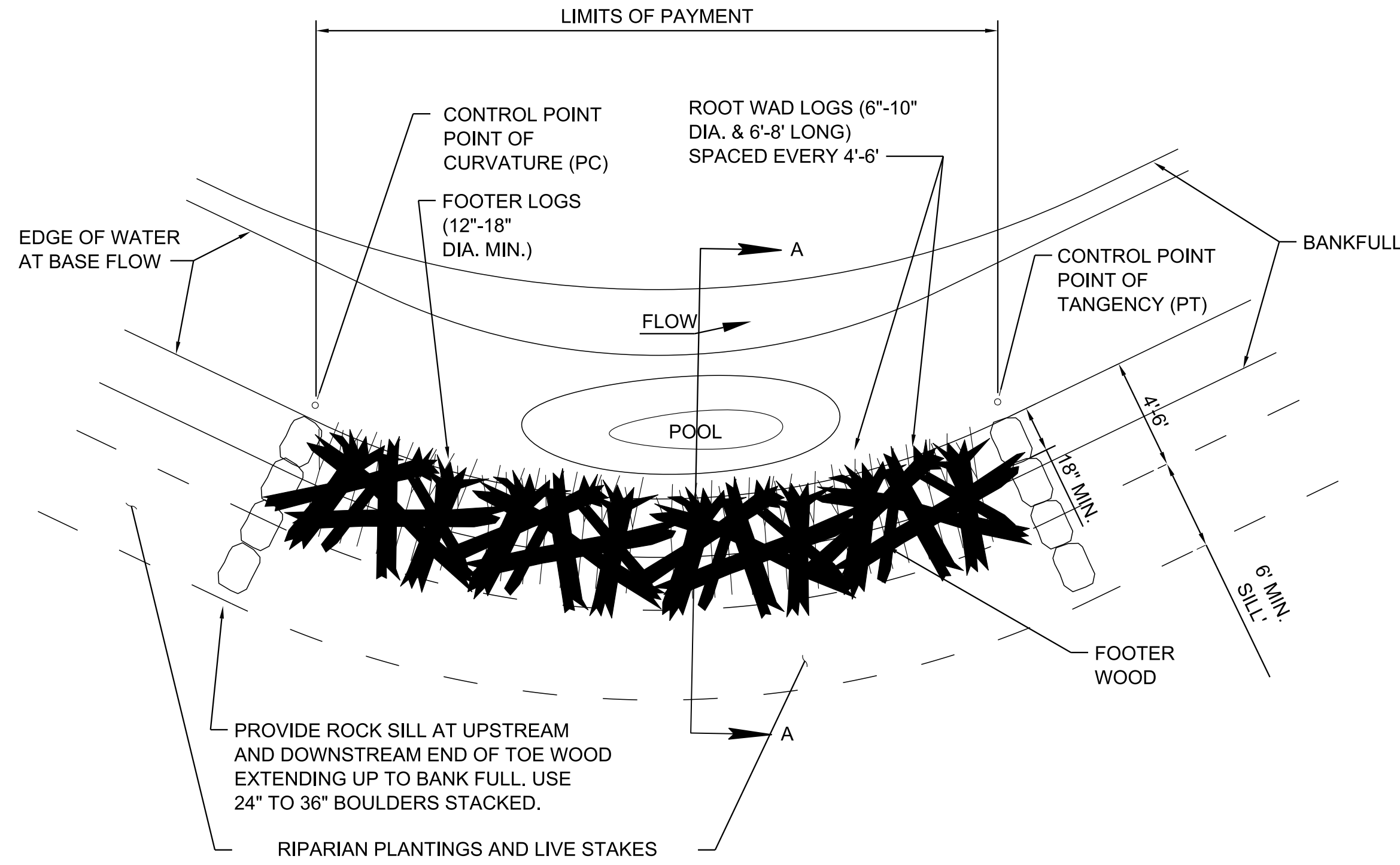
