Information for File # 2015-01132-RMM

Applicant: Scott County

Corps Contact: Ryan Malterud

Address: 180 Fifth Street East, St. Paul, Minnesota 56101

E-Mail: Ryan.M.Malterud@usace.army.mil

Phone: (651) 290-5286

Primary County: Scott

Section: 3 and 10

Township: 113 North

Range: 25 West

Information Complete On: June 12, 2015

Posting Expires On: July 2, 2015

Authorization Type: LOP-05-MN

This application is being reviewed in accordance with the practices for documenting Corps jurisdiction under Sections 9 & 10 of the Rivers and Harbor Act of 1899 and Section 404 of the Clean Water Act identified in Regulatory Guidance Letter 07-01. We have made a preliminary determination that the aquatic resources that would be impacted by the proposed project are regulated by the Corps of Engineers under Section 404 of the Clean Water Act. Our jurisdictional review and final jurisdictional determination could result in modifications to the scope of the project's regulated waterbody/wetland impacts and compensatory mitigation requirements identified above. Any approved jurisdictional determination made prior to reaching a permit decision will be posted on the St. Paul District web page at http://www.mvp.usace.army.mil/.

Project Description and Purpose (As stated by the applicant):

The proposed project would stabilize active erosion in four areas within a ravine system located in Blakeley Township. The eroding stream has two branches, the east branch which is not a DNR protected water and the west branch is a DNR protected water. This project is designed to reduce the sediment loss from the eroding channels and ravines through the use of rock check dams and hard armoring the channel bottom. Stabilization techniques proposed are designed to significantly reduce channel incision, the migration of nick points and head cuts such that sediment rates would be significantly reduced. Channel armoring and grade control will be used to halt channel incision and prevent head cuts from migrating upstream. Grade control structures will also slow flow velocities upstream of the structures and reduce erosive pressures on banks. Riprap will be used to armor banks and the channel bed in locations that are

vulnerable to erosion. In other locations, graded banks will be treated with turf reinforcement mats to provide erosion protection.

Area 1
Area 1 has channel downcutting and bank erosion caused by runoff primarily from farm fields. The runoff discharges through a culvert approximately half way up the ravine slope between the field and the bottom of the ravine. The work in Area 1 will include replacing the existing culvert and extending the new culvert to the bottom of the ravine. The end of the culvert will feature a riprap stilling pool proceeding downstream to dissipate energy of the large flow velocities that have caused significant scour. Additionally, the channel downstream of the stilling pool will be lined with riprap and filter for approximately 100 feet to prevent further downcutting and erosion in the steep channel.

Area 2
Area 2 has severe channel incision that has caused the bed of the ravine to downcut by up to 20 feet. The work in Area 2 will include grading to create a consistent channel slope; check dams to slow velocities, provide grade control, and partially reconnect the channel to a floodplain; riprap-lined channel with filter in areas most vulnerable to future erosion; and turf-reinforcement material on the banks above the riprap armoring of channel to provide additional erosion protection. The grading is intended to balance cut and fill volumes such that all material graded from the banks to create more stable slopes will be used to raise the channel bed. Approximately 14 rock check dams will be installed in Area 2, each approximately 5-feet tall with a low-flow channel to properly convey bankfull flows. Due to the steep grades, approximately 1,700 feet of the channel will also be lined with riprap and filter as added protection against downcutting and erosion. To the extent possible, construction activities will be conducted from and within the channel itself in order to minimize disturbance.

Area 3
Area 3 has also had channel incision and bank widening. The work in Area 3 will include bank grading and check dams to raise the channel bed, reduce flood velocities, and partially reconnect the channel to the floodplain. A portion of the channel will also be lined with riprap and filter for added erosion protection. The check dams will have an overflow channel to convey the bankfull flow and facilitate the creation of a stable channel and floodplain upstream of each check dam. The check dams are also expected to trap some sediment behind them and prevent it from being deposited at the County Road 6 and Union Pacific Bridges and the Minnesota River floodplain wetlands.

Area 4
Area 4 also has some channel and bank erosion in the upper extents of the ravine system. Construction activities will include lining entrance channels from County Road 60 (CR 60) to the ravine with riprap and filter to prevent additional erosion in these areas; installing a new drop manhole structure and outlet at the end of the CR 60 culvert and stabilizing the scour hole that has been created downstream of the culvert; installation of check dams near CR 60 and a private driveway to slow runoff entering the ravine system; and a sheet pile structure and outlet system to provide up to ≤15-acre-feet of 100-year flood detention and equipped with an emergency overflow fixture at elevation 957.53. The sheet pile structure will be located just

downstream of the confluence of the east and west heads of the west branch of Unnamed Tributary DNR protected stream. The structure would be approximately 150- to 170-feet wide at the top and 24.4 feet tall. Construction of the sheet pile structure would create a temporary detention pond approximately 2.2 acres in size with the capacity of detain up to 15-acre-feet of water. The sheet pile structure would include a multi-stage outlet to control the rate of water release during different storm events. There will be a low-flow outlet to slowly release detained runoff from storms roughly equivalent to the 1-year storm and drain completely within 24 hours. There will also be a riser that will convey flow during events greater than an approximately 1-year storm. It will be sized and set at an elevation such that there is one foot of freeboard between the expected 100-year water surface elevation and the emergency overflow elevation at 957.53 feet. The emergency overflow elevation is approximately 20.4-feet higher than the bottom of the ravine. The emergency overflow will be approximately 15-feet wide and 4-feet tall and will be able to convey the full peak flow from a 100-year storm. This will ensure that the structure will be able to safely convey a second 100-year storm in the event that there are back-to-back extreme storm events.

Downstream of the sheet pile structure, there will be a riprap lined stilling pool that will prevent erosion in the scenario in which the emergency overflow is used.

