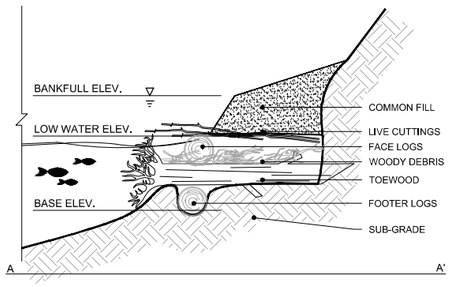
1. INSTALLATION SUMMARY

ENGINEER OR OWNER'S REPRESENTATIVE MUST BE PRESENT FOR INSTALLATION OF TOEWOOD BENCH.

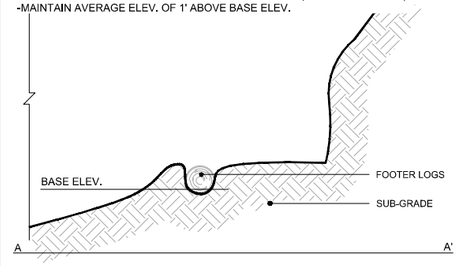
THE DRAWINGS ON THIS PAGE ARE NOT TO SCALE.

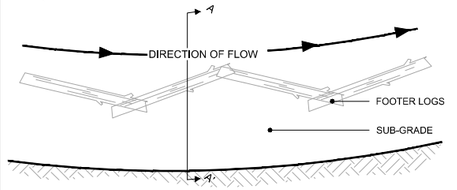


2. SUBGRADE AND FOOTER LOGS

SPECIFICATION:
-8" TO 1' DIAMETER
-LIMBS REMOVED
-APPROX 10' LENGTH

PLACEMENT:
-EXCAVATE TO BASE ELEVATION - CONTRACTOR SHALL MAKE EFFORT TO SEPARATE GRANULAR AND FINE FILL NATIVE MATERIAL FOR USE IN STEPS 4 AND 6.
-PLACE FOOTER LOGS 30 DEGREES FROM PARALLEL TO STREAM FLOW WITH ENDS STACKED CREATING A ZIG ZAG PATTERN (PLAN VIEW BELOW)
-MAINTAIN AVERAGE ELEV. OF 1' ABOVE BASE ELEV.



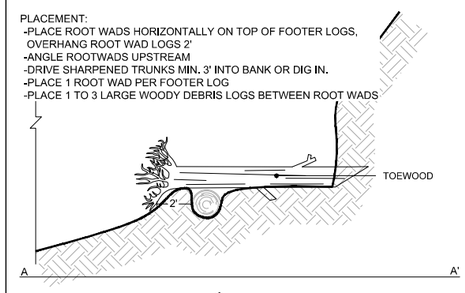


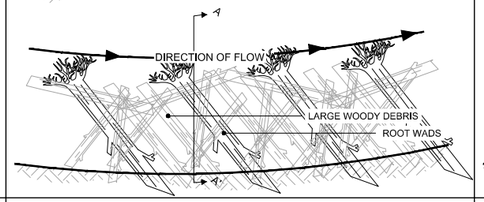
3. ROOT WADS & LRG WOODY DEBRIS

ROOT WAD SPECIFICATION:
-8" MIN DIAMETER
-LENGTH INDICATED IN DESIGN CROSS SECTION OR 8' MIN.
-LIMBS REMOVED
-ROOT WADS LEFT INTACT
-ENDS SHARPENED TO A POINT

LARGE WOODY DEBRIS SPECIFICATION:
-4" MIN DIAMETER

PLACEMENT:
-PLACE ROOT WADS HORIZONTALLY ON TOP OF FOOTER LOGS, OVERHANG ROOT WAD LOGS 2'
-ANGLE ROOTWADS UPSTREAM
-DRIVE SHARPENED TRUNKS MIN. 3' INTO BANK OR DIG IN.
-PLACE 1 ROOT WAD PER FOOTER LOG
-PLACE 1 TO 3 LARGE WOODY DEBRIS LOGS BETWEEN ROOT WADS

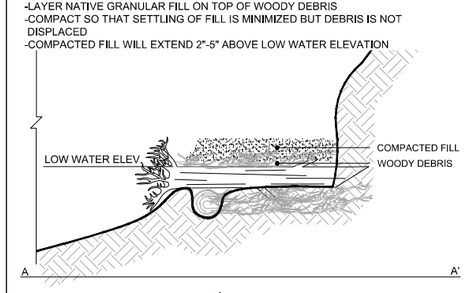


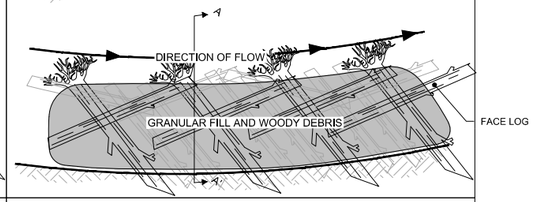


4. WOODY DEBRIS & GRANULAR FILL

SPECIFICATION:
-WOODY MATERIAL (COMPOSED OF SMALL LIMBS AND BRANCHES, APPROX. 4" MAX DIAMETER AND SMALLER)
-DO NOT USE ROTTEN WOODY MATERIAL
-NATIVE GRANULAR FILL

PLACEMENT:
-FILL BETWEEN FOOTER LOGS AND TOEWOOD WITH WOODY DEBRIS
-STACK WOODY DEBRIS TO LOW WATER ELEVATION
-LAYER NATIVE GRANULAR FILL ON TOP OF WOODY DEBRIS
-COMPACT SO THAT SETTLING OF FILL IS MINIMIZED BUT DEBRIS IS NOT DISPLACED
-COMPACTED FILL WILL EXTEND 2"-5" ABOVE LOW WATER ELEVATION