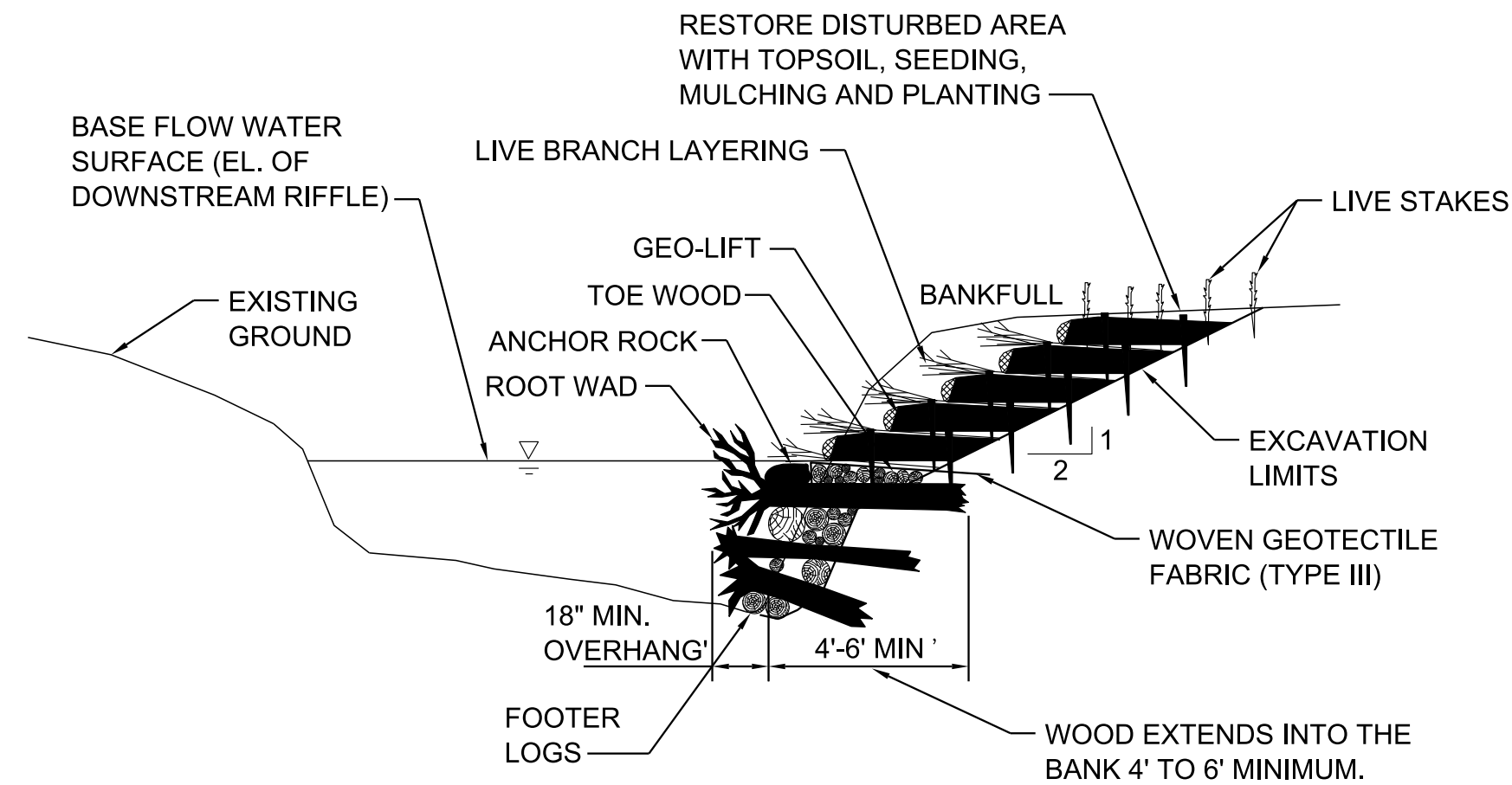


