

APPENDIX B2

BAYOU CASOTTE ENERGY'S PROCEDURES

BAYOU CASOTTE ENERGY'S

WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES

JULY 2005

INTRODUCTION

Bayou Casotte Energy LLC (Bayou Casotte Energy) has developed the following guidelines to be used during the construction of the Casotte Landing LNG Terminal Project (Project) proposed near Pascagoula in Jackson County, Mississippi.

This document has been created in conjunction and is consistent with the Federal Energy Regulatory Commission (FERC) Office of Energy Projects (OEP) construction, restoration and maintenance guidelines commonly referred to as the *Wetland and Waterbody Construction and Mitigation Procedures (Procedures), 1/17/2003 Version*.

Bayou Casotte Energy has reviewed the FERC Procedures and has determined that adoption of the Procedures to address erosion and sedimentation control and environmental construction issues that may be encountered on the Project.

Bayou Casotte Energy is committed to assuring the necessary efforts are undertaken for each new proposed project to review and verify that all requirements and/or guidelines are applicable and can be complied with during construction and operational maintenance of a project.

In the event Bayou Casotte Energy is unable to comply and/or accept the guidelines set out in the FERC Procedures, variances will be requested from the specific guideline or requirement with full justification for the requested variance offering equal or better protection for the protected resource.

This document is a preliminary document, which will be further modified based on site-specific conditions or requests made and agreed to by Casotte Landing and respective landowners, permitting agencies and/or other regulatory agencies with jurisdictional authority over resources that may be impacted by the construction of this Project. Figures will be added to this document for clarification and utilization during the construction phase of the proposed Project.

Bayou Casotte Energy has identified and is requesting several variances to the FERC Procedures, which are outlined in the following.



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BAYOU CASOTTE ENERGY’S WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES

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BAYOU CASOTTE ENERGY'S WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES

WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES (PROCEDURES)

Construction activities associated with Casotte Landing are both similar to, and different from, typical construction activities related to natural gas facilities, particularly as they apply to wetland resource areas and waterbodies. The similarities are in that there are wetland resource areas and waterbodies requiring total avoidance and other areas that are being used for temporary workspace. There are also differences in that certain wetland resource areas will be permanently filled and waterbodies permanently rerouted/relocated per the approved Terminal site design. Ultimate care must be used when distinguishing between these wetland resource areas and waterbodies on the approved Project plans as different construction techniques and mitigation measures will be applied dependent upon the area in question. Only those wetland resource areas and waterbodies to be avoided or used as temporary workspace will be marked in the field. Workspace buffers associated with these wetland resource areas and waterbodies will be applied according to the approved site-specific plans.

I. APPLICABILITY

- A. The intent of these Procedures is to assist applicants by identifying baseline mitigation measures for minimizing the extent and duration of project-related disturbance on wetlands and waterbodies. The project sponsors should specify in their applications for a FERC Certificate (Certificate) any individual measures in these Procedures they consider unnecessary, technically infeasible, or unsuitable due to local conditions and to fully describe any alternative measures they would use. Applicants should also explain how those alternative measures would achieve a comparable level of mitigation.

Bayou Casotte Energy has prepared variances to portions of these Procedures and noted them in the text. Detailed discussions associated with these variances are attached to the end of this plan.

Once a project is certificated, further changes can be approved. Any such changes from the measures in these Procedures (or the applicant's approved procedures) will be approved by the Director of the Office of Energy Projects (Director), upon the applicant's written request, if the Director agrees that an alternative measure:

1. provides equal or better environmental protection;



2. is necessary because a portion of these Procedures is infeasible or unworkable based on project-specific conditions; or
3. is specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Any requirements in these Procedures to file material with the Secretary of the FERC (Secretary) do not apply to projects undertaken under the provisions of the blanket certificate program. This exemption does not apply to a request for alternative measures.

Project-related impacts on non-wetland areas are addressed in the staff's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan).

B. DEFINITIONS

1. "Waterbody" includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes:
 - a. "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing;
 - b. "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and
 - c. "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.
2. "Wetland" includes any area that is not in actively cultivated or rotated cropland and that satisfies the requirements of the current Federal methodology for identifying and delineating wetlands.

II. PRECONSTRUCTION FILING

1. The following information shall be filed with the Secretary prior to the beginning of construction:
 1. the hydrostatic testing information specified in section VII.B.3. and a wetland delineation report as described in section VI.A.1., if applicable; and
 2. a schedule identifying when trenching or blasting would occur within each waterbody greater than 10 feet wide, or within any designated coldwater



fishery. The project sponsor shall revise the schedule as necessary to provide FERC staff at least 14 days advance notice. Changes within this last 14-day period must provide for at least 48 hours advance notice.

2. The following site-specific construction plans required by these Procedures must be filed with the Secretary for the review and written approval by the Director:
 1. plans for extra work areas that would be closer than 50 feet from a waterbody or wetland;
 2. plans for major waterbody crossings;
 3. plans for the use of a construction right-of-way greater than 75 feet wide in wetlands; and
 4. plans for horizontal directional drill (HDD) "crossings" of wetlands or waterbodies.

III. ENVIRONMENTAL INSPECTORS

- A. At least one Environmental Inspector having knowledge of the wetland and waterbody conditions in the project area is required for each construction spread (*a "spread" is defined herein as both the Terminal and the Natural Gas System Interconnections*). The number and experience of Environmental Inspectors assigned to each construction spread should be appropriate for the length of the construction spread and the number/significance of resources affected.
- B. The Environmental Inspector's responsibilities are outlined in the Upland Erosion Control, Revegetation, and Maintenance Plan (Plan).

IV. PRECONSTRUCTION PLANNING

- A. A copy of the Stormwater Pollution Prevention Plan (SWPPP) prepared for compliance with the U.S. Environmental Protection Agency's (EPA) National Stormwater Program General Permit requirements must be available in the field on each construction spread. The SWPPP shall contain Spill Prevention and Response Procedures that meet the requirements of state and Federal agencies.
 1. It shall be the responsibility of the project sponsor and its contractors to structure their operations in a manner that reduces the risk of spills or the accidental exposure of fuels or hazardous materials to waterbodies or wetlands. The project sponsor and its contractors must, at a minimum, ensure that:



- a. all employees handling fuels and other hazardous materials are properly trained;
 - b. all equipment is in good operating order and inspected on a regular basis;
 - c. fuel trucks transporting fuel to on-site equipment travel only on approved access roads;
 - d. ***for those Project areas utilized via an easement agreement only,*** all equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. These activities can occur closer only if the Environmental Inspector finds, in advance, no reasonable alternative and the project sponsor and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill.
 - e. ***for those Project areas utilized via an easement agreement only,*** hazardous materials, including chemicals, fuels, and lubricating oils, are not stored within 100 feet of a wetland, waterbody, or designated municipal watershed area, unless the location is designated for such use by an appropriate governmental authority. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas; and
 - f. ***for those Project areas utilized via an easement agreement only,*** concrete coating activities are not performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use.
2. The project sponsor and its contractors must structure their operations in a manner that provides for the prompt and effective cleanup of spills of fuel and other hazardous materials. At a minimum, the project sponsor and its contractors must:
- a. ensure that each construction crew (including cleanup crews) has on hand sufficient supplies of absorbent and barrier materials to allow the rapid containment and recovery of spilled materials and knows the procedure for reporting spills;
 - b. ensure that each construction crew has on hand sufficient tools and material to stop leaks;



- c. know the contact names and telephone numbers for all local, state, and Federal agencies (including, if necessary, the U. S. Coast Guard and the National Response Center) that must be notified of a spill; and
- d. follow the requirements of those agencies in cleaning up the spill, in excavating and disposing of soils or other materials contaminated by a spill, and in collecting and disposing of waste generated during spill cleanup.

B. AGENCY COORDINATION

The project sponsor must coordinate with the appropriate local, state, and Federal agencies as outlined in these Procedures and in the Certificate.

V. WATERBODY CROSSINGS

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply to the U.S. Army Corps of Engineers (COE), or its delegated agency, for the appropriate wetland and waterbody crossing permits.
2. Provide written notification to authorities responsible for potable surface water supply intakes located within 3 miles downstream of the crossing at least 1 week before beginning work in the waterbody, or as otherwise specified by that authority.
3. Apply for state-issued waterbody crossing permits and obtain individual or generic section 401 water quality certification or waiver.
4. Notify appropriate state authorities at least 48 hours before beginning trenching or blasting within the waterbody, or as specified in state permits.

B. INSTALLATION

1. Time Window for Construction

Unless expressly permitted or further restricted by the appropriate state agency in writing on a site-specific basis, instream work, except that required to install or remove equipment bridges, must occur during the following time windows:

- a. coldwater fisheries - June 1 through September 30; and



- b. coolwater and warmwater fisheries - June 1 through November
2. Extra Work Areas
 - a. ***For those Project areas utilized via an easement agreement only,*** locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.
 - b. ***For those Project areas utilized via an easement agreement only,*** the project sponsor shall file with the Secretary for review and written approval by the Director, a site-specific construction plan for each extra work area with a less than 50-foot setback from the water's edge, (except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land) and a site-specific explanation of the conditions that will not permit a 50-foot setback.
 - c. Limit clearing of vegetation between extra work areas and the edge of the waterbody to the certificated construction right-of-way.
 - d. Limit the size of extra work areas to the minimum needed to construct the waterbody crossing.
3. General Crossing Procedures
 - a. Comply with the COE, or its delegated agency, permit terms and conditions.
 - b. Construct crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit.
 - c. If the pipeline parallels a waterbody, attempt to maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the construction right-of-way.
 - d. Where waterbodies meander or have multiple channels, route the pipeline to minimize the number of waterbody crossings.
 - e. Maintain adequate flow rates to protect aquatic life, and prevent the interruption of existing downstream uses.



- f. ***For those Project areas utilized via an easement agreement only,*** Waterbody buffers (extra work area setbacks, refueling restrictions, etc.) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

4. Spoil Pile Placement and Control

- a. ***For those Project areas utilized via an easement agreement only,*** all spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, must be placed in the construction right-of-way at least 10 feet from the water's edge or in additional extra work areas as described in section V.B.2.
- b. Use sediment barriers to prevent the flow of spoil or heavily silt-laden water into any waterbody.

