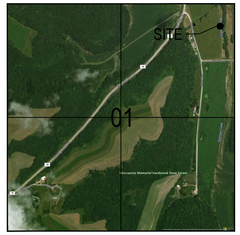
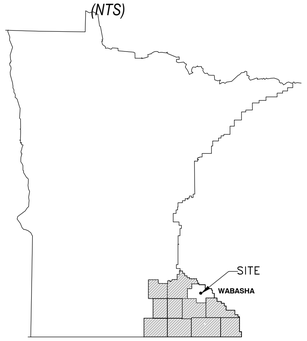
R 011 W




SITE MAP

(NTS)




LOCATION IN MINNESOTA

**PROJECT IN COOPERATION WITH**

WABASHA COUNTY SWCD

DEPARTMENT OF NATURAL RESOURCES

TROUT UNLIMITED

BEFORE START OF CONSTRUCTION, THE OWNER(S) OF ANY UTILITIES INVOLVED MUST BE NOTIFIED. THE EXCAVATOR IS RESPONSIBLE FOR GIVING NOTICE BY CALLING "GOPHER STATE ONE-CALL" AT (612)-454-0002 (TWIN CITIES METRO AREA) OR (800)-252-1166 (ALL OTHER LOCATIONS) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION.

TSA STAFF MUST BE NOTIFIED AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION. A PRE-CONSTRUCTION MEETING IS REQUIRED. THIS SHOULD INCLUDE ALL CONTRACTORS, THE LANDOWNER, AND A TSA REPRESENTATIVE. IN THE EVENT ANY UTILITIES COULD POTENTIALLY BE IMPACTED DURING CONSTRUCTION, A REPRESENTATIVE OF THE UTILITY COMPANY SHOULD ATTEND AS WELL.

NOTE: CHANGES IN DRAWINGS OR SPECIFICATIONS MUST BE AUTHORIZED BY THE OWNER AND THE ENGINEER OR SWCD REPRESENTATIVE WITH THE PROPER APPROVAL AUTHORITY.

SUPPORT BY SWCD TECHNICAL SERVICE AREA #7

# DETAIL PLANS FOR MILLER/McNALLAN GORMAN CREEK STREAM HABITAT IMPROVEMENT WABASHA COUNTY, MN

INDEX OF DRAWINGS



**CONSTRUCTION SITE EROSION AND SEDIMENT CONTROL**

Conservation projects with more than one acre of non-cropland soil disturbance are operating under an exception to National Pollution Discharge Elimination System (NPDES) permitting requirements. The following provisions must be implemented to minimize erosion and potential sediment damage on those projects. For all other conservation practices, these provisions should always be implemented where possible.

1.) Locate topsoil or other temporary stockpiles in a location where they will not be subject to erosion from concentrated flow.

2.) If permanent vegetation is disturbed, limit the area of disturbance to the minimum required for the project.

3.) Seed areas where permanent vegetation is planned according to the critical area planting or seeding specifications for the project. Seeding must be done within the following time frames after final grading unless work is completed after the fall seeding cutoff date.

Slopes 3:1 or steeper - 7 days
Slopes 10:1 to 3:1 - 14 days
Slopes 10:1 or flatter - 21 days

4.) If a grassed waterway will be completed after the fall seeding cutoff date, do not leave a loosened soil surface over the winter. Track the finished grade to lightly compact the soil surface for additional erosion protection over winter. Consider mulching for steep or erodible soils.

Projects operating under the NPDES permit exception may be required to obtain a permit if the provisions above are not met. Sediment discharges from any construction project that may impact water quality may result in enforcement action under state water quality rules.

Contractor _____ Date _____

| Bid Item | Unit | Total Qty | Units |
|---|---|---|---|
| | Estimated Quantities | | |
| 1 | Mobilization | 3 | Phases |
| 2 | *Site Clearing and Selective Tree Harvest for Rootwads and other practices (per Tree) | 194 | Each |
| 3 | Common Excavation - Onsite Disposal - Minor Channel Excavation for Pools | 1110 | C.Y. |
| 4 | Common Excavation - Offsite Disposal - Major Channel Excavation and Bank Shaping | 1960 | C.Y. |
| 5 | Common Excavation - Offsite Disposal - Floodplain Corridor Excavation and Upper Bank Shaping | 20341 | C.Y. |
| 6 | Common Fill (includes 2415 C.Y. Floodplain Corridor) | 4542 | C.Y. |
| 7 | Bank Toe Rock (Main 311 ft, Trib 271 ft, total = 682 ft) - MN DOT CLASS II (F&I) | 101 | C.Y. |
| 8 | Bank Toe Wood (682 ft) - 6 Trees per site(Ave.) 6" min. dia x (7' min., 11' max.), 37 Structures (F&I) | 222 | Each |
| 7 | Cover Rocks (3ft by 1.5 ft by 1.5ft Average), need to cover approx 40 ft , 2 rows (F&I) | 30 | Each |
| 8 | HammerHead Pool Tree Rootwads (6" Dia. Min, 7ft) (F&I) | 112 | Each |
| 9 | HammerHead Pool Tree Footer Logs (F&I) | 112 | Each |
| 10 | HammerHead Pool Log Rootwad Rocks (F&I) | 560 | Each |
| 11 | HammerHead Pool Riffle Rock MN Dot Class III (F&I) | 104 | C.Y. |
| 12 | HammerHead Pool Riffle Rock - 3/4" Gravel (F&I) | 24 | C.Y. |
| 15 | Log Rootwad w/Rocks - 15 min. to 24" max. Rocks (F&I) | 100 | Each |
| 16 | Log Rootwad Trees (6" Dia min., 8' max) (F&I) | 40 | Each |
| 13 | Simple Log Deflector w/Rootwad (364 ft total length covered) - 6" Logs w/Rootwad (F&I) | 32 | Each |
| 14 | Simple Log Deflector w/Rootwad (364 ft total length covered) - 15" Logs w/Rootwad (F&I) | 20 | Each |
| 19 | Rock Clusters - 1.5 ft to 2 ft Dia. Angular Rocks- 4 per cluster (Ave.) (F&I) | 92 | Each |
| 20 | Rock Deflectors (Mn Dot Class II Angular Rock) (F&I) | 16 | C.Y. |
| 13 | Rock Arch Rapids Arch Boulders - 3' Dia. Rock (F&I) | 72 | Each |
| 14 | Rock Arch Rapids Riprap Mn Dot Class II Angular Rock Riprap (F&I) | 250 | C.Y. |
| 15 | Rock Arch Rapids Riprap Bedding Mn Dot Granular Filter B1b Material (F&I) | 130 | C.Y. |
| 16 | Cattle Crossing Class I Mn Dot Rock Rip (F&I) | 5 | C.Y. |
| 17 | Cattle Crossing Non-Woven Geotextile Fabric, Geotex 801 or Approved Equal (F&I) | 50 | S.Y. |
| 18 | Spawn Bedding Limestone Gravel (D50 = 5/8 in, (Min. - Max. = 13/64 in. - 1 11/16 in., 90 c.y. for Arch Rapids "Chinking" F&I) | 125 | C.Y. |
| 19 | Seeding for Access Routes (F&I) | 1 | Job |
| 20 | Seed - State Mix 34-261 (Custom Grass/Sedge blend for Lower stream banks, PLS (31.5 lbs/Ac)) (F&I) | 44.1 | Lbs. |
| 21 | Seed - State Mix 33-262 (Custom Grass/Forbe blend for Floodplain Corridor and Upper stream banks, PLS,44 lbs/ac) (F&I) | 440 | Lbs. |
| 22 | Seed - Cover Crop (Annual Ryegrass, < 2.5 lbs /Ac, use 2 acres for Permanent Soil Stockpile) (F&I) | 39 | Lbs. |
| 23 | Rapid Stabilization Method #2 - Type 3884.B - Hydromulch and Tackifier or Mn DOT Type 3 (F&I) | 13.88 | Ac |
| 24 | Fertilizer (N-P-K at 60-60-60 lbs/Ac) (F&I) | 11.9 | Ac |
| 25 | Temporary Irrigation for Vegetation Establishment (11.9 Ac) | 1 | Lump |
| 26 | Extended Vegetation Management - Year 1 after Construction | 1 | Lump |
| 27 | Extended Vegetation Management - Year 2 after Construction | 1 | Lump |
| 28 | Extended Vegetation Management - Year 3 after Construction | 1 | Lump |
| 29 | Inspections and Maintenace/Repair of Work - Year 1 after Construction Completion | 1 | Lump |
| 30 | Inspections and Maintenace/Repair of Work - Year 2 after Construction Completion | 1 | Lump |
| 31 | Inspections and Maintenace/Repair of Work - Year 3 after Construction Completion | 1 | Lump |

**INDEX FOR CONSTRUCTION MATERIALS AND SPECIFICATIONS**

NOTICE: The applicable Minnesota Construction and Material Specifications for Conservation Practices and Standard Construction Details are attached to and are part of the plan and can also be found at the website listed below:
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mn/technical/engineering/?cid=nrcs142p2_023718

"Minnesota Specifications for conservation practices apply for all materials and construction work."

**Minnesota Construction and Material Specifications applicable to this job are as follows:**

| | | | | |
|---|---|---|---|---|
| MN-2 | MN-4 | MN-5 | MN-6 | MN-9 |
| MN-11 | MN-21 | MN-23 | MN-26 | MN-61 |
| MN-92 | MN-523 | MN-591 | | |

**PREPARED BY:**

TECHNICAL SERVICE AREA #7

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**
**GORMAN CREEK STREAM RESTORATION**

WABASHA SOIL & WATER CONSERVATION DISTRICT
WABASHA COUNTY, MINNESOTA

COVER | SHEET 1 OF 13

GENERAL UTILITY NOTES

1. CONTRACTOR SHALL CONTACT 'GOPHER STATE ONE CALL' A MINIMUM OF TWO WORKING DAYS PRIOR TO EXCAVATION/CONSTRUCTION FOR UTILITY LOCATIONS.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND INVERTS, SHOWN OR NOT SHOWN. ANY DISCREPANCY BETWEEN PLANS AND FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL PUBLIC AND PRIVATE UTILITIES FOR LOCATIONS OF UNDERGROUND WIRES, CABLES, CONDUITS, PIPES, MANHOLES, VALVES, OR OTHER BURIED STRUCTURES BEFORE COMMENCING CONSTRUCTION ACTIVITIES.
4. CONTRACTOR SHALL IMMEDIATELY CONTACT AFFECTED UTILITY COMPANIES TO REPORT ANY DAMAGE OF UTILITIES. CONTRACTOR SHALL CONTRACT WITH A QUALIFIED UTILITY CONTRACTOR FOR REPAIR OR REPLACEMENT OF THE ABOVE WHEN DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.

CONSTRUCTION LIMITS AND ACCESS

1. CONSTRUCTION SHALL BE LIMITED TO THE PARCEL IN WHICH THE CHANNELS ARE LOCATED WITH THE EXCEPTION OF THE PHASE 4 DIVERSION AND TEMPORARY SOIL STOCKPILES LOCATED ON ADJACENT PROPERTY TO THE NORTH AND EAST. ANY ADDITIONAL DISTURBANCE MUST APPROVED BY THE PROJECT ENGINEER AND OWNER. DISTURBANCE WITHIN THE CONSTRUCTION LIMITS SHALL BE FURTHER LIMITED TO THE GREATEST EXTENT PRACTICABLE TO MINIMIZE IMPACTS TO THE GREATER ECOSYSTEM.
2. DISTURBANCE WITHIN THE CONSTRUCTION LIMITS AS WELL AS ACCESS ROUTES TO THE CONSTRUCTION LIMITS, MATERIAL STOCKPILE LOCATIONS, AND OTHER ACTIVITIES OUTSIDE OF THE CONSTRUCTION LIMITS SHALL BE PROPOSED BY THE CONTRACTOR IN WRITING (PLAN AND SKETCH), AND APPROVED BY THE PROJECT ENGINEER AND OWNER.
3. ANY DISTURBANCE OUTSIDE OF AREAS APPROVED FOR DISTURBANCE WITHIN THE CONSTRUCTION LIMITS AND APPROVED ACCESS ROUTES AND STOCKPILE LOCATIONS ARE TO BE REPAIRED BY THE CONTRACTOR, PER THE DISCRETION OF THE PROJECT ENGINEER AT THE COST OF THE CONTRACTOR.
4. PUBLIC INFRASTRUCTURE AND PRIVATE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING: ROADWAY SURFACES, BRIDGES AND ABUTMENTS, DRIVEWAYS, FENCES, AND STRUCTURES ARE TO BE PROTECTED BY THE CONTRACTOR AT THE COST OF THE CONTRACTOR. ANY DAMAGES SHALL BE REPAIRED PER THE DISCRETION OF THE PROJECT ENGINEER AT THE COST OF THE CONTRACTOR.
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL, RIGHT OF WAY, AND/OR ACCESS PERMITS.

