Docket #0001 Date Filed: 5/27/2020

IN THE UNITED STATES BANKRUPTCY COURT
FOR THE DISTRICT OF DELAWARE

In re:	Chapter 11
WELDED CONSTRUCTION, L.P., *et al.*,[1] Debtors and Debtors In Possession.	Case No. 18-12378 (CSS)
	(Jointly Administered)
WELDED CONSTRUCTION, L.P., Plaintiff, vs. EARTH PIPELINE SERVICES, INC., Defendant.	Adv. Pro. No. 20-____ (CSS)

COMPLAINT AND OBJECTION TO PROOF OF
CLAIM NUMBER 592 FILED BY EARTH PIPELINE SERVICES, INC.

The above-captioned plaintiff ("Welded"), by its undersigned attorneys, for its Complaint against the above-captioned defendant ("Earth"), and for its Objection to proof of claim number 592 ("Claim No. 592"), attached hereto as **Exhibit D**, filed by Earth, hereby alleges as follows:

[1] The Debtors in these chapter 11 cases, along with the last four digits of each Debtor's federal tax identification number, are: Welded Construction, L.P. (5008) and Welded Construction Michigan, LLC (9830). The mailing address for each of the Debtors is P.O. Box 470, Perrysburg, OH 43552-0470.

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SUMMARY OF ACTION

The Mountaineer Express Pipeline Project ("MXP") located in West Virginia is a pipeline project owned by TC Energy Corporation (f/k/a TransCanada Corporation) ("TransCanada"), a successor to NiSource Corporate Services Company/Columbia Pipeline Group and Columbia Gas Transmission, LLC ("Columbia Gas") and is designed to transport domestically produced natural gas liquids across the state of West Virginia. Pursuant to an agreement with Columbia Gas, Welded oversaw the construction of MXP as the general contractor. According to two (2) subcontracts between Welded and Earth, Subcontract No. 2018-01-01.1 (the "Hand Felling Subcontract") and Subcontract No. 2018-01-01.2 (the "Mechanical Clearing Subcontract", and together with the "Hand Felling Subcontract", the "Subcontracts"),[2] Earth contracted to provide hand felling and mechanical clearing services on MXP within an agreed-to Project Schedule.

During the course of its performance, Earth committed multiple breaches of the Subcontracts, including continuously failing to meet the deadlines established by the Project Schedule and committing numerous safety violations. As these failures mounted, TransCanada and Welded concluded that Earth's consistent non-compliance with the Subcontracts was unacceptable and could not be permitted to continue. Earth's hand felling and mechanical clearing work had to be completed before the next phase of work on MXP could be commenced. Earth's failure to perform under the Subcontracts impeded the progress of follow on subcontractors and threatened to jeopardize the entire MXP timeline. Earth's inability to timely and safely perform its obligations created liability exposure for Welded, as well as TransCanada. In order to ameliorate those concerns, Welded, at TransCanada's direction, terminated Earth for "cause" in

[2] A copy of the Hand Felling Subcontract is attached hereto as **Exhibit A**, and a copy of the Mechanical Clearing Subcontract is attached hereto as **Exhibit B**. Each of the exhibits listed in the Mechanical Clearing Subcontract refer to and incorporate by reference each of the exhibits listed in the Hand Felling Subcontract.

accordance with the terms of the Subcontracts. As a result of Earth's breaches of the Subcontracts, Welded was forced to allocate equipment and personnel, and hire additional subcontractors, to perform the services Earth was contracted to perform, and the clearing of MXP was completed months behind schedule.

Welded brings this action against Earth to: (i) recover damages resulting from Earth's material breach of the Subcontracts, and (ii) avoid and recover $1,811,129.30 in transfers made to Earth in the ninety (90) day period prior to the commencement of Welded's bankruptcy proceedings (the "Preference Period") pursuant to sections 547 and 550 of chapter 11 of title 11 of the United States Code (the "Bankruptcy Code"). In addition, Welded hereby objects to Claim No. 592 filed by Earth, pursuant to section 502(b) of the Bankruptcy Code and Rule 3007 of the Federal Rules of Bankruptcy Procedure (the "Bankruptcy Rules").

JURISDICTION AND VENUE

1. On October 22, 2018 (the "Petition Date"), Welded filed for relief under chapter 11 of the Bankruptcy Code (collectively, the "Chapter 11 Cases") in the United States Bankruptcy Court for the District of Delaware (the "Court"). Welded is continuing to operate its businesses and manage its properties as debtors in possession pursuant to sections 1107(a) and 1108 of the Bankruptcy Code.

2. The Court has jurisdiction over this adversary proceeding pursuant to 28 U.S.C. § 1334(b) and the *Amended Standing Order of Reference* from the United States District Court for the District of Delaware, dated as of February 29, 2012.

3. Venue is proper in this District pursuant to 28 U.S.C. § 1409 because this adversary proceeding arises in cases commenced under title 11 of chapter 11 of the Bankruptcy Code.

4. This action is a core proceeding pursuant to 28 U.S.C. § 157(b)(2)(A), (B), (C), and (O). Accordingly, the Court may enter a final order or judgment consistent with Article III of the

United States Constitution. Welded consents to the entry of final orders or judgment by the Court if it is determined that the Court, absent consent of the parties, cannot enter final orders or judgment consistent with Article III of the United States Constitution.

5. The statutory predicates for the relief sought herein are sections 502(b), 547 and 550 of the Bankruptcy Code, and Bankruptcy Rules 3007 and 7001.

PARTIES

6. Welded is a Delaware limited partnership.

7. At all relevant times, Welded's headquarters was located at 26933 Eckel Road, Perrysburg, OH 43551.

8. On information and belief, Earth is a Wyoming Corporation with its principle place of business located at 2949 S. Bridge Rd., Washington, Washington County, Pennsylvania 15301. Earth has filed Claim No. 592 in the Chapter 11 Cases and is subject to personal jurisdiction before this Court; Welded believes that Earth can be served with process by and through the attorney who filed Claim No. 592, Mark A. Lindsay, Esq., Bernstein-Burkley, P.C., 707 Grant Street, Pittsburgh, Pennsylvania 15219.

FACTUAL BACKGROUND

I. The Subcontracts

9. Following weeks of negotiations, the Hand Felling Subcontract was executed on March 8, 2018, and the Mechanical Clearing Subcontract was executed on March 20, 2018. Certain relevant provisions of the Subcontracts are as follows:[3]

a. The parties agreed that Earth would complete its work in accordance with the Project Schedule, which set a completion date of June 1, 2018 with

[3] All capitalized terms used but not otherwise defined herein shall have the meanings ascribed to such terms in the Subcontract.

respect to hand felling and mechanical clearing work.[4] Under the Subcontracts' "Time is of the Essence" provisions, Earth committed "to prosecute the Work with all due diligence and to complete the Work within the time stated in the Contract Documents or the [Project] Schedule, whichever is sooner."[5] In recognition of the import of the Project Schedule, the Subcontracts each contained a provision regarding "Delays caused by [Earth]," which provided for certain reporting responsibilities and remedy rights to ensure that the work progressed as required.[6]

b. Each Subcontract included a "Termination" provisions stating that Welded may, in its sole discretion, immediately terminate the Subcontracts for cause by giving written notice to Earth, if Earth, among other things, (a) fails to comply with any requirement of the Subcontracts, (b) breaches its obligations under the Subcontracts, or (c) repeatedly violates any obligation or in the reasonable opinion of Welded fails to meet a material requirement of the Subcontracts.[7]

c. Each Subcontract included express requirements for change requests that applied to Welded and Earth. These requirements included specified change forms, which were attached as exhibits to each Subcontract.

d. Each Subcontract included a "Warranty" provision whereby Earth represented, among other things, that it had the requisite competence, skill, physical resources, and number of trained, skilled, and licensed personnel required to perform the work.[8]

10. At the request of TransCanada, Welded was required to follow, and to ensure that all subcontractors used by Welded on the MXP follow, the Steep Slope Work Specification. As provided in the Steep Slope Work Specification:

> The purpose of the Steep Slope Work Specification is to ensure that the Scope of Work for any project owned, operated or under the direction of TransCanada PipeLines Limited (the Company) as well as all partially owned entities and/or joint ventures where the Company has or might have operational control in Canada, the United States and Mexico adheres to the following requirements:

[4] Upon information and belief, the parties subsequently agreed to the following completion dates: May 11, 2018 for hand felling work, and June 23, 2018 for mechanical clearing work.

[5] *See, e.g.*, Exhibit A, at Exhibit G General Terms and Conditions p. 1.

[6] *See, e.g.*, Exhibit A, at Exhibit G General Terms and Conditions p. 4.

[7] *See, e.g.*, Exhibit A, at Exhibit G General Terms and Conditions p. 2.

[8] *See, e.g.*, Exhibit A, at Exhibit G General Terms and Conditions p. 10.

1. Steep slopes are identified, assessed, maintained and managed according to a systematic documented and demonstrated methodology;

2. The planning, assessment, maintenance and management of steep slopes are conducted by qualified, trained, and competent crews; and

3. The planning, assessment, maintenance and management of steep slopes meet the Company, Contractor and applicable regulatory requirements.

11. Prior to the execution of the Subcontracts, on March 1, 2018, Julie A. Conn, Welded's field contract attorney for the MXP, emailed the Steep Slope Work Specification to Earth representatives indicating that "Earth Pipeline will need to comply with the attached Steep Slope Work Specification from TransCanada." The following day, Joshua D. Roberts ("Roberts"), Earth's CEO, responded stating that Earth would "review and let [Conn] know if [Earth] ha[d] any concerns." Thereafter, at no time prior to execution of the Subcontracts did Earth object to the Steep Slope Work Specification or indicate that compliance with the Steep Slope Work Specification would necessitate any deviation from the pricing schedule set forth in the Earth proposal (the "Pricing Schedule"), which the parties agreed upon and integrated into the Subcontracts as Exhibit F.

II. Earth's Failures to Comply with the Project Schedule

12. From the outset of its work on the MXP, Earth failed to comply with the Project Schedule. As a result, Welded was forced to regularly advise Earth that its non-compliance was unacceptable and corrective measures were required.[9]

13. Earth began its work on the MXP on March 10, 2018, with respect to hand felling, and April 7, 2018, with respect to mechanical clearing.

[9] The correspondence noted in this section represents only a sample of the notifications that were provided to Earth regarding its breaches of the Subcontract.

14. On April 16, 2018, Mett Carrol ("Carrol"), the Welded Senior Project Manager on MXP, sent the first of many correspondence to Roberts, notifying him that, among other things, mechanical clearing was not proceeding quickly enough and Earth's progress would ultimately delay the construction of the MXP. Carrol's letter recommended the equipment that Earth should add to meet the Project Schedule.

15. On April 24, 2018, Carrol again sent correspondence to Roberts notifying him that Earth was behind schedule and needed to immediately comply with the Subcontracts. This correspondence directed Roberts to the Subcontracts' "Project Schedule" and "Time is of the Essence" provisions, and reminded Roberts that Earth would be liable to Welded for any delay or additional cost incurred by Welded.

16. On April 28, 2018, after it became clear that Earth could not comply with the Project Schedule, Welded issued its first contractor change directive (the "First Change Directive") to Earth in accordance with the terms of the Subcontracts. Specifically, Welded informed Earth that it was de-scoping Earth's responsibilities on the MXP as follows:

> As noted in my email to you dated April 13, 2018, my April 16, 2018 letter to you (2018-01-01-LTR-001) and my April 24, 2018 letter to you (2018-01-01-LTR-002), Earth is behind schedule for mechanical clearing Work. Welded now understands that, due to Line Strikes on Spreads 1 and 2, Earth's clearing operations have been shut down by Columbia Gas Transmission/TransCanada (CGT/TC) pending satisfactory corrective action by Earth. Welded's concern over anticipated schedule impact to mainline production crews has risen to the level that Welded now expects significant delays to mainline production crews, placing its contractual obligations to CGT/TC at risk. Accordingly, Welded is decreasing the scope of mechanical clearing Work to be performed by Earth under the Agreement. A Contractor Change Directive, attached hereto and hereby incorporated herein, reflects the scope change in more detail. Please send written acknowledgement of Change Directive 001, review it, sign it and return it to me as soon as possible I am available to discuss details at your earliest convenience.

> Earth must maintain all resources currently working on Spread 1, but may add additional resources. Earth must continue its efforts to get back on track and to maintain the schedule agreed upon by Welded and Earth.

17. Earth's progress failed to improve after the First Change Directive. As a result, on May 2, 2018, Carrol again sent correspondence to Roberts notifying Earth that it remained behind schedule, and at that point, three (3) to eight (8) pieces of Earth's equipment had been out of service for multiple days, further exacerbating an already untenable situation.

18. On May 4, 2018, Welded notified Earth of its continued failure to comply with the Project Schedule in correspondence from Carrol to Roberts, along with a second contractor change directive further de-scoping Earth's responsibilities (the "Second Change Directive"). Specifically, with this correspondence, Carrol included an analysis that reflected, among other things, Earth was eighty-three (83) forecasted days behind schedule on Section 1 of the MXP, eighteen (18) days behind schedule on Section 2 of the MXP, and twenty-one (21) days behind schedule on Section 3 of the MXP. Regarding the Second Change Directive, Carrol notified Roberts that based upon the schedule analysis of actual progress to date and in a continuing effort to avoid additional delays to mainline crews, Earth's work for Section 1 of Spread 1 of the MXP, as it pertains to mechanical clearing, under the Mechanical Clearing Subcontract was being reduced.

19. On May 8, 2018, as Earth continued to fall further behind schedule, Carrol sent further correspondence to Roberts with yet another change directive de-scoping Earth's work (the "Third Change Directive", and together, with the First and Second Change Directives, the "Change Directives"). Akin to the prior letters, Carrol informed Roberts that, "based upon the schedule analysis of actual progress to date and in a continuing effort to avoid additional delays to mainline

crews, Welded hereby notifies Earth of a reduction to the Work for Section 1 of Spread 1 of the Mountaineer Xpress Project, as it pertains to mechanical clearing under [the Mechanical Clearing Subcontract]."

20. The Change Directives decreased the amount of the Subcontracts by $2,808,104. In addition, Welded incurred costs and expenses of approximately $460,000 for the personnel and equipment Welded was required to supply to assist Earth with the mechanical clearing work provided for in the Subcontracts, to maintain the Project Schedule, and to avoid further delays to Welded crews.

III. Earth's Safety Violations While Working on the MXP

21. In addition to Earth's failure to comply with the Project Schedule, Earth's performance was marked by numerous safety violations and related incidents that made it clear that Earth personnel lacked the necessary qualifications or training to work on MXP and were failing to properly comply with the Steep Slope Work Specification. These violations and incidents included:

a. On April 27, 2018, an Earth excavator operator caused an excavator to knock down a power line while attempting to fell a tree. The excavator operator was terminated by Earth following this incident.

b. On May 5, 2018, an Earth lowboy operator unloaded a piece of broken equipment on the right-of-way that was leaking hydraulic oil. Welded employees were required to take immediate remedial action to temporarily prevent further environmental contamination while the equipment sat on the right-of-way until an Earth mechanic could repair the equipment. Although an Earth mechanic arrived to repair the faulty equipment the following day, he did so without notifying anyone from Welded, and he performed the repair improperly such that additional hydraulic oil further contaminated the area.

c. On May 8, 2018, an Earth employee spilled several gallons of diesel fuel while refueling his machine.

d. On May 12, 2018, an Earth bulldozer operator crashed a bulldozer into a parked vehicle. In violation of certain operating guidelines, the bulldozer

operator did not have a spotter even though he was tracking the bulldozer through a congested area. The bulldozer operator was terminated by Earth following this incident.

e. On May 21, 2018, an Earth excavator operator was clearing brush when a vine became lodged in the excavator's cab, which shattered the glass of the excavator's cab.

f. On June 13, 2018, an Earth excavator operator capsized an excavator after ignoring right-of-way conditions. As a result of this incident, Earth crews were directed to stand down pending further notice from Welded.

g. On June 22, 2018, an Earth lowboy operator collided with a minivan, causing damage to the minivan.

22. These repeated safety violations, when combined with Earth's inability to comply with the Project Schedule, left TransCanada and Welded with no choice but to terminate Earth for cause.

IV. Welded Terminated Earth for "Cause"

23. On June 22, 2018, following a directive from TransCanada that Welded remove Earth from the MXP for safety concerns, Carrol provided verbal notice to Roberts that Welded was terminating the Subcontracts for "cause."

24. The same day, Welded sent correspondence reiterating that Earth was terminated for "cause" (the "Termination Letter"). In the Termination Letter, Welded reserved all of its rights under the Subcontracts, including the right to set off any costs incurred to rectify the issues caused by Earth against amounts payable to Earth.

25. On July 17, 2018, Earth sent correspondence to Welded that confirmed it had demobilized from the project effective as of July 10, 2018.

26. Earth's breaches of the Subcontracts required Welded to enter into contracts with three (3) other subcontractors to finish the work that Earth contracted to perform. The hand felling and mechanical clearing of the MXP was completed on August 17, 2018—over three (3) months

behind schedule. The cost of these additional subcontractors totaled approximately $485,000, and Welded estimates that it incurred an additional $2,800,000 in damages due to the delay in completing the project.

V. The Steep Slope Change Order and Invoice

27. On April 26, 2018, Earth submitted to Welded a change order related to the Steep Slope Work Specification, eight (8) weeks after the Steep Slope Work Specification was provided to Earth (the "Steep Slope Change Order") in the amount of $6,505,744.00. On April 28, 2018, Welded sent correspondence to Earth that, among other things, informed Earth that the Steep Slope Change Order could not be evaluated as submitted because Earth had failed to comply with the requirements for change orders specified in the Subcontracts. Further, Welded provided detailed instructions to Earth regarding what information was necessary to evaluate the Steep Slope Change Order.

28. Following numerous inquiries from Welded employees, and over three (3) months after the Steep Slope Change Order was rejected, Earth resubmitted the Steep Slope Change Order in the reduced amount of $2,469,172.75. On September 4, 2018, only six (6) days prior to filing a lien against the MXP, Earth submitted invoice WELD-MXP-17 (the "Steep Slope Invoice") to Welded in the amount of $2,250,627 for "Change in Steep Slope Work Spec." Notably, the charges reflected in the Steep Slope Invoice were not included in an initial Notice of Mechanic's Lien that Earth sent to Welded on August 1, 2018.

VI. The Preferential Transfers

29. Historically, Welded utilized a centralized cash management system (the "Cash Management System") to collect and transfer funds from numerous sources and accounts and disburse funds to satisfy obligations arising from daily operations. Welded used the Cash Management System to streamline the collection, transfer, and disbursement of funds generated

by Welded's business operations, and Welded accurately recorded such collections, transfers, and disbursements as they were made. Welded recorded in its books and records any receipts and/or disbursements. The Cash Management System consisted of an integrated network of bank accounts held at, *inter alia*, Huntington National Bank ("Huntington Bank"), (b) JPMorgan Chase Bank, N.A., (c) M&T Bank, and (d) MetaBank, N.A.. Disbursements to creditors were primarily made from the Huntington Bank operating account (the "Disbursement Account").

30. During the Preference Period, Welded continued to operate its business affairs, including the transfer of property, either by checks, cashier checks, wire transfers, ACH transfers, direct deposits or otherwise, to certain entities.

31. Welded and Earth conducted business with one another through and including July 10, 2018 pursuant to the Subcontracts.

32. As provided for in the Subcontracts, Welded purchased goods and/or services from Earth.

33. Welded completed an analysis of all readily available information and is seeking to avoid all of the transfers of an interest of Welded's property made by Welded to Earth within the Preference Period.

34. Welded made transfers of an interest of its property to or for the benefit of Earth during the Preference Period through payments aggregating to an amount not less than $1,811,129.30 (the "Transfers"). The details of each of the Transfers are set forth on the Statement of Account, which is attached hereto and incorporated by reference as **Exhibit C**.

35. During the course of this proceeding, Welded may learn (through discovery or otherwise) of additional transfers made to Earth during the Preference Period. It is Welded's intention to avoid and recover all transfers made by Welded of any interest in its property to or for

the benefit of Earth or any other transferee. Welded reserves its right to amend this Complaint to include: (a) further information regarding the Transfers, (b) additional transfers, or (c) additional defendants (collectively, items (a)-(c) the "Amendments"), which may become known to Welded at any time during this Adversary Proceeding, through formal discovery or otherwise, and for the Amendments to relate back to this original Complaint.

36. Welded acknowledges that some of the Transfers might be subject to defenses under section 547(c) of the Bankruptcy Code, for which Earth bears the burden of proof under section 547(g) of the Bankruptcy Code.

VII. Earth Filed Claim No. 592 in the Chapter 11 Cases

37. Earth filed Claim No. 592, in which Earth contends Welded is indebted to Earth in the aggregate amount of $3,650,300.42 for contractual services provided to Welded on the MXP. Specifically, in the eight (8) invoices attached to Claim No. 592, Earth asserts Welded is obligated to pay Earth for (1) clearing and hand felling work ($85,649.90), (2) clearing and timber-mat installation ($44,550.00), (3) clearing ($28,134.00), (4) stand-by ($597,396.00), (5) retainage ($344,534.03), (6) the Steep Slope Invoice ($2,250,627.00), (7) stand-by for access-road delay ($223,938.12), and (8) timber removal ($69,960.00). Welded does not dispute the invoices submitted for clearing ($28,134.00) and timber removal ($69,960.00), except that such amounts are subject to setoff or other netting requirements. All other invoices are disputed in whole, or in part, as they: (i) relate to work that was neither approved nor completed, (ii) were improperly calculated, or (iii) reflect work that Earth was not entitled to invoice under the Subcontracts.

38. With respect to the Steep Slope Invoice, in light of Earth's repeated safety violations, including the incident in which Earth capsized equipment, it is apparent that Earth never complied with the Steep Slope Work Specification while working on the MXP. And, even if Earth was in compliance, it was aware of the Steep Slope Work Specification prior to the parties' entry

into the Subcontracts and any change in the Pricing Schedule related to the Steep Slope Work Specification should have been negotiated at that time, or, subsequently approved in accordance with the change provisions provided for in the Subcontracts. Indeed, Earth was clearly aware of the Subcontracts' requirements for Change Orders because Welded reiterated those requirements when the Steep Slope Change Order was submitted and rejected, yet Earth failed to resubmit the Steep Slope Change Order for months, and sat silently, only to re-submit the Steep Slope Change Order after it was terminated for cause.

39. A reconciliation of the invoices submitted by Earth against Welded's books and records establishes that Claim No. 592 should be modified to an amount no greater than $652,847.60.

40. Claim No. 592 should be reduced to reflect the amount of work Earth actually performed, and which was approved by Welded, and to account for the actual amounts due to Earth under each Subcontracts. Any failure to modify the Earth claim as indicated above will result in Earth receiving an unwarranted recovery, to the detriment of other creditors in the Chapter 11 Cases.

VIII. The Mechanics Lien Action

41. On or about March 8, 2019, Earth filed two (2) lawsuits against Columbia Gas—one in the Circuit Court of Wetzel County, West Virginia (the "Wetzel County Case") and another in the Circuit Court of Marshall County, West Virginia (the "Marshall County Case" and together with the Wetzel County Case, the "Mechanics Lien Action")—asserting a mechanic's lien claim against the MXP arising from amounts allegedly owed by Welded to Earth for work performed under the Subcontracts. The amounts asserted in Claim No. 592 relate to the same obligations for which Welded seeks to recover against Columbia Gas in the Mechanics Lien Action.

42. On May 14, 2019, following a *Notice of Removal* filed by Columbia, the United States District Court for the Northern District of West Virginia (the "WV District Court") ordered that it would hear the Mechanics Lien Action.

43. On June 26, 2019 following a *Motion to Transfer Venue* filed by Columbia Gas, the WV District Court entered an order transferring the Mechanics Lien Action to the United States District Court for the District of Delaware (the "DE District Court"). On July 15, 2019, the DE District Court entered an order referring the Mechanics Lien Action to the Bankruptcy Court, with the Wetzel County Case pending at Adv. Pro No. 19-50274 (CSS) and the Marshal County Case pending at Adv. Pro No. 19-50275 (CSS).

44. On May 6, 2020, the Bankruptcy Court consolidated the pending adversaries and ordered the Mechanics Lien Action to be administered within Adv. Pro No. 19-50274 (CSS).

CLAIMS

COUNT I
(Breach of Contract)

45. Welded incorporates all preceding paragraphs as if fully re-alleged herein.

46. Welded and Earth entered into the Subcontracts, which are valid and binding contracts.

47. Earth breached the Subcontracts by failing to provide hand felling and mechanical clearing services on MXP in a timely manner in accordance with the Project Schedule.

48. Earth breached the Subcontracts by failing to perform its work with the requisite competence, skill, physical resources, and number of trained, skilled, and licensed personnel required to perform the services as warranted in the Subcontracts.

49. Earth breached the Subcontracts by failing to perform its work in accordance with the various safety and environmental specifications required by the Subcontracts.

50. As a direct and proximate result of Earth's breaches of the Subcontracts: (i) Welded was required to remediate Earth's failure to safely and competently complete the work by (a) allocating equipment and personnel to Earth and (b) hiring three (3) other subcontractors to complete the work Earth agreed to perform, at great expense in cost and time; and (ii) the MXP clearing was completed well-behind schedule, at a significant cost to Welded.

51. By reason of the foregoing, Welded has been damaged in an amount in excess of $3,750,000.

COUNT II
(Claim to Avoid Preferential Transfers Pursuant to Bankruptcy Code Section 547)

52. Welded incorporates all preceding paragraphs as if fully re-alleged herein.

53. The Transfers are avoidable as preferential transfers of interests of Welded pursuant to section 547 of the Bankruptcy Code based upon the following:

a. Each Transfer constitutes a transfer of an interest of Welded to or for the benefit of Earth within the meaning of section 547(b)(1) of the Bankruptcy Code;

b. Each Transfer was made on account of antecedent debt owed by Welded before such transfer of an interest of Welded was made within the meaning of section 547(b)(2) of the Bankruptcy Code;

c. Welded was insolvent or is presumed to have been insolvent during the ninety (90) days prior to the commencement of the Chapter 11 Cases, sections 547(b)(3) and (f) of the Bankruptcy Code;

d. Each transfer of an interest in Welded's property in respect of the Transfers falls within the ninety (90) day period prior to the Petition Date, section 547(b)(4) of the Bankruptcy Code; and

e. The Transfers, if not avoided, will enable Earth to receive more than it would receive if (i) the Chapter 11 Cases were cases under chapter 7 of the Bankruptcy Code, (ii) the Transfers had not been made, and (iii) Earth received payment of such debt to the extent provided under the Bankruptcy Code, section 547(b)(5) of the Bankruptcy Code.

54. By reason of the foregoing, Welded is entitled to a judgment avoiding the Transfers pursuant to section 547 of the Bankruptcy Code.

COUNT III
(Claim to Recover Property Pursuant to Bankruptcy Code Section 550)

55. Welded incorporates all preceding paragraphs as if fully re-alleged herein.

56. Welded is entitled to avoid the Transfers pursuant to section 547(b) of the Bankruptcy Code.

57. Earth was the initial transferee of the Transfers or the immediate or mediate transferee of such initial transferee or the person for whose benefit the Transfers were made.

58. Pursuant to section 550(a) of the Bankruptcy Code, Welded is entitled to recover the Transfers from Earth, plus interest thereon to the date of payment, and the costs of this action.

COUNT IV
(Objection to Claim No. 592)

59. Welded incorporates all preceding paragraphs as if fully re-alleged herein.

60. Earth filed Claim No. 592 against Welded on February 28, 2019.

61. Welded hereby objects to Claim No. 592 pursuant to section 502(b) of the Bankruptcy Code on the grounds that Claim No. 592 should be modified to an amount no greater than $652,847.60 so as to reflect the amount of work Earth performed and Welded approved, and to account for the actual amounts due to Earth under the Subcontracts.

62. Further, to the extent it is determined that Welded owes any amounts to Earth on account of or in connection with Claim No. 592, then, pursuant to section 558 of the Bankruptcy

Code and applicable state law, Welded is entitled to judgment that it is permitted to offset the amounts Welded owes to Earth under the Subcontracts against Welded's liability on account of Claim No. 592.

63. Welded reserves any and all other defenses and rights to object to Claim No. 592 on any other grounds.

COUNT III
(Declaratory Judgment—Setoff)

64. Welded incorporates all preceding paragraphs as if fully re-alleged herein.

65. Welded and Earth entered into the Subcontracts, which are valid and binding contracts.

66. The Subcontracts provide that if Earth was noncompliant with the Project Schedule, Welded could offset costs and expenses incurred on account of Earth's delay or noncompliance from any payments due to Earth.

67. The Subcontracts provide a warranty by Earth that it, among other things, had the requisite competence, skill, physical resources, and number of trained, skilled, and licensed personnel required to perform the work.

