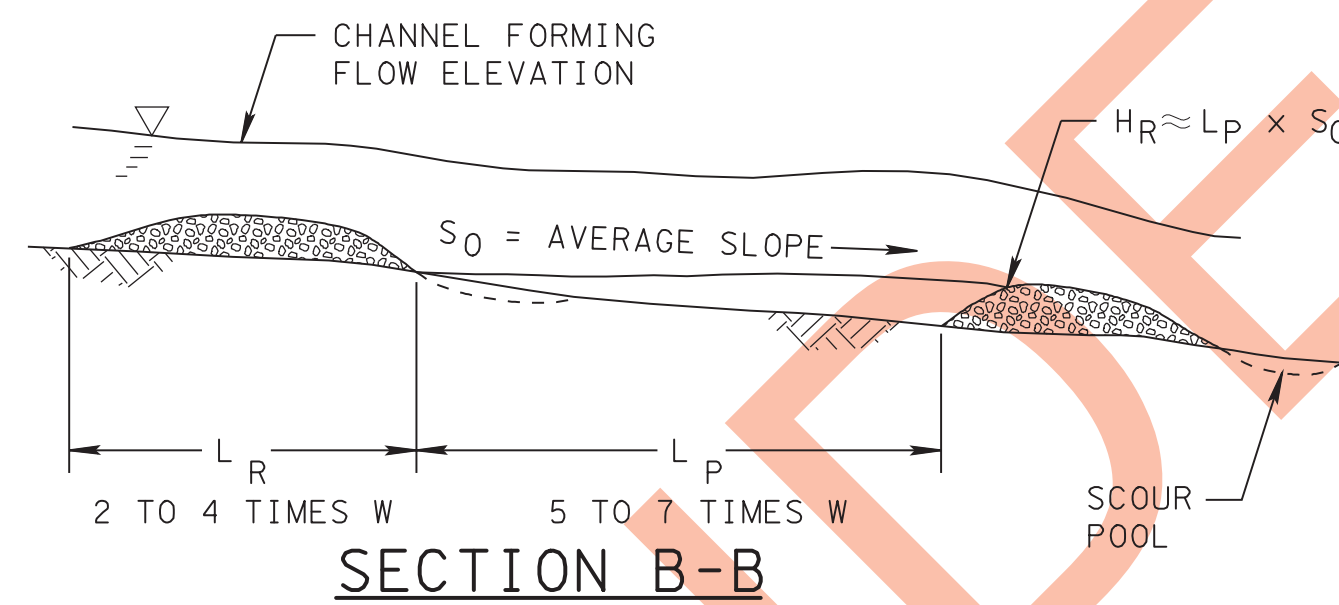
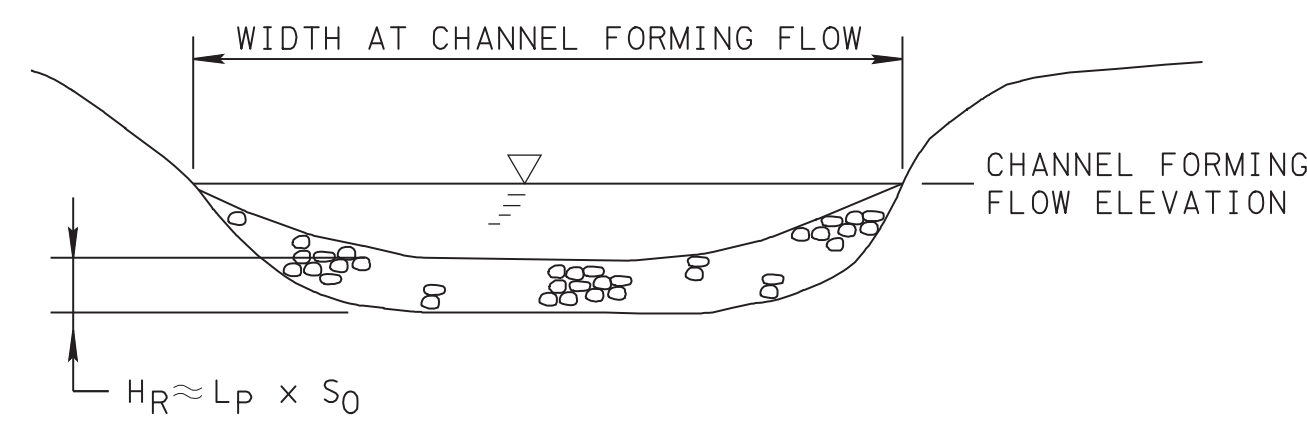
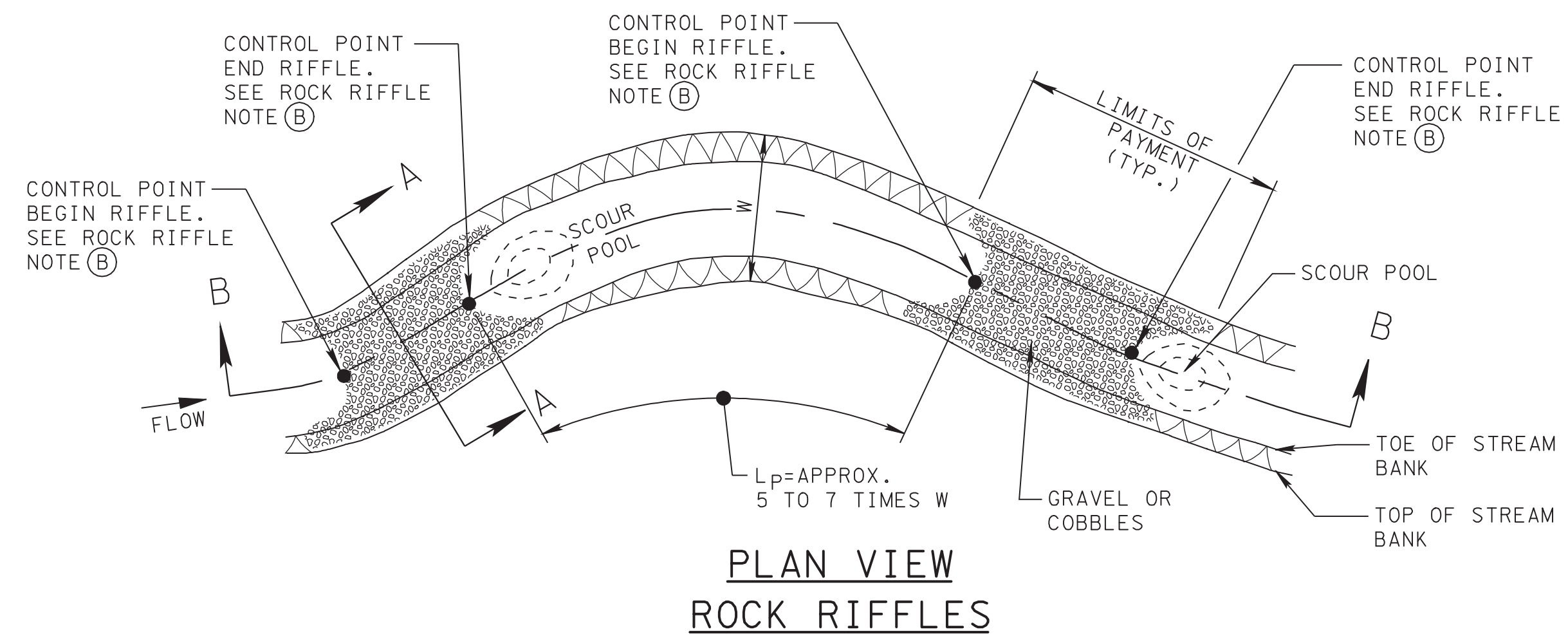


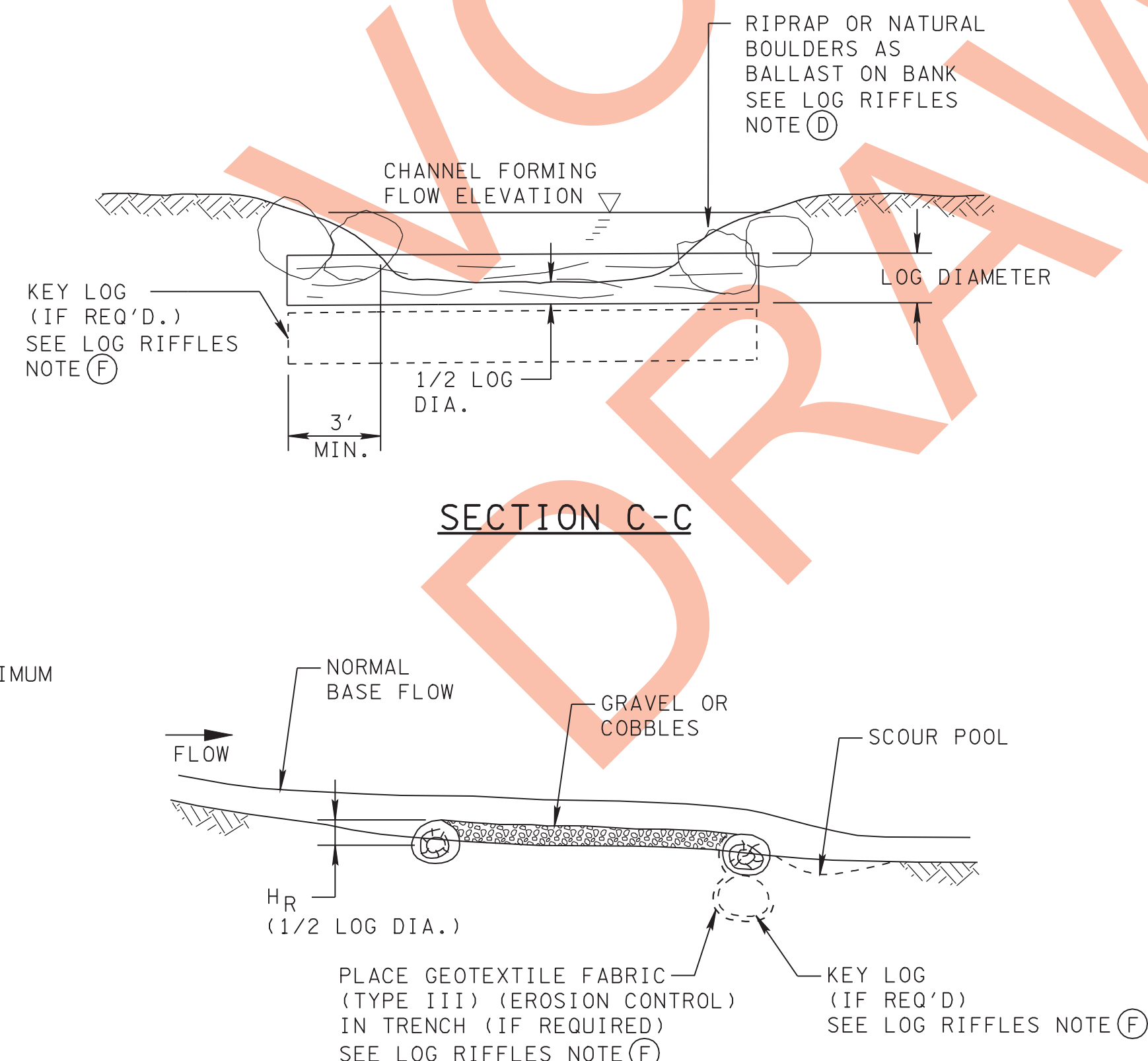
