



Restoration Guidance for Streams with Adjacent Wetlands in Piedmont and Coastal Plain Regions

Module 5: Construction and Post- construction



Construction and Post- construction - Construction

- **Oversight**

- **Environmental inspector/monitor onsite to coordinate with the contractor is recommended.**
- **In some cases regulatory agencies can require that the inspector or monitor be independent and report directly to the agency.**

- **Invasive species**

- **Clean and disinfect clothing and equipment prior to and after construction.**
- **Disinfect at least 50 feet away from streams and wetlands to protect aquatic life/amphibians from chlorine**



Construction and Post- construction - Construction

CONSTRUCTION NOTES

1. CONTACT US FISH AND WILDLIFE SERVICE CHESAPEAKE BAY FIELD OFFICE OR THE NATURE CONSERVANCY (TNC) FOR CONSTRUCTION LAYOUT AND PRECONSTRUCTION MEETING.
2. CONSTRUCTION MUST BE SUPERVISED BY A MEMBER OF THE US FISH AND WILDLIFE SERVICE OR TNC.
3. THREE WORKING DAYS BEFORE CONSTRUCTION BEGINS CONTACT MISS UTILITY AT 1-800-441-8355.
4. THERE WILL NOT BE A CONSTRUCTION ROAD. ACCESS WILL VARY BASED ON THE METHOD THAT REMOVES THE LEAST NUMBER OF LARGE TREES. TO BE DETERMINED ON SITE BY CONSTRUCTION MANAGER. USE LOGGING MATS ON ACCESS ROAD IN ORDER TO MINIMIZE DAMAGE TO FLOODPLAIN DURING CONSTRUCTION.
5. NO SPOIL SHALL BE PLACED WITHIN 10' OF THE CHANNELIZED RIVER. SPOIL ELEVATIONS SHOULD NOT BE GREATER THAN 1.5' ABOVE EXISTING SPOIL HEIGHT. ALL SPOIL PLACEMENT SHALL BE GRADED TO A MINIMUM OF 2:1 SLOPE OR FLATTER.
6. BREACHES WILL BE CLOSELY MONITORED TO ADDRESS ANY POTENTIAL EROSION PROBLEMS THAT MIGHT OCCUR. ANY ISSUES WILL BE FIXED IMMEDIATELY.
7. NO CHANGES SHALL BE MADE TO THE PLANS WITHOUT PRIOR APPROVAL FROM THE PERSON RESPONSIBLE FOR THE DESIGN.

Plan detail courtesy of The Nature Conservancy and USFWS



Construction and Post- construction - Construction

MOBILIZATION AND DEMOBILIZATION

The work consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.

Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the contractor's operations at the site; premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable.

One of the primary purposes of this project is to provide high quality habitat for wildlife, which includes a diverse community of native plants. **To prevent contamination of the site with noxious and invasive plants, equipment (including buckets, tracks, and tires) shall be reasonably clean and free of soil and plant materials prior to mobilization.**

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

Plan detail courtesy of The
Nature Conservancy and
USFWS



Construction and Post- construction - Construction

Equipment selection

- **Use smallest equipment practicable for safety, including ATVs for access rather than larger equipment.**
- **It may be justifiable to use larger equipment if it would be operating at lower psi (e.g. 8 psi).**
- **Install structures by hand when feasible.**
- **Be prepared to provide rationale for equipment selection.**
- **Use smaller pipes and pumps to reduce limit of disturbance.**
- **Cease pump operation at the end of each day**



Construction and Post- construction - Access

- **Walk access route with agencies to identify trees to be retained or removed. Access should be located in existing gaps where they exist.**
- **Access path may meander to avoid trees or other selected habitat features.**
- **Limit compaction and damage to tree roots by using mulch, mats and more mulch for access roads and staging areas.**
- **Limit access roads to 12' in width or less. Additional documentation and justification is required for wider roads.**
- **Use of streambeds as access points must be justified and found by MDE to result in fewer undesirable impacts than operating in the floodplain.**
- **Avoid travel through NNIS infested areas, or work in these areas last.**



Construction and Post- construction - Tree Retention

- **If trees must be removed, remove selected trees <24” dbh or that are not healthy. Pine plantations may be removed.**
- **Install planking and protection fences before construction equipment enters site.**
- **Cut trees flush to ground, leaving stump and roots, or push tree down leaving roots in contact with soil. If cut trees not used as part of restoration, leave in riparian areas as woody debris.**
- **Limit cutting of roots when installing erosion and sediment control fences.**
- **Allow varying slope angles on channel banks to retain selected trees on the bank.**



