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engineering and environmental consultants

BARR

April 11, 2018

Mr. Mark Ray, P.E.
Director of Public Works
4141 Douglas Dr. N.
Crystal, MN, 55422-1696

Re: 50% Design Plans – Winnetka Pond Dredging Project
City of Crystal Project 2018-04

Dear Mr. Ray:

Attached please find the 50% design plans for the Winnetka Pond Dredging Project. The Bassett Creek Watershed Management Commission (BCWMC) is funding the Winnetka Pond Dredging Project (BCWMC CIP project BCP-2: Bassett Creek Park Pond Phase I Dredging Project) through a 2018 ad valorem levy (via Hennepin County). Per the cooperative agreement between the City of Crystal and the BCWMC, the city is to construct the project, and the plans and specifications are subject to approval by the Commission. Also, per the BCWMC's CIP project flow chart, the 50% design plans for this project must be submitted to the BCWMC for review and approval. If the attached 50% plans meet the city's approval, we recommend submitting them, along with this letter, to the BCWMC for inclusion in the meeting packet for their April 19th meeting. Barr staff will present the 50% plans to the BCWMC at the meeting and answer any questions from the BCWMC.

The remainder of this letter presents information about the feasibility study, the design features of the project, and approval/permitting needs.

Feasibility Study Summary and Selected Project

The BCWMC completed the *Feasibility Report for Bassett Creek Park Pond and Winnetka Pond East Dredging Project (May 2017)* to evaluate options for dredging accumulated sediment from Bassett Creek Park Pond and Winnetka Pond. The BCWMC selected completing the Winnetka Pond East alternative 3 project (deepening to 6.0 feet), along with add-on 1 (native buffer) and add-on 2 (goose management). The selected project will provide water quality improvement by (1) providing additional permanent pool storage for sedimentation and to prevent re-suspension of sediment, (2) minimizing downstream transport of sediment, (3) filtering pollutants such as phosphorus, sediment, and bacteria from stormwater runoff, and (4) reducing phosphorus and bacteria loads from geese.

During the design process, City of Crystal staff met with the Winnetka Village Apartments management staff to discuss the native buffer and goose management measures. As a result of these discussions and further discussion at the March 20th city council workshop, the city council decided to move ahead with installing the native buffer, and to continue to manage goose populations at Winnetka Pond (and other waterbodies along the North Branch).

Design features – 50% plans

The primary design features of the proposed work, as shown on the attached 50% plans, include:

1. Pond dredging. The design calls for removal of approximately 18,500 cubic yards of accumulated sediment and native soils to deepen the pond to a depth of 6 feet (the feasibility study estimated 18,400 cubic yards of excavation). As originally designed, the pond depth was only 2 feet. A large portion of the original volume has now been filled in with accumulated sediment, allowing for increased sediment resuspension and transport downstream. Increasing the depth is still subject to review and approval by the Minnesota Department of Natural Resources (MDNR).

2. Maintenance access. The design includes providing maintenance access at two locations. The west access point is a 12-foot-wide vehicle ramp at a 10% maximum slope. This access point will be used for construction hauling traffic. The east access near the outlet structure will allow for maintenance vehicle parking while city crews perform routine maintenance at the outlet structure. Both access locations will have turf reinforcement to prevent rutting and compaction and will be maintained as native buffer or turf grass. This design feature was not identified in the feasibility study.

3. Outlet structure modifications. To reduce the frequency of obstructed flows, the design includes removing the existing grate and installing a new hinged grate with sloping bars. The design will also allow maintenance crews to clean the new grate more effectively and easily than the current structure. The existing plywood weir will be replaced with a concrete weir of the same dimensions, elevations, and orifice size/shape to ensure no change in flood elevations or outflow. The joints of the downstream 42-inch pipe have separated, which allows soil to infiltrate into the pipe. The project includes replacing these sections of pipe.

4. Erosion repair and new storm sewer installation. The runoff from the existing driveway curb cuts has resulted in visible erosion along the slopes, forming channels on both sides of the driveway, and depositing sediment in the pond. The design calls for installing new storm sewer inlets at each curb cut location and directing that stormwater through pipes into the existing box culvert that connects the east and west ponds. This design feature was not identified in the feasibility study, as the issue was identified later, during the existing condition field evaluation, where it became apparent the project would need to address the problem.

5. Expanding the existing vegetated buffer. To improve erosion control and the filtering of stormwater runoff, the design calls for removing the vegetation within the existing buffer and expanding the footprint. The restored buffer will be planted with native plant species. The buffer will be a minimum 30 feet in width and includes a 10 foot wide mow strip along the driveway perimeter. The area of the expanded buffer is approximately 1.1 acres (the feasibility study estimated a buffer area of 0.85 acres). Since a portion of the buffer is on private property and outside of any existing easements the city will pursue acquisition of a permanent easement over both the buffer area that is located on private property (on the far west end of the pond) and the very west portion of the pond. An easement is needed for the City to have the right to plant and maintain the buffer.

6. Goose management. At the March 20th work session, the city council decided to continue goose management at Winnetka pond by city staff. The city is currently performing goose management in the form of egg addling at other locations within the city (Bassett Creek Park Pond). City staff performed goose management at Winnetka Pond in the past, turned it over to the apartment

management staff, but the apartment management staff subsequently discontinued goose management activities.

Opinion of cost

The table below summarizes our opinion of costs, based on the 50% design plans:

Table 1 Opinion of Cost Summary

Item Description	Cost
Project costs eligible for BCWMC reimbursement:	
Pond dredging and general work	$ 540,000
Other pond improvements	$ 44,500
Native buffer	$ 18,000
Existing drainage corrections	$ 21,500
Goose management	$ 0[1]
Total estimated construction costs	**$ 624,000**
Contingency (+20%)	**$ 125,000**
Engineering costs	$ 81,000
Total construction and engineering costs	**$ 830,000**
Other project costs that the city requests the BCWMC consider for reimbursement:	
Easement acquisition costs	$ 3,000[2]

[1] Work already performed by city staff

[2] Costs include easement development and recording, but not purchasing of easement. If easement purchase required, costs will be higher.

The detailed cost estimate is also attached.

Per the cooperative agreement between the city and the BCWMC, the BCWMC's total reimbursement for this project may not exceed $1,000,000, less Commission expenses. The current balance (as of March 7, 2018) in the CIP budget for this project is $938,930.75. The total estimated construction and engineering costs ($830,000), plus easement acquisition costs are well within the reimbursable costs allowed for this project.

Approvals/permit requirements

In addition to BCWMC approval of the plans, other permits/approvals will be required for this project. Of largest concern is the MDNR public waters work permit.

Winnetka Pond is a MDNR Public Water (#27062900P) and the MDNR requires a Public Waters Work Permit for any work below the ordinary high water level (OHWL). Winnetka Pond East was created in about 1968 as part of the Winnetka Village Apartments development. Because the project pre-dates permitting, MDNR and United States Army Corps of Engineers (USACE) permits were not required. Typically, removal of accumulated sediment is permitted with some documentation, such as the available original construction drawings for the site. Deepening the pond to 6 feet would involve additional permitting considerations because it would require excavating into native material in a MDNR public water wetland, which is also under jurisdiction of the USACE. Barr contacted the MDNR area hydrologist (Jason Spiegel) and he indicated that we can make a case for excavation beyond removing accumulated sediment. It will be evaluated in terms of how much excavation is proposed below the original elevation

(i.e., as originally constructed). (Note: we heard a similar message from Jason Spiegel at the December 8th, 2017 DeCola Ponds B&C Feasibility Study agency meeting.)

A USACE joint permit (Section 404 permit and Section 401 Certification) is not required but is recommended. The USACE may consider the pond a "previously-authorized structure," which would simplify permitting. As long as there is no re-grading of the pond bottom, the USACE does not consider it a wetland impact and therefore the USACE does not regulate the activity.

There is a narrow fringe of Wetland Conservation Act (WCA) wetland above the MDNR OHWL at the southeastern and eastern sides of the pond. Site access through this area is needed during construction, which will cause temporary wetland impacts within the WCA wetland. This would be considered a no-loss under MN Rules 8420.0415 H, as long as the disturbed areas are restored back to original elevation, and vegetation is restored within six months of the start of activity. The project will also result in permanent wetland impacts due to the fill required to allow for routine maintenance access within this portion of WCA wetland; the area of wetland fill will likely be within the allowable de minimis exemption amount ($\leq$400 square feet). A joint application form requesting approval of both the WCA no-loss and de minimis exemption will be required.

