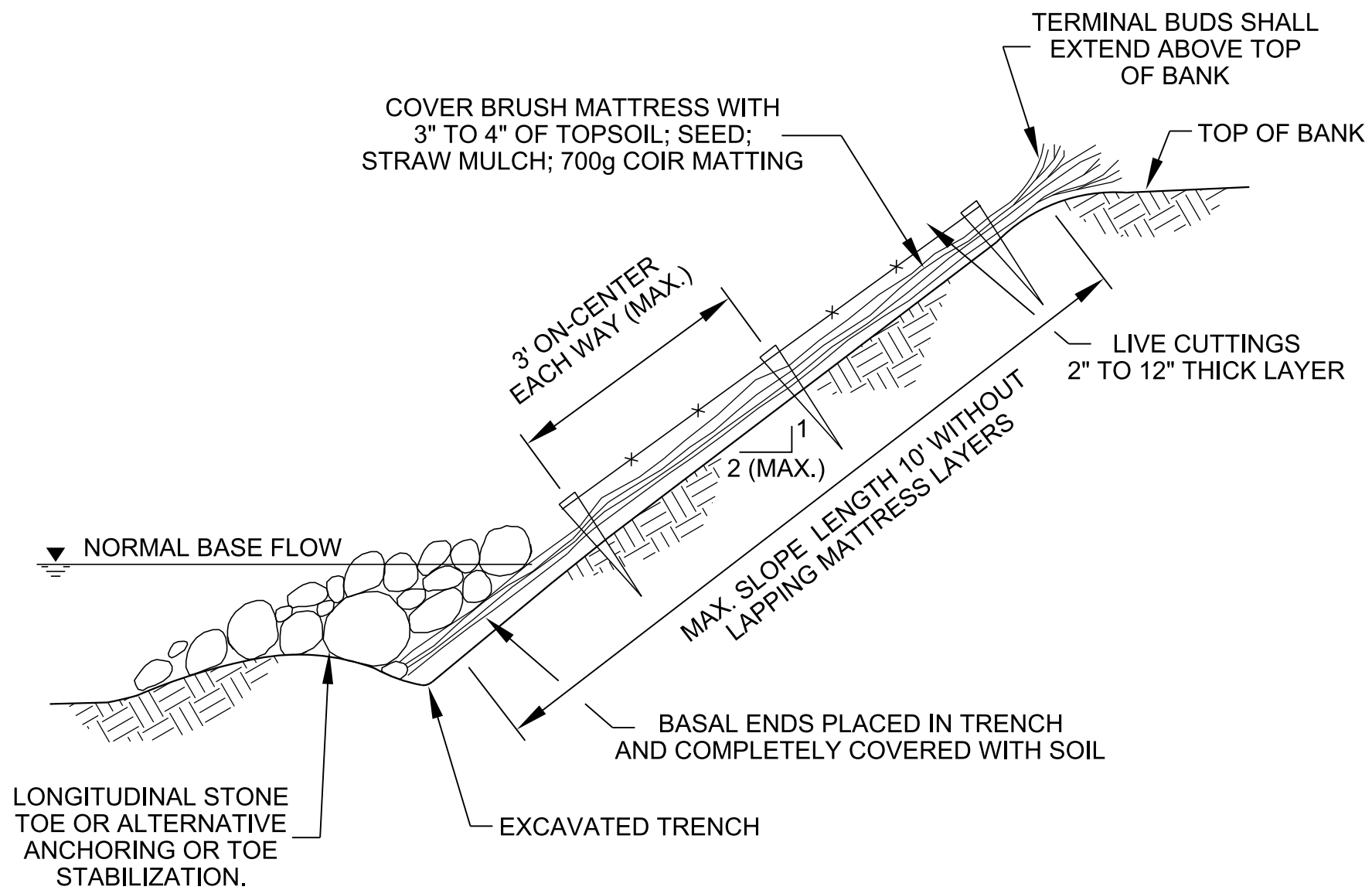
