

PUBLIC NOTICE



US ARMY CORPS
OF ENGINEERS
OMAHA DISTRICT

APPLICANT: TRANSCANADA KEYSTONE
PIPELINE, LP
APPLICATION NO: NWO-2020-01055-PIE
WATERWAY: MULTIPLE WATERWAYS &
WETLANDS
ISSUE DATE: AUGUST 14, 2020
EXPIRATION DATE: SEPTEMBER 13, 2020

30 DAY NOTICE

South Dakota Regulatory Office, 28563 Powerhouse Rd, Room 118, Pierre, SD 57501
<http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/SouthDakota.aspx>

JOINT NOTICE OF PERMIT PENDING

US ARMY CORPS OF ENGINEERS
AND
SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
AND
NEBRASKA DEPARTMENT OF ENVIRONMENT AND ENERGY

JOINT PUBLIC NOTICE: This public notice is issued jointly by the U.S. Army Corps of Engineers, Omaha District (USACE); the South Dakota Department of Environment and Natural Resources (SDDENR), 523 East Capitol Avenue, Pierre, South Dakota 57501; and the Nebraska Department of Environment and Energy (NDEE), P.O. Box 98922, Lincoln, Nebraska 68509. The SDDENR and NDEE will review the proposed project for state certification in accordance with the provisions of Section 401 of the Clean Water Act. SDDENR and NDEE hereby incorporate this public notice as their own public notice and procedures by reference thereto.

The project described herein is not being proposed by USACE, but by the applicant; USACE will evaluate the proposed work to determine if it is permittable under current laws and regulations. This notice may also be viewed at the USACE web site at:
<https://www.nwo.usace.army.mil/Missions/Dam-and-Lake-Projects/Oil-and-Gas-Development/KXL/>

AUTHORITY: Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344).

USACE regulatory authorities are limited by statute to activities affecting waters and wetlands regulated pursuant to the Section 10 and Section 404 authorities. USACE regulatory jurisdiction does not extend to a pipeline's entire route; it is limited to the crossings of regulated waters and immediately adjacent uplands. The upland areas that are not immediately adjacent to wetland and waterbody crossings are not within the USACE scope of analysis. Therefore, USACE does not have regulatory jurisdiction over portions of the pipeline that cross upland areas.

APPLICANT: TransCanada Keystone Pipeline, LP, Keystone Pipeline Projects, 700 Louisiana Street, Houston, Texas, 77002.

PROJECT LOCATION: The proposed Keystone XL Pipeline Project (Project) within the United States would be located in Montana, South Dakota, and Nebraska, connecting to the existing Keystone Cushing Extension pipeline, which extends from Steele City, Nebraska, to Cushing, Oklahoma. In total, the Project would consist of approximately 1,209 miles of new, 36-inch-diameter pipeline, with approximately 327 miles of pipeline in Canada and approximately 882 miles in the United States (U.S.). The Project would cross the international border between Saskatchewan, Canada, and the U.S. near Morgan, Montana, and would include pipeline generally within a 110-foot-wide temporary construction right-of-way (ROW) and a 50-foot-wide permanent ROW in Montana, South Dakota, and Nebraska. The approximate start of the Project in Montana is located at the following coordinates: 48.99, -107.54. The approximate end of the Project in Nebraska is located at the following coordinates: 40.04, -96.99.

PROJECT DESCRIPTION: TransCanada Keystone Pipeline, L.P. (Keystone) proposes to construct a pipeline system and ancillary facilities (e.g., access roads) that would transport Western Canadian Sedimentary Basin (WCSB) heavy crude oil from its existing facilities in Hardisty, Alberta, Canada, and Bakken crude oil from an on-ramp in Baker, Montana, to Steele City, Nebraska. There are a total of 729 locations along the pipeline route where wetlands and waterbodies would be impacted by the pipeline crossing, access roads, and temporary workspace. A majority of impacts to wetlands and waterbodies would occur from open-trench crossings (temporary excavation and side-cast filling) of the pipeline. The fill material in aquatic resources would consist of temporary side-cast trench soil material, rock, culverts/flumes for access crossings, and temporary construction mats. Aside from pipe ditching/trenching, timber mats, and temporary and permanent access roads, there are no other activities proposed that result in a discharge of dredged or fill material in aquatic resources. The applicant's proposed typical plan and elevation drawings showing the general location and character of proposed pipe crossings and permanent and temporary access crossings in aquatic resources are attached. The Individual Permit Application will soon be available online at <https://www.nwo.usace.army.mil/Missions/Dam-and-Lake-Projects/Oil-and-Gas-Development/KXL/>

PROJECT PURPOSE: The purpose of the project, as stated by the applicant, is to provide the infrastructure to transport up to 830,000 barrels per day of crude oil from the WCSB in Canada and the Bakken Shale Formation in the U.S. to existing pipeline facilities near Steele City, Nebraska, for onward delivery to Cushing, Oklahoma and the U.S. Gulf Coast area.

SPECIAL AQUATIC SITES AND OTHER WATERBODIES: The project would permanently impact a total of 0.13 acres of wetlands and 0.18 acres of waterbodies (streams, ponds, and canals) by the construction of permanent access roads. A total of 32.91 acres of wetlands and 25.40 acres of waterbodies would be temporarily impacted by temporary access roads and open-trench pipeline crossings. A total of 203 wetlands and 526 waterbodies [104 perennial streams, 185 intermittent streams, 220 ephemeral streams, and 17 man-made waterbodies (ponds and canals)] would be impacted (temporarily or permanently) by the pipeline construction. The limits of jurisdiction have not been verified by the USACE and could be revised prior to the permit decision. An approved jurisdictional determination (AJD) was not requested by the applicant and thus, the Corps has not completed an AJD for this project.

APPLICANT'S STATEMENT OF AVOIDANCE, MINIMIZATION, AND COMPENSATORY MITIGATION FOR UNAVOIDABLE IMPACTS TO AQUATIC RESOURCES: The applicant's pipeline route construction procedures and compliance program [Construction Mitigation and Reclamation Plan (CMRP)] are designed to minimize environmental impacts during construction and restoration. The pipeline route has been refined several times to reduce waterbody and wetland impacts through avoiding waterbody and wetland crossings where practicable, minimizing the number of times that a single waterbody is crossed, crossing waterbodies perpendicularly where practicable, and reducing the width of the ROW to 85 feet in wetlands in Montana and Nebraska and 75 feet in South Dakota, where practicable.

During the applicant's consultation with federal and state agencies and local stakeholders, additional reroutes were incorporated to avoid or minimize impacts to significant resources or identified concerns (including forested wetlands). In addition, timing windows were established in the project schedule to protect biological resources, such as spawning fish and threatened/endangered species. Additional mitigation measures proposed by the applicant include erosion and sediment controls to be implemented during and after construction, environmental training of all project workers and supervisors, best management practices (BMPs) incorporated into the project design and construction, wetland and waterbody construction procedures designed to minimize impacts during construction and reclamation of the crossings, spill prevention and clean-up procedures, hazardous materials handling guidelines, and clean-up, seeding, and reclamation details to ensure effective stabilization of the ROW and project disturbances.

Temporary equipment or materials installed to provide access (e.g. timber mats, timber rip-rap, and rock and flume crossing materials) would be removed from wetlands and waterbodies at the completion of construction. Disturbances associated with temporary equipment access methods would be restored and stabilized after the bridging equipment and access materials are removed. Wetlands and waterbodies would be restored to pre-construction conditions. The project would utilize trenchless horizontal directional drill (HDD) and conventional boring methods to avoid impacts to some specific waterbodies and wetlands. No discharge of dredge or fill material into waters of the U.S. is anticipated at HDD or bored crossings.

Compensatory mitigation for permanent impacts to aquatic resources is not proposed by the applicant at this time, with the following rationale:

Keystone is not proposing compensatory mitigation to offset the permanent impacts to waters of the U.S. resulting from the construction of the Project. Keystone has evaluated impacts to wetlands and waterbodies, as well as other environmental impacts, throughout the route selection process. The project design incorporated routing selection and construction techniques to avoid and minimize impacts to wetlands, to the maximum extent practical. The construction of permanent access roads will result in the permanent loss of a cumulative 0.13 acres of palustrine emergent (PEM) wetlands. This impact calculation is a total impact of multiple independent crossings of PEM wetlands along the entire 830+ mile Project. Each crossing of an aquatic resource by a permanent access road will result in less than a tenth of an acre of impact. The acreage calculations are provided in Table H-1 in Appendix H of the Individual Permit Application.

Of the cumulative 0.21 acres of PFO wetlands that would be temporarily disturbed during construction, 0.12 acres of the PFO wetlands would be allowed to restore to pre-construction condition as this portion of the ROW would not be required to be maintained in an herbaceous state. Following construction, this 0.12 acres of PFO wetlands would be planted with tree and shrub species consistent with dominant woody species currently observed in the wetland

complexes. Keystone anticipates the planting of 1 to 3-inch saplings on 10 to 15-foot centers within the restored workspace.

The construction of the Project would require the permanent cover class conversion of the remaining 0.09 acres of PFO wetlands from PFO to PEM because of the maintenance of a 30-foot corridor centered on the pipeline centerline in herbaceous cover for inspection and aerial patrol during operations. However, this 0.09 acres is based on several crossings of waters of the U.S. with impacts at each individual wetland being less. As Keystone is only proposing to maintain a 30-foot corridor in an herbaceous state, the functional wetland impact in these locations may be minimal. Keystone has implemented many measures to ensure that wetland and waterbody impacts are avoided or minimized along the Project. Keystone believes that compensatory mitigation for the limited amount of converted PFO is not warranted.

BACKGROUND: In compliance with the National Environmental Policy Act (NEPA), the U.S. Department of State (DOS) performed an alternative analysis pursuant to 40 CFR 1502.14. USACE was a cooperating agency during the development of the DOS Environmental Impact Statement (EIS). The analysis included the evaluation of three categories of alternatives, including the No Action Alternative, major pipeline route alternatives, and other alternatives considered but eliminated from detailed analysis.

Alternatives were eliminated by DOS on the basis of the relative potential environmental, logistical, economic, safety, and engineering costs and benefits of each aspect. The DOS completed three final NEPA documents, with each document evaluating new route alternatives as part of the process of identifying and evaluating the Proposed Action. For a detailed description of the alternatives considered in the development of the current Project route refer to Section 3.14 of the 2011 Keystone XL Final EIS, Section 2.2 of the January 2014 Keystone XL Final Supplemental EIS, and Chapter 2.0 of the December 2019 Keystone XL Final Supplemental EIS. The link to these documents can be found at <https://www.state.gov/keystone-pipeline-xl/>

Section 14 of the Rivers and Harbors Act of 1899 (Section 408) prohibits the use or alteration of a federal flood control or navigation project without prior permission from the Secretary of the Army or his designee. Because the proposed Project would cross the Missouri River in Montana downstream of the Fort Peck Spillway and would be trenched across federal property administered by USACE for the Fort Peck Project, a Section 408 permission was required. The Section 408 Decision was signed by USACE on January 21, 2020 and was incorporated into the Bureau of Land Management's (BLM) Decision to grant a right-of-way and temporary use permit on federally-administered land for the Project which was signed on January 22, 2020.

The applicant's list of other government (federal, state and local) authorizations obtained or requested by the applicant is attached to this notice (Table B-1 from the Individual Permit Application).

CULTURAL RESOURCES: Compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, is being carried out by the DOS in accordance with the 2013 Programmatic Agreement (PA) for the Keystone XL Pipeline Project. Under the terms of the PA, the DOS is the lead federal agency. USACE is a signatory party to the PA and will verify that the PA is being followed for any activities to be authorized under the Individual Permit.

ENDANGERED SPECIES: The BLM developed a Biological Assessment (BA), in coordination with other federal agencies including USACE, for the Project that was submitted to the US Fish & Wildlife Service (USFWS) on September 30, 2019. An amended BA was submitted by the BLM to the USFWS on November 27, 2019. The BA addressed all federal agency actions associated with the KXL Project along the entire 875 miles of pipeline route within the continental U.S. The USFWS concurred with the determinations made in the BA and provided a Biological Opinion (BO) for the American burying beetle (*Nicrophorus americanus*) on December 23, 2019 (see attached Table 1). Additionally, on November 25, 2019, Keystone submitted a Draft Habitat Conservation Plan to the USFWS under Section 10 of the ESA for an Incidental Take Permit (ITP) of the American burying beetle.

WATER QUALITY CERTIFICATION: The SDDENR and the NDEE will review the proposed project for state certification in accordance with the provisions of Section 401 of the Clean Water Act (33 USC 1341). The certifications, if issued, will express the States' opinions that the operations undertaken by the applicant will not result in a violation of applicable water quality standards. The certifications, if issued, may contain conditions in which the applicant must comply to ensure water quality standards are not violated.

The Montana Department of Environmental Quality (MDEQ) will also review the proposed project for state certification in accordance with the provisions of Section 401 of the Clean Water Act. The MDEQ will issue a separate public notice for the project which can be viewed at <http://deq.mt.gov/Public/notices/wqnotices>

PUBLIC INTEREST REVIEW: The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of aquatic resources. The benefit which reasonably may be expected to accrue from the proposals must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the activity will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production, and, in general the needs and welfare of the people. In addition, the evaluation of the impacts of the project on public interest will include application of the guidelines promulgated by the Administrator, EPA, under authority of Section 404(b) of the Clean Water Act (40 CFR Part 230).

