

June 13, 2018

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

**Re: 90% Design Plans – Winnetka Pond Dredging Project  
City of Crystal Project 2018-04**

Dear Mr. Ray:

Attached please find the 90% 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 agreement, the 90% design plans for this project must be submitted to the BCWMC for review and approval. If the attached 90% 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 June 21<sup>st</sup> meeting. Barr staff will present the 90% 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.

Earlier in 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 20<sup>th</sup> 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 – 90% plans**

The primary design features of the proposed work, as shown on the attached 90% 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. (No change in pond dredging amounts from 50% design). Minnesota Department of Natural Resources (MDNR) staff have indicated that increasing the depth to 6 feet is justifiable, although formal approval is needed (see "Approvals/permit requirements" section).

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. (No change from 50% design.)
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. (No change from 50% design.)
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. (No change from 50% design.)
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). (No change in buffer area since 50% design.) Because a portion of the buffer is on private property and outside of any existing easements, the city is in the process of acquiring 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. Once acquired, the easement will allow the City to plant and maintain the buffer, and perform any future pond or storm sewer maintenance. The city anticipates completing the easement acquisition by August 2018.
6. Goose management. At the March 20<sup>th</sup> 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. (No change from 50% design.)

**Opinion of cost**

The table below summarizes our opinion of costs, based on the 90% design plans:

**Table 1 Opinion of Cost Summary**

<b>Item Description</b>	<b>Cost</b>
<b>Project costs eligible for BCWMC reimbursement:</b>	
Pond dredging and general work	\$ 536,000
Other pond improvements	\$ 47,000
Native buffer	\$ 17,000
Existing drainage corrections	\$ 23,000
Goose management	\$ 0 <sup>1</sup>
<b>Total estimated construction costs</b>	<b>\$ 623,000</b>
Contingency (+15%)	<b>\$ 93,000</b>
Engineering costs	\$ 82,500
<b>Total construction and engineering costs</b>	<b>\$ 798,500</b>
<b>Other project costs that the city requests the BCWMC consider for reimbursement:</b>	
Easement acquisition costs (engineering and legal services only)	\$ 3,000 <sup>2</sup>

<sup>1</sup> Work already performed by city staff

<sup>2</sup> Costs include easement development and recording, but not purchasing of easement.

The total estimated construction and engineering costs (\$798,500) shown above are less than the 50% design estimated costs (\$830,000). However, the pond dredging costs are 75% of the total estimated construction cost. A small increase in the unit price (cost per cubic yard of pond dredging) will have a significant impact on total project cost. If the low bidder construction cost results in the total project cost being over budget the pond depth could be reduced to lower the total project cost accordingly.

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 May 9, 2018) in the CIP budget for this project is \$938,930.75. The total estimated construction and engineering costs (\$798,500), plus easement acquisition costs (engineering and legal services only) 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.

Permit applications have been submitted for the following:

- 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 involves additional permitting considerations because it requires excavating into native material in a MDNR public water wetland, which is also under jurisdiction of the USACE. Barr contacted the MDNR area hydrologist after we submitted the permit application and he indicated that the sediment removal and trapping that would be achieved by the 6-foot excavation are sufficient justification for the project. We anticipate MDNR permit approval around mid-August 2018.

- Wetland Conservation Act (WCA) permit. There is a narrow fringe of 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 (approximately 350 square feet). This will 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 (approximately 130 square feet) due to the fill required to allow for routine maintenance access within this portion of WCA wetland; the area of permanent wetland fill is within the allowable de minimis exemption amount ( $\leq 400$  square feet). We submitted a joint application form requesting approval of both the WCA no-loss and de minimis exemption.
- USACE joint permit application (Section 404 permit and Section 401 Certification), although the permit is not required. Submitting this application formally documents that the project will follow the rules for work in a USACE jurisdictional wetland. This is the same application as required for the WCA permit. The USACE may consider the pond a "previously-authorized structure," which will 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.

A Minnesota Pollution Control Agency (MPCA) Construction Stormwater General Permit is required for construction activity if land disturbance outside of the pond dredging is greater than 1 acre. However, the permit does not consider disturbance of less than 5 acres for the purpose of routine maintenance as construction activity. Managing or improving the existing vegetation around the pond falls under routine maintenance. The remaining construction activity that does not fall under routine maintenance is less than 1 acre, therefore a permit (along with a SWPPP) is not required. Although a SWPPP is not required, the plans include erosion and sediment control measures as needed.

### **Recommendations**

We recommend that the city request 1) BCWMC approval of the 90% drawings, 2) BCWMC authorization for the city to proceed with final 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](mailto:kchandler@barr.com).

Sincerely,



Karen L. Chandler, P.E.  
Vice President

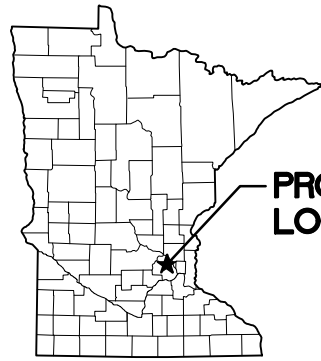
**CITY OF CRYSTAL**  
**WINNETKA POND DREDGING PROJECT**  
ENGINEERS OPINION OF COST  
DATED JUNE 13, 2018

M&P Item	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	EXTENSION
<b>POND DREDGING AND GENERAL WORK</b>					
1.06.A	MOBILIZATION/DEMOBILIZATION	LS	1	\$ 31,000.00	\$ 31,000.00
1.06.B	CONTROL OF WATER/DEWATERING	LS	1	\$ 20,000.00	\$ 20,000.00
1.06.C	EROSION CONTROL CONSTRUCTION ENTRANCE	EACH	1	\$ 2,500.00	\$ 2,500.00
1.06.D	ROCK FILTER DIKE	LS	1	\$ 2,000.00	\$ 2,000.00
1.06.E	INLET PROTECTION	EACH	6	\$ 200.00	\$ 1,200.00
1.06.F	SILT FENCE	LF	850	\$ 2.50	\$ 2,125.00
1.06.G	REMOVE STORM SEWER PIPE 42" RCP	LF	28	\$ 35.00	\$ 980.00
1.06.H	REMOVE EXISTING WEIR AND TRASH RACK	LS	1	\$ 1,000.00	\$ 1,000.00
1.06.I	REMOVE TREE	EACH	1	\$ 500.00	\$ 500.00
1.06.J	REMOVE FALLEN TREES AND DEBRIS	LS	1	\$ 5,000.00	\$ 5,000.00
1.06.K	COMMON EXCAVATION	CY	600	\$ 12.00	\$ 7,200.00
1.06.L	POND DREDGING OF MPCA DREDGED MATERIAL LEVEL 1 REMOVAL AND DISPOSAL	CY	18,500	\$ 25.00	\$ 462,500.00
<b>SUBTOTAL</b>					<b>\$ 536,005.00</b>
<b>OTHER POND IMPROVEMENTS</b>					
1.06.M	STORM SEWER PIPE 42" RCP CLASS 3	LF	28	\$ 220.00	\$ 6,160.00
1.06.O	CONNECT TO EXISTING MANHOLE	EACH	2	\$ 300.00	\$ 600.00
1.06.P	RIPRAP AT PIPES AND STRUCTURES	TON	76	\$ 65.00	\$ 4,940.00
1.06.Q	CONCRETE WEIR	LS	1	\$ 3,000.00	\$ 3,000.00
1.06.S	OUTLET STRUCTURE TRASH RACK	LS	1	\$ 9,000.00	\$ 9,000.00
1.06.T	TOPSOIL SALVAGE AND REINSTALL	CY	170	\$ 12.00	\$ 2,040.00
1.06.U	TOPSOIL IMPORT	CY	100	\$ 30.00	\$ 3,000.00
1.06.V	MAINTENANCE ACCESS TURF REINFORCEMENT (NETLON)	LS	1	\$ 10,000.00	\$ 10,000.00
1.06.W	MAINTENANCE ACCESS SOIL	CY	100	\$ 60.00	\$ 6,000.00
1.06.Y	SEEDING LOW MAINTENANCE TURF	ACRE	0.4	\$ 1,500.00	\$ 600.00
1.06.BB	HYDROMULCH	LS	1	\$ 2,000.00	\$ 2,000.00
<b>SUBTOTAL</b>					<b>\$ 47,340.00</b>
<b>NATIVE BUFFER</b>					
1.06.X	POND BUFFER VEGETATION REMOVAL	ACRE	0.5	\$ 4,500.00	\$ 2,250.00
1.06.Y	SEEDING SHORT GRASS PAIRIE	ACRE	1.1	\$ 8,800.00	\$ 9,680.00
1.06.AA	DISC-AHCHORED STRAW MULCH	ACRE	1.1	\$ 2,000.00	\$ 2,200.00
1.06.CC	ONE YEAR SEEDING WARRANTY AND ESTABLISHMENT	LS	1	\$ 3,000.00	\$ 3,000.00
<b>SUBTOTAL</b>					<b>\$ 17,130.00</b>
<b>EXISTING DRAINAGE CORRECTIONS</b>					
1.06.G	REMOVE STORM SEWER 12" CMP FLARED END	LS	1	\$ 200.00	\$ 200.00
1.06.I	REMOVE TREE	EACH	1	\$ 500.00	\$ 500.00
1.06.M	STORM SEWER 12" ALUMINIZED CMP FLARED END	LS	1	\$ 300.00	\$ 300.00
1.06.M	STORM SEWER PIPE 12" PVC SDR-35	LF	153	\$ 30.00	\$ 4,590.00
1.06.N	STORM SEWER CATCH BASIN 24" PVC NYLOPLAST	EACH	3	\$ 2,000.00	\$ 6,000.00
1.06.N	STORM SEWER DROP STRUCTURE 24" PVC	EACH	2	\$ 2,500.00	\$ 5,000.00
1.06.O	CONNECT TO EXISTING BOX CULVERT	EACH	2	\$ 800.00	\$ 1,600.00
1.06.P	RIPRAP AT PIPES AND STRUCTURES	TON	8	\$ 65.00	\$ 520.00
1.06.R	CONCRETE AROUND CATCH BASIN	EACH	3	\$ 1,000.00	\$ 3,000.00
1.06.Z	REPAIR EROSION	LS	1	\$ 1,000.00	\$ 1,000.00
<b>SUBTOTAL</b>					<b>\$ 22,710.00</b>
<b>CONSTRUCTION TOTAL</b>					<b>\$ 623,185.00</b>
CONTINGENCY (+15%)					<b>\$ 93,000.00</b>
<b>ENGINEERING TOTAL</b>					<b>\$ 82,500.00</b>
<b>PROJECT TOTAL</b>					<b>\$ 798,685.00</b>