GENERAL LANDSCAPE NOTES

1. CONTRACTOR SHALL INSPECT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS RELATING TO THE NATURE AND SCOPE OF WORK.
2. CONTRACTOR SHALL VERIFY PLAN LAYOUT AND BRING TO THE ATTENTION OF THE ENGINEER DISCREPANCIES WHICH MAY COMPROMISE THE DESIGN OR INTENT OF THE LAYOUT.
3. CONTRACTOR SHALL ASSURE COMPLIANCE WITH APPLICABLE CODES AND REGULATIONS GOVERNING THE WORK AND MATERIALS SUPPLIED.
4. CONTRACTOR SHALL PROTECT EXISTING ROADS, CURBS/GUTTERS, TRAILS, TREES, IRRIGATION SYSTEM, LAWNS AND SITE ELEMENTS DURING CONSTRUCTION OPERATIONS. DAMAGE TO SAME SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
5. CONTRACTOR SHALL REVIEW THE SITE FOR DEFICIENCIES IN SITE CONDITIONS WHICH MIGHT NEGATIVELY AFFECT PLANT ESTABLISHMENT, SURVIVAL OR WARRANTY. UNDESIRABLE SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BEGINNING OF WORK.
6. CONTRACTOR IS RESPONSIBLE FOR ONGOING MAINTENANCE OF NEWLY INSTALLED MATERIALS THROUGHOUT THE LENGTH OF THE PROJECT. REPAIR OF ACTS OF VANDALISM OR DAMAGE WHICH MAY OCCUR SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. EXISTING TREES OR SIGNIFICANT SHRUB MASSINGS FOUND ON SITE SHALL BE PROTECTED AND SAVED UNLESS NOTED TO BE REMOVED OR ARE LOCATED IN AN AREA TO BE GRADED. QUESTIONS REGARDING EXISTING PLANT MATERIAL SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO REMOVAL. CONTRACTOR SHALL WALK THE SITE WITH THE ENGINEER PRIOR TO SITE REMOVALS AND GRADING TO DETERMINE EXACT CONSTRUCTION LIMITS.

VEGETATION ESTABLISHMENT AND IRRIGATION

1. STATE MIX 34-261 SHALL BE USED FOR DISTURBED AREAS WITHIN A 6 FOOT BUFFER ON BOTH SIDES OF THE CONSTRUCTED CHANNELS OUTSIDE EDGES. ALL DISTURBED AREAS OUTSIDE OF THE CHANNEL BUFFER ARE TO BE SEEDED WITH STATE MIX 33-262 AND COVERED WITH HYDROMULCH AT A RATE AS SPECIFIED IN THE SEEDING PLAN.
2. IRRIGATION MAY BE REQUIRED FOR ALL SEEDED AREAS TO PROMOTE THE GERMINATION OF THE COVER CROP AND NATIVE SEED. IRRIGATION WILL DEPEND ON THE FREQUENCY AND DURATION OF RAIN EVENTS DURING THE PROJECT. IF LESS THAN 0.5 INCHES OF PRECIPITATION OCCURS OVER A 7-DAY PERIOD DURING PROJECT CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AN IRRIGATION EQUIVALENT OF ONE-INCH OF PRECIPITATION ON ALL PREVIOUSLY SEEDED AREAS.
3. IRRIGATION SHALL BE PROVIDED AS NEEDED FOR THE DURATION OF PROJECT CONSTRUCTION AT THE DISCRETION OF THE PROJECT ENGINEER
4. SEEDING SHALL FOLLOW THE SEEDING PLAN AND SEEDING SPECIFICATION.
5. SEED SHALL BE LOCAL ORIGIN AND WILD ECOTYPE. SEED ORIGIN SHALL BE CERTIFIED BY THE MN CROP IMPROVEMENT ASSOCIATION. LOCAL ORIGIN SHALL MEAN WITHIN 175 MILES OF PROJECT SITE. PROVIDE MCIA DOCUMENTATION TO ENGINEER PRIOR TO SEEDING. ONLY NATIVE SEED WILL BE INSTALLED WITHIN THE PROJECT SITE, EXCEPT FOR COVER CROP.
6. COVER CROP SHALL CONSIST OF ANNUAL RYE GRASS OR APPROVED EQUAL.
7. SOW SEED MIXES ON DISTURBED AREAS AFTER ALL GRADING AND CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8. IF AREAS OF BARE GROUND PERSIST AFTER FIRST GROWING SEASON, RESEED PER PLAN.

TREE PROTECTION AND HARVEST

1. SITE CLEARING FOR ACCESS ROUTES AND RESHAPING OF STREAMBANKS TO INCLUDE HARVEST OF TREES FOR TOE WOOD. TREES HARVESTED IN THESE AREAS SHALL BE REMOVED WHOLE WITH THE ROOT BALL ATTACHED. TREES TO REMAIN WITHIN THESE AREAS WILL BE IDENTIFIED IN THE PLANS OR WILL BE MARKED IN THE FIELD BY THE PROJECT ENGINEER AND SHALL BE PROTECTED. VERY FEW TREES WILL BE LEFT AS NEARLY ALL ARE LOCATED WITHIN THE PLANNED FLOODPLAIN CORRIDOR AND ARE UNDESIRABLE BOXELDERS
2. TREE HARVEST OUTSIDE OF ACCESS ROUTES AND STREAMBANK RESHAPING AREAS WILL BE DIRECTED BY THE PROJECT ENGINEER AND OWNER. ALL TREES TO BE HARVESTED OUTSIDE OF CONSTRUCTION LIMITS AND ACCESS ROUTES SHALL BE CLEARLY MARKED BY THE PROJECT ENGINEER AND OWNER. EXISTING TREES OUTSIDE OF CONSTRUCTION LIMITS AND ACCESS ROUTES SHALL BE PROTECTED UNLESS MARKED TO BE HARVESTED. ALL TREES NOT MARKED FOR REMOVAL SHALL BE LEFT STANDING UNDISTURBED.
3. TREE HARVEST SHALL NOT DEBARK OR DAMAGE TREES TO REMAIN. KEEP CONSTRUCTION EQUIPMENT OUT OF DRIP LINE OF EXISTING TREES TO LIMIT SOIL COMPACTION AROUND THE ROOT SYSTEM.
4. QUESTIONS REGARDING EXISTING TREES, SHRUBS, OR OTHER VEGETATION SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER PRIOR TO REMOVAL.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL UNUSED TREE AND BRUSH DEBRIS AT THE COMPLETION OF THE PROJECT UNLESS OTHERWISE DIRECTED.

GRADING & EROSION CONTROL NOTES

1. ACCEPTANCE OF INSTALLED PERIMETER EROSION CONTROL AND CONSTRUCTION ENTRANCE MUST BE MADE BEFORE BEGINNING SITE GRADING ACTIVITIES. SOME TEMPORARY EROSION CONTROL MEASURES MAY BE INSTALLED AS GRADING OCCURS IN THE SPECIFIC AREA. MAINTAIN EROSION CONTROLS THROUGHOUT THE GRADING PROCESS AND REMOVE UPON APPROVAL OF ENGINEER.
2. ALL CONSTRUCTION ENTRANCES SHALL BE SURFACED WITH CRUSHED ROCK (OR APPROVED EQUAL) ACROSS FULL WIDTH FROM ENTRANCE POINT TO 50 FEET INTO THE CONSTRUCTION ZONE.
3. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH NPDES AND STATE PERMITS.
4. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES, INCLUDING THE REMOVAL OF ACCUMULATED SILT IN FRONT OF TEMPORARY EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL RE-ESTABLISH ANY EXISTING EROSION CONTROL DISTURBED BY CONSTRUCTION.
5. CONTRACTOR SHALL PROVIDE ADDITIONAL TEMPORARY EROSION CONTROL MEASURES AS REQUIRED FOR CONSTRUCTION OR AS REQUIRED BY ENGINEER AND SHALL BE INCIDENTAL TO THE CONTRACT.
6. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES UPON APPROVAL OF ENGINEER.
7. THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED ONTO EXISTING STREETS AND PAVED AREAS WITHIN 24 HOURS OF DISCOVERY OR REQUESTED BY ENGINEER AND SHALL BE INCIDENTAL TO THE CONTRACT.
8. INSPECT EROSION CONTROL DEVICES AFTER EACH RAINFALL PER MNDOT SPECIFICATION AND SPECIAL PROVISIONS. IMMEDIATELY REPAIR FAILED OR FAILING EROSION CONTROL DEVICES.
9. INSPECT THE ENTIRE CONSTRUCTION SITE A MINIMUM OF ONCE EVERY 7 DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS.
10. MINIMIZE DISTURBANCE TO THE EXTENT FEASIBLE. DISTURBANCE OUTSIDE OF CONSTRUCTION LIMITS SHALL BE RESTORED TO PRE CONSTRUCTION CONDITIONS AT THE COST OF THE CONTRACTOR.
11. SEE MN SPEC 21 AND 23 FOR EARTHWORK, SUBGRADE, AND SUBBASE FOR ALL EXCAVATION/EARTHWORK RELATED WORK AND QUALITY CONTROL.
12. REVIEW SPECIAL PROVISIONS FOR MODIFICATIONS TO MN SPECIFICATIONS.
13. EARTHWORK ASSUMPTIONS
    A. SEE CONTRACT DOCUMENTS FOR INCLUSIONS, INCLUDING BUT NOT LIMITED TO MEASUREMENT & PAYMENT.
    B. ALL QUANTITIES ARE PLAN QUANTITIES.

PERMITS

1. CONTRACTOR SHALL ADHERE TO ALL PERMIT REQUIREMENTS AND WILL BE SUBJECTED TO ALL PENALTIES AND FINES FOR NOT ABIDING BY THE PERMIT REQUIREMENTS
    A. MINNESOTA DEPARTMENT OF NATURAL RESOURCES, PUBLIC WATERS PERMIT, WATER APPROPRIATIONS
    B. UNITED STATES ARMY CORPS OF ENGINEERS PERMIT
    C. MINNESOTA POLLUTION CONTROL AGENCY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
    D. OTHERS AS REQUIRED

## TEMPORARY BENCHMARK DESCRIPTIONS

TBM #2: NAIL IN FENCE POST APPROXIMATELY 630 FT E ALONG FENCE LINE FROM NW PASTURE FENCE CORNER

TBM #6: REBAR APPROXIMATELY 300FT WEST OF NORTHWESTERLY CULVERT OUTLET (NOT VERIFIED)

TBM #7: NAIL IN POWER POLE APPROXIMATELY 12FT NW OF NORTHWESTERLY CULVERT OUTLET ALONG FENCE LINE

TBM #8: REBAR IN GROUND APPROXIMATELY 711FT E ALONG FENCE FORM NW PASTURE FENCE CORNER AND 44FT S FROM THAT LOCATION

TBM #9: REBAR IN GROUND ALONG E ROAD SHOULDER APPROXIMATELY 65FT SLIGHTLY NW OF E END ROAD CULVERT

TBM #10: HUB W/ LATH APPROXIMATELY 84FT N OF E END OF ROAD CULVERT

TBM #11: HUB W/ LATH APPROXIMATELY 65FT SE OF NW PASTURE FENCE CORNER

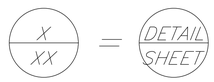
## DEFINITIONS

VALLEY = THE IMMEDIATE FLOODPLAIN THAT IS TO BE EXCAVATED AS PART OF THE COMPLETE DESIGNED CORRIDOR. DOES NOT REFER TO THE ENTIRE VALLEY BOTTOM THAT EXISTS IN A BROADER LANDSCAPE VIEW

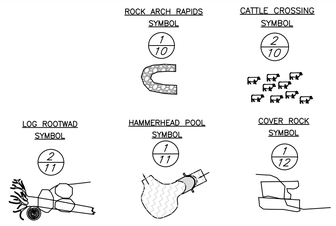
T.S.S.L = TEMPORARY SOIL STOCKPILE LOCATION (SOILS TO BE REMOVED WITHIN 6 MONTHS OF PLACEMENT)