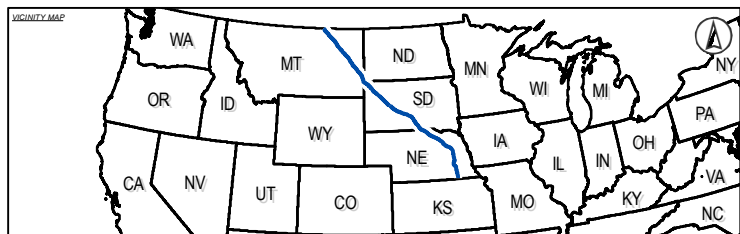
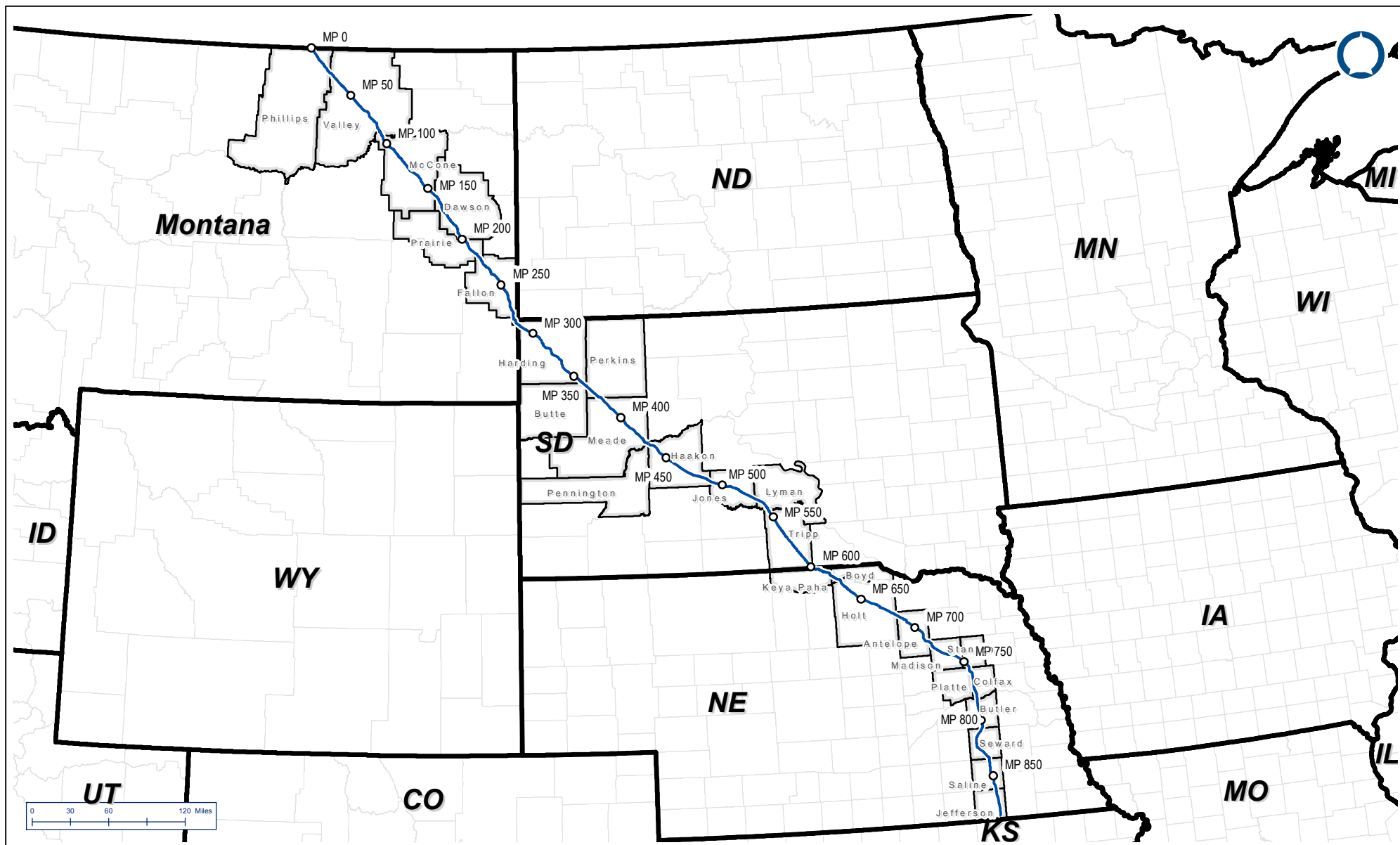
COMMENTS: This notice is provided to outline details of the above-described activity so USACE may consider all pertinent comments prior to determining if issuance of a permit would be in the public interest. Any interested party is invited to submit to this office written facts or objections relative to the activity on or before the public notice expiration date. Comments both favorable and unfavorable will be accepted and made a part of the record and will receive full consideration in determining whether it would be in the public interest to issue the Department of the Army permit. Copies of all comments, including names and addresses of commenters, may be provided to the applicant. Comments should be emailed to nwo-kxl-pn@usace.army.mil or mailed to the address shown at the top of the first page of this public notice.

PUBLIC HEARING: Public hearings will be scheduled and conducted for the purpose of collecting information or evidence which will be considered in evaluating the proposed USACE permit action described in this public notice. Public hearings are public proceedings that also afford the public an opportunity to present their views, opinions, and information on such permit actions or Federal projects [33 CFR 327.3(a)]. A public notice will be issued 30 days prior to the scheduled public hearings.

ADDITIONAL INFORMATION: Additional information about this application may be obtained by sending an email to nwo-kxl-pn@usace.army.mil, writing to the USACE Omaha District Regulatory Project Manager at the address shown at the top of the first page of this public notice, or by calling (402) 995-2027.

REQUEST TO POSTMASTERS: Please post this notice conspicuously and continuously until the expiration date specified at the top of page one.

NOTICE TO EDITORS: This notice is provided as background information for your use in formatting news stories. This notice is not a contract for classified display advertising.



Legend

- Keystone XL Milepost
- Keystone XL Centerline (2020-02-21)
- ▭ State Boundary
- ▭ Project Centerline Impact - Counties

KEYSTONE XL PROJECT
- Figure 1-1 -
Project Location Map

COUNTRY:	USA	DRAWN BY:	JC
STATE:	MT / SD / NE	CHECKED BY:	CW
REV. NO.:	0	REVISION	DATE
		ISSUED FOR REVIEW	2020-05-15
DATE:	2020-05-15	PROJECTION:	NAD83 (UTM 13/14 N)

PREPARED BY:
exp Energy Services Inc.
t: +1 713 439 3600 | f: +1 713 963 9085
1600 West Loop South, Suite 850
Houston, TX 77027
U.S.A.
www.exp.com



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Table B-1 - Project Permits, Licenses, Approvals, and Consultation Requirements for the Project

Agency	Permit or Consultation/Authority	Agency Action	Status
Federal			
Office of the U.S. President	Presidential Permit, Executive Order 13337 of April 30, 2004 (69 Fed. Reg. 25299, et seq.)	Considers approval of cross-border facilities	Issued March 2019
U.S. Department of State (DOS)	National Environmental Policy Act Clearance	DOS is the lead federal agency for the environmental review in connection with consideration of Presidential Permit application	Final Supplemental Environmental Impact Statement for the Keystone XL Project Issued December 20, 2019
	Section 106 of the National Historic Preservation Act (NHPA)	DOS is the lead federal agency for compliance with Section 106 of NHPA and consultation with interested Tribal agencies	Programmatic Agreement amended and signed by cooperating agencies and entities in 2013
U.S. Army Corps of Engineers (USACE) – Omaha District	Section 10 of the Rivers and Harbor Act / 404 of the Clean Water Act (CWA)	Considers issuance of Section 404 permits for the placement of dredge or fill material in waters of the United States, including wetlands and issuance of Section 10 for the crossing of navigable waters of the United States.	Pending USACE approval
U.S. Army Corps of Engineers (USACE) – Omaha District	Section 408, Navigation and Navigable Waters (33 USC 408)	Considers issuance of Section 408 permits for the construction, placement, maintenance, or modification of a structure or improvements in, over, below, or above a navigable river	Permission Issued January 21, 2020
Bureau of Land Management (BLM)	SF 299 Right-of-Way (ROW) Grant and Temporary Use Permit with Determination of National Environmental Policy Act Adequacy	Considers issuance of permit for construction projects on BLM land	ROW Grant Offer Issued January 22, 2020; ROW grant signed February 7, 2020.
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act (ESA) Section 7 Consultation	Considers lead agency findings of an impact of federally listed or proposed species; provide Biological Opinion (BO) if the Project is likely to adversely affect federally listed or proposed species or their habitats	Amended BO for the Keystone XL Project issued December 23, 2019
	Section 10 -Incidental Take Permit (ITP) for American Burying Beetle (ABB)	Considers issuance of permit under Section 10 of the ESA to private, non-federal entities projects that might result in the wake of an endangered or threatened species	On November 25, 2019, Keystone submitted a Draft Habitat Conservation Plan to the USFWS under Section 10 of the ESA for an ITP of the American burying beetle. Anticipated that USFWS will issue Incidental Take Permit in August 2020
State and Local			
Montana			
Montana Department of Environmental Quality	Major Oil Pipeline Siting Act Certificate	Major Facility Siting Act (MFSA) Certificate of Compliance	Considers issuance of certification to construct a major pipeline to be placed in operation of Montana

Table B-1 - Project Permits, Licenses, Approvals, and Consultation Requirements for the Project

Agency	Permit or Consultation/Authority	Agency Action	Status
	MFSA Certificate of Compliance	Considers issuance of certification to construct a major pipeline to be placed in operation of Montana	Issued: March 30, 2012
	Section 401, CWA, Water Quality Certification	Considers issuance of permit for stream and wetland crossings	Issued in concert with issuance of the Section 10/404 Permit.
	Section 402 CWA NPDES Discharge Permit for Hydrostatic Test Water (MTG770000)	Considers issuance of permit for discharge of hydrostatic test waters	Permit applications are submitted/issued by spread and in accordance with construction start dates.
	Section 402 CWA NPDES General Permit for Construction Dewatering (MTG070000)	Considers issuance of permit for discharges from dewatering construction to surface waters	Permit applications are submitted/issued by spread and in accordance with construction start dates.
	Section 402 CWA NPDES General Permit for Construction Stormwater Discharge (MTG0100000)	Considers issuance of permit for discharges associated with activity that causes land disturbance equal to or greater than one acre	Permit applications are submitted/issued by spread and in accordance with construction start dates.
	318 Authorization	Considers issuance of permit for activities that will cause unavoidable short-term violations of water quality standards (turbidity)	Permit applications are submitted/issued by spread and in accordance with construction start dates.
County Conservation District	310 Authorization	Considers issuance of permit for activities that physically alters or modifies the bed or banks of a perennially flowing stream	Pending application submittal
Montana Department of Transportation	State Highway Crossing and Access Permits	Considers issuance of permits to construct, operate, use, and/or maintain a facility within a state managed roadway	Majority of permits acquired
County and Local Authorities	Road Crossing and Access Permits	Considers issuance of permits to construct, operate, use, and/or maintain a facility within a county or local authority managed right-of-way	Majority of permits acquired
	Pump Station Zoning Approvals, where required		
	Special or Conditional Use Permits, where required		
	Municipal Water Use Agreements	Considers issuance of agreement to appropriate water use within a county or local authority	Majority of permits acquired
South Dakota			
South Dakota Public Utilities Commission (PUC)	Energy Conversion and Transmission Facilities Act	Considers issuance of certification to construct a major utility to be placed in operation within South Dakota	A PUC certificate was issued March 2010
South Dakota Department of	Section 401, CWA, Water Quality Certification	Considers issuance of permit for stream and wetland crossings; consult for Section 404 process	Issued in concert with issuance of the Section 10/404 Permit.

Table B-1 - Project Permits, Licenses, Approvals, and Consultation Requirements for the Project

Agency	Permit or Consultation/Authority	Agency Action	Status
Environment and Natural Resources	Section 402 CWA NPDES Hydrostatic Testing/Temporary Water Use Permit (SDG070000)	Considers issuance of General Permit regulating hydrostatic test water discharge, construction dewatering to waters of the State, and Temporary Water Use Permit	Permit applications are submitted/issued by spread and in accordance with construction start dates.
	General Stormwater Discharge and Construction Site Dewatering Permit (NER160000)	Considers issuance of permit for discharges associated with activity that causes land disturbance equal to or greater than one acre.	Permit applications are submitted/issued by spread and in accordance with construction start dates.
	Standard Water Appropriations Permit	Considers issuance of permit to appropriate water from a state jurisdictional waterbody.	Application submitted
County Floodplain Departments	County Floodplain Permits	Considers issuance of permits and review of work in floodplains	Pending application submittal
South Dakota Department of Transportation	State Highway Crossing and Access Permits	Considers issuance of permits to construct, operate, use, and/or maintain a facility within a state managed roadway	Majority of permits acquired
County and local Authorities	Road Crossing and Access Permits	Considers issuance of permits to construct, operate, use, and/or maintain a facility within a county or local authority managed ROW	Majority of permits acquired
	Pump Station Zoning Approvals, where required		
	Special or Conditional Use Permits, where required		
	Municipal Water Use Agreements	Reviews under County approval process	Majority of permits acquired
Nebraska			
Nebraska Public Service Commission (PSC)	Major Oil Pipeline Siting Act Certificate	Considers issuance of certification to construct a major pipeline to be placed in operation of Nebraska.	On November 20, 2017, the Nebraska PSC approved the Mainline Alternative Route
Nebraska Department of Environment and Energy	Section 401, CWA, Water Quality Certification	Considers issuance of permit for stream and wetland crossings	Issued in concert with issuance of the Section 10/404 Permit.
	Section 402 CWA NPDES-General Hydrostatic Test Water Discharge Permit (NEG672000)	Considers issuance of permit for discharge of hydrostatic test waters.	Permit applications are submitted/issued by spread and in accordance with construction start dates.
	Section 402 CWA NPDES General Storm Water Discharges from Construction Sites Permit (NER160000)	Considers issuance of permit for discharges associated with activity that causes land disturbance equal to or greater than one acre.	Permit applications are submitted/issued by spread and in accordance with construction start dates.
	Section 402 CWA NPDES General Dewatering Discharges from Construction Excavation Sites and/or Wells Permit (NEG671000)	Considers issuance of permit for discharges from dewatering construction excavations to ground and surface waters	Permit applications are submitted/issued by spread and in accordance with construction start dates.
Nebraska Department of Natural Resources	Permit to Appropriate Water	Considers issuance of permit to appropriate water from a state jurisdictional waterbody	Permit applications are submitted/issued by spread and in accordance with construction start dates.
County Floodplain Departments	County Floodplain Permits	Considers issuance of permits and review of work in floodplains	Permit applications are submitted/issued by spread and in accordance with construction start dates.

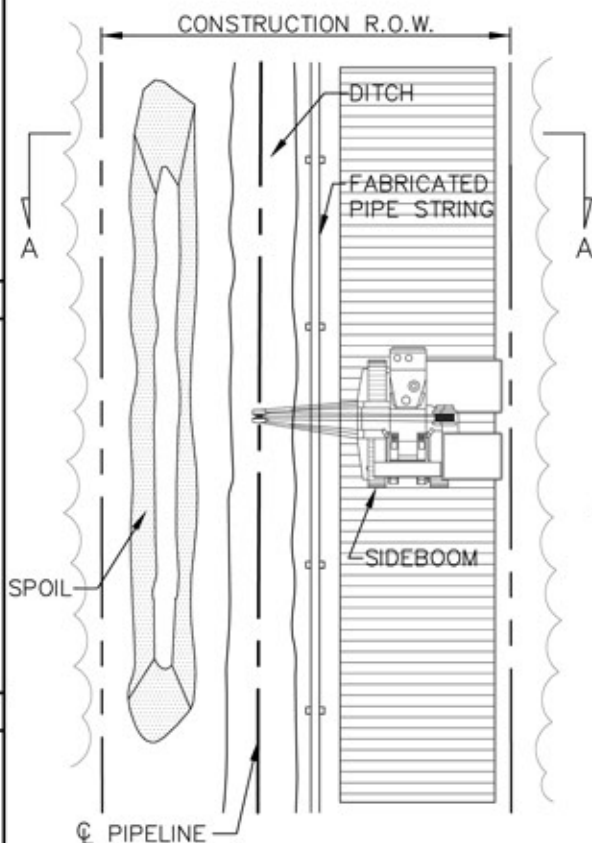
Table B-1 - Project Permits, Licenses, Approvals, and Consultation Requirements for the Project

Agency	Permit or Consultation/Authority	Agency Action	Status
County and Local Authorities	Road Crossing and Access Permits	Considers issuance of permits to construct, operate, use, and/or maintain a facility within a county or local authority managed right-of-way.	Majority of permits acquired
	Pump Station Zoning Approvals, where required		
	Special or Conditional Use Permits, where required		
	Municipal Water Use Agreements	Considers issuance of agreement to appropriate water use within a county or local authority.	Pending application submittal
Key: ABB: American burying beetle CWA: Clean Water Act DOS: U.S. Department of State ITP: Incidental Take Permit MFSA: Major Facility Siting Act NHPA: National Historic Preservation Act PSC: Public Service Commission PUC: Public Utilities Commission ROW: right-of-way USACE: U.S. Army Corps of Engineers USFWS: U.S. Fish and Wildlife Service			

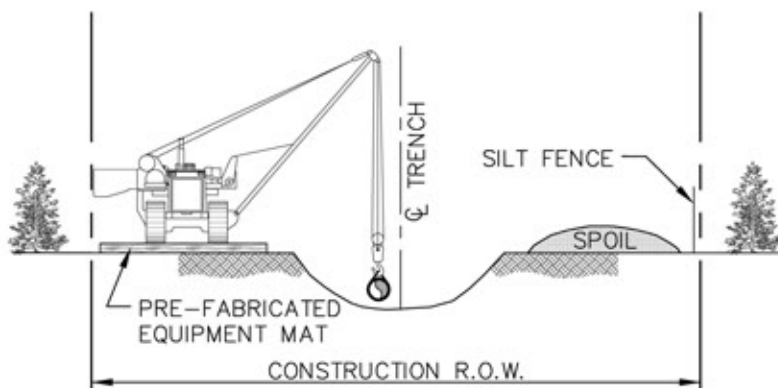
Table 1: Endangered Species Act Effect Determination Summary from Bureau of Land Management's November 26, 2019 Biological Assessment

