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May 4, 2016

Steven Robertson
City of Duluth
Community Planning
411 W First St
Duluth, MN 55802

Daryl Wierzbinski
U.S. Army Corps of Engineers
600 S. Lake Avenue, Suite 211
Duluth, MN 55802

Re: Application for Wetland Conservation Act and USACE RGP-003-MN
Lake Superior College
City of Duluth, MN

Dear Mr. Robertson and Mr. Sande:

On behalf of Lake Superior College, Barr Engineering Co. is submitting a joint Wetland Conservation Act and USACE Regional General Permit application to a road improvement project on the Lake Superior College campus, located within the City of Duluth, St. Louis County, Minnesota.

Enclosed are the permit application, project plans, project location figures, and all other required attachments, as well as a check for $150.00 from Barr Engineering on behalf of Lake Superior College for the application fee.

If you have any questions about the information presented in this permit application, please contact me at (218) 788-6302

Sincerely,

Kaitlin Werner

Kaitlin Werner, PE
Civil Engineer
Barr Engineering Co.

Joint Application Form for Activities Affecting Water Resources in Minnesota

This joint application form is the accepted means for initiating review of proposals that may affect a water resource (wetland, tributary, lake, etc.) in the State of Minnesota under state and federal regulatory programs. Applicants for Minnesota Department of Natural Resources (DNR) Public Waters permits **MUST** use the MPARS online permitting system for submitting applications to the DNR. Applicants can use the information entered into MPARS to substitute for completing parts of this joint application form (see the paragraph on MPARS at the end of the joint application form instructions for additional information). This form is only applicable to the water resource aspects of proposed projects under state and federal regulatory programs; other local applications and approvals may be required. Depending on the nature of the project and the location and type of water resources impacted, multiple authorizations may be required as different regulatory programs have different types of jurisdiction over different types of resources.

Regulatory Review Structure

Federal

The St. Paul District of the U.S. Army Corps of Engineers (Corps) is the federal agency that regulates discharges of dredged or fill material into waters of the United States (wetlands, tributaries, lakes, etc.) under Section 404 of the Clean Water Act (CWA) and regulates work in navigable waters under Section 10 of the Rivers and Harbors Act. Applications are assigned to Corps project managers who are responsible for implementing the Corps regulatory program within a particular geographic area.

State

There are three state regulatory programs that regulate activities affecting water resources. The Wetland Conservation Act (WCA) regulates most activities affecting wetlands. It is administered by local government units (LGUs) which can be counties, townships, cities, watershed districts, watershed management organizations or state agencies (on state-owned land). The Minnesota DNR Division of Ecological and Water Resources issues permits for work in specially-designated public waters via the Public Waters Work Permit Program (DNR Public Waters Permits). The Minnesota Pollution Control Agency (MPCA) under Section 401 of the Clean Water Act certifies that discharges of dredged or fill material authorized by a federal permit or license comply with state water quality standards. One or more of these regulatory programs may be applicable to any one project.

Required Information

Prior to submitting an application, applicants are **strongly encouraged** to seek input from the Corps Project Manager and LGU staff to identify regulatory issues and required application materials for their proposed project. Project proponents can request a pre-application consultation with the Corps and LGU to discuss their proposed project by providing the information required in Sections 1 through 5 of this joint application form to facilitate a meaningful discussion about their project. Many LGUs provide a venue (such as regularly scheduled technical evaluation panel meetings) for potential applicants to discuss their projects with multiple agencies prior to submitting an application. Contact information is provided below.

The following bullets outline the information generally required for several common types of determinations/authorizations.

- For delineation approvals and/or jurisdictional determinations, submit Parts 1, 2 and 5, and Attachment A.
- For activities involving CWA/WCA exemptions, WCA no-loss determinations, and activities not requiring mitigation, submit Parts 1 through 5, and Attachment B.
- For activities requiring compensatory mitigation/replacement plan, submit Parts 1 thru 5, and Attachments C and D.
- For local road authority activities that qualify for the state's local road wetland replacement program, submit Parts 1 through 5, and Attachments C, D (if applicable), and E to both the Corps and the LGU.

Submission Instructions

Send the completed joint application form and all required attachments to:

U.S Army Corps of Engineers. Applications may be sent directly to the appropriate Corps Office. For a current listing of areas of responsibilities and contact information, visit the St. Paul District's website at: http://www.mvp.usace.army.mil/Missions/Regulatory.aspx and select "Minnesota" from the contact Information box. Alternatively, applications may be sent directly to the St. Paul District Headquarters and the Corps will forward them to the appropriate field office.

Section 401 Water Quality Certification: Applicants do not need to submit the joint application form to the MPCA unless specifically requested. The MPCA will request a copy of the completed joint application form directly from an applicant when they determine an individual 401 water quality certification is required for a proposed project.

Wetland Conservation Act Local Government Unit: Send to the appropriate Local Government Unit. If necessary, contact your county Soil and Water Conservation District (SWCD) office or visit the Board of Water and Soil Resources (BWSR) web site (www.bwsr.state.mn.us) to determine the appropriate LGU.

DNR Public Waters Permitting: In 2014 the DNR will begin using the Minnesota DNR Permitting and Reporting System (MPARS) for submission of Public Waters permit applications (https://webapps11.dnr.state.mn.us/mpars/public/authentication/login). Applicants for Public Waters permits **MUST** use the MPARS online permitting system for submitting applications to the DNR. To avoid duplication and to streamline the application process among the various resource agencies, applicants can use the information entered into MPARS to substitute for completing parts of this joint application form. The MPARS print/save function will provide the applicant with a copy of the Public Waters permit application which, at a minimum, will satisfy Parts one and two of this joint application. For certain types of activities, the MPARS application may also provide all of the necessary information required under Parts three and four of the joint application. However, it is the responsibility of the Applicant to make sure that the joint application contains all of the required information, including identification of all aquatic resources impacted by the project (see Part four of the joint application). After confirming that the MPARS application contains all of the required information in Parts one and two the Applicant may attach a copy to the joint application and fill in any missing information in the remainder of the joint application.

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name: Gary Adams – Lake Superior College
Mailing Address: 2101 Trinity Road Duluth, MN 55811
Phone: 218-733-2005
E-mail Address: g.adams@lsc.edu

Authorized Contact (do not complete if same as above): Kaitlin Werner – Barr Engineering Co.
Mailing Address: 325 S. Lake Ave. Suite 700 Duluth, MN 55802
Phone: 218-788-6302
E-mail Address: KWerner@barr.com

Agent Name: Lindsay Tekler – Barr Engineering Co.
Mailing Address: 325 S. Lake Ave. Suite 700 Duluth, MN 55802
Phone: 218-529-7185
E-mail Address: LTekler@barr.com

PART TWO: Site Location Information

County: St. Louis **City/Township:** Duluth
Parcel ID and/or Address: 010-3755-00071, 010-3755-00010, 010-3755-00060, 010-3755-00070, 010-3755-00080
Legal Description (Section, Township, Range): T50N, R14W, S29
Lat/Long (decimal degrees): 46.787516N, -92.146033W
Attach a map showing the location of the site in relation to local streets, roads, highways.
Approximate size of site (acres) or if a linear project, length (feet): 0.60 acre project area

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

This joint permit application includes a request for wetland type confirmation, delineation concurrence, and preliminary jurisdictional determination. In addition, we maintain that the proposed project aquatic resource impacts do not require wetland replacement/compensatory mitigation as they meet the WCA requirements of the de-minimis exemption. The proposed project is seeking authorization by the USACE under the reporting category O (Residential, commercial, agricultural, and institutional

developments) of regional general permit RGP-003-MN. The required attachments and supporting exhibits provide the necessary documentation for this request.

Included with this joint application are:
Exhibit A – Project Location Figures
Exhibit B – Project Plans
Exhibit C – Wetland Delineation Report
Exhibit D –Impacts Figure
Exhibit E – Endangered Resources Review
Exhibit F – Cultural Resources Review

Project Description, Purpose, and Need

The proposed project will primarily consist of improving the condition of the north entrance road and west parking lot of the Lake Superior College (LSC) campus. The project location is shown in the attached project location figures (Exhibit A). The construction will consists of replacing the existing culvert under the north entrance road, road resurfacing, and raising the profile of the north entrance road, as shown in the attached project plans (Exhibit B).

The project is needed because the north entrance road and west parking lot are showing signs of significant wear and tear, as well as to address vehicle safety issues. In addition to the need to fix the cracked pavement, the north entrance road profile will be raised and leveled to increased driver's sight distance of traffic on USH 53/Trinity Road and to increase vehicle maneuverability during the winter season. Additionally, the culvert under the north entrance road had been damaged from the weight of the vehicle traffic and is no longer functioning to move water through the drainage ditch located at the toe-slope of USH 53/Trinity Road, causing flooding over the north entrance road in the spring season. The culvert will be replaced with a round culvert at the same elevation, and the drainage capacity will not be increased.

Project Schedule

Construction of the project will begin in mid to early June 2016 and should last for approximately 4 weeks. Site restoration activities, including seeding, mulching, and the installation of erosion control blanket, will begin within 7 days of the completion of ground disturbing activity.

Aquatic Resource Impacts

The wetland delineation was conducted on October 9, 2015 and the wetland delineation report is being submitted concurrent with this joint permit application (Exhibit C).The anticipated wetland and ditch impacts are associated with the culvert replacement and profile adjustment of the north entrance road. No wetland impacts will occur with the construction associated with the improvements in the west parking lot. All impacts will be permanent and are shown in the attached impact figure (Exhibit D). As impacts were not avoidable to fulfill the goals of the project, impacts to wetlands and the ditch were minimized to the extent practicable. Further discussion of the wetland impact minimization measures is described in Appendix C.

Endangered Resources Review

A desktop Natural Heritage Information System Rare Features Data review was conducted for rare, threatened, and endangered species within a 1-mile radius of the project through a license agreement with the Minnesota Department of Natural Resources. Federal and state listed species were considered as part of the review. The supporting documentation can be found in the attached Exhibit E.

Cultural/Historical Resources Review

A desktop review of the potential cultural and historical sites within the project area was conducted by the Minnesota State Historic Preservation Office. No archeological sites or historic structures were identified in the review. The supporting documentation can be found in the attached Exhibit F.

Other Permits and Approvals Needed

City of Duluth Stormwater Permit
City of Duluth Erosion and Sediment Control Permit
City of Duluth Fill and Grading Permit
City of Duluth Shoreland Zoning Permit
MN Department of Transportation Right-of-Way Permit

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource** [3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]
1	wetland	fill	permanent	0.01 acres	1.94 acres	Fresh (wet) meadow	St. Louis Co., watershed # 3, bank service area # 1
	wetland	fill	permanent	0.02 acres	4.50 acres	Hardwood swamp	
2	Drainage ditch	fill	permanent	9 linear ft.	unknown	N/A	

[1]If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

None of the above planned impacts have occurred.

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: _____ 5-4-16 Date:

I hereby authorize Kaitlin Werner to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

_____

[1] The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.

Attachment A
Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

By submission of the enclosed wetland delineation report, I am requesting that the U.S. Army Corps of Engineers, St. Paul District (Corps) and/or the Wetland Conservation Act Local Government Unit (LGU) provide me with the following (check all that apply):

☒ **Wetland Type Confirmation**

☒ **Delineation Concurrence**. Concurrence with a delineation is a written notification from the Corps and a decision from the LGU concurring, not concurring, or commenting on the boundaries of the aquatic resources delineated on the property. Delineation concurrences are generally valid for five years unless site conditions change. Under this request alone, the Corps will not address the jurisdictional status of the aquatic resources on the property, only the boundaries of the resources within the review area (including wetlands, tributaries, lakes, etc.).

☒ **Preliminary Jurisdictional Determination**. A preliminary jurisdictional determination (PJD) is a non-binding written indication from the Corps that waters, including wetlands, identified on a parcel may be waters of the United States. For purposes of computation of impacts and compensatory mitigation requirements, a permit decision made on the basis of a PJD will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. PJDs are advisory in nature and may not be appealed.

☐ **Approved Jurisdictional Determination**. An approved jurisdictional determination (AJD) is an official Corps determination that jurisdictional waters of the United States are either present or absent on the property. AJDs can generally be relied upon by the affected party for five years. An AJD may be appealed through the Corps administrative appeal process.

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).
http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx

Attachment B
Supporting Information for Applications Involving Exemptions, No Loss Determinations, and Activities Not Requiring Mitigation

Complete this part ***if*** you maintain that the identified aquatic resource impacts in Part Four do not require wetland replacement/compensatory mitigation OR ***if*** you are seeking verification that the proposed water resource impacts are either exempt from replacement or are not under CWA/WCA jurisdiction.

Identify the specific exemption or no-loss provision for which you believe your project or site qualifies:

De minimis exemption under WCA of wetland types 1, 2, 6, or 7 in a greater than 80 percent area.

Provide a detailed explanation of how your project or site qualifies for the above. Be specific and provide and refer to attachments and exhibits that support your contention. Applicants should refer to rules (e.g. WCA rules), guidance documents (e.g. BWSR guidance, Corps guidance letters/public notices), and permit conditions (e.g. Corps General Permit conditions) to determine the necessary information to support the application. Applicants are strongly encouraged to contact the WCA LGU and Corps Project Manager prior to submitting an application if they are unsure of what type of information to provide:

Impact associated with the project include 1,052 square feet of permanent wetland impact associated with the placement of fill to raise the road profile of the north entrance road, as well as 9 linear feet of permanent impact to the drainage ditch associated with the culvert replacement. The replacement culvert will be 4.5 feet longer on each side of the drainage ditch to span the width of the new road profile. The permanent wetland impacts are within the allowable de minimis exemption for wetland types 2 and 7 (see Exhibit D) under MN WCA rules 8420.0420Subp. 8A(1)(a) and the 2012 WCA Statute Changes 103G.2241, Subd. 9. (1) which allows up to 10,000 square feet of type 1, 2, 6, or 7 permanent wetland impacts. Phone consultation on 2/11/2016 with R.C. Boheim from St. Louis County Soil and Water Conservation confirmed that these wetland impacts are within the allowable de minimis for WCA and that no mitigation would be required.

Phone consultation with Daryl Wierzbinski from the USACE on 2/16/2016 confirmed that the permanent wetland impacts associated with this project would be authorized under the regional general permit RGP-003-MN, reporting category O for residential, commercial, agricultural, and institutional developments and that no mitigation would be required.

Attachment C
Avoidance and Minimization

Project Purpose, Need, and Requirements. Clearly state the purpose of your project and need for your project. Also include a description of any specific requirements of the project as they relate to site location, project footprint, water management, and any other applicable requirements. Attach an overhead plan sheet showing all relevant features of the project (buildings, roads, etc.), aquatic resource features (impact areas noted) and construction details (grading plans, storm water management plans, etc.), referencing these as necessary:

The proposed project will primarily consist of improving the condition of the north entrance road and west parking lot of the Lake Superior College (LSC) campus. The project location is shown in the attached project location figures (Exhibit A). The construction will consists of replacing the existing culvert under the north entrance road, road resurfacing, and raising the profile of the north entrance road, as shown in the attached project plans (Exhibit B).

The project is needed because the north entrance road and west parking lot are showing signs of significant wear and tear, as well as to address vehicle safety issues. In addition to the need to fix the cracked pavement, the north entrance road profile will be raised and leveled to increased driver's sight distance of traffic on USH 53/Trinity Road and to increase vehicle maneuverability during the winter season. Additionally, the culvert under the north entrance road had been damaged from the weight of the vehicle traffic and is no longer functioning to move water through the drainage ditch located at the toe-slope of USH 53/Trinity Road, causing flooding over the north entrance road in the spring season. The culvert will be replaced with a round culvert at the same elevation, and the drainage capacity will not be increased.

Avoidance. Both the CWA and the WCA require that impacts to aquatic resources be avoided if practicable alternatives exist. Clearly describe all on-site measures considered to avoid impacts to aquatic resources and discuss at least two project alternatives that avoid all impacts to aquatic resources on the site. These alternatives may include alternative site plans, alternate sites, and/or not doing the project. Alternatives should be feasible and prudent (see MN Rules 8420.0520 Subp. 2 C). Applicants are encouraged to attach drawings and plans to support their analysis:

The first project alternative was to replace the existing culvert and repave the road within the existing footprint, without raising the road profile. This alternative was discussed but rejected as it would address the deteriorating road conditions, but would not address the other goals of this project. The ditch flow through the culvert would still over-top the road in the spring season and vehicle sight distance and maneuverability when approaching the USH 53 intersection would not be increased.

The second project alternative was to replace the existing culvert, repave the road, and raise the road profile, but to a lesser elevation. Although this alternative would create less impact to wetlands on site, this alternative was rejected as it would not meet the goals of the project long-term. The ditch flow through the culvert could still over-top the road in the spring season in high flows and vehicle sight distance and maneuverability when approaching the USH 53 intersection would not be sufficiently increased enough to meet the safety goals of the project.

The third and selected alternative was to replace the existing culvert, repave the road, and raise the road to a more elevated profile. This alternative was determined to be the best alternative to meet the long-term goals of the project. Avoidance of the wetlands on site was unavoidable to achieve the goals of the project. Therefore, focus was shifted to minimizing the impacts to wetlands and ditch on site.

Minimization. Both the CWA and the WCA require that all unavoidable impacts to aquatic resources be minimized to the greatest extent practicable. Discuss all features of the proposed project that have been modified to minimize the impacts to water resources (see MN Rules 8420.0520 Subp. 4):

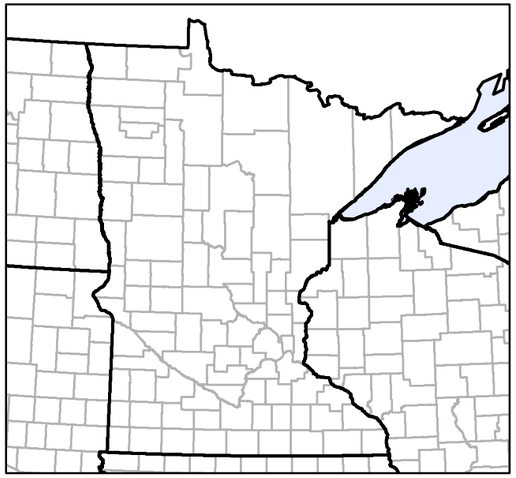
Modifications to the project design plans were implemented throughout the design process to minimize impacts to wetlands and the ditch on site. Initial plans at the 60% design stage included road slopes of 3:1, which would have caused greater wetland impact. Slopes were later decreased to a 2:1 ratio to minimize impacts to the wetlands on site. In addition, erosion and sediment control BMP's will be installed prior to all ground disturbance to minimize impacts to the wetland areas, including silt fence, biologs, and erosion control blanket. More information can be found in the attached project plans (Exhibit B).

Off-Site Alternatives. An off-site alternatives analysis is not required for all permit applications. If you know that your proposal will require an individual permit (standard permit or letter of permission) from the U.S. Army Corps of Engineers, you may be required to provide an off-site alternatives analysis. The alternatives analysis is not required for a complete application but must be provided during the review process in order for the Corps to complete the evaluation of your application and reach a final decision. Applicants with questions about when an off-site alternatives analysis is required should contact their Corps Project Manager.

Not applicable to this project.

Exhibit A

Project Location Figures



Culvert

Roads

Public Water Inventory Watercourses

Duluth Streams

Construction Limits

Public Water Inventory Basins

National Wetland Inventory

BARR

N

0 50 100 200

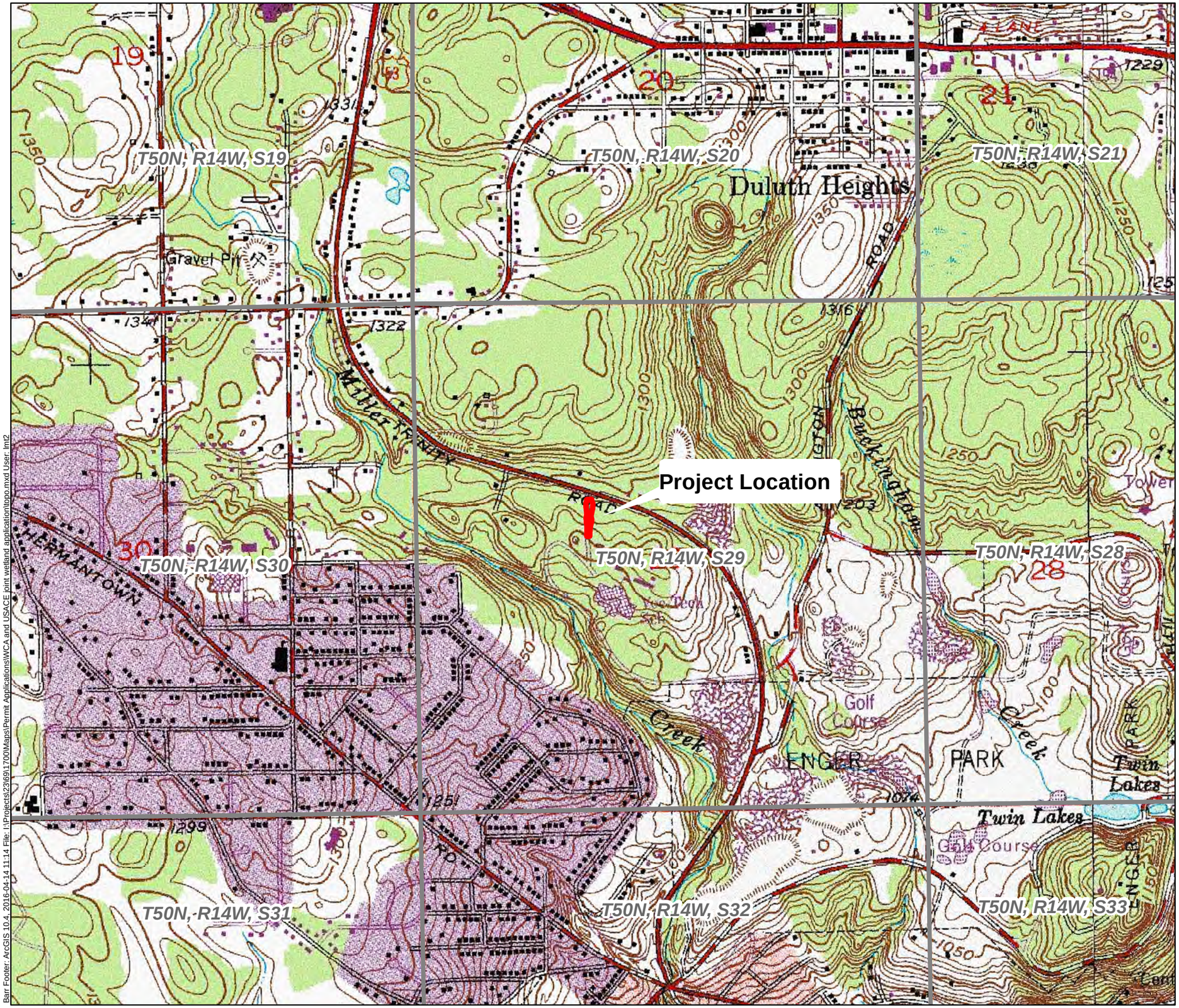
Feet

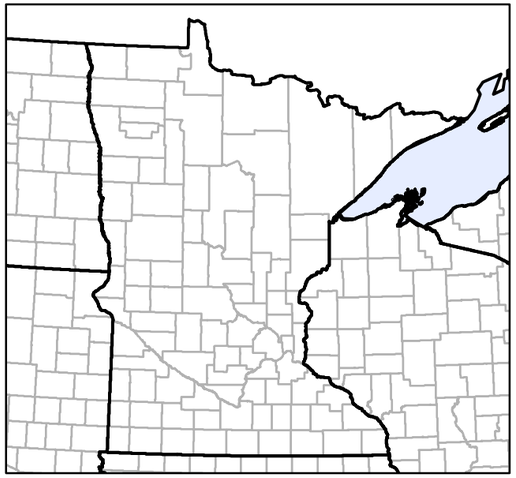
Imagery: St. Louis County, 2013

Project Location Map

Joint Permit Application
April 2016
Lake Superior College Road Improvement
Duluth, MN

Barr Footer: ArcGIS 10.4, 2016-04-14 11:09 File: I:\Projects\23\69\17\00\Maps\Permit Applications\WCA and USACE joint wetland application\project_location.mxd User: lmt2





Project Area

N

0 500 1,000 2,000

Feet

Topographic Map

Joint Permit Application
April 2016
Lake Superior College Road Improvement
Duluth, MN

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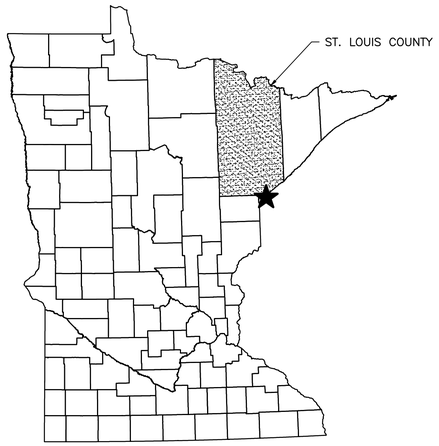
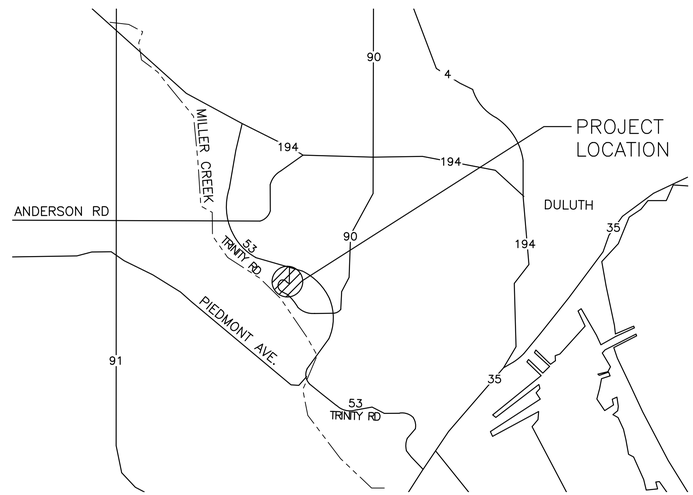
Exhibit B