# WINNETKA POND DREDGING PROJECT

## CITY OF CRYSTAL

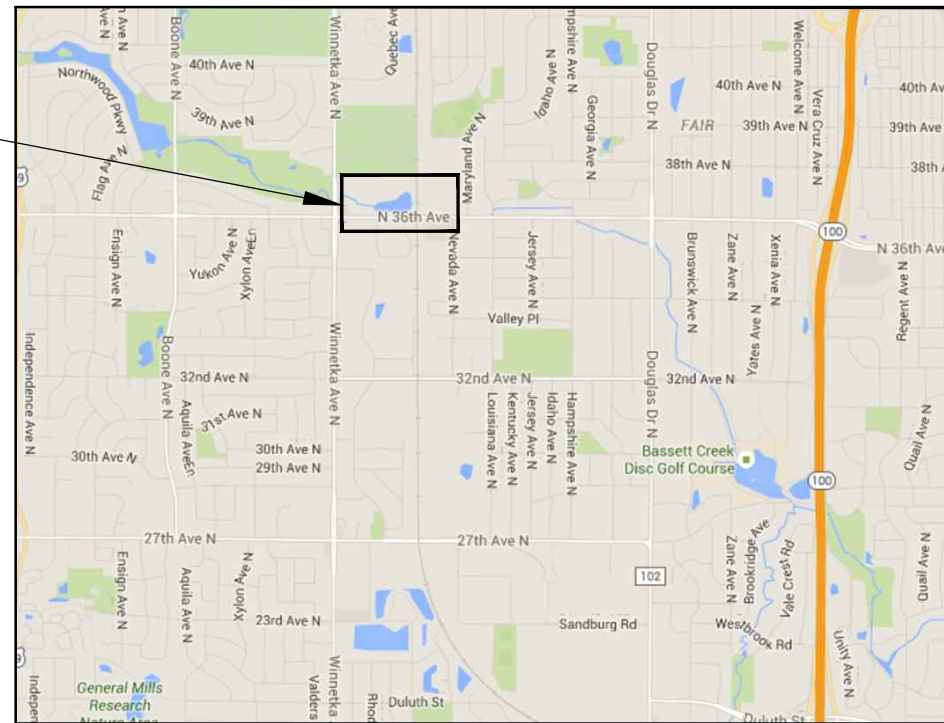
### CRYSTAL, MN



PROJECT LOCATION

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:  
CALL BEFORE YOU DIG.  
1-800-252-1166

CADD USER: PATRICK E. BROCKAMP FILE: M:\DESIGN\23271622\_00\23271622\_001.DWG PLOT SCALE: 1:2 PLOT DATE: 6/13/2018 3:00 PM

		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.		CLIENT BID CONSTRUCTION		03/08/18 06/13/18		Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com		Scale Date Drawn Checked Designed Approved		AS SHOWN 06/13/2018 CMH3 PEB BARR PEB		CITY OF CRYSTAL CRYSTAL, MINNESOTA		WINNETKA POND DREDGING PROJECT		BARR PROJECT No. 23/27-1622.00				
B		CMH3	PEB	PEB	06/13/2018	90% DRAFT FOR REVIEW		PRINTED NAME PATRICK BROCKAMP		RELEASED TO/FOR		A B C 0 1 2 3		DATE RELEASED		CLIENT PROJECT No. 2018-04		DWG. No. G-01		REV. No. B		
A		CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW		SIGNATURE								TITLE SHEET AND SITE LOCATION MAP						
NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION		DATE	LICENSE #														

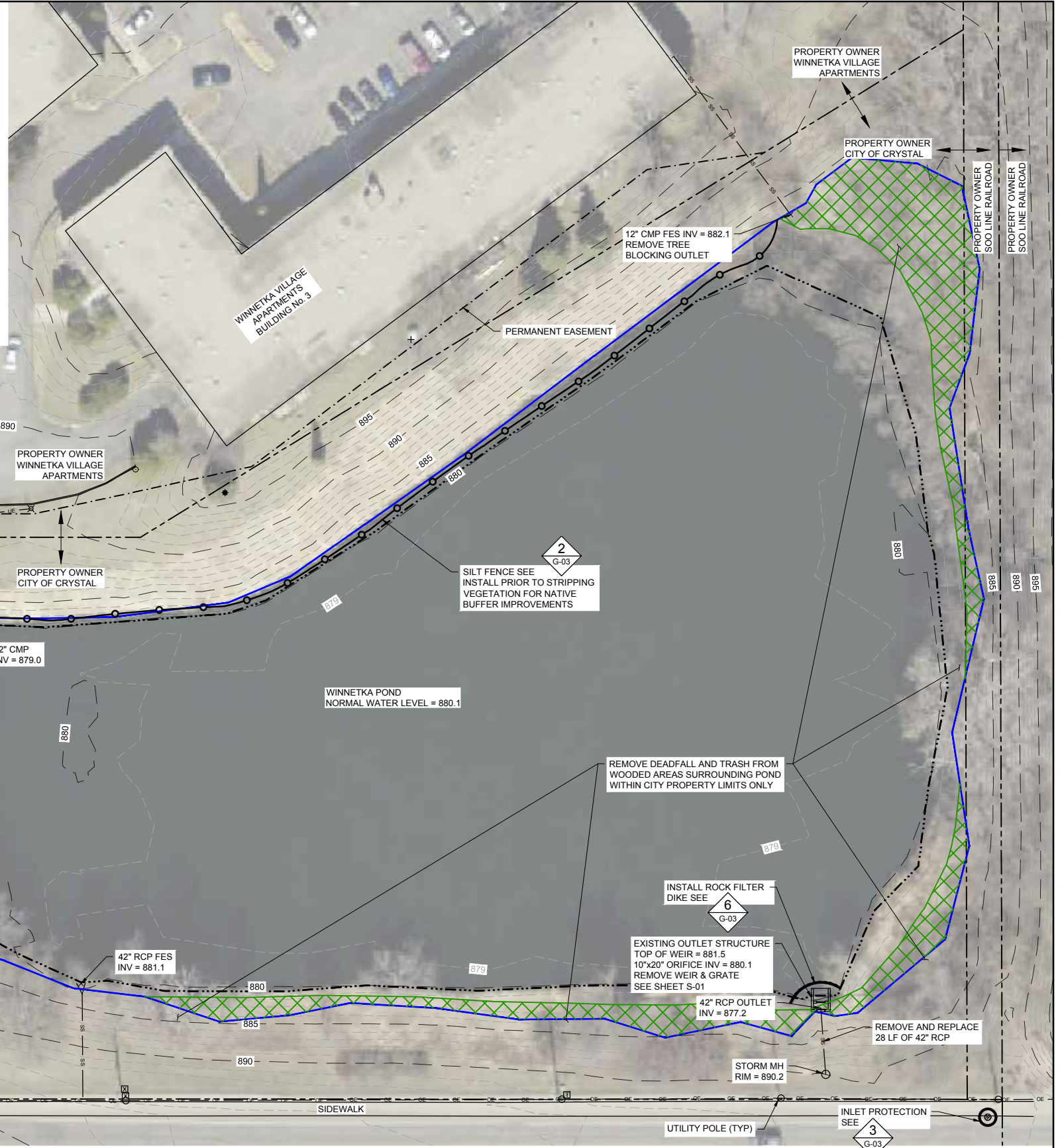
90% DRAFT  
FOR REVIEW

**LEGEND**

- - - - -879- - - - - EXISTING MINOR CONTOUR
- - - - -880- - - - - EXISTING MAJOR CONTOUR
- - - - -879- - - - - PROPOSED MINOR CONTOUR
- - - - -880- - - - - PROPOSED MAJOR CONTOUR
- DECIDUOUS TREE
- \* CONIFEROUS TREE
- - - - - PROPERTY LINE
- - - - - PERMANENT EASEMENT
- - - - - POND NORMAL WATER LEVEL
- SS SS EXISTING STORM SEWER
- SAN SAN EXISTING SANITARY SEWER
- CW CW EXISTING WATER MAIN
- UE UE EXISTING BURIED ELECTRIC
- CATV CATV EXISTING BURIED CABLE TV
- OE OE EXISTING OVERHEAD ELECTRIC
- SILT FENCE
- INLET PROTECTION
- ▨ WCA WETLAND
- ▨ FIELD DELINEATED WETLAND BOUNDARY