5. Equipment Bridges

- a. Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the number of such crossings of each waterbody to one per piece of clearing equipment.
- b. Construct equipment bridges to maintain unrestricted flow and to prevent soil from entering the waterbody. Examples of such bridges include:
 - (1) equipment pads and culvert(s) ***where culverts are necessary to support the equipment pads;***
 - (2) equipment pads or railroad car bridges without culverts;
 - (3) clean rock fill, and culvert(s); and
 - (4) flexi-float or portable bridges ***or salvaged flat bed rail cars or equivalent.***

Additional options for equipment bridges may be utilized that achieve the performance objectives noted above. Do not use soil to construct or stabilize equipment bridges.

- c. Design and maintain each equipment bridge to ***accommodate*** the highest flow expected to occur while the bridge is in place ***as determined by historical records for the expected construction***



period or by an engineer in consultation with applicable state agencies and the USACE. Align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts.

- d. Design and maintain equipment bridges to prevent soil from entering the waterbody.
- e. Remove equipment bridges as soon as possible after permanent seeding unless the COE, or its delegated agency, authorizes it as a permanent bridge.
- f. If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the right-of-way is available, remove equipment bridges as soon as possible after final cleanup.

6. Dry-Ditch Crossing Methods

a. Unless approved otherwise by the appropriate state agency, install the pipeline using one of the dry-ditch methods outlined below for crossings of waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are state-designated as either coldwater or significant coolwater or warmwater fisheries.

b. Dam and Pump

- (1) The dam-and-pump method may be used without prior approval for crossings of waterbodies where pumps can adequately transfer streamflow volumes around the work area, and there are no concerns about sensitive species passage.
- (2) Implementation of the dam-and-pump crossing method must meet the following performance criteria:
 - (i) use sufficient pumps, including on-site backup pumps, to maintain downstream flows;
 - (ii) construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner);
 - (iii) screen pump intakes;



- (iv) prevent streambed scour at pump discharge; and
- (v) monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

c. Flume Crossing

The flume crossing method requires implementation of the following steps:

- (1) install flume pipe after blasting (if necessary), but before any trenching;
- (2) use sand bag or sand bag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required in to achieve an effective seal);
- (3) properly align flume pipe(s) to prevent bank erosion and streambed scour;
- (4) do not remove flume pipe during trenching, pipelaying, or backfilling activities, or initial streambed restoration efforts; and
- (5) remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete;

d. Horizontal Directional Drill (HDD)

To the extent they were not provided as part of the pre-certification process, for each waterbody or wetland that would be crossed using the HDD method, provide a plan that includes:

- (1) site-specific construction diagrams that show the location of mud pits, pipe assembly areas, and all areas to be disturbed or cleared for construction;
- (2) a description of how an inadvertent release of drilling mud would be contained and cleaned up; and
- (3) a contingency plan for crossing the waterbody or wetland in the event the directional drill is unsuccessful and how the abandoned drill hole would be sealed, if necessary.

7. Crossings of Minor Waterbodies

Where a dry-ditch crossing is not required, minor waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

- a. except for blasting and other rock breaking measures, complete instream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) within 24 hours. Streambanks and unconsolidated streambeds may require additional restoration after this period;
- b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and
- c. equipment bridges are not required at minor waterbodies that do not have a state-designated fishery classification (e.g., agricultural or intermittent drainage ditches). However, if an equipment bridge is used it must be constructed as described in section V.B.5.

8. Crossings of Intermediate Waterbodies

Where a dry-ditch crossing is not required, intermediate waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

- a. complete instream construction activities (not including blasting and other rock breaking measures) within 48 hours, unless site-specific conditions (*i.e., local noise ordinances, etc.*) make completion within 48 hours infeasible;
- b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and
- c. all other construction equipment must cross on an equipment bridge as specified in section V.B.5.

9. Crossings of Major Waterbodies

Before construction, the project sponsor shall file with the Secretary for the review and written approval by the Director a detailed, site-specific construction plan and scaled drawings identifying all areas to be disturbed by construction for each major waterbody crossing (the scaled drawings



are not required for any offshore portions of pipeline projects). This plan should be developed in consultation with the appropriate state and Federal agencies and should include extra work areas, spoil storage areas, sediment control structures, etc., as well as mitigation for navigational issues.

The Environmental Inspector may adjust the final placement of the erosion and sediment control structures in the field to maximize effectiveness.

10. Temporary Erosion and Sediment Control

Install sediment barriers (as defined in section IV.F.2.a. of the Plan) of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan; however, the following specific measures must be implemented at stream crossings:

- a. install sediment barriers across the entire construction right-of-way at all waterbody crossings ***with provisions to access any equipment bridges present***, where necessary to prevent the flow of sediments into the waterbody. In the travel lane, these may consist of removable sediment barriers or drivable berms. Removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent;
- b. where waterbodies are adjacent to the construction right-of-way, install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way; and
- c. use trench plugs at all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody.



11. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any waterbody. Remove the dewatering structures as soon as possible after the completion of dewatering activities.

C. RESTORATION

1. Use clean gravel or native cobbles for the upper 1 foot of trench backfill in all waterbodies that contain coldwater fisheries.
2. For open-cut crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing instream construction activities. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.
3. Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector.
4. Application of riprap for bank stabilization must comply with COE, or its delegated agency, permit terms and conditions.
5. Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques such as seeding and erosion control fabric *or flexible channel liners*.
6. Revegetate disturbed riparian areas with conservation grasses and legumes or native plant species, preferably woody species.
7. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody, or as needed to prevent sediment transport into the waterbody. In addition, install sediment barriers as outlined in the Plan. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.
8. Sections V.C.3. through V.C.6. above also apply to those perennial or intermittent streams not flowing at the time of construction.



D. *POST-CONSTRUCTION MAINTENANCE*

1. *Along the Natural Gas System Interconnections only*, limit vegetation maintenance adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be maintained in a herbaceous state. In addition, trees that are located within 15 feet of the pipeline that are greater than 15 feet in height may be cut and removed from the permanent right-of-way.
2. Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.

VI. WETLAND CROSSINGS

A. *GENERAL*

1. The project sponsor shall conduct a wetland delineation using the current Federal methodology and file a wetland delineation report with the Secretary before construction. This report shall identify:
 - a. by milepost all wetlands that would be affected;
 - b. the National Wetlands Inventory (NWI) classification for each wetland;
 - c. the crossing length of each wetland in feet; and
 - d. the area of permanent and temporary disturbance that would occur in each wetland by NWI classification type.

The requirements outlined in this section do not apply to wetlands in actively cultivated or rotated cropland. Standard upland protective measures, including workspace and topsoiling requirements, apply to these agricultural wetlands.

2. Route the pipeline to avoid wetland areas to the maximum extent possible. If a wetland cannot be avoided or crossed by following an existing right-of-way, route the new pipeline in a manner that minimizes disturbance to wetlands. Where looping an existing pipeline, overlap the existing pipeline right-of-way with the new construction right-of-way. In addition,



- locate the loop line no more than 25 feet away from the existing pipeline unless site-specific constraints would adversely affect the stability of the existing pipeline.
3. Limit the width of the construction right-of-way to 75 feet or less. Prior written approval of the Director is required where topographic conditions or soil limitations require that the construction right-of-way width within the boundaries of a federally delineated wetland be expanded beyond 75 feet. Early in the planning process the project sponsor is encouraged to identify site-specific areas where existing soils lack adequate unconfined compressive strength that would result in excessively wide ditches and/or difficult to contain spoil piles. ***Bayou Casotte Energy is proposing a nominal construction right-of-way of 110 feet in several locations along the pipeline route. The soils expected along the pipeline route are predominately poorly drained mucky sandy clay loam that is frequently flooded. Moreover, the water table is typically very close to the surface. These conditions will adversely affect the slope and stability of the excavation and indicate greater than normal excavation (ditch) widths and spoil volume. In addition to these complications, an expanded construction right-of-way is needed due to the containment of a dual pipeline configuration.***
 4. ***For those Project areas utilized via an easement agreement only,*** wetland boundaries and buffers must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.
 5. Implement the measures of sections V. and VI. in the event a waterbody crossing is located within or adjacent to a wetland crossing. If all measures of sections V. and VI. cannot be met, the project sponsor must file with the Secretary a site-specific crossing plan for review and written approval by the Director before construction. This crossing plan shall address at a minimum:
 - a. spoil control;
 - b. equipment bridges;
 - c. restoration of waterbody banks and wetland hydrology;
 - d. timing of the waterbody crossing;
 - e. method of crossing; and
 - f. size and location of all extra work areas.



6. ***For those Project areas utilized via an easement agreement only***, do not locate aboveground facilities in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with U.S. Department of Transportation regulations.

B. *INSTALLATION*

1. Extra Work Areas and Access Roads
 - a. ***For those Project areas utilized via an easement agreement only***, locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.
 - b. ***For those Project areas utilized via an easement agreement only***, the project sponsor shall file with the Secretary for review and written approval by the Director, a site-specific construction plan for each extra work area with a less than 50-foot setback from wetland boundaries (except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land) and a site-specific explanation of the conditions that will not permit a 50-foot setback.
 - c. Limit clearing of vegetation between extra work areas and the edge of the wetland to the certificated construction right-of-way.
 - d. The construction right-of-way may be used for access when the wetland soil is firm enough to avoid rutting or the construction right-of-way has been appropriately stabilized to avoid rutting (e.g., with timber riprap, prefabricated equipment mats, terra mats).

In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing shall use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction right-of-way.

Bayou Casotte Energy is proposing the use of three techniques to construct wetland crossings. The three include:



Method I Dry or Moist Wetlands

This method will typically apply to the crossing of a Type I wetland. A Type I wetland typically has groundwater level existing some depth below the surface. Equipment can traverse the wetland without the support of mats and trench excavations are stable. Topsoil will be segregated. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.

Method II Saturated, Wetland Crossing

This method will apply to the crossing of a Type II wetland. Soils are saturated and non-cohesive. Difficult trenching, conditions are likely, and trench widths of up to 35 feet are common. In these wetland types, supplemental support in the form of timber rip-rap or prefabricated equipment mats is required. Topsoil stripping is impractical due to the nature of the soil. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.