Project Plans

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE
DULUTH, MINNESOTA



COUNTY MAP
NOT TO SCALE



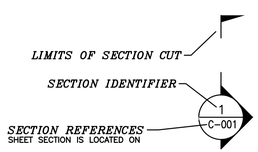
VICINITY MAP
LAKE SUPERIOR COLLEGE
2101 TRINITY ROAD
DULUTH, MN 55811

PROJECT TOPOGRAPHY IS FROM FIELD SURVEY COMPLETED OCTOBER AND NOVEMBER 2015

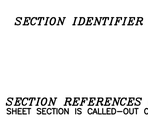
PROJECT COORDINATE SYSTEM IS MN STATE PLANE NORTH, NAD83, US SURVEY FEET

PROJECT DATUM IS NAVD88, US FEET

DRAWING INDEX	
SHEET NUMBER	TITLE
G–01	TITLE SHEET
G–02	LEGEND AND CONTACTS
C–001	EXISTING SITE CONDITIONS
C–002	DEMOLITION PLAN
C–003	PROPOSED SITE PLAN, GRADING, AND EROSION CONTROL PLAN
C–004	PLAN AND PROFILE INDEX
C–005	PLAN AND PROFILE STATION 0+00–6+00
C–006	PLAN AND PROFILE STATION 6+00–11+20
C–007	PLAN AND PROFILE STATION 11+20–14+45
C–008	CROSS SECTIONS 0+00 TO 1+75
C–009	CROSS SECTIONS 2+00 TO 3+75
C–010	CROSS SECTIONS 4+00 TO 5+75
C–011	CROSS SECTIONS 6+00 TO 7+75
C–012	CROSS SECTIONS 8+00 TO 9+75
C–013	CROSS SECTIONS 10+00 TO 11+75
C–014	CROSS SECTIONS 12+00 TO 13+50
C–015	PAVEMENT MARKING/PERMANENT SIGNING PLAN
C–016	DETAIL SHEET 1 OF 2
C–017	DETAIL SHEET 2 OF 2

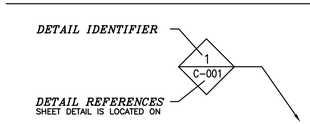


SECTION VIEW CALL OUT

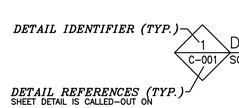


SECTION: GRAPHICS STANDARDS
SCALE: 1=1

SECTION VIEW TITLE



DETAIL VIEW CALL OUT



DETAIL: GRAPHICS STANDARDS
SCALE: 1=1

DETAIL VIEW TITLE

ISSUED FOR BID

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LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

TITLE SHEET

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. G–01
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CADD USER: Kaitlin T. Werner FILE: M:\DESIGN\23691700.00\23691700_G–01_TITLE SHEET.DWG PLOT SCALE: 1:1 PLOT DATE: 4/21/2016 1:12 PM
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CONTACTS

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GARY ADAMS
(218) 733–2005

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COMFORT SYSTEMS
BILL BERGSTROM
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bbergstrom@duluthmn.gov

CABLE
CHARTER COMMUNICATIONS
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NICK WALTERS
OFFICE (218) 529–8025
CELL (218) 461–5485
nicholas.walters@charter.com

PHONE
CENTURYLINK
1–800–526–3557

ELECTRICAL
MINNESOTA POWER
KEVIN KOSKELA
OFFICE (218)355–2536
CELL (218) 721–2683
kkoskela@mnpower.com

MNDOT

FOR LOCATE
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LEGEND

PROPOSED

- ROAD CENTERLINE
- 1220 MAJOR CONTOUR
- 1218 MINOR CONTOUR
- SIGN
- ROADWAY
- EDGE OF GRAVEL
- CURB AND GUTTER
- TREELINE
- EROSION CONTROL BLANKET
- SAW CUT
- SILT FENCE
- ROCK CHECK DAM
- DRAINAGE DIRECTION
- SEDIMENT CONTROL LOG

EXISTING

- ROAD CENTERLINE
- 1220 MAJOR CONTOUR
- 1218 MINOR CONTOUR
- SIGN
- ROADWAY
- EDGE OF GRAVEL
- CURB AND GUTTER
- TREELINE
- T T UNDERGROUND TELEPHONE
- CONTROL POINT
- UE UE UNDERGROUND ELECTRIC
- OE OE OVERHEAD ELECTRIC
- GAS GAS UNDERGROUND GAS
- LIGHT POLE
- POWER POLE
- ELECTRIC MANHOLE
- HYDRANT
- WATER MAIN VALVE
- W W WATER MAIN
- BOLLARD
- WETLAND BOUNDARY
- x x x FENCE
- TREE
- DRAINAGE DIRECTION

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ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

LEGEND AND CONTACTS

BARR PROJECT No. 23691700
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DWG. No. G–02
REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_G-02.DWG PLOT SCALE: 1:1 PLOT DATE: 3/27/2016 4:34 PM
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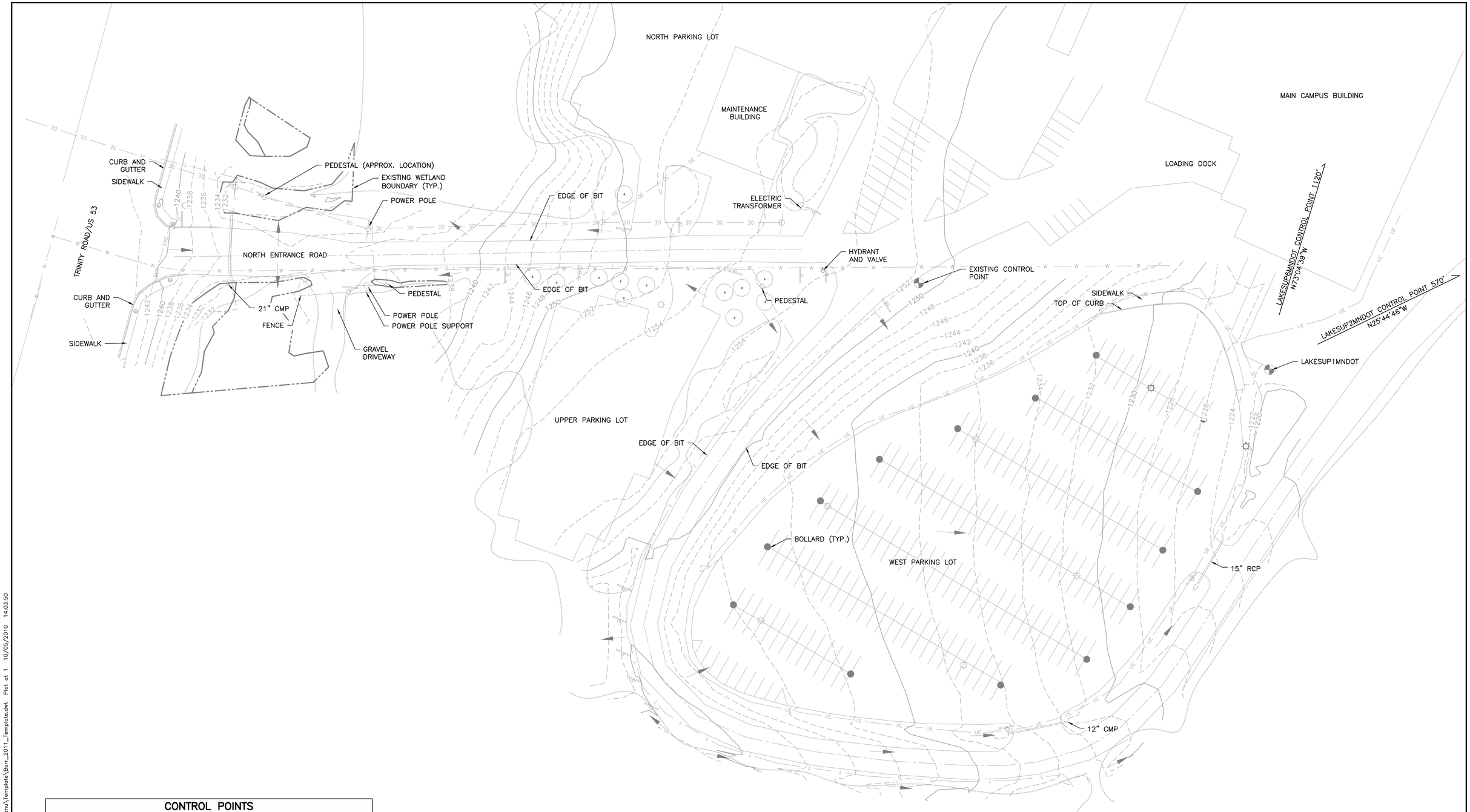

CONTROL POINTS			
ID	N	E	ELEV.
LAKESUP1MNDOT	433481.91	2863557.25	1222.68
LAKESUP2MNDOT	432966.80	2863805.49	1222.16
LAKESUP6MNDOT	433161.10	2864626.43	1233.26

NOTE: EXISTING CONTROL POINT WAS NOT SURVEYED

1 PLAN: EXISTING SITE CONDITIONS
1"=40'-0"

0 40' 80'

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ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

EXISTING SITE CONDITIONS

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EXISTING SIGN LEGEND		
SIGN NUMBER	SIGN TEXT OR TYPE	SALVAGE OR REMOVE SIGN
1	STOP	SALVAGE
2	NO DUMPING VIOLATORS WILL BE PROSECUTED	SALVAGE
3	LAKE SUPERIOR COLLEGE TOBACCO FREE CAMPUS TOBACCO USE IS PROHIBITED ON COLLEGE PROPERTY BEGINNING AUGUST 24TH 2009	SALVAGE
4	CAUTION SLOW DOWN PEDESTRIAN TRAFFIC	SALVAGE
5	STOP	SALVAGE
6	DELIVERIES, LOT 4, LOT 5 LAKE SUPERIOR COLLEGE	SALVAGE
7	YIELD	SALVAGE
8	A BUILDING, H BUILDING, DELIVERIES, CAMPUS PARKING	SALVAGE
9	STOP	SALVAGE
10	STOP	SALVAGE
11	STOP	SALVAGE
12	20 MPH	REMOVE
13–16	OBJECT MARKER	SALVAGE

1 PLAN: EXISTING SITE CONDITIONS
1"=40'-0"
0 40' 80'

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LAKE SUPERIOR COLLEGE
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ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

DEMOLITION PLAN

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C-002
REV. No. C

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-002.DWG PLOT SCALE: 1:1 PLOT DATE: 4/13/2016 3:16 PM
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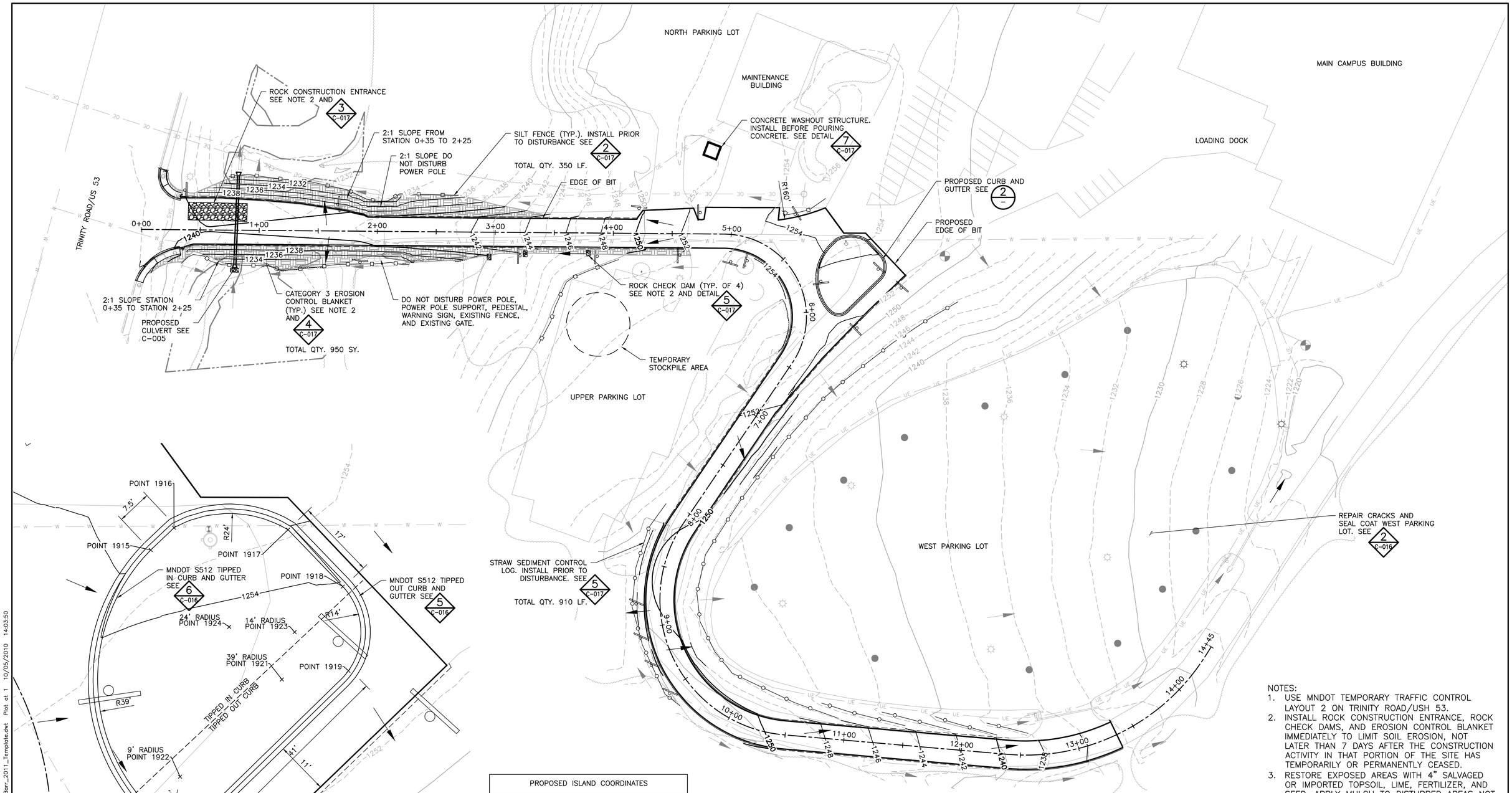
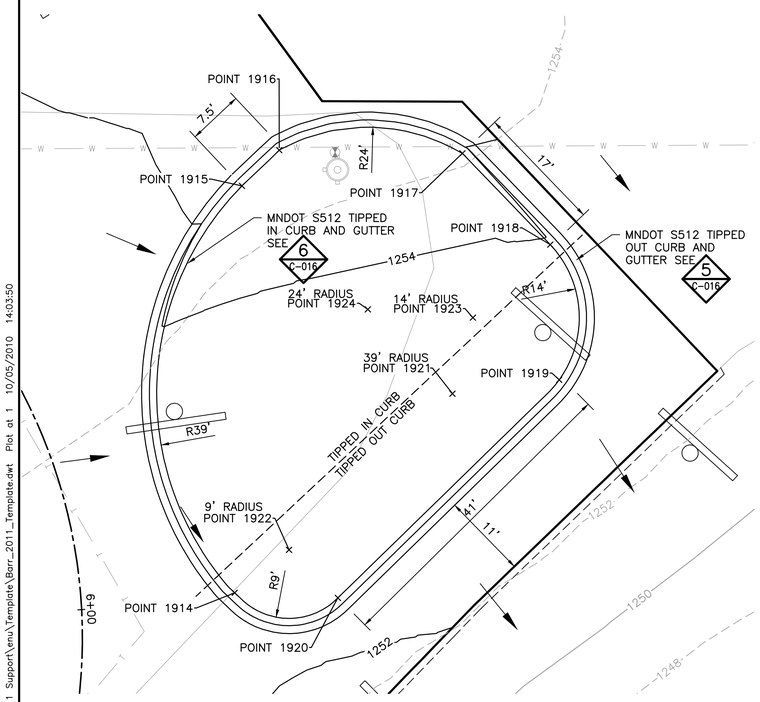


1 PLAN: PROPOSED SITE CONDITIONS
1"=40'-0"
0 40' 80'



2 PLAN: PROPOSED ISLAND DETAILS
1"=10'-0"
0 10' 20'

PROPOSED ISLAND COORDINATES			
POINT #	ELEVATION	NORTHING	EASTING
1914	1253.01	433884.7008	2863587.4328
1915	1254.63	433883.7404	2863641.1259
1916	1254.69	433878.8158	2863645.8363
1917	1254.48	433854.6449	2863645.4137
1918	1254.04	433843.0453	2863633.3703
1919	1253.35	433841.8634	2863615.5330
1920	1252.95	433871.0765	2863586.7556

PROPOSED ISLAND COORDINATES FOR CURVE RADII			
POINT #	ELEVATION	NORTHING	EASTING
1921	1253.17	433855.9553	2863613.6990
1922	1252.92	433877.5262	2863593.0922
1923	1253.62	433853.2601	2863623.7356
1924	1253.76	433867.1246	2863624.8288

NOTES:
1. USE MNDOT TEMPORARY TRAFFIC CONTROL LAYOUT 2 ON TRINITY ROAD/USH 53.
2. INSTALL ROCK CONSTRUCTION ENTRANCE, ROCK CHECK DAMS, AND EROSION CONTROL BLANKET IMMEDIATELY TO LIMIT SOIL EROSION, NOT LATER THAN 7 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.
3. RESTORE EXPOSED AREAS WITH 4" SALVAGED OR IMPORTED TOPSOIL, LIME, FERTILIZER, AND SEED. APPLY MULCH TO DISTURBED AREAS NOT COVERED WITH EROSION CONTROL BLANKET.
4. APPLY STATE SEED MIX 25-141 AT A RATE OF 59 LB/ACRE. SEE DETAIL 6 ON C-017 FOR MIX SPECIFICATIONS.

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LAKE SUPERIOR COLLEGE

PROPOSED SITE, GRADING, EROSION CONTROL PLAN

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C-003
REV. No. C

CADD USER: Candi Nylund FILE: M:\DESIGN\23691700.00\23691700_C-003.DWG PLOT SCALE: 1:1 PLOT DATE: 4/21/2016 12:36 PM
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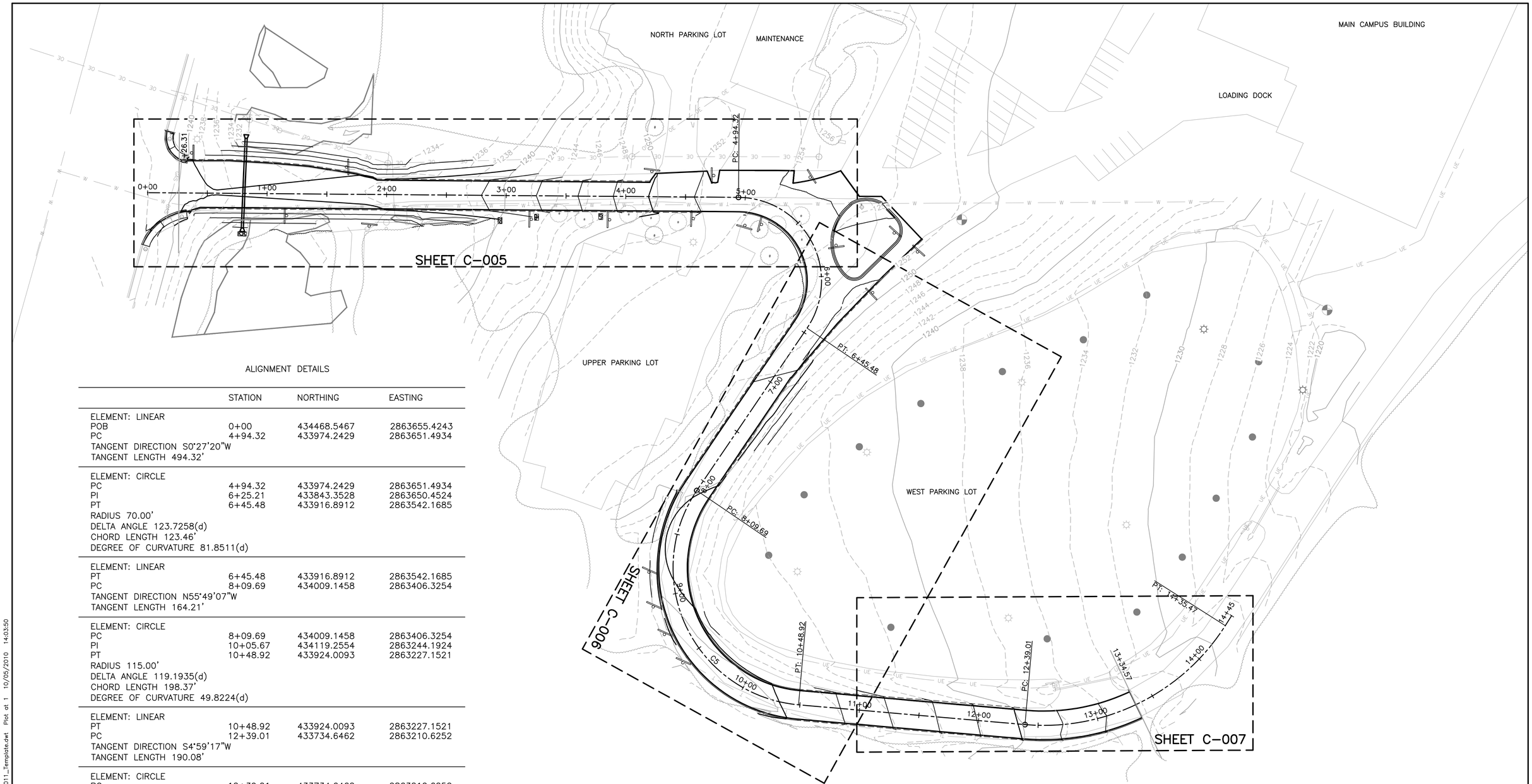

ALIGNMENT DETAILS

	STATION	NORTHING	EASTING
ELEMENT: LINEAR			
POB	0+00	434468.5467	2863655.4243
PC	4+94.32	433974.2429	2863651.4934
TANGENT DIRECTION S0°27'20"W			
TANGENT LENGTH 494.32'			
ELEMENT: CIRCLE			
PC	4+94.32	433974.2429	2863651.4934
PI	6+25.21	433843.3528	2863650.4524
PT	6+45.48	433916.8912	2863542.1685
RADIUS 70.00'			
DELTA ANGLE 123.7258(d)			
CHORD LENGTH 123.46'			
DEGREE OF CURVATURE 81.8511(d)			
ELEMENT: LINEAR			
PT	6+45.48	433916.8912	2863542.1685
PC	8+09.69	434009.1458	2863406.3254
TANGENT DIRECTION N55°49'07"W			
TANGENT LENGTH 164.21'			
ELEMENT: CIRCLE			
PC	8+09.69	434009.1458	2863406.3254
PI	10+05.67	434119.2554	2863244.1924
PT	10+48.92	433924.0093	2863227.1521
RADIUS 115.00'			
DELTA ANGLE 119.1935(d)			
CHORD LENGTH 198.37'			
DEGREE OF CURVATURE 49.8224(d)			
ELEMENT: LINEAR			
PT	10+48.92	433924.0093	2863227.1521
PC	12+39.01	433734.6462	2863210.6252
TANGENT DIRECTION S4°59'17"W			
TANGENT LENGTH 190.08'			
ELEMENT: CIRCLE			
PC	12+39.01	433734.6462	2863210.6252
PI	13+48.31	433625.7589	2863201.1219
PT	14+35.47	433567.1066	2863293.3535
RADIUS 180.00'			
DELTA ANGLE 62.5347(d)			
CHORD LENGTH 186.85'			
DEGREE OF CURVATURE 31.8310(d)			
ELEMENT: LINEAR			
PT	14+35.47	433567.1066	2863293.3535
PC	14+45.34	433561.8063	2863301.6885
TANGENT DIRECTION S57°32'48"E			
TANGENT LENGTH 9.88'			

1 PLAN: PROPOSED SITE CONDITIONS
1"=40'-0"

0 40' 80'

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DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