A Minnesota Pollution Control Agency (MPCA) Construction Stormwater General Permit is required if land disturbance outside of the pond dredging is greater than 1 acre. If the final project includes the native buffer as currently designed, the total disturbance will exceed the 1 acre threshold. The general contractor would obtain this permit after the city awards the project. In addition, a stormwater pollution prevention plan (SWPPP) would be added to the construction drawings.

Recommendations

We recommend that the city request 1) BCWMC approval of the 50% drawings, 2) BCWMC authorization for the city to proceed with 90% plans, contract documents, and permitting, and 3) BCWMC consideration of reimbursement for easement development and acquisition costs.

If you have any questions, please contact me at 952-832-2813 or kchandler@barr.com.

Sincerely,

Karen L. Chandler

Karen L. Chandler, P.E.
Vice President

CITY OF CRYSTAL

WINNETKA POND DREDGING PROJECT

ENGINEERS OPINION OF COST

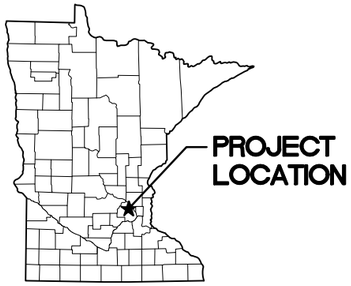
DATED APRIL 11, 2018

ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	EXTENSION
POND DREDGING AND GENERAL				
MOBILIZATION/DEMOBILIZATION	LS	1	$ 31,000.00	$ 31,000.00
CONTROL OF WATER/DEWATERING	LS	1	$ 20,000.00	$ 20,000.00
ROCK CONSTRUCTION ENTRANCE	EACH	1	$ 3,000.00	$ 3,000.00
ROCK FILTER DIKE	LS	1	$ 2,000.00	$ 2,000.00
REMOVE 42" RCP	LF	28	$ 30.00	$ 840.00
REMOVE EXISTING WEIR AND TRASH RACK	LS	1	$ 1,000.00	$ 1,000.00
REMOVE FALLEN TREES AND DEBRIS	LS	1	$ 10,000.00	$ 10,000.00
COMMON EXCAVATION (P)	CY	600	$ 16.00	$ 9,600.00
POND DREDGING OF MPCA DREDGED MATERIAL LEVEL 1 REMOVAL AND DISPOSAL (P)	CY	18,500	$ 25.00	$ 462,500.00
			SUBTOTAL	***$ 539,940.00***
POND IMPROVEMENTS				
INSTALL NEW 42" RCP CLASS 3	LF	28	$ 180.00	$ 5,040.00
CONNECT TO EXISTING STRUCTURE	EACH	2	$ 300.00	$ 600.00
INSTALL CONCRETE WEIR	LS	1	$ 3,000.00	$ 3,000.00
OUTLET STRUCTURE TRASH RACK	EACH	1	$ 4,200.00	$ 4,200.00
INSTALL RIPRAP AT PIPES AND STRUCTURES	TON	84	$ 65.00	$ 5,460.00
MAINTENANCE ACCESS SOIL	CY	100	$ 40.00	$ 4,000.00
MAINTENANCE ACCESS TURF REINFORCEMENT (NETLON)	LS	1	$ 12,000.00	$ 12,000.00
SALVAGE AND REINSTALL TOPSOIL	CY	240	$ 5.00	$ 1,200.00
IMPORT TOPSOIL	CY	100	$ 35.00	$ 3,500.00
TURF SEEDING	ACRE	0.4	$ 2,000.00	$ 800.00
HYDROMULCH	SY	1,900	$ 2.50	$ 4,750.00
			SUBTOTAL	***$ 44,550.00***
NATIVE BUFFER				
HERBICIDE ERADICATION OF EXISTING POND BUFFER	ACRE	0.5	$ 4,500.00	$ 2,250.00
NATIVE BUFFER SEEDING	ACRE	1.1	$ 8,800.00	$ 9,680.00
STRAW MULCH	ACRE	1.1	$ 3,000.00	$ 3,300.00
ONE YEAR SEEDING WARRANTY AND ESTABLISHMENT	LS	1	$ 3,000.00	$ 3,000.00
			SUBTOTAL	***$ 18,230.00***
EXISTING DRAINAGE CORRECTIONS				
REMOVE TREE AND FLARED END	LS	1	$ 600.00	$ 600.00
INSTALL NEW 12" CMP FLARED END WITH RIPRAP	LS	1	$ 800.00	$ 800.00
STORM SEWER NEAR DRIVEWAY	LS	1	$ 19,000.00	$ 19,000.00
REPAIR EROSION WITH GRADING AND SEEDING	LS	1	$ 1,000.00	$ 1,000.00
			SUBTOTAL	***$ 21,400.00***
			CONSTRUCTION TOTAL	**$ 624,120.00**
			CONTINGENCY (+20%)	**$ 125,000.00**
			ENGINEERING TOTAL	**$ 81,000.00**
			PROJECT TOTAL	**$ 830,120.00**

WINNETKA POND DREDGING PROJECT

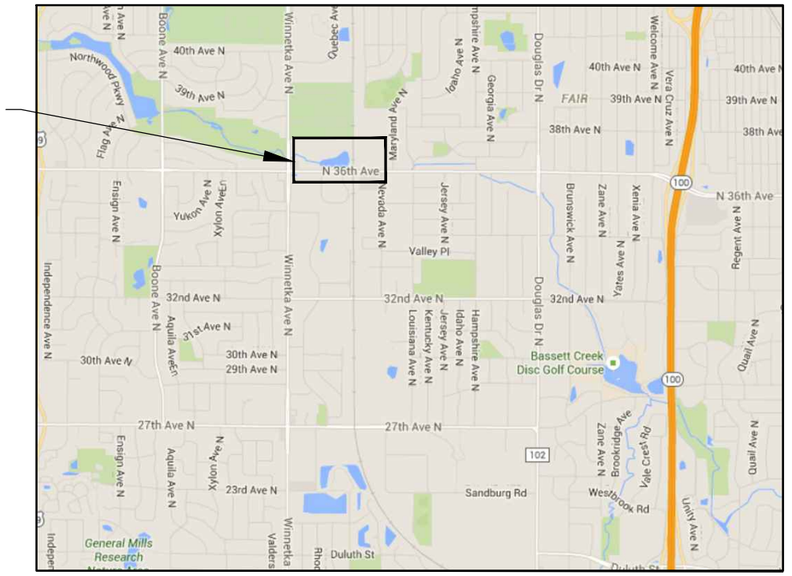
CITY OF CRYSTAL

CRYSTAL, MN



LOCATION MAP

PROJECT LOCATION



VICINITY MAP

SHEET INDEX	
NO.	SHEET NAME
G-01	TITLE SHEET AND SITE LOCATION MAP
G-02	EXISTING CONDITIONS, REMOVALS, & EROSION CONTROL PLAN
G-03	EROSION CONTROL DETAILS
C-01	GRADING PLAN
C-02	GRADING SECTIONS
C-03	STORM SEWER PLAN, PROFILES, AND DETAILS
C-04	NATIVE BUFFER AND RESTORATION PLAN
C-05	MISCELLANEOUS DETAILS
S-01	OUTLET STRUCTURE SECTIONS AND DETAILS

ENGINEER:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
MINNEAPOLIS, MN 55435
PH: 952-842-3593
FAX: 952-832-2601
WWW.BARR.COM
CONTACT: PATRICK BROCKAMP

OWNER:
CITY OF CRYSTAL

CITY of CRYSTAL

COORDINATE SYSTEM: HENNEPIN COUNTY
HORIZONTAL DATUM: NAD83 (2011)
VERTICAL DATUM: NAVD88

GOPHER STATE ONE CALL

GOPHER STATE ONE CALL:
CALL BEFORE YOU DIG.
1-800-252-1166

50% DRAFT
FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW

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 PATRICK BROCKAMP

SIGNATURE _____

DATE _____ LICENSE # _____

	03/08/18						
CLIENT							
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.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