Method III Partially/Completely Flooded Wetland

In these wetlands, standing surface water or high groundwater levels are present. Difficult trenching conditions may exist, and trench widths of up to 35 feet are common. Topsoil stripping is impossible due to the flooded conditions. Pipe stringing and fabrication may take place within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.

- e. The only access roads, other than the construction right-of-way, that can be used in wetlands without Director approval, are those existing roads that can be used with no modification and no impact on the wetland.
2. Crossing Procedures
 - a. Comply with COE, or its delegated agency, permit terms and conditions
 - b. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.



- c. *In Type III wetlands* use "push-pull" or "float" techniques to place the pipe in the trench where water and other site conditions allow.
- d. Minimize the length of time that topsoil is segregated and the trench is open.
- e. Limit construction equipment operating in *Type II and Type III* wetland areas to that needed to clear the construction right-of-way, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction right-of-way.
- f. Cut vegetation just aboveground level, leaving existing root systems in place, and remove it from the wetland for disposal.
- g. Limit pulling of tree stumps and grading activities to directly over the trenchline. Do not grade or remove stumps or root systems from the rest of the construction right-of-way in wetlands unless the Chief Inspector and Environmental Inspector determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction right-of-way.
- h. Segregate the top 1 foot of topsoil from the area disturbed by trenching in *Type I wetlands*, except in areas where standing water is present or soils are saturated or frozen. Immediately after backfilling is complete, restore the segregated topsoil to its original location.
- i. Do not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to support equipment on the construction right-of-way.
- j. If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-ground-weight construction equipment, or operate normal equipment on timber riprap, prefabricated equipment mats, or terra mats.
- k. Do not cut trees outside of the approved construction work area to obtain timber for riprap or equipment mats.
- l. Attempt to use no more than two layers of timber riprap to support equipment on the construction right-of-way.



- m. Remove all project-related material used to support equipment on the construction right-of-way upon completion of construction.

3. Temporary Sediment Control

Install sediment barriers (as defined in section IV.F.2.a. of the Plan) immediately after initial disturbance of the wetland or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench). Except as noted below in section VI.B.3.c., maintain sediment barriers until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan.

- a. Install sediment barriers across the entire construction right-of-way at all wetland crossings where necessary to prevent sediment flow into the wetland. In the travel lane, these may consist of removable sediment barriers or drivable berms. Removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent
- b. Where wetlands are adjacent to the construction right-of-way and the right-of-way slopes toward the wetland, install sediment barriers along the edge of the construction right-of-way as necessary to prevent sediment flow into the wetland.
- c. Install sediment barriers along the *downslope* edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way through wetlands. Remove these sediment barriers during right-of-way cleanup.

4. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any wetland. Remove the dewatering structures as soon as possible after the completion of dewatering activities.



C. RESTORATION

1. Where the pipeline trench may drain a wetland, construct trench breakers and/or seal the trench bottom as necessary to maintain the original wetland hydrology.
2. For each wetland crossed, install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In addition, install sediment barriers as outlined in the Plan. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.
3. Do not use fertilizer, lime, or mulch unless required in writing by the appropriate land management or state agency.
4. Consult with the appropriate land management or state agency to develop a project-specific wetland restoration plan. The restoration plan should include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of undesirable exotic species (e.g., purple loosestrife and phragmites), and monitoring the success of the revegetation and weed control efforts. Provide this plan to the FERC staff upon request.
5. Until a project-specific wetland restoration plan is developed and/or implemented, temporarily revegetate the construction right-of-way with annual ryegrass at a rate of 40 pounds/acre (unless standing water is present).
6. Ensure that all disturbed areas successfully revegetate with wetland herbaceous and/or woody plant species.
7. Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are judged to be successful as specified in section VII.A.5. of the Plan.

D. POST-CONSTRUCTION MAINTENANCE

1. Do not conduct vegetation maintenance over the full width of the permanent right-of-way in wetlands. However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline and up



to 10 feet wide may be maintained in an herbaceous state. In addition, trees within 15 feet of the pipeline that are greater than 15 feet in height may be selectively cut and removed from the permanent right-of-way.

2. Do not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate land management agency or state agency.
3. Monitor and record the success of wetland revegetation annually for the first 3 years after construction or until wetland revegetation is successful, ***except in circumstances where property is purchased and developed or until revegetation is deemed successful.*** At the end of 3 years after construction, file a report with the Secretary identifying the status of the wetland revegetation efforts. Include the percent cover achieved and problem areas (weed invasion issues, poor revegetation, etc.). Continue to file a report annually until wetland revegetation is successful.
4. Wetland revegetation shall be considered successful if the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of 3 years, develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate the wetland. Continue revegetation efforts until wetland revegetation is successful.

VII. HYDROSTATIC TESTING

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply for state-issued water withdrawal permits, as required.
2. Apply for National Pollutant Discharge Elimination System (NPDES) or state-issued discharge permits, as required.
3. Notify appropriate state agencies of intent to use specific sources at least 48 hours before testing activities unless they waive this requirement in writing.

B. GENERAL

1. Perform non-destructive testing of all pipeline section welds or hydrotest the pipeline sections, before installation under waterbodies or wetlands.



2. If pumps used for hydrostatic testing are within 100 feet of any waterbody or wetland, address the operation and refueling of these pumps in the project's Spill Prevention and Response Procedures.
3. The project sponsor shall file with the Secretary before construction a list identifying the location of all waterbodies proposed for use as a hydrostatic test water source or discharge location.

C. INTAKE SOURCE AND RATE

1. Screen the intake hose to prevent entrainment of fish.
2. Do not use state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate Federal, state, and/or local permitting agencies grant written permission.
3. Maintain adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.
4. Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

D. DISCHARGE LOCATION, METHOD, AND RATE

1. Regulate discharge rate, use energy dissipation device(s), and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive streamflow.
2. Do not discharge into state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate Federal, state, and local permitting agencies grant written permission.



VARIANCES DETAILED DISCUSSION



1. Section III.A.
Add – “...*(a “spread” is defined herein as both the Terminal and the Natural Gas System Interconnections)*...”

Due to the point-source and slower-paced nature of LNG terminal construction and the short length of the Natural Gas System Interconnections, Bayou Casotte Energy anticipates that one (1) Environmental Inspector shall suffice for the Project.

2. Section IV.A.1.d., e., and f.
Add – “*for those Project areas utilized via an easement agreement only,...*”

The construction of the Terminal will involve the permanent filling and loss of wetland resource areas within the site. These measures are not applicable.

3. Section V.B.2.a., b., V.B.3.f., V.B.4.a., VI.A.4., 6., and VI.B.1.a. and b.
Add – “*For those Project areas utilized via an easement agreement only,...*”

The construction of the Terminal will involve the permanent filling and loss of wetland resource areas within the site. These measures are not applicable.

4. Section V.B.5.b.(1)
Add – “...*where culverts are necessary to support the equipment pads;*”

This will allow small, well defined channels to be spanned by a single set of equipment pads only, with no installation of a culvert while negating or minimizing environmental impacts to the stream.

5. Section V.B.5.b.(4)
Add – “...*or salvaged flat bed rail cars or equivalent.*”

Bayou Casotte Energy proposes to ad salvage flat bed rail cars because they may be more readily available to contractors while still providing the same level of environmental protection.

6. Section V.B.5.c.
Modify – “Design and maintain each equipment bridge to *accommodate* the highest flow expected to occur while the bridge is in place *as determined by historical records for the expected construction period or by an engineer in consultation with applicable state agencies and the USACE.*”

It is not reasonable to design the bridge or other conveyance to withstand the largest flow possible. Historical data and/or engineering design criteria exist which provide guidance for the appropriate design flow given the length of time and season of installation. The utilization of an engineer or consultation with the applicable state agencies or the USACE will enable the equipment bridge to be designed for the site-specific conditions.



7. Section V.B.8.a.
Add – “...*(i.e., local noise ordinances, etc.)*...”

There may be conditions, such as noise ordinances, which make the completion of the crossing within 48 hours infeasible; however the crossing will be completed as soon as practicable.

8. Section V.B.10.a.
Add – “...*with provisions to access any equipment bridges present*...”

Bayou Casotte Energy proposes that access gaps be installed and opened only when work is in progress within the area and to allow for access into the work area. Silt fence and straw bale barriers will be used to close the gaps upon completion of the daily work and during a rain event. Silt Fencing and hay bales will be regularly inspected, maintained and replaced when needed.

9. Section V.C.5.
Add – “...*or flexible channel liners*.”

Liners used for channel restoration must be capable of withstanding tractive forces caused by channelized flow. The industry term for such liners is “flexible channel liners”. Pre-seeded liners are not typically used since it is often difficult to obtain optimum seed mixes and success is generally poor. Experience shows that the use of the flexible channel liners will provide better environmental protection than pre-seeded liners.

10. Section V.D.1.
Add – “*Along the Natural Gas System Interconnections only*...”

Due to the nature of LNG terminal grounds maintenance, this section shall only apply to the Natural Gas System Interconnections.

11. Section VI.A.3.
Add – “*Bayou Casotte Energy is proposing a nominal construction right-of-way of 110 feet in several locations along the pipeline route. The soils expected along the pipeline route are predominately poorly drained mucky sandy clay loam that is frequently flooded. Moreover, the water table is typically very close to the surface. These conditions will adversely affect the slope and stability of the excavation and indicate greater than normal excavation (ditch) widths and spoil volume. In addition to these complications, an expanded construction right-of-way is needed due to the containment of a dual pipeline configuration.*”

Adequate workspace is the single greatest factor controlling the efficiency of pipeline construction with respect to time, environmental impact, and cost. Bayou Casotte Energy expended considerable effort in the development of what it considers the optimum construction right-of-way width for the Natural Gas System Interconnections. This width was determined based on the recommendations outlined in the FERC Plan and Procedures, the collective



experience of pipeline construction in southern Mississippi, and the conditions expected on this Project.

The construction right-of-way width requested is based on the experience of the Bayou Casotte Energy team, field inspections and the knowledge of the subsoil profile.