B.F.E = BANKFULL ELEVATION

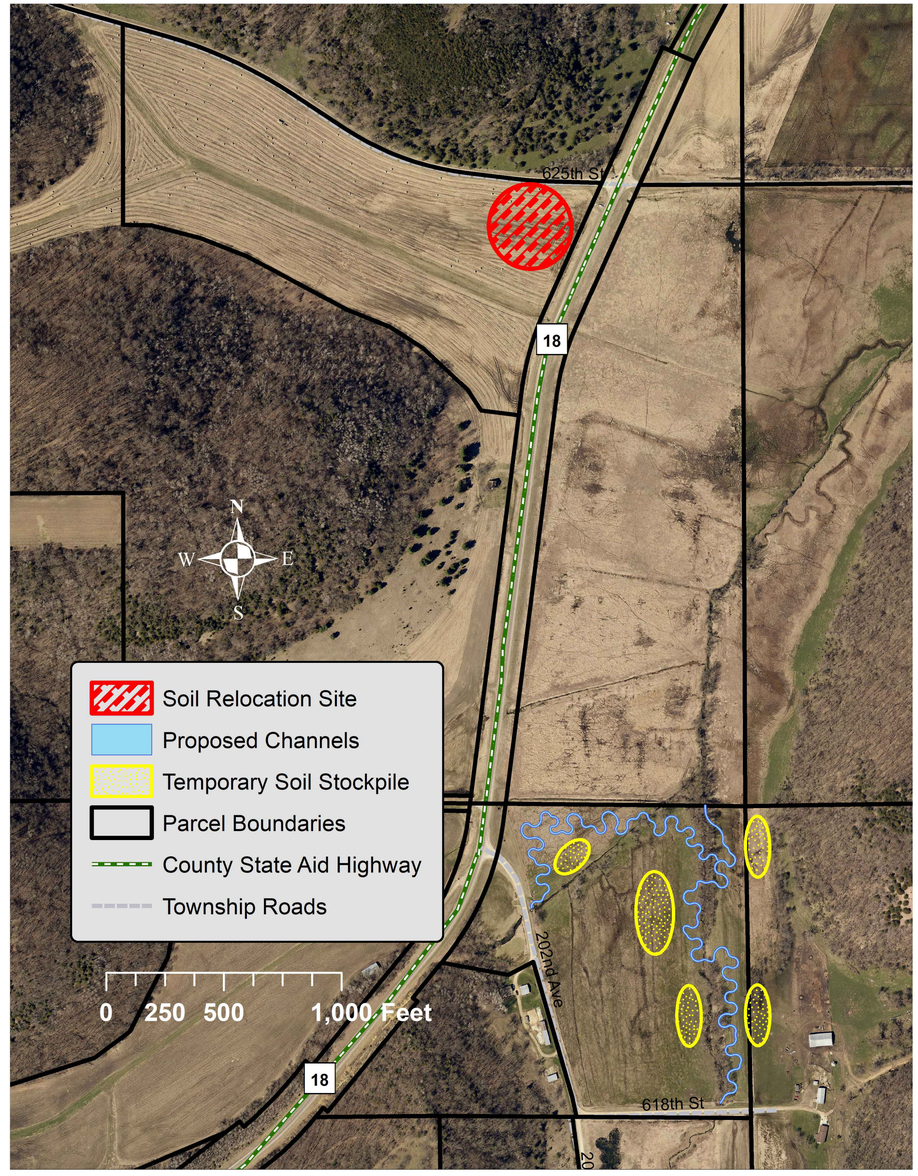
## HABITAT STRUCTURE TABLE OF CONTENTS




HABITAT STRUCTURE DETAILS: SYMBOLS ARE AS SHOWN IN PLAN VIEWS, USE CALLOUTS TO FIND LOCATION OF ADDITIONAL DETAILS ON SHEETS 11-12

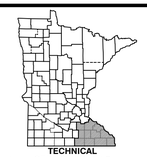



## LONG TERM SOIL RELOCATION SITE




SURPLUS EXCAVATED MATERIAL MUST BE MOVED TO SOIL RELOCATION SITE DURING TIMES WHEN THE CONDITIONS ALLOW MINIMAL IMPACT TO ROADS, FROZEN GROUND. IF DAMAGED, ROADS MUST BE REPAIRED TO ITS PRIOR EXISTING CONDITION AFTER THE PROJECT IS COMPLETE. THE ROADS MUST BE KEPT IN USABLE CONDITION THROUGHOUT THE DURATION OF THE PROJECT FOR LOCAL TRAFFIC.

TEMPORARY SOIL STOCKPILE LOCATIONS ARE FOR THE STORAGE OF SOILS THAT WILL BE USED AS FILL IN LATER PROJECT PHASES. THE USE OF THESE AREAS WILL BE MINIMIZED AS MUCH AS POSSIBLE AND RETURNED TO PRE-EXISTING ELEVATION AND SEEDED ONCE PROJECT IS COMPLETE. DURING USE OF THESE SITES, STOCKPILED MATERIALS WILL BE SURROUNDED BY SILT FENCE AND TEMPORARILY SEEDED.




**PREPARED BY:**

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

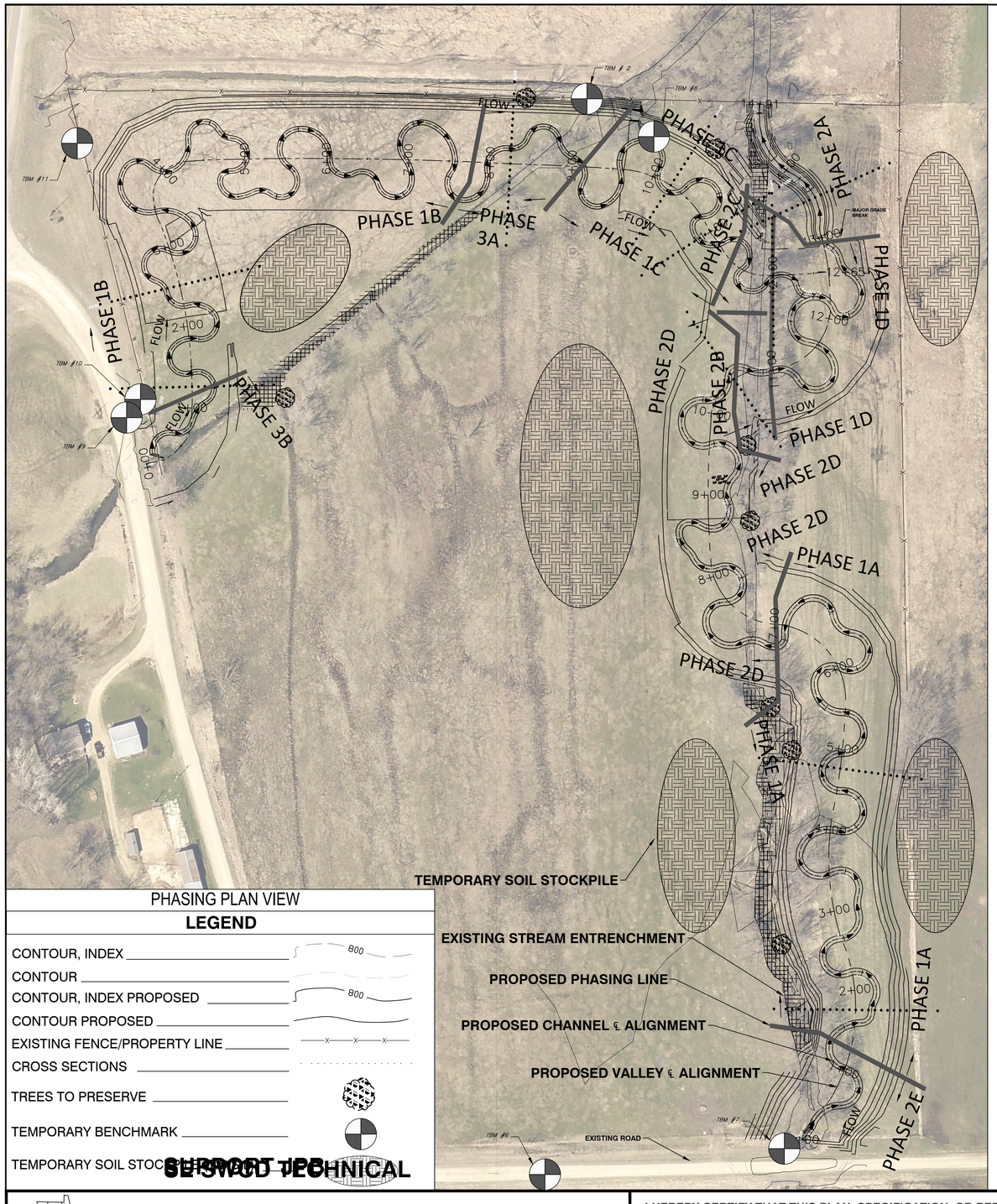
PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**

**GORMAN CREEK STREAM RESTORATION**

WABASHA SOIL & WATER CONSERVATION DISTRICT
WABASHA COUNTY, MINNESOTA

NOTES | SHEET 2 OF 13







PHASING PLAN VIEW

**LEGEND**

CONTOUR, INDEX
CONTOUR
CONTOUR, INDEX PROPOSED
CONTOUR PROPOSED
EXISTING FENCE/PROPERTY LINE
CROSS SECTIONS
TREES TO PRESERVE
TEMPORARY BENCHMARK
TEMPORARY SOIL STOCKPILE

**SEDIMENT TECHNICAL REPORT JPG**

## PHASING PLAN DESCRIPTION

SALVAGING AND SPREADING TOPSOIL:
APPROXIMATELY 6" OF TOPSOIL SHALL BE SALVAGED FROM THE PROPOSED DISTURBANCE AREA. A MINIMUM OF 3" OF TOPSOIL SHALL BE SPREAD ON DISTURBED AREAS.

NOTE:
PHASING IS SHOWN THAT CONSTRUCTION CAN BE COMPLETED IN ANY MANNER PREFERRED AS LONG AS ANY PHASE LABELED WITH PHASE 1 ARE COMPLETED FIRST (CAN BE COMPLETED SIMULTANEOUSLY OR IN ANY ORDER) THEN PHASE 2 IS TO BE COMPLETED IN ALPHABETICAL ORDER AND THEN PHASE 3 IS TO BE COMPLETED NEXT IN ALPHABETICAL ORDER AS WELL.. CHANGES TO PHASING SEQUENCE OR BOUNDARIES SUBJECT TO SITE CONDITIONS MAY BE MODIFIED PER THE ENGINEER OR TECHNICAL REPRESENTATIVE. (SEE FURTHER OPERATIONAL ORDER AND DISCUSSION BELOW)

PHASE DETAILS:

PHASE 1
COMPLETE ALL PARTS SIMULTANEOUSLY OR IN ANY ORDER, BEFORE MOVING TO PHASE 2. PHASE 1 PROJECT WORK TAKES PLACE ENTIRELY OUTSIDE OF EXISTING CHANNELS. IT IS RECOMMENDED THAT PORTIONS OF WORK BEING CONSTRUCTED ARE APPROPRIATE FOR EQUIPMENT & PERSONNEL PROVIDED.

PHASE 2
AFTER PHASE 1 IS FINISHED. COMPLETE PHASE 2 IN ALPHABETICAL ORDER STARTING WITH PHASE 2A.

- PHASE 2A COMPLETE PHASE 2A EXCEPT FOR THE EXISTING CHANNEL PORTION. THIS SHOULD BE LEFT ALONE UNTIL FLOW IS REDIRECTED THROUGH THE PHASE 1D REGION BY CUTTING THE CORRIDOR INTO THE EXISTING CHANNEL DURING PHASE 2B. IN EXISTING CHANNEL PORTION SMALL TEMPORARY DIVERSIONS AND FLOW CONTROL MAY BE NECESSARY TO COMPLETE ALL PRACTICES APPROPRIATELY *[NO FLOW REDIRECTION OCCURS IN PHASE 2A]*
- PHASE 2B CUT CORRIDOR TO CONNECT EXISTING CHANNEL FLOW TO PHASE 1D REGION. FILL EXISTING CHANNEL ON DOWNSTREAM END OF PHASE 2B TO DESIGN ELEVATION(MINIMUM). THIS WILL EFFECTIVELY PLUG THE EXISTING CHANNEL RESULTING IN REDIRECTED FLOW THROUGH PHASE 1D. FINISH REMAINING PORTION OF PHASE 2B EXCEPT FOR THE UPSTREAM END OF THE EXISTING CHANNEL UNTIL FLOW IS REDIRECTED THROUGH PHASE 2D REGION. *[AFTER PHASE 2B MAIN CHANNEL FLOW SHOULD BE IN EXISTING CHANNEL UNTIL UPSTREAM END OF PHASE 2B THEN IN THE CONSTRUCTED CHANNEL PHASE 1D FOR THE REMAINDER OF THE PROJECT AREA]*
- PHASE 2C THIS PHASE WILL ALSO INCLUDE FINISHING THE UPSTREAM END OF PHASE 2A. CAN BE COMPLETED ONCE PHASE 2B HAS REDIRECTED FLOW. *[NO FLOW REDIRECTION OCCURS IN PHASE 2C]*
- PHASE 2D IN EXISTING CHANNEL, PLACE FILL ON THE LEFT DOWNSTREAM SIDE OF EXISTING CHANNEL ENTRENCHMENT TO PINCH FLOW TO THE RIGHT DOWNSTREAM SIDE. COMPLETE AS MUCH OF PHASE 2D THAT CAN BE DONE WITHOUT FURTHER IMPACTING EXISTING FLOWPATH (LEFT DOWNSTREAM SIDE OR CORRIDOR). MAKE SURE THE DESIGNED CHANNEL IS COMPLETELY CUT THROUGH THIS REGION. CONNECT UPSTREAM END TO FLOW AND PLUG EXISTING CHANNEL AT UPSTREAM END TO REDIRECT FLOW THROUGH CONSTRUCTED CHANNEL. FINISH PHASE 2D INCLUDING WORK IN EXISTING CHANNEL AREA. PHASE 2D MAIN CHANNEL FLOW SHOULD BE IN THE EXISTING CHANNEL UNTIL THE UPSTREAM END OF PHASE 2D IS COMPLETED THEN IN THE CONSTRUCTED CHANNEL FOR THE REMAINDER OF THE PROJECT AREA DOWNSTREAM.
- PHASE 2E BUILD RIGHT DOWNSTREAM SIDE OF CORRIDOR INCLUDING CHANNEL. CONNECT TO EXISTING CHANNEL. FINISH REMAINING LEFT DOWNSTREAM CORRIDOR INCLUDING FILLING EXISTING CHANNEL AND REDIRECTING FLOW THROUGH PHASE 1A REGION. *[AFTER PHASE 2E MAIN CHANNEL FLOW SHOULD BE IN THE CONSTRUCTED CHANNEL FOR THE ENTIRE PROJECT AREA]*

MAIN CHANNEL COMPLETE

PHASE 3
AFTER PHASES 1 AND 2 ARE FINISHED, COMPLETE PHASE 3 IN ALPHABETICAL ORDER STARTING WITH PHASE 3A.