Scale	AS SHOWN
Date	03/08/2018
Drawn	CMH3
Checked	PEB
Designed	BARR
Approved	

CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND
DREDGING PROJECT

TITLE SHEET AND SITE LOCATION MAP

BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	G-01
REV. No.	A

WINNETKA VILLAGE APARTMENTS BUILDING No. 2
WINNETKA VILLAGE APARTMENTS BUILDING No. 3
WINNETKA VILLAGE APARTMENTS BUILDING No. 1
PROPERTY OWNER WINNETKA VILLAGE APARTMENTS
PROPERTY OWNER CITY OF CRYSTAL
PROPERTY OWNER SOO LINE RAILROAD
PROPERTY OWNER SOO LINE RAILROAD
12" CMP FES INV = 882.1 REMOVE TREE BLOCKING OUTLET
PROTECT BIRDHOUSE
12" CMP INV = 882.1
4'x7' RCPB INV = 877.0
LIGHT POLE (TYP)
CABLE BOX
12" CMP INV = 879.0
WINNETKA POND NORMAL WATER LEVEL = 880.1
4'x7' RCPB INV = 876.0
REMOVE DEADFALL AND TRASH FROM WOODED AREAS SURROUNDING POND WITHIN CITY PROPERTY LIMITS ONLY
EROSION
APARTMENT DRIVEWAY NO CONSTRUCTION TRAFFIC ALLOWED
REMOVE TREE
INSTALL ROCK FILTER DIKE SEE 6 G-03
PROPERTY OWNER WINNETKA VILLAGE APARTMENTS
PROPERTY OWNER CITY OF CRYSTAL
42" RCP FES INV = 881.1
EXISTING OUTLET STRUCTURE TOP OF WEIR = 881.5 10"x20" ORIFICE INV = 880.1 REMOVE WEIR & GRATE SEE SHEET S-01
42" RCP OUTLET INV = 877.2
EROSION
PROTECT FLAG POLES, SIGN, AND LANDSCAPING
REMOVE AND REPLACE 28 LF OF 42" RCP
STORM MH RIM = 890.2
DO NOT ENTER
SIDEWALK
CONSTRUCTION ENTRANCE SEE 1 G-03
36TH AVE N
UTILITY POLE (TYP)
INLET PROTECTION SEE 3 G-03

EXISTING MINOR CONTOUR
EXISTING MAJOR CONTOUR
PROPOSED MINOR CONTOUR
PROPOSED MAJOR CONTOUR
DECIDUOUS TREE
CONIFEROUS TREE
PROPERTY LINE
POND NORMAL WATER LEVEL
STORM SEWER
SANITARY SEWER
WATER MAIN
BURIED ELECTRIC
BURIED CABLE TV
OVERHEAD ELECTRIC
INLET PROTECTION

NOTES:

1. SURVEYED TREES WITH SYMBOLS DO NOT REPRESENT ALL TREES WITHIN OR AROUND THE WORK LIMITS. PROTECT ALL TREES UNLESS NOTED FOR REMOVAL

1 - PLAN: EXSITING CONDITIONS, REMOVALS, & EROSION CONTROL PLAN

SCALE IN FEET 0 30 60

50% DRAFT FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW

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 PATRICK BROCKAMP

SIGNATURE

DATE LICENSE #

	03/08/18						
CLIENT							
BID							
CONSTRUCTION							
RELEASED TO/FOR	A	B	C	0	1	2	3
	DATE RELEASED						

BARR

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Scale	AS SHOWN
Date	03/08/2018
Drawn	CMH3
Checked	PEB
Designed	BARR
Approved	

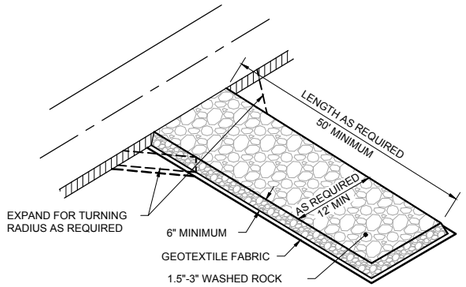
CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND
DREDGING PROJECT

EXISTING CONDITIONS, REMOVALS, & EROSION CONTROL PLAN

BARR PROJECT No.	
23/27-1622.00	
CLIENT PROJECT No.	
2018-04	
DWG. No.	REV. No.
G-02	A

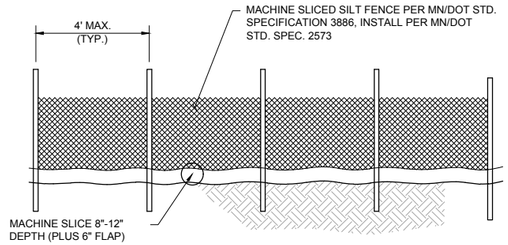
CADD USER: PATRICK E. BROCKAMP FILE: M:\DESIGN\23271622.00\23271622.00_G-02.DWG PLOT SCALE: 1:2 PLOT DATE: 3/8/2018 12:40 PM



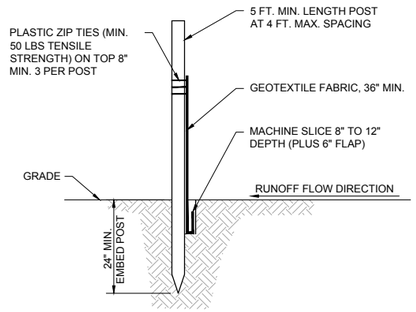
NOTES:

1. MAINTAIN ENTRANCE THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIR OR REPLACE AS REQUIRED TO PREVENT TRACKING OFFSITE.
2. REMOVE ENTRANCE IN CONJUNCTION WITH FINAL GRADING AND SITE STABILIZATION.

1 - DETAIL: CONSTRUCTION ENTRANCE - ROCK
NOT TO SCALE



DOWNSTREAM VIEW

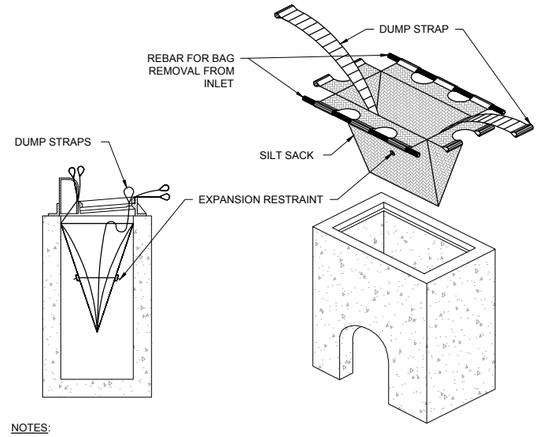


SECTION VIEW

NOTES:

1. INSTALL SILT FENCE PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED AND MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD.
2. SILT FENCE MATERIALS AND INSTALLATION SHALL MEET THE REQUIREMENTS OF MN/DOT SPECIFICATIONS 2573 AND 3886.
3. NO HOLES OR GAPS SHALL BE PRESENT IN/UNDER SILT FENCE. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
4. REMOVE ACCUMULATED SEDIMENT WHEN BUILD UP REACHES 1/3 OF FENCE HEIGHT, OR INSTALL A SECOND SILT FENCE DOWNSTREAM OF THE ORIGINAL FENCE AT A SUITABLE DISTANCE.
5. WHEN SPLICES ARE NECESSARY MAKE SPLICE AT POST ACCORDING TO SPLICE DETAIL. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE. ROTATE BOTH POSTS TOGETHER AT LEAST 180 DEGREES TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL. CUT THE FABRIC NEAR THE BOTTOM OF THE POSTS TO ACCOMMODATE THE 6 INCH FLAP, THEN DRIVE BOTH POSTS AND BURY THE FLAP AND COMPACT BACKFILL.
6. REMOVE SILT FENCE AND ANY ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

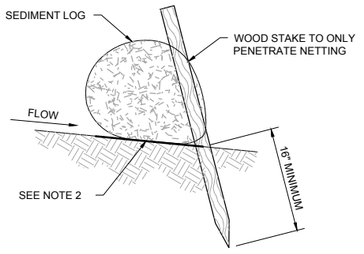
2 - DETAIL: SILT FENCE - MACHINE SLICED
NOT TO SCALE



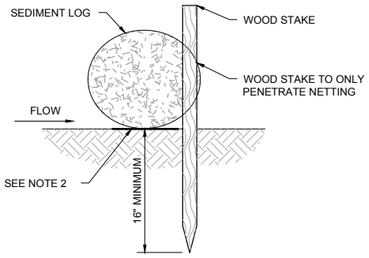
NOTES:

1. INSTALL INLET PROTECTION PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED OR IMMEDIATELY FOLLOWING ANY CATCHBASIN INSTALLATION AND MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD.
2. MATERIALS SHALL BE SUFFICIENT TO ALLOW FLOW WHILE BLOCKING SEDIMENT. NO HOLES OR GAPS SHALL BE PRESENT IN/AROUND FILTER SACK.
3. CLEAN FILTER SACK AND REMOVE ACCUMULATED SEDIMENT AS REQUIRED TO ALLOW FLOW INTO THE CATCHBASIN AND PREVENT SEDIMENT FROM LEAVING THE DEVICE.
4. REMOVE DEVICE AND ANY ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