SSURGO database information and other publicly available sources were used by Bayou Casotte Energy to confirm the probable soils that will be encountered along the proposed pipeline route. These sources contain valuable information regarding soils and their general properties, and support Bayou Casotte Energy's position that the excavations will be difficult.

The proposed pipeline corridor associated with the Natural Gas Systems Interconnections traverses essentially flat coastal plain terrains. The subsoil profile expected involves predominantly non-cohesive material with a relatively high water table. The soils are predominately poorly drained mucky sandy clay loam that is frequently flooded that typically exhibit loose density. Under these soil conditions, unstable excavations and dewatering problems would be encountered by any construction, which involves earth moving. Unstable soils for the purposes of this discussion refer to soils that present instabilities during construction and not to long-term instabilities that would affect the integrity of the installed pipeline.

The length of time an excavation is open is of critical importance in these types of soils. Wetting-drying cycles will cause changes in the strength of granular soils; the longer an excavation is left open the more likely it may become unstable. Granular soils are also susceptible to shock and vibration resulting from working equipment, pile driving, etc. This is another factor why the right-of-way width as requested by Bayou Casotte Energy is necessary. Decreased construction right-of-way width will slow down the progress resulting in increased excavation time. This will lead to the increased potential for sloughing in the ditch.

Unless some kind of support is provided, the soils encountered will lead to wide trench and bore-pit excavations, and extensive dewatering.

In general, due to the fine grained nature of the mucky sandy clay loam, low permeabilities are expected. As a result, drainage may not be immediate and unstable rapid draw-down conditions may occur if there are rapid differences in water elevations between the trench and the surrounding natural terrain. Also, local liquefaction may occur as a result of vibrations, spoil damping, or other sudden loading.

Slope stability analysis indicates failures may occur that would involve the adjacent spoil, unless the edge of the mound is kept at a minimum distance on the order of seven feet from the edge of the trench. It must be kept in mind that any slide involves an extra volume to be removed to clear the trench; such extra volume would require additional workspace and might trigger new slides if simply dumped on top of the existing spoil.



All of the conditions listed will adversely affect the slope and stability of the excavation and indicate greater than normal excavation (ditch) widths and spoil volumes.

12. Section VI.B.1.d.

Add – “*Bayou Casotte Energy is proposing the use of three techniques to affect wetland crossing. The three include:*

Method I Dry or Moist Wetlands

This method will typically apply to the crossing of a Type I wetland. A Type I wetland typically has groundwater level existing some depth below the surface. Equipment can traverse the wetland without the support of mats and trench excavations are stable. Topsoil will be segregated. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.

Method II Saturated, Wetland Crossing

This method will apply to the crossing of a Type II wetland. Soils are saturated and non-cohesive. Difficult trenching, conditions are likely, and trench widths of up to 35 feet are common. In these wetland types, supplemental support in the form of timber rip-rap or prefabricated equipment mats is required. Topsoil stripping is impractical due to the nature of the soil. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.

Method III Partially/Completely Flooded Wetland

In these wetlands, standing surface water or high groundwater levels are present. Difficult trenching conditions may exist, and trench widths of up to 35 feet are common. Topsoil stripping is impossible due to the flooded conditions. Pipe stringing and fabrication may take place within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.”

The type of wetlands crossed will dictate the necessary stabilization methods. Defining the types of wetlands will make the crossing requirements more defined for the contractor while still providing the environmental protection the Commission requires.

13. Section VI.B.2.c.

Add – “*In Type III wetlands...*”

It is not necessary to use the “push-pull” or “float” techniques in all wetlands, only those that are considered flooded and where there is enough water to do so.

14. Section VI.B.2.e.

Add – “*...Type II and Type III...*”

In Type 1 wetlands, which are considered dry wetlands, equipment can traverse the wetland without the support of mats and continue the construction spread through the wetland; the soils are unsaturated.



15. Section VI.B.2.h.
Add – “...**Type I wetlands**...”

The soils in Type II and Type III wetlands are too saturated for the topsoil to be segregated.

16. Section VI.B.3.c.
Add – “...**downslope**...”

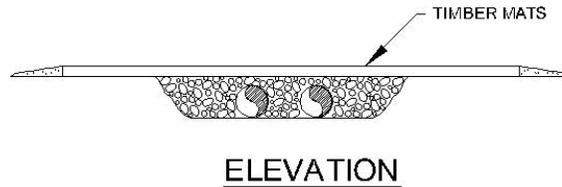
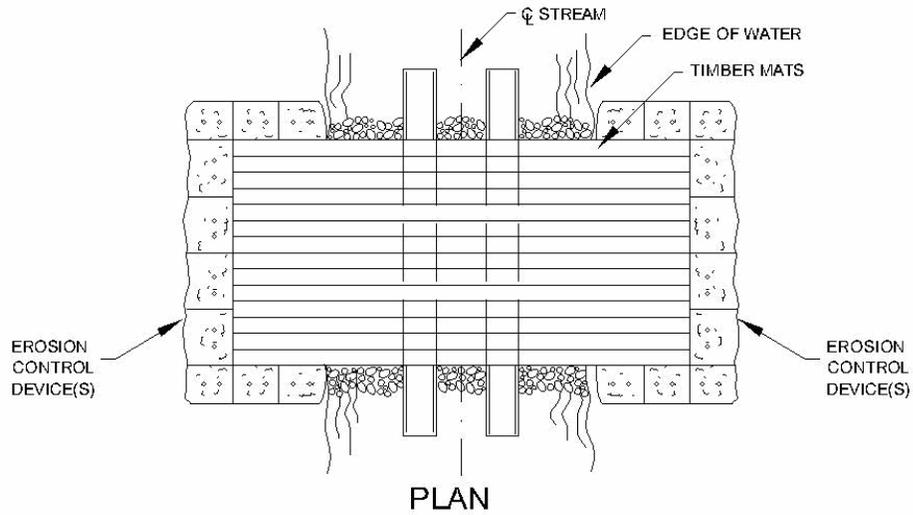
Placing the sediment barriers along the downslope edge of the construction right-of-way will provide the necessary environmental protection to the wetland.

17. Section VI.D.3.
Add – “...**except in circumstances where property is purchased and developed or until revegetation is deemed successful.**”

If the property containing a wetland is sold and developed, Bayou Casotte Energy should no longer be required to monitor that wetland. If revegetation is established earlier than 3 years, Bayou Casotte Energy will not be required to monitor the wetland.

FIGURES

TIMBER MAT WITH CULVERT BRIDGE



NOTES

1. THIS TYPE OF BRIDGE IS GENERALLY USED FOR MEDIUM-SIZED STREAM CROSSINGS.
2. THE NUMBER AND SIZE OF THE FLUME PIPES WILL BE DESIGNED TO HANDLE MAXIMUM EXPECTED FLOW OF STREAM AT TIME OF CONSTRUCTION.
3. CLEAN, SILT-FREE ROCK TO BE USED ONLY. INSTALL 1 FT. MIN. OF FILL OVER CULVERT.
4. BRIDGE TO REMAIN IN PLACE UNTIL THE COMPLETION OF FINAL RESTORATION.
5. SILT FENCE, WEED-FREE STRAW BALES OR SANDBAGS MAY BE USED INTERCHANGEABLY.
6. STRAW BALES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORK DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.

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PROJECT APPROVAL	
SURVEY DATE:	
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PROJECT ID:	
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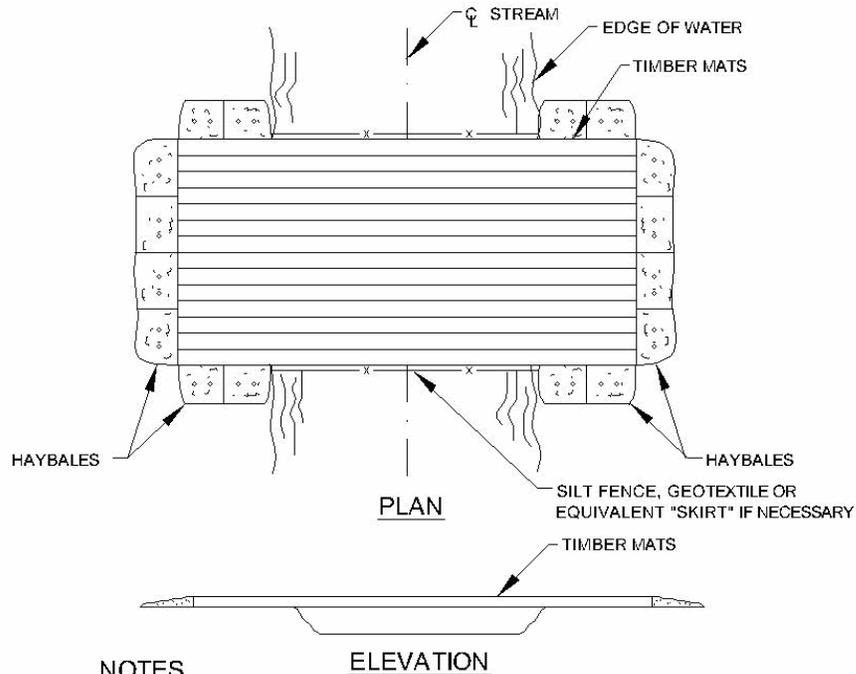
TYPICAL
ROCK/CULVERT BRIDGE
EQUIPMENT CROSSING

DWG. NO.

PROC - 1

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REVISIONS					

TIMBER MAT BRIDGE WITHOUT CULVERTS



NOTES

1. THIS TYPE OF BRIDGE IS GENERALLY USED FOR SMALL STREAM CROSSINGS LESS THAN 20 FEET IN WIDTH IN COMBINATION WITH A PROPER STREAM BANK CONFIGURATION.
2. BRIDGE WILL BE TEMPORARILY REMOVED IF HIGH WATER RENDERS IT UNSAFE FOR CROSSING.
3. BRIDGE TO REMAIN IN PLACE UNTIL THE COMPLETION OF FINAL RESTORATION.
4. SILT FENCE, HAYBALES OR SANDBAGS MAY BE USED INTERCHANGEABLY.
5. A "SKIRT" FORMED OF SILT FENCE, GEOTEXTILE FABRIC OR EQUIVALENT SHALL BE PLACED ON THE SIDES AND BOTTOM OF THE BRIDGE TO TRAP SEDIMENT AS NECESSARY.
6. INDIVIDUAL MATS SHALL BE ANCHORED AND BUTTED TIGHTLY TO MINIMIZE THE INTRODUCTION OF SEDIMENT TO THE WATERBODY.
7. STRAW BALES OR APPROPRIATE BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORK DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.