68. Earth breached the Subcontracts by failing to provide hand felling and mechanical clearing services on the MXP in a timely or competent manner in accordance with the Subcontracts.

69. As a direct and proximate result of Earth's breach of the Subcontracts: (i) Earth was required to remediate Earth's failure to complete the work by (a) allocating equipment and personnel to Earth and (b) hiring three (3) other subcontractors to complete the work Earth agreed to perform, at great expense in cost and time, and (ii) the MXP clearing was completed well-behind schedule, at a significant cost to Welded.

70. Claim No. 592 represents amounts relating to disputed payments that Welded allegedly owes to Earth pursuant to the Subcontracts.

71. To the extent that it is later determined at trial that amounts are owed by Welded to Earth on account of the Claim No. 592, pursuant to section 558 of the Bankruptcy Code, and applicable state law, Welded is entitled to offset the damages Welded suffered as result of Earth's material breach of the Subcontracts against Welded's liability on account of Claim No. 592.

72. To the extent applicable, an actual controversy exists between the parties regarding Welded's right to offset any amounts that Welded allegedly owes to Earth under the Subcontracts.

73. To the extent applicable, there exists a substantial controversy between Welded and Earth of sufficient immediacy and reality to warrant the issuance of a declaratory judgment under 28 U.S.C. § 2201. A prompt judicial determination of the respective rights and duties of the parties in these respects is necessary and appropriate.

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RELIEF REQUESTED

WHEREFORE, Welded respectfully requests judgment against Earth including the following:

A. An award of damages to Welded in an amount to be determined at trial, but in no event less than $3,750,000;

B. An order avoiding the Avoided Transfers under section 547 of the Bankruptcy Code, in the total aggregate amount of not less than $1,811,129.30;

C. An order that the Avoided Transfers, to the extent that they are avoided pursuant to section 547 of the Bankruptcy Code, be recovered by Welded pursuant to section 550 of the Bankruptcy Code;

D. An order declaring that Claim No. 592 is modified to an amount no greater than $652,847.60;

E. An order, to the extent necessary, declaring that Welded is permitted to offset the amounts Earth owes to Welded for its breaches of the Subcontracts against Welded's liability, if any, on account of Claim No. 592;

F. An award of attorneys' fees, pre- and post-judgment interest, costs, and expenses; and

G. Such other or further relief as the Court finds just and equitable.

Dated: May 27, 2020
Wilmington, Delaware

YOUNG CONAWAY STARGATT & TAYLOR, LLP

/s/ Kevin A. Guerke

Sean M. Beach (No. 4070)
Kevin A. Guerke (No. 4096)
Kenneth J. Enos (No. 4544)
Tara C. Pakrouh (No. 6192)
Rodney Square
1000 North King Street
Wilmington, DE 19801
Telephone: (302) 571-6600
Facsimile: (302) 571-1253
Email: sbeach@ycst.com
kguerke@ycst.com
kenos@ycst.com
tpakrouh@ycst.com

Counsel to Welded

EXHIBIT A

Hand Felling Subcontract

CONSTRUCTION SUBCONTRACT

Subcontract Number: **2018-01-01.1 Hand Felling**

Subcontractor: **EARTH PIPELINE SERVICES, INC.**
Address: 135 Technology Drive, Suite 100, Canonsburg, PA 15317

Contact: Joshua Roberts
jroberts@earthpipelines.com
Office: 724-243-3699
Cell: 412-737-3442

Work Locations: Marshall County and Wetzel Counties, WV

Yard Address: 169 Distribution Road, Triadelphia, WV 26059

This subcontract is effective as of the 8th the day of March 2018, by and between **Welded Construction, L.P.**, a Delaware Limited Partnership (CONTRACTOR) and the above named SUBCONTRACTOR (the "Parties"). The Parties hereby agree that all Work specified below shall be performed by the SUBCONTRACTOR understanding that CONTRACTOR is committed to safety, health and the protection of the environment as core values reflected in all aspects of its operations. SUBCONTRACTOR shall perform all activities in accordance with these principles and all provisions of this Subcontract Agreement that consists of this Subcontract Agreement, the following documents and the attachments, appendices, drawings, specifications, documents and exhibits specified therein and hereby incorporated herein (Subcontract):

Subcontract Form of Agreement
Exhibit "A" – Labor and Equipment Rates – Extra Work
Exhibit "B" – Administrative Forms
Exhibit "C" – Insurance Requirements
Exhibit "D" – Additional Insured
Exhibit "E" – Baseline Schedule
Exhibit "F" – Subcontractor Proposal
Exhibit "G" – General Terms & Conditions
Exhibit "H" – Safety Requirements
Exhibit "I" – CPG Environmental Standards – West Virginia
Exhibit "J" – CPG Pipeline Construction Standard CS.220.001 (2016)

A WORK TO BE PERFORMED (Work): Except as specified elsewhere in the subcontract, SUBCONTRACTOR shall furnish all union labor; materials; tools; supplies; equipment; transportation; supervision, technical, professional and other services; and shall perform all operations necessary and required to satisfactorily perform the following:

Hand Felling of trees on the pipeline construction right-of-way (ROW), all extra work spaces and access roads requiring tree-removal (the "Work") for the above-described project in Marshall and Wetzel Counties in West Virginia, subject to all applicable environmental guidelines and Construction Stipulations including but not limited to the following:

- TREES: Trees will be cut in standard log lengths and dropped to the ground

See attached Exhibit F (Subcontractor's proposal dated March 5, 2018) for additional details, assumptions and exclusions.

The Work is a portion of the goods and services to be provided by CONTRACTOR to Columbia Gas Transmission, LLC (OWNER) for **Spread 1** of the **Mountaineer Express Pipeline Project in Marshall and Wetzel Counties in West Virginia.**

B. SCHEDULE. The Work shall be performed in accordance with the dates set forth in the Exhibit "E".

- Work to begin on or about March 9, 2018, but no later than March 9, 2018.
- Subject to the date Work actually begins, the Work is to be completed on or about April 28, 2018 unless time period is specifically extended in writing. The Baseline Schedule reflected in Exhibit E and the anticipated completion date will be adjusted/extended to correlate with the date Work actually begins.

C. *COMPENSATION: As full consideration for the satisfactory performance by SUBCONTRACTOR of this* subcontract, CONTRACTOR shall pay to SUBCONTRACTOR compensation in accordance with the prices for

- Mobilization
- Hand Felling-Right –of-way
- Hand Felling – Access Roads

set forth in Exhibits F, A and with the payment provisions of this subcontract (Exhibit G).

This subcontract embodies the entire agreement between CONTRACTOR and SUBCONTRACTOR and supersedes all other writings. The parties shall not be bound by or be liable for any statement, representation, promise, inducement or understanding not set forth herein.

CONTRACTOR:		**SUBCONTRACTOR:**	
Welded Construction, L.P.		**Earth Pipeline Services, Inc.**	
Authorized Signature:		Authorized Signature:	
Print Name:	Mett D. Carroll	Print Name:	Joshua D. Roberts
Print Title:	Project Manager	Print Title:	Chief Executive Officer

45-4611593

(Federal Tax Payer I.D. Number)

EXHIBIT A

LABOR & EQUIPMENT RATES FOR EXTRA WORK

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

Labor Force

	Hourly Rate	OT Rate
General Superintendent	$ 175.00	$ 262.50
Superintendent	$ 161.50	$ 242.25
Assistant Superintendent	$ 152.00	$ 228.00
Project Manager	$ 161.50	$ 242.25
Safety Manager	$ 152.00	$ 228.00
Safety Coordinator	$ 142.00	$ 213.00
Project Engineer	$ 152.00	$ 228.00
Foreman	$ 142.50	$ 213.75
Operator	$ 123.50	$ 185.25
Mechanic	$ 123.50	$ 185.25
Oiler	$ 123.50	$ 185.25
Laborer	$ 85.50	$ 128.25
Administrative	$ 85.50	$ 128.25
Per Diem	$100/day	NA

*All rates based on 40-hour workweek

Equipment

Trucks/Trailers/Misc

Machine	Hourly Rate	Daily Rate
Pickup Truck 1/2 ton	$ 16.00	$ 144.00
Pickup Truck 3/4 ton	$ 17.00	$ 153.00
Pickup Truck 1 ton	$ 20.00	$ 180.00
Tractor - 50 ton Lowboy	$ 95.00	$ 855.00
Roll-Off - Sled	$ 85.00	$ 765.00
Roll-Off - 30 Yd	$ 85.00	$ 765.00
Roll-Off - Flatbed	$ 85.00	$ 765.00
Log/Grapple Truck	$ 95.00	$ 855.00
Mechanic Truck	$ 90.00	$ 810.00
Fuel Truck	$ 90.00	$ 810.00
Bob Dump Truck	$ 60.00	$ 540.00
18 Wheeler Dump Truck	$ 85.00	$ 765.00
Bucket Truck	$ 100.00	$ 900.00
Hybrid Trailer (Hand Felling)	$ 15.00	$ 135.00
Gooseneck trailer	$ 15.00	$ 135.00
Enclosed trailer	$ 12.00	$ 108.00
Dump Trailer	$ 13.00	$ 117.00
Morooka	$ 80.00	$ 720.00
UTV	$ 16.00	$ 144.00
Connex	$ 10.00	$ 90.00

Excavators

Machine	Hourly Rate	Daily Rate
Mini	$ 64.00	$ 576.00
10-20,000 lb	$ 124.00	$ 1,116.00
25-40,000 lb	$ 128.00	$ 1,152.00
45-50,000 lb	$ 176.00	$ 1,584.00
50-60,000 lb	$ 176.00	$ 1,584.00

EXHIBIT A

LABOR & EQUIPMENT RATES FOR EXTRA WORK

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

70-80,000 lb	$ 208.00	$ 1,872.00
Excavator thumb	$ 32.00	$ 288.00
Dozers		
Machine	***Hourly Rate***	***Daily Rate***
70-80 hp	$ 96.00	$ 864.00
80-110 hp	$ 120.00	$ 1,080.00
110-160 hp	$ 144.00	$ 1,296.00
110-160 hp w/winch	$ 252.00	$ 2,268.00
160-210 hp	$ 176.00	$ 1,584.00
160-210 hp w/winch	$ 192.00	$ 1,728.00
Forestry Equipment		
Machine	***Hourly Rate***	***Daily Rate***
Feller Buncher	$ 352.00	$ 3,168.00
Track Chipper	$ 360.00	$ 3,240.00
Sneller stump grinder	$ 400.00	$ 3,600.00
Brush Mulcher (Fecon)	$ 232.00	$ 2,088.00
Forwarder	$ 248.00	$ 2,232.00
Skidder	$ 224.00	$ 2,016.00
Tagalong chipper	$ 68.00	$ 612.00
Chainsaw Stihl 261 or equivelant	$ 6.00	$ 54.00
Chainsaw Stihl 362 or equivelant	$ 7.00	$ 63.00
Chainsaw Stihl 441 or greater	$ 9.00	$ 81.00
Misc. & Supplies	Cost + 15%	
Reclamation Equipment		
Machine	***Hourly Rate***	***Daily Rate***
Track Skid Steer	$ 76.50	$ 688.50
Farm Tractor under 100 hp	$ 59.50	$ 535.50
Farm Tractor 100 hp+	$ 119.00	$ 1,071.00
Broadcast Seeder	$ 8.50	$ 76.50
Disc	$ 13.60	$ 122.40
Straw Blower	$ 42.50	$ 382.50
Round Bale Blower	$ 76.50	$ 688.50
Crimper/Cultipacker	$ 10.20	$ 91.80
15' batwing brush hog	$ 25.50	$ 229.50
Harley Rake	$ 17.00	$ 153.00
Post Driver	$ 34.00	$ 306.00
6000 lb lime buggy	$ 17.00	$ 153.00
Pressure washer	$ 17.00	$ 153.00
Trencher	$ 34.00	$ 306.00

EXHIBIT B
ADMINISTRATIVE FORMS

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

Attached to and forming part of Subcontract No. 2018-01-01 between Contractor and Subcontractor, the following are incorporated into this Exhibit and must be utilized for this Subcontract:

B-1 Contractor Change Directive
B-2 Change Order
B-3 Subcontractor Release for Interim Payment
B-4 Subcontractor Release for Final Payment
B-5 RFI

Exhibit B-1: Contractor Change Directive

SUBCONTRACT NO. _____ CHANGE DIRECTIVE NO. _____

CORRESPONDENCE NO._____ Additional Pages attached to this request: _____
Total No. of Pages _____

COMMITMENT SECTION

PROJECT LOCATION	DATE	CONTRACTOR WORK ORDER NO.
SUBCONTRACTOR	ADDRESS	

Reference to Contract Sections associated with this Change Directive:

Reference to Drawings associated with or impacted by this Change Directive (as required):

Detailed Description of the Change:

Project Scope of Work:	☐ Unchanged	☐ Reduced	☐ Increased
Request Cost based on:	☐ Lump Sum	☐ Unit Cost	☐ Time and Material

To be completed by the Subcontractor:

Total Value of Change	$
Total Impact to Schedule	Calendar Days (Enter # of Days)

NOTE: By executing this Change Order Directive, Subcontractor acknowledges that all cost and schedule impacts have been expressly identified. No further adjustments for this Work shall be made.

Revised Date of Completion:	

To be completed by Welded:

Revised Contract Value:

When signed by the Subcontractor and Contractor, this document becomes effective immediately as a Construction Change Directive (CCD), and the Subcontractor shall proceed in accordance with the change described above.
If the Subcontractor plans to seek an adjustment as a result of this Construction Change Directive, the Subcontractor must submit a proposed adjustment to the Contractor within five (5) Business Days of the receipt of this document.
Work may not proceed until all cost and schedule impacts associated with the change order have been submitted for Welded's review and approval.
Signed authorization by a Welded representative is required to commence Work associated with this Change Directive.
Subcontractor acknowledges that Contractor, by authorizing this Change Directive, does not waive or modify any contractual rights or responsibilities unless such waiver or modification is expressly set forth in this Change Order.

Approvals:

Sub-Contractor Representative: _____
AUTHORIZED REPRESENTATIVE SIGNATURE DATE

Contractor Representative: _____
AUTHORIZED REPRESENTATIVE SIGNATURE DATE

Remarks: _____

Revision Date – 12/12/13

Exhibit B-2: Subcontractor Requested Change

SUBCONTRACT NO. _____ SUBCONTRACTOR REQUESTED CHANGE NO. _____

CORRESPONDENCE NO._____ Additional Pages attached to this request: _____
Total No. of Pages _____

COMMITMENT SECTION

PROJECT LOCATION	DATE	COMPANY WORK ORDER NO.
CONTRACTOR	ADDRESS	

Contractor is hereby notified that the following circumstances have arisen that Sub-Contractor believes entitles it to request a change:

Reference to Contract Sections associated with this requested change:

Reference to Drawings associated with or impacted by this requested change (as required):

Detailed Description of the Change:

Project Scope of Work:	☐ Unchanged	☐ Reduced	☐ Increased
Cost Proposal Basis:	☐ Lump Sum	☐ Unit Cost	☐ Time and Material

Estimated Value of Change	$
Estimated Impact to Schedule	Calendar Days (Enter # of Days)

NOTE: By executing this Change Order Request, Subcontractor acknowledges that all cost and schedule impacts have been expressly identified. No further adjustments for this Work shall be made.

Sub-Contractor's Representative: _____
AUTHORIZED REPRESENTATIVE DATE

Remarks: _____

Welded Approval: **Date:**

The Subcontractor is responsible to complete this form in its entirety and provide associated backup as noted above in this request and / or provide additional backup required to substantiate the change order request.
All T&M/Unit Cost changes will require timesheets for Welded Project Manager (or designee) approval.
Signed authorization by a Welded representative is required to commence Work noted in this Change Request.
Subcontractor acknowledges that Contractor, by authorizing this change request, does not waive or modify any contractual rights or responsibilities unless such waiver or modification is expressly set forth in this change request.

Revision Date: 12/12/2013

EXHIBIT B-3

SUBCONTRACTOR RELEASE FOR INTERIM PAYMENT (US)

This Release is delivered pursuant to Exhibit L14 of the construction Contract No.: 4600008133 between Columbia Gas Transmission, LLC (the "Company") and Welded Construction, LP (the "Contractor")

Subcontractor's Name:	**[Name]** (the "Subcontractor")
Address:	
Phone No.:	
Project:	
Project Owner:	
Release Effective Date:	**[Date of Notice of Final Completion]**

1) I am [Subcontractor's Project Manager, President or Chief Financial Officer] of the Subcontractor and I have personal knowledge of the facts herein declared and I make this declaration in my capacity as an authorized signatory of the Subcontractor.

2) I am duly authorized to make the following declaration, and to act on behalf of the Subcontractor with respect to the Project.

3) The total amount payable to the Subcontractor under its contract with the Contractor for the Project as of the Effective Date of this Release is as follows:

Original contract amount:	$XXXX
Change orders:	$YYYY
Adjusted contract amount:	$YYYY
Previous payments received:	$YYYY
Current payment due:	$XXXX

4) The Subcontractor hereby certifies that all payments owing by the Contractor in the performance of the Work have been fully satisfied and paid through the Effective Date of this Release, including, but not limited to, amounts due to its subcontractors and suppliers, and amounts due for taxes, wages and fringe benefits, and there are no overdue amounts owing to its employees, subcontractors, suppliers for labour or materials furnished to the Contractor or Supplier for the Project, except for holdback monies properly retained or payments deferred by agreement or amounts withheld by reason of legitimate dispute.

5) The Subcontractor does hereby unconditionally release and forever discharge the Company, its affiliates, contractors, subcontractors, the employees and agents of any of them, and the property, materials and assets of the Company from any and all liabilities relating to tax releases, including Governmental Units, Landowners, utilities and the like which arise out of or relate to Contractor's obligations under the Contract through the Effective Date of this Release.

6) To the best of the Subcontractor's knowledge, there are no unsatisfied claims by third parties attributable to the Contractor and there are no liens or other indebtedness owing to itself or its subcontractors existing in connection with the Work.

7) The Subcontractor does, to the extent permitted by law, hereby unconditionally release and forever discharge the Company, its affiliates, contractors, subcontractors, the employees and agents of any of them, and the property, materials and assets of the Company from any and all claims and liabilities of any nature or kind (including any demands for labour and materials furnished by it for the Project or to assert any such

claims related thereto) arising out of, relating to, or under the Contract through the Effective Date of this Release.

8) The Subcontractor fully understands the nature and terms of and has voluntarily executed this Release for the purpose of making full and final compromise, adjustment, and settlement of any and all claims it may have for compensation for Work performed under the Contract through the Effective Date of this Release.

9) All of the facts hereinbefore declared are true.

[Subcontractor's Full Legal Name]

_____

[Signatory's Name], [Signatory's Title]
Authorized Signatory

Declared before me in [City], [State], on this [Day] day of [Month] 20 .

_____

[Notary Public's Name]
Notary Public

EXHIBIT B-4

SUBCONTRACTOR RELEASE FOR FINAL PAYMENT (Canada or US)

This Release is delivered pursuant to Exhibit L of the construction Contract No.:460008133 between Columbia Gas Transmission, LLC (the "Company") and Welded Construction, LP (the "Contractor"), dated November 3, 2017, (the "Contract") (the "Work").

Subcontractor's Name:	**[Name]** (the "Subcontractor")
Address:	
Phone No.:	
Project:	
Project Owner:	
Release Effective Date:	**[Date of Notice of Final Completion]**

1) I am [Subcontractor's Project Manager, President or Chief Financial Officer] of the Subcontractor and I have personal knowledge of the facts herein declared and I make this declaration in my capacity as an authorized signatory of the Subcontractor.

2) I am duly authorized to make the following declaration, and to act on behalf of the Subcontractor with respect to the Project.

3) The total amount payable to the Subcontractor under its contract with the Contractor for the Project as of the Effective Date of this Release is as follows:

Original contract amount:	$XXXX
Change orders:	$YYYY
Adjusted contract amount:	$YYYY
Previous payments received:	$YYYY
Current payment due:	$XXXX

4) The Subcontractor hereby certifies that all payments owing by the Contractor in the performance of the Work have been fully satisfied and paid through the Effective Date of this Release, including, but not limited to, amounts due to its subcontractors and suppliers, and amounts due for taxes, wages and fringe benefits, and there are no overdue amounts owing to its employees, subcontractors, suppliers for labour or materials furnished to the Contractor or Supplier for the Project, except for holdback monies properly retained or payments deferred by agreement or amounts withheld by reason of legitimate dispute.

5) The Subcontractor does hereby unconditionally release and forever discharge the Company, its affiliates, contractors, subcontractors, the employees and agents of any of them, and the property, materials and assets of the Company from any and all liabilities relating to tax releases, including Governmental Units, Landowners, utilities and the like which arise out of or relate to Contractor's obligations under the Contract through the Effective Date of this Release.

6) To the best of the Subcontractor's knowledge, there are no unsatisfied claims by third parties attributable to the Contractor and there are no liens or other indebtedness owing to itself or its subcontractors existing in connection with the Work.

7) The Subcontractor does, to the extent permitted by law, hereby unconditionally release and forever discharge the Company, its affiliates, contractors, subcontractors, the employees and agents of any of them, and the property, materials and assets of the Company from any and all claims and liabilities of any nature or kind (including any demands for labour and materials furnished by it for the Project or to assert any such claims related thereto) arising out of, relating to, or under the Contract through the Effective Date of this Release.

8) The Subcontractor fully understands the nature and terms of and has voluntarily executed this Release for the purpose of making full and final compromise, adjustment, and settlement of any and all claims it may have for compensation for Work performed under the Contract.

9) All of the facts hereinbefore declared are true.

[Subcontractor's Full Legal Name]

_____

[Signatory's Name], [Signatory's Title]
Authorized Signatory

Declared before me in [City], [Province or State], on this [Day] day of [Month] 20 .

_____

[Notary Public's Name]
Notary Public

REQUEST FOR INFORMATION (B-5)

Project #:

TO:				**SUBCONTRACTOR:**			
Project Name:						**RFI #:**	
Referenced Documents:							
Work Activities:	CIVIL	STRUCT	MECH	ELECT	INSTRU	OTHER	Asbes Abate
Information Requested:							

ORIGIN:		**DATE:**		**APPRVD:**		**DATE:**	
PLEASE REPLY BY:							
RESPONSE:							

RESPONDER:		**DATE:**		**CO REP:**		**DATE:**	
Distribution							

EXHIBIT C

EXHIBIT TO SUBCONTRACT

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

Worker's Compensation

Statutory benefits and limits. Insurance shall contain benefits and limits in full compliance with all state and federal requirements. It shall also include Other States Coverage and Voluntary Compensation Endorsements and Employer's Liability Insurance as follows:

Employer's Liability per:

Accident	Disease (Policy Limit)	Disease (Each)
$1,000,000	$1,000,000	$1,000,000

Coverage should include USL&H if warranted by type of work.

Commercial General Liability (ISO Form CG 0001 10 01)

Including products/completed operations, independent contractor's protective, owner's and contractor's protective liability, broad form contractual liability insuring the subcontract contained herein, per project aggregates, and broad form property damage, with the exclusion pertaining to explosion, collapse and underground property damage eliminated for all the above coverages; blanket contractual coverage including Contractor's indemnity obligations; it shall not contain any cross-liability exclusion and Broad Form Property Damage coverage with bodily injury and property damage of combined single limits of not less than those stated per occurrence.

Minimum Limits	Combined Single Limit
Bodily Injury and Property Damage	$1,000,000 Each Occurrence
General Aggregate	$2,000,000 Per Project
Products/Completed Operations	$2,000,000 Aggregate
Personal Injury	$1,000,000
Stop Gap Liability for Monopolistic States* (ND, OH, WA & WY)	$1,000,000 Limit

Business Automobile Liability

Including owned, non-owned, leased and hired vehicle coverage.

Bodily Injury and Property Damage	$1,000,000 Each Occurrence

Umbrella/ Excess Liability

Bodily Injury and Property Damage	$5,000,000 Each Occurrence $5,000,000 Aggregate

***Use of Umbrella/Excess Liability Coverage is permitted to meet limits**

Coverage should be "follow form" and excess of the Employer's Liability, Commercial General Liability and Automobile Liability Coverage.

Pollution Liability (Only required for Environmental work)

Bodily Injury and Property Damage	$5,000,000 Each Occurrence

Professional Liability Insurance**

**This coverage is required only when architectural or engineering services are provided as part of the Work.

Minimum Limit of Liability	$5,000,000 Per Claim

EXHIBIT C

EXHIBIT TO SUBCONTRACT

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

Contractor's Equipment

Including coverage for loss or damage to equipment, owned by or on bare rental from a third party or parties and used by Subcontractor for which Subcontractor is responsible to insure in performing the Work at the Work Site, having coverage in accordance with the replacement value of such equipment.

INSURANCE REQUIREMENTS

- **The CONTRACTOR and Owner are to be named Additional Insureds on all of the above General and Umbrella/Excess Liability coverages, except Professional Liability and so described on the Certificate(s) of Insurance. Additional insured endorsement MUST be attached to the Certificate of Insurance and must be ISO forms: CG 2010 (1185) or CG 2010 (0704) in combination with CG 2037 (0704) or the equivalent, which covers on-going and completed operations.**

- **All policies must contain a waiver of subrogation in favor of CONTRACTOR and Owner and be so described on the Certificate(s) of Insurance**.

- Prior to the start of any WORK, SUBCONTRACTOR will furnish original Certificate(s) of Insurance to CONTRACTOR evidencing that all insurance coverage required is in force and that it will not be canceled, non-renewed or materially change with less than thirty (30) days prior written notice thereof mailed by Certified Mail to CONTRACTOR and Owner. Replacement Certificates of Insurance, evidencing replacement or renewed coverage, will be delivered to CONTRACTOR and all Additional and Named Insureds on or before the expiration date of any Policies.

- The SUBCONTRACTOR shall not have any exclusion under their General Liability or Umbrella/Excess policies for work performed on Residential Type Projects such as: Apartments, Dormitories, Military Housing, Assisted Living Facilities, Nursing Homes, Hospitals or any facilities capable of providing in-house patient stay. Evidence of this type of coverage must be displayed on the Certificate of Insurance AND through evidence of Endorsement or as displayed and denoted in the policy coverage form, a copy of which must be supplied with the certificate of insurance. Any Exclusion pertaining to this type of work on these policies is UNACCEPTABLE. Further, any exclusion of this type must be declared and a copy submitted with the requested insurance certificate.

- All sub-subcontractors shall maintain the same types and amounts of insurance and be subject to the same requirements as SUBCONTRACTOR.

- All policies shall be written on an occurrence basis, except for Professional Liability.

- All policies shall provide primary coverage and not calling upon any other insurance procured by other parties for defense, payment or contribution. This shall be so described on the Certificate of Insurance(s).

- All policies shall contain endorsements requiring thirty (30) days' advance written notice to named and additional insureds of any cancellation, non-renewal or material change in coverages.

- All policies shall be written by responsible insurance companies with a Best's rating of AVIII or better and be licensed to do business in the state in which the Job is located.

- Completed operations coverage will be maintained for at least two (2) years after completion of the WORK.

- SUBCONTRACTOR shall forward SUBCONTRACTOR'S Certificate of Insurance through SUBCONTRACTOR'S Agent prior to the commencement of work and/or payment with CONTRACTOR, which shall be subject to the CONTRACTOR'S approval of adequacy of protection and the satisfactory character of the insurer. The Certificate of Insurance should be mailed within five days of receipt of the contract, regardless of when SUBCONTRACTOR'S work will start. If covered under a Blanket Agreement, please submit only one "Blanket" Certificate of Insurance which states: "For "All Jobs, All Locations."

- SUBCONTRACTOR shall not do anything to cause any of the insurance required to be invalidated in whole or in part.

EXHIBIT C

EXHIBIT TO SUBCONTRACT

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

- At CONTRACTOR'S request, from time to time or at any time, originals or copies of SUBCONTRACTOR'S or sub-subcontractor's policies, certified by the carrier, shall be delivered to CONTRACTOR.

- CONTRACTOR does not represent that the coverage and limits set out in these insurance requirements will necessarily be adequate to protect the SUBCONTRACTOR, and such coverage and limits shall not be deemed as a limitation on the SUBCONTRACTOR'S liability under the indemnities provided to the CONTRACTOR and others under this agreement.

- If any action or proceeding is commenced to enforce the rights of the CONTRACTOR as an additional insured under this Subcontract, and the CONTRACTOR prevails in that action, the SUBCONTRACTOR and/or its insurer agrees to pay, in addition to any other relief granted, the actual reasonable attorneys' fees which the prevailing party has paid or is obligated to pay and all costs and expenses, not merely recoverable costs, which the prevailing party has paid or is obligated to pay. This provision is independent and severable from any other provision of this Subcontract and shall be enforceable as a separate agreement.