In addition, a low maintenance road will be incorporated into the outlet of the downstream stilling basin to allow the landowner to cross the ravine and access pasture lands on both sides and potentially allow access for structure or ravine maintenance.

Downstream portions of the ravine currently experience high flows and are at risk of future erosion, especially during peak flow events. The sheet pile structure would reduce erosion risk by reducing peak flows, slowing flow velocities downstream, and subsequently reducing downstream erosion. The XP-SWMM hydrology and hydraulics model developed for the project estimates peak flows downstream of the structure would be reduced by 33-72% during a two-year event and by 33-48% in a 100-year event, depending on the comparison location. Peak velocities downstream of the structure are estimated to be reduced by 11-28% during a 2-year event and by 8-10% in a 100-year event.

Name, Area and Types of Waters (Including Wetlands) Subject to Loss:

There are no wetland impacts associated with this project. This project will result in the discharge of dredged and fill material into approximately 10,000 linear feet (2.68 acres) of Quarry Creek.

Compensatory Mitigation:

Although the impacts to Quarry Creek are permanent the applicant believes there will be no functional loss of the stream as a result of the project and is not proposing any mitigation. The project is intended to reduce the amount of sediment being discharged downstream and will improve water quality in the Minnesota River.

Drawings: MVP-2015-01132-RMM Page 1 of 13through MVP-2015-01132-RMM Page 13 of 13.

N

Quarry Creek

Attachment 1

1. - Aquatic Resource ID

Scott

This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information, and data located in various city, county, and state offices, and other sources affecting the area shown, and is to be used for reference purposes only. Scott County is not responsible for any inaccuracies herein contained. If discrepancies are found, please contact the Scott County Surveyors Office.

0 0.25 0.5 1 Miles

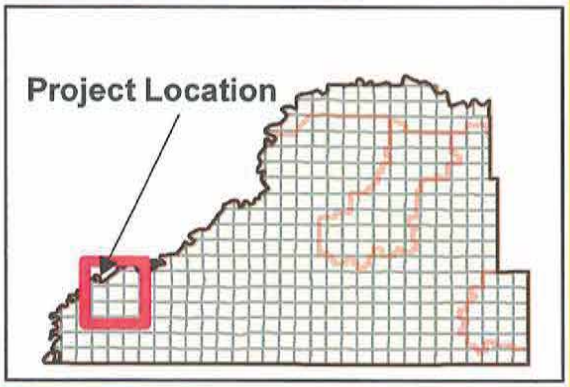


Figure 6-1

QUARRY CREEK
STABILIZATION AREAS
Quarry Creek EAW
Scott County WMO
Scott County, MN

Attachment 2-1

SCOTT WATERSHED MANAGEMENT ORGANIZATION

QUARRY CREEK

BLAKELEY TOWNSHIP

COUNTY MAP

SHEET INDEX

G–GENERAL
C–CIVIL

SHEET NO.	TITLE
G–01	SITE LOCATION AND SHEET INDEX
C–01	GENERAL PLAN
C–02	WEST BRANCH/WEST HEAD, PLAN AND PROFILE
C–03	WEST BRANCH/EAST HEAD, PLAN AND PROFILE
C–04	EAST BRANCH/MEULENERS RAVINE, PLAN AND PROFILE
C–05	EAST BRANCH/0+00 TO 15+00, PLAN AND PROFILE
C–06	EAST BRANCH/MIDDLE HEAD, PLAN AND PROFILE
C–07	EAST BRANCH/15+00 TO 30+00, PLAN AND PROFILE
C–08	EAST BRANCH/30+00 TO 45+00, PLAN AND PROFILE
C–09	EAST BRANCH/45+00 TO 60+00, PLAN AND PROFILE
C–10	WEST BRANCH/NORTH HEAD, PLAN AND PROFILE
C–11	SECTIONS AND DETAILS 1
C–12	SECTIONS AND DETAILS 2
C–13	CROSS SECTIONS 1
C–14	CROSS SECTIONS 2
C–15	CROSS SECTIONS 3
C–16	CROSS SECTIONS 4
C–17	CROSS SECTIONS 5
C–18	CROSS SECTIONS 6
C–19	CROSS SECTIONS 7

