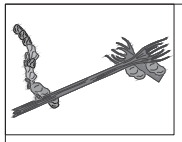
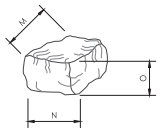
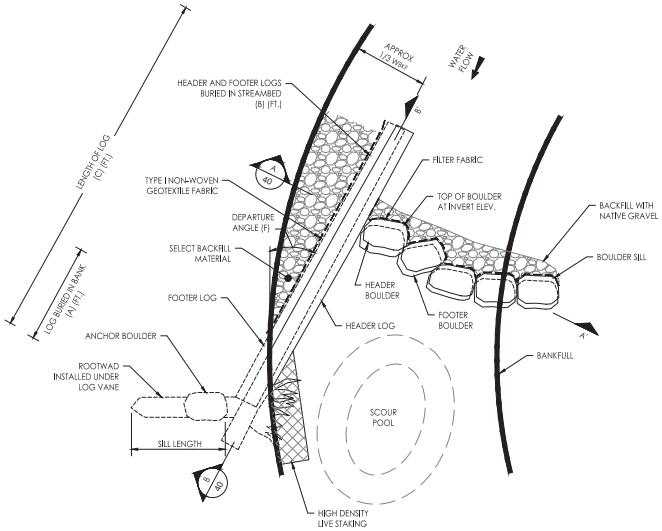


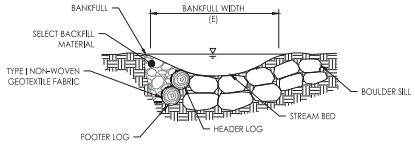
PLAN - SYMBOL

STRUCTURE BOULDER DIMENSIONS

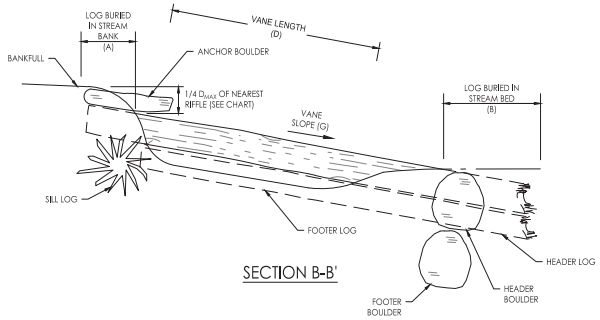




1/40 DETAIL - LOG VANE WITH BOULDER HOOK
NOT TO SCALE



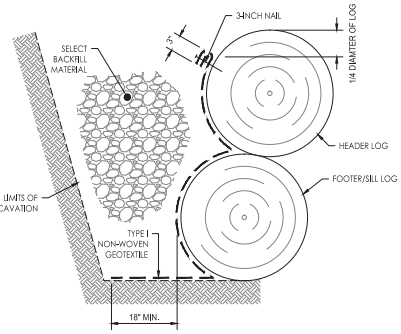
SECTION A-A'



SECTION B-B'

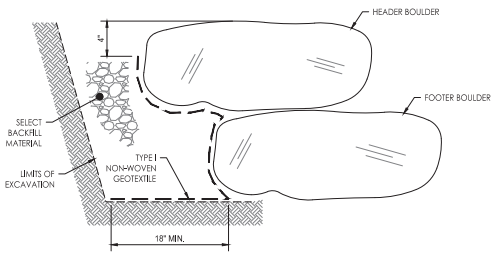
NOTES:

1. REFER TO STRUCTURE TABLE FOR DIMENSIONS.
2. LOGS SHALL HAVE MINIMUM DIAMETER AND MINIMUM LENGTH AS SHOWN IN THE TABLE.
3. ALL LOGS SHALL BE RELATIVELY STRAIGHT AND LIMBS SHALL BE TRIMMED FLUSH.
4. SILL LOG SHALL BE PLACED PERPENDICULAR TO THE BANKFULL FLOW DIRECTION.
5. THE FOOTER LOG SHALL EXTEND FROM THE SILL LOG TO THE END OF THE HEADER LOG.
6. SET INVERT AT ELEVATION SHOWN IN REACH PROFILE.
7. HEADER LOG SHALL BE PLACED SLIGHTLY DOWNSTREAM ON TOP OF THE FOOTER LOG AS SHOWN IN THE DETAIL.
8. HEADER LOG SHALL TIE INTO THE STREAM BANK AT A MAXIMUM ELEVATION OF 3/4 BANKFULL AND MINIMUM ELEVATION OF 1/2 BANKFULL MEASURED AT THE NEXT DOWNSTREAM RIFFLE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
9. CUTTING OF THE HEADER OR SILL LOG ROOTWAD MAY BE REQUIRED TO PREVENT THE ROOTWAD FROM PROTRUDING ABOVE THE BANKFULL ELEVATION.
10. ALL GAPS LARGER THAN 2 INCHES BETWEEN THE HEADER AND FOOTER LOGS SHALL BE CHINKED WITH LIMBS AND/OR BRUSH ON THE UPSTREAM SIDE PRIOR TO PLACEMENT OF THE GEOTEXTILE.
11. ON THE UPSTREAM SIDE OF THE LOGS AND SILL BOULDERS A LAYER OF NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED AS SHOWN IN DETAIL 2 ON SHEET 40 ALONG THE ENTIRE LENGTH OF THE LOG. GEOTEXTILE FABRIC IS INCIDENTAL TO CONSTRUCTION.
12. NAIL NON-WOVEN GEOTEXTILE TO EDGE OF HEADER LOG AS SHOWN IN THE GEOTEXTILE PLACEMENT DETAIL.
13. SILL BOULDERS SHALL EXTEND FROM THE HEADER LOG TO BEYOND BANKFULL WIDTH.
14. SILL BOULDERS SHALL PROTRUDE 0.1 FOOT ABOVE THE CHANNEL BOTTOM UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
15. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, HEADER BOULDERS SHALL BE UNDERLAIN BY FOOTING BOULDERS.
16. SEE THE PLANTING TABLE FOR DETAILS ON HIGH DENSITY LIVE STAKING.
17. LIVE STAKE PLANTING RATE SHALL REMAIN THE SAME BUT SOME LIVE STAKES SHALL BE CONCENTRATED IN AREA SHOWN.



NOTES:

1. NON-WOVEN GEOTEXTILE FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER LOG/ROCK OR LIMITS OF EXCAVATION, WHICHEVER IS LOWER, UP TO 3/4 THE DIAMETER OF THE HEADER LOG OR 4 INCHES FROM THE TOP OF THE HEADER ROCK UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. PRIOR TO SECURING THE NON-WOVEN GEOTEXTILE FABRIC TO HEADER LOGS, TWO 34-INCH FOLDS SHALL BE PLACED IN THE UPPER END OF THE FABRIC CREATING THREE LAYERS OF FABRIC FOR THE NAIL TO PENETRATE PRIOR TO REACHING THE LOG.
3. SECURE THE NON-WOVEN GEOTEXTILE TO THE HEADER LOG BY NAILING 34-INCH 10J GALVANIZED ROOFING NAILS THE ENTIRE LENGTH OF THE LOG, 6-INCHES ON CENTER.
4. SELECT BACKFILL MATERIAL SHALL BE A MIXTURE OF COBBLE, GRAVEL, AND FINES THAT MAY BE HARVESTED FROM ON SITE. THE MIXTURE SHALL BE AT LEAST 30 PERCENT COBBLE AND 40 PERCENT GRAVEL.



2/40 DETAIL - GEOTEXTILE PLACEMENT
NOT TO SCALE

Figure 5. Log Vane with Boulder Hook structure is an example of structures containing oblique vanes.

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KNOWLTON CREEK STREAM RESTORATION PROJECT FINAL DESIGN PLANS
DULUTH, MINNESOTA

Title
DETAILS (3)

Permit-Seal

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