Common Name	Scientific Name	Federal Status	Findings Summary
Black-footed ferret	<i>Mustela nigripes</i>	Endangered Populations/ Experimental Populations	NLAA NLAA
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	MA
Interior least tern	<i>Sternula antillarum</i>	Endangered	NLAA
Piping plover	<i>Charadrius melodus</i>	Threatened	NLAA
Rufa red knot	<i>Calidris canutus rufa</i>	Threatened	NLAA
Whooping crane	<i>Grus americana</i>	Endangered	NLAA
Pallid sturgeon	<i>Scaphirhynchus albus</i>	Endangered	NLAA
Topeka shiner	<i>Notropis topeka</i>	Endangered	NLAA
American burying beetle	<i>Nicrophorus americanus</i>	Endangered	MALAA
Western prairie fringed orchid	<i>Platanthera praeclara</i>	Threatened	NLAA

MA = may affect, but complies with 4(d) rule; MALAA = may affect, likely to adversely affect;
NLAA = may affect, not likely to adversely affect



PLAN VIEW



SECTION A-A

CONSTRUCTION PROCEDURES:

1. FLAG WETLAND BOUNDARIES PRIOR TO CLEARING.
2. NO REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER THE PROJECT'S SPILL PREVENTION PROCEDURES.
3. INSTALL TEMPORARY SLOPE BREAKER UPSLOPE WITHIN 100 FEET OF WETLAND BOUNDARY IF DIRECTED BY THE PROJECT.
4. INSTALL TIMBER MATS/RIPRAP THROUGH ENTIRE WETLAND AREA. EQUIPMENT NECESSARY FOR RIGHT-OF-WAY CLEARING MAY MAKE ONE (1) PASS THROUGH THE WETLAND BEFORE MATS ARE INSTALLED.
5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS (STRAW BALES AND/OR SILT FENCE) AT DOWNSLOPE EDGE OF RIGHT-OF-WAY AND ALONG WETLAND EDGE AS REQUIRED.
6. RESTRICT ROOT GRUBBING TO ONLY THAT AREA OVER THE DITCHLINE AND DITCH SPOIL AREAS AND REMOVED FROM WETLAND FOR DISPOSAL.
7. DO NOT TRENCH WETLAND UNTIL PIPE IS READY TO INSTALL.
8. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
9. LEAVE HARD PLUGS AT EDGE OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
10. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND AND ADJACENT TO ALIGNMENT, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN.
11. TRENCH THROUGH WETLANDS.
12. LOWER-IN PIPE, INSTALL TRENCH PLUGS AT WETLAND EDGES AS REQUIRED AND BACKFILL IMMEDIATELY.
13. REMOVE TIMBER MATS OR PRE-FABRICATED MATS FROM WETLAND UPON COMPLETION.
14. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL IF SALVAGED AND INSTALL PERMANENT EROSION CONTROL.

2010-10-11 UPDATED DRAWING NOTES

02

REVISED NOTES 2 & 3

01

REVISIONS

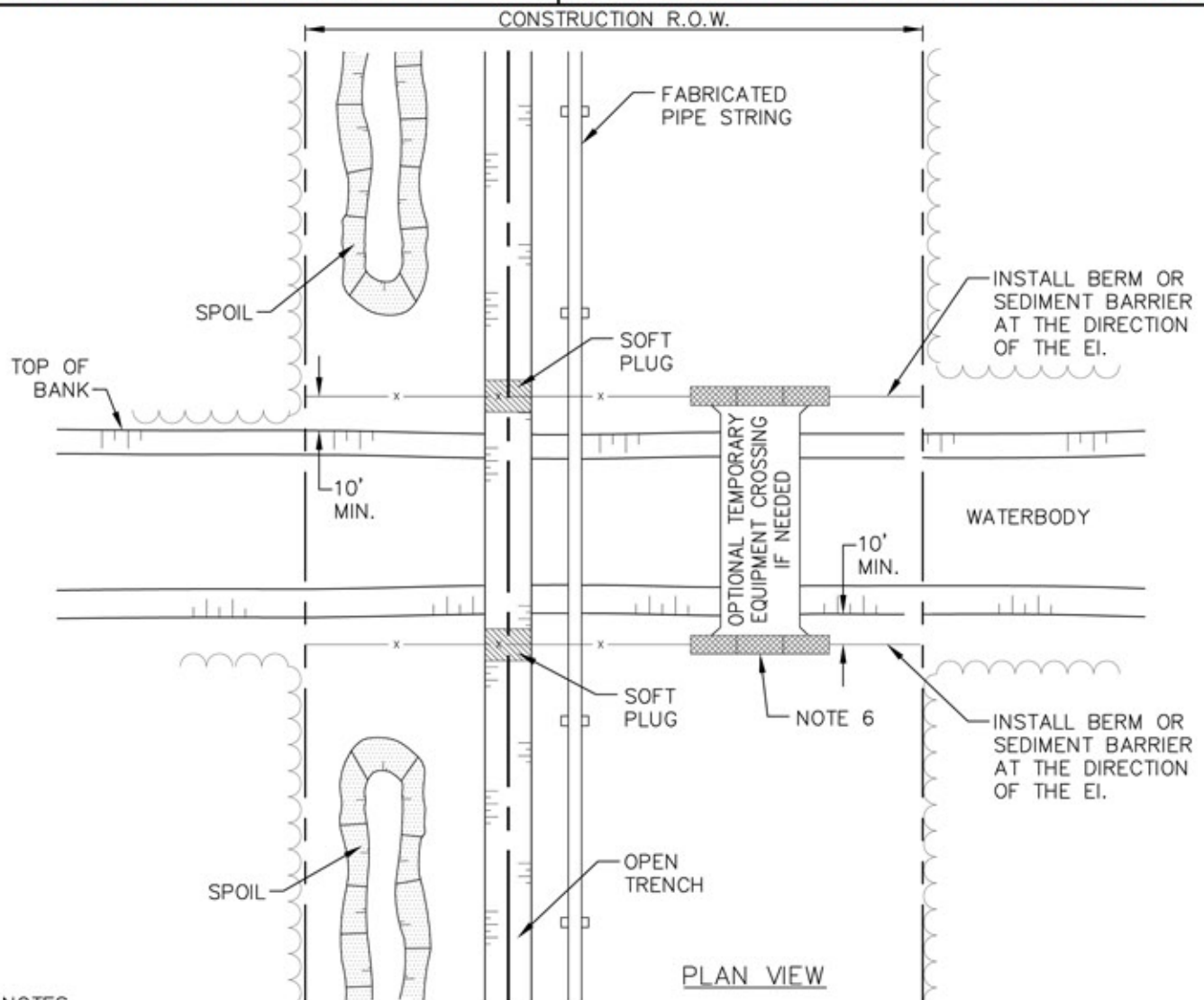
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exp Energy Services Inc.
t: +1.850.385.5441 | f: +1.850.385.5523
1300 Metropolitan Blvd
Tallahassee, FL 32308
USA

www.exp.com

DESIGNER:	
JMP	2010-10-21
NAME	DATE
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KEYSTONE XL PROJECT			
FIA # 4359	CHAINAGE:	DISCIPLINE # 03	
TITLE			
DETAIL 9			
STANDARD WETLAND CROSSING METHOD			
SCALE N.T.S.	DWG No 4359-03-ML-03-702	REV 02	



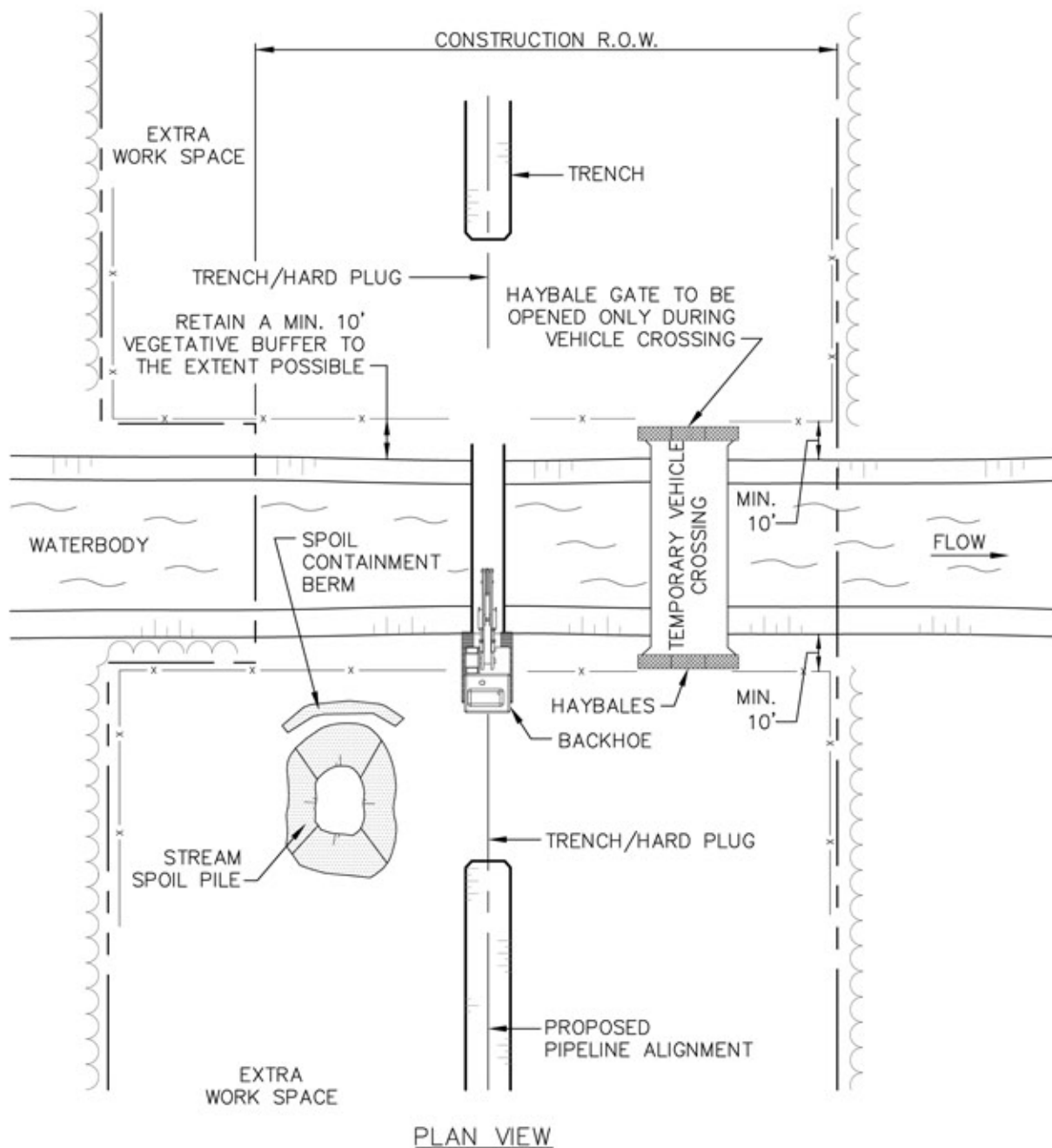
NOTES:

1. THIS METHOD APPLIES TO DRY WASHES, SWALES, INCISED DRAINAGES AND DITCHES WITH NO PERCEPTIBLE FLOW AT TIME OF CROSSING. IF FLOWS ARE PRESENT DURING CONSTRUCTION REFER TO DETAIL 12.
2. CLEARING AND GRADING, TOPSOIL SALVAGE AND TOPSOIL STRIPPING DEPTHS SHALL BE THE SAME AS INDICATED FOR ADJACENT UPLAND UNLESS OTHERWISE DIRECTED BY KEYSTONE.
3. EI TO FLAG THE ORDINARY HIGH WATER MARK (OHWM) PRIOR TO CLEARING.
4. INSTALL SILT FENCE OR A BERM AT DIRECTION OF KEYSTONE EI TO PREVENT RUNOFF FROM ROW TO ADJACENT, UNDISTURBED DRAINAGE.
5. STOCKPILE TOPSOIL AND SPOIL SEPARATELY. TOPSOIL SHALL NOT BE STOCKPILED ACROSS THE DRAINAGE CHANNEL AND SHALL BE PLACED A MINIMUM OF 15 FEET FROM THE OHWM OR TO SUIT CONDITIONS AND PROTECT THE DRAINAGE AS DETERMINED BY KEYSTONE.
6. INSTALL TEMPORARY SLOPE BREAKERS WHERE IDENTIFIED BY THE EI.
7. TRENCH, STRING PIPE, AND BACKFILL USING STANDARD UPLAND CONSTRUCTION PROCEDURES UNLESS OTHERWISE DIRECTED BY KEYSTONE.
8. RESTORE WATERCOURSE CHANNEL AND BANKS (EXCEPT TRAVEL LANE IF USED) TO APPROXIMATE PRE-CONSTRUCTION PROFILE IMMEDIATELY AFTER PIPE IS LOWERED IN AND BACKFILLED. INSTALL PERMANENT EROSION CONTROLS WHERE DIRECTED BY KEYSTONE.
9. REMOVE ANY TEMPORARY CROSSING STRUCTURES AND/OR GRAVEL.



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KEYSTONE XL PROJECT		
FIA # 4359	CHAINAGE:	DISCIPLINE # 03
TITLE		
DETAIL 11		
TYPICAL OPEN CUT WET CROSSING METHOD		
NON-FLOWING WATERBODY		
SCALE N.T.S.	DWG No 4359-03-ML-03-704	REV 03



02 2010-10-11 REVISED TITLE BLOCK

01 UPDATED DRAWING NOTES

REVISIONS

TransCanada
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exp Energy Services Inc.
E: +1.850.385.5441 | F: +1.850.385.5523
1300 Metropolitan Blvd
Tallahassee, FL 32308
USA

www.exp.com

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KEYSTONE XL PROJECT			
FIA # 4359	CHAINAGE:	DISCIPLINE # 03	
TITLE			
DETAIL 12 TYPICAL OPEN CUT WET CROSSING METHOD FLOWING WATERBODY			
SCALE N.T.S.	DWG No 4359-03-ML-03-705	REV 02	

CONSTRUCTION PROCEDURES:

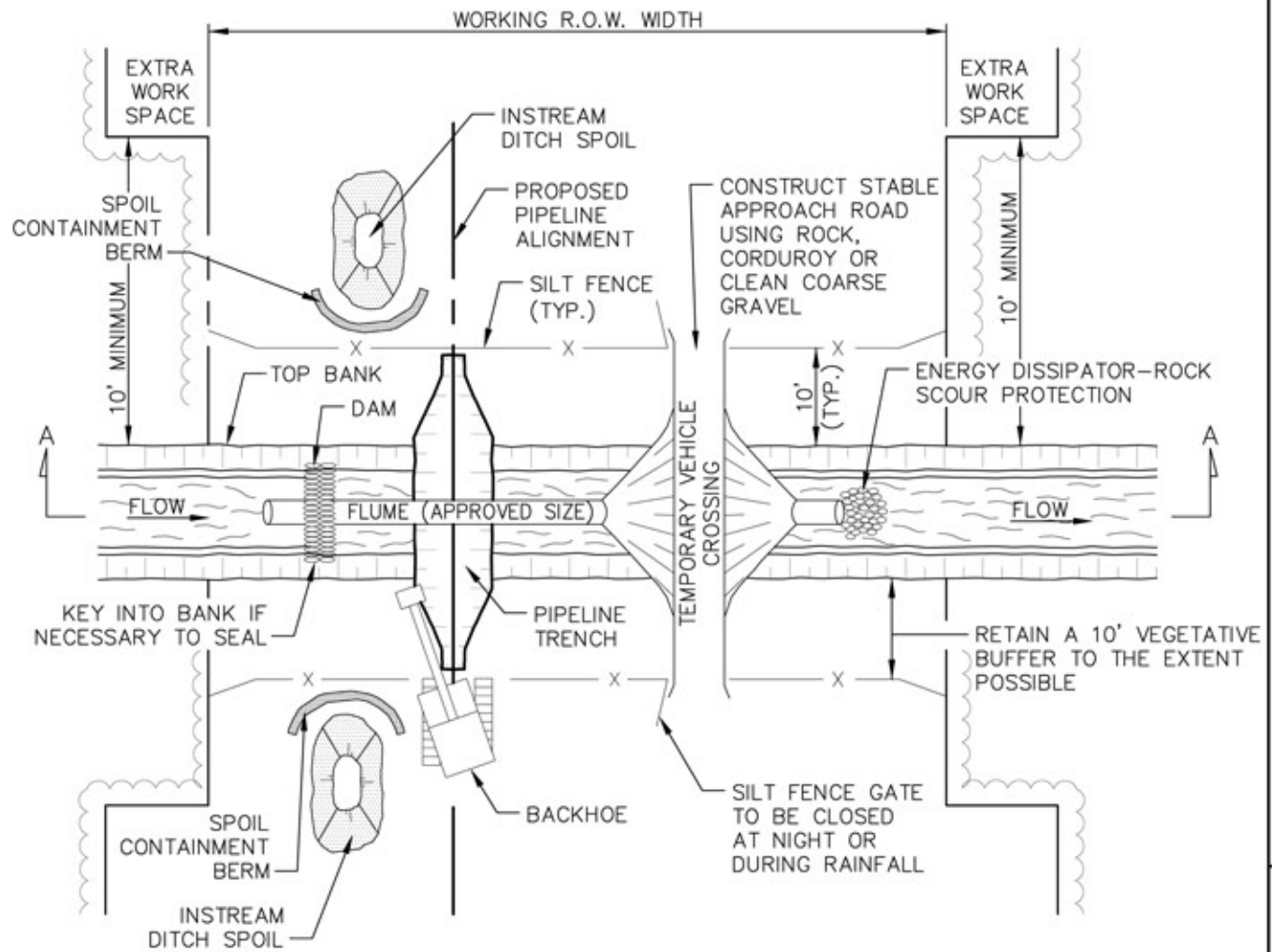
1. RIGHT-OF-WAY BOUNDARIES AND WORK SPACE LIMITS SHALL BE CLEARLY DELINEATED. STAGING FOR MAKEUP SHALL BE LOCATED A MINIMUM OF 10 FEET FROM WATERBODY.
2. CLEARING LIMITS WILL BE CLEARLY DELINEATED AND 10 FOOT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREA AND THE WATERBODY SHALL BE MAINTAINED TO THE EXTENT POSSIBLE. ALL CLEARING SHALL BE MINIMIZED TO THE EXTENT POSSIBLE AND TO ONLY THAT NECESSARY FOR CONSTRUCTION. WOODY VEGETATION SHALL BE CUT AT GROUND LEVEL AND THE STUMPS/ROOTS LEFT IN PLACE TO THE EXTENT POSSIBLE.
3. TOPSOIL SHALL BE STRIPPED FROM THE DITCH LINE IN ALL WETLANDS RIPARIAN.
4. CONTRACTOR SHALL INSTALL SIGNS APPROXIMATELY 100 FEET MINIMUM FROM EACH WATERBODY AND WETLAND TO IDENTIFY THE HAZARDOUS MATERIALS EXCLUSION AREA.
5. EROSION AND SEDIMENT CONTROL
 - a. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED OR ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS WATERBODY OR WETLAND.
 - b. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY OR INDIRECTLY INTO THE WATERBODY. ALL EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO SUIT ACTUAL SITE CONDITIONS. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION.
 - c. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED CONSTRUCTION RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
 - d. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE WATERBODY CROSSING UNTIL THE WATER CROSSING IS INSTALLED AND BACKFILLED.
 - e. TRENCH BREAKERS ARE TO BE INSTALLED AT THE SAME SPACING AND IMMEDIATELY UPSLOPE OF PERMANENT SLOPE BREAKERS, OR AS DIRECTED BY THE COMPANY.
6. CONTRACTOR SHALL MAINTAIN HARD PLUGS IN THE DITCH AT THE WATERBODY UNTIL JUST PRIOR TO PIPE INSTALLATION. CONTRACTOR SHALL EXCAVATE TRENCH AND INSTALL PIPE AS EXPEDIENTLY AS PRACTICAL TO REDUCE THE DURATION OF WORK ACTIVITIES IN THE WATERBODY BED.
7. CONTRACTOR SHALL PLACE TRENCH SPOIL ONLY IN CERTIFICATED WORK SPACE AND A MINIMUM OF 10 FEET FROM THE WATERBODY BANKS TO PREVENT ENTRY OF SPOIL INTO THE WATERBODY. SPOIL SHALL BE CONTAINED AS NECESSARY USING EITHER A STRAW BALE BARRIER OR AN EARTH/ROCK BERM.
8. CONTRACTOR SHALL RESTORE THE WATERBODY AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, UNLESS OTHERWISE APPROVED BY THE COMPANY. CONTRACTOR SHALL INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED. ANY MATERIALS PLACED IN THE WATERBODY TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATERBODY AND WETLAND BOUNDARIES UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.
9. VEHICLE CROSSING CAN BE CONSTRUCTED USING EITHER A FLUME CROSSING OR A TEMPORARY BRIDGE. VEHICLE CROSSING ONLY REQUIRED IF STREAM SUPPORTS A STATE DESIGNATED FISHERY.

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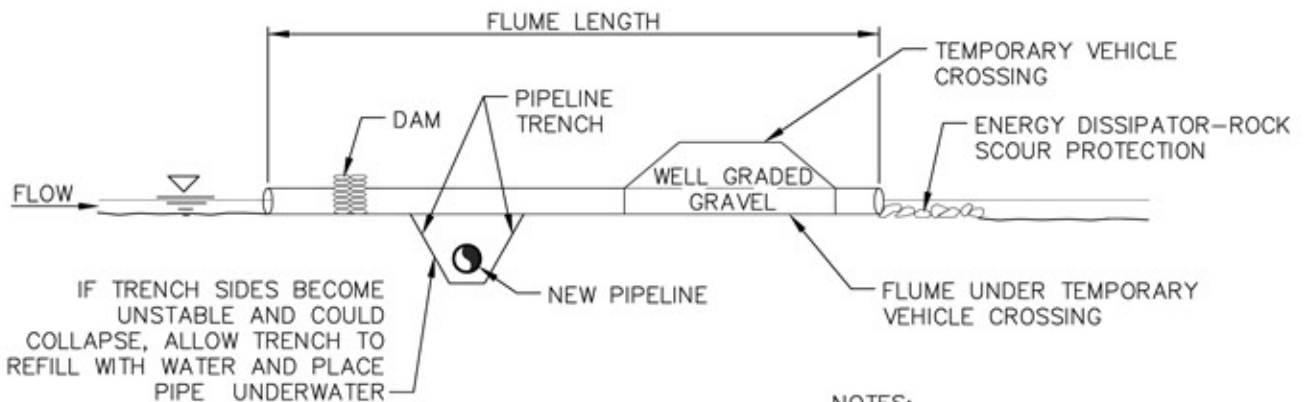


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KEYSTONE XL PROJECT			
FIA # 4359	CHAINAGE:	DISCIPLINE # 03	
TITLE			
DETAIL 12A			
TYPICAL OPEN CUT WET CROSSING METHOD			
FLOWING WATERBODY - CONSTRUCTION PROCEDURES			
SCALE	N.T.S.	DWG No	4359-03-ML-03-706
			REV 01



PLAN VIEW



SECTION A-A

NOTES:

1. PIPELINE PLACEMENT WITHIN RIGHT-OF-WAY CONCEPTUAL ONLY.
2. SEE DETAIL 13A FOR CONSTRUCTION PROCEDURES.

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Tallahassee, FL 32308
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KEYSTONE XL PROJECT
FIA # 4359 CHAINAGE: DISCIPLINE # 03
TITLE
DETAIL 13
TYPICAL DRY FLUME CROSSING METHOD
SCALE N.T.S. DWG No 4359-03-ML-03-707 REV 01

CONSTRUCTION PROCEDURES:

1. MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURE NEEDED TO PROTECT WATER QUALITY.
2. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE FLUME MUST BE ON-SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER WORK.
3. TO THE EXTENT POSSIBLE, MAINTAIN A MINIMUM 10 FT. VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SILT FENCE OR STRAW BALE BARRIER UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE.
4. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED OR ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS STREAM.
 - a. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY INTO THE STREAM.
 - b. EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS.
 - c. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION. UTILIZE STRAW BALE BARRIERS ONLY IN LIEU OF A SILT FENCE WHERE FREQUENT ACCESS IS REQUIRED.
 - d. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
 - e. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED PORTIONS OF THE RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
 - f. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
5. PIPE SHALL BE STRUNG AND WELDED FOR READY INSTALLATION PRIOR TO WATERCOURSE TRENCHING.
6. FLUME CAPACITY DURING DRY CROSSING SHALL BE SUFFICIENT TO ACCOMMODATE 1.5 TIMES THE FLOW MEASURED AT THE TIME OF CONSTRUCTION PROVIDED THAT THE FLUMES WILL BE IN PLACE NOT MORE THAN 96 HOURS AND NO PRECIPITATION IS FORECAST. FLUME CAPACITY FOR VEHICLE ACCESS SHALL BE SUFFICIENT TO PASS THE 2 YEAR DESIGN FLOW OR THE FLOW REASONABLY EXPECTED TO OCCUR DURING THE INSTALLATION. EXCESS FLUMES REQUIRED FOR LONGER TERM ACCESS SHALL BE CAPPED DURING DRY CROSSING PROCEDURES.
7. ENSURE THAT THE DAMS AND VEHICLE CROSSING ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION.
8. FLUMES ARE TO BE SET WITH 10 PERCENT OF THEIR DIAMETER BELOW STREAMBED LEVEL WHERE SOIL CONDITIONS PERMIT (OTHERWISE INSTALLED AT STREAM GRADE AND SLOPE.)
9. PLACE IMPERVIOUS DAMS AT EACH END OF THE FLUME, UPSTREAM FIRST, THEN DOWNSTREAM. ACCEPTABLE ALTERNATIVES INCLUDE GRAVEL WITH RIP-RAP PROTECTION, SAND BAGS, STEEL PLATE AND ROCKFILL. DURING INSTALLATION, INSTALL AN IMPERVIOUS MEMBRANE, IF NECESSARY, TO LIMIT LEAKAGE. DAMS MAY NEED KEYING INTO THE BANK AND STREAMBED. EXCAVATE TRENCH THROUGH PLUGS AND UNDER FLUME FROM BOTH SIDES. WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE.
 - a. LOWER IN PIPE BY PASSING UNDER FLUME AND BACKFILL IMMEDIATELY WITH SPOIL MATERIAL.
 - b. IT IS NOT NECESSARY TO DEWATER THE IN-STREAM TRENCH, HOWEVER, DISPLACED WATER SHALL BE PUMPED TO A STABLE UPLAND AREA TO AVOID OVERTOPPING OF DAMS DURING PIPE PLACEMENT.
 - c. IF THE SPOIL MATERIAL IS NOT SUITABLE, USE IMPORTED CLEAN GRANULAR MATERIAL.
 - d. IF BLASTING IS REQUIRED, USE CONTROLLED BLASTING TECHNIQUES TO PREVENT DAMAGE TO THE FLOW CONVEYANCE SYSTEM. ALTERNATIVELY, BLASTING MAY BE ACCOMPLISHED PRIOR TO THE FLUME INSTALLATION BY DRILLING THROUGH THE OVERBURDEN.
10. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 10 FT. OF THE WATERCOURSE. THIS MATERIAL SHALL BE CONTAINED TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE.
11. DEWATERING OF THE ONLAND TRENCH SHOULD OCCUR IN A STABLE VEGETATED AREA A MINIMUM OF 50 FT. FROM ANY WATERBODY. THE PUMP DISCHARGE SHOULD BE DIRECTED ONTO A STABLE SPILL PAD CONSTRUCTED OF ROCKFILL OR TIMBERS TO PREVENT LOCALIZED EROSION. THE DISCHARGE WATER SHOULD ALSO BE FORCED INTO SHEET FLOW IMMEDIATELY BEYOND THE SPILL PAD BY USING STRAW BALES AND THE NATURAL TOPOGRAPHY.
12. FLUMES SHOULD BE REMOVED AS SOON AS POSSIBLE, WHEN NO LONGER REQUIRED FOR PIPE LAYING OR FOR ROAD ACCESS, IN THE FOLLOWING MANNER:
 - a. REMOVE THE VEHICLE CROSSING RAMP. BANKS ARE TO BE RESTORED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH THE FLOW CONDITIONS (E.G., EROSION CONTROL BLANKETS, CRIBBING, ROCK RIP-RAP, ETC.) TO THE MAXIMUM EXTENT POSSIBLE BEFORE REMOVING THE DAMS.
 - b. REMOVE DOWNSTREAM DAM.
 - c. REMOVE UPSTREAM DAM.
 - d. REMOVE FLUME.
 - e. COMPLETE BANK TRIMMING AND EROSION PROTECTION. IF SANDBAGS ARE USED FOR THE DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS.
13. RESTORE THE STREAMBED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, BUT NOT TO EXCEED 2 HORIZONTAL TO 1 VERTICAL.
 - a. INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED ON A SITE SPECIFIC BASIS. IN THE ABSENCE OF SITE SPECIFIC INFORMATION, A FLEXIBLE CHANNEL LINER SUCH AS NAG C125 OR C350 WHICH IS CAPABLE OF WITHSTANDING ANTICIPATED FLOW SHALL BE INSTALLED. ALTERNATIVELY, ROCK RIP-RAP SHALL BE INSTALLED.
 - b. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING.
 - c. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATER COURSE UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.



exp Energy Services Inc.

t: +1.850.385.5441 | f: +1.850.385.5523

1300 Metropolitan Blvd

Tallahassee, FL 32308

USA

www.exp.com

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KEYSTONE XL PROJECT

FIA # 4359

CHAINAGE:

DISCIPLINE # 03

TITLE

DETAIL 13A
TYPICAL DRY FLUME CROSSING METHOD -
CONSTRUCTION PROCEDURES

SCALE

N.T.S.