SITE LOCATION MAP

UPDATED FEB 2015
60% DESIGN

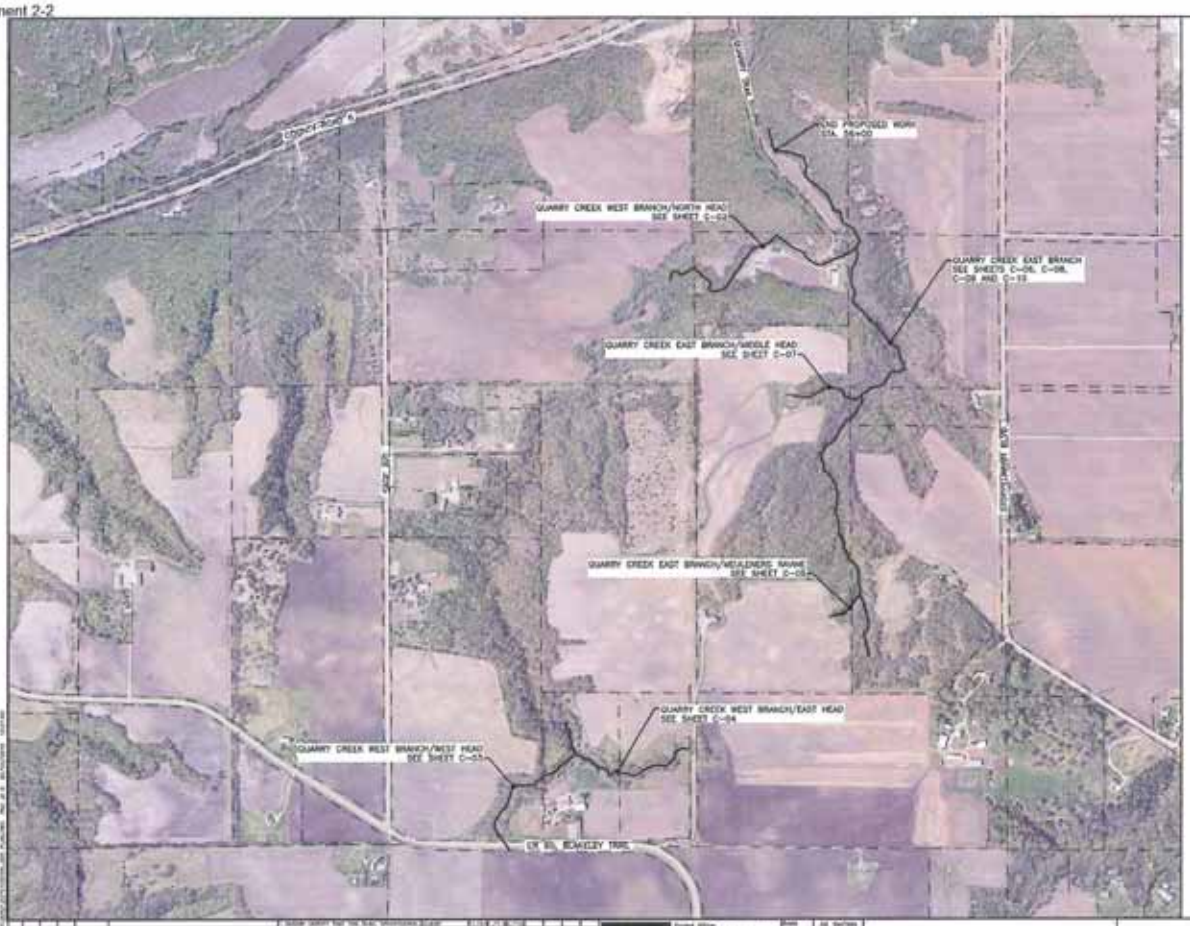
NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

RELEASED FOR REVIEW — DATE RECEIVED: A B C D 1 2 3

BARR — Project Office: BARR ENGINEERING CO., 4700 WEST 77TH STREET, MINNEAPOLIS, MN 55435

DATE: AS SHOWN; DRAWN: 11/24/2014; DESIGN: GDK; CHECKED: ; ORIGINAL: BARR; REVISED: ; APPROVED: ; REVISED: ; REVISED: ; REVIS