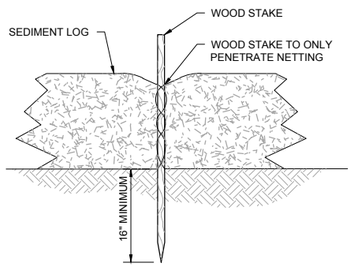
3 - DETAIL: INLET PROTECTION - FILTER SACK
NOT TO SCALE



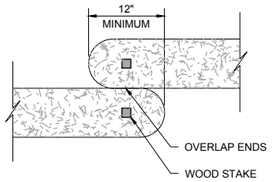
SIDE VIEW ON SLOPE



SIDE VIEW FLAT



FRONT VIEW

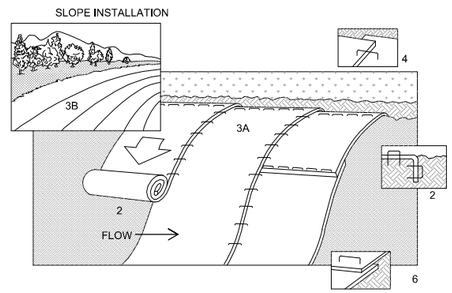


TOP VIEW

NOTES:

1. INSTALL SEDIMENT LOG ALONG CONTOURS (CONSTANT ELEVATION).
2. REMOVE ALL SNOW AND SOIL IRREGULARITIES SO EROSION LOG IS IN FULL CONTACT WITH THE GROUND (NO GAPS SHALL BE PRESENT UNDER SEDIMENT LOG).
3. REMOVE ACCUMULATED SEDIMENT WHEN REACHING 1/3 OF LOG HEIGHT.
4. MAINTAIN SEDIMENT LOG THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIR OR REPLACED AS REQUIRED.

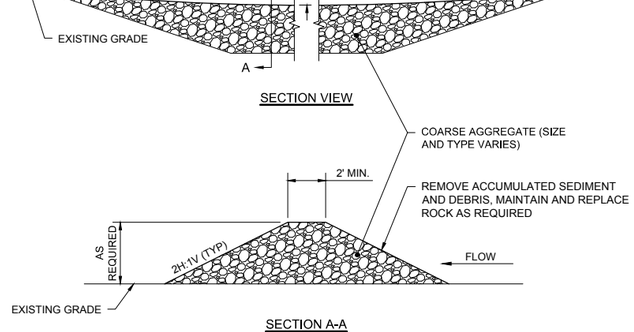
4 - DETAIL: EROSION LOG - STAKING
NOT TO SCALE



NOTES:

1. REFER TO MANUFACTURER RECOMMENDATIONS FOR STAPLE PATTERNS FOR SLOPE INSTALLATIONS.
2. PREPARE SOIL BY LOOSENING TOP 1-2 INCHES AND APPLY SEED (AND FERTILIZER WHERE REQUIRED) PRIOR TO INSTALLING BLANKETS. GROUND SHOULD BE SMOOTH AND FREE OF DEBRIS.
3. BEGIN (A) AT THE TOP OF THE SLOPE AND ROLL THE BLANKETS DOWN OR (B) AT ONE END OF THE SLOPE AND ROLL THE BLANKETS 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.
6. BLANKET MATERIALS SHALL BE AS SPECIFIED OR AS APPROVED BY ENGINEER.

5 - DETAIL: EROSION CONTROL BLANKET - INSTALLATION
NOT TO SCALE



NOTES:

1. AGGREGATE SIZE MAY VARY AND DEPENDING ON CHANNEL SIZE, FLOW, SEDIMENT LOAD OR OTHER SITE CONDITIONS. AGGREGATE USED SHOULD BE RELATIVELY FREE OF SEDIMENT PRIOR TO INSTALLATION.
2. CLEAN OR REPLACE WHEN SEDIMENT BUILD UP REACHES 1/2 OF THE DIKE HEIGHT, ALTERNATIVELY A SECOND ROCK FILTER DIKE MAY BE INSTALLED DOWNSTREAM OF THE EXISTING DIKE AT A SUITABLE DISTANCE.
3. MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD. ROCK AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

6 - DETAIL: ROCK FILTER DIKE
NOT TO SCALE

50% DRAFT FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW

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PRINTED NAME PATRICK BROCKAMP
SIGNATURE
DATE - LICENSE # -

	03/08/18						
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BID							
CONSTRUCTION							
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	DATE RELEASED						

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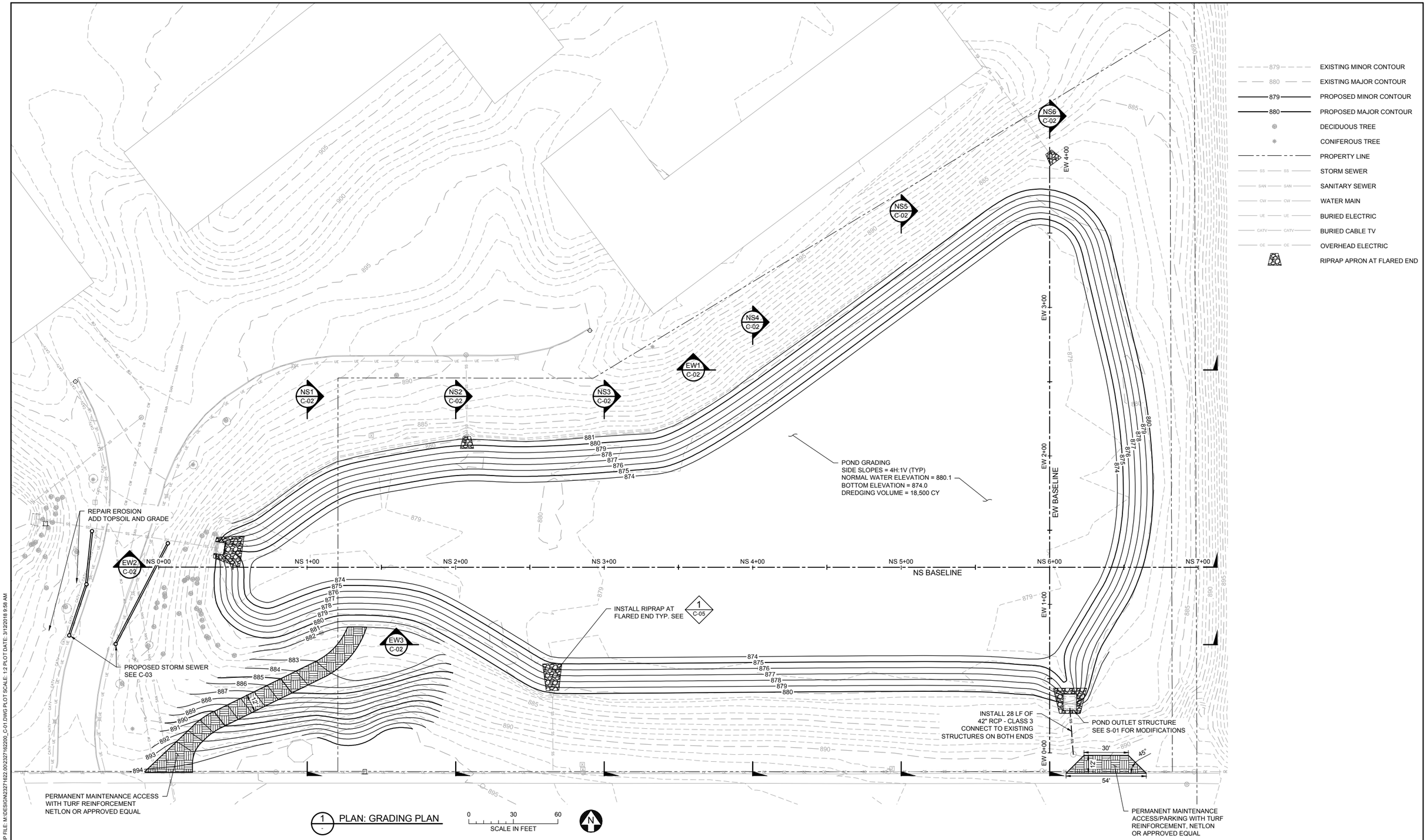
Date	03/08/2018
Drawn	CMH3
Checked	PEB
Designed	BARR
Approved	

CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND
DREDGING PROJECT

EROSION CONTROL DETAILS

BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	G-03
REV. No.	A



1 PLAN: GRADING PLAN

0 30 60
SCALE IN FEET

50% DRAFT
FOR REVIEW

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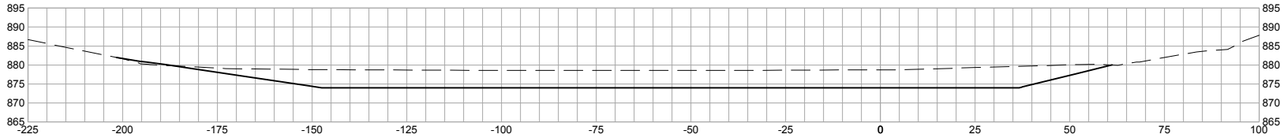
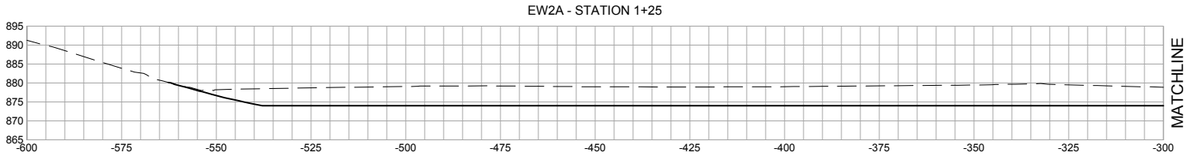
CITY OF CRYSTAL
CRYSTAL, MINNESOTA

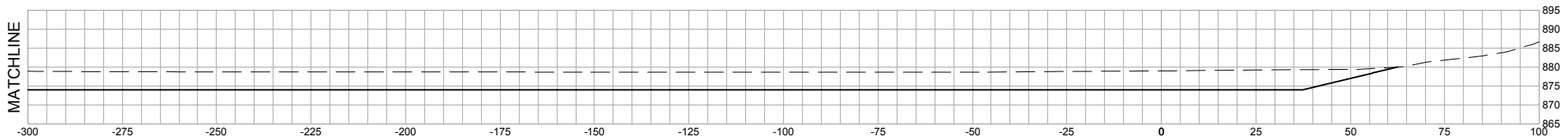
WINNETKA POND
DREDGING PROJECT

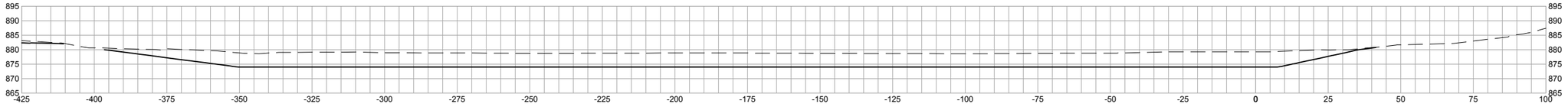
GRADING PLAN

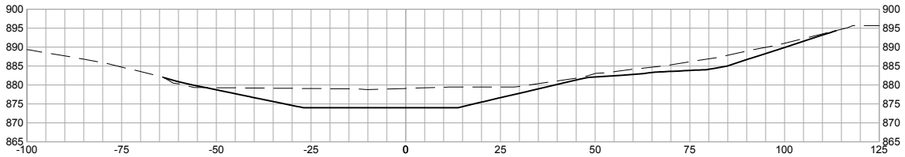
BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	C-01
REV. No.	A

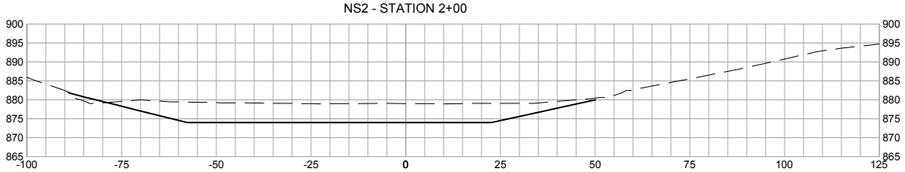


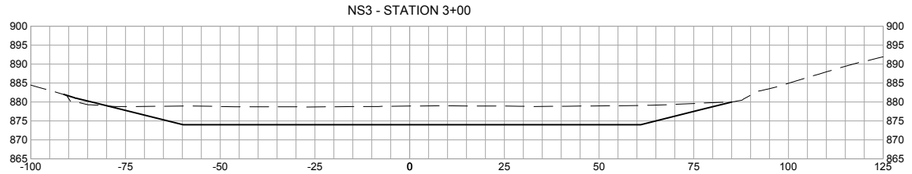


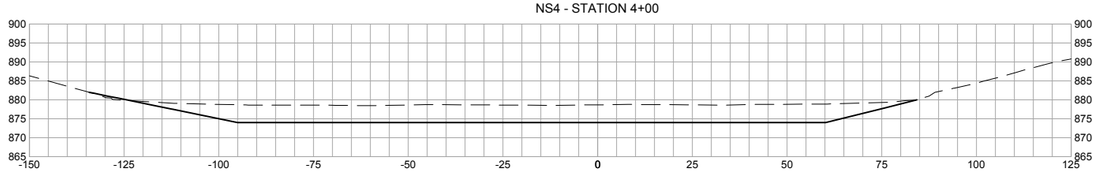


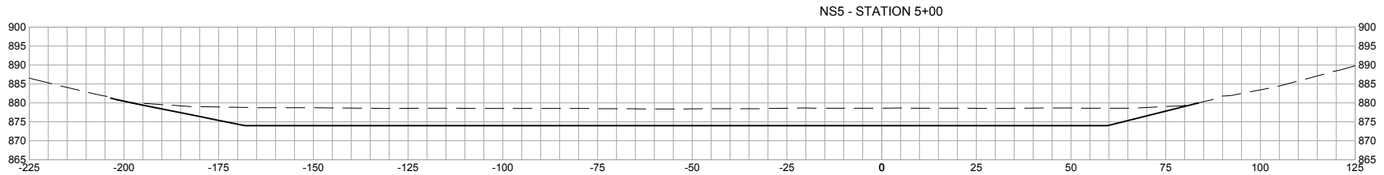


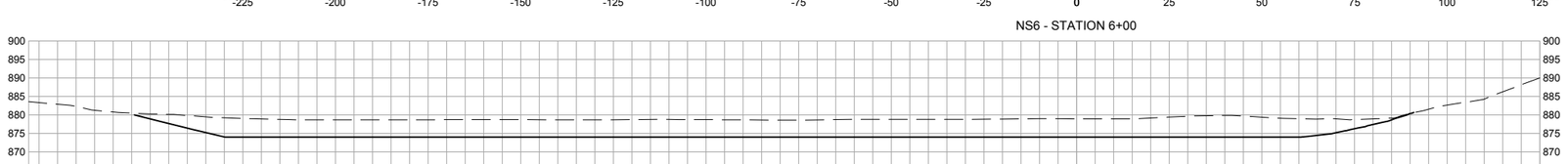












50% DRAFT FOR REVIEW

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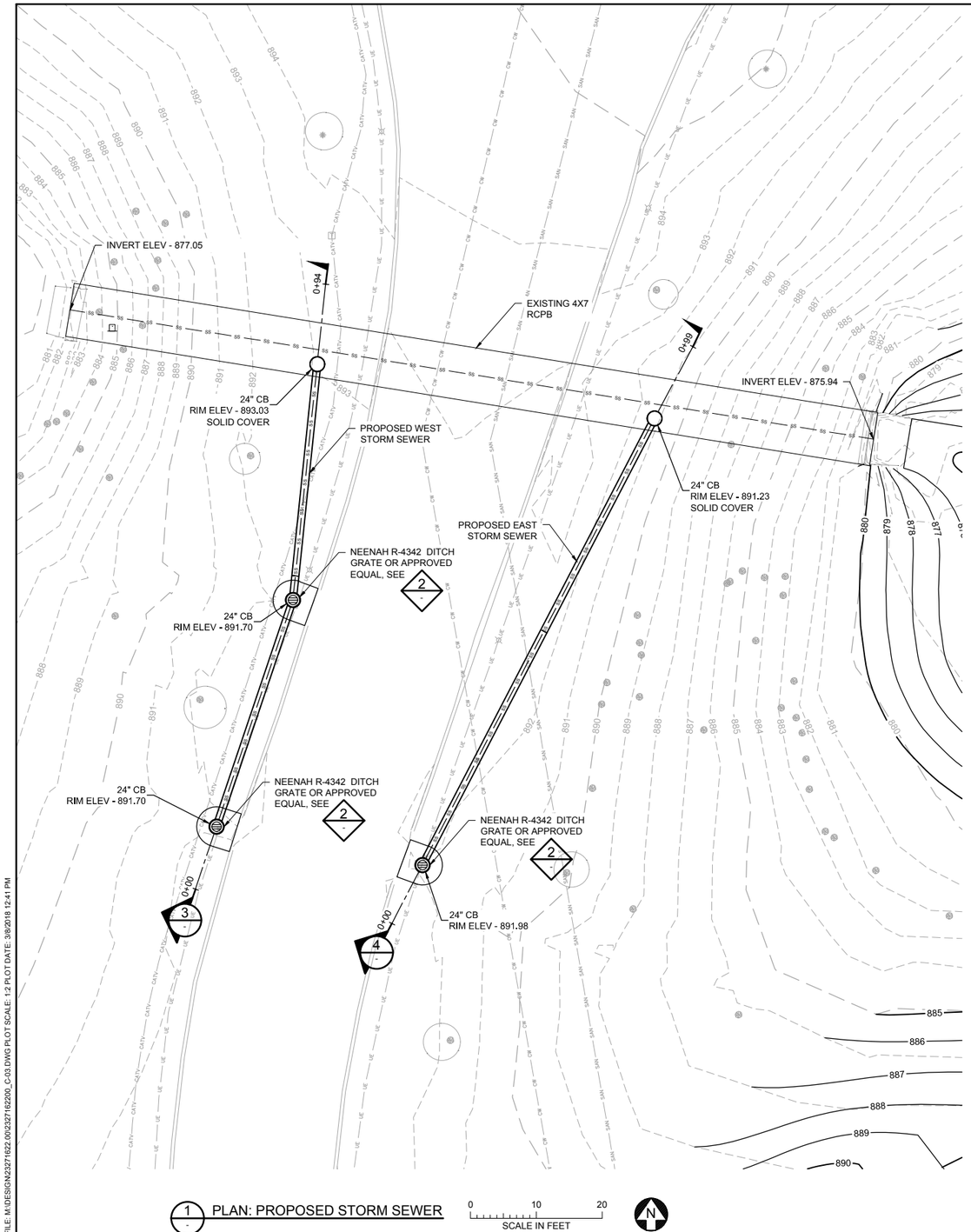
Date	03/08/2018
Drawn	CMH3
Checked	PEB
Designed	BARR
Approved	

CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND
DREDGING PROJECT

GRADING SECTIONS

BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	C-02
REV. No.	A



1 PLAN: PROPOSED STORM SEWER

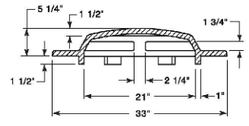
0 10 20
SCALE IN FEET

879 EXISTING MINOR CONTOUR
880 EXISTING MAJOR CONTOUR
879 PROPOSED MINOR CONTOUR
880 PROPOSED MAJOR CONTOUR
DECIDUOUS TREE
CONIFEROUS TREE
SS STORM SEWER
SAN SANITARY SEWER
CW WATER MAIN
UE BURIED ELECTRIC
CATV BURIED CABLE TV
OE OVERHEAD ELECTRIC

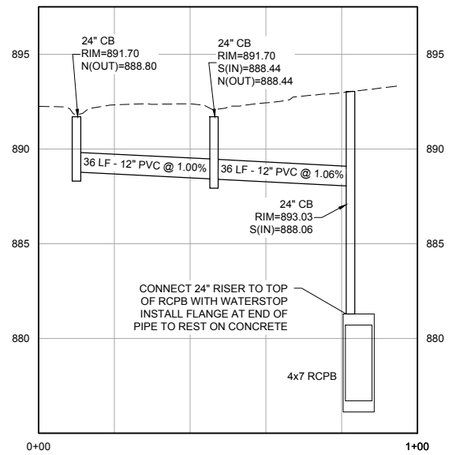
R-4342
Ditch Grate, Stool Type

Light Duty

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-4342	Beehive	2.0	6.0

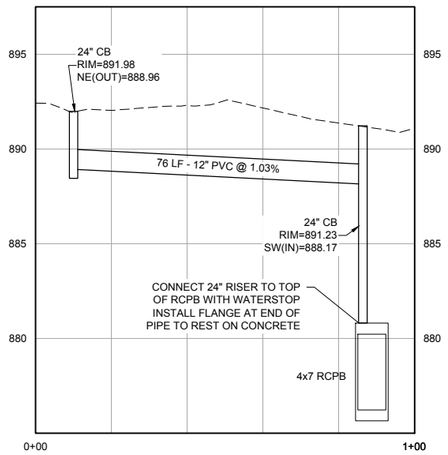


2 DETAIL: STOOL GRATE
NOT TO SCALE



3 PROFILE: PROPOSED WEST STORM SEWER

0 20 40
HORIZONTAL SCALE IN FEET
0 2 4 6 8
VERTICAL SCALE IN FEET



4 PROFILE: PROPOSED EAST STORM SEWER

0 20 40
HORIZONTAL SCALE IN FEET
0 2 4 6 8
VERTICAL SCALE IN FEET

50% DRAFT FOR REVIEW

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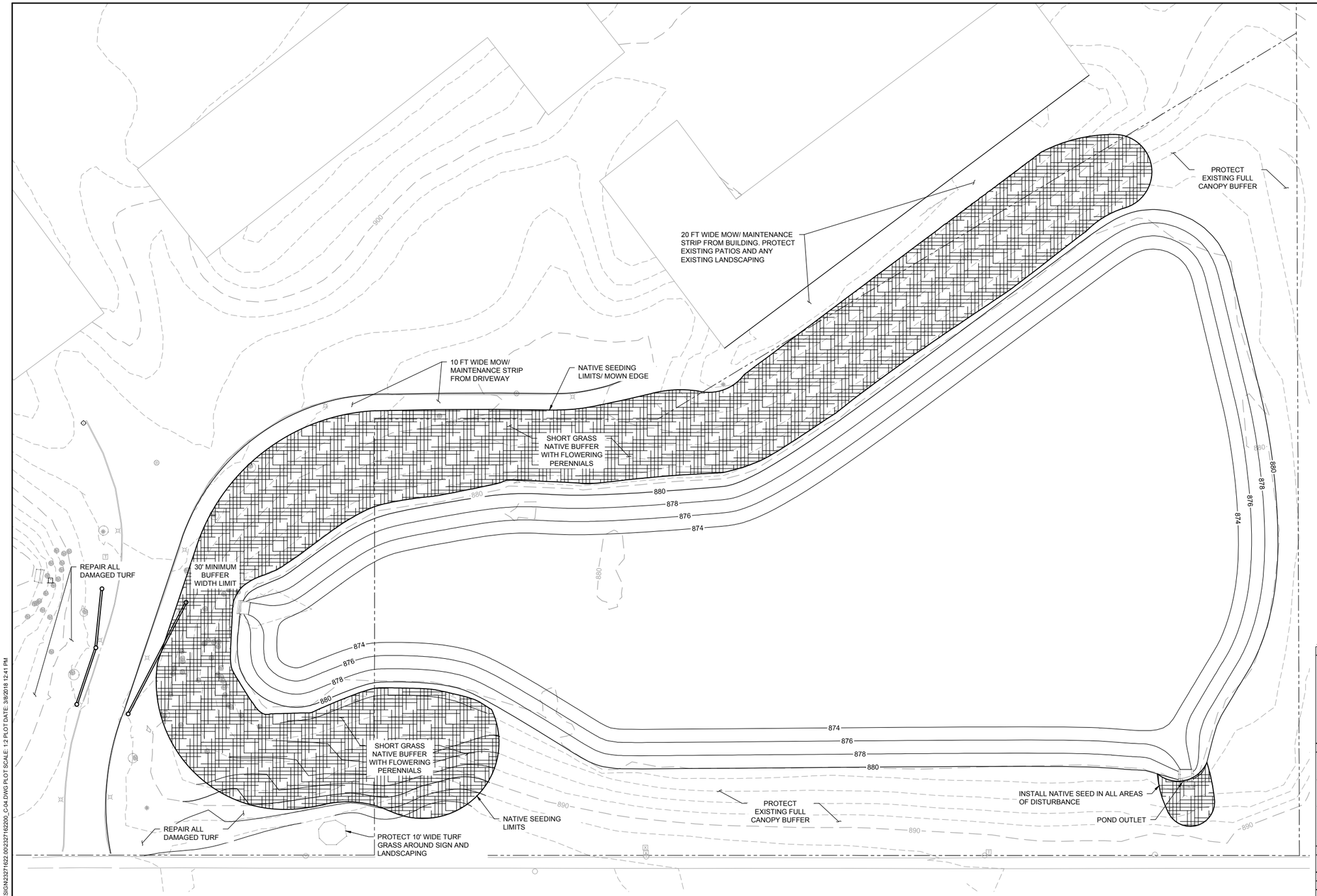
Designed	BARR
Approved	

CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND
DREDGING PROJECT

PROPOSED STORM SEWER
PLAN AND PROFILE

BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	C-03
REV. No.	A



1 PLAN: NATIVE BUFFER AND RESTORATION PLAN

0 30 60
SCALE IN FEET

N

879 EXISTING MINOR CONTOUR
880 EXISTING MAJOR CONTOUR
879 PROPOSED MINOR CONTOUR
880 PROPOSED MAJOR CONTOUR
DECIDUOUS TREE
CONIFEROUS TREE
PROPERTY LINE
SS STORM SEWER
SAN SANITARY SEWER
CW WATER MAIN
UE BURIED ELECTRIC
CATV BURIED CABLE TV
OE OVERHEAD ELECTRIC
NATIVE BUFFER AREA

SEEDING NOTES:
1. ANY GRASS OR WEEDS WITHIN SEEDING AREAS SHALL BE SPRAYED WITH HERBICIDE 14 DAYS PRIOR TO TILLING.
2. ALL HERBICIDE APPLICATION SHALL BE APPLIED BY A LICENSED APPLICATOR WITHIN THE STATE OF MINNESOTA.
3. AFTER SEEDING, TYPE 8 MULCH MATERIAL SHALL BE DISC-ANCHORED OVER ENTIRE SEEDING AREA IN ACCORDANCE WITH MN/DOT STANDARD SPECIFICATION 3882.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION. IN THE CASE OF ANY DISCREPANCIES BETWEEN THIS DETAIL, PLANS, OR SPECIFICATIONS.

