = 0.605 af, Depth > 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48" 

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,638</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>428,390</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>432,028</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>428,390</td>
<td></td>
<td>99.16% Pervious Area</td>
</tr>
<tr>
<td>3,638</td>
<td></td>
<td>0.84% Impervious Area</td>
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<table>
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<th>Capacity (cfs)</th>
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<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 23S: TO WETLAND

Runoff Area = 432,028 sf
Runoff Volume = 0.605 af
Runoff Depth > 0.73"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 15.99 cfs @ 12.15 hrs, Volume = 0.740 af, Depth > 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs

MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,490</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>518,531</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>528,021</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>518,531</td>
<td></td>
<td>98.20% Pervious Area</td>
</tr>
<tr>
<td>9,490</td>
<td></td>
<td>1.80% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 24S: TO WETLAND

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=528,021 sf
Runoff Volume=0.740 af
Runoff Depth > 0.73"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 14.94 cfs @ 12.15 hrs, Volume= 0.691 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,876</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>491,290</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>493,166</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>491,290</td>
<td></td>
<td>99.62% Pervious Area</td>
</tr>
<tr>
<td>1,876</td>
<td></td>
<td>0.38% Impervious Area</td>
</tr>
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<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 25S: TO WETLAND

- MSE 24-hr 3
- 1-Year Rainfall=2.48"
- Runoff Area=493,166 sf
- Runoff Volume=0.691 af
- Runoff Depth>0.73"
- Tc=7.0 min
- CN=78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 8.09 cfs @ 12.15 hrs, Volume= 0.372 af, Depth > 0.78".

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,363</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 26S: TO WETLAND

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=249,494 sf
Runoff Volume=0.372 af
Runoff Depth > 0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 60.32 cfs @ 12.15 hrs, Volume = 2.775 af, Depth > 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>11,076</td>
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<tr>
<td>1,812,788</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>1,860,073</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,812,788</td>
<td>97.46%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>47,285</td>
<td>2.54%</td>
<td>Impervious Area</td>
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<table>
<thead>
<tr>
<th>Tc Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
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<tr>
<td>7.0</td>
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<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 27S: TO WETLAND

Hydrograph

- MSE 24-hr 3 1-Year Rainfall = 2.48"
- Runoff Area = 1,860,073 sf
- Runoff Volume = 2.775 af
- Runoff Depth > 0.78"
- Tc = 7.0 min
- CN = 79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 4.35 cfs @ 12.15 hrs, Volume= 0.201 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>1,680</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142,060</td>
<td></td>
<td>98.83% Pervious Area</td>
</tr>
<tr>
<td>1,680</td>
<td>1.17% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Direct Entry,

Subcatchment 28S: TO WETLAND

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=143,740 sf
Runoff Volume=0.201 af
Runoff Depth>0.73"
Tc=7.0 min
CN=78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 11.98 cfs @ 12.15 hrs, Volume= 0.554 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395,477</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>395,477</td>
<td>100.00% Pervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 29S: TO WETLAND

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=395,477 sf
Runoff Volume=0.554 af
Runoff Depth>0.73"
Tc=7.0 min
CN=78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 96.60 cfs @ 12.15 hrs, Volume = 4.468 af, Depth > 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tr>
<td>3,189,501</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>3,189,501</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 30S: TO WETLAND

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"  
Runoff Area=3,189,501 sf  
Runoff Volume=4.468 af  
Runoff Depth>0.73"  
Tc=7.0 min  
CN=78
Summary for Reach 1R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 19.930 ac, 0.00% Impervious, Inflow Depth > 0.72" for 1-Year event
Inflow = 10.21 cfs @ 12.66 hrs, Volume= 1.199 af
Outflow = 10.21 cfs @ 12.66 hrs, Volume= 1.199 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 2R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.038 ac, 0.00% Impervious, Inflow Depth > 0.72” for 1-Year event
Inflow = 4.58 cfs @ 12.68 hrs, Volume= 0.544 af
Outflow = 4.58 cfs @ 12.68 hrs, Volume= 0.544 af, Attenu= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: SOUTHEAST

Hydrograph
Summary for Reach 3R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.892 ac, 0.00% Impervious, Inflow Depth > 0.72" for 1-Year event
Inflow = 5.64 cfs @ 12.65 hrs, Volume = 0.655 af
Outflow = 5.64 cfs @ 12.65 hrs, Volume = 0.655 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs

Reach 3R: SOUTHWEST

Hydrograph
### Existing Drainage

**Prepared by Kimley-Horn and Associates**

**MSE 24-hr 3 2-Year Rainfall=2.82"**

**Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points**

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Type</th>
<th>Impervious (%)</th>
<th>Area (sf)</th>
<th>Depth</th>
<th>Tc (min)</th>
<th>CN</th>
<th>Runoff (cfs)</th>
<th>Runoff (af)</th>
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</thead>
<tbody>
<tr>
<td>1S: DD TO SOUTHEAST</td>
<td></td>
<td>0.00</td>
<td>393,708</td>
<td>&gt;0.94&quot;</td>
<td>45.1</td>
<td>78</td>
<td>6.06</td>
<td>0.706</td>
</tr>
<tr>
<td>Flow Length=300'</td>
<td>Slope=0.0400 '/'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2S: DD TO SOUTHWEST</td>
<td></td>
<td>0.00</td>
<td>340,424</td>
<td>&gt;0.94&quot;</td>
<td>44.7</td>
<td>78</td>
<td>5.29</td>
<td>0.611</td>
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<tr>
<td>Flow Length=550'</td>
<td>Slope=0.0750 '/'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3S: DD TO SOUTHWEST</td>
<td></td>
<td>0.00</td>
<td>134,017</td>
<td>&gt;0.94&quot;</td>
<td>40.1</td>
<td>78</td>
<td>2.23</td>
<td>0.241</td>
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<tr>
<td>Flow Length=500'</td>
<td>Slope=0.0750 '/'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11S: TO WETLAND</td>
<td></td>
<td>7.39</td>
<td>230,474</td>
<td>&gt;1.00&quot;</td>
<td>7.0</td>
<td>79</td>
<td>9.70</td>
<td>0.443</td>
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<tr>
<td>12S: HORSE BARNS</td>
<td></td>
<td>14.59</td>
<td>96,048</td>
<td>&gt;1.12&quot;</td>
<td>7.0</td>
<td>81</td>
<td>4.51</td>
<td>0.206</td>
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<tr>
<td>19S: TO WETLAND</td>
<td></td>
<td>6.50</td>
<td>94,094</td>
<td>&gt;1.00&quot;</td>
<td>7.0</td>
<td>79</td>
<td>3.96</td>
<td>0.181</td>
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<tr>
<td>20S: TO WETLAND</td>
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<td>4.92</td>
<td>202,427</td>
<td>&gt;1.00&quot;</td>
<td>7.0</td>
<td>79</td>
<td>8.52</td>
<td>0.389</td>
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<tr>
<td>21S: TO WETLAND</td>
<td></td>
<td>1.85</td>
<td>503,672</td>
<td>&gt;0.95&quot;</td>
<td>7.0</td>
<td>78</td>
<td>19.99</td>
<td>0.916</td>
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<tr>
<td>22S: TO WETLAND</td>
<td></td>
<td>0.42</td>
<td>315,367</td>
<td>&gt;0.95&quot;</td>
<td>7.0</td>
<td>78</td>
<td>12.52</td>
<td>0.573</td>
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<tr>
<td>23S: TO WETLAND</td>
<td></td>
<td>0.84</td>
<td>432,028</td>
<td>&gt;0.95&quot;</td>
<td>7.0</td>
<td>78</td>
<td>17.15</td>
<td>0.785</td>
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<tr>
<td>24S: TO WETLAND</td>
<td></td>
<td>1.80</td>
<td>528,021</td>
<td>&gt;0.95&quot;</td>
<td>7.0</td>
<td>78</td>
<td>20.96</td>
<td>0.960</td>
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<tr>
<td>25S: TO WETLAND</td>
<td></td>
<td>0.38</td>
<td>493,166</td>
<td>&gt;0.95&quot;</td>
<td>7.0</td>
<td>78</td>
<td>19.57</td>
<td>0.897</td>
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<tr>
<td>26S: TO WETLAND</td>
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<td>2.55</td>
<td>249,494</td>
<td>&gt;1.00&quot;</td>
<td>7.0</td>
<td>79</td>
<td>10.50</td>
<td>0.480</td>
</tr>
<tr>
<td>27S: TO WETLAND</td>
<td></td>
<td>2.54</td>
<td>1,860,073</td>
<td>&gt;1.00&quot;</td>
<td>7.0</td>
<td>79</td>
<td>78.27</td>
<td>3.576</td>
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<tr>
<td>28S: TO WETLAND</td>
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<td>1.17</td>
<td>143,740</td>
<td>&gt;0.95&quot;</td>
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<td>78</td>
<td>5.71</td>
<td>0.261</td>
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<tr>
<td>29S: TO WETLAND</td>
<td></td>
<td>0.00</td>
<td>395,477</td>
<td>&gt;0.95&quot;</td>
<td>7.0</td>
<td>78</td>
<td>15.70</td>
<td>0.719</td>
</tr>
</tbody>
</table>
Subcatchment 30S: TO WETLAND

Runoff Area = 3,189,501 sf  0.00% Impervious  Runoff Depth > 0.95"
Tc = 7.0 min  CN = 78  Runoff = 126.60 cfs  5.798 af

Reach 1R: TOTAL

Inflow = 13.53 cfs  1.557 af
Outflow = 13.53 cfs  1.557 af

Reach 2R: SOUTHEAST

Inflow = 6.06 cfs  0.706 af
Outflow = 6.06 cfs  0.706 af

Reach 3R: SOUTHWEST

Inflow = 7.48 cfs  0.851 af
Outflow = 7.48 cfs  0.851 af

Total Runoff Area = 220.425 ac  Runoff Volume = 17.741 af  Average Runoff Depth = 0.97"
98.67% Pervious = 217.485 ac  1.33% Impervious = 2.941 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 6.06 cfs @ 12.66 hrs, Volume = 0.706 af, Depth > 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 2-Year Rainfall = 2.82"  

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>393,708</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>393,708</td>
<td>100.00% Pervious Area</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.1</td>
<td>300</td>
<td>0.0400</td>
<td>0.11</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n = 0.400 P2 = 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 1S: DD TO SOUTHEAST

Hydrograph

MSE 24-hr 3 2-Year Rainfall = 2.82"
Runoff Area = 393,708 sf
Runoff Volume = 0.706 af
Runoff Depth > 0.94"
Flow Length = 300'
Slope = 0.0400 '/'
Tc = 45.1 min
CN = 78
Summary for Subcatchment 2S: DD TO SOUTHWEST

Runoff = 5.29 cfs @ 12.66 hrs, Volume= 0.611 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>340,424</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>340,424</td>
<td>100</td>
<td>100.00% Pervious Area</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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</thead>
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<tr>
<td>22.7</td>
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<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
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<tr>
<td>22.0</td>
<td>250</td>
<td>0.0600</td>
<td>0.19</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

| 44.7     | 550           |               |                  |               | Total                                  |

Subcatchment 2S: DD TO SOUTHWEST

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=340,424 sf
Runoff Volume=0.611 af
Runoff Depth>0.94"
Flow Length=550'
Tc=44.7 min
CN=78
Summary for Subcatchment 3S: DD TO SOUTHWEST

Runoff = 2.23 cfs @ 12.59 hrs, Volume= 0.241 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>134,017</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>134,017</td>
<td>100</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc  (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>23.3</td>
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<td>0.21</td>
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<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
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<tr>
<td>16.8</td>
<td>200</td>
<td>0.0750</td>
<td>0.20</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

40.1 500 Total

Subcatchment 3S: DD TO SOUTHWEST

MSE 24-hr 3
2-Year Rainfall=2.82"
Runoff Area=134,017 sf
Runoff Volume=0.241 af
Runoff Depth>0.94"
Flow Length=500'
Slope=0.0750 '/'
Tc=40.1 min
CN=78
Summary for Subcatchment 11S: TO WETLAND

Runoff = 9.70 cfs @ 12.15 hrs, Volume = 0.443 af, Depth > 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 2-Year Rainfall = 2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,039</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>213,435</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>213,435</td>
<td></td>
<td>92.61% Pervious Area</td>
</tr>
<tr>
<td>17,039</td>
<td></td>
<td>7.39% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 11S: TO WETLAND

MSE 24-hr 3 2-Year Rainfall = 2.82"
Runoff Area = 230,474 sf
Runoff Volume = 0.443 af
Runoff Depth > 1.00"
Tc = 7.0 min
CN = 79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 4.51 cfs @ 12.15 hrs, Volume = 0.206 af, Depth > 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall = 2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,013</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>96,048</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>82,035</td>
<td>85.41</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>14,013</td>
<td>14.59</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 12S: HORSE BARNS

Hydrograph

MSE 24-hr 3 2-Year Rainfall = 2.82"
Runoff Area = 96,048 sf
Runoff Volume = 0.206 af
Runoff Depth > 1.12"
Tc = 7.0 min
CN = 81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 3.96 cfs @ 12.15 hrs, Volume= 0.181 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>6,114</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>87,980</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
<td></td>
<td>93.50% Pervious Area</td>
</tr>
<tr>
<td>6,114</td>
<td></td>
<td>6.50% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 19S: TO WETLAND

MSE 24-hr 3
2-Year Rainfall=2.82"
Runoff Area=94,094 sf
Runoff Volume=0.181 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 20S: TO WETLAND

Runoff = 8.52 cfs @ 12.15 hrs, Volume= 0.389 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,960</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>192,467</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>202,427</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>192,467</td>
<td></td>
<td>95.08% Pervious Area</td>
</tr>
<tr>
<td>9,960</td>
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<td>4.92% Impervious Area</td>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<td>7.0</td>
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<td>Direct Entry,</td>
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</tbody>
</table>

Subcatchment 20S: TO WETLAND

![Hydrograph](image)

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=202,427 sf
Runoff Volume=0.389 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 21S: TO WETLAND

Runoff = 19.99 cfs @ 12.15 hrs, Volume= 0.916 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
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<td>494,335</td>
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<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
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<tr>
<td>494,335</td>
<td>98.15% Pervious Area</td>
<td></td>
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<tr>
<td>9,337</td>
<td>1.85% Impervious Area</td>
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<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 21S: TO WETLAND

Hydrograph

MSE 24-hr 3  2-Year Rainfall=2.82"
Runoff Area=503,672 sf
Runoff Volume=0.916 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 22S: TO WETLAND

Runoff = 12.52 cfs @ 12.15 hrs, Volume= 0.573 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
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<tr>
<td>1,310</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
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<tr>
<td>314,057</td>
<td>99.58%</td>
<td>Pervious Area</td>
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<tr>
<td>1,310</td>
<td>0.42%</td>
<td>Impervious Area</td>
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Tc = 7.0 min

Subcatchment 22S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=315,367 sf
Runoff Volume=0.573 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 17.15 cfs @ 12.15 hrs, Volume= 0.785 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3,638</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>428,390</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<td>432,028</td>
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<td>Weighted Average</td>
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<tr>
<td>428,390</td>
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<td>99.16% Pervious Area</td>
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<tr>
<td>3,638</td>
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<td>0.84% Impervious Area</td>
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Tc = 7.0 min

Subcatchment 23S: TO WETLAND

MSE 24-hr 3  2-Year Rainfall=2.82"
Runoff Area=432,028 sf
Runoff Volume=0.785 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 20.96 cfs @ 12.15 hrs, Volume= 0.960 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>9,490</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>518,531</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>528,021</td>
<td>78</td>
<td>Weighted Average</td>
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<tr>
<td>518,531</td>
<td>98</td>
<td>98.20% Pervious Area</td>
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<tr>
<td>9,490</td>
<td>1.80% Impervious Area</td>
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<th>Capacity (cfs)</th>
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<tbody>
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<td>7.0</td>
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<td></td>
<td>Direct Entry,</td>
</tr>
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Subcatchment 24S: TO WETLAND

Hydrograph

MSE 24-hr 3  2-Year Rainfall=2.82"
Runoff Area=528,021 sf
Runoff Volume=0.960 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 19.57 cfs @ 12.15 hrs, Volume= 0.897 af, Depth > 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>1,876</td>
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<tr>
<td>491,290</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>493,166</td>
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<td>Weighted Average</td>
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<tr>
<td>491,290</td>
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<td>99.62% Pervious Area</td>
</tr>
<tr>
<td>1,876</td>
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<td>0.38% Impervious Area</td>
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Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Subcatchment 25S: TO WETLAND

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=493,166 sf
Runoff Volume=0.897 af
Runoff Depth > 0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 10.50 cfs @ 12.15 hrs, Volume= 0.480 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>Paved parking, HSG D</td>
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<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
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Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Subcatchment 26S: TO WETLAND

Hydrograph

MSE 24-hr 3
2-Year Rainfall=2.82"
Runoff Area=249,494 sf
Runoff Volume=0.480 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 78.27 cfs @ 12.15 hrs, Volume= 3.576 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
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<tr>
<th>Area (sf)</th>
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<th>Description</th>
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<tbody>
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<tr>
<td>11,076</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>1,812,788</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>1,860,073</td>
<td>79</td>
<td>Weighted Average</td>
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<tr>
<td>1,812,788</td>
<td>97.46%</td>
<td>Pervious Area</td>
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<tr>
<td>47,285</td>
<td>2.54%</td>
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<th>Length (feet)</th>
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<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>7.0</td>
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<td></td>
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<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 27S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=1,860,073 sf
Runoff Volume=3.576 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 5.71 cfs @ 12.15 hrs, Volume= 0.261 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<td>Paved parking, HSG D</td>
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<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
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<tr>
<td>142,060</td>
<td></td>
<td>98.83% Pervious Area</td>
</tr>
<tr>
<td>1,680</td>
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<td>1.17% Impervious Area</td>
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<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>7.0</td>
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<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
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Subcatchment 28S: TO WETLAND

Hydrograph

MSE 24-hr 3  2-Year Rainfall=2.82"
Runoff Area=143,740 sf
Runoff Volume=0.261 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 15.70 cfs @ 12.15 hrs, Volume= 0.719 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<tr>
<td>395,477</td>
<td>100</td>
<td>100.00% Pervious Area</td>
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</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Direct Entry,

Subcatchment 29S: TO WETLAND

Hydrograph

- MSE 24-hr 3  2-Year Rainfall=2.82"
- Runoff Area=395,477 sf
- Runoff Volume=0.719 af
- Runoff Depth>0.95"
- Tc=7.0 min
- CN=78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 126.60 cfs @ 12.15 hrs, Volume = 5.798 af, Depth > 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 2-Year Rainfall = 2.82"

<table>
<thead>
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<th>Area (sf)</th>
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<th>Description</th>
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<tbody>
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<tr>
<td>3,189,501</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
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</table>

Tc=7.0 min
Direct Entry,

Subcatchment 30S: TO WETLAND

Hydrograph

MSE 24-hr 3
2-Year Rainfall = 2.82"
Runoff Area = 3,189,501 sf
Runoff Volume = 5.798 af
Runoff Depth > 0.95"
Tc=7.0 min
CN=78
Summary for Reach 1R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 19.930 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2-Year event
Inflow = 13.53 cfs @ 12.65 hrs, Volume= 1.557 af
Outflow = 13.53 cfs @ 12.65 hrs, Volume= 1.557 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL

Hydrograph

Inflow Area=19.930 ac
Summary for Reach 2R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.038 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2-Year event
Inflow = 6.06 cfs @ 12.66 hrs, Volume= 0.706 af
Outflow = 6.06 cfs @ 12.66 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 3R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.892 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2-Year event
Inflow = 7.48 cfs @ 12.64 hrs, Volume= 0.851 af
Outflow = 7.48 cfs @ 12.64 hrs, Volume= 0.851 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

Existing Drainage

Prepared by Kimley-Horn and Associates
Printed 2/28/2019

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1S: DD TO SOUTHEAST
Runoff Area=393,708 sf  0.00% Impervious  Runoff Depth>1.92"
Flow Length=300'  Slope=0.0400 '/'  Tc=45.1 min  CN=78  Runoff=12.74 cfs  1.445 af

Subcatchment 2S: DD TO SOUTHWEST
Runoff Area=340,424 sf  0.00% Impervious  Runoff Depth>1.92"
Flow Length=550'  Tc=44.7 min  CN=78  Runoff=11.11 cfs  1.249 af

Subcatchment 3S: DD TO SOUTHWEST
Runoff Area=134,017 sf  0.00% Impervious  Runoff Depth>1.92"
Flow Length=500'  Slope=0.0750 '/'  Tc=40.1 min  CN=78  Runoff=4.68 cfs  0.493 af

Subcatchment 11S: TO WETLAND
Runoff Area=230,474 sf  7.39% Impervious  Runoff Depth>2.02"
Tc=7.0 min  CN=79  Runoff=19.43 cfs  0.890 af

Subcatchment 12S: HORSE BARNES
Runoff Area=96,048 sf  14.59% Impervious  Runoff Depth>2.18"
Tc=7.0 min  CN=81  Runoff=8.69 cfs  0.400 af

Subcatchment 19S: TO WETLAND
Runoff Area=94,094 sf  6.50% Impervious  Runoff Depth>2.02"
Tc=7.0 min  CN=79  Runoff=7.93 cfs  0.363 af

Subcatchment 20S: TO WETLAND
Runoff Area=202,427 sf  4.92% Impervious  Runoff Depth>2.02"
Tc=7.0 min  CN=79  Runoff=17.06 cfs  0.782 af

Subcatchment 21S: TO WETLAND
Runoff Area=503,672 sf  1.85% Impervious  Runoff Depth>1.94"
Tc=7.0 min  CN=78  Runoff=40.90 cfs  1.870 af

Subcatchment 22S: TO WETLAND
Runoff Area=315,367 sf  0.42% Impervious  Runoff Depth>1.94"
Tc=7.0 min  CN=78  Runoff=25.61 cfs  1.171 af

Subcatchment 23S: TO WETLAND
Runoff Area=432,028 sf  0.84% Impervious  Runoff Depth>1.94"
Tc=7.0 min  CN=78  Runoff=35.08 cfs  1.604 af

Subcatchment 24S: TO WETLAND
Runoff Area=528,021 sf  1.80% Impervious  Runoff Depth>1.94"
Tc=7.0 min  CN=78  Runoff=42.88 cfs  1.960 af

Subcatchment 25S: TO WETLAND
Runoff Area=493,166 sf  0.38% Impervious  Runoff Depth>1.94"
Tc=7.0 min  CN=78  Runoff=40.05 cfs  1.831 af

Subcatchment 26S: TO WETLAND
Runoff Area=249,494 sf  2.55% Impervious  Runoff Depth>2.02"
Tc=7.0 min  CN=79  Runoff=21.03 cfs  0.963 af

Subcatchment 27S: TO WETLAND
Runoff Area=1,860,073 sf  2.54% Impervious  Runoff Depth>2.02"
Tc=7.0 min  CN=79  Runoff=156.78 cfs  7.182 af

Subcatchment 28S: TO WETLAND
Runoff Area=143,740 sf  1.17% Impervious  Runoff Depth>1.94"
Tc=7.0 min  CN=78  Runoff=11.67 cfs  0.534 af

Subcatchment 29S: TO WETLAND
Runoff Area=395,477 sf  0.00% Impervious  Runoff Depth>1.94"
Tc=7.0 min  CN=78  Runoff=32.11 cfs  1.468 af
Existing Drainage

Subcatchment 30S: TO WETLAND
Runoff Area = 3,189,501 sf  0.00% Impervious  Runoff Depth > 1.94"
Tc = 7.0 min  CN = 78  Runoff = 259.00 cfs  11.842 af

Reach 1R: TOTAL
Inflow = 28.44 cfs  3.187 af
Outflow = 28.44 cfs  3.187 af

Reach 2R: SOUTHEAST
Inflow = 12.74 cfs  1.445 af
Outflow = 12.74 cfs  1.445 af

Reach 3R: SOUTHWEST
Inflow = 15.71 cfs  1.742 af
Outflow = 15.71 cfs  1.742 af

Total Runoff Area = 220.425 ac  Runoff Volume = 36.047 af  Average Runoff Depth = 1.96"
98.67% Pervious = 217.485 ac  1.33% Impervious = 2.941 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 12.74 cfs @ 12.64 hrs, Volume= 1.445 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>393,708</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.1</td>
<td>300</td>
<td>0.0400</td>
<td>0.11</td>
<td></td>
<td>Sheet Flow,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>n= 0.400  P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 1S: DD TO SOUTHEAST

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=393,708 sf
Runoff Volume=1.445 af
Runoff Depth>1.92"
Flow Length=300'
Slope=0.0400 '/'
Tc=45.1 min
CN=78
Summary for Subcatchment 2S: DD TO SOUTHWEST

Runoff = 11.11 cfs @ 12.63 hrs, Volume= 1.249 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>340,424</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>340,424</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.7</td>
<td>300</td>
<td>0.0800</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
<tr>
<td>22.0</td>
<td>250</td>
<td>0.0600</td>
<td>0.19</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

| 44.7     | 550           |               |                   |                | Total                        |

Subcatchment 2S: DD TO SOUTHWEST

MSE 24-hr 3  10-Year Rainfall=4.18"
Runoff Area=340,424 sf
Runoff Volume=1.249 af
Runoff Depth>1.92"
Flow Length=550'
Tc=44.7 min
CN=78
Summary for Subcatchment 3S: DD TO SOUTHWEST

Runoff = 4.68 cfs @ 12.57 hrs, Volume= 0.493 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>134,017</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>134,017</td>
<td>100.00% Pervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.3</td>
<td>300</td>
<td>0.0750</td>
<td>0.21</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
<tr>
<td>16.8</td>
<td>200</td>
<td>0.0750</td>
<td>0.20</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
<tr>
<td>40.1</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Subcatchment 3S: DD TO SOUTHWEST

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=134,017 sf
Runoff Volume=0.493 af
Runoff Depth>1.92"
Flow Length=500'
Slope=0.0750 '/'
Tc=40.1 min
CN=78
Summary for Subcatchment 11S: TO WETLAND

Runoff = 19.43 cfs @ 12.14 hrs, Volume= 0.890 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,039</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>213,435</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>213,435</td>
<td></td>
<td>92.61% Pervious Area</td>
</tr>
<tr>
<td>17,039</td>
<td></td>
<td>7.39% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
7.0    (min) (feet) (ft/ft) (ft/sec) (cfs) Direct Entry, Subcatchment 11S: TO WETLAND

MSE 24-hr 3  10-Year Rainfall=4.18"
Runoff Area=230,474 sf
Runoff Volume=0.890 af
Runoff Depth>2.02"
Tc=7.0 min
CN=79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 8.69 cfs @ 12.14 hrs, Volume= 0.400 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,013</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>96,048</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>82,035</td>
<td>85.41% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>14,013</td>
<td>14.59% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

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

Subcatchment 12S: HORSE BARNS

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=96,048 sf
Runoff Volume=0.400 af
Runoff Depth>2.18"
Tc=7.0 min
CN=81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 7.93 cfs @ 12.14 hrs, Volume= 0.363 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,114</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>87,980</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
<td></td>
<td>93.50% Pervious Area</td>
</tr>
<tr>
<td>6,114</td>
<td></td>
<td>6.50% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 19S: TO WETLAND

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=94,094 sf
Runoff Volume=0.363 af
Runoff Depth>2.02"
Tc=7.0 min
CN=79
**Summary for Subcatchment 20S: TO WETLAND**

Runoff = 17.06 cfs @ 12.14 hrs, Volume = 0.782 af, Depth > 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,960</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>192,467</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>202,427</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>192,467</td>
<td></td>
<td>95.08% Pervious Area</td>
</tr>
<tr>
<td>9,960</td>
<td></td>
<td>4.92% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

**Subcatchment 20S: TO WETLAND**

Hydrograph

- MSE 24-hr 3 10-Year Rainfall=4.18"
- Runoff Area=202,427 sf
- Runoff Volume=0.782 af
- Runoff Depth > 2.02"
- Tc=7.0 min
- CN=79
Summary for Subcatchment 21S: TO WETLAND

Runoff = 40.90 cfs @ 12.15 hrs, Volume= 1.870 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,337</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>494,335</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>494,335</td>
<td></td>
<td>98.15% Pervious Area</td>
</tr>
<tr>
<td>9,337</td>
<td></td>
<td>1.85% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
( min) (feet) (ft/ft) (ft/sec) (cfs)                  
7.0

Subcatchment 21S: TO WETLAND

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=503,672 sf
Runoff Volume=1.870 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Subcatchment 22S: TO WETLAND

Runoff = 25.61 cfs @ 12.15 hrs, Volume = 1.171 af, Depth > 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,310</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>314,057</td>
<td>99.58%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>1,310</td>
<td>0.42%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 22S: TO WETLAND

MSE 24-hr 3
10-Year Rainfall = 4.18"
Runoff Area = 315,367 sf
Runoff Volume = 1.171 af
Runoff Depth > 1.94"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 35.08 cfs @ 12.15 hrs, Volume = 1.604 af, Depth > 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,638</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>428,390</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>432,028</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>428,390</td>
<td></td>
<td>99.16% Pervious Area</td>
</tr>
<tr>
<td>3,638</td>
<td>0.84% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 23S: TO WETLAND

Hydrograph

MSE 24-hr 3 10-Year Rainfall = 4.18"
Runoff Area = 432,028 sf
Runoff Volume = 1.604 af
Runoff Depth > 1.94"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 42.88 cfs @ 12.15 hrs, Volume= 1.960 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,490</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>518,531</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>528,021</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>518,531</td>
<td></td>
<td>98.20% Pervious Area</td>
</tr>
<tr>
<td>9,490</td>
<td></td>
<td>1.80% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 24S: TO WETLAND

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=528,021 sf
Runoff Volume=1.960 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 40.05 cfs @ 12.15 hrs, Volume = 1.831 af, Depth > 1.94" 

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,876</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>491,290</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>493,166</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>491,290</td>
<td></td>
<td>99.62% Pervious Area</td>
</tr>
<tr>
<td>1,876</td>
<td>0.38% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 25S: TO WETLAND

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=493,166 sf 
Runoff Volume=1.831 af 
Runoff Depth>1.94"
Tc=7.0 min 
CN=78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 21.03 cfs @ 12.14 hrs, Volume= 0.963 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,363</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
</tr>
</tbody>
</table>

Tc=7.0 min

MSE 24-hr 3  10-Year Rainfall=4.18"
Runoff Area=249,494 sf
Runoff Volume=0.963 af
Runoff Depth>2.02"
Tc=7.0 min
CN=79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 156.78 cfs @ 12.14 hrs, Volume = 7.182 af, Depth > 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,209</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,076</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,812,788</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
</tbody>
</table>

1,860,073  79  Weighted Average
1,812,788  97.46% Pervious Area
47,285     2.54% Impervious Area

Tc = 7.0 min
Length (feet) Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description
Direct Entry,

Subcatchment 27S: TO WETLAND

Hydrograph

MSE 24-hr 3 10-Year Rainfall = 4.18"
Runoff Area = 1,860,073 sf
Runoff Volume = 7.182 af
Runoff Depth > 2.02"
Tc = 7.0 min
CN = 79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 11.67 cfs @ 12.15 hrs, Volume= 0.534 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,680</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142,060</td>
<td></td>
<td>98.83% Pervious Area</td>
</tr>
<tr>
<td>1,680</td>
<td></td>
<td>1.17% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 28S: TO WETLAND

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=143,740 sf
Runoff Volume=0.534 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 32.11 cfs @ 12.15 hrs, Volume = 1.468 af, Depth > 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395,477</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>395,477</td>
<td>100.00% Pervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Direct Entry,

Subcatchment 29S: TO WETLAND

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area = 395,477 sf
Runoff Volume = 1.468 af
Runoff Depth > 1.94"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 259.00 cfs @ 12.15 hrs, Volume= 11.842 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,189,501</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>3,189,501</td>
<td>100.00% Pervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc=7.0 min

Subcatchment 30S: TO WETLAND

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=3,189,501 sf
Runoff Volume=11.842 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Reach 1R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 19.930 ac, 0.00% Impervious, Inflow Depth > 1.92" for 10-Year event
Inflow = 28.44 cfs @ 12.62 hrs, Volume= 3.187 af
Outflow = 28.44 cfs @ 12.62 hrs, Volume= 3.187 af, Attenuation=0%, Lag=0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL

Hydrograph
Summary for Reach 2R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.038 ac, 0.00% Impervious, Inflow Depth > 1.92" for 10-Year event
Inflow = 12.74 cfs @ 12.64 hrs, Volume= 1.445 af
Outflow = 12.74 cfs @ 12.64 hrs, Volume= 1.445 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 3R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.892 ac, 0.00% Impervious, Inflow Depth > 1.92" for 10-Year event
Inflow = 15.71 cfs @ 12.61 hrs, Volume = 1.742 af
Outflow = 15.71 cfs @ 12.61 hrs, Volume = 1.742 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs

Reach 3R: SOUTHWEST

Hydrograph
Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: DD TO SOUTHEAST
Flow Length=300'
Runoff Area=393,708 sf 0.00% Impervious Runoff Depth>4.52"
Slope=0.0400 '/'  Tc=45.1 min  CN=78  Runoff=29.88 cfs 3.401 af

Subcatchment2S: DD TO SOUTHWEST
Flow Length=550'
Runoff Area=340,424 sf 0.00% Impervious Runoff Depth>4.52"
Slope=0.0750 '/'  Tc=44.7 min  CN=78  Runoff=26.01 cfs 2.941 af

Subcatchment3S: DD TO SOUTHWEST
Flow Length=500'
Runoff Area=134,017 sf 0.00% Impervious Runoff Depth>4.52"
Slope=0.0750 '/'  Tc=40.1 min  CN=78  Runoff=10.94 cfs 1.159 af

Subcatchment11S: TO WETLAND
Runoff Area=230,474 sf 7.39% Impervious Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=43.50 cfs 2.059 af

Subcatchment12S: HORSE BARNS
Runoff Area=96,048 sf 14.59% Impervious Runoff Depth>4.89"
Tc=7.0 min  CN=81  Runoff=18.81 cfs 0.899 af

Subcatchment19S: TO WETLAND
Runoff Area=94,094 sf 6.50% Impervious Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=17.76 cfs 0.841 af

Subcatchment20S: TO WETLAND
Runoff Area=202,427 sf 4.92% Impervious Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=38.20 cfs 1.808 af

Subcatchment21S: TO WETLAND
Runoff Area=503,672 sf 1.85% Impervious Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=93.22 cfs 4.394 af

Subcatchment22S: TO WETLAND
Runoff Area=315,367 sf 0.42% Impervious Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=58.37 cfs 2.751 af

Subcatchment23S: TO WETLAND
Runoff Area=432,028 sf 0.84% Impervious Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=79.96 cfs 3.769 af

Subcatchment24S: TO WETLAND
Runoff Area=528,021 sf 1.80% Impervious Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=97.72 cfs 4.606 af

Subcatchment25S: TO WETLAND
Runoff Area=493,166 sf 0.38% Impervious Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=91.27 cfs 4.302 af

Subcatchment26S: TO WETLAND
Runoff Area=249,494 sf 2.55% Impervious Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=47.08 cfs 2.229 af

Subcatchment27S: TO WETLAND
Runoff Area=1,860,073 sf 2.54% Impervious Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=351.04 cfs 16.618 af

Subcatchment28S: TO WETLAND
Runoff Area=143,740 sf 1.17% Impervious Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=26.60 cfs 1.254 af

Subcatchment29S: TO WETLAND
Runoff Area=395,477 sf 0.00% Impervious Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=73.19 cfs 3.450 af
Subcatchment 30S: TO WETLAND

Runoff Area = 3,189,501 sf  0.00% Impervious  Runoff Depth > 4.56"
Tc = 7.0 min  CN = 78  Runoff = 590.30 cfs  27.822 af

Reach 1R: TOTAL

Inflow = 66.65 cfs  7.501 af
Outflow = 66.65 cfs  7.501 af

Reach 2R: SOUTHEAST

Inflow = 29.88 cfs  3.401 af
Outflow = 29.88 cfs  3.401 af

Reach 3R: SOUTHWEST

Inflow = 36.82 cfs  4.100 af
Outflow = 36.82 cfs  4.100 af

Total Runoff Area = 220.425 ac  Runoff Volume = 84.301 af  Average Runoff Depth = 4.59"
98.67% Pervious = 217.485 ac  1.33% Impervious = 2.941 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 29.88 cfs @ 12.62 hrs, Volume= 3.401 af, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>393,708</td>
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<td>Meadow, non-grazed, HSG D</td>
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<td></td>
<td>100.00%</td>
<td>Pervious Area</td>
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<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
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<td>Sheet Flow, Woods: Light underbrush n= 0.400  P2= 2.42&quot;</td>
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Subcatchment 1S: DD TO SOUTHEAST

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=393,708 sf
Runoff Volume=3.401 af
Runoff Depth>4.52"
Flow Length=300'
Slope=0.0400 '/l'
Tc=45.1 min
CN=78
Summary for Subcatchment 2S: DD TO SOUTHWEST

Runoff = 26.01 cfs @ 12.61 hrs, Volume = 2.941 af, Depth > 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
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<th>Area (sf)</th>
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<tr>
<td>340,424</td>
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<td>Pervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<td>22.7</td>
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<td>Sheet Flow, Grass: Dense n = 0.240 P2 = 2.42&quot;</td>
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<tr>
<td>22.0</td>
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<td>0.0600</td>
<td>0.19</td>
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<td>Sheet Flow, Grass: Dense n = 0.240 P2 = 2.42&quot;</td>
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44.7 550 Total

Subcatchment 2S: DD TO SOUTHWEST

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=340,424 sf
Runoff Volume=2.941 af
Runoff Depth>4.52"
Flow Length=550'
Tc=44.7 min
CN=78
Summary for Subcatchment 3S: DD TO SOUTHWEST

Runoff = 10.94 cfs @ 12.55 hrs, Volume = 1.159 af, Depth > 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>134,017</td>
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<td>134,017</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
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<th>Capacity (cfs)</th>
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<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
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40.1 500 Total

Subcatchment 3S: DD TO SOUTHWEST

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=134,017 sf
Runoff Volume=1.159 af
Runoff Depth>4.52"
Flow Length=500'
Slope=0.0750 '/'
Tc=40.1 min
CN=78
Summary for Subcatchment 11S: TO WETLAND

Runoff = 43.50 cfs @ 12.14 hrs, Volume = 2.059 af, Depth > 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 100-Year Rainfall = 7.29"

<table>
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<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<td>Paved parking, HSG D</td>
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<tr>
<td>213,435</td>
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<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
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<tr>
<td>213,435</td>
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<td>92.61% Pervious Area</td>
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<tr>
<td>17,039</td>
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<td>7.39% Impervious Area</td>
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</table>

Tc = 7.0 min

Direct Entry,

Subcatchment 11S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall = 7.29"
Runoff Area = 230,474 sf
Runoff Volume = 2.059 af
Runoff Depth > 4.67"
Tc = 7.0 min
CN = 79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 18.81 cfs @ 12.14 hrs, Volume= 0.899 af, Depth > 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<td>96,048</td>
<td>81</td>
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<tr>
<td>82,035</td>
<td>85.41% Pervious Area</td>
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<tr>
<td>14,013</td>
<td>14.59% Impervious Area</td>
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Tc Length Slope Velocity Capacity Description
7.0 (min) (feet) (ft/ft) (ft/sec) (cfs)

Subcatchment 12S: HORSE BARNS

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=96,048 sf
Runoff Volume=0.899 af
Runoff Depth>4.89"
Tc=7.0 min
CN=81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 17.76 cfs @ 12.14 hrs, Volume = 0.841 af, Depth > 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>6,114</td>
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<tr>
<td>87,980</td>
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<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
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<td>93.50% Pervious Area</td>
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<tr>
<td>6,114</td>
<td></td>
<td>6.50% Impervious Area</td>
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Tc = 7.0 min

Subcatchment 19S: TO WETLAND

Hydrograph

MSE 24-hr 3  100-Year Rainfall=7.29"
Runoff Area=94,094 sf
Runoff Volume=0.841 af
Runoff Depth>4.67"
Tc=7.0 min
CN=79
Summary for Subcatchment 20S: TO WETLAND

Runoff = 38.20 cfs @ 12.14 hrs, Volume = 1.808 af, Depth > 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 100-Year Rainfall = 7.29"

Area (sf)  CN  Description
9,960  98  Paved parking, HSG D
192,467  78  Meadow, non-grazed, HSG D

202,427  79  Weighted Average
192,467  95.08% Pervious Area
9,960  4.92% Impervious Area

Tc = 7.0 min
Length (feet)  Slope (ft/ft)  Velocity (ft/sec)  Capacity (cfs)  Description
Direct Entry,

Subcatchment 20S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall = 7.29"
Runoff Area = 202,427 sf
Runoff Volume = 1.808 af
Runoff Depth > 4.67"
Tc = 7.0 min
CN = 79
Summary for Subcatchment 21S: TO WETLAND

Runoff = 93.22 cfs @ 12.14 hrs, Volume= 4.394 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>494,335</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>494,335</td>
<td></td>
<td>98.15% Pervious Area</td>
</tr>
<tr>
<td>9,337</td>
<td></td>
<td>1.85% Impervious Area</td>
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</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)                |
7.0  