ELEVATION

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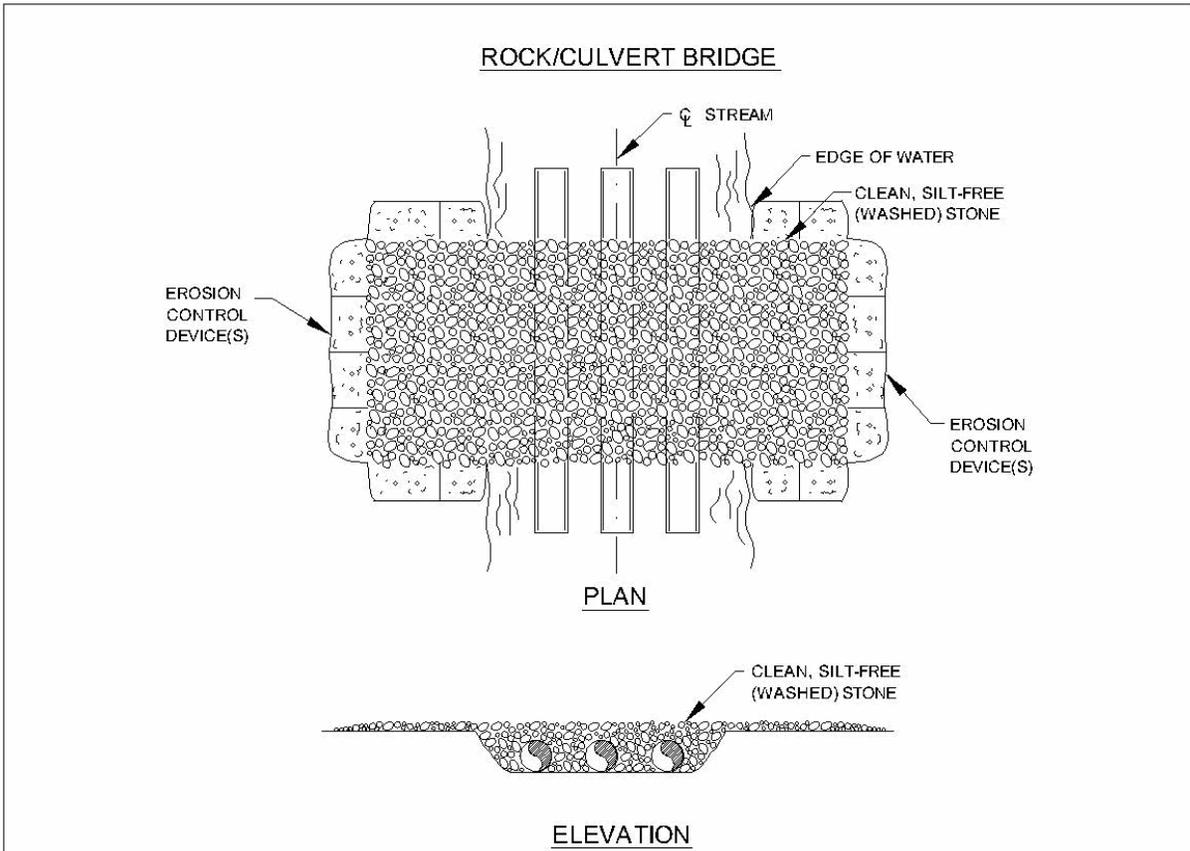


TYPICAL MAT BRIDGE
WITHOUT CULVERTS
EQUIPMENT CROSSING

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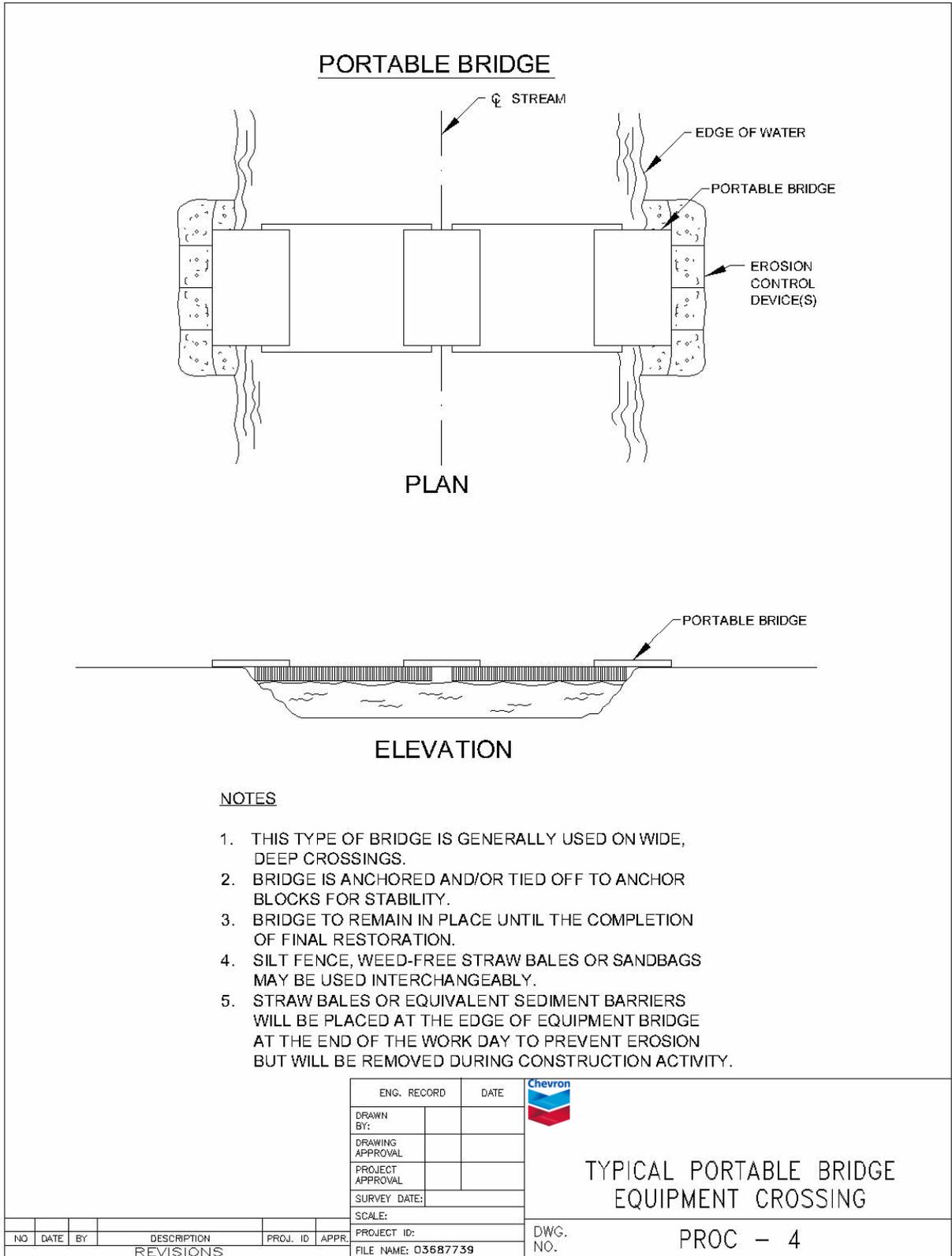
PROC - 2