Attachment 2-2



PLAN
SCALE IN FEET

UPDATED FEB 2016
60% DESIGN

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

BARR

SCOTT WMO
SHAKOPEE, MINNESOTA

QUARRY CREEK
BLAKELEY TOWNSHIP

GENERAL
PLAN

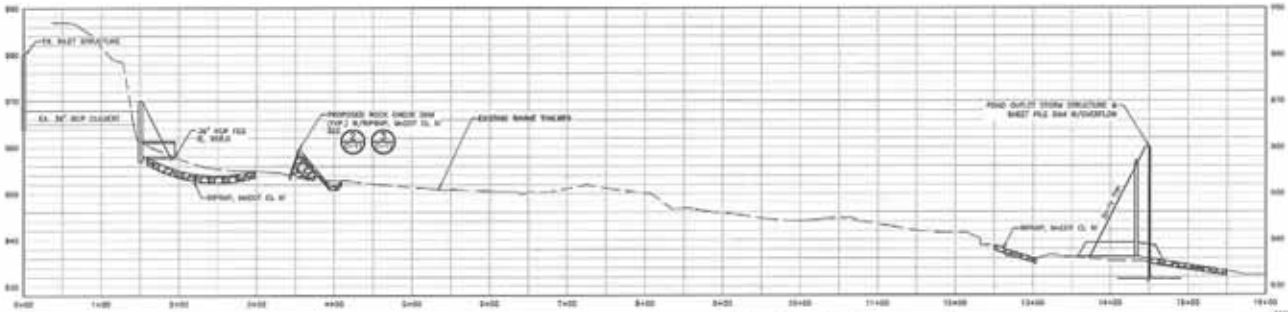
BARR PROJECT No. 23/70-1037.02

DWG. No. C-01

REV. No. C

Attachment 2-3

1 PLAN: WEST BRANCH/WEST HEAD



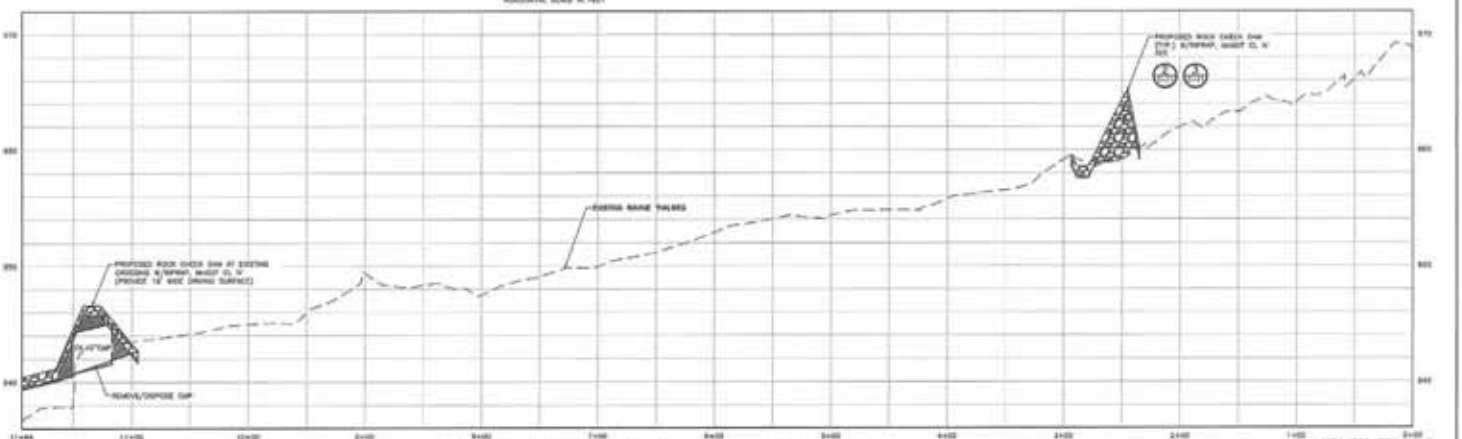
2 PROFILE: WEST BRANCH/WEST HEAD

UPDATED FEB 2015
60% DESIGN

| | | |

Attachment 2-4

PLAN: WEST BRANCH/EAST HEAD



PROFILE: WEST BRANCH/EAST HEAD

UPDATED FEB 2015
60% DESIGN

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

BARR

SCOTT WMO
SHAKOPEE, MINNESOTA

QUARRY CREEK
BLAKELEY TOWNSHIP

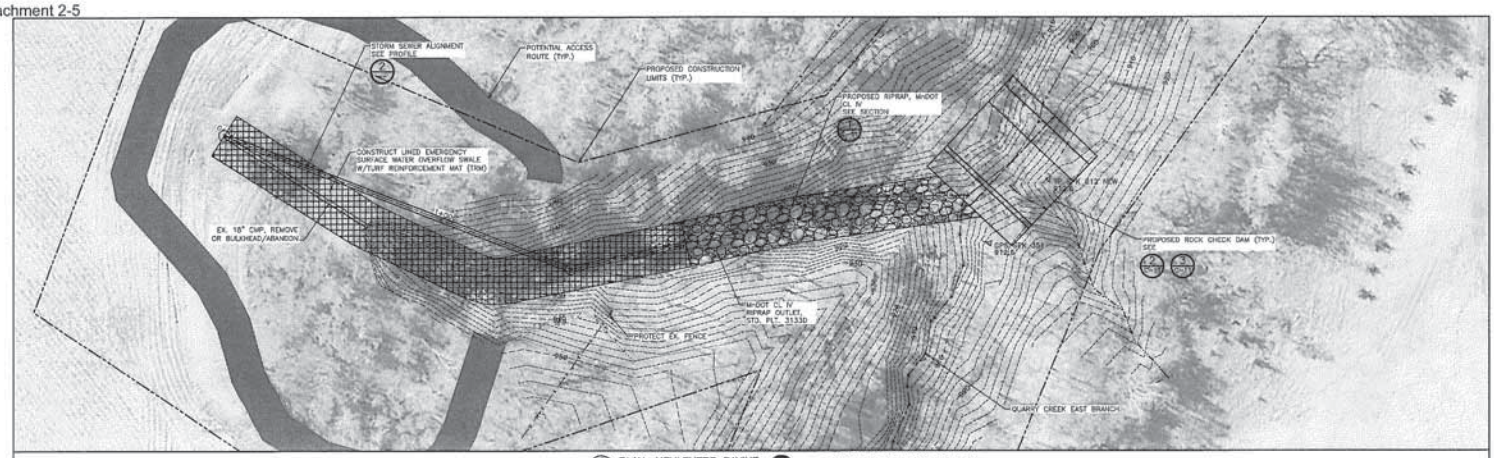
WEST BRANCH/EAST HEAD
PLAN AND PROFILE

23/70-1027.02

C-03

C

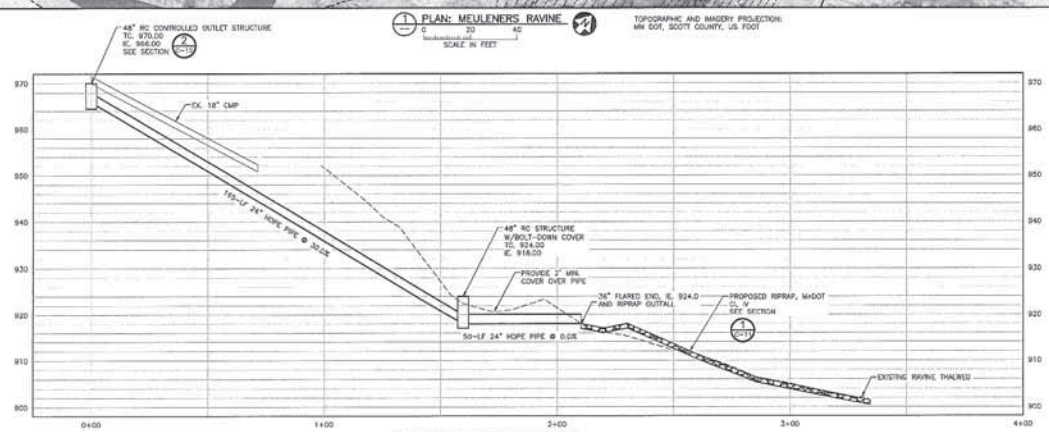
Attachment 2-5



PLAN: MEULENERS RAVINE

SCALE IN FEET

TOPOGRAPHIC AND IMAGERY PROJECTION: MN DOT, SCOTT COUNTY, US FOOT



PROFILE: MEULENERS RAVINE

HORIZ. SCALE IN FEET

VERT. SCALE IN FEET

UPDATED FEB 2015
60% DESIGN

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.

SIGNATURE

PRINTED NAME

DATE REG. NO.