- PHASE 3A COMPLETE AS MUCH OF THIS REGION AS POSSIBLE WITHOUT IMPACTING EXISTING FLOW. CUT CHANNEL CONNECTION WITH PHASE 1C REGION. FILL EXISTING CHANNEL DOWNSTREAM OF THIS JUNCTION TO CAUSE A REDIRECTION OF FLOW INTO 1C . LEAVE UPSTREAM END OF THE EXISITING CHANNEL IN PHASE 3A REGION UNTIL FLOW IS REDIRECTED THROUGH PHASE 1B REGION DURING PHASE 3B. CONNECT PHASE 3A CHANNEL TO PHASE 1B CHANNEL. AFTER PHASE 3A, TRIBUTARY CHANNEL FLOW SHOULD BE IN EXISTING CHANNEL UNTIL IT INTERSECTS WITH PLANNED CHANNEL OF PHASE 3A. BEYOND THIS POINT FLOW HAS BEEN REDIRECTED THROUGH PHASE 1C AND 2C AND MERGES WITH THE PROPOSED MAIN CHANNEL IN PHASE 1D REGION.
- PHASE 3B BUILD FROM DOWNSTREAM TO UPSTREAM. MAKE CONNECTION TO THE EXISTING CHANNEL. BLOCK FLOW OF THE EXISTING CHANNEL BY FILLING DOWNSTREAM OF THE CONNECTION. COMPLETE UPSTREAM END OF EXISTING CHANNEL AREA OF PHASE 3A. *[AFTER PHASE 3B FLOW SHOULD BE IN CONSTRUCTED CHANNEL THROUGH ENTIRE PROJECT AREA]*

TRIBUTARY COMPLETE

**PHASE 1 STATIONS**

| Phase | Alignment | Station Start/End |
|---|---|---|
| *Phase 1A* | *Main Valley* | *1+25 to 6+95* |
| *Phase 1B* | *Tributary Valley* | *1+15 to 7+80* |
| *Phase 1C* | *Tributary Valley* | *9+20 to 11+45* |
| *Phase 1D* | *Main Valley* | *19+05 to 12+95* |

**PHASE 2 STATIONS**

| Phase | Alignment | Station Start/End |
|---|---|---|
| *Phase 2A* | *Main Valley* | *12+95 to 14+91* |
| *Phase 2B* | *Main Valley* | *10+50 to 19+05* |
| *Phase 2C* | *Tributary Valley* | *11+45 to 12+65* |
| *Phase 2D* | *Main Valley* | *6+95 to 10+50* |
| *Phase 2E* | *Main Valley* | *0 to 1+25* |

**PHASE 3 STATIONS**

| Phase | Alignment | Station Start/End |
|---|---|---|
| *Phase 3A* | *Tributary Valley* | *7+80 to 9+20* |
| *Phase 3B* | *Tributary Valley* | *0 to 1+15* |

** PHASE BOUNDARIES ARE APPROXIMATE AND MAY BE MODIFIED AT THE DISCRETION OF PROJECT ENGINEER OR TECHNICAL REPRESENTATIVE*

TECHNICAL SERVICE AREA #7

**PREPARED BY:**

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**
**GORMAN CREEK STREAM RESTORATION**

WABASHA SOIL & WATER CONSERVATION DISTRICT
WABASHA COUNTY, MINNESOTA

PHASING PLAN VIEW | SHEET 3 OF 13

PHASE 1B

PLAN VIEW PHASE 1B

PHASE 1C

PLAN VIEW PHASE 1C

PHASE 1A

PLAN VIEW PHASE 1A

MAJOR GRADE BREAK

PHASE 1D

PLAN VIEW PHASE 1D

FLOW

## LEGEND

CONTOUR, INDEX _____ 800

CONTOUR _____

CONTOUR, INDEX PROPOSED _____ 800

CONTOUR PROPOSED _____

EXISTING FENCE/PROPERTY LINE _____

TREES TO PRESERVE _____

DETAIL CALLOUTS _____ DETAIL SHEET

EXISTING CHANNEL FILL _____

SEE SWCD TECHNICAL SUPPORT DOC

VALLEY CENTERLINE _____

CHANNEL CENTERLINE _____

TEMPORARY SOIL STOCKPILE (T.S.S.L) _____

*Scale applies to all plan views*

30 0 30 60 90

SCALE IN FEET

N

HABITAT STRUCTURE DETAILS:
FOR A LEGEND OF ALL HABITAT SYMBOLS, SEE SHEET 3 (NOTES). FOR ADDITIONAL DETAILS ON HABITAT STRUCTURE DIMENSIONS AND PLANS SEE SHEETS 11-12

SALVAGING AND SPREADING TOPSOIL:
APPROXIMATELY 6" OF TOPSOIL SHALL BE SALVAGED FROM THE PROPOSED DISTURBED AREA. A MINIMUM OF 3" OF TOPSOIL SHALL BE SPREAD ON DISTURBED AREAS.

TECHNICAL SERVICE AREA #7

**PREPARED BY:**

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |

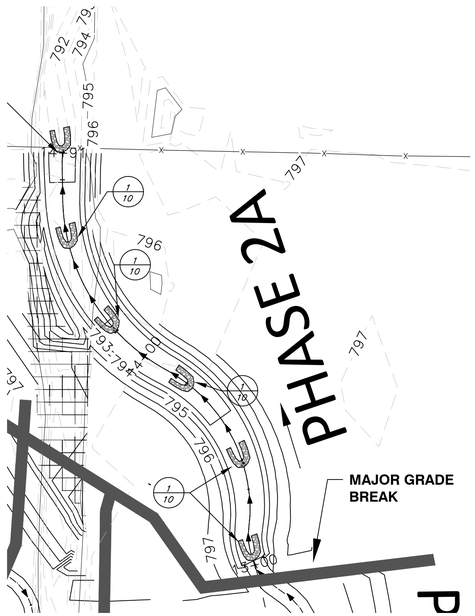
PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**

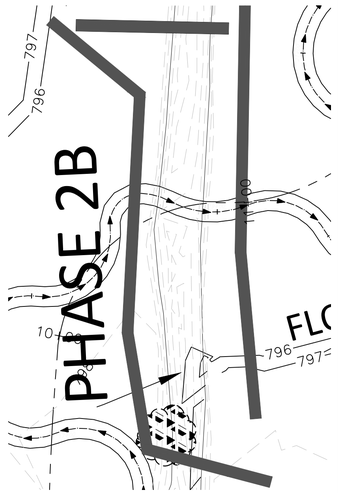
**GORMAN CREEK STREAM RESTORATION**

**WABASHA SOIL & WATER CONSERVATION DISTRICT**
**WABASHA COUNTY, MINNESOTA**

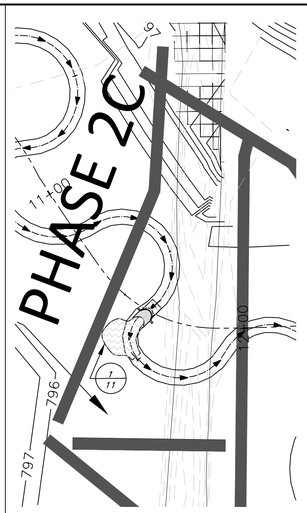
PHASE 1 PLAN VIEWS | SHEET 4 OF 13



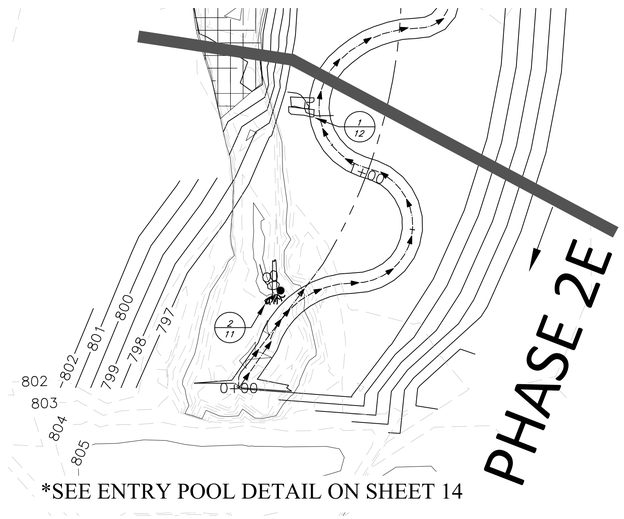

PLAN VIEW PHASE 2A




PLAN VIEW PHASE 2B

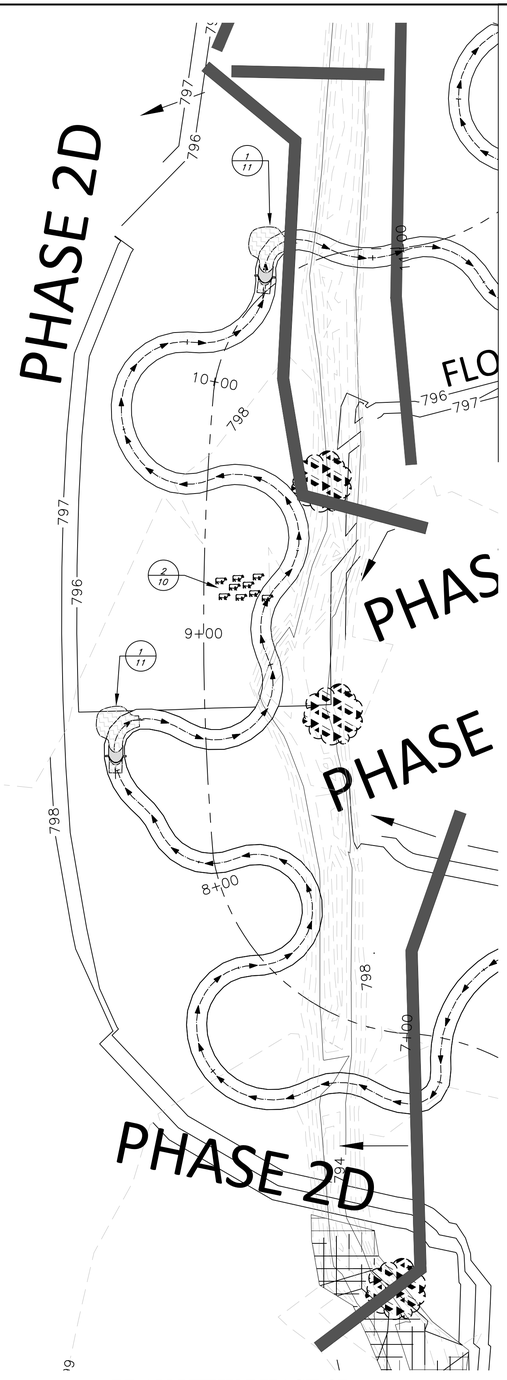



PLAN VIEW PHASE 2C

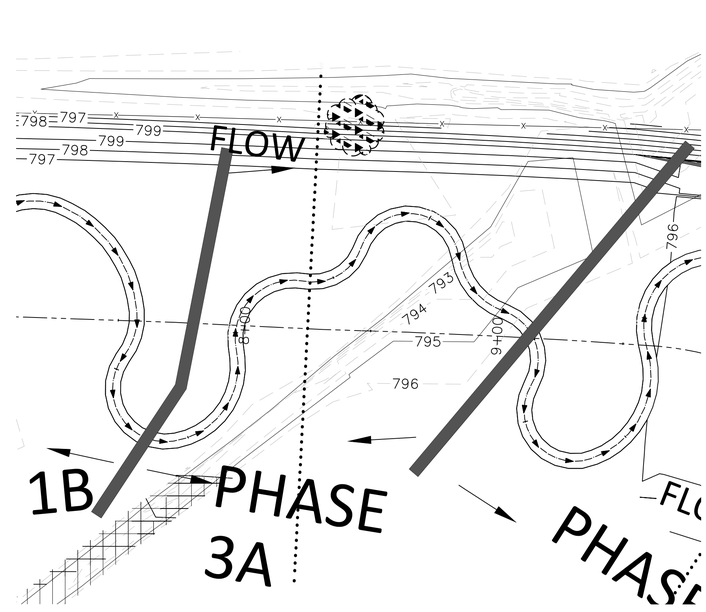



*SEE ENTRY POOL DETAIL ON SHEET 14

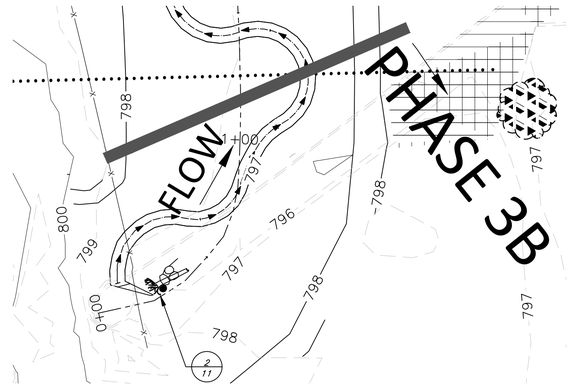
PLAN VIEW PHASE 2E




PLAN VIEW PHASE 2D




PLAN VIEW PHASE 3A




PLAN VIEW PHASE 3B

## LEGEND

CONTOUR, INDEX _____ 800

CONTOUR _____

CONTOUR, INDEX PROPOSED _____ 800

CONTOUR PROPOSED _____

EXISTING FENCE/PROPERTY LINE _____

TREES TO PRESERVE _____

DETAIL CALLOUTS _____ DETAIL SHEET

EXISTING CHANNEL FILL _____

VALLEY CENTERLINE _____

CHANNEL CENTERLINE _____

*Scale applies to all plan views

30 0 30 60 90

SCALE IN FEET

N

SEE SWCD TECHNICAL SUPPORT TOO

HABITAT STRUCTURE DETAILS:
FOR A LEGEND OF ALL HABITAT SYMBOLS, SEE SHEET 3 (NOTES). FOR ADDITIONAL DETAILS ON HABITAT STRUCTURE DIMENSIONS AND PLANS SEE SHEETS 11-12

SALVAGING AND SPREADING TOPSOIL:
APPROXIMATELY 6" OF TOPSOIL SHALL BE SALVAGED FROM THE PROPOSED DISTURBED AREA. A MINIMUM OF 3" OF TOPSOIL SHALL BE SPREAD ON DISTURBED AREAS.