PLAN AND PROFILE INDEX

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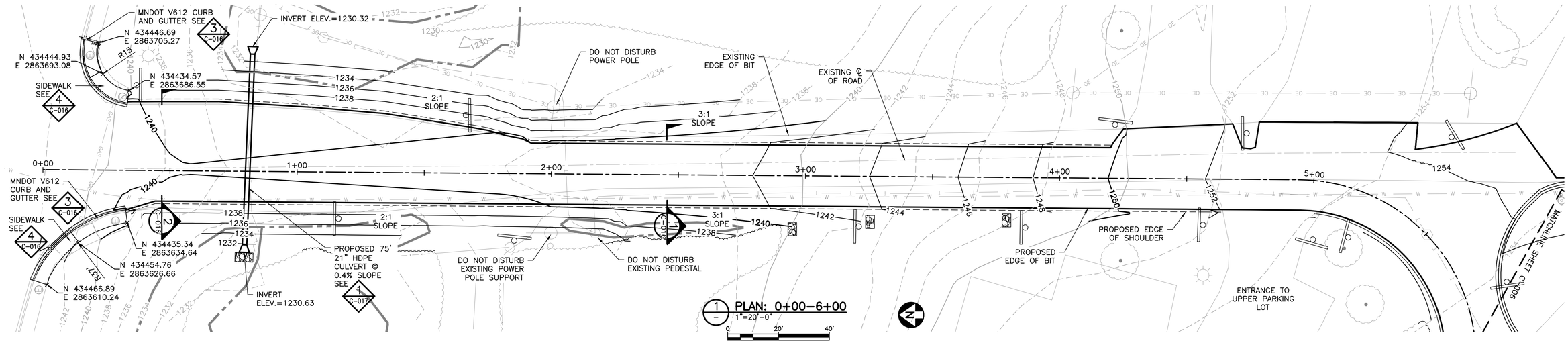
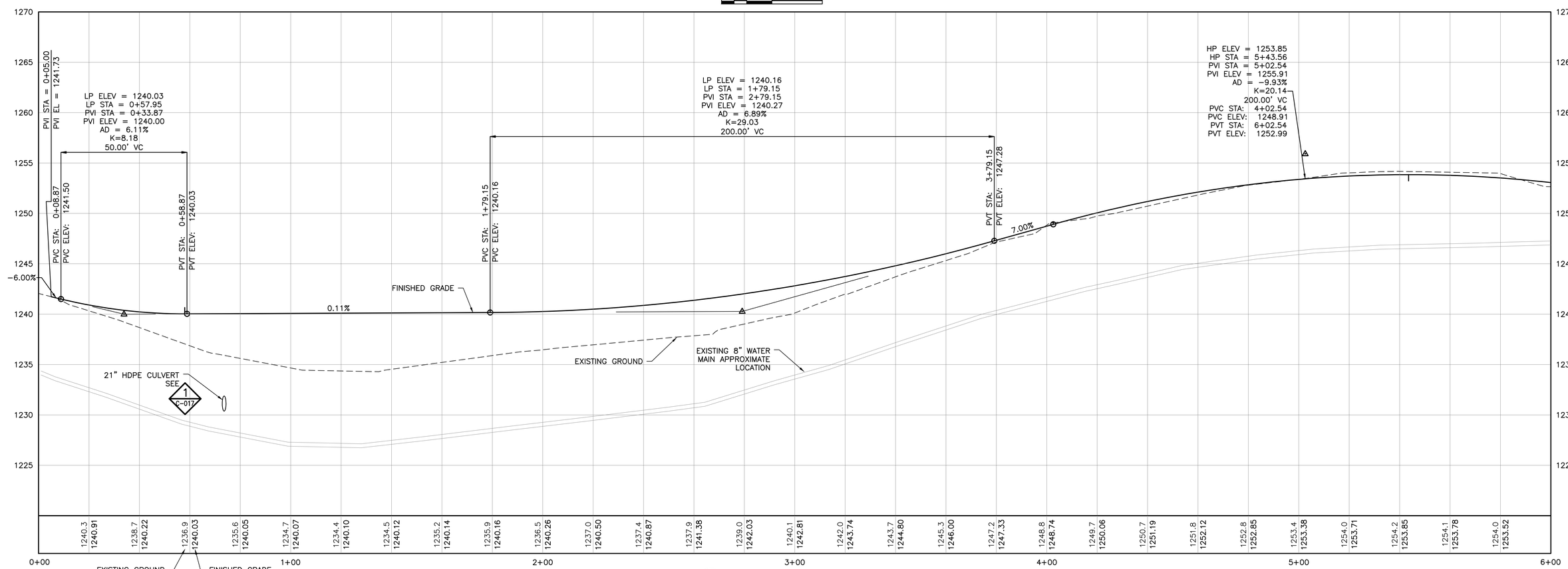


1 PLAN: 0+00–6+00
1"=20'–0"



1 ELEVATION: 0+00–6+00

HORIZONTAL SCALE 0 20' 40'

VERTICAL SCALE 0 5' 10'

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ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

NORTH ENTRANCE ROAD PLAN AND PROFILE
0+00–6+00

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C–005
REV. No. C

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-005.DWG PLOT SCALE: 1:1 PLOT DATE: 4/13/2016 3:17 PM
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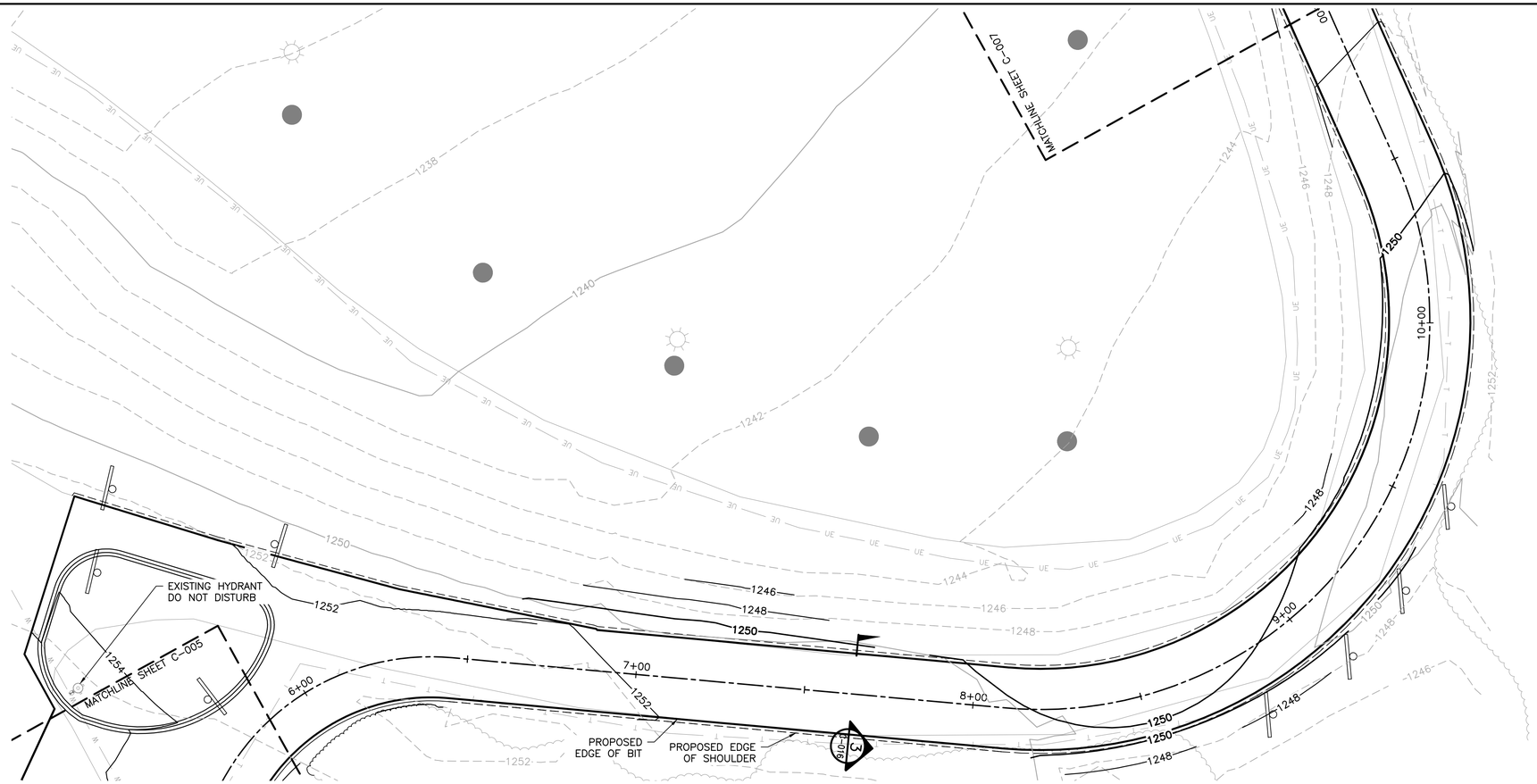
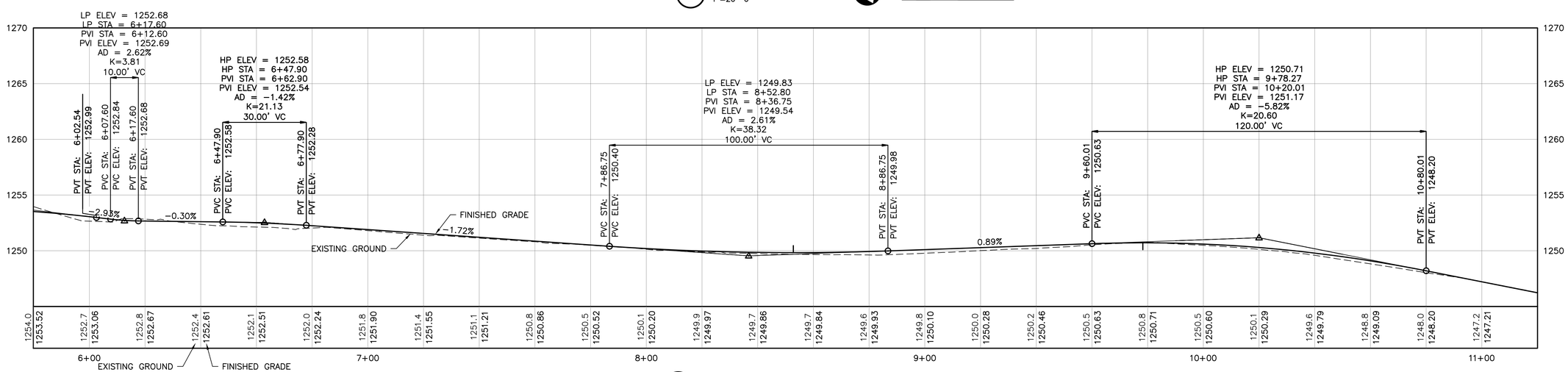


1 PLAN: 6+00–11+20
1"=20'–0"

0 20' 40'



1 ELEVATION: 6+00–11+20

0 20' 40' HORIZONTAL SCALE

0 5' 10' VERTICAL SCALE

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LAKE SUPERIOR COLLEGE

NORTH ENTRANCE ROAD PLAN AND PROFILE
6+00–11+20

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C–006
REV. No. C

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-006.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 1:57 PM
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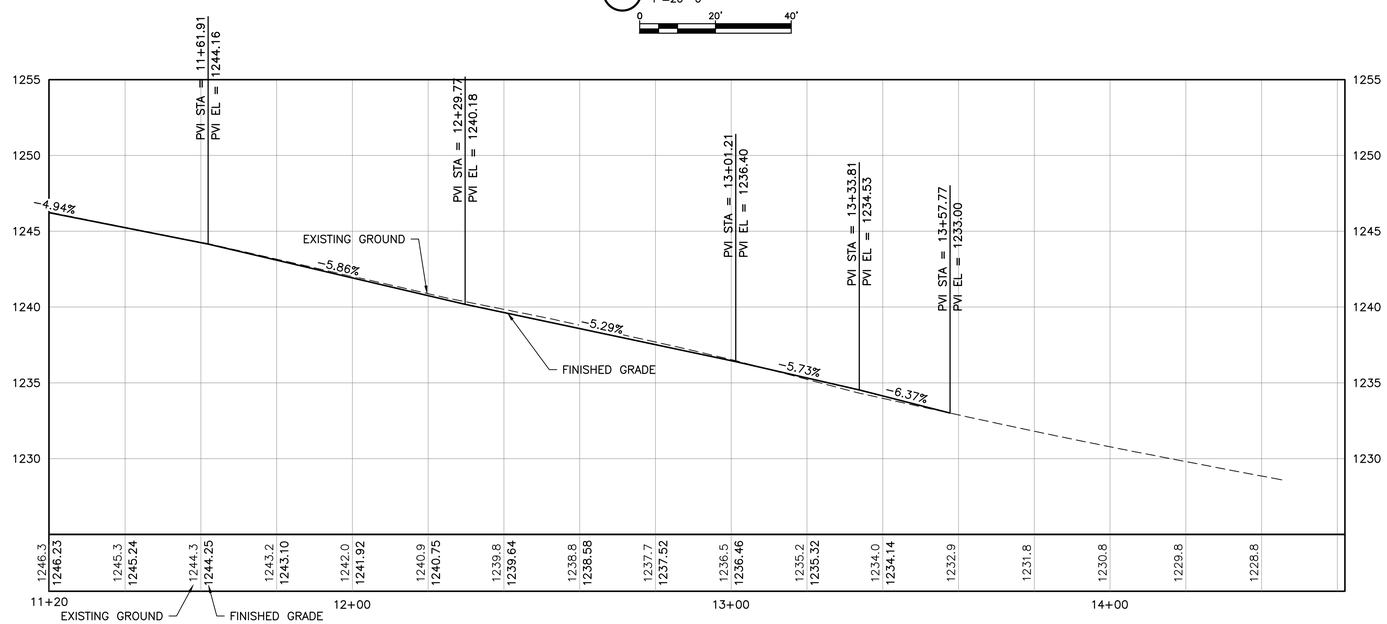
1 PLAN: 11+20–14+45
1"=20'–0"
0 20' 40'



1 ELEVATION: 11+20–14+45

0 20' 40' HORIZONTAL SCALE

0 5' 10' VERTICAL SCALE

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CONSTRUCTION							
	DATE RELEASED						

BARR

Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1–800–632–2277

Project Office:
BARR ENGINEERING CO.
325 SOUTH LAKE AVENUE
SUITE 700
DULUTH, MN. 55802
Ph: 1–800–786–5830
Fax: (218) 727–6450
www.barr.com

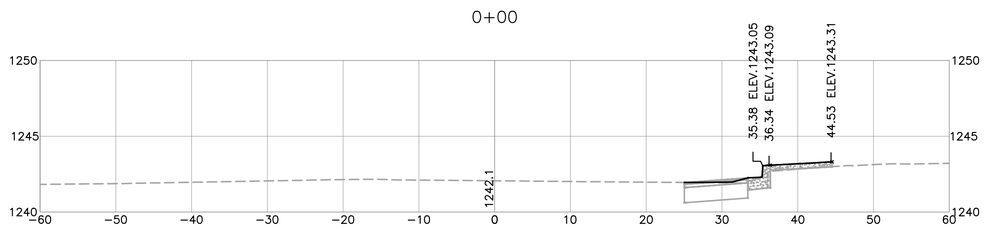
Scale	AS SHOWN
Date	11/11/2015
Drawn	RRR2
Checked	
Designed	
Approved	

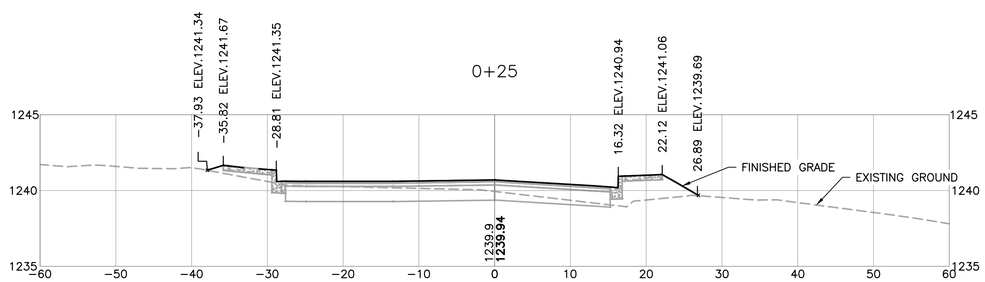
LAKE SUPERIOR COLLEGE
DULUTH, MN

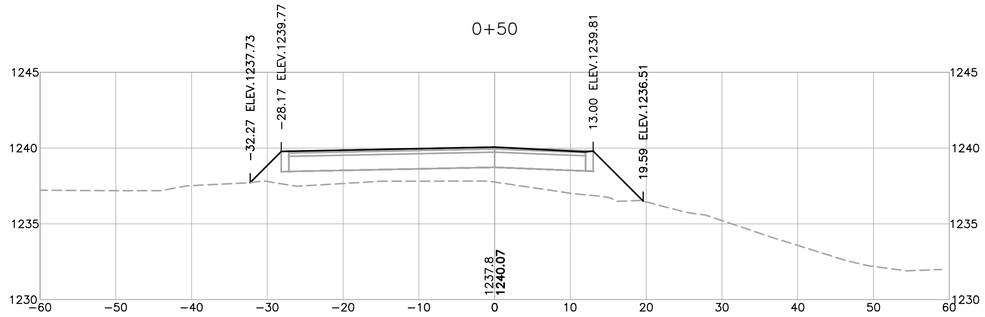
ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

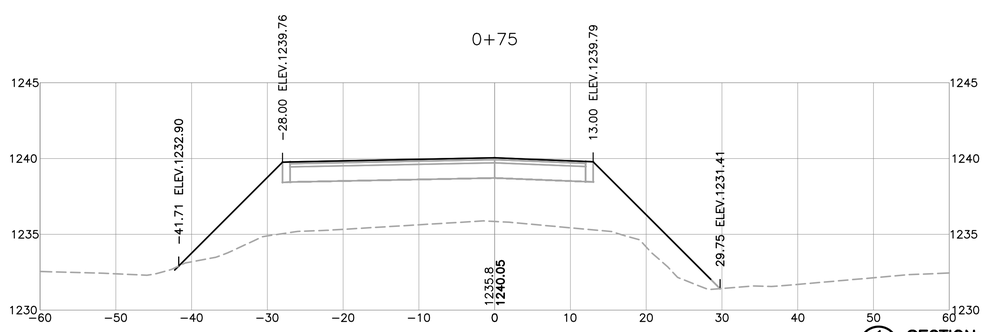
NORTH ENTRANCE ROAD PLAN AND PROFILE
11+20–14+45

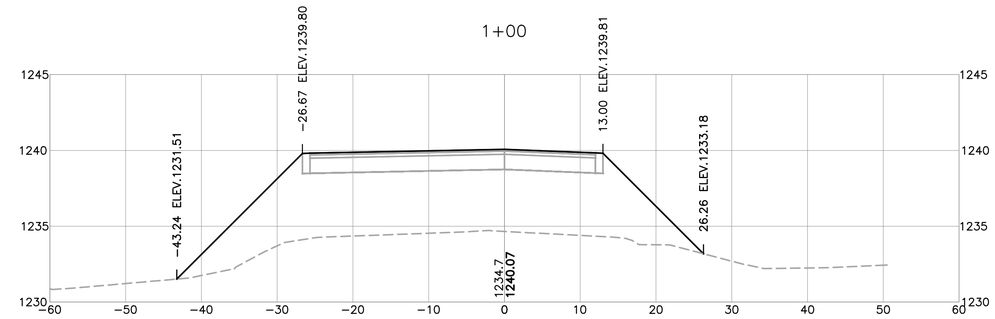
BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C–007
REV. No. C

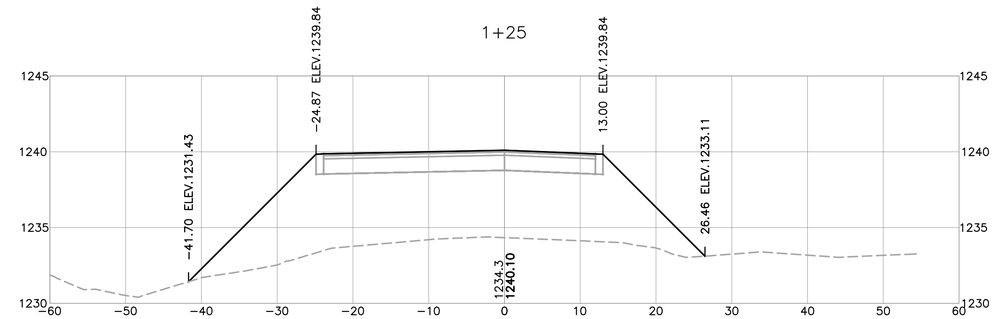


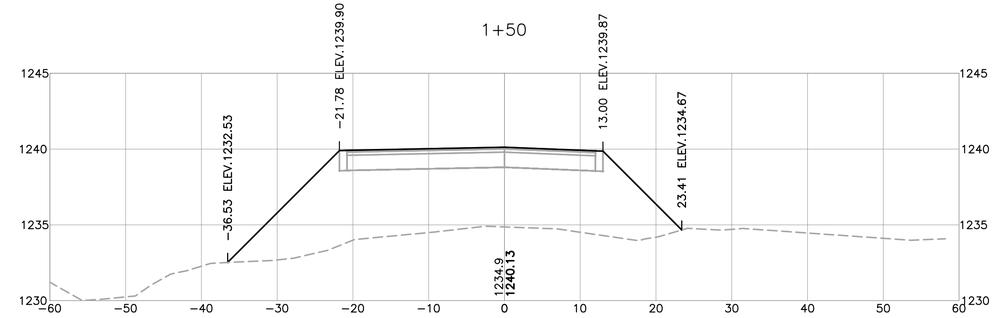


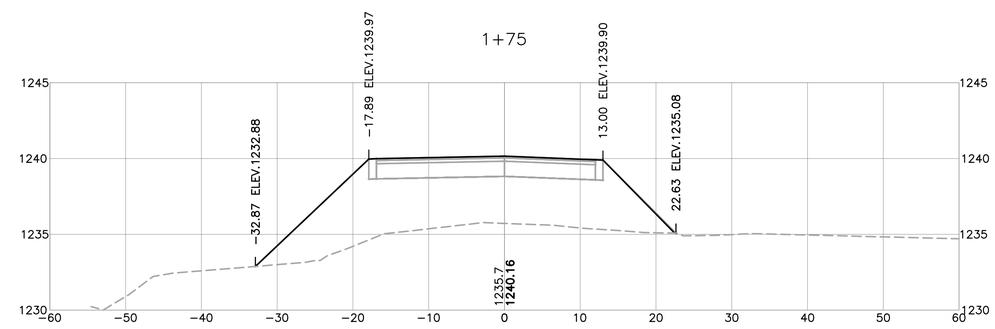












1 SECTION: CROSS SECTIONS

HORIZONTAL SCALE 0 10' 20'

VERTICAL SCALE 0 5' 10'

ISSUED FOR BID

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	01/27/16						
BID		03/11/16					
CONSTRUCTION							

DATE RELEASED

BARR

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BARR ENGINEERING CO.
325 SOUTH LAKE AVENUE
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DULUTH, MN 55802
Ph: 1-800-786-5830
Fax: (218) 529-8202
www.barr.com

Scale	AS SHOWN
Date	01/26/16
Drawn	RRR2
Checked	
Designed	
Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

CROSS SECTIONS 0+00 TO 1+75

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C-008
REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-008.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:23 PM
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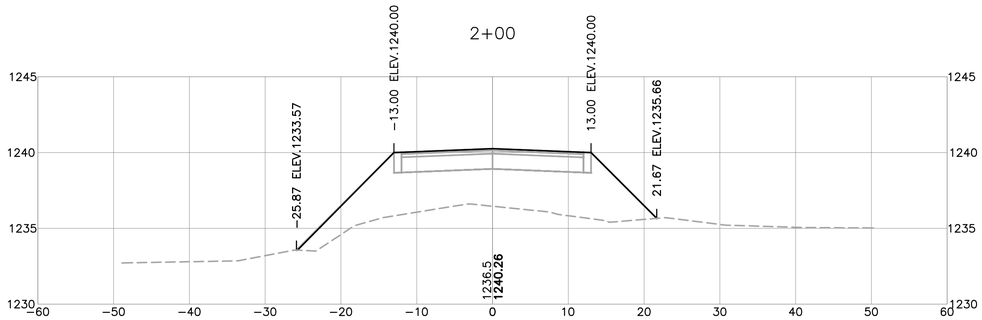