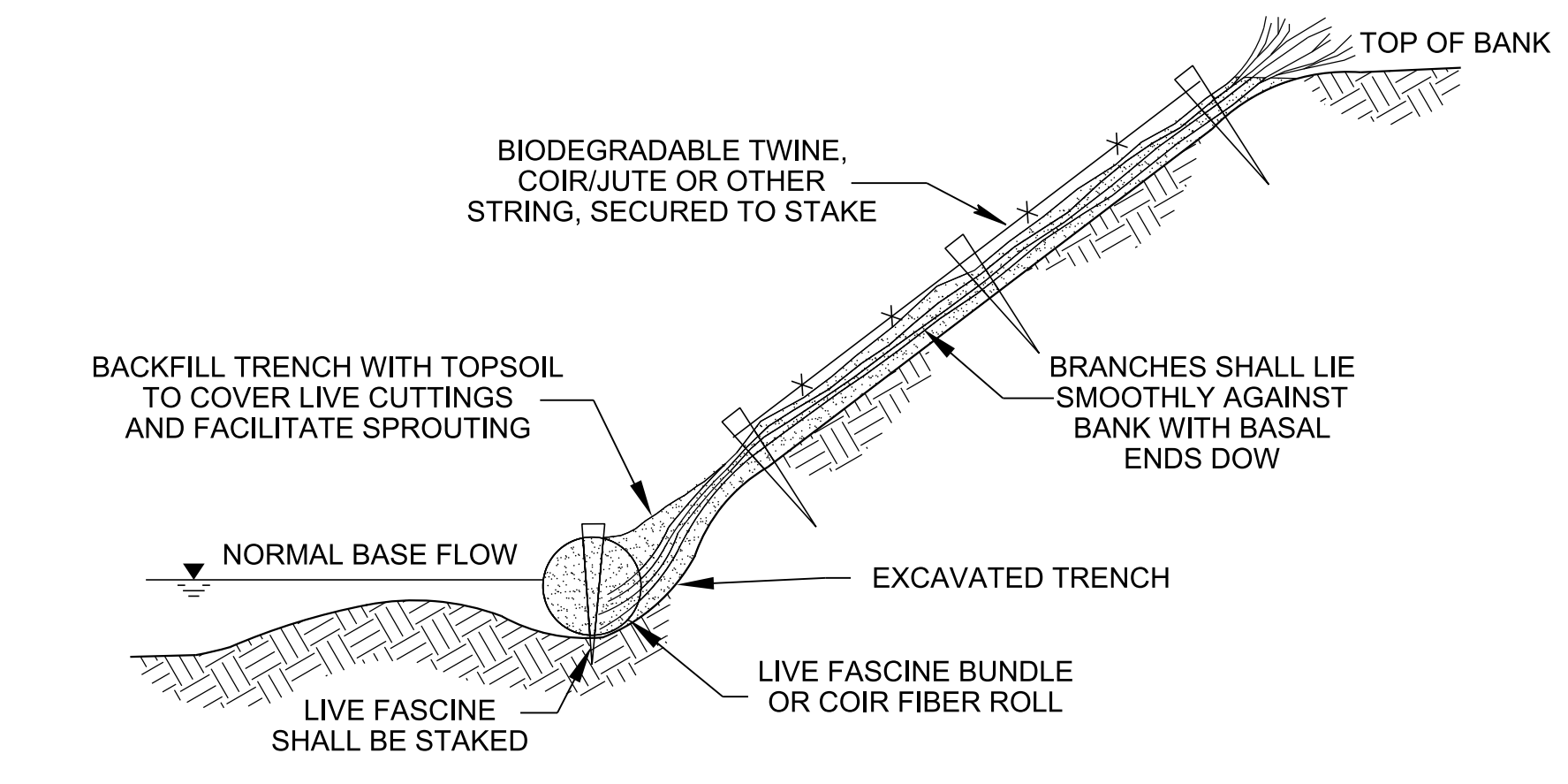