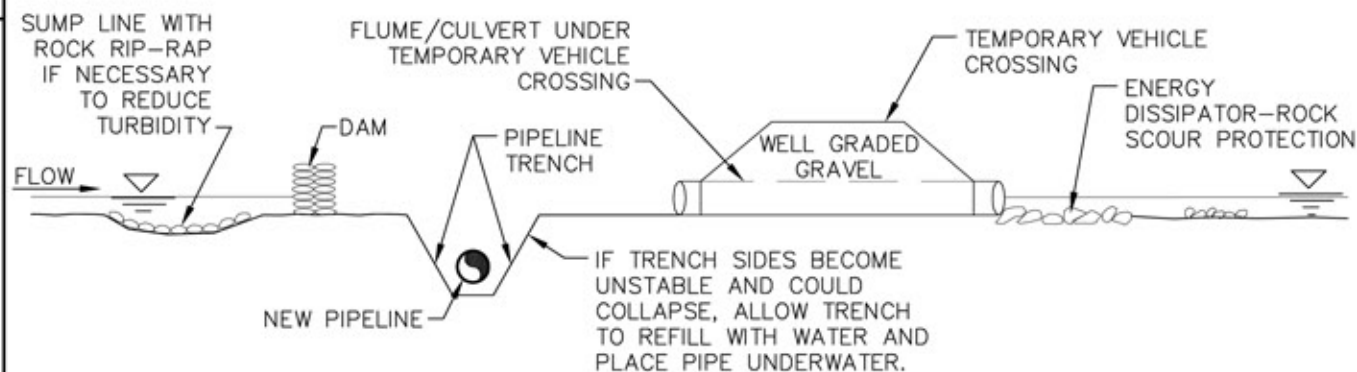
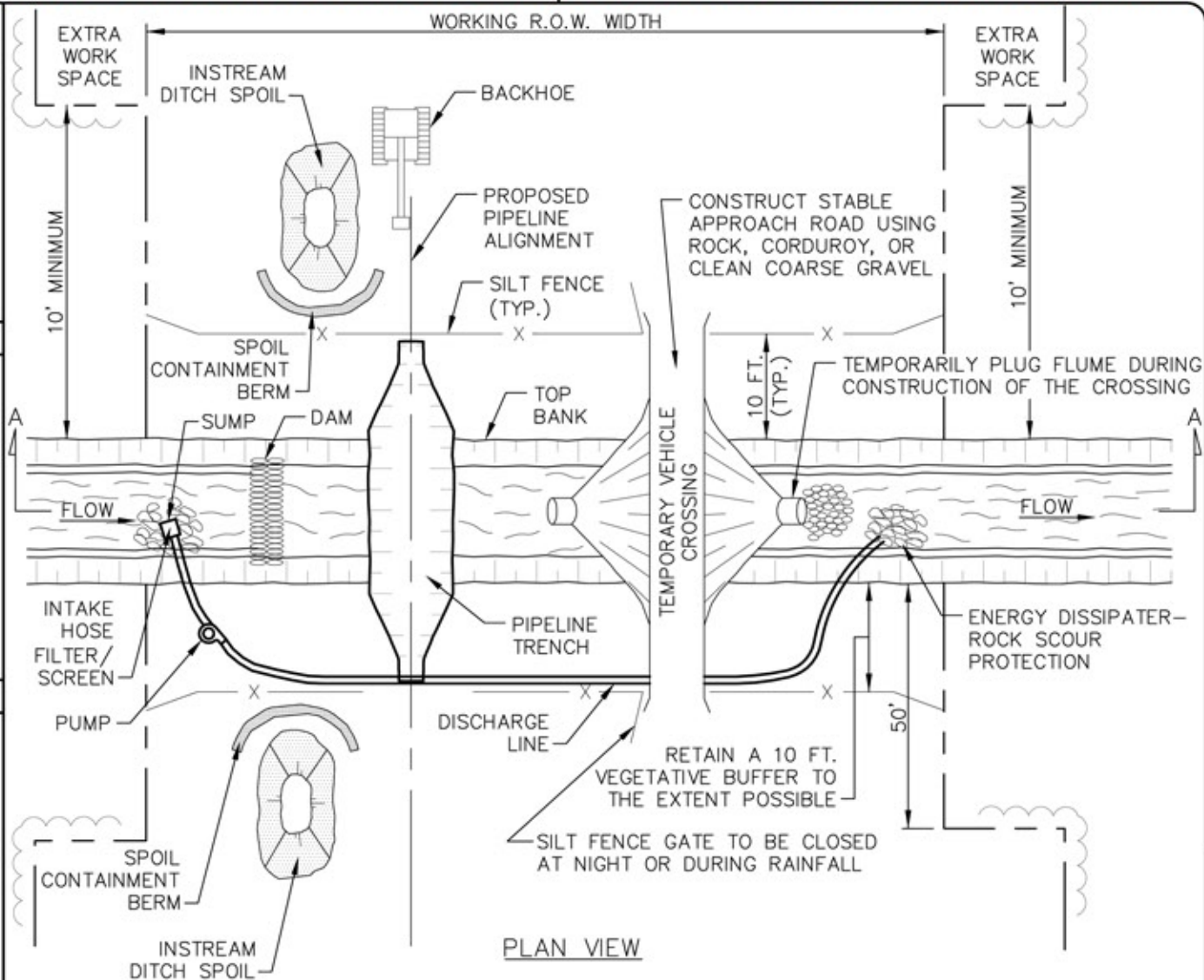
DWG No

4359-03-ML-03-708

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THESE ARE TYPICAL DRAWINGS; ACTUAL SITE CONDITIONS MAY VARY FROM THE SITE GRAPHICALLY REPRESENTED.



NOTES:

1. PIPELINE PLACEMENT WITHIN RIGHT-OF-WAY CONCEPTUAL ONLY.
2. SEE DETAIL 14A FOR CONSTRUCTION PROCEDURES.

SECTION A-A

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KEYSTONE XL PROJECT

FIA # 4359 CHAINAGE: DISCIPLINE # 03

TITLE
**DETAIL 14
TYPICAL DAM AND PUMP CROSSING**

SCALE N.T.S. DWG No 4359-03-ML-03-709 REV 01

CONSTRUCTION PROCEDURES:

1. WHERE NECESSARY, OBTAIN PRIOR APPROVAL BEFORE USING THE DAM AND PUMP METHOD.
2. IF THERE IS ANY FLOW IN THE WATERCOURSE, INSTALL PUMPS TO MAINTAIN STREAMFLOW AROUND THE BLOCKED OFF SECTIONS OF CHANNEL. THE PUMP IS TO HAVE 1.5 TIMES THE PUMPING CAPACITY OF ANTICIPATED FLOW. A SECOND STANDBY PUMP OF EQUAL CAPACITY IS TO BE READILY AVAILABLE AT ALL TIMES. AN ENERGY DISSIPATER IS TO BE BUILT TO ACCEPT PUMP DISCHARGE WITHOUT STREAMBED OR STREAMBANK EROSION. IF THE CROSSING IS PROLONGED BEYOND ONE DAY THE OPERATION NEEDS TO BE MONITORED OVERNIGHT.
3. SCHEDULE INSTREAM ACTIVITY FOR LOW FLOW PERIODS IF POSSIBLE.
4. MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURES NEEDED TO PROTECT WATER QUALITY. INSTALL PRE-WORK SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE PLAN. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE DAMS AND TO PUMP WATER MUST BE ON SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER CONSTRUCTION. PIPE SHOULD BE STRUNG, WELDED AND COATED AND READY FOR INSTALLATION PRIOR TO WATERCOURSE TRENCHING.
5. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED AND ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS STREAM.
 - a. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY INTO THE STREAM.
 - b. EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS.
 - c. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION. UTILIZE STRAW BALE BARRIERS ONLY IN LIEU OF A SILT FENCE WHERE FREQUENT ACCESS IS REQUIRED.
 - d. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
 - e. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED PORTIONS OF THE RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
 - f. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
6. TO THE EXTENT POSSIBLE, MAINTAIN A MINIMUM 10 FEET VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SILT FENCE UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE. THE SILT FENCE SHOULD INCORPORATE REMOVABLE "GATES" AS REQUIRED TO ALLOW ACCESS WHILE MAINTAINING EASE OF REPLACEMENT FOR OVERNIGHT OR DURING PERIODS OF RAINFALL.
7. CONSTRUCT A TEMPORARY SUMP UPSTREAM OF THE DAM AND LINE WITH ROCKFILL IF A NATURAL POOL DOES NOT EXIST. INSTALL THE PUMP OR PUMP INTAKE IN THE POOL OR SUMP. DISCHARGE WATER ONTO AN ENERGY DISSIPATER DOWNSTREAM OF THE WORK AREA.
8. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 10 FT. OF THE WATERCOURSE. THIS MATERIAL MUST BE CONTAINED WITHIN BERM CONTAINMENT, WITH SECONDARY SILT FENCE PROTECTION TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE.
9. CHEMICALS, FUELS, LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT REFUELED WITHIN 100 FT. OF THE WATERBODY. PUMPS ARE TO BE REFUELED AS PER THE SPCC PLANS.
10. STAGING AREAS ARE TO BE LOCATED AT LEAST 10 FT. FROM THE WATER'S EDGE (WHERE TOPOGRAPHIC CONDITIONS PERMIT) AND SHALL BE THE MINIMUM SIZE NEEDED.
11. DAMS ARE TO BE MADE OF STEEL PLATE, INFLATABLE PLASTIC DAM, SAND BAGS, COBBLES, WELL GRADED COARSE GRAVEL FILL, OR ROCK FILL. DAMS MAY NEED KEYING INTO THE BANKS AND STREAMBED. ENSURE THAT THE DAM AND VEHICLE CROSSING ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION. CAP FLUMES USED UNDER VEHICLE CROSSING DURING DRY CROSSING.
12. DEWATER AREA BETWEEN DAMS IF POSSIBLE. DEWATERING SHOULD OCCUR IN A STABLE VEGETATIVE AREA A MINIMUM OF 50 FT. FROM ANY WATERBODY. THE PUMP DISCHARGE SHOULD BE DISCHARGED ONTO A STABLE SPILL PAD CONSTRUCTED OF ROCKFILL SANDBAGS, OR TIMBERS TO PREVENT LOCALIZED EROSION. THE DISCHARGE WATER SHOULD ALSO BE FORCED INTO SHEET FLOW IMMEDIATELY BEYOND THE SPILL PAD BY USING STRAW BALES AND THE NATURAL TOPOGRAPHY DISCHARGED WATER SHALL NOT BE ALLOWED TO FLOW INTO ANY WATERCOURSE OR WETLAND. IF IT IS NOT POSSIBLE TO DEWATER THE EXCAVATION DUE TO SOILS WITH A HIGH HYDRAULIC CONDUCTIVITY, THE EXCAVATION AND PIPE PLACEMENT IS TO BE CARRIED OUT IN THE STANDING WATER. PUMP ANY DISPLACED WATER AS DESCRIBED ABOVE TO PREVENT OVERTOPPING OF DAMS.
13. EXCAVATE TRENCH THROUGH PLUGS AND STREAMBED FROM BOTH SIDES, RE-POSITIONING DISCHARGE HOSE AS NECESSARY. LOWER THE PIPE IN THE TRENCH AND BACKFILL IMMEDIATELY. DURING THIS OPERATION WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE.
14. CONTRACTOR SHALL RESTORE THE STREAM BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, BUT NOT TO EXCEED 2 HORIZONTAL TO 1 VERTICAL.
 - a. CONTRACTOR SHALL INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED ON A SITE SPECIFIC BASIS. IN THE ABSENCE OF SITE SPECIFIC INFORMATION, A FLEXIBLE CHANNEL LINER SUCH AS NAG C125 OR C350 WHICH IS CAPABLE OF WITHSTANDING ANTICIPATED FLOW SHALL BE INSTALLED. ALTERNATIVELY, ROCK RIP-RAP SHALL BE INSTALLED.
 - b. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING.
 - c. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATER COURSE UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.
15. WHEN THE STREAMBED HAS BEEN RESTORED, THE CREEK BANKS ARE TO BE CONTOURED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH FLOW VELOCITY BETWEEN DAMS (E.G., EROSION CONTROL BLANKETS, CRIBBING, ROCK RIP-RAP, ETC.). THE DAMS ARE TO BE REMOVED DOWNSTREAM FIRST. KEEP PUMP RUNNING UNTIL NORMAL FLOW IS RESUMED. COMPLETE BANK TRIMMING AND EROSION PROTECTION. IF SANDBAGS ARE USED FOR THE DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS.

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REVISED TITLE

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KEYSTONE XL PROJECT

FIA # 4359

CHAINAGE:

DISCIPLINE # 03

TITLE

DETAIL 14A
TYPICAL DAM AND PUMP CROSSING -
CONSTRUCTION PROCEDURES

SCALE

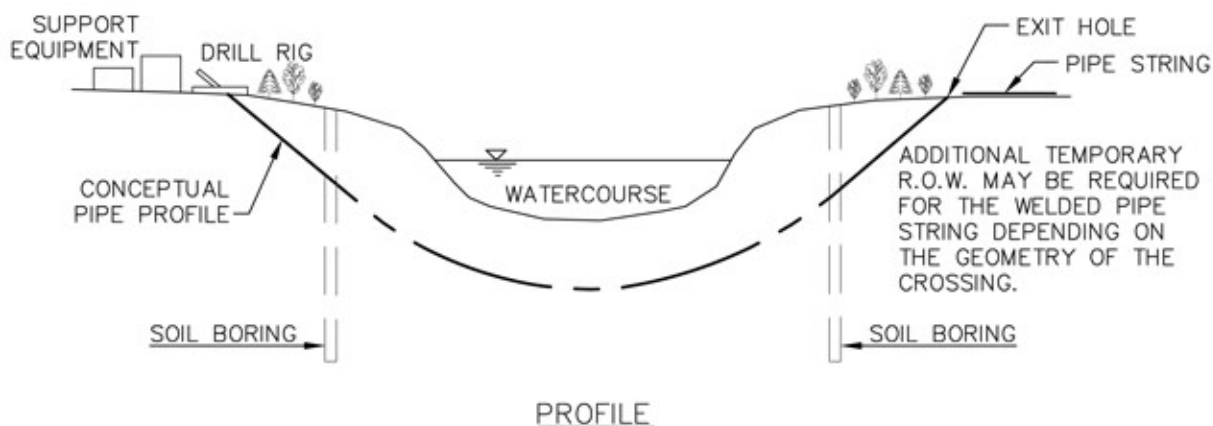
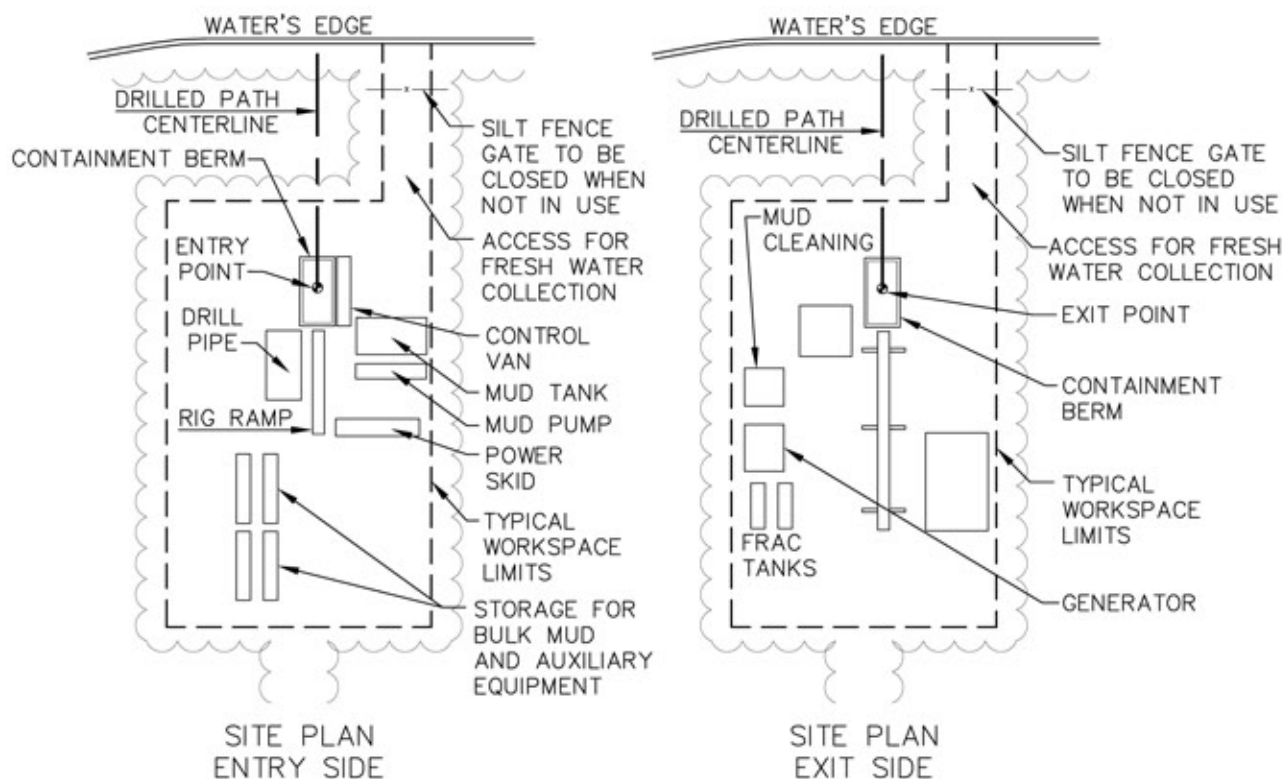
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DWG No