CLIENT 1/24/14 2/19

BID

CONSTRUCTION

RELEASED TO/FOR: A B C 0 1 2 3 — DATE RELEASED

BARR

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

Project Office: BARR ENGINEERING CO. 4700 WEST 77TH STREET MINNEAPOLIS, MN. 55435-4803 Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com

Scale	AS SHOWN
Date	11/24/2014
Drawn	GDR
Checked	
Designed	BARR
Approved	

SCOTT WMO
SHAKOPEE, MINNESOTA

QUARRY CREEK
BLAKELEY TOWNSHIP

EAST BRANCH/MEULENERS RAVINE
PLAN & PROFILE

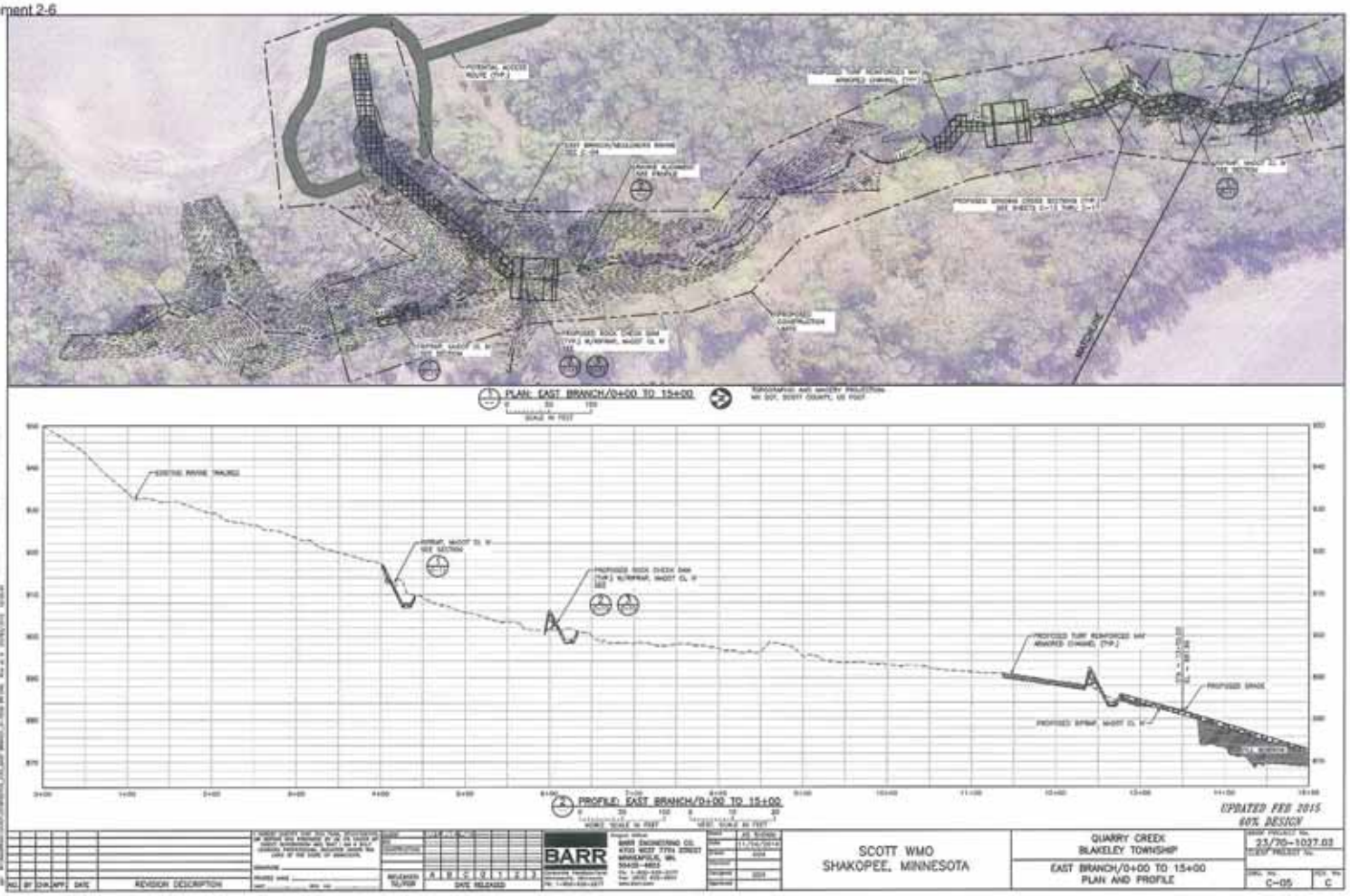
BARR PROJECT No. 23/70-1027.02

CLIENT PROJECT No.

DWG. No. C-04

REV. No. C

Attachment 2-6



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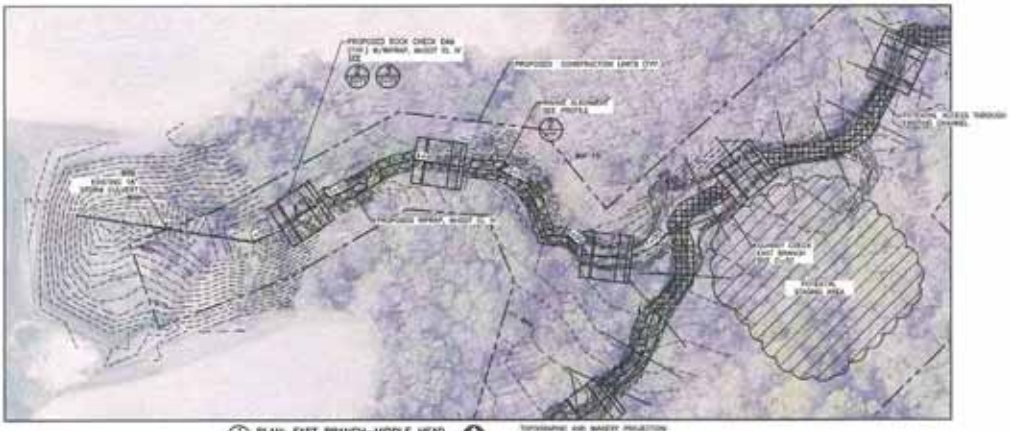
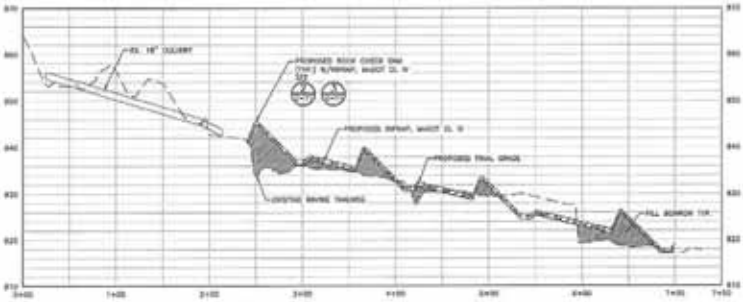


