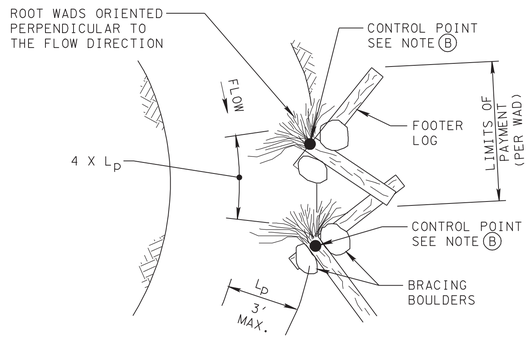
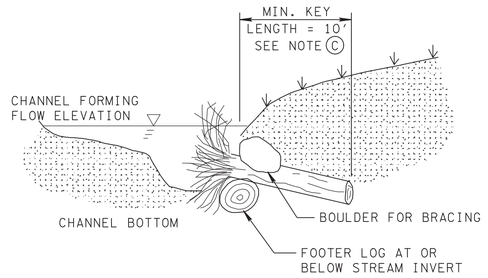
ROOT WAD

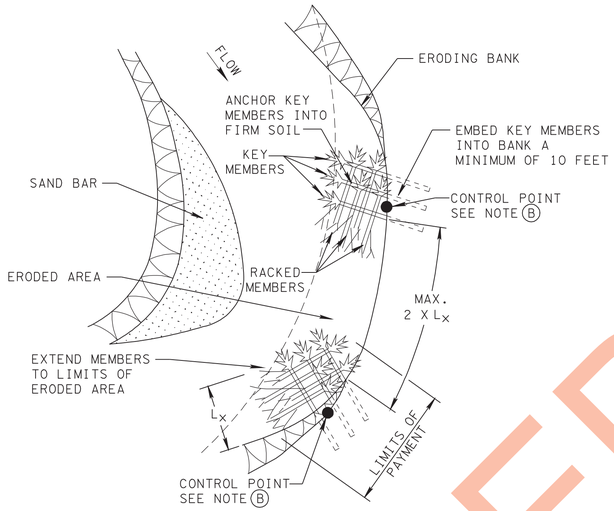


PLAN VIEW
ROOT WAD REVETMENT



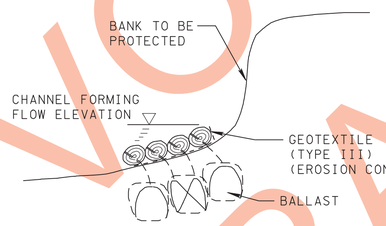
SECTION VIEW
ROOT WAD

RACK STRUCTURE

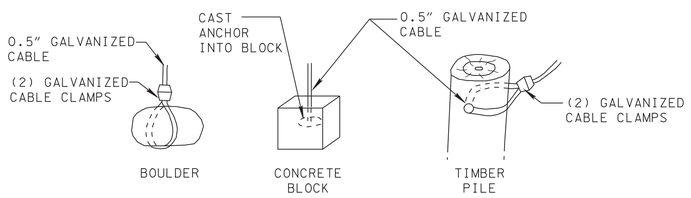


PLAN VIEW
RACK STRUCTURES

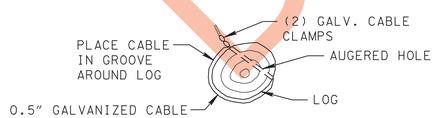
LOG REVETMENT



SECTION VIEW
LOG REVETMENT

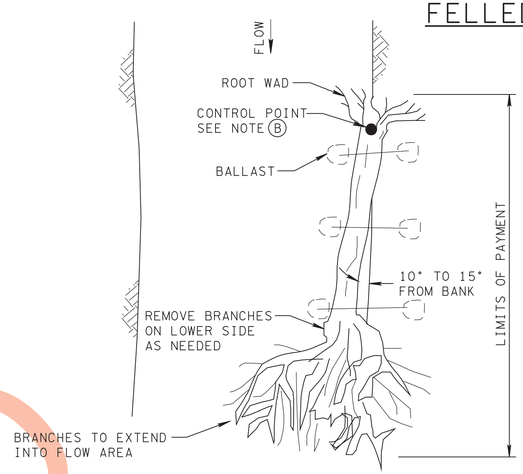


BALLAST TYPES FOR ANCHORS

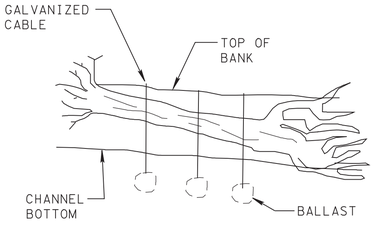


ANCHOR CONNECTION
LOG REVETMENT

FELLED TREE



PLAN VIEW
FELLED TREE



TREE PLACEMENT
ON BANK

LARGE WOODY DEBRIS GENERAL NOTES

(A) LARGE WOODY DEBRIS MAY HAVE A VARIETY OF CONFIGURATIONS BASED ON THE PURPOSE OF THE INSTALLATION. ROOT WADS, LOG REVETMENTS AND FELLED TREES MAY BE USED TO PREVENT EROSION ON AN OUTSIDE CHANNEL BEND WHILE ALSO PROVIDING HABITAT OPPORTUNITIES. RACK STRUCTURES CAN PREVENT EROSION AND ALSO HELP ENCOURAGE THE DEPOSITION OF SEDIMENT TO REBUILD AN ERODED BANK. LARGE WOODY DEBRIS SHOULD NOT BE PLACED ON STREAMS THAT DO NOT ALREADY HAVE SIGNIFICANT RIPARIAN TREE COVER.