**GENERAL NOTES:**

1. PRIOR TO COMMENCING WORK AT THE SITE, CONTACT GOPHER ONE-CALL (1-800-252-1166) AND HAVE ALL EXISTING UTILITIES, PUBLIC AND PRIVATE, FIELD LOCATED AND MARKED. EXISTING UTILITIES SHALL BE PROTECTED UNLESS OTHERWISE INDICATED. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED AT EXPENSE OF CONTRACTOR.
2. NOTIFY ENGINEER IMMEDIATELY IF SITE CONDITIONS OR UTILITIES DIFFER SIGNIFICANTLY FROM THAT SHOWN.
3. ALL EXISTING UTILITIES MUST REMAIN OPERATIONAL FOR THE DURATION OF CONSTRUCTION.
4. SURVEYED TREES WITH SYMBOLS DO NOT REPRESENT ALL TREES WITHIN OR AROUND THE WORK LIMITS. PROTECT ALL TREES UNLESS NOTED FOR REMOVAL.
5. MINIMIZE DISTURBANCE OF TREES/SHRUBS/ VEGETATION NOT MARKED FOR REMOVAL, INCLUDING MINIMIZING DISTURBANCE OF SOILS WITHIN THE TREE DRIFLINE.
6. ALL STOCKPILES SHALL BE LOCATED WITHIN CONSTRUCTION LIMITS OR DESIGNATED STAGING AREAS. DO NOT STOCKPILE MATERIALS OR DRIVE VEHICLES/EQUIPMENT WITHIN TREE DRIFLINE(S) UNLESS APPROVED BY ENGINEER.
7. PROTECT ALL STRUCTURES, UTILITIES AND TREES WHICH ARE NOT BEING REMOVED. COORDINATE ALL DEMOLITION WORK WITH OWNER/ENGINEER.
8. ALL CONTROL OF WATER AND EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE SEQUENCED, INSTALLED, MAINTAINED AND MONITORED BY CONTRACTOR.
9. SWEEP BITUMINOUS PAVEMENT DAILY, OR AS REQUIRED TO KEEP FROM TRACKING MATERIALS OFFSITE.
10. CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ANY DAMAGE RESULTING FROM THE CONTRACTOR'S WORK.
11. REPAIR OR REMOVE ITEMS THAT ARE DAMAGED BY CONTRACTOR. REPAIR AND INSTALLATION OF DAMAGED ITEMS WILL BE PERFORMED TO CONDITION AT LEAST EQUAL TO THAT WHICH EXISTED PRIOR TO START OF WORK AT NO ADDITIONAL COST TO OWNER.
12. NO CONCRETE OR RUBBLE SHALL BE BACKFILLED ONSITE. RECYCLE DEMOLISHED DEBRIS PER THE SPECIFICATIONS OR DISPOSE OF AT AN OFFSITE LOCATION WITHIN ALL LOCAL, STATE AND FEDERAL GUIDELINES, LAWS AND REGULATIONS.
13. ESTABLISH AND MAINTAIN TRAFFIC AND PEDESTRIAN SAFETY CONTROL MEASURES PRIOR TO START OF CONSTRUCTION. TRAFFIC AND PEDESTRIAN SAFETY CONTROL MEASURES SHALL BE COORDINATED WITH OWNER.
14. CONTRACTOR IS RESPONSIBLE FOR KEEPING THE SITE PERIMETER SAFE FOR PEDESTRIANS, CHILDREN, PETS AND OTHER PASSERS-BY FOR ALL DAYS AND NIGHTS DURING THE DURATION OF THE WORK, FOR BOTH WORKING AND NON-WORKING HOURS.
15. PROVIDE A CONTINUOUS, ACCESSIBLE, AND SAFE PEDESTRIAN WALKWAY THAT MEETS ADA AND MN MUTCD STANDARDS IF WORKING IN A SIDEWALK AREA, AND TRAFFIC CONTROL PER MN MUTCD REQUIREMENTS FOR THE WORK IN THE PUBLIC RIGHT OF WAY AREA.
16. APARTMENT ENTRANCE MUST REMAIN OPEN FOR THE DURATION OF CONSTRUCTION.
17. COORDINATE ALL WORK AND SITE ACCESS WITH ROADWAY WEIGHT RESTRICTION REGULATIONS. CONTRACTOR IS RESPONSIBLE FOR OBTAINING TEMPORARY ACCESS PERMITS, IF REQUIRED.



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



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NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION
B	CMH3	PEB	PEB	06/13/2018	90% DRAFT FOR REVIEW
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 #: \_\_\_\_\_

CLIENT	BID	CONSTRUCTION	RELEASED TO/OF	DATE RELEASED
03/08/18	06/13/18		A B C 0 1 2 3	

**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

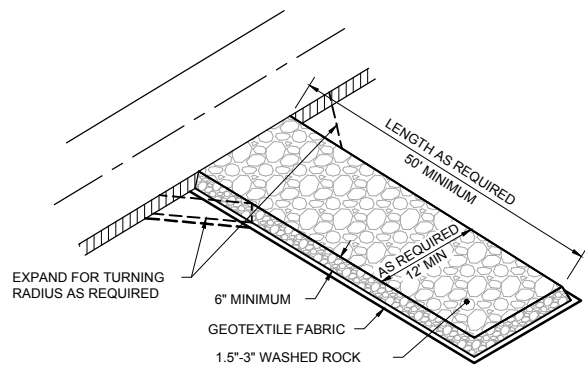
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Date	06/13/2018
Drawn	CMH3
Checked	PEB
Designed	BARR
Approved	PEB

**CITY OF CRYSTAL**  
CRYSTAL, MINNESOTA

**WINNETKA POND DREDGING PROJECT**  
EXISTING CONDITIONS, REMOVALS, & EROSION CONTROL PLAN

90% DRAFT FOR REVIEW

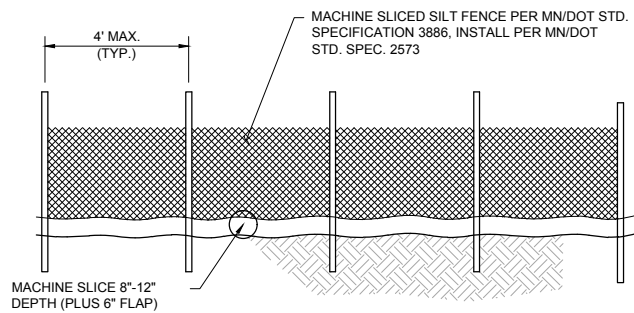
BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	G-02
REV. No.	B



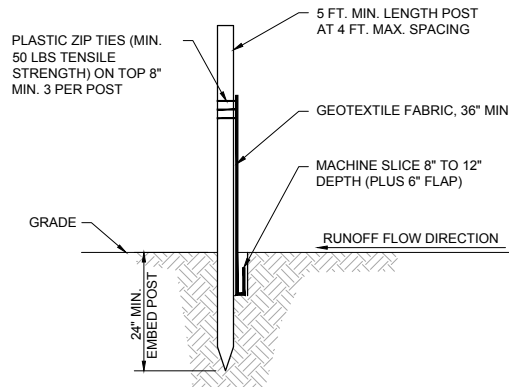
**NOTES:**

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.

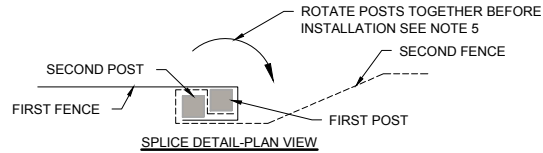
**1** DETAIL: CONSTRUCTION ENTRANCE - ROCK  
NOT TO SCALE



**DOWNSTREAM VIEW**



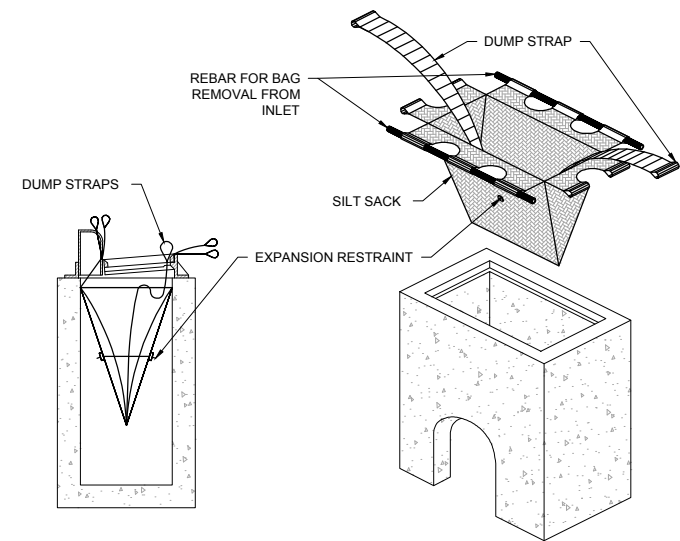
**SECTION VIEW**



**SPLICE DETAIL-PLAN VIEW**

**NOTES:**

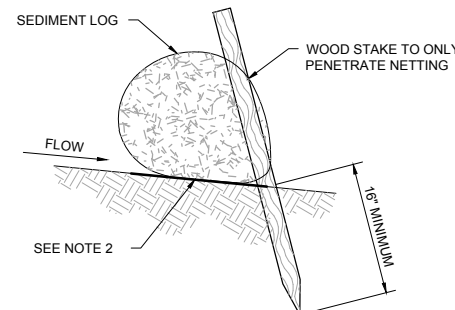
1. INSTALL SILT FENCE PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED AND MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD.
2. SILT FENCE MATERIALS AND INSTALLATION SHALL MEET THE REQUIREMENTS OF MN/DOT SPECIFICATIONS 2573 AND 3886.
3. NO HOLES OR GAPS SHALL BE PRESENT IN/UNDER SILT FENCE. PREPARE AREA 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.



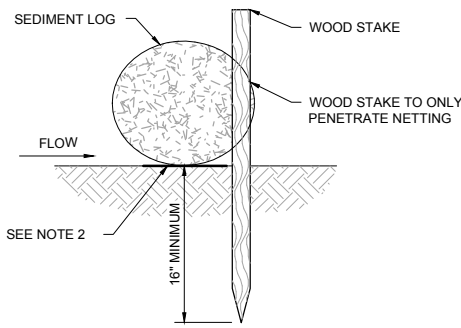
**NOTES:**

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.

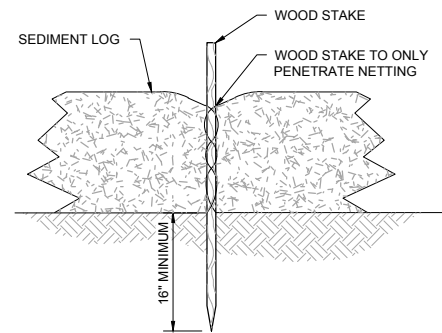
**3** DETAIL: INLET PROTECTION - FILTER SACK  
NOT TO SCALE



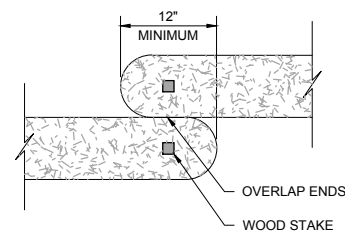
**SIDE VIEW ON SLOPE**



**SIDE VIEW FLAT**



**FRONT VIEW**



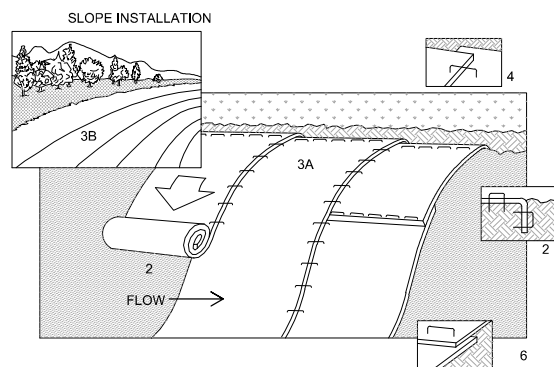
**TOP VIEW**

**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

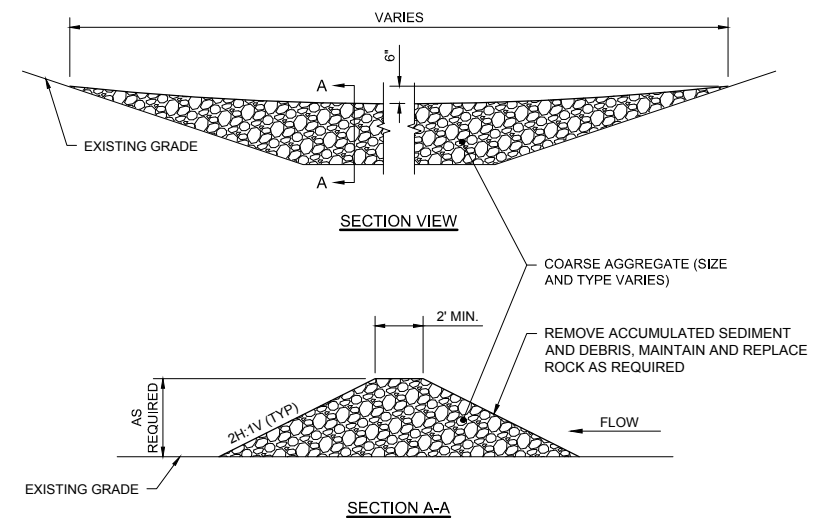
**2** DETAIL: SILT FENCE - MACHINE SLICED  
NOT TO SCALE