Direct Entry,

Subcatchment 21S: TO WETLAND

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=503,672 sf
Runoff Volume=4.394 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 22S: TO WETLAND

Runoff = 58.37 cfs @ 12.14 hrs, Volume= 2.751 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
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<tr>
<th>Area (sf)</th>
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<tbody>
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<td>Paved parking, HSG D</td>
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<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>314,057</td>
<td>99.58%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>1,310</td>
<td>0.42%</td>
<td>Impervious Area</td>
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</table>

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

Subcatchment 22S: TO WETLAND

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=315,367 sf
Runoff Volume=2.751 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 79.96 cfs @ 12.14 hrs, Volume= 3.769 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<th>Description</th>
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<tbody>
<tr>
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<td>428,390</td>
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<td>432,028</td>
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<td>428,390</td>
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<td>99.16% Pervious Area</td>
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<td>3,638</td>
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<td>0.84% Impervious Area</td>
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Tc = 7.0 min, Direct Entry,

Subcatchment 23S: TO WETLAND

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=432,028 sf
Runoff Volume=3.769 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 97.72 cfs @ 12.14 hrs, Volume= 4.606 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
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<tbody>
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<td>Paved parking, HSG D</td>
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<td>528,021</td>
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<td>Weighted Average</td>
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<tr>
<td>518,531</td>
<td>98.20% Pervious Area</td>
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<tr>
<td>9,490</td>
<td>1.80% Impervious Area</td>
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Tc=7.0 min

Subcatchment 24S: TO WETLAND

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=528,021 sf
Runoff Volume=4.606 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 91.27 cfs @ 12.14 hrs, Volume= 4.302 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
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<tr>
<td>493,166</td>
<td>78</td>
<td>Weighted Average</td>
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<tr>
<td>491,290</td>
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<td>99.62% Pervious Area</td>
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<tr>
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<td>0.38% Impervious Area</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
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<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 25S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"

Runoff Area=493,166 sf
Runoff Volume=4.302 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 47.08 cfs @ 12.14 hrs, Volume = 2.229 af, Depth > 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 100-Year Rainfall = 7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,363</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Hydrograph

MSE 24-hr 3
100-Year Rainfall = 7.29"
Runoff Area = 249,494 sf
Runoff Volume = 2.229 af
Runoff Depth > 4.67"
Tc = 7.0 min
CN = 79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 351.04 cfs @ 12.14 hrs, Volume= 16.618 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

Area (sf) CN Description
---  ---  ------------------------------------------------------------------
36,209 98  Paved parking, HSG D
11,076 98  Paved parking, HSG D
1,812,788 78  Meadow, non-grazed, HSG D
1,860,073 79  Weighted Average
1,812,788 97.46% Pervious Area
47,285 2.54% Impervious Area

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs) ------------------------------------------------------------------
7.0

Direct Entry,

Subcatchment 27S: TO WETLAND

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=1,860,073 sf
Runoff Volume=16.618 af
Runoff Depth>4.67"
Tc=7.0 min
CN=79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 26.60 cfs @ 12.14 hrs, Volume= 1.254 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,680</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142,060</td>
<td>98.83% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>1,680</td>
<td>1.17% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 28S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=143,740 sf
Runoff Volume=1.254 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 73.19 cfs @ 12.14 hrs, Volume= 3.450 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395,477</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>395,477</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 29S: TO WETLAND

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=395,477 sf
Runoff Volume=3.450 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 590.30 cfs @ 12.14 hrs, Volume= 27.822 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,189,501</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>3,189,501</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 30S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=3,189,501 sf
Runoff Volume=27.822 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Reach 1R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 19.930 ac, 0.00% Impervious, Inflow Depth > 4.52" for 100-Year event
Inflow = 66.65 cfs @ 12.60 hrs, Volume = 7.501 af
Outflow = 66.65 cfs @ 12.60 hrs, Volume = 7.501 af, Attenuation = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs

Reach 1R: TOTAL

Hydrograph
Summary for Reach 2R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.038 ac, 0.00% Impervious, Inflow Depth > 4.52" for 100-Year event
Inflow = 29.88 cfs @ 12.62 hrs, Volume= 3.401 af
Outflow = 29.88 cfs @ 12.62 hrs, Volume= 3.401 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: SOUTHEAST

Hydrograph

Inflow Area=9.038 ac
Summary for Reach 3R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.892 ac, 0.00% Impervious, Inflow Depth > 4.52" for 100-Year event
Inflow = 36.82 cfs @ 12.59 hrs, Volume= 4.100 af
Outflow = 36.82 cfs @ 12.59 hrs, Volume= 4.100 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 3R: SOUTHWEST

Hydrograph

Inflow Area=10.892 ac
### Area Listing (all nodes)

<table>
<thead>
<tr>
<th>Area</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.365</td>
<td>98</td>
<td>Unconnected roofs, HSG D (1S)</td>
</tr>
<tr>
<td>220.428</td>
<td>79</td>
<td>TOTAL AREA</td>
</tr>
<tr>
<td>Area (acres)</td>
<td>Soil Group</td>
<td>Subcatchment Numbers</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>0.000</td>
<td>HSG A</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG B</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG C</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td><strong>220.428</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td><strong>)</strong></td>
</tr>
</tbody>
</table>
## Ground Covers (all nodes)

<table>
<thead>
<tr>
<th>Subcatchment Numbers</th>
<th>HSG-A (acres)</th>
<th>HSG-B (acres)</th>
<th>HSG-C (acres)</th>
<th>HSG-D (acres)</th>
<th>Other (acres)</th>
<th>Total (acres)</th>
<th>Ground Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meadow, non-grazed 1S, 2S, 3S, 4S, 5Sa, 5Sb, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>214.266</td>
<td>0.000</td>
<td>214.266</td>
<td></td>
</tr>
<tr>
<td>Paved parking 3S, 4S, 5Sa, 5Sb, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S</td>
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<td>0.000</td>
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<td>5.797</td>
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<tr>
<td>Unconnected roofs 1S</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.365</td>
<td>0.000</td>
<td>0.365</td>
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</tr>
<tr>
<td>TOTAL AREA</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>220.428</td>
<td>0.000</td>
<td>220.428</td>
<td></td>
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</tbody>
</table>
### Pipe Listing (all nodes)

<table>
<thead>
<tr>
<th>Line#</th>
<th>Node</th>
<th>In-Invert (feet)</th>
<th>Out-Invert (feet)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>n</th>
<th>Diam/Width (inches)</th>
<th>Height (inches)</th>
<th>Inside-Fill (inches)</th>
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<td>1,045.50</td>
<td>1,045.00</td>
<td>80.0</td>
<td>0.0063</td>
<td>0.011</td>
<td>12.0</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>2</td>
<td>5Pa</td>
<td>1,067.00</td>
<td>1,048.00</td>
<td>200.0</td>
<td>0.0950</td>
<td>0.011</td>
<td>6.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3</td>
<td>5Pb</td>
<td>1,065.00</td>
<td>1,048.00</td>
<td>130.0</td>
<td>0.1308</td>
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<tr>
<td>4</td>
<td>7P</td>
<td>1,069.00</td>
<td>1,068.00</td>
<td>100.0</td>
<td>0.0100</td>
<td>0.011</td>
<td>6.0</td>
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<tr>
<td>5</td>
<td>8P</td>
<td>1,066.00</td>
<td>1,065.00</td>
<td>100.0</td>
<td>0.0100</td>
<td>0.011</td>
<td>6.0</td>
<td>0.0</td>
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<tr>
<td>6</td>
<td>9P</td>
<td>1,065.50</td>
<td>1,064.50</td>
<td>88.0</td>
<td>0.0114</td>
<td>0.011</td>
<td>12.0</td>
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<tr>
<td>7</td>
<td>10P</td>
<td>1,051.00</td>
<td>1,048.00</td>
<td>98.0</td>
<td>0.0306</td>
<td>0.011</td>
<td>12.0</td>
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<tr>
<td>8</td>
<td>12P</td>
<td>1,050.00</td>
<td>1,049.50</td>
<td>40.0</td>
<td>0.0125</td>
<td>0.011</td>
<td>6.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Subcatchment 1S: DD TO SOUTHEAST
- Runoff Area: 386,575 sf
- Impervious: 4.12%
- Runoff Depth: 0.72”
- Flow Length: 300’
- Slope: 0.0400 /
- Tc: 45.1 min
- UI Adjusted CN: 78
- Runoff: 4.50 cfs
- 0.534 af

Subcatchment 2S: DD TO SW
- Runoff Area: 81,336 sf
- Impervious: 0.00%
- Runoff Depth: 0.72”
- Tc: 40.1 min
- CN: 78
- Runoff: 1.02 cfs
- 0.113 af

Subcatchment 3S: TO DETENTION BASIN
- Runoff Area: 69,734 sf
- Impervious: 42.00%
- Runoff Depth: 1.17”
- Tc: 7.0 min
- CN: 86
- Runoff: 3.42 cfs
- 0.156 af

Subcatchment 4S: ZANE WEST SIDE TO
- Runoff Area: 20,240 sf
- Impervious: 28.66%
- Runoff Depth: 1.05”
- Tc: 7.0 min
- CN: 84
- Runoff: 0.89 cfs
- 0.041 af

Subcatchment 5Sa: PARKING LOT BASIN
- Runoff Area: 30,255 sf
- Impervious: 50.16%
- Runoff Depth: 1.31”
- Tc: 10.0 min
- CN: 88
- Runoff: 1.44 cfs
- 0.076 af

Subcatchment 5Sb: PARKING LOT BASIN
- Runoff Area: 20,505 sf
- Impervious: 74.01%
- Runoff Depth: 0.83”
- Tc: 7.0 min
- CN: 88
- Runoff: 1.39 cfs
- 0.067 af

Subcatchment 6S: TO FILTRATION BASIN
- Runoff Area: 41,422 sf
- Impervious: 10.62%
- Runoff Depth: 0.83”
- Tc: 10.0 min
- CN: 80
- Runoff: 2.36 cfs
- 0.174 af

Subcatchment 7S: PARENT DROP OFF
- Runoff Area: 92,061 sf
- Impervious: 25.69%
- Runoff Depth: 0.99”
- Flow Length: 275’
- Slope: 0.0800 /
- Tc: 21.2 min
- CN: 83
- Runoff: 2.36 cfs
- 0.174 af

Subcatchment 8S: BUS DROP OFF
- Runoff Area: 48,017 sf
- Impervious: 39.84%
- Runoff Depth: 1.17”
- Flow Length: 210’
- Slope: 0.0900 /
- Tc: 16.3 min
- CN: 86
- Runoff: 1.68 cfs
- 0.107 af

Subcatchment 9S: TO DETENTION BASIN
- Runoff Area: 47,568 sf
- Impervious: 12.61%
- Runoff Depth: 0.88”
- Flow Length: 230’
- Slope: 0.0900 /
- Tc: 17.5 min
- CN: 81
- Runoff: 1.18 cfs
- 0.080 af

Subcatchment 10S: ZANE WEST SIDE TO
- Runoff Area: 30,563 sf
- Impervious: 18.98%
- Runoff Depth: 0.93”
- Tc: 7.0 min
- CN: 82
- Runoff: 1.20 cfs
- 0.055 af

Subcatchment 11S: TO WETLAND
- Runoff Area: 230,474 sf
- Impervious: 7.39%
- Runoff Depth: 0.78”
- Tc: 7.0 min
- CN: 79
- Runoff: 7.47 cfs
- 0.344 af

Subcatchment 12S: HORSE BARNS
- Runoff Area: 96,048 sf
- Impervious: 14.59%
- Runoff Depth: 0.88”
- Tc: 7.0 min
- CN: 81
- Runoff: 3.54 cfs
- 0.162 af

Subcatchment 19S: TO WETLAND
- Runoff Area: 94,094 sf
- Impervious: 6.50%
- Runoff Depth: 0.78”
- Tc: 7.0 min
- CN: 79
- Runoff: 3.05 cfs
- 0.140 af

Subcatchment 20S: TO WETLAND
- Runoff Area: 202,427 sf
- Impervious: 4.92%
- Runoff Depth: 0.78”
- Tc: 7.0 min
- CN: 79
- Runoff: 6.56 cfs
- 0.302 af

Subcatchment 21S: TO WETLAND
- Runoff Area: 503,672 sf
- Impervious: 1.85%
- Runoff Depth: 0.73”
- Tc: 7.0 min
- CN: 78
- Runoff: 15.26 cfs
- 0.705 af
<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>TO WETLAND</th>
<th>Runoff Area</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>22S:</td>
<td></td>
<td>315,367 sf</td>
<td>0.42%</td>
<td>&gt;0.73&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>9.55 cfs</td>
</tr>
<tr>
<td>23S:</td>
<td></td>
<td>432,028 sf</td>
<td>0.84%</td>
<td>&gt;0.73&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>13.09 cfs</td>
</tr>
<tr>
<td>24S:</td>
<td></td>
<td>528,021 sf</td>
<td>1.80%</td>
<td>&gt;0.73&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>15.99 cfs</td>
</tr>
<tr>
<td>25S:</td>
<td></td>
<td>493,166 sf</td>
<td>0.38%</td>
<td>&gt;0.73&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>14.94 cfs</td>
</tr>
<tr>
<td>26S:</td>
<td></td>
<td>249,494 sf</td>
<td>2.55%</td>
<td>&gt;0.78&quot;</td>
<td>7.0 min</td>
<td>79</td>
<td>8.09 cfs</td>
</tr>
<tr>
<td>27S:</td>
<td></td>
<td>1,860,073 sf</td>
<td>2.54%</td>
<td>&gt;0.78&quot;</td>
<td>7.0 min</td>
<td>79</td>
<td>60.32 cfs</td>
</tr>
<tr>
<td>28S:</td>
<td></td>
<td>143,740 sf</td>
<td>1.17%</td>
<td>&gt;0.73&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>4.35 cfs</td>
</tr>
<tr>
<td>29S:</td>
<td></td>
<td>395,477 sf</td>
<td>0.00%</td>
<td>&gt;0.73&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>11.98 cfs</td>
</tr>
<tr>
<td>30S:</td>
<td></td>
<td>3,189,501 sf</td>
<td>0.00%</td>
<td>&gt;0.73&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>96.60 cfs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reach 11R:</th>
<th>SOUTHWEST</th>
<th>Inflow</th>
<th>Outflow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4.34 cfs</td>
<td>0.860 af</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reach 18R:</th>
<th>TOTAL</th>
<th>Inflow</th>
<th>Outflow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10.01 cfs</td>
<td>1.556 af</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reach 19R:</th>
<th>SOUTHEAST</th>
<th>Inflow</th>
<th>Outflow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4.50 cfs</td>
<td>0.534 af</td>
</tr>
</tbody>
</table>

| Pond 3P:   | DETENTION BASIN F | Peak Elev: 1,046.95' | Storage: 6,423 cf | Inflow: 6.96 cfs | 0.753 af |
|           | Primary: 3.25 cfs | 0.707 af | Secondary: 0.00 cfs | 0.000 af | Outflow: 3.25 cfs | 0.707 af |

| Pond 5Pa:  | FILTRATION BASIN C1 | Peak Elev: 1,069.11' | Storage: 119 cf | Inflow: 1.44 cfs | 0.076 af |
|           | Primary: 1.14 cfs | 0.076 af | Secondary: 0.00 cfs | 0.000 af | Outflow: 1.14 cfs | 0.076 af |

| Pond 5Pb:  | FILTRATION BASIN C2 | Peak Elev: 1,067.07' | Storage: 76 cf | Inflow: 1.39 cfs | 0.067 af |
|           | Primary: 1.12 cfs | 0.067 af | Secondary: 0.00 cfs | 0.000 af | Outflow: 1.12 cfs | 0.067 af |

| Pond 7P:   | FILTRATION BASIN B | Peak Elev: 1,071.95' | Storage: 1,471 cf | Inflow: 2.36 cfs | 0.174 af |
|           | Primary: 1.08 cfs | 0.174 af | Secondary: 0.00 cfs | 0.000 af | Outflow: 1.08 cfs | 0.174 af |

| Pond 8P:   | FILTRATION BASIN A | Peak Elev: 1,068.18' | Storage: 646 cf | Inflow: 1.68 cfs | 0.107 af |
|           | Primary: 0.94 cfs | 0.107 af | Secondary: 0.00 cfs | 0.000 af | Outflow: 0.94 cfs | 0.107 af |
Pond 9P: DETENTION BASIN D
Peak Elev=1,066.04' Storage=2,155 cf Inflow=1.99 cfs 0.135 af
Primary=0.97 cfs 0.108 af Secondary=0.00 cfs 0.000 af Outflow=0.97 cfs 0.108 af

Pond 10P: FILTRATION BASIN E
Peak Elev=1,055.42' Storage=4,910 cf Inflow=3.38 cfs 0.455 af
Primary=1.68 cfs 0.455 af Secondary=0.00 cfs 0.000 af Outflow=1.68 cfs 0.455 af

Pond 12P: FILTRATION BASIN G
Peak Elev=1,053.38' Storage=1,152 cf Inflow=3.54 cfs 0.162 af
Primary=1.46 cfs 0.162 af Secondary=0.00 cfs 0.000 af Outflow=1.46 cfs 0.162 af

Total Runoff Area = 220.428 ac Runoff Volume = 13.967 af Average Runoff Depth = 0.76"
97.20% Pervious = 214.266 ac 2.80% Impervious = 6.162 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 4.50 cfs @ 12.68 hrs, Volume = 0.534 af, Depth > 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Adj</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,910</td>
<td>98</td>
<td></td>
<td>Unconnected roofs, HSG D</td>
</tr>
<tr>
<td>370,665</td>
<td>78</td>
<td></td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>386,575</td>
<td>79</td>
<td>78</td>
<td>Weighted Average, UI Adjusted</td>
</tr>
<tr>
<td>370,665</td>
<td></td>
<td></td>
<td>95.88% Pervious Area</td>
</tr>
<tr>
<td>15,910</td>
<td></td>
<td></td>
<td>4.12% Impervious Area</td>
</tr>
<tr>
<td>15,910</td>
<td></td>
<td></td>
<td>100.00% Unconnected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.1</td>
<td>300</td>
<td>0.0400</td>
<td>0.11</td>
<td></td>
<td>Sheet Flow, Woods: Light underbrush n = 0.400 P2 = 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 1S: DD TO SOUTHEAST

Hydrograph

MSE 24-hr 3
1-Year Rainfall = 2.48"
Runoff Area = 386,575 sf
Runoff Volume = 0.534 af
Runoff Depth > 0.72"
Flow Length = 300'
Slope = 0.0400 '/'
Tc = 45.1 min
UI Adjusted CN = 78
Summary for Subcatchment 2S: DD TO SW

Runoff = 1.02 cfs @ 12.60 hrs, Volume= 0.113 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>81,336</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>81,336</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 40.1 min

Subcatchment 2S: DD TO SW

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=81,336 sf
Runoff Volume=0.113 af
Runoff Depth>0.72"
Tc=40.1 min
CN=78
Summary for Subcatchment 3S: TO DETENTION BASIN F

Runoff = 3.42 cfs @ 12.15 hrs, Volume= 0.156 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>29,291</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>40,443</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>69,734</td>
<td>86</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>40,443</td>
<td></td>
<td>58.00% Pervious Area</td>
</tr>
<tr>
<td>29,291</td>
<td></td>
<td>42.00% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min
Length = Direct Entry,
Slope = ft/ft
Velocity = ft/sec
Capacity = cfs
Description = 

Subcatchment 3S: TO DETENTION BASIN F

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=69,734 sf
Runoff Volume=0.156 af
Runoff Depth>1.17"
Tc=7.0 min
CN=86
Summary for Subcatchment 4S: ZANE WEST SIDE TO SW

Runoff = 0.89 cfs @ 12.15 hrs, Volume= 0.041 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,800</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>14,440</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>20,240</td>
<td>84</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>14,440</td>
<td></td>
<td>71.34% Pervious Area</td>
</tr>
<tr>
<td>5,800</td>
<td></td>
<td>28.66% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=20,240 sf
Runoff Volume=0.041 af
Runoff Depth>1.05"
Tc=7.0 min
CN=84
Summary for Subcatchment 5Sa: PARKING LOT BASIN

Runoff = 1.44 cfs @ 12.18 hrs, Volume = 0.076 af, Depth > 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>15,080</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,255</td>
<td>88</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>15,080</td>
<td></td>
<td>49.84% Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
<td></td>
<td>50.16% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 10.0 min

Direct Entry,

Subcatchment 5Sa: PARKING LOT BASIN

![Hydrograph]

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=30,255 sf
Runoff Volume=0.076 af
Runoff Depth>1.31"
Tc=10.0 min
CN=88
Summary for Subcatchment 5Sb: PARKING LOT BASIN

Runoff = 1.39 cfs @ 12.14 hrs, Volume= 0.067 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>5,330</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>20,505</td>
<td>93</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>5,330</td>
<td></td>
<td>25.99% Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
<td></td>
<td>74.01% Impervious Area</td>
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</table>

<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 5Sb: PARKING LOT BASIN

**Hydrograph**

- MSE 24-hr 3
- 1-Year Rainfall=2.48"
- Runoff Area=20,505 sf
- Runoff Volume=0.067 af
- Runoff Depth>1.70"
- Tc=7.0 min
- CN=93
Summary for Subcatchment 6S: TO FILTRATION BASIN E

Runoff = 1.24 cfs @ 12.19 hrs, Volume= 0.066 af, Depth> 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,400</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>37,022</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>41,422</td>
<td>80</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>37,022</td>
<td>89.38%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>4,400</td>
<td>10.62%</td>
<td>Impervious Area</td>
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</tbody>
</table>

Tc = 10.0 min
Direct Entry,

Subcatchment 6S: TO FILTRATION BASIN E

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=41,422 sf
Runoff Volume=0.066 af
Runoff Depth>0.83"
Tc=10.0 min
CN=80
Summary for Subcatchment 7S: PARENT DROPOFF

Runoff = 2.36 cfs @ 12.32 hrs, Volume = 0.174 af, Depth > 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23,650</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>68,411</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>92,061</td>
<td>83</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>68,411</td>
<td>74.31% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>23,650</td>
<td>25.69% Impervious Area</td>
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</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>21.2</td>
<td>275</td>
<td>0.0800</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n = 0.240 P2 = 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 7S: PARENT DROPOFF

Hydrograph

MSE 24-hr 3
1-Year Rainfall = 2.48"
Runoff Area = 92,061 sf
Runoff Volume = 0.174 af
Runoff Depth > 0.99"
Flow Length = 275'
Slope = 0.0800 '/'
Tc = 21.2 min
CN = 83
Summary for Subcatchment 8S: BUS DROPOFF

Runoff = 1.68 cfs @ 12.26 hrs, Volume= 0.107 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,128</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>28,889</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>48,017</td>
<td>86</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>19,128</td>
<td></td>
<td>39.84% Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>16.3</td>
<td>210</td>
<td>0.0900</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 8S: BUS DROPOFF

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=48,017 sf
Runoff Volume=0.107 af
Runoff Depth>1.17"
Flow Length=210'
Slope=0.0900 '/'
Tc=16.3 min
CN=86
Summary for Subcatchment 9S: TO DETENTION BASIN D

Runoff = 1.18 cfs @ 12.28 hrs, Volume= 0.080 af, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<td>Paved parking, HSG D</td>
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<td>41,568</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>47,568</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>41,568</td>
<td>87.39% Pervious Area</td>
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</tr>
<tr>
<td>6,000</td>
<td>12.61% Impervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
</table>
| 17.5     | 230           | 0.0900        | 0.22              |                | Sheet Flow, Grass: Dense n= 0.240 P2= 2.42"

Subcatchment 9S: TO DETENTION BASIN D

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=47,568 sf
Runoff Volume=0.080 af
Runoff Depth>0.88"
Flow Length=230'
Slope=0.0900 '/'
Tc=17.5 min
CN=81
Summary for Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

Runoff = 1.20 cfs @ 12.15 hrs, Volume= 0.055 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,800</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>24,763</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,563</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>24,763</td>
<td></td>
<td>81.02% Pervious Area</td>
</tr>
<tr>
<td>5,800</td>
<td></td>
<td>18.98% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"  
Runoff Area=30,563 sf  
Runoff Volume=0.055 af  
Runoff Depth>0.93"  
Tc=7.0 min  
CN=82
Summary for Subcatchment 11S: TO WETLAND

Runoff = 7.47 cfs @ 12.15 hrs, Volume= 0.344 af, Depth> 0.78"  

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,039</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>213,435</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>213,435</td>
<td></td>
<td>92.61% Pervious Area</td>
</tr>
<tr>
<td>17,039</td>
<td></td>
<td>7.39% Impervious Area</td>
</tr>
</tbody>
</table>

Tc=7.0 min  

Subcatchment 11S: TO WETLAND

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=230,474 sf
Runoff Volume=0.344 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 3.54 cfs @ 12.15 hrs, Volume= 0.162 af, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,013</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>96,048</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>82,035</td>
<td>85.41% Impervious Area</td>
<td></td>
</tr>
<tr>
<td>14,013</td>
<td>14.59% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 12S: HORSE BARNS

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=96,048 sf
Runoff Volume=0.162 af
Runoff Depth>0.88"
Tc=7.0 min
CN=81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 3.05 cfs @ 12.15 hrs, Volume = 0.140 af, Depth > 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,114</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>87,980</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
<td></td>
<td>93.50% Pervious Area</td>
</tr>
<tr>
<td>6,114</td>
<td></td>
<td>6.50% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 19S: TO WETLAND

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=94,094 sf
Runoff Volume=0.140 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 20S: TO WETLAND

Runoff = 6.56 cfs @ 12.15 hrs, Volume= 0.302 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>9,960</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>192,467</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>202,427</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>192,467</td>
<td></td>
<td>95.08% Pervious Area</td>
</tr>
<tr>
<td>9,960</td>
<td></td>
<td>4.92% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 20S: TO WETLAND

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=202,427 sf
Runoff Volume=0.302 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 21S: TO WETLAND

Runoff = 15.26 cfs @ 12.15 hrs, Volume= 0.705 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,337</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>494,335</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
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<tr>
<td>494,335</td>
<td>98.15% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>9,337</td>
<td>1.85% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc=7.0 min

Subcatchment 21S: TO WETLAND

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=503,672 sf
Runoff Volume=0.705 af
Runoff Depth>0.73"
Tc=7.0 min
CN=78
Summary for Subcatchment 22S: TO WETLAND

Runoff = 9.55 cfs @ 12.15 hrs, Volume= 0.442 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,310</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>314,057</td>
<td>99.58% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>1,310</td>
<td>0.42% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

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

Subcatchment 22S: TO WETLAND

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=315,367 sf
Runoff Volume=0.442 af
Runoff Depth>0.73"
Tc=7.0 min
CN=78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 13.09 cfs @ 12.15 hrs, Volume= 0.605 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,638</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>428,390</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>432,028</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>428,390</td>
<td></td>
<td>99.16% Pervious Area</td>
</tr>
<tr>
<td>3,638</td>
<td></td>
<td>0.84% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min
Length = 7.0 feet
Slope = 11.0 ft/ft
Velocity = 2.0 ft/sec
Capacity = 0.00 cfs

Subcatchment 23S: TO WETLAND

Hydrograph

13.09 cfs at 12.15 hrs

MSE 24-hr 3 1-Year Rainfall=2.48"  Runoff Area=432,028 sf  Runoff Volume=0.605 af  Runoff Depth>0.73"  Tc=7.0 min  CN=78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 15.99 cfs @ 12.15 hrs, Volume= 0.740 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,490</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>518,531</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>528,021</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>518,531</td>
<td></td>
<td>98.20% Pervious Area</td>
</tr>
<tr>
<td>9,490</td>
<td></td>
<td>1.80% Impervious Area</td>
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</tbody>
</table>

Tc=7.0 min
Length (feet)
Slope (ft/ft)
Velocity (ft/sec)
Capacity (cfs)

Direct Entry,

Subcatchment 24S: TO WETLAND

Hydrograph

MSE 24-hr 3  1-Year Rainfall=2.48"
Runoff Area=528,021 sf
Runoff Volume=0.740 af
Runoff Depth>0.73"
Tc=7.0 min
CN=78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 14.94 cfs @ 12.15 hrs, Volume= 0.691 af, Depth> 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,876</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>491,290</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>493,166</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>491,290</td>
<td></td>
<td>99.62% Pervious Area</td>
</tr>
<tr>
<td>1,876</td>
<td></td>
<td>0.38% Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 25S: TO WETLAND

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=493,166 sf
Runoff Volume=0.691 af
Runoff Depth>0.73"
Tc=7.0 min
CN=78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 8.09 cfs @ 12.15 hrs, Volume= 0.372 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,363</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 26S: TO WETLAND

Hydrograph

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=249,494 sf
Runoff Volume=0.372 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 60.32 cfs @ 12.15 hrs, Volume= 2.775 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,209</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,076</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,812,788</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>1,860,073</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,812,788</td>
<td>79</td>
<td>97.46% Pervious Area</td>
</tr>
<tr>
<td>47,285</td>
<td>2.54% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
7.0 (min) (feet) (ft/ft) (ft/sec) (cfs)

Direct Entry,

Subcatchment 27S: TO WETLAND

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=1,860,073 sf
Runoff Volume=2.775 af
Runoff Depth>0.78"
Tc=7.0 min
CN=79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 4.35 cfs @ 12.15 hrs, Volume = 0.201 af, Depth > 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,680</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142,060</td>
<td></td>
<td>98.83% Pervious Area</td>
</tr>
<tr>
<td>1,680</td>
<td></td>
<td>1.17% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Subcatchment 28S: TO WETLAND

Hydrograph

MSE 24-hr 3 1-Year Rainfall = 2.48"
Runoff Area = 143,740 sf
Runoff Volume = 0.201 af
Runoff Depth > 0.73"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 11.98 cfs @ 12.15 hrs, Volume = 0.554 af, Depth > 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395,477</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>395,477</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 29S: TO WETLAND

Hydrograph

MSE 24-hr 3
1-Year Rainfall = 2.48"
Runoff Area = 395,477 sf
Runoff Volume = 0.554 af
Runoff Depth > 0.73"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 96.60 cfs @ 12.15 hrs, Volume = 4.468 af, Depth > 0.73"It

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall = 2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,189,501</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>3,189,501</td>
<td>100</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 30S: TO WETLAND

MSE 24-hr 3 1-Year Rainfall = 2.48"
Runoff Area = 3,189,501 sf
Runoff Volume = 4.468 af
Runoff Depth > 0.73"
Tc = 7.0 min
CN = 78
Summary for Reach 11R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.058 ac, 25.83% Impervious, Inflow Depth > 0.93" for 1-Year event
Inflow = 4.34 cfs @ 12.51 hrs, Volume= 0.860 af
Outflow = 4.34 cfs @ 12.51 hrs, Volume= 0.860 af, Attenuation= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 18R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22.138 ac, 16.01% Impervious, Inflow Depth > 0.84" for 1-Year event
Inflow = 10.01 cfs @ 12.62 hrs, Volume= 1.556 af
Outflow = 10.01 cfs @ 12.62 hrs, Volume= 1.556 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 19R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.875 ac, 4.12% Impervious, Inflow Depth > 0.72" for 1-Year event
Inflow = 4.50 cfs @ 12.68 hrs, Volume= 0.534 af
Outflow = 4.50 cfs @ 12.68 hrs, Volume= 0.534 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Pond 3P: DETENTION BASIN F

Inflow Area = 8.726 ac, 31.21% Impervious, Inflow Depth > 1.04” for 1-Year event
Inflow = 6.96 cfs @ 12.15 hrs, Volume = 0.753 af
Outflow = 3.25 cfs @ 12.40 hrs, Volume = 0.707 af, Atten= 53%, Lag= 15.2 min
Primary = 3.25 cfs @ 12.40 hrs, Volume = 0.707 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,046.95’ @ 12.40 hrs Surf.Area= 4,885 sf Storage= 6,423 cf

Plug-Flow detention time= 44.6 min calculated for 0.707 af (94% of inflow)
Center-of-Mass det. time= 25.0 min (841.6 - 816.6)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,045.00’</td>
<td>28,188 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,045.00</td>
<td>2,675</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,046.00</td>
<td>2,850</td>
<td>2,763</td>
<td>2,763</td>
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<tr>
<td>1,047.00</td>
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<td>3,925</td>
<td>6,688</td>
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<td>12,188</td>
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<tr>
<td>1,050.00</td>
<td>10,000</td>
<td>9,000</td>
<td>28,188</td>
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</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,045.50’</td>
<td>12.0” Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 80.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,045.50’ / 1,045.00’ S= 0.0063 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,048.00’</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 1.00 2.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 16.00 50.00 80.00</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=3.25 cfs @ 12.40 hrs HW=1,046.95’ (Free Discharge)
1= Culvert (Inlet Controls 3.25 cfs @ 4.13 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,045.00’ (Free Discharge)
2= Custom Weir/Orifice (Controls 0.00 cfs)
Pond 3P: DETENTION BASIN F

Inflow Area=8.726 ac
Peak Elev=1,046.95'
Storage=6,423 cf
Summary for Pond 5Pa: FILTRATION BASIN C1

[44] Hint: Outlet device #1 is below defined storage
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.695 ac, 50.16% Impervious, Inflow Depth > 1.31” for 1-Year event
Inflow = 1.44 cfs @ 12.18 hrs, Volume= 0.076 af
Outflow = 1.14 cfs @ 12.25 hrs, Volume= 0.076 af, Atten= 21%, Lag= 4.1 min
Primary = 1.14 cfs @ 12.25 hrs, Volume= 0.076 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,069.11' @ 12.25 hrs Surf.Area= 551 sf Storage= 119 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.5 min ( 784.7 - 784.2 )

Volume Invert Avail.Storage Storage Description
#1 1,069.00' 6,980 cf Custom Stage Data (Prismatic) Listed below

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,069.00</td>
<td>400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,070.00</td>
<td>1,780</td>
<td>1,090</td>
<td>1,090</td>
</tr>
<tr>
<td>1,071.00</td>
<td>10,000</td>
<td>5,890</td>
<td>6,980</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 1,067.00' 6.0" Round Draintile
L= 200.0' CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,067.00' / 1,048.00' S= 0.0950 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,070.00' Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 180.00 250.00

Primary OutFlow Max=1.14 cfs @ 12.25 hrs HW=1,069.11' (Free Discharge)
↑1=Draintile (Inlet Controls 1.14 cfs @ 5.79 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,069.00’ (Free Discharge)
↑2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 5Pa: FILTRATION BASIN C1

Hydrograph

Inflow Area=0.695 ac
Peak Elev=1,069.11'
Storage=119 cf
Summary for Pond 5Pb: FILTRATION BASIN C2

Inflow Area = 0.471 ac, 74.01% Impervious, Inflow Depth > 1.70” for 1-Year event
Inflow = 1.39 cfs @ 12.14 hrs, Volume= 0.067 af
Outflow = 1.12 cfs @ 12.20 hrs, Volume= 0.067 af, Atten= 19%, Lag= 3.5 min
Primary = 1.12 cfs @ 12.20 hrs, Volume= 0.067 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,067.07’ @ 12.19 hrs Surf.Area= 496 sf Storage= 76 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.4 min (767.8 - 767.4)

Volume Invert Avail.Storage Storage Description
#1 1,067.00’ 6,980 cf Custom Stage Data (Prismatic) Listed below

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1,067.00</td>
<td>400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,068.00</td>
<td>1,780</td>
<td>1,090</td>
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<tr>
<td>1,069.00</td>
<td>10,000</td>
<td>5,890</td>
<td>6,980</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,065.00’</td>
<td>6.0” Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 130.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,065.00’ / 1,048.00’ S= 0.1308 ’</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf</td>
</tr>
</tbody>
</table>

| #2     | Secondary | 1,068.00’ | Custom Weir/Orifice, Cv= 2.62 (C= 3.28) |
|        |           |         | Head (feet) 0.00 1.00 |
|        |           |         | Width (feet) 180.00 250.00 |

Primary OutFlow Max=1.12 cfs @ 12.20 hrs HW=1,067.07’ (Free Discharge)
↑1=Draintile (Inlet Controls 1.12 cfs @ 5.73 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,067.00’ (Free Discharge)
↑2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 5Pb: FILTRATION BASIN C2

Inflow Area=0.471 ac
Peak Elev=1,067.07'
Storage=76 cf

Flow (cfs)

Time (hours)
Summary for Pond 7P: FILTRATION BASIN B

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 2.113 ac, 25.69% Impervious, Inflow Depth > 0.99" for 1-Year event

Inflow = 2.36 cfs @ 12.32 hrs, Volume = 0.174 af

Outflow = 1.08 cfs @ 12.64 hrs, Volume = 0.174 af, Atten = 54%, Lag = 19.3 min

Primary = 1.08 cfs @ 12.64 hrs, Volume = 0.174 af

Secondary = 0.00 cfs @ 5.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
Peak Elev = 1,071.95' @ 12.64 hrs Surf.Area = 1,775 sf Storage = 1,471 cf

Plug-Flow detention time = (not calculated: outflow precedes inflow)
Center-of-Mass det. time = 9.3 min (813.6 - 804.3)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
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<tbody>
<tr>
<td>#1</td>
<td>1,071.00'</td>
<td>19,815 cf</td>
<td>Custom Stage Data (Prismatic) listed below</td>
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<thead>
<tr>
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<tbody>
<tr>
<td>1,071.00</td>
<td>1,300</td>
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<td>0</td>
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<tr>
<td>1,072.00</td>
<td>1,800</td>
<td>1,550</td>
<td>1,550</td>
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<tr>
<td>1,073.00</td>
<td>2,365</td>
<td>2,083</td>
<td>3,633</td>
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<tr>
<td>1,074.00</td>
<td>30,000</td>
<td>16,183</td>
<td>19,815</td>
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<table>
<thead>
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<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
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<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,069.00'</td>
<td>6.0&quot; Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = 100.0' CMP, mitered to conform to fill, Ke = 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert = 1,069.00' / 1,068.00' S = 0.0100 '/' Cc = 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n = 0.011 PVC, smooth interior, Flow Area = 0.20 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,073.00'</td>
<td>Custom Weir/Orifice, Cv = 2.62 (C = 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) = 0.00 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) = 60.00 90.00</td>
</tr>
</tbody>
</table>

Primary OutFlow Max = 1.08 cfs @ 12.64 hrs HW = 1,071.95' (Free Discharge)

Secondary OutFlow Max = 0.00 cfs @ 5.00 hrs HW = 1,071.00' (Free Discharge)
Pond 7P: FILTRATION BASIN B

Inflow Area=2.113 ac
Peak Elev=1,071.95'
Storage=1,471 cf
Summary for Pond 8P: FILTRATION BASIN A

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 1.102 ac, 39.84% Impervious, Inflow Depth > 1.17" for 1-Year event
Inflow = 1.68 cfs @ 12.26 hrs, Volume= 0.107 af
Outflow = 0.94 cfs @ 12.45 hrs, Volume= 0.107 af, Atten= 44%, Lag= 11.8 min
Primary = 0.94 cfs @ 12.45 hrs, Volume= 0.107 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,068.18' @ 12.45 hrs  Surf.Area= 3,334 sf  Storage= 646 cf
Plug-Flow detention time= 5.2 min calculated for 0.107 af (100% of inflow)
Center-of-Mass det. time= 4.9 min ( 798.8 - 793.9 )

Volume Invert Avail.Storage Storage Description
#1 1,068.00' 31,066 cf Custom Stage Data (Prismatic) Listed below

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<tr>
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<tbody>
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<td>1,069.00</td>
<td>4,080</td>
<td>3,626</td>
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<td>1,071.00</td>
<td>5,600</td>
<td>5,200</td>
<td>13,266</td>
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<td>1,072.00</td>
<td>30,000</td>
<td>17,800</td>
<td>31,066</td>
</tr>
</tbody>
</table>

Device Routing Invert | Outlet Devices
#1 Primary 1,066.00' | 6.0" Round Draintile
L= 100.0' CPP, projecting, no headwall, Ke= 0.900
Inlet / Outlet Invert= 1,066.00' / 1,065.00'  S= 0.0100 '/'  Cc= 0.900
n= 0.011  PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,071.00' | Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 30.00 50.00

Primary OutFlow Max=0.94 cfs @ 12.45 hrs  HW=1,068.18'  (Free Discharge)
Primary OutFlow (Barrel Controls 0.94 cfs @ 4.78 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs  HW=1,068.00'  (Free Discharge)
Secondary OutFlow (Controls 0.00 cfs)
Pond 8P: FILTRATION BASIN A

Inflow Area = 1.102 ac
Peak Elev = 1,068.18'
Storage = 646 cf

Hydrograph

Flow (cfs)

Time (hours)