- Subcontractor shall immediately notify Contractor regarding the occurrence of any of the following events: (a) any significant loss covered by a policy required to be maintained by this Agreement; (b) any significant disputes with an insurer; (c) the early cancellation of any policy; (d) the failure to pay any premium payment; (e) the failure, for any reason, to maintain any policy required to by maintained by this Agreement; and (f) any significant change in any insurance coverage contracted by Subcontractor. Subcontractor shall assist and cooperate in the timely settlement of any claim hereunder.

EXHIBIT D

ADDITIONAL INSURED

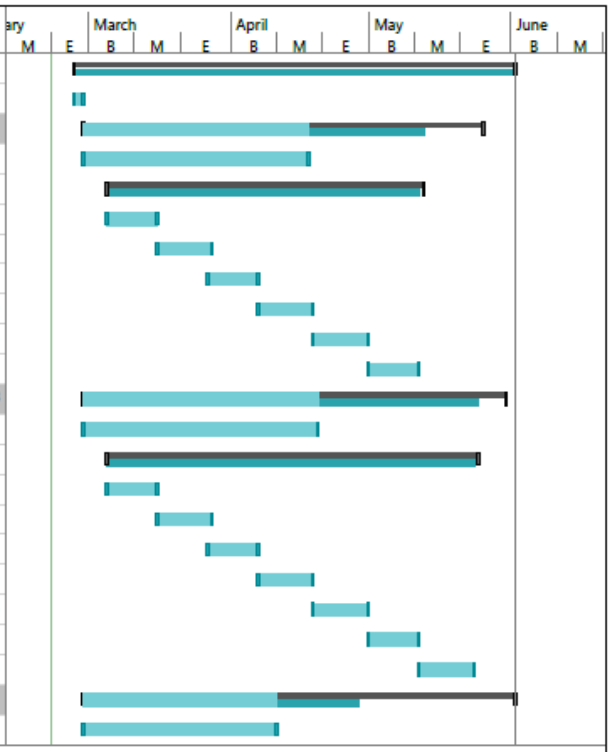
As it Pertains to Project	CPG Mountaineer Express, Spread 1	Subcontract Number	2018-01-01

Contractor:	Welded Construction, L.P. c/o Dean McDowell, Chief Financial Officer 26933 Eckel Road, Perrysburg, OH 43551 Email: dmcdowell@welded.com
Owner:	N/A

EXHIBIT E
SCHEDULE

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

ID	Task Name	Working Days	Start	Finish
1	MXP - Spread 1 (Sections 1-3)	83 days	Mon 2/26/18	Fri 6/1/18
2	Training	2 days	Mon 2/26/18	Tue 2/27/18
3	**Section 1 - 0+00 to 365+00**	**75 days**	**Wed 2/28/18**	**Fri 5/25/18**
4	Hand Felling	42 days	Wed 2/28/18	Tue 4/17/18
5	**Mechanized Clearing**	**60 days**	**Mon 3/5/18**	**Sat 5/12/18**
6	Work Day 1 - 10 (Sta 0+00 - 80+67)	10 days	Mon 3/5/18	Thu 3/15/18
7	Work Day 11 - 20 (Sta 80+67 - 129+19)	10 days	Fri 3/16/18	Tue 3/27/18
8	Work Day 21 - 30 (Sta 129+19 - 211+96)	10 days	Tue 3/27/18	Fri 4/6/18
9	Work Day 31 - 40 (Sta 211+96 - 274+76)	10 days	Sat 4/7/18	Wed 4/18/18
10	Work Day 41 - 50 (Sta 274+76 - 332+09)	10 days	Thu 4/19/18	Mon 4/30/18
11	Work Day 51 - 60 (Sta 332+09 - 365+00)	10 days	Tue 5/1/18	Fri 5/11/18
12	**Section 2 - 365+00 - 750+00**	**79 days**	**Wed 2/28/18**	**Wed 5/30/18**
13	Hand Felling	44 days	Wed 2/28/18	Thu 4/19/18
14	**Mechanized Clearing**	**70 days**	**Mon 3/5/18**	**Thu 5/24/18**
15	Work Day 1 - 10 (Sta 365+00 - 421+45)	10 days	Mon 3/5/18	Thu 3/15/18
16	Work Day 11 - 20 (Sta 421+45 - 481+39)	10 days	Fri 3/16/18	Tue 3/27/18
17	Work Day 21 - 30 (Sta 481+39 - 537+11)	10 days	Tue 3/27/18	Fri 4/6/18
18	Work Day 31 - 40 (Sta 537+11 - 578+49)	10 days	Sat 4/7/18	Wed 4/18/18
19	Work Day 41 - 50 (Sta 578+49 - 626+31)	10 days	Thu 4/19/18	Mon 4/30/18
20	Work Day 51 - 60 (Sta 626+31 - 714+23)	10 days	Tue 5/1/18	Fri 5/11/18
21	Work Day 61 - 70 (Sta 714+23 - 750+00)	10 days	Sat 5/12/18	Wed 5/23/18
22	**Section 3 - 750+00 to 970+50**	**81 days**	**Wed 2/28/18**	**Fri 6/1/18**
23	Hand Felling	36 days	Wed 2/28/18	Tue 4/10/18



Project: MXP - Spread 1
Date: Wed 2/21/18

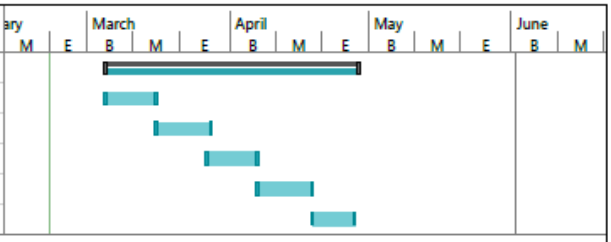
Task
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Start-only
Finish-only
External Tasks
External Milestone
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Page 1

EXHIBIT E
SCHEDULE

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

ID	Task Name	Working Days	Start	Finish
24	**Mechanized Clearing**	**48 days**	**Mon 3/5/18**	**Sat 4/28/18**
25	Work Day 1 - 10 (Sta 970+50 - 914+23)	10 days	Mon 3/5/18	Thu 3/15/18
26	Work Day 11 - 20 (Sta 914+23 - 892+97)	10 days	Fri 3/16/18	Tue 3/27/18
27	Work Day 21 - 30 (Sta 892+97 - 866+27)	10 days	Tue 3/27/18	Fri 4/6/18
28	Work Day 31 - 40 (Sta 866+27 - 807+01)	10 days	Sat 4/7/18	Wed 4/18/18
29	Work Day 41 - 48 (Sta 807+01 - 750+00)	8 days	Thu 4/19/18	Fri 4/27/18



Project: MXP - Spread 1
Date: Wed 2/21/18

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

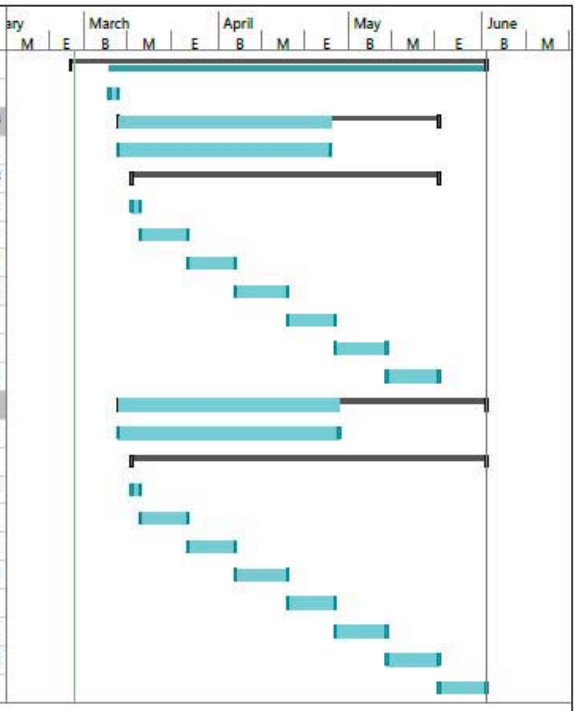
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EXHIBIT E, Rev.1

SCHEDULE

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

ID	Task Name	Working Days	Start	Finish
1	MXP - Spread 1 (Sections 1-3)	83 days	Mon 2/26/18	Fri 6/1/18
2	Hand Felling Training	2 days	Wed 3/7/18	Thu 3/8/18
3	**Section 1 - 0+00 to 365+00**	**63 days**	**Fri 3/9/18**	**Mon 5/21/18**
4	Hand Felling	42 days	Fri 3/9/18	Thu 4/26/18
5	**Mechanized Clearing**	**61 days**	**Mon 3/12/18**	**Mon 5/21/18**
6	Training	2 days	Mon 3/12/18	Tue 3/13/18
7	Work Day 1 - 10 (Sta 0+00 - 80+67)	10 days	Wed 3/14/18	Sat 3/24/18
8	Work Day 11 - 20 (Sta 80+67 - 129+19)	10 days	Sun 3/25/18	Wed 4/4/18
9	Work Day 21 - 30 (Sta 129+19 - 211+96)	10 days	Thu 4/5/18	Mon 4/16/18
10	Work Day 31 - 40 (Sta 211+96 - 274+76)	10 days	Tue 4/17/18	Fri 4/27/18
11	Work Day 41 - 50 (Sta 274+76 - 332+09)	10 days	Sat 4/28/18	Wed 5/9/18
12	Work Day 51 - 60 (Sta 332+09 - 365+00)	10 days	Thu 5/10/18	Mon 5/21/18
13	**Section 2 - 365+00 - 750+00**	**73 days**	**Fri 3/9/18**	**Fri 6/1/18**
14	Hand Felling	44 days	Fri 3/9/18	Sat 4/28/18
15	**Mechanized Clearing**	**71 days**	**Mon 3/12/18**	**Fri 6/1/18**
16	Training	2 days	Mon 3/12/18	Tue 3/13/18
17	Work Day 1 - 10 (Sta 365+00 - 421+45)	10 days	Wed 3/14/18	Sat 3/24/18
18	Work Day 11 - 20 (Sta 421+45 - 481+39)	10 days	Sun 3/25/18	Wed 4/4/18
19	Work Day 21 - 30 (Sta 481+39 - 537+11)	10 days	Thu 4/5/18	Mon 4/16/18
20	Work Day 31 - 40 (Sta 537+11 - 578+49)	10 days	Tue 4/17/18	Fri 4/27/18
21	Work Day 41 - 50 (Sta 578+49 - 626+31)	10 days	Sat 4/28/18	Wed 5/9/18
22	Work Day 51 - 60 (Sta 626+31 - 714+23)	10 days	Thu 5/10/18	Mon 5/21/18
23	Work Day 61 - 70 (Sta 714+23 - 750+00)	10 days	Tue 5/22/18	Fri 6/1/18



Project: MXP - Spread 1
Date: Tue 2/27/18

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
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External Tasks
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Deadline
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Manual Progress

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EXHIBIT E, Rev.1

SCHEDULE

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

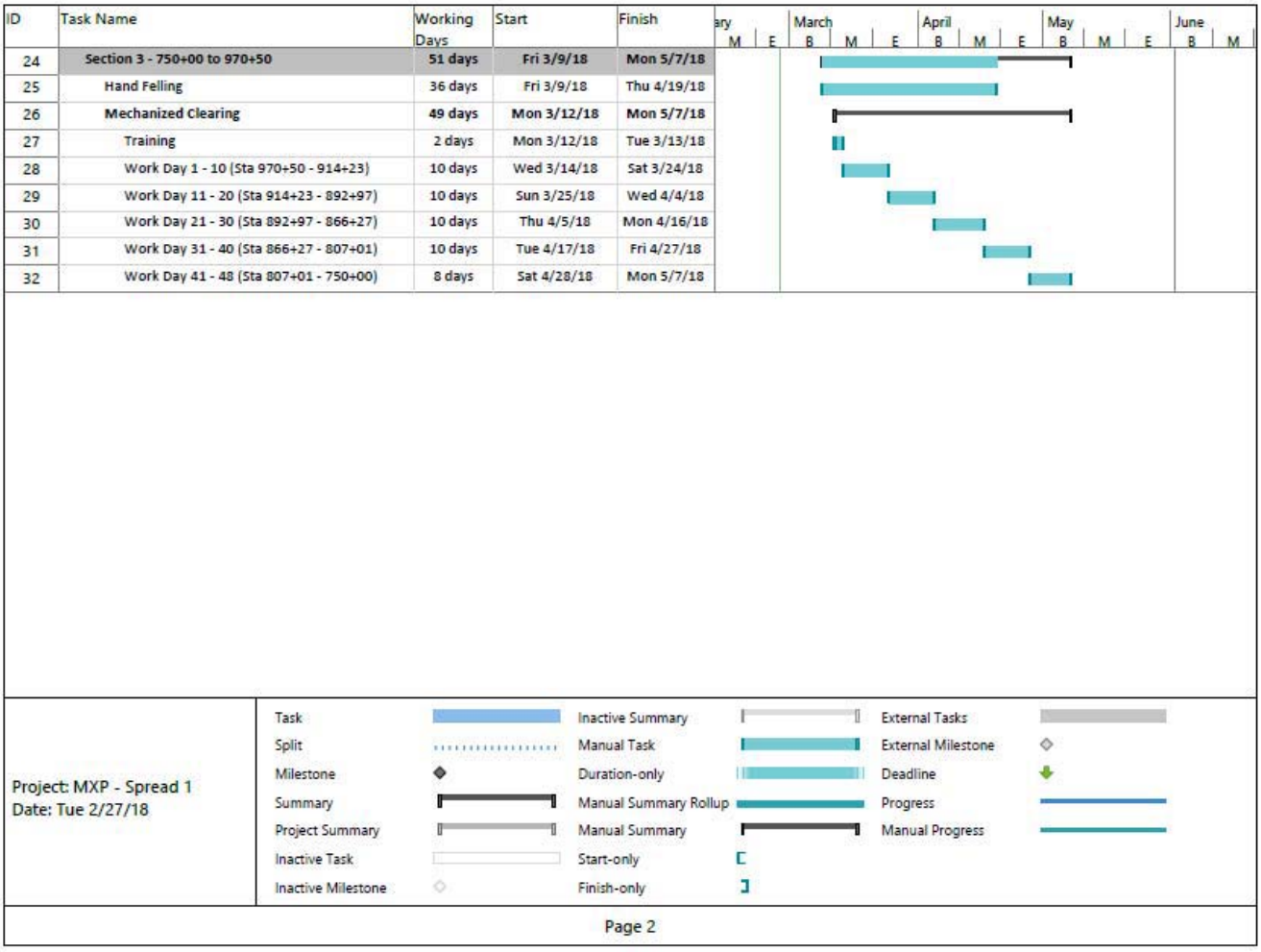


EXHIBIT F

Subcontractors Proposal

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01



Mountaineer Xpress – RFP Tree Clearing

From:	Tanner Bechtel, Earth Pipeline Services, Inc.
Date:	February ~~8th~~ 13th, 2018
Project Name:	Mountaineer Xpress Pipeline – Spread #1
Subject:	RFP – Tree Clearing

Dear All:

Earth Pipeline Services, Inc. ("CONTRACTOR") appreciates the opportunity to provide **Welded Construction, L.P.** ("COMPANY") with this proposal for timber clearing on the Mountaineer Xpress Pipeline Project. In the event any terms or provisions of this proposal contradicts or are inconsistent with the terms of the scope of work presented to CONTRACTOR, the terms of this proposal shall have precedence and be deemed controlling. CONTRACTOR's proposal is to provide a bid for services based on the provided alignment, scope of work, intended start dates/schedules, and the understanding of customary construction services in the given terrains.

TABLE OF REQUESTED CONTENTS

A. OVERVIEW OF COST 2
B. CLEARING WORK PLAN 3
C. SAFETY 3
D. ASSUMPTIONS AND EXCLUSIONS... 4

REQUEST FOR PROPOSAL RESPONSE

EXHIBIT F

Subcontractors Proposal

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

Project Info						
Project Name:				Mountaineer Xpress - Spread #1		
Project Location:				Marshall & Wetzel Co., WV		
Project Length:				Ft | MI	99,436	18.83
Submittal Info						
Client:				Welded Construction, L.P.		
Services:				Clearing, RCE, & ECD		
Start Date | Completion Date				3/9/2018		TBD
Item #	Item Description	Service	Est Qty	U/M	Unit Price	Total
1	**Timber Clearing**					
	Mobilization	Mob	1.00	EA	$ 350,000.00	$ 350,000.00
	Grubbing - ROW	Complete Spread	99,436.00	LF	$ 52.00	$ 5,170,672.00
	Grubbing - Access Roads - Windrow, Burn, Chip	Complete Spread		LF	$ 12.00	$ -
	Hand Felling - Right-of-way	Complete Spread	99,436.00	LF	$ 7.95	$ 790,516.20
	Hand Felling - Access Roads	Complete Spread		LF	$ 3.55	$ -
	Haul Wood Chips (within 20-miles one-way of location)	Haul/Remove		LF	$ 60.00	$ -
	Haul Logs (within 20-miles one-way of location)	Haul/Remove		LF	$ 60.00	$ -
	Haul Logs & Chips (within 20-miles one-way of location)	Haul/Remove		LF	$ 90.00	$ -
	**T&M charged in addition for locations outside of 20-miles.	Haul/Remove		T&M	T&M	$ -
	** Complete Spread to mean all footage from start to finish.					
2	**RCE**					
	Install Goal Posts	Provide & Install	-	EA	$ 600.00	$ -
	Install Rock Construction Entrance (RCE) Construction (50' x 20' typical)	Install	-	EA	$ 6,500.00	$ -
	Install Flume Pipe, Plastic, 20' Length (minimum of 20" diameter)	Install	-	LF	$ 25.00	$ -
3	**Fencing**					
	Install Orange Safety Fence	Provide & Install	-	LF	$ 6.00	$ -
	Install Fence Gaps	Provide & Install	-	EA	$ 750.00	$ -
	Install 4-Strand Barbed Wire Fencing, w/metal T-Posts	Provide & Install	-	LF	$ 6.75	$ -
	Install 5-Strand Barbed Wire Fencing, w/metal T-Posts	Provide & Install	-	LF	$ 7.75	$ -
4	**Erosion Controls**					
	Install Standard Silt Fence	Install	-	LF	$ 6.50	$ -
	Install Super Silt Fence	Install	-	LF	$ 12.50	$ -
	Install 8" Diameter Compost Filter Sock	Install	-	LF	$ 5.50	$ -
	Install 12" Diameter Compost Filter Sock	Install	-	LF	$ 8.00	$ -
	Install 18" Diameter Compost Filter Sock	Install	-	LF	$ 11.25	$ -
	Install 24" Diameter Compost Filter Sock	Install	-	LF	$ 15.50	$ -
	Install 32" Diameter Compost Filter Sock	Install	-	LF	$ 23.00	$ -
5	**Timber Mats**					
	Load, Haul & Place 18' Timber Mat	Haul & Install	-	EA	$ 300.00	$ -
	Load, Haul & Place 20' Timber Mat	Haul & Install	-	EA	$ 160.00	$ -
	Load, Haul & Place 24' Timber Mat	Haul & Install	-	EA	$ 220.00	$ -
	Load, Haul & Place 30' Timber Mat	Haul & Install	-	EA	$ 280.00	$ -
	Load, Haul & Place 36' Timber Mat	Haul & Install	-	EA	$ 600.00	$ -
	Load, Haul & Place 40' Timber Mat	Haul & Install	-	EA	$ 600.00	$ -
	Relocate Timber Mat (pickup, clean, load, haul & place mat)	Haul & Install	-	EA	$ 140.00	$ -
	Perm. Bridge < 30' (incl. Sideboards and Geotextile Fabric)	Install	-	EA	$ 3,500.00	$ -
	Perm. Bridge >= 30' (incl. Sideboards and Geotextile Fabric)	Install	-	EA	$ 5,500.00	$ -
	Install Geo-textile Fabric	Install	-	SY	$ 1.40	$ -
	Wetland Sideboards	Install	-	LF	$ 10.00	$ -
6	**Move Around**					
	Move Around – Clearing Crew	Perform	-	EACH MOVE PER EACH CREW	$ 40,000.00	$ -
	Move Around – Hand Felling Crew	Perform	-	EACH MOVE PER EACH CREW	$ 5,000.00	$ -
	Move Around – Mat Crew	Perform	-	EACH MOVE PER EACH CREW	$ 25,000.00	$ -
	Move Around – Rock Construction Entrance (RCE) Crew	Perform	-	EACH MOVE PER EACH CREW	$ 10,000.00	$ -
	Move Around – Environmental Construction Device (ECD) Crew	Perform	-	EACH MOVE PER EACH CREW	$ 10,000.00	$ -
7	**Stand-By**					
	Standby – Clearing Crew	Perform	-	T&M	T&M	$ -
	Standby – Hand-Felling Crew	Perform	-	T&M	T&M	$ -
	Standby – Mat Crew	Perform	-	T&M	T&M	$ -
	Standby – Rock Construction Entrance (RCE) Crew	Perform	-	T&M	T&M	$ -
	Standby – Environmental Control Device (ECD) Crew	Perform	-	T&M	T&M	$ -

Prices are applicable to minimum quantities quoted and may be revised if quantities are increased.
All items without quantities are assumed to be unit pay items, unless otherwise agreed upon.

Based on IFC documents dated: 02/23/18
Based on Construction Line List dated: 02/23/18
Based on moving in a linear direction with zero (0) move arounds.
Based on full access road availability and usability shown in IFC documents dated: 02/23/18
Based on Earth Pipelines' winch plan submitted on 02/12/18.
All items may be revised if scope or schedule changes, as stated above.
Price to "Load, Haul & Place 18' Timber Mat" shall be $300/ 18' mat for the first 1,941 18' mats installed by Earth; every mat in addition to 1,941 18' mat will be charged at a rate of $100/ 18' mat.

- Permits: All permits, including ground disturbance, road bonds, EMA's, RUMA's, and the like, will be obtained by COMPANY.
- Staking/Flagging: All Limits of Disturbance (LOD) shall be clearly marked by COMPANY prior to timber felling and/or clearing. CONTRACTOR will not be responsible for re-marking or re-staking of any stakes that are damaged during clearing activities. Additionally, pipeline centerline will be marked at all resource crossings or foreign line crossings for accurate placement of mats.
- Rock Outcrops: COMPANY shall handle all blasting and/or hammering that is required for the safe passage of COMPANY's equipment.
- RCE/Access Roads: RCE's & Access Roads will be installed by COMPANY ahead of CONTRACTOR's clearing activities.
- Materials: Materials to be provided by COMPANY include but are not limited to the following, timber mats, silt fences, silt socks, geotextile fabric, stone/aggregate, and culverts/flumes.
- Sanitation Facilities: COMPANY shall provide sanitation facilities along the right-of-way in an adequate and accessible manner.
- Move Around: CONTRACTOR may charge a move-around in the event CONTRACTOR cannot work in a lineal direction along the right of way.
- Yard/Laydown: COMPANY will provide adequate space for CONTRACTOR at COMPANY's most local laydown yard.
- Pot Holing: COMPANY will pot hole all needed foreign easement crossing prior to CONTRACTOR's timber clearing activities.

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

B. CLEARING WORK PLAN

- **Construction Clearing Scope**
  The following scope has been interpreted and selected based upon material and information provided. CONTRACTOR reserves the ability to alter the scope as long as it adheres to any processes and procedures allowed for in the RFP and/or by COMPANY.
  - Trees
    - Trees will be cut in standard log lengths and placed adjacent to the right-of-way.
      - Marketable Timber to be defined as any tree with a six-inch (6") DBH and length greater than eight-feet (8').
  - Brush
    - Brush may be windrowed inside ~~or outside~~ of, and adjacent to, the LOD, chipped and broadcast on and/or off ROW in upland areas, up to two-inches (2") thick, or burned in compliance with CPG Construction Stiplulations (Line List), Environmental and Construction specifications. There is to be no hauling of material.
      - Timber/Brush may be processed, windrowed, chipped & broadcast, or burned on adjacent properties within the LOD.
      - Burning to be permitted 24-hours per day, at a minimum from Monday (6AM) through Sunday (6AM) in compliance with State Burn Permit.
  - Stumps
    - Stumps to be ground, and incorporated into the soil or burned.
  - Mulching/Mowing
    - Any brush, tops, etc... remaining after skidding, chipping, and/or burning activities may be mulched and incorporated into the soil.

C. SAFETY

General

- 2014
  - TRIR – 0
  - Hours Worked – 26,892
  - DART – 0
- 2015
  - TRIR – 4.61
  - Hours Worked – 43,360
  - DART – 4.61
- 2016
  - TRIR – 0
  - Hours Worked – 54,122
  - DART – 0
- 2017
  - TRIR – 0
  - Hours Worked – 88,250
  - DART – 0

Safety and Winch Plans can be made available upon request.

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EXHIBIT F

Subcontractors Proposal

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

D. ASSUMPTIONS AND EXCLUSIONS

- **Permits**

All permits, including ground disturbance, road bonds, EMA's, RUMA's, and the like, will be obtained by COMPANY.

- **Staking/Flagging**

All Limits of Disturbance (LOD) shall be clearly marked by COMPANY prior to timber felling and/or clearing. CONTRACTOR will not be responsible for re-marking or re-staking of any stakes that are damaged during clearing activities. Additionally, pipeline centerline will be marked at all resource crossings or foreign line crossings for accurate placement of mats.

- **Rock Outcrops**

COMPANY shall handle all blasting and/or hammering that is required for the safe passage of COMPANY's equipment.

- **RCE/Access Roads**

RCE's & Access Roads will be installed by COMPANY ahead of CONTRACTOR's clearing activities.

- **Materials**

Materials to be provided by COMPANY include but are not limited to the following, timber mats, silt fences, silt socks, geotextile fabric, stone/aggregate, and culverts/flumes.

- **Stand-By**

Subject to the terms of Exhbit G, attached to and incorporated into this Subcontract 2018-01-01, Stand-By time shall be invoiced in a prorated manner each hour CONTRACTOR is restricted from working due to circumstances outside of CONTRACTOR's control. The first two (2) hours of each stand-by period shall not trigger stand-by pay.

- **Sanitation Facilities**

COMPANY shall provide sanitation facilities along the right-of-way in an adequate and accessible manner.

- **Move Around**

CONTRACTOR may charge a move-around in the event CONTRACTOR cannot work in a lineal direction along the right of way due to circumstances outside of CONTRACTOR's control~~.~~, including but not limited to, un-acquired parcels, environmental and/or safety stand-downs, and stream/road crossings in-which it is deemed not safe to cross without COMPANY properly grading the right-of-way ahead of time.

- **Yard/Laydown**

COMPANY will provide adequate space for CONTRACTOR at COMPANY's most local laydown yard.

- **Pot Holing**

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EXHIBIT F

Subcontractors Proposal

As it Pertains to Project	CPG Mountaineer Xpress, Spread 1	Subcontract Number	2018-01-01

COMPANY will pot hole all needed foreign easement crossing prior to CONTRACTOR's timber clearing activities.

- **Line List and Scope of Work Interpretations and Discretion**

It is assumed that it will be at CONTRACTOR's discretion whether timber/brush is burned, chipped, or windrowed. 'Chipping' or 'disposal of brush' method to include broadcasting of chips on and/or off LOD, up to two-inches (2") thick, or burned.

EXHIBIT G

GENERAL TERMS AND CONDITIONS

As it Pertains to Project	Columbia Gas Transmission MXP Spread 1	Subcontract Number	2018-01-01

Invoicing

Subcontractor shall submit a monthly signed invoice, itemized to the Contractor's satisfaction, for the portion of the work completed, less Ten percent (10%) retainage (Retention). In conjunction to Subcontractor's signed invoice, an affidavit asserting that Contractor is in compliance with the payment terms of this Subcontract Agreement must be submitted. Within thirty (30) days after a satisfactory receipt of invoice and affidavit, payment shall be made to the Subcontractor for the Net Payable amount. The remaining (Retention) will be retained by Contractor until final acceptance of the Work and payable within forty-five (45) days. Hand Felling Work may be invoiced at five percent (5%) retainage and such retention may be invoiced upon successful completion of hand felling activities and payable NET 45. The retention invoice must include a properly executed Affidavit and Release. All invoices are to be sent via email to: ap@welded.com with a copy to jconn@welded.com.

Right to Setoff

Contractor may set off against any amount payable under the Agreement any and all present and future indebtedness of Subcontractor to Contractor.

Project Schedule

Prior to starting the Work Subcontractor shall supply a detailed Project Schedule and Man Power Chart that is in compliance with the requirements of Contractor and this Agreement. The Project Schedule shall reflect all required activities with duration, and the Man Power Chart shall reflect the required manpower to accomplish the Work and shall be updated weekly. Subcontractor shall administer the Work in accordance with the Project Schedule. Subcontractor also shall notify Contractor immediately in writing at any time that Subcontractor has reason to believe that there will be a material deviation in the Project Schedule and shall specify in said notice the corrective action planned by Subcontractor.