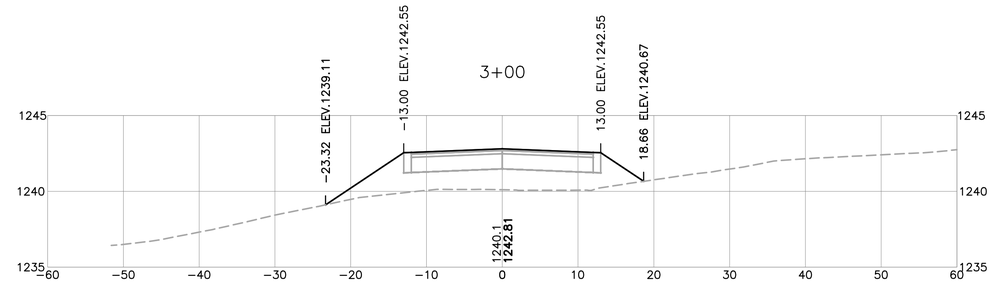

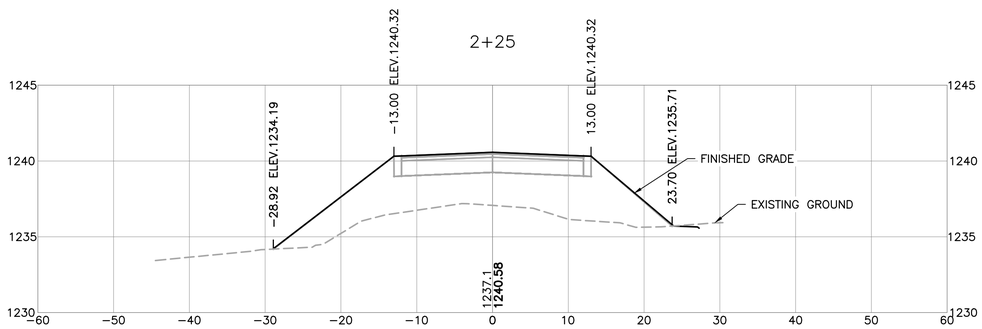

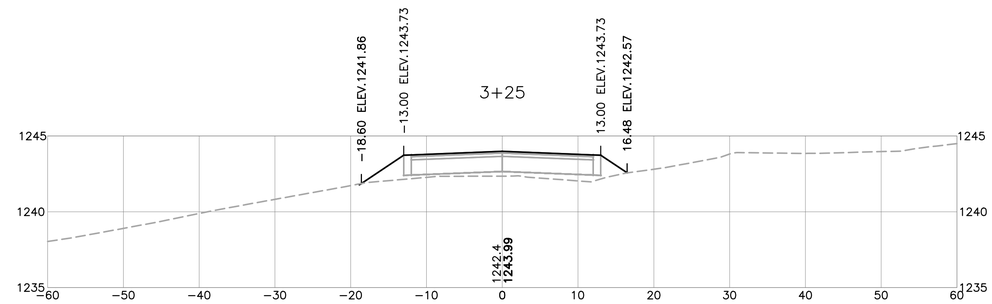

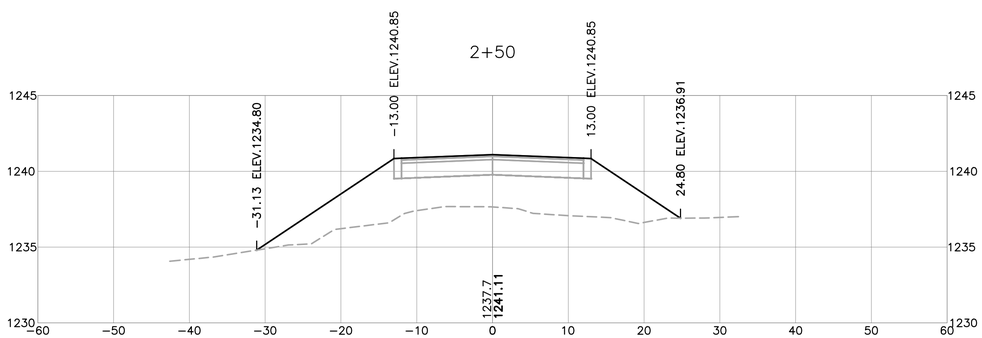

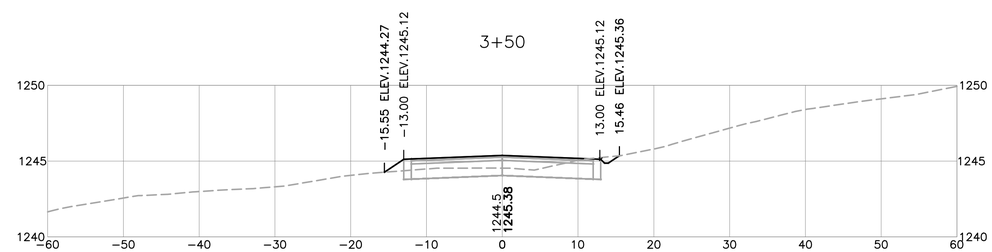

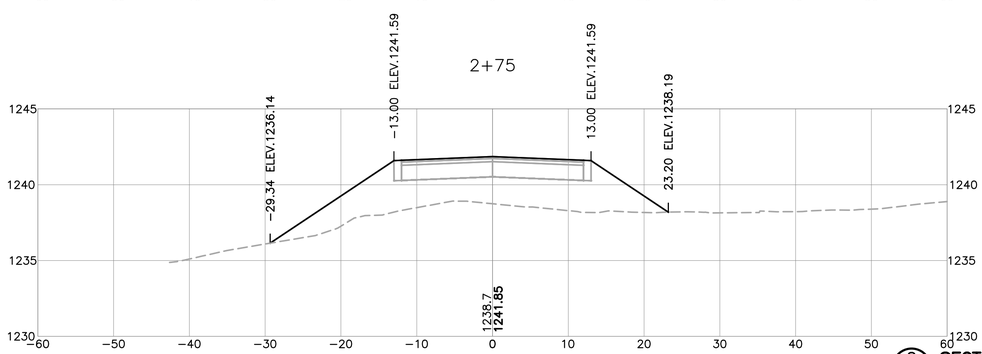

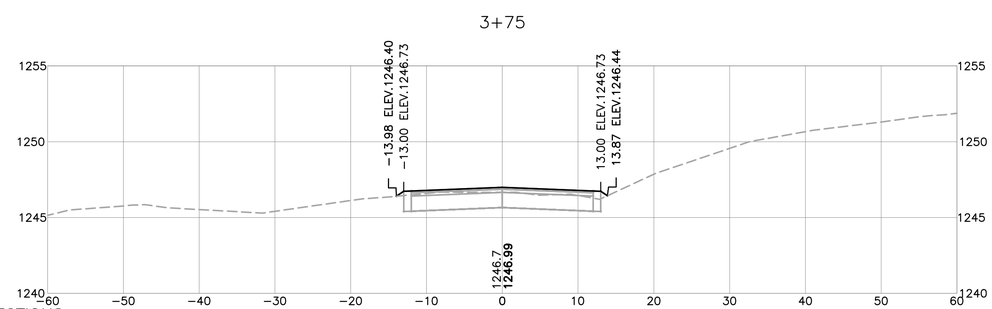

2 SECTION: CROSS SECTIONS

HORIZONTAL SCALE 0 10' 20'

VERTICAL SCALE 0 5' 10'

ISSUED FOR BID

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	01/27/16						
BID		03/11/16					
CONSTRUCTION							
DATE RELEASED							

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Scale	AS SHOWN
Date	01/26/16
Drawn	RRR2
Checked	
Designed	
Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

CROSS SECTIONS 2+00 TO 3+75

BARR PROJECT No. 23691700

CLIENT PROJECT No.

DWG. No. C-009

REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-009.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:09 PM

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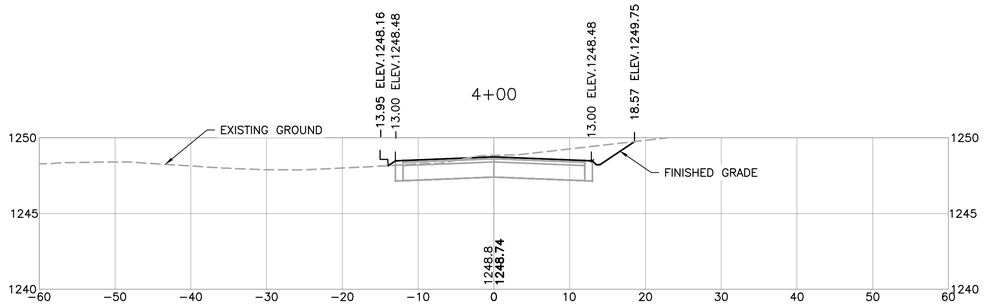

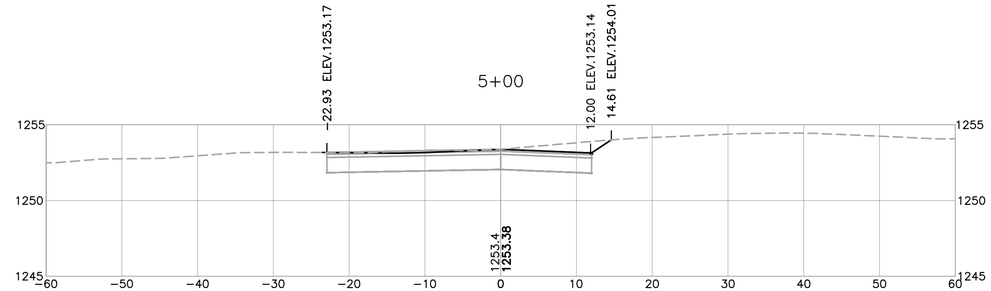

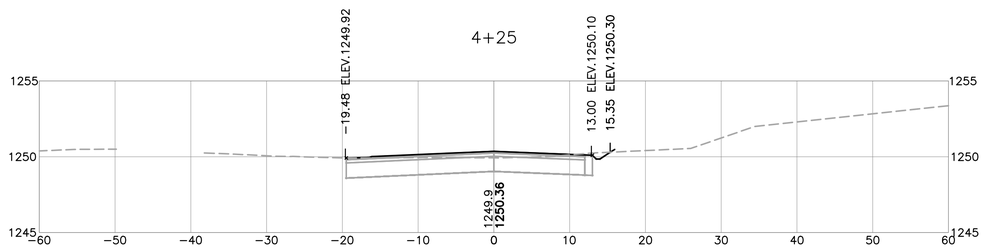

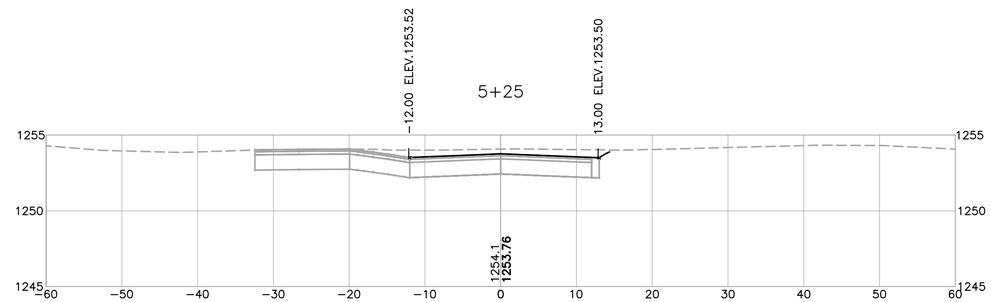

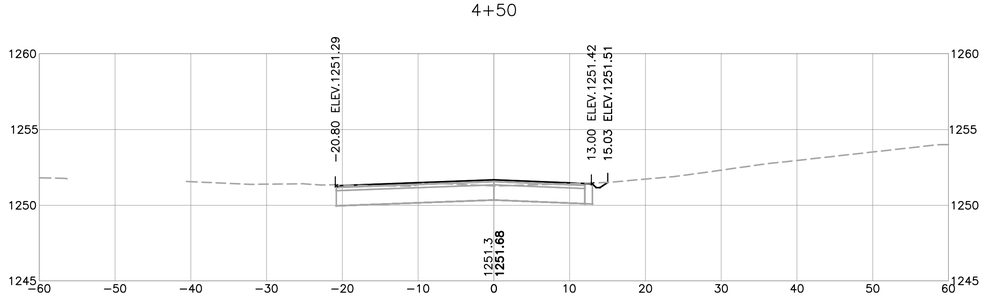

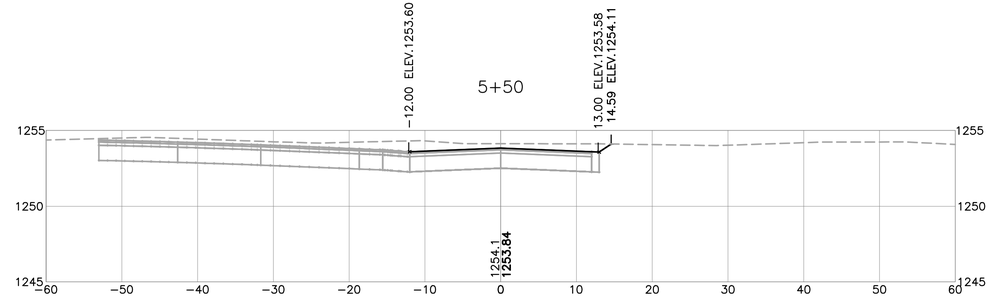

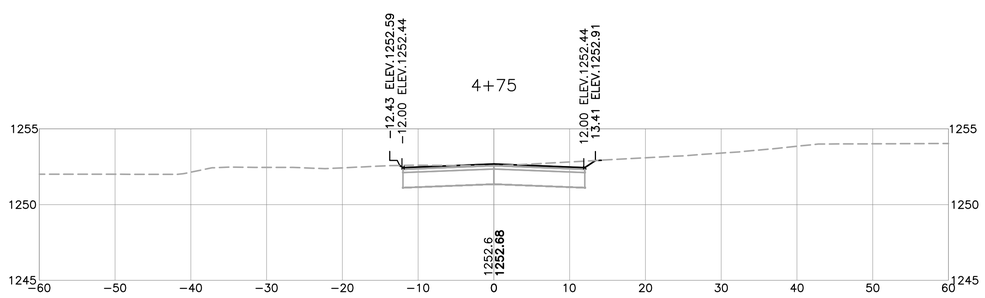

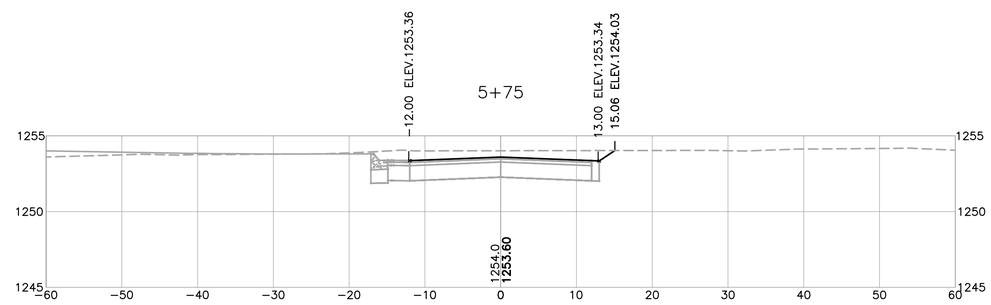

2 SECTION: CROSS SECTIONS

HORIZONTAL SCALE 0 10' 20'

VERTICAL SCALE 0 5' 10'

ISSUED FOR BID

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	01/27/16						
BID		03/11/16					
CONSTRUCTION							

DATE RELEASED

BARR
Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
325 SOUTH LAKE AVENUE
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Scale	AS SHOWN
Date	01/26/16
Drawn	RRR2
Checked	
Designed	
Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

CROSS SECTIONS 4+00 TO 5+75

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C-010
REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-010.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:08 PM
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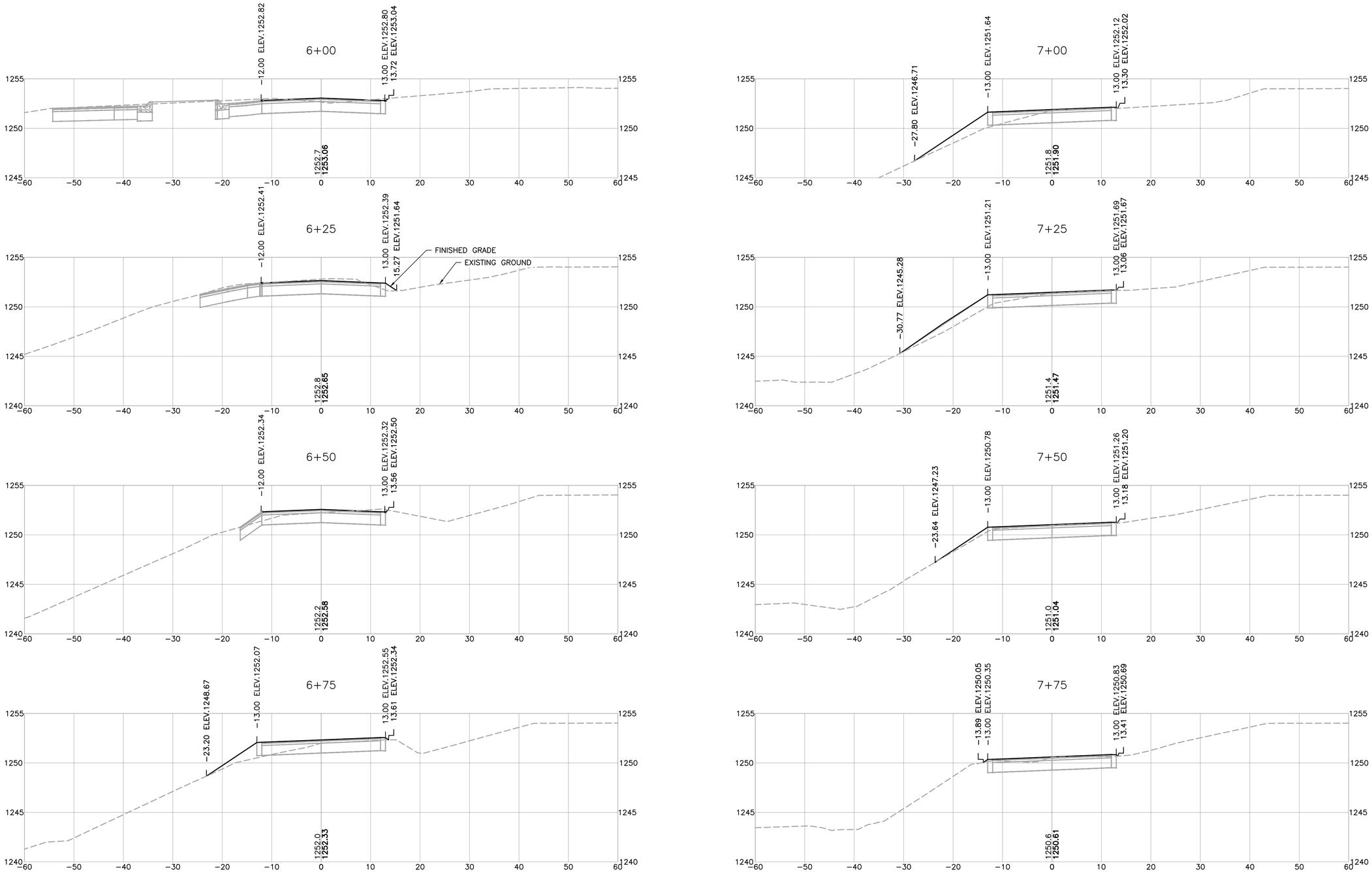

2 SECTION: CROSS SECTIONS

HORIZONTAL SCALE 0 10' 20'

VERTICAL SCALE 0 5' 10'

ISSUED FOR BID

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	01/27/16						
BID		03/11/16					
CONSTRUCTION							

DATE RELEASED

BARR

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Scale	AS SHOWN
Date	01/26/16
Drawn	RRR2
Checked	
Designed	
Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

CROSS SECTIONS 6+00 TO 7+75

BARR PROJECT No. 23691700

CLIENT PROJECT No.

DWG. No. C-011

REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-011.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:15 PM
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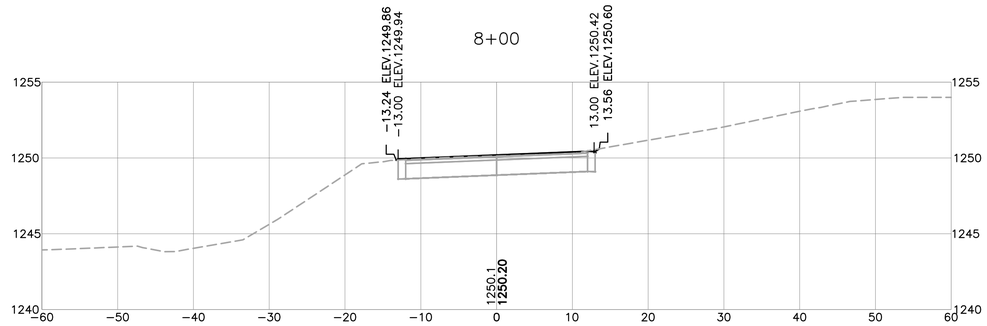

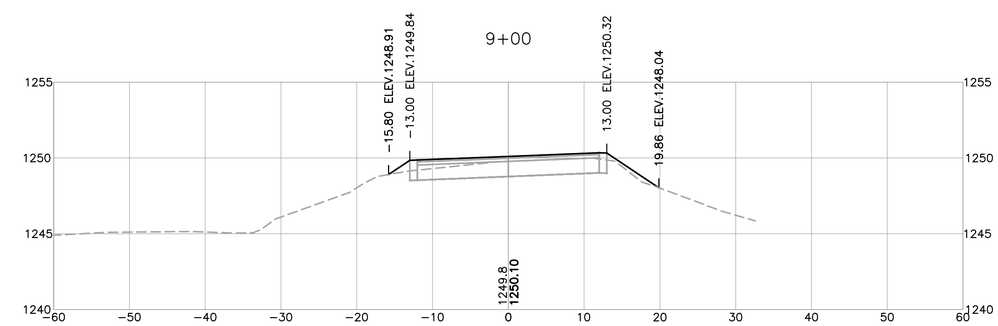

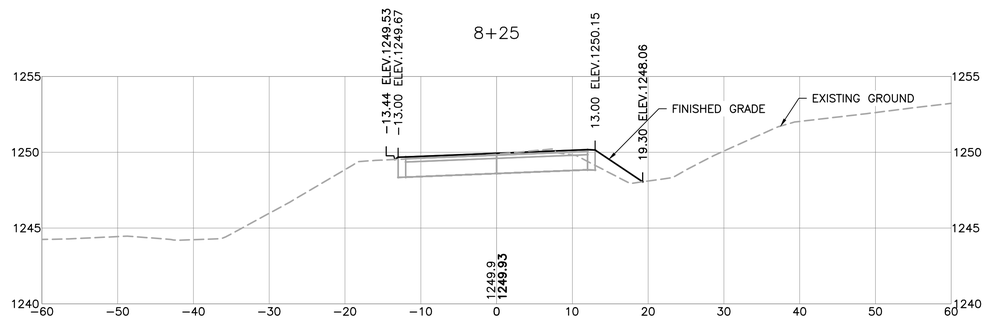

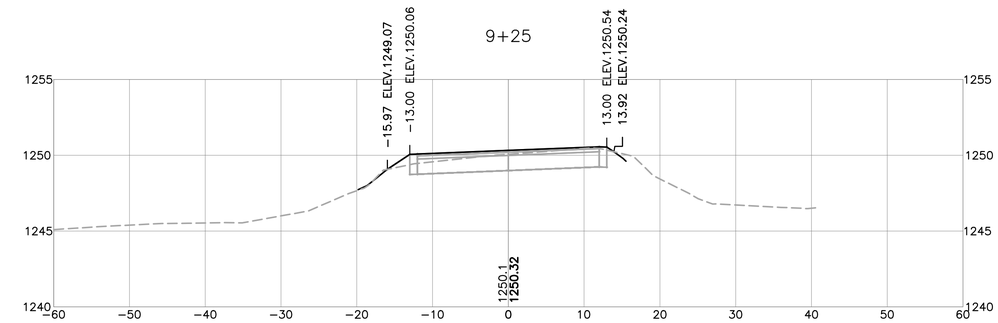

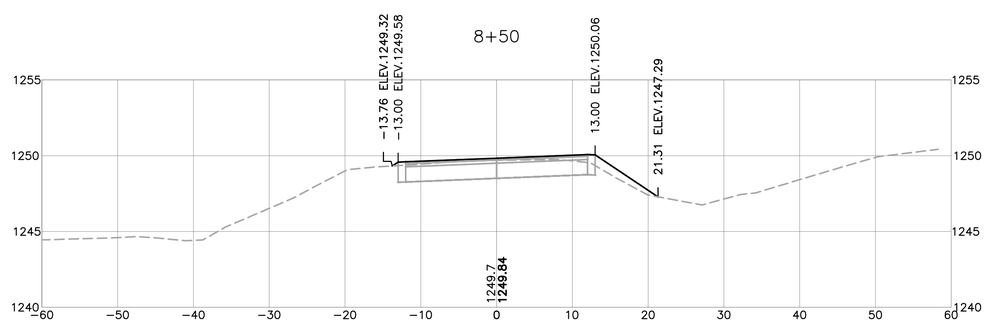

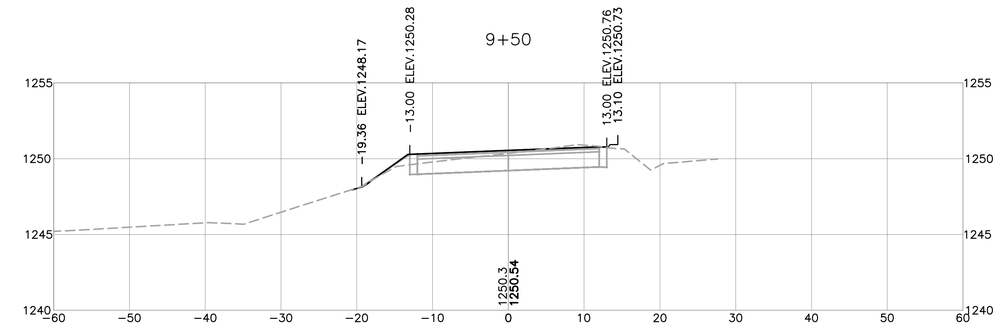

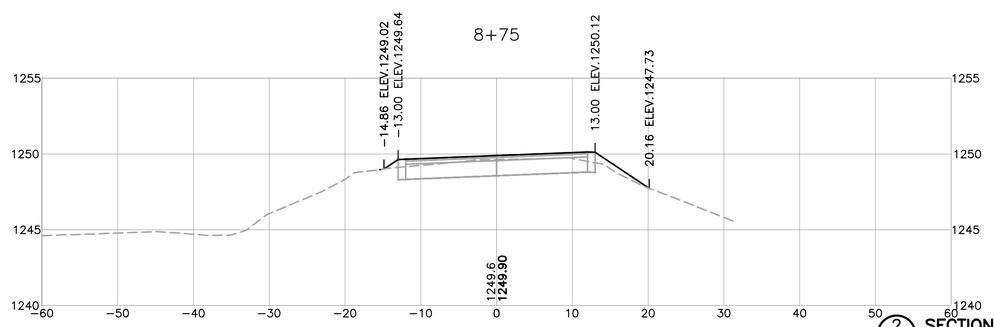

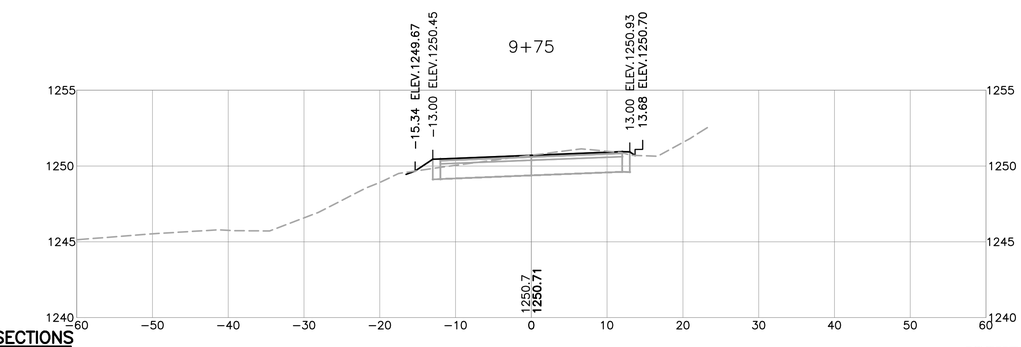

2 SECTION: CROSS SECTIONS

HORIZONTAL SCALE 0 10' 20'