0.00 cfs
0.94 cfs
0.94 cfs
1.68 cfs

Inflow
Outflow
Primary
Secondary
Summary for Pond 9P: DETNETON BASIN D

Inflow Area = 1.794 ac, 15.10% Impervious, Inflow Depth > 0.90" for 1-Year event
Inflow = 1.99 cfs @ 12.17 hrs, Volume = 0.135 af
Outflow = 0.97 cfs @ 12.48 hrs, Volume = 0.108 af, Atten= 51%, Lag= 18.2 min
Primary = 0.97 cfs @ 12.48 hrs, Volume = 0.108 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,066.04’ @ 12.48 hrs  Surf.Area= 2,430 sf  Storage= 2,155 cf

Plug-Flow detention time= 87.1 min calculated for 0.108 af (80% of inflow)
Center-of-Mass det. time= 38.4 min (839.7 - 801.3 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,065.00’</td>
<td>19,250 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>1,065.00</td>
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<td>0</td>
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<tr>
<td>1,066.00</td>
<td>2,400</td>
<td>2,050</td>
<td>2,050</td>
</tr>
<tr>
<td>1,067.00</td>
<td>3,100</td>
<td>2,750</td>
<td>4,800</td>
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<td>1,070.00</td>
<td>6,800</td>
<td>6,150</td>
<td>19,250</td>
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<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
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</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,065.50’</td>
<td>12.0” Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 88.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,065.50’ / 1,064.50’ S= 0.0114 ’ Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,069.00’</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=0.96 cfs @ 12.48 hrs  HW=1,066.04’ (Free Discharge) 1=Culvert (Inlet Controls 0.96 cfs @ 2.21 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs  HW=1,065.00’ (Free Discharge) 2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 9P: DETNEION BASIN D

Inflow Area=1.794 ac
Peak Elev=1,066.04'
Storage=2,155 cf
Summary for Pond 10P: FILTRATION BASIN E

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 5.960 ac, 22.72% Impervious, Inflow Depth > 0.92" for 1-Year event
Inflow = 3.38 cfs @ 12.41 hrs, Volume= 0.455 af
Outflow = 1.68 cfs @ 13.22 hrs, Volume= 0.455 af, Atten= 50%, Lag= 49.0 min
Primary = 1.68 cfs @ 13.22 hrs, Volume= 0.455 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,055.42' @ 13.22 hrs  Surf.Area= 4,156 sf  Storage= 4,910 cf
Plug-Flow detention time= 25.1 min calculated for 0.453 af (100% of inflow)
Center-of-Mass det. time= 24.8 min ( 839.4 - 814.6 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,054.00'</td>
<td>19,630 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
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</table>

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>0</td>
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<tr>
<td>1,055.00</td>
<td>3,700</td>
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<td>4,780</td>
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<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,051.00'</td>
<td>12.0&quot; Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 98.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,051.00' / 1,048.00’ S= 0.0306 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>1,052.00'</td>
<td>6.0&quot; Vert. 6&quot; D.T.</td>
</tr>
<tr>
<td>#3</td>
<td>Device 1</td>
<td>1,056.00'</td>
<td>48.0&quot; Horiz. Grate</td>
</tr>
<tr>
<td>#4</td>
<td>Secondary</td>
<td>1,056.70'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=1.68 cfs @ 13.22 hrs HW=1,055.42' (Free Discharge)
1=Culvert (Passes 0.00 cfs of 6.61 cfs potential flow)
3=Grate (Controls 0.00 cfs)
2=6" D.T. (Orifice Controls 1.68 cfs @ 8.58 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,054.00’ (Free Discharge)
4=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 10P: FILTRATION BASIN E

Inflow Area = 5.960 ac
Peak Elev = 1,055.42'
Storage = 4,910 cf

Hydrograph

Time (hours)
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Flow (cfs)
0 1 2 3

Inflow
Outflow
Primary
Secondary

3.38 cfs
1.68 cfs
1.68 cfs
0.00 cfs
Summary for Pond 12P: FILTRATION BASIN G

[44] Hint: Outlet device #1 is below defined storage
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 2.205 ac, 14.59% Impervious, Inflow Depth > 0.88” for 1-Year event
Inflow = 3.54 cfs @ 12.15 hrs, Volume= 0.162 af
Outflow = 1.46 cfs @ 12.30 hrs, Volume= 0.162 af, Atten= 59%, Lag= 9.4 min
Primary = 1.46 cfs @ 12.30 hrs, Volume= 0.162 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,053.38’ @ 12.30 hrs Surf.Area= 1,167 sf Storage= 1,152 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.5 min (801.7 - 797.2)

Volume Invert Avail.Storage Storage Description
#1 1,052.00’ 5,200 cf Custom Stage Data (Prismatic) Listed below

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<tr>
<th>Elevation</th>
<th>Surf.Area</th>
<th>Inc.Store</th>
<th>Cum.Store</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(feet)</td>
<td>(sq-ft)</td>
<td>(cubic-feet)</td>
</tr>
<tr>
<td>1,052.00</td>
<td>430</td>
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<td>0</td>
</tr>
<tr>
<td>1,053.00</td>
<td>925</td>
<td>678</td>
<td>678</td>
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<tr>
<td>1,054.00</td>
<td>1,560</td>
<td>1,243</td>
<td>1,920</td>
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<tr>
<td>1,055.00</td>
<td>5,000</td>
<td>3,280</td>
<td>5,200</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 1,050.00’ 6.0” Round Draintile
L= 40.0’ CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,050.00’ / 1,049.50’ S= 0.0125 ’’ Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,053.50’ Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 0.50
Width (feet) 6.00 10.00

Primary OutFlow Max= 1.45 cfs @ 12.30 hrs HW= 1,053.38’ (Free Discharge)
1= Draintile (Barrel Controls 1.45 cfs @ 7.41 fps)

Secondary OutFlow Max= 0.00 cfs @ 5.00 hrs HW= 1,052.00’ (Free Discharge)
2= Custom Weir/Orifice (Controls 0.00 cfs)
Pond 12P: FILTRATION BASIN G

Inflow Area=2.205 ac
Peak Elev=1,053.38'
Storage=1,152 cf
Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1S: DD TO SOUTHEAST
Runoff Area=386,575 sf 4.12% Impervious Runoff Depth>0.94"
Flow Length=300’ Slope=0.0400 '/' Tc=45.1 min UI Adjusted CN=78 Runoff=5.95 cfs 0.693 af

Subcatchment 2S: DD TO SW
Runoff Area=81,336 sf 0.00% Impervious Runoff Depth>0.94"
Tc=40.1 min CN=78 Runoff=1.35 cfs 0.146 af

Subcatchment 3S: TO DETENTION BASIN
Runoff Area=69,734 sf 42.00% Impervious Runoff Depth>1.45"
Tc=7.0 min CN=86 Runoff=4.19 cfs 0.193 af

Subcatchment 4S: ZANE WEST SIDE TO
Runoff Area=20,240 sf 28.66% Impervious Runoff Depth>1.31"
Tc=7.0 min CN=84 Runoff=1.11 cfs 0.051 af

Subcatchment 5Sa: PARKING LOT BASIN
Runoff Area=30,255 sf 50.16% Impervious Runoff Depth>1.59"
Tc=10.0 min CN=88 Runoff=1.74 cfs 0.092 af

Subcatchment 5Sb: PARKING LOT BASIN
Runoff Area=20,505 sf 74.01% Impervious Runoff Depth>2.01"
Tc=7.0 min CN=93 Runoff=1.62 cfs 0.079 af

Subcatchment 6S: TO FILTRATION BASIN
Runoff Area=41,422 sf 10.62% Impervious Runoff Depth>1.06"
Tc=10.0 min CN=80 Runoff=1.60 cfs 0.084 af

Subcatchment 7S: PARENT DROPOFF
Runoff Area=92,061 sf 25.69% Impervious Runoff Depth>1.24"
Flow Length=275’ Slope=0.0800 '/' Tc=21.2 min CN=83 Runoff=2.97 cfs 0.218 af

Subcatchment 8S: BUS DROPOFF
Runoff Area=48,017 sf 39.84% Impervious Runoff Depth>1.44"
Flow Length=210’ Slope=0.0900 '/' Tc=16.3 min CN=86 Runoff=2.06 cfs 0.132 af

Subcatchment 9S: TO DETENTION BASIN
Runoff Area=47,568 sf 12.61% Impervious Runoff Depth>1.12"
Flow Length=230’ Slope=0.0900 '/' Tc=17.5 min CN=81 Runoff=1.52 cfs 0.102 af

Subcatchment 10S: ZANE WEST SIDE TO
Runoff Area=30,563 sf 18.98% Impervious Runoff Depth>1.18"
Tc=7.0 min CN=82 Runoff=1.51 cfs 0.069 af

Subcatchment 11S: TO WETLAND
Runoff Area=230,474 sf 7.39% Impervious Runoff Depth>1.00"
Tc=7.0 min CN=79 Runoff=9.70 cfs 0.443 af

Subcatchment 12S: HORSE BARNS
Runoff Area=96,048 sf 14.59% Impervious Runoff Depth>1.12"
Tc=7.0 min CN=81 Runoff=4.51 cfs 0.206 af

Subcatchment 19S: TO WETLAND
Runoff Area=94,094 sf 6.50% Impervious Runoff Depth>1.00"
Tc=7.0 min CN=79 Runoff=3.96 cfs 0.181 af

Subcatchment 20S: TO WETLAND
Runoff Area=202,427 sf 4.92% Impervious Runoff Depth>1.00"
Tc=7.0 min CN=79 Runoff=8.52 cfs 0.389 af

Subcatchment 21S: TO WETLAND
Runoff Area=503,672 sf 1.85% Impervious Runoff Depth>0.95"
Tc=7.0 min CN=78 Runoff=19.99 cfs 0.916 af
### Subcatchment 22S: TO WETLAND
- **Runoff Area:** 315,367 sf
- **Impervious Area:** 0.42%
- **Runoff Depth:** >0.95"
- **Tc:** 7.0 min
- **CN:** 78
- **Runoff:** 12.52 cfs, 0.573 af

### Subcatchment 23S: TO WETLAND
- **Runoff Area:** 432,028 sf
- **Impervious Area:** 0.84%
- **Runoff Depth:** >0.95"
- **Tc:** 7.0 min
- **CN:** 78
- **Runoff:** 17.15 cfs, 0.785 af

### Subcatchment 24S: TO WETLAND
- **Runoff Area:** 528,021 sf
- **Impervious Area:** 1.80%
- **Runoff Depth:** >0.95"
- **Tc:** 7.0 min
- **CN:** 78
- **Runoff:** 20.96 cfs, 0.960 af

### Subcatchment 25S: TO WETLAND
- **Runoff Area:** 249,494 sf
- **Impervious Area:** 2.55%
- **Runoff Depth:** >1.00"
- **Tc:** 7.0 min
- **CN:** 79
- **Runoff:** 10.50 cfs, 0.480 af

### Subcatchment 26S: TO WETLAND
- **Runoff Area:** 1,860,073 sf
- **Impervious Area:** 2.54%
- **Runoff Depth:** >1.00"
- **Tc:** 7.0 min
- **CN:** 79
- **Runoff:** 78.27 cfs, 3.576 af

### Subcatchment 27S: TO WETLAND
- **Runoff Area:** 1,860,073 sf
- **Impervious Area:** 2.54%
- **Runoff Depth:** >1.00"
- **Tc:** 7.0 min
- **CN:** 79
- **Runoff:** 78.27 cfs, 3.576 af

### Subcatchment 28S: TO WETLAND
- **Runoff Area:** 143,740 sf
- **Impervious Area:** 1.17%
- **Runoff Depth:** >0.95"
- **Tc:** 7.0 min
- **CN:** 78
- **Runoff:** 5.71 cfs, 0.261 af

### Subcatchment 29S: TO WETLAND
- **Runoff Area:** 3,189,501 sf
- **Impervious Area:** 0.00%
- **Runoff Depth:** >0.95"
- **Tc:** 7.0 min
- **CN:** 78
- **Runoff:** 126.60 cfs, 5.798 af

### Reach 11R: SOUTHWEST
- **Inflow:** 5.13 cfs, 1.091 af
- **Outflow:** 5.13 cfs, 1.091 af

### Reach 18R: TOTAL
- **Inflow:** 12.33 cfs, 1.990 af
- **Outflow:** 12.33 cfs, 1.990 af

### Reach 19R: SOUTHEAST
- **Inflow:** 5.95 cfs, 0.693 af
- **Outflow:** 5.95 cfs, 0.693 af

### Pond 3P: DETENTION BASIN F
- **Peak Elev:** 1,047.19'
- **Storage:** 7,674 cf
- **Inflow:** 7.79 cfs, 0.942 af
- **Primary:** 3.65 cfs, 0.894 af
- **Secondary:** 0.00 cfs, 0.000 af
- **Outflow:** 3.65 cfs, 0.894 af

### Pond 5Pa: FILTRATION BASIN C1
- **Peak Elev:** 1,069.24'
- **Storage:** 267 cf
- **Inflow:** 1.74 cfs, 0.092 af
- **Primary:** 1.18 cfs, 0.092 af
- **Secondary:** 0.00 cfs, 0.000 af
- **Outflow:** 1.18 cfs, 0.092 af

### Pond 5Pb: FILTRATION BASIN C2
- **Peak Elev:** 1,067.15'
- **Storage:** 167 cf
- **Inflow:** 1.62 cfs, 0.079 af
- **Primary:** 1.15 cfs, 0.079 af
- **Secondary:** 0.00 cfs, 0.000 af
- **Outflow:** 1.15 cfs, 0.079 af

### Pond 7P: FILTRATION BASIN B
- **Peak Elev:** 1,072.36'
- **Storage:** 2,306 cf
- **Inflow:** 2.97 cfs, 0.218 af
- **Primary:** 1.14 cfs, 0.218 af
- **Secondary:** 0.00 cfs, 0.000 af
- **Outflow:** 1.14 cfs, 0.218 af

### Pond 8P: FILTRATION BASIN A
- **Peak Elev:** 1,068.29'
- **Storage:** 1,052 cf
- **Inflow:** 2.06 cfs, 0.132 af
- **Primary:** 0.96 cfs, 0.132 af
- **Secondary:** 0.00 cfs, 0.000 af
- **Outflow:** 0.96 cfs, 0.132 af
MSE 24-hr 3  2-Year Rainfall=2.82"

Pond 9P: DETENTION BASIN D
   Peak Elev=1,066.19'  Storage=2,508 cf  Inflow=2.55 cfs  0.171 af
   Primary=1.43 cfs  0.144 af  Secondary=0.00 cfs  0.000 af  Outflow=1.43 cfs  0.144 af

Pond 10P: FILTRATION BASIN E
   Peak Elev=1,055.94'  Storage=7,187 cf  Inflow=4.12 cfs  0.578 af
   Primary=1.82 cfs  0.578 af  Secondary=0.00 cfs  0.000 af  Outflow=1.82 cfs  0.578 af

Pond 12P: FILTRATION BASIN G
   Peak Elev=1,053.66'  Storage=1,497 cf  Inflow=4.51 cfs  0.206 af
   Primary=1.51 cfs  0.194 af  Secondary=1.36 cfs  0.012 af  Outflow=2.87 cfs  0.206 af

   Total Runoff Area = 220.428 ac  Runoff Volume = 18.043 af  Average Runoff Depth = 0.98"
   97.20% Pervious = 214.266 ac  2.80% Impervious = 6.162 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 5.95 cfs @ 12.66 hrs, Volume = 0.693 af, Depth > 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 2-Year Rainfall = 2.82"

### Area (sf) CN Adj Description

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Adj</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>98</td>
<td></td>
<td>Unconnected roofs, HSG D</td>
</tr>
<tr>
<td>370,665</td>
<td>78</td>
<td></td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>386,575</td>
<td>79</td>
<td>78</td>
<td>Weighted Average, UI Adjusted</td>
</tr>
<tr>
<td>370,665</td>
<td></td>
<td></td>
<td>95.88% Pervious Area</td>
</tr>
<tr>
<td>15,910</td>
<td></td>
<td></td>
<td>4.12% Impervious Area</td>
</tr>
<tr>
<td>15,910</td>
<td></td>
<td></td>
<td>100.00% Unconnected</td>
</tr>
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</table>

### Tc Length Slope Velocity Capacity Description

<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
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<td>300</td>
<td>0.0400</td>
<td>0.11</td>
<td></td>
<td>Sheet Flow,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n = 0.400 P2 = 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 1S: DD TO SOUTHEAST

**Hydrograph**

MSE 24-hr 3 2-Year Rainfall = 2.82"
Runoff Area = 386,575 sf
Runoff Volume = 0.693 af
Runoff Depth > 0.94"
Flow Length = 300'
Slope = 0.0400 '/'
Tc = 45.1 min
UI Adjusted CN = 78
## Summary for Subcatchment 2S: DD TO SW

Runoff = 1.35 cfs @ 12.59 hrs, Volume= 0.146 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>81,336</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>81,336</td>
<td>100%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.1</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

### Subcatchment 2S: DD TO SW

**Hydrograph**

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=81,336 sf
Runoff Volume=0.146 af
Runoff Depth>0.94"
Tc=40.1 min
CN=78
Summary for Subcatchment 3S: TO DETENTION BASIN F

Runoff = 4.19 cfs @ 12.14 hrs, Volume= 0.193 af, Depth> 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>29,291</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>40,443</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>69,734</td>
<td>86</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>40,443</td>
<td></td>
<td>58.00% Pervious Area</td>
</tr>
<tr>
<td>29,291</td>
<td></td>
<td>42.00% Impervious Area</td>
</tr>
</tbody>
</table>

Tc=7.0 min

Subcatchment 3S: TO DETENTION BASIN F

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=69,734 sf
Runoff Volume=0.193 af
Runoff Depth>1.45"
Tc=7.0 min
CN=86
Summary for Subcatchment 4S: ZANE WEST SIDE TO SW

Runoff = 1.11 cfs @ 12.15 hrs, Volume= 0.051 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<td>14,440</td>
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<td>Meadow, non-grazed, HSG D</td>
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<td>20,240</td>
<td>84</td>
<td>Weighted Average</td>
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<tr>
<td>14,440</td>
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<td>71.34% Pervious Area</td>
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<tr>
<td>5,800</td>
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<td>28.66% Impervious Area</td>
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</table>

Tc Length Slope Velocity Capacity Description
7.0  Direct Entry,  

Subcatchment 4S: ZANE WEST SIDE TO SW

MSE 24-hr 3
2-Year Rainfall=2.82"
Runoff Area=20,240 sf
Runoff Volume=0.051 af
Runoff Depth>1.31"
Tc=7.0 min
CN=84
Summary for Subcatchment 5Sa: PARKING LOT BASIN

Runoff = 1.74 cfs @ 12.18 hrs, Volume= 0.092 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
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<td>Paved parking, HSG D</td>
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<tr>
<td>15,080</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,255</td>
<td>88</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>15,080</td>
<td></td>
<td>49.84% Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
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<td>50.16% Impervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
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<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>10.0</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 5Sa: PARKING LOT BASIN

MSE 24-hr 3
2-Year Rainfall=2.82"
Runoff Area=30,255 sf
Runoff Volume=0.092 af
Runoff Depth>1.59"
Tc=10.0 min
CN=88
Summary for Subcatchment 5Sb: PARKING LOT BASIN

Runoff = 1.62 cfs @ 12.14 hrs, Volume= 0.079 af, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>15,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>5,330</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>20,505</td>
<td>93</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>5,330</td>
<td></td>
<td>25.99% Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
<td></td>
<td>74.01% Impervious Area</td>
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</table>

Tc Length Slope Velocity Capacity Description
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<tr>
<th>(min)</th>
<th>(feet)</th>
<th>(ft/ft)</th>
<th>(ft/sec)</th>
<th>(cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 5Sb: PARKING LOT BASIN

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=20,505 sf
Runoff Volume=0.079 af
Runoff Depth>2.01"
Tc=7.0 min
CN=93
Summary for Subcatchment 6S: TO FILTRATION BASIN E

Runoff = 1.60 cfs @ 12.18 hrs, Volume = 0.084 af, Depth > 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<td>37,022</td>
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<tr>
<td>41,422</td>
<td>80</td>
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</tr>
<tr>
<td>37,022</td>
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<td>89.38% Pervious Area</td>
</tr>
<tr>
<td>4,400</td>
<td></td>
<td>10.62% Impervious Area</td>
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</tbody>
</table>

Subcatchment 6S: TO FILTRATION BASIN E

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area = 41,422 sf
Runoff Volume = 0.084 af
Runoff Depth > 1.06"
Tc = 10.0 min
CN = 80
Summary for Subcatchment 7S: PARENT DROPOFF

Runoff = 2.97 cfs @ 12.32 hrs, Volume= 0.218 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23,650</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>68,411</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>92,061</td>
<td>83</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>23,650</td>
<td>25.69% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.2</td>
<td>275</td>
<td>0.0800</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 7S: PARENT DROPOFF

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=92,061 sf
Runoff Volume=0.218 af
Runoff Depth>1.24"
Flow Length=275'
Slope=0.0800 '/" 
Tc=21.2 min
CN=83
Summary for Subcatchment 8S: BUS DROPOFF

Runoff = 2.06 cfs @ 12.25 hrs, Volume= 0.132 af, Depth> 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,128</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>28,889</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>48,017</td>
<td>86</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>28,889</td>
<td></td>
<td>60.16% Pervious Area</td>
</tr>
<tr>
<td>19,128</td>
<td></td>
<td>39.84% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>16.3</td>
<td>210</td>
<td>0.0900</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 8S: BUS DROPOFF

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=48,017 sf
Runoff Volume=0.132 af
Runoff Depth>1.44"
Flow Length=210'
Slope=0.0900 '/'
Tc=16.3 min
CN=86
Summary for Subcatchment 9S: TO DETENTION BASIN D

Runoff = 1.52 cfs @ 12.27 hrs, Volume= 0.102 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,000</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>41,568</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>47,568</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>41,568</td>
<td></td>
<td>87.39% Pervious Area</td>
</tr>
<tr>
<td>6,000</td>
<td>12.61% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5</td>
<td>230</td>
<td>0.0900</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 9S: TO DETENTION BASIN D

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=47,568 sf
Runoff Volume=0.102 af
Runoff Depth>1.12"
Flow Length=230'
Slope=0.0900 '/'
Tc=17.5 min
CN=81
Summary for Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

Runoff = 1.51 cfs @ 12.15 hrs, Volume= 0.069 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>24,763</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,563</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>24,763</td>
<td></td>
<td>81.02% Pervious Area</td>
</tr>
<tr>
<td>5,800</td>
<td></td>
<td>18.98% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=30,563 sf
Runoff Volume=0.069 af
Runoff Depth>1.18"
Tc=7.0 min
CN=82
Summary for Subcatchment 11S: TO WETLAND

Runoff = 9.70 cfs @ 12.15 hrs, Volume= 0.443 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,039</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>213,435</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>213,435</td>
<td></td>
<td>92.61% Pervious Area</td>
</tr>
<tr>
<td>17,039</td>
<td></td>
<td>7.39% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 11S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=230,474 sf
Runoff Volume=0.443 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 4.51 cfs @ 12.15 hrs, Volume= 0.206 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,013</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>96,048</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>82,035</td>
<td></td>
<td>85.41% Pervious Area</td>
</tr>
<tr>
<td>14,013</td>
<td></td>
<td>14.59% Impervious Area</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 12S: HORSE BARNS

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=96,048 sf
Runoff Volume=0.206 af
Runoff Depth>1.12"
Tc=7.0 min
CN=81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 3.96 cfs @ 12.15 hrs, Volume= 0.181 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,114</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>87,980</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
<td>93.50% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>6,114</td>
<td>6.50% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc=7.0 min

Subcatchment 19S: TO WETLAND

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=94,094 sf
Runoff Volume=0.181 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 20S: TO WETLAND

Runoff = 8.52 cfs @ 12.15 hrs, Volume= 0.389 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,960</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>192,467</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>202,427</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>192,467</td>
<td></td>
<td>95.08% Pervious Area</td>
</tr>
<tr>
<td>9,960</td>
<td></td>
<td>4.92% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 20S: TO WETLAND

MSE 24-hr 3  2-Year Rainfall=2.82"
Runoff Area=202,427 sf
Runoff Volume=0.389 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 21S: TO WETLAND

Runoff = 19.99 cfs @ 12.15 hrs, Volume= 0.916 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,337</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>494,335</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>494,335</td>
<td></td>
<td>98.15% Pervious Area</td>
</tr>
<tr>
<td>9,337</td>
<td></td>
<td>1.85% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
--- --- --- --- ---
7.0  Direct Entry,

Subcatchment 21S: TO WETLAND

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=503,672 sf
Runoff Volume=0.916 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 22S: TO WETLAND

Runoff = 12.52 cfs @ 12.15 hrs, Volume= 0.573 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

---

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,310</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>314,057</td>
<td></td>
<td>99.58% Pervious Area</td>
</tr>
<tr>
<td>1,310</td>
<td></td>
<td>0.42% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

---

Subcatchment 22S: TO WETLAND

Runoff Area=315,367 sf
Runoff Volume=0.573 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 17.15 cfs @ 12.15 hrs, Volume= 0.785 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>3,638</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>428,390</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>432,028</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>428,390</td>
<td></td>
<td>99.16% Pervious Area</td>
</tr>
<tr>
<td>3,638</td>
<td></td>
<td>0.84% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 23S: TO WETLAND

MSE 24-hr 3 2-Year Rainfall=2.82"

Runoff Area=432,028 sf
Runoff Volume=0.785 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 20.96 cfs @ 12.15 hrs, Volume= 0.960 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,490</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>518,531</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>528,021</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>518,531</td>
<td></td>
<td>98.20% Pervious Area</td>
</tr>
<tr>
<td>9,490</td>
<td></td>
<td>1.80% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 24S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=528,021 sf
Runoff Volume=0.960 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 19.57 cfs @ 12.15 hrs, Volume= 0.897 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,876</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>491,290</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>493,166</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>491,290</td>
<td></td>
<td>99.62% Pervious Area</td>
</tr>
<tr>
<td>1,876</td>
<td></td>
<td>0.38% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Direct Entry,

Subcatchment 25S: TO WETLAND

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=493,166 sf
Runoff Volume=0.897 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 10.50 cfs @ 12.15 hrs, Volume = 0.480 af, Depth > 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,363</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
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</tbody>
</table>

Subcatchment 26S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=249,494 sf
Runoff Volume=0.480 af
Runoff Depth > 1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 78.27 cfs @ 12.15 hrs, Volume= 3.576 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,209</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,076</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,812,788</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>1,860,073</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,812,788</td>
<td></td>
<td>97.46% Pervious Area</td>
</tr>
<tr>
<td>47,285</td>
<td></td>
<td>2.54% Impervious Area</td>
</tr>
</tbody>
</table>

Tc (min) Length (feet) Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description
7.0        

Direct Entry,

Subcatchment 27S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=1,860,073 sf
Runoff Volume=3.576 af
Runoff Depth>1.00"
Tc=7.0 min
CN=79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 5.71 cfs @ 12.15 hrs, Volume= 0.261 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,680</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142,060</td>
<td></td>
<td>98.83% Pervious Area</td>
</tr>
<tr>
<td>1,680</td>
<td></td>
<td>1.17% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
7.0

Subcatchment 28S: TO WETLAND

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=143,740 sf
Runoff Volume=0.261 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 15.70 cfs @ 12.15 hrs, Volume= 0.719 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395,477</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>395,477</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min
Length (feet) Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description

Direct Entry,

Subcatchment 29S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=395,477 sf
Runoff Volume=0.719 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 126.60 cfs @ 12.15 hrs, Volume= 5.798 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,189,501</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>3,189,501</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

Direct Entry,

Subcatchment 30S: TO WETLAND

Hydrograph

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=3,189,501 sf
Runoff Volume=5.798 af
Runoff Depth>0.95"
Tc=7.0 min
CN=78
Summary for Reach 11R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.058 ac, 25.83% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 5.13 cfs @ 12.51 hrs, Volume= 1.091 af
Outflow = 5.13 cfs @ 12.51 hrs, Volume= 1.091 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 11R: SOUTHWEST
Summary for Reach 18R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22.138 ac, 16.01% Impervious, Inflow Depth > 1.08" for 2-Year event
Inflow = 12.33 cfs @ 12.62 hrs, Volume= 1.990 af
Outflow = 12.33 cfs @ 12.62 hrs, Volume= 1.990 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 18R: TOTAL

Inflow Area=22.138 ac
Summary for Reach 19R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.875 ac, 4.12% Impervious, Inflow Depth > 0.94” for 2-Year event
Inflow = 5.95 cfs @ 12.66 hrs, Volume= 0.693 af
Outflow = 5.95 cfs @ 12.66 hrs, Volume= 0.693 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 19R: SOUTHEAST

Hydrograph
Summary for Pond 3P: DETENTION BASIN F

Inflow Area = 8.726 ac, 31.21% Impervious, Inflow Depth > 1.30" for 2-Year event
Inflow = 7.79 cfs @ 12.15 hrs, Volume = 0.942 af
Outflow = 3.65 cfs @ 12.45 hrs, Volume = 0.894 af, Attenuation = 53%, Lag = 18.3 min
Primary = 3.65 cfs @ 12.45 hrs, Volume = 0.894 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
Peak Elev = 1,047.19' @ 12.45 hrs, Surf.Area = 5,194 sf, Storage = 7,674 cf

Plug-Flow detention time = 41.2 min calculated for 0.891 af (95% of inflow)
Center-of-Mass detention time = 25.4 min (847.0 - 821.6)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,045.00'</td>
<td>28,188 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,045.00</td>
<td>2,675</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,046.00</td>
<td>2,850</td>
<td>2,763</td>
<td>2,763</td>
</tr>
<tr>
<td>1,047.00</td>
<td>5,000</td>
<td>3,925</td>
<td>6,688</td>
</tr>
<tr>
<td>1,048.00</td>
<td>6,000</td>
<td>5,500</td>
<td>12,188</td>
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<tr>
<td>1,049.00</td>
<td>8,000</td>
<td>7,000</td>
<td>19,188</td>
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<tr>
<td>1,050.00</td>
<td>10,000</td>
<td>9,000</td>
<td>28,188</td>
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</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,045.50'</td>
<td>12.0&quot; Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = 80.0', CMP, mitered to conform to fill, Ke = 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert = 1,045.50' / 1,045.00'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S = 0.0063 '/'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cc = 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n = 0.011 PVC, smooth interior, Flow Area = 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,048.00'</td>
<td>Custom Weir/Orifice, Cv = 2.62 (C = 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 1.00 2.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 16.00 50.00 80.00</td>
</tr>
</tbody>
</table>

**Primary Outflow** Max = 3.64 cfs @ 12.45 hrs HW = 1,047.19' (Free Discharge)

**Secondary Outflow** Max = 0.00 cfs @ 5.00 hrs HW = 1,045.00' (Free Discharge)
Pond 3P: DETENTION BASIN F

Inflow Area=8.726 ac
Peak Elev=1,047.19'
Storage=7,674 cf
Summary for Pond 5Pa: FILTRATION BASIN C1

**Hint:** Outlet device #1 is below defined storage

**Warning:** Oscillations may require smaller dt or Finer Routing (severity=3)

<table>
<thead>
<tr>
<th>Inflow Area</th>
<th>0.695 ac, 50.16% Impervious, Inflow Depth &gt; 1.59” for 2-Year event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflow</td>
<td>0.74 cfs @ 12.18 hrs, Volume= 0.092 af</td>
</tr>
<tr>
<td>Outflow</td>
<td>1.18 cfs @ 12.27 hrs, Volume= 0.092 af, Atten= 32%, Lag= 5.8 min</td>
</tr>
<tr>
<td>Primary</td>
<td>1.18 cfs @ 12.27 hrs, Volume= 0.092 af</td>
</tr>
<tr>
<td>Secondary</td>
<td>0.00 cfs @ 5.00 hrs, Volume= 0.000 af</td>
</tr>
</tbody>
</table>

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,069.24' @ 12.27 hrs  Surf.Area= 738 sf  Storage= 267 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.0 min (782.0 - 781.0)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,069.00'</td>
<td>6,980 cf</td>
<td><strong>Custom Stage Data (Prismatic)</strong> Listed below</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,069.00</td>
<td>400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,070.00</td>
<td>1,780</td>
<td>1,090</td>
<td>1,090</td>
</tr>
<tr>
<td>1,071.00</td>
<td>10,000</td>
<td>5,890</td>
<td>6,980</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,067.00'</td>
<td>6.0&quot; Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 200.0'  CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,067.00' / 1,048.00' S= 0.0950 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011  PVC, smooth interior, Flow Area= 0.20 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,070.00'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 180.00 250.00</td>
</tr>
</tbody>
</table>

**Primary OutFlow** Max=1.18 cfs @ 12.27 hrs  HW=1,069.24' (Free Discharge)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs  HW=1,069.00' (Free Discharge)
Pond 5Pa: FILTRATION BASIN C1

Inflow Area=0.695 ac
Peak Elev=1,069.24'
Storage=267 cf
Summary for Pond 5Pb: FILTRATION BASIN C2

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 0.471 ac, 74.01% Impervious, Inflow Depth > 2.01" for 2-Year event
Inflow = 1.62 cfs @ 12.14 hrs, Volume= 0.079 af
Outflow = 1.15 cfs @ 12.21 hrs, Volume= 0.079 af, Atten= 29%, Lag= 3.9 min
Primary = 1.15 cfs @ 12.21 hrs, Volume= 0.079 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,067.15' @ 12.21 hrs  Surf.Area= 611 sf  Storage= 167 cf

Plug-Flow detention time= 0.7 min calculated for 0.079 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (765.2 - 764.5)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,067.00'</td>
<td>6,980 cf</td>
<td>Custom Stage Data (Prismatic) listed below</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1,067.00</td>
<td>400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,068.00</td>
<td>1,780</td>
<td>1,090</td>
<td>1,090</td>
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<tr>
<td>1,069.00</td>
<td>10,000</td>
<td>5,890</td>
<td>6,980</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,065.00'</td>
<td>6.0&quot; Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 130.0' CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,065.00' / 1,048.00' S= 0.1308 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,068.00'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00  1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 180.00  250.00</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=1.15 cfs @ 12.21 hrs  HW=1,067.15' (Free Discharge)
↑=1=Draintile (Inlet Controls 1.15 cfs @ 5.86 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs  HW=1,067.00' (Free Discharge)
↑=2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 5Pb: FILTRATION BASIN C2

Inflow Area=0.471 ac
Peak Elev=1,067.15'
Storage=167 cf
Summary for Pond 7P: FILTRATION BASIN B

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 2.113 ac, 25.69% Impervious, Inflow Depth > 1.24" for 2-Year event
Inflow = 2.97 cfs @ 12.32 hrs, Volume= 0.218 af
Outflow = 1.14 cfs @ 12.70 hrs, Volume= 0.218 af, Atten= 62%, Lag= 22.5 min
Primary = 1.14 cfs @ 12.70 hrs, Volume= 0.218 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,072.36' @ 12.70 hrs  Surf.Area= 2,005 sf  Storage= 2,306 cf

Plug-Flow detention time= 14.8 min calculated for 0.218 af (100% of inflow)
Center-of-Mass det. time= 14.7 min (815.3 - 800.6)

Volume Invert Avail.Storage Storage Description
#1 1,071.00' 19,815 cf  Custom Stage Data (Prismatic) listed below

Elevation Surf.Area Inc.Store Cum.Store
(feet) (sq-ft) (cubic-feet) (cubic-feet)
1,071.00 1,300 0 0
1,072.00 1,800 1,550 1,550
1,073.00 2,365 2,083 3,633
1,074.00 30,000 16,183 19,815

Device Routing Invert Outlet Devices
#1 Primary 1,069.00' 6.0" Round Draintile
L= 100.0' CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,069.00' / 1,068.00' S= 0.0100 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,073.00'  Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 60.00 90.00

Primary OutFlow Max=1.14 cfs @ 12.70 hrs HW=1,072.36' (Free Discharge)
↑1=Draintile (Barrel Controls 1.14 cfs @ 5.81 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,071.00' (Free Discharge)
↑2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 7P: FILTRATION BASIN B

Hydrograph

Inflow Area=2.113 ac
Peak Elev=1,072.36'
Storage=2,306 cf
Summary for Pond 8P: FILTRATION BASIN A

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 1.102 ac, 39.84% Impervious, Inflow Depth > 1.44” for 2-Year event
Inflow = 2.06 cfs @ 12.25 hrs, Volume= 0.132 af
Outflow = 0.96 cfs @ 12.50 hrs, Volume= 0.132 af, Atten= 54%, Lag= 14.8 min
Primary = 0.96 cfs @ 12.50 hrs, Volume= 0.132 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,068.29’ @ 12.50 hrs Surf.Area= 3,435 sf Storage= 1,052 cf

Plug-Flow detention time= 7.9 min calculated for 0.132 af (100% of inflow)
Center-of-Mass det. time= 7.5 min (798.1 - 790.6)

Volume Invert Avail.Storage Storage Description
#1 1,068.00’ 31,066 cf Custom Stage Data (Prismatic) Listed below

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,068.00</td>
<td>3,172</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,069.00</td>
<td>4,080</td>
<td>3,626</td>
<td>3,626</td>
</tr>
<tr>
<td>1,070.00</td>
<td>4,800</td>
<td>4,440</td>
<td>8,066</td>
</tr>
<tr>
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<td>5,200</td>
<td>13,266</td>
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<tr>
<td>1,072.00</td>
<td>30,000</td>
<td>17,800</td>
<td>31,066</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 1,066.00’ 6.0” Round Draintile
L= 100.0’ CPP, projecting, no headwall, Ke= 0.900
Inlet / Outlet Invert= 1,066.00’ / 1,065.00’ S= 0.0100 ’’ Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,071.00’ Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 30.00 50.00

Primary OutFlow Max=0.96 cfs @ 12.50 hrs HW=1,068.29’ (Free Discharge)
1=Draintile (Barrel Controls 0.96 cfs @ 4.87 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,068.00’ (Free Discharge)
2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 8P: FILTRATION BASIN A

Hydrograph

Inflow Area=1.102 ac
Peak Elev=1,068.29'
Storage=1,052 cf
Summary for Pond 9P: DETNETION BASIN D

Inflow Area = 1.794 ac, 15.10% Impervious, Inflow Depth > 1.14” for 2-Year event
Inflow = 2.55 cfs @ 12.17 hrs, Volume= 0.171 af
Outflow = 1.43 cfs @ 12.43 hrs, Volume= 0.144 af, Atten= 44%, Lag= 15.2 min
Primary = 1.43 cfs @ 12.43 hrs, Volume= 0.144 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,066.19’ @ 12.43 hrs  Surf.Area= 2,530 sf  Storage= 2,508 cf

Plug-Flow detention time= 74.0 min calculated for 0.143 af (84% of inflow)
Center-of-Mass det. time= 32.6 min (830.0 - 797.4 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,065.00’</td>
<td>19,250 cf</td>
<td>Custom Stage Data (Prismatic)</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,065.00</td>
<td>1,700</td>
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<td>1,070.00</td>
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<th>Device</th>
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<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,065.50’</td>
<td>12.0” Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 88.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,065.50’ / 1,064.50’ S= 0.0114 ’</td>
</tr>
<tr>
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<td></td>
<td>Cc= 0.900</td>
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<tr>
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<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,069.00’</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Head (feet) 0.00 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 12.00 50.00</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=1.42 cfs @ 12.43 hrs HW=1,066.18’ (Free Discharge)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,065.00’ (Free Discharge)
Pond 9P: DETENTION BASIN D

Hydrograph

Inflow Area=1.794 ac
Peak Elev=1,066.19'
Storage=2,508 cf
Summary for Pond 10P: FILTRATION BASIN E

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 5.960 ac, 22.72% Impervious, Inflow Depth > 1.16" for 2-Year event
Inflow = 4.12 cfs @ 12.25 hrs, Volume= 0.578 af
Outflow = 1.82 cfs @ 13.34 hrs, Volume= 0.578 af, Atten= 56%, Lag= 65.2 min
Primary = 1.82 cfs @ 13.34 hrs, Volume= 0.578 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,055.94' @ 13.34 hrs Surf.Area= 4,711 sf Storage= 7,187 cf

Plug-Flow detention time= 36.2 min calculated for 0.578 af (100% of inflow)
Center-of-Mass det. time= 36.0 min (848.5 - 812.5)

### Volume

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<th>Invert</th>
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<td>1,054.00'</td>
<td>19,630 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
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<thead>
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<tr>
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<td>0</td>
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<tr>
<td>1,055.00</td>
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<th>Outlet Devices</th>
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<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,051.00'</td>
<td>12.0&quot; Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 98.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,051.00' / 1,048.00' S= 0.0306 '/' Cc= 0.900</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
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<tr>
<td>#2</td>
<td>Primary</td>
<td>1,052.00'</td>
<td>6.0&quot; Vert. 6&quot; D.T. C= 0.600</td>
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<td>#3</td>
<td>Device 1</td>
<td>1,056.00'</td>
<td>48.0&quot; Horiz. Grate C= 0.600 Limited to weir flow at low heads</td>
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<td>Secondary</td>
<td>1,056.70'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
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<tr>
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<td></td>
<td>Head (feet) 0.00 1.00</td>
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<td></td>
<td></td>
<td></td>
<td>Width (feet) 8.00 20.00</td>
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</tbody>
</table>