TECHNICAL SERVICE AREA #7

PREPARED BY:

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

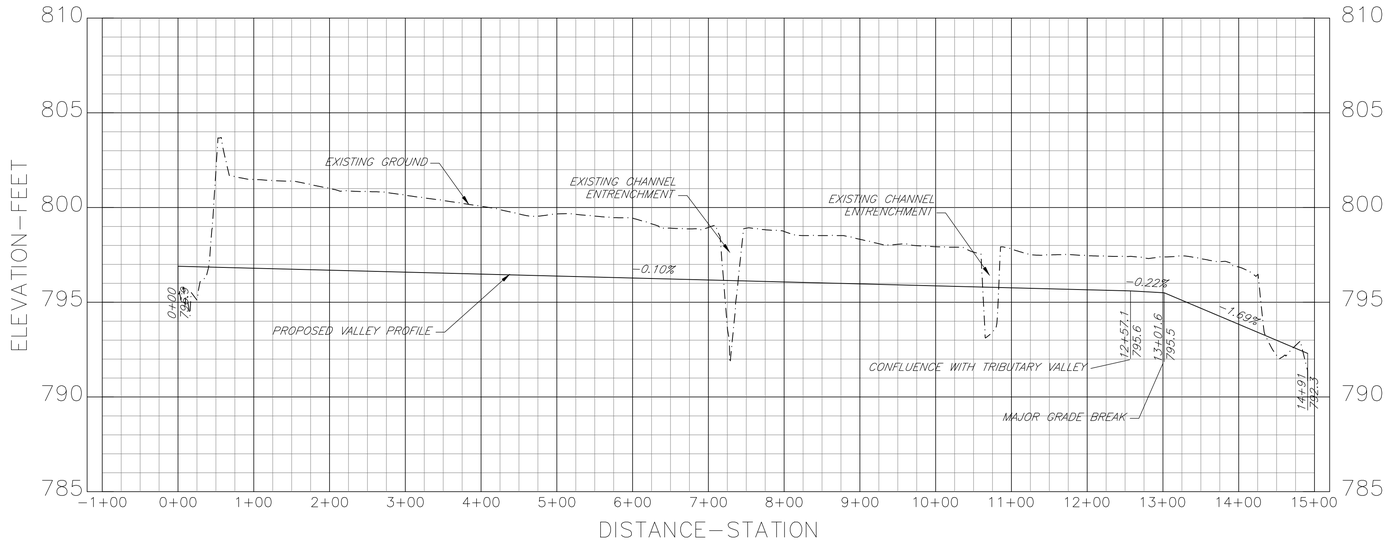
**MILLER/McNALLAN**

**GORMAN CREEK STREAM RESTORATION**

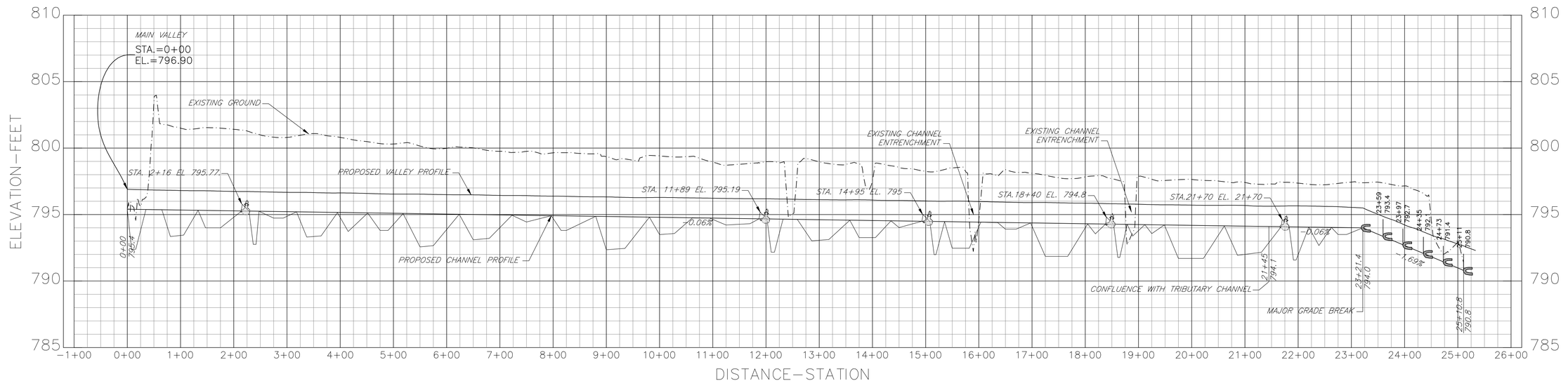
WABASHA SOIL & WATER CONSERVATION DISTRICT
WABASHA COUNTY, MINNESOTA

PHASE 2 PLAN VIEWS | SHEET 5 OF 13

## PROFILE ALONG CENTERLINE OF MAIN VALLEY CENTERLINE




## PROFILE ALONG CENTERLINE OF MAIN CHANNEL CENTERLINE




*SYMBOLS SHOWN REPRESENT GRADE CONTROLL STRUCTURES ONLY, ADDITIONAL STRUCTURES ARE SHOWN AND SHOWN IN PLAN VIEWS (PAGES 4–6)

**SUPPORT IDB**
**SE SWCD TECHNICAL**

### CROSS SECTIONS LEGEND

ORIGINAL GROUND
PROPOSED GROUND
HAMMERHEAD POOL
CROSS VANE-V

TECHNICAL SERVICE AREA #7

**PREPARED BY:**

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

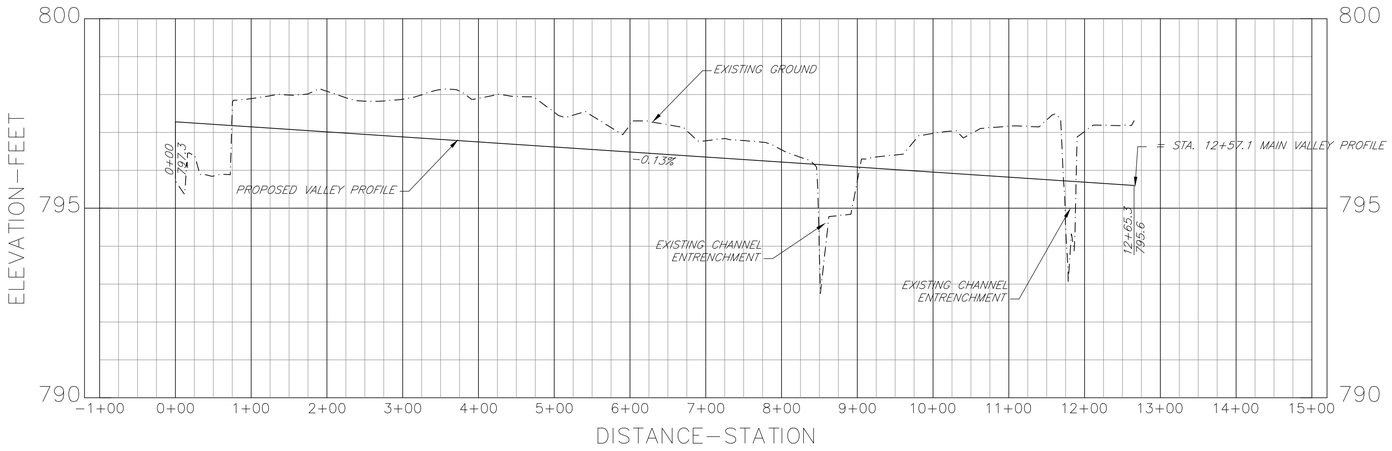
PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**
**GORMAN CREEK STREAM RESTORATION**

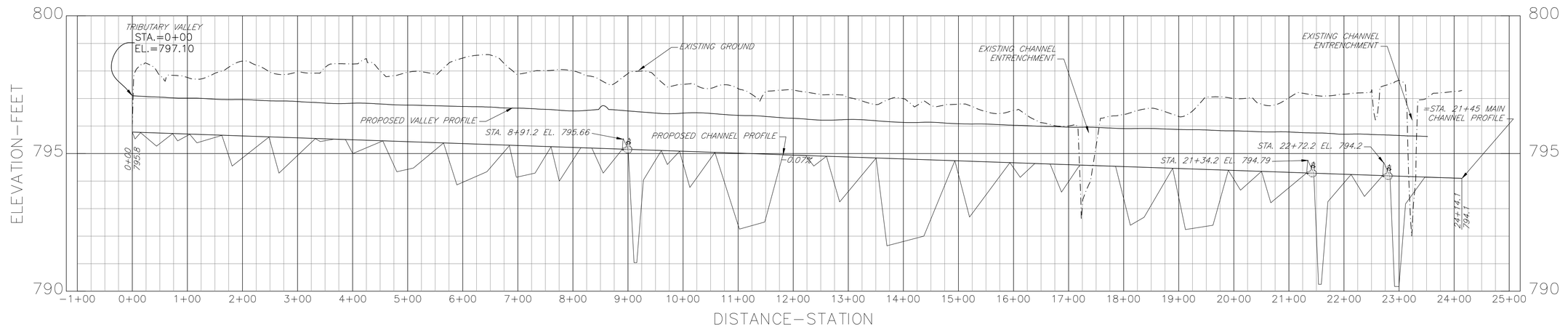
**WABASHA SOIL & WATER CONSERVATION DISTRICT**
**WABASHA COUNTY, MINNESOTA**

PROFILES - MAIN CHANNEL

## PROFILE ALONG CENTERLINE OF TRIBUTARY VALLEY CENTERLINE




## PROFILE ALONG CENTERLINE OF TRIBUTARY CHANNEL CENTERLINE




*SYMBOLS SHOWN REPRESENT GRADE CONTROLL STRUCTURES ONLY, ADDITIONAL STRUCTURES SHOWN IN PLAN VIEWS (PAGES 4–6)

SUPPORT JPB
SE SWCD TECHNICAL

CROSS SECTIONS LEGEND

ORIGINAL GROUND
PROPOSED GROUND
HAMMERHEAD POOL

TECHNICAL SERVICE AREA #7

PREPARED BY:

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

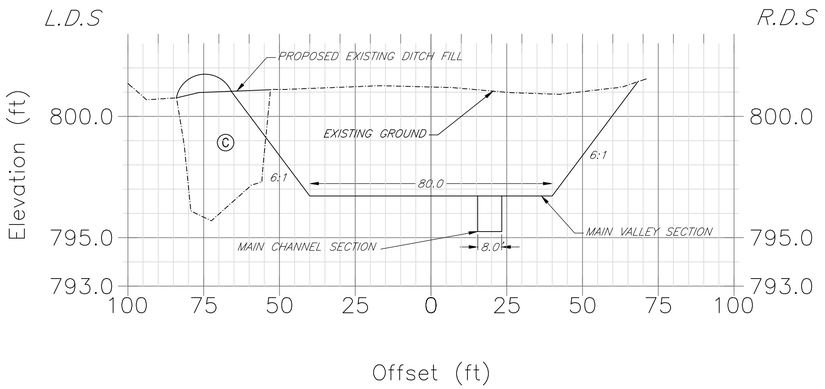
**MILLER/McNALLAN**

**GORMAN CREEK STREAM RESTORATION**

WABASHA SOIL & WATER CONSERVATION DISTRICT
WABASHA COUNTY, MINNESOTA

PROFILES - TRIBUTARY

## STA. 1+75 ALONG Main Valley Centerline



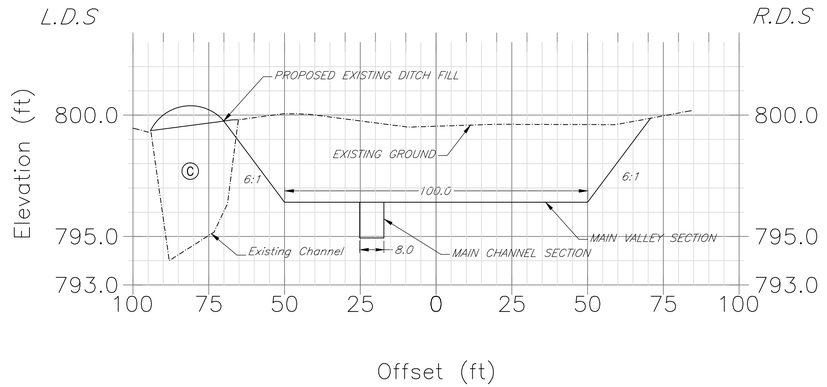

*80ft BOTTOM WIDTH TYPICAL CROSS SECTION*

*STA. 0+00 to STA. 2+25.9*

*STA. 12+50.9 to STA.12+85*

* ACTUAL CHANNEL SHAPE SHALL BE PARABOLIC AND VARY THROUGHOUT LENGTH OF ALIGNMENT

## STA. 4+75 ALONG Main Valley Centerline




*100ft BOTTOM WIDTH TYPICAL CROSS SECTION*

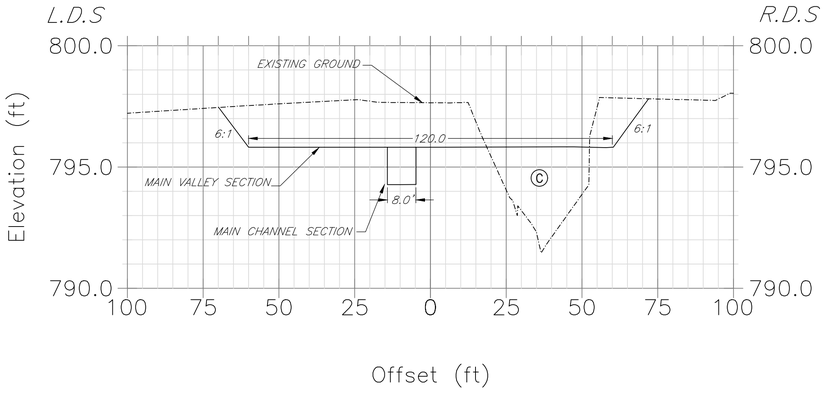
*STA. 2+25.9 to STA. 5+75.9*

*STA. 7+75.9 to STA. 10+25.9*

*STA. 12+25.9 to STA. 12+50.9*

* ACTUAL CHANNEL SHAPE SHALL BE PARABOLIC AND VARY THROUGHOUT LENGTH OF ALIGNMENT

## STA. 10+50 ALONG Main Valley Centerline



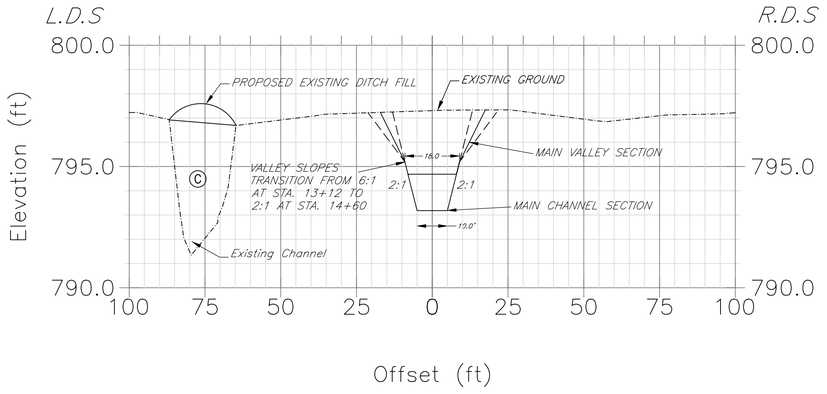

*120ft BOTTOM WIDTH TYPICAL CROSS SECTION*

*STA. 5+75.9 to STA. 7+75.9*

*STA. 10+25.9 to STA. 12+25.9*

* ACTUAL CHANNEL SHAPE SHALL BE PARABOLIC AND VARY THROUGHOUT LENGTH OF ALIGNMENT

## STA. 13+50 ALONG Main Valley Centerline




*18ft BOTTOM WIDTH TYPICAL CROSS SECTION*

*STA. 13+01.6 to STA. 14+91*

**SUPPORT JOB SE SWCD TECHNICAL**

**CROSS SECTIONS LEGEND**

ORIGINAL GROUND _____

PROPOSED GROUND _____

COMPACTED FILL _____ Ⓒ

**PREPARED BY:**

TECHNICAL SERVICE AREA #7

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

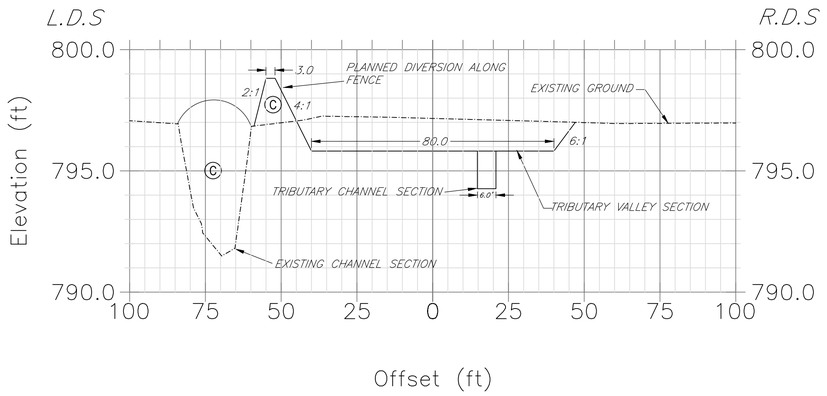
**MILLER/McNALLAN**

**GORMAN CREEK STREAM RESTORATION**

**WABASHA SOIL & WATER CONSERVATION DISTRICT**
**WABASHA COUNTY, MINNESOTA**

CROSS-SECTIONS - MAIN CHANNEL | SHEET 8 OF 13

## STA. 11+00 ALONG Tributary Valley Centerline



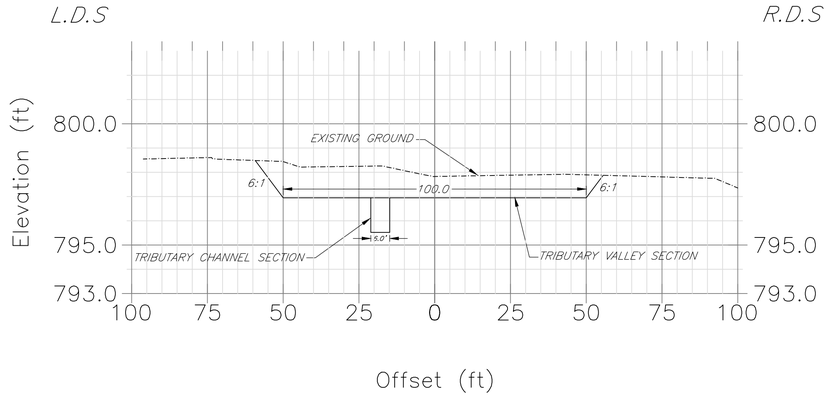

80ft BOTTOM WIDTH TYPICAL CROSS SECTION

STA. 0+00 to STA. 1+72.1

STA. 10+72.1 to STA.11+72.1

* ACTUAL CHANNEL SHAPE SHALL BE PARABOLIC AND VARY THROUGHOUT LENGTH OF ALIGNMENT

## STA. 2+50 ALONG Tributary Valley Centerline



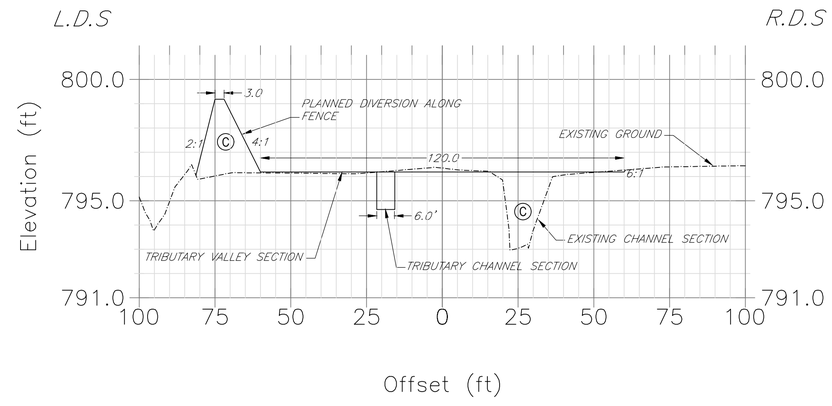

100ft BOTTOM WIDTH TYPICAL CROSS SECTION

STA. 1+72.1 to STA. 347.1

STA. 9+72.1 to STA.10+72.1

* ACTUAL CHANNEL SHAPE SHALL BE PARABOLIC AND VARY THROUGHOUT LENGTH OF ALIGNMENT

## STA. 8+25 ALONG Tributary Valley Centerline

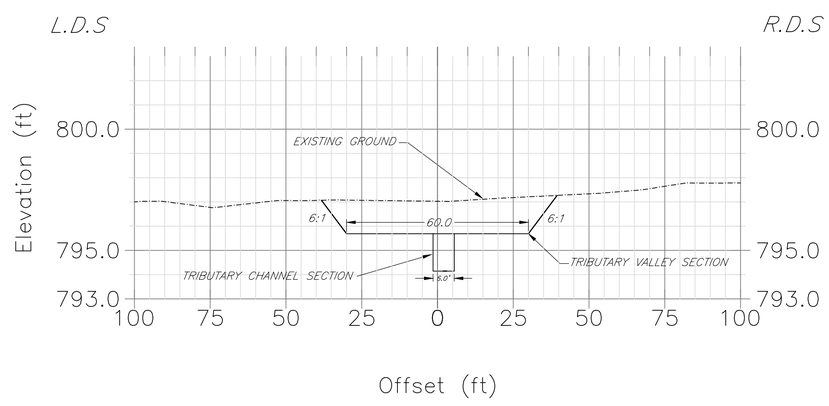



120ft BOTTOM WIDTH TYPICAL CROSS SECTION

STA. 3+47.1 to STA. 9+72.1

* ACTUAL CHANNEL SHAPE SHALL BE PARABOLIC AND VARY THROUGHOUT LENGTH OF ALIGNMENT

## STA. 12+00 ALONG Tributary Valley Centerline




60ft BOTTOM WIDTH TYPICAL CROSS SECTION

STA. 11+72.1 to STA. 12+65.1

* ACTUAL CHANNEL SHAPE SHALL BE PARABOLIC AND VARY THROUGHOUT LENGTH OF ALIGNMENT

**SUPPORT IDP**
**SE SWCD TECHNICAL**

CROSS SECTIONS LEGEND

ORIGINAL GROUND
PROPOSED GROUND
COMPACTED FILL
Ⓒ

**PREPARED BY:**

TECHNICAL SERVICE AREA #7

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

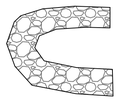
**MILLER/McNALLAN**
**GORMAN CREEK STREAM RESTORATION**

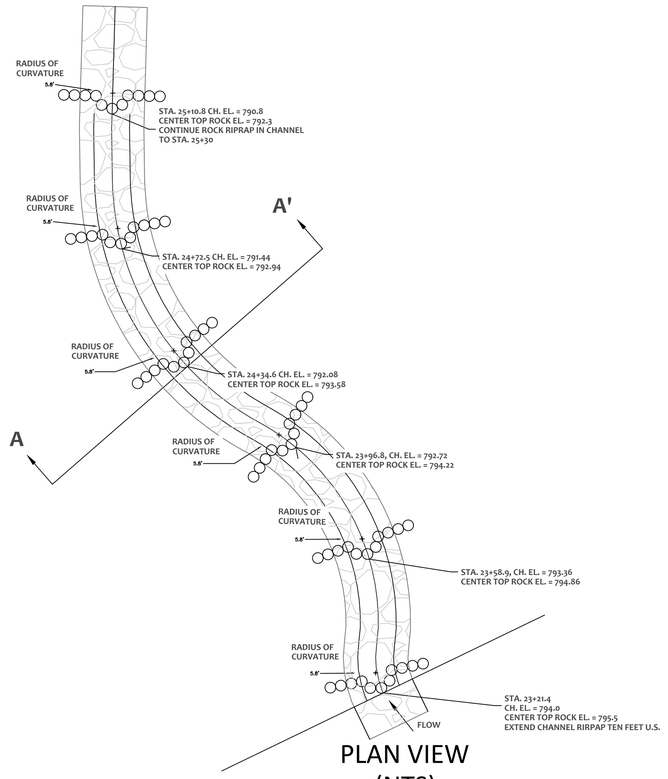
WABASHA SOIL & WATER CONSERVATION DISTRICT
WABASHA COUNTY, MINNESOTA

CROSS-SECTIONS - TRIBUTARY | SHEET 9 OF 13

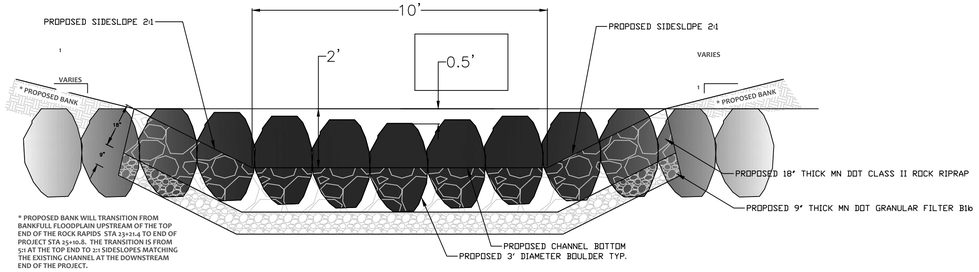
ROCK ARCH RAPIDS SYMBOL

1/10






PLAN VIEW
(NTS)