1 PLAN: EAST BRANCH–MIDDLE HEAD

0 50 100
SCALE IN FEET

TOPOGRAPHIC AND IMAGERY PROJECTION
MN DOT, SCOTT COUNTY, US 2001



2 PROFILE: EAST BRANCH–MIDDLE HEAD

0 50 100 0 10 20
HORIZ. SCALE IN FEET VERT. SCALE IN FEET

UPDATED FEB 2015
60% DESIGN

REV.	BY	CHK	APP	DATE	REVISION DESCRIPTION

RELEASED TO/FOR: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 1 2 3

DATE RELEASED

BARR

BARR ENGINEERING CO.
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
55435-4803
Ph: 1-952-832-2277
Fax: (952) 832-2601
www.barr.com

Drawn: AS SHOWN
Date: 12/24/2014
Checked: DATE
Designed: DATE
Approved: DATE

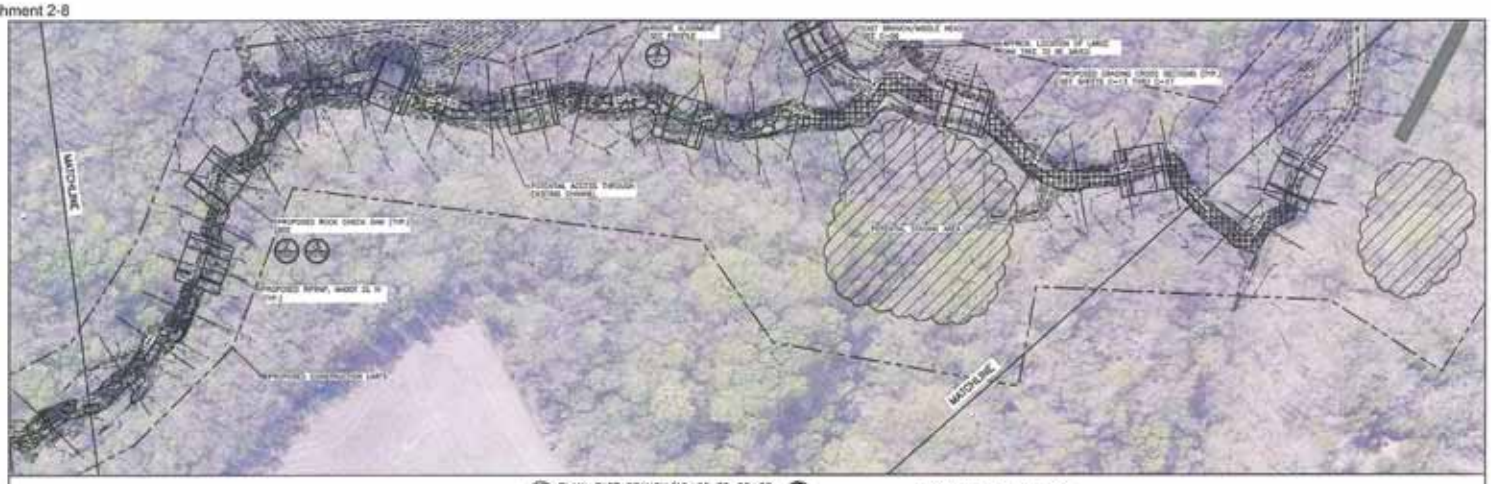
SCOTT WMO
SHAKOPEE, MINNESOTA

QUARRY CREEK
SCOTT COUNTY

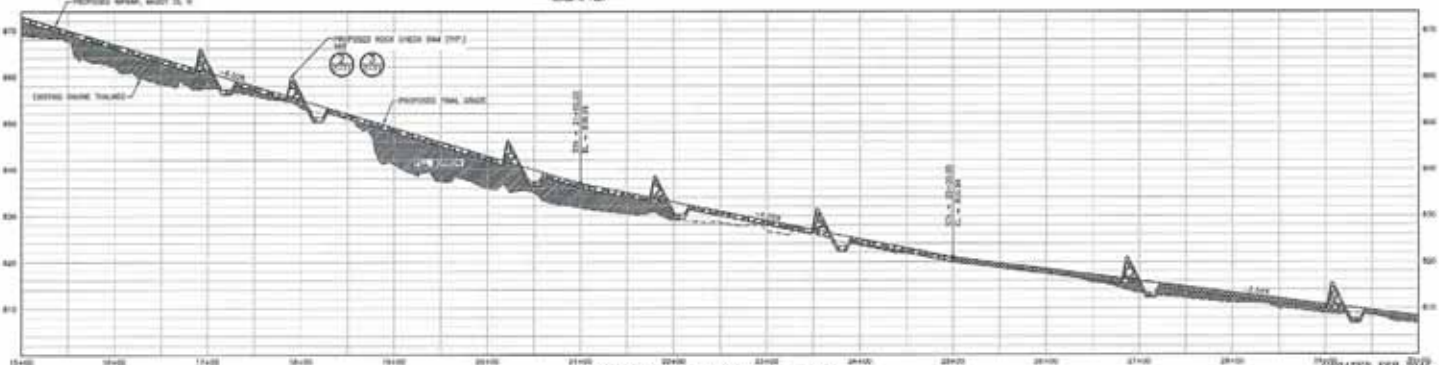
EAST BRANCH/MIDDLE HEAD
PLAN AND PROFILE