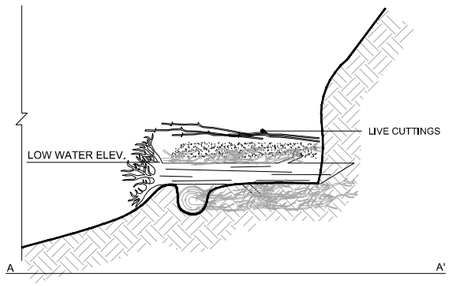


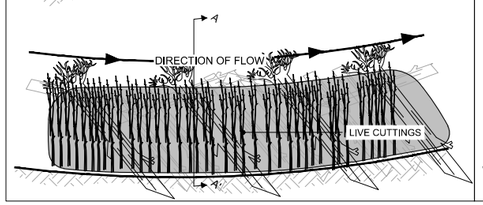


5. LIVE CUTTINGS

SPECIFICATION:
-SEE LIVE CUTTING DETAIL D-03 ON SHEET R-02

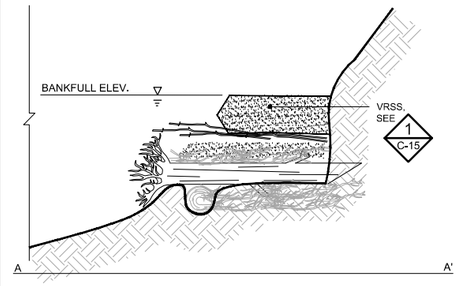
PLACEMENT:
-LAY CUTTINGS WITH A DENSITY OF 3 CUTTINGS PER LINEAL FOOT
-TOPS OF CUTTING WILL POINT TOWARD CHANNEL
-TRIM EXPOSED ENDS OF CUTTINGS, LEAVE NO MORE THAN 6" EXPOSED
-DEPOSIT NATIVE FILL OVER CUTTINGS AND WATER LIBERALLY, COMPRESS FILL TO 2"- 4" THICK OVER CUTTINGS

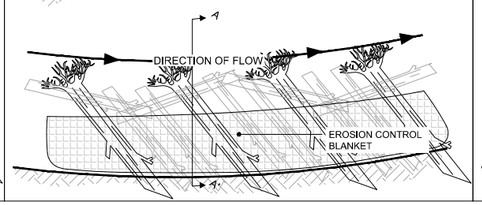




6. UPPER BANK STABILIZATION (VARIES, SEE PLANS)

STABILIZE UPPER BANK AS SPECIFIED:
-SEE VRSS DETAIL
-SEE LANDSCAPE PLANS

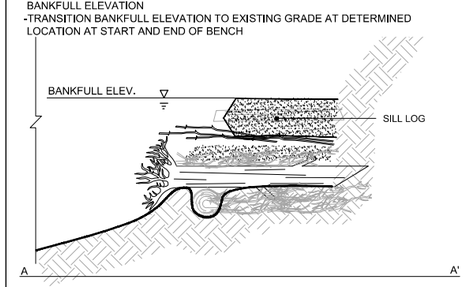


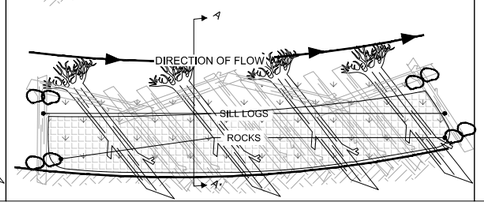


7. SILL LOGS & TERMINATION

SPECIFICATION:
-10" MIN DIAMETER
-LIMBS REMOVED
-LENGTH DETERMINED BY WIDTH OF TOEWOOD BENCH

PLACEMENT:
-PLACE ONE SILL LOG AT THE START AND END OF THE TOEWOOD BENCH PERPENDICULAR TO THE DIRECTION OF FLOW.
-PLACE LARGE ROCKS ON TOP OF SILL LOG, TOP OF ROCK WILL MEET BANKFULL ELEVATION
-TRANSITION BANKFULL ELEVATION TO EXISTING GRADE AT DETERMINED LOCATION AT START AND END OF BENCH





1 - DETAIL: TOE WOOD
NOT TO SCALE

59% DESIGN
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

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

PRINTED NAME _____

SIGNATURE _____

DATE ____ LICENSE # _____

#	BY	CHK	APP	DATE	RELEASE/REVISION DESCRIPTION
A	EPF	JCO	JCO	06/20/2025	ISSUED FOR REVIEW

BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
SUITE 200
MINNEAPOLIS, MN 55435

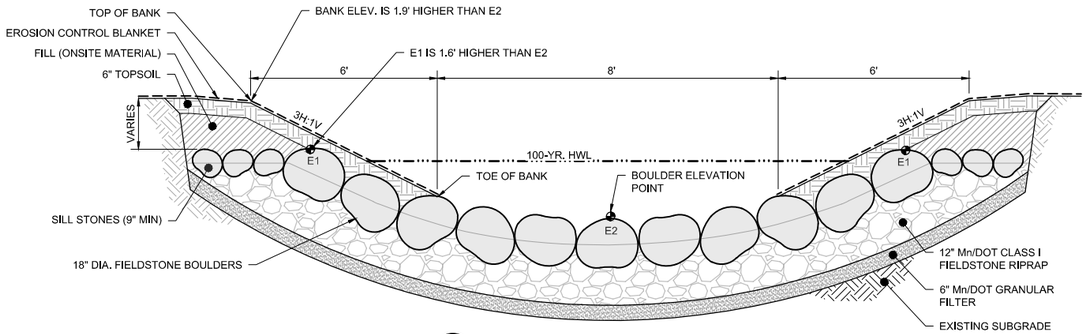
PH: 1-800-632-2277
WWW.BARR.COM
MINNESOTA ENGINEERING FIRM
NUMBER 10104111545

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION
GOLDEN VALLEY, MINNESOTA

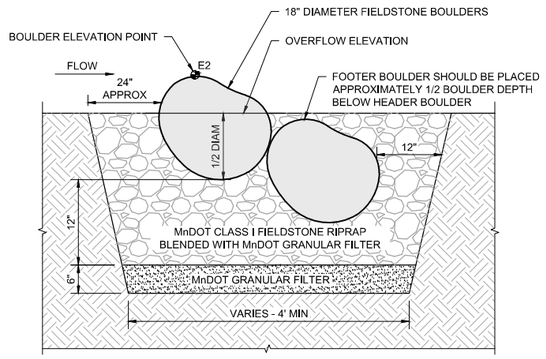
BASSETT CREEK MAIN STEM RESTORATION - PHASE 1
GOLDEN VALLEY, MINNESOTA
STREAM STABILIZATION DETAILS