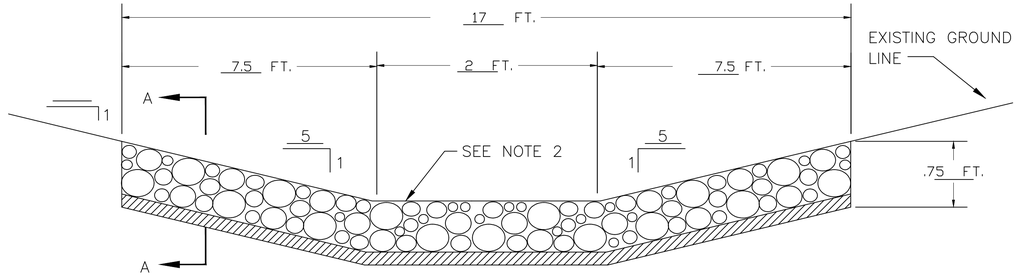

SECTION A-A' TYPICAL
(NTS)

ROCK ARCH RAPIDS

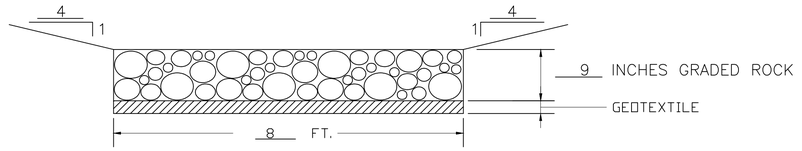
*SOD MATS ARE TO BE USED AS A FINISHED SURFACE WHERE POSSIBLE AND SOURCED FROM ADJACENT WORK LIMITS AS DIRECTED BY THE ENGINEER OR TECHNICAL REPRESENTATIVE*

**SUPPORT JPB**
**SE SWCD TECHNICAL**

CONTRACTOR SHALL ANTICIPATE ADJUSTING OR RESETTING UP TO A MAXIMUM OF 25% OF BOULDERS AS DIRECTED BY THE ENGINEER OR APPOINTED REPRESENTATIVE TO ASSURE FISH PASSAGE AND THAT FLOWS ARE DIRECTED DOWN THE CENTER OF THE CHANNEL.




PROFILE ALONG CENTERLINE OF CROSSING (STA. 16+35 MAIN CH.)




SECTION A–A

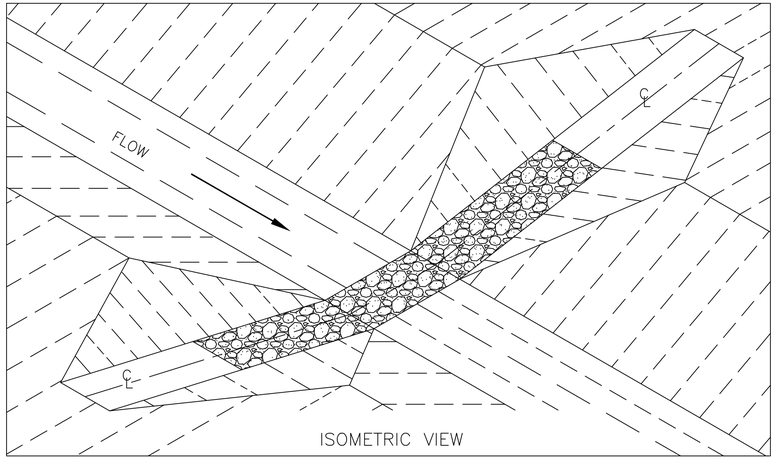
| QUANTITY ESTIMATE* | |
|---|---|
| EXCAVATION | 5 CU. YD. |
| GEOTEXTILE WOVEN/NON WOVEN CLASS _____ | 50 SQ. YDS. |
| GRADED ROCK | 5 CU. YD. |

GRADED ROCK: 100% PASSING THE BASE COURSE THICKNESS DIMENSION WITH A MAX. OF 10% PASSING THE 3/4" SIEVE. ALL SIZES BETWEEN THE LIMITS ARE TO BE REPRESENTED.

*ESTIMATED TO THE NEAT LINES AND GRADES

NOTES:

1. COMPACT SURFACING MATERIAL BY EQUIPMENT TRAVEL.
2. CROSSINGS SHALL HAVE THE TOP–MOST SURFACE LAYER AT THE SAME LEVEL AS THE NATURAL STREAMBED IMMEDIATELY UPSTREAM AND DOWNSTREAM FROM THE CROSSING.
3. USE SPAWN BEDDING MATERIAL IN CHANNEL (ONLY) TO FILL SURFACE.
4. MAIN CHANNEL START STATION 16+35
5. SOD MATS ARE TO BE USED AS A FINISHED SURFACE WHERE POSSIBLE AND SOURCED FROM ADJACENT WORK LIMITS AS DIRECTED BY THE ENGINEER OR TECHNICAL REPRESENTATIVE




ISOMETRIC VIEW

GRADED ROCK MATERIAL GRADATION

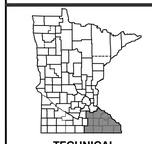
| PERCENT PASSING BY WEIGHT | SIZE (INCHES) |
|---|---|
| 100 | 4.5" – 6" |
| 85 | 3.9" – 5.4" |
| 50 | 3" – 3.9" |
| 15 | 0.9" – 1.5" |

GRADED ROCK CROSSING
(GEOTEXTILE BASE)

CATTLE CROSSING

2/10

USDA United States Department of Agriculture
Natural Resources Conservation Service



TECHNICAL SERVICE AREA #7

**PREPARED BY:**

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

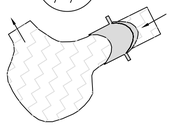
**MILLER/McNALLAN**
**GORMAN CREEK STREAM RESTORATION**

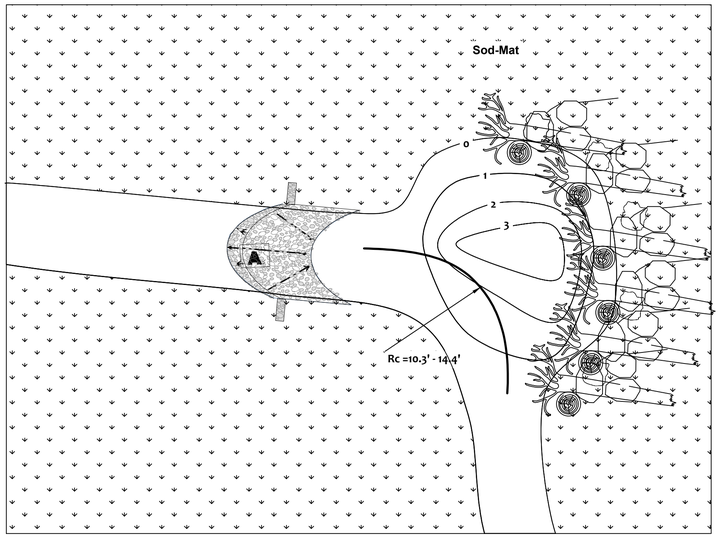
**WABASHA SOIL & WATER CONSERVATION DISTRICT**
**WABASHA COUNTY, MINNESOTA**

DETAILS | SHEET 10 OF 13

HAMMERHEAD POOL SYMBOL

1/11





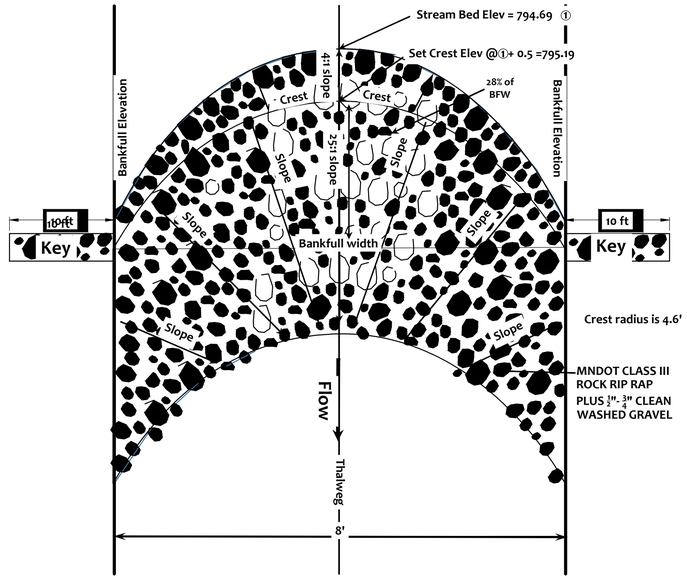

*DEPTH SHOWN IS FOR EXAMPLE, ACTUAL DEPTH WILL VARY FROM 3 TO 5 FEET

| MATERIALS - HAMMERHEAD POOL (PER STRUCTURE) | | |
|---|---|---|
| ITEM | UNITS | QTY |
| MNDOT CLASS III ROCK RIP RAP | C.Y. | 13 |
| 1½", ¾" WASHED CLEAN GRAVEL | C.Y. | 3 |
| 6"-15", 8' LOGS W/ ROOT WAD | EA. | 28 |
| 6"-15", 10' FOOTER LOGS | EA. | 14 |
| 15"-24" LOG ROOTWAD ANGULAR ANCHOR ROCKS | EA. | 70 |

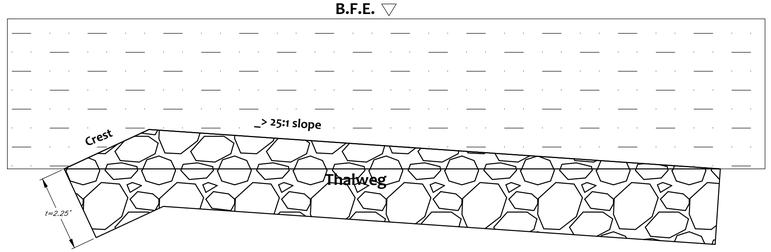
HAMMERHEAD POOL

SOD MATS ARE TO BE USED AS A FINISHED SURFACE WHERE POSSIBLE AND SOURCED FROM ADJACENT WORK LIMITS AS DIRECTED BY THE ENGINEER OR TECHNICAL REPRESENTATIVE

**Rock riffle design planview**




**Centerline profile**

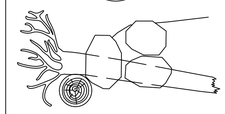


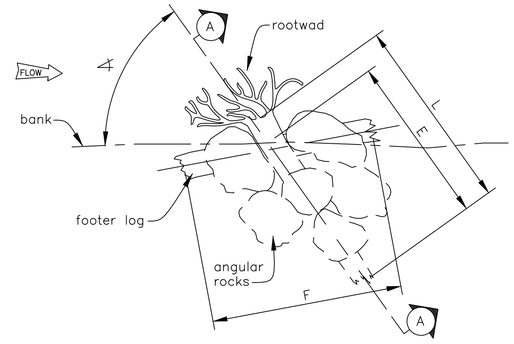

**RIFFLE CREST ELEVATION**

| MAIN CHANNEL ℄ | |
|---|---|
| STATION ALONG ℄ | ELEVATION AT RIFFLE CREST |
| 2+16 | 795.77 |
| 11+89 | 795.19 |
| 14+95 | 795 |
| 18+40 | 794.8 |
| | |
| TRIBUTARY CHANNEL ℄ | |
| STATION ALONG ℄ | ELEVATION AT RIFFLE CREST |
| 8+91.2 | 795.66 |
| 21+34.3 | 794.79 |
| 22+72.2 | 794.7 |

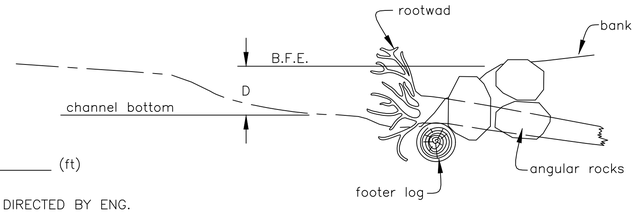
LOG ROOTWAD SYMBOL

2/11






PLAN VIEW




SECTION A

DIMENSIONS

D = 1.5 (ft)

ROOTWAD

Species AS DIRECTED BY ENG. OR CONST. INSPECTOR

Dia = 6 min (in) 12 max (in)

L = 7 min (ft) 10 max (ft)

E = 5 min (ft) 8 max (ft)

∠ = AS DIRECTED BY ENG. OR CONST. INSPECTOR deg

FOOTER LOG

Species AS DIRECTED BY ENG. OR CONST. INSPECTOR

Dia = 6 min (in) 12 max (in)

F = 10 min (ft) 15 max (ft)

ANGULAR ROCKS

Dia = 15 min (in) 24 max (in)

# of rocks per structure 5

B.F.E. = BANKFULL FLOW ELEVATION

GENERAL NOTES

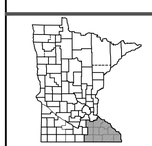
1. Top of footer log shall be one foot below lowest streambed elevation.
2. This standard drawing requires supporting technical documentation prior to use and must be adapted to the specific site.