**Primary OutFlow** Max= 1.82 cfs @ 13.34 hrs HW=1,055.94' (Free Discharge)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=1,054.00' (Free Discharge)
Pond 10P: FILTRATION BASIN E

Inflow Area=5.960 ac
Peak Elev=1,055.94'
Storage=7,187 cf
Summary for Pond 12P: FILTRATION BASIN G

[44] Hint: Outlet device #1 is below defined storage

- **Inflow Area**: 2.205 ac, 14.59% Impervious, Inflow Depth > 1.12'' for 2-Year event
- **Inflow**: 4.51 cfs @ 12.15 hrs, Volume= 0.206 af
- **Outflow**: 2.87 cfs @ 12.25 hrs, Volume= 0.206 af, Atten= 36%, Lag= 6.2 min
- **Primary**: 1.51 cfs @ 12.25 hrs, Volume= 0.194 af
- **Secondary**: 1.36 cfs @ 12.25 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,053.66' @ 12.25 hrs  Surf.Area= 1,344 sf  Storage= 1,497 cf

Plug-Flow detention time= 5.4 min calculated for 0.206 af (100% of inflow)
Center-of-Mass det. time= 5.3 min (798.5 - 793.2)

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<th>Outlet Devices</th>
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<td>Primary</td>
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<td>6.0” Round Draintile</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>L= 40.0’ MIP, mitered to conform to fill, Ke= 0.700</td>
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<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,050.00’ / 1,049.50’ S= 0.0125 '/' Cc= 0.900</td>
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<td>n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf</td>
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<td>#2</td>
<td>Secondary</td>
<td>1,053.50'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
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<tr>
<td></td>
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<td>Width (feet) 6.00 10.00</td>
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</table>

**Primary OutFlow** Max= 1.51 cfs @ 12.25 hrs  HW=1,053.66’ (Free Discharge)

**Secondary OutFlow** Max= 1.36 cfs @ 12.25 hrs  HW=1,053.66’ (Free Discharge)
Pond 12P: FILTRATION BASIN G

Hydrograph

Inflow Area=2.205 ac
Peak Elev=1,053.66'
Storage=1,497 cf
Subcatchment 1S: DD TO SOUTHEAST
- Runoff Area: 386,575 sf
- Impervious: 4.12%
- Runoff Depth: >1.92"
- Flow Length: 300'
- Slope: 0.0400 '/'
- Tc: 45.1 min
- UI Adjusted CN: 78
- Runoff: 12.51 cfs, 1.419 af

Subcatchment 2S: DD TO SW
- Runoff Area: 81,336 sf
- Impervious: 0.00%
- Runoff Depth: >1.92"
- Tc: 40.1 min
- CN: 78
- Runoff: 2.84 cfs, 0.299 af

Subcatchment 3S: TO DETENTION BASIN
- Runoff Area: 69,734 sf
- Impervious: 42.00%
- Runoff Depth: >2.61"
- Tc: 7.0 min
- CN: 86
- Runoff: 7.38 cfs, 0.348 af

Subcatchment 4S: ZANE WEST SIDE TO
- Runoff Area: 20,240 sf
- Impervious: 28.66%
- Runoff Depth: >2.43"
- Tc: 7.0 min
- CN: 84
- Runoff: 7.38 cfs, 0.348 af

Subcatchment 5Sa: PARKING LOT BASIN
- Runoff Area: 30,255 sf
- Impervious: 50.16%
- Runoff Depth: >2.79"
- Tc: 10.0 min
- CN: 88
- Runoff: 2.99 cfs, 0.161 af

Subcatchment 5Sb: PARKING LOT BASIN
- Runoff Area: 41,422 sf
- Impervious: 74.01%
- Runoff Depth: >3.29"
- Tc: 7.0 min
- CN: 93
- Runoff: 2.57 cfs, 0.129 af

Subcatchment 6S: TO FILTRATION BASIN
- Runoff Area: 48,017 sf
- Impervious: 39.84%
- Runoff Depth: >2.60"
- Flow Length: 275'
- Slope: 0.0800 '/'
- Tc: 21.2 min
- CN: 80
- Runoff: 5.60 cfs, 0.411 af

Subcatchment 7S: PARENT DROPOFF
- Runoff Area: 92,061 sf
- Impervious: 25.69%
- Runoff Depth: >2.34"
- Flow Length: 230'
- Slope: 0.0900 '/'
- Tc: 17.5 min
- CN: 81
- Runoff: 2.97 cfs, 0.198 af

Subcatchment 8S: BUS DROPOFF
- Runoff Area: 47,568 sf
- Impervious: 12.61%
- Runoff Depth: >2.17"
- Flow Length: 230'
- Slope: 0.0900 '/'
- Tc: 17.5 min
- CN: 81
- Runoff: 2.97 cfs, 0.198 af

Subcatchment 9S: TO DETENTION BASIN
- Runoff Area: 30,563 sf
- Impervious: 18.98%
- Runoff Depth: >2.26"
- Tc: 7.0 min
- CN: 82
- Runoff: 2.86 cfs, 0.132 af

Subcatchment 10S: ZANE WEST SIDE TO
- Runoff Area: 202,427 sf
- Impervious: 4.92%
- Runoff Depth: >2.02"
- Tc: 7.0 min
- CN: 79
- Runoff: 19.43 cfs, 0.890 af

Subcatchment 11S: TO WETLAND
- Runoff Area: 203,728 sf
- Impervious: 1.85%
- Runoff Depth: >1.94"
- Tc: 7.0 min
- CN: 78
- Runoff: 40.90 cfs, 1.870 af

Subcatchment 12S: HORSE BARN
- Runoff Area: 96,048 sf
- Impervious: 14.59%
- Runoff Depth: >2.18"
- Tc: 7.0 min
- CN: 81
- Runoff: 8.69 cfs, 0.400 af

Subcatchment 19S: TO WETLAND
- Runoff Area: 94,094 sf
- Impervious: 6.50%
- Runoff Depth: >2.02"
- Tc: 7.0 min
- CN: 79
- Runoff: 7.93 cfs, 0.363 af

Subcatchment 20S: TO WETLAND
- Runoff Area: 202,427 sf
- Impervious: 4.92%
- Runoff Depth: >2.02"
- Tc: 7.0 min
- CN: 79
- Runoff: 17.06 cfs, 0.782 af

Subcatchment 21S: TO WETLAND
- Runoff Area: 503,672 sf
- Impervious: 1.85%
- Runoff Depth: >1.94"
- Tc: 7.0 min
- CN: 78
- Runoff: 40.90 cfs, 1.870 af
Subcatchment 22S: TO WETLAND
Runoff Area = 315,367 sf  0.42% Impervious  Runoff Depth > 1.94"
  Tc = 7.0 min  CN = 78  Runoff = 25.61 cfs  1.171 af

Subcatchment 23S: TO WETLAND
Runoff Area = 432,028 sf  0.84% Impervious  Runoff Depth > 1.94"
  Tc = 7.0 min  CN = 78  Runoff = 35.08 cfs  1.604 af

Subcatchment 24S: TO WETLAND
Runoff Area = 528,021 sf  1.80% Impervious  Runoff Depth > 1.94"
  Tc = 7.0 min  CN = 78  Runoff = 42.88 cfs  1.960 af

Subcatchment 25S: TO WETLAND
Runoff Area = 493,166 sf  0.38% Impervious  Runoff Depth > 2.02"
  Tc = 7.0 min  CN = 79  Runoff = 40.05 cfs  1.831 af

Subcatchment 26S: TO WETLAND
Runoff Area = 249,494 sf  2.55% Impervious  Runoff Depth > 2.02"
  Tc = 7.0 min  CN = 79  Runoff = 21.03 cfs  0.963 af

Subcatchment 27S: TO WETLAND
Runoff Area = 1,860,073 sf  2.54% Impervious  Runoff Depth > 2.02"
  Tc = 7.0 min  CN = 79  Runoff = 156.78 cfs  7.182 af

Subcatchment 28S: TO WETLAND
Runoff Area = 143,740 sf  1.17% Impervious  Runoff Depth > 1.94"
  Tc = 7.0 min  CN = 78  Runoff = 11.67 cfs  0.534 af

Subcatchment 29S: TO WETLAND
Runoff Area = 3,189,501 sf  0.00% Impervious  Runoff Depth > 1.94"
  Tc = 7.0 min  CN = 78  Runoff = 259.00 cfs  11.842 af

Reach 11R: SOUTHWEST
Inflow = 13.80 cfs  2.097 af
Outflow = 13.80 cfs  2.097 af

Reach 18R: TOTAL
Inflow = 27.71 cfs  3.916 af
Outflow = 27.71 cfs  3.916 af

Reach 19R: SOUTHEAST
Inflow = 12.51 cfs  1.419 af
Outflow = 12.51 cfs  1.419 af

Pond 3P: DETENTION BASIN F
Peak Elev = 1,048.21'  Storage = 13,463 cf  Inflow = 11.58 cfs  1.756 af
Primary = 4.96 cfs  1.543 af  Secondary = 5.75 cfs  0.161 af
Outflow = 10.71 cfs  1.704 af

Pond 5Pa: FILTRATION BASIN C1
Peak Elev = 1,070.00'  Storage = 1,103 cf  Inflow = 2.99 cfs  0.161 af
Primary = 1.38 cfs  0.162 af  Secondary = 0.02 cfs  0.000 af
Outflow = 1.40 cfs  0.162 af

Pond 5Pb: FILTRATION BASIN C2
Peak Elev = 1,067.61'  Storage = 664 cf  Inflow = 2.57 cfs  0.129 af
Primary = 1.28 cfs  0.129 af  Secondary = 0.00 cfs  0.000 af
Outflow = 1.28 cfs  0.129 af

Pond 7P: FILTRATION BASIN B
Peak Elev = 1,073.05'  Storage = 4,497 cf  Inflow = 5.60 cfs  0.411 af
Primary = 1.24 cfs  0.346 af  Secondary = 2.53 cfs  0.065 af
Outflow = 3.77 cfs  0.411 af

Pond 8P: FILTRATION BASIN A
Peak Elev = 1,068.85'  Storage = 3,076 cf  Inflow = 3.67 cfs  0.239 af
Primary = 1.05 cfs  0.239 af  Secondary = 0.00 cfs  0.000 af
Outflow = 1.05 cfs  0.239 af
Proposed Drainage

MSE 24-hr 3 10-Year Rainfall=4.18"

Prepared by Kimley-Horn and Associates
Printed 2/28/2019
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Pond 9P: DETENTION BASIN D
Peak Elev=1,066.80’ Storage=4,192 cf Inflow=4.98 cfs 0.330 af
Primary=2.98 cfs 0.302 af Secondary=0.00 cfs 0.000 af Outflow=2.98 cfs 0.302 af

Pond 10P: FILTRATION BASIN E
Peak Elev=1,056.28’ Storage=8,885 cf Inflow=8.50 cfs 1.118 af
Primary=8.03 cfs 1.117 af Secondary=0.00 cfs 0.000 af Outflow=8.03 cfs 1.117 af

Pond 12P: FILTRATION BASIN G
Peak Elev=1,053.95’ Storage=1,864 cf Inflow=8.69 cfs 0.400 af
Primary=1.57 cfs 0.297 af Secondary=7.44 cfs 0.104 af Outflow=9.02 cfs 0.400 af

Total Runoff Area = 220.428 ac Runoff Volume = 36.456 af Average Runoff Depth = 1.98"
97.20% Pervious = 214.266 ac 2.80% Impervious = 6.162 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 12.51 cfs @ 12.64 hrs, Volume= 1.419 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
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<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Adj</th>
<th>Description</th>
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<tbody>
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<td>98</td>
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<td>Unconnected roofs, HSG D</td>
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<tr>
<td>370,665</td>
<td>78</td>
<td></td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
</tbody>
</table>

| 386,575    | 79 | 78  | Weighted Average, UI Adjusted    |
| 370,665    |    |     | 95.88% Pervious Area             |
| 15,910     |    |     | 4.12% Impervious Area            |
| 15,910     |    |     | 100.00% Unconnected              |

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
45.1 300 0.0400 0.11 Sheet Flow,
Woods: Light underbrush n= 0.400 P2= 2.42"

Subcatchment 1S: DD TO SOUTHEAST

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=386,575 sf
Runoff Volume=1.419 af
Runoff Depth>1.92"
Flow Length=300'
Slope=0.0400 '/'
Tc=45.1 min
UI Adjusted CN=78
**Summary for Subcatchment 2S: DD TO SW**

Runoff = 2.84 cfs @ 12.57 hrs, Volume = 0.299 af, Depth > 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>81,336</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>81,336</td>
<td>100.00% Pervious Area</td>
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**Subcatchment 2S: DD TO SW**

- **MSE 24-hr 3 10-Year Rainfall=4.18"**
- **Runoff Area=81,336 sf**
- **Runoff Volume=0.299 af**
- **Runoff Depth>1.92"**
- **Tc=40.1 min**
- **CN=78**
Summary for Subcatchment 3S: TO DETENTION BASIN F

Runoff = 7.38 cfs @ 12.14 hrs, Volume= 0.348 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

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<td>Paved parking, HSG D</td>
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<td>40,443</td>
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<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>69,734</td>
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<td>Weighted Average</td>
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<tr>
<td>29,291</td>
<td>42.00% Impervious Area</td>
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Tc=7.0 min

Direct Entry,

Subcatchment 3S: TO DETENTION BASIN F

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=69,734 sf
Runoff Volume=0.348 af
Runoff Depth>2.61"
Tc=7.0 min
CN=86
Summary for Subcatchment 4S: ZANE WEST SIDE TO SW

Runoff = 2.02 cfs @ 12.14 hrs, Volume= 0.094 af, Depth> 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,800</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>14,440</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>20,240</td>
<td>84</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>14,440</td>
<td></td>
<td>71.34% Pervious Area</td>
</tr>
<tr>
<td>5,800</td>
<td></td>
<td>28.66% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 4S: ZANE WEST SIDE TO SW

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=20,240 sf
Runoff Volume=0.094 af
Runoff Depth>2.43"
Tc=7.0 min
CN=84
Summary for Subcatchment 5Sa: PARKING LOT BASIN

Runoff = 2.99 cfs @ 12.17 hrs, Volume= 0.161 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,175</td>
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<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>15,080</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,255</td>
<td>88</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>15,080</td>
<td></td>
<td>49.84% Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
<td></td>
<td>50.16% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 10.0 min

Subcatchment 5Sa: PARKING LOT BASIN

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=30,255 sf
Runoff Volume=0.161 af
Runoff Depth>2.79"
Tc=10.0 min
CN=88
Summary for Subcatchment 5Sb: PARKING LOT BASIN

Runoff = 2.57 cfs @ 12.14 hrs, Volume= 0.129 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>5,330</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>20,505</td>
<td>93</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>5,330</td>
<td>74.01%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
<td>25.99%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td>Direct Entry,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subcatchment 5Sb: PARKING LOT BASIN

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=20,505 sf
Runoff Volume=0.129 af
Runoff Depth>3.29"
Tc=7.0 min
CN=93
Summary for Subcatchment 6S: TO FILTRATION BASIN E

Runoff = 3.16 cfs @ 12.18 hrs, Volume= 0.166 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,400</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>37,022</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>41,422</td>
<td>80</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>37,022</td>
<td></td>
<td>89.38% Pervious Area</td>
</tr>
<tr>
<td>4,400</td>
<td></td>
<td>10.62% Impervious Area</td>
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</table>

<table>
<thead>
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<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 6S: TO FILTRATION BASIN E

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=41,422 sf
Runoff Volume=0.166 af
Runoff Depth>2.10"
Tc=10.0 min
CN=80
Summary for Subcatchment 7S: PARENT DROPOFF

Runoff = 5.60 cfs @ 12.31 hrs, Volume= 0.411 af, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23,650</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>68,411</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>92,061</td>
<td>83</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>23,650</td>
<td>25.69%</td>
<td>Impervious Area</td>
</tr>
<tr>
<td>68,411</td>
<td>74.31%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.2</td>
<td>275</td>
<td>0.0800</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 7S: PARENT DROPOFF

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=92,061 sf
Runoff Volume=0.411 af
Runoff Depth>2.34"
Flow Length=275' Slope=0.0800 '/'
Tc=21.2 min
CN=83
Summary for Subcatchment 8S: BUS DROPOFF

Runoff = 3.67 cfs @ 12.25 hrs, Volume= 0.239 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,128</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>28,889</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>48,017</td>
<td>86</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>28,889</td>
<td>60.16%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>19,128</td>
<td>39.84%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc  (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>16.3</td>
<td>210</td>
<td>0.0900</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240  P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 8S: BUS DROPOFF

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=48,017 sf
Runoff Volume=0.239 af
Runoff Depth>2.60"
Flow Length=210'
Slope=0.0900 '/'
Tc=16.3 min
CN=86
Summary for Subcatchment 9S: TO DETENTION BASIN D

Runoff = 2.97 cfs @ 12.27 hrs, Volume= 0.198 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,000</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>41,568</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>47,568</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>41,568</td>
<td></td>
<td>87.39% Pervious Area</td>
</tr>
<tr>
<td>6,000</td>
<td>12.61% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5</td>
<td>230</td>
<td>0.0900</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 9S: TO DETENTION BASIN D

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=47,568 sf
Runoff Volume=0.198 af
Runoff Depth>2.17"
Flow Length=230'
Slope=0.0900 '/'
Tc=17.5 min
CN=81
Summary for Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

Runoff = 2.86 cfs @ 12.14 hrs, Volume= 0.132 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,800</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>24,763</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,563</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>24,763</td>
<td></td>
<td>81.02% Pervious Area</td>
</tr>
<tr>
<td>5,800</td>
<td></td>
<td>18.98% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=30,563 sf
Runoff Volume=0.132 af
Runoff Depth>2.26"
Tc=7.0 min
CN=82
Summary for Subcatchment 11S: TO WETLAND

Runoff = 19.43 cfs @ 12.14 hrs, Volume = 0.890 af, Depth > 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>17,039</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>213,435</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>213,435</td>
<td></td>
<td>92.61% Pervious Area</td>
</tr>
<tr>
<td>17,039</td>
<td></td>
<td>7.39% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 11S: TO WETLAND

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=230,474 sf
Runoff Volume=0.890 af
Runoff Depth>2.02"
Tc=7.0 min
CN=79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 8.69 cfs @ 12.14 hrs, Volume= 0.400 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,013</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>96,048</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>82,035</td>
<td></td>
<td>85.41% Pervious Area</td>
</tr>
<tr>
<td>14,013</td>
<td></td>
<td>14.59% Impervious Area</td>
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</tbody>
</table>

Tc = 7.0 min

Subcatchment 12S: HORSE BARNS

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=96,048 sf
Runoff Volume=0.400 af
Runoff Depth>2.18"
Tc=7.0 min
CN=81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 7.93 cfs @ 12.14 hrs, Volume= 0.363 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,114</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>87,980</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
<td>93.50% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>6,114</td>
<td>6.50% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
7.0  Direct Entry,

Subcatchment 19S: TO WETLAND
Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=94,094 sf
Runoff Volume=0.363 af
Runoff Depth>2.02"
Tc=7.0 min
CN=79
Summary for Subcatchment 20S: TO WETLAND

Runoff = 17.06 cfs @ 12.14 hrs, Volume= 0.782 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,960</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>192,467</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>202,427</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>192,467</td>
<td>95</td>
<td>95.08% Pervious Area</td>
</tr>
<tr>
<td>9,960</td>
<td></td>
<td>4.92% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 20S: TO WETLAND

- MSE 24-hr 3
- 10-Year Rainfall=4.18"
- Runoff Area=202,427 sf
- Runoff Volume=0.782 af
- Runoff Depth>2.02"
- Tc=7.0 min
- CN=79

Hydrograph
Summary for Subcatchment 21S: TO WETLAND

Runoff = 40.90 cfs @ 12.15 hrs, Volume = 1.870 af, Depth > 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,337</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>494,335</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>494,335</td>
<td></td>
<td>98.15% Pervious Area</td>
</tr>
<tr>
<td>9,337</td>
<td></td>
<td>1.85% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 21S: TO WETLAND

Hydrograph

MSE 24-hr 3
10-Year Rainfall = 4.18"
Runoff Area = 503,672 sf
Runoff Volume = 1.870 af
Runoff Depth > 1.94"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 22S: TO WETLAND

Runoff  =  25.61 cfs @ 12.15 hrs, Volume= 1.171 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,310</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>314,057</td>
<td>99.58% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>1,310</td>
<td>0.42% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min
Length (feet) Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description
--- | --- | --- | --- | --- | ---
7.0 |  |  |  |  |

Direct Entry,

Subcatchment 22S: TO WETLAND

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=315,367 sf
Runoff Volume=1.171 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 35.08 cfs @ 12.15 hrs, Volume= 1.604 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,638</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>428,390</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>432,028</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>428,390</td>
<td>99.16%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>3,638</td>
<td>0.84%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

Tc | Length | Slope | Velocity | Capacity | Description
---|--------|-------|----------|----------|----------------|
7.0 |        |       |          |          | Direct Entry,

Subcatchment 23S: TO WETLAND

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=432,028 sf
Runoff Volume=1.604 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 42.88 cfs @ 12.15 hrs, Volume = 1.960 af, Depth > 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,490</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>518,531</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>528,021</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>518,531</td>
<td>98.20% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>9,490</td>
<td>1.80% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 24S: TO WETLAND

MSE 24-hr 3 10-Year Rainfall = 4.18"
Runoff Area = 528,021 sf
Runoff Volume = 1.960 af
Runoff Depth > 1.94"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 40.05 cfs @ 12.15 hrs, Volume = 1.831 af, Depth > 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,876</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>491,290</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>493,166</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>491,290</td>
<td></td>
<td>99.62% Pervious Area</td>
</tr>
<tr>
<td>1,876</td>
<td></td>
<td>0.38% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 25S: TO WETLAND

Hydrograph

- MSE 24-hr 3
- 10-Year Rainfall = 4.18"
- Runoff Area = 493,166 sf
- Runoff Volume = 1.831 af
- Runoff Depth > 1.94"
- Tc = 7.0 min
- CN = 78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 21.03 cfs @ 12.14 hrs, Volume= 0.963 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,363</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 26S: TO WETLAND

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=249,494 sf
Runoff Volume=0.963 af
Runoff Depth>2.02"
Tc=7.0 min
CN=79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 156.78 cfs @ 12.14 hrs, Volume = 7.182 af, Depth > 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,209</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,076</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,812,788</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>1,860,073</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,812,788</td>
<td></td>
<td>97.46% Pervious Area</td>
</tr>
<tr>
<td>47,285</td>
<td></td>
<td>2.54% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 27S: TO WETLAND

Hydrograph

MSE 24-hr 3 10-Year Rainfall = 4.18"
Runoff Area = 1,860,073 sf
Runoff Volume = 7.182 af
Runoff Depth > 2.02"
Tc = 7.0 min
CN = 79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 11.67 cfs @ 12.15 hrs, Volume= 0.534 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,680</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142,060</td>
<td></td>
<td>98.83% Pervious Area</td>
</tr>
<tr>
<td>1,680</td>
<td></td>
<td>1.17% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 28S: TO WETLAND

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=143,740 sf
Runoff Volume=0.534 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 32.11 cfs @ 12.15 hrs, Volume= 1.468 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395,477</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>395,477</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Direct Entry,

Subcatchment 29S: TO WETLAND

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=395,477 sf
Runoff Volume=1.468 af
Runoff Depth>1.94"
Tc=7.0 min
CN=78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 259.00 cfs @ 12.15 hrs, Volume= 11.842 af, Depth> 1.94”

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18”

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,189,501</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>3,189,501</td>
<td>100</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 30S: TO WETLAND

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18”
Runoff Area=3,189,501 sf
Runoff Volume=11.842 af
Runoff Depth>1.94”
Tc=7.0 min
CN=78
Summary for Reach 11R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.058 ac, 25.83% Impervious, Inflow Depth > 2.28" for 10-Year event
Inflow = 13.80 cfs @ 12.59 hrs, Volume= 2.097 af
Outflow = 13.80 cfs @ 12.59 hrs, Volume= 2.097 af, Attenuation 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 18R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22.138 ac, 16.01% Impervious, Inflow Depth > 2.12" for 10-Year event
Inflow = 27.71 cfs @ 12.60 hrs, Volume= 3.916 af
Outflow = 27.71 cfs @ 12.60 hrs, Volume= 3.916 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 18R: TOTAL

Inflow Area=22.138 ac
Summary for Reach 19R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.875 ac, 4.12% Impervious, Inflow Depth > 1.92" for 10-Year event
Inflow = 12.51 cfs @ 12.64 hrs, Volume = 1.419 af
Outflow = 12.51 cfs @ 12.64 hrs, Volume = 1.419 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs

Reach 19R: SOUTHEAST

Hydrograph
Summary for Pond 3P: DETENTION BASIN F

[79] Warning: Submerged Pond 5Pa Primary device # 1 OUTLET by 0.21’
[79] Warning: Submerged Pond 5Pb Primary device # 1 OUTLET by 0.21’
[79] Warning: Submerged Pond 10P Primary device # 1 OUTLET by 0.21’

Inflow Area = 8.726 ac, 31.21% Impervious, Inflow Depth > 2.41” for 10-Year event
Inflow = 11.58 cfs @ 12.54 hrs, Volume= 1.756 af
Outflow = 10.71 cfs @ 12.60 hrs, Volume= 1.704 af, Atten= 8%, Lag= 3.6 min
Primary = 4.96 cfs @ 12.60 hrs, Volume= 1.543 af
Secondary = 5.75 cfs @ 12.60 hrs, Volume= 0.161 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,048.21’ @ 12.60 hrs Surf.Area= 6,411 sf Storage= 13,463 cf

Plug-Flow detention time= 38.7 min calculated for 1.704 af (97% of inflow)
Center-of-Mass det. time= 28.1 min (841.6 - 813.5 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,045.00’</td>
<td>28,188 cf</td>
<td>Custom Stage Data (Prismatic)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,045.00</td>
<td>2,675</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,046.00</td>
<td>2,850</td>
<td>2,763</td>
<td>2,763</td>
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<tr>
<td>1,047.00</td>
<td>5,000</td>
<td>3,925</td>
<td>6,688</td>
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<tr>
<td>1,048.00</td>
<td>6,000</td>
<td>5,500</td>
<td>12,188</td>
</tr>
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<tr>
<td>1,050.00</td>
<td>10,000</td>
<td>9,000</td>
<td>28,188</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,045.50’</td>
<td><strong>12.0’ Round Culvert</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 80.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,045.50’ / 1,045.00’ S= 0.0063 ’/ Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,048.00’</td>
<td><strong>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 1.00 2.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 16.00 50.00 80.00</td>
</tr>
</tbody>
</table>

**Primary OutFlow** Max=4.95 cfs @ 12.60 hrs HW=1,048.20’ (Free Discharge)
**Secondary OutFlow** Max=5.70 cfs @ 12.60 hrs HW=1,048.20’ (Free Discharge)
Pond 3P: DETENTION BASIN F

Inflow Area=8.726 ac
Peak Elev=1,048.21'
Storage=13,463 cf
Summary for Pond 5Pa: FILTRATION BASIN C1

[44] Hint: Outlet device #1 is below defined storage
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 0.695 ac, 50.16% Impervious, Inflow Depth > 2.79” for 10-Year event
Inflow = 2.99 cfs @ 12.17 hrs, Volume= 0.161 af
Outflow = 1.40 cfs @ 12.35 hrs, Volume= 0.162 af, Atten= 53%, Lag= 10.3 min
Primary = 1.38 cfs @ 12.34 hrs, Volume= 0.162 af
Secondary = 0.02 cfs @ 12.35 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,070.00’ @ 12.34 hrs Surf.Area= 1,799 sf Storage= 1,103 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.3 min ( 775.9 - 771.6 )

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,069.00’</td>
<td>Custom Stage Data (Prismatic) Listed below</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,069.00</td>
<td>400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,070.00</td>
<td>1,780</td>
<td>1,090</td>
<td>1,090</td>
</tr>
<tr>
<td>1,071.00</td>
<td>10,000</td>
<td>5,890</td>
<td>6,980</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 1,067.00’ 6.0” Round Draintile
L= 200.0’ CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,067.00’ / 1,048.00’ S= 0.0950 ’/ Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,070.00’ Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 180.00 250.00

Primary OutFlow Max=1.38 cfs @ 12.34 hrs HW=1,070.00’ (Free Discharge)
1=Draintile (Inlet Controls 1.38 cfs @ 7.04 fps)

Secondary OutFlow Max=0.00 cfs @ 12.35 hrs HW=1,070.00’ (Free Discharge)
2=Custom Weir/Orifice (Weir Controls 0.00 cfs @ 0.05 fps)
Pond 5Pa: FILTRATION BASIN C1

Inflow Area=0.695 ac
Peak Elev=1,070.00'
Storage=1,103 cf
Summary for Pond 5Pb: FILTRATION BASIN C2

[44] Hint: Outlet device #1 is below defined storage
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 0.471 ac, 74.01% Impervious, Inflow Depth > 3.29” for 10-Year event
Inflow = 2.57 cfs @ 12.14 hrs, Volume= 0.129 af
Outflow = 1.28 cfs @ 12.25 hrs, Volume= 0.129 af, Atten= 50%, Lag= 6.8 min
Primary = 1.28 cfs @ 12.25 hrs, Volume= 0.129 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,067.61' @ 12.25 hrs Surf.Area= 1,241 sf Storage= 664 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.4 min (758.3 - 755.9)

Volume Invert Avail.Storage Storage Description
#1 1,067.00' 6,980 cf Custom Stage Data (Prismatic) Listed below

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,067.00</td>
<td>400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,068.00</td>
<td>1,780</td>
<td>1,090</td>
<td>1,090</td>
</tr>
<tr>
<td>1,069.00</td>
<td>10,000</td>
<td>5,890</td>
<td>6,980</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 1,065.00' 6.0" Round Draintile
L=130.0' CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,065.00' / 1,048.00' S= 0.1308 '/' Cc= 0.900
n=0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,068.00' Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 180.00 250.00

Primary OutFlow Max=1.28 cfs @ 12.25 hrs HW=1,067.61' (Free Discharge)

↑1=Draintile (Inlet Controls 1.28 cfs @ 6.52 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,067.00' (Free Discharge)

↑2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 5Pb: FILTRATION BASIN C2

Inflow Area=0.471 ac
Peak Elev=1,067.61'
Storage=664 cf
Summary for Pond 7P: FILTRATION BASIN B

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 2.113 ac, 25.69% Impervious, Inflow Depth > 2.34" for 10-Year event
Inflow = 5.60 cfs @ 12.31 hrs, Volume= 0.411 af
Outflow = 3.77 cfs @ 12.51 hrs, Volume= 0.411 af, Atten= 33%, Lag= 11.6 min
Primary = 1.24 cfs @ 12.51 hrs, Volume= 0.346 af
Secondary = 2.53 cfs @ 12.51 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,073.05' @ 12.51 hrs Surf.Area= 3,842 sf Storage= 4,497 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 21.6 min (812.0 - 790.4)

<table>
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<th>Volume</th>
<th>Invert</th>
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<td>1,071.00'</td>
<td>19,815 cf</td>
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<td>1,072.00</td>
<td>1,800</td>
<td>1,550</td>
<td>1,550</td>
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<td>1,073.00</td>
<td>2,365</td>
<td>2,083</td>
<td>3,633</td>
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<td>1,074.00</td>
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<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,069.00'</td>
<td>6.0&quot; Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L=100.0' CMP, mitered to conform to fill, Ke=0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,069.00' / 1,068.00' S=0.0100 '/' Cc=0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n=0.011 PVC, smooth interior, Flow Area=0.20 sf</td>
</tr>
</tbody>
</table>

| #2     | Secondary | 1,073.00' | Custom Weir/Orifice, Cv= 2.62 (C= 3.28) |
|        |           |         | Head (feet) 0.00 1.00 |
|        |           |         | Width (feet) 60.00 90.00 |

**Primary OutFlow** Max=1.24 cfs @ 12.51 hrs HW=1,073.05' (Free Discharge)

**Secondary OutFlow** Max=2.43 cfs @ 12.51 hrs HW=1,073.05' (Free Discharge)
Pond 7P: FILTRATION BASIN B

Inflow Area=2.113 ac
Peak Elev=1,073.05'
Storage=4,497 cf
Summary for Pond 8P: FILTRATION BASIN A

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 1.102 ac, 39.84% Impervious, Inflow Depth > 2.60" for 10-Year event
Inflow = 3.67 cfs @ 12.25 hrs, Volume= 0.239 af
Outflow = 1.05 cfs @ 12.63 hrs, Volume= 0.239 af, Attenuation= 71%, Lag= 22.8 min
Primary = 1.05 cfs @ 12.63 hrs, Volume= 0.239 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,068.85' @ 12.63 hrs Surf.Area= 3,942 sf Storage= 3,076 cf

Plug-Flow detention time= 21.7 min calculated for 0.239 af (100% of inflow)
Center-of-Mass det. time= 21.4 min (802.3 - 780.9)

Volume Invert Avail.Storage Storage Description
#1 1,068.00' 31,066 cf Custom Stage Data (Prismatic) Listed below

Elevation Surf.Area Inc.Store Cum.Store
(feet) (sq-ft) (cubic-feet) (cubic-feet)
1,068.00 3,172 0 0
1,069.00 4,080 3,626 3,626
1,070.00 4,800 4,440 8,066
1,071.00 5,600 5,200 13,266
1,072.00 30,000 17,800 31,066

Device Routing Invert Outlet Devices
#1 Primary 1,066.00' 6.0" Round Draintile
L= 100.0' CPP, projecting, no headwall, Ke= 0.900
Inlet / Outlet Invert= 1,066.00' / 1,065.00' S= 0.0100 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,071.00' Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 30.00 50.00

Primary OutFlow Max=1.05 cfs @ 12.63 hrs HW=1,068.85' (Free Discharge)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,068.00' (Free Discharge)
Inflow Area=1.102 ac
Peak Elev=1,068.85'
Storage=3,076 cf
Summary for Pond 9P: DETNETION BASIN D

Inflow Area = 1.794 ac, 15.10% Impervious, Inflow Depth > 2.21" for 10-Year event
Inflow = 4.98 cfs @ 12.17 hrs, Volume= 0.330 af
Outflow = 2.98 cfs @ 12.39 hrs, Volume= 0.302 af, Atten= 40%, Lag= 13.4 min
Primary = 2.98 cfs @ 12.39 hrs, Volume= 0.302 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,066.80’ @ 12.39 hrs   Surf.Area= 2,960 sf   Storage= 4,192 cf

Plug-Flow detention time= 51.4 min calculated for 0.301 af (91% of inflow)
Center-of-Mass det. time= 24.6 min ( 811.3 - 786.7 )

Volume Invert Avail.Storage Storage Description
#1 1,065.00’ 19,250 cf Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation Surf.Area Inc.Store Cum.Store
(feet) (sq-ft) (cubic-feet) (cubic-feet)
1,065.00 1,700 0 0
1,066.00 2,400 2,050 2,050
1,067.00 3,100 2,750 4,800
1,068.00 4,000 3,550 8,350
1,069.00 5,500 4,750 13,100
1,070.00 6,800 6,150 19,250

Device Routing Invert Outlet Devices
#1 Primary 1,065.50’ 12.0” Round Culvert
L= 88.0’ CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,065.50’ / 1,064.50’ S= 0.0114 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

#2 Secondary 1,069.00’ Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 12.00 50.00

Primary OutFlow Max=2.98 cfs @ 12.39 hrs  HW=1,066.80’ (Free Discharge)
1=Culvert (Inlet Controls 2.98 cfs @ 3.79 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs  HW=1,065.00’ (Free Discharge)
2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 9P: DETENTION BASIN D

Inflow Area=1.794 ac
Peak Elev=1,066.80'
Storage=4,192 cf

Hydrograph
Summary for Pond 10P: FILTRATION BASIN E

[44] Hint: Outlet device #2 is below defined storage

| Inflow Area | 5.960 ac, 22.72% Impervious, Inflow Depth > 2.25" for 10-Year event |
| Inflow      | 8.50 cfs @ 12.48 hrs, Volume= 1.118 af |
| Outflow     | 8.03 cfs @ 12.56 hrs, Volume= 1.117 af, Atten= 6%, Lag= 4.9 min |
| Primary     | 8.03 cfs @ 12.56 hrs, Volume= 1.117 af |
| Secondary   | 0.00 cfs @ 5.00 hrs, Volume= 0.000 af |

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,056.28’ @ 12.56 hrs Surf.Area= 5,137 sf Storage= 8,885 cf

Plug-Flow detention time= 32.1 min calculated for 1.113 af (100% of inflow)
Center-of-Mass det. time= 31.8 min (837.8 - 805.9)

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<th>Avail.Storage</th>
<th>Storage Description</th>
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<td>#1</td>
<td>1,054.00’</td>
<td>19,630 cf</td>
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<td>2,800</td>
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<td>1.055.00</td>
<td>3,700</td>
<td>3,250</td>
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<td>Primary</td>
<td>1,051.00’</td>
<td>12.0” Round Culvert</td>
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<td></td>
<td></td>
<td>L= 98.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,051.00’ / 1,048.00’ S= 0.0306 ’/’ Cc= 0.900</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
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<tr>
<td>#2</td>
<td>Primary</td>
<td>1,052.00’</td>
<td>6.0” Vert. 6” D.T.</td>
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<td>C= 0.600</td>
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<tr>
<td>#3</td>
<td>Device 1</td>
<td>1,056.00’</td>
<td>48.0” Horiz. Grate</td>
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<td></td>
<td></td>
<td></td>
<td>C= 0.600 Limited to weir flow at low heads</td>
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<tr>
<td>#4</td>
<td>Secondary</td>
<td>1,056.70’</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
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<td></td>
<td></td>
<td>Head (feet) 0.00 1.00</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 8.00 20.00</td>
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Primary OutFlow Max=7.94 cfs @ 12.56 hrs HW=1,056.28’ (Free Discharge)
1=Culvert (Passes 6.04 cfs of 7.29 cfs potential flow)
3=Grate (Weir Controls 6.04 cfs @ 1.73 fps)
2=6” D.T. (Orifice Controls 1.90 cfs @ 9.66 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,054.00’ (Free Discharge)
4=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 10P: FILTRATION BASIN E

Hydrograph

Inflow Area = 5.960 ac
Peak Elev = 1,056.28'
Storage = 8,885 cf

Flow (cfs)

Time (hours)

MSE 24-hr 3 10-Year Rainfall = 4.18"

Printed 2/28/2019
Prepared by Kimley-Horn and Associates
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Summary for Pond 12P: FILTRATION BASIN G

[44] Hint: Outlet device #1 is below defined storage
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 2.205 ac, 14.59% Impervious, Inflow Depth > 2.18” for 10-Year event
Inflow = 8.69 cfs @ 12.14 hrs, Volume= 0.400 af
Outflow = 9.02 cfs @ 12.16 hrs, Volume= 0.400 af, Atten= 0%, Lag= 1.0 min
Primary = 1.57 cfs @ 12.16 hrs, Volume= 0.297 af
Secondary = 7.44 cfs @ 12.16 hrs, Volume= 0.104 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,053.95’ @ 12.16 hrs Surf.Area= 1,531 sf Storage= 1,864 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.7 min (787.0 - 782.3)

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<td>5,200 cf</td>
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<td>430</td>
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<td>1,053.00</td>
<td>925</td>
<td>678</td>
<td>678</td>
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<tr>
<td>1,054.00</td>
<td>1,560</td>
<td>1,243</td>
<td>1,920</td>
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<tr>
<td>1,055.00</td>
<td>5,000</td>
<td>3,280</td>
<td>5,200</td>
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<th>Outlet Devices</th>
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<td>#1</td>
<td>Primary</td>
<td>1,050.00’</td>
<td>6.0” Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 40.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,050.00’ / 1,049.50’ S= 0.0125 '/' Cc= 0.900</td>
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<td>n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf</td>
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<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,053.50’</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
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<td></td>
<td></td>
<td>Head (feet) 0.00 0.50</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 6.00 10.00</td>
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Primary OutFlow Max=1.57 cfs @ 12.16 hrs HW=1,053.93’ (Free Discharge)

Secondary OutFlow Max=6.94 cfs @ 12.16 hrs HW=1,053.93’ (Free Discharge)
Pond 12P: FILTRATION BASIN G

Inflow Area=2.205 ac
Peak Elev=1,053.95'
Storage=1,864 cf
Proposed Drainage

Prepared by Kimley-Horn and Associates

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1S: DD TO SOUTHEAST
Runoff Area=386,575 sf  4.12% Impervious  Runoff Depth>4.52"
Flow Length=300'  Slope=0.0400 '/'  Tc=45.1 min  UI Adjusted CN=78  Runoff=29.34 cfs  3.339 af

Subcatchment 2S: DD TO SW
Runoff Area=81,336 sf  0.00% Impervious  Runoff Depth>4.52"
Tc=40.1 min  CN=78  Runoff=6.64 cfs  0.704 af

Subcatchment 3S: TO DETENTION BASIN
Runoff Area=69,734 sf  42.00% Impervious  Runoff Depth>5.46"
Tc=7.0 min  CN=86  Runoff=14.77 cfs  0.728 af