VERTICAL SCALE 0 5' 10'

ISSUED FOR BID

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

CLIENT	01/27/16							
BID		03/11/16						
CONSTRUCTION								
RELEASED TO/FOR	A	B	C	0	1	2	3	
	DATE RELEASED							

BARR

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Scale	AS SHOWN
Date	01/26/16
Drawn	RRR2
Checked	
Designed	
Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

CROSS SECTIONS 8+00 TO 9+75

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C-012
REV. No. B

CADD USER: Randy R. Roberts FILE: M:\DESIGN\23691700.00\23691700_C-012.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:15 PM
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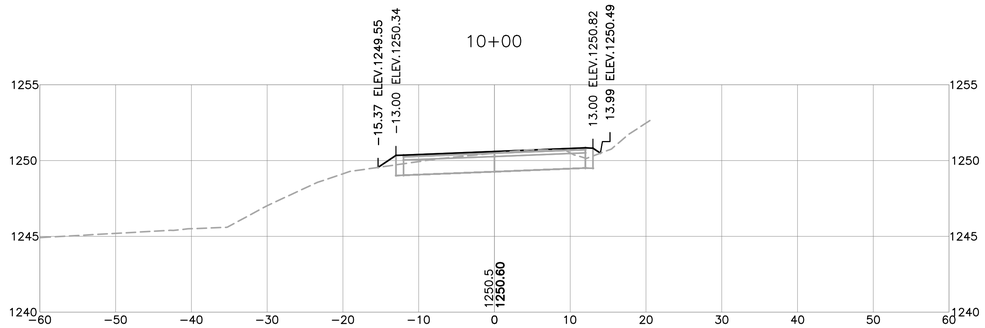

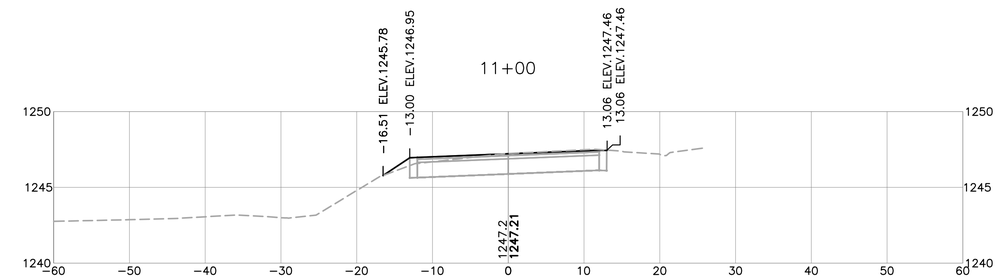

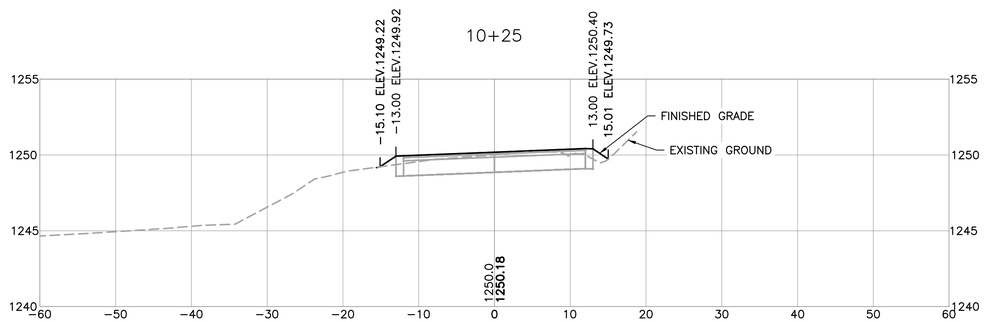

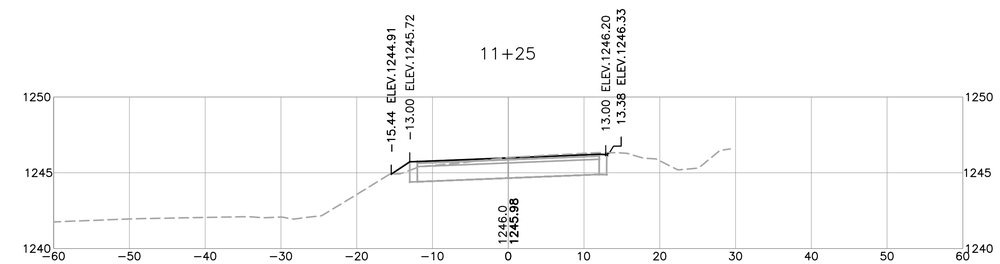

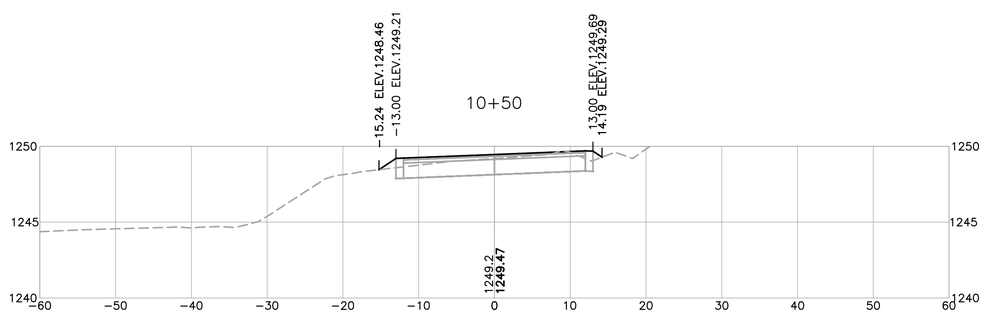

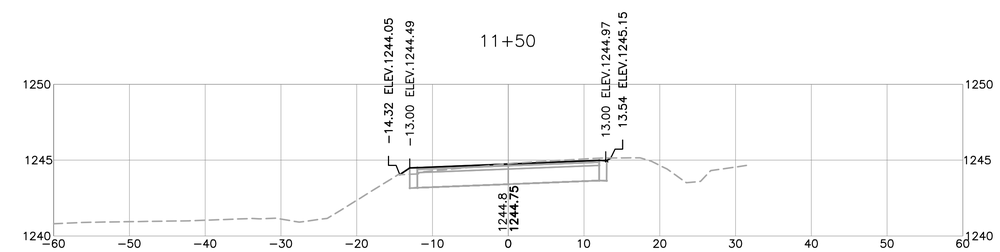

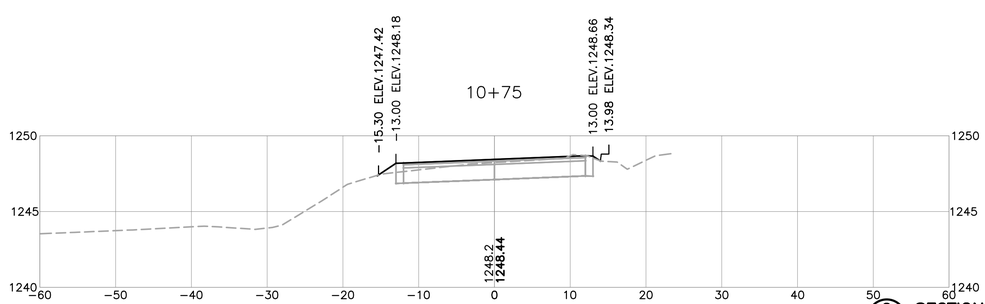

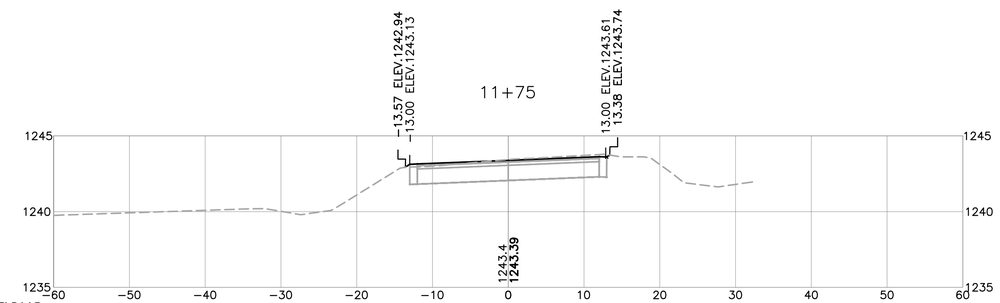

2 SECTION: CROSS SECTIONS

HORIZONTAL SCALE 0 10' 20'

VERTICAL SCALE 0 5' 10'

ISSUED FOR BID

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DATE _____ LICENSE # _____

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CONSTRUCTION							
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	DATE RELEASED						

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Date	01/26/16
Drawn	RRR2
Checked	
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Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

CROSS SECTIONS 10+00 TO 11+75

BARR PROJECT No. 23691700

CLIENT PROJECT No.

DWG. No. C-013

REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-013.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:15 PM

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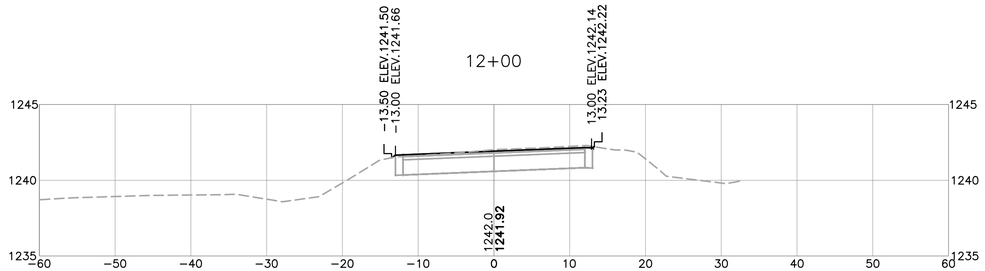

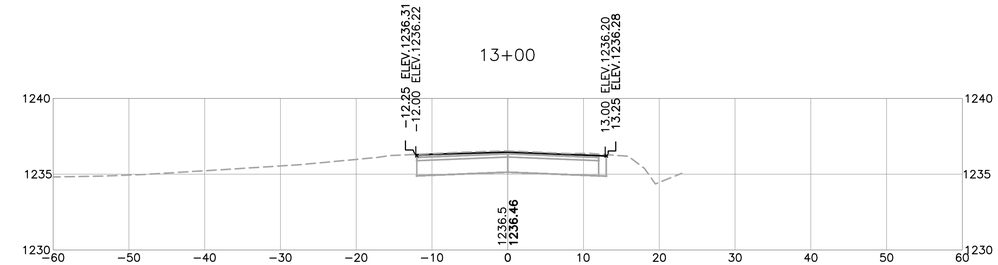

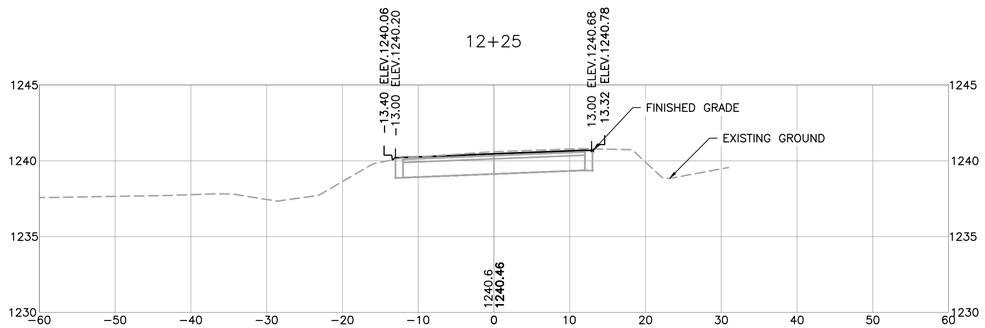

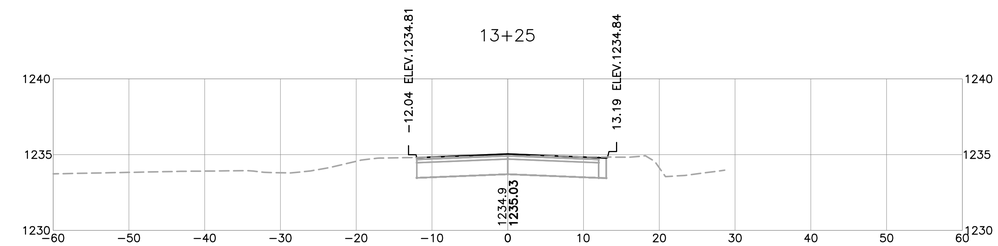

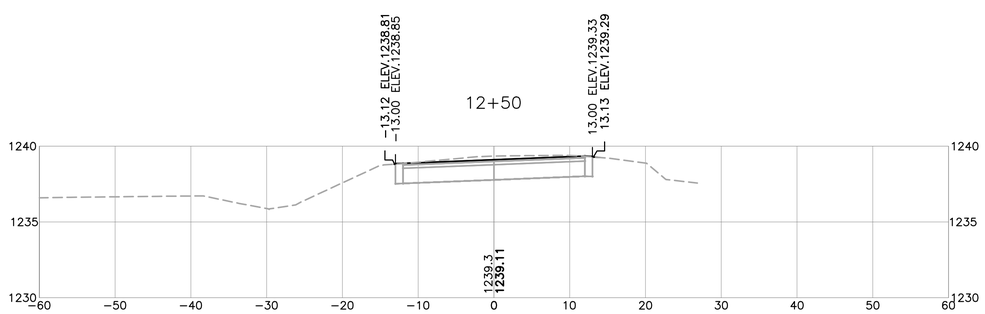

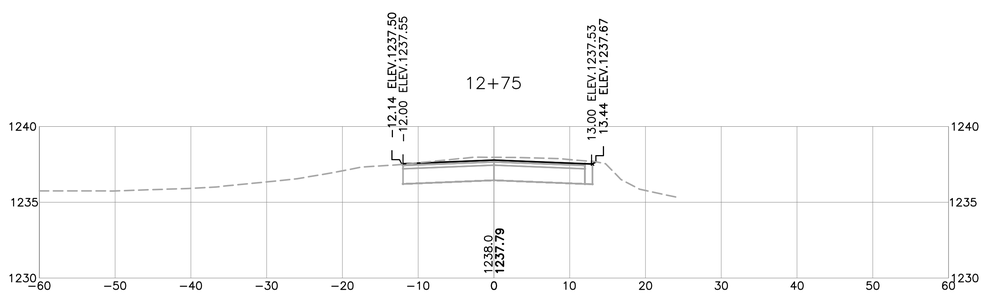

2 SECTION: CROSS SECTIONS

HORIZONTAL SCALE 0 10' 20'

VERTICAL SCALE 0 5' 10'

ISSUED FOR BID

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BID		03/11/16					
CONSTRUCTION							

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Date	01/26/16
Drawn	RRR2
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LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

CROSS SECTIONS 12+00 TO 13+50

BARR PROJECT No. 23691700

CLIENT PROJECT No.

DWG. No. C-014

REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-014.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:14 PM
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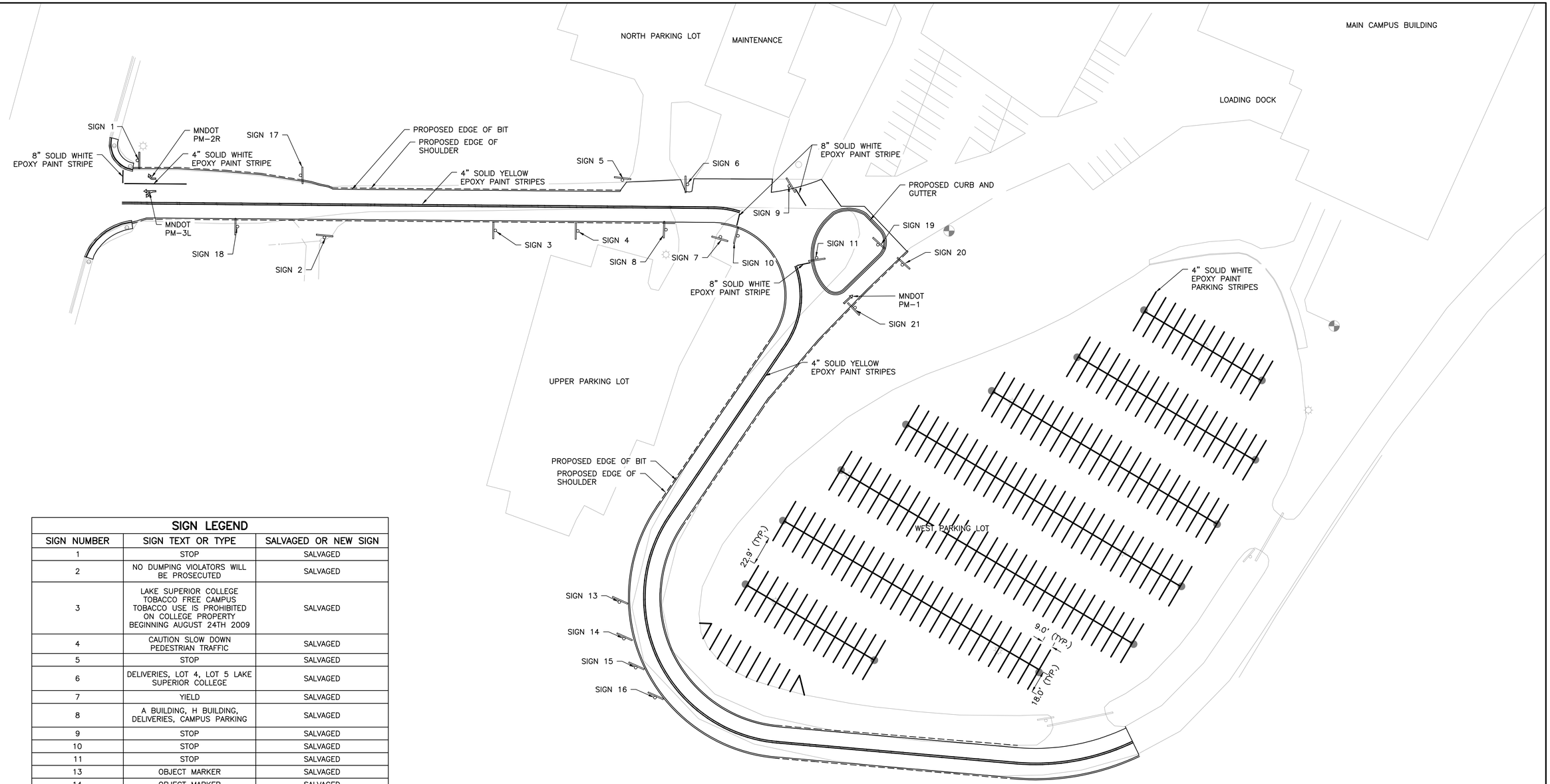

SIGN LEGEND

SIGN NUMBER	SIGN TEXT OR TYPE	SALVAGED OR NEW SIGN
1	STOP	SALVAGED
2	NO DUMPING VIOLATORS WILL BE PROSECUTED	SALVAGED
3	LAKE SUPERIOR COLLEGE TOBACCO FREE CAMPUS TOBACCO USE IS PROHIBITED ON COLLEGE PROPERTY BEGINNING AUGUST 24TH 2009	SALVAGED
4	CAUTION SLOW DOWN PEDESTRIAN TRAFFIC	SALVAGED
5	STOP	SALVAGED
6	DELIVERIES, LOT 4, LOT 5 LAKE SUPERIOR COLLEGE	SALVAGED
7	YIELD	SALVAGED
8	A BUILDING, H BUILDING, DELIVERIES, CAMPUS PARKING	SALVAGED
9	STOP	SALVAGED
10	STOP	SALVAGED
11	STOP	SALVAGED
13	OBJECT MARKER	SALVAGED
14	OBJECT MARKER	SALVAGED
15	OBJECT MARKER	SALVAGED
16	OBJECT MARKER	SALVAGED
17	MNDOT R3-8DA	NEW
18	20 MPH MNDOT R2-1	NEW
19	DO NOT ENTER MNDOT R5-1	NEW
20	DO NOT ENTER MNDOT R5-1	NEW
21	BEGIN ONE WAY MNDOT R6-6	NEW

1 PLAN: PROPOSED SITE CONDITIONS
1"=40'-0"
0 40' 80'

ISSUED FOR BID

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Designed	
Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

PAVEMENT MARKING/PERMANENT SIGNING PLAN

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C-015
REV. No. B

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-015.DWG PLOT SCALE: 1:1 PLOT DATE: 4/9/2016 2:14 PM
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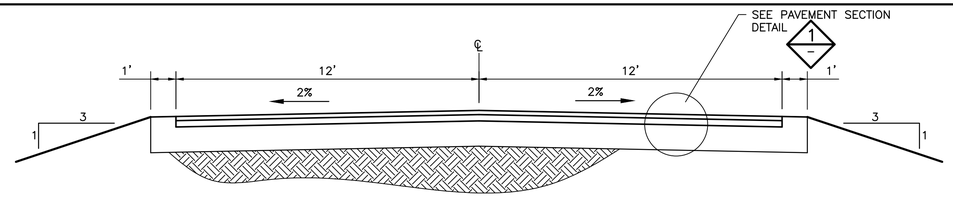
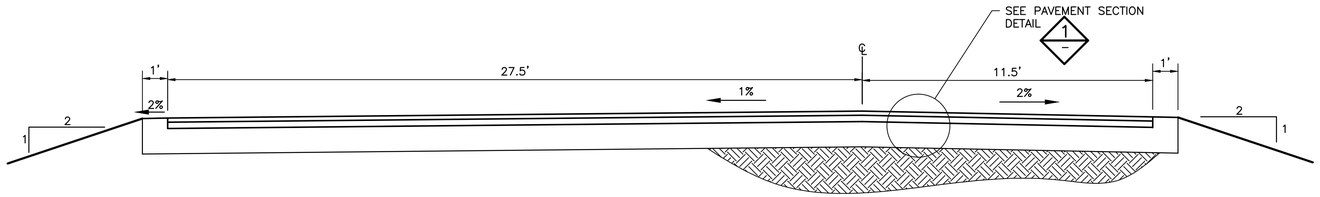
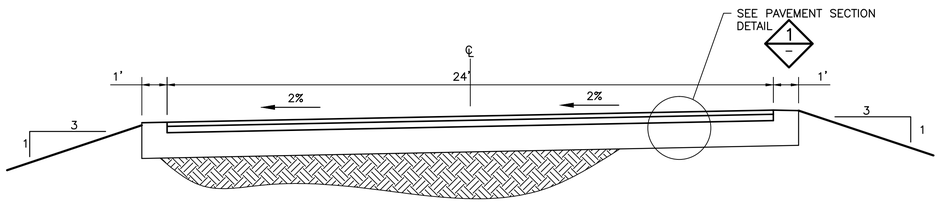


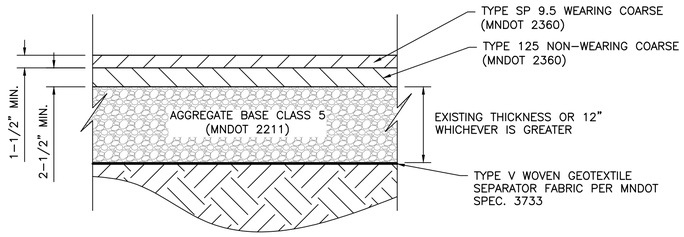
1 C-005 TYPICAL ROAD SECTION: TWO LANE CENTER CROWN
1"=3'-0"



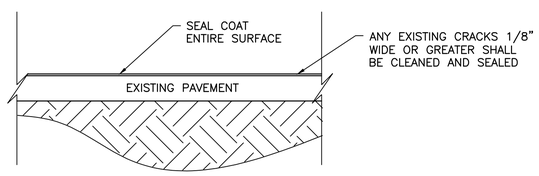
2 C-005 TYPICAL ROAD SECTION: TWO LANE WITH RIGHT TURN LANE
1"=3'-0"