BARR PROJECT # 23272114.00
DWG # C-11
REV # A

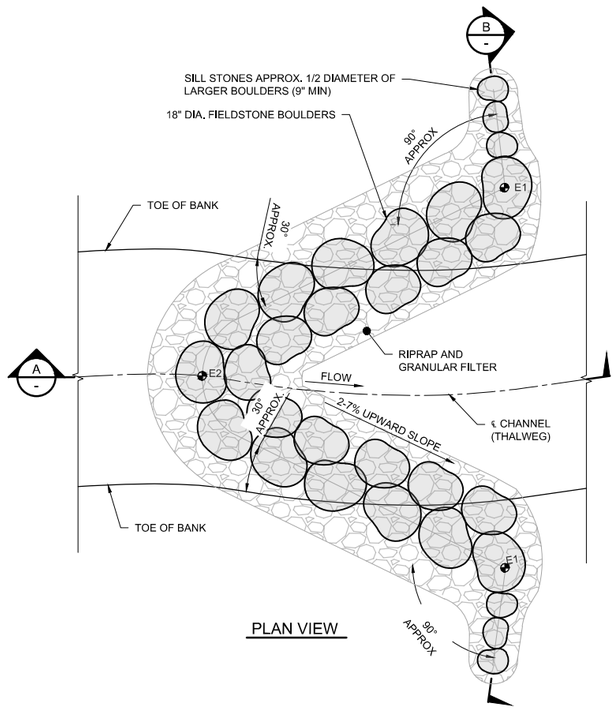
ORIGINAL DRAWING SIZE: ANSI FULL BLEED B (11.00 X 17.00 INCHES) | PLOT SCALE: 1:2 | PLOT DATE: 7/4/2025 10:38 AM
CADD USER: ERIC.P.FITZGERALD | FILE: N:\DESIGN\23272114\.00\C2327211_C-11.DWG



B - SECTION: CROSS VANE - DOUBLE BOULDER
NOT TO SCALE



A - SECTION: CROSS VANE - DOUBLE BOULDER
NOT TO SCALE

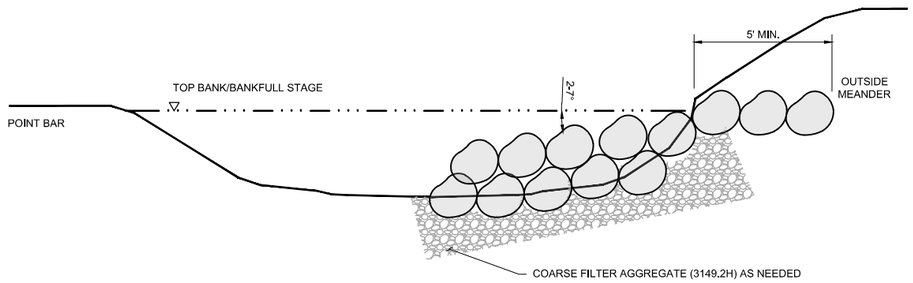


PLAN VIEW

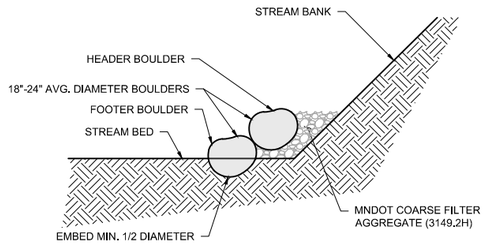
1 - DETAIL: CROSS VANE - DOUBLE BOULDER
NOT TO SCALE

NOTES:

1. CROSS VANE LOCATIONS AND ELEVATIONS ARE APPROXIMATE AND MAY BE MODIFIED IN THE FIELD BY THE ENGINEER.
2. FINAL BOULDER PLACEMENT TO BE APPROVED BY THE ENGINEER IN THE FIELD. CONTRACTOR MAY BE REQUIRED TO ADJUST BOULDER ELEVATIONS AND ROTATION.
3. THERE SHALL BE NO SIGNIFICANT GAPS BETWEEN BOULDERS. MnDOT CLASS I FIELDSTONE RIPRAP BLENDED WITH MnDOT GRANULAR FILTER SHALL BE PLACED ON THE UPSTREAM SIDE OF THE BOULDERS TO PLUG SMALL GAPS (MAY REQUIRE HAND PLACEMENT).
4. BOULDERS OF AN UNSUITABLE SHAPE MAY BE RE-LOCATED OR REJECTED.
5. INSTALL EROSION CONTROL BLANKET ON DISTURBED BANKS.



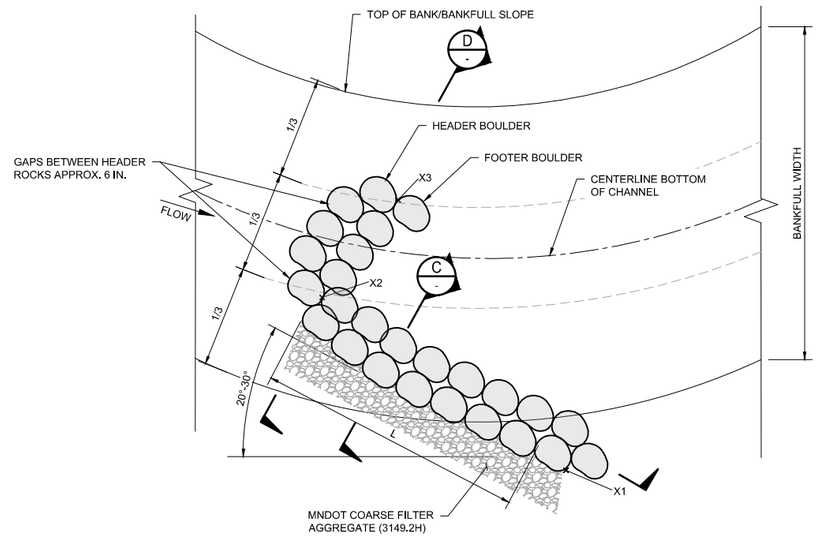
D - SECTION: J-HOOK BOULDER VANE
NOT TO SCALE



C - SECTION: J-HOOK BOULDER VANE
NOT TO SCALE

NOTES:

1. COARSE BACKFILL (MNDOT COARSE FILTER AGGREGATE) SHALL BE PLACED TO A THICKNESS EQUAL TO THE DEPTH OF THE HEADER AND FOOTER BOULDERS AND SHALL EXTEND OUT FORM THE VANE ARMS TO THE STREAM BANK.
2. THE VANE ARM OF THE BOULDER J-HOOK SHALL BE CONSTRUCTED FIRST, FOLLOWED BY THE HOOK.
3. BOULDER J-HOOK VANES SHALL BE BUILT TYPICALLY AS FOLLOWS:
   A. OVER EXCAVATE STREAM BED TO A DEPTH EQUAL TO THE TOTAL THICKNESS OF THE HEADER AND FOOTER BOULDERS.
   B. PLACE FOOTER BOULDERS OF THE VANE ARM. THERE SHALL BE NO GAPS BETWEEN BOULDERS.
   C. PLACE COARSE BACKFILL BEHIND THE FOOTER BOULDERS.
   D. INSTALL HEADER BOULDERS ON THE VANE ARM ON TOP OF AND SET SLIGHTLY BACK FROM THE FOOTER BOULDERS (SUCH THAT PART OF THE HEADER BOULDER IS RESTING ON THE COARSE BACKFILL). HEADER BOULDERS SHALL SPAN THE SEAMS OF THE FOOTER BOULDERS. THERE SHALL BE NO GAPS BETWEEN BOULDERS.
   E. PLACE COARSE BACKFILL BEHIND HEADER BOULDERS ENSURING THAT ANY VOIDS BETWEEN THE BOULDERS ARE FILLED.
   F. PLACE EACH BOULDER TO FORM THE HOOK BY INSTALLING A FOOTER BOULDER, THEN A HEADER BOULDER. GAPS AS WIDE AS 1/4 TO 1/3 THE BOULDER DIAMETER SHALL BE LEFT BETWEEN THE HOOK BOULDERS.