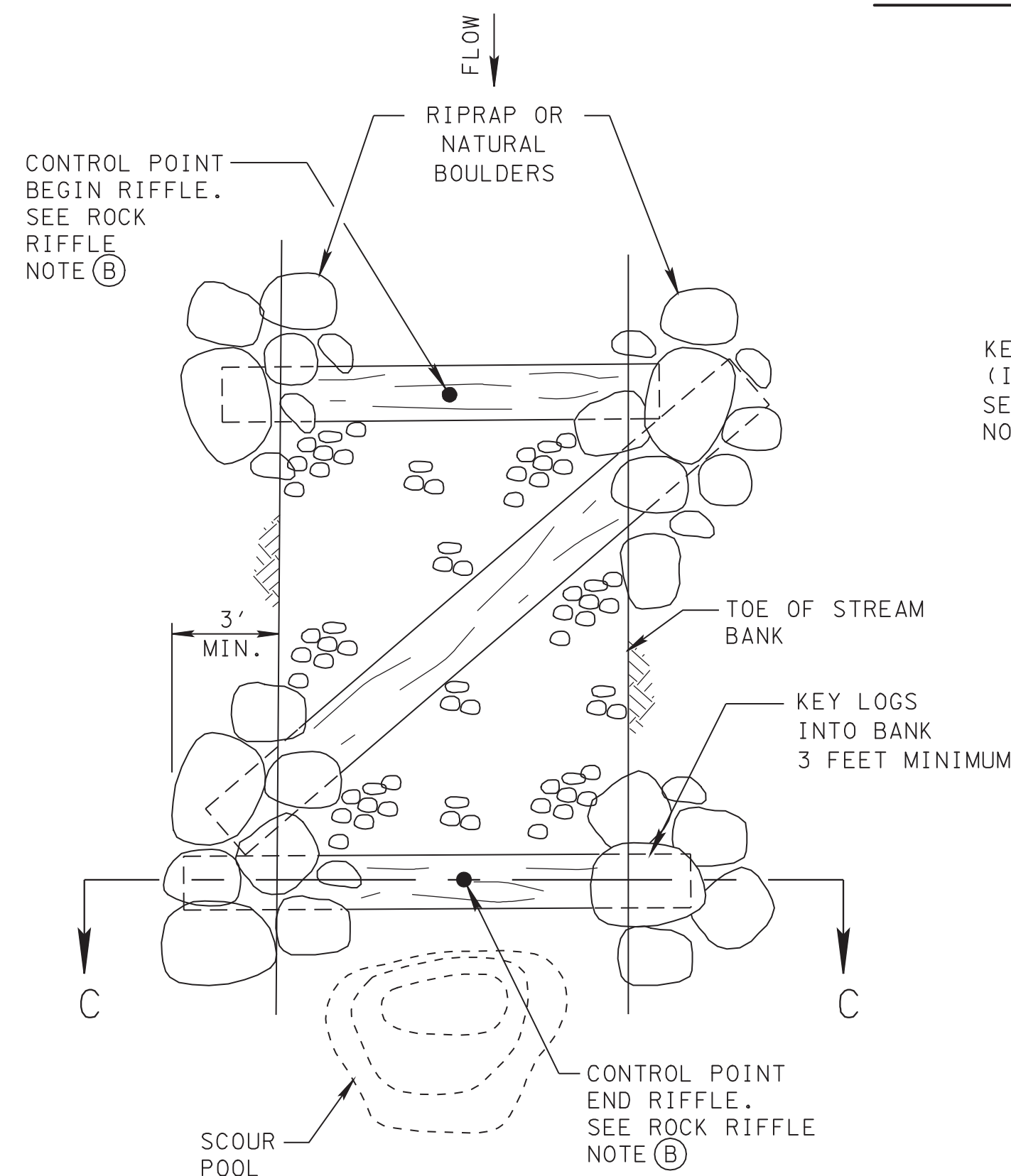
ROCK RIFFLE



ROCK RIFFLE GENERAL NOTES

- (A) ROCK RIFFLES ARE HYDRAULIC CONTROL MEASURES THAT MAY BE USED TO RECREATE THE POOL AND RIFFLE PROFILE PRESENT IN THE EXISTING STREAM THAT IS TO BE RELOCATED.
- (B) CONSTRUCT RIFFLES AT THE BEGINNING AND ENDING CONTROL POINT LOCATIONS INDICATED IN THE STREAM MITIGATION DATA TABLE IN THE PROJECT PLANS OR AS DIRECTED BY THE ENGINEER.