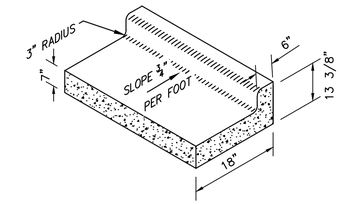
3 C-007 TYPICAL ROAD SECTION: TWO LANE SUPERELEVATED
1"=3'-0"



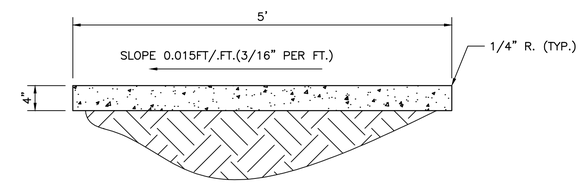
1 – DETAIL: NORTH ENTRANCE ROAD PAVEMENT SECTION
1"=1'-0"



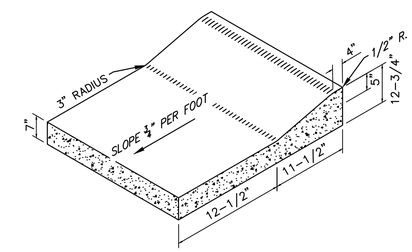
2 C-003 DETAIL: PARKING AREA REPAIR DETAIL
1"=1'-0" SEAL COAT EXISTING SURFACE



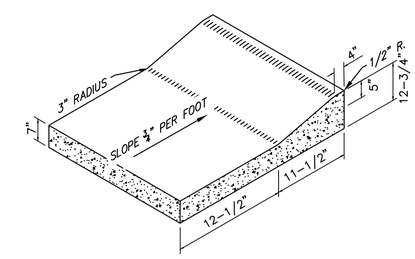
3 C-005 DETAIL: MNDOT V612 CONCRETE CURB AND GUTTER
NOT TO SCALE



4 C-005 DETAIL: CONCRETE SIDEWALK SECTION
NOT TO SCALE



5 C-003 DETAIL: MNDOT S512 CONCRETE CURB AND GUTTER TIPPED OUT
NOT TO SCALE



6 C-003 DETAIL: MNDOT S512 CONCRETE CURB AND GUTTER TIPPED IN
NOT TO SCALE

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CONSTRUCTION							
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LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

DETAIL
SHEET 1 OF 2

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C-016
REV. No. C

CADD USER: Randy R Roberts FILE: M:\DESIGN\23691700.00\23691700_C-016.DWG PLOT SCALE: 1:1 PLOT DATE: 4/7/2016 6:48 PM
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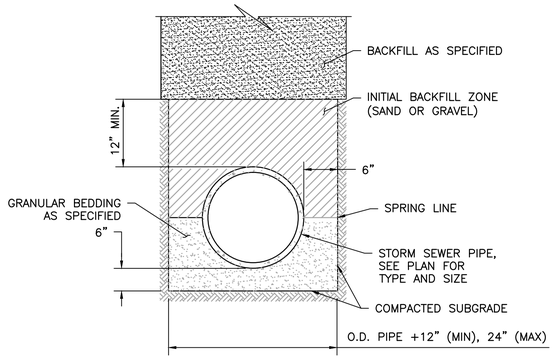
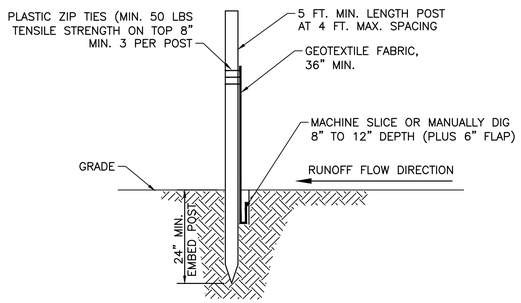


1 C-005 DETAIL: STORM SEWER PIPE AND BEDDING

NOT TO SCALE



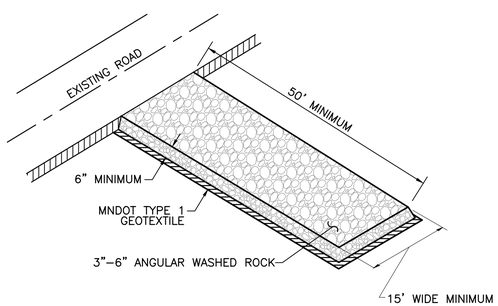
SECTION VIEW

NOTE:

1. WHEN SEDIMENT BUILD UP REACHES 1.5 FEET, THE SILT FENCE SHOULD BE REMOVED OR A SECOND SILT FENCE BUILT UPSTREAM OF THE EXISTING ONE AT A SUITABLE DISTANCE.
2. CONTRACTOR SHALL REMOVE ALL SILT FENCE AND SEDIMENT FOLLOWING CONSTRUCTION AND SOIL STABILIZATION.

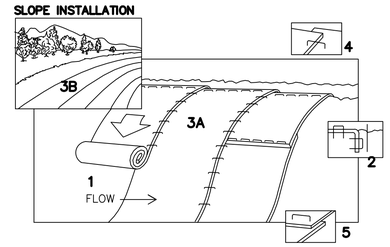
2 C-003 DETAIL: SILT FENCE

NOT TO SCALE



3 C-003 DETAIL: ROCK CONSTRUCTION ENTRANCE

NOT TO SCALE

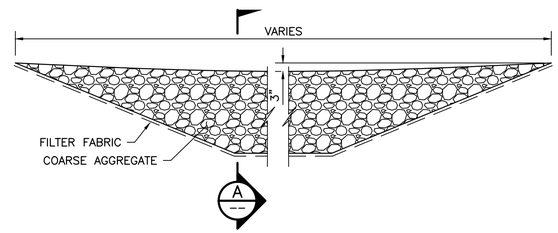


NOTE: REFER TO MANUFACTURER'S GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 6" OVERLAP, WITH THE UPHILL BLANKET ON TOP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.

4 C-003 DETAIL: EROSION CONTROL BLANKET INSTALLATION

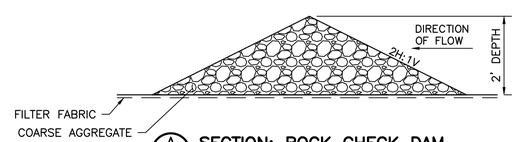
NOT TO SCALE



5 C-003 DETAIL: ROCK CHECK DAM

NOT TO SCALE

NOTE: ROCK CHECK DAM SHOULD CONSIST OF WELL-GRADED STONE CONSISTING OF A MIXTURE OF ROCK SIZES WITH THE FOLLOWING GRADATION
100% LESS THAN 24 INCHES
75% LESS THAN 15 INCHES
50% LESS THAN 12 INCHES
10% LESS THAN 4 INCHES

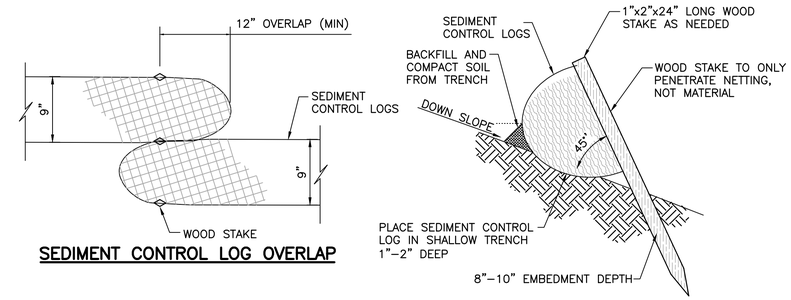


A SECTION: ROCK CHECK DAM

NOT TO SCALE

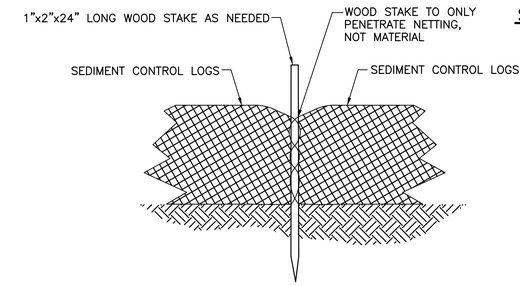
CONCRETE WASHOUT NOTES:

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.



SEDIMENT CONTROL LOG OVERLAP

STAKE DETAIL–SIDE VIEW



STAKE DETAIL–FRONT VIEW

5 C-003 DETAIL: STRAW SEDIMENT CONTROL LOGS

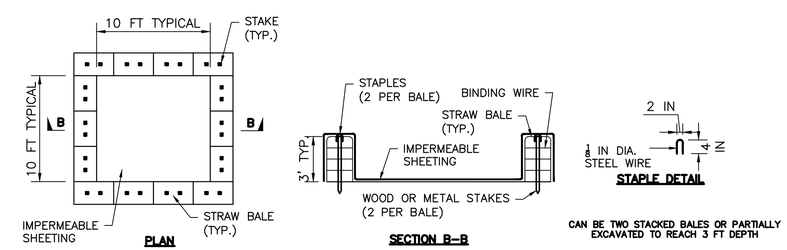
NOT TO SCALE

25-141 Mesic General Roadside

Common Name	Scientific Name	Rate (lb/ac)	Rate (kg/ha)	% of Mix (by weight)	Seeds/ sq ft
Park Kentucky bluegrass	*Poa pratensis Park*	15.75	17.65	26.69%	502.50
Perennial Ryegrass	*Lolium perenne*	13.25	14.85	22.46%	66.00
Smooth Brome	*Bromus inermis*	7.75	8.69	13.14%	25.42
Canada bluegrass*	*Poa compressa*	7.50	8.41	12.71%	412.00
fowl bluegrass	*Poa palustris*	4.00	4.48	6.78%	191.00
slender wheatgrass	*Elymus trachycaulus*	2.00	2.24	3.40%	5.08
Timothy	*Phleum pratense*	1.75	1.96	2.97%	49.50
switchgrass	*Panicum virgatum*	1.50	1.68	2.54%	7.70
	Grasses Subtotal	53.50	59.97	90.69%	1259.20
Alfalfa	*Medicago sativa*	3.50	3.92	5.92%	18.20
White Clover	*Trifolium repens*	2.00	2.24	3.39%	32.70
	Forbs Subtotal	5.50	6.16	9.31%	50.90
	Total	59.00	66.13	100.00%	1310.10

6 C-003 DETAIL: STATE SEED MIX 25-141

NOT TO SCALE



7 C-003 DETAIL: CONCRETE WASHOUT – STRUCTURE WITH STRAW BALES

NOT TO SCALE

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SIGNATURE ____

DATE ____ LICENSE # ____

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CLIENT	01/27/16						
BID		03/11/16					
CONSTRUCTION							
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BARR

Corporate Headquarters: Minneapolis, Minnesota Ph: 1–800–632–2277

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Scale	AS SHOWN
Date	01/26/2016
Drawn	RRR2
Checked	
Designed	
Approved	

LAKE SUPERIOR COLLEGE
DULUTH, MN

ROAD AND PARKING IMPROVEMENTS
LAKE SUPERIOR COLLEGE

DETAIL
SHEET 2 OF 2

BARR PROJECT No. 23691700
CLIENT PROJECT No.
DWG. No. C–017
REV. No. B

CADD USER: Candi Nylund FILE: M:\DESIGN\23691700.00\23691700_C-017.DWG PLOT SCALE: 1:1 PLOT DATE: 4/21/2016 12:37 PM
BARR M:\AutoCAD 2011\AutoCAD 2011 Support\enu\Template\Barr_2011_Template.dwt Plot at 1 10/05/2010 14:03:50

Exhibit C

Wetland Delineation Report

Wetland Delineation Report

Prepared for:

Gary Adams
Lake Superior College
Duluth, MN

October 28, 2015

Wetland Delineation Report

Prepared for:

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Wetland Delineation Report
Lake Superior College

October 28, 2015

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Appendix A Wetland Determination Data Forms

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1.0 Introduction

Barr Engineering Company (Barr) delineated wetland boundaries within the project area provided for the replacement of a culvert and to raise the road profile (project) of the north entrance road to the Lake Superior College (LSC) campus. The culvert replacement and road improvement is part of a larger project to improve the north entrance road and west parking lot on the LSC campus.

The project site is located at the north entrance road to LSC, near the road's intersection with U.S. Highway (USH) 53/Trinity Road within the City of Duluth. It is located within Township 50 North, Range 14 West, Section 29 in St. Louis County, Minnesota (Figure 1).

The wetland delineation was undertaken to determine the amount of impacts that may occur with the proposed project. The delineation was conducted on October 9, 2015, by Lindsay Tekler, an environmental scientist at Barr. Delineation in the field occurred within the limits of the proposed project, which consisted of the east and west sides of the existing north entrance road (Figure 1).

2.0 Wetland Delineation and Classification Methods

The wetland delineation was conducted according to guidance from the U.S. Army Corps of Engineers (USACE), including the Routine On-Site Determination Method as specified in the *1987 U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE, 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (USACE 2012), and the *Guidance for Submittal of Delineation Reports to the St. Paul District Corps of Engineers and Wetland Conservation Act Local Governmental Units in Minnesota, Version 2.0* (USACE 2015).

Wetland boundaries were defined by sampling in a wetland and an adjacent upland in a series of paired plots. The observations at each sampling plot were recorded on wetland determination data forms (Appendix A). Data was collected for soils, vegetation, and hydrology at each sample site. Soils were examined to a depth of at least 24 inches below the ground surface, or until refusal occurred due to the presence of bedrock or coarse fragments. Representative soil samples from each boring were examined for color, texture, and the presence of hydric soil indicators. Soil colors (e.g., 7.5YR 4/2, etc.) were determined using Munsell® soil color charts, and soil textures were classified by feel. The NRCS hydric soil indicators (Version 7.0, 2010) were used to identify hydric soils. Hydrologic conditions were evaluated at each sample site. Plant species at each sample site were identified, and percent areal cover was estimated. Dominant species were determined using the 50/20 rule, and the corresponding wetland indicator status of each plant species was recorded using the current National Wetland Plant List (USACE 2014). A determination of hydrophytic vegetation status was made using the rapid test, dominance test, and prevalence index. Photographs were collected of the study area to document site conditions (Appendix B).

Wetland boundaries were collected on site using a Trimble GeoXH 6000 Global Positioning System (GPS) Unit, capable of recording positions with sub-foot horizontal accuracy. Wetland boundaries were later digitized in ArcView© 10.3 Geographic Information System (GIS) software.

Delineated wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Circular 39 System (U.S. Fish and Wildlife 1956), the USFWS Cowardin System (Cowardin et al. 1979), and the Eggers and Reed Plant Community Classification System (Eggers and Reed 2011). A comparison of these classification systems is provided in Table 1.

3.0 Background Information

Prior to conducting field work, the following background information was consulted to obtain information on the general site characteristics and to establish the probability and potential location of wetlands on the site.

3.1 Antecedent Hydrology

Monthly precipitation data provided by the National Oceanic and Atmospheric Administration (NOAA) Regional Climate Centers from the Duluth International Airport weather station was compared with historic WETS table precipitation data from a 30-year dataset (1971—2000) from the same weather station to determine if normal hydrologic and climatic conditions were present on-site during the delineation. When compared to the WETS data, the observed precipitation data from three months prior to the delineation indicated normal conditions in July and August and wetter than normal conditions in September (Table 2). In addition, the recorded data for the week prior to the delineation was 0.23 inches of precipitation. As a result of this antecedent precipitation history data, Barr determined that wetter than normal hydrologic conditions were present at the time of the delineation.

3.2 Topography

The U.S.G.S. topographic map displays relatively flat topography within the project area, which was confirmed on-site during the wetland delineation. The surrounding landscape is steeply sloping from the north and gently sloping from the south towards the project area (Figure 2). The on-site field assessment confirmed this topography and observed that the surrounding landscape generally slopes and drains toward the project area.

3.3 Existing Wetland and Waterway Mapping

A portion of the eastern side of the project area is mapped as wetland by current National Wetland Inventory (NWI) mapping as freshwater forested/shrub wetland (Figure 3). While the NWI mapping on the eastern side of the entrance road somewhat matches the wetland delineated on-site, the NWI mapping on the western side does not correlate with existing wetland conditions. More information on the wetland conditions on site can be found in Section 4 and Figure 6.

Current City of Duluth waterway mapping does not show any waterways within the project area (Figure 3). There are also no Public Water Inventory waterways or basins within the project area (Figure 3). No waterways were found on-site during the delineation. One drainage ditch was found at the toe-of-slope of Trinity Road/USH 53 and traveled through the culvert within the project area (Figure 6).

3.4 Soils

The U.S. Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS) *Soil Survey of St. Louis County* identified three soil types within the project area (Figure 5). A detailed description of each NRCS mapped soil type can be found in Table 3.

Sampling plots taken during the delineation were located within the predominant NRCS mapped soil type (Table 3). Plots 1-W, 1-U, 2-W, and 2-U were located within the mapped F134A Giese muck, depressional, 0 to 1 percent slopes soil type. NRCS identified a soil texture of silt loam over gravelly sandy loam for this soil type. At these four plots, a soil of gravelly sandy loam and silt loam was observed, confirming the NRCS texture.

Further descriptions of the soils found within each sampling plot can be found in Section 4 and the wetland determination data forms located in Appendix A.

4.0 Wetland Delineation Results and Discussion

Barr inspected the project area on October 9, 2015. A total of 0.23 acres of wetland was found within the approximately 0.66 acre project area, comprising 35 percent of the total project area (Areas 1A, 1B, 2, and 2B). The locations of the sampling plots and wetland boundaries can be found in Figure 6. A description of the identified wetlands, associated sampling plots, and other site conditions is provided below.

4.1 Wetland 1

This wetland complex is located at the toe-of-slope of USH 53/Trinity Road on the east side of the entrance road (Figure 6). Within the project area, this wetland consists of wet meadow (type 2) and shallow marsh (type 3) wetland. A drainage ditch that flows through the existing culvert widens and transitions into shallow marsh south of the culvert. The wetland complex is approximately 0.07 acres or 2,892 square feet in size within the project area (Areas 1A and 1B). The wetland extends beyond the project area to the south of Area 1A and to the east of Areas 1B as hardwood swamp (type 7) and shallow marsh (type 3). A stormwater retention pond is located just east of Area 1A.

Within the wetland complex, the most prevalent species were Canada bluejoint grass (*Calamagrostis canadensis)*, reed canary grass (*Phalaris arundinacea)*, narrow leaved cattail (*Typha angustifolia)*, and giant goldenrod (*Solidago gigantea).* The observed soil texture throughout the profile was gravelly sandy loam in the first layer, mucky silt loam in the second layer, and loam in the third layer. The soil met the requirements to fulfil the redox dark surface (F6) and red parent material (F21) hydric soil indicators. Hydrology was indicated by saturation at the surface, a water table at 3 inches, water stained leaves, a depressional geomorphic position, and a positive FAC-neutral test.

Documentation of hydrophytic vegetation, wetland hydrology, hydric soils, and other site conditions for the wetland 1 are described in the data sheet for sampling plot 1-W (Appendix A). Representative photographs of plot 1-W and the wetland 1 complex are provided in Appendix B.

4.1 Wetland 2

This wetland complex is located at the toe-of-slope of USH 53/Trinity Road on the west side of the entrance road (Figure 6). This wetland complex is a mixture of wet meadow (type 2), shallow marsh (type 3), and hardwood swamp (type 7) wetland. The shallow marsh narrows and channelizes, transitioning into the drainage ditch that flows west to east through the existing culvert. The wetland complex is approximately 0.17 acres or 7,238 square feet in size within the project area (Areas 2A and 2B). The wetland extends beyond the project area to the west of Area 2A as hardwood swamp, wet meadow, and shallow marsh but is bounded to the south by a gravel access road to maintenance buildings (Figure 6). South of the access road and maintenance building, hardwood swamp (type 7) wetland was found within Area 2B, but the majority of this wetland is located outside of the project area, continuing to the west. Wetland 1 is divided from wetland 2 by the LSC entrance road that runs north-south.

Within the wetland complex, the most prevalent species were Canada bluejoint grass, reed canary grass, narrow leaved cattail, water horsetail (*Equisetum fluviatile),* Bebb's willow (*Salix bebbiana)*, speckled alder (*Alnus incana)*, and balsam poplar (*Populus balsamifera)*. The observed soil texture was gravelly sandy loam over loam and the soil met the requirements to fulfil the redox dark surface hydric soil indicator. Hydrology was indicated by 1 inch of surface water, saturation and a water table at the surface, water stained leaves, hydrogen sulfide odor, a depressional geomorphic position, and a positive FAC-neutral test.

Documentation of hydrophytic vegetation, wetland hydrology, hydric soils, and other site conditions for wetland 2 are described in the data sheet for sampling plot 2-W (Appendix A). Representative photographs of plot 2-W and the wetland 2 complex are provided in Appendix B.

4.2 Upland Descriptions

Upland areas within the project area included the hillslope of USH 53/Trinity Road and the shoulder of the entrance road to LSC. Uplands comprise a total of 0.43 acres or 65 percent of the total project area (Areas 1A, 1B, 2A, and 2B). Upland areas surrounding the project area included the hillslope of Trinity Road/USH 53, a portion of the forest in Area 2A, a berm dividing wetland 1 from the stormwater pond in Area 1A, the road shoulder on Area 2B, and all of Area 1B (Figure 6).

Transitions into uplands were characterized by rises in ground elevation, upland plant species, and an absence of wetland hydrology and hydric soils. The most prevalent species within upland buffer areas were Kentucky blue grass (*Poa pratensis)*, quack grass (*Elymus repens)*, smooth brome grass (*Bromus inermis)*, common Timothy grass (*Phleum pratense)*, birdsfoot trefoil (*Lotus corniculatus)*, and Canada goldenrod (*Solidago canadensis)*.

Documentation of upland conditions are described in the data sheets for sampling plots 1-U and 2-U (Appendix A). Representative photographs of uplands are provided in Appendix B.

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Tables

Table 1. Wetland Classifications.

Wetland Plant Community Types (Eggers and Reed)	Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979)	Fish and Wildlife Service Circular 39 (Shaw and Fredine 1971)
Shallow, Open Water	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating, and floating-leaved	Type 5: Inland open fresh water
Deep Marsh	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating, and floating-leaved; and emergent; persistent and nonpersistent	Type 4: Inland deep fresh marsh
Shallow Marsh	Palustrine; emergent; persistent and nonpersistent	Type 3: Inland shallow fresh marsh
Sedge Meadow	Palustrine; emergent; narrow-leaved persistent	Type 2: Inland fresh meadow
Fresh (Wet) Meadow	Palustrine; emergent; broad- and narrow-leaved persistent	Type 1: Seasonally flooded basin or flat;
		Type 2: Inland fresh meadow
Wet to Wet-Mesic Prairie	Palustrine; emergent; broad- and narrow-leaved persistent	Type 1: Seasonally flooded basin or flat;
		Type 2: Inland fresh meadow
Calcareous Fen	Palustrine; emergent; narrow-leaved persistent; and scrub/shrub, broad leaved deciduous	Type 2: Inland fresh meadow
Open Bog	Palustrine; moss/lichen; and scrub/shrub; broad-leaved evergreen	Type 8: Bog
Coniferous Bog	Palustrine; forested: needle-leaved evergreen and deciduous	Type 8: Bog
Shrub - Carr	Palustrine; scrub/shrub; broad-leaved deciduous	Type 6: Shrub swamp
Alder Thicket	Palustrine; scrub/shrub; broad-leaved deciduous	Type 6: Shrub swamp
Hardwood Swamp	Palustrine; forested; broad-leaved deciduous	Type 7: Wooded swamp
Coniferous Swamp	Palustrine; forested; needle-leaved deciduous and evergreen	Type 7: Wooded swamp
Floodplain Forest	Palustrine; forested; broad-leaved deciduous	Type 1: Seasonally flooded basin or flat
Seasonally Flooded Basin	Palustrine; flat; emergent; persistent and non-persistent	Type 1: Seasonally flooded basin or flat

Table 2. Precipitation Summary Compared to WETS Data.