ISOMETRIC VIEW

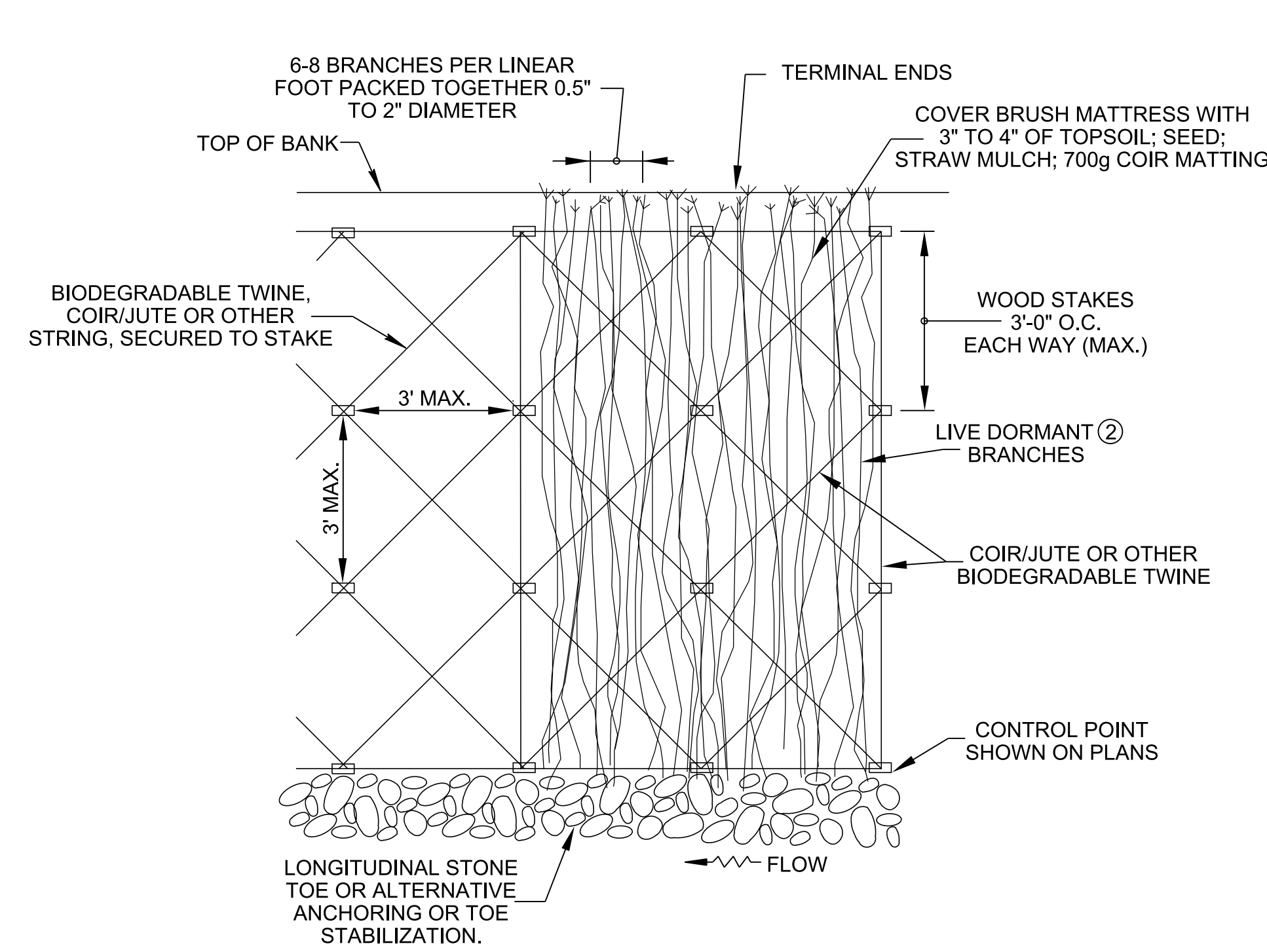
NOTE ①: BASAL ENDS OF CUTTINGS SHALL EXTEND INTO TRENCH AND SHALL BE COVERED WITH TOPSOIL PRIOR TO PLACEMENT OF LONGITUDINAL STONE TOE OR ALTERNATIVE ANCHORING OR TOE STABILIZATION.