Subcatchment 4S: ZANE WEST SIDE TO
Runoff Area=20,240 sf  28.66% Impervious  Runoff Depth>5.23"
Tc=7.0 min  CN=84  Runoff=4.16 cfs  0.202 af

Subcatchment 5Sa: PARKING LOT BASIN
Runoff Area=30,255 sf  50.16% Impervious  Runoff Depth>5.68"
Tc=10.0 min  CN=88  Runoff=5.83 cfs  0.329 af

Subcatchment 5Sb: PARKING LOT BASIN
Runoff Area=20,505 sf  74.01% Impervious  Runoff Depth>6.25"
Tc=7.0 min  CN=93  Runoff=4.69 cfs  0.245 af

Subcatchment 6S: TO FILTRATION BASIN
Runoff Area=41,422 sf  10.62% Impervious  Runoff Depth>4.78"
Tc=10.0 min  CN=80  Runoff=7.02 cfs  0.379 af

Subcatchment 7S: PARENT DROPOFF
Runoff Area=92,061 sf  25.69% Impervious  Runoff Depth>5.10"
Flow Length=275'  Slope=0.0800 '/'  Tc=21.2 min  CN=83  Runoff=11.91 cfs  0.898 af

Subcatchment 8S: BUS DROPOFF
Runoff Area=48,017 sf  39.84% Impervious  Runoff Depth>5.44"
Flow Length=210'  Slope=0.0900 '/'  Tc=16.3 min  CN=86  Runoff=7.42 cfs  0.500 af

Subcatchment 9S: TO DETENTION BASIN
Runoff Area=47,568 sf  12.61% Impervious  Runoff Depth>4.88"
Flow Length=230'  Slope=0.0900 '/'  Tc=17.5 min  CN=81  Runoff=6.53 cfs  0.444 af

Subcatchment 10S: ZANE WEST SIDE TO
Runoff Area=30,563 sf  18.98% Impervious  Runoff Depth>5.00"
Tc=7.0 min  CN=82  Runoff=6.09 cfs  0.293 af

Subcatchment 11S: TO WETLAND
Runoff Area=230,474 sf  7.39% Impervious  Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=43.50 cfs  2.059 af

Subcatchment 12S: HORSE BARNs
Runoff Area=96,048 sf  14.59% Impervious  Runoff Depth>4.89"
Tc=7.0 min  CN=81  Runoff=18.81 cfs  0.899 af

Subcatchment 19S: TO WETLAND
Runoff Area=94,094 sf  6.50% Impervious  Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=17.76 cfs  0.841 af

Subcatchment 20S: TO WETLAND
Runoff Area=202,427 sf  4.92% Impervious  Runoff Depth>4.67"
Tc=7.0 min  CN=79  Runoff=38.20 cfs  1.808 af

Subcatchment 21S: TO WETLAND
Runoff Area=503,672 sf  1.85% Impervious  Runoff Depth>4.56"
Tc=7.0 min  CN=78  Runoff=93.22 cfs  4.394 af
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<th>Subcatchment</th>
<th>Area</th>
<th>Impervious</th>
<th>Depth</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff</th>
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<td>22S TO WETLAND</td>
<td>315,367 sf</td>
<td>0.42%</td>
<td>&gt;4.56&quot;</td>
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<td>78</td>
<td>58.37 cfs</td>
<td>2.751 af</td>
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<td>23S TO WETLAND</td>
<td>432,028 sf</td>
<td>0.84%</td>
<td>&gt;4.56&quot;</td>
<td>7.0 min</td>
<td>78</td>
<td>79.96 cfs</td>
<td>3.769 af</td>
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<td>24S TO WETLAND</td>
<td>528,021 sf</td>
<td>1.80%</td>
<td>&gt;4.56&quot;</td>
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<td>78</td>
<td>97.72 cfs</td>
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<td>25S TO WETLAND</td>
<td>493,166 sf</td>
<td>0.38%</td>
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<td>91.27 cfs</td>
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<td>26S TO WETLAND</td>
<td>249,494 sf</td>
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<td>79</td>
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<td>73.19 cfs</td>
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<td>590.30 cfs</td>
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</tr>
<tr>
<td>Outflow</td>
<td>37.88 cfs</td>
<td>4.628 af</td>
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</tr>
<tr>
<td>Reach 18R: TOTAL</td>
<td></td>
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</tr>
<tr>
<td>Inflow</td>
<td>64.89 cfs</td>
<td>8.866 af</td>
<td></td>
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<td>Outflow</td>
<td>64.89 cfs</td>
<td>8.866 af</td>
<td></td>
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<tr>
<td>Reach 19R: SOUTHEAST</td>
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<tr>
<td>Inflow</td>
<td>29.34 cfs</td>
<td>3.339 af</td>
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<td></td>
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<tr>
<td>Outflow</td>
<td>29.34 cfs</td>
<td>3.339 af</td>
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<td></td>
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</tr>
<tr>
<td>Pond 3P: DETENTION BASIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Peak Elev</td>
<td>1,048.50'</td>
<td>Storage</td>
<td>15,468 cf</td>
<td>Inflow</td>
<td>33.24 cfs</td>
<td>3.783 af</td>
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<tr>
<td>Primary</td>
<td>5.28 cfs</td>
<td>2.355 af</td>
<td>Secondary</td>
<td>26.79 cfs</td>
<td>3.167 af</td>
<td>Outflow</td>
<td>32.07 cfs</td>
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<tr>
<td>Pond 5Pa: FILTRATION BASIN</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Peak Elev</td>
<td>1,070.04'</td>
<td>Storage</td>
<td>1,323 cf</td>
<td>Inflow</td>
<td>5.83 cfs</td>
<td>0.329 af</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>1.39 cfs</td>
<td>0.261 af</td>
<td>Secondary</td>
<td>5.08 cfs</td>
<td>0.068 af</td>
<td>Outflow</td>
<td>6.48 cfs</td>
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<tr>
<td>Pond 5Pb: FILTRATION BASIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Elev</td>
<td>1,068.05'</td>
<td>Storage</td>
<td>1,414 cf</td>
<td>Inflow</td>
<td>9.53 cfs</td>
<td>0.313 af</td>
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</tr>
<tr>
<td>Primary</td>
<td>1.40 cfs</td>
<td>0.221 af</td>
<td>Secondary</td>
<td>7.72 cfs</td>
<td>0.092 af</td>
<td>Outflow</td>
<td>9.12 cfs</td>
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<tr>
<td>Pond 7P: FILTRATION BASIN</td>
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<td></td>
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<tr>
<td>Peak Elev</td>
<td>1,073.14'</td>
<td>Storage</td>
<td>5,846 cf</td>
<td>Inflow</td>
<td>11.91 cfs</td>
<td>0.898 af</td>
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<tr>
<td>Primary</td>
<td>1.25 cfs</td>
<td>0.526 af</td>
<td>Secondary</td>
<td>10.25 cfs</td>
<td>0.372 af</td>
<td>Outflow</td>
<td>11.50 cfs</td>
</tr>
<tr>
<td>Pond 8P: FILTRATION BASIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Elev</td>
<td>1,070.16'</td>
<td>Storage</td>
<td>8,877 cf</td>
<td>Inflow</td>
<td>7.42 cfs</td>
<td>0.500 af</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>1.24 cfs</td>
<td>0.500 af</td>
<td>Secondary</td>
<td>0.00 cfs</td>
<td>0.000 af</td>
<td>Outflow</td>
<td>1.24 cfs</td>
</tr>
</tbody>
</table>
### Pond 9P: DETENTION BASIN D
- Peak Elev: 1,068.30'
- Storage: 9,601 cf
- Inflow: 10.90 cfs 0.737 af
- Primary: 5.06 cfs 0.706 af
- Secondary: 0.00 cfs 0.000 af
- Outflow: 5.06 cfs 0.706 af

### Pond 10P: FILTRATION BASIN E
- Peak Elev: 1,057.14'
- Storage: 13,759 cf
- Inflow: 20.69 cfs 2.482 af
- Primary: 10.01 cfs 2.215 af
- Secondary: 9.64 cfs 0.266 af
- Outflow: 19.65 cfs 2.481 af

### Pond 12P: FILTRATION BASIN G
- Peak Elev: 1,054.33'
- Storage: 3,012 cf
- Inflow: 18.81 cfs 0.899 af
- Primary: 1.65 cfs 0.508 af
- Secondary: 14.64 cfs 0.391 af
- Outflow: 16.29 cfs 0.899 af

**Total Runoff Area = 220.428 ac**  **Runoff Volume = 84.861 af**  **Average Runoff Depth = 4.62"**

97.20% Pervious = 214.266 ac  2.80% Impervious = 6.162 ac
Summary for Subcatchment 1S: DD TO SOUTHEAST

Runoff = 29.34 cfs @ 12.62 hrs, Volume= 3.339 af, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Adj</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,910</td>
<td>98</td>
<td></td>
<td>Unconnected roofs, HSG D</td>
</tr>
<tr>
<td>370,665</td>
<td>78</td>
<td></td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>386,575</td>
<td>79</td>
<td>78</td>
<td>Weighted Average, UI Adjusted</td>
</tr>
<tr>
<td>370,665</td>
<td>95.88%</td>
<td></td>
<td>Pervious Area</td>
</tr>
<tr>
<td>15,910</td>
<td>4.12%</td>
<td></td>
<td>Impervious Area</td>
</tr>
<tr>
<td>15,910</td>
<td>100.00%</td>
<td></td>
<td>Unconnected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
</table>
| 45.1     | 300           | 0.0400        | 0.11              |                | Sheet Flow, Woods: Light underbrush n = 0.400 P2= 2.42"

Subcatchment 1S: DD TO SOUTHEAST

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29" Runoff Area=386,575 sf Runoff Volume=3.339 af Runoff Depth>4.52" Flow Length=300' Slope=0.0400 '/' Tc=45.1 min UI Adjusted CN=78
Summary for Subcatchment 2S: DD TO SW

Runoff = 6.64 cfs @ 12.55 hrs, Volume= 0.704 af, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>81,336</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>81,336</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 40.1 min

Subcatchment 2S: DD TO SW

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=81,336 sf
Runoff Volume=0.704 af
Runoff Depth>4.52"
Tc=40.1 min
CN=78
Summary for Subcatchment 3S: TO DETENTION BASIN F

Runoff = 14.77 cfs @ 12.14 hrs, Volume= 0.728 af, Depth> 5.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>29,291</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>40,443</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>69,734</td>
<td>86</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>40,443</td>
<td>58.00% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>29,291</td>
<td>42.00% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 3S: TO DETENTION BASIN F

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=69,734 sf
Runoff Volume=0.728 af
Runoff Depth>5.46"
Tc=7.0 min
CN=86
Summary for Subcatchment 4S: ZANE WEST SIDE TO SW

Runoff = 4.16 cfs @ 12.14 hrs, Volume= 0.202 af, Depth > 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,800</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>14,440</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>20,240</td>
<td>84</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>14,440</td>
<td></td>
<td>71.34% Pervious Area</td>
</tr>
<tr>
<td>5,800</td>
<td></td>
<td>28.66% Impervious Area</td>
</tr>
</tbody>
</table>

Tc=7.0 min

Direct Entry,

Subcatchment 4S: ZANE WEST SIDE TO SW

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=20,240 sf
Runoff Volume=0.202 af
Runoff Depth > 5.23"
Tc=7.0 min
CN=84
Summary for Subcatchment 5Sa: PARKING LOT BASIN

Runoff = 5.83 cfs @ 12.17 hrs, Volume= 0.329 af, Depth> 5.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>15,080</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,255</td>
<td>88</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>15,080</td>
<td></td>
<td>49.84% Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
<td></td>
<td>50.16% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 10.0 min

Subcatchment 5Sa: PARKING LOT BASIN

Runoff Area=30,255 sf
Runoff Volume=0.329 af
Runoff Depth>5.68"
Tc=10.0 min
CN=88
**Summary for Subcatchment 5Sb: PARKING LOT BASIN**

Runoff = 4.69 cfs @ 12.14 hrs, Volume= 0.245 af, Depth> 6.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>15,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>5,330</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>20,505</td>
<td>93</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>5,330</td>
<td></td>
<td>25.99% Pervious Area</td>
</tr>
<tr>
<td>15,175</td>
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<td>74.01% Impervious Area</td>
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<table>
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<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
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<tbody>
<tr>
<td>7.0</td>
<td>1000 ft</td>
<td>1%</td>
<td>1 ft/sec</td>
<td>5 cfs</td>
<td>Direct Entry,</td>
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**Subcatchment 5Sb: PARKING LOT BASIN**

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=20,505 sf
Runoff Volume=0.245 af
Runoff Depth>6.25"
Tc=7.0 min
CN=93
Runoff = 7.02 cfs @ 12.17 hrs, Volume= 0.379 af, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>4,400</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>37,022</td>
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<td>Meadow, non-grazed, HSG D</td>
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<tr>
<td>41,422</td>
<td>80</td>
<td>Weighted Average</td>
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<tr>
<td>37,022</td>
<td>89.38% Pervious Area</td>
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<tr>
<td>4,400</td>
<td>10.62% Impervious Area</td>
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</tr>
</tbody>
</table>

Tc = 10.0 min

Subcatchment 6S: TO FILTRATION BASIN E

Hydrograph

MSE 24-hr 3  100-Year Rainfall=7.29"
Runoff Area=41,422 sf
Runoff Volume=0.379 af
Runoff Depth>4.78"
Tc=10.0 min
CN=80
Summary for Subcatchment 7S: PARENT DROPOFF

Runoff = 11.91 cfs @ 12.31 hrs, Volume= 0.898 af, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>23,650</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>68,411</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>92,061</td>
<td>83</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>23,650</td>
<td>74.31% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>68,411</td>
<td>25.69% Impervious Area</td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<td>21.2</td>
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<td>0.22</td>
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<td>Sheet Flow, Grass: Dense n= 0.240  P2= 2.42&quot;</td>
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</tbody>
</table>

Subcatchment 7S: PARENT DROPOFF

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=92,061 sf
Runoff Volume=0.898 af
Runoff Depth>5.10"
Flow Length=275'
Slope=0.0800 '/'
Tc=21.2 min
CN=83
Summary for Subcatchment 8S: BUS DROPOFF

Runoff = 7.42 cfs @ 12.25 hrs, Volume= 0.500 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,128</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>28,889</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>48,017</td>
<td>86</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>19,128</td>
<td>39.84% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>28,889</td>
<td>60.16% Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
</table>
| 16.3     | 210           | 0.0900        | 0.22              |                | Sheet Flow, Grass: Dense n=0.240 P2=2.42"

Subcatchment 8S: BUS DROPOFF

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=48,017 sf
Runoff Volume=0.500 af
Runoff Depth>5.44"
Flow Length=210'
Slope=0.0900 '/'
Tc=16.3 min
CN=86
Summary for Subcatchment 9S: TO DETENTION BASIN D

Runoff = 6.53 cfs @ 12.26 hrs, Volume = 0.444 af, Depth > 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 100-Year Rainfall = 7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,000</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>41,568</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>47,568</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>41,568</td>
<td></td>
<td>87.39% Pervious Area</td>
</tr>
<tr>
<td>6,000</td>
<td></td>
<td>12.61% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5</td>
<td>230</td>
<td>0.0900</td>
<td>0.22</td>
<td></td>
<td>Sheet Flow, Grass: Dense n = 0.240 P2 = 2.42&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 9S: TO DETENTION BASIN D

Hydrograph

MSE 24-hr 3 100-Year Rainfall = 7.29"
Runoff Area = 47,568 sf
Runoff Volume = 0.444 af
Runoff Depth > 4.88"
Flow Length = 230'
Slope = 0.0900 '/'
Tc = 17.5 min
CN = 81
Summary for Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

Runoff = 6.09 cfs @ 12.14 hrs, Volume= 0.293 af, Depth> 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,800</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>24,763</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>30,563</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>24,763</td>
<td></td>
<td>81.02% Pervious Area</td>
</tr>
<tr>
<td>5,800</td>
<td></td>
<td>18.98% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 10S: ZANE WEST SIDE TO NORTH BASIN

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=30,563 sf
Runoff Volume=0.293 af
Runoff Depth>5.00"
Tc=7.0 min
CN=82
Summary for Subcatchment 11S: TO WETLAND

Runoff = 43.50 cfs @ 12.14 hrs, Volume= 2.059 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,039</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>213,435</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>230,474</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>213,435</td>
<td></td>
<td>92.61% Pervious Area</td>
</tr>
<tr>
<td>17,039</td>
<td></td>
<td>7.39% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 11S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=230,474 sf
Runoff Volume=2.059 af
Runoff Depth>4.67"
Tc=7.0 min
CN=79
Summary for Subcatchment 12S: HORSE BARNS

Runoff = 18.81 cfs @ 12.14 hrs, Volume= 0.899 af, Depth> 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,013</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>82,035</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>96,048</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>82,035</td>
<td></td>
<td>85.41% Pervious Area</td>
</tr>
<tr>
<td>14,013</td>
<td></td>
<td>14.59% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min
Length (feet) Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description
7.0

Subcatchment 12S: HORSE BARNS

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=96,048 sf
Runoff Volume=0.899 af
Runoff Depth>4.89"
Tc=7.0 min
CN=81
Summary for Subcatchment 19S: TO WETLAND

Runoff = 17.76 cfs @ 12.14 hrs, Volume= 0.841 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,114</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>87,980</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>94,094</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>87,980</td>
<td>93.50% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>6,114</td>
<td>6.50% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 19S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=94,094 sf
Runoff Volume=0.841 af
Runoff Depth>4.67"
Tc=7.0 min
CN=79
Summary for Subcatchment 20S: TO WETLAND

Runoff = 38.20 cfs @ 12.14 hrs, Volume= 1.808 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,960</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>192,467</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>202,427</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>192,467</td>
<td></td>
<td>95.08% Pervious Area</td>
</tr>
<tr>
<td>9,960</td>
<td></td>
<td>4.92% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min
Length (feet) 7.0
Slope (ft/ft) 7.0
Velocity (ft/sec) 7.0
Capacity (cfs) 7.0
Description Direct Entry,

Subcatchment 20S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=202,427 sf
Runoff Volume=1.808 af
Runoff Depth>4.67"
Tc=7.0 min
CN=79
Summary for Subcatchment 21S: TO WETLAND

Runoff = 93.22 cfs @ 12.14 hrs, Volume= 4.394 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,337</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>494,335</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>503,672</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>494,335</td>
<td></td>
<td>98.15% Pervious Area</td>
</tr>
<tr>
<td>9,337</td>
<td></td>
<td>1.85% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 21S: TO WETLAND

Direct Entry,

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=503,672 sf
Runoff Volume=4.394 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 22S: TO WETLAND

Runoff \( = \) 58.37 cfs @ 12.14 hrs, Volume= 2.751 af, Depth> 4.56" 

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,310</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>314,057</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>315,367</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>314,057</td>
<td></td>
<td>99.58% Pervious Area</td>
</tr>
<tr>
<td>1,310</td>
<td></td>
<td>0.42% Impervious Area</td>
</tr>
</tbody>
</table>

Tc=7.0 min

Direct Entry, Subcatchment 22S: TO WETLAND

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=315,367 sf
Runoff Volume=2.751 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 23S: TO WETLAND

Runoff = 79.96 cfs @ 12.14 hrs, Volume= 3.769 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,638</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>428,390</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>432,028</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>428,390</td>
<td></td>
<td>99.16% Pervious Area</td>
</tr>
<tr>
<td>3,638</td>
<td></td>
<td>0.84% Impervious Area</td>
</tr>
</tbody>
</table>

Tc=7.0 min
Length (feet)  Velocity (ft/sec)  Capacity (cfs)  Description
7.0            -              -               -               Direct Entry,

Subcatchment 23S: TO WETLAND

MSE 24-hr 3  100-Year Rainfall=7.29"
Runoff Area=432,028 sf
Runoff Volume=3.769 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 24S: TO WETLAND

Runoff = 97.72 cfs @ 12.14 hrs, Volume= 4.606 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,490</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>518,531</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>528,021</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>518,531</td>
<td>98.20% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>9,490</td>
<td>1.80% Impervious Area</td>
<td></td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 24S: TO WETLAND

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=528,021 sf
Runoff Volume=4.606 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 25S: TO WETLAND

Runoff = 91.27 cfs @ 12.14 hrs, Volume= 4.302 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,876</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>491,290</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>493,166</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>491,290</td>
<td></td>
<td>99.62% Pervious Area</td>
</tr>
<tr>
<td>1,876</td>
<td></td>
<td>0.38% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 25S: TO WETLAND

Hydrograph

MSE 24-hr 3 100-Year Rainfall=7.29"
Runoff Area=493,166 sf
Runoff Volume=4.302 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 26S: TO WETLAND

Runoff = 47.08 cfs @ 12.14 hrs, Volume= 2.229 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,363</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>243,131</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>249,494</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>243,131</td>
<td></td>
<td>97.45% Pervious Area</td>
</tr>
<tr>
<td>6,363</td>
<td></td>
<td>2.55% Impervious Area</td>
</tr>
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</table>

Tc=7.0 min  Length  Slope  Velocity  Capacity  Description
(min)      (feet)  (ft/ft)  (ft/sec)  (cfs)    Direct Entry,

Subcatchment 26S: TO WETLAND

Hydrograph

MSE 24-hr 3  100-Year Rainfall=7.29"
Runoff Area=249,494 sf
Runoff Volume=2.229 af
Runoff Depth>4.67"
Tc=7.0 min
CN=79
Summary for Subcatchment 27S: TO WETLAND

Runoff = 351.04 cfs @ 12.14 hrs, Volume = 16.618 af, Depth > 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3  100-Year Rainfall = 7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,209</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,076</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,812,788</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>1,860,073</td>
<td>79</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,812,788</td>
<td>79</td>
<td>97.46% Pervious Area</td>
</tr>
<tr>
<td>47,285</td>
<td>2.54% Impervious Area</td>
<td></td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 27S: TO WETLAND

Hydrograph

MSE 24-hr 3  100-Year Rainfall = 7.29"
Runoff Area = 1,860,073 sf
Runoff Volume = 16.618 af
Runoff Depth > 4.67"
Tc = 7.0 min
CN = 79
Summary for Subcatchment 28S: TO WETLAND

Runoff = 26.60 cfs @ 12.14 hrs, Volume= 1.254 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,680</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>142,060</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>143,740</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142,060</td>
<td></td>
<td>98.83% Pervious Area</td>
</tr>
<tr>
<td>1,680</td>
<td></td>
<td>1.17% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 28S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=143,740 sf
Runoff Volume=1.254 af
Runoff Depth>4.56"
Tc=7.0 min
CN=78
Summary for Subcatchment 29S: TO WETLAND

Runoff = 73.19 cfs @ 12.14 hrs, Volume = 3.450 af, Depth > 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall = 7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395,477</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>395,477</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 7.0 min

Subcatchment 29S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall = 7.29"
Runoff Area = 395,477 sf
Runoff Volume = 3.450 af
Runoff Depth > 4.56"
Tc = 7.0 min
CN = 78
Summary for Subcatchment 30S: TO WETLAND

Runoff = 590.30 cfs @ 12.14 hrs, Volume = 27.822 af, Depth > 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,189,501</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>3,189,501</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
( min) (feet) (ft/ft) (ft/sec) (cfs)                                           Direct Entry,
7.0

Subcatchment 30S: TO WETLAND

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area = 3,189,501 sf
Runoff Volume = 27.822 af
Runoff Depth > 4.56"
Tc = 7.0 min
CN = 78
Summary for Reach 11R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 11.058 ac, 25.83% Impervious, Inflow Depth > 5.02" for 100-Year event
Inflow = 37.88 cfs @ 12.21 hrs, Volume = 4.628 af
Outflow = 37.88 cfs @ 12.21 hrs, Volume = 4.628 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
Summary for Reach 18R: TOTAL

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22.138 ac, 16.01% Impervious, Inflow Depth > 4.81" for 100-Year event
Inflow = 64.89 cfs @ 12.21 hrs, Volume= 8.866 af
Outflow = 64.89 cfs @ 12.21 hrs, Volume= 8.866 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 18R: TOTAL

Hydrograph

Inflow Area=22.138 ac
Summary for Reach 19R: SOUTHEAST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.875 ac, 4.12% Impervious, Inflow Depth > 4.52" for 100-Year event
Inflow = 29.34 cfs @ 12.62 hrs, Volume= 3.339 af
Outflow = 29.34 cfs @ 12.62 hrs, Volume= 3.339 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 19R: SOUTHEAST

Hydrograph
Summary for Pond 3P: DETENTION BASIN F

[79] Warning: Submerged Pond 5Pa Primary device # 1 OUTLET by 0.50'
[79] Warning: Submerged Pond 5Pb Primary device # 1 OUTLET by 0.50'
[79] Warning: Submerged Pond 10P Primary device # 1 OUTLET by 0.50'

Inflow Area = 8.726 ac, 31.21% Impervious, Inflow Depth > 5.20" for 100-Year event
Inflow = 33.24 cfs @ 12.17 hrs, Volume= 3.783 af
Outflow = 32.07 cfs @ 12.21 hrs, Volume= 3.722 af, Atten= 4%, Lag= 2.2 min
Primary = 5.28 cfs @ 12.21 hrs, Volume= 2.355 af
Secondary = 26.79 cfs @ 12.21 hrs, Volume= 1.367 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,048.50' @ 12.21 hrs Surf.Area= 7,009 sf Storage= 15,468 cf

Plug-Flow detention time= 26.3 min calculated for 3.722 af (98% of inflow)
Center-of-Mass det. time= 20.2 min ( 822.0 - 801.8 )

<table>
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<tr>
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<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
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<td>28,188 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
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<tr>
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<th>Invert</th>
<th>Outlet Devices</th>
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<tr>
<td>#1</td>
<td>Primary</td>
<td>1,045.50'</td>
<td>12.0&quot; Round Culvert</td>
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<td></td>
<td></td>
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<td>L= 80.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
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<tr>
<td></td>
<td></td>
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<td>Inlet / Outlet Invert= 1,045.50' / 1,045.00’ S= 0.0063 '/' Cc= 0.900</td>
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<tr>
<td></td>
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<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
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<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,048.00'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 1.00 2.00</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Width (feet) 16.00 50.00 80.00</td>
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Primary OutFlow Max=5.27 cfs @ 12.21 hrs HW=1,048.49' (Free Discharge)
↑1=Culvert (Inlet Controls 5.27 cfs @ 6.71 fps)

Secondary OutFlow Max=25.87 cfs @ 12.21 hrs HW=1,048.49’ (Free Discharge)
↑2=Custom Weir/Orifice (Weir Controls 25.87 cfs @ 2.14 fps)
Pond 3P: DETENTION BASIN F

Inflow Area=8.726 ac
Peak Elev=1,048.50'
Storage=15,468 cf

Hydrograph

Time (hours)

Flow (cfs)

MSE 24-hr 3  100-Year Rainfall=7.29"
Summary for Pond 5Pa: FILTRATION BASIN C1

[44] Hint: Outlet device #1 is below defined storage
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.695 ac, 50.16% Impervious, Inflow Depth > 5.68” for 100-Year event
Inflow  = 5.83 cfs @ 12.17 hrs, Volume= 0.329 af
Outflow = 6.48 cfs @ 12.17 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min
Primary = 1.39 cfs @ 12.15 hrs, Volume= 0.261 af
Secondary = 5.08 cfs @ 12.17 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,070.04’ @ 12.15 hrs  Surf.Area= 2,106 sf  Storage= 1,323 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.9 min (763.1 - 759.2)

<table>
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<th>Volume</th>
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<th>Avail.Storage</th>
<th>Storage Description</th>
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<td>6,980 cf</td>
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<th>Inc.Store</th>
<th>Cum.Store</th>
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<td>(feet)</td>
<td>(sq-ft)</td>
<td>(cubic-feet)</td>
<td>(cubic-feet)</td>
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<td>1,780</td>
<td>1,090</td>
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<td>6,980</td>
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Device | Routing | Invert | Outlet Devices |
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<tr>
<td>#1</td>
<td>Primary</td>
<td>1,067.00'</td>
<td>6.0” Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 200.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,067.00’ / 1,048.00’  S= 0.0950 '/'  Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,070.00'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00  1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 180.00  250.00</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=1.39 cfs @ 12.15 hrs  HW=1,070.04’ (Free Discharge)
↑1=Draintile (Inlet Controls 1.39 cfs @ 7.10 fps)

Secondary OutFlow Max=4.41 cfs @ 12.17 hrs  HW=1,070.04’ (Free Discharge)
↑2=Custom Weir/Orifice (Weir Controls 4.41 cfs @ 0.64 fps)
Pond 5Pa: FILTRATION BASIN C1

Inflow Area = 0.695 ac
Peak Elev = 1,070.04'
Storage = 1,323 cf
Summary for Pond 5Pb: FILTRATION BASIN C2

[82] Warning: Early inflow requires earlier time span
[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 0.471 ac, 74.01% Impervious, Inflow Depth > 7.98" for 100-Year event
Inflow = 9.53 cfs @ 12.16 hrs, Volume= 0.313 af
Outflow = 9.12 cfs @ 12.19 hrs, Volume= 0.313 af, Atten= 4%, Lag= 1.8 min
Primary = 1.40 cfs @ 12.19 hrs, Volume= 0.221 af
Secondary = 7.72 cfs @ 12.19 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,068.05' @ 12.19 hrs Surf.Area= 2,232 sf Storage= 1,414 cf

Plug-Flow detention time= 3.4 min calculated for 0.312 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (746.7 - 743.3)

Volume Invert Avail.Storage Storage Description
#1 1,067.00' 6,980 cf Custom Stage Data (Prismatic) Listed below

Elevation Surf.Area Inc.Store Cum.Store
(feet) (sq-ft) (cubic-feet) (cubic-feet)
1,067.00 400 0 0
1,068.00 1,780 1,090 1,090
1,069.00 10,000 5,890 6,980

Device Routing Invert Outlet Devices
#1 Primary 1,065.00' 6.0" Round Draintile
L= 130.0' CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,065.00' / 1,048.00' S= 0.1308 '/' Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

#2 Secondary 1,068.00' Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 180.00 250.00

Primary OutFlow Max=1.40 cfs @ 12.19 hrs HW=1,068.05' (Free Discharge)
↑1=Draintile (Inlet Controls 1.40 cfs @ 7.11 fps)

Secondary OutFlow Max=7.24 cfs @ 12.19 hrs HW=1,068.05' (Free Discharge)
↑2=Custom Weir/Orifice (Weir Controls 7.24 cfs @ 0.75 fps)
Pond 5Pb: FILTRATION BASIN C2

**Inflow Area=0.471 ac**

**Peak Elev=1,068.05’**

**Storage=1,414 cf**
Summary for Pond 7P: FILTRATION BASIN B

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 2.113 ac, 25.69% Impervious, Inflow Depth > 5.10" for 100-Year event

Inflow    = 11.91 cfs @ 12.31 hrs, Volume= 0.898 af
Outflow   = 11.50 cfs @ 12.36 hrs, Volume= 0.898 af, Atten= 3%, Lag= 3.1 min
Primary   = 1.25 cfs @ 12.36 hrs, Volume= 0.526 af
Secondary = 10.25 cfs @ 12.36 hrs, Volume= 0.372 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,073.14' @ 12.36 hrs  Surf.Area= 6,145 sf  Storage= 5,846 cf

Plug-Flow detention time= 16.3 min calculated for 0.895 af (100% of inflow)
Center-of-Mass det. time= 16.2 min ( 793.6 - 777.4 )

### Volume

<table>
<thead>
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<th>#1</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
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<td>19,815 cf</td>
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<tbody>
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<th>Outlet Devices</th>
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<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,069.00'</td>
<td><strong>6.0&quot; Round Draintile</strong></td>
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<tr>
<td></td>
<td></td>
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<td>L= 100.0'  CMP, mitered to conform to fill, Ke= 0.700</td>
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<td>Inlet / Outlet Invert= 1,069.00' / 1,068.00'  S= 0.0100 '/'  Cc= 0.900</td>
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<tr>
<td></td>
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<td></td>
<td>n= 0.011  PVC, smooth interior, Flow Area= 0.20 sf</td>
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<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,073.00'</td>
<td><strong>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</strong></td>
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<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00  1.00</td>
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<td>Width (feet) 60.00  90.00</td>
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**Primary OutFlow** Max=1.25 cfs @ 12.36 hrs  HW=1,073.14'  (Free Discharge)

**Secondary OutFlow** Max=10.13 cfs @ 12.36 hrs  HW=1,073.14'  (Free Discharge)
Pond 7P: FILTRATION BASIN B

Inflow Area=2.113 ac
Peak Elev=1,073.14'
Storage=5,846 cf
Summary for Pond 8P: FILTRATION BASIN A

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 1.102 ac, 39.84% Impervious, Inflow Depth > 5.44" for 100-Year event

Inflow = 7.42 cfs @ 12.25 hrs, Volume= 0.500 af
Outflow = 1.24 cfs @ 12.79 hrs, Volume= 0.500 af, Atten= 83%, Lag= 32.7 min
Primary = 1.24 cfs @ 12.79 hrs, Volume= 0.500 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,075.16' @ 12.79 hrs  Surf.Area= 4,925 sf  Storage= 8,877 cf

Plug-Flow detention time= 58.7 min calculated for 0.500 af (100% of inflow)
Center-of-Mass det. time= 58.5 min (826.7 - 768.3)

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<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
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<tbody>
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<td>1,068.00'</td>
<td>31,066 cf</td>
<td>Custom Stage Data (Prismatic) listed below</td>
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<th>Outlet Devices</th>
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<td>#1</td>
<td>Primary</td>
<td>1,066.00'</td>
<td>6.0&quot; Round Draintile</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>L= 100.0' CPP, projecting, no headwall, Ke= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,066.00' / 1,065.00' S= 0.0100 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf</td>
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<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,071.00'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
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<tr>
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<td></td>
<td></td>
<td>Head (feet) 0.00 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 30.00 50.00</td>
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Primary OutFlow Max= 1.24 cfs @ 12.79 hrs HW=1,075.16' (Free Discharge)
↑ 1=Draintile (Barrel Controls 1.24 cfs @ 6.30 fps)

Secondary OutFlow Max= 0.00 cfs @ 5.00 hrs HW=1,068.00' (Free Discharge)
↑ 2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 8P: FILTRATION BASIN A

Inflow Area = 1.102 ac
Peak Elev = 1,070.16'
Storage = 8,877 cf
Summary for Pond 9P: DETNETION BASIN D

Inflow Area = 1.794 ac, 15.10% Impervious, Inflow Depth > 4.93" for 100-Year event
Inflow = 10.90 cfs @ 12.17 hrs, Volume= 0.737 af
Outflow = 5.06 cfs @ 12.45 hrs, Volume= 0.706 af, Atten= 54%, Lag= 17.0 min
Primary = 5.06 cfs @ 12.45 hrs, Volume= 0.706 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,068.30’ @ 12.45 hrs Surf.Area= 4,444 sf Storage= 9,601 cf

Plug-Flow detention time= 40.7 min calculated for 0.703 af (95% of inflow)
Center-of-Mass det. time= 25.8 min (799.1 - 773.4)

Volume Invert Avail.Storage Storage Description
#1 1,065.00’ 19,250 cf Custom Stage Data (Prismatic) Listed below (Recalc)

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<td>1,070.00</td>
<td>6,800</td>
<td>6,150</td>
<td>19,250</td>
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Device Routing Invert Outlet Devices
#1 Primary 1,065.50’ 12.0” Round Culvert
L= 88.0’ CMP, mitered to conform to fill, Ke= 0.700
Inlet / Outlet Invert= 1,065.50’ / 1,064.50’ S= 0.0114’’ Cc= 0.900
n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

#2 Secondary 1,069.00’ Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
Head (feet) 0.00 1.00
Width (feet) 12.00 50.00

Primary OutFlow Max= 5.06 cfs @ 12.45 hrs HW= 1,068.30’ (Free Discharge)
↑-1=Culvert (Inlet Controls 5.06 cfs @ 6.44 fps)

Secondary OutFlow Max= 0.00 cfs @ 5.00 hrs HW= 1,065.00’ (Free Discharge)
↑-2=Custom Weir/Orifice (Controls 0.00 cfs)
Pond 9P: DETNETION BASIN D

Hydrograph

Inflow Area=1.794 ac
Peak Elev=1,068.30'
Storage=9,601 cf
Summary for Pond 10P: FILTRATION BASIN E

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 5.960 ac, 22.72% Impervious, Inflow Depth > 5.00" for 100-Year event

Inflow = 20.69 cfs @ 12.33 hrs, Volume= 2.482 af
Outflow = 19.65 cfs @ 12.41 hrs, Volume= 2.481 af, Atten= 5%, Lag= 4.9 min
Primary = 10.01 cfs @ 12.41 hrs, Volume= 2.215 af
Secondary = 9.64 cfs @ 12.41 hrs, Volume= 0.266 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,057.14' @ 12.41 hrs Surface Area= 6,238 sf Storage= 13,759 cf

Plug-Flow detention time= 25.7 min calculated for 2.473 af (100% of inflow)
Center-of-Mass det. time= 25.5 min (824.1 - 798.7)

<table>
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<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,054.00'</td>
<td>19,630 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,054.00</td>
<td>2,800</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,055.00</td>
<td>3,700</td>
<td>3,250</td>
<td>3,250</td>
</tr>
<tr>
<td>1,056.00</td>
<td>4,780</td>
<td>4,240</td>
<td>7,490</td>
</tr>
<tr>
<td>1,057.00</td>
<td>6,050</td>
<td>5,415</td>
<td>12,905</td>
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<tr>
<td>1,058.00</td>
<td>7,400</td>
<td>6,725</td>
<td>19,630</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,051.00'</td>
<td>12.0&quot; Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 98.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,051.00' / 1,048.00' S= 0.0306 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>1,052.00'</td>
<td>6.0&quot; Vert. 6&quot; D.T. C= 0.600</td>
</tr>
<tr>
<td>#3</td>
<td>Device 1</td>
<td>1,056.00'</td>
<td>48.0&quot; Horiz. Grate C= 0.600 Limited to weir flow at low heads</td>
</tr>
<tr>
<td>#4</td>
<td>Secondary</td>
<td>1,056.70'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 8.00 20.00</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=10.01 cfs @ 12.41 hrs HW=1,057.13' (Free Discharge)

1=Culvert (Inlet Controls 7.92 cfs @ 10.09 fps)
3=Grate (Passes 7.92 cfs of 49.68 cfs potential flow)
2=6" D.T. (Orifice Controls 2.09 cfs @ 10.64 fps)

Secondary OutFlow Max=9.48 cfs @ 12.41 hrs HW=1,057.14' (Free Discharge)
4=Custom Weir/Orifice (Weir Controls 9.48 cfs @ 2.05 fps)
Pond 10P: FILTRATION BASIN E

Hydrograph

Inflow Area=5.960 ac
Peak Elev=1,057.14'
Storage=13,759 cf
Summary for Pond 12P: FILTRATION BASIN G

[44] Hint: Outlet device #1 is below defined storage
[95] Warning: Outlet Device #2 rise exceeded

Inflow Area = 2.205 ac, 14.59% Impervious, Inflow Depth > 4.89" for 100-Year event
Inflow = 18.81 cfs @ 12.14 hrs, Volume= 0.899 af
Outflow = 16.29 cfs @ 12.18 hrs, Volume= 0.899 af, Atten= 13%, Lag= 2.3 min
Primary = 1.65 cfs @ 12.18 hrs, Volume= 0.508 af
Secondary = 14.64 cfs @ 12.18 hrs, Volume= 0.391 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,054.33' @ 12.18 hrs Surf.Area= 2,705 sf Storage= 3,012 cf

Plug-Flow detention time= 4.4 min calculated for 0.899 af (100% of inflow)
Center-of-Mass det. time= 4.4 min ( 773.1 - 768.8 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1,052.00'</td>
<td>5,200 cf</td>
<td>Custom Stage Data (Prismatic)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Surf.Area</th>
<th>Inc.Store</th>
<th>Cum.Store</th>
</tr>
</thead>
<tbody>
<tr>
<td>(feet)</td>
<td>(sq-ft)</td>
<td>(cubic-feet)</td>
<td>(cubic-feet)</td>
</tr>
<tr>
<td>1,052.00</td>
<td>430</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,053.00</td>
<td>925</td>
<td>678</td>
<td>678</td>
</tr>
<tr>
<td>1,054.00</td>
<td>1,560</td>
<td>1,243</td>
<td>1,920</td>
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<tr>
<td>1,055.00</td>
<td>5,000</td>
<td>3,280</td>
<td>5,200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>1,050.00'</td>
<td>6.0&quot; Round Draintile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 40.0’ CMP, mitered to conform to fill, Ke= 0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 1,050.00’ / 1,049.50’ S= 0.0125 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>1,053.50'</td>
<td>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 0.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Width (feet) 6.00 10.00</td>
</tr>
</tbody>
</table>

**Primary OutFlow** Max=1.64 cfs @ 12.18 hrs HW=1,054.31' (Free Discharge)

**Secondary OutFlow** Max=14.29 cfs @ 12.18 hrs HW=1,054.31' (Free Discharge)
Pond 12P: FILTRATION BASIN G

Inflow Area=2.205 ac
Peak Elev=1,054.33'
Storage=3,012 cf
## Area Listing (all nodes)