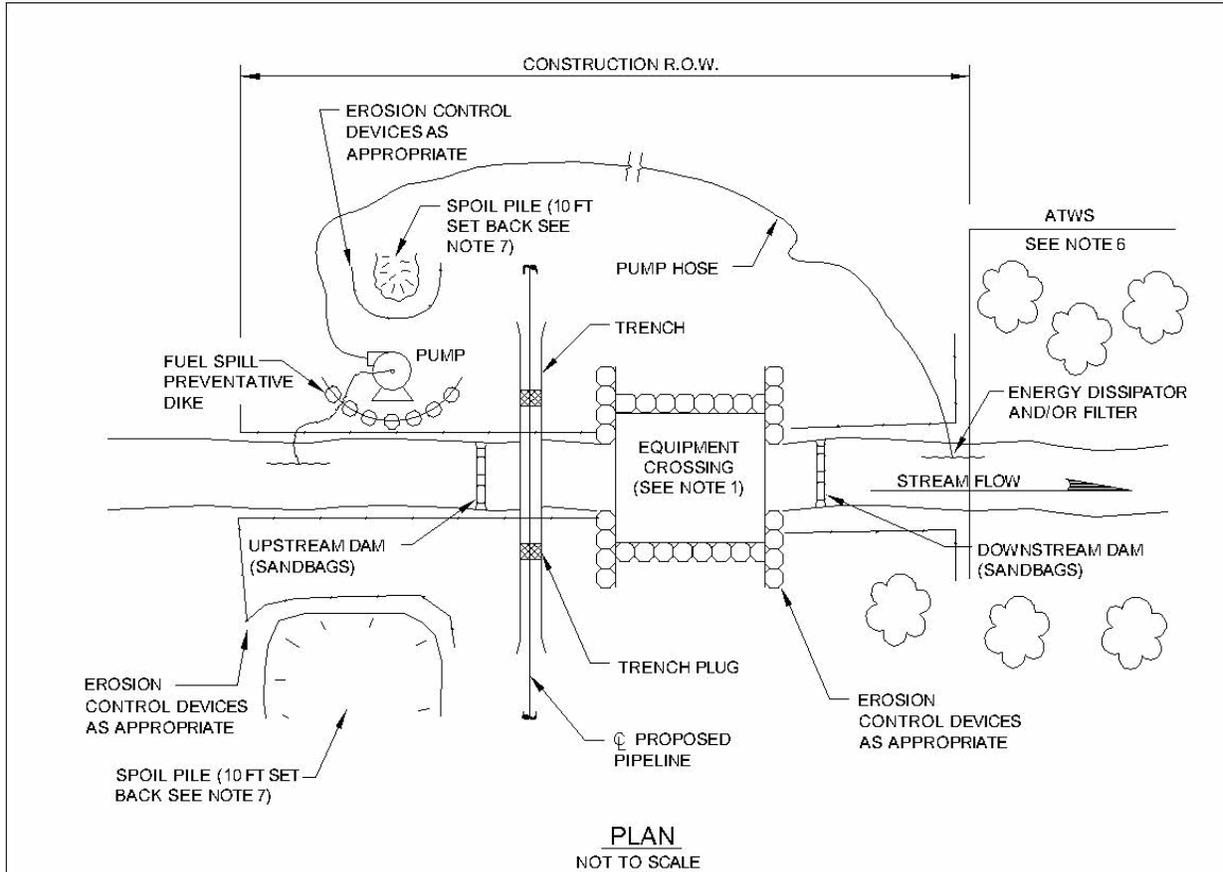


NOTES

1. THIS TYPE OF BRIDGE IS USED ON MEDIUM TO LARGE STREAMS WITH POTENTIAL FOR SIGNIFICANT FLOW.
2. THE NUMBER AND SIZE OF FLUME PIPES WILL BE DESIGNED TO HANDLE THE MAXIMUM EXPECTED FLOW OF THE STREAM AT TIME OF CONSTRUCTION.
3. CLEAN, SILT-FREE ROCK TO BE USED ONLY. INSTALL 1 FT. MIN. OF FILL OVER CULVERT.
4. BRIDGE TO REMAIN IN PLACE UNTIL THE COMPLETION OF FINAL RESTORATION.
5. SILT FENCE, WEED-FREE STRAW BALES OR SANDBAGS MAY BE USED INTERCHANGEABLY.
6. STRAW BALES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORK DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.

ENG. RECORD		DATE		TYPICAL ROCK & FLUME EQUIPMENT CROSSING				
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PROJECT APPROVAL								
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REVISIONS						FILE NAME: 03687737		

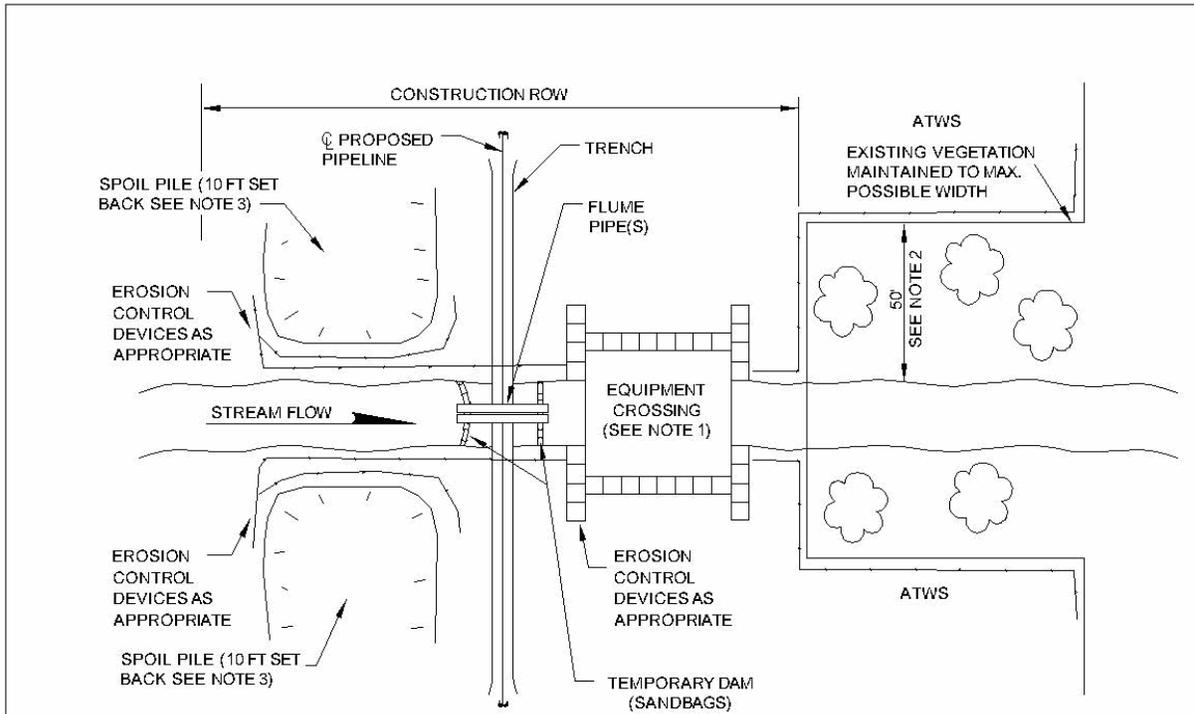




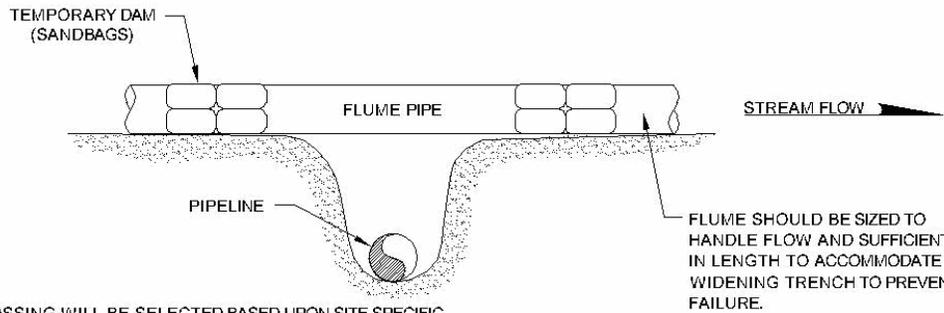
NOTES:

1. EQUIPMENT CROSSINGS WILL BE SELECTED BASED UPON SITE SPECIFIC CONDITIONS (REFER TO PROC - 1 TO PROC - 4).
2. SET UP PUMP AND HOSE AS SHOWN, OR USE OTHER PRACTICAL ALTERNATIVES. PUMP SHOULD HAVE TWICE THE PUMPING CAPACITY OF ANTICIPATED FLOW.
3. CONTRACTOR TO ENSURE A SUFFICIENT NUMBER OF ACTIVE AND BACKUP PUMPS TO MAINTAIN THE CAPACITY OF THE STREAM FLOW AT ALL TIMES DURING INSTALLATION.
4. ALL INTAKE HOSES WILL BE SCREENED.
5. DISMANTLE DOWNSTREAM DAM, THEN UPSTREAM DAM. KEEP PUMP RUNNING TO MAINTAIN STREAM FLOW.
6. THE REQUIRED SET BACK FOR ATWS IS 50 FEET FROM TOP OF BANK UNLESS APPROVED OTHERWISE BY THE APPROPRIATE AGENCIES.
7. THE MINIMUM REQUIRED SETBACK FOR SPOIL PILE IS 10 FEET FROM THE TOP OF BANK.
8. STRAW BALES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORK DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.

ENG. RECORD		DATE		<p style="font-size: 1.2em; margin: 0;">TYPICAL DRY WATERBODY CROSSING (METHOD 2B, PUMP-AROUND)</p>	
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DRAWING APPROVAL					
PROJECT APPROVAL					
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SCALE:			<p style="font-size: 1.2em; margin: 0;">DWC. NO. PROC - 5</p>		
PROJECT ID:					
FILE NAME: 03687731					
NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					



CROSS SECTION FOR TRENCH FLUMING



NOTE:

1. EQUIPMENT CROSSING WILL BE SELECTED BASED UPON SITE SPECIFIC CONDITIONS (REFER TO PROC - 1 TO PROC - 4).
2. THE REQUIRED SET BACK FOR ATWS IS 50 FEET FROM TOP OF BANK UNLESS APPROVED OTHERWISE BY THE APPROPRIATE AGENCIES.
3. THE MINIMUM REQUIRED SETBACK FOR SPOIL PILE IS 10 FEET FROM THE TOP OF BANK.
4. EQUIPMENT BRIDGE SHALL REMAIN IN PLACE UNTIL THE COMPLETION OF FINAL RESTORATION.
5. STRAW BALES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORKDAY DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.

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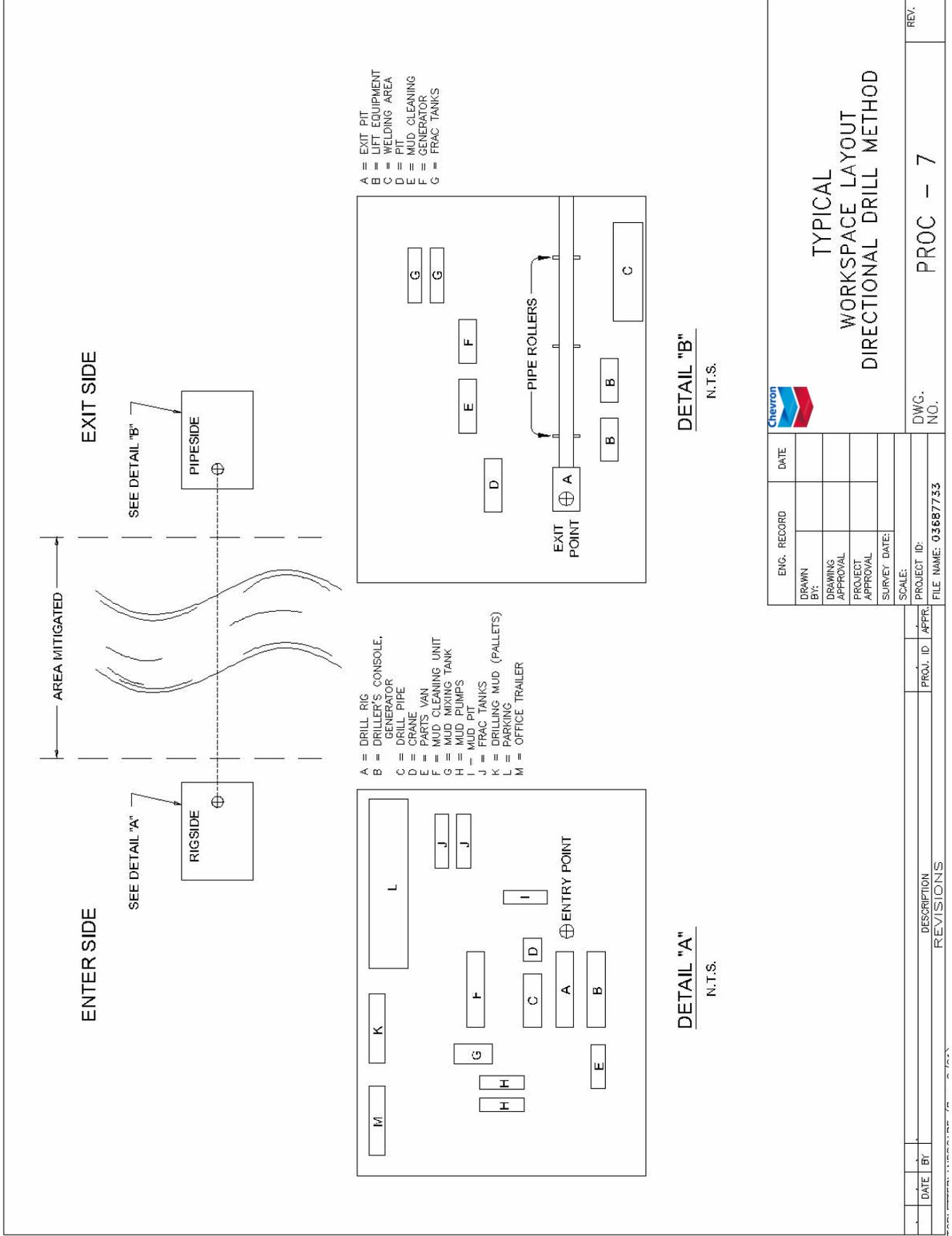