SEEDING ESTABLISHMENT NOTES:
1. SEEDING AREAS SHALL BE FREE OF DEAD OR DYING PATCHES LARGER THAN TEN SQUARE FOOT FOR ENTIRETY OF THE ONE YEAR WARRANTY OF PLANTING WORK. SEE SPECIFICATION 32-93-00 HERBACEOUS PLANT ESTABLISHMENT FOR MORE INFORMATION.
2. CONTRACTOR WILL BE RESPONSIBLE FOR WATERING (REGARDLESS OF NOTIFICATION) DURING ENTIRE ONE YEAR WARRANTY PERIOD. WATERING WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
3. ONCE A MONTH (MAY THROUGH OCTOBER) DURING MAINTENANCE PERIOD CONTRACTOR SHALL INSPECT FOR INVASIVE WEED ENCROACHMENT, DEAD PLANTS AND EROSION PROBLEMS AS PER SPECIFICATION 32-93-00.
4. UPON DISCOVERY OF INVASIVE SPECIES DURING SCHEDULED INSPECTIONS CONDUCT HERBICIDE AND/OR MANUAL TREATMENTS FOR WEED CONTROL.

SHORT GRASS SEED MIX :

Common Name	*Botanic Name*	Rate (lb/ac)	% of Mix (% by Wt)
Sideoats Grama	*Bouteloua curtipendula*	1.75	14.25
Blue Grama	*Bouteloua gracilis*	2.00	16.29
Kalm's Brome	*Bromus kalmii*	0.25	2.04
Plains Oval Sedge	*Carex brevior*	0.06	0.49
Poverty Oat Grass	*Danthonia spicata*	0.50	4.07
Squirrel-tail Grass	*Hordeum jubatum*	0.50	4.07
June Grass	*Koeleria macrantha*	0.30	2.44
Little Bluestem	*Schizachyrium scoparium*	3.00	24.43
Sand Dropseed	*Sporobolus cryptandrus*	1.00	8.14
Prairie Dropseed	*Sporobolus heterolepis*	0.12	0.98
	Total Grasses & Sedges	**9.48**	**77.20**
Pussytoes	*Antennaria plantaginifolia*	0.01	0.08
Prairie onion	*Allium stellatum*	0.25	2.04
Butterfly weed	*Asclepias tuberosa*	0.30	2.44
Whorled milkweed	*Asclepias verticillata*	0.06	0.49
partridge pea	*Chamaecrista fasciculata*	0.80	6.51
Prairie smoke	*Geum triflorum*	0.01	0.08
White prairie clover	*Petalostemum candidum*	0.50	4.07
Purple prairie clover	*Petalostemum purpureum*	0.80	6.51
Pasque flower	*Pulsatilla nutalliana*	0.01	0.08
Goat's Rue	*Tephrosia virginiana*	0.06	0.49
	Total Forbes	**2.80**	**22.80**
	Total	**12.28**	**100.00**

Cover Crop			
Common Name	***Botanic Name***	Rate (lb/ac)	% of Mix (% by Wt)
Oats	*Avena sativa*	3.00	100.00
	Total	**3.00**	**100.00**

90% DRAFT FOR REVIEW

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Approved	

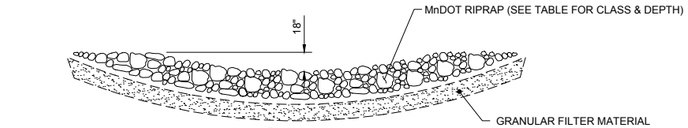
CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND
DREDGING PROJECT

NATIVE BUFFER AND RESTORATION PLAN

BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	C-04
REV. No.	A

CAD/ USER: PATRICK.E. BROCKAMP FILE: M:\DESIGN\23271622.00\23271622200_C-04.DWG PLOT SCALE: 1:2 PLOT DATE: 3/8/2018 12:41 PM



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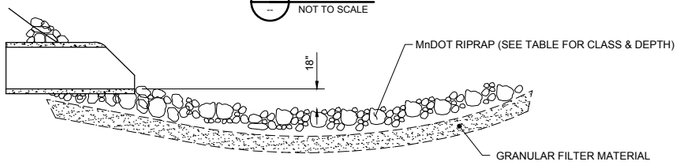

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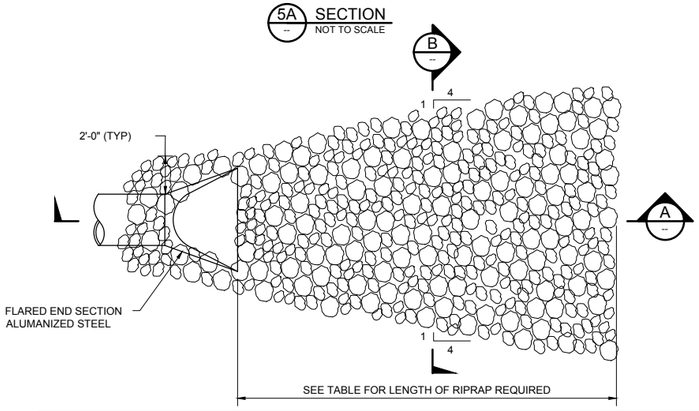

FES SIZE (IN)	RIPRAP LENGTH (FT)	RIPRAP CLASS	RIPRAP DEPTH (IN)	RIPRAP QTY (CY)
12	8	III	18	5
42	18	III	18	19
48x84 (4'x7') RCPB	12	III	18	15
OUTLET STRUCTURE	4	III	18	12

NOTES:
1. GEOTEXTILE FABRIC SHOULD COVER THE AREA OF THE RIPRAP AND EXTEND UNDER THE PIPE END APRON 3 FEET MINIMUM.
2. DIMENSIONS AND QUANTITIES REFERENCE MN/DOT STANDARD PLATES 3133D AND 3134D.

1 DETAIL: RIPRAP OUTFALL
NOT TO SCALE

50% DRAFT
FOR REVIEW

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CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND
DREDGING PROJECT

MISCELLANEOUS DETAILS

BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
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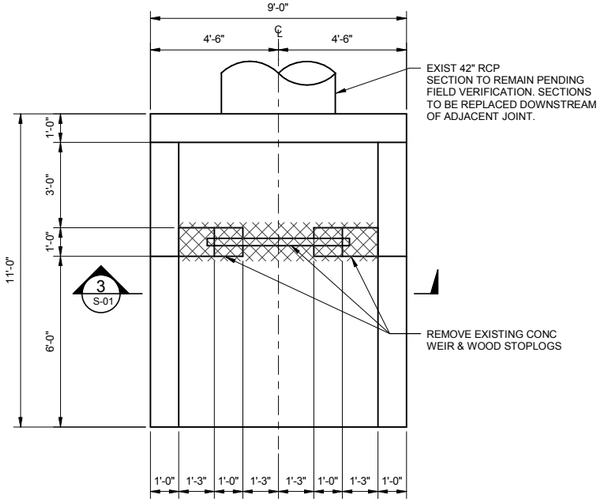
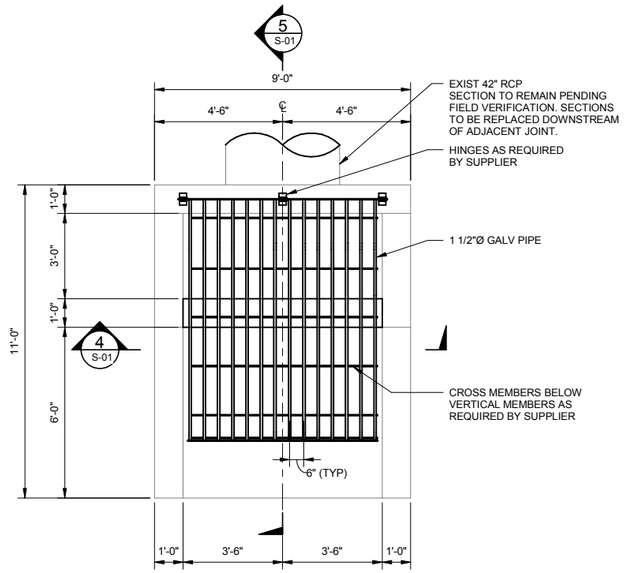
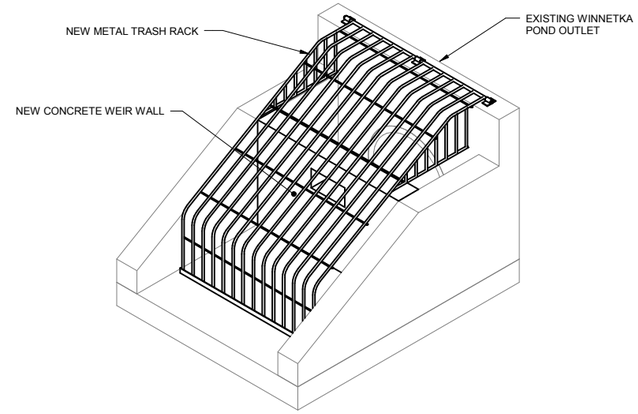
REV. No.	A