<table>
<thead>
<tr>
<th>Area</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.314</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D (4S, 5S)</td>
</tr>
<tr>
<td>0.624</td>
<td>98</td>
<td>Paved parking, HSG D (4S, 5S)</td>
</tr>
<tr>
<td><strong>2.939</strong></td>
<td><strong>82</strong></td>
<td><strong>TOTAL AREA</strong></td>
</tr>
</tbody>
</table>
### Soil Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>Soil Group</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>HSG A</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG B</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>HSG C</td>
<td></td>
</tr>
<tr>
<td>2.939</td>
<td>HSG D</td>
<td>4S, 5S</td>
</tr>
<tr>
<td>0.000</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td><strong>2.939</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
<tr>
<td>HSG-A (acres)</td>
<td>HSG-B (acres)</td>
<td>HSG-C (acres)</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>0.000</strong></td>
<td><strong>0.000</strong></td>
<td><strong>0.000</strong></td>
</tr>
</tbody>
</table>
**Roadway Existing Drainage**

**MSE 24-hr 3 1-Year Rainfall=2.48”**

Prepared by Kimley-Horn and Associates

Printed 2/28/2019

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**Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH**
- Runoff Area=88,228 sf 21.57% Impervious
- Runoff Depth>0.94”
- Flow Length=430’ Slope=0.0410 '/' Tc=5.1 min CN=82
- Runoff=3.63 cfs 0.158 af

**Subcatchment 5S: ZANE AVENUE AND**
- Runoff Area=39,778 sf 20.55% Impervious
- Runoff Depth>0.94”
- Flow Length=430’ Slope=0.0410 '/' Tc=5.1 min CN=82
- Runoff=1.64 cfs 0.071 af

**Reach 4R: WEST**
- Inflow=3.63 cfs 0.158 af
- Outflow=3.63 cfs 0.158 af

**Reach 5R: SOUTHWEST**
- Inflow=1.64 cfs 0.071 af
- Outflow=1.64 cfs 0.071 af

**Reach 6R: OFF SITE**
- Inflow=5.27 cfs 0.229 af
- Outflow=5.27 cfs 0.229 af

**Total Runoff Area = 2.939 ac**  **Runoff Volume = 0.229 af**  **Average Runoff Depth = 0.94”**

78.75% Pervious = 2.314 ac 21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.63 cfs @ 12.12 hrs, Volume = 0.158 af, Depth > 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,028</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>69,200</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>88,228</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>69,200</td>
<td>78.43% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>19,028</td>
<td>21.57% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>430</td>
<td>0.0410</td>
<td>1.42</td>
<td></td>
<td>Shallow Concentrated Flow, Short Grass Pasture, Kv = 7.0 fps</td>
</tr>
</tbody>
</table>

Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=88,228 sf
Runoff Volume=0.158 af
Runoff Depth > 0.94"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.64 cfs @ 12.12 hrs, Volume= 0.071 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>31,603</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>39,778</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>31,603</td>
<td>79.45% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>8,175</td>
<td>20.55% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)

5.1 430 0.0410 1.42 Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps

Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=39,778 sf
Runoff Volume=0.071 af
Runoff Depth>0.94"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 0.94" for 1-Year event
Inflow = 3.63 cfs @ 12.12 hrs, Volume= 0.158 af
Outflow = 3.63 cfs @ 12.12 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 0.94" for 1-Year event
Inflow = 1.64 cfs @ 12.12 hrs, Volume= 0.071 af
Outflow = 1.64 cfs @ 12.12 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SOUTHWEST

Hydrograph

Inflow Area=0.913 ac
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 0.94" for 1-Year event
Inflow = 5.27 cfs @ 12.12 hrs, Volume= 0.229 af
Outflow = 5.27 cfs @ 12.12 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: OFF SITE

Hydrograph

Inflow Area=2.939 ac
Roadway Existing Drainage

Prepared by Kimley-Horn and Associates

Printed 2/28/2019

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MSE 24-hr 3 2-Year Rainfall=2.82"

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>1.18"
Flow Length=430’  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=4.59 cfs  0.199 af

Subcatchment 5S: ZANE AVENUE AND
Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>1.18"
Flow Length=430’  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=2.07 cfs  0.090 af

Reach 4R: WEST
Inflow=4.59 cfs  0.199 af
Outflow=4.59 cfs  0.199 af

Reach 5R: SOUTHWEST
Inflow=2.07 cfs  0.090 af
Outflow=2.07 cfs  0.090 af

Reach 6R: OFF SITE
Inflow=6.66 cfs  0.289 af
Outflow=6.66 cfs  0.289 af

Total Runoff Area = 2.939 ac  Runoff Volume = 0.289 af  Average Runoff Depth = 1.18"
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.59 cfs @ 12.12 hrs, Volume= 0.199 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,028</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>69,200</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
</tbody>
</table>

88,228     82  Weighted Average
69,200  78.43% Pervious Area
19,028  21.57% Impervious Area

Tc  Length  Slope  Velocity  Capacity  Description
(min)    (feet) (ft/ft) (ft/sec) (cfs)              
5.1      430  0.0410  1.42  Shallow Concentrated Flow,

Short Grass Pasture  Kv= 7.0 fps

Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

MSE 24-hr 3
2-Year Rainfall=2.82"
Runoff Area=88,228 sf
Runoff Volume=0.199 af
Runoff Depth>1.18"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.07 cfs @ 12.12 hrs, Volume= 0.090 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>31,603</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>39,778</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>31,603</td>
<td>79.45% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>8,175</td>
<td>20.55% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>430</td>
<td>0.0410</td>
<td>1.42</td>
<td></td>
<td>Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps</td>
</tr>
</tbody>
</table>

Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=39,778 sf
Runoff Volume=0.090 af
Runoff Depth>1.18"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 4.59 cfs @ 12.12 hrs, Volume = 0.199 af
Outflow = 4.59 cfs @ 12.12 hrs, Volume = 0.199 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 2.07 cfs @ 12.12 hrs, Volume= 0.090 af
Outflow = 2.07 cfs @ 12.12 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SOUTHWEST

Hydrograph

Inflow Area=0.913 ac
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 6.66 cfs @ 12.12 hrs, Volume= 0.289 af
Outflow = 6.66 cfs @ 12.12 hrs, Volume= 0.289 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Roadway Existing Drainage

MSE 24-hr 3 10-Year Rainfall=4.18"

Prepared by Kimley-Horn and Associates

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>2.26"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=8.68 cfs  0.382 af

Subcatchment 5S: ZANE AVENUE AND
Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>2.26"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=3.91 cfs  0.172 af

Reach 4R: WEST
Inflow=8.68 cfs  0.382 af
Outflow=8.68 cfs  0.382 af

Reach 5R: SOUTHWEST
Inflow=3.91 cfs  0.172 af
Outflow=3.91 cfs  0.172 af

Reach 6R: OFF SITE
Inflow=12.59 cfs  0.554 af
Outflow=12.59 cfs  0.554 af

Total Runoff Area = 2.939 ac  Runoff Volume = 0.554 af  Average Runoff Depth = 2.26"
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 8.68 cfs @ 12.12 hrs, Volume = 0.382 af, Depth > 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3 10-Year Rainfall = 4.18"

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<tr>
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<td>78</td>
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<td>1.42</td>
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<td>Shallow Concentrated Flow, Short Grass Pasture  K_v = 7.0 fps</td>
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Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

MSE 24-hr 3 10-Year Rainfall = 4.18"
Runoff Area = 88,228 sf
Runoff Volume = 0.382 af
Runoff Depth > 2.26"
Flow Length = 430'
Slope = 0.0410 '/'
Tc = 5.1 min
CN = 82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

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Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=39,778 sf
Runoff Volume=0.172 af
Runoff Depth>2.26"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 2.26" for 10-Year event
Inflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af
Outflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: WEST

Hydrograph

Inflow Area=2.025 ac
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 2.26" for 10-Year event
Inflow = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SOUTHWEST

Hydrograph
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 2.26" for 10-Year event
Inflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af
Outflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af, Attenuation = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: OFF SITE

Hydrograph

Inflow Area=2.939 ac
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: ZANE AVENUE NORTH
Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>5.01"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=18.50 cfs  0.845 af

Subcatchment 5S: ZANE AVENUE AND
Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>5.01"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=8.34 cfs  0.381 af

Reach 4R: WEST
Inflow=18.50 cfs  0.845 af
Outflow=18.50 cfs  0.845 af

Reach 5R: SOUTHWEST
Inflow=8.34 cfs  0.381 af
Outflow=8.34 cfs  0.381 af

Reach 6R: OFF SITE
Inflow=26.84 cfs  1.226 af
Outflow=26.84 cfs  1.226 af

Total Runoff Area = 2.939 ac  Runoff Volume = 1.226 af  Average Runoff Depth = 5.01"
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 18.50 cfs @ 12.12 hrs, Volume = 0.845 af, Depth > 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

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Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=88,228 sf
Runoff Volume=0.845 af
Runoff Depth>5.01"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 8.34 cfs @ 12.12 hrs, Volume= 0.381 af, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

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Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=39,778 sf
Runoff Volume=0.381 af
Runoff Depth>5.01"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 5.01" for 100-Year event
Inflow = 18.50 cfs @ 12.12 hrs, Volume= 0.845 af
Outflow = 18.50 cfs @ 12.12 hrs, Volume= 0.845 af, Attenuation= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: WEST

Hydrograph

Inflow Area=2.025 ac
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 5.01" for 100-Year event
Inflow = 8.34 cfs @ 12.12 hrs, Volume= 0.381 af
Outflow = 8.34 cfs @ 12.12 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SOUTHWEST

Hydrograph

Inflow Area=0.913 ac
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 5.01" for 100-Year event
Inflow = 26.84 cfs @ 12.12 hrs, Volume= 1.226 af
Outflow = 26.84 cfs @ 12.12 hrs, Volume= 1.226 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: OFF SITE

Hydrograph

Inflow Area=2.939 ac
Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>2.26"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=8.68 cfs  0.382 af

Subcatchment 5S: ZANE AVENUE AND
Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>2.26"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=3.91 cfs  0.172 af

Reach 4R: WEST
Inflow=8.68 cfs  0.382 af
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Reach 5R: SOUTHWEST
Inflow=3.91 cfs  0.172 af
Outflow=3.91 cfs  0.172 af

Reach 6R: OFF SITE
Inflow=12.59 cfs  0.554 af
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Total Runoff Area = 2.939 ac  Runoff Volume = 0.554 af  Average Runoff Depth = 2.26"
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=4.18"

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Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
Custom Rainfall=4.18"
Runoff Area=88,228 sf
Runoff Volume=0.382 af
Runoff Depth>2.26"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=4.18"

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Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
Custom Rainfall=4.18"
Runoff Area=39,778 sf
Runoff Volume=0.172 af
Runoff Depth>2.26"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 2.26" for Custom event
Inflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af
Outflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 2.26" for Custom event
Inflow = 3.91 cfs @ 12.12 hrs, Volume = 0.172 af
Outflow = 3.91 cfs @ 12.12 hrs, Volume = 0.172 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 5.00-20.00 hrs, dt = 0.05 hrs

Reach 5R: SOUTHWEST

Hydrograph

Inflow Area = 0.913 ac
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 2.26" for Custom event
Inflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af
Outflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
## Area Listing (all nodes)

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<th>Area (acres)</th>
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<tr>
<td>0.624</td>
<td>98</td>
<td>Paved parking, HSG D (4S, 5S)</td>
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<tr>
<td><strong>2.939</strong></td>
<td><strong>82</strong></td>
<td><strong>TOTAL AREA</strong></td>
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## Soil Listing (all nodes)

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<tr>
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Roadway Existing Drainage

MSE 24-hr 3  1-Year Rainfall=2.48"

Prepared by Kimley-Horn and Associates
Printed 2/28/2019
HydroCAD® 10.00-22  s/n 09843 © 2018 HydroCAD Software Solutions LLC

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>0.94"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=3.63 cfs  0.158 af

Subcatchment 5S: ZANE AVENUE AND
Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>0.94"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=1.64 cfs  0.071 af

Reach 4R: WEST
Inflow=3.63 cfs  0.158 af
Outflow=3.63 cfs  0.158 af

Reach 5R: SOUTHWEST
Inflow=1.64 cfs  0.071 af
Outflow=1.64 cfs  0.071 af

Reach 6R: OFF SITE
Inflow=5.27 cfs  0.229 af
Outflow=5.27 cfs  0.229 af

Total Runoff Area = 2.939 ac  Runoff Volume = 0.229 af  Average Runoff Depth = 0.94"
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.63 cfs @ 12.12 hrs, Volume= 0.158 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

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Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

MSE 24-hr 3 1-Year Rainfall=2.48"
Runoff Area=88,228 sf
Runoff Volume=0.158 af
Runoff Depth>0.94"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.64 cfs @ 12.12 hrs, Volume= 0.071 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.48"

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Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

MSE 24-hr 3
1-Year Rainfall=2.48"
Runoff Area=39,778 sf
Runoff Volume=0.071 af
Runoff Depth>0.94"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 0.94" for 1-Year event
Inflow = 3.63 cfs @ 12.12 hrs, Volume = 0.158 af
Outflow = 3.63 cfs @ 12.12 hrs, Volume = 0.158 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 0.94" for 1-Year event
Inflow = 1.64 cfs @ 12.12 hrs, Volume= 0.071 af
Outflow = 1.64 cfs @ 12.12 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 0.94" for 1-Year event
Inflow = 5.27 cfs @ 12.12 hrs, Volume= 0.229 af
Outflow = 5.27 cfs @ 12.12 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Roadway Existing Drainage

MSE 24-hr 3 2-Year Rainfall=2.82"

Prepared by Kimley-Horn and Associates
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>1.18"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=4.59 cfs  0.199 af

Subcatchment 5S: ZANE AVENUE AND
Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>1.18"
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=2.07 cfs  0.090 af

Reach 4R: WEST
Inflow=4.59 cfs  0.199 af
Outflow=4.59 cfs  0.199 af

Reach 5R: SOUTHWEST
Inflow=2.07 cfs  0.090 af
Outflow=2.07 cfs  0.090 af

Reach 6R: OFF SITE
Inflow=6.66 cfs  0.289 af
Outflow=6.66 cfs  0.289 af

Total Runoff Area = 2.939 ac  Runoff Volume = 0.289 af  Average Runoff Depth = 1.18"
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.59 cfs @ 12.12 hrs, Volume= 0.199 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

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Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)  
5.1 430 0.0410 1.42 Shallow Concentrated Flow, Short Grass Pasture  Kv= 7.0 fps

Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[Image: Hydrograph]

MSE 24-hr 3 2-Year Rainfall=2.82"
Runoff Area=88,228 sf
Runoff Volume=0.199 af
Runoff Depth>1.18"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.07 cfs @ 12.12 hrs, Volume= 0.090 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.82"

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Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
2-Year Rainfall=2.82"
Runoff Area=39,778 sf
Runoff Volume=0.090 af
Runoff Depth>1.18"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 4.59 cfs @ 12.12 hrs, Volume= 0.199 af
Outflow = 4.59 cfs @ 12.12 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 2.07 cfs @ 12.12 hrs, Volume= 0.090 af
Outflow = 2.07 cfs @ 12.12 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 1.18" for 2-Year event
Inflow = 6.66 cfs @ 12.12 hrs, Volume= 0.289 af
Outflow = 6.66 cfs @ 12.12 hrs, Volume= 0.289 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: OFF SITE

Hydrograph

Inflow Area=2.939 ac
Roadway Existing Drainage

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
- Runoff Area=88,228 sf, 21.57% Impervious, Runoff Depth>2.26"
- Flow Length=430', Slope=0.0410 '/' , Tc=5.1 min, CN=82, Runoff=8.68 cfs, 0.382 af

Subcatchment 5S: ZANE AVENUE AND
- Runoff Area=39,778 sf, 20.55% Impervious, Runoff Depth>2.26"
- Flow Length=430', Slope=0.0410 '/' , Tc=5.1 min, CN=82, Runoff=3.91 cfs, 0.172 af

Reach 4R: WEST
- Inflow=8.68 cfs, 0.382 af
- Outflow=8.68 cfs, 0.382 af

Reach 5R: SOUTHWEST
- Inflow=3.91 cfs, 0.172 af
- Outflow=3.91 cfs, 0.172 af

Reach 6R: OFF SITE
- Inflow=12.59 cfs, 0.554 af
- Outflow=12.59 cfs, 0.554 af

Total Runoff Area = 2.939 ac, Runoff Volume = 0.554 af, Average Runoff Depth = 2.26"
78.75% Pervious = 2.314 ac, 21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff  =  8.68 cfs @  12.12 hrs,  Volume=  0.382 af,  Depth>  2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  10-Year Rainfall=4.18"

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Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
10-Year Rainfall=4.18"
Runoff Area=88,228 sf
Runoff Volume=0.382 af
Runoff Depth>2.26"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=4.18"

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Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

MSE 24-hr 3 10-Year Rainfall=4.18"
Runoff Area=39,778 sf
Runoff Volume=0.172 af
Runoff Depth>2.26"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 2.26" for 10-Year event
Inflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af
Outflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 2.26” for 10-Year event
Inflow = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SOUTHWEST

Hydrograph

Inflow Area=0.913 ac
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 2.26" for 10-Year event
Inflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af
Outflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: OFF SITE

Hydrograph
Roadway Existing Drainage

Prepared by Kimley-Horn and Associates

Printed 2/28/2019

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MSE 24-hr 3  100-Year Rainfall=7.29''

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>5.01''
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=18.50 cfs  0.845 af

Subcatchment 5S: ZANE AVENUE AND
Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>5.01''
Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=8.34 cfs  0.381 af

Reach 4R: WEST
Inflow=18.50 cfs  0.845 af
Outflow=18.50 cfs  0.845 af

Reach 5R: SOUTHWEST
Inflow=8.34 cfs  0.381 af
Outflow=8.34 cfs  0.381 af

Reach 6R: OFF SITE
Inflow=26.84 cfs  1.226 af
Outflow=26.84 cfs  1.226 af

Total Runoff Area = 2.939 ac  Runoff Volume = 1.226 af  Average Runoff Depth = 5.01''
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 18.50 cfs @ 12.12 hrs, Volume= 0.845 af, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=7.29"

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Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=88,228 sf
Runoff Volume=0.845 af
Runoff Depth>5.01"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 8.34 cfs @ 12.12 hrs, Volume= 0.381 af, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3  100-Year Rainfall=7.29"

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<tr>
<td>8,175</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>31,603</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>39,778</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>31,603</td>
<td></td>
<td>79.45% Pervious Area</td>
</tr>
<tr>
<td>8,175</td>
<td></td>
<td>20.55% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
5.1   430   0.0410   1.42   Shallow Concentrated Flow,
                  Short Grass Pasture  Kv= 7.0 fps

Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
100-Year Rainfall=7.29"
Runoff Area=39,778 sf
Runoff Volume=0.381 af
Runoff Depth>5.01"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 5.01" for 100-Year event
Inflow = 18.50 cfs @ 12.12 hrs, Volume= 0.845 af
Outflow = 18.50 cfs @ 12.12 hrs, Volume= 0.845 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: WEST

Hydrograph

Inflow Area=2.025 ac
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 5.01" for 100-Year event
Inflow = 8.34 cfs @ 12.12 hrs, Volume= 0.381 af
Outflow = 8.34 cfs @ 12.12 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: SOUTHWEST

Hydrograph

Inflow Area=0.913 ac
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 5.01" for 100-Year event
Inflow = 26.84 cfs @ 12.12 hrs, Volume= 1.226 af
Outflow = 26.84 cfs @ 12.12 hrs, Volume= 1.226 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 4S: ZANE AVENUE NORTH
- Runoff Area=88,228 sf  21.57% Impervious  Runoff Depth>2.26"
- Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=8.68 cfs  0.382 af

Subcatchment 5S: ZANE AVENUE AND
- Runoff Area=39,778 sf  20.55% Impervious  Runoff Depth>2.26"
- Flow Length=430'  Slope=0.0410 '/'  Tc=5.1 min  CN=82  Runoff=3.91 cfs  0.172 af

Reach 4R: WEST
- Inflow=8.68 cfs  0.382 af
- Outflow=8.68 cfs  0.382 af

Reach 5R: SOUTHWEST
- Inflow=3.91 cfs  0.172 af
- Outflow=3.91 cfs  0.172 af

Reach 6R: OFF SITE
- Inflow=12.59 cfs  0.554 af
- Outflow=12.59 cfs  0.554 af

Total Runoff Area = 2.939 ac  Runoff Volume = 0.554 af  Average Runoff Depth = 2.26"
78.75% Pervious = 2.314 ac  21.25% Impervious = 0.624 ac
Summary for Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,028</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>69,200</td>
<td>78</td>
<td>Meadow, non-grazed, HSG D</td>
</tr>
<tr>
<td>88,228</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>69,200</td>
<td>78.43% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>19,028</td>
<td>21.57% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>430</td>
<td>0.0410</td>
<td>1.42</td>
<td></td>
<td>Shallow Concentrated Flow, Short Grass Pasture  K_v= 7.0 fps</td>
</tr>
</tbody>
</table>

Subcatchment 4S: ZANE AVENUE NORTH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3
Custom Rainfall=4.18"
Runoff Area=88,228 sf
Runoff Volume=0.382 af
Runoff Depth>2.26"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 Custom Rainfall=4.18"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,175</td>
<td>98</td>
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<td>78</td>
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<tr>
<td>39,778</td>
<td>82</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>31,603</td>
<td>79.45%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>8,175</td>
<td>20.55%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
5.1 430 0.0410 1.42 Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps

Subcatchment 5S: ZANE AVENUE AND 240TH PRE DEVELOPMENT

Hydrograph

MSE 24-hr 3 Custom Rainfall=4.18"
Runoff Area=39,778 sf
Runoff Volume=0.172 af
Runoff Depth>2.26"
Flow Length=430'
Slope=0.0410 '/'
Tc=5.1 min
CN=82
Summary for Reach 4R: WEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.025 ac, 21.57% Impervious, Inflow Depth > 2.26" for Custom event
Inflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af
Outflow = 8.68 cfs @ 12.12 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: WEST

Hydrograph

Inflow Area=2.025 ac
Summary for Reach 5R: SOUTHWEST

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.913 ac, 20.55% Impervious, Inflow Depth > 2.26" for Custom event
Inflow = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 3.91 cfs @ 12.12 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Summary for Reach 6R: OFF SITE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.939 ac, 21.25% Impervious, Inflow Depth > 2.26" for Custom event
Inflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af
Outflow = 12.59 cfs @ 12.12 hrs, Volume= 0.554 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: OFF SITE

Inflow Area=2.939 ac
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TABLE OF CONTENTS

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7.0 Field Investigation ................................................................................................................. 4
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FIGURES

Figure 1. Project Location
Figure 2. Investigated Areas
Figure 3. USGS 7.5 Minute Topographical Map
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APPENDICES

Appendix A. National Wetlands Inventory
Appendix B. Hydric Soils Information
Appendix C. Precipitation Data
Appendix D. MN DNR Public Waters Inventory
Appendix E. Field Data Sheets
Appendix F. Site Photos
Appendix G. Contours
1.0 EXECUTIVE SUMMARY

Wetland Scientist Ashley Payne, CWD (#1259) with Kimley-Horn and Associates, Inc. (KH) conducted a wetland investigation and field delineation for an approximately 60-acres located south of 230th Street, New Market Township, Scott County, Minnesota. The wetland investigation and delineation occurred on October 10, 2018. During the investigation, fifteen (15) areas were reviewed and delineated. Two of the delineated wetlands are identified on the DNR Public Waters Inventory. The delineated resources were reviewed in the field by the delineator and representatives from the Scott County SWCD, and BWSR on November 7th, 2018. A couple of the boundaries were adjusted, and those changes are reflected in the attached report. The results of the field investigation and delineation are summarized below:

- **Wetland A** is a Type 2/5 – Fresh Wet Meadow/Open Water Wetland. A portion of Wetland A is identified as DNR Public Water #329W. Wetland A within the investigated area is approximately 0.34 acres.
- **Wetland B** is a Type 3 – Shallow Marsh wetland. This fringe wetland was dominated by cattails and sedges. Wetland B is approximately 0.24 acres within the investigated area.
- **Wetland C** is a Type 3 – Shallow Marsh Wetland. Wetland C is approximately 0.35 acres.
- **Wetland D** is a Type 5 – Open Water wetland. This Wetland is approximately 0.52 within the investigated area and is separated from Wetland E by a berm.
- **Wetland E** is a Type 5- Open Water wetland. Wetland E is approximately 1.69 acres within the investigated area and is separated from Wetlands D and J by constructed berms.
- **Wetland F** is a Type 1 – Seasonally Flooded Basin. This wetland is currently grazed by cattle and appears to function as a drainage swale. Wetland F is approximately 0.09 acres.
- **Wetland G** is a Type 3 – Shallow Marsh Wetland. Wetland G is approximately 0.36 acres.
- **Wetland H** is a Type 2/5 – Fresh Wet Meadow/Open Water Wetland. This wetland is currently grazed by cattle. Wetland H is approximately 0.62 acres.
- **Wetland I** is a Type 3 – Shallow Marsh Wetland. This wetland is approximately 0.16 acres.
- **Wetland J** is a Type 5 – Open Water Wetland. This wetland is also identified as DNR Public Waters Inventory #342W. Wetland J is approximately 3.22 acres within the investigated area. Wetland J is separated from Wetland E by an upland berm.
- **Wetland K** is a Type 3 – Shallow Marsh Wetland. This wetland appears to be isolated from other wetlands on the site. Wetland K is approximately 0.37 acres.
- **Wetland L** is a Type 5 – Open Water Wetland. Wetland L is approximately 0.53 acres.
- **Wetland M** is a Type 3 – Shallow Marsh Wetland. Wetland M is approximately 0.22 acres.
- **Wetland N** is a Type 2/3 – Fresh Wet Meadow/Shallow Marsh Wetland. Wetland N is approximately 6.889 acres within the investigated area.
- **Wetland O** is a Type 2 – Fresh Wet Meadow Wetland. Wetland O is approximately 1.97 acres within the investigated area.
- **Wetland P** is a Type 1 – Seasonally Flooded Basin. Wetland P is approximately 0.04 acres within the investigated area.
- **Wetland Q** is a Type 1/3- Seasonally Flooded Basin/Shallow Marsh Wetland located along Zane Avenue. This wetland is approximately 0.17 acres within the investigated area.
- **Wetland R** is a Type 2- Fresh Wet Meadow Wetland. This wetland area is a roadside ditch conveying roadway run-off in the right-of-way. Wetland R is approximately 0.02 acres within the investigated area.
- **Wetland S** is a Type 2 – Fresh Wet Meadow Wetland. This wetland area is a roadside ditch conveying roadway run-off in the right-of-way. Wetland S is approximately 0.02 acres within the investigated area.
2.0 SITE LOCATION

Proposed site is located south of 230th Street and west of Natchez Ave, in the New Market Township, Scott County, Minnesota (Figure 1).

3.0 PROJECT DESCRIPTION

YMCA of Greater Twin Cities is evaluating their options to develop to site into a camp. The total site is approximately 220 acres with the investigated areas totaling approximately 60 acres. The investigated areas are shown in Figure 2.

4.0 PURPOSE OF THE DELINEATION

The purpose of this delineation was to identify the extent of wetlands within the site. This information will be used to facilitate project design and to determine if wetland impacts are avoidable and/or if minimization of impacts can result from design modifications.

5.0 SITE DESCRIPTION

The site is currently undeveloped and consists of pasture land and roadway right-of-way. The site is surrounded by rural residential, farmland, and pastureland. The site has significant grade changes varying from 1100 feet to 1028 feet in elevation. Contours are shown in Appendix G.

6.0 PRELIMINARY INVESTIGATION

Prior to field reconnaissance, potential wetland areas within the project sites were identified through a desktop review of NWI mapping, aerial photography (2018), Minnesota DNR PWI, site topography, and the soil survey for Scott County.

NWI mapping, updated by the Minnesota DNR, identified multiple wetlands within the areas of investigation (Appendix A).

According to the Natural Resources Conservation Service’s (NRCS) Web Soil Survey, multiple soil map units were considered 90% or more hydric. Maps and information obtained from the NRCS online web survey are included in Appendix B.

The Scott County, Minnesota 7.5-minute topographic map (U.S. Geological Survey) identified multiple aquatic resources within the project site (Figure 2). The site is located in Section 9, Township 113N, Range 21W.

Precipitation data for the project site was obtained from an online data retrieval system, created and maintained by the Climatology Working Group at the University of Minnesota (available at http://climate.umn.edu/doc/historical.htm). This information was used to determine if the climatic/hydrologic conditions are typical for this time of year. Rainfall levels for the three months leading up to the October 10th field review were compared to historical data. The data shows overall the three months prior to the field review had normal precipitation conditions. This information is included in Appendix C. The site received 1.28 inches of rain the week prior to the field review. The weather was overcast with some traces of precipitation on the day of the field review.

The Minnesota DNR PWI was reviewed and two DNR public waters were identified within the areas of investigation. The inventory is included in Appendix D.
7.0 FIELD INVESTIGATION

Wetland scientist Ashley Payne, CWD (#1259 with Kimley-Horn and Associates, Inc. conducted a routine level 2 wetland delineation, as outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE, 1987) along with the Midwest Regional Supplement Version 2.0 (USACE, 2010), for the project.

During the onsite delineation, vegetation, soils, and current hydrologic characteristics were evaluated at each potential wetland area within the project site. A transect, including at least one upland and one wetland sample point, was completed for wetland types within the investigated areas. identified to meet wetland criteria. Wetland boundaries were flagged with wetland delineation flags where one or more of the three criteria were no longer present. The sample point locations and wetland boundaries were surveyed with a Trimble GPS and are shown in Figure 3. The field data sheets are included in Appendix E. Site photos can be found in Appendix F.

The delineated wetland boundaries were reviewed in the field by representatives from the Scott County SWCD and BWSR on November 7, 2018. Discussions and comments from the site review were incorporated into the delineation report and delineated boundaries identified in Figure 4-1 to 4-4.

8.0 WETLAND CHARACTERISTICS

A summary of the field investigation and delineation is included in the table below. Delineated boundaries and sample point locations are shown in Figure 4-1 to 4-4.

Table 1. Delineation Summary

<table>
<thead>
<tr>
<th>Area ID</th>
<th>Type</th>
<th>Size (within investigated area)</th>
<th>Sample Points</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland A</td>
<td>Type 2/5 – Fresh Wet Meadow/Open Water Wetland</td>
<td>0.34 acres</td>
<td>SP-6, SP-7</td>
<td>Wetland A is part of DNR Public Waters #329W. Wetland Boundary was based on change in topography and the change in vegetation from hydrophytic to upland dominated vegetation.</td>
</tr>
<tr>
<td>Wetland B</td>
<td>Type 3 – Shallow Marsh Wetland</td>
<td>0.24 acres</td>
<td>SP-6, SP-7</td>
<td>Wetland B was a fringe wetland dominated by cattails and sedges.</td>
</tr>
<tr>
<td>Wetland C</td>
<td>Type 3 – Shallow Marsh</td>
<td>0.35 acres</td>
<td>SP-3, SP-4</td>
<td>Wetland C was an isolated basin surrounded by upland area that are currently grazed.</td>
</tr>
<tr>
<td>Wetland D</td>
<td>Type 5 – Open Water Wetland</td>
<td>0.52 acres</td>
<td>SP-6, SP-7</td>
<td>Wetland D was an open water basin separated from Wetlands B and E by constructed berms.</td>
</tr>
<tr>
<td>Wetland E</td>
<td>Type 5 – Open Water Wetland</td>
<td>1.69 acres</td>
<td>SP-8, SP-9</td>
<td>Wetland E was an open water basin separated from Wetlands D and J by constructed berms. The upland areas adjacent to the wetland were grazed.</td>
</tr>
<tr>
<td>Wetland F</td>
<td>Type 1 – Seasonally Flooded Basin</td>
<td>0.09 acres</td>
<td>SP-14, SP-15</td>
<td>Wetland F was a drainage swale located between Wetlands G and I.</td>
</tr>
<tr>
<td>Area ID</td>
<td>Type</td>
<td>Size (within investigated area)</td>
<td>Sample Points</td>
<td>Notes</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------</td>
<td>----------------------------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wetland G</td>
<td>Type 3 – Shallow Marsh Wetland</td>
<td>0.36 acres</td>
<td>SP-14, SP-15</td>
<td>Wetland G was a shallow marsh wetland dominated by cattails and bulrush with a small amount of Type 1 wetland fringe.</td>
</tr>
<tr>
<td>Wetland H</td>
<td>Type 2/5 – Fresh Wet Meadow/Open Water Wetland</td>
<td>0.62 acres</td>
<td>SP-3, SP-4, SP-5</td>
<td>Wetland was an open water basin that extended east into a fresh wet meadow wetland surrounded by uplands.</td>
</tr>
<tr>
<td>Wetland I</td>
<td>Type 3 – Shallow Marsh Wetland</td>
<td>0.16 acres</td>
<td>SP-14, SP-15</td>
<td>Wetland I was small shallow marsh wetland dominated by bulrush and cattails.</td>
</tr>
<tr>
<td>Wetland J</td>
<td>Type 5 – Open Water Wetland</td>
<td>3.22 acres</td>
<td>SP-10, SP-11</td>
<td>Wetland J is part of DNR Public Waters #324W. Wetland Boundary was based on change in topography and the change in vegetation from hydrophytic to upland dominated vegetation. Wetland J was separated from Wetland E by a constructed berm.</td>
</tr>
<tr>
<td>Wetland K</td>
<td>Type 3 – Shallow Marsh Wetland</td>
<td>0.37 acres</td>
<td>SP-1, SP-2</td>
<td>Wetland K was a small depressional wetland located in the northwest corner of the project site. This wetland appears to be isolated from other aquatic resources.</td>
</tr>
<tr>
<td>Wetland L</td>
<td>Type 5- Open Water Wetland</td>
<td>0.53 acres</td>
<td>SP-12, SP-13</td>
<td>Wetland L was an open water wetland was a small area of fringe wetland.</td>
</tr>
<tr>
<td>Wetland M</td>
<td>Type 3- Shallow Marsh Wetland</td>
<td>0.22 acres</td>
<td>SP-12, SP-13</td>
<td>Wetland M was shallow marsh wetland dominated by emergent vegetation.</td>
</tr>
<tr>
<td>Wetland N</td>
<td>Type 2/3 – Fresh Wet Meadow/Shallow Marsh Wetland</td>
<td>6.89 acres</td>
<td>SP-18, SP-19</td>
<td>Wetland N was a large wetland complex dominated by reed canary grass, sedges, and emergent vegetation.</td>
</tr>
<tr>
<td>Wetland O</td>
<td>Type 2 – Fresh Wet Meadow</td>
<td>1.97 acres</td>
<td>SP-16, SP-17</td>
<td>Wetland O was dominated by reed canary grass and some emergent vegetation.</td>
</tr>
<tr>
<td>Wetland P</td>
<td>Type 1 – Seasonally Flooded Basin</td>
<td>0.04 acres</td>
<td>SP-18, SP-19</td>
<td>Wetland P is connected to Wetland N to the north and was dominated by reed canary grass.</td>
</tr>
<tr>
<td>Wetland Q</td>
<td>Type 1/3 – Seasonally Flooded Basin/Shallow Marsh</td>
<td>0.17 acres</td>
<td>SP-18, SP-19</td>
<td>Wetland Q was a roadside ditch and shallow marsh wetland separated from Wetland P by Zane Avenue.</td>
</tr>
</tbody>
</table>
### 9.0 REGULATORY REQUIREMENTS

The following provides a general summary of the permit requirements that may pertain to the project. Any activity planned within areas identified as wetland must be coordinated with and approved by the appropriate agencies prior to commencement of such activities.

Agencies representing two levels of government in Minnesota regulate certain activities that affect lakes, rivers, streams, and wetlands are listed below:

- **Federal** – U.S. Army Corps of Engineers (USACE): Section 404 of the Clean Water Act.
- **State** – MnDNR: DNR Public Waters Program
- **Local** – Local Government Units (LGU) (including cities, counties, watershed management organizations, soil and water conservation districts, and townships): Wetland Conservation Act (WCA) Replacement Plan. The New Market Township is the LGU.

The regulatory authority of the USACE generally covers Waters of the United States, including those that are subject to WCA. Generally, the USACE reviews delineations to determine concurrence with the delineated boundaries.

In Minnesota, a joint application process has been developed for projects with anticipated wetland impacts. Applications are coordinated between the USACE and the LGU. Any public waters impacts require a MnDNR Public Waters Work Permit which is applied for through the DNR’s MPARS online system.

### 10.0 REPORT PREPARATION

The procedures followed for this wetland delineation are in accordance with the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Midwest Regional Supplement* (Version 2.0) (USACE 2010).

This report describes site conditions for a specific date-in-time, and is generally valid for a period of five years from the date of the revised field investigation and delineation – October 10th, 2018.
11.0 REFERENCES


Minnesota Board of Water and Soil Resources. Information regarding Minnesota wetland regulations (includes links to other regulatory websites). Available at http://www.bwsr.state.mn.us/wetlands/index.html, downloaded October 2016.