Time is of the Essence

Subcontractor agrees that time is of the essence in the performance of its Work. Subcontractor agrees to prosecute the Work with all due diligence and to complete the Work within the time stated in the Contract Documents or the Schedule, whichever is sooner. Prior to commencement of the Work, Subcontractor shall prepare and submit a Schedule in accordance with Contractor's requirements for completion of the Work.

Subcontractor shall continuously monitor, report, forecast and control the progress of the Work in accordance with the Schedule. Subcontractor shall provide scheduling detail as the Work progresses. If such reporting or forecasting indicates a delay or potential delay, Subcontractor shall promptly take corrective action to mitigate such delay or potential delay and to get back on schedule and to avoid such delay at no cost to Contractor.

Subcontractor's reports shall be sufficiently detailed to present Contractor with an accurate status of the Work's Schedule, variances from the Schedule and reasons therefore, and planned corrective action. Reports shall be in writing and provided as established by Contractor.

Contractor's Right to Accelerate the Work at no Additional Cost to Contractor

If Subcontractor's progress impacts Contractor's linear progression of the work, or if in the reasonable belief of the Contractor, the Subcontractor will not meet the completion dates set forth in the Subcontractor's Project Schedule, the Contractor may direct the Subcontractor to accelerate the Work in a manner acceptable to the Contractor and at no additional cost to the Contractor unless the delay is the result of the acts or omissions of the Contractor. If Contractor directs the Subcontractor to accelerate the Work, Subcontractor shall promptly provide a plan, including its recommendation, for the most effective and economical acceleration of the Work. If such plan is unacceptable to the Contractor or the Subcontractor fails to provide a plan within seven (7) Days, Contractor may direct Subcontractor to follow an acceleration plan provided by Contractor.

As it Pertains to Project	Columbia Gas Transmission MXP Spread 1	Subcontract Number	2018-01-01

Termination

Termination for Convenience. In addition to any other rights that Contractor may have hereunder, or in Law, Contractor may at any time, in the exercise of its sole and arbitrary discretion, terminate the Agreement, the Work or any portion thereof by giving no less than fourteen (14) Days' notice to Subcontractor specifying the Work or portion thereof to be terminated and the effective date of the termination. Upon receipt of such notice, Subcontractor shall continue to perform all other portions of the Work not terminated, if any, in strict accordance with the Agreement. If the Agreement or any portion thereof is terminated, in accordance with this article Subcontractor agrees to waive any claims for damages, including loss of anticipated profits or any other consequential or special damages, arising out of such termination and agrees that the sole and exclusive remedy for such termination shall be only for payment of the Work performed, including demobilization. Contractor shall not be liable for any damages (consequential, special or otherwise, including loss of profits) as a result of the termination of the Work or any portion thereof.

Termination for Cause. Contractor may, in its sole discretion, immediately terminate the Agreement or any part of the Work by giving written notice to Subcontractor if any of the following occur:

1. Subcontractor becomes insolvent or seeks protection from creditors under federal or state Law, or if a bankruptcy petition is filed against Subcontractor and not dismissed with in forty-five (45) days.
2. If an order is made or a resolution is passed for the winding up or liquidation of Subcontractor
3. If a custodian, receiver, manager or other officer with similar powers is appointed in respect of Subcontractor or any of Subcontractor's property
4. If Subcontractor ceases to carry on in the ordinary course of business
5. If a creditor takes possession of any of Subcontractors' property, or if a distress, execution or any similar process is levied or enforced against such property and remains unsatisfied by Subcontractor
6. If Subcontractor fails to comply with any requirement of this Agreement
7. If Subcontractor breaches its obligations under this Agreement
8. If Subcontractor repeatedly violates any obligation or in the reasonably opinion of Contractor has failed to meet a material requirement of this Agreement
9. If the project receives an order from any Governmental Authority for breach of Law that requires an immediate suspension of the Work, including a stop work order related to safety or environmental violations.

   Upon receipt of such notice from Contractor, Subcontractor shall discontinue the Work in accordance with the notice, and shall (i) cease performance of the Work to the extent directed by Contractor in the notice; (ii) take all actions that Contractor may direct, or as may be necessary or expected under Prudent Industry Practices for the protection and preservation of the Facility and all property or other Project Supplied Materials or supplies related thereto (in whatever stage of completion), including return of the Project Supplied Materials (including unloading and stocking for proper storage) as directed by Contractor; and (iii) at Contractor's instruction, assign its rights under all Permits, subcontracts, warranties, guarantees, and other agreements or documents pertaining to the Work to Contractor or its respective designees.
10. Subcontractor shall be liable to Contractor for all additional directs costs and expenses incurred by Contractor in completing the Work that would not have been incurred but for the termination hereunder (including any additional direct costs to complete or to have a third party complete the Work), in addition to all other rights and remedies of Contractor pursuant to the Agreement and at Law.
11. In addition to the termination rights set forth in herein, if Subcontractor has failed to comply with any of the terms of the Agreement, or is in material breach of any representation, declaration or warranty, including representations and warranties obligations, Contractor may, in its sole discretion, give Subcontractor notice of default. Subcontractor shall have five (5) Days immediately following receipt of the notice, or such longer time as Contractor believes to be reasonable and has specified in the notice

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of default or has subsequently agreed upon in writing, to remedy or to commence to remedy and diligently continue to remedy such default, failing which, Contractor may by further notice to Subcontractor terminate or suspend the whole or any part of the Agreement or the Work; provided that, where Contractor determines, in its reasonable discretion, that the default is not capable of being remedied or not capable of being remedied within a reasonable amount of time, Contractor may, by notice to Subcontractor, immediately terminate or suspend the whole or any part of the Agreement. Upon receipt of such notice from Contractor, Subcontractor shall discontinue the Work in accordance with the notice and shall (i) cease performance of the Work to the extent directed by Contractor in the notice; (ii) take all actions that Contractor may direct, or as may be necessary or expected under Prudent Industry Practices for the protection and preservation of the Facility and all property or other Project Supplied Materials or supplies related thereto (in whatever stage of completion), including return of the Project Supplied Materials (including unloading and stocking for proper storage) as directed by Contractor; and (iii) at Contractor's instruction, assign its rights under all Permits, subcontracts, warranties, guarantees, and other agreements or documents pertaining to the Work to Contractor or its respective designees. Subcontractor acknowledges that it will not be reimbursed for any costs arising from a suspension.

12. Where the whole or any part of the Agreement is suspended under this article, Contractor may, at any time, immediately terminate any or all of the suspended portion of the Agreement.

13. If the Agreement or any portion of the Work is terminated pursuant to this article, Contractor may complete or have others complete the Work. If the Agreement is terminated, Subcontractor is not entitled to further payment from Contractor until the Work is complete and Contractor has fully ascertained all of its costs and damages arising out of or related to the default (including, without limitation, legal, expert, design) (the "Completion Costs"). Any amount payable to Subcontractor for Work satisfactorily performed to the date of termination will be offset by the Completion Costs, the sum of any monies already paid to Subcontractor and any additional amount Contractor must pay to obtain satisfactory completion of the Work by others.

14. Contractor shall not be liable for any damages (consequential, special or otherwise, including loss of profits) as a result of the termination of the Work or any portion thereof by Contractor pursuant to any provisions of this article. The rights and remedies of Contractor provided in this article are in addition to the rights and remedies of Contractor provided by Law, or under any other provision of the Agreement.

15. If Contractor elects to terminate or suspend this Agreement or any part of the Work, and a court or other body of competent jurisdiction finds such termination or suspension was invalid, such termination or suspension shall be considered to be a termination for convenience.

Suspension of Work. Contractor may, in the exercise of its sole and arbitrary discretion, at any time or times, by notice to Subcontractor specifying the effective date of the suspension, require Subcontractor to suspend the Work or any portion thereof. Upon receiving written notice, Subcontractor shall discontinue the Suspended Work immediately, place no further purchase orders or subcontracts with respect to the Suspended Work, properly protect and secure the Work in accordance with Prudent Industry Practice, not remove any Work or equipment or tangibles forming part of the Work from the Work Site without written consent of Contractor, and promptly make reasonable efforts to obtain suspension terms satisfactory to Contractor with respect to all existing purchase orders, subcontracts, supply contracts and rental agreements related to the Suspended Work. Subcontractor shall continue to perform all other portions of the Work which have not been suspended by Contractor.

Contractor may at any time authorize resumption of the Suspended Work or any part thereof, by giving Subcontractor reasonable notice specifying the part of the Suspended Work to be resumed and the effective date of such resumption. Subcontractor shall resume the Suspended Work on the date and to the extent specified in the notice.

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Subcontractor shall utilize its employees, equipment and materials in such manner, and take such other steps as may be necessary or desirable to minimize the costs associated with the Suspended Work. During the period of Suspended Work, Subcontractor shall secure and protect the Suspended Work and the impacted Facilities and all materials and equipment to be used or incorporated therein.

If there is Suspended Work, such event shall constitute a Change and Contractor shall reimburse Subcontractor for those direct costs, exclusive of profit, reasonably incurred by Subcontractor as a direct result of the suspension of the Work if reimbursement is provided by Company to Contractor and provided that Subcontractor takes reasonable measures to minimize all such costs. Contractor shall not be liable for any other costs or damages, including loss of profits or any other consequential or special damages, on account of the Suspended Work or any part thereof or the deletion of Suspended Work from the Agreement. Subcontractor shall promptly provide all information and records Contractor may require to verify claimed costs.

Subcontractor acknowledges that it will not be reimbursed for any costs arising from Suspended Work that causes Subcontractor to cease all or a portion of the Work for a period of time which is less than two (2) hours before the Work can recommence. It is further acknowledged by Subcontractor that it has made adequate allowance in the Price for delays of less than two (2) hours in duration.

Notwithstanding anything else in this Suspension Article, in any circumstance where the Subcontractor is entitled to a Work Schedule extension the Contractor may, in its discretion, require compression of the Work Schedule rather than an extension of time to the extent schedule compression is reasonably practicable. In such case Subcontractor will be entitled to compensation through the change order process or as otherwise agreed for the additional efforts necessary to meet the compressed Work Schedule.

Delays caused by Subcontractor

If Subcontractor is responsible for a delay in the progress of the Work, or fails to complete any portion of the Work in accordance with the Work Schedule, then Subcontractor shall, at no additional cost to Contractor; (a) work overtime, acquire and use any necessary additional labor and equipment and perform whatever other acts are required or requested by Contractor to make up the lost time and to avoid further or other delay in the performance of the Work; (b) prepare and implement a recovery plan; and (c) work diligently to mitigate all damages incurred as a result of the delay.

Subcontractor shall promptly notify Contractor in writing: (i) of any occurrence that Subcontractor has reason to believe will materially adversely affect the Project Schedule or the Work Schedule; or (ii) if the performance of the Work is not in compliance with the Project Schedule or the Work Schedule or Subcontractor's adherence to any Critical Path progress of the Work Schedule and/or the Project Schedule is behind for any reason by more than five (5) Days.

If at any time, in the reasonable opinion of Contractor, Subcontractor is not in compliance with the Project Schedule or the Work Schedule or its adherence to the Critical Path progress of the Work Schedule and/or the Project Schedule is behind for any reason by more than five (5) Days Contractor may provide notice to Subcontractor.

Where Subcontractor has provided notice in accordance with this article, Subcontractor will specify in said notice the corrective action recommended by Subcontractor in the form of a recovery plan. Where Contractor has provided notice to Subcontractor, Subcontractor shall prepare and provide to Contractor a recovery plan within five (5) Days of receipt of the notice. The recovery plan will set forth in reasonable detail the manner in which Subcontractor intends to meet the dates set forth in the Work Schedule and the Project Schedule, including the specific steps to be taken, the expected pace of recovery, and the expected recovery date, and shall require Subcontractor to take such steps as are necessary to make up the lost time and to avoid further or other delays in the performance of the Work including, if necessary, working overtime, increasing the number of working Days or hours per Day, and acquiring and using any necessary additional labor and equipment and whatever other acts are required by Contractor. If Contractor has not commented within ten (10) Days, it shall be deemed to have reviewed the plan without comment, provided that in no event shall

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Contractor be considered to have approved a recovery plan. Subcontractor shall, at no cost to Contractor, promptly implement and thereafter shall diligently continue to adhere to the recovery plan in order to meet the dates set forth in the Work Schedule and Project Schedule. During implementation of the recovery plan Subcontractor shall provide sufficient information to Contractor to show its compliance with the recovery plan and indicating the improvements being made to the Work Schedule and Project Schedule. It is a breach of this Agreement if Subcontractor, in the opinion of Contractor, is not complying with the recovery plan or fails to provide sufficient detail to show its compliance.

Subcontractor acknowledges that the Project Schedule and Work Schedule are vital to the success of the project. In addition to any other rights and remedies of Contractor hereunder, Subcontractor further acknowledges that Contractor may incur additional costs and expenses if the Project Schedule and Work Schedule are not complied with, including costs of Other Subcontractors, internal personnel, overhead and standby costs of Contractor and Other Subcontractors, and that where such costs and expenses are incurred Subcontractor is liable therefor. In addition to any other remedies Contractor may have, where Subcontractor is not in compliance with the Project Schedule and Work Schedule the reasonable and verifiable amount of such costs and expenses may be deducted from any payments due to Subcontractor and retained by Contractor on account of such costs and expenses.

Claims for costs associated with any weather-related delays and the associated productivity impacts shall not be compensated by Contractor.

Force Majeure

"Force Majeure" means any unforeseeable act or event that: (i) renders it impossible for the affected Party to perform its obligations under this Agreement; (ii) is beyond the reasonable control of the affected Party; (iii) is not due to the fault or negligence of the affected Party; and (iv) could not have been avoided by such Party through the exercise of due diligence, including the expenditure of any reasonable sum of money. Without limiting the generality of the foregoing, Force Majeure may include any of the following events: war, riot, terrorism, act of vandalism, rebellion, epidemic, Catastrophic Weather, general strike, fire, explosion, and also includes any late delivery of Project Supplied Materials where such delay is due to any event of Force Majeure. Notwithstanding the foregoing, Force Majeure shall not include: (a) late delivery of any Subcontractor supplied equipment and materials (except to the extent that such delay is due to any event of Force Majeure), (b) delays resulting from the breakdown of any Subcontractor supplied equipment and materials, (c) delays caused by inefficiencies on the part of Subcontractor, (d) Work Site specific labor disruptions, (e) the condition of the Work Site (unless caused by an event of Force Majeure), (f) late performance caused by Subcontractor's inefficiency in hiring or failure to hire (due to unavailability or otherwise) adequate labor or supervisory personnel, (g) any local, general or seasonal weather conditions or climates except Catastrophic Weather, or (h) financial issues affecting the Party claiming the Force Majeure.

If any Party cannot comply with any obligation hereunder as a result of Force Majeure, such Party shall notify the other Party in writing as promptly as possible, but in any event within twenty-four (24) hours of such event, giving the reason for the non-compliance, particulars of the Force Majeure and the obligation or condition affected. Such event of Force Majeure shall constitute a Change, and any obligation of a Party shall be temporarily suspended during the period in which such Party is unable to perform by reason of Force Majeure, but only to the extent of such inability to perform. The obligations of Subcontractor to perform as provided by the Agreement through means not affected by the Force Majeure shall continue. The Party affected by the Force Majeure shall promptly notify the other Party as soon as such event no longer prevents it from complying with its obligation, and shall thereafter resume performance of the Work.

The Party that has given a notice of Force Majeure shall mitigate the effects of such Force Majeure on the performance of its obligations. Where the Parties reasonably believe that the Force Majeure will continue for more than five (5) Days or where the Force Majeure does continue for more than five (5) Days, the Parties shall meet as soon as practicable to review the situation and its implications on the Work Schedule and to discuss the appropriate course of action in the circumstances.

No adjustment of the Work Schedule for any event of Force Majeure shall be made with respect to the first forty-eight (48) hours of direct and actual adverse impact to the milestone dates set forth in the Work Schedule arising out of such event of Force Majeure. If the performance of the Work is delayed or interrupted as a result of Force Majeure beyond forty-eight (48) hours, the Work Schedule, only as it relates to the direct and actual adverse impact to the milestone

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dates set forth in the Work Schedule, shall be adjusted on an equitable basis. Any Work Schedule adjustment shall include only that period of time by which the Work Schedule is directly and actually delayed by such Force Majeure.

An event of Force Majeure shall not give rise to any increase to the Price or claim for delay and no productivity impact costs shall be due or payable by Contractor as a result of an event of Force Majeure.

Notwithstanding anything else in this Article, in any circumstance where the Subcontractor is entitled to a Work Schedule extension the Contractor may, in its discretion, require compression of the Work Schedule rather than an extension of time to the extent schedule compression is reasonably practicable. In such case Subcontractor will be entitled to compensation in accordance with the change order process or as otherwise agreed for the additional efforts necessary to meet the compressed Work Schedule.

Change Directives

Contractor may at any time by issuing a Change Directive to Subcontractor, require a change in the work, or the method, sequencing, conduct, or timing of the Work of this Agreement. See Exhibit B-1 for Contractor Change Directive. Subcontractor shall comply with any Change Directive, but shall have the right to claim an adjustment, if applicable. If Contractor issues a Change Directive and no agreement has been reached as to an adjustment, then the Subcontractor shall diligently proceed as though on a time and materials basis pursuant to Exhibit A (Labor and Equipment Rates). Subcontractor shall keep such project records of the daily cost incurred by completing such Change Directive and submit such records to the Contractor on a daily basis AND Subcontractor shall receive payment for completing the work associated with the Change Directive until the parties mutually agree to the terms of a Change Order. If Subcontractor and Contractor fail to agree on an Adjustment, then the provisions of the section titled “Disputes” may be invoked to resolve the dispute.

Change Orders shall contain full particulars of the Changes and any Adjustments and shall represent the full and final agreement as to the Change and any Adjustments.

In addition, in the event of an emergency which Contractor determines endangers life or property, Contractor may use oral orders to Subcontractor for any work required by reason of such emergency. Subcontractor shall commence and complete such emergency work as directed by Contractor. Such changes must be formalized in writing within forty-eight (48) hours of the event.

Subcontractor Requested Change

Subcontractor may, at any time, by written notice in a form consistent with Exhibit B-2 Subcontractor Requested Change to Contractor, request a Change within (2) days Business Days of the event giving rise to the Subcontractor’s request. Only a Change Order submitted on the approved form to the Contractor may be deemed adequate for consideration. Subcontractor expressly waives any right to a Change in the event such notice is not made within forty-eight (48) hours of the change event. Subcontractor is not permitted to proceed with any work which Subcontractor will seek a change request without prior written authorization from Contractor. Contractor will review and respond no later than (10) Business Days. All Subcontractor change requests must include all supporting documentation. Contractor shall notify Subcontractor of its acceptance or rejection of such request or such request shall be deemed rejected. If Contractor rejects the Change requested by Subcontractor, Subcontractor shall continue with the Work without the Change. If Subcontractor and Contractor fail to agree on an Adjustment, then the provisions of the Section titled “Disputes” may be invoked to resolve the dispute.

Claims

If Subcontractor has any claim against Contractor, excluding claims for payment relating to Change Orders, notice of each such claim shall be submitted in writing to Contractor within five days after the occurrence of the event giving rise to the claim. Resolution of properly filed claims is within Contractor’s sole discretion. If the Subcontractor disputes Contractor’s decision on Subcontractor’s properly filed claims, then Subcontractor may invoke the Dispute Resolution procedures of this Agreement following Final Completion of the specific Project.

Disputes

EXHIBIT G

GENERAL TERMS AND CONDITIONS

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Applicability of Dispute Resolution Procedures. Except for matters requiring immediate injunctive or similar equitable relief or matters where the relief is prescribed by Statute, all claims, disputes or other matters in question between the Parties arising out of or relating in any way to this Agreement (hereinafter collectively referred to as a "Dispute") will be resolved pursuant to this article.

Senior Officers to Resolve. The Parties shall make all reasonable efforts to resolve Disputes arising out of the performance of the Work by amicable negotiations and agree to provide without prejudice, frank, candid and timely disclosure of relevant facts, information, and documents to facilitate these negotiations. Any Dispute shall initially be submitted to a senior officer from each Party for resolution by mutual agreement between said senior officers. If either Party wishes a Dispute to be submitted to senior officers pursuant to this clause, such Party shall serve upon the other Party a notice in writing (a "Senior Officer's Notice") requesting that the Dispute be so referred. Such negotiation shall be on a without prejudice basis. However, should such senior officers fail to arrive at a mutually agreed resolution of the Dispute within thirty (30) Days, or such longer period as may be agreed by such senior officers, after service of the Senior Officer's Notice, the Dispute shall then be referred to mediation.

Mediation Proceedings

(A) If the Parties agree to refer a Dispute to mediation the Parties have thirty (30) Days from the Day such agreement is reached to agree on the appointment of a mediator (the "Project Mediator"). If the Parties do not agree on the appointment of a Project Mediator, then either Party may request the American Arbitration Association, or any similar body acceptable to the Parties, in the state where the Work Site is located (or such other state as the Parties may agree upon) to appoint a chartered mediator to act as Project Mediator, who, when so appointed, will be deemed acceptable to the Parties and to have been appointed by them. In the event such Project Mediator is unavailable to mediate a particular dispute, then the American Arbitration Association, or any similar body acceptable to the Parties may be asked to appoint a suitable replacement.

(B) The Parties will submit the Dispute in writing to the Project Mediator, and afford to the Project Mediator access to all records, documents and information related to the Dispute that the Project Mediator may request; provided however, no Party will be required to provide anything that would be protected by privilege, including but not limited to lawyer-client communications, work product, and litigation privilege, and any comparable privilege in any court or other adjudicatory body. The Parties shall meet with the Project Mediator at such reasonable times as the Project Mediator may require and shall, throughout the intervention of the Project Mediator, negotiate in good faith to resolve the dispute. All proceedings are agreed to be without prejudice, and the cost of the Project Mediator will be shared equally between the Parties.

(C) If the dispute cannot be resolved within forty-five (45) Days of the Project Mediator being requested to assist, or within such further period agreed to by the Parties, the Project Mediator may terminate the negotiations by giving notice to the Parties. However, the Project Mediator

Agreement in Full Force and Effect. Performance of the Agreement and the Work shall continue during any Dispute, provided that performance of the Work in dispute shall only continue if, and in the manner, Contractor so directs. Except as otherwise provided in this Agreement, no payments due or payable by Contractor shall be withheld on account of a Dispute other than payments which are the subject of the Dispute.

Insurance

Without limiting in any way the scope of any obligations or liabilities assumed hereunder by Subcontractor, Subcontractor shall procure or cause to be procured and maintained at its expense, for the duration of this Subcontract, the insurance policies described in **Exhibit C - Insurance**.

The General Liability, Business Automobile Liability, Umbrella or Excess Liability and Pollution Liability Policies shall include Contractor, Company and its subsidiaries and affiliates, and the third parties as listed in **Exhibit D – Additional Insured.**

Liens

Subcontractor shall cause any Lien which may be filed or recorded against the Work, the Facility, the Work Site or any lands or property of Company to be released and discharged forthwith at the cost and expense of Subcontractor. If

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Subcontractor fails to release or obtain the release and discharge any such Lien, then Contractor may, but shall not be obliged to, discharge, release or otherwise deal with the Lien, and Subcontractor shall pay any and all costs and expenses incurred by Contractor in so releasing, discharging or otherwise dealing with the Lien, including fees and expenses of legal counsel. Any amounts so paid by Contractor may be deducted from any amounts due Subcontractor whether under the Agreement or otherwise. No amounts are payable by Contractor to Subcontractor so long as a Lien remains registered against the Work, the Facilities, the Work Site or any lands or property of Contractor, arising out of the Work.

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Subcontractors Liability and Indemnity

Subcontractor shall be liable to Contractor and Company for any and all Claims incurred by or suffered by Contractor or Company, to the property of Company, the Work or the Facilities, to the extent caused by Subcontractor's breach or non-compliance with any term or provision of this Agreement, or inaccuracy or incompleteness of any representation or warranty herein, or the fault, negligence or willful misconduct, whether active or passive, of Subcontractor or any of Subcontractor's third party vendors or Subcontractors, or their respective directors, officers, employees, agents, servants, representatives or any other person directly or indirectly acting on their behalf or under their direction or control.

Subcontractor shall defend, indemnify and hold harmless Contractor, its Affiliates, and each of their officers, directors, employees, invitees, consultants, contractors, representatives and agents and any other person directly or indirectly acting on any of the foregoing's behalf or under their direction or control (collectively, the "Contractor Indemnified Parties") from and against any and all Claims of whatever nature, including all fees and expenses of legal counsel, legal proceedings, investigations or dispute resolution costs which may be brought against Contractor Indemnified Parties or which Contractor Indemnified Parties may incur, suffer, sustain or pay to the extent caused by:

(A) any breach or non-compliance with any term or provisions of this Agreement, or inaccuracy or incompleteness of any representation or warranty, by Subcontractor;

(B) the fault, negligence, or willful misconduct, whether active or passive, of Subcontractor or any third party Subcontractor, or their respective directors, officers, employees, agents, servants, representatives or any other person directly or indirectly acting on their behalf or under their direction or control (or any acts or omissions of Contractor, Other subcontractors or their respective employees or agents while acting under the direction and control of Subcontractor or any of Subcontractor's third party vendors or Subcontractors or their respective employees or agents), related to this Agreement or the performance or non-performance of the Work hereunder;

(C) any taxes or third party obligations, or any related contributions and penalties, imposed on Subcontractor or Contractor by any Governmental Authority or other authority, to the extent payable by and the responsibility of Subcontractor as a result of the Agreement;

(D) the failure of Subcontractor or any of Subcontractor's third party vendors or Subcontractors to comply with the Law, including any fine, penalty, sanction imposed or assessed by any Governmental Authority relating to such failure, related to this Agreement or the performance or non-performance of the Work hereunder;

(E) any patent, trademark, copyright, industrial design, or other intellectual property infringement pertaining to any equipment, machinery, materials, compositions, processes, methods or designs, specified for use or used by Subcontractor in connection with the Work, except for those supplied or specified for use by Contractor to Subcontractor;

(F) all Liens and claims made or liability incurred by Contractor on account of the Work performed or materials supplied by any Subcontractor, including fees and expenses of legal counsel, but only to the extent Subcontractor has been paid by Contract all amounts due under this Agreement; and

(G) any of Subcontractor Prepared Documents being incorrect or inconsistent with the Agreement or the Law.

Subcontractor shall, at its sole cost and expense, if requested by Contractor, defend any Contractor Indemnified Party entitled to be indemnified under this article. Contractor shall have the right, if it so elects, to participate in any such defence and Subcontractor shall have the right to settle claims without first consulting Contractor, provided that if any settlement of any Claim would lead to liability or create any financial or other obligation on the part of any Contractor Indemnified Party, Subcontractor shall not enter into any such settlement without the consent of Contractor. If Contractor, acting reasonably, considers that the failure to settle any claim, demand, action or proceeding to which it or others are entitled to be indemnified by Subcontractor would be detrimental to its interests, it may so notify Subcontractor, and if, within ten (10) Days thereafter, Subcontractor fails to conclude a settlement with the claimant, then Contractor may, in its sole discretion, settle the claim, demand, action or proceeding in such amount as it considers reasonable and

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Subcontractor agrees to immediately pay to Contractor all or such portion of the amount so paid in settlement as Contractor, in its sole discretion, designates as Subcontractor's liability.

The obligations of Subcontractor under this article shall not be construed to negate, abridge or reduce other rights or remedies of any Contractor Indemnified Parties which would otherwise exist.

Contractor shall indemnify and hold harmless Subcontractor and its officers, directors, employees, consultants, and agents (collectively, the "Subcontractor Indemnified Parties") from and against any and all Claims which may be brought against Subcontractor Indemnified Parties or which Subcontractor Indemnified Parties may incur, suffer, sustain or pay arising out of or in connection with any Claims which arise on account of and are attributable to:

(A) a lack of or defect in title or an alleged lack of or defect in title to the Work Site;

(B) an environmental condition at the Work Site which is the responsibility of the project;

(C) Hazardous Materials supplied by Contractor in connection with this Agreement and while under Contractor's care and control;

(D) defective Project Supplied Materials; and

(e) the negligence or willful misconduct of Contractor Indemnified Parties.

If Contractor accepts the responsibility to indemnify a Subcontractor Indemnified Party, then it shall be entitled to retain and instruct legal counsel to act for and on behalf of such Subcontractor Indemnified Party and to settle, compromise and pay any claim, demand, action or proceeding without obtaining prior approval from the Subcontractor Indemnified Party in whose favor the indemnity has been provided. Subcontractor shall, and shall cause any other Subcontractor Indemnified Party to co-operate in all respects in contesting any third party claim for which Contractor has accepted responsibility.

The obligations of Contractor under this article shall not be construed to negate, abridge or reduce any other rights or remedies of any Subcontractor Indemnified Party which would otherwise exist.