**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

CADD USER: PATRICK E. BROCKAMP FILE: M:\DESIGN\2371622\00\237162200\_G-03.DWG PLOT SCALE: 1:2 PLOT DATE: 6/13/2018 3:07 PM

NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION
B	CMH3	PEB	PEB	06/13/2018	90% DRAFT FOR REVIEW
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 #: \_\_\_\_\_

CLIENT	03/08/18	06/13/18							
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  
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Scale	AS SHOWN
Date	06/13/2018
Drawn	CMH3
Checked	PEB
Designed	BARR
Approved	

CITY OF CRYSTAL  
CRYSTAL, MINNESOTA

WINNETKA POND  
DREDGING PROJECT  
EROSION CONTROL  
DETAILS

90% DRAFT  
FOR REVIEW

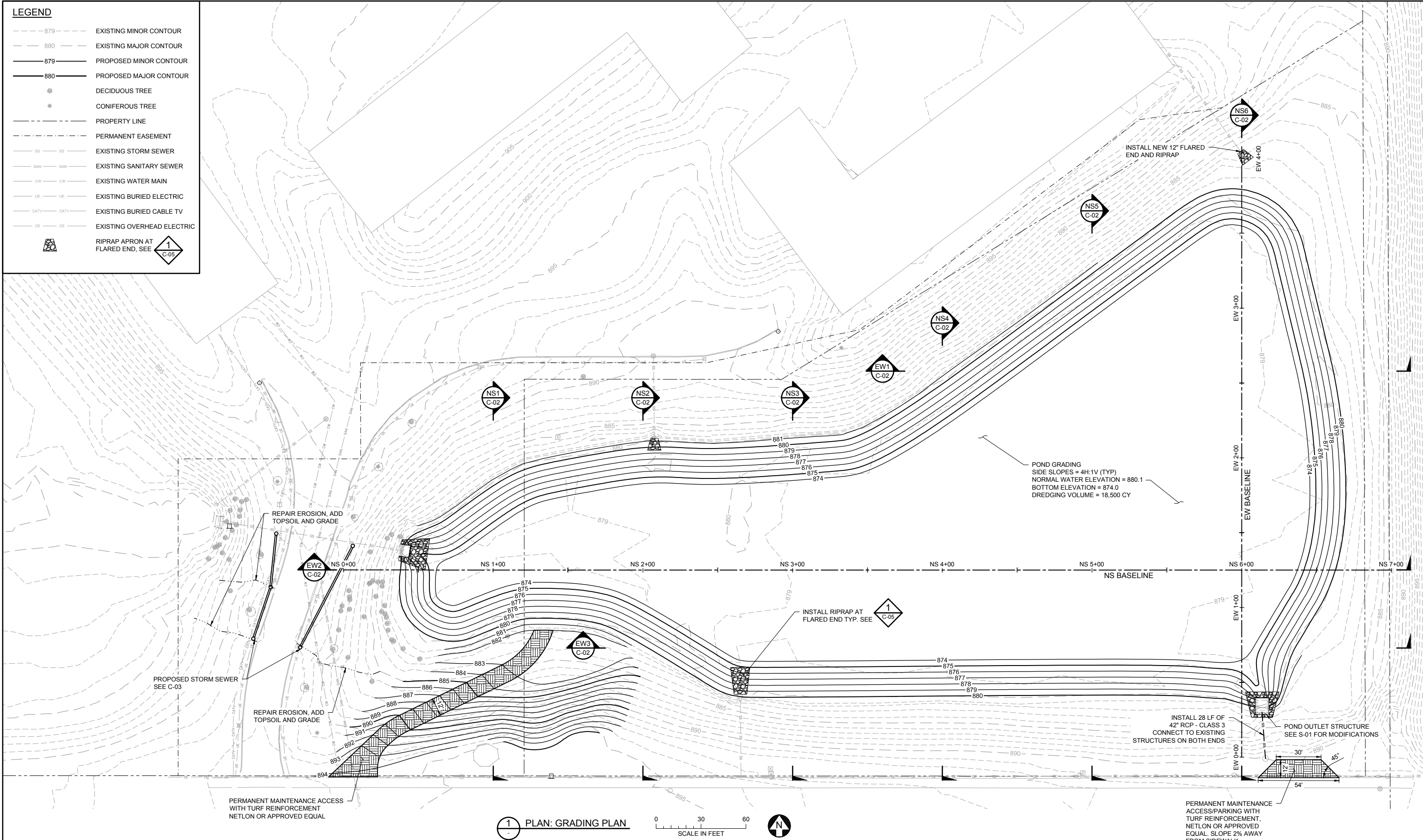
BARR PROJECT No.	23/27-1622.00
CLIENT PROJECT No.	2018-04
DWG. No.	G-03
REV. No.	B



**LEGEND**

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- DECIDUOUS TREE
- CONIFEROUS TREE
- PROPERTY LINE
- PERMANENT EASEMENT
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATER MAIN
- EXISTING BURIED ELECTRIC
- EXISTING BURIED CABLE TV
- EXISTING OVERHEAD ELECTRIC
- RIPRAP APRON AT FLARED END, SEE

CADD USER: PATRICK E. BROCKAMP FILE: M:\DESIGN\23271622\_00\2327162200\_C-01.DWG PLOT SCALE: 1:2 PLOT DATE: 6/13/2018 3:10 PM



**PLAN: GRADING PLAN**  
 0 30 60  
 SCALE IN FEET

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	CMH3	PEB	PEB	06/13/2018	90% DRAFT FOR REVIEW
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 PRINTED NAME: **PATRICK BROCKAMP**  
 SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_ LICENSE # \_\_\_\_\_