(B) STATIONS, OFFSETS AND REQUIRED ANCHOR STRENGTH FOR LARGE WOODY DEBRIS INSTALLATIONS WILL BE PROVIDED IN THE STREAM MITIGATION DATA TABLE IN THE PROJECT PLANS. CONSTRUCT AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. CONSTRUCT LARGE WOODY DEBRIS STRUCTURES WITH LOCALLY AVAILABLE ROT RESISTANT TREE SPECIES SUCH AS CEDAR OR WHITE OAK.

(C) ROOT WADS SHALL BE PLACED SO THAT THE ROOT FAN IS NO MORE THAN 3 FEET FROM THE BANK. WHERE THE CHANNEL WIDTH IS LESS THAN 15 FEET, THE TRUNK SHOULD BE KEYED INTO THE BANK A MINIMUM DISTANCE OF 10 FEET. IN LARGER STREAMS, THE KEY LENGTH SHOULD BE INCREASED TO 20 FEET. CONSTRUCT KEYS BY EXCAVATING A TRENCH IN THE STREAM BANK AND BURYING THE TRUNK. ROOT WADS SHOULD BE SUPPORTED ON FOOTER LOGS PLACED IN A TRENCH AT THE BANK LINE. LARGE BOULDERS MAY BE PLACED ON TOP OF THE LOG TO PROVIDE INCREASED STABILITY.

(D) RACK STRUCTURES SHALL BE USED ONLY WHERE THE UNDERLYING SOILS OFFER SUFFICIENT STRENGTH TO FIRMLY HOLD THE ANCHORS. THE KEY MEMBERS SHOULD BE KEYED INTO THE BANK AS DESCRIBED IN NOTE (C) WITH THE ROOT FANS FACING THE CHANNEL. RACKED MEMBERS SHOULD INTERLOCK WITH THE KEY MEMBERS WITH ROOT FANS FACING UPSTREAM. THE ENTIRE STRUCTURE SHOULD BE ANGLED SO THAT THE FLOW INTERSECTS THE RACKED MEMBERS AT AN ANGLE OF 15 DEGREES. THE STRUCTURE SHALL ALSO BE ANCHORED AS DESCRIBED IN NOTE (G). THE TOP OF THE STRUCTURE SHOULD BE AT THE CHANNEL FORMING FLOW ELEVATION WHILE THE LOWEST MEMBERS SHOULD BE BELOW THE ANTICIPATED SCOUR DEPTH.

(E) EACH LOG IN A LOG REVETMENT SHALL BE SECURED AT BOTH ENDS BY APPROPRIATE ANCHORS AS DESCRIBED IN NOTE (G). ANCHORS SHOULD BE PLACED THROUGH HOLES BORED IN THE LOGS AND TIED WITH TWO GALVANIZED CABLE CLAMPS. LOGS SHALL BE PLACED ON GEOTEXTILE FABRIC (TYPE III) (EROSION CONTROL). ONLY GEOTEXTILE (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.

(F) FELLED TREES SHALL BE PLACED SO THAT THE ROOT FAN IS NEAR THE TOP OF BANK. THE TRUNK SHOULD BE PLACED AT AN ANGLE OF 10 TO 15 DEGREES WITH THE BANK LINE SO THAT THE BRANCHES EXTEND INTO THE ACTIVE FLOW OF THE STREAM. BRANCHES MAY BE REMOVED AS NEEDED FROM THE UNDERSIDE OF THE TREE TO FACILITATE PLACEMENT IN THE CHANNEL. BRANCH REMOVAL SHALL BE KEPT TO A MINIMUM.

(G) ANCHORS SHALL CONSIST OF GALVANIZED CABLE. THE GAUGE OF CABLE, TYPE OF BALLAST AND CLAMPS SHALL BE SELECTED BY THE CONTRACTOR BASED ON THE REQUIRED ANCHOR TENSILE STRENGTH SHOWN IN THE STREAM MITIGATION TABLE IN THE PROJECT PLANS. ANCHORS SHALL BE BALLASTED BY MEANS OF BOULDERS, CONCRETE BLOCKS OR TIMBER PILES BURIED IN WELL COMPACTED SOILS AT A LEVEL BELOW THE EXPECTED SCOUR DEPTH.

(H) LARGE WOODY DEBRIS SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBERS:

209-03.62	STREAM MITIGATION - ROOT WAD (SIZE) PER EACH
209-03.63	STREAM MITIGATION - RACK STRUCTURE (SIZE) PER EACH
209-03.64	STREAM MITIGATION - FELLED TREE (SIZE) PER EACH
209-03.65	STREAM MITIGATION - LOG REVETMENTS (DESCRIPTION) PER LINEAR FOOT

NOTE: SIZE IS DEFINED BY THE AVERAGE DIAMETER OF THE TREE TRUNK.

PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION OF THE SPECIFIED WOODY DEBRIS STRUCTURE.

(I) ALL HARDWARE SHALL BE LISTED ON THE QUALIFIED PRODUCT LIST OR APPROVED BY TDOT IN ADVANCE OF IT'S USE AND INTENDED PURPOSE.

STREAM MITIGATION PLAN LEGEND: LR / LR — LOG REVETMENT

STREAM MITIGATION PLAN LEGEND: # — RACK STRUCTURE

STREAM MITIGATION PLAN LEGEND: — ROOT WAD

STREAM MITIGATION PLAN LEGEND: — FELLED TREE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

LARGE WOODY DEBRIS

NOT TO SCALE | 8-01-11 | D-NSD-10