Month	WETS: 1971 - 2000			Precipitation Amount (inches)				
		30% chance						
	Average	less than	more than	2011	2012	2013	2014	2015
January	1.12	0.68	1.36	1.11	*0.37*	**1.39**	0.73	*0.46*
February	0.83	0.46	1.00	*0.31*	**1.41**	**1.16**	**2.12**	*0.38*
March	1.69	1.01	2.05	*0.83*	1.62	2.04	1.91	*0.79*
April	2.09	1.26	2.53	**3.79**	**3.70**	**5.04**	**3.30**	*1.03*
May	2.95	1.84	3.57	2.27	**6.61**	**3.67**	**4.37**	**3.73**
June	4.25	2.91	5.07	3.72	**10.03**	4.54	4.47	3.64
July	4.20	2.81	5.03	4.57	3.09	*1.73*	3.42	3.01
August	4.22	2.83	5.05	**5.71**	*1.42*	*1.98*	4.63	4.09
September	4.13	2.76	4.94	*1.48*	*0.84*	*1.26*	*1.64*	**6.81**
October	2.46	1.40	2.99	*1.13*	*1.34*	**3.93**	1.80	0.23
November	2.12	1.11	2.58	*0.60*	1.33	*0.82*	*0.98*	
December	0.94	0.56	1.14	*0.55*	**1.44**	**2.88**	**1.26**	
Annual	31.00	27.78	33.71	*26.07*	33.20	30.44	30.63	

Legend:
Bold = above normal range
Italics = below normal range
Underline = incomplete monthly data

Sources:
NOAA Duluth International Airport Station WETS and monthly totals: http://agacis.rcc-acis.org/27137/wets
Weather Underground Betty Rubble Station weekly total: http://www.wunderground.com/weather-forecast/zmw:55811.1.99999

Formula to determine if normal hydrologic conditions are present:

$$Y = 1(x1) + 2(x2) + 3(x3)$$

Where (x1) = precipitation normality value for 3 months before the delineation (July)
Where (x2) = precipitation normality value for 2 months before the delineation (August)
Where (x3) = precipitation normality value for 1 month before the delineation (September)
(Precipitation normality values are: 1 for below normal range, 2 for within normal range, and 3 for above normal range)

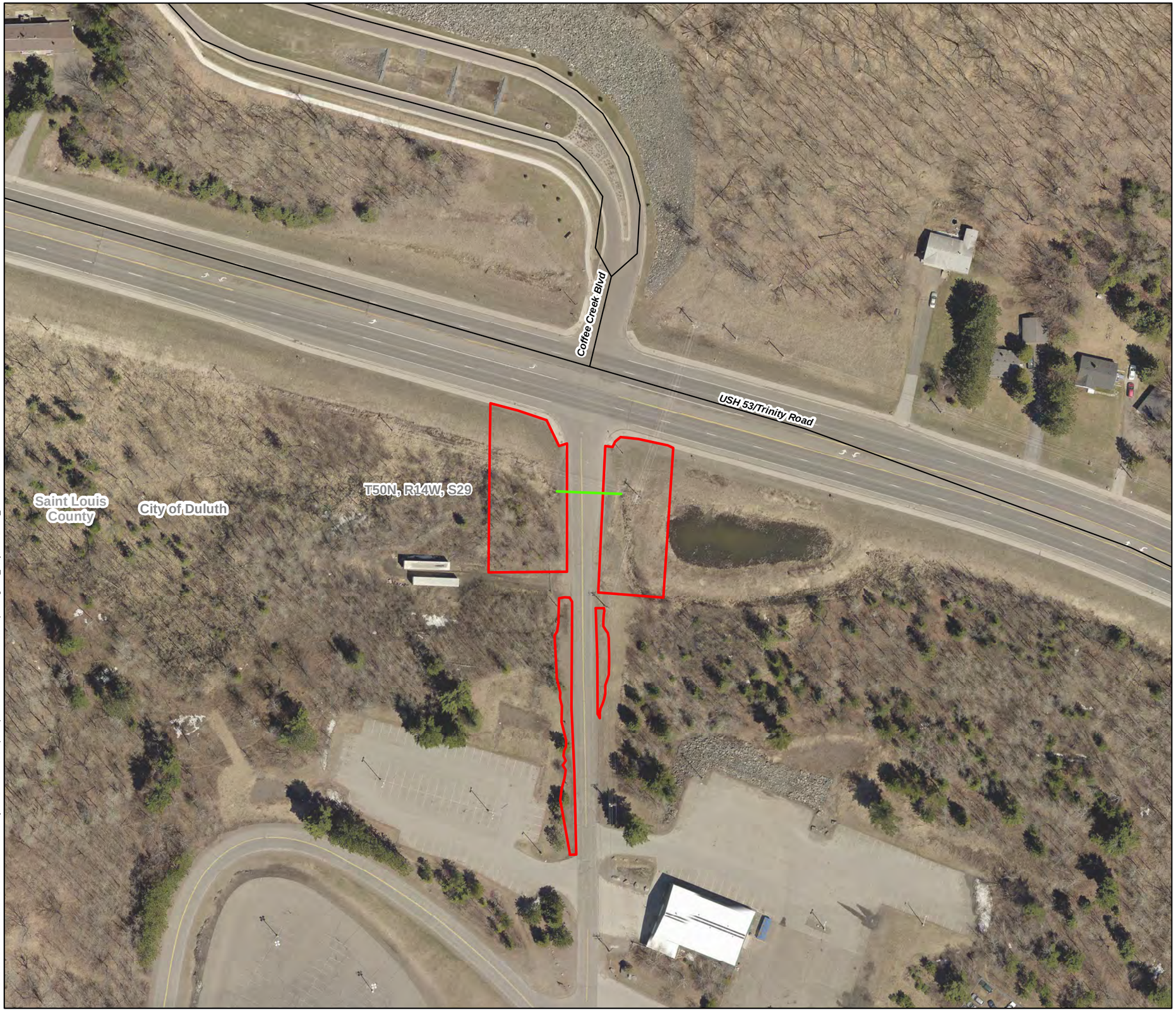
Y value of 6-9 indicates dry conditions
Y value of 10-14 indicates normal conditions
Y value of 15-18 indicates wet conditions

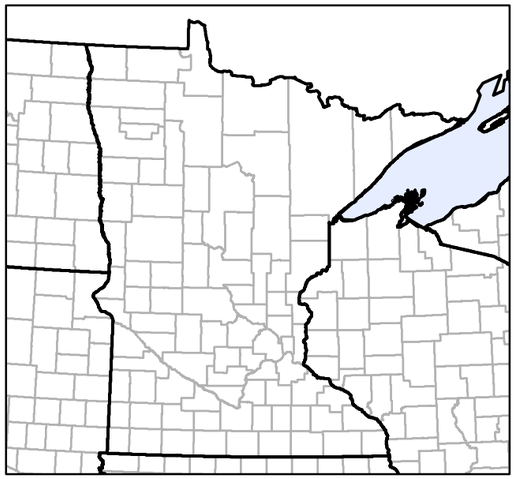
$$Y = 1(x1) + 2(x2) + 3(x3)$$
$$Y = 1(2) + 2(2) + 3(3)$$
Y = 15 = wet hydrologic conditions

Table 3. NRCS Mapped Soil Units within the Project Area.

Soil Symbol	Soil Name	Texture	Hydric Rating	Drainage Class	Depth to Water Table	Frequency of Flooding and Ponding	Associated Sampling Plots	Percent of Project Area
F134A	Giese muck, depressional, 0 to 1 percent slopes	Muck; silt loam; gravelly sandy loam	Hydric	Very poorly drained	0 inches	None; frequent	1-W, 1-U; 2-W, 2-U	93.1%
F147D	Ahmeek-Canosia-Rock outcrop complex, 0 to 25 percent slopes	Silt loam; gravelly sandy loam	Partially hydric	Well drained	>80 inches	None; none	None	6.7%
F156D	Rock outcrop-Ahmeek, bedrock substratum-Barto complex, 4 to 18 percent slopes	Silt loam; Gravelly sandy loam	Not hydric	Well drained	>80 inches	None; none	None	0.2%
							Total	**100%**

Figures





Culvert

Roads

Evaluation Area

N

0 50 100 200

Feet

Imagery: St. Louis County, 2013

Figure 1: Project Location Map

BARR

Wetland Delineation Report
October 28, 2015
Lake Superior College
Duluth, MN

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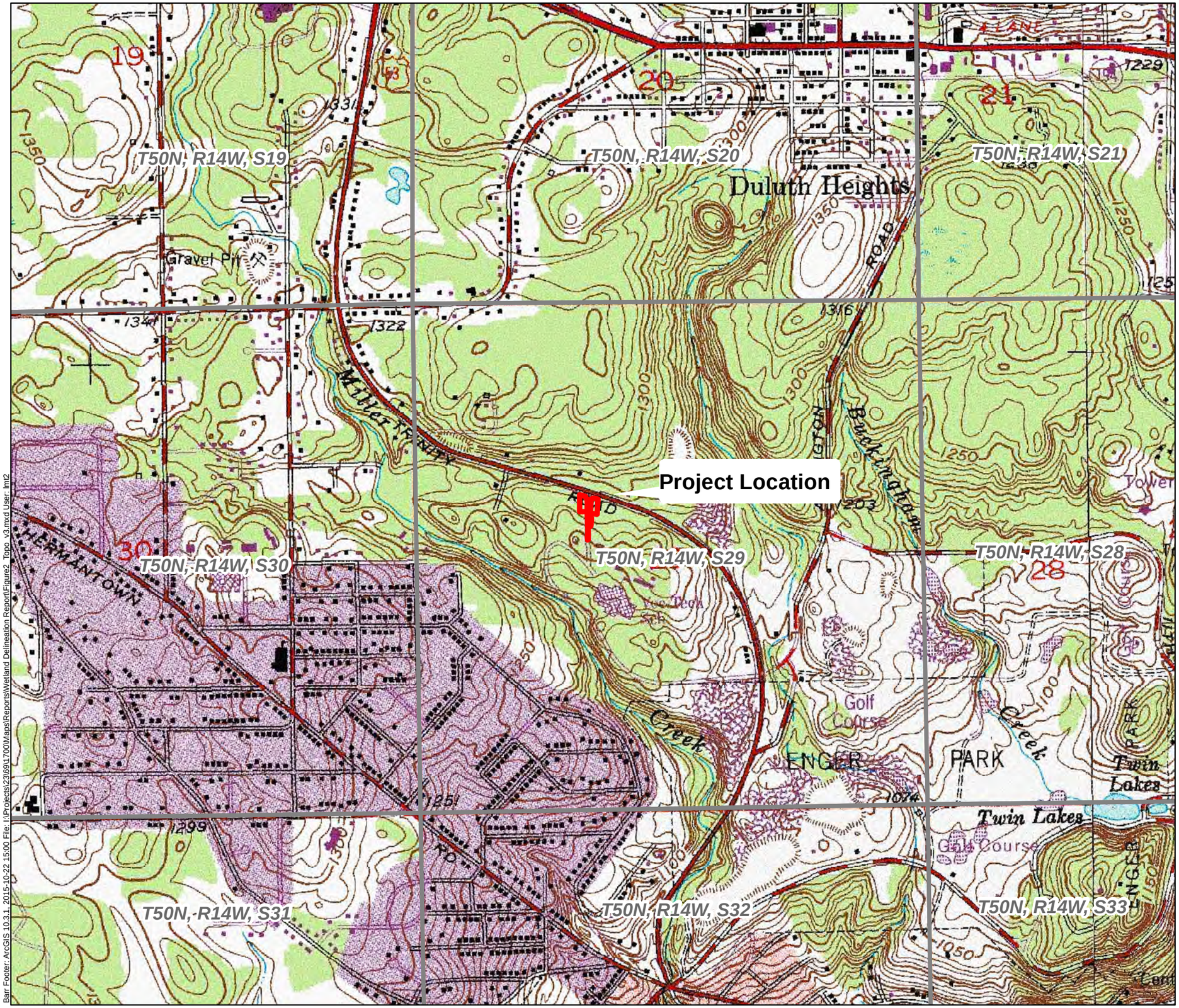

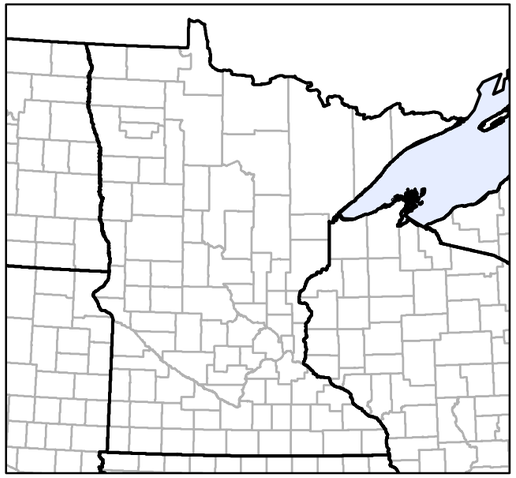

Evaluation Area

N

0 500 1,000 2,000

Feet

Figure 2: Topographic Map

BARR

Wetland Delineation Report
October 28, 2015
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Duluth, MN

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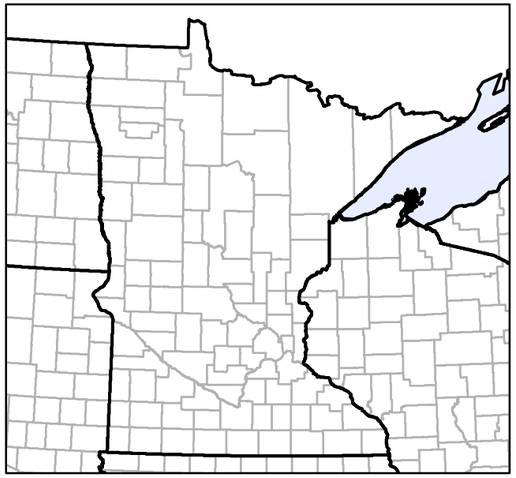

Culvert

Roads

Evaluation Area

National Wetland Inventory

Freshwater Forested/Shrub Wetland

N

0 50 100 200

Feet

Imagery: St. Louis County, 2013

Figure 3: National Wetland Inventory

BARR

Wetland Delineation Report
October 28, 2015
Lake Superior College
Duluth, MN

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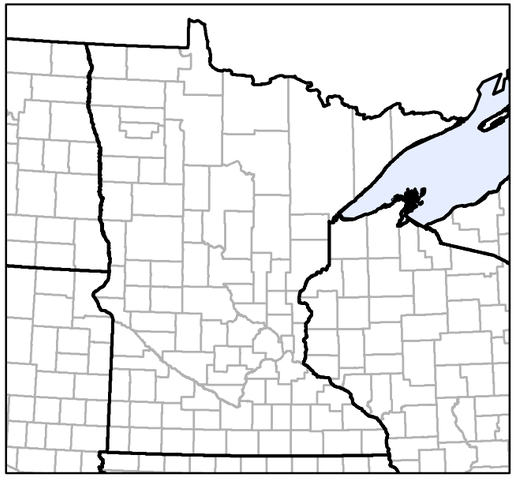

Culvert

Roads

Duluth Streams

PWI Perennial Watercourse

Public Water Inventory Basins

Evaluation Area

N

0 500 1,000 2,000

Feet

Imagery: St. Louis County, 2013

Figure 4: Public Waters Inventory

BARR

Wetland Delineation Report
October 28, 2015
Lake Superior College
Duluth, MN

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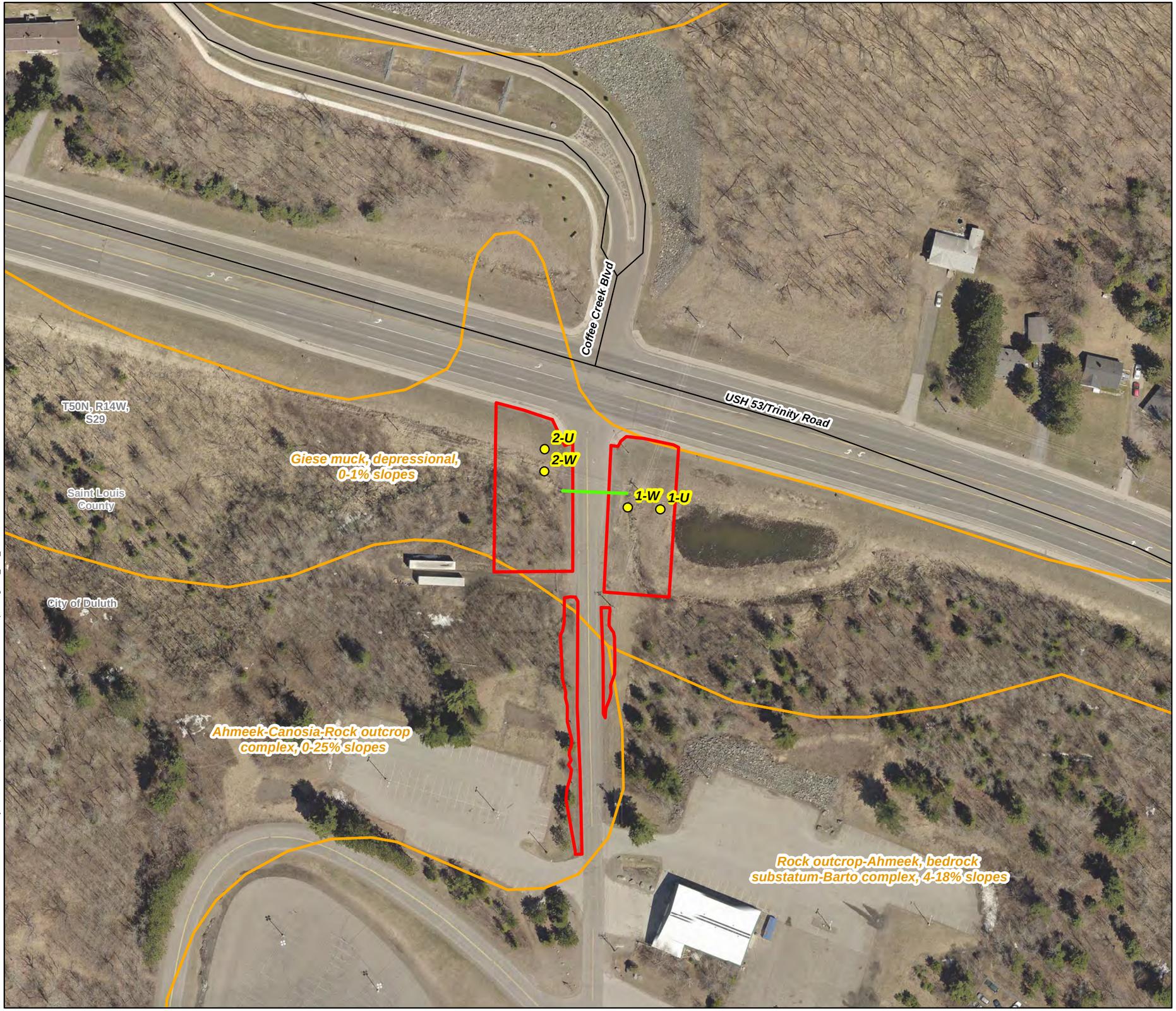

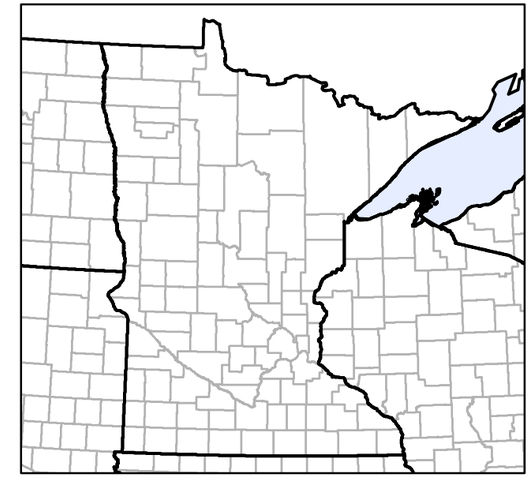

Sampling Plots
Culvert
Roads
NRCS Mapped Soil Units
Evaluation Area

N

0 50 100 200
Feet

Imagery: St. Louis County, 2013

Figure 5 NRCS Mapped Soils

BARR

Wetland Delineation Report
October 28, 2015
Lake Superior College
Duluth, MN

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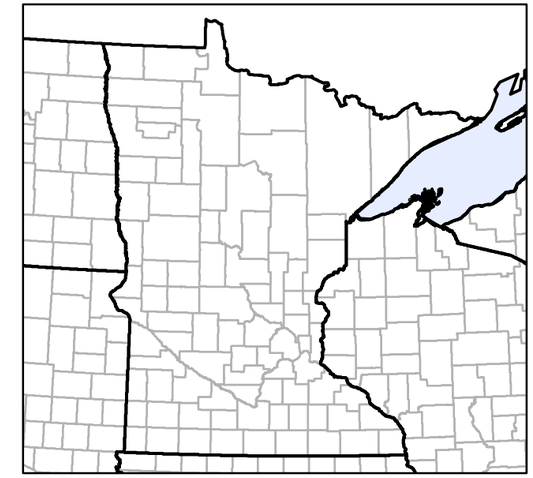

Sampling Plots
Roads
Drainage Ditch
Evaluation Area

Wetlands Within Evaluation Area

Wet Meadow/Type 2
Shallow Marsh/Type 3
Hardwood Swamp/Type 7

N

0 25 50 100
Feet

Imagery: St. Louis County, 2013

Figure 6: Delineation Results Map

BARR

Wetland Delineation Report
October 28, 2015
Lake Superior College
Duluth, MN

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Appendix A

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site:	Lake Superior College parking and road improvement	Applicant/Owner:	Lake Superior College	City/County:	Duluth, St. Louis County	State: MN	Sampling Date: 10/09/15
Investigator(s):	L. Tekler	Section:	29	Township:	50N	Range: 14W	Sampling Point: 1-U
Land Form:	Terrace	Local Relief:	Convex	Slope %:	0	Soil Map Unit Name:	Giese muck, depressional, 0-1% slopes
Subregion (LRR):	K	Latitude:	434370.244	Longitude:	2863732.496	Datum:	NAD83
Cowardin Classification:	Upland	Circular 39 Classification:	Upland			Mapped NWI Classification:	PFO1B

Are climatic/hydrologic conditions on the site typical for this time of year? No (If no, explain in remarks)

Eggers & Reed (primary): Upland

Are vegetation No Soil Yes Hydrology No significantly disturbed?

Are "normal circumstances" present? Yes

Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Are vegetation No Soil No Hydrology No naturally problematic?

Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	No	General Remarks (explain any answers if needed):	Plot is located on the east side of the culvert, on an upland berm separating the stormwater pond from the wetland. Climatic conditions are wetter than normal.
Hydric soil present?	No		
Indicators of wetland hydrology present?	No		
Is the sampled area within a wetland?	No	If yes, optional Wetland Site ID:	

VEGETATION

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
3.	0		
4.	0		
Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
3.	0		
4.	0		
5.	0		
Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Bromus inermis	60	Yes	UPL
2. Lotus corniculatus	15	No	FACU
3. Phleum pratense	15	No	FACU
4. Poa pratensis	10	No	FACU
5. Tanacetum vulgare	5	No	FACU
6. Solidago canadensis	3	No	FACU
7. Calamagrostis canadensis	3	No	OBL
8. Phalaris arundinacea	3	No	FACW
Total Cover:	114		

Woody Vine Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: 0 % Sphagnum Moss Cover: 0

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	22.8	57
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	0.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:	
OBL Species	3	X 1	3	
FACW Species	3	X 2	6	
FAC Species	0	X 3	0	
FACU Species	48	X 4	192	
UPL Species	60	X 5	300	
Column Totals:	114	(A)	501	(B)

Prevalence Index = B/A = 4.39

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
No	Dominance Test is >50%
No	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? No

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

SOIL

Sampling Point: 1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 13	7.5YR 3/3	100					silt loam	dry, coarse fragments
2.	-								
3.	-								
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR R, MLRA 149B)
- ☐ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Mucky Mineral (F1) (LRR K, L)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): **Type:** _____ **Depth (inches):** _____

Hydric soil present? No

Soil Remarks: Auger refusal at 13" despite multiple attempts due to coarse fragments/fill.

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)
- ☐ Marl Deposits (B15)
- ☐ 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)
- ☐ Other (explain in remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Surface Water Depth (inches): None

Water table present? ☐ Water Table Depth (inches): None

Saturation present? (includes capillary fringe) ☐ Saturation Depth (inches): None

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks: No visible indicators of wetland hydrology were observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site:	Lake Superior College parking and road improvement	Applicant/Owner:	Lake Superior College	City/County:	Duluth, St. Louis County	State: MN	Sampling Date: 10/09/15
Investigator(s):	L. Tekler	Section:	29	Township:	50N	Range: 14W	Sampling Point: 1-W
Land Form:	Depression	Local Relief:	Concave	Slope %:	3	Soil Map Unit Name:	Giese muck, depressional, 0-1% slopes
Subregion (LRR):	K	Latitude:	434372.225	Longitude:	2863698.481	Datum:	NAD83
Cowardin Classification:	PEM1B	Circular 39 Classification:	2, 3, 4, 7			Mapped NWI Classification:	PFO1B

Are climatic/hydrologic conditions on the site typical for this time of year? No (If no, explain in remarks)

Are vegetation No Soil No Hydrology No significantly disturbed?

Are vegetation No Soil No Hydrology No naturally problematic?

Are "normal circumstances" present? Yes

Eggers & Reed (primary): Fresh (Wet) Meadow
Eggers & Reed (secondary): Hardwood Swamp
Eggers & Reed (tertiary): Shallow Marsh
Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present? Yes
Hydric soil present? Yes
Indicators of wetland hydrology present? Yes
Is the sampled area within a wetland? Yes

General Remarks (explain any answers if needed): Plot is located in wet meadow portion of wetland complex, near the drainage ditch, on the east side of the entrance road. The drainage ditch transitions into shallow marsh to the south. Hardwood swamp wetland is also present but it lies outside of the project area. Climatic conditions are wetter than normal.