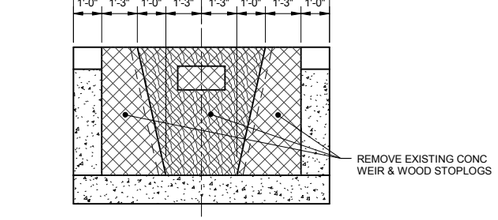
1 PLAN: EXISTING OUTLET - DEMO
3/8" = 1'-0"



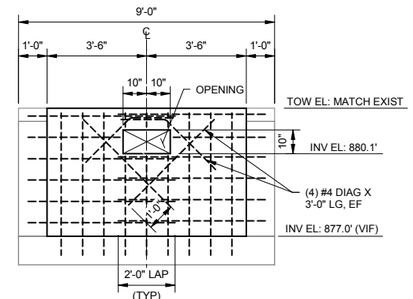
2 PLAN: EXISTING OUTLET - NEW
3/8" = 1'-0"



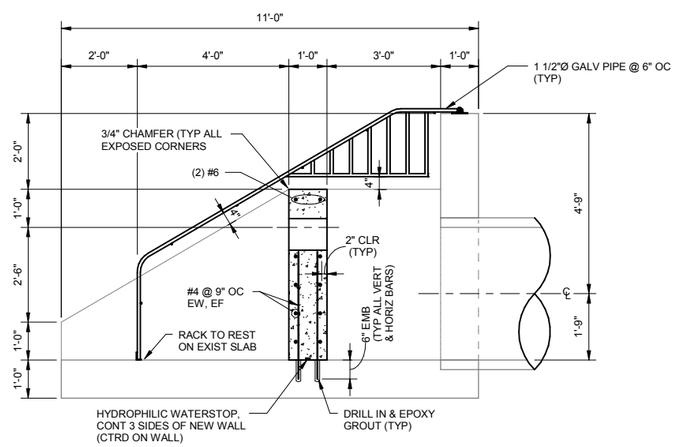
6 ISOMETRIC: WEIR WALL AND TRASH RACK



3 SECTION: WIER WALL - DEMO
S-01 3/8" = 1'-0"



4 SECTION: WIER WALL - NEW
S-01 3/8" = 1'-0"



5 SECTION: WIER WALL & TRASH RACK - NEW
S-01 1/2" = 1'-0"

STRUCTURAL NOTES AND SPECIFICATIONS:

I GENERAL

1. ENGINEER'S ACCEPTANCE MUST BE SECURED FOR ALL STRUCTURAL SUBSTITUTIONS.
2. THE MANUFACTURE OR FABRICATION OF ANY ITEMS PRIOR TO WRITTEN REVIEW OF REQUIRED SUBMITTALS WILL BE ENTIRELY AT THE RISK OF THE CONTRACTOR.

II CAST IN PLACE CONCRETE

1. SUBMIT CONCRETE MIX DESIGN FOR REVIEW COMPLYING WITH THE REQUIREMENTS OF THESE SPECIFICATIONS.
2. MINIMUM COMPRESSIVE STRENGTH: 4500 PSI @ 28 DAYS
3. CONCRETE DURABILITY REQUIREMENTS: ACI 301 4.2.2.7:
   a. SULFATE RESISTANCE: S0
   b. FREEZE THAW RESISTANCE REQUIREMENT: F2
   c. PERMIABILITY REQUIREMENT: P0
   d. REINFORCING CORROSION RESISTANCE REQUIREMENT: C1
   e. MAXIMUM WATER-TO-CEMENT RATIO: 0.45
   f. MINIMUM AIR CONTENT: ACI 301 TABLE 4.2.2.7.b.1 (±1.5%)
4. CEMENTITIOUS MATERIAL: PORTLAND CEMENT PER ACI 301 4.2.1.1 OR POZZOLANIC MINERAL ADMIXTURE PER ACI 301 4.2.1.1.d
5. AGGREGATES: GRADATION PER ACI 301 4.2.2.1 AND MAX SIZE PER ACI 301 4.2.2.3
6. WATER: ACI 301 4.2.1.3
7. ADMIXTURES: CHLORIDE FREE WATER REDUCTING ADMIXTURE AND SUPERLASTICIZER AS IN ACCORDANCE WITH THE APPROVED CONCRETE MIX DESIGN SUBMITTAL
8. CURING MATERIALS: WATER PER ASTM C1602, MEMBRANE CURING PER ASTM C309 OR ASTM C1315, OR WATERPROOF SHEETS PER ASTM C171
9. REINFORCING STEEL: ASTM A615, A706, A996 (TYPE R), OR A970; GRADE 60.
10. HYDROPHILIC WATERSTOP: SIKA SWELLSTOP II (3/8" x 3/4") HYDROPHILIC WATER STOP COMPRISED OF MENTONITE CLAY, HYDROPHLILIC POLYMERS, AND BUTYL RUBBER (OR APPROVED EQUAL)
11. EPOXY ADHESIVE FOR REBAR ANCHORAGE: HILTI-RE 500 (OR APPROVED EQUAL)

III TRASH RACK

1. DESIGNED AND MANUFACTURED BY HAALA INDUSTRIES TO THE DIMENSION REQUIREMENTS SHOWN IN THE DRAWINGS OR APPROVED EQUAL.
2. SUBMIT FABRICATION DRAWINGS FOR REVIEW DETAILED IN ACCORDANCE WITH THE THIRTEENTH EDITION OF THE AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION) "STEEL CONSTRUCTION MANUAL". ALL STEEL CONSTRUCTION SHALL COMPLY WITH THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS DATED MARCH 9, 2005 [AISC 360-05] (WITH AMENDMENTS).
3. HINGE: GALV STEEL, DESIGN AND ANCHORAGE BY TRASHRACK MANUFACTURER
4. STEEL PIPES: ASTM A53, GRADE B GALV
5. STRUCTURAL WELDING: AWS D1.1 STRUCTURAL WELDING CODE. ALL WELDERS SHALL HAVE EVIDENCE OF PASSING THE AMERICAN WELDING SOCIETY STANDARD QUALIFICATIONS TESTS AS DETAILED IN AWS D1.1.

50% DRAFT
FOR REVIEW

NO.	BY	CHK	DATE	REVISION DESCRIPTION
A	SWO	BJS	03/08/18	ISSUED FOR REVIEW

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 BRIAN SILJENBERG
DATE REG NO. 50033

CLIENT | 3/8/18 | RELEASED TO/FOR | A | DATE RELEASED

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

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
SUITE 200
MINNEAPOLIS, MN 55435
Ph: 1-800-225-1966
Fax: (218) 262-3460
www.barr.com

Scale	AS SHOWN
Date	02/28/2018
Drawn	SWO
Checked	BJS
Designed	JNB
Approved	BJS

CITY OF CRYSTAL
CRYSTAL, MINNESOTA

WINNETKA POND OUTLET STRUCTURE
DREDGING PROJECT

OUTLET STRUCTURE & TRASH RACK
PLANS, SECTIONS AND DETAILS

BARR PROJECT NO.	23/27 - 1622.00
CLIENT PROJECT NO.	2018-04
DWG NO.	S-01
REV NO.	A

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