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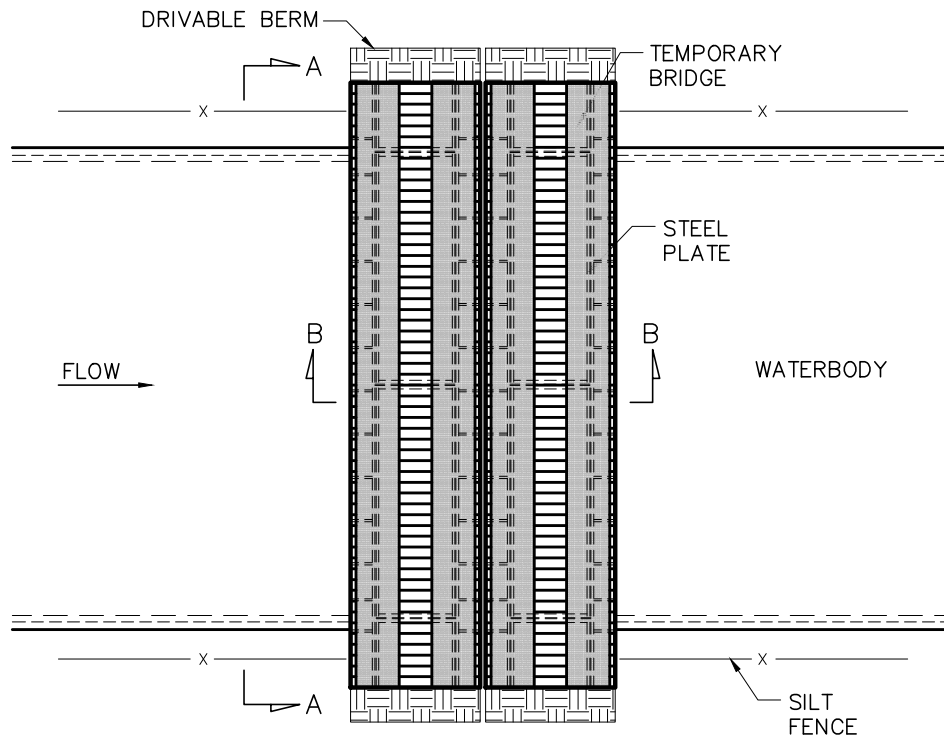
NOTES:

1. SET UP DRILLING EQUIPMENT A MINIMUM OF 100 FEET FROM THE EDGE OF THE WATERCOURSE. LIMIT CLEARING BETWEEN DRILL ENTRY AND EXIT POINT TO HAND CUTTING BRUSH FOR TRACKING WIRES.
2. ENSURE THAT ONLY BENTONITE-BASED DRILLING MUD IS USED.
3. INSTALL SUITABLE DRILLING MUD TANKS OR SUMPS TO PREVENT CONTAMINATION OF WATERCOURSE.
4. INSTALL BERMS DOWNSLOPE FROM THE DRILL ENTRY AND ANTICIPATED EXIT POINTS TO CONTAIN ANY RELEASE OF DRILLING MUD.
5. DISPOSE OF DRILLING MUD IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AUTHORITY REQUIREMENTS.



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JMP	2010-10-21
NAME	DATE
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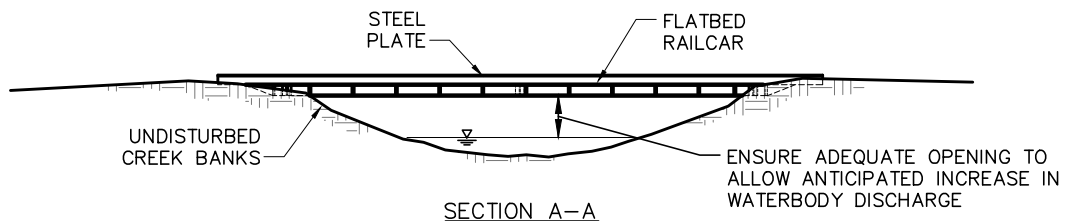
KEYSTONE XL PROJECT		
FIA # 4359	CHAINAGE:	DISCIPLINE # 03
TITLE		
DETAIL 15		
TYPICAL HORIZONTAL DRILL (HDD) SITE PLAN & PROFILE		
SCALE N.T.S.	DWG No 4359-03-ML-03-711	REV 02



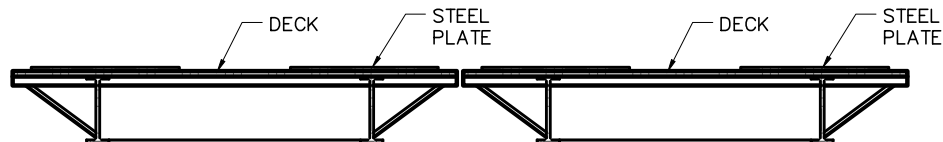
PLAN VIEW

NOTES:

1. SEE DETAIL 18A FOR CONSTRUCTION PROCEDURES.



SECTION A-A



SECTION B-B



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GENERAL INFORMATION - KEYSTONE SYSTEM

FACILITY #

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ENG STN:

DISC #

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TITLE

DETAIL - 18
TYPICAL RAILCAR BRIDGE CROSSING

SCALE N.T.S.

DWG # 1399-03-ML-00-067

REV A

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A

REVISIONS

CONSTRUCTION PROCEDURES:

1. THIS TYPICAL DRAWING PROVIDES FOR A RAILCAR BRIDGE EQUIPMENT CROSSING.
2. BRIDGE SHOULD BE A MINIMUM OF 12 FEET LONGER THAN BANK TO BANK WIDTH.
3. BEST MANAGEMENT PRACTICES UTILIZING EROSION CONTROL DEVICES, SUCH AS HAY BALES AND SILT FENCE ARE REQUIRED TO PREVENT SEDIMENTATION OF THE WATERBODY. EROSION PROTECTION SHALL BE PLACED ON THE WATERBODY BANKS AND A DRIVABLE BERM WILL BE ADDED ON BOTH ENDS OF THE BRIDGE.
4. DURING FINAL CLEANUP, REMOVE TEMPORARY EQUIPMENT CROSSINGS AS SOON AS POSSIBLE. INSTALLED MATERIALS, SUCH AS HAY BALES AND SILT FENCE MUST BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS AND REQUIREMENTS. THE WATERBODY BED, BANKS, AND AREAS AFFECTED BY CONSTRUCTION OF THE TEMPORARY EQUIPMENT CROSSING SHOULD BE RESTORED TO A STABLE CONDITION. IF REQUIRED TO PREVENT TRANSPORT OF SEDIMENTATION TO THE WATERBODY, SILT FENCE SHOULD BE INSTALLED AT THE TOP OF THE BANKS.
5. CONTRACTOR TO VERIFY BRIDGE IS CERTIFIED TO SUPPORT EXPECTED LOADS.
6. BRIDGE MUST BE REMOVED PRIOR TO SPRING THAW, OR MUST BE INSTALLED TO MEET SPRING THAW CONDITIONS.
7. CONSTRUCTION MATS MAY BE REQUIRED AT THE ENDS TO SUPPORT THE BRIDGE AND PROVIDE A SAFE FOOTING.



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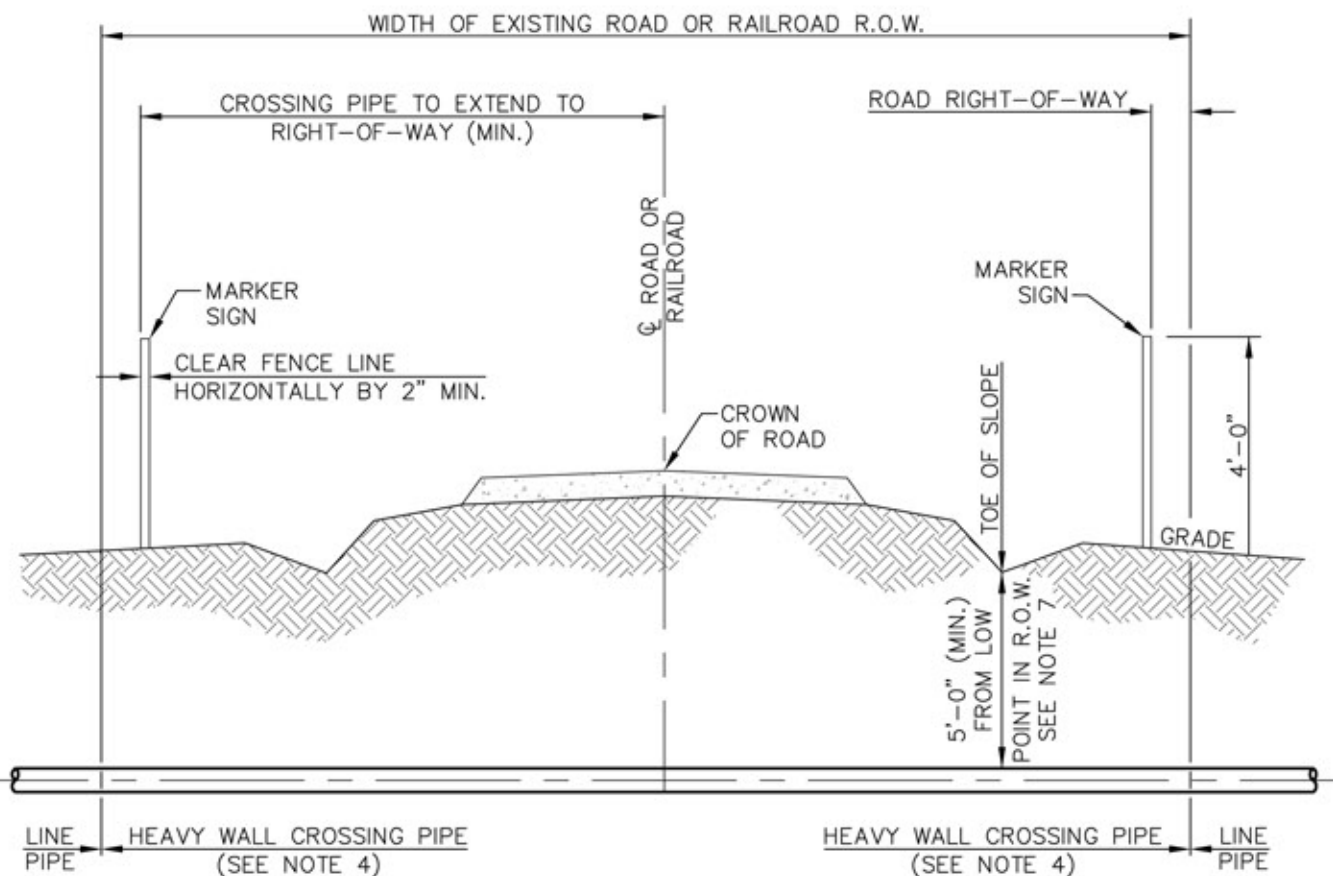
TITLE

DETAIL – 18A
 TYPICAL RAILCAR BRIDGE CROSSING
 CONSTRUCTION PROCEDURES

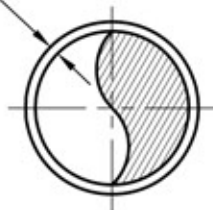
SCALE N.T.S.

DWG # 1399-03-ML-00-068

REV A



BORE ANNULUS TO BE
NO LARGER THAN 1"
GREATER THAN COATED
LINE PIPE



NOTES:

1. CROSSINGS SHALL BE IN ACCORDANCE WITH APPLICABLE PERMIT.
2. ROAD CROSSING PIPE SHALL EXTEND AT MINIMUM TO RIGHT-OF-WAY LINE UNLESS OTHERWISE SPECIFIED.
3. THE TYPE AND MINIMUM REQUIRED LENGTH OF PIPE FOR CROSSINGS OF ROADS SHALL BE AS SPECIFIED ON ALIGNMENT SHEETS.
4. PIPE FOR BORED CROSSINGS TO INCLUDE ABRASION-RESISTANT (ARB) COATING.
5. PIPELINE MARKER AND TEST STATIONS TO BE INSTALLED ON RIGHT-OF-WAY LINE NEXT TO FENCE IF POSSIBLE.
6. THE CROSSING PIPE SHALL BE STRAIGHT WITH NO VERTICAL OR HORIZONTAL BENDS WITHIN ROAD RIGHT-OF-WAY.
7. MINIMUM PIPELINE COVER IN DRAINAGE DITCHES AT PUBLIC ROADS IS 60 INCHES; 36 INCHES IN CONSOLIDATED ROCK.

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exp Energy Services Inc.
t: +1.850.385.5441 | f: +1.850.385.5523
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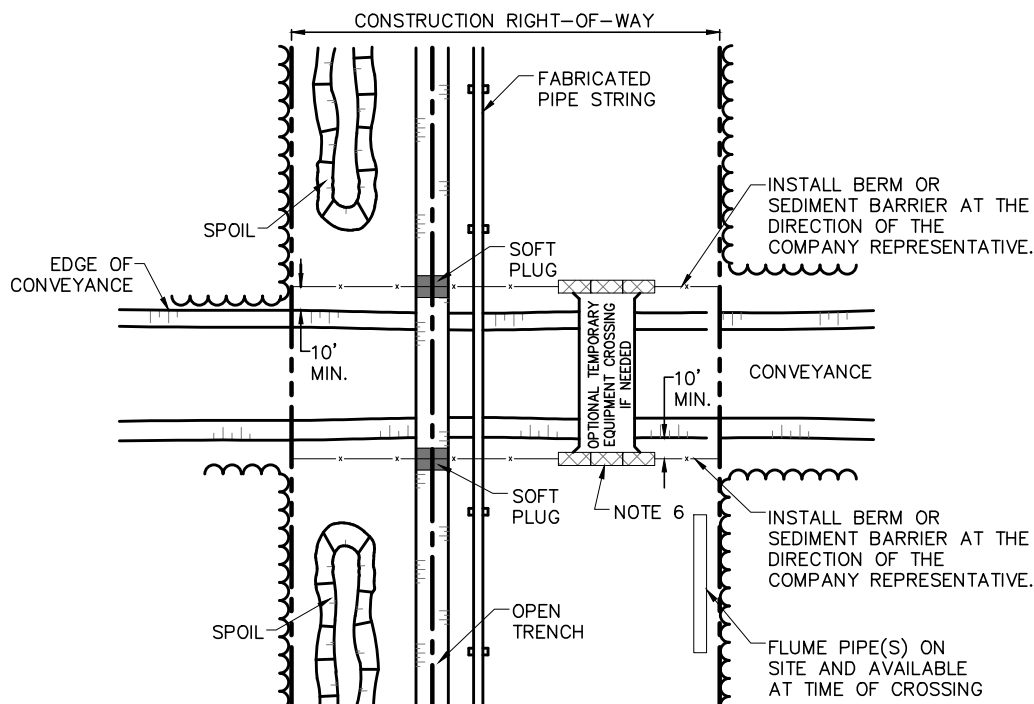
KEYSTONE XL PROJECT

FIA # 4359	CHAINAGE:	DISCIPLINE # 03
TITLE DETAIL 21 TYPICAL UNCASD ROAD/RAILROAD CROSSING BORE DETAIL		
SCALE N.T.S.	DWG No 4359-03-ML-03-717	REV 02



1. CROSSING SHALL BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE PERMIT.
2. CASING PIPE SHALL EXTEND AT MINIMUM TO 2 FEET PAST THE RIGHT-OF-WAY LINE UNLESS OTHERWISE SPECIFIED.
3. THE TYPE AND MINIMUM REQUIRED LENGTH OF PIPE FOR CROSSING SHALL BE AS SPECIFIED ON ALIGNMENT SHEETS.
4. PIPE FOR CASSED CROSSINGS TO INCLUDE ABRASION RESISTANT (ARO) COATING.
5. PIPELINE MARKERS, VENTS, AND TEST STATIONS TO BE INSTALLED ON RIGHT-OF-WAY LINE NEXT TO FENCE OR CROPLINE IF POSSIBLE.
6. THE CROSSING PIPE SHALL BE STRAIGHT WITH NO VERTICAL OR HORIZONTAL BENDS WITHIN RIGHT-OF-WAY.
7. ANY DISTURBED AREA SHALL BE RESTORED TO PRECROSSING OR BETTER CONDITION.
8. DEPTH OF COVER IS TO BE MEASURED FROM NATURAL GROUND TO THE TOP OF THE CASING.
9. PIPE CASING SHALL BE INSTALLED PER DETAIL 75 - TYPICAL CASING DETAIL.