2 - DETAIL: J-HOOK BOULDER VANE
NOT TO SCALE

50% DESIGN
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

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

PRINTED NAME -

SIGNATURE

DATE - LICENSE # -

#	BY	CHK	APP	DATE	RELEASE/REVISION DESCRIPTION
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
A	EPF	JCO	JCO	06/20/2025	ISSUED FOR REVIEW

BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
SUITE 200
MINNEAPOLIS, MN 55435

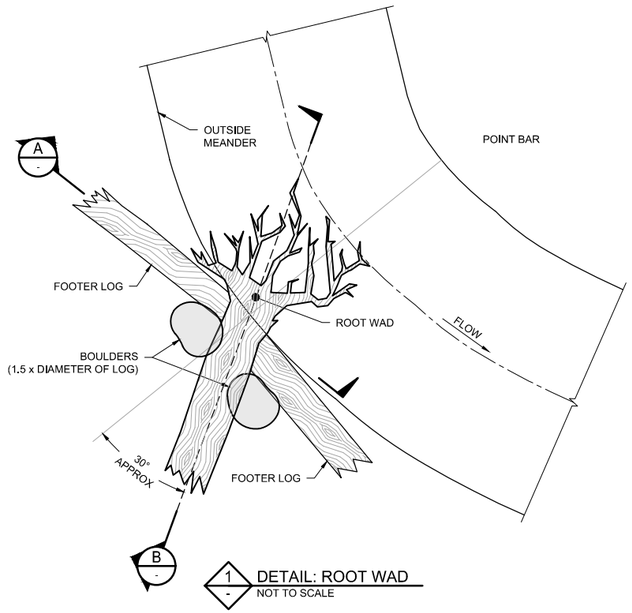
PH: 1-800-632-2277
WWW.BARR.COM
MINNESOTA ENGINEERING FIRM
NUMBER 10104111545

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION
GOLDEN VALLEY, MINNESOTA

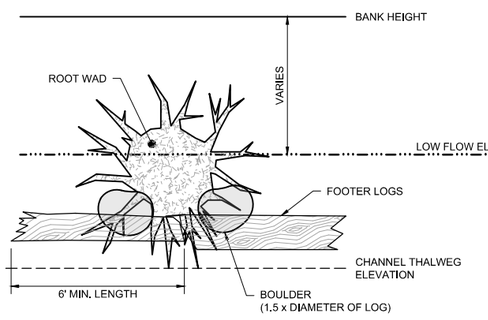
BASSETT CREEK MAIN STEM RESTORATION - PHASE 1
GOLDEN VALLEY, MINNESOTA
STREAM STABILIZATION DETAILS

BARR PROJECT # 23272114.00
DWG # C-12
REV # A

ORIGINAL DRAWING SIZE: ANSI FULL BLEED B (11.00 X 17.00 INCHES) PLOT SCALE: 1:2 PLOT DATE: 7/4/2025 10:31 AM
CAD USER: ERIC P. FITZGERALD FILE: M:\DES\GV\23272114.00\CES\23272114_C-12.DWG



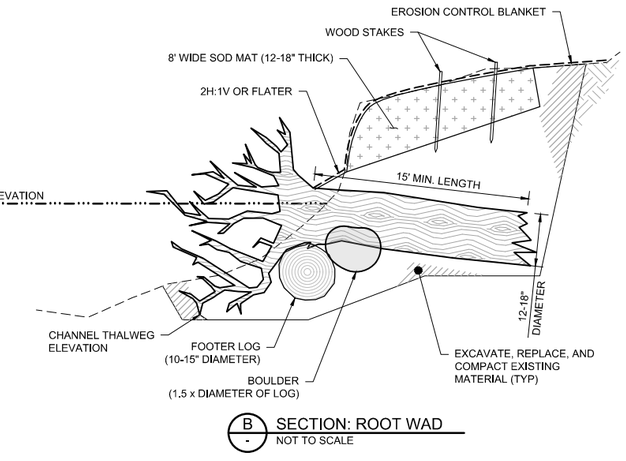
1 DETAIL: ROOT WAD
NOT TO SCALE



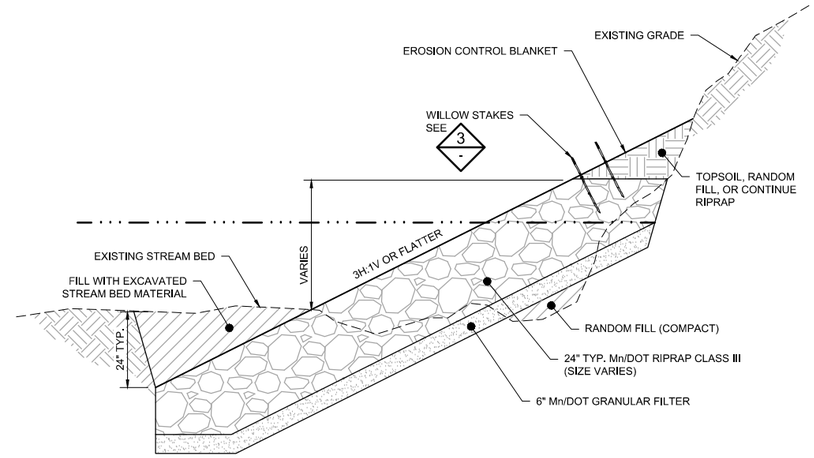
A SECTION: ROOT WAD
NOT TO SCALE

GENERAL NOTES:

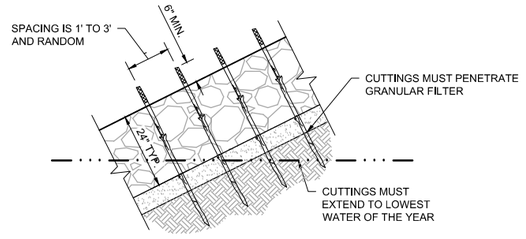
1. THE ENGINEER MUST BE NOTIFIED AT LEAST 3 DAYS PRIOR TO ROOT WAD INSTALLATION AND MUST BE ON SITE DURING INSTALLATION.
2. TO THE EXTENT POSSIBLE, ROOT WADS SHOULD BE CREATED FROM TREES THAT WILL BE REMOVED FROM THE SITES WITHIN THE PROJECT AREA.
3. CONSTRUCTION SHOULD PROCEED FROM DOWNSTREAM TO UPSTREAM IN AREAS WHERE MORE THAN ONE ROOT WAD WILL BE INSTALLED AS SHOWN ON THE DRAWINGS.
4. EXCAVATE A TRENCH ALONG THE STREAMBANK TOE FOR THE FOOTER LOGS.
5. PLACE THE FOOTER LOGS INTO THE TRENCH, WITH THE TOPS OF THE LOGS AT SPECIFIED ELEVATIONS FOR EACH SITE.
6. EXCAVATE A TRENCH IN WHICH TO PLACE THE ROOT WAD. IN SOFT SOILS IT MAY BE POSSIBLE TO DRIVE THE ROOT WAD INTO THE BANK WITH EQUIPMENT AFTER SHARPENING THE END TO A POINT. CARE SHALL BE TAKEN NOT TO DAMAGE THE ROOT WAD.
7. THE ROOT WAD MUST BE PLACED IN THE BANK SO THAT THE BACK OF THE ROOT FAN RESTS AGAINST THE FRONT OF THE FOOTER LOG.
8. THE ROOT FAN MUST BE PLACED SUCH THAT THE FAN IS ANGLED UPSTREAM AS SHOWN AND AS DIRECTED BY THE ENGINEEER.
9. MOVING UPSTREAM, THE PROCESS IS REPEATED FOR EACH ADDITIONAL ROOT WAD AS SHOWN ON THE DRAWINGS.
10. LARGE BOULDERS ARE PLACED ON EITHER SIDE OF THE TRUNK OF EACH ROOTWAD.
11. PLACE BACK FILL OVER THE BOULDERS AS NECESSARY WITH A COARSE FILTER AGGREGATE (MN/DOT STANDARD SPECIFICATION 3142.2H) AND MATCH EXISTING GRADE WITH 6" OF TOPSOIL.
12. REVEGETATE AND STABILIZE WITH EROSION CONTROL BLANKET AS SPECIFIED FOR EACH SITE AS SHOWN IN THE DRAWINGS AND DIRECTED BY THE ENGINEER.
13. TRIM THE ROOTS THAT EXTEND ABOVE THE STREAM BANK TO A HEIGHT SLIGHTLY BELOW BANK HEIGHT AS DIRECTED BY THE ENGINEER.
14. USE SELECT ON-SITE TREES AS NOTED IN GENERAL NOTES.



B SECTION: ROOT WAD
NOT TO SCALE



2 DETAIL: RIPRAP TOE PROTECTION
NOT TO SCALE



STAKE PLANTING

GENERAL NOTES:

1. USE WILLOW OR WILLOW TYPE ADVENTITIOUSLY ROOTABLE STOCK.
2. MATERIAL SHOULD BE FROM AN AREA WITH SIMILAR SOIL, CLIMATE, AND LOCATION RELATIVE TO THE STREAM.
3. THE MATERIAL SHALL BE AT LEAST TWO YEARS OLD AND FREE OF DISEASE, ROT, OR INSECT INFESTATION.
4. MATERIAL SHALL BE HARVESTED WHILE DORMANT AND SOAKED (1 TO 14 DAYS) BEFORE INSTALLATION.

3 DETAIL: WILLOW STAKES
NOT TO SCALE

50% DESIGN
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

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

PRINTED NAME -

SIGNATURE

DATE - , LICENSE # -

#	BY	CHK	APP	DATE	RELEASE/REVISION DESCRIPTION
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
A	EPF	JCO	JCO	06/20/2025	ISSUED FOR REVIEW

BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
SUITE 200
MINNEAPOLIS, MN 55435

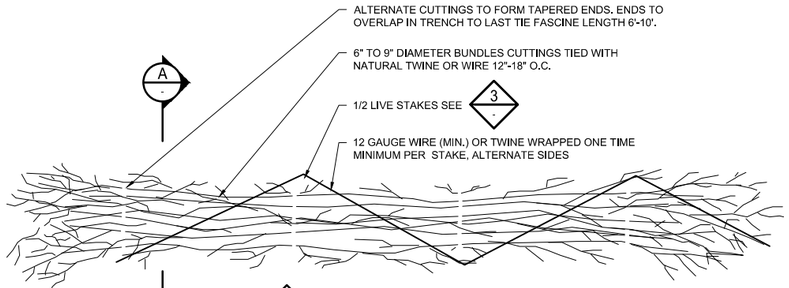
PH: 1-800-632-2277
WWW.BARR.COM
MINNESOTA ENGINEERING FIRM
NUMBER 10104111545

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION
GOLDEN VALLEY, MINNESOTA

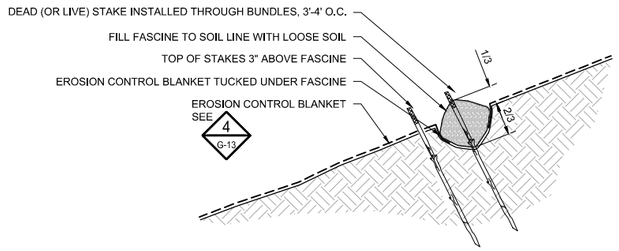
BASSETT CREEK MAIN STEM RESTORATION - PHASE 1
GOLDEN VALLEY, MINNESOTA
STREAM STABILIZATION DETAILS

BARR PROJECT # 23272114.00
DWG # C-13
REV # A

ORIGINAL DRAWING SIZE: ANSI FULL BLEED B (11.00 X 17.00 INCHES) | PLOT SCALE: 1:2 | PLOT DATE: 7/4/2025 10:27 AM
CADD USER: ERIC.P.FITZGERALD | FILE: K:\DESIGN\0022721\14_WOODS\23272114_C-11.DWG



1 - DETAIL: LIVE FASCINES
NOT TO SCALE



A - SECTION: LIVE FASCINES
NOT TO SCALE

GENERAL

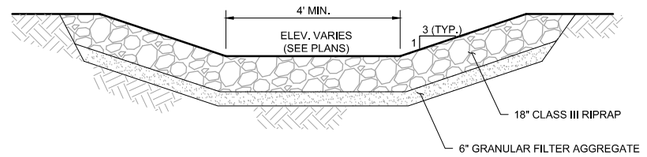
1. THE ENGINEER MUST BE NOTIFIED AT LEAST 3 DAYS PRIOR TO FASCINES INSTALLATION AND MUST BE ON SITE DURING INSTALLATION.
2. THE DORMANT CUTTINGS FOR FASCINES SHOULD ONLY BE INSTALLED DURING THE DORMANT SEASON, AFTER LEAF DROP IN THE FALL AND BEFORE BUD BREAK IN THE SPRING.
3. LIVE FASCINES ARE LIVE PLANT MATERIALS, HANDLE WITH CARE. SEE LIVE CUTTINGS DETAIL FOR SIZE, CARE, AND INSTALLATION METHODS.