Notwithstanding anything else in the Agreement, neither Party shall be liable to the other Party for consequential, incidental or indirect damages, except (i) to the extent of amounts recoverable under a policy or policies of insurance required to be maintained pursuant to the provisions of the Agreement, whether required to be maintained by Subcontractor or Contractor, (ii) the obligation to indemnify and defend against third party Claims arising in tort for bodily injury and property damage pursuant to article 32, or (iii) as caused by the applicable Party's willful misconduct or gross negligence.

Notwithstanding anything else in this Agreement, the maximum liability of either Party under this Agreement, whether based on tort, strict liability, breach of contract or otherwise, shall be limited to the Price, except: (i) to the extent such liability arises from the Party's fraud, gross negligence or willful misconduct; (ii) amounts recoverable under a policy or policies of insurance required to be maintained by the indemnifying Party hereunder shall be in addition to the cap on liability in this section; or (iii) pursuant to the obligation to indemnify and defend against third party Claims arising in tort for bodily injury and property damage pursuant to this Article.

Warranty:

Subcontractor represents and warrants that it has the requisite competence, skill, physical resources, and number of trained, skilled, and licensed personnel (qualified by education and experience to perform its assigned tasks), required hereunder and that it has and shall maintain the capability, experience, registrations, licenses, permits, and government approvals required to perform the Work herein.

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Subcontractor shall be duly incorporated and validly existing under the Law and it is registered and qualified to do business and perform the Work in each jurisdiction in which the Work is to be performed.

Subcontractor hereby warrants and guarantees that all Subcontractor furnished materials will be merchantable, new, unless specifically noted otherwise in the Subcontract Documents, and will be free from defects in design, workmanship, and materials; and that all Work shall be (i) performed in accordance with the industry practices within the industry prevailing at the time of the Agreement (ii) performed in compliance with all applicable federal, state or local laws, ordinances, and regulations, including all Environmental Requirements, Safety and Health Requirements, 29 CFR part 470 (the Beck Notice), and all applicable judicial decrees or voluntary remediation agreements; (iii) performed in conformance with the Subcontract Documents for the specific Project; (iv) suitable for its intended purpose as specified in the Subcontract Documents or as otherwise known by Subcontractor; (v) fit for the particular purpose intended by the Subcontract Documents; (vi) fully tested pursuant to the Subcontract Documents; and (vii) performed in a manner that does not infringe any patent, copyright, trade secret right, trademark right, or any other intellectual property or proprietary right of any third party.

In addition to Subcontractor's warranty obligations, Subcontractor agrees when applicable to the Work to be performed under this Agreement, at any time during the term of this Agreement, to repair, re-perform or replace, at Contractor's option, any Defective Work (including, without limitation, materials). All costs and expenses associated with access to or repair or replacement of Defective Work, including all transportation costs, shall be paid by Subcontractor, and Contractor may charge Subcontractor all expenses of unpacking, examining, repacking, and reshipping any rejected Defective Work. This obligation shall extend for a period of one year from the date of final payment or from the completion date for a specific Project, whichever occurs later. All warranties for any repaired or replaced Defective Work shall be extended to one year from the date of Contractor's acceptance of the repaired or replaced Defective Work or for the duration of the unused warranty period if such period is longer; however, in no event shall the Warranty Period exceed an aggregate of twenty-four (24) months. Subcontractor shall maintain equipment and replace Work damaged as a consequence of Defective Work, all without any cost to Contractor.

With respect to any materials or equipment procured by Contractor from a vendor, Contractor's liability for such materials and equipment shall be limited to "passing through" to Company the benefits of any warranty received from the applicable vendor to Company. The foregoing warranties are in lieu of all other express, implied and/or statutory warranties.

Hazardous Materials

"Hazardous Material" means any pollutant, contaminant, constituent, chemical, mixture, raw material, intermediate product, finished product or by-product, hydrocarbon or any fraction thereof, asbestos or asbestos-containing material, polychlorinated biphenyls, or industrial, solid, toxic, radioactive, infectious, disease-causing or hazardous substance, material, waste or agent, including all substances, material or wastes which are identified or regulated under any Law or the Policies and Guidelines or which may threaten life or property or adversely affect human, animal or vegetation health or the environment

Subcontractor shall examine the Project Sites involved in performing the Work and shall secure full knowledge of all reasonably ascertainable conditions under which the Work is to be executed and completed.

Subcontractor shall not perform any Work in which it uses or incorporates, in whole or in part, any Hazardous Materials in violation of any such Environmental Requirements, or in such a manner as to leave any Hazardous Materials which could be hazardous to persons or property or cause liability to Contractor. Subcontractor shall notify Contractor in writing upon receipt of any material at the Project Site requiring Material Safety Data Sheets (MSDS), and Subcontractor shall promptly provide the MSDS; furthermore, Subcontractor shall remove all unused materials and Subcontractor Waste Materials from the Project Site upon completion of the Work and properly dispose of all such Waste Materials.

Unless the release of Hazardous Materials is the subject of the Project, Subcontractor shall upon discovery of an existing or suspected release on or at the Project Site, cease Work in that area, immediately contact the Contractor's Designated Representative and notify Contractor in writing. If the release is subject to reporting pursuant to any Environmental Requirements, Subcontractor shall timely report the release to governmental authorities, or ensure in a timely manner Contractor's Representative is notified and reports the release to governmental authorities. Subcontractor shall continue Work at the Project Site in the areas unaffected by the release unless otherwise advised by Contractor. Upon receiving

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Contractor's prior written approval, Subcontractor shall remove and properly dispose of all Hazardous Materials and Waste Materials in compliance with all applicable federal, state, and local requirements governing such Hazardous Materials and removal, transportation, and disposal thereof. Upon request, Subcontractor shall provide Contractor with a copy of any licenses, permits, or manifests used in connection with the disposal of any Hazardous Materials or Waste Materials.

In the event Subcontractor transports Waste Materials to an off-site facility (or facilities) for treatment and/or disposal, Subcontractor shall ensure that such facility is in compliance with all Environmental Requirements.

Subcontractor shall handle and preserve, all Waste Materials samples, cuttings, or Hazardous Materials taken for characterization or other like reasons in a manner consistent with the level of care and skill exercised by other Subcontractors under similar circumstances at the time the samples are obtained.

Safety

The Subcontractor acknowledges Contractor's drug free workplace policy and agrees employees shall be subject to pre-employment and random testing in accordance with the Contractor's policy.

Subcontractor shall comply with all applicable local and federal safety and health requirements and laws, regulations, order, directives, codes and guidelines, including OSHA. Subcontractor shall also comply with Owner Safety and Security Requirements as attached by Exhibit, and do so without demanding further compensation from Contractor for such compliance. Site specific safety training will be required. All training will be at Subcontractors sole cost.

Subcontractor represents and warrants that it has an effective health and safety management system that ensures the Work at the Work Site will be carried out safely and in compliance with OHS Legislation and the Agreement. More specifically, Subcontractor represents and warrants that its health and safety management system includes (i) safe work procedures and policies; (ii) safety orientation courses; and (iii) any other operational controls (the "Safety Programs"), all of which meet or exceed the safety requirements of all OHS Legislation and the specifications provided by Exhibit attached as Occupational Health and Safety Specifications for Prime/General Contractors.

Subcontractor shall undertake and implement all safety measures, precautions and programs, including any special precautions which may be required due to hazardous or otherwise dangerous parts of the Work and shall provide all necessary protection to prevent damage, injury or loss to:

(a) All persons performing the Work and all other persons who may be affected by the Work;

(b) All the Work and all materials and equipment whether in storage on or off the Site, under the care, custody or control Subcontractors or agents; and

(c) Other property at the Site or adjacent areas, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

Subcontractor shall comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority having jurisdiction for the safety of persons or property to protect them from damage, injury, or loss. As required by law, existing conditions, and the progress of the Work, Subcontractor shall erect, maintain, and otherwise implement all such safeguards necessary for safety and protection. Such safeguards shall include, but are not limited to, posting danger signs and other warnings against hazards, promulgating safety procedures and notifying owners and users of adjacent facilities.

Contractor and Company shall have the right to stop any work at the Work site which is thought to be unsafe or not in conformity with OHS Legislation or the Site Specific Safety Plan.

Subcontractor shall exercise the utmost care when the use or storage of explosives or other Hazardous Materials or equipment is necessary for the performance of the Work. Subcontractor shall place all explosives or Hazardous Materials under the supervision of properly qualified personnel in accordance with all existing laws, ordinances, codes, rules, regulations, orders, and decisions of all governmental authorities having jurisdiction over the Project Site.

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In any emergency affecting the safety of persons or property arising out of the Work, Subcontractor shall act immediately (i) to prevent threatened damage, injury, or loss, and (ii) contact the Contractor's Designated Representative of such emergency.

Substance Abuse Policy

a) For Projects that involve natural gas pipelines or liquefied natural gas facilities, the Department of Transportation (DOT) has instituted rules to control the use of drugs and alcohol in the Natural Gas and Hazardous Liquid Pipeline Industry as well as at Liquefied Natural Gas (LNG) facilities. All contractors that have employees who work in positions covered by the applicable regulations are required to establish an anti-drug and alcohol testing program that complies with (1) 49 CFR Parts 199 and 40 of the DOT Regulations and/or (2) applicable state requirements for natural gas pipelines or LNG facilities. The Subcontractor warrants that all of its employees performing Work for the project are in compliance with the above referenced regulations and such anti-drug and alcohol testing programs.

Personal Protective Equipment (PPE) shall be worn and properly utilized, at all times, by Subcontractor's employees while on the job site or while undertaking any work associated with the Project. Subcontractor shall furnish, at its own expense, any necessary material and/or training to conform to these requirements.

Owner's employees or agents may stop work or require corrective action should they determine, in their sole discretion, that Subcontractor's work procedures or equipment do not comply with applicable safety requirements. Owner's decision to stop or alter Subcontractor's unsafe work procedures or equipment shall not obligate Owner or Contractor to reimburse Subcontractor for any associated lost time or other costs. Such costs shall be the sole responsibility of the Subcontractor

Prior to commencement of construction activities, Subcontractor shall make the necessary notification(s) to the appropriate utility warning one call system(s). In areas not covered by one call systems, Subcontractor shall notify Operators of any foreign facilities encountered during construction.

Subcontractor acknowledges that it has received, read, understands, and will comply with the Minimum Requirements For Pipeline Construction In Close Proximity To High Voltage A.C. Overhead Electric Power Lines and shall comply with all requirements and standards therein.

Operator Qualification

For Projects that involve natural gas pipelines or liquefied natural gas facilities, the DOT has instituted rules establishing the requirements and responsibilities for the qualification of individuals who perform covered tasks as defined within 49 CFR, Part 192. If required by Owner or 49 CFR, Part 192 prior to October 28, 2002 and for all Projects which involve covered tasks as defined in 49 CFR, Part 192 after October 28, 2002, Subcontractor shall provide and maintain a written plan identifying its DOT Operator Qualification program that meets the requirements of 49 CFR, Part 192, Subpart N and Owner's approval. The Subcontractor shall certify that all of its employees performing Work for the project are in compliance with the above referenced regulations and any subsequent regulations issued by DOT. Subcontractor shall use only qualified employees to perform covered tasks and provide Contractor with documentation of any modifications that are made in its written plan or its employee's qualifications to perform those covered tasks (at an interval of not less than once per month).

Confidential Information

During the term of this Agreement and thereafter, except as Contractor may authorize in writing, Subcontractor shall (i) treat and cause to be treated as confidential all Confidential Information; (ii) not disclose any Confidential Information to any third party or make available any reports, recommendations, extracts, summaries, analysis or conclusions based on the Confidential Information; (iii) reveal the Confidential Information only to those employees of Subcontractor who require such access in order to perform the Work hereunder; (iv) grant access to Confidential Information only to employees of Subcontractor who have signed a confidentiality agreement (v) use or grant access to Confidential Information only in connection with the performance of Work pursuant to this Agreement; (vi) make copies of any tangible embodiment of Confidential Information only as necessary for the performance of such Work; (vii) remove any tangible

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embodiment of Confidential Information from the premises of Owner (viii) maintain the security of Confidential Information; and (ix) maintain policies and procedures and comply with all applicable laws and regulations to detect, prevent and mitigate the risk of loss, unauthorized access, use, modification, destruction or disclosure of Owner's and its Affiliates' Confidential Information.

Subcontractor may disclose only such Confidential Information as is necessary to comply with a regulatory, legal, or governmental request and only after providing immediate notification to Contractor and Owner allowing sufficient time for Owner to seek a protective or limiting order or otherwise prohibiting the disclosure of the requested Confidential Information as Owner deems necessary in its sole discretion. Subcontractor shall act in good faith to assist to seek a protective order or order limiting disclosure.

In performing the Work, at a minimum, Subcontractors shall employ industry standard data and system security measures for securing Confidential Information so as to reasonably ensure that Confidential Information is not lost or stolen, or otherwise used, modified or accessed, attempted to be accessed, or allow access to any third party without Owner's prior express written approval or by any Subcontractor employee or agent who is not authorized to access the Confidential Information. Subcontractors shall upon discovery of any breach of security or unauthorized access, immediately: (i) notify Contractor and Owner of any loss or unauthorized disclosure, possession, use or modification of the Confidential Information or any suspected attempt at such activity or breach of Subcontractors' security measures, by any person or entity; (ii) investigate and take corrective action in response thereto; and (iii) provide assurance to Owner's reasonable satisfaction that such activities or breach or potential breach shall not reoccur.

While at Owner's or its Affiliate's facilities or using Owner's or its Affiliate's equipment or accessing Owner's or its Affiliate's systems (including telephone systems, electronic mail systems, and computer systems) Subcontractors and their respective personnel shall observe and follow all applicable Owner or Affiliate policies and standards, including those policies relating to security of and access to Confidential Information as such policies and standards are modified and supplemented from time to time. Applicable policies will be made available upon request.

Upon termination of this Agreement, excluding one (1) complete set of documents for Subcontractor's records, the Subcontractor, shall either return the Confidential Information, at Owners sole discretion, to Contractor or Owner or comply with the following minimum standards regarding the proper disposal of Confidential Information: (i) implement and monitor compliance with policies and procedures that prohibit unauthorized access to, acquisition of, or use of Confidential Information during the collection, transportation and disposal of Confidential Information; (ii) paper documents containing Confidential Information shall be either redacted, burned, pulverized or shredded so that Confidential Information cannot practicably be read or reconstructed; and (iii) electronic media and other non-paper media containing Confidential Information shall be destroyed or erased so that Confidential Information cannot practicably be read or reconstructed.

If Subcontractors provision of Work involves the processing of Confidential or other information so as to place Subcontractors in a position to observe indicators of identity theft (e.g. consumer fraud alerts, notifications or warnings; suspicious documents, personal identification information, or activity; or notice from customers, law enforcement or others regarding identity theft), Subcontractors shall: (i) maintain policies and procedures to identify, detect and respond to Red Flags, substantially in accordance with Owner's program regarding such Red Flags, as updated from time to time, a current copy of which will be made available upon request, (ii) report the detection of any such Red Flags to Owner; and (iii) take appropriate measures to prevent or mitigate the risk of identity theft that may arise in the performance of such Work.

Ownership of Work Product

Any and all products of the Work performed by Subcontractor and any of its employees under this Agreement used in connection with this Agreement, including all inventions, discoveries, formulas, processes, devices, methods, compositions, compilations, outlines, notes, reports, system plans, flow charts, source codes, and other forms of computer software, algorithms, procedures, policies, data, documentation, and other materials or information which Subcontractor or any of its employees may conceive, invent, author, create, reduce to practice, construct, compile, develop, or improve in the course of performing the Work or otherwise delivered to Owner as part of the Work (collectively, "Work Product") shall be the sole and exclusive property of Owner from and after the time it is created.

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Subcontractor agrees to disclose to Contractor and Owner the existence of any Work Product of which Owner would not otherwise be aware promptly upon its creation.

Subcontractor agrees to assign and hereby does assign to Owner (together with its successors and assigns) the sole and exclusive right, title, and interest in all Work Product, including any and all related patent, copyright, trademark, trade secret, and other property or proprietary rights of any nature whatsoever. Subcontractor warrants and agrees to execute and deliver to Owner, and Subcontractor and the employees of Subcontractor to execute and deliver to Owner, any and all documents that Owner may reasonably request to convey to Owner any interest Subcontractor, or any of its employees may have in any Work Product or that are otherwise necessary to protect and perfect Owner's interest in any Work Product. Subcontractor further warrants and agrees to take, and Subcontractor agrees to cause Subcontractor's employees to take, such other actions as Owner may reasonably request to protect and perfect Owner's interest in any Work Product. Subcontractor further agrees that the sums paid to Subcontractor by Contractor in connection with Subcontractor's performance of the Work serve, in part, as full consideration for the foregoing assignment, and that said consideration is fair and reasonable, and was bargained for by Subcontractor. Subcontractor represents and warrants that it has full right, power, and authority to grant the assignment granted under this Article.



Columbia Gas Transmission, LLC

Mountaineer XPress Project

Traffic Management Plan

July 2017

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INTRODUCTION

Columbia Gas Transmission, LLC (Columbia) developed this Traffic Management Plan to describe measures CPG and their contractors will implement to minimize potential impacts on all public accessible federal, state, and local roadways during the construction of the Mountaineer XPress Project (MXP) located within multiple counties throughout the state of West Virginia. This plan outlines traffic control measures to reduce public impact, measures to achieve the highest level of safety, and roadway restoration measures during and post MXP construction activities. Areas of high risk include pipeline crossings at public roadway rights-of-way, temporary and permanent pipeline access driveways, equipment yards, pipe storage yards, field offices, and an increase of commuting traffic for construction personnel; however, the measures outlined in this plan will reduce potential impacts to the general public traversing these roads and ensure that appropriate measures are in place to safely construct the project.

TRAFFIC CONTROL

MXP construction activities such as; utility crossings of public roadways, temporary and permanent driveways, and roadway repairs/upgrades require coordination with the West Virginia Division of Highways (WVDOH). All work within the WVDOH Legal-Right-of-Way (LRW) must be submitted for approval by the WVDOH and require an appropriate Traffic Control Plan. An approved permit to conduct such work must remain on site or the nearest job trailer for reference. Typical traffic control measures include flaggers, warning lights, signs, and barriers per the WVDOH *Manual on Temporary Traffic Control for Streets and Highways*, *Second Printing, March 2006*. The pipeline will be buried to the depth required by the WVDOH utility crossing permits, and will be designed to withstand the anticipated external loadings.

Public traffic detours on public roadways may be required during certain pipeline construction activities. Activities that may require roadway detours include, but are not limited to open cut pipeline crossings of public roads or public roadway repairs/upgrades. As required by WVDOT, all public roadway detours will follow the traffic control procedures outlined in Section 636, 657 and 715 of the *West Virginia Department of Transportation, Division of Highways, Standard Specifications, Roads and Bridges*, *adopted 2010* and the aforementioned traffic control manual. Continual monitoring of the detour route will be necessary to ensure the signs along the route do not become damaged or misleading to the general public. The detour signs

will then be removed and existing road signs will be returned to their original state upon completion of the construction that forced the road closure.

All pipeline activities that would require a detour shall be sequenced to minimize overlapping detours or multiple traffic control zones along a particular portion of public roadway that may expose drivers to sequential delays. To ensure the safety of construction workers and the public, Columbia contractor(s) shall maintain traffic flow for emergency vehicles whenever possible. All necessary construction materials to complete the activity should be onsite before work begins, including steel plating for emergency situations. The following additional traffic control measures shall be implemented: Additional warning signs are to be placed on major intersecting roadways as directed by WVDOT and access to all businesses and dwellings will be maintained during all phases of construction.

For most open cut crossings of WVDOH roadways, CPG intends to maintain traffic across the crossing, in lieu of establishing a detour. At these open cut crossings, traffic will be maintained as a single lane with flaggers in accordance with Case A5 of the *WVDOH Manual on Temporary Traffic Control for Streets and Highways, Second Printing, March 2006*. The construction sequence includes, establishing traffic control in accordance with the aforementioned figure, and then proceeding to excavate the pipeline trench. If the excavation results in delays to public traffic for 15 minutes, the excavation will be stopped, and a road plate will be placed across the trench to allow traffic to proceed. Steel plates used for such purpose shall be securely pinned and ramped on each approach to allow traffic flow. This operation would continue until the trench is fully excavated. Then, single lane traffic would be maintained on road plates until the pipe section is ready for installation. The pipe section will be fabricated outside of WVDOH legal right of way. After the pipe section is prepared, traffic will be stopped, the road plates will be removed, and the pipe section placed into the trench. If this process results in delays to public traffic for 15 minutes, the road plates will be placed, and traffic accommodated across the trench. While traffic is stopped, flowable fill will be placed around the pipe for backfill. After the flowable fill is placed, and the right of way cleared, traffic would be opened to normal operations. The road plates would remain over the trench until the flowable fill is cured. Final restoration of the crossing will be completed after the pipeline right of way has been reclaimed, and in accordance with the details associated with the WVDOH crossing permit. For locations where public traffic cannot be maintained, a detour shall be

established. In these cases, road plates will still be available to provide emergency access across the pipe trench.

Columbia contractors shall utilize the 811 "One Call" system two days prior to any excavation activity, to allow state and local utility operators, to verify and mark all known underground utilities located near the construction area. In the event that other utilities are inadvertently disrupted by MXP activities, MXP will insure restoration to those utilities as quickly as possible. Columbia contractors shall also provide 48 hour notification to the local WVDOH District Oil & Gas Coordinator prior any construction activity associated with the approved permit.

Traffic control measures for roadway repairs are cited in the Roadway Sustainment Section of this Traffic Management Plan.

After this natural gas pipeline is in service, operations and maintenance activities will be conducted with light, passenger-type vehicles. To minimize the impact to roadways and traffic, repairs and/or replacement of the installed pipe will be done from outside of the roadway right-of-way when possible. When the repairs are required inside of the roadway right-of-way, the pipeline will be abandoned by removing the line from service, filling the pipe with an appropriate grout, and capping both ends. A new crossing will be installed a safe distance from the existing pipe and tied into the existing pipeline.

TRAFFIC AWARENESS AND RESTRICTIONS

The daily commuting of the construction workforce to the project areas may temporarily affect traffic; however, measures will be taken to minimize these occurrences. Columbia has designated various types of workspaces (pipe storage, contractor yards, staging areas, etc.) as the primary parking areas for employees' personal vehicles. Workers would then be transported from primary parking area(s) to the construction site in buses provided by the contractor(s) to reduce the volume of traffic on public roadways.

In addition to the construction workforce, the delivery of construction equipment and materials to the work areas may temporarily affect traffic. The construction equipment would be initially staged at pipe storage and/or contractor yards and then transported to the pipeline construction right-of-way via designated haul roads. Haul roads have been identified by the

Columbia team and are currently being reviewed by WVDOT. The equipment and/or materials will be delivered at a temporary workspace adjacent to the pipeline right-of-way. To minimize distributions to traffic on local roads, lager arterial highways will be used as much as practicable to transport the construction equipment and materials to the project sites. As construction progresses, much of the equipment and materials will be transported along the pipeline right of way, reducing the potential disruption to traffic. As a result, most equipment would be located within the pipeline right-of-way for the majority of its use. An exception to this would be at public road crossings. Columbia contractors shall not unload materials or equipment within public right-of-way, unless specifically indicated within the applicable permit.

The MXP pipeline utility crossings are typically designed and permitted to have temporary rock construction entrances on both side of the public road, within the pipeline right-of-way, to traverse equipment from one side of the public road to the other. The purpose of the rock entrance is to prevent or reduce the amount of debris tracked onto the public roadway from construction vehicles. In the event debris does enter the publically traveled way, Columbia contractor(s) shall use water trucks, power washers, sweeping and/or vacuuming equipment to remove debris off the travel way as quickly as possible. Columbia contractor(s) shall also abide by all traffic control measures outlined in the applicable permit. In the interest of public safety, Columbia will provide 48 hour notice to WVDOH before beginning construction of any driveway or public road crossing, or road closure, so that public notices can be provided to federal, state and local emergency responders.

All Columbia contractors with Commercial Motor Vehicles (CMV), as defined in the *WVDOH Commercial Driver's License (CDL) Rules and* Regulations *Manual*, shall abide by the annually posted *WVDOH High Travel Days, Events and Other Restriction Where Travel is Not Allowed*. A more detailed summary of these dates/times can be viewed in the References section of this Traffic Management Plan.

MXP construction activities will require numerous oversize and/or overweight (OS/OW) vehicles to travel on designated haul routes and Columbia contractors are required to utilize the WVDOH wvgotpermits.com permitting system for such vehicles and abide by any and all additional OS/OW permit restrictions. These additional restrictions include but are not limited to; furnishing sufficient flagmen or pilot vehicles to protect traffic along the public roads, restricting construction traffic when the surface of highways is made hazardous by rain, sleet, snow, ice, or when movement is made hazardous by fog or wind, parking the vehicle at the first convenient

location off the travel way to permit passing when the normal flow of other vehicular traffic travel at a higher speed than contractor's vehicles. OS/OW vehicle definitions are outlined the *West Virginia Code Chapter 17C, Article 17*.

ROADWAY SUSTAINMENT

Columbia is required by WVDOT to execute an Oil and Gas Bonding Agreement pursuant to the WVDOT Oil & Gas Road Policy Addendum. These Agreements will necessitate that Columbia designate public access roads to be used by the Project, and maintain certain classifications of roadways "as good or better" than their condition before use has occurred. Columbia will document the condition of these roadways before use begins by geo-tagged High Definition windshield videos, mobile LiDAR scanning, 360° imagery and supplemental photographs of critical locations. Columbia shall accompany WVDOH if requested to meet to determine if the roadway meets the requirements of both WVDOH and Columbia. If damages occur on a bonded road as a result of Columbia's activities, the parties will agree upon the appropriate method of repair. All work will be performed by WVDOT workforce or by contractors approved by WVDOT and Columbia. The parties will ensure that all work meets the WVDOT standards and specifications. Upon completion of the MXP pipeline and Columbia's use of the bonded roads, Columbia shall notify WVDOH. Columbia shall coordinate with WVDOH to resolve any outstanding roadway issues to insure release of Columbia's bond.

Columbia will develop an in-house notification process where developing roadway maintenance issues are documented and addressed. All transportation operators for Columbia will be instructed to notify roadway maintenance managers of developing roadway problems so they can be addressed in a proactive manner. The *West Virginia Department of Transportation Division of Highways Standard Detail Book, Volume I, dated May 2016 & Volume II, dated January 1, 1994*, along with the *West Virginia Department of Transportation Division of Highways 2010 Edition Typical Sections and Related Details* shall apply to all roadway projects. Columbia will coordinate with WVDOH to develop details for the *Roadway Maintenance for Roads Maintained Under the West Virginia Oil and Gas Road Policy*.

Typical repair types may include:

- Repair of potholes in paved roadways with a Pot-Hole Repair detail.

- Repair of minor damage on paved roadways by patching with asphalt according to a Mill & Fill detail.
- Repair of roadway base failures with an Undercut detail or Base Failure – Repair detail.
- Restoration of surface treatment roadway surfacing by application of new surface treatment.
- Restoration of major damages to paved roadways by reconstruction and/or asphalt overlay per the Resurfacing – One Course detail.
- Repair of minor damages to gravel roadways by regrading and/or adding additional aggregate.
- Restoration of major damages to gravel roadways by reconstruction or gravel overlay in accordance with the Stone Stabilized Roadway detail.
- Repair of damages to roadway shoulders with a Shoulder Reconstruction detail or Edge Failure Repair detail.

Aforementioned repair details shall be per the *West Virginia Department of Transportation* Division *of Highways Standard Detail Book, Volume I, dated May 2016 & Volume II, dated January 1, 1994*. Columbia shall develop additional details for atypical repairs and coordinate with the WVDOH for approval.

Columbia will distribute and review the approved haul routes to the contractors in multiple formats to insure off-routing is limited. Columbia holds off-routing of construction vehicles to an excessive standard because this could potentially cause roadway damage on non-bonded roadways and private land, cause traffic jams, or funnel overweight vehicles to weight restricted structures. Columbia will have direct field personal in additional to contractor staff to assist the direction of construction personal.

The MXP project utilizes a significant amount of unpaved haul routes located in a rural setting. Therefore, Columbia contractors are prepared to implement dust suppression measures as necessary during MXP operations. The predominant method of dust suppression will be controlled by periodic surface wetting using water trucks. Columbia Contractor(s) may propose the use of tackifiers for a longer term dust suppression, provided that the proposed product has been approved by WVDOH.

Roadway deterioration may occur on MXP haul routes and require emergency roadway repairs. Through the WVDOH permitting process of haul routes, Columbia has provided a 24/7 Road Maintenance Contact and a 24/7 Backup Contact to WVDOH for such emergencies. These 24/7 contacts shall coordinate with the WVDOH to quickly determine and implement the safest temporary emergency repair method that will open the roadway back the traveling public and Columbia operators. Once a temporary solution is implemented, Columbia will coordinate with the WVDOH to determine a long term roadway repair solution that will remain post Columbia operations.

Columbia has designated contact personal for all permits required by the WVDOH and these shall be located at all construction locations that are in effect within the WVDOH right-of-way or nearby field office. Columbia contractors shall have access to all Columbia contacts and WVDOH contacts. In the event that any issue arises that affects or potentially affects the traveling public, Columbia field personal shall immediately contact the Columbia and WVDOH 24/7 contact personal noted on the applicable permit.

A permit application has been filed with WVDEP that includes detailed drawings and plans to control potential erosion and sedimentation from the MXP project footprint. Specific plans to restore and stabilize slopes over 30% grade (both during and after construction), as well as, all associated disturbance, are included in the application. If the standard slope stability practices are not sufficient, or if slope stability has the potential to affect the integrity of public roadways, or if WVDOH has cause for concern that the proposed slope design will affect the integrity of the roadway, Columbia will involve WVDOH in the development of additional slope stability mitigation measures and WVDOH will approve before it is implemented.

REFERENCES

The Columbia team has used, but are not limited to the following references in preparation of this Traffic Management Plan. Columbia and its contractor(s) shall utilize the following references to comply with all applicable Local, State/Commonwealth and Federal Agency laws and regulations.

- *West Virginia Department of Transportation, Division of Highways, Standard Specifications, Roads and Bridges*, *adopted 2010*:
  - http://www.transportation.wv.gov/highways/contractadmin/specifications/2017StandSpec/Documents/2017_Standard.pdf
- *West Virginia Department of Transportation, Division of Highways, Manual on Temporary Traffic Control for Streets and Highways*, *Second Printing, March 2006:*
  - http://www.transportation.wv.gov/highways/engineering/Manuals/Traffic/TCM_06L.pdf
- *High Travel Days, Events and Other Restrictions Where Travel is Not Allowed*:
  - http://www.transportation.wv.gov/highways/maintenance/hauling_permits/Documents/HIGH%20TRAVEL%20DAYS.pdf
- *West Virginia Code Title 157 Legislation Rule Department of Transpiration Division of Highways Series 5 Traffic and Safety Rules*:
  - http://apps.sos.wv.gov/adlaw/csr/readfile.aspx?DocId=9922&Format=PDF
- *West Virginia Code Chapter 17C. Traffic Regulations and Laws of the Road Article 17. Size, Weight, and Load:*
  - http://www.legis.state.wv.us/WVCODE/ChapterEntire.cfm?chap=17c&art=17
- *West Virginia Department of Transportation Division of Highways Standard Detail Book, Volume I, dated May 2016 & Volume II, dated January 1, 1994:*
  - http://www.transportation.wv.gov/highways/engineering/StandardDetails/Vol1/2015StandardDetailsVolume1%2011-2-2015.pdf
  - http://www.transportation.wv.gov/highways/engineering/Pages/Revised-Standard-Details-Volume-2.aspx
- *West Virginia Department of Transportation Division of Highways 2010 Edition Typical Sections and Related Details:*
  - http://www.transportation.wv.gov/highways/engineering/Typicals/2010%20Typical%20Sections%20and%20Related%20Details.pdf
- *West Virginia Department of Transportation Division of Highways Oil and Gas Policy Addendum, dated February 5, 2013*
  - http://www.transportation.wv.gov/highways/policies/Documents/OilAndGasPolicyAddendum.pdf
- *West Virginia Department of Transportation, Division of Highways, Manual on Rules and Regulation for Constructing Driveways on State Highway Rights of Ways - May 2004*
  - *http://www.transportation.wv.gov/highways/engineering/Manuals/Traffic/Driveway.pdf*

- *West Virginia Department of Transportation, Division of Highways, Accommodation of Utilities on Highway Right of Way and Adjustment and Relocation of Utilitu Facilities on Highway Projects, dated June 15, 2007*
    - *http://www.transportation.wv.gov/highways/engineering/files/ACCOMMODATION_OF_UTILITIES.pdf*

Contact Information			
Statewide	Marvin Murphy (304) 558-2804 Marvin.G.Murphy@wv.gov	Gary Clayton (304) 842-1556 Gary.K.Clayton@wv.gov	Jacob Bumgarner (304) 420-4648 Jacob.M.Bumgarner@wv.gov
Agency/ District	**Oil & Gas (O&G) Coordinator/ Permits Manager**	**Maintenance**	**48 Hour Notice**
District 6 1 DOT Drive Moundsville, WV 26041	Corey Gast (304) 843-4019 corey.m.gast@wv.gov	Darren Wise (304) 843-4135 Darren.P.Wise@wv.gov	Corey Gast (304) 843-4106 corey.m.gast@wv.gov
District 4 2460 Murphy's Run Road Bridgeport, WV 26330	Mike Roncone (304) 626-5472 Michael.J.Roncone@w.v.gov	John J. Jordan (304) 842-1558 John.J.Jordan@wv.gov	(304) 842-1609
District 3 624 Depot Street Parkersburg, WV 26101	Susan Fought (304) 420-4726 Susan.K.Fought@wv.gov	David Smith (304) 420-4711 David.C.Smith@wv.gov	Susan Fought (304) 420-4646
District 2 801 Madison Avenue Huntington, WV 25712	Gregory Surber (304) 528-5830 Gregory.L.Surber@wv.gov	Robert Mantzel (304) 528-5868 Robert.V.Mantzel@wv.gov	(304) 528-5868
District 1 1340 Smith Street Charleston, WV 25301	Bill Dorsey (304) 356-3864 Bill.L.Dorsey@wv.gov OR Steve Young (304) 558-7836 Steve.Young@wv.gov	Tom Hively (304) 767-5412 Thomas.B.Hively@wv.gov	Tom Hively (304) 767-5412 Thomas.B.Hively@wv.gov

Exhibit H

Mountaineer XPress (MXP)
Pipeline Project

"Site Specific Safety Plan"

Document Control (ID)	**MX00981-WEL-SA-PLN-0001**

Rev. No.	Date	Revision Description	Preparer Name	Reviewer Name	Project Manager	Client (TCPL) Approval
A	1/18/2018	Issued for Review	Welded Safety	TransCanada	Mett Carroll	
B	2/3/2018	Issued for Review	Welded Safety	TransCanada	Mett Carroll	
0	2/12/2018	Issued for Use	Welded Safety	TransCanada	Mett Carroll	
1	2/21/2018	Issued for Use	Welded Safety	TransCanada	Mett Carroll	

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1 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to define a consistent and uniform approach for implementing the Environmental, Health and Safety requirements of Welded Construction, MXP Project. It is the intent to meet and exceed applicable US/regional/state environmental (OSHA, DOT), safety and health standards and owner requirements (**TransCanada's OHPL Specification Rev 1, Excavation Specification Rev 2, and the Temporary Access Roads Specification Rev 0)**. The elements contained in this plan are to establish and assure maximum protection for employees, owner/ agents, authorized visitors, and the environment. The program objectives are to comply with the "spirit" of safety and thereby go beyond the concept of "technical" compliance with the requirements by implementation of concepts that promote continuous improvement. To that extent, actual field practice may often exceed the requirements of this plan. It should be understood that this plan is "evergreen" and subject to periodic review and updating so that it meets the need of project.

This Site Specific Safety Plan has been developed to give instruction and guidance to all MXP Project personnel on the development and implementation of the safety program and act as a "short form" reading document to identify key points of each work procedure. It should identify and incorporate ES&H considerations as related but not limited to the construction of this pipeline. As applicable, various ES&H execution procedures, plans and assessments will be referenced in this document. Welded and any subcontractor will adhere to and enforce the requirements of the TransCanada Safety Management Plan (**SMP**). It will be implemented in this document and training.

1.2 SCOPE

The primary purpose of this Site Specific Safety Plan is to provide a consistent approach for ES&H requirements, for all MXP Project personnel, facilities/offices, subcontractors, and other companies engaged in services while performing work at/for MXP Project.

The Site Specific Safety Plan is built upon Welded Construction's philosophy that every incident is preventable, and with this in mind, forms the basis for ES&H processes, procedures, and requirements that will be implemented on the Project. The ES&H EP will comply with all Welded ES&H policies, Owner, Federal OSHA standards, as well as local government requirements and standards. In an event when one standard differs from another, the most stringent will apply.

The ES&H EP also describes primary roles, responsibilities, accountabilities, and ES&H deliverables. This ES&H EP emphasizes the importance of Senior Management leading a safety program and identifies the responsibilities that they will hold in this regard.

The ES&H EP is a document that is reviewed and updated to reflect changing ES&H requirements and standards in support of a proactive safety culture. All revisions will be coordinated with MXP Project senior leadership and Welded corporate ES&H manager for review and/or approval.

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All Welded employees and subcontractors working on the MXP Project are accountable to uphold the values and principles contained within this document, being responsible for the health, safety, and welfare of themselves and fellow colleagues. It is therefore their primary responsibility to comply with the processes and procedures contained within this plan and to apply them consistently. The ES&H Lead will be responsible for updating this plan in accordance with MXP Project and/or Welded corporate requirements.

Plans, sub-plans and yard specific procedures provide a greater level of detail for particular aspects of the ES&H program are available for review and approval prior to implementation. They describe the methods by which activities shall be undertaken, in accordance with Welded policies and best practices. As applicable, the list below outlines ES&H plans/procedures that may apply to the MXP Project. The MXP Project task will have a hazard assessment completed to identify potential risks. Based on this assessment, relevant plans/procedures/training will be developed to mitigate the identified risks for that specific location.

- Drug, Alcohol, Policy
- ES&H Training Matrix
- Emergency Response Plan
- Respiratory Protection Plan
- Flagger Training & Traffic Management
- Machine/Equipment Personnel Awareness
- Lock Out/Tag Out Plan
- Hazard Identification Awareness
- People Based Safety Program
- Hazardous Work Permit Process
- Short Service (Green Hand) Employee Program
- Stop Work Authority Program
- Hazard Communication
- Incident Reporting, Response, Investigation & Management Process
- Confined Space Operations Procedure
- Lifting & Rigging Operations Procedures
- Excavation & Trenching Operations
- Fall Protection & Prevention - Work at Heights
- Hand and Power Tools Safety
- Safe Material Handling and Storage
- Safety Watches
- Good Catch/Near Miss Program
- Site Specific Steep Slope Plan
- Engineering Preventative Measures
- Temporary Bridge Construction Matting

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- Overhead Power Line Awareness
- Road Bore & Public Safety
- NTD/X-Ray
- Hydrostatic Testing
- Fatigue Management Plan

1.3 ES&H MANAGEMENT PHILOSOPHY

The success of the MXP Project's ES&H programs will be the result of:

- Welded and TrandCanada Management commitment to excellence in ES&H performance at all levels.
- Sensitivity to the needs of employees, customers and the public.

As the General Contractor, Welded will comply with the TransCanada Safety Management Plan. Coordinating and overseeing the performance of work of all employees on the MXP Project. No work will be so important to jeopardize environmental, general public, or employees health

2 ZERO-INCIDENT POLICY STATEMENT

Welded Construction, working for the MXP Project, is committed to avoiding incidents and other unplanned occurrences that result in injury to people, interruption of production, or damage to equipment or the environment.

This policy:

- Applied to every task undertaken, is to take every action necessary in engineering, planning, assigning, and supervising all work operations to establish and maintain safe and healthful working conditions.
- Philosophy is presented to all site personnel during Employee Orientation.

3 ROLES AND RESPONSIBILITIES

The following descriptions outline the ES&H responsibilities for all levels of site management and supervision.

3.1 ES&H Ownership & Management

The Project Manager will hold the Management Team (MT) accountable for ES&H performance. These individuals are responsible for taking immediate action to mitigate any issues.

3.1.1 Project Manager

The Project Manager is the Senior Manager, ultimately responsible and accountable for all work execution including ES&H. Responsibilities are:

- Create an overall project culture and communicate a vision where ES&H considerations are integrated and are given management attention equal to

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cost, quality and schedule.
- Hold the MT accountable for ES&H performance through ongoing review of management system effectiveness.
- Provide the physical and financial resources and management support necessary to carry out ES&H Management System requirements.
- Lead the effort to establish Project ES&H objectives and expectations.
- Lead Steep Slope Work Plan development.

3.1.2 Site Superintendent

The Site Superintendent is ultimately responsible and accountable for all site activities including ES&H. Responsibilities are, but not limited to:

- Create a safety culture on site where ES&H considerations are integrated and are given management attention equal to cost, quality and schedule.
- Require and empower all reports to assert Stop Work Authority obligation as a condition of employment.
- Hold the Site Management Team accountable for ES&H performance.
- Provide the necessary site resources and management support necessary to carry out ES&H Management System requirements.
- Clearly and visibly communicate ES&H goals and expectations to all Site Team Members.
- Assist to ensure identification of drug and alcohol reasonable suspicion based on training.
- Be a champion and support all aspects of the ES&H Management Plan.
- Be a champion and support the Zero Incident Safety Culture on site where incidents are an unacceptable consequence of performing work.
- Lead by positive example.
- Communicate personally with direct reports on ES&H related to their area of responsibility.
- Create a Site culture that embraces continuous ES&H improvement.
- Participate actively in ES&H promotional activities.
- Include ES&H Management in the performance evaluation criterion for line supervisors as well as contractors.
- Communicate and measure employee performance against identified ES&H goals and objectives.
- Participate in all incident investigations.
- Ensure that all equipment that is brought on site is inspected and safe for construction use.
- Champion the PBS and Good Catch/Near Miss programs.
- Assist in leading Steep Slope Work Plan development.

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3.1.3 Assistant Superintendents

Accident prevention through pro-active safety measures is the personal responsibility of the assistant superintendent. Responsibilities are, but not limited to:

- Oversight and assurance of all construction activities in the work areas.
- Provide the necessary motivation to implement, monitor for effectiveness, and fully endorse an effective Zero Incident program.
- Require and empower all reports to assert Stop Work Authority obligation as a condition of employment.
- Delegate areas of special responsibility for the detailed activities needed to carry out the ES&H objectives of the safety program.
- Responsible for ensuring that all construction activities are completed in accordance with the project ES&H objectives and that all of their line management is suitably competent and trained to perform the same.
- Maintain a high visibility for ES&H related processes both in the field and in the office.
- Assist to ensure identification of drug and alcohol reasonable suspicion based on training.
- Responsible for direction of all Construction Activities in their area of responsibility.
- Be thoroughly familiar with project Safety Procedures, Safety Execution Plan, Construction Environmental Control Plan, emergency and evacuation procedures, and any other relevant safety program.
- Conduct at least one safety walk per week with the ES&H Rep for their area.
- Participate in investigations for incidents / injuries.
- Ensure that all equipment that is brought on site is inspected and safe for construction use.
- Support the PBS and Good Catch/Near Miss programs.
- Assist in Steep Slope Work Plan development.

3.1.4 Construction Field Supervision (Foreman, Straw)

Field Supervisors shall be responsible for thoroughly instructing employees in the safe work practices applicable to their work and in enforcing all ES&H requirements. They will act positively to eliminate hazards and unsafe behavior. Supervision assigned to the job-site have the responsibility for hazard recognition for their crews work, task training and conduct of personnel under their control. Front Line Supervisors are the key personnel in the Safety Program because they are in constant contact with their employees. Their specific ES&H responsibilities include, but are not limited to the following:

- Support the Site Specific Safety Plan as presented.
- Require and empower all reports to assert Stop Work Authority obligation as a

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condition of employment.
- Be proactive in keeping safety regulations from being circumvented.
- Treat employees with dignity and respect.
- Observe project personal work habits and take prompt action whenever unsafe behavior is noted.
- Conduct weekly safety meetings and daily tailgate meetings.
- Plan safety into every task before work has begun with job safety analysis program.
- When an incident, accident or near miss occurs, ensure full involvement in accident/incident investigations.
- Notify the safety department immediately upon knowledge of any incident, injury or near miss.
- They shall act as ambassadors for safety and shall continuously participate in the ES&H program through their daily observations for unsafe behavior. They shall participate in JSA reviews as required.
- Assist to ensure identification of drug and alcohol reasonable suspicion based on training.
- Support the PBS and Good Catch/Near Miss programs.
- True Assessor and Execution of Steep Slope Work Plan development.
- Inspect & maintain all mat bridges and the construction of them.

3.1.5 Project Safety Lead

The ES&H Lead will advise the Project Superintendent, and Craft Supervisors as to ways in which the project safety program can best be implemented.

Responsibilities are:
- Be responsible for coordinating the Project ES&H Program with the Project Safety Specialists and all contractors on the project.
- Be responsible for ensuring all ES&H activities on site are in accordance with this Site Specific Safety Plan.
- Be proactively involved in providing guidance to the construction staff, contractors, vendors, and visitors on compliance with ES&H requirements.
- Function as the ES&H liaison between the customer, company and contractor companies.
- Be responsible for assuring that all medical resources are in accordance with project requirements.
- Ensure that all Emergency Response Planning is in accordance with site and project requirements.
- Ensure that construction activities comply with all ES&H standards.
- Assist with ES&H training / inductions, ongoing awareness training, and hazard Identification.

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- Ensure that Job Hazard Analysis, Job Safety Analysis and the approved work permitting system are carried out to support construction activities.
- Participate in daily and weekly ES&H inspections of the work area including contractors.
- Attend, monitor and assist in toolbox talks with employees and front line supervisors.
- Lead site safety meetings and disseminate investigation findings to the craft supervisors on site.
- Assist to ensure identification of drug and alcohol reasonable suspicion based on training.
- Ensures ES&H training is performed as intended.
- To facilitate incident and accident investigations.
- To monitor and assist in vehicle and tool inspections.
- Assist in approval of the Steep Slope Work Plan

3.1.6 Field Safety Assistant

Responsibilities are:

- Assist and support Project Safety Lead in all aspects of the work.

3.1.7 ES&H Trainer/People Based Safety Coordinator

Responsibilities are:

- Develop and execute orientations and training
- Cultivating, implement and encourage PBS participation
- Review and categorize ‘need for improvement’ information gathered from PBS
- Develop training based on needs discovered using PBS feedback
- Schedule training accordingly
- Provide an incentive program for involvement in PBS

3.1.8 Employee and Workforce

Responsibilities are to:

- Understand the work and working environment, and to stop the work of themselves and/or others in the event of uncertainties.
- Report for work Drug and Alcohol free, fit for duty, and perform their job according to established safe practices.
- Make safety a part of their job by following safety rules, regulations, and by using all safeguards and safety equipment provided.
- Understand and strictly comply with Welded’s Life Criticals.
- Wear or use approved protective equipment/ clothing when required to do so.
- Take an active part as outlined in the Project ES&H Management Plan to ensure their safety and injury-free employment as well as being alert to unsafe

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practices of their fellow employees.
- Report and correct any hazardous conditions, practices or behaviors in their work areas.
- Be responsible for active participation in project safety and health programs, suggestion systems, and training activities.
- Immediately report all injuries, any unsafe practices or conditions, or any evidence of impaired health occurring in the course of the work to their supervisor and the Safety Department.
- Inspect & maintain all mat bridges and the construction of them by a CP.

All Employees have the right to:
- A safe place to work.
- Be made aware of ES&H procedures and trained to carry out their tasks.
- Stop the job if conditions are deemed unsafe, without fear of retribution.
- Thorough investigation of all incidents.
- Have unsafe or negligent behavior at any level addressed.
  NOTE: All employees must be prepared in the event of an unforeseen hazard to exercise the reasonable caution and leadership appropriate to the situation.

4 ADDITIONAL ROLES & ROSPINSIBILITIES

Communication will vary on this project. Lack of cell phone service requires full compliance and understand of the Emergency Response Plan by all MXP Project personnel. Areas will have marked GPS Coordinates, Service areas, Muster Points, etc.
- Establishing repeaters, cell phone boosters, GPS pagers, etc. will occur and evolve throughout the MXP Project.

All Welded and sub-contractors will comply with TransCanada's Fatigue Management Plan. Welded and sub-contractor will initially refer to their own, but will comply with TC's.

All sub-contractors, by contract agree to fully support and participate in the project Safety Management Execution Plan, and all its processes, programs and activities. All sub-contractors will have a project kick-off meeting to include ES&H site-specific deliverables prior to start of work.

4.1 Contracts Department:
- Ensures that the division of ES&H responsibility is clear and unambiguous in all contractual agreements between Welded and any other entity (e.g., joint venture, consortium, subcontract, etc.).
- Ensures all contractors and subcontractors are contractually obligated and in compliance with the Welded Site Specific Safety Plan.

4.2 Procurement/Purchasing:
- Ensures that only ES&H project/facility approved Safety and Health equipment is purchased
- Ensures that Safety Data Sheets (SDSs) are requested with every purchase order

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that involves chemicals and/or chemical substances.

- Considers the size and weight of consumables with respect to manual handling requirements.

5 MXP PROJECT LIFE CRITICAL REQUIREMENTS

Life Critical Requirements that, if violated, could result in death, serious physical harm, and major equipment damage. MXP Project has a zero-tolerance for employees who commit safety absolute violations and these employees will be subject to immediate termination.

1	Drug and Alcohol Policy	<u>Compliance with Drug and Alcohol Policy</u> • Always report to work fit for duty. • Never use, possess, distribute, sell or be under the influence of illegal drugs and/or abuse controlled substances (including prescription drugs not authorized by a physician). • Never consume or be under the influence of alcohol. • Employees using prescription or legal non-prescription drugs that might in any way impair their ability to perform assigned job duties shall immediately notify human resources/labor relations/industrial relations before using the drugs at work. • Medications that can be detected under testing protocols must have a prescription indicating employee name and quantity.
2	Fall Protection and Prevention	<u>Never work at unprotected heights or near openings without the use of required fall protection</u> • Never expose yourself, direct/allow others to be exposed to potential falls from unprotected heights of 6 feet or greater without the use of positive fall protection or fall arrest equipment. (Exception: Use of personal fall protection is not required when climbing or working on fixed ladders less than 24 feet in length or on portable ladders). • Always secure at an approved anchorage point. • Never work around exposed edges and floor openings that are not securely covered and/or hard barricaded. Immediately report all unguarded open holes.

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3	Confined Space Entry	Never enter a confined space unless trained, authorized and an entry permit has been completed. • Never enter a confined space unless atmospheric testing has been performed. • Never enter a confined space without an approved permit. • Never enter a confined space without an attendant at the entrance and an effective way to communicate.	
4	LOTO (Lockout/Tagout)	Never commence work until all energy sources have been identified and isolated in accordance with procedures. • Never remove and/or tamper with any tag and/or lock installed for the safety of personnel. • Prior to work lock and tag machinery, equipment, components, and/or systems that may contain any type of stored energy. • All residual/stored energy must be eliminated prior to any work activities.	
5	Rigging, Lifting Operations & Suspended Personnel Platforms	Never conduct lifting operations unless authorized and verified as competent. Never work under a suspended load. • Operate all equipment in accordance with the manufacturer's instruction/guidelines and/or the Bechtel Crane and Rigging Operations Standard Work Process Procedures. • Never hoist loads over people. • Never work within a load shadow, i.e., anywhere the load can fall. • Never cross a barricade that controls an area with a suspended load unless you are authorized, i.e., part of the lift team. • Never operate cranes, lifting equipment, suspended personnel platforms, and/or rigging devices unless authorized and verified as competent.	

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6	Barricades (Hard & Soft)	Never disregard or bypass signage and barricading. • Always install safety fence around open ditch and bell holes. • Disconnecting load indicators • Removing rotating equipment guards • Fixing triggers/power switches in the “on” position • Removing equipment/tool handles • Hard wiring electrical wires into outlets • Use of damaged equipment and/or tools that have been tagged out of service • Failure to use outrigger pads	
7	Defeating Safety Devices	Never disable, bypass, modify or remove any safety protection device without authorization. This includes but is not limited to: • Disconnecting load indicators • Removing grinding guards • Fixing triggers/power switches in the “on” position • Disconnecting equipment back up alarms • Use of damaged equipment and/or tools that have been tagged out of service • Failure to use outrigger pads • Failure to use of maintain safety latches	

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8	Safe Driving Standards	<u>Never operate any vehicle without all passangers securely on.</u> • Never drive a company vehicle without a valid drivers license. • Always obey speed limits and be alert and aware of any and all road hazards. • Always make sure you loads are secure and safe for travel. • Never use your cell phone while driving. • Always maintain a clean and hazard free vehicle. • Never leave anything sitting on the dashboard that could heat up and explode.	
9	Man vs. Equipment	<u>Never enter the danger zone where contact could result in personal injury or damage during operations.</u> • Only qualified and competent personnel are permitted to operate heavy equipment. • Stay alert of your surroundings and never stand in a pinch point or under a suspended load. • Establish communication with the operator. The spotter must maintain line of site with the operator. Never more your equipment until you know where everyone is on the ground. Always use a spotter when the operator has limited vision or overhead power lines. • Never use your cell phone while operating equipment. • Never walk on the off side/blind side or behind a piece of equipment. • Never assume the operator sees you. • Stay away from the equipment's swing radius.	

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10	Excavation & Trenching	<u>Never access an excavation deeper than 4 feet that has not been sloped, benched or shored and an excavation permit completed.</u> • Never enter an excavation or trench, or direct others to enter without a prior, documented, formal assessment by a competent person. • Atmospheric Test any disturbed soil prior to employees entering the excavation. • Never perform excavations without a competent person present. • Adequate ingress/egress such as stairs and ladders are required within 25 feet of each worker in all trenches greater than 4 feet in depth.	

5.1 MXP PROJECT SAFETY VIOLATION ACTIONS

Further to the previous statements on Life Critical violations, Safety Violations have a direct relationship to job site safety and health even where the exposure is not likely to cause death, serious physical harm, or major equipment damage.
The consistent application of consequences is vital to the credibility of the program, and the following outline shall guide the escalation of disciplinary measures. It is not necessary for safety violations to be identical for the progressive steps of discipline to apply.

Steps in the progressive discipline process include:

- Formal Verbal Counseling - Discuss and document the job-related problem and results required. Note the consequences that will apply if problem is not corrected. Establish time frame for corrective action and set follow-up date. Employee signs and dates the warning, and warning is held by Project Safety Manager until the conclusion of the employee's service. At this time, the warning is discarded if no further infractions have occurred.
- Final Written Warning - with Human Resources, prepare Final Written Warning. Reference the verbal warning. Document problem and results required. State termination date if problem is not corrected. Set follow-up date. Employee signs and dates the warning. Warning is placed in employee file.
- Final Action - if the problem is corrected, a follow-up memo will be prepared. If the problem continues, the employee will receive notice of termination. Both documents are to be reviewed by Human Resources. This process does not alter the company's right to terminate employment at any time, or for any reason. Final Action may occur at any point in the progressive discipline process as circumstances warrant, and following review by Human Resources. This may be accelerated depending on the severity of the non-compliance (e.g. Life Critical Non-Compliance).

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- In the event of potentially mitigating or aggravating circumstances, Site Superintendent may request to deviate from these disciplinary steps. Such request shall be made in writing and shall require the concurrence of Welded's General Superintendent and approval by the Project's Executive Sponsor.

6 ADMINISTRATIVE PROCEDURES

6.1 ORIENTATION AND TRAINING

The responsibility for promoting Zero Incident Performance Philosophy then lies with each supervisor employee working on the site. The site manager or their designee shall attend each new hire orientation/ induction to clearly define their expectations and the MXP Project Safety Philosophy.

The ES&H trainer is responsible to facilitate the communication of the Safety and Health execution plan through the site specific orientation and Supervisor Orientation training processes which will at a minimum include education and detailed hazard recognition sessions for the following procedures:

Emergencies and Evacuation Plan
Accident investigation
Green Hand program
Job Safety Analysis
Personal Protective Equipment
Housekeeping, Fire Prevention and Protection
Vehicle & equipment compliance program
Lockout-Tagout
Back Injury Prevention
Competent person (Confined Space, Excavations, Working at Heights, Safety Watch, Permit to Work, Respiratory)
Hazard Recognition
Environmental Awareness (including Non-Manual Staff)
People Based Safety (PBS) Observation Facilitators & Supervisors
Safety Absolutes

Additional training will be derived from; leading and lagging indicators gathered from multiple resources including PBS assessments and need-based training established by MXP Project. A good catch, near miss program will also be implemented on each spread. This program will encourage all Welded employees to turn in near misses and good catches to the safety team on a daily basis. Excavation safety/awareness will refer to **TransCanada's Excavation Specification Rev: 02.**

6.2 GOVERNMENT INSPECTIONS

As soon as it becomes apparent that a government agency is considering conducting an investigation or inspection, the knowledgeable person will notify the MXP Project Superintendent

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and ES&H Manager. They will notify the Welded Corporate ES&H Manager, President and the Legal Department and discuss any particular issues concerning the potential visit.

6.3 SAFETY RECOGNITION PROGRAM

Welded encourages the development of safe working habits by recognizing outstanding safety performance. Recognition of those people who have been leaders in the safety program is crucial to targeting safe behaviors that lead to zero-incidents. Program will be developed to include PBS team and general craft population.

6.4 REPORTS AND RECORDS

The ES&H Lead or designee, and contractors, will maintain:

- Records of employees' ES&H training.
- JSA's will be turned in to Welded ES&H department.
- Metrics data.
- Incident and Near Miss reports.
- All injury/illness records in Welded Incident Notification System.

6.5 TOOLBOX SAFETY MEETINGS

Each supervisor will conduct a weekly ES&H toolbox talks (separate from JSA's) that cover messages/lessons learned that are applicable to the work employees are performing. Contractors may elect to create their own weekly topic or use the weekly safety communication provided by Welded for MXP Project. Documentation of these weekly meetings will be submitted to the Site Superintendent, or designee, each week. The ES&H Manager will issue Bulletins or Safety Alerts at times to enhance topic-specific knowledge and advise personnel of incidents and lessons learned.

6.6 PEOPLE BASED SAFETY PROCESS (PBS)

PBS is an employee-owned, proactive and positive reinforcement process that engages employees in observing work behaviors and giving immediate constructive feedback in a "No-Name/No-Blame" environment. Over 95 percent of all accidents can be attributed to an at-risk behavior. PBS affords management the opportunity to utilize at-risk behavior observation data and take action in the form of interventions and targeted training to effectively prevent incidents. PBS will be implemented and championed by site management. All contractors must participate in the PBS program, the client representatives are welcome to engage as well.

6.7 SUB-CONTRACTOR ENVIRONMENTAL SAFETY AND HEALTH REQUIREMENTS

Welded will screen and qualify sub-contractors, based on previous performance and bid document submissions. In some situations, Welded may elect to visit a site the contractor is working to observe the implementation of ES&H programs. Welded may also elect to deliver to the subcontractor a stock ES&H plan that they will be obligated to follow. The sub-contractor shall deliver in writing their intent to follow all Welded standards at the site regardless of whether they use their own plan to define how they will accomplish this or use a stock plan delivered by Welded.

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6.8 INCIDENT INVESTIGATION AND REPORTING

6.8.1 Initial Response

All accidents, including those involving motorized and hoisting equipment must be verbally reported immediately to the Welded Supervisor.
Should any incident occur the MXP Project the ES&H manager shall be notified immediately and ensure the following:

- Proper medical treatment, of all injured/ill individuals, is accomplished including emergency evacuation, if required.
- The scene is to be secured and controlled; any unsafe conditions are remedied or sealed-off.
- All personnel involved in the incident have been tested for substance use in accordance with the requirements.
- Unauthorized personnel are prohibited from entering/accessing the incident scene.
- The environment is protected.
- Potential witnesses are identified and contact information is obtained.
- The ES&H manager, or designee, shall obtain a written signed statement from each employee who witnessed the incident, describing what they saw in their own words.
- Relevant evidence is preserved, including but not limited to:
    - Photographs
    - Work control documents
    - Tools
    - Equipment

6.8.2 OSHA Recordkeeping Responsibility

The Occupational Safety and Health Act of 1970 requires covered employees to prepare and maintain records of occupational injuries and illnesses. The primary component of this recordkeeping is the OSHA 300 Log and it is supported by our First Report of Injury form and the Supplemental Report of Injury. The Welded MXP Project ES&H manager is responsible for maintaining an OSHA 300 Log at each site, in the United States. The OSHA 300 Log is maintained on a calendar year basis and must be initiated in January and completed at year end even if no injuries occurred. Copies of the OSHA 300 Log may be obtained from the nearest U. S. Department of Labor office. The completed OSHA 300 Log for the previous year must be posted for employee viewing from February 1 until March 1.

6.8.3 Daily First Aid Record

All injuries and illnesses, treated or reported, must be entered on the Daily First Aid Record, successively as they are reported to the ES&H manager. There are no exceptions to this recording and reporting requirement. The above requirements will include all employees, visitors, etc., treated or anyone seeking assistance for an illness or injury. Each log sheet should be used on a monthly basis as long as the day of the injury is recorded on the line describing the injury.

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6.8.4 Near Miss / Good Catch Event Reporting

Near Miss Reports focus attention on practices or conditions that have the potential to result in an injury or a collision. A near miss is an unplanned event that does not result in injury, illness, or damage but has the potential to do so. Other familiar terms for such events are “close call” or “near hit”. Reporting near misses causes us to examine conditions before an injury or damage occurs. The purpose of near miss reporting is to correct problems with our safety practices or facilities, not to find fault with individuals. A superior ES&H program will generate a lot of near miss reports in comparison to how many injuries or damages occur in the program.
A near miss incident is:

- An object falling from an elevated position (e.g., tools, crates, file boxes).
- Any incident that could have resulted in treatment by a doctor.
- Any incident where safety gear (safety harness, face shield, safety glasses) prevented injury.
- Any incident that might cause us to upgrade safety practices.

A good catch is when an employee sees or prevents a near miss or incident from occurring by pausing/stopping work to correct the situation. This scenario occurs consistently on the R-O-W and will be discussed with the project the benefits and learning points.

These Near Misses, Good Catches will be tracked and documented by Welded ES&H and on the weekly dashboard. The information will also be shared with TransCanada on their “TC – SHARE CARD COMPLIANCE” weekly.

6.9 MODIFIED WORK DUTY/RESTRICTED WORK ACTIVITY

Any employee who, as the result of an occupational injury or illness, cannot perform one or more parts of their regularly scheduled job or is not capable of working a complete shift, but can, in accordance with restrictions from a competent medical authority, perform productive, limited work shall be deemed to be on restricted work activity or placed on a modified work duty schedule.

6.10 ENVIRONMENTAL, SAFETY, AND HEALTH ASSESSMENTS

The ES&H manager for MXP Project will use the Welded ES&H policies to govern the internal assessments and self-assessments.

- Identification and correction of unsafe acts, conditions or equipment is the on-going responsibility of all personnel.
- Daily inspections are required by supervision. Surrounding homes and the public exposure to open excavations (Road Bores, Open Cuts, etc.) will be mitigated for compliance.
- JSA assessments. The purpose of the assessments is to facilitate upstream measurement and provide continuous improvement measures.

The ES&H manager, Safety Specialist and Zero Accident Team Members will conduct a formal safety and health assessment each month in the form of a formal walk through of the project to identify hazards. Monthly Safety Self-Assessments of the project shall be conducted. The ES&H manager and Safety team will develop an assessment matrix, assigning

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management and supervision the portions of the project procedures to be assessed. The MXP Project assessment tool will be used as the template for this assessment.

The ES&H manager or designee is responsible for reviewing the assessments and providing technical direction regarding resolution of action items. Weekly and daily inspections will be performed in accordance with a schedule and format developed by the ES&H Department, approved and distributed by the Project Superintendent. These inspections shall include all areas, locations, and disciplines, including office locations. Weekly inspections will be documented. Responsibility and time frames, for corrective actions, shall be assigned and tracked to closure.

7 SAFE WORK PLANNING

These processes reflect Welded Construction's commitment to expectations, industry practices, and regulatory requirements designed to provide protection to employees, personnel, visitors, and the public. Welded strives to support and develop a safe working culture by encouraging two-way communication between management and employees; by facilitating an atmosphere of trust and respect; listening to employee suggestions and issues; taking appropriate steps without reprisal. Welded management recognizes that employee behavior alone cannot guarantee a safe environment. Welded will strive to provide a workplace free from recognized hazards and educate and coach employees to avoid at-risk behaviors.

7.1 JOB SAFETY ANALYSIS (JSA)

- Supervisors will establish employee involvement in the Job Safety Analysis development and discussion daily before any work is commenced. The daily (pre-work) JSA briefing is the final checkpoint for verifying the safety preparedness of the crew at the jobsite. As such, the discussion must verify that:
    - All crew members understand the work to be completed under the JSA, and that identified hazards are linked to specific aspects of the work and specific mitigations.
    - Tools and machinery brought to the work area are in good condition and, where necessary, properly equipped with safeguards
    - If working in a confined space, atmospheric monitors, respiratory protection, and other personal protective equipment brought to the jobsite is operable, calibrated, and in good condition
    - The necessary first aid or medical provisions are available (emergency call numbers known to crew)
    - All mitigation methods described in the JSA for the current scope of work are in place and working
    - **Meet and Greet,** anyone approaching the work area that was not present at the JSA meeting, will be met before entering work area, by a Welded employee, who attended original JSA meeting. Visitors will be informed of the JSA discussion and all recognized hazards on location.
    - Any changes are proposed or take effect after the initial JSA, then the current JSA becomes obsolete. New tasks or new environments will require a new JSA to be

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documented and discussed with the crew. The "Suggestions/Comments" section may be utilized pending the changed environment or task.

The JSA will be displayed and/or available for review in the immediate work area. JSA's are to be returned to the supervisor and forwarded to the ES&H Department at the end of each day. Welded ES&H will submit the JSA's to Consumer's representative daily as well. The ES&H Department shall be responsible for maintaining a file of completed JSA's for and will perform daily JSA audits to ensure adequate completion and usage. JSA's will also provide data towards evaluating worker knowledge and participation. This data will be used to determine training, personnel and/or equipment needs.

7.2 EMERGENCIES PREPAREDNESS

The site Emergency Response Plan (ERP) should be referred to for detail on how the site will handle emergencies and evacuations in Marshall and Wetzel County. Mock scenarios for preparedness will be proposed by TransCanada, and Welded will comply. Documenting these mock scenarios will be kept by the Welded ES&H team.

Some key points regarding this procedure are:

- All employees will receive education regarding the emergency and evacuation requirements in New Employee Safety Orientation/ Induction.
- Emergency Evacuation maps and emergency telephone numbers shall be posted throughout the job site, in each foreman's truck and in all offices, trailers, and lunchrooms.
- The designated assembly points are defined in the ERP and shall be communicated to all employees daily.
- Pending the R-O-W, muster points will typically be the road crossings. Muster points will be identified with signage and documented on the JSA in the morning. Difficult to reach road crossings will be shared with employees in region and will be emphasized with local emergency response.
- Emergency Response times will be posted in the ERP that each crew will have. Welded ES&H will meet with local agencies to ensure locations are known.
- Cellphone service will be limited. A designated area where service is known will be marked near these limited service areas. If Satellite phones are approved by TransCanada, then designated personnel will be assigned in these limited service areas.
- Base Notification chain for minor/major incidents are in the ERP and will be referred to. The trained First Aid/CPR will be documented on the JSA.
- Radio contact will be through set repeaters and a designated Safety Channel will be known.
- The ERP may be updated due to changing environments. The Project Safety Lead will insert any known requirements into this section or information that completes the detail for key points. These details such as Superintendent advice by points, and responsibilities for response in this section.

7.3 PERSONAL PROTECTIVE EQUIPMENT

The following section specifically outlines the Personal Protective Equipment requirements on MXP

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Project Property. The following are general requirements:

- Each employee will be issued and required to wear an approved side impact hard hat.
- Each employee is required to wear approved safety glasses at all times.
- Hearing protection will be worn at all locations where noise levels meet or exceed 85 dBA (time weighted average, 8-hr TWA)
- Personal clothing worn to work will be appropriate to protect the employee from injury. Long pants, shirts with sleeves at least 4 inches in length, and compliant work boots with a defined heel and safety toe will be required on jobsites; the soles and heels of boots must be well maintained. Loose, oily or otherwise unsafe clothing will be prohibited.
- When the work environment presents the hazard of respiratory or chemical exposure, employees will be instructed in the appropriate protective measures and provided the necessary personal protective equipment.
- All personal protective equipment will be routinely inspected and maintained.
- Appropriate PPE will be worn correctly at all times on site. Damaged or defective PPE will not be worn and replaced immediately.
- Contractor will monitor its employees for compliance and will take immediate corrective action when non-compliance is observed.
- All visitors, contractors, vendors and suppliers while at the work location will comply with PPE and dress code requirements at all times.

7.3.1 Head Protection

- ANSI Z89.1 Hard hats are required at all times in construction work areas.
- Only side impact hardhats will be allowed on project.
- Bump caps and metallic hard hats or caps are prohibited.
- Hard hats are required to be worn and facing with brim forward at all times while on site. (The only exception being for surveyors, while performing certain survey activities.)
- Hard hats will not be altered in any way.
- Chinstraps will be worn in high wind or when performing overhead work.
- Hard hats must be worn directly on the head - wearing baseball caps under a hardhat is prohibited.

7.3.2 Eye Protection

- All personnel will wear approved protective eyewear with side shields while on site. Eyewear must meet the requirements of ANSI Z.87.1 and is required to be worn at all times on site
- Tinted lenses are prohibited inside areas with limited illumination. This includes prescription glasses.
- Goggles and face shields will be worn concurrently by personnel involved in, assisting with, or working adjacent to any activity where there may be a danger of projected debris, sparks or other particles, and/or corrosive fluids or mist. Such work situations include, but are not limited to:
  - Working with rotating equipment such as grinders, drills, lathes.
  - Cutting and welding.

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- Chipping, chiseling or caulking.
- Using cartridge operated tools.
- Blasting – abrasive and grit.
- Working with chemicals.
- Mixing drilling fluids, acids or other toxic hazardous fluids.
- Working with paints, disinfectant, pesticides or other toxic or hazardous fluids.
- Working with strong sources of electromagnetic radiation, welding, machines, etc.
- Working in the open with the risk of windblown particles.

- Employees whose vision requires the use of corrective lenses will wear one of the following:
  - Personal eyeglasses whose protective lenses provide optical correction with permanent fixed side shields (slip-on side shields are prohibited) and conform to nationally recognized standards.
  - Safety goggles over their glasses, or goggles that incorporate a corrective lens mounted behind the protective lens, or safety over-glasses.
- Welders will wear an appropriate welding helmet and safety glasses per the MXP Project.

7.3.3 High Visibility PPE

- During low-light conditions and around operating heavy equipment/vehicles, only high visibility clothing meeting the applicable local standards will be worn. Brightly colored jackets and/or “tee shirts” with no reflective materials are not acceptable.

7.3.4 Hearing Protection

If a job-related hearing hazard is extreme or prolonged and requires a form of hearing protection, then the implementation of the hearing protection program will be used for the affected employees. This includes the mandatory use of protective equipment when operating equipment produces sound levels above the 85 dBA (8-hr TWA) levels.

- Only approved hearing protection will be worn by all personnel in designated areas.
- Areas where hearing protection must be used must have signs posted.
- The level of protection will be defined by the DSR for the specific areas where hearing protection is required.

7.3.5 Foot Protection

At a minimum, work boots with a defined heel are required. In addition, the following requirements will apply, if applicable:

- Safety toe boots must meet applicable regulatory guidelines.
- Additional foot protection, such as shin protection, metatarsal guards, etc. will be worn any time the job being performed creates additional hazards and possible injury of the foot or lower leg/ankle extremity.

Employees must have proper work boots meeting the above requirements.

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7.3.6 Hand Protection

All personnel engaged in work will wear gloves appropriate for the task being performed. Appropriate work gloves will be worn whenever personnel are performing work where their hands and fingers might be cut or punctured by the material they are handling.

- All personnel engaged in handling wire, cable, or other sharp material will wear cut and puncture resistant gloves.
- Welded will issue gloves appropriate for the work being performed to personnel.
- Work gloves must be in good condition, meaning free from holes and fraying.
- All personnel who are working in energized electrical panels and components will use approved and tested rubber insulated gloves.
- Work gloves will not be required when work activities require the ability to complete detailed work with the fingers, such as terminating wiring. (The use of gloves in these types of work operations is not feasible.) Generally, work gloves should not be worn when operating rotating tools or equipment, such as a conduit threading machine, drill press, or other rotating machinery.

7.3.7 Dress Requirements

All personnel are required to wear clothing appropriate for the work performed. Minimum requirements: Long pants, shirts with sleeves at least 4 inches in length, and work boots are required to be worn on work sites.

- Sleeveless shirts, sleeves rolled up onto the ball of the shoulder, and other such apparel or practices are prohibited. Wearing shorts is prohibited while working on-site.
- Persons working near moving machinery must be cognizant of the fact and prevent clothing and body parts from being caught by moving components.
- Clothing soaked with grease, paint, thinners, solvents, fuels, or similar materials will not be worn.
- Dress code requirements apply to all employees, vendors, suppliers, and delivery personnel who step outside of their vehicle.
- Visitors and personnel working at office trailer facilities must wear sturdy shoes and appropriate clothing for personal safety; sandals and open-toe shoes are not allowed.

NOTE: Failure to adhere to any of these Personal Protective Equipment requirements will result in disciplinary action up to and including removal from the site.

7.4 HOUSEKEEPING

Welded understands that good housekeeping is a key to ES&H performance. Housekeeping will be monitored and instances of poor housekeeping will be corrected in a timely fashion. Points of the procedure are:

- Adequate time will be assigned to ensure that good housekeeping is maintained.
- Any instances of poor housekeeping resulting in the creation of a tripping, slipping, fire hazard or loss shall be corrected immediately
- Ensure that all emergency exits and access passageways, fire doors, break-glass alarm points, fire-fighting equipment, first aid stations, and other emergency stations are kept clean,

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and unobstructed.

- Ensure all cables are controlled and systems developed to either provide protective covers or suspend cable above head height away from moving or projecting equipment.

7.5 FIRE PREVENTION AND PROTECTION

Welded has developed a fire prevention and protection plan for the site. This plan details what actions the facility will take to prevent fires from occurring, and what measures are in place to respond to fires which may occur. This plan takes into account the construction area, warehouses, and offices. It is the intent of Welded to comply with the actions that the MXP Project is taking to comply are:

Welders must wear flame resistant clothing while welding. The ability of the clothing to stop burns from welding slag will be taken into consideration when selecting the clothing. Housekeeping and fire prevention are emphasized in the New Employee Safety Orientation and shall remain a high priority at all times throughout the facility. Both will be focused on by all team leaders and during all inspections and audits. Housekeeping, fire prevention and protection will be profiled in the job safety meetings on a regular basis. Housekeeping is a fundamental and necessary activity at any facility and is the responsibility of every individual working at the facility. Permanent locations, maintenance and inspections of fire extinguishers shall be the responsibility of the ES&H Representative. Contractors are responsible for the maintenance and inspections of their fire extinguishers that they provide. If normal fire prevention methods are not sufficient to adequately ensure the prevention of fires, additional personnel shall be added (fire watch) to guard against potential fires. Fire watch personnel will be trained and shall remain at the location a sufficient amount of time after hot work is stopped to ensure that no possibility of fire exists. Foremen are responsible for keeping their area orderly and cleaned as necessary. Foremen shall ensure that combustibles are removed, covered or minimized, from the source of hot work. A properly selected functional fire extinguisher shall be at all work locations during welding, cutting, grinding, soldering or any other open flame.

All hazards of compressed gas cylinders, will be addressed prior to use by the supervisor with the employee. Oxy-acetylene equipment shall have flash arrestors installed at the regulators and at the torch. Wastes or rags containing flammable or combustible liquids that create a fire hazard will be placed in covered metal containers and be properly marked.

7.5.1 Flammable and Combustible Liquids

Only approved containers and portable tanks will be used for storage of flammable or combustible liquids. No more than 15 gallons will be stored in a room outside of an approved storage cabinet. Storage cabinets will be labeled with conspicuous lettering "FLAMMABLE - KEEP FIRE AWAY". No more than 60 gallons of flammable or 120 gallons of combustible liquids will be stored in any one storage cabinet or container. Materials that react with water to create a fire hazard will not be stored with flammable or combustible liquids. Outside portable tank storage will be located no closer than

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20 feet to any building. Tanks and dispensing units will be protected against collision damage. Storage areas will be kept free of weeds, debris, and combustible material not necessary to the storage. Dispensing units will be protected against collision damage. Tanks and containers should be conspicuously marked with the name of the product they contain and “FLAMMABLE - KEEP FIRE AWAY.” "No Smoking” signs will be posted in hazardous areas. Approved smoking areas will be designated and properly posted.

Transfer of flammable liquids from one storage container to another will be done only when containers are electrically interconnected (bonded). Drawing or transferring will be done only through a closed piping system from safety cans by means of a device drawing through the top or by gravity or pump through an approved self-closing valve. Transferring by means of air pressure is prohibited. Dispensing devices, hoses, and nozzles for flammable liquids will be of the approved type. Flammable and combustible liquids will not be used within 50 feet of open flame or other source of ignition. "No Smoking” signs will be posted in appropriate areas; flammable and combustible liquids will be kept in closed containers when not actually in use. Disposal of flammable and combustible liquids will be in accordance with governing requirements.

At least one portable fire extinguisher having a rating of not less than 20B will be located outside of, but not more than 10 feet from, the door of the room used for storage of more than 60 gallons of liquid. At least one portable fire extinguisher having a rating of not less than 30B will be located not less than 25 feet or more than 75 feet from any flammable liquid storage area. At least one portable fire extinguisher having a rating of not less than 20B:C will be provided on any vehicle loading, transporting, or dispensing flammable or combustible liquids; in all service and refueling areas; and within 75 feet of each pump or dispenser.

Transportation of fuel on the R-O-W and in the Warehouse will comply with all DOT compliance standards that are set. Traffic management will be required when difficult access roads require the Fuel Truck to back in or out of the road approach.

7.5.2 Fire Prevention and Protection

To prevent ignition hazards, electrical wiring and equipment will be installed in accordance with the local building code requirements. Smoking will be prohibited in areas where fire hazards may exist, and "No Smoking" signs will be posted.

Carbon tetrachloride extinguishers are prohibited. Extinguishers will be conspicuously located where they will be readily accessible and immediately available in case of fire, and their locations will be conspicuously marked. Extinguishers will be installed on hangers or in brackets provided. Those weighing not over 40 pounds will be installed so that the top of the extinguisher is not more than 3 ½ feet from the floor.

7.5.3 Welding, Cutting, and Other Hot Work

For complete Welded and MXP Project safety requirements regarding hot work, refer to: Fire

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Prevention and Protection, Hazardous Work Permits, and General Safe Work Practices.

- Fuel gas hose and oxygen hoses will be easily distinguishable and not interchangeable.
- When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 8 inches can be covered by tape.
- All hose and torches in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance must be inspected at beginning of each working shift. Defective hose(s) must be removed from service.
- Hoses, cables, and other equipment must be kept clear of passageways, ladders, and stairs.
- Valves on fuel gas will not be opened more than 1½ turns. If a special wrench is required for closing the valve, the wrench will be left in position on the stem at all times or until the task is completed and the caps are replaced.
- Torches will be lighted by friction lighters or other approved devices only. Cylinders, all hose apparatus, and connectors will be kept free of oil and grease, and not handled with oily or greasy hands or gloves.
- Oxygen/fuel gas systems will be equipped with approved backflow valves, pressure relief devices and flash arrestors at the gauges and the torch.
- Fuel gas/oxygen equipment will be disconnected from the source when left unattended, such as overnight or at completion of the task. Torches will not be left unattended inside a confined space.
- All employees will use the proper personal protective equipment and clothing when performing or assisting in cutting and welding operations (goggles, shields, gloves, etc.).
- Welding leads and equipment will be properly maintained and inspected before use. Defective equipment will not be used and will be reported to supervision.
- Arc welding and cutting operations will be shielded by appropriate screens, shields, or other safeguards for the protection of personnel or materials exposed to sparks, slag, falling objects, or the ultraviolet (UV)/infrared (IR) radiation of the arc.
- The frame of all arc welding or cutting machines will be grounded effectively when the machine's power outlets are being used.
- If electrode holders are to be left unattended, such as overnight or at completion of the task, the electrodes will be removed and the holder placed where it is protected from unintentional contact.
- Welding machines will be turned off when being moved or when the welder leaves the immediate work area for any length of time.
- No welding or cutting will be done where flammable paints, compounds, or dust may create a hazard.
- A fire extinguisher with a 30 lb. Class A, B, C rating will be at the work location during welding, cutting, soldering, etc.
- Pipelines containing flammable liquids or gases, or electrical cables will not be used as a ground.
- Where a preservative coating is present, the coating will be removed with a cold removal method such as brush grinding or scraping for a sufficient distance in each direction to prevent burning of the coating.

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- Electric welding leads will be kept off the walking surface or in an elevated position.
- Welding leads or cords that cross a pathway or roadway will be protected from damage and eliminated as a tripping hazard.
- Welding leads with broken insulation will be taken out of service and repaired. Ground leads can be repaired with tape as long as the safe current carrying capacity is not compromised.

7.5.4 Inspections

Extinguishers will be inspected daily by the employee performing the hot work to ensure that they have not been actuated or tampered with, and to detect any damage. The Welded Safety team is responsible for ensuring that monthly inspections of the extinguishers on site are performed (NFPA 10). A record of monthly inspections should be maintained for one year.

7.6 VEHICLE SAFETY MANAGEMENT

All employees must be qualified prior to operating the equipment. Yard/warehouse supervision and the Welded safety manager will continually monitor work sites to confirm these requirements are met. Only authorized operators will be permitted to operate equipment and/or leased or owned vehicles. Operators of equipment and vehicles shall possess a current and valid certificate of competency issued by a recognized authority and driver's permit approved by the SME. Operators shall be required to demonstrate their competency to operate relevant equipment and vehicles to the Welded MXP Project Equipment Supervisor prior to commencement of work on site. Heavy equipment that shall require demonstrated competency includes:

- All earth moving equipment
- Lifting equipment, including pipelayers
- Rubber-tire and rubber track road bore machines
- Fork lift trucks
- Elevated Work Platforms
- Articulated trucks
- Any other equipment identified by MXP Project management.

Traffic Control will also be included in vehicle safety management. Like fuel trucks, any vehicles that have difficult access on or off the road approached will need traffic control. All MXP Project personnel will only travel on permitted haul routes and roads. All flagging operations and hauling operations will comply with the Traffic Management Plans of Welded and TransCanada.

7.7 LOCKOUT/TAGOUT PROCEDURE

Lockout Tagout procedure, "System & Equipment Safety Tagging/Lockout" will be used. Each designated Welded employee, and designated contractors representative, involved in a lockout / tagout procedure, will be formally trained prior to commencement of any work. Basic information and hazard identification regarding the Lockout / Tagout Procedure is provided at New Employee Safety Orientation and periodically at Weekly Safety Meetings. Due to the importance of compliance with this procedure the Superintendent shall ensure that all team leaders are trained on the Lockout / Tagout Procedure. This training will be included in the supervisor's orientation for Team leaders to be held before they assume their supervisory duties. Documentation of this training

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and comprehension testing shall be maintained and made available for review. Willful violations of the lockout/tagout procedure by any Welded employee or contractor will result in disciplinary actions up to and including result in removal from the facility.

7.8 CONFINED SPACES

The confined space program is designed to confirm that potential hazards are identified prior to entry and to verify that safe work practices are utilized during all activities regarding confined spaces. Employees or contractors will implement the following requirements, engage and involve the necessary resources to confirm compliance. MXP Project will like encounter Confined Space entry for back welding processes.

A “Confined Space” is any space that has the following characteristics:

- Limited or restricted entry and exit
- Not designed for continuous employee occupancy
- A space that can be bodily entered

Potential hazards associated with Confined spaces are:

- Possible structural, mechanical or potential energy hazards;
- The possibility of gasses, liquids or solids being admitted during occupancy; or
- Oxygen deficient or enriched atmosphere, flammable/explosive atmosphere, or a toxic atmosphere.

When MXP encounters a Confined Space entry, only trained personnel may be involved. Welded will have a Training Course that is done by a 3rd party, and it will produce qualifications for entrants, attendants, and supervisors. Confined Space entry’s that are more than 2-40’ sections, a “pup”, and a fitting will require a Welded and TransCanada plan for approval. Terrain that is in a slope, incline, or decline will also require an approved plan. Documentation of the Confined Space entry must also be completed by a trained Entrant/Attendant/Supervisor. One employee SHALL not be all three required positions, but an Entrant/Attendant may be interchangeable due to the Welding and Helping task of a back weld. The Supervisor will be in charge of correct documentation of the entry. Employees who may enter the Confined Space will need to do fitness testing with Welded’s medical team. Attendant will assist in ensuring the required equipment is defective free and sufficient for the entry. Equipment used during Confined Space entry will depend on the type of Confined Space entry, but may include the following:

- Rescue Wristlets / Body Harness’
- Approved Rope / Cable – Primary & Secondary
- Secured “Skateboard” for egress/ingress
- Calibrated/Bumped 4-gas monitor
- Ventilation System
- “Anchor” Support Base

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Any equipment lacking will be provided to the employees prior to entry. Emergency response facilities will be known prior to entry to act for rescue services. General awareness of Confined Spaces will be discussed in the Welded Orientation, and more Confined Space information may be referred to in the Welded Construction, L.P. Safety Manual - Section 9.

7.9 FALL PREVENTION/PROTECTION

Welded is committed to a 100% fall protection plan. This requires thorough planning, innovative thought and total dedication by the entire team. JSA meetings will assist in this effort. Fall protection requirements will be provided in the New Employee Safety Orientation/ Induction. Employees required to utilize secondary fall protection shall be thoroughly trained in fall hazard recognition, fall protection equipment, and the details of the Fall Prevention/Protection Procedure. Secondary fall protection (Safety harness/lanyard systems) will be used by all employees where a fall distance of six feet or more exist, unless they are on a permanent platform or green tagged scaffold. All lifeline systems anchorage points will be installed by a qualified person designated by the Field Superintendent. Inspection records for retractable life lines will be maintained by the Safety Manager. Willful violations of the Fall Protection Program by any employee, Welded or contractor, may result in removal from the project. Refer to the Welded Life Critical Requirement and work rules.

7.10 SAFETY WATCHES

Some key areas to note are; guidelines and standards will be established for the duties and responsibilities of safety watches including fire watch, traffic watch and equipment watch. Employees will be trained and assigned to warn others of potential unsafe situations or emergency conditions, and provide safety action as necessary. Orange or high visibility fluorescent vests and signal horns will be provided to fire watch personnel and confined space attendants. Appropriate emergency response personnel will be immediately available for emergency situations.

7.11 HAZARDOUS WORK PERMITS

Hazardous work permits will be used to control work where particular hazards exist. This permit will not be used on general work. The Welded Safety Manager shall determine where and when these permits will be put in place. Key points of the procedure are:

- The Hazardous Work Permit (HWP) is required for tasks that pose an increased risk of serious injury or illness, and controls against those hazards must be emphasized.
- The HWP is also required for any work determined, by the Safety Manager, to be significantly hazardous.
- A logbook will be used to number all issued HWPs in sequential order.
- The HWP will be reviewed with entry personnel prior to work and periodically thereafter by the immediate supervisor and by the ES&H Representative.

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7.12 OCCUPATIONAL HEALTH

7.12.1 Hazard Communication

The SME is responsible for ensuring that the guidelines set forth in this procedure are followed to ensure that the hazards of all chemicals used are evaluated and the information concerning these hazards is communicated to affected employees.

A chemical inventory list shall be developed for the warehouse/yard facilitates and will be updated on an ongoing basis.

A list of all hazardous materials shall be developed and maintained at each site. A compliance program must be established in writing and a copy made available at the site. Employees must be able to read and understand the hazard communication document. Manufacturers' or distributors' warning labels must be attached to the hazardous materials containers and maintained until the containers are safely disposed. All other chemical containers used shall also be labeled with the same information or comparable information. Safety Data Sheets (SDS) must be provided by manufacturers or distributors and maintained at the job site for reference and training purposes. Employees working with hazardous chemicals, as well as those hazardous chemicals that may contact them, shall be provided information and training concerning the hazardous chemicals. Training will include, but will not be limited to:

- Explanation of the Hazard Communication Standard
- Training requirements of the standard
- Company Hazard Communication Program explanation and location
- Chemical inventory listing and where to find it
- Location of hazardous chemicals
- Description of labeling system
- Description of client/plant hazard rating system
- Description of use of SDS's and their location

7.12.2 Heat Stress

Heat stress generally describes the impact of heat, from any source, on the organs of the body and the person as a whole. The stresses of heat on the body manifest themselves in five common ailments: heat exhaustion, heat cramps, heat stroke, heat syncope, and heat rash. Different parts of the country and world have different environmental conditions which affect this generic standard. Local practices, average temperatures, and common working habits should be considered when addressing this standard.

Once the Heat Index reaches 80 degrees Fahrenheit the SME should institute a heat stress prevention program. The ES&H manager should develop a heat stress management plan for the operations site.

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7.12.3 Cold Stress

Cold stress, similar to Heat stress, is the impact of cold on the organs of the body and the person as a whole. These stresses typically encountered on the body are Frostbite and Hypothermia. Frostbite typically focuses on hands, toes, and nose feeling numb, skin color changes. Hypothermia can happen when the body temperature drops below 95 degrees F, your body shakes uncontrollable, mental confusion or losing consciousness.

To prevent this Cold stress, hydration will be as important as heat related illness. Coffee is not hydration, water is best. Have a warm area such as a pickup truck for breaks and lunch time. Dress in warm layers and wear gloves.

7.12.4 Noise

Employees' hearing will be protected in accordance with this procedure and accepted hearing conservation measures. Supervision shall determine which job assignments could expose an employee to noise levels greater than 85 dBA, 8-hour Time Weighted Average (TWA). A continuing, effective hearing conservation program will be provided for each employee exposed to noise levels of more than 85 dBA, 8-hour TWA. The hearing conservation program will include:

- Monitoring noise levels to identify work areas or specific equipment which exceeds 85 dBA. Measurements will be performed using an ANSI Type II sound level meter, or better, set on the A scale, slow response.
- Implementing feasible engineering and administrative controls to reduce employee exposures to 85 dBA, or less.
- Training on the effects of noise exposure and the proper use of ear protection.
- Providing and enforcing the use of adequate ear protection for employees who work in areas exceeding 85 dBA.

7.12.5 Environmental Responsibility

Welded is committed to proper disposal of industrial wastes. In most operations, these wastes include: oil, solvents, anti-freeze, oil filters, oil dry material, and equipment washing fluids. Not all of the above wastes are considered hazardous. The wastes may or may not be considered hazardous by applicable regulatory agency. Even though not designated hazardous, all industrial wastes should be properly disposed of.

Appropriate storage provisions must be made for waste fluids including provisions for leak containment and spill control equipment. This could include oil dry, oil absorbent pads, or mops and buckets. All tanks and containers must be properly labeled to identify contents.

At operating centers, equipment washing system should include an approved oil/water separator or alternate means of capturing wash water and disposal of wastewater into an approved industrial sewer system.

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The federal government (EPA) does not consider waste oil as hazardous waste provided it has not been contaminated with hazardous materials. For this reason, solvents and other hazardous materials should not be dumped in the waste oil. Some states consider waste oil to be hazardous; i.e., California. When operating in one of these states, Welded must comply with state environmental regulations.

7.13 Safe Use of Hand and Power Tools

Employees using hand and power tools that are exposed to the hazard of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases will be provided with the personal protective equipment necessary to protect them from the hazard.
Following these five basic safety rules can reduce/prevent most hazards involved in the use of power tools:

- Keep all tools in good condition with regular maintenance.
- Use the right tool for the job.
- Examine each tool for damage before use.
- Operate according to the manufacturer's instructions, never remove guards.
- Provide and use the right protective equipment.

For complete safety requirements regarding hand and power tools, refer to: CP 200 – General Safe Work Practices.

7.13.1 Power Tool Precautions

Power tools can be hazardous when improperly used. Depending on the type of power tool and the power source used (i.e., electric, pneumatic, liquid fuel, hydraulic, and powder–actuated, etc.), certain precautionary steps must be taken.
Employees will be trained in the use of all power tools utilized to perform their tasks. They will understand the general safety precautions and potential hazards associated with use of that tool, including specific manufacturer use instructions.

Power tool users will observe the following general precautions:

- Always be aware of other workers in your immediate area that may be affected by your use of that tool, verify they are working under your JHA and have the same training and PPE as you are required to wear.
- Never carry tools by the cords or hoses. Tools that must be raised or lowered from one elevation to another will be placed in tool bags or raised by hand lines.
- While working overhead, install barricades or other positive means to safeguard employees working below.
- Damaged or defective tools are to be taken out of service, tagged "Do Not Operate," and stored in a controlled area until appropriate repairs have been made.
- Tools are not to be altered in any way and will be operated in accordance with manufacturing specifications.
- Tools required to have guards will only be operated with guards in place.
- Persons who operate ground compactors, rollers, chisel impact hammers, jumping jacks

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(compactors) and other such tools will wear metal foot protection.

- Disconnect tools when not in use, before servicing, and when changing accessories, such as blades, bits, and cutters.
- Job-made tools of any kind are prohibited on the jobsite (such as tools made of rebar, rigging equipment, or equipment that is modified in any way) unless designed by an engineer and approved by MXP Project management.
- Metallic measuring tapes or metal fish tapes will not be used on or near exposed energized conductors, power lines and/or other related equipment.
- Tools will not be thrown from place to place or from person to person.
- Tools will not be left unsecured on scaffolds, platforms, or other elevated places where falling could endanger employees below.
- Impact tools such as chisels, punches, drift pins, and hammers, that become worn, mushroomed, or cracked, will be removed from service.
- The proper apparel should be worn – loose clothing, ties, or jewelry can become caught in moving parts and should not be worn when operating power tools.
- Only manufacturer-approved extensions will be used for added leverage on any tool.
- Tools with sharp edges will be stored and handled so they will not cause injury.
- Tool handles will be kept clean of oil and grease.
- Trigger locks will not be used on any portable power tools.

7.13.2 Electric Tools

Employees using electric tools must be aware of several dangers including electric shock. To protect the user from shock, portable electrical tools will utilize one or more of the following:

- Double insulated properties.
- GFCIs provided for all areas having a damp or wet atmosphere where electrical equipment or portable electric tools may be used.

7.13.3 Pneumatic Tools

There are several dangers encountered in the use of pneumatic tools. One of the main dangers is being hit by one of the tool's attachments or some kind of fastener the worker is using along with the tool. To protect employees from these types of hazards, users will follow the additional requirements below:

- Air supply hoses exceeding ½ inch internal diameter will be protected by excess flow valves to prevent "whipping" in the event of hose separation or failure. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.
- When using pneumatic tools, employees must check that the tools are fastened securely to the hose to prevent them from becoming disconnected.
- The pressure of compressed air used for cleaning purposes must be reduced to 30 psi or less. Compressed air will not be used for cleaning or blowing dust from any part of the body or clothing.
- A safety clip or retainer must be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel.

Electronic documents once printed, are uncontrolled and may become outdated.
Refer to the electronic documents for current revisions.

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7.13.4 Gasoline/Other Fuel Powered Tools

The most serious hazard with fuel powered tools comes from fuel vapors that can burn or explode. To prevent this from happening, employees will follow these requirements:

- Gasoline powered tools will not be used in unventilated areas or confined spaces.
- Gasoline will be dispensed from only approved safety cans. These cans will be properly labeled and stored when not in use.
- Safety cans must be refilled on the ground.
- Fire extinguishers must be available in the area when fuel-powered tools are used.
- Use extreme care while handling, transporting, and storing gas or fuel and always handle according to proper procedures for flammable liquids.
- Before the tank for a fuel powered tool is refilled, the user must shut the engine down and allow it to cool to prevent accidental igniting of hazardous vapors.

7.13.5 Hand Tools

- Only self-retracting and guarded knives may be used.
- Tie wraps, boxes, etc. will only be cut with snips or guarded knives.
- Post drivers will be used anytime a post is inserted into the ground.
- When working with tools at heights, always use a tool lanyard to secure tools from falling.

NOTE: Unguarded knives, such as common utility knives, are **prohibited.** Guarded and retractable knives will be used when the task requires the use of a knife.

7.14 POWERED INDUSTRIAL TRUCKS

Only trained and authorized operators shall be permitted to operate powered industrial trucks.

A competent person shall conduct evaluation of operator's performance at least annually. Operators shall be medically qualified and screened for substance abuse. Forklifts shall be in sound operating condition, and may be fitted with flashing lights or other marking devices.

Unauthorized personnel shall not be permitted to ride on powered industrial trucks. Only trucks equipped with a seat belt and safe place for passengers to ride shall be authorized to carry passengers. Riding on a powered industrial truck in other than a manufacturer-provided seat (e.g., on the forks, the counterweight frame, side boards, etc.) shall be strictly prohibited and will result in disciplinary actions.

Spinner knobs must not be attached to steering hand wheels of trucks unless specifically designed for the safe operation of equipment.

7.15 BARRICADES AND SIGNS

Welded sites will comply with the requirements in MXP Project Policy/Procedure . Some elements of

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this procedure are:
The Foreman is responsible for barricades being properly erected, maintained and for identification of potential hazards.
Barricades will be placed in conjunction with tags on potential access sides, which identify the hazard and list the name of the responsible Foreman. Barricades must be removed promptly when the hazard no longer exists.

Blasting can occur on this project. A third party blasting contractor will lead this task. In the event of any blasting, all MXP Project personnel will comply with the barricades and signage of the operation. Blasting representative will lead the controlled site with Welded and TransCanada assistance. Confirmation with any notification requirements will also be necessary prior to blasting. Refer to blasting contractor for further information.

7.16 PORTABLE LADDERS - CONTROL AND INSPECTION

The following lists requirements for ladder usage and storage on MXP Project Property.
For complete safety requirements regarding ladders, ref – Portable Ladders Inspection and Control.

7.16.1 Ladder Specifications

- Two or more people will not work from the same ladder unless it is specifically designed for two people. Pre-task planning must be conducted before employees use a two-person stepladder.
- Ladders will be secured from movement with bracing, rope, cord, wire, or other substantial material.
- All ladders will be placed on firm footing.
- Folding, multi-purpose ladders (i.e., Versa-ladders, etc.) are prohibited.
- Tripod ladders (ladders with three legs) are prohibited.
- Joining two ladders together is prohibited.
- Trestle ladders are not to be used to support scaffold planking.
- All portable ladders will be equipped with non-skid safety feet and placed on a stable base. The access areas at the top and bottom of ladders in use will be kept clear of obstructions.
- Ladders will be placed with secure footing, lashed, or held in position.
- The side rails of all ladders will extend 3 feet above the landing. When this is not practical, grab rails will be installed. All ladders in use will be tied, blocked, or otherwise secured to prevent against accidental displacement.
- The foot of a ladder, where possible, will be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder (the length along the ladder between the foot and the support).
- Employees will always face the ladder when climbing up or down.
- When portable ladders (step or extension) are used as a stationary work platform, employees will utilize appropriate fall protection/restraint equipment when work elevation equals 6 or more feet. However, ladders are generally used only for access. Any work performed while on a ladder should be minor maintenance. Three points of contact (one hand and two feet)

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must be maintained at all times.

- Short ladders will not be spliced together to make longer ladders.
- Ladders will never be used in the horizontal position as scaffolds or work platforms.
- The top of a regular stepladder will not be used as a step.
- Use both hands when climbing and descending ladders (three-point contact rule).
- Carrying tools while climbing or descending ladders is prohibited. To help reduce the possibility, a hoist rope and bag should be secured nearby ladders that serve as access to overhead work areas.
- Access to the top and base of all ladders will be kept clear at all times.

7.16.2 Inspecting Ladders

- Welded employees and contractors will inspect and mark all ladders at least quarterly per the Quarterly Inspection Program shown in Figure 1. Personnel who use ladders are responsible and expected to inspect ladders before use. Non-inspected ladders will not be used. Bends, dents, cracks, loose or missing rivets, disconnected braces, and corrosion can seriously weaken a ladder. The area around rivet points on fiberglass ladders will be carefully inspected for hairline stress cracks. Any defective ladders will be destroyed or removed from use immediately.
- Ladders with broken, bent or missing rungs, broken or split side rails, or damaged in other ways will be immediately removed from service.

7.16.3 Storing and Transporting Ladders

- When not in use, ladders will be stored on racks or on their sides and in designated locations.
- Where feasible, ladders will be stored and protected from the elements, with good ventilation, and away from excessive heat.
- Materials are not to be stored on ladders.
- Ladders being transported by motor vehicles will be properly supported. Supporting points will be made of material such as wood or rubber-covered iron pipe to minimize chafing and the effects of vibration and movement during transport.
- Ladders over 12 feet in length will be carried by two employees.

7.17 CRANES AND MATERIAL HANDLING

Cranes and lifting require operators to be Competent Persons in crane operation and rigging. Lift risk categories include low risk lifts, medium risk lifts, critical risk lifts and super-critical lifts.
Workers must be kept clear of loads about to be lifted and no person must ever be located under a suspended load.

7.17.1 General Crane and Rigging Operation

- The superintendent responsible for the work operation will have a competent person assigned and available as the person in charge of any lifting operation. A competent person is a person who is responsible for attaching rigging gear (i.e. shackles, slings, etc.) from the load to be lifted to the mechanical lifting equipment. This person will have knowledge,

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experience, background and training in rigging, hoisting, lifting, and signaling methods. This person will be capable of identifying existing and predictable hazards in the surroundings or working conditions and have authorization to take prompt corrective measures to eliminate or correct the condition.

- Steel or hardwood mat pads will be provided and/or installed under crane and boom-truck outriggers when they are extended. Boom-trucks are considered cranes.
- Crane and hoist equipment will be inspected daily before use, annually and per manufacturer's recommendation.
- Rigging will be inspected before use with a documented inspection conducted every quarter per the Quarterly Inspection Program shown in Figure 1.

Figure 1 – Quarterly Inspection Program

Quarterly Inspection Program (Ladders, Electrical Equipment and Cords, Fall Protection and Lifting/Rigging Equipment)	
1st Quarter	January – February – March
2nd Quarter	April – May – June
3rd Quarter	July – August – September
4th Quarter	October – November – December

- Each signal person will meet the following qualification requirements:
  - Know and understand the type of signals used.
  - Be competent in the application of the type of signals used.
  - Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.

7.17.2 Crane Operators

- Cranes and lifting operators must be competent to operate the crane as proven by examination and hold a current certificate.
- Before leaving a crane unattended, the operator must land the load, disengage the master clutch, set all locking devices, put controls in neutral, secure the crane against movement, and stop the engine.
- Operate all equipment in accordance with the manufacturer's instructions.

7.17.3 Spotters/Riggers/Oilers

- Be able to determine the weight, center of gravity and characteristics of a load.
- Inspect and determine whether a wire rope sling or other piece of lifting equipment is damaged or not fit for purpose.
- Be familiar with the different and correct rigging techniques.
- Know the correct hand signals.

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7.17.4 Competent Person

All lifting will have a competent person to control overall lifting operations. Competent persons will be dispatched from the local union halls, and union operators brought on by Site Superintendent. Operators will go through a Verification of Operator Competency (VOC) that will be agreed upon with Welded and Local Operator Unions. Duties will specifically include:

- Assessment and planning of lifts with regard to the selection of cranes, lifting gear, equipment, instruction and supervision.
- Ensuring that the equipment selected has been adequately inspected and maintained.
- Ensuring that an effective procedure is in place for reporting defects, taking into account remedial actions.
- Taking responsibility for the organization and control of lifting operations.
- Stopping any unsafe operation.

7.17.5 Ground Conditions

- Ground conditions must be considered for stability and loading capabilities.
- Outrigger and track loading must be established before positioning the crane.

7.17.6 Overhead Power Lines

- At no time will any piece of equipment work within the following limits of energized overhead power lines (absolute limits of approach):
  - Up to 50 kV– Minimum 10 Feet
  - Over 50 to 200 kV – Minimum 15 Feet
  - Over 200 to 350 kV – Minimum 20 Feet
  - Over 350 to 500 kV – Minimum 25 Feet
  - Over 500 to 750 kV – Minimum 35 Feet
  - Over 750 to 1000 kV – Minimum 45 Feet
  - Over 1000 kV – As established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.

- If work cannot reasonably be accomplished within the absolute limits of approach, then work must be approved by Corporate ES&H Director, PM, and Site Superintendent before any work commences.
- Welded will actively understand the heights and voltages of the Overhead Power Lines on the R-O-W and Haul Roads. Welded will also utilize the TransCanada provided details based on engineering of the MXP Project. Goal Posts and signs will be place according to Figure 1.
- Hand felling and Mechanical clearing contractor will provide a safety plan in working near or around OHPL that should comply with Welded's and TransCanada's standards. Welded will also comply with **TransCanada's OHPL Specification Rev 01.**

7.17.7 Rigging

Rigging is defined as the hardware or equipment used to safely attach a load to a lifting or hoisting

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device by means of adequately rated and applied slings.

- Slings include wire ropes, chains, synthetic web and metal mesh made into forms, with or without fittings and other approved tools/materials, for handling loads. All connecting devices must be manufactured for rigging and hoisting operations.

7.18 COMPRESSED GAS CYLINDERS

Compressed gas cylinder use and storage will be governed the requirements of Welded's Policy/Procedure, which contains the full set of requirements. Some key points of the procedure are:

- Information is provided in the New Employee Safety Orientation/ Induction with detailed instruction provided by team leaders.
- All cylinders shall be stored in the upright position and be properly secured by means of a substantial chain or cable. Cylinders shall be stored in areas away from construction activities in conspicuously marked racks indicating type of gas and whether cylinder is full or empty. Oxygen cylinders shall be stored a minimum of 20 feet from flammable gas or flammable liquid storage areas or be protected by a five foot firewall having a fire resistance of at least one hour.
- Wheeled carts or racks with fork skids shall be used to transport cylinders.
- Cylinders shall be securely fastened in the upright position while being transported.
- Flash back arrestors shall be installed on all cutting torches. Flash arrestors shall be installed on the downstream side of oxygen and fuel gas regulators to which the appropriate hoses will be attached.
- The appropriate hoses shall be purchased for the type of fuel gas utilized.

7.19 ELECTRICAL EQUIPMENT INSPECTION/GFCI

Employees shall visually inspect receptacles, extension cords, and equipment connected by cord and plug before each use for external defects. Where there is evidence of damage, the damaged item shall be taken out of service and tagged with a Defective Tool Tag. All temporary distribution panels shall be labeled with the location of the feed. All branch circuits shall be labeled.

7.20 MAN VS EQUIPMENT INTERFACE

Work must be planned so that the interaction between workers and equipment is minimized to the extent possible. Specific hazard control measures must be identified in the JSA for all work that involves workers and equipment interacting in the same area. It is the responsibility of the field supervisor to confirm all control measures are in place prior to starting work including:

- Confirming all excavation, filling, and tipping areas have adequate JSAs completed.
- Creating designated traffic routes, vehicle segregation measures through physical barriers, and positions of safety created for traffic watches and spotters.
- Confirming waste areas and material storage areas have firm, flat areas maintained for loading/unloading processes.
- Position welfare facilities and offices to minimize road crossings by people.

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- Segregate and identify specific parking areas to avoid light vehicles and trucks from interacting with workers.
- Confirm access roads are well maintained, with adequate dust control, to prevent excessive vehicle wear.

Also, access roads being built will also require Man vs Equipment awareness. Handling mats and building these access roads are for competent operators. Ground employee awareness will be emphasized, and the **TransCanada Temporary Access Roads Specification Rev: 0** will be referenced. Maintenance of these access roads will be required by Welded and any subcontractor.

In addition, before working around equipment, each employee and contractor must attend one of the following training courses, depending on their role.

- Man vs Equipment Training for Supervisors
  - This course is designed for field supervision and details multiple ways of planning and executing work to protect employees from equipment. It also focuses on equipment inspection and training requirements for drivers and operators on site.
- Man vs Equipment Training for Drivers & Operators
  - This course is designed for truck drivers and heavy equipment operators on inspection of their equipment and safe operation on site. It focuses on identifying unsafe road conditions, the importance of safety equipment on the equipment, required inspection by the Contractor's Equipment Department, operating their equipment safely, and the responsibility to stop work if an unsafe condition or action is observed.
- Man vs Equipment Training for Other Employees
  - This course is designed for all employees who work around heavy equipment but are not supervising work. It focuses on identifying areas where employees should work that are out of the line-of-fire, ways to physically protect workers from vehicles and equipment, and the responsibility to stop work if an unsafe condition or action is observed.

7.21 OFFICE FACILITIES

All personnel working in an office shall receive orientation regarding emergency and fire evacuation, as well as any other pertinent training such as hazard communication, First Aid/CPR, lockout and tag out, etc.

7.22 CLOSING

Welded Construction, L.P. will comply with all requirements on the MXP project. All site specific Safety Plans and Work Plans are available for review at the request of TransCanada or any authorized requester. Various plans have been submitted to TransCanada. Updates to any plan that has been submitted to TransCanada, will be resubmitted when the updates are necessary.

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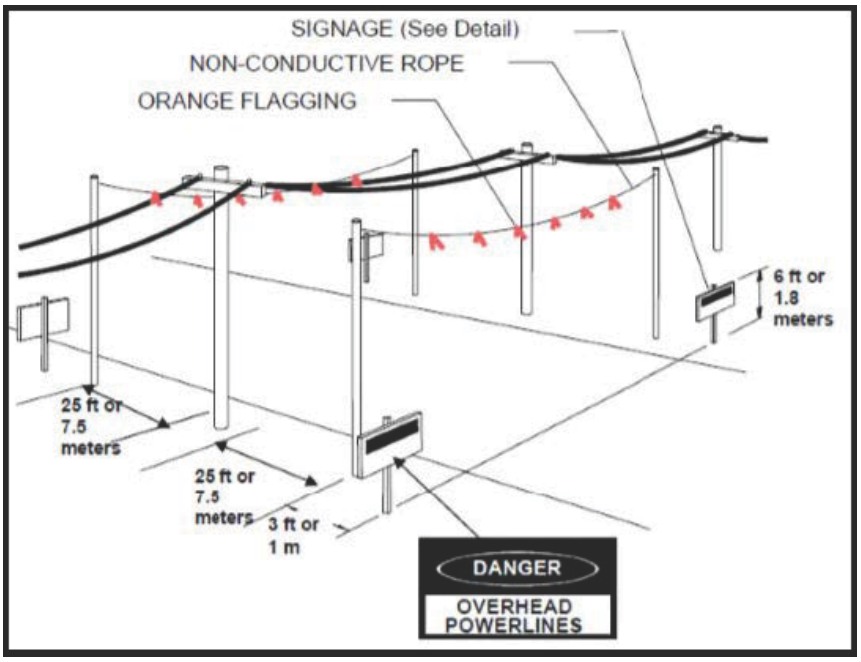


Figure 1 - Depicts the layout for the goal posts and signs for OHPL.

EMERGENCY RESPONSE PLAN

Project: 2018-01 - Spread 1

Mountaineer Express Project - TransCanada

Moundsville, WV to Wileyville, WV

Counties: Marshall & Wetzel

Districts: Franklin, Meade, Proctor, & Center

Project ES&H Lead	J. Scott Dearwester	(419) 460-2839
Project ES&H	Justin Walker	(419) 250-5748
Superintendent	Art Gavlock	(419) 460-1697
Superintendent	Robert Seebeck	(419) 250-5691
Superintendent	Rick Emret	(570) 772-3657
Project Manager	Mett Carroll	(713) 253-9317

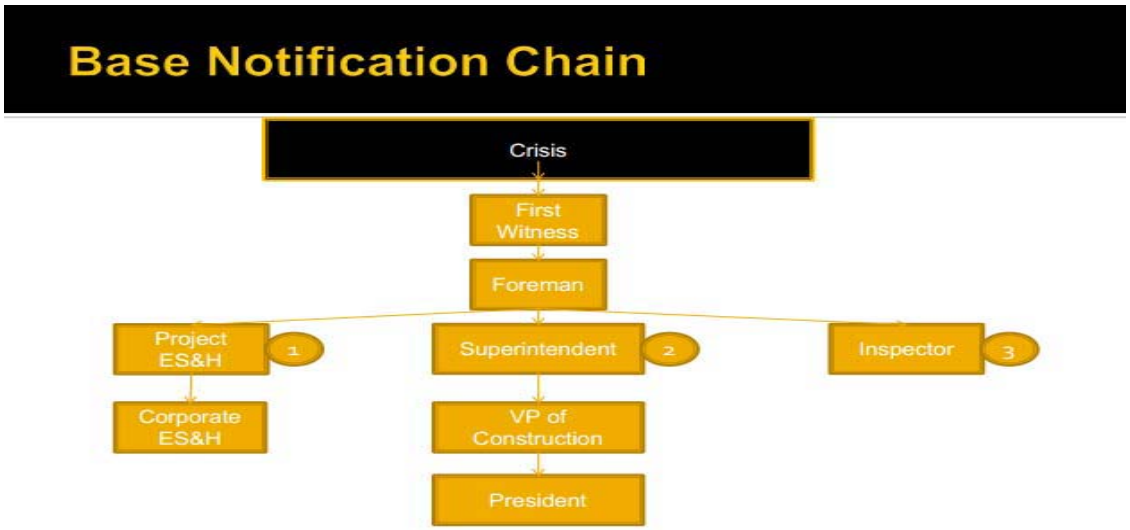
Emergency Communication: In the event of an incident, we will communicate via cell phone and/or radio. Contact **Scott Dearwester** who will coordinate with the applicable Superintendent (**Art Gavlock, Robert Seebeck,** or **Rick Emret**) and **Mett Carroll**. In case of an emergency, CALL 911. Safety Radio Channel will be **"Channel 0"** and will be used for Safety use only.

In this Emergency Response Plan (ERP) you will be provided with three key things:

1. Notification procedures required on the Right-Of-Way based on severity.
2. List of the local Fire Department, Law Enforcement, and Hospitals.
3. Google Map images of the quickest route to the closest medical facility per the road crossing you are located.
4. Mock drills based on TransCanada scenario will occur. Crews will need to be familiar with notification protocol, local emergency response location/time, and responding with limited cell phone reception.

For Non-Serious Injuries/Illnesses/Incidents