SECTION A-A



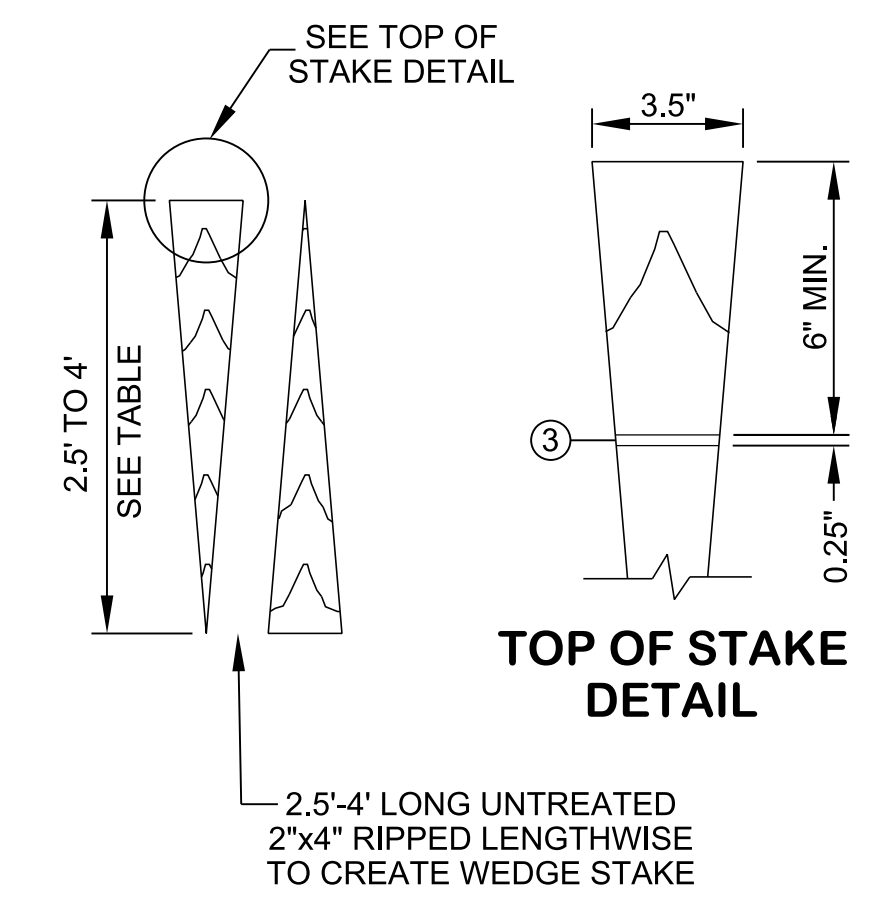
EXAMPLE OF ALTERNATIVE STABILIZATION AT TOE OF SLOPE



**PLAN VIEW
BRUSH MATTRESS**

FULL OR PARTIAL SUN REQUIRED FOR USE.

NOTE ②: BRANCHES SHOULD BE PLACED PERPENDICULAR TO FLOW.