CLIENT	3/3/2018	6/13/18			
BID					
CONSTRUCTION					
RELEASED TO/FOR	A	B	C	0	1 2 3
DATE RELEASED					

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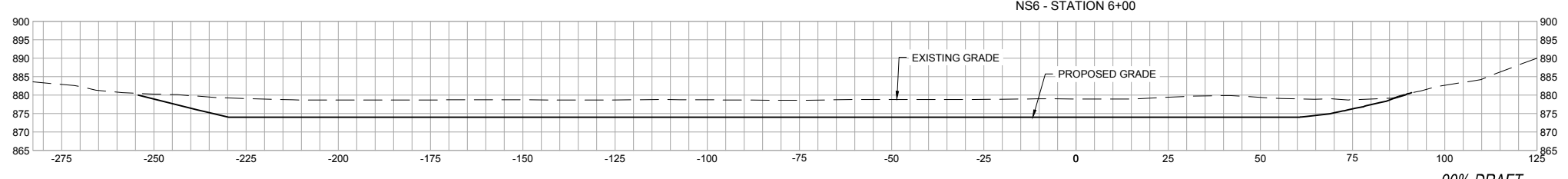
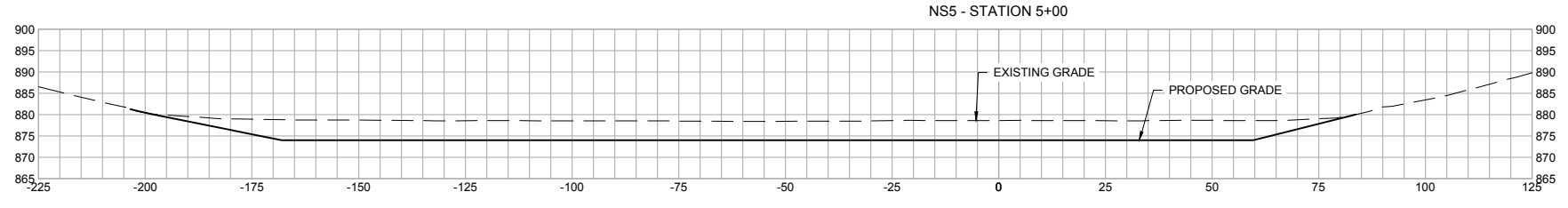
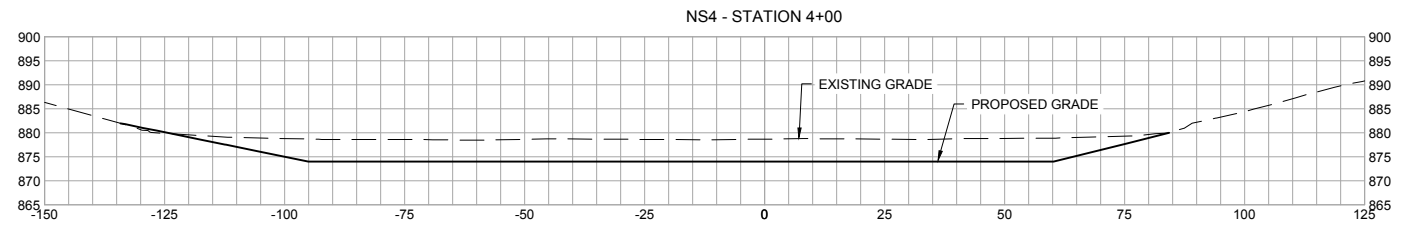
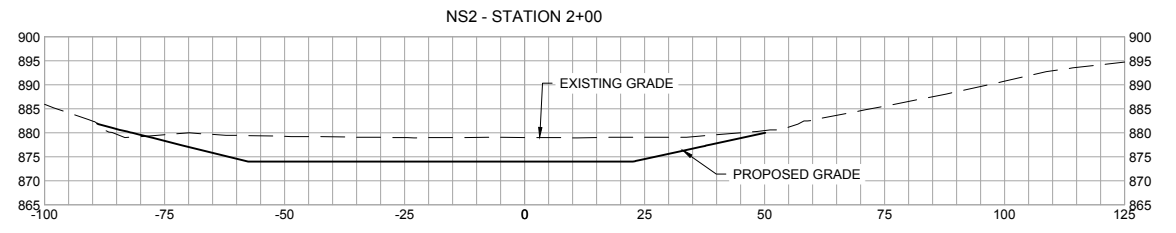
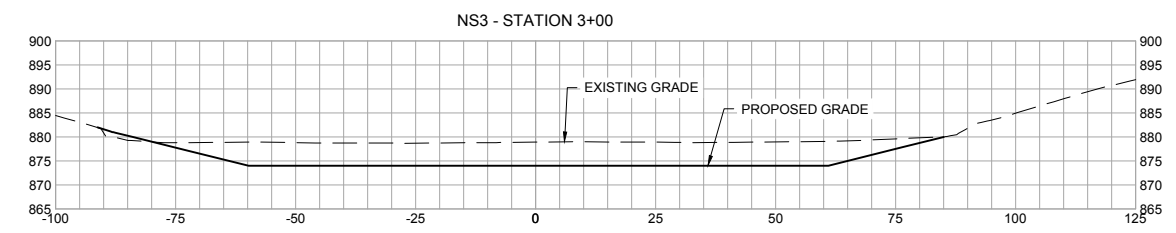
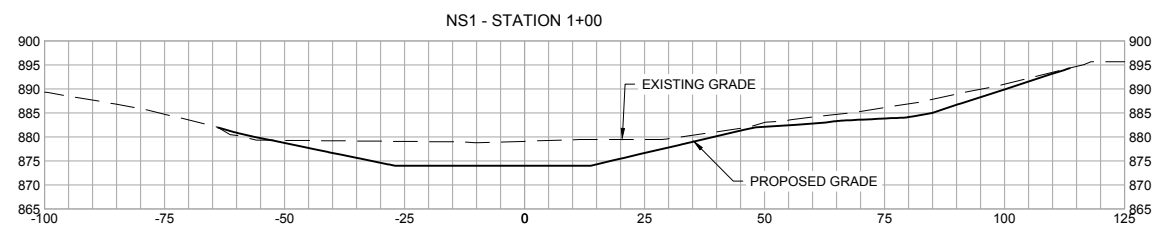
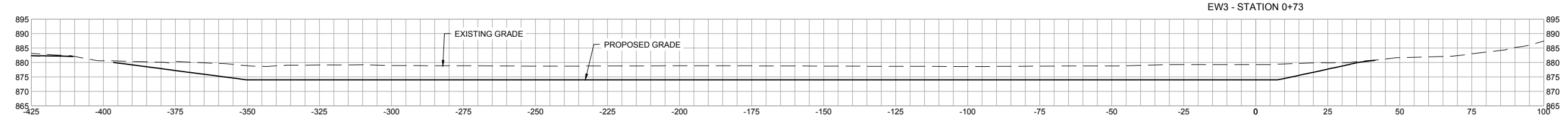
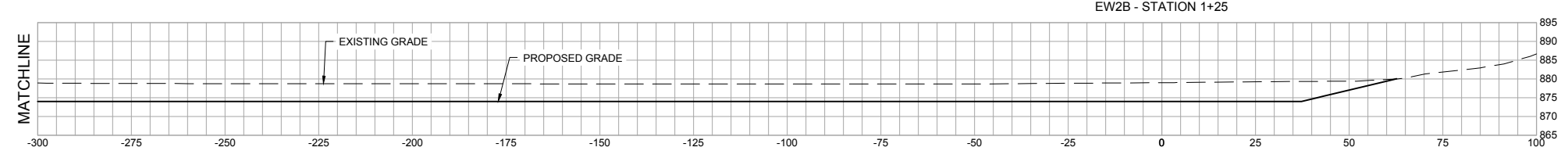
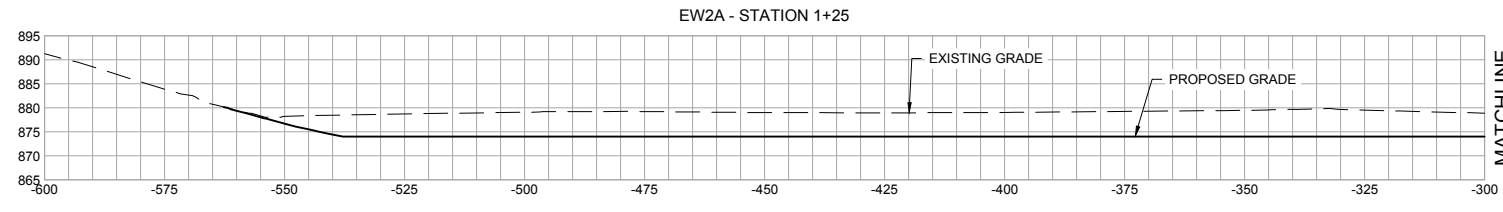
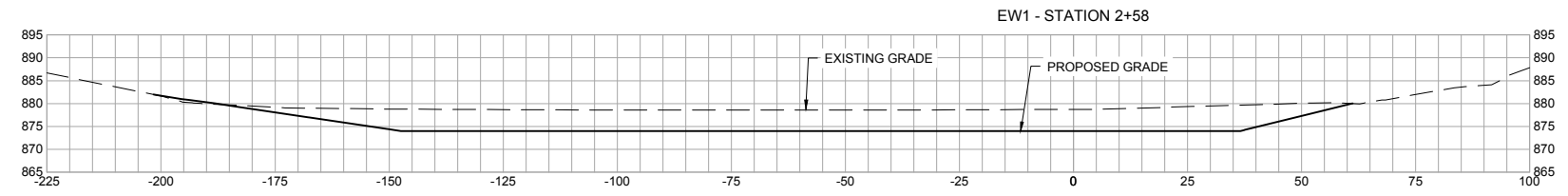
Scale	AS SHOWN
Date	06/13/2018
Drawn	CMH3
Checked	PEB
Designed	BARR
Approved	PEB

CITY OF CRYSTAL  
 CRYSTAL, MINNESOTA

**WINNETKA POND  
 DREDGING PROJECT**  
 GRADING PLAN

90% DRAFT FOR REVIEW

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



CADD USER: PATRICK E. BROCKAMP FILE: M:\DESIGN\2371622\00\237162200\_C-02.DWG PLOT SCALE: 1/2 PLOT DATE: 6/13/2018 3:11 PM

90% DRAFT  
FOR REVIEW

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
B	CMH3	PEB	PEB	06/13/2018	90% DRAFT FOR REVIEW
A	CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW

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PRINTED NAME: PATRICK BROCKAMP  
SIGNATURE: \_\_\_\_\_  
DATE: \_\_\_\_\_ LICENSE #: \_\_\_\_\_

CLIENT	BID	CONSTRUCTION	RELEASED TO/FOR	DATE RELEASED
03/08/18	06/13/18		A B C 0 1 2 3	

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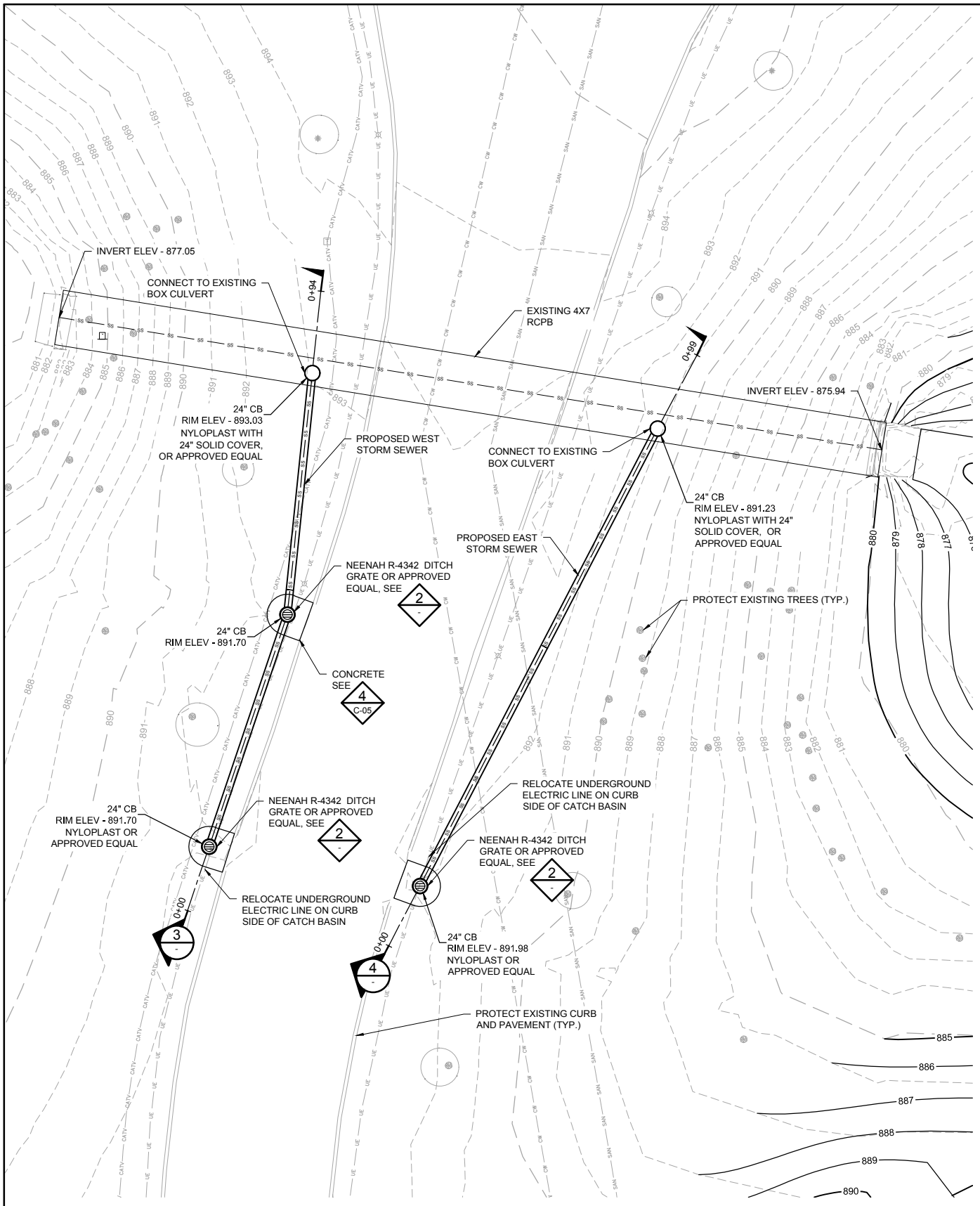
Project Office:  
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Scale	AS SHOWN
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Drawn	CMH3
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Designed	BARR
Approved	PEB