PREPARATION

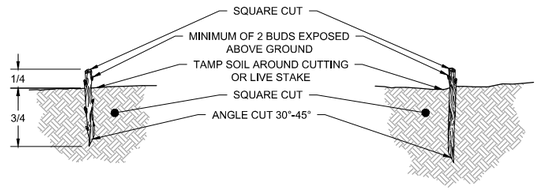
4. BRANCHES FOR FASCINE SHALL BE ½"-2" MINIMUM BUTT DIAMETER.
5. SOAK THE LIVE BRANCHES FOR A MINIMUM OF 24 HOURS (IDEALLY 5-7 DAYS) IN FLOWING WATER BEFORE PLANTING.
6. ASSEMBLE THE FASCINE BY LAYING OUT LIVE BRANCHES WITH THE CUT ENDS PLACED IN OPPOSITE DIRECTIONS IN A LONG SAUSAGE-LIKE BUNDLE.
7. TIE BUNDLES WITH TWINE AT 12"-18" INCREMENTS. FINISHED BUNDLES SHOULD BE 6-9" IN DIAMETER.

PLACEMENT

8. CONSTRUCT FASCINES FROM LOWEST TO HIGHEST ELEVATION.
9. INSTALL FASCINES PARALLEL TO CONTOURS, UNLESS SPECIFIED OTHERWISE.
10. EXCAVATE A HORIZONTAL TRENCH ALONG THE SLOPE. THE TRENCH SHOULD BE ROUGHLY 2/3 THE DIAMETER OF THE FASCINE.
11. DISPOSE EXCAVATED SOIL ON-SITE ABOVE ORDINARY HIGH WATER LINE.
12. INSTALL EROSION CONTROL BLANKET ACROSS THE TRENCH AND CUT ALONG THE CENTERLINE OF THE TRENCH. STAKE ENDS OF BLANKET IN THE BOTTOM OF THE TRENCH. 6-8" OF THE BLANKET SHOULD BE TUCKED UNDER THE FASCINE.
13. PLACE BUNDLES IN TRENCH, BACKFILL, COMPACT, AND WATER.
14. PLACE WOODEN (OR LIVE) STAKES AT A 3-4' INTERVAL THROUGH THE CENTER OF THE BUNDLE. LEAVE 3 INCHES OF STAKES ABOVE THE BUNDLE.



2 - DETAIL: RIPRAP CHANNEL ARMORING
NOT TO SCALE



GENERAL NOTES:

1. LIVE STAKE OR CUTTING PLANTED PERPENDICULAR TO GROUND SURFACE.
2. SEE PLANT MATERIAL LIST FOR SPECIES LENGTH AND SPACING.
3. LIVE STAKES SHALL BE 1/4" DIAMETER MINIMUM.
4. LIVE STAKES OR CUTTINGS TO HAVE PLANTING END CUT AT 45° ANGLE AND DIPPED IN ROOTING HORMONE OR EQUIVALENT PRIOR TO INSTALLATION.
5. LIVE STAKES OR CUTTINGS TO BE KEPT WRAPPED OR KEPT WET AND OUT OF SUN DURING TRANSPORT/STAGING UNTIL INSTALLATION.

3 - DETAIL: LIVE CUTTINGS OR LIVE STAKES
NOT TO SCALE

50% DESIGN
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

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

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

#	BY	CHK	APP	DATE	RELEASE/REVISION DESCRIPTION
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
A	EPF	JCO	JCO	06/20/2025	ISSUED FOR REVIEW

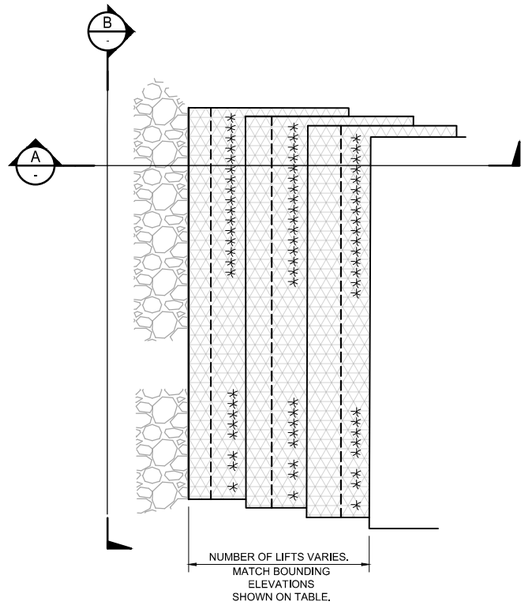
BARR®
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
SUITE 200
MINNEAPOLIS, MN 55435
PH: 1-800-632-2277
WWW.BARR.COM
MINNESOTA ENGINEERING FIRM
NUMBER 10104111545

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION
GOLDEN VALLEY, MINNESOTA

