

A. AS-BUILT DRAWINGS - DURING CONSTRUCTION

THE CONTRACTOR AND THE ENGINEER SHALL WORK TOGETHER TO MAINTAIN A SET OF PRINTS SHOWING ANY CHANGES OR CORRECTIONS IN RED. THESE PRINTS SHALL BE SUBMITTED TO THE ENGINEER AT THE COMPLETION OF THE WORK.

B. STREAM MITIGATION DEFINITIONS:

- BANKFULL ELEVATION - BANKFULL ELEVATION IS THE POINT OF INCIPIENT FLOODING IN AN ALLUVIAL CHANNEL.
- FLOODPLAIN SILL - A FLOODPLAIN SILL IS THE BURIED EXTENSION OF THE STRUCTURE AND IS PERPENDICULAR TO THE FLOW DIRECTION OF THE BANKFULL CHANNEL ACROSS THE BANKFULL BENCH OR FLOODPLAIN.
- FOOTER BOULDERS - FOOTER BOULDERS ARE PLACED TO PROVIDE A FOUNDATION FOR THE SURFACE BOULDERS IN EACH HYDRAULIC STRUCTURE. THE LOWEST COURSE OF FOOTER BOULDERS ARE BURIED IN THE CHANNEL TO A DEPTH BELOW THE CALCULATED OR MEASURED SCOUR DEPTH. FOOTER BOULDERS SHALL BE DURABLE LIMESTONE WITH DIMENSIONS SHOWN IN THE DETAILS. TYPICALLY, FOOTER BOULDERS ARE BURIED IN THE CHANNEL BOTTOM AND NOT SEEN WHEN THE STRUCTURE IS COMPLETED. ALL SURFACE BOULDERS FOR ALL STRUCTURES REQUIRE FOOTER BOULDERS UNLESS BEDROCK IS ENCOUNTERED AT THE PROPOSED ELEVATION OF FOOTER BOULDERS.
- SURFACE BOULDERS - SURFACE BOULDERS ARE THE TOP-MOST COURSE OF BOULDERS USED IN EACH CROSS VANE OR OTHER ROCK STRUCTURE. ALL SURFACE BOULDERS CAN BE SEEN PROTRUDING FROM THE WATER SURFACE DURING EXTREMELY LOW FLOWS. SURFACE BOULDERS SHALL BE DURABLE LIMESTONE WITH DIMENSIONS SHOWN IN THE DETAILS.
- THALWEG - THE THALWEG IS THE LOWEST POINT OF THE BANKFULL CHANNEL DESCRIBED BY THE STREAM PROFILE. THIS ELEVATION IS THE REFERENCE FOR ALL ELEVATIONS ON OR ALONG THE CHANNEL AND HYDRAULIC STRUCTURES DESCRIBED IN THIS SECTION AND IN THE PROJECT DRAWINGS.
- VANE ANGLE - THE VANE ANGLE IS THE SMALLEST ANGLE MEASURED BETWEEN A VANE AND A LINE TANGENT TO THE BANKFULL ELEVATION AT THE POINT WHERE THE VANE INTERSECTS THE BANK. THE VANE ANGLE SHALL BE BETWEEN TWENTY PERCENT (20%) AND THIRTY PERCENT (30%), OR AS SPECIFIED IN THE STREAM MITIGATION DATA TABLE.
- VANE LENGTH -THE VANE LENGTH IS THE DISTANCE BETWEEN THE UPSTREAM LIMIT OF THE VANE ARM AT THE CHANNEL BED TO THE DOWNSTREAM INSERTION POINT OF THE VANE ARM INTO THE STREAM BANK.
- VANE SLOPE - THE VANE SLOPE IS THE SLOPE OF THE VANE ARM FROM THE UPSTREAM LIMIT AT THE CHANNEL BED TO THE DOWNSTREAM INSERTION POINT OF THE VANE ARM INTO THE STREAM BANK. THE VANE SLOPE SHALL BE BETWEEN TWO PERCENT (2%) AND FIVE (5%) FOR BOULDERS OR FOUR PERCENT (4%) FOR LOGS AND THE VANE ARMS SHALL TIE INTO THE BANKS AT HALF TO THREE QUARTERS OF THE BANKFULL ELEVATION. SLOPE AND ELEVATION INFORMATION INDICATED IN THE STREAM MITIGATION TABLE OR AS DIRECTED BY THE ENGINEER SHALL BE FOLLOWED IF PRESENT.
- SUBSTRATE RESTORATION - SUBSTRATE RESTORATION IS DESIGNED TO REPLACE AND RESTORE COARSE SUBSTRATE (GRAVEL, COBBLE, AND BOULDER) TO THE STREAM CHANNEL IN CASES WHERE COARSE SUBSTRATES OR BEDROCK ARE ABSENT FOLLOWING CHANNEL EXCAVATION. THE PURPOSE OF SUBSTRATE RESTORATION IS TO PROVIDE NATURAL SUBSTRATE AND EROSION AND SCOUR PROTECTION IN THE CHANNEL.
- BASE FLOW- FOR THE PURPOSE OF THESE STREAM DESIGN SPECIFICATIONS, A FLOW EQUAL TO ONE CUBIC FOOT PER SECOND PER SQUARE MILE OF DRAINAGE AREA.