If yes, optional Wetland Site ID: Wetland 1

VEGETATION

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
3.	0		
4.	0		
Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix bebbiana	10	Yes	FACW
2.	0		
3.	0		
4.	0		
5.	0		
Total Cover:	10		

Herb Stratum (Plot Size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Calamagrostis canadensis	40	Yes	OBL
2. Phalaris arundinacea	15	Yes	FACW
3. Typha angustifolia	10	No	OBL
4. Tanacetum vulgare	5	No	FACU
5. Scirpus cyperinus	3	No	OBL
6. Solidago gigantea	3	No	FACW
7. Solidago canadensis	3	No	FACU
8. Equisetum arvense	3	No	FAC
Total Cover:	82		

Woody Vine Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: 18 % Sphagnum Moss Cover: 0

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	2	5
Herb Stratum	16.4	41
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	100.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:	
OBL Species	53	X 1	53	
FACW Species	28	X 2	56	
FAC Species	3	X 3	9	
FACU Species	8	X 4	32	
UPL Species	0	X 5	0	
Column Totals:	92	(A)	150	(B)

Prevalence Index = B/A = 1.63

Hydrophytic Vegetation Indicators:

Yes	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

SOIL

Sampling Point: 1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 5	7.5YR 3/2	90	7.5YR 5/8	10	C	M	gravelly sandy loam	saturated
2.	5 - 12	10YR 2/1	70	5YR 5/8	30	C	M	mucky silt loam	saturated, contains organic
3.	12 - 23	7.5YR 3/2	85					loam	saturated, coarse fragments
4.	-	10GY/2.5/1	15						
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR R, MLRA 149B)
- ☐ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Mucky Mineral (F1) (LRR K, L)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☑ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): **Type:** none **Depth (inches):** -

Hydric soil present? Yes

Soil Remarks: Indicator F6 is met by the second layer having the required thickness, location, color, and amount of redox; F21 is met by the first layer having the required thickness, location, color, and amount of redox.

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)
- ☐ Marl Deposits (B15)
- ☐ 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)
- ☐ Other (explain in remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	☐	Surface Water Depth (inches):	None
Water table present?	☑	Water Table Depth (inches):	3
Saturation present? (includes capillary fringe)	☑	Saturation Depth (inches):	0

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks: Wetland hydrology is met due to the presence of multiple primary and secondary indicators.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site:	Lake Superior College parking and road improvement	Applicant/Owner:	Lake Superior College	City/County:	Duluth, St. Louis County	State: MN	Sampling Date: 10/09/15
Investigator(s):	L. Tekler	Section:	29	Township:	50N	Range: 14W	Sampling Point: 2-U
Land Form:	Backslope	Local Relief:	Convex	Slope %:	5	Soil Map Unit Name:	Giese muck, depressional, 0-1% slopes
Subregion (LRR):	K	Latitude:	434433.077	Longitude:	2863611.791	Datum:	NAD83
Cowardin Classification:	Upland	Circular 39 Classification:	Upland			Mapped NWI Classification:	Upland

Are climatic/hydrologic conditions on the site typical for this time of year? No (If no, explain in remarks) Eggers & Reed (primary): Upland

Are vegetation No Soil Yes Hydrology No significantly disturbed? Are "normal circumstances" present? Yes Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Are vegetation No Soil No Hydrology No naturally problematic? Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	No	General Remarks (explain any answers if needed):	Plot is located on the wide side of the entrance road, on the backslope of Trinity Road. Climatic conditions are wetter than normal.
Hydric soil present?	No		
Indicators of wetland hydrology present?	No		
Is the sampled area within a wetland?	No	If yes, optional Wetland Site ID:	

VEGETATION

Tree Stratum (Plot Size: 30 ft)		Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
	Total Cover:	0		
Sapling/Shrub Stratum (Plot Size: 15 ft)				
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		
Herb Stratum (Plot Size: 5 ft)				
1.	Poa pratensis	70	Yes	FACU
2.	Phleum pratense	15	No	FACU
3.	Lotus corniculatus	10	No	FACU
4.	Elymus repens	5	No	FACU
5.	Fragaria virginiana	5	No	FACU
6.	Taraxacum officinale	5	No	FACU
7.		0		
8.		0		
	Total Cover:	110		
Woody Vine Stratum (Plot Size: 30 ft)				
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: 0 % Sphagnum Moss Cover: 0

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	22	55
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	0.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:	
OBL Species	0	X 1	0	
FACW Species	0	X 2	0	
FAC Species	0	X 3	0	
FACU Species	110	X 4	440	
UPL Species	0	X 5	0	
Column Totals:	110	(A)	440	(B)
Prevalence Index = B/A =			4.00	

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
No	Dominance Test is >50%
No	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? No

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

SOIL

Sampling Point: 2-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 6	7.5YR 3/3	100					silt loam	dry, coarse fragments
2.	-								
3.	-								
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR R, MLRA 149B)
- ☐ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Mucky Mineral (F1) (LRR K, L)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): **Type:** _____ **Depth (inches):** _____

Hydric soil present? No

Soil Remarks: Auger refusal despite multiple attempts due to coarse fragments/fill.

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)
- ☐ Marl Deposits (B15)
- ☐ 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)
- ☐ Other (explain in remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Surface Water Depth (inches): None

Water table present? ☐ Water Table Depth (inches): None

Saturation present? (includes capillary fringe) ☐ Saturation Depth (inches): None

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks: No visible indicators of wetland hydrology were observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site:	Lake Superior College parking and road improvement	Applicant/Owner:	Lake Superior College	City/County:	Duluth, St. Louis County	State: MN	Sampling Date: 10/09/15
Investigator(s):	L. Tekler	Section:	29	Township:	50N	Range: 14W	Sampling Point: 2-W
Land Form:	Depression	Local Relief:	Concave	Slope %:	0	Soil Map Unit Name:	Giese muck, depressional, 0-1% slopes
Subregion (LRR):	K	Latitude:	434409.947	Longitude:	2863611.46	Datum:	NAD83
Cowardin Classification:	PFO1B	Circular 39 Classification:	7, 3, 2			Mapped NWI Classification:	Upland

Are climatic/hydrologic conditions on the site typical for this time of year? No (If no, explain in remarks)

Are vegetation No Soil No Hydrology No significantly disturbed?

Are vegetation No Soil No Hydrology No naturally problematic?

Are "normal circumstances" present? Yes

Eggers & Reed (primary): Hardwood Swamp
Eggers & Reed (secondary): Fresh (Wet) Meadow
Eggers & Reed (tertiary): Shallow Marsh
Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present? Yes
Hydric soil present? Yes
Indicators of wetland hydrology present? Yes
Is the sampled area within a wetland? Yes

General Remarks (explain any answers if needed): Plot is located in shallow marsh portion of the wetland complex, near the drainage ditch. The majority of the complex is hardwood swamp. The drainage ditch transitions into shallow marsh to the west, but most is present outside of the project area. Wet meadow fringe around the ditch. Climatic conditions are wetter than normal.

If yes, optional Wetland Site ID: Wetland 2

VEGETATION

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
3.	0		
4.	0		
Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix bebbiana	20	Yes	FACW
2. Alnus incana	15	Yes	FACW
3.	0		
4.	0		
5.	0		
Total Cover:	35		

Herb Stratum (Plot Size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha angustifolia	40	Yes	OBL
2. Equisetum fluviatile	25	Yes	OBL
3. Calamagrostis canadensis	15	No	OBL
4. Carex lacustris	5	No	OBL
5. Phalaris arundinacea	5	No	FACW
6.	0		
7.	0		
8.	0		
Total Cover:	90		

Woody Vine Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: 10 % Sphagnum Moss Cover: 0

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	7	17.5
Herb Stratum	18	45
Woody Vine Stratum	0	0

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:			Multiply by:	
OBL Species	85	X 1	85	
FACW Species	40	X 2	80	
FAC Species	0	X 3	0	
FACU Species	0	X 4	0	
UPL Species	0	X 5	0	
Column Totals:	125	(A)	165	(B)

Prevalence Index = B/A = 1.32

Hydrophytic Vegetation Indicators:

Yes	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

SOIL

Sampling Point: 2-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 7	10YR 2/2	75	7.5YR 5/8	25	C	M	gravelly sandy loam	saturated
2.	7 - 18	10YR 2/1	85	7.5YR 5/8	15	C	M	muck loam	saturated, contains organic
3.	-								
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR R, MLRA 149B)
- ☐ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- ☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ☐ Loamy Mucky Mineral (F1) (LRR K, L)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): **Type:** _____ **Depth (inches):** _____

Hydric soil present? Yes

Soil Remarks: Auger refusal at 18" despite multiple attempts due to coarse fragments. F6 is met due to having a layer >4" thick entirely in the upper 12" with value <3 and chroma <=2 with >5% redox conc.

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)
- ☐ Marl Deposits (B15)
- ☑ 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)
- ☐ Other (explain in remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	☑	Surface Water Depth (inches):	1
Water table present?	☑	Water Table Depth (inches):	0
Saturation present? (includes capillary fringe)	☑	Saturation Depth (inches):	0

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks: Wetland hydrology is met due to the presence of multiple primary and secondary indicators.

Appendix B

Site Photographs

Appendix B: Photo Log Of Wetland Delineation.

Photo 1: Wetland 1 and the drainage ditch, facing SE.

Photo 2: Wetland 2 and the drainage ditch, facing SSW.

Appendix B: Photo Log Of Wetland Delineation.

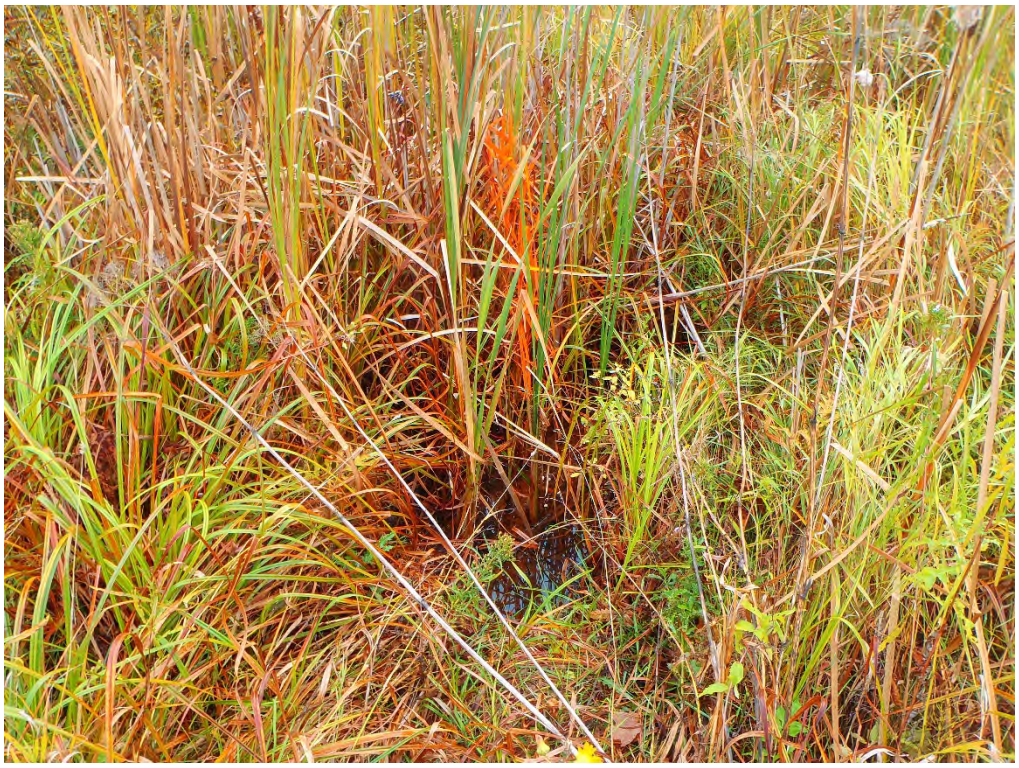


Photo 3: Drainage ditch on the east side of the culvert, facing E.

Photo 4: Drainage ditch on the west side of the culvert, facing W.

Appendix B: Photo Log Of Wetland Delineation.

Photo 5: The hardwood swamp community of wetland 2 on the west side of the culvert, facing SW.

Photo 6: The wet meadow community and drainage ditch, transitioning into shallow marsh, in wetland 2 on the west side of the culvert, facing WNW.

Appendix B: Photo Log Of Wetland Delineation.

Photo 7: Sampling plot 1-W in wetland 1, near the drainage ditch, on the east side of the culvert, facing E.

Photo 8: Sampling plot 1-U on the east side of the culvert, facing S.

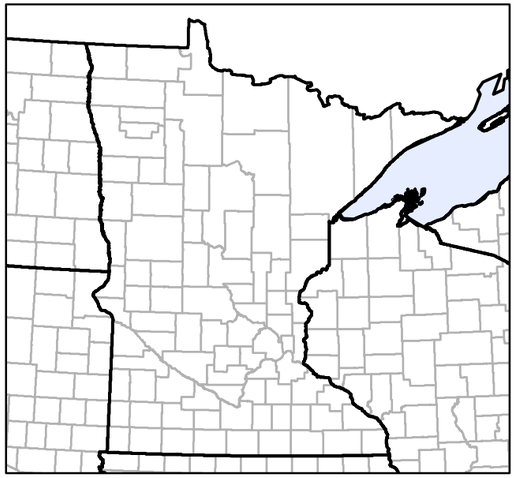
Appendix B: Photo Log Of Wetland Delineation.

Photo 9: Sampling plot 2-W in wetland 2, near the drainage ditch, on the west side of the culvert, facing SW.

Photo 10: Sampling plot 2-U on the west side of the culvert, facing W.

Exhibit D

Impacts Figure



Roads

Construction Limits

Wetland Impact (Aquatic Resource ID 1)

Wet Meadow

Hardwood Swamp

Ditch Impact (Aquatic Resource ID 2)

Drainage Ditch

BARR

N

0 25 50 100

Feet

Imagery: St. Louis County, 2013

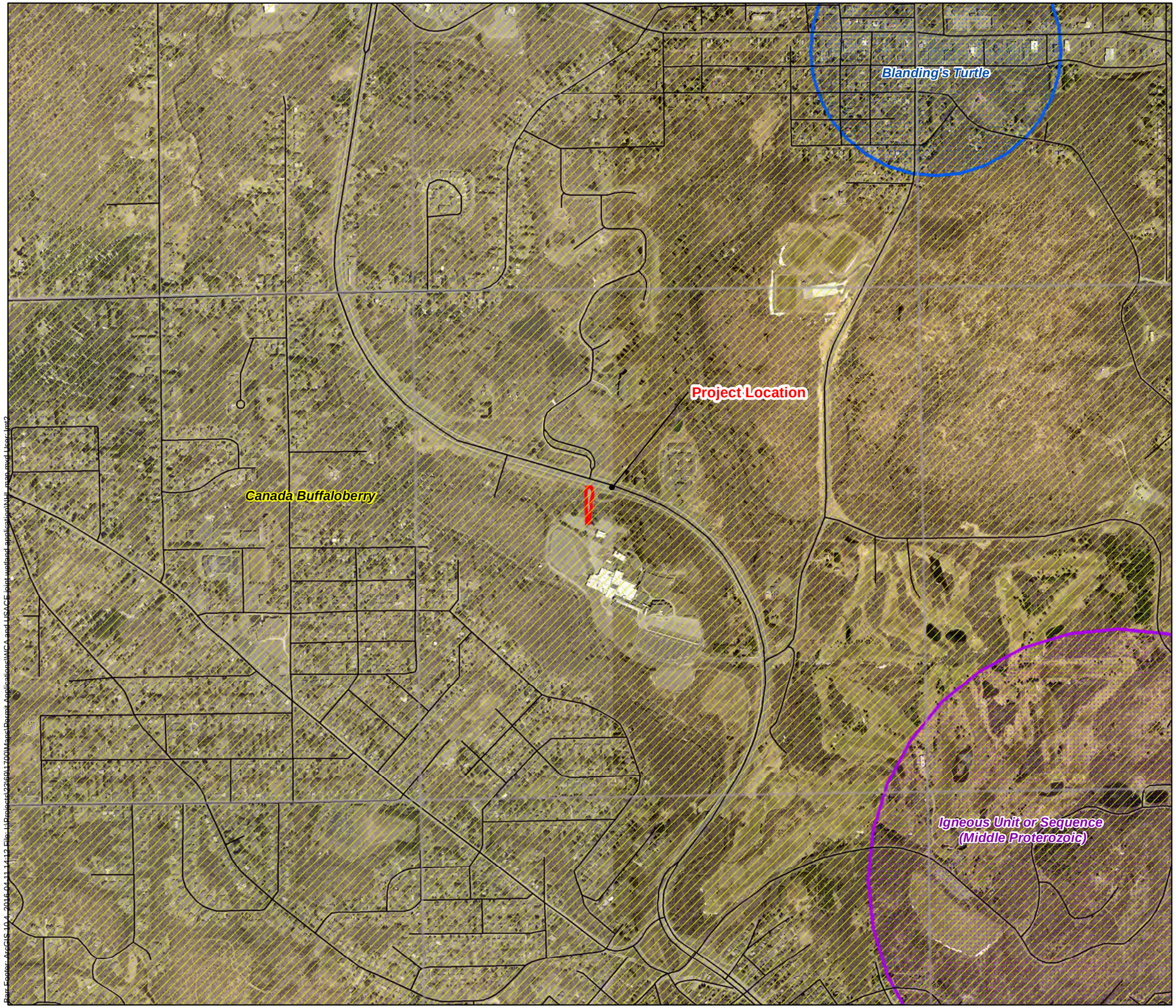
Wetland Impacts

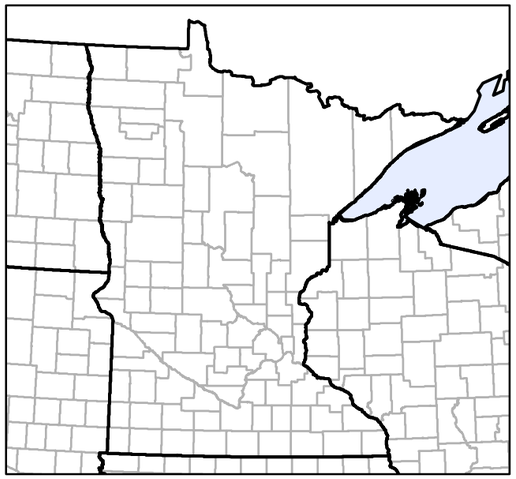
Joint Permit Application
April 2016
Lake Superior College Road Improvement
Duluth, MN

Barr Footer: ArcGIS 10.4, 2016-04-12 14:49 File: U:\Projects\22\60\1700\Maps\Permit Applications\WCA and USACE joint wetland application\Wetland_impact_and_User_list2

Exhibit E

Endangered Resources Review





Roads

Project Area

Rare Natural Features - Element Occurances

Vertebrate Animal

Vascular Plant

Geologic

BARR

N

0 500 1,000 2,000

Feet

Imagery: St. Louis County, 2013

Rare and Natural Features

Joint Permit Application
Arpil 2016
Lake Superior College Road Improvement
Duluth, MN

Rare and Sensitive Species Review - Minnesota

Project Name: Lake Superior College Road Improvements **T50N, R14W, S29**

Federal Review (County List)

County	Common Name	Scientific Name	Federal ESA Status	Habitat	Justification
St. Louis	Bald Eagle	*Haliaeetus leucocephalus*	Protected by Bald and Golden Eagle Ace and Migratory Bird Treaty Act	Nests in mature trees near bodies of water.	The required habitat for this species does not exist within the project area. The project area consists of wet meadow and forested type wetland along the roadside. There are no large bodies of water within 1 mile of the project area.
	Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.	The required habitat for this species does not exist within the project area. There are no caves within or near the project area. As part of this project, 8 trees with be cleared. According to the MN DNR, there are no known hibernacula or maternity roost trees within this township in St. Louis County. In addtion, clearing will be conducted outside of the time when this species enters their winter hibernacula.
	Canada Lynx	*Lynx canadensis*	Threatened	Solitary, large range, prefers mature coniferous forest habitat, rare at southern extent of range, linked to snowshoe hare abundance.	The required habitat for this species does not exist witin the project area. The wooded areas within the project area and surrounding the project area are small pockets of deciduous forest.
	Canada Lynx Critical Habitat	*NA*	NA	Critical habitat in Cook, Koochiching, Lake and St. Louis counties.	Canada Lynx critical habitat does not intersect the project area.
	Piping Plover (Great Lakes Breeding Population)	*Charadrius melodus*	Endangered	Associated with fairly wide, sandy, sparsely or unvegetated beaches when nesting. Outside breeding season birds may be found on beaches, lagoon edges or areas of rubble. Nests on sandy beaches with areas of gravel or pebble substrate and little or no vegetation.	The required habitat for this species does not exist within the project area. The project area consists of wet meadow and forested type wetland along the roadside. There are no beaches or lagoon edges within the project area.
Reviewer:	**Lindsay Tekler**			**Date: 4/11/16**	

State Review (NHIS Data)

County	Common Name	Scientific Name	MN Status	Habitat	Justification
St. Louis	Canada Buffaloberry	*Shepherdia canadensis*	Special Concern	Part shade, sun; dry, rocky soil; open woods, forest edges, riverbanks, rocky shores, rock outcrops	Suitable habitat for this species may be present within the project area. Impact to this species may occur as 8 trees will be cleared as part of this project.
	Igneous Unit or Sequence (Middle Proterozoic)	*N/A*	N/A	N/A	This geologic feature does not occur within the project area.
	Blanding's Turtle	*Emydoidea blandingii*	Threatened	Wetland complexes and adjacent sandy uplands are necessary to support viable populations of Blanding's turtles. Calm, shallow waters, including wetlands associated with rivers and streams, with rich, aquatic vegetation are especially preferred.	Suitable habitat for this species may be present within the non-wooded portions of the project area. Due to the intense vehicle traffic through and immediately surrounding the project area, as well as the blocked flow through the existing non-functioning culvert, there is a small likelihood of this species existing within the project area, as these obstructions would inhibit the movement of this species. Howver, measures will be taken to avoid impact to this species. These include installing silt/exclusionary fencing around all construction areas, distributing the species fact sheet to all contractors woking on-site, installing turtle crossing signs near the road, and physically moving any species that enter construction areas. As the project area is densely vegetated and does not contain sandy soil areas, no nesting habitat for this species will be impacted.
Reviewer:	**Lindsay Tekler**			**Date: 4/11/16**	

CAUTION

BLANDING'S TURTLES

MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are state-listed as Threatened and are protected under Minnesota Statute 84.095, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. For additional information on turtles, or to report a Blanding's turtle sighting, contact the DNR Nongame Specialist nearest you: Bemidji (218-308-2641); Grand Rapids (218-327-4518); New Ulm (507-359-6033); Rochester (507-280-5070); or St. Paul (651-259-5764).

DESCRIPTION: The Blanding's turtle is a medium to large turtle (5 to 10 inches) with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third, enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head, legs, and tail are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck.

BLANDING'S TURTLES DO NOT MAKE GOOD PETS
IT IS ILLEGAL TO KEEP THIS THREATENED SPECIES IN CAPTIVITY

Environmental Review Fact Sheet Series

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle

(*Emydoidea blandingii*)

Minnesota Status:	Threatened	State Rank[1]:	S2
Federal Status:	none	Global Rank[1]:	G4

HABITAT USE

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (e.g., cattails, water lilies) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding′s turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade* and road kills during seasonal movements
- increase in predator populations (skunks, raccoons, etc.) which prey on nests and young

*It is illegal to possess this threatened species.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	**List 2. *Additional* recommendations for areas known to be of state-wide importance to Blanding's turtles.**
GENERAL	
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road-crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETLANDS	
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid- afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROADS	
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROADS cont.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.
UTILITIES	
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).	
Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles).
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.
Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).

Protecting Blanding's Turtle Nests: Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is ***very important*** that the fencing be **removed <u>before August 1st</u>** so the young turtles can escape from the nest when they hatch!

REFERENCES

[1]Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). http://www.natureserve.org/ranking.htm (15 April 2001).

Coffin, B., and L. Pfannmuller. 1988. Minnesota's Endangered Flora and Fauna. University of Minnesota Press, Minneapolis, 473 pp.

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Moriarty, J. J., and M. Linck. 1994. Suggested guidelines for projects occurring in Blanding's turtle habitat. Unpublished report to the Minnesota DNR. 8 pp.

Oldfield, B., and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis, 237 pp.

Sajwaj, T. D., and J. W. Lang. 2000. Thermal ecology of Blanding′s turtle in central Minnesota. Chelonian Conservation and Biology 3(4):626-636.

Exhibit F

Cultural Resources Review

Lindsay M. Tekler

From: Thomas Cinadr <thomas.cinadr@mnhs.org>
Sent: Wednesday, April 13, 2016 8:01 AM
To: Lindsay M. Tekler
Subject: Re: database review request

THIS EMAIL IS NOT A PROJECT CLEARANCE.

This message simply reports the results of the cultural resources database search you requested. The database search produced results for only previously known archaeological sites and historic properties. Please read the note below carefully.

No archaeological sites or historic structures were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested.

The result of this database search provides a listing of recorded archaeological sites and historic architectural properties that are included in the current SHPO databases. Because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development projects within that area. Additional research, including field survey, may be necessary to adequately assess the area's potential to contain historic properties.

If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson in Review and Compliance @ 651-259-3455 or by email at kelly.graggjohnson@mnhs.org.

The Minnesota SHPO Survey Manuals and Database Metadata and Contractor Lists can be found at
http://www.mnhs.org/shpo/survey/inventories.htm

Tom Cinadr
Survey and Information Management Coordinator
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Minnesota Historical Society
345 Kellogg Blvd. West
St. Paul, MN 55102

651-259-3453

On Mon, Apr 11, 2016 at 4:19 PM, Lindsay M. Tekler <LTekler@barr.com> wrote:

Hi Tom,

Could you provide me with the results of a database search of any known historic or cultural resources within the SE ¼ of the NW ¼ of T50N, R14W, S29 in the City of Duluth in St. Louis County. Site locations maps are attached for your reference.

Please let me know if you need any more information.

Thank you,

Lindsay M. Tekler

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resourceful. naturally. BARR