BRUSH MATTRESS STAKE DETAIL

STAKE LENGTH	
SOIL TYPE	LENGTH (FEET)
CLAY	2.5
SILT	3.0
SAND	4.0
LOAM	2.5

NOTE ③: NOTCH STAKES TO 3/8\"/>

BRUSH MATTRESS NOTES

- (A) BRUSH MATTRESS IS A BANK STABILIZATION PRACTICE THAT PROTECTS A STREAMBANK FROM EROSION, CAPTURES SEDIMENT DURING HIGH FLOWS, AND ENHANCES THE ESTABLISHMENT AND GROWTH OF NATIVE VEGETATION USING LIVE BRANCHES AND CUTTINGS ANCHORED TO THE STREAM BANK.
- (B) BRUSH MATTRESSES SHOULD NOT BE USED WHERE PERENNIAL (YEAR ROUND) STREAM FLOW IS NOT PRESENT OR ALONG STREAMS WITH ANTICIPATED HIGH SEDIMENT LOADS.
- (C) LIVE DORMANT CUTTINGS SHALL BE PLACED ON THE SLOPE PERPENDICULAR TO THE STREAM AND THE MATTRESS SHALL BE BETWEEN 2 INCHES AND 12 INCHES THICK. CUTTINGS SHALL BE STRAIGHT, FLEXIBLE BRANCHES OF WILLOW, SHRUB DOGWOOD, OR OTHER APPROVED SPECIES.
- (D) LIVE DORMANT CUTTINGS OR BRANCHES SHALL BE A MINIMUM OF 0.5-INCHES IN DIAMETER AT THE BASAL END AND NO GREATER THAN 2 INCHES. BASAL ENDS OF THE BRANCHES SHOULD BE CUT AT A 30 TO 45 DEGREE ANGLE AND SHALL BE INSTALLED BELOW THE NORMAL BASE FLOW ELEVATION IN THE TRENCH.
- (E) MAXIMUM GRADE OF SLOPE FOR BRUSH MATTRESS SHALL BE 2H:1V OR FLATTER AND SHALL BE UNIFORMLY GRADED AND SHAPED TO PROVIDE ADEQUATE SOIL TO STEM CONTACT. MAXIMUM FACE LENGTH OF SLOPE SHALL BE 10 FEET. WHERE LONGER SLOPES ARE PRESENT, USE MULTIPLE ROWS OF BRUSH MATTRESS WITH MINIMUM 1 FOOT OVERLAP. TERMINAL ENDS OF LOWER ROW SHALL LAP OVER THE BASAL ENDS OF UPPER ROW.
- (F) CARE SHOULD BE TAKEN WHEN INSTALLING LONGITUDINAL STONE TOE, COIR FIBER ROLLS OR LIVE FASCINES IN TRENCH TO AVOID PUTTING THE BRANCHES IN TENSION AND LIFTING THEM FROM THE STREAMBANK.
- (G) ROCK FOR LONGITUDINAL STONE TOE OR ALTERNATIVE TOE STABILIZATION SHALL BE SIZED ACCORDING TO COMPUTED FLOW VELOCITY AND SHEAR STRESS ALONG THE BANK. FOR ADDITIONAL DETAILS OF LONGITUDINAL STONE TOE SEE STANDARD DRAWING D-NSD-13. FOR DETAILS OF LIVE FASCINES SEE STANDARD DRAWING D-NSD-35.
- (H) WOOD STAKES MAY BE STANDARD COMMERCIAL GRADE UNTREATED LUMBER CUT TO LENGTH, RIPPED LENGTHWISE TO PRODUCE TWO WEDGE SHAPED STAKES, AND NOTCHED AT THE TOP TO ACCEPT 1 TURN OF THE TWINE, STRING, OR BIODEGRADABLE WIRE WITHIN THE NOTCH. WHERE DORMANT LIVE STAKES ARE USED INSTEAD OF DEAD STAKES, NOTCH FOR TWINE SHALL BE OMITTED. NON-BIODEGRADABLE STAKES ARE NOT PERMITTED FOR USE WITH BRUSH MATTRESS.
- (I) TYPICAL INSTALLATION SEQUENCE:
 - (1) COLLECT AND SOAK LIVE BRANCHES A MINIMUM OF 24 HOURS. 5-7 DAYS PREFERRED. LEAVE SIDE BRANCHES INTACT.
- (2) EXCAVATE BANK TO DESIRED GRADE CLEARING AWAY LARGE DEBRIS.
- (3) EXCAVATE AN 8 TO 12-INCH DEEP HORIZONTAL TRENCH AT THE TOE OF SLOPE.
- (4) LAY CUTTINGS FLAT AGAINST THE SLOPE WITH BASAL ENDS PLACED DEEPLY IN THE TRENCH EXPOSED TO MOIST SOIL.
- (5) INSTALL WEDGE STAKES OR LIVE STAKES LEAVING APPROXIMATELY 12 INCHES OF THE TOP OF STAKE EXPOSED. DISCARD AND REPLACE SHATTERED STAKES.
- (6) TIE TWINE, STRING, OR OTHER BIODEGRADABLE WIRE AROUND STAKES IN A DIAGONAL PATTERN BETWEEN EACH ROW OF STAKES.
- (7) DRIVE THE STAKES IN FURTHER TO COMPRESS THE MATTRESS AGAINST THE SLOPE LEAVING A MINIMUM OF 6 INCHES OF THE STAKE ABOVE THE MATTRESS.
- (8) INSTALL LONGITUDINAL STONE TOE OR OTHER APPROVED ALTERNATE IN TRENCH.
- (9) BACKFILL IN AND BETWEEN THE BRANCHES WITH LOOSE MATERIAL UNTIL APPROXIMATELY HALF THE MATTRESS REMAINS EXPOSED. WET THE SURFACE TO WASH SOIL DOWN BETWEEN THE BRANCHES.
- (10) COVER BRUSH MATTRESS WITH 3-4 INCHES OF TOPSOIL TO PROVIDE ROOTING MEDIUM. SPREAD TEMPORARY AND PERMANENT SEED MIX, STRAW MUCH AND MEDIUM. INSTALL COIR MATTING OVER BRUSH MATTRESS.
- (J) ALL TWINE, STRING, WIRE OR OTHER MEASURES USED FOR SECURING MATTRESS TO STAKES SHALL BE BIODEGRADABLE. WHERE COIR TWINE IS USED, IT SHALL BE MACHINE SPUN BRISTLE COIR OF 0.2 TO 0.25-INCH THICKNESS WITH BREAK STRENGTH OF 70 TO 100 POUNDS. JUTE OR OTHER BIODEGRADABLE MATERIAL IS ACCEPTABLE. BRANCHES SHALL BE FLEXIBLE ENOUGH TO CONFORM TO ANY SLOPE SURFACE IRREGULARITIES AND SHOULD BE INSTALLED DURING DORMANT SEASON.
- (K) PAYMENT FOR THE BRUSH MATTRESS SYSTEM SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION, AND SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:
 - 209-03.59, STREAM MITIGATION - BRUSH MATTRESS, S.Y.
- (L) LONGITUDINAL STONE TOE, COIR FIBER ROLL, AND LIVE FASCINE BUNDLES SHALL BE PAID FOR ACCORDING TO THEIR RESPECTIVE STANDARD DRAWINGS.

STREAM MITIGATION PLAN LEGEND:



BRUSH MATTRESS

REV. 9-15-17: MODIFIED THE STREAM MITIGATION PLAN LEGEND SYMBOL.
 REV. 9-15-17: MODIFIED THE STREAM MITIGATION PLAN LEGEND SYMBOL.
 REV. 05-01-20: SPLIT AND MODIFIED BRUSH MATTRESS NOTE (K) AND ADDED NOTE (L). REDREW SHEET.

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.

STATE OF TENNESSEE
 STANDARD DRAWING
 DEPARTMENT OF TRANSPORTATION

**BRUSH
MATTRESS**

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NOT TO SCALE