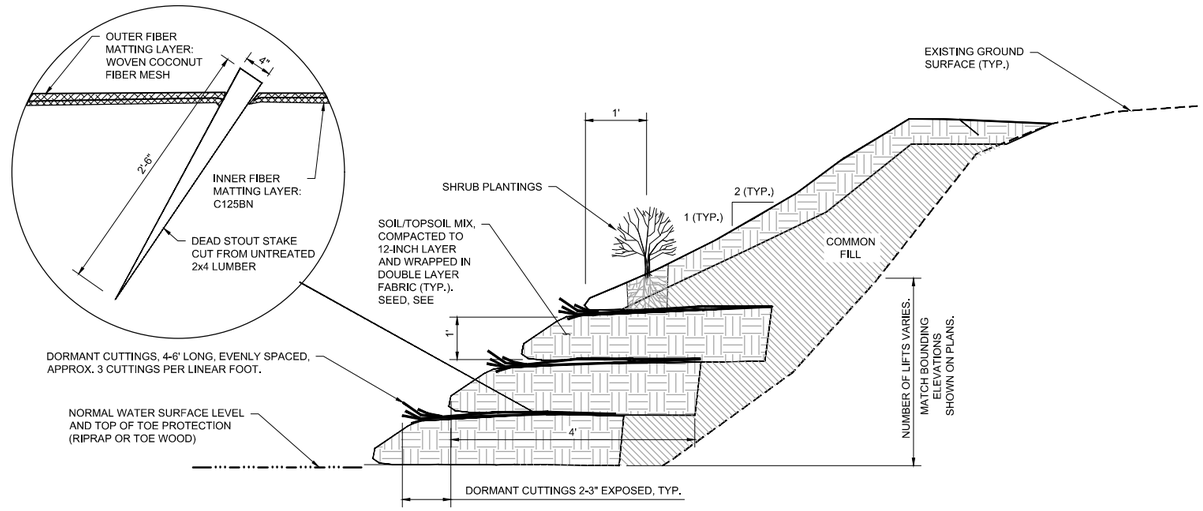
BASSETT CREEK MAIN STEM RESTORATION - PHASE 1
GOLDEN VALLEY, MINNESOTA
STREAM STABILIZATION DETAILS

BARR PROJECT # 23272114.00
DWG # C-14
REV # A

ORIGINAL DRAWING SIZE: ANSI FULL BLEED B (11.00" X 17.00 INCHES) PLOT SCALE: 1:2 PLOT DATE: 7/4/2025 10:25 AM
CAD USER: ERIC P. FITZGERALD FILE: M:\DESIGN\23272114.00\23272114_C-31.DWG



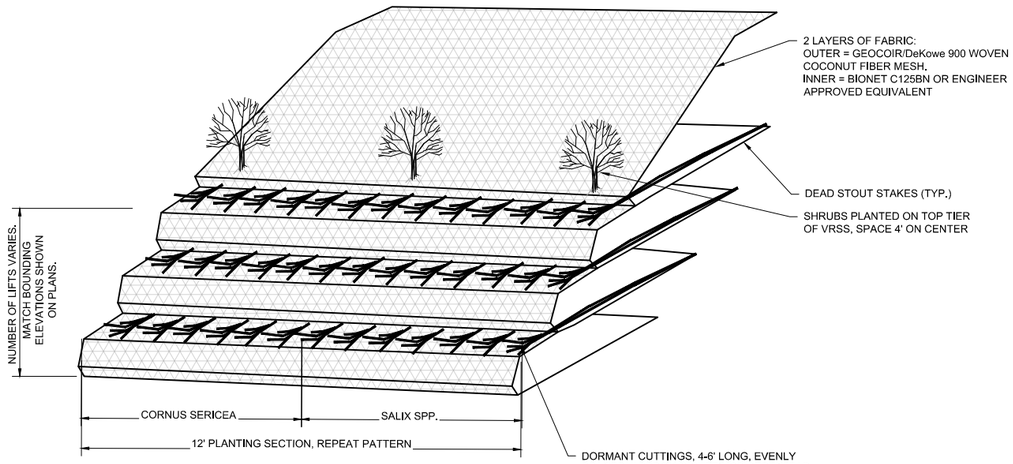
1 - DETAIL: LIVE PLANT VEGETATED REINFORCED SOIL SLOPE (V.R.S.S.)
NOT TO SCALE



A - SECTION: LIVE PLANT VEGETATED REINFORCED SOIL SLOPE (V.R.S.S.)
NOT TO SCALE

NOTES:

1. THE ENGINEER MUST BE NOTIFIED AT LEAST 3 DAYS PRIOR TO ROOT WAD INSTALLATION AND MUST BE ON SITE DURING INSTALLATION.
2. SOAK DORMANT CUTTINGS FOR A MINIMUM OF 24 HOURS IN FLOWING WATER BEFORE PLANTING. SOAKING FOR 5-7 DAYS IS CONSIDERED IDEAL. THE DORMANT CUTTINGS SHOULD ONLY BE INSTALLED DURING THE DORMANT SEASON, AFTER LEAF DROP IN THE FALL AND BEFORE BUD BREAK IN THE SPRING. DORMANT CUTTINGS STORED IN COLD STORAGE WITH NO VISIBLE SIGN OF BUD BREAK MAY BE USED INTO LATE SPRING.
3. INSTALL RIPRAP AND GRANULAR FILTER AGGREGATE AS SPECIFIED IN SECTION 02375 AND AS SHOWN ON THE DRAWINGS.
4. EXCAVATE THE EXISTING STREAMBANK SLOPE SHOREWARD FROM AND LEVEL WITH THE TOP OF THE RIPRAP TO FORM A STABLE, UNDISTURBED SURFACE. A FLAT BENCH SHOULD BE CREATED FROM THE TOE OF THE STABLE CUT SLOPE TO THE TOE OF THE PROPOSED STREAM BANK RIPRAP.
5. DORMANT CUTTINGS ARE TO BE PLACED ON TOP OF THE RIPRAP EXCAVATED BENCH AT 3 BRANCHES PER LINEAR FOOT; THE BASAL END OF THE CUTTINGS SHOULD EXTEND AT LEAST 2 FOOT PAST THE BACK OF THE RIPRAP. NO MORE THAN 6 INCHES OF THE BUDDING END OF THE LIVE BRANCH SHOULD EXTEND PAST THE FRONT OF THE RIPRAP. COVER THE DORMANT CUTTINGS WITH TOPSOIL TO CREATE AN EVEN SURFACE FOR THE CONSTRUCTION OF THE FIRST SOIL LIFT.
6. LAY NATURAL FIBER MATTING ON BOTTOM OF THE BENCH, OVERLAPPING ADJACENT MATTING BY 1 FOOT. THE OUTER EXPOSED FIBER MATTING LAYER OF EACH SOIL LIFT SHALL BE GEOCOIR/DEKOWE 900 WOVEN COCONUT FIBER MESH, BIOD-MATTM 90, OR AN ENGINEER APPROVED EQUIVALENT.
7. THE INNER LAYER OF EACH SOIL LIFT SHALL BE BIONET C125BN OR AN ENGINEER APPROVED EQUIVALENT. LAY THE INNER LAYER OF BIONET ON TOP OF NATURAL FIBER MATTING OF EACH SOIL LIFT. FABRIC SHOULD BE INSTALLED SMOOTH WITH NO UNNECESSARY FOLDS OR WRINKLES. STAKE THE SHOREWARD END OF THE FIBER MATTING IN PLACE WITH WOODEN STAKES SPACED EVERY THREE FEET AS SHOWN ON THE DRAWINGS.
8. THE FIRST 6 TO 8 INCHES OF THE BOTTOM SOIL LIFT SHALL BE FILLED WITH GRAVEL AND SAND MATERIAL EXCAVATED FROM THE STREAM BED. THE TOP 6 TO 8 INCHES ON THE FRONT OF SURFACE LAYER SHOULD BE COMPRISED OF TOPSOIL MIX AS SHOWN ON THE DRAWINGS.
9. THE TOPSOIL LAYER SHALL BE SEEDED WITH THE VRSS SEED MIX AT 0.7 POUNDS PER 1,000 SQUARE FEET OF LIFT SURFACE AREA AS SHOWN ON THE DRAWINGS.
10. FOLD THE FIBER MATTING OVER THE FILL MATERIAL AND STAKE IN PLACE SO THE FABRIC IS TAUT AND SMOOTH WITH NO UNNECESSARY FOLDS OR WRINKLES. BACKFILL BEHIND THE BOTTOM SOIL LIFT WITH GRANULAR FILTER MATERIAL TO MEET THE EXISTING SLOPE AS SHOWN ON THE DRAWINGS.