Figures
Figure 2. Investigated Areas

Legend
- Delineated Wetland Boundaries
- Areas Requiring Investigation
- Project Site
WETLAND J
TYPE 5
3.22 ACRES

WETLAND E
TYPE 5
1.69 ACRES

WETLAND H
TYPE 2/5
0.62 ACRES

WETLAND K
TYPE 3
0.37 ACRES

WETLAND G
TYPE 3
0.36 ACRES

WETLAND C
TYPE 3
0.35 ACRES

WETLAND A
TYPE 2/5
0.34 ACRES

WETLAND B
TYPE 3
0.24 ACRES

WETLAND I
TYPE 3
0.16 ACRES

WETLAND F
TYPE 1
0.09 ACRES

Figure 4-1. Delineated Wetland Boundaries
Figure 4-2. Delineated Wetland Boundaries
Figure 4-3. Delineated Wetland Boundaries
240th Street
Zane Ave
WETLAND Q
TYPE 2/5
0.17 ACRES
WETLAND P
TYPE 1
0.04 ACRES
WETLAND R
TYPE 2
0.02 ACRES
WETLAND S
TYPE 2
0.02 ACRES

Legend
- Delineated Wetland Boundaries
- Areas Requiring Investigation
- Project Site

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 4-4. Delineated Wetland Boundaries
APPENDIX A

National Wetland Inventory
APPENDIX B

Hydric Soils Information
The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Scott County, Minnesota

Survey Area Data: Version 14, Sep 12, 2018

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

Date(s) aerial images were photographed: Jul 1, 2013—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
## Hydric Rating by Map Unit

<table>
<thead>
<tr>
<th>Map unit symbol</th>
<th>Map unit name</th>
<th>Rating</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>DaB2</td>
<td>Dakota loam, 2 to 6 percent slopes, moderately eroded</td>
<td>10</td>
<td>0.1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Ga</td>
<td>Glencoe silty clay loam, 0 to 1 percent slopes</td>
<td>100</td>
<td>7.7</td>
<td>3.5%</td>
</tr>
<tr>
<td>HaB</td>
<td>Hayden loam, 2 to 6 percent slopes</td>
<td>5</td>
<td>14.2</td>
<td>6.4%</td>
</tr>
<tr>
<td>HaC</td>
<td>Hayden loam, 6 to 10 percent slopes</td>
<td>5</td>
<td>2.5</td>
<td>1.1%</td>
</tr>
<tr>
<td>HaC2</td>
<td>Hayden loam, 6 to 10 percent slopes, moderately eroded</td>
<td>5</td>
<td>12.3</td>
<td>5.6%</td>
</tr>
<tr>
<td>HaD</td>
<td>Hayden loam, 10 to 22 percent slopes</td>
<td>8</td>
<td>9.1</td>
<td>4.1%</td>
</tr>
<tr>
<td>HaD2</td>
<td>Hayden loam, 10 to 22 percent slopes, moderately eroded</td>
<td>8</td>
<td>10.1</td>
<td>4.6%</td>
</tr>
<tr>
<td>HaE2</td>
<td>Hayden loam, 18 to 25 percent slopes</td>
<td>0</td>
<td>39.5</td>
<td>17.9%</td>
</tr>
<tr>
<td>HaF2</td>
<td>Hayden loam, 22 to 40 percent slopes</td>
<td>0</td>
<td>6.2</td>
<td>2.8%</td>
</tr>
<tr>
<td>HbC</td>
<td>Hayden sandy loam, 6 to 12 percent slopes</td>
<td>0</td>
<td>0.8</td>
<td>0.3%</td>
</tr>
<tr>
<td>HbC2</td>
<td>Hayden sandy loam, 6 to 12 percent slopes, moderately eroded</td>
<td>0</td>
<td>2.7</td>
<td>1.2%</td>
</tr>
<tr>
<td>HbD3</td>
<td>Hayden sandy clay loam, 12 to 18 percent slopes, severely eroded</td>
<td>0</td>
<td>0.9</td>
<td>0.4%</td>
</tr>
<tr>
<td>HbE2</td>
<td>Hayden sandy loam, 18 to 25 percent slopes</td>
<td>0</td>
<td>12.9</td>
<td>5.9%</td>
</tr>
<tr>
<td>HbE3</td>
<td>Hayden sandy clay loam, 18 to 25 percent slopes</td>
<td>0</td>
<td>11.3</td>
<td>5.1%</td>
</tr>
<tr>
<td>HbF2</td>
<td>Hayden sandy loam, 25 to 35 percent slopes</td>
<td>0</td>
<td>0.2</td>
<td>0.1%</td>
</tr>
<tr>
<td>HcD3</td>
<td>Hayden soils, 12 to 18 percent slopes, severely eroded</td>
<td>0</td>
<td>4.1</td>
<td>1.9%</td>
</tr>
<tr>
<td>HcE3</td>
<td>Hayden soils, 18 to 25 percent slopes</td>
<td>0</td>
<td>6.0</td>
<td>2.7%</td>
</tr>
<tr>
<td>Map unit symbol</td>
<td>Map unit name</td>
<td>Rating</td>
<td>Acres in AOI</td>
<td>Percent of AOI</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td>LbC2</td>
<td>Estherville-Burnsville complex, 6 to 12 percent slopes, moderately eroded</td>
<td>5</td>
<td>2.0</td>
<td>0.9%</td>
</tr>
<tr>
<td>LbD</td>
<td>Estherville-Burnsville complex, 12 to 50 percent slopes</td>
<td>5</td>
<td>2.2</td>
<td>1.0%</td>
</tr>
<tr>
<td>LcB</td>
<td>Lester loam, 2 to 6 percent slopes</td>
<td>10</td>
<td>0.7</td>
<td>0.3%</td>
</tr>
<tr>
<td>LcB2</td>
<td>Lester loam, 2 to 6 percent slopes, moderately eroded</td>
<td>0</td>
<td>2.4</td>
<td>1.1%</td>
</tr>
<tr>
<td>Ma</td>
<td>Marsh</td>
<td>100</td>
<td>2.7</td>
<td>1.2%</td>
</tr>
<tr>
<td>PaA</td>
<td>Klossner muck, 0 to 1 percent slopes</td>
<td>100</td>
<td>5.0</td>
<td>2.3%</td>
</tr>
<tr>
<td>PbA</td>
<td>Houghton muck, 0 to 1 percent slopes</td>
<td>100</td>
<td>65.3</td>
<td>29.6%</td>
</tr>
<tr>
<td>Sb</td>
<td>Steep land, Hayden-Lester materials</td>
<td>0</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>TcB</td>
<td>Terril loam, 2 to 6 percent slopes</td>
<td>8</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td></td>
<td><strong>221.0</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named ‘Rating’. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:


**Rating Options**

*Aggregation Method:* Percent Present  
*Component Percent Cutoff:* None Specified  
*Tie-break Rule:* Lower
APPENDIX C

Precipitation Data
Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:
- county: Scott
- township number: 113N
- township name: New Market
- range number: 21W
- nearest community: New Market
- section number: 9

Aerial photograph or site visit date:
Wednesday, October 10, 2018

Score using 1981-2010 normal period

<table>
<thead>
<tr>
<th>values are in inches</th>
<th>first prior month: 2018</th>
<th>second prior month: 2018</th>
<th>third prior month: 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>estimated precipitation total for this location:</td>
<td>5.46 2.32 3.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>there is a 30% chance this location will have less than:</td>
<td>1.99 3.72 2.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>there is a 30% chance this location will have more than:</td>
<td>4.43 5.33 4.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>type of month:</td>
<td>dry normal wet</td>
<td>wet dry normal</td>
<td></td>
</tr>
<tr>
<td>monthly score</td>
<td>3 * 3 = 9 2 * 1 = 2 1 * 2 = 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>multi-month score:</td>
<td>6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)</td>
<td>13 (Normal)</td>
<td></td>
</tr>
</tbody>
</table>

Other Resources:
- retrieve daily precipitation data
- view radar-based precipitation estimates
- view weekly precipitation maps
- Evaluating Antecedent Precipitation Conditions (BWSR)
APPENDIX D

MN DNR Public Waters Inventory
APPENDIX E

Field Data Sheets
### SUMMARY OF FINDINGS

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric soil present?</td>
<td>Y</td>
</tr>
<tr>
<td>Indicators of wetland hydrology present?</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Is the sampled area within a wetland?**  
Y

**Remarks:**

- Depressional area.

### VEGETATION — Use scientific names of plants.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Species</th>
<th>Amount</th>
<th>% Cover</th>
<th>Number of Dominant Species that are OBL, FACW, or FAC:</th>
<th>Total Number of Dominant Species Across all Strata:</th>
<th>Percent of Dominant Species that are OBL, FACW, or FAC:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree stratum</td>
<td>Populus tremuloides</td>
<td>1</td>
<td>20</td>
<td>3 (A)</td>
<td>3 (B)</td>
<td>100.00% (A/B)</td>
</tr>
<tr>
<td>Sapling/Shrub stratum</td>
<td>Rhamnus cathartica</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herb stratum</td>
<td>Phalaris arundinacea</td>
<td>1</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

- (Include photo numbers here or on a separate sheet)
### Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Color (moist)</th>
<th>%</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>10YR 2/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>cl lo</td>
<td></td>
</tr>
<tr>
<td>3-8</td>
<td>10YR 3/1</td>
<td>95</td>
<td>5</td>
<td>10YR 4/6</td>
<td>10C</td>
<td>M</td>
<td>M</td>
<td>cl lo</td>
<td></td>
</tr>
<tr>
<td>8-16</td>
<td>10YR 3/1</td>
<td>70</td>
<td>10</td>
<td>10YR 4/6</td>
<td>10C</td>
<td>M</td>
<td>M</td>
<td>cl lo</td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

### Indicators for Problematic Hydric Soils:

- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

### Restrictive Layer (if observed):

- Hydric soil present? Y
- Type: 
- Depth (inches): 
- Remarks: indicator met within top 16 inches

### HYDROLOGY

#### Wetland Hydrology Indicators:

**Primary Indicators (minimum of one is required; check all that apply)**
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)

**Secondary Indicators (minimum of two required)**
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)

**Field Observations:**

- Surface water present? Yes
- Water table present? Yes
- Saturation present? Yes
- (includes capillary fringe)

**Indicators of wetland hydrology present? Y**

**Depth (inches):**

**Remarks:**

- Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

- Area received approximately 3 inches the week before the site review.
### HYDROPHYTIC VEGETATION INDICATORS:

- **Rapid test for hydrophytic vegetation**
  - X Dominance test is >50%
  - Prevalence index is ≤3.0*
  - Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
  - Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### VEGETATION

**--- Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Absolute % Cover</th>
<th>Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree stratum (Plot size: 30')</td>
<td>1 <em>Populus tremuloides</em></td>
<td>Y FAC</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

30 = Total Cover

<table>
<thead>
<tr>
<th>Sapling/ Shrub stratum (Plot size: 15')</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Absolute % Cover</th>
<th>Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 <em>Rhamnus cathartica</em></td>
<td>40</td>
<td>Y FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 <em>Cornus racemosa</em></td>
<td>20</td>
<td>Y FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 <em>Populus tremuloides</em></td>
<td>20</td>
<td>Y FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

80 = Total Cover

<table>
<thead>
<tr>
<th>Herb stratum (Plot size: 5')</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Absolute % Cover</th>
<th>Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 <em>Rhamnus cathartica</em></td>
<td>5</td>
<td>Y FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 <em>Apocynum androsaemifolium</em></td>
<td>5</td>
<td>Y UPL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10 = Total Cover

<table>
<thead>
<tr>
<th>Woody vine stratum (Plot size: 30')</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Absolute % Cover</th>
<th>Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 = Total Cover

Remarks: (Include photo numbers here or on a separate sheet)
**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Location**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>10YR 3/2</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>sa lo</td>
<td></td>
</tr>
<tr>
<td>19-24</td>
<td>10YR 4/3</td>
<td>98</td>
<td>10YR 4/6</td>
<td>2</td>
<td>C</td>
<td>M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.  **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

**Indicators for Problematic Hydric Soils:**
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

**Restrictive Layer (if observed):**
- Type: ____________________________
- Depth (inches): ____________________
- Remarks: ________________________
- Hydric soil present? N

**HYDROLOGY**

**Wetland Hydrology Indicators:**
- Primary Indicators (minimum of one is required; check all that apply)
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)
  - Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)
- Secondary Indicators (minimum of two required)
  - Surface Soil Cracks (B6)
  - Drainage Patterns (B10)
  - Dry-Season Water Table (C2)
  - Clayfish Burrows (C8)
  - Saturation Visible on Aerial Imagery (C9)
  - Stunted or Stressed Plants (D1)
  - Geomorphic Position (D2)
  - FAC-Neutral Test (D5)

**Field Observations:**
- Surface water present? Yes ______ No ______
- Water table present? Yes ______ No ______
- Saturation present? Yes ______ No ______
- (includes capillary fringe)
- Depth (inches): ____________________
- Indicators of wetland hydrology present? N

**Remarks:**
- Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Area received approximately 3 inches the week before the site review.
**SUMMARY OF FINDINGS**

| Hydrophytic vegetation present? | Y |
| Hydric soil present? | Y |
| Indicators of wetland hydrology present? | Y |

Remarks: (If needed, explain any answers in remarks.)

**VEGETATION** -- Use scientific names of plants.

**Dominance Test Worksheet**

| Number of Dominant Species that are OBL, FACW, or FAC: 1 (A) |
| Total Number of Dominant Species Across all Strata: 1 (B) |
| Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B) |

**Prevalence Index Worksheet**

<table>
<thead>
<tr>
<th>Total % Cover of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBL species</td>
</tr>
<tr>
<td>FACW species</td>
</tr>
<tr>
<td>FAC species</td>
</tr>
<tr>
<td>FACU species</td>
</tr>
<tr>
<td>UPL species</td>
</tr>
<tr>
<td>Column totals</td>
</tr>
</tbody>
</table>

Prevalence Index = B/A = 1.94

**Hydrophytic Vegetation Indicators:**

- Rapid test for hydrophytic vegetation
  - X Dominance test is >50%
  - X Prevalence index is ≤3.0*
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Remarks: (Include photo numbers here or on a separate sheet)
**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist)</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>10YR 2/1</td>
<td>100</td>
<td>cl lo</td>
<td></td>
</tr>
<tr>
<td>4-20</td>
<td>10YR 2/1</td>
<td>95 10YR 4/6</td>
<td>5 C M</td>
<td>cl lo</td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

**Indicators for Problematic Hydric Soils:**

- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

**Restrictive Layer (if observed):**

- Type: 
- Depth (inches): 
- Remarks: soil met within to 20 inches

**HYDROLOGY**

**Wetland Hydrology Indicators:**

- Surface water present? Yes
- Water table present? Yes
- Saturation present? Yes

<table>
<thead>
<tr>
<th>Primary Indicators (minimum of one is required; check all that apply)</th>
<th>Secondary Indicators (minimum of two required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water (A1)</td>
<td>Surface Soil Cracks (B6)</td>
</tr>
<tr>
<td>High Water Table (A2)</td>
<td>Drainage Patterns (B10)</td>
</tr>
<tr>
<td>X Saturation (A3)</td>
<td>Dry-Season Water Table (C2)</td>
</tr>
<tr>
<td>Water Marks (B1)</td>
<td>Clayfish Burrows (C8)</td>
</tr>
<tr>
<td>Sediment Deposits (B2)</td>
<td>Saturation Visible on Aerial Imagery (C9)</td>
</tr>
<tr>
<td>Drift Deposits (B3)</td>
<td>Stunted or Stressed Plants (D1)</td>
</tr>
<tr>
<td>Algal Mat or Crust (B4)</td>
<td>Geomorphic Position (D2)</td>
</tr>
<tr>
<td>Iron Deposits (B5)</td>
<td>FAC-Neutral Test (D5)</td>
</tr>
<tr>
<td>Inundation Visible on Aerial Imagery (B7)</td>
<td></td>
</tr>
<tr>
<td>Sparsely Vegetated Concave Surface (B8)</td>
<td></td>
</tr>
<tr>
<td>Water-Stained Leaves (B9)</td>
<td></td>
</tr>
</tbody>
</table>

**Field Observations:**

- Surface water present? Yes
- Water table present? Yes
- Saturation present? Yes

<table>
<thead>
<tr>
<th>Indicators of wetland hydrology present?</th>
<th>Y</th>
</tr>
</thead>
</table>

**Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:**

**Remarks:**

Area received approximately 3 inches the week before the site review.
WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: YMCA Camp  
City/County: Scott County  
State: MN  
Sampling Date: 10/10/2018  
Applicant/Owner: YMCA  
Sampling Point: SP-4  
Investigator(s): A. Payne, L. Payne  
Local relief (concave, convex, none): none  
Landform (hillslope, terrace, etc.): hillslope  
Section, Township, Range: S 9, T 113N, R 21W

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation, soil significantly disturbed? X
Are vegetation, soil naturally problematic? Y (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>N</th>
<th>Is the sampled area within a wetland?</th>
<th>N</th>
</tr>
</thead>
</table>

Remarks: (Include photo numbers here or on a separate sheet)
grazed area

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')

<table>
<thead>
<tr>
<th></th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<td>5</td>
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</tr>
</tbody>
</table>

0 = Total Cover

Sapling/Shrub stratum (Plot size: 15')

<p>| | | | |</p>
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<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>2</td>
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<tr>
<td>5</td>
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<td></td>
</tr>
</tbody>
</table>

0 = Total Cover

Herb stratum (Plot size: 5')

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Poa pratensis</td>
<td>50 Y FAC</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Trifolium repens</td>
<td>30 Y FACU</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Taraxacum officinale</td>
<td>20 Y FACU</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
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<tr>
<td>10</td>
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</tr>
</tbody>
</table>

44.44% Absolute Cover

100 = Total Cover

Woody vine stratum (Plot size: 30')

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 = Total Cover

Remarks: (Include photo numbers here or on a separate sheet)

Hydrophytic Vegetation Indicators:
- Rapid test for hydrophytic vegetation
- Dominance test is >50%
- Prevalence index is ≤3.0*
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

Dominance Test Worksheet
- Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)
- Total Number of Dominant Species Across all Strata: 3 (B)
- Percent of Dominant Species that are OBL, FACW, or FAC: 33.33% (A/B)

Prevalence Index Worksheet
- Total % Cover of:
  - OBL species 0 x 1 = 0
  - FACW species 0 x 2 = 0
  - FAC species 50 x 3 = 150
  - FACU species 50 x 4 = 200
  - UPL species 0 x 5 = 0
- Column totals 100 (A) 350 (B)
- Prevalence Index = B/A = 3.50

Hydrophytic vegetation present? N

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Matrix Color (moist)</th>
<th>% Color (moist)</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>10YR 2/1</td>
<td>100</td>
<td></td>
<td>cl lo</td>
<td></td>
</tr>
<tr>
<td>10-24</td>
<td>10YR 2/1</td>
<td>98</td>
<td>7.5YR 5/6</td>
<td>2</td>
<td>M</td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

### Indicators for Problematic Hydric Soils:
- Coast Prairie Redox (A16)
- Dark Surface (S7)
- Iron-Manganese Masses (F12)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

### Restrictive Layer (if observed):
Type: 
Depth (inches): 
Remarks:

### Hydric soil present? N

**HYDROLOGY**

### Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- FAC-Neutral Test (D5)

### Field Observations:
- Surface water present? Yes _____ No X Depth (inches): 
- Water table present? Yes _____ No X Depth (inches): 
- Saturation present? Yes _____ No X Depth (inches): 
- Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
- Area received approximately 3 inches the week before the site review.
**WETLAND DETERMINATION DATA FORM - Midwest Region**

**Project/Site:** YMCA Camp  
**City/County:** Scott County  
**State:** MN  
**Sampling Date:** 10/10/2018  
**Applicant/Owner:** YMCA  
**Investigator(s):** A. Payne, L. Payne  
**Landform (hilsslope, terrace, etc.):** depression  
**Local relief (concave, convex, none):** concave  
**Slope (%):**  
**Soil Map Unit Name:** Y  
**NWI Classification:** Y  
**Section, Township, Range:** S 9, T 113N, R 21W  

**SUMMARY OF FINDINGS**

- Hydrophytic vegetation present? _Y_  
- Hydric soil present? _Y_  
- Is the sampled area within a wetland? _Y_  

Remarks: (If needed, explain any answers in remarks.)

- sample point completed within the swale

**VEGETATION -- Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>(Plot size: 30')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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</tr>
<tr>
<td>5</td>
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<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

<table>
<thead>
<tr>
<th>Sapling/Shrub stratum</th>
<th>(Plot size: 15')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td>2</td>
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<tr>
<td>5</td>
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<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

<table>
<thead>
<tr>
<th>Herb stratum</th>
<th>(Plot size: 5')</th>
<th>Scientific Name</th>
<th>Absolute % Cover</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Phalaris arundinacea</em></td>
<td>100</td>
<td>Y</td>
<td>FACW</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
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<td>4</td>
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<tr>
<td>5</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

<table>
<thead>
<tr>
<th>Woody vine stratum</th>
<th>(Plot size: 30')</th>
<th>Scientific Name</th>
<th>Absolute % Cover</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

- Total Cover = 0

**Dominance Test Worksheet**

- Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)
- Total Number of Dominant Species Across all Strata: 1 (B)
- Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

<table>
<thead>
<tr>
<th>Prevalence Index Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total % Cover of:</td>
</tr>
<tr>
<td>OBL species 0 x 1 = 0</td>
</tr>
<tr>
<td>FACW species 100 x 2 = 200</td>
</tr>
<tr>
<td>FAC species 0 x 3 = 0</td>
</tr>
<tr>
<td>FACU species 0 x 4 = 0</td>
</tr>
<tr>
<td>UPL species 0 x 5 = 0</td>
</tr>
<tr>
<td>Column totals 100 (A) 200 (B)</td>
</tr>
</tbody>
</table>

- Prevalence Index = B/A = 2.00

**Hydrophytic Vegetation Indicators:**

- Rapid test for hydrophytic vegetation
- Prevalence index is ≤3.0
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

- *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Remarks:** (Include photo numbers here or on a separate sheet)
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist) %</th>
<th>Redox Features Color (moist) %</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>10YR 2/1</td>
<td>95</td>
<td>7.5YR 4/6</td>
<td>5</td>
<td>C</td>
<td>M</td>
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</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- Histisol (A1)
- Stunted or Stressed Plants (D1)
- Other (explain in remarks)
- Depth (inches): 0-12

Indicators for Problematic Hydric Soils:

- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

Restrictive Layer (if observed):

Type:  

Depth (inches): 0-12

Indicators of hydric soil present? Y

Hydric soil met within top 12 inches.

HYDROLOGY

Wetland Hydrology Indicators:

- Surface Water (A1)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Primary Indicators (minimum of one is required; check all that apply)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Secondary Indicators (minimum of two required)
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Sediment Depressions (C9)
- Stunted or Stressed Plants (D1)
- Other (Explain in Remarks)

Field Observations:

- Surface water present? Yes
- Water table present? Yes
- Saturation present? Yes
- Includes capillary fringe
- Depth (inches): 0-12

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
**WETLAND DETERMINATION DATA FORM - Midwest Region**

**Project/Site:** YMCA Camp  
**City/County:** Scott County  
**State:** MN  
**Sampling Date:** 10/10/2018  
**Applicant/Owner:** YMCA  
**Sampling Point:** SP-6  
**Investigator(s):** A. Payne, L. Payne  
**Landform (hillslope, terrace, etc.):** depression  
**Local relief (concave, convex, none):** concave

<table>
<thead>
<tr>
<th>Slope (%):</th>
<th>Soil Map Unit Name</th>
<th>Lat:</th>
<th>Long:</th>
<th>Datum:</th>
<th>NWI Classification:</th>
</tr>
</thead>
</table>

**Are climatic/hydrologic conditions of the site typical for this time of the year?**

- [ ] Yes  
- [ ] No  

(If no, explain in remarks.)

**Are vegetation, soil significantly disturbed?**

- [ ] Yes  
- [ ] No  

(If needed, explain any answers in remarks.)

**Are vegetation, soil naturally problematic?**

- [ ] Yes  
- [ ] No  

(If needed, explain any answers in remarks.)

---

### SUMMARY OF FINDINGS

- **Hydrophytic vegetation present?** [ ]  
- **Hydric soil present?** [ ]  
- **Is the sampled area within a wetland?** [ ]

(If yes, optional wetland site ID: ______)

**Remarks:** (Include photo numbers here or on a separate sheet)

---

### VEGETATION

---

#### Tree Stratum

- **Plot size:** 30’

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>= Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

#### Sapling/Shrub Stratum

- **Plot size:** 15’

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>= Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

#### Herb Stratum

- **Plot size:** 5’

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>= Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carex lacustris</td>
<td>Phalaris arundinacea</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

#### Woody Vine Stratum

- **Plot size:** 30’

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>= Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

---

### Dominance Test Worksheet

- **Number of Dominant Species that are OBL, FACW, or FAC:** 3  
- **Total Number of Dominant Species Across all Strata:** 3

#### Prevalence Index Worksheet

- **Total % Cover of:**
  - OBL species: 70  
  - FACW species: 30  
  - FAC species: 0  
  - FACU species: 0  
  - UPL species: 0

- **Column totals:** 100  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>= Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

#### Hydrophytic Vegetation Indicators:

- **Rapid test for hydrophytic vegetation**
  - X Dominance test is >50%
  - X Prevalence index is ≤3.0*

#### Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)

#### Problematic hydrophytic vegetation*

(If needed, explain in remarks)

---

**Remarks:** (Include photo numbers here or on a separate sheet)
### Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>10YR 5/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>sa cl</td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Gleyed Matrix (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

### Restrictive Layer (If observed):

Type: ____________________________

Depth (inches): ______________________

Remarks: hydric soil met within top 14 inches.

### HYDROLOGY

#### Wetland Hydrology Indicators:

<table>
<thead>
<tr>
<th>Primary Indicators (minimum of one is required; check all that apply)</th>
<th>Secondary Indicators (minimum of two required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X Surface Water (A1)</td>
<td>Surface Soil Cracks (B6)</td>
</tr>
<tr>
<td>X High Water Table (A2)</td>
<td>Drainage Patterns (B10)</td>
</tr>
<tr>
<td>X Saturation (A3)</td>
<td>Dry-Season Water Table (C2)</td>
</tr>
<tr>
<td>Water Marks (B1)</td>
<td>Crayfish Burrows (C8)</td>
</tr>
<tr>
<td>Sediment Deposits (B2)</td>
<td>Saturation Visible on Aerial Imagery (C9)</td>
</tr>
<tr>
<td>Drift Deposits (B3)</td>
<td>Stunted or Stressed Plants (D1)</td>
</tr>
<tr>
<td>Algal Mat or Crust (B4)</td>
<td>Geomorphic Position (D2)</td>
</tr>
<tr>
<td>Iron Deposits (B5)</td>
<td>FAC-Neutral Test (D5)</td>
</tr>
<tr>
<td>Inundation Visible on Aerial Imagery (B7)</td>
<td></td>
</tr>
<tr>
<td>Sparsely Vegetated Concave Surface (B8)</td>
<td></td>
</tr>
<tr>
<td>Water-Stained Leaves (B9)</td>
<td></td>
</tr>
</tbody>
</table>

#### Field Observations:

<table>
<thead>
<tr>
<th>Surface water present?</th>
<th>Yes</th>
<th>X</th>
<th>No</th>
<th>Depth (inches): 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water table present?</td>
<td>Yes</td>
<td>X</td>
<td>No</td>
<td>Depth (inches): 0</td>
</tr>
<tr>
<td>(includes capillary fringe)</td>
<td></td>
<td></td>
<td></td>
<td>Depth (inches): 0</td>
</tr>
</tbody>
</table>

### Remarks:

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
**WETLAND DETERMINATION DATA FORM - Midwest Region**

**Project/Site:** YMCA Camp  
**City/County:** Scott County  
**Sampling Date:** 10/10/2018

**Applicant/Owner:** YMCA  
**State:** MN  
**Sampling Point:** SP-7

**Investigator(s):** A. Payne, L. Payne  
**Section, Township, Range:** S 9, T 113N, R 21W

**Landform (hillslope, terrace, etc.):** slope  
**Local relief (concave, convex, none):** none

**Slope (%):**  
**Lat:**  
**Long:**  
**Datum:**

**Soil Map Unit Name:** Y  
**WRI Classification:**

---

**SUMMARY OF FINDINGS**

- Hydrophytic vegetation present? **N**  
- Hydric soil present? **N**  
- Indicators of wetland hydrology present? **N**  
- Is the sampled area within a wetland? **N**

**Remarks:** (Include photo numbers here or on a separate sheet)

2.5 ft upslope from SP-6. Grazed Area.

---

**VEGETATION** -- Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>(Plot size: 30')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

**Sapling/Shrub stratum** (Plot size: 15')

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>(Plot size: 15')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>30</td>
<td><strong>Juniperus virginiana</strong></td>
<td>FACU</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>10</td>
<td><strong>Rhamnus cathartica</strong></td>
<td>FAC</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 40

**Herb stratum** (Plot size: 5')

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>(Plot size: 5')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>45</td>
<td><strong>Poa pratensis</strong></td>
<td>FAC</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>20</td>
<td><strong>Plantago major</strong></td>
<td>FAC</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>20</td>
<td><strong>Trifolium repens</strong></td>
<td>FACU</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>20</td>
<td><strong>Symphyotrichum ericoides</strong></td>
<td>FACU</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
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<td>7</td>
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<td>8</td>
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<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>105</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 105

**Woody vine stratum** (Plot size: 30')

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>(Plot size: 30')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

---

**Dominance Test Worksheet**

- Number of Dominant Species that are OBL, FACW, or FAC: **3** (A)
- Total Number of Dominant Species Across all Strata: **6** (B)
- Percent of Dominant Species that are OBL, FACW, or FAC: **50.00%** (A/B)

**Prevalence Index Worksheet**

- Total % Cover of:
  - OBL species: **0 x 1 = 0**
  - FACW species: **0 x 2 = 0**
  - FAC species: **75 x 3 = 225**
  - FACU species: **70 x 4 = 280**
  - UPL species: **0 x 5 = 0**

- Column totals: **145** (A)  
- **505** (B)

- Prevalence Index = B/A = **3.48**

**Hydrophytic Vegetation Indicators:**

- Rapid test for hydrophytic vegetation: **Dominance test is >50%**  
- Prevalence index is ≤3.0*
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Remarks:**

Remarks: (Include photo numbers here or on a separate sheet)
## SOIL Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.
**Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

### Indicators for Problematic Hydric Soils:
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

### Restrictive Layer (if observed):
Type: 
Depth (inches): 
Remarks:

not investigated due to lack of vegetation

### HYDROLOGY

#### Wetland Hydrology Indicators:
**Primary Indicators (minimum of one is required; check all that apply)**
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)

**Secondary Indicators (minimum of two required)**
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)

#### Field Observations:
- Surface water present? Yes No X Depth (inches): 
- Water table present? Yes No X Depth (inches): 
- Saturation present? Yes No X Depth (inches): (includes capillary fringe)

**Indicators of wetland hydrology present?** N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

US Army Corps of Engineers  Midwest Region
### WETLAND DETERMINATION DATA FORM - Midwest Region

**Project/Site:** YMCA Camp  
**City/County:** Scott County  
**Sampling Date:** 10/10/2018

**Applicant/Owner:** YMCA  
**State:** MN  
**Investigator(s):** A. Payne, L. Payne

**Landform (hillslope, terrace, etc.):** depression  
**Section, Township, Range:** S 9, T 113N, R 21W

**Slope (%):**  
**Soil Map Unit Name:**  
**NWI Classification:**  
**Investigator(s):** A. Payne, L. Payne

**Remarks:** (Include photo numbers here or on a separate sheet)

---

**SUMMARY OF FINDINGS**

- Hydrophytic vegetation present? **Y**
- Hydric soil present? **Y**
- Indicators of wetland hydrology present? **Y**
- Is the sampled area within a wetland? **Y**
- If yes, optional wetland site ID: ____________

**Remarks:** (Explain alternative procedures here or in a separate report.)

---

**VEGETATION** — Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 30’)</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Dominance Test Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

<table>
<thead>
<tr>
<th>Sapling/Shrub stratum (Plot size: 15’)</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Dominance Test Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<td>4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

<table>
<thead>
<tr>
<th>Herb stratum (Plot size: 5’)</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Dominance Test Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Phalaris arundinacea</td>
<td>90</td>
<td>Y</td>
<td>FACW</td>
<td></td>
</tr>
<tr>
<td>2  Schoenoplectus tabernaemontani</td>
<td>10</td>
<td>N</td>
<td>OBL</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
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</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 100

<table>
<thead>
<tr>
<th>Woody vine stratum (Plot size: 30’)</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Dominance Test Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total Cover = 0

---

**Hydrophytic Vegetation Indicators:**

- Rapid test for hydrophytic vegetation
  - If dominance test is >50%
  - If prevalence index is ≤3.0*

  - Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
  - Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** **Y**

---

**Prevalence Index Worksheet**

<table>
<thead>
<tr>
<th>Total % Cover</th>
<th>OBL species</th>
<th>FACW species</th>
<th>FAC species</th>
<th>FACU species</th>
<th>UPL species</th>
<th>Column totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>90</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td></td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

- Total % Cover = 100 (A), 190 (B)
- Prevalence Index = B/A = 1.90

---

**Remarks:** (Include photo numbers here or on a separate sheet)
## Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>10YR 2/2</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-20</td>
<td>10YR 2/1</td>
<td>95</td>
<td>7.5YR 4/6</td>
<td>5</td>
<td>C</td>
<td>M</td>
<td>sa cl</td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>10YR 4/1</td>
<td>90</td>
<td>7.5YR 4/6</td>
<td>10</td>
<td>C</td>
<td>M</td>
<td>sa cl</td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:
- Histisol (A1)  
- Histic Epipedon (A2)  
- Black Histic (A3)  
- Hydrogen Sulfide (A4)  
- Stratified Layers (A5)  
- 2 cm Muck (A10)  
- Depleted Below Dark Surface (A11)  
- Thick Dark Surface (A12)  
- Sandy Mucky Mineral (S1)  
- 5 cm Mucky Peat or Peat (S3)

### Indicators for Problematic Hydric Soils:
- Coast Prairie Redox (A16) (LRR K, L, R)  
- Dark Surface (S7) (LRR K, L)  
- Iron-Manganese Masses (F12) (LRR K, L, R)  
- Very Shallow Dark Surface (TF12)  
- Other (explain in remarks)

### Restrictive Layer (if observed):
- Type:  
- Depth (inches):  
- Remarks:

### Hydric soil present? Y

### HYDROLOGY

#### Wetland Hydrology Indicators:
- Primary Indicators (minimum of one is required; check all that apply)
  - Surface Water (A1)  
  - High Water Table (A2)  
  - Saturation (A3)  
  - Water Marks (B1)  
  - Sediment Deposits (B2)  
  - Drift Deposits (B3)  
  - Algal Mat or Crust (B4)  
  - Iron Deposits (B5)  
  - Inundation Visible on Aerial Imagery (B7)  
  - Sparsely Vegetated Concave Surface (B8)  
  - Water-Stained Leaves (B9)
- Secondary Indicators (minimum of two required)
  - True Aquatic Plants (B14)  
  - Hydrogen Sulfide Odor (C1)  
  - Oxidized Rhizospheres on Living Roots (C3)  
  - Presence of Reduced Iron (C4)  
  - Recent Iron Reduction in Tilled Soils (C6)  
  - Thin Muck Surface (C7)  
  - Gauge or Well Data (D9)  
  - Other (Explain in Remarks)

#### Field Observations:
- Surface water present? Yes  
- Water table present? Yes  
- Saturation present? Yes  
- Depth (inches):  
- Indicators of wetland hydrology present? Y

Describes recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
### VEGETATION -- Use scientific names of plants.

**Tree Stratum** (Plot size: 30')

<table>
<thead>
<tr>
<th>Number</th>
<th>Tree Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<td>3</td>
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<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sapling/Shrub stratum** (Plot size: 15')

<table>
<thead>
<tr>
<th>Number</th>
<th>Tree Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Herb stratum** (Plot size: 5')

<table>
<thead>
<tr>
<th>Number</th>
<th>Plant Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Poa pratensis</td>
<td>40</td>
<td>Y</td>
<td>FAC</td>
</tr>
<tr>
<td>2</td>
<td>Trifolium repens</td>
<td>40</td>
<td>Y</td>
<td>FACU</td>
</tr>
<tr>
<td>3</td>
<td>Plantago major</td>
<td>10</td>
<td>N</td>
<td>FAC</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
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<tr>
<td>6</td>
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<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>8</td>
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<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Woody vine stratum** (Plot size: 30')

<table>
<thead>
<tr>
<th>Number</th>
<th>Tree Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Dominance Test Worksheet

- Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)
- Total Number of Dominant Species Across all Strata: 2 (B)
- Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

### Prevalence Index Worksheet

- Total % Cover of:
  - OBL species: 0 x 1 = 0
  - FACW species: 0 x 2 = 0
  - FAC species: 50 x 3 = 150
  - FACU species: 40 x 4 = 160
  - UPL species: 0 x 5 = 0
- Column totals: 90 (A) 310 (B)
- Prevalence Index = B/A = 3.44

### Hydrophytic Vegetation Indicators:

- Rapid test for hydrophytic vegetation
  - Dominance test is >50% (Yes)
  - Prevalence index is ≤3.0* (Yes)
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Remarks:

Include photo numbers here or on a separate sheet.
### Wetland Hydrology Indicators:

**Primary Indicators (minimum of one is required; check all that apply)**

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)

**Field Observations:**

<table>
<thead>
<tr>
<th>Surface water present?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water table present?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Saturation present?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

(includes capillary fringe)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>X</th>
</tr>
</thead>
</table>

**Hydric Soil Indicators:**

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

**Indicators for Problematic Hydric Soils:**

- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic*

### Remarks:

- not investigated due to lack of vegetation

### HYDROLOGY

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

**Remarks:**
**WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site: YMCA Camp  
Applicant/Owner: YMCA  
Investigator(s): A. Payne, L. Payne  
Landform (hillslope, terrace, etc.): slope  
Slope (%):  
Soil Map Unit Name:  
Section, Township, Range: S 9, T 113N, R 21W  
State: MN  
Sampling Point: SP-10  
Sampling Date: 10/10/2018  
Latitude:  
Longitude:  
Datum:  
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)  
Are vegetation, soil significantly disturbed?  
Are vegetation, soil naturally problematic?  

**SUMMARY OF FINDINGS**

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric soil present?</td>
<td>Y</td>
</tr>
<tr>
<td>Indicators of wetland hydrology present?</td>
<td>Y</td>
</tr>
</tbody>
</table>

Is the sampled area within a wetland? Y  
Remarks: (Explain alternative procedures here or in a separate report.)  

edge of wetland on north side

**VEGETATION** -- Use scientific names of plants.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Stratum (Plot size: 30’)</td>
<td><strong>1 Salix nigra</strong></td>
<td>20 Y OBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>5</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapling/Shrub stratum (Plot size: 15’)</td>
<td></td>
<td>20 = Total Cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1 Carex lacustris</strong></td>
<td>40 Y OBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2 Scirpus atrovirens</strong></td>
<td>30 Y OBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>3 Phalaris arundinacea</strong></td>
<td>20 Y FACW</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>5</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herb stratum (Plot size: 5’)</td>
<td></td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1</strong> Carex lacustris</td>
<td>40 Y OBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2</strong> Scirpus atrovirens</td>
<td>30 Y OBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>3 Phalaris arundinacea</strong></td>
<td>20 Y FACW</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>5</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody vine stratum (Plot size: 30’)</td>
<td></td>
<td>90 = Total Cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2</strong></td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dominance Test Worksheet**

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)  
Total Number of Dominant Species Across all Strata: 4 (B)  
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)  

**Prevalence Index Worksheet**

Total % Cover of:  
OBL species 90 x 1 = 90  
FACW species 20 x 2 = 40  
FAC species 0 x 3 = 0  
FACU species 0 x 4 = 0  
UPL species 0 x 5 = 0  
Column totals 110 (A) 130 (B)  
Prevalence Index = B/A = 1.18

**Hydrophytic Vegetation Indicators:**

- Rapid test for hydrophytic vegetation  
- Dominance test is >50%  
- Prevalence index is ≤3.0*  

Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)  
Problematic hydrophytic vegetation*  
(explain)  

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic  

Remarks: (Include photo numbers here or on a separate sheet)  

US Army Corps of Engineers Midwest Region
### Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>10YR 2/2</td>
<td>10YR 4/6</td>
<td>5 C M</td>
<td>cl lo</td>
</tr>
<tr>
<td>6-16</td>
<td>10YR 2/1</td>
<td>10YR 4/6</td>
<td>5 C M</td>
<td>sa cl</td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

### Indicators for Problematic Hydric Soils:
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

### Restrictive Layer (if observed):
Type: __________________________
Depth (inches): __________________________
Remarks: met within the top 16 inches

### HYDROLOGY

#### Wetland Hydrology Indicators:
**Primary Indicators (minimum of one is required; check all that apply)**
- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Clayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)

#### Field Observations:
- Surface water present? Yes X No Depth (inches): 1
- Water table present? Yes X No Depth (inches): 4
- Saturation present? Yes X No Depth (inches): 0

**Indicators of wetland hydrology present?** Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

US Army Corps of Engineers Midwest Region
**WETLAND DETERMINATION DATA FORM - Midwest Region**

- **Project/Site**: YMCA Camp
- **Applicant/Owner**: YMCA
- **Investigator(s)**: A. Payne, L. Payne
- **Sampling Date**: 10/10/2018
- **Section, Township, Range**: S 9, T 113N, R 21W
- **Morphological adaptations** (provide supporting data in Remarks or on a separate sheet)

### SUMMARY OF FINDINGS

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>N</th>
<th>Is the sampled area within a wetland?</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric soil present?</td>
<td>N</td>
<td>f yes, optional wetland site ID:</td>
<td></td>
</tr>
<tr>
<td>Indicators of wetland hydrology present?</td>
<td>N</td>
<td>Remarks: (If needed, explain any answers in remarks.)</td>
<td></td>
</tr>
</tbody>
</table>

### VEGETATION -- Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>(Plot size: 30')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapling/Shrub stratum</td>
<td>(Plot size: 15')</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<td>3</td>
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<tr>
<td>4</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herb stratum</td>
<td>(Plot size: 5')</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Poa pratensis</td>
<td>30 Y FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Trifolium repens</td>
<td>30 Y FACU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Taraxacum officinale</td>
<td>20 Y FACU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Plantago major</td>
<td>20 Y FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>6</td>
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<td></td>
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</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>100 = Total Cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody vine stratum</td>
<td>(Plot size: 30')</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Dominance Test Worksheet

- Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)
- Total Number of Dominant Species Across all Strata: 4 (B)
- Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

### Prevalence Index Worksheet

- Total % Cover of:
  - OBL species 0 x 1 = 0
  - FACW species 0 x 2 = 0
  - FAC species 50 x 3 = 150
  - FACU species 50 x 4 = 200
  - UPL species 0 x 5 = 0
- Column totals: 100 (A) 350 (B)
- Prevalence Index = B/A = 3.50

### Hydrophytic Vegetation Indicators:

- Rapid test for hydrophytic vegetation
  - Dominance test is >50%
  - Prevalence index is ≤3.0*
  - Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
  - Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Remarks: (Include photo numbers here or on a separate sheet)
### SOIL Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24</td>
<td>10YR 2/2</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>sa lo</td>
<td>gravel present</td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:
- Histisol (A1)
- Saturated Redox (F6)
- Depleted Redox (F7)
- Redox Depressions (F8)

### Indicators for Problematic Hydric Soils:
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

### Restrictive Layer (if observed):
**Type:**
**Depth (inches):**
**Remarks:**
met within the top 16 inches

### HYDROLOGY

#### Wetland Hydrology Indicators:

**Primary Indicators (minimum of one is required; check all that apply)**
- Surface Water (A1)
- True Aquatic Plants (B14)
- Saturation (A3)
- Hydrogen Sulphide Odor (C1)
- Water Marks (B1)
- Oxidized Rhizospheres on Living Roots (C3)
- Sediment Deposits (B2)
- Presence of Reduced Iron (C4)
- Drift Deposits (B3)
- Recent Iron Reduction in Tilled Soils (C6)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Thin Muck Surface (C7)
- Inundation Visible on Aerial Imagery (B7)
- Geomorphic Position (D2)
- Sparsely Vegetated Concave Surface (B8)
- FAC-Neutral Test (D5)
- Water-Stained Leaves (B9)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)

### Field Observations:

- Surface water present? Yes  No  X  Depth (inches):  
- Water table present? Yes  No  X  Depth (inches):  
- Saturation present? Yes  No  X  Depth (inches): (includes capillary fringe)

**Indicators of wetland hydrology present?** N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

**Remarks:**

US Army Corps of Engineers  Midwest Region
**WETLAND DETERMINATION DATA FORM - Midwest Region**

**Project/Site:** YMCA Camp

**City/County:** Scott County

**Applicant/Owner:** YMCA

**State:** MN

**Investigator(s):** A. Payne, L. Payne

**Section, Township, Range:** S 9, T 113N, R 21W

**Landform (hillslope, terrace, etc.):** terrace

**Local relief (concave, convex, none):** none

**Slope (%):**

**Lat:**

**Long:**

**Datum:**

**Soil Map Unit Name:** Y

**WII Classification:** Y

**Are climatic/hydrologic conditions of the site typical for this time of the year?** Y (If no, explain in remarks)

**Are vegetation, soil significantly disturbed?** Yes

**Are vegetation, soil naturally problematic?** No

**SUMMARY OF FINDINGS**

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric soil present?</td>
<td>Y</td>
</tr>
<tr>
<td>Indicators of wetland hydrology present?</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Is the sampled area within a wetland?** Y

f yes, optional wetland site ID:

**Remarks:** (Explain alternative procedures here or in a separate report.)

### VEGETATION -- Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dominance Test Worksheet**

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

**Prevalence Index Worksheet**

Total % Cover of:

- OBL species: 0 x 1 = 0
- FACW species: 100 x 2 = 200
- FAC species: 0 x 3 = 0
- FACU species: 0 x 4 = 0
- UPL species: 0 x 5 = 0

Column totals: 100 (A) 200 (B)

Prevalence Index = B/A = 2.00

**Hydrophytic Vegetation Indicators:**

- Rapid test for hydrophytic vegetation
  - Dominance test is >50%
  - Prevalence index is ≤3.0*
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** Y

**Remarks:** (Include photo numbers here or on a separate sheet)
### Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix Color (moist) %</th>
<th>Redox Features Color (moist) %</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-8</td>
<td>10YR 2/2 85</td>
<td>7.5YR 4/6 5</td>
<td></td>
<td></td>
<td>sa lo</td>
<td></td>
</tr>
<tr>
<td>10YR 3/4</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

#### Hydric Soil Indicators:
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

#### Indicators for Problematic Hydric Soils:
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

#### Restrictive Layer (if observed):
Type: ____________________________
Depth (inches): __________________
Remarks: met within the top 18 inches

#### Hydric soil present? Y

### HYDROLOGY

#### Wetland Hydrology Indicators:
**Primary Indicators (minimum of one is required; check all that apply)**
- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)

#### Field Observations:
Indicators of wetland hydrology present? Y

<table>
<thead>
<tr>
<th>Field Observations</th>
<th>Yes</th>
<th>X</th>
<th>No</th>
<th>Depth (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface water present?</td>
<td>X</td>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Water table present?</td>
<td>X</td>
<td>No</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Saturation present?</td>
<td>X</td>
<td>No</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

#### Remarks:
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
**WETLAND DETERMINATION DATA FORM - Midwest Region**

**Project/Site:** YMCA Camp  
**City/County:** Scott County  
**Sampling Date:** 10/10/2018

**Applicant/Owner:** YMCA  
**State:** MN  
**Sampling Point:** SP-13

**Investigator(s):** A. Payne, L. Payne  
**Section, Township, Range:** S 9, T 113N, R 21W

**Landform (hillslope, terrace, etc.):** terrace  
**Local relief (concave, convex, none):** none

**Slope (%):**  
**Lat:**  
**Long:**  
**Datum:**

**Soil Map Unit Name:**  
**WIFI Classification:**

**Are climatic/hydrologic conditions of the site typical for this time of the year?** Y  
(If no, explain in remarks)

**Are vegetation, soil significantly disturbed?** No  
(If needed, explain any answers in remarks.)

**Are vegetation, soil naturally problematic?** Yes  
(If needed, explain any answers in remarks.)

### SUMMARY OF FINDINGS

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>Y</th>
<th>Hydric soil present?</th>
<th>Y</th>
<th>Indicators of wetland hydrology present?</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Is the sampled area within a wetland?</strong></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** (Explain alternative procedures here or in a separate report.)