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	EXP NAME	2020-08-06 DATE	FACILITY # 1399	ENG STN:	DISC # 00
 EXP Energy Services Inc. C-1713-638-9000 IT - 1713-663-9005 1800 West Loop South, Suite 850 Houston, TX 77027 USA www.exp.com	CHECKED BY:	DESIGN CHECKER:	TITLE DETAIL - 158 TYPICAL CASSED CROSSING		
	ADH	OTB	SCALE N.T.S.	DWG # 1399-03-ML-00-072	REV A



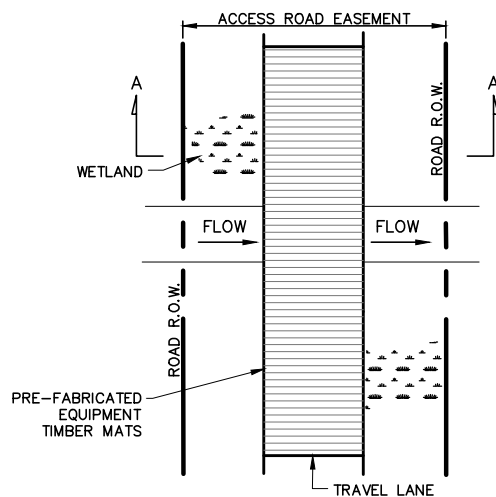
PLAN VIEW

NOTES:

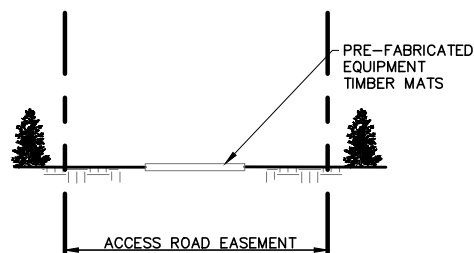
1. THIS METHOD APPLIES TO CONVEYANCES SUCH AS DRY WASHES, SWALES, INCISED DRAINAGES, AND DITCHES. CLEARING AND GRADING, TOPSOIL SALVAGE, AND TOPSOIL STRIPPING DEPTHS SHALL BE THE SAME AS INDICATED FOR ADJACENT UPLAND UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE.
2. INSTALL SILT FENCE OR A BERM AT DIRECTION OF COMPANY REPRESENTATIVE TO PREVENT RUNOFF FROM RIGHT-OF-WAY TO ADJACENT, UNDISTURBED CONVEYANCE.
3. STOCKPILE TOPSOIL AND SPOIL SEPARATELY. TOPSOIL SHALL NORMALLY BE PLACED 15 FEET FROM THE TOP OF SLOPE OR TO SUIT SITE CONDITIONS AS TO PROTECT THE CONVEYANCE AS DETERMINED BY COMPANY REPRESENTATIVE.
4. INSTALL TEMPORARY SLOPE BREAKERS, WHERE IDENTIFIED, BY THE COMPANY REPRESENTATIVE.
5. TRENCH, STRING PIPE, AND BACKFILL USING STANDARD CONSTRUCTION PROCEDURES UNLESS OTHERWISE DIRECTED BY COMPANY REPRESENTATIVE.
6. IN MONTANA, THE OPEN CUT (DRY) CROSSING METHOD IS TO BE USED WHEN THERE IS NO WATER PRESENT AT THE TIME OF THE CROSSING. IF THE CONVEYANCE HAS THE POTENTIAL TO FLOW WATER DURING THE CROSSING INSTALLATION PERIOD (E.G., PENDING WEATHER EVENT), THEN A FLUME PIPE(S) WILL BE INSTALLED ACROSS THE TRENCH TO MAINTAIN THE CROSSING IN THE DRY. IF NO WATER IS PRESENT AT THE TIME OF PIPE INSTALLATION INTO THE DITCH, THE FLUME CAN BE TEMPORARILY REMOVED DURING LOWERING-IN. THE FLUME MUST BE REINSTALLED AND REMAIN IN PLACE UNTIL THE CROSSING IS BACKFILLED AND THE CHANNEL RESTORED. IF WATER IS PRESENT, THE FLUME PIPE(S) WILL REMAIN IN PLACE UNTIL EITHER THE CROSSING IS COMPLETE (BACKFILL AND TEMPORARY SLOPE RESTORATION) OR UNTIL WATER IS NO LONGER PRESENT DURING EXECUTION OF THE INSTALLATION.
7. IN SOUTH DAKOTA AND NEBRASKA, THE OPEN CUT (DRY) CROSSING METHOD IS TO BE USED WHEN THERE IS NO WATER PRESENT AT THE TIME OF THE CROSSING. IF THE CONVEYANCE HAS THE POTENTIAL TO AFLOW HIGH VOLUME OF WATER DURING THE CROSSING INSTALLATION PERIOD (E.G., PENDING WEATHER EVENT), THEN A FLUME PIPE(S) SHOULD BE INSTALLED ACROSS THE TRENCH. THE FLUME SHOULD BE SIZED BASED UPON EXPECTED FLOW VOLUME TO MAINTAIN THE CROSSING IN THE DRY AS DETERMINED AT THE TIME OF INSTALLATION. IF LOW FLOW VOLUME IS EXPECTED, THE CROSSING CAN BE COMPLETED AS AN OPEN CUT (WET) METHOD. SHOULD A FLUME PIPE BE INSTALLED, IT MAY BE TEMPORARILY REMOVED DURING LOWERING-IN AND REPLACED THEREAFTER AND REMAIN IN PLACE UNTIL EITHER THE CROSSING IS COMPLETE (BACKFILL AND TEMPORARY SLOPE RESTORATION) OR UNTIL WATER IS NO LONGER PRESENT DURING EXECUTION OF THE INSTALLATION.
8. RESTORE CONVEYANCE CHANNEL (EXCEPT TRAVEL LANE IF USED) TO APPROXIMATE PRE-CONSTRUCTION PROFILE IMMEDIATELY AFTER PIPE IS LOWERED IN AND BACKFILLED. INSTALL PERMANENT EROSION CONTROLS WHERE DIRECTED BY COMPANY REPRESENTATIVE.
9. REMOVE ANY TEMPORARY CROSSING STRUCTURES AND/OR GRAVEL.

REVISIONS
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	NAME: _____ DATE: 2020-01-28	FACILITY # 1399	ENG STN:	DISC # 00
CHECKED BY: ALS	DESIGN CHECKER: SS	TITLE: DETAIL 161 TYPICAL CONVEYANCE CROSSING METHOD CROSSING DETAIL		
		SCALE: N.T.S.	DWG # 1399-03-ML-00-050	REV: A



PLAN VIEW



SECTION A-A

CONSTRUCTION PROCEDURES:

1. FLAG WATERBODY/WETLAND BOUNDARIES PRIOR TO ACCESS ROAD CONSTRUCTION OR IMPROVEMENT ACTIVITIES.
2. IN MONTANA, WETLANDS/WATERBODY TO BE SURROUNDED WITH SILT FENCE EXCEPT IN THE TRAVEL LANE WHERE A DRIVABLE BERM WILL BE INSTALLED IN PLACE OF SILT FENCE TO PREVENT SEDIMENT FROM ENTERING THE WATERBODY/WETLAND.
3. NO REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND/WATERBODY. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND/WATERBODY BOUNDARY. REFUEL STATIONARY EQUIPMENT PER THE PROJECT'S SPILL PREVENTION PROCEDURES.
4. INSTALL TEMPORARY SLOPE BREAKER UPSLOPE WITHIN 100 FEET OF WETLAND/WATERBODY BOUNDARY IF DIRECTED BY COMPANY REPRESENTATIVE.
5. INSTALL TIMBER MATS THROUGH THE ENTIRE LENGTH OF THE WATERBODY/WETLAND AREA. EQUIPMENT NECESSARY FOR ROAD CONSTRUCTION OR IMPROVEMENT MAY MAKE ONE PASS BEFORE CONSTRUCTION AND IMPROVEMENT ACTIVITIES BEFORE MATS ARE INSTALLED.
6. INSTALL STRAW BALE AND/OR SILT FENCE ALONG THE WATERBODY/WETLAND EDGES AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
7. NO ACTIVITIES ARE TO BE CONDUCTED OTHER THAN THE USE OF THE ACCESS ROAD UNLESS PRIOR APPROVAL IS GRANTED BY THE ENVIRONMENTAL INSPECTOR.
8. REMOVE TIMBER MATS UPON PROJECT COMPLETION AND USE OF THE ROAD.
9. RESTORE ANY DISTURBED SURFACE OR THE WATERBODY/WETLAND AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
10. DURING WINTER CONDITIONS, IMPROVE SOIL STABILITY IN WATERBODIES/WETLANDS BY CUTTING AND REMOVING VEGETATION AND BY DRIVING FROST INTO SOILS BY PASSING EQUIPMENT ACROSS THE WATERBODY/WETLAND.
11. SILT FENCE MAY BE INSTALLED ACROSS ROAD EASEMENT AT THE APPROACHES TO WATERBODIES/WETLANDS PRIOR TO THE SPRING RUN-OFF.



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GENERAL INFORMATION - KEYSTONE SYSTEM

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TITLE

DETAIL - 184

TYPICAL CONSTRUCTION ACCESS ROAD THROUGH
WETLANDS/WATERBODIES, TIMBER MATTING PROTECTION

SCALE N.T.S.

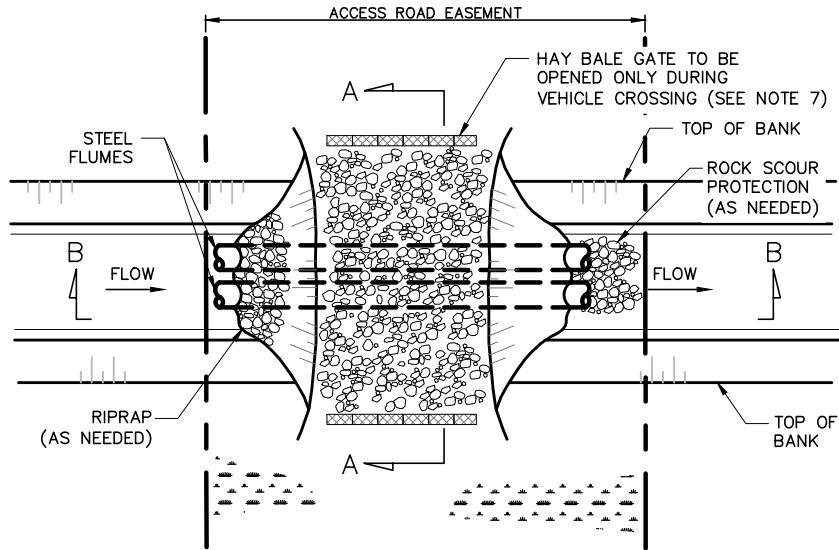
DWG # 1399-03-ML-00-069

REV A

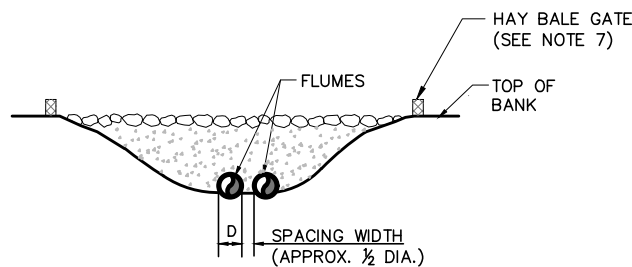
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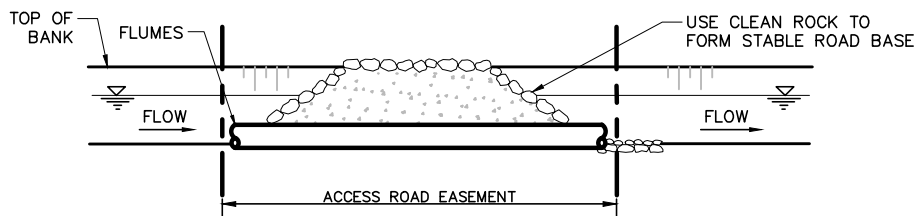
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PLAN VIEW



SECTION A-A



SECTION B-B



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GENERAL INFORMATION - KEYSTONE SYSTEM

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DETAIL - 185

TYPICAL CONSTRUCTION ACCESS ROAD THROUGH WETLANDS/
WATERBODIES, PERMANENT/TEMPORARY FLUME CROSSING

SCALE N.T.S.

DWG # 1399-03-ML-00-070

REV A

CONSTRUCTION PROCEDURES:

THE FOLLOWING IS A SEQUENCE OF CONSTRUCTION PROCEDURES AND MEASURES TO BE FOLLOWED AT ALL TEMPORARY FLUME EQUIPMENT CROSSINGS. FOR THE PERMANENT FLUME EQUIPMENT CROSSINGS, MORE MEASURES WILL BE APPLIED TO ENSURE PROPER DEPTH OF EXCAVATION IN REGARDS TO THE REQUIRED SUBGRADE DEPTH, VEGETATION AND ORGANIC MATERIAL STRIPPING DEPTH, ROAD BASE AGGREGATE COMPACTION RATE, AGGREGATE SIZING, ROAD SIDE SLOPES, AND FLUME SIZING.