B - SECTION: LIVE PLANT VEGETATED REINFORCED SOIL SLOPE (V.R.S.S.)
NOT TO SCALE

50% DESIGN
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

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

PRINTED NAME -

SIGNATURE

DATE - LICENSE # -

#	BY	CHK	APP	DATE	RELEASE/REVISION DESCRIPTION
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
A	EPF	JCO	JCO	06/20/2025	ISSUED FOR REVIEW

BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
SUITE 200
MINNEAPOLIS, MN 55435

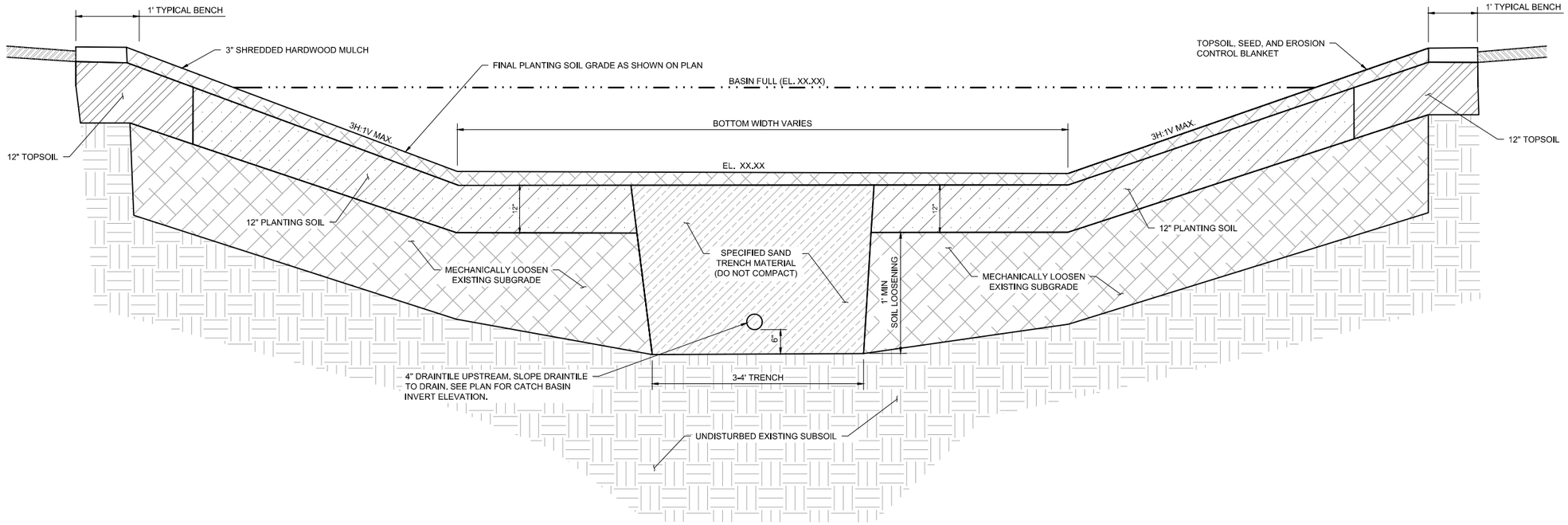
PH: 1-800-632-2277
WWW.BARR.COM
MINNESOTA ENGINEERING FIRM
NUMBER 10104111545

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION
GOLDEN VALLEY, MINNESOTA

BASSETT CREEK MAIN STEM RESTORATION - PHASE 1
GOLDEN VALLEY, MINNESOTA
STREAM STABILIZATION DETAILS

BARR PROJECT # 23272114.00
DWG # C-15
REV # A

ORIGINAL DRAWING SIZE: ANSI FULL BLEED B (11.00" X 17.00" INCHES) PLOT SCALE: 1:2 PLOT DATE: 7/9/2025 11:21 AM
CADD USER: BRIAN T. MAHOLTZ FILE: K:\DESIGN\23272114.00\23272114_C-11.DWG



1 - SECTION: RAINWATER GARDEN (PRELIMINARY DESIGN)
NOT TO SCALE

50% DESIGN
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

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

PRINTED NAME -

SIGNATURE

DATE -, LICENSE # -

#	BY	CHK	APP	DATE	RELEASE/REVISION DESCRIPTION
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
A	EPF	JCO	JCO	06/20/2025	ISSUED FOR REVIEW

BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
SUITE 200
MINNEAPOLIS, MN 55435

PH: 1-800-632-2277
WWW.BARR.COM
MINNESOTA ENGINEERING FIRM
NUMBER 10104111545

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION
GOLDEN VALLEY, MINNESOTA

BASSETT CREEK MAIN STEM RESTORATION - PHASE 1
GOLDEN VALLEY, MINNESOTA
RAINWATER GARDEN DETAILS

BARR PROJECT # 23272114.00
DWG # C-16
REV # A

ORIGINAL DRAWING SIZE: ANSI FULL BLEED B (11.00 X 17.00 INCHES) PLOT SCALE: 1:2 PLOT DATE: 7/9/2025 11:21 AM
CADD USER: BRIAN R. MIHALE FILE: M:\DESIGN\23272114.00\23272114_C-11.DWG