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WOOD TOE
PLAN VIEW

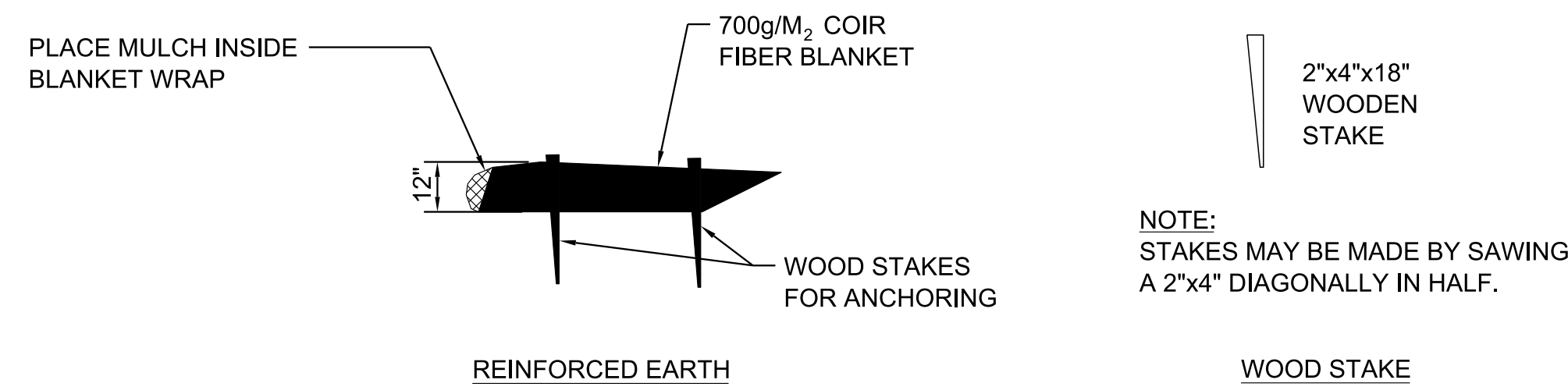


SECTION A-A

STREAM MITIGATION PLAN LEGEND:



WOOD AND BOULDER TOE WITH GEO-LIFTS



WOOD AND BOULDER TOE WITH GEO-LIFTS NOTES

- (A) WOOD AND BOULDER TOE WITH GEO-LIFTS AND LIVE BRUSH LAYERING ARE BANK STABILIZATION MEASURES THAT PROTECT THE STREAM BANK ALONG OUTSIDE MEANDER BENDS FROM EROSION AND ENHANCE THE ESTABLISHMENT AND GROWTH OF NATIVE VEGETATION USING LIVE BRANCHES AND CUTTINGS. WOOD TOE ALSO PROVIDES HABITAT FOR INVERTEBRATES AND FISH AND HELPS TO MAINTAIN POOL DEPTH BY CREATING TURBULENT FLOW AND SCOUR ALONG THE STREAM BED.
- (B) WOOD AND BOULDER TOE WITH LIVE BRUSH LAYERING SHOULD BE PLACED AT THE STATIONS, OFFSETS, ELEVATIONS, AND GEOMORPHIC POSITIONS INDICATED ON THE STREAM MITIGATION DATA TABLE IN THE PROJECT PLANS, STREAM MITIGATION PLAN, OR AS DIRECTED BY THE ENGINEER. AT A MINIMUM, THE BANKFULL WIDTH, WOOD AND BOULDER DIMENSIONS AND ELEVATIONS, NUMBER AND DIMENSIONS OF GEO-LIFTS, AND LENGTH AND NUMBER OF LIVE BRUSH AND CUTTINGS SHOULD BE SPECIFIED IN THE STREAM MITIGATION DATA TABLE.
- (C) WOOD TOE SHALL CONSIST OF A MIX OF ROOT WADS, LOGS, BRANCHES, BRUSH, AND OTHER WOODY VEGETATION INSTALLED AT VARIOUS ANGLE, BUT NOT PARALLEL TO THE FLOW.
- (D) BOULDER TOE SHALL BE DURABLE LIMESTONE OF THE SIZE(S) INDICATED ON THE STREAM MITIGATION DATA TABLE, OR AS DIRECTED BY THE ENGINEER.
- (E) A HYDRAULIC EXCAVATOR WITH A HYDRAULIC THUMB SHALL BE USED TO PLACE WOOD AND BOULDERS.
- (F) CONSTRUCT WOOD OR BOULDER TOE, GEO-LIFTS, AND LIVE BRUSH LAYERING BY:
- (1) SHAPE THE CHANNEL AND FLOODPLAIN TO THE SPECIFIED GRADES AND DIMENSIONS.
 - (2) EXCAVATE THE POOL AND GRADE EXISTING BANK SUBGRADE TO 2:1 (MIN).
 - (3) FOR WOOD TOE, LAYER THE WOOD WITH LARGER MATERIAL ON THE BOTTOM AND A MAT OF BRANCHES AS THE TOP LAYER. IF USED, ANGLE ROOT WADS SLIGHTLY UPSTREAM INTO THE FLOW. FILL GAPS BETWEEN LARGER MATERIAL WITH A MIX OF BRANCHES AND WOODY DEBRIS. THE TOP LAYER OF TOE WOOD SHALL BE AT THE ESTABLISHED NORMAL BASE FLOW ELEVATION (I.E., ELEVATION OF THE DOWNSTREAM RIFFLE). PLACE TYPE III WOVEN GEOTEXTILE FABRIC ON TOP OF WOOD TOE.
 - (4) FOR BOULDER TOE, EXCAVATE BANK TO KEY IN BOULDERS AND PLACE TYPE III WOVEN GEOTEXTILE FABRIC ALONG THE EXCAVATED BANK. PLACE BOULDERS IN OVERLAPPING LAYERS AND IMBRICATE EACH LAYER. BACKFILL AREA BEHIND BOULDER WITH SOIL OR ALLUVIUM AND COMPACT WITH EXCAVATOR BUCKET.
 - (5) CONSTRUCT GEO-LIFTS AND LIVE BRUSH LAYERING ABOVE WOOD OR BOULDER TOE, AS FOLLOWS:
 - (a) FOR EACH LIFT, PLACE BRUSH CUTTINGS PERPENDICULAR TO THE BANK AT A DENSITY OF 10-12 STEMS PER FOOT AND COVER WITH TWO INCHES OF SOIL.
 - (b) LAY 700G COIR BLANKETS OVER THE LIVE CUTTINGS PARALLEL TO THE BANK AND SHINGLED IN A DOWNSTREAM DIRECTION.
 - (c) PLACE SPECIFIED SOIL LIFT OVER THE BACK HALF OF THE COIR BLANKET AND COMPACT WITH THE EXCAVATOR BUCKET.
 - (d) PLACE CLEAN STRAW OR MULCH ALONG THE FACE OF THE SOIL LIFT. WRAP THE LIFT WITH THE FRONT HALF OF THE COIR BLANKET AND STAKE IN PLACE WITH A MINIMUM OF TWO ROWS OF 2"x4"x18" WOOD STAKES AT FIVE-FOOT SPACING.
 - (e) REPEAT STEPS (a) THROUGH (d) FOR EACH GEO-LIFT SPECIFIED.
 - (f) PLACE LIVE STAKES OR WOODY PLANTINGS, AS SPECIFIED, ON THE TOP LIFT.
- (G) ALL MATERIALS ARE TO BE APPROVED BY ENGINEER OR ENGINEER'S ONSITE CONSTRUCTION OBSERVER.
- (H) WOOD TOE WITH REINFORCED EARTH AND LIVE BRUSH LAYERING SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:

209-03.67 STREAM MITIGATION - TOE WOOD WITH REINFORCED EARTH PER LINEAR FOOT

209-03.42 STREAM MITIGATION - LIVE BRUSH LAYERING PER LINEAR FOOT

BOULDER TOE SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:

209-03.68 STREAM MITIGATION - BOULDER TOE PER LINEAR FOOT

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR THE CONSTRUCTION OF THE TOE WOOD WITH REINFORCED EARTH AND LIVE BRUSH LAYERING.

MATERIAL SHOWN ARE ONLY A GRAPHICAL REPRESENTATION AND DO NOT DEPICT THE ACTUAL DEPTH OR QUANTITY OF MATERIALS TO APPROPRIATELY CONSTRUCT OR STABILIZE THE CHANNEL.

NOT TO SCALE

STATE OF TENNESSEE
DEPARTMENT OF
TRANSPORTATION

WOOD AND
BOULDER TOE
WITH GEO-LIFTS

11-01-16

D-NSD-32