C. FLOODPLAIN AND CHANNEL CONSTRUCTION

- CHANNEL RELOCATION WORK SHALL BE COMPLETED AND RESTORED PRIOR TO ALLOWING FLOW TO ENTER INTO THE NEWLY CONSTRUCTED STREAM CHANNEL. A TEMPORARY DAM AND PUMP-AROUND SHALL BE INSTALLED TO FACILITATE CONSTRUCTION OF THE CHANNEL "IN THE DRY". DIVERSION PUMP SHALL BE CAPABLE OF MAINTAINING DRY CONDITIONS FOR CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE PUMP, OR PUMPS, AVAILABLE HAVE SUFFICIENT CAPACITY. THE DAM SHALL BE PLACED SUCH THAT IT CAN BE OVERTOPPED DURING HIGH FLOWS WITHOUT RESULTING IN FLOODING. THE CONTRACTOR MAY PHASE CHANNEL CONSTRUCTION TO ALLOW FOR PORTIONS OF THE CHANNEL TO BE CONSTRUCTED "IN THE DRY", REDUCING PUMP-AROUND NEEDS.
- THE CONTRACTOR SHALL STAKE OUT THE PROPOSED STREAM CENTERLINE AND STRUCTURE LOCATIONS FOR APPROVAL BY THE ENGINEER BEFORE INITIATING EXCAVATION. DEPENDING ON THE SITE CONDITIONS, SOME SHIFTING OF THE STREAM CHANNEL AND VANE STRUCTURES MAY BE NECESSARY. ANY COST ASSOCIATED WITH CHANGING CHANNEL ALIGNMENT AND STRUCTURE LOCATIONS SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION. IF CHANNEL ALIGNMENT AND/OR STRUCTURE LOCATIONS ARE CHANGED IN THE FIELD, THE TOOT ENVIRONMENTAL DIVISION SHALL BE CONTACTED FOR A REVIEW OF PERMITS.
- THE PROPOSED STREAM CHANNEL SHALL BE CONSTRUCTED BY FIRST EXCAVATING THE FLOODPLAIN TO THE ELEVATIONS AND DIMENSIONS SPECIFIED ON THE STREAM MITIGATION GRADING PLAN. THE PROPOSED STREAM CHANNEL SHALL THEN BE EXCAVATED TO THE PROPER DEPTHS INDICATED ON THE PROFILE AND CROSS SECTIONS. THIS SHALL BE DONE AS UNCLASSIFIED EXCAVATION AND IS TYPICALLY ACCOMPLISHED WITH A TRACK EXCAVATOR WITH HYDRAULIC THUMB. ANY STOCKPILING OR DOUBLE-HANDLING OF MATERIALS NECESSARY TO BUILD THE CHANNEL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

D. QUALIFICATIONS

THE CONTRACTOR SHALL SUBMIT WRITTEN EVIDENCE OF THE FOLLOWING MINIMUM QUALIFICATIONS AND EXPERIENCE REQUIREMENTS TO BE CONSIDERED FOR THIS PROJECT:

- AT LEAST ONE OF THE CONTRACTOR'S ON-SITE CONSTRUCTION PERSONNEL (SITE SUPERINTENDENT, FOREMAN, OR EQUIPMENT OPERATOR) SHALL HAVE COMPLETED ROSGEN NATURAL STREAM RESTORATION COURSEWORK TO LEVEL II (APPLIED FLUVIAL GEOMORPHOLOGY) OR ABOVE, OR HAVE COMPLETED EQUIVALENT COURSEWORK AS APPROVED BY THE ENVIRONMENTAL DIVISION AT TOOT.
- AT LEAST ONE OF THE CONTRACTOR'S ON-SITE PERSONNEL (SITE SUPERINTENDENT, FOREMAN, OR EQUIPMENT OPERATOR) SHALL HAVE COMPLETED TENNESSEE LEVEL I AND LEVEL II EROSION PREVENTION AND SEDIMENT CONTROL TRAINING.

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STATE OF TENNESSEE
STANDARD
DRAWING
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SPECIAL NOTES
FOR NATURAL
STREAM DESIGN

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