TYPICAL
DRY WATERBODY CROSSING
(METHOD 2A - FLUMED)

DWG. NO.

PROC - 6

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					



- A = EXIT PIT
- B = LIFT EQUIPMENT
- C = WELDING AREA
- D = PIT
- E = MUD CLEANING GENERATOR
- F = MUD MIXING TANK
- G = FRAC TANKS

- A = DRILL RIG
- B = DRILLER'S CONSOLE, GENERATOR
- C = DRILL PIPE
- D = CRANE
- E = PARTS VAN
- F = MUD CLEANING UNIT
- G = MUD MIXING TANK
- H = MUD PUMPS
- I = MUD PIT
- J = FRAC TANKS
- K = DRILLING MUD (PALLETES)
- L = PARKING TRAILER
- M = OFFICE TRAILER

DETAIL "B"
N.T.S.

DETAIL "A"
N.T.S.



TYPICAL
WORKSPACE LAYOUT
DIRECTIONAL DRILL METHOD

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PROJECT APPROVAL	
SURVEY DATE:	
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PROJECT ID:	FILE NAME: 03687733

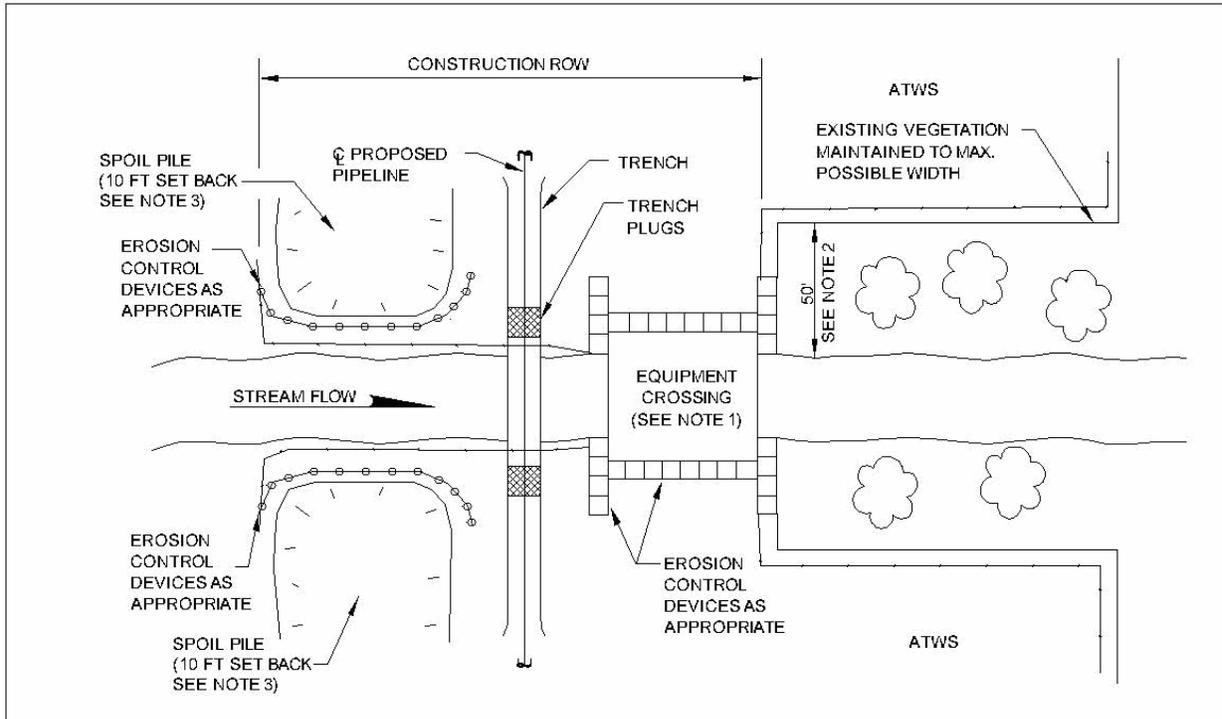
PROC - 7

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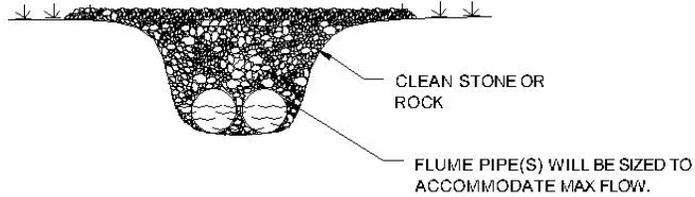
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DESCRIPTION
REVISIONS

DATE	BY	DESCRIPTION



CROSS SECTION FOR EQUIPMENT CROSSING



NOTE:

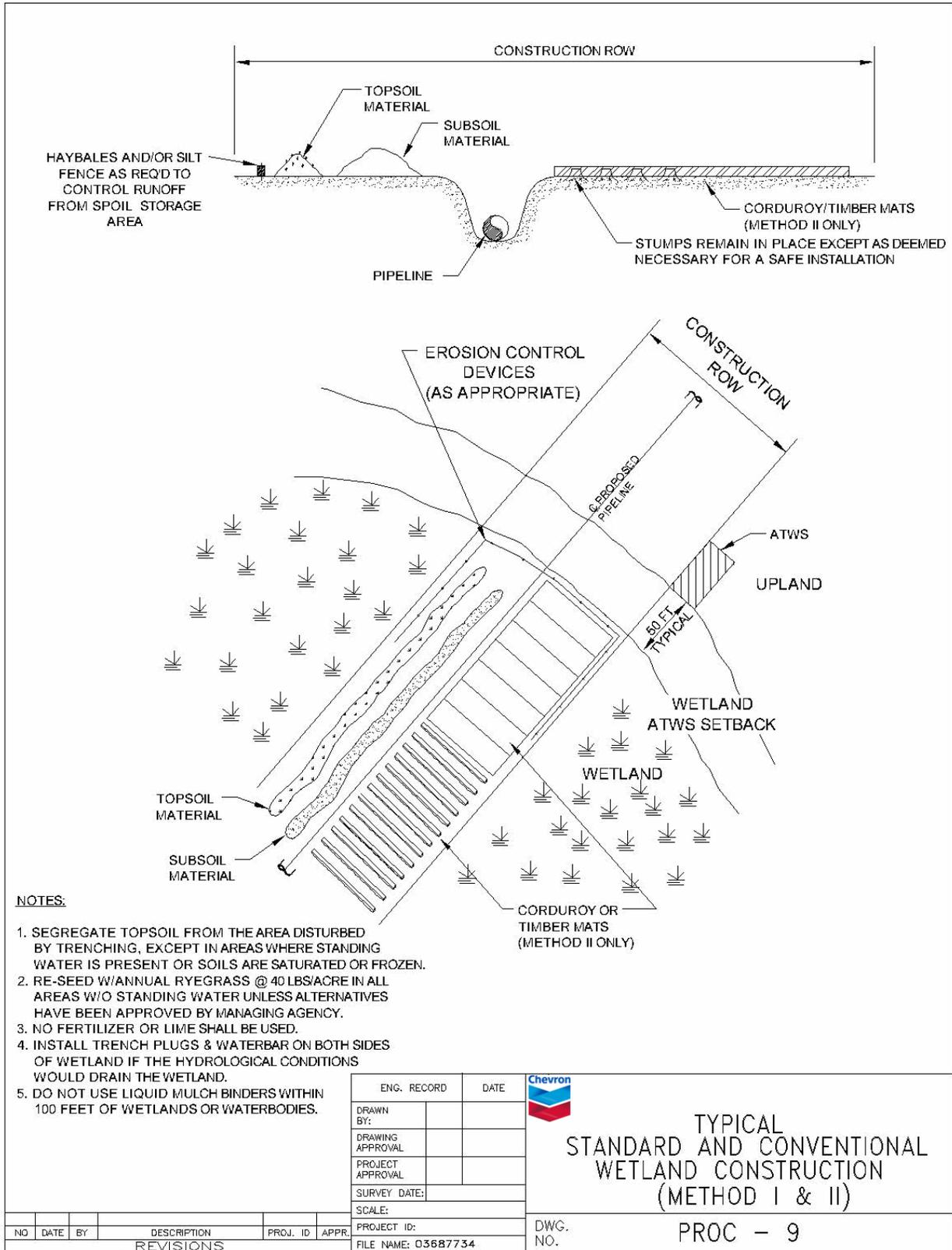
1. EQUIPMENT CROSSINGS WILL BE SELECTED BASED UPON SITE SPECIFIC CONDITIONS (REFER TO PROC - 1 TO PROC - 4).
2. THE REQUIRED SET BACK FOR ATWS IS 50 FEET FROM TOP OF BANK UNLESS APPROVED OTHERWISE BY THE APPROPRIATE AGENCIES.
3. THE MINIMUM REQUIRED SETBACK FOR SPOIL PILE IS 10 FEET FROM THE TOP OF BANK.
4. EQUIPMENT BRIDGE TO REMAIN IN PLACE UNTIL THE COMPLETION OF FINAL RESORATION.
5. STRAW BALES OR EQUIVALENT SEDIMENT BARRIERS WILL BE PLACED AT THE EDGE OF EQUIPMENT BRIDGE AT THE END OF THE WORK DAY TO PREVENT EROSION BUT WILL BE REMOVED DURING CONSTRUCTION ACTIVITY.