### VEGETATION — Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 30')</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hydric soil present?** Y  
**Indicators of wetland hydrology present?** N  
**Is the sampled area within a wetland?** N

**Remarks:** (Include photo numbers here or on a separate sheet)

#### Dominance Test Worksheet

**Number of Dominant Species that are OBL, FACW, or FAC:** 1 (A)  
**Total Number of Dominant Species Across all Strata:** 3 (B)  
**Percent of Dominant Species that are OBL, FACW, or FAC:** 33.33% (A/B)

#### Prevalence Index Worksheet

**Total % Cover of:**  
**OBL species** 0 x 1 = 0  
**FACW species** 0 x 2 = 0  
**FAC species** 60 x 3 = 180  
**FACU species** 40 x 4 = 160  
**UPL species** 0 x 5 = 0  
**Column totals** 100 (A) 340 (B)  
**Prevalence Index = B/A =** 3.40

#### Hydrophytic Vegetation Indicators:

- Rapid test for hydrophytic vegetation  
- Dominance test is >50%  
- Prevalence index is ≤3.0*  
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)  
- Problematic hydrophytic vegetation* (explain)  

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** N

### Remarks:

**Vegetation**

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
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<td></td>
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<td>4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hydric soil present?** Y  
**Indicators of wetland hydrology present?** N  
**Is the sampled area within a wetland?** N

**Remarks:** (Include photo numbers here or on a separate sheet)

### Dominance Test Worksheet

**Number of Dominant Species that are OBL, FACW, or FAC:** 1 (A)  
**Total Number of Dominant Species Across all Strata:** 3 (B)  
**Percent of Dominant Species that are OBL, FACW, or FAC:** 33.33% (A/B)

#### Prevalence Index Worksheet

**Total % Cover of:**  
**OBL species** 0 x 1 = 0  
**FACW species** 0 x 2 = 0  
**FAC species** 60 x 3 = 180  
**FACU species** 40 x 4 = 160  
**UPL species** 0 x 5 = 0  
**Column totals** 100 (A) 340 (B)  
**Prevalence Index = B/A =** 3.40

#### Hydrophytic Vegetation Indicators:

- Rapid test for hydrophytic vegetation  
- Dominance test is >50%  
- Prevalence index is ≤3.0*  
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)  
- Problematic hydrophytic vegetation* (explain)  

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** N

### Remarks:

**Vegetation**

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<td>4</td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hydric soil present?** Y  
**Indicators of wetland hydrology present?** N  
**Is the sampled area within a wetland?** N

**Remarks:** (Include photo numbers here or on a separate sheet)
SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-16</td>
<td>10YR 2/2</td>
<td>10YR 4/6</td>
<td>sa lo</td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- Histisol (A1)
  - Histic Epipedon (A2)
  - Black Histic (A3)
  - Hydrogen Sulfide (A4)
  - Stratified Layers (A5)
  - 2 cm Muck (A10)
  - Depleted Below Dark Surface (A11)
  - Thick Dark Surface (A12)
  - Sandy Mucky Mineral (S1)
  - 5 cm Mucky Peat or Peat (S3)

Sandy Gleyed Matrix (S4)
Sandy Redox (S5)
Stripped Matrix (S6)
Loamy Mucky Mineral (F1)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

Restrictive Layer (if observed):

- Type: ___________________________
- Depth (inches): ___________________

Remarks: ___________________________

Hydric soil present? Y

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)

Aquatic Fauna (B13)
True Aquatic Plants (B14)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tilled Soils (C6)
Thin Muck Surface (C7)
Gauge or Well Data (D9)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)

Field Observations:

- Surface water present? Yes X No Depth (inches): ___________________
- Water table present? Yes X No Depth (inches): ___________________
- Saturation present? Yes X No Depth (inches): ___________________

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: ___________________________

US Army Corps of Engineers Midwest Region
**WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site: YMCA Camp  City/County: Scott County  Sampling Date: 10/10/2018  
Applicant/Owner: YMCA  State: MN  Sampling Point: SP-14  
Investigator(s): A. Payne, L. Payne  Section, Township, Range: S 9, T 113N, R 21W  
Landform (hillslope, terrace, etc.): terrace  Local relief (concave, convex, none): none  
Slope (%):  
Lat:  Long:  Datum:  
Soil Map Unit Name  NWI Classification:  
Are climatic/hydrologic conditions of the site typical for this time of the year?  Y  (If no, explain in remarks)  
Are vegetation, soil significantly disturbed? Are normal conditions present?  Yes  
Are vegetation, soil naturally problematic?  

### SUMMARY OF FINDINGS

| Hydrophytic vegetation present? | N | Is the sampled area within a wetland? | N | If yes, optional wetland site ID: 
---|---|---|---|---|
| Hydric soil present? | N |  
| Indicators of wetland hydrology present? | N |  

Remarks: (Explain alternative procedures here or in a separate report.)

### VEGETATION -- Use scientific names of plants.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Plot size</th>
<th>Absolute Cover %</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Dominance Test Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Stratum (Plot size: 30’)</td>
<td></td>
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<tr>
<td>Sapling/Shrub stratum (Plot size: 15’)</td>
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<td>5</td>
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<td></td>
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<tr>
<td>Herb stratum (Plot size: 5’)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Poa pratensis</td>
<td>40</td>
<td>Y</td>
<td>FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Taraxacum officinale</td>
<td>30</td>
<td>Y</td>
<td>FACU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Trifolium repens</td>
<td>30</td>
<td>Y</td>
<td>FACU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Plantago major</td>
<td>10</td>
<td>N</td>
<td>FAC</td>
<td></td>
<td></td>
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<td>10</td>
<td>110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Woody vine stratum (Plot size: 30’) | | | | | |
| 1 | | | | | |
| 2 | | | | | |
| 0 | | | | | |

Remarks: (Include photo numbers here or on a separate sheet)

---

**US Army Corps of Engineers Midwest Region**
**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-8</td>
<td>10YR 3/2</td>
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<td></td>
<td>sa lo</td>
<td></td>
</tr>
<tr>
<td>8-20</td>
<td>10YR 2/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>clay</td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

**Indicators for Problematic Hydric Soils:**
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

**Restrictive Layer (if observed):**

<table>
<thead>
<tr>
<th>Type:</th>
<th>Depth (inches):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

**Hydric soil present?** N

**HYDROLOGY**

**Wetland Hydrology Indicators:**

**Primary Indicators (minimum of one is required; check all that apply):**
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)

**Secondary Indicators (minimum of two required):**
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)

**Field Observations:**

- Surface water present? Yes ___ No X Depth (inches): 
- Water table present? Yes ___ No X Depth (inches): 
- Saturation present? Yes ___ No X Depth (inches): 

**Indicators of wetland hydrology present?** N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

**Remarks:**
### WETLAND DETERMINATION DATA FORM - Midwest Region

**Project/Site:** YMCA Camp  
**City/County:** Scott County  
**State:** MN  
**Sampling Date:** 10/10/2018  
**Applicant/Owner:** YMCA  
**Investigator(s):** A. Payne, L. Payne  
**Landform:** terrace  
**Slope (%):**  
**Slope Lat:**  
**Slope Long:**  
**Datum:**  
**Soil Map Unit Name:**  
**Wetland Site ID:** Y  
**Investigator(s):** A. Payne, L. Payne  

**Are climatic/hydrologic conditions of the site typical for this time of the year?** Y  
*(If no, explain in remarks.)*

**Are vegetation, soil significantly disturbed?**  
**Are vegetation, soil naturally problematic?** Yes

### SUMMARY OF FINDINGS

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>Y</th>
<th>Are the sampled area within a wetland?</th>
<th>Y</th>
</tr>
</thead>
</table>

**Remarks:** (Explain alternative procedures here or in a separate report.)

### VEGETATION -- Use scientific names of plants.

**Tree Stratum** (Plot size: 30’)

<table>
<thead>
<tr>
<th>Plot</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<td>5</td>
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</tbody>
</table>

**Sapling/Shrub stratum** (Plot size: 15’)

<table>
<thead>
<tr>
<th>Plot</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>5</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Herb stratum** (Plot size: 5’)

<table>
<thead>
<tr>
<th>Plot</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plantago major</td>
<td>10 N FACU</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Trifolium repens</td>
<td>10 Y FACW</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Phalaris arundinacea</td>
<td>80 Y FACW</td>
<td></td>
</tr>
</tbody>
</table>

**Woody vine stratum** (Plot size: 30’)

<table>
<thead>
<tr>
<th>Plot</th>
<th>Absolute % Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Dominance Test Worksheet**

- Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)
- Total Number of Dominant Species Across all Strata: 1 (B)
- Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

**Prevalence Index Worksheet**

- Total % Cover of:
  - OBL species 0 x 1 = 0
  - FACW species 80 x 2 = 160
  - FAC species 10 x 3 = 30
  - FACU species 10 x 4 = 40
  - UPL species 0 x 5 = 0
- Column totals 100 (A) 230 (B)
- Prevalence Index = B/A = 2.30

**Hydrophytic Vegetation Indicators:**

- Rapid test for hydrophytic vegetation
- Dominance test is >50%
- Prevalence index is ≤3.0*
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

**Hydrophytic vegetation present?** Y

**Remarks:** (Include photo numbers here or on a separate sheet)
### Soils

#### Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
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<td>95</td>
<td>10YR 4/6</td>
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<td>cl lo</td>
<td></td>
</tr>
<tr>
<td>6-12</td>
<td>10YR 5/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>clay</td>
<td></td>
</tr>
</tbody>
</table>

**Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.  **Location: PL = Pore Lining, M = Matrix

#### Hydraulic Soil Indicators:

- Histisol (A1)
  - Histic Epipedon (A2)
  - Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

#### Indicators for Problematic Hydric Soils:

- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

#### Restrictive Layer (if observed):

<table>
<thead>
<tr>
<th>Type:</th>
<th>Depth (inches):</th>
<th>Hydric soil present?</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks:</td>
<td></td>
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</tbody>
</table>

**HYDROLOGY**

#### Wetland Hydrology Indicators:

**Primary Indicators (minimum of one is required; check all that apply)**

- Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)

**Secondary Indicators (minimum of two required)**

- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)

**Field Observations:**

<table>
<thead>
<tr>
<th>Surface water present?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water table present?</td>
<td>Yes</td>
<td>X</td>
</tr>
<tr>
<td>Saturation present?</td>
<td>Yes</td>
<td>X</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth (inches):</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Indicators of wetland hydrology present?</th>
<th>Y</th>
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</thead>
</table>

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

**Remarks:**
### VEGETATION

---

#### Tree Stratum (Plot size: 30’)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

\[= \text{Total Cover}\]

#### Sapling/Shrub stratum (Plot size: 15’)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
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<tr>
<td>5</td>
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</tbody>
</table>

\[= \text{Total Cover}\]

#### Herb stratum (Plot size: 5’)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>Y</td>
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<td>2</td>
<td>20</td>
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<td>N</td>
<td>FAC</td>
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<td>10</td>
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</tr>
</tbody>
</table>

\[= \text{Total Cover}\]

#### Woody vine stratum (Plot size: 30’)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[= \text{Total Cover}\]

### Remarks

Include photo numbers here or on a separate sheet.

#### Hydrophytic Vegetation Indicators:

- **Rapid test for hydrophytic vegetation**
  - Dominance test is >50%
  - Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
  - Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
### Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>0-4</td>
<td>10YR 2/2</td>
<td>7.5YR 5/6</td>
<td>cl lo</td>
<td></td>
</tr>
<tr>
<td>4-16</td>
<td>10YR 2/2</td>
<td>7.5YR 5/6</td>
<td>cl lo</td>
<td></td>
</tr>
<tr>
<td>10YR 4/2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (A13)
- 5 cm Mucky Peat or Peat (A14)

### Hydric soil present? Y

### Restrictive Layer (if observed):
Type: 
Depth (inches): 
Remarks:

### HYDROLOGY

#### Wetland Hydrology Indicators:
- **Primary Indicators** (minimum of one is required; check all that apply)
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Inundation Visible on Aerial Imagery (B7)
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  - Water-Stained Leaves (B9)
  - Aquatic Fauna (B13)
  - True Aquatic Plants (B14)
  - Oxidized Rhizospheres on Living Roots (C3)
  - Presence of Reduced Iron (C4)
  - Recent Iron Reduction in Tilled Soils (C6)
  - Thin Muck Surface (C7)
  - Gauge or Well Data (D9)

- **Secondary Indicators** (minimum of two required)
  - Surface Soil Cracks (B6)
  - Drainage Patterns (B10)
  - Dry-Season Water Table (C2)
  - Crayfish Burrows (C8)
  - Saturation Visible on Aerial Imagery (C9)
  - Stunted or Stressed Plants (D1)
  - Geomorphic Position (D2)
  - FAC-Neutral Test (D5)

#### Field Observations:
- Surface water present? Yes  No  X Depth (inches): 
- Water table present? Yes  No  X Depth (inches): 
- Saturation present? Yes  No  X Depth (inches): 

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
**WETLAND DETERMINATION DATA FORM - Midwest Region**

- **Project/Site:** YMCA Camp
- **City/County:** Scott County
- **Sampling Date:** 10/10/2018
- **Investigator(s):** A. Payne, L. Payne
- **Landform:** terrace
- **Local relief:** none
- **Soil Map Unit Name:**
- **Lat:**
- **Long:**
- **Datum:**

### SUMMARY OF FINDINGS

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>N</th>
<th>Is the sampled area within a wetland?</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric soil present?</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators of wetland hydrology present?</td>
<td>N</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** (If needed, explain any answers in remarks.)

### VEGETATION -- Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>Plot size: 30'</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<td>2</td>
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<tr>
<td>5</td>
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</tr>
</tbody>
</table>

**Hydrophytic vegetation present?**  N

**Hydric soil present?**  N

**Indicators of wetland hydrology present?**  N

**Remarks:** (Include photo numbers here or on a separate sheet)

### Dominance Test Worksheet

- **Number of Dominant Species that are OBL, FACW, or FAC:** 1 (A)
- **Total Number of Dominant Species Across All Strata:** 2 (B)
- **Percent of Dominant Species that are OBL, FACW, or FAC:** 50.00% (A/B)

### Prevalence Index Worksheet

- **Total % Cover of:**
  - OBL species 40 x 1 = 0
  - FACW species 10 x 2 = 20
  - FAC species 50 x 3 = 150
  - FACU species 0 x 4 = 0
  - UPL species 0 x 5 = 0
- **Column totals:** 100 (A) 310 (B)
- **Prevalence Index = B/A =** 3.10

### Hydrophytic Vegetation Indicators:

- **Dominance test is >50%**
- **Prevalence index is ≤3.0**
- **Morphological adaptations** (provide supporting data in Remarks or on a separate sheet)
- **Problematic hydrophytic vegetation** (explain)

- **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic**

**Hydrophytic vegetation present?**  N

**Remarks:** (Include photo numbers here or on a separate sheet)
**SOIL**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (Inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-16</td>
<td>10YR 3/3</td>
<td>100</td>
<td></td>
<td></td>
<td>sa lo</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

**Hydric Soil Indicators:**
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulphide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

**Indicators for Problematic Hydric Soils:**
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

**Hydric soil present? N**

**Restrictive Layer (if observed):**

Type: ____________________________

Depth (inches): ____________________________

Remarks: ____________________________

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface water present? Yes  No  X  Depth (inches): __________
Water table present? Yes  No  X  Depth (inches): __________
Saturation present? Yes  No  X  Depth (inches): __________
(includes capillary fringe)

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: ____________________________

US Army Corps of Engineers  Midwest Region
WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: YMCA Camp
Applicant/Owner: YMCA
Investigator(s): A. Payne, L. Payne
Landform (hillslope, terrace, etc.): terrace

Slope (%): Local relief (concave, convex, none): none
Lat: Long: Datum:

Soil Map Unit Name: 

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation, soil significantly disturbed? Are normal conditions present? Yes

Are vegetation, soil naturally problematic? 

SUMMARY OF FINDINGS

Hydrophytic vegetation present? N
Hydric soil present? N
Indicators of wetland hydrology present? N

Is the sampled area within a wetland? N

Remarks: (Explain alternative procedures here or in a separate report.)

Remarks: (Include photo numbers here or on a separate sheet)

VEGETATION -- Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 30’)</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
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<td>3</td>
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<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

<table>
<thead>
<tr>
<th>Sapling/Shrub stratum (Plot size: 15’)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

<table>
<thead>
<tr>
<th>Herb stratum (Plot size: 5’)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bromus inermis</td>
<td>60 Y FACU</td>
<td></td>
</tr>
<tr>
<td>2 Poa pratensis</td>
<td>20 Y FAC</td>
<td></td>
</tr>
<tr>
<td>3 Trifolium repens</td>
<td>10 N FACU</td>
<td></td>
</tr>
<tr>
<td>4 Phalaris arundinacea</td>
<td>10 N FACW</td>
<td></td>
</tr>
<tr>
<td>5</td>
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<td></td>
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<td>6</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

<table>
<thead>
<tr>
<th>Woody vine stratum (Plot size: 30’)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across all Strata: 2 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:
OBL species 0 x 1 = 0
FACW species 10 x 2 = 20
FAC species 20 x 3 = 60
FACU species 70 x 4 = 280
UPL species 0 x 5 = 0
Column totals 100 (A) 360 (B)
Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

Rapid test for hydrophytic vegetation
- Dominance test is >50%
- Prevalence index is ≤3.0*
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N
### Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type*</th>
<th>Loc**</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>10YR 3/2</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>sa lo</td>
<td>gravel present</td>
</tr>
<tr>
<td>20-24</td>
<td>10YR 2/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>cl lo</td>
<td></td>
</tr>
</tbody>
</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

### Hydric Soil Indicators:
- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

### Indicators for Problematic Hydric Soils:
- Coast Prairie Redox (A16) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Very Shallow Dark Surface (TF12)
- Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

### Restrictive Layer (if observed):
Type: _____________________________

Hydric soil present? N

Remarks: __________________________

### HYDROLOGY

#### Wetland Hydrology Indicators:

<table>
<thead>
<tr>
<th>Primary Indicators (minimum of one is required; check all that apply)</th>
<th>Secondary Indicators (minimum of two required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water (A1)</td>
<td>Surface Soil Cracks (B6)</td>
</tr>
<tr>
<td>High Water Table (A2)</td>
<td>Drainage Patterns (B10)</td>
</tr>
<tr>
<td>Saturation (A3)</td>
<td>Dry-Season Water Table (C2)</td>
</tr>
<tr>
<td>Water Marks (B1)</td>
<td>Crayfish Burrows (C8)</td>
</tr>
<tr>
<td>Sediment Deposits (B2)</td>
<td>Saturation Visible on Aerial Imagery (C9)</td>
</tr>
<tr>
<td>Drift Deposits (B3)</td>
<td>Stunted or Stressed Plants (D1)</td>
</tr>
<tr>
<td>Algal Mat or Crust (B4)</td>
<td>Geomorphic Position (D2)</td>
</tr>
<tr>
<td>Iron Deposits (B5)</td>
<td>FAC-Neutral Test (D5)</td>
</tr>
<tr>
<td>Inundation Visible on Aerial Imagery (B7)</td>
<td></td>
</tr>
<tr>
<td>Sparsely Vegetated Concave Surface (B8)</td>
<td></td>
</tr>
<tr>
<td>Water-Stained Leaves (B9)</td>
<td></td>
</tr>
</tbody>
</table>

#### Field Observations:
- Surface water present? Yes No
- Water table present? Yes No
- Saturation present? Yes No

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: __________________________
**WETLAND DETERMINATION DATA FORM - Midwest Region**

**Project/Site:** YMCA Camp  
**City/County:** Scott County  
**State:** MN  
**Applicant/Owner:** YMCA Camp  
**Sampling Date:** 10/10/2018  
**Investigator(s):** A. Payne, L. Payne  
**Landform:** terrace  
**Section, Township, Range:** S 9, T 113N, R 21W  
**Slope (%):**  
**Lat:**  
**Long:**  
**Datum:**  

**Soil Map Unit Name:**  
**NWI Classification:**  
**Investigator(s):** A. Payne, L. Payne  
**Applicant/Owner:** YMCA State:  

---

### SUMMARY OF FINDINGS

<table>
<thead>
<tr>
<th>Hydrophytic vegetation present?</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric soil present?</td>
<td>Y</td>
</tr>
<tr>
<td>Indicators of wetland hydrology present?</td>
<td>Y</td>
</tr>
<tr>
<td>Is the sampled area within a wetland?</td>
<td>Y</td>
</tr>
</tbody>
</table>

Remarks: (Explain alternative procedures here or in a separate report.)

---

### VEGETATION

**Use scientific names of plants.**

#### Tree Stratum

<table>
<thead>
<tr>
<th>Plot size: 30’</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<td></td>
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<td>2</td>
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<td>4</td>
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<td></td>
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<tr>
<td>5</td>
<td>0</td>
<td>Total Cover</td>
<td></td>
</tr>
</tbody>
</table>

#### Sapling/Shrub stratum

<table>
<thead>
<tr>
<th>Plot size: 15’</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>5</td>
<td>0</td>
<td>Total Cover</td>
<td></td>
</tr>
</tbody>
</table>

#### Herb stratum

<table>
<thead>
<tr>
<th>Plot size: 5’</th>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Phalaris arundinacea</td>
<td>100</td>
<td>Y FACW</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<td>3</td>
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</tr>
<tr>
<td>10</td>
<td>100</td>
<td>Total Cover</td>
<td></td>
</tr>
</tbody>
</table>

#### Woody vine stratum

<table>
<thead>
<tr>
<th>Plot size: 30’</th>
<th>Absolute % Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>0</td>
<td>Total Cover</td>
<td></td>
</tr>
</tbody>
</table>

### Domination Test Worksheet

<table>
<thead>
<tr>
<th>Number of Dominant Species that are OBL, FACW, or FAC:</th>
<th>1</th>
<th>(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Dominant Species Across all Strata:</td>
<td>1</td>
<td>(B)</td>
</tr>
<tr>
<td>Percent of Dominant Species that are OBL, FACW, or FAC:</td>
<td>100.00%</td>
<td>(A/B)</td>
</tr>
</tbody>
</table>

### Prevalence Index Worksheet

<table>
<thead>
<tr>
<th>Total % Cover of:</th>
<th>OBL species</th>
<th>FAC species</th>
<th>FACU species</th>
<th>UPL species</th>
<th>Column totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 x 1 =</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>100 x 2 =</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>0 x 4 =</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 x 5 =</td>
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<td>0</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Column totals</td>
<td>100 (A)</td>
<td>200 (B)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence Index = B/A =</td>
<td>2.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Hydrophytic Vegetation Indicators

- Rapid test for hydrophytic vegetation
- Dominance test is >50%
- Prevalence index is ≤3.0*
- Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- Problematic hydrophytic vegetation* (explain)

Remarks: (Explain any answers in remarks.)

---

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

### Hydrophytic vegetation present? Y
# Soil Profile Description

(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
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<td>95 10YR 4/6</td>
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</table>

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

## Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 5 cm Mucky Peat or Peat (S3)

## Hydric soil present? Y

## Restrictive Layer (if observed):

<table>
<thead>
<tr>
<th>Type:</th>
<th>Depth (inches):</th>
<th>Remarks:</th>
</tr>
</thead>
</table>

## HYDROLOGY

### Wetland Hydrology Indicators:

**Primary Indicators (minimum of one is required; check all that apply)**

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)

**Secondary Indicators (minimum of two required)**

- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Gauge or Well Data (D9)
- Other (Explain in Remarks)

### Field Observations:

- Surface water present? Yes No X Depth (inches):
- Water table present? Yes No X Depth (inches):
- Saturation present? Yes No X Depth (inches): (includes capillary fringe)

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
APPENDIX F

Site Photos
APPENDIX G

Contour Map
MEMORANDUM

Date: November 9, 2018
To: Brian Kirk
YMCA of the Greater Twin Cities
From: Douglas Arnold, P.E.
Dan Elenbaas, P.E.
Subject: Traffic Analysis
YMCA Camp – New Market, MN

Introduction
YMCA is proposing a new camp located west of CSAH 91 (Natchez Avenue) between 230th Street East and CSAH 62 (240th Street East) in New Market, Minnesota. The primary access to the camp will be from Zane Avenue, which is currently a township road that connects to 240th Street East approximately 4,000 feet west of CSAH 91 and 1,350 feet east of Dakota Avenue.

The following memorandum provides a traffic analysis for the proposed development that will include a review of existing traffic conditions, proposed development information including trip generation, and an operational analysis of the site access intersection along CSAH 62, including a review of turn lane needs.

Existing Conditions
CSAH 62 is currently a two-lane undivided roadway with a rural cross-section. CSAH 62 provides a connection between CSAH 87 (Revere Avenue) and CSAH 91. The speed limit is assumed to be 55 miles per hour. At its intersection with Zane Avenue, the eastbound approach has a shared left-through lane and the westbound approach has a shared through-right lane.

Zane Avenue is currently a two-lane undivided gravel roadway with a rural cross section that extends from CSAH 62 north approximately 2,400 feet. Zane Avenue currently serves five (5) single-family dwelling units. At its intersection with CSAH 62, the southbound approach has a shared left-right lane.

Existing Traffic Counts
A 24-hour machine tube count was performed along CSAH 62 in the vicinity of Zane Avenue on Wednesday, October 10, 2018 in order to determine the Average Daily Traffic (ADT) and peak hour roadway volumes along CSAH 62. Attached is the traffic count data collected October 10, 2018. The following provides a summary of the existing traffic count:

• ADT – 435 vehicles per day
• AM Peak Hour (7:00-8:00 AM) – 40 peak hour trips (15 eastbound, 25 westbound)
• PM Peak Hour (4:45-5:45 PM) – 60 peak hour trips (25 eastbound, 35 westbound)

Traffic volumes along Zane Avenue were estimated based on the land uses that the roadway serves (five single-family residential units). Based on information provided in the Institute of Transportation Engineers (ITE) *Trip Generation, 10th Edition*, the ADT along Zane Avenue is expected to be +/- 50 vehicles per day (5 trips during the AM peak hour and 5 trips during the PM peak hour).

**Historic Crash Review**

Historic crash data is provided by the Minnesota Department of Transportation (MnDOT) as part of its Crash Mapping Analysis Tool (CMAT), which includes previous five years of crash data. Based on a review of the CMAT, there have been no crashes reported during the past 5-year period.

**Proposed Development**

YMCA is proposing a new camp located west of CSAH 91 between 230th Street East and CSAH 62, with primary access along CSAH 62 via Zane Avenue. The camp will primarily be used during the summer months for school aged children. There will be some evening and weekend events, and events during the school year; however, these will be significantly less frequent than the summer weekday events.

Trip generation forecasts for the camp were provided by the YMCA and are based on the projected number of attendees at each of the events. The following provides estimated arrival and departure times for events during the summer months:

- **Daytime** – Passenger vehicles for camp staff and campers typically arrive between 8:30-9:00 AM and 8:45-9:15 AM, respectively. Passenger vehicles for campers and camp staff typically depart between 3:15-4:15 PM and 4:00-5:00 PM, respectively. Buses arrive for student drop-off between 8:45-9:15 AM and return in the afternoon for student pick-up from 2:30-3:00 PM.
- **Evenings** – Passenger vehicles (camp staff and families) typically arrive from 4:30-5:30 PM and depart by 7:30-8:15 PM. No buses are anticipated for evening events.
- **Weekends** – Varies depending on event. No buses are anticipated for weekend events.

The following provides estimated arrival and departure times for events during the school year:

- **Daytime** – No events are expected regularly during this period.
- **Evenings** – No significant events are expected during this time period although most passenger vehicles will arrive between 4:30-5:30 PM and most will leave between 7:30-8:15 PM.
- **Weekends** – Passenger vehicles typically arrive by 11:30-12:00 PM and depart by 4:00-5:00 PM. No buses are anticipated for weekend events.

Based on these schedules and a review of existing traffic count data collected along CSAH 62, it is anticipated that most of the camp traffic would occur outside of the peak hours of CSAH 62.
**Table 1** provides a summary of anticipated hourly trip generation for the camp during the summer peak times (AM and PM peak hours), which is anticipated to be the peak traffic generator for the camp. The table includes a breakdown of passenger vehicles and buses; 75 passenger vehicles and 15 buses during the peak hours. It was assumed that 40% of the passenger vehicle traffic would be camp staff and the other 60% of the passenger vehicles would be parent drop-off/pick-up traffic. Buses were assumed to drop-off in the morning, leave the site, and return in the afternoon.

**Table 1: Anticipated Trip Generation (Weekday - Summer Months)**

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Weekday – AM Peak Hour</th>
<th>Weekday – AM Peak Hour</th>
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<tr>
<td></td>
<td>In</td>
<td>Out</td>
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<tr>
<td>Cars</td>
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<td>Buses</td>
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</table>

Based on anticipated travel patterns of site generated traffic by the YMCA camp, the distribution of passenger vehicles was assumed to be 20% to/from the west along CSAH 62 and 80% to/from the east along CSAH 62. It was assumed that all bus traffic would travel to/from the east along CSAH 62.

**Intersection Analysis**

An intersection capacity analysis was performed for weekday AM and PM peak hours at the proposed intersection of CSAH 62 & Zane Avenue. Although most of the site traffic is expected to occur outside of the peak hours, the analysis assumed that the site traffic would occur during the peak hour of the adjacent street to provide a conservative analysis.

**Table 2** provides a summary of the forecasted AM and PM peak hour traffic volumes at the intersection of CSAH 62 & Zane Avenue, accounting for both background traffic already at the intersection and the addition of YMCA site generated traffic.

**Table 2: Anticipated Peak Hour Traffic Volumes**

<table>
<thead>
<tr>
<th>Traffic Volumes</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
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<tr>
<td>Total*</td>
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*Volumes rounded up to the nearest five vehicles
Synchro/SimTraffic was used to quantify intersection delay and level of service (LOS) during the weekday AM and PM peak hours using the traffic volumes provided in Table 2. The analysis was performed assuming a single-lane approach on all three legs of the intersection. Based on the analysis, all vehicle movements are anticipated to operate at LOS A during the AM and PM peak hours. The Synchro reports are provided as an attachment.

**Turn Lane Analysis**

Based on discussion with Scott County staff, dedicated turn lanes are recommended by Scott County at the intersection of CSAH 62 & Zane Avenue in conjunction with the proposed YCMA Day Camp. Scott County’s 2040 Comprehensive Plan (Appendix A3, Note 4) states that “turn lanes shall be required at all public road access locations on County or State roads; turn lanes at private access will be evaluated on a case by case basis.”

Although Zane Avenue is a public road, the CSAH 62 & Zane Avenue intersection will operate more like a private access than a public road connection since it is not a through street and would only serve five private residential units and the proposed YMCA Day Camp. The need to construct turns lanes at this intersection should be consider further by Scott County with this information in mind:

- The existing traffic volumes along CSAH 62 are low with an ADT of less than 500 vehicles per day, and 60 vehicles or less during the peak hours.
- There have not been any crashes along CSAH 62 between Dakota Avenue and Natchez Avenue over the last five years. This same segment of CSAH 62 has twelve access connections between Dakota Avenue and CSAH 91. None of the twelve accesses or intersections of Dakota Avenue and CSAH 91 have dedicated turn or bypass lanes.
- The intersection analysis shows that all movements are anticipated to operate at LOS A during the AM and PM peak hours.
- YMCA, who is the site developer, is a non-profit organization and this facility is being constructed with a limited construction budget and during non-summer months there will not be regular traffic generated by the site. The burden to pay for the cost of these turn lanes would jeopardize the financial feasibility of the project.

Although MnDOT does not have jurisdiction over these roadways their policies are often used to provide comparisons given the vast roadway network they operation within Minnesota. Guidelines for providing turn lanes are also discussed in MnDOT’s Access Management Manual (Section 3.4.9). Within this section, there are warrants listed for providing turn lanes on undivided highways. The following provides a summary of the nine warrants and how they would apply to the intersection of CSAH 62 & Zane Avenue (warrant in **bold**, response in *italics***):

- **Warrant 1: Passing Lane/Climbing Lane** – At high-volume driveways (> 100 trips per day) and all public street connections located on highway segments where passing lanes or climbing lanes are present in the approach direction.
  *There is not a passing/climbing lane present along 240th Street in the vicinity of Zane Avenue.*
• **Warrant 2: Limited Sight Distance/Terrain** – At all driveways and public street connections with inadequate stopping sight distance or located on short vertical curves or steep grades. Designers may consider alternative options, such as access relocation, vegetation removal, and spot grading as alternatives to building turn lanes.

   *There is adequate stopping sight distance along 240th Street at Zane Avenue. Any vegetation that could impact driver visibility will be removed.*

• **Warrant 3: Railroad Crossings** – At high-volume driveways (> 100 trips per day) and all public street connections where a railroad is parallel to the highway and where the potential exists for vehicles delayed by a train to back up into the through-lanes of the highway, creating both safety and operational problems. At these locations, the queuing of traffic caused by train movements should be considered. If the cross street between the railroad and the highway does not provide adequate storage, then a turn lane or turn-lane treatment should be considered on the highway to provide the additional storage needed.

   *There is not a railroad along 240th Street in the vicinity of Zane Avenue.*

• **Warrant 4: Signalized Intersections** – At all signalized public street connections and driveways.

   *The intersection of 240th Street & Zane Avenue is not signalized and the projected volumes at this intersection are not anticipated to necessitate the installation of a traffic signal.*

• **Warrant 5: Heavy-Vehicle Traffic** – At all driveways and public street connections on high-speed highways (posted speed ≥ 45 mph) where the heavy-vehicle turning volume is 15 or more vehicles per hour for at least eight hours a day for four months or more per year. Examples of this include gravel operations, large grain elevators, or large distribution centers.

   *There are anticipated to be 15 heavy vehicles (buses) turning from 240th Street to Zane Avenue during the AM peak hour. However, the number of heavy vehicles turning from 240th Street onto Zane Avenue is anticipated to be minimal the remaining hours of the day. Therefore, the number of heavy vehicles turning is not anticipated to exceed 15 vehicles for eight hours of the day.*

• **Warrant 6: School Entrances** – At public and private school driveways on high-speed highways (posted speed ≥ 45 mph) used by school traffic.

   *Zane Avenue does not provide access to any schools.*

• **Warrant 7: Crash History** – At high-volume driveways (>100 trips per day) and all public street connections that demonstrate a history of crashes of the type suitable to correction by a turn lane or turn-lane treatment (typically three or more correctable crashes in one year), or where adequate trial of other remedies has failed to reduce the crash frequency.

   *There have not been any crashes at the intersection of 240th Street & Zane Avenue in the last five years.*

• **Warrant 8: Corridor Crash Experience** – On highway corridors that demonstrate a history of similar crash types suitable to correction by providing corridor-wide consistency in turn-lane use.

   *There have not been any reported crashes along 240th Street between Texas Avenue and Natchez Avenue over the last five years.*
• **Warrant 9: Vehicular Volume Warrant** – At high-volume driveways (>100 trips per day) and all public street connections on high-speed highways (posted speed ≥ 45 mph) that satisfy the criteria in Figures 3.40 and 3.41.

A 24-hour traffic count was performed in October 2018 along 240th Street in the vicinity of Zane Avenue. Based on the count, the Average Daily Traffic (ADT) was approximately 435 vehicles. Based on the existing land uses along Zane Avenue and the projected volume generated by the proposed development, the cross-street ADT is anticipated to be approximately 500 vehicles per day.

Based on Figure 3.40 (Warrant 9 for Left-Turn Lanes), a minimum ADT of 1,500 vehicles per day on the cross-street are needed to warrant a left-turn lane. Since the projected cross-street volume is anticipated to be approximately 500 vehicles per day, a left-turn lane or bypass lane is not warranted.

Based on Figure 3.41 (Warrant 9 for Right-Turn Lanes), a minimum ADT of 1,500 vehicles per day along the major street is needed to warrant a right-turn lane. Since the projected ADT along 240th Street is anticipated to be less than 1500 vehicles per day, a right-turn lane is not warranted.

Based on this information, turn lanes along CSAH 62 are not warranted based on the MnDOT guidance.

**Conclusions and Recommendations**

YMCA is proposing a new camp located west of CSAH 91 between 230th Street East and CSAH 62 in New Market, Minnesota. The primary access to the camp will be from Zane Avenue, which is currently a township road that connects to 240th Street East approximately 4,000 feet west of CSAH 91 and 1,350 feet east of Dakota Avenue.

The preceding memorandum provided a summary of existing conditions along CSAH 62 and Zane Avenue, project traffic information from the YMCA Day Camp, intersection capacity analysis at the study intersection, and an evaluation of turn lane needs at the study intersection.

Based on the analysis, the intersection of CSAH 62 & Zane Avenue is anticipated to operate at LOS A with the addition of YMCA traffic under side-street stop-controlled conditions and no dedicated turn lanes. Additionally, there has not be historic trends in crashes along this section of CSAH 62 that would necessitate the need for turn lanes.

The YMCA, who is the site developer, is a non-profit organization and this facility is being constructed with a limited construction budget. The burden to pay for the cost of these turn lanes would jeopardize the financial feasibility of the project. When CSAH 62 is in need of reconstruction, the installation of dedicated turn lanes could be considered.
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### Intersection

| Int Delay, s/veh | 4.5 |

### Movement

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| Mvmt Flow | 11 | 27 | 38 | 60 | 87 | 16 |

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