Construction and Post- construction - Tree Retention

Here is an example of trees with protective fencing and planks around the trunks



Photo: MDE



Construction and Post- construction – Stabilization and Planting

- **Stabilize site at end of each day to reduce areas of exposed soil, including areas where pump may be removed each day. Cover bare soil with temporary soil erosion control matting or mulch which can be removed for the next days' construction**
- **Use permanent stabilization mix of native species appropriate for region**
- **Straw mulch should be certified by the supplier as weed-free**
- **Remediate areas of soil compaction.**
- **Mulch from the access road may be spread through the site to a maximum depth of 2 inches to help build organic matter.**
- **Plantings must be species native to the physiographic region. Tree and shrub plantings must be protected from herbivory, and replaced as needed.**



Construction and Post- construction – Stabilization and Planting

CONSTRUCTION SEQUENCING

1. EMPLOY ALL SEDIMENT AND EROSION CONTROL MEASURES BEFORE BEGINNING WORK.
2. AT THE END OF EACH DAY, ALL COMPLETED CONSTRUCTION SHALL BE SEEDED AND FILL AREAS MULCHED WITH STRAW AND THE BREACHES COVERED WITH JUTE MATTING. BEGIN WORKING ON THE BREACH FURTHEST AWAY FROM THE ROAD ACCESS, COMPLETE EACH BREACH IN THE FOLLOWING SEQUENCE:
 - A. CLEAR TREES IN THE BREACH FOOTPRINT, AND PLACE ON THE SPOIL PILES OUTSIDE OF THE BREACH AREA AND FILL AREAS. PLACEMENT OF TREES WILL BE DIRECTED BY THE ON-SITE CONSTRUCTION MANAGER.
 - B. GRADE BREACH LOCATIONS TO PROPER ELEVATION AND PLACE SPOIL IN THE DESIGNATED SPOIL DISPOSAL AREAS.
 - C. PLACE THE TREES THAT WERE TEMPORARILY STORED IN FLOODPLAIN ON FILL AREAS.
 - D. REMOVE ANY SOIL FILL FROM THE FLOODPLAIN THAT MAY HAVE FALLEN OFF THE ROOTBALLS OF THE CLEARED TREES.
 - E. SEED AND STRAW FILL AREAS THAT ARE NOT COVERED BY TREES
 - F. SEED AND PLACE JUTE MATTING IN THE BREACHES
3. CONSTRUCT BREACHES ACCORDING TO DRAWING. USFWS OR TNC WILL VERIFY FLOODPLAIN ELEVATION AND SET GRADE STAKES AT EACH BREACH. PLACE SPOIL FROM BREACHES IN THE DESIGNATED DISPOSAL AREAS SHOWN ON THE MAP OR IDENTIFIED BY USFWS/TNC.
4. ALL SPOIL DISPOSAL AREAS SHALL BE SEEDED IMMEDIATELY FOLLOWING FINAL GRADING USING MIX 2, AND STABILIZED WITH STRAW MULCH APPLIED AT 2 TONS/ACRE AT 1 2" DEPTH. BREACHES SHALL BE SEEDED IMMEDIATELY USING MIX 1. ALL SEEDING AND PLANTING MIXES ARE FOUND ON PAGE 4 OF THESE PLANS.
5. AFTER SEEDING THE BREACHES, INSTALL JUTE MATTING ACCORDING TO PRODUCT SPECIFICATIONS.

Plan courtesy The Nature Conservancy and USFWS



Construction and Post- construction - Monitoring and Remediation

- **Determine if flow will be non-erosive through the altered channel.**
- **Adjust channel geometries as necessary if flow was found to be erosive.**
- **Create additional habitat features (e.g. shallow pool in areas of equipment staging in floodplain**



Construction and Post- construction – Monitoring and Remediation

- **Comply with monitoring requirements of authorization**
- **At a minimum, monitoring will require an evaluation of structural integrity**
- **Wetlands which intended to be temporarily lost must be successfully re-established and meet specified vegetation standards**
- **Indicate in the monitoring report remedial actions necessary to meet performance standards**



Construction and Post- construction - Monitoring and Remediation

- **Repeated monitoring, maintenance, and remediation may be necessary to achieve success of planted vegetation.**
- **Modify structures as needed to ensure that surface and ground water are at approved and desired levels to maintain desired vegetation.**
- **Modify, repair, or replace failed structures. Remove material which may threaten infrastructure.**
- **Submit required monitoring reports on schedule.**
- **Plan ahead to obtain resources to monitor the site for new NNIS or the spread of existing populations, and to treat NNIS as needed.**
- **Treatment of non-native species may be needed beyond the duration of monitoring for continued project success.**



Next Steps

Recommendations Welcome for:

- **Additional Practices to Protect Wetland/Riparian Areas**
- **Format/Ease of Use of Forms**
- **Assessment**

Recommendations to be Considered for Future Revisions in 2024

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