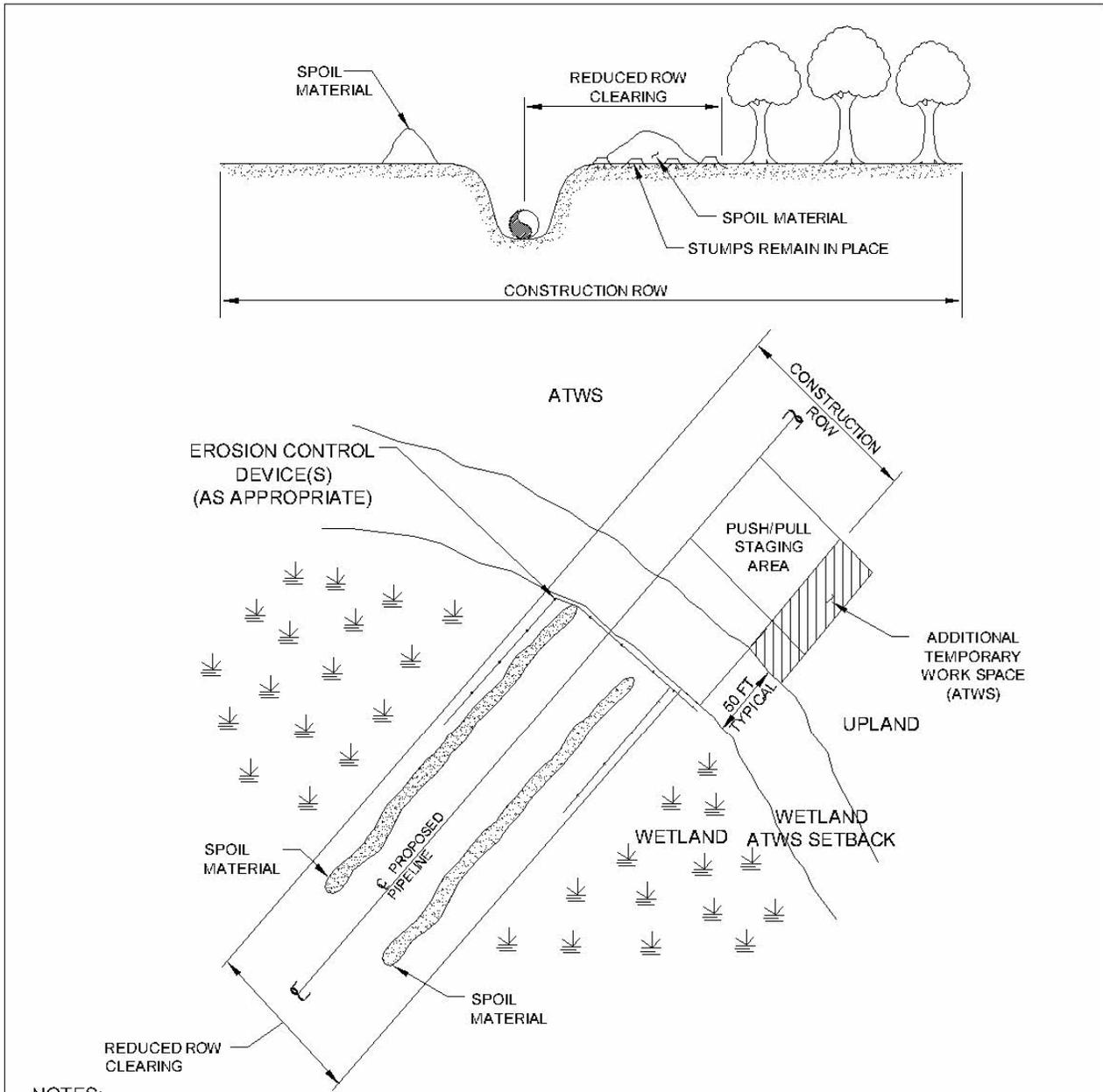
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TYPICAL
WET WATERBODY
CROSSING (METHOD 1)
PROC - 8

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					





NOTES:

1. SEGREGATE TOPSOIL FROM THE AREA DISTURBED BY TRENCHING, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED OR FROZEN.
2. INSTALL TRENCH BREAKERS & WATERBARS ON BOTH SIDES OF THE WETLAND IF HYDROLOGIC CONDITIONS WOULD DRAIN THE WETLAND.
3. DO NOT SEED WETLAND AREAS W/ SATURATED SOIL.
4. NO FERTILIZER OR LIME IS PERMITTED.
5. DO NOT USE LIQUID MULCH BINDERS WITHIN 100 FEET OF WETLANDS OR WATERBODIES.

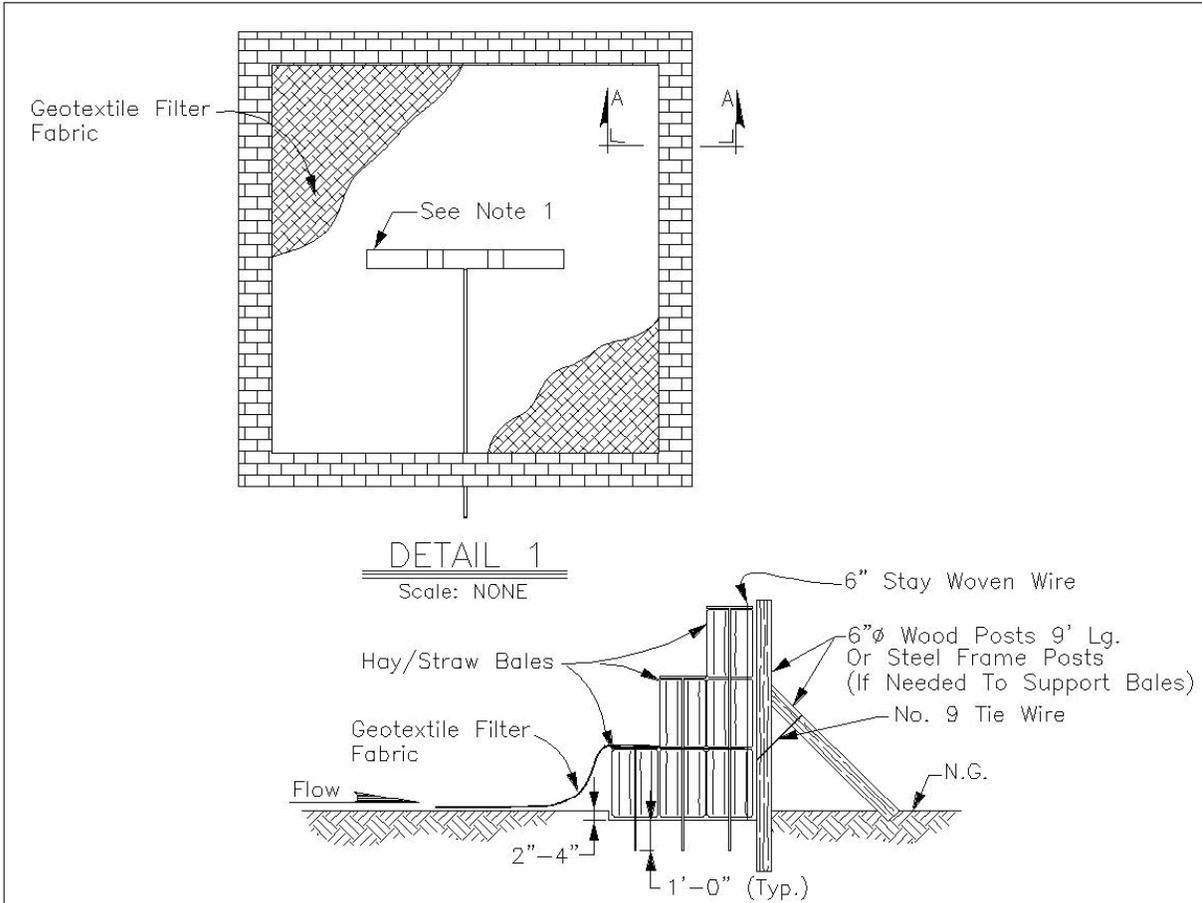
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TYPICAL
PUSH/PULL WETLAND
CONSTRUCTION (METHOD III)

DWG. NO. PROC - 10



NOTES:

1. Energy Dissipator (Baffle Device, Splash Plate, Filter Bag) To Be Anchored By Contractor.
2. Typical Energy Dissipator Must Be Used In Conjunction w/ Filter (As Appropriate).
3. Attempt to Locate In An Upland Area.
4. Sediment Must Be Removed When Accumulations Reach 1/2 The Height Of The Filters.
5. Discharge Structure To Be Underlain With Geotextile Fabric.
6. Do Not Discharge Into State-designated Exceptional Value Waters, Waterbodies Which Provide Habitat For Federally Listed T&E Species, Or Waterbodies Designated As Public Water Supplies, Unless Appropriate Federal, State, And Local Permitting Agencies Grant Written Permission.

SECTION "A-A"

Scale: NONE

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PROJECT APPROVAL	
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PROJECT ID:	
FILE NAME: 03687726	



TYPICAL
ENERGY DISSIPATOR

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

DWG. NO.

PROC - 11