CITY OF CRYSTAL  
CRYSTAL, MINNESOTA

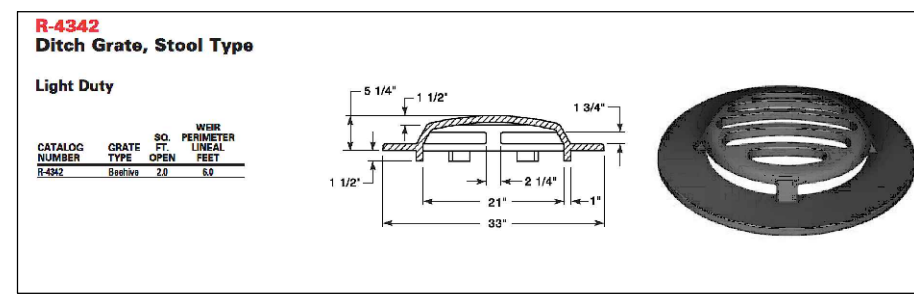
WINNETKA POND  
DREDGING PROJECT  
GRADING SECTIONS

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

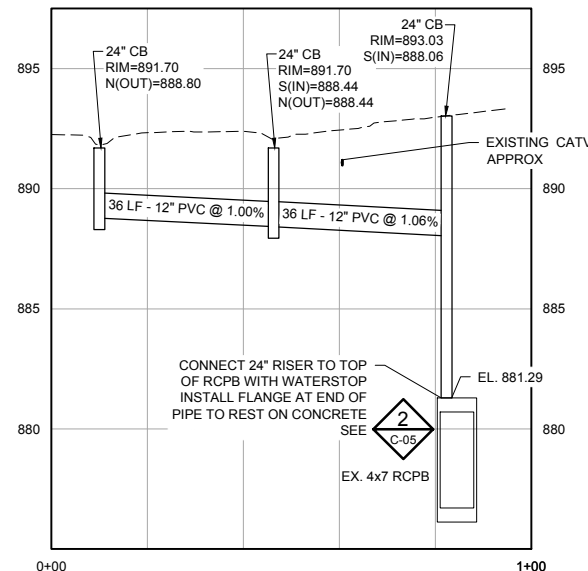


**1 PLAN: PROPOSED STORM SEWER**  
 SCALE IN FEET: 0, 10, 20  
 NORTH ARROW

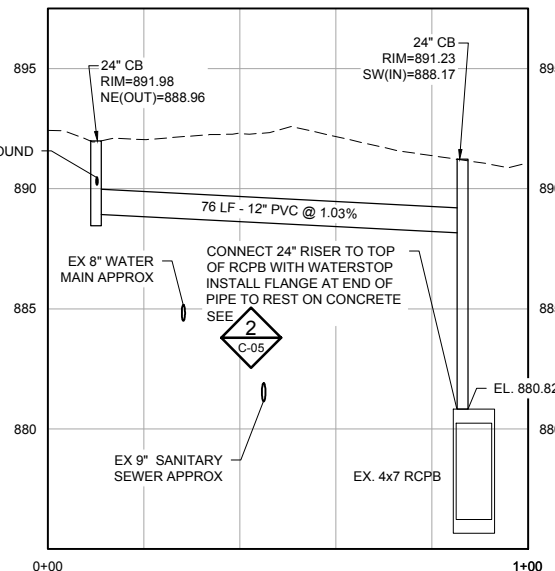
- LEGEND**
- - - 879 - - - EXISTING MINOR CONTOUR
  - - - 880 - - - EXISTING MAJOR CONTOUR
  - - - 879 - - - PROPOSED MINOR CONTOUR
  - - - 880 - - - PROPOSED MAJOR CONTOUR
  - DECIDUOUS TREE
  - CONIFEROUS TREE
  - SS - SS EXISTING STORM SEWER
  - SAN - SAN EXISTING SANITARY SEWER
  - CW - CW EXISTING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



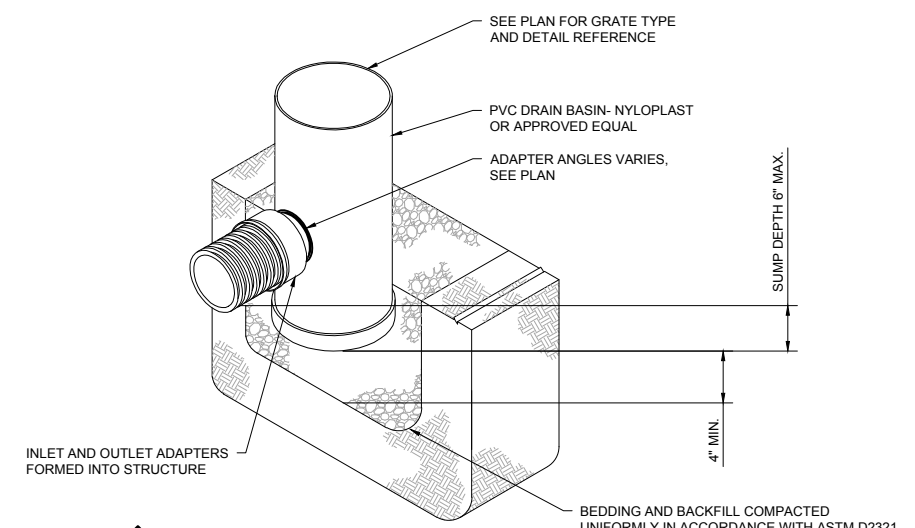
**2 DETAIL: STOOL GRATE**  
 NOT TO SCALE



**3 PROFILE: PROPOSED WEST STORM SEWER**  
 HORIZONTAL SCALE IN FEET: 0, 20, 40  
 VERTICAL SCALE IN FEET: 0, 2, 4, 6, 8



**4 PROFILE: PROPOSED EAST STORM SEWER**  
 HORIZONTAL SCALE IN FEET: 0, 20, 40  
 VERTICAL SCALE IN FEET: 0, 2, 4, 6, 8



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NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION
B	CMH3	PEB	PEB	06/13/2018	90% DRAFT FOR REVIEW
A	CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW

PRINTED NAME: PATRICK BROCKAMP  
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Date	06/13/2018
Drawn	CMH3
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Designed	BARR
Approved	PEB

CITY OF CRYSTAL  
 CRYSTAL, MINNESOTA

WINNETKA POND  
 DREDGING PROJECT  
 PROPOSED STORM SEWER  
 PLAN AND PROFILE

90% DRAFT FOR REVIEW

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

**LEGEND**

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

- SEEDING NOTES:**
- ANY GRASS OR WEEDS WITHIN SEEDING AREAS SHALL BE SPRAYED WITH HERBICIDE 14 DAYS PRIOR TO TILLING.
  - ALL HERBICIDE APPLICATION SHALL BE APPLIED BY A LICENSED APPLICATOR WITHIN THE STATE OF MINNESOTA.
  - ALL DISTURBED TURF GRASS SHALL BE REPAIRED USING BWSR LOW-MAINTENANCE TURF MIX AS PER SPECIFICATION 32-93-10
  - AFTER SEEDING, TYPE 8 MULCH MATERIAL SHALL BE DISC-ANCHORED OVER ENTIRE SEEDING AREA IN ACCORDANCE WITH MN/DOT STANDARD SPECIFICATION 3882.
  - REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- SEEDING ESTABLISHMENT NOTES:**
- SEEDING AREAS SHALL BE FREE OF DEAD OR DYING PATCHES LARGER THAN TEN SQUARE FEET FOR ENTIRETY OF THE ONE YEAR WARRANTY OF PLANTING WORK. SEE SPECIFICATION 32-93-00 HERBACEOUS PLANT ESTABLISHMENT FOR MORE INFORMATION.
  - CONTRACTOR WILL BE RESPONSIBLE FOR WATERING (REGARDLESS OF NOTIFICATION) DURING ENTIRE ONE YEAR WARRANTY PERIOD. WATERING WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
  - ONCE A MONTH (MAY THROUGH OCTOBER) DURING MAINTENANCE PERIOD CONTRACTOR SHALL INSPECT FOR INVASIVE WEED ENCROACHMENT, DEAD PLANTS AND EROSION PROBLEMS AS PER SPECIFICATION 32-93-10.
  - UPON DISCOVERY OF INVASIVE SPECIES DURING SCHEDULED INSPECTIONS CONDUCT HERBICIDE AND/OR MANUAL TREATMENTS FOR WEED CONTROL.