LOG ROOTWAD DETAIL

drawing not to scale

SOD MATS ARE TO BE USED AS A FINISHED SURFACE WHERE POSSIBLE AND SOURCED FROM ADJACENT WORK LIMITS AS DIRECTED BY THE ENGINEER OR TECHNICAL REPRESENTATIVE

**PREPARED BY:**



TECHNICAL SERVICE AREA #7

**SUPPORT JPB SE SWCD TECHNICAL**

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

| REVISIONS: | | |
|---|---|---|
| BY: | DATE: | DESCRIPTION: |
| | | |
| | | |
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**

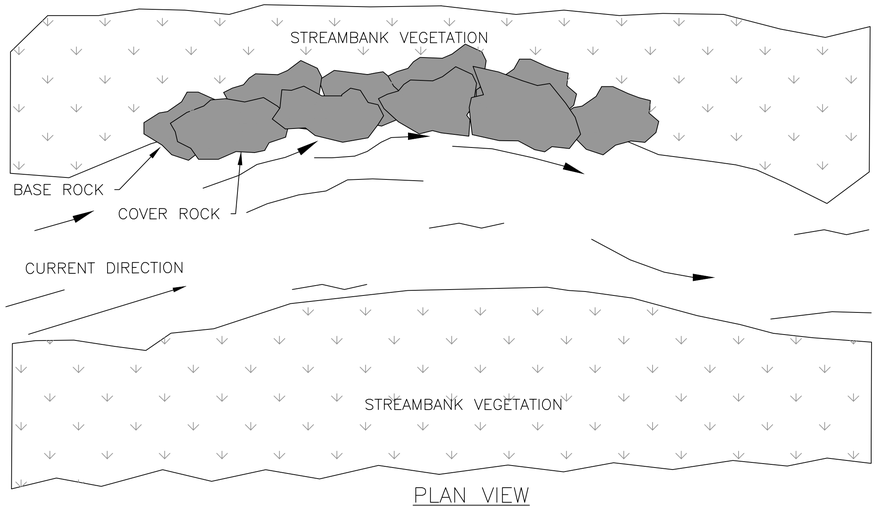
**GORMAN CREEK STREAM RESTORATION**

**WABASHA SOIL & WATER CONSERVATION DISTRICT**
**WABASHA COUNTY, MINNESOTA**

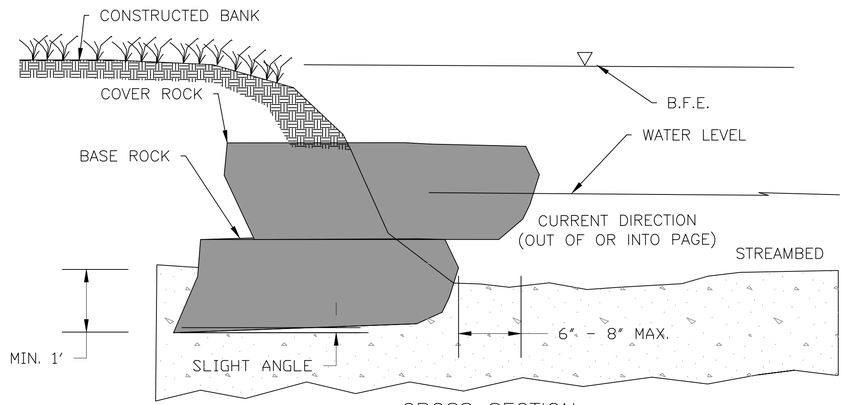
DETAILS | SHEET 11 OF 13

COVER ROCK SYMBOL

1/12




PLAN VIEW




CROSS SECTION

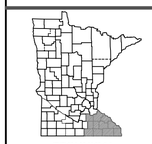
- AVERAGE ROCK SIZE– 1.5' x 3.0'x 1.5' THICK BASE AND COVER–ROCK.
- BASE ROCK IS TO BE EXCAVATED INTO BOTTOM WITH SLIGHT PITCH AWAY FROM STREAM BED STREAM SIDE OF ROCK IS HIGHER THAN BANK SIDE
- COVER ROCK CAN EXTEND PAST OUTSIDE OF BASE ROCK ON BANK SIDE OF BASE ROCK AND IS PREFERRED.
- USE BOULDERS WITH IRREGULARITIES OR MULTIPLE BOULDERS TOGETHER TO PROVIDE SLIGHT OVERHANGING COVER.
- PLACE BOULDERS SO CURRENT WILL BE DEFLECTED AS SHOWN ON PLAN VIEW
- SOD MATS ARE TO BE USED AS A FINISHED SURFACE WHERE POSSIBLE AND SOURCED FROM ADJACENT WORK LIMITS AS DIRECTED BY THE ENGINEER OR TECHNICAL REPRESENTATIVE

**Cover Rock Practice Stationing**

| -lignment | Start Station | End Station |
|---|---|---|
| *Tributary* | *4+64* | *4+72* |
| *Tributary* | *5+76* | *5+84* |
| *Main* | *1+62* | *1+70* |
| *Main* | *3+34* | *3+42* |
| *Main* | *5+40* | *5+48* |

**SUPPORT JPB**
**SE SWCD TECHNICAL**

COVER ROCK
(NTS)



TECHNICAL SERVICE AREA #7

**PREPARED BY:**

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

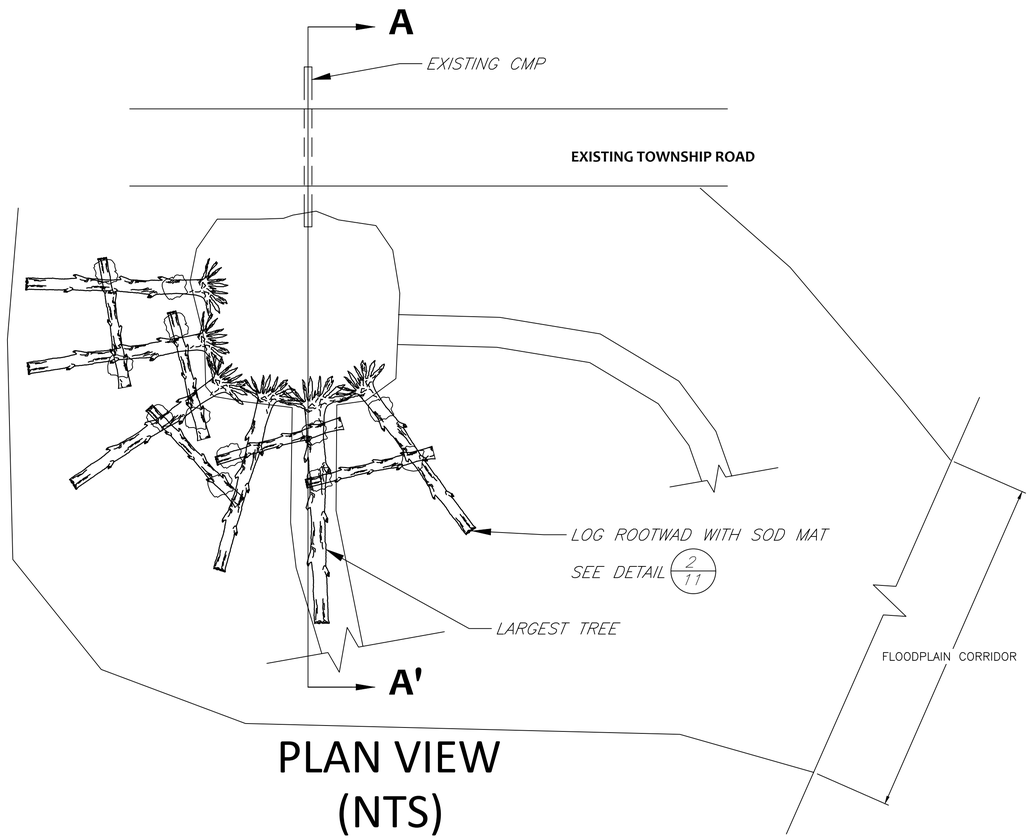
PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**
**GORMAN CREEK STREAM RESTORATION**

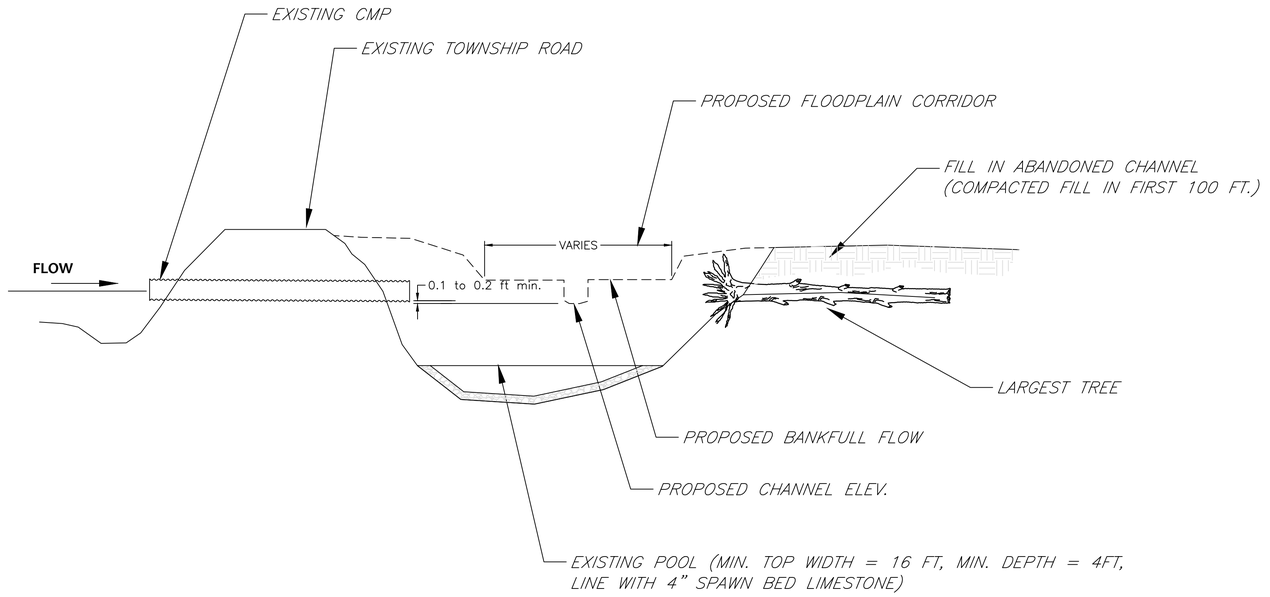
**WABASHA SOIL & WATER CONSERVATION DISTRICT**
**WABASHA COUNTY, MINNESOTA**

DETAILS | SHEET 12 OF 13

# MAIN AND TRIBUTARY CHANNEL
# STARTING POOL TYPICAL
# (NTS)




## PLAN VIEW
## (NTS)




## SECTION A-A' TYPICAL
## (NTS)

SOD MATS ARE TO BE USED AS A FINISHED SURFACE WHERE POSSIBLE AND SOURCED FROM ADJACENT WORK LIMITS AS DIRECTED BY THE ENGINEER OR TECHNICAL REPRESENTATIVE

**SUPPORT JDB**
**SE SWCD TECHNICAL**

**PREPARED BY:**

TECHNICAL
SERVICE AREA #7

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: _____ TYPED NAME: PETER R. FRYER, P.E.

DATE: _____ LIC. NO. 25268

| | | DATE |
|---|---|---|
| DESIGNED | M. KEMPINGER / P. FRYER | 6/2021 |
| DRAWN | M. KEMPINGER / C. NELSON/ P. FRYER | 8/2021 |
| CHECKED | C. NELSON/K. ZYTKOVICZ | ---- |

REVISIONS:

| BY: | DATE: | DESCRIPTION: |
|---|---|---|
| | | |
| | | |
| | | |

PROJECT ID: WA20056 NRCS Engineering Job Class: V

**MILLER/McNALLAN**
**GORMAN CREEK STREAM RESTORATION**

WABASHA SOIL & WATER CONSERVATION DISTRICT
WABASHA COUNTY, MINNESOTA

DETAILS | SHEET 13 OF 13