1. A PORTABLE FLEXI-FLOAT OR TEMPORARY BRIDGE MAY BE SUBSTITUTED FOR THE TEMPORARY FLUME CROSSING.
2. THE LENGTH OF THE FLUME SHALL BE SUFFICIENT TO SPAN THE ENTIRE AREA REQUIRED FOR VEHICULAR ACCESS, EXTENDING 4 FEET BEYOND TOE OF FILL MATERIAL. A LONGER PIPE IS TO BE USED, IF NEEDED, TO MAINTAIN STABLE SIDE SLOPES. FLUME CAPACITY TO BE BASED ON THE MINIMUM 2-YEAR DESIGN FLOW OR MAXIMUM FLOW ANTICIPATED TO OCCUR DURING INSTALLATION, AS SPECIFIED IN CONSTRUCTION DOCUMENTS.
3. WHERE PRACTICAL, BACKFILL AROUND THE PIPES AT THE ROAD WITH CLEAN, COARSE ROCK FILL MATERIAL. IF SCOUR IS POSSIBLE, RIPRAP IS TO BE PLACED ON THE WATERBODY/WETLAND BED DOWNSTREAM OF THE PIPE OUTLET EXTENDING A MINIMUM OF TWO PIPE DIAMETERS. ALTERNATIVELY, TIMBER EQUIPMENT MATS, SAND BAGS OR TIMBER CORDUROY MAY BE USED TO FORM THE TRAVEL SURFACE.
4. TO REDUCE DEBRIS ENTERING THE WATERBODY/WETLAND FROM EQUIPMENT TRACKS, THE APPROACH ROAD LEADING TO THE CULVERT CROSSING MUST BE RAISED AND STABLE SO EQUIPMENT LOADS ARE SUPPORTED A SUFFICIENT DISTANCE BACK FROM THE WATERBODY/WETLAND. IF CUTS ARE NEEDED TO OBTAIN A SATISFACTORY GRADE, THEY ARE TO BE DUG WITH SIDE DITCHES AND STABLE SLOPES. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO LIMIT THE POTENTIAL FOR SEDIMENT TO ENTER THE WATERBODY/WETLAND (E.G., CHECK DAMS, SILT FENCE, RIPRAP, SEED AND MULCH, SEDIMENT TRAPS, DRIVABLE BERMS, ETC.).
5. PERIODICALLY CHECK THE TEMPORARY CROSSING INSTALLATION AND REMOVE ANY BUILDUP OF SEDIMENT OR DEBRIS ON THE BRIDGE. DISPOSE OF THIS MATERIAL AT LEAST 100 FEET FROM THE WATERBODY/WETLAND AND ABOVE THE HIGH-WATER LEVEL.
6. RESTORE WATERBODY/WETLAND BANKS AND BOTTOM.
7. NO HAY BALE GATE WILL BE USED ON PERMANENT ACCESS ROADS.
8. SEE BELOW.

MONTANA:

1. CULVERTS SHALL BE INSTALLED IN ACCORDANCE WITH MDEQ 318 PERMIT CONDITIONS OR EQUIVALENT. CULVERTS SHALL BE SIZED FOR MINIMUM 2-YEAR FLOOD ON TEMPORARY ROADS AND A 100-YEAR FLOOD ON PERMANENT ROADS.

SOUTH DAKOTA:

1. IN WATERBODY/WETLAND CHANNELS, THE CULVERT OPENING WIDTH OF A WATERBODY/WETLAND CROSSING SHALL NOT BE LESS THAN THE MEAN BANK TO BANK WIDTH AS MEASURED FROM THE ORDINARY HIGH WATER MARK (OHWM) IN THE AFFECTED WATERBODY/WETLAND REACH. IN STABLE CHANNELS, THE OHWM IS OFTEN FOUND AT THE POINT WHERE OVER-BANK FLOW BEGINS DURING A FLOOD EVENT. IN INCISED CHANNELS THAT DO NOT FREQUENTLY ACCESS A FLOODPLAIN OR UPPER TERRACE, THE OHWM IS GENERALLY LOCATED WITHIN THE ENTRENCHED CHANNEL. THE OHWM MAY BE IDENTIFIED BY OBSERVING INDICATORS SUCH AS A DISTINCT CHANGE IN SLOPE, A CHANGE IN VEGETATION CHARACTERISTICS, OR A CHANGE IN SEDIMENT CHARACTERISTICS, SEE 33 CFR 328.3(E).
2. IN WATERBODIES/WETLANDS WITH INTERMITTENT OR PERENNIAL FLOW AND A STABLE BED, CULVERT WATERBODY/WETLAND CROSSINGS SHALL BE INSTALLED WITH THE CULVERT INVERT SET BELOW THE NATURAL FLOW LINE OF THE CHANNEL ACCORDING TO THE SPECIFICATIONS BELOW. THE REGIONAL CONDITION DOES NOT APPLY IN INSTANCES WHERE THE LOWERING OF THE CULVERT INVERT WOULD ALLOW A HEADCUT TO MIGRATE UPSTREAM OF THE PROJECT INTO AN UNAFFECTED WATERBODY/WETLAND REACH.
3. THE PERMITTEE SHALL INSTALL CULVERTS SO THAT THE CULVERT INVERT IS SET BELOW THE NATURAL FLOWLINE OF THE WATERBODY/WETLAND ACCORDING TO THE FOLLOWING:
 - a. FOR ALL CULVERT TYPES WITHIN A DRAINAGE AREA THAT IS ≤ 100 ACRES, A CULVERT INVERT DEPRESSION BELOW WATERBODY/WETLAND GRADE LINE IS NOT REQUIRED;
 - b. FOR CULVERT WITH A PIPE DIAMETER < 8 FEET AND WITHIN A DRAINAGE AREA THAT IS 100 TO 640 ACRES, A 0.5 FOOT CULVERT INVERT DEPRESSION BELOW WATERBODY/WETLAND GRADE LINE IS REQUIRED;
 - c. FOR CULVERT WITH A PIPE DIAMETER < 8 FEET AND WITHIN A DRAINAGE AREA THAT IS > 640 ACRES, A 1-FOOT CULVERT INVERT DEPRESSION BELOW WATERBODY/WETLAND GRADE LINE IS REQUIRED;
 - d. FOR CULVERT WITH A PIPE DIAMETER ≥ 8 FEET AND WITHIN A DRAINAGE AREA OF ANY SIZE, A CULVERT INVERT DEPRESSION BELOW WATERBODY/WETLAND GRADE LINE THAT IS 20 PERCENT OF PIPE DIAMETER IS REQUIRED; AND
 - e. FOR A BOX CULVERT WITHIN A DRAINAGE OF ANY SIZE, A 1-FOOT CULVERT INVERT DEPRESSION BELOW WATERBODY/WETLAND GRADE LINE IS REQUIRED.
4. THE WATERBODY/WETLAND FLOW LINE SHALL BE DEFINED AS THE LONGITUDINAL AVERAGE OF THE LOW-FLOW WATERBODY/WETLAND CHANNEL. THE SLOPE OF THE CULVERT SHOULD BE PARALLEL TO THE SLOPE OF THE WATERBODY/WETLAND FLOW LINE. THE CULVERT INVERT DEPRESSION DEPTH SHALL BE MEASURED AT THE CULVERT INLET FOR CULVERTS INSTALLED AT A SLOPE LESS THAN THE SLOPE OF THE WATERBODY/WETLAND GRADE LINE. RIPRAP INLET AND OUTLET PROTECTION SHALL BE PLACED TO MATCH THE HEIGHT OF THE CULVERT INVERT.

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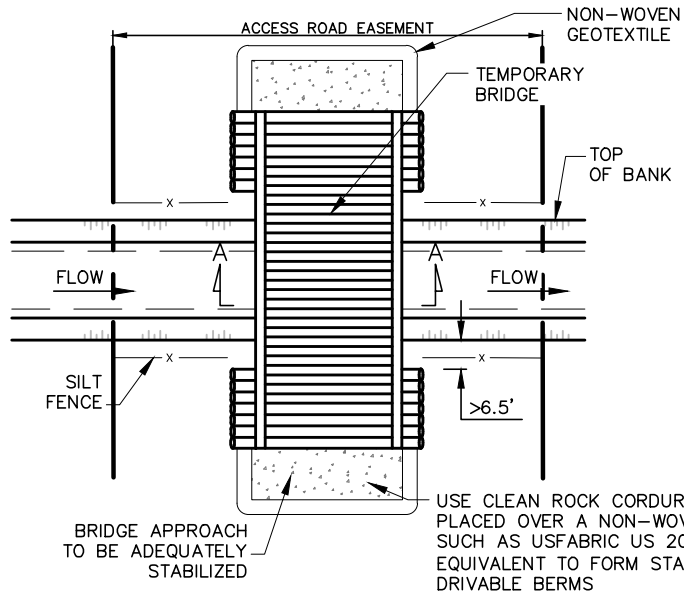
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TYPICAL CONSTRUCTION ACCESS ROAD THROUGH WETLANDS/WATERBODIES,
PERMANENT/TEMPORARY FLUME CROSSING-CONSTRUCTION PROCEDURES

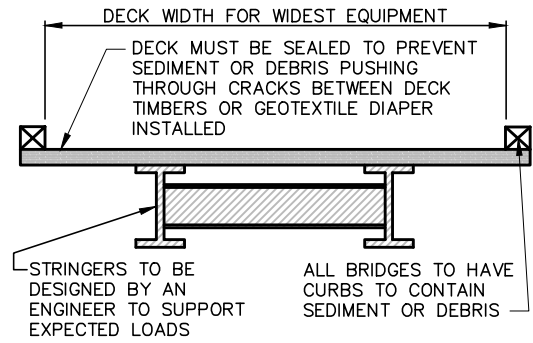
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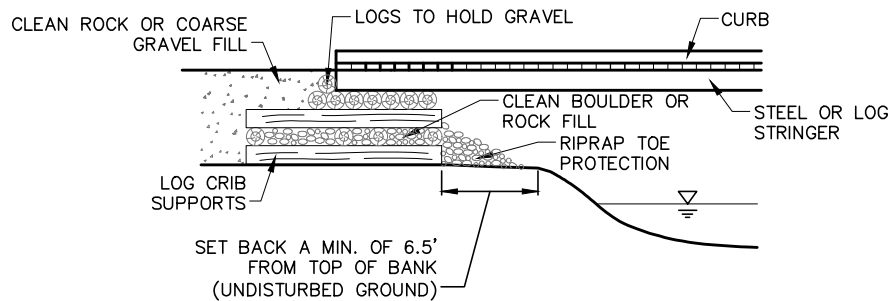
REV A



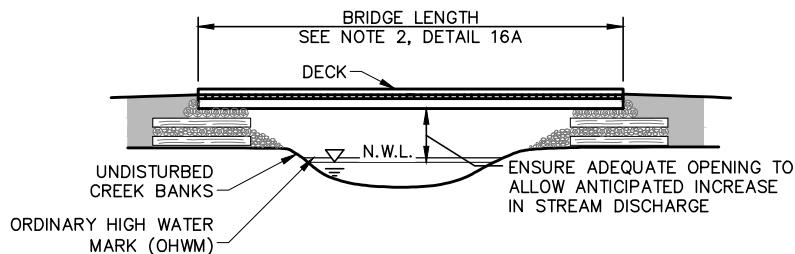
PLAN VIEW



SECTION A-A
TYPICAL TEMPORARY BRIDGE
CROSSING



TYPICAL TEMPORARY CRIB
ABUTMENT



BRIDGE PROFILE

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DETAIL - 186
TYPICAL TEMPORARY BRIDGE/MAT CROSSING

SCALE N.T.S.

DWG # 1399-03-ML-00-063

REV A

CONSTRUCTION PROCEDURES:

IN GENERAL TERMS, THE FOLLOWING IS A SEQUENCE OF CONSTRUCTION PROCEDURES THAT ARE RECOMMENDED TO BE FOLLOWED FOR TEMPORARY BRIDGE CROSSINGS:

1. DETERMINE BRIDGE LENGTH REQUIRED AND FOLLOW EITHER METHOD A) OR B) FOR DETERMINING THE OPENING SIZE. IF A) IS FOLLOWED, A MINIMUM 6.5 FOOT SETBACK FROM TOP OF BANK MUST BE PRESERVED AS A "NO DISTURBANCE AREA". IF ABUTMENTS OR PIERS IN THE WATERBODY/WETLAND BED ARE REQUIRED, METHOD B) IS TO BE FOLLOWED.
2. INSTALL THE BRIDGE IN A MANNER THAT WILL MINIMIZE SEDIMENT ENTERING THE WATERBODY/WETLAND. STRINGERS MUST BE DESIGNED TO SUPPORT THE LOADS EXPECTED ON THE BRIDGE. CURBS MUST BE INSTALLED ALONG THE EDGE OF THE DECK TO CONTAIN SEDIMENT AND DEBRIS ON THE BRIDGE. FASTENERS CONNECTING COMPONENTS MUST BE STRONG ENOUGH TO HOLD THEM IN POSITION DURING THE LIFE OF THE BRIDGE. CRIBS ARE TO BE FILLED WITH ROCK OR COBBLE. RIPRAP EROSION PROTECTION IS TO BE PLACED AROUND THE CRIBS AND ON ANY FILL SLOPES PROJECTING INTO THE WATERBODY/WETLAND.
3. ROAD APPROACHES (DRIVABLE BERMS) LEADING TO THE BRIDGE MUST BE RAISED AND STABLE SO EQUIPMENT LOADS ARE SUPPORTED A SUFFICIENT DISTANCE BACK FROM THE WATERBODY/WETLAND TO REDUCE SEDIMENT AND DEBRIS ENTERING THE WATERBODY/WETLAND FROM EQUIPMENT TRACKS. THIS MAY REQUIRE USING MATERIALS SUCH AS GRAVEL, ROCK, OR CORDUROY. ANY GRAVEL OR ROCK USED MUST BE CLEAN. DO NOT USE SOIL TO CONSTRUCT OR STABILIZE EQUIPMENT BRIDGES. IF CUTS ARE NEEDED TO OBTAIN A SATISFACTORY GRADE, THEY ARE TO BE DUG WITH SIDE DITCHES AND STABLE SLOPES. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO KEEP SEDIMENT ON LAND (E.G., SILT FENCING, FILTER CLOTH, RIPRAP, SEED AND MULCH, ETC.).
4. MAINTAIN A SILT FENCE ON EACH SIDE OF THE WATERBODY/WETLAND EXTENDING A MINIMUM OF 10 FEET BEYOND THE WIDTH OF DISTURBANCE UNTIL VEGETATION HAS BEEN ESTABLISHED IN UPSLOPE AREAS.
5. REMOVE TEMPORARY CROSSINGS AS SOON AS POSSIBLE AFTER FINAL CLEANUP. MATERIALS PLACED ALONG THE WATERBODY/WETLAND SHOULD BE COMPLETELY REMOVED DURING FINAL CLEANUP. REMOVAL SHOULD NOT OCCUR OUTSIDE THE CONSTRUCTION WINDOWS. COORDINATE WITH COMPANY REPRESENTATIVE FOR APPROVED GRAVEL DISPOSAL METHODS. BRIDGE MATERIALS ARE TO BE REMOVED FROM THE CROSSING AREA. THE WATERBODY/WETLAND BED AND BANKS ARE TO BE RESTORED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH THE EXPECTED FLOW CONDITIONS.
6. DURING WINTER CONDITIONS, A GEOTEXTILE FABRIC WILL BE PLACED UPON THE SURFACE AND/OR SNOW PRIOR TO THE INSTALLATION OF THE BRIDGE SUCH THAT GRAVEL OR DIRT FROM EQUIPMENT USED IN THE CONSTRUCTION OF THE BRIDGE OR EQUIPMENT CROSSING THE BRIDGE CAN BE COLLECTED AND REMOVED WHEN THE BRIDGE IS DISMANTLED.
7. INSTALLATION AND REMOVAL OF BRIDGES SHALL ACCOUNT FOR HIGH WATER LEVELS DURING THE SPRING MELT. WHEN FROZEN CONDITIONS ARE PRESENT, THE CONTRACTOR WILL EITHER REMOVE THE BRIDGE PRIOR TO THE ONSET OF FROZEN CONDITIONS, OR PLAN TO INSTALL THE BRIDGE TO A HEIGHT THAT WILL NOT IMPEDE SPRING RUN-OFF.
8. BRIDGE SHALL BE STABILIZED BY CABLES AND DEADMAN ANCHORS. DEADMAN ANCHORS SHALL BE INSTALLED ABOVE ORDINARY HIGH WATER MARK (OHWM) LEVEL.

	DESIGNER:		GENERAL INFORMATION – KEYSTONE SYSTEM		
	EXP NAME	2020-07-23 DATE	FACILITY #	ENG STN:	DISC #
	CHECKED BY:		TITLE		
ADH	OTB	DETAIL – 186A TYPICAL TEMPORARY BRIDGE/MAT CROSSING CONSTRUCTION PROCEDURES			REV A
		SCALE N.T.S.	DWG # 1399-03-ML-00-064		