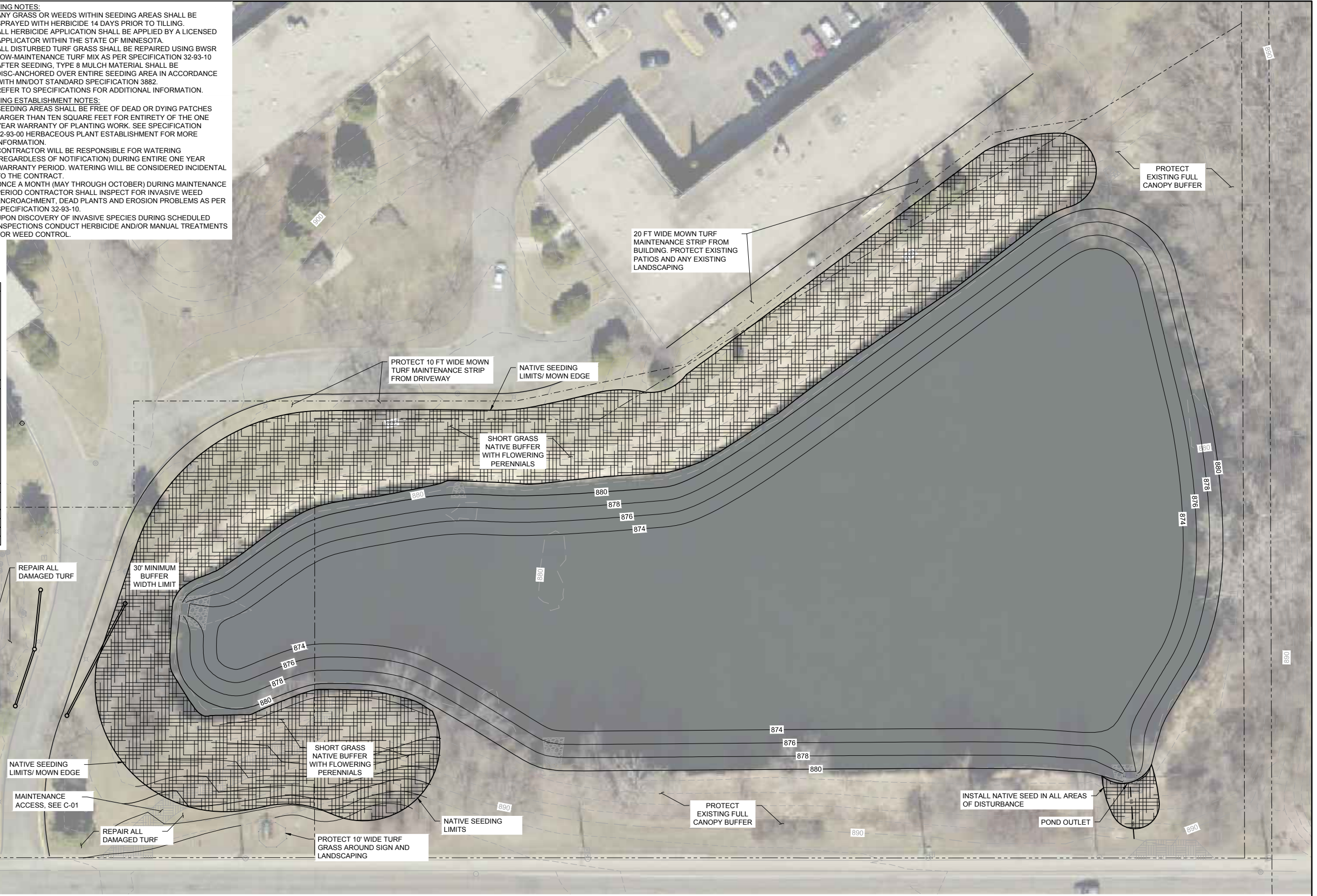
**SHORT GRASS SEED MIX:**

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

**Cover Crop**

Common Name	Botanic Name	Rate (lb/ac)	% of Mix (% by Wt)
Oats	<i>Avena sativa</i>	3.00	100.00
<b>Total</b>		<b>3.00</b>	<b>100.00</b>



1 PLAN: NATIVE BUFFER AND RESTORATION PLAN

0 30 60  
SCALE IN FEET

CADD USER: PATRICK E. BROCKAMP FILE: M:\DESIGN\2371622\_00\237162200\_CADD\DWG\PLT\SCALE: 1:2 PLOT DATE: 6/13/2018 3:17 PM

NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION
B	CMH3	MEK2	PEB	06/13/2018	90% DRAFT FOR REVIEW
A	CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW

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DATE: \_\_\_\_\_ LICENSE #: \_\_\_\_\_

CLIENT	BID	CONSTRUCTION	RELEASED TO/FOR	DATE RELEASED
03/08/18	06/13/18		A B C 0 1 2 3	

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Scale	AS SHOWN
Date	06/13/2018
Drawn	CMH3
Checked	PEB
Designed	MEK2
Approved	PEB

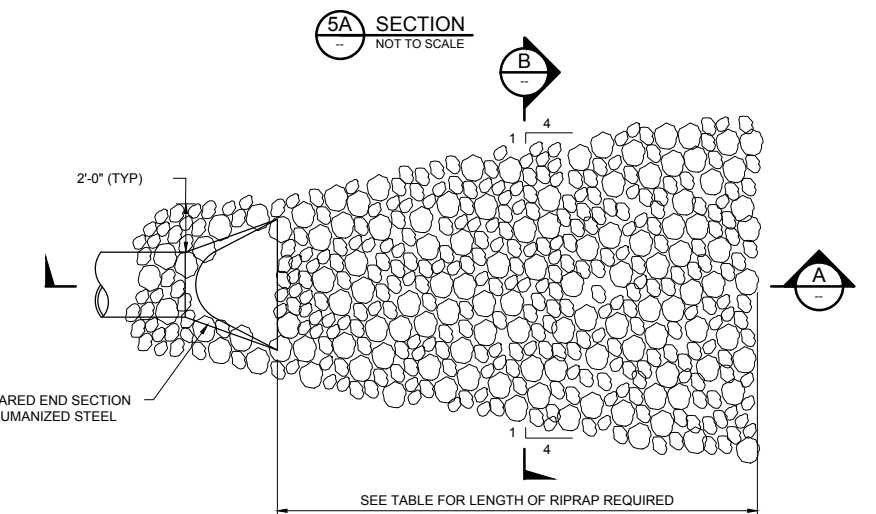
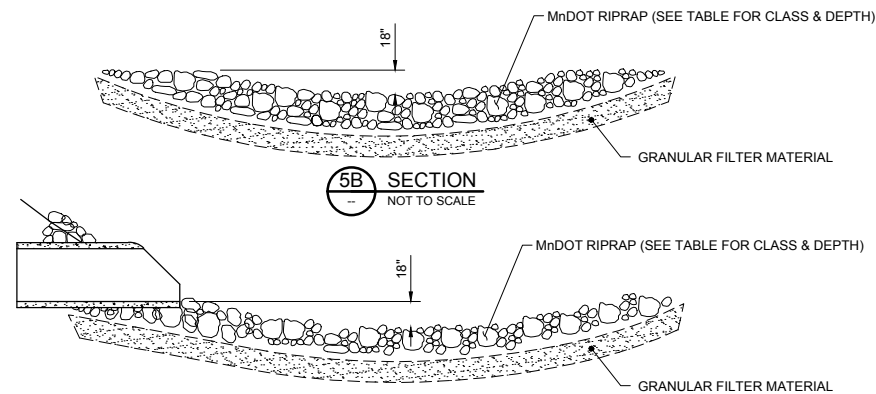
CITY OF CRYSTAL  
CRYSTAL, MINNESOTA

**WINNETKA POND DREDGING PROJECT**

**NATIVE BUFFER AND RESTORATION PLAN**

90% DRAFT FOR REVIEW

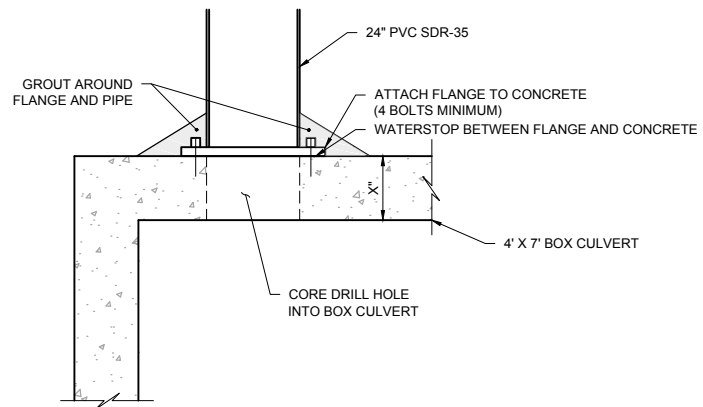
BARR PROJECT No. 23/27-1622.00  
CLIENT PROJECT No. 2018-04  
DWG. No. C-04  
REV. No. B



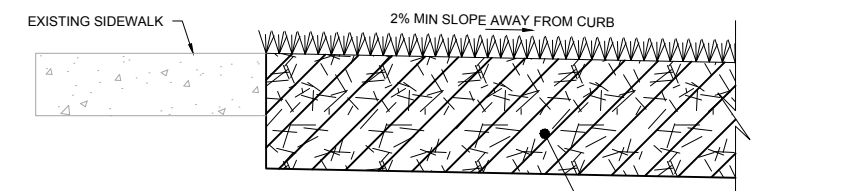
FES SIZE (IN)	RIPRAP LENGTH (FT)	RIPRAP CLASS	RIPRAP DEPTH (IN)	RIPRAP QTY (CY)
12	8	III	18	5
42	18	III	18	19
48x84 (4'x7') RCPB	12	III	18	15
OUTLET STRUCTURE	4	III	18	12

- 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

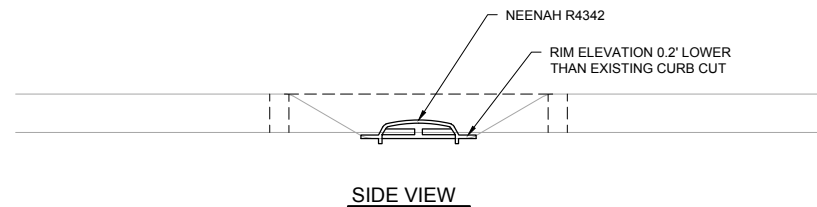


**2** DETAIL: CONNECTION TO BOX CULVERT  
NOT TO SCALE

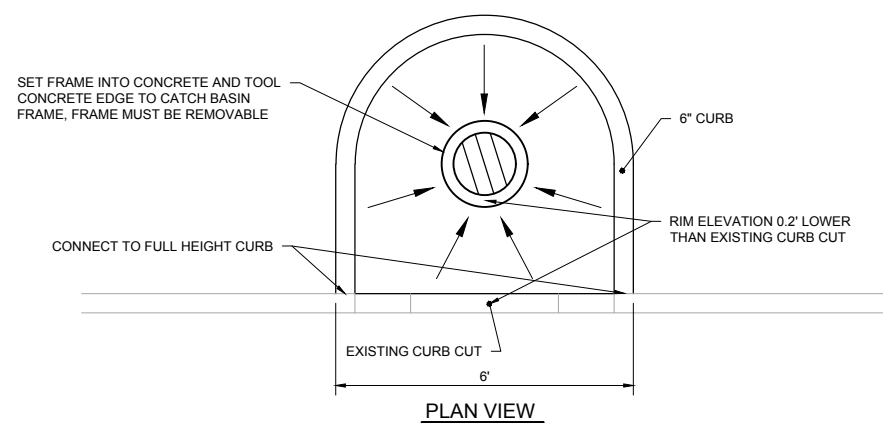


- NOTES:
1. NETLON ATS TO BE INSTALLED AT A DENSITY OF ONE BALE PER FIVE (5) CY OF FILTRATION SOIL, OR APPROVED EQUAL.
  2. SUBGRADE TO BE SLOPED AT A MINIMUM OF 2% IF SUBGRADE SOILS ARE UNSUITABLE FOR INFILTRATION.