- (C) RIFFLES SHOULD BE CONSTRUCTED IN STRAIGHT REACHES OF THE STREAM RATHER THAN IN THE BENDS. CONSTRUCT FROM THE SIDES OF THE CHANNEL, PLACING THE ROCKS IN THE CENTER LAST. THE CENTER OF THE RIFFLE SHOULD BE LOWER THAN THE SIDES IN ORDER TO HELP CONCENTRATE LOW FLOWS TO THE MIDDLE OF THE CHANNEL. THE RIFFLE HEIGHT (H_R) SHOULD NOT BE GREATER THAN THE WATER DEPTH AT NORMAL FLOW.
- (D) THE MATERIALS USED TO CONSTRUCT A RIFFLE IN THE RELOCATED CHANNEL SHOULD HAVE A PARTICLE SIZE DISTRIBUTION SIMILAR TO THE MATERIALS FOUND IN NATURALLY OCCURRING RIFFLES ON THE STREAM. WHERE POSSIBLE, USE RIFFLE MATERIALS FROM THE STREAM BEING RELOCATED TO CONSTRUCT RIFFLES IN THE RELOCATED CHANNEL REACH. OTHERWISE THE D_{50} OF THE MATERIAL TO BE USED WILL BE PROVIDED IN THE STREAM MITIGATION DATA TABLE IN THE PROJECT PLANS.
- (E) ROCK RIFFLES SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:
709-05.81 ROCK RIFFLES PER LUMP SUM
PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR THE CONSTRUCTION OF THE ROCK RIFFLE.

LOG RIFFLE



LOG RIFFLES GENERAL NOTES

- (A) LOG RIFFLES ARE HYDRAULIC CONTROL MEASURES THAT MAY BE USED TO RECREATE THE POOL AND RIFFLE PROFILE PRESENT IN THE EXISTING STREAM THAT IS TO BE RELOCATED AS WELL AS TO ADD OXYGEN TO THE WATER AND PROVIDE SUBSTRATE FOR AQUATIC ORGANISMS.
- (B) CONSTRUCT LOG RIFFLES AT THE BEGINNING AND ENDING CONTROL POINT LOCATIONS INDICATED IN THE STREAM MITIGATION DATA TABLE IN THE PROJECT PLANS OR AS DIRECTED BY THE ENGINEER. THE TABLE WILL ALSO INDICATE THE MINIMUM REQUIRED LOG DIAMETER AND THE D_{50} OF THE GRAVEL AND COBBLES PLACED BETWEEN THE LOGS. THE RIFFLE HEIGHT, H_R , SHALL GENERALLY BE EQUAL TO HALF OF THE LOG DIAMETER.
- (C) GRAVEL OR COBBLES PLACED BETWEEN THE LOGS SHOULD CORRESPOND TO THE MATERIAL PRESENT IN RIFFLES IN THE EXISTING STREAM. IF POSSIBLE USE THE EXISTING MATERIAL TO CONSTRUCT THE RIFFLES IN THE RELOCATED STREAM.
- (D) THE LOGS SHOULD BE KEYED INTO THE BANKS A MINIMUM OF 3 FEET AND NATURAL BOULDERS OR RIPRAP USED TO PROVIDE EXTRA BALLAST. ADDITIONAL STONE SHOULD BE PLACED ABOVE THE ENDS OF THE LOGS IN ORDER TO PROVIDE MATERIAL THAT WILL FILL IN THE VOIDS LEFT AS THE LOGS DECAY.
- (E) SELECT LOGS FROM LOCALLY AVAILABLE WOOD SPECIES THAT DECAY RELATIVELY SLOWLY, SUCH AS CEDAR OR WHITE OAK.
- (F) WHERE THE CHANNEL IS CHARACTERIZED BY NON-COHESIVE MATERIALS SUCH AS SAND OR SILT, PLACE A KEY LOG BENEATH THE DOWNSTREAM RIFFLE LOG TO PREVENT UNDERMINING. THE TRENCH WITH THIS LOG SHOULD BE LINED WITH GEOTEXTILE FABRIC (TYPE III) (EROSION CONTROL) TO SEAL THE STRUCTURE. ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.
- (G) LOG RIFFLES SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:
709-05.80 LOG RIFFLES PER EACH
PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR THE CONSTRUCTION OF THE LOG RIFFLES.