BARR PROJECT No. 23/70-1027.02
CLIENT PROJECT No.
DWG. No. C-06
REV. No. C

Attachment 2-8



PLAN: EAST BRANCH/15+00 TO 30+00



PROFILE: EAST BRANCH/15+00 TO 30+00

UPDATED FEB 2015
60% DESIGN

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

RELEASED TO/FOR: A B C D 1 2 3 — DATE RELEASED

BARR
BARR ENGINEERING CO.
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
55435-4803

Date	11/14/2014
Drawn	
Designed	
Checked	
Approved	

SCOTT WMO
SHAKOPEE, MINNESOTA

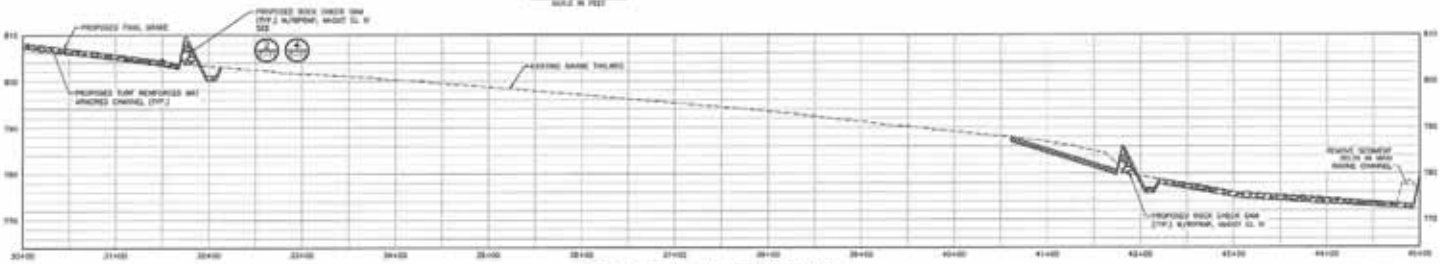
QUARRY CREEK
BLAKELEY TOWNSHIP

EAST BRANCH/15+00 TO 30+00
PLAN AND PROFILE

BARR PROJECT NO. 23/70-1027.02
CLIENT PROJECT NO.
DWG. NO. C-07
REV. NO. C

Attachment 2-9

PLAN: EAST BRANCH/30+00 TO 45+00



PROFILE: EAST BRANCH/30+00 TO 45+00

UPDATED FEB 2015
60% DESIGN

BARR

SCOTT WMO
SHAKOPEE, MINNESOTA

QUARRY CREEK
BLAKELEY TOWNSHIP

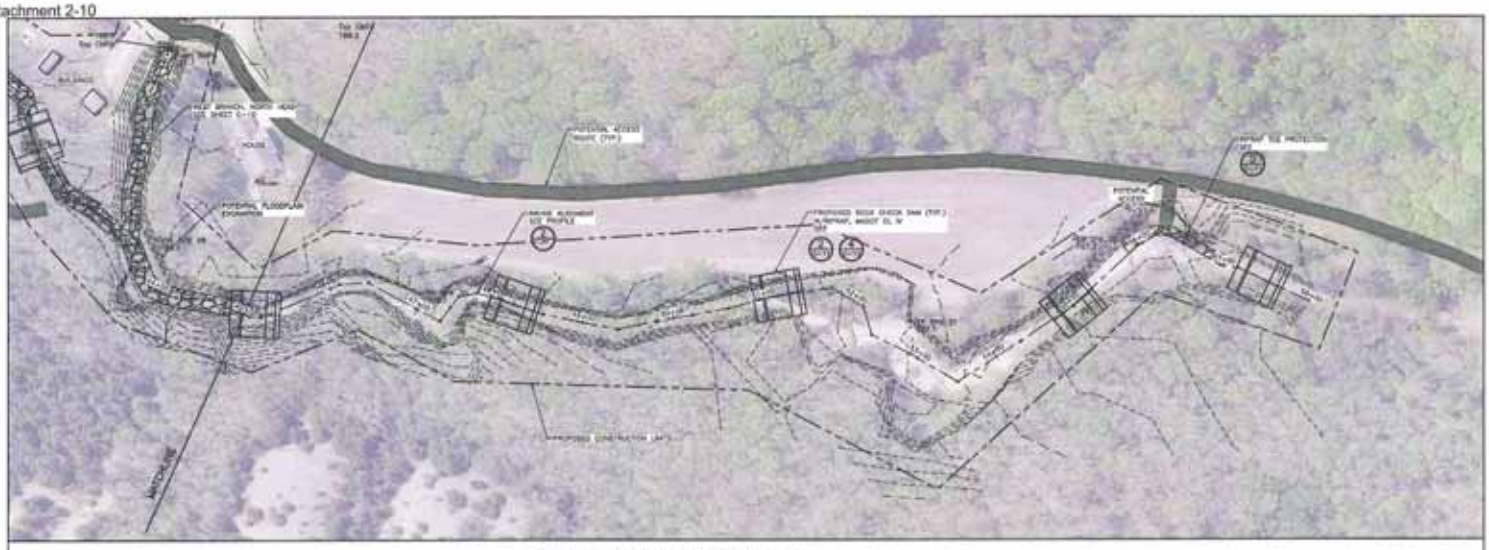
EAST BRANCH/30+00 TO 45+00
PLAN AND PROFILE

23/70-1027.02

C-08

C

Attachment 2-10



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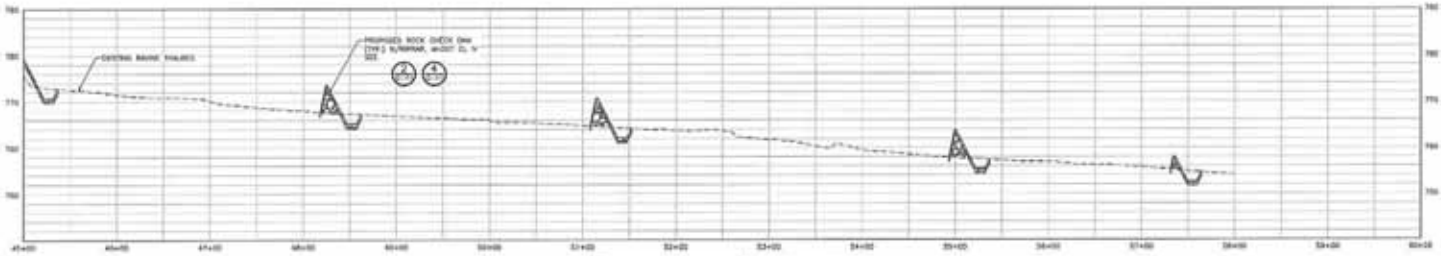
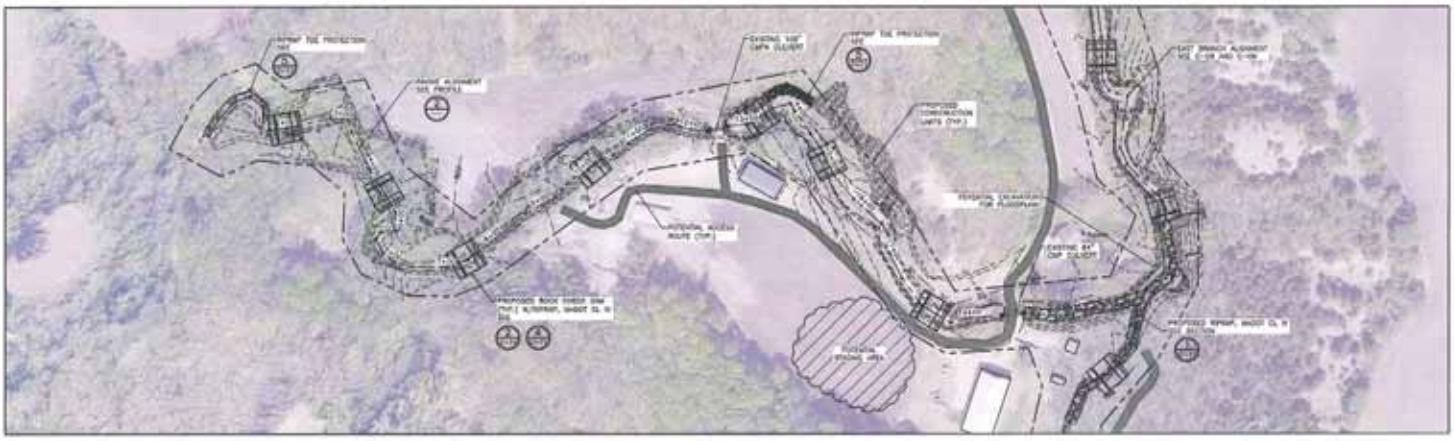


PROFILE: EAST BRANCH/45+00 TO 60+00

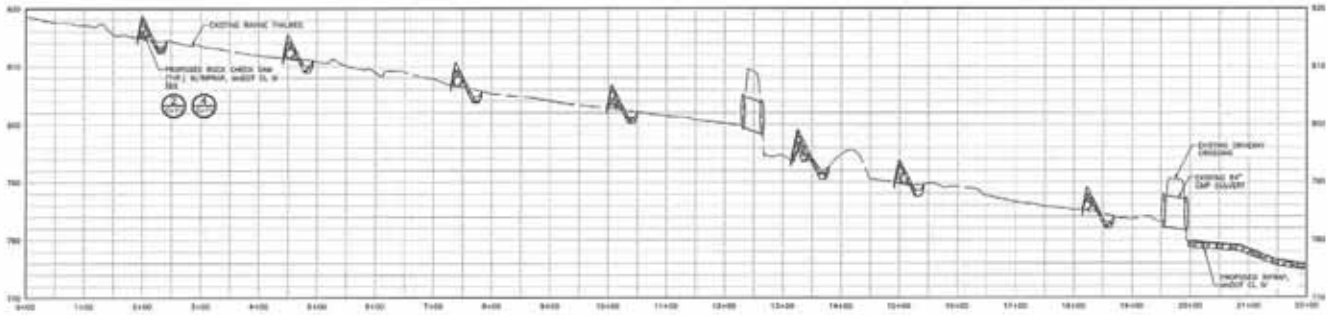
UPDATED FOR 2015 60% DESIGN

BARR	SCOTT WMO SHAKOPEE, MINNESOTA
QUARRY CREEK BLAKELEY TOWNSHIP	EAST BRANCH/45+00 TO 60+00 PLAN AND PROFILE
BARR PROJECT No. 23/70-1027.02	DRG. No. C-09

Attachment 2-11



PLAN: WEST BRANCH/NORTH HEAD



PROFILE: WEST BRANCH/NORTH HEAD

UPDATED FEB 2015
60% DESIGN

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