**3** DETAIL: POLYMER TURF REINFORCEMENT - MAINTENANCE ACCESS  
C-01 NOT TO SCALE



SIDE VIEW



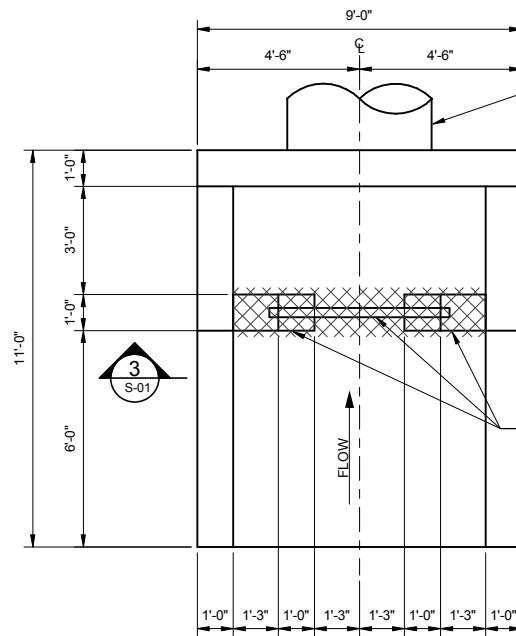
PLAN VIEW

**5** DETAIL: CONCRETE AROUND CATCH BASIN  
NOT TO SCALE

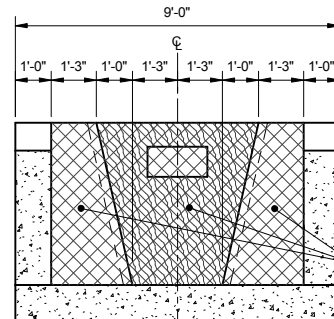
CADD USER: PATRICK E. BROCKAMP FILE: M:\DESIGN\23271622\_00\2327162200\_C-05.DWG PLOT SCALE: 1:2 PLOT DATE: 6/13/2018 3:23 PM

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 #: _____		CLIENT: BARR ENGINEERING CO. BID: 23/27-1622.00 CONSTRUCTION:		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: 06/13/2018 Drawn: CMH3 Checked: PEB Designed: BARR Approved:		<b>CITY OF CRYSTAL</b> CRYSTAL, MINNESOTA		<b>WINNETKA POND DREDGING PROJECT</b> MISCELLANEOUS DETAILS		BARR PROJECT No. 23/27-1622.00 CLIENT PROJECT No. 2018-04	
		RELEASED TO/FOR: A B C 0 1 2 3 DATE RELEASED:		DWG. No. C-05 REV. No. B									
NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION								
B	CMH3	PEB	PEB	06/13/2018	90% DRAFT FOR REVIEW								
A	CMH3	PEB	PEB	03/08/2018	50% DRAFT FOR REVIEW								

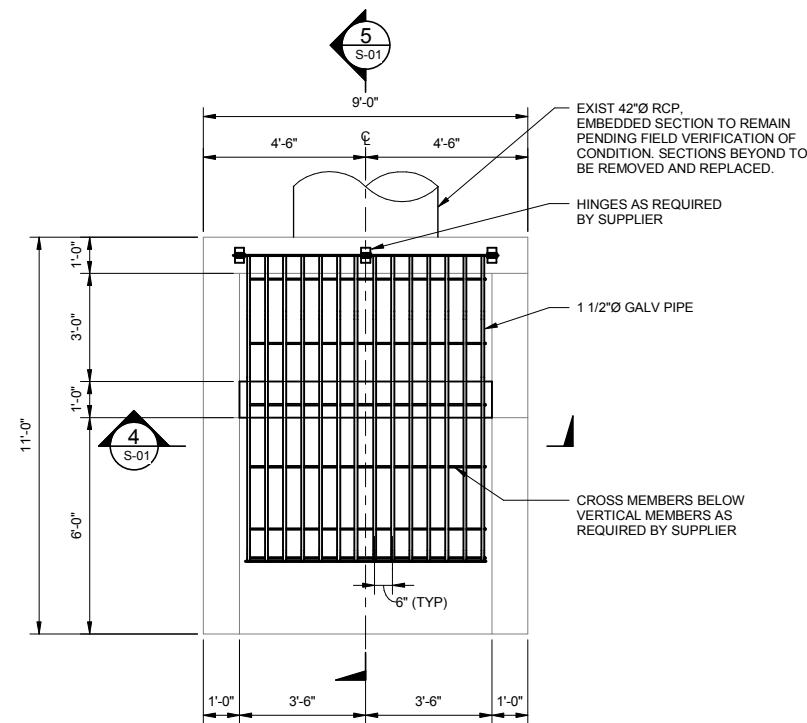
90% DRAFT FOR REVIEW



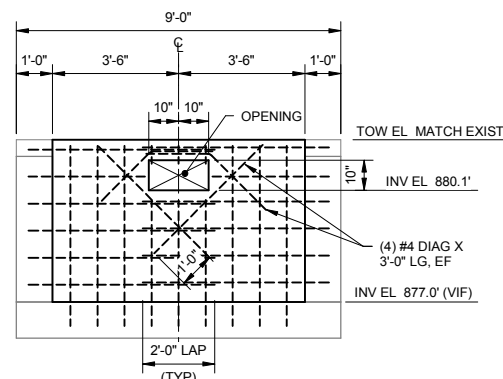
1 PLAN: EXISTING OUTLET - DEMO  
3/8" = 1'-0"



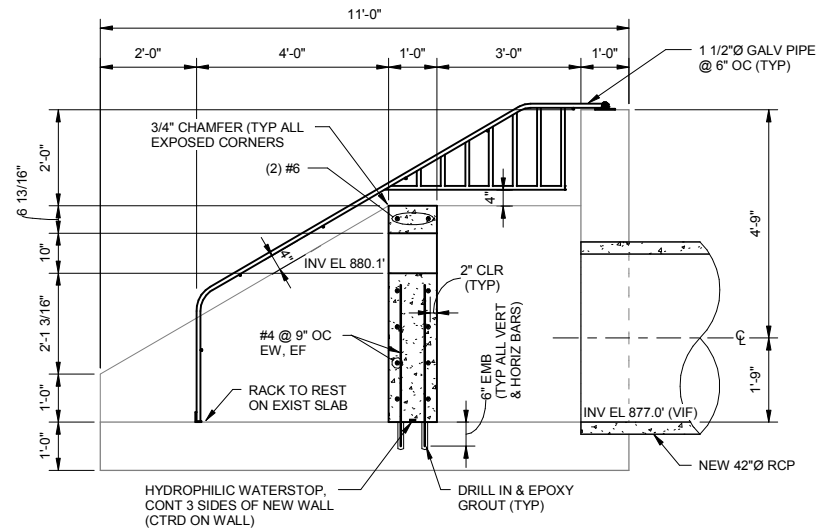
3 SECTION: WEIR WALL - DEMO  
3/8" = 1'-0"



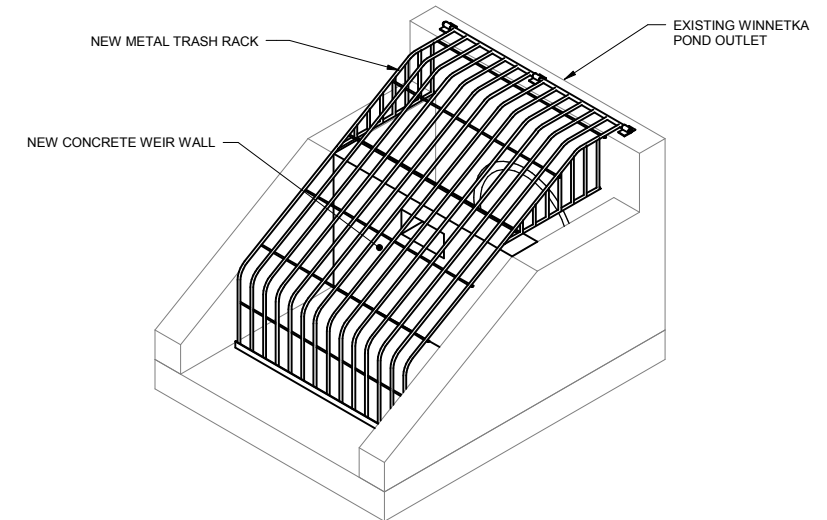
2 PLAN: EXISTING OUTLET - NEW  
3/8" = 1'-0"



4 SECTION: WEIR WALL - NEW  
3/8" = 1'-0"



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



6 ISOMETRIC: WEIR WALL AND TRASH RACK

**STRUCTURAL NOTES AND SPECIFICATIONS:**

**I GENERAL**

- ENGINEER'S ACCEPTANCE MUST BE SECURED FOR ALL STRUCTURAL SUBSTITUTIONS.
- 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**

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

**III TRASH RACK**

- DESIGNED AND MANUFACTURED BY HAALA INDUSTRIES TO THE DIMENSION REQUIREMENTS SHOWN IN THE DRAWINGS OR APPROVED EQUAL.
- 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).
- HINGE: GALV STEEL, DESIGN AND ANCHORAGE BY TRASHRACK MANUFACTURER
- STEEL PIPES: ASTM A53, GRADE B GALV
- 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.

90% DRAFT  
FOR REVIEW

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NO.	BY	CHK	DATE	REVISION DESCRIPTION
B	SWO	BJS	06/13/18	ISSUED FOR REVIEW
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	6/13/18					
RELEASED TO/FOR	A	B					

**BARR**  
Corporate Headquarters:  
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Ph: 1-800-632-2277

Project Office:  
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4300 MARKETPOINTE DRIVE  
SUITE 200  
MINNEAPOLIS, MN 55435  
Ph: 1-800-225-1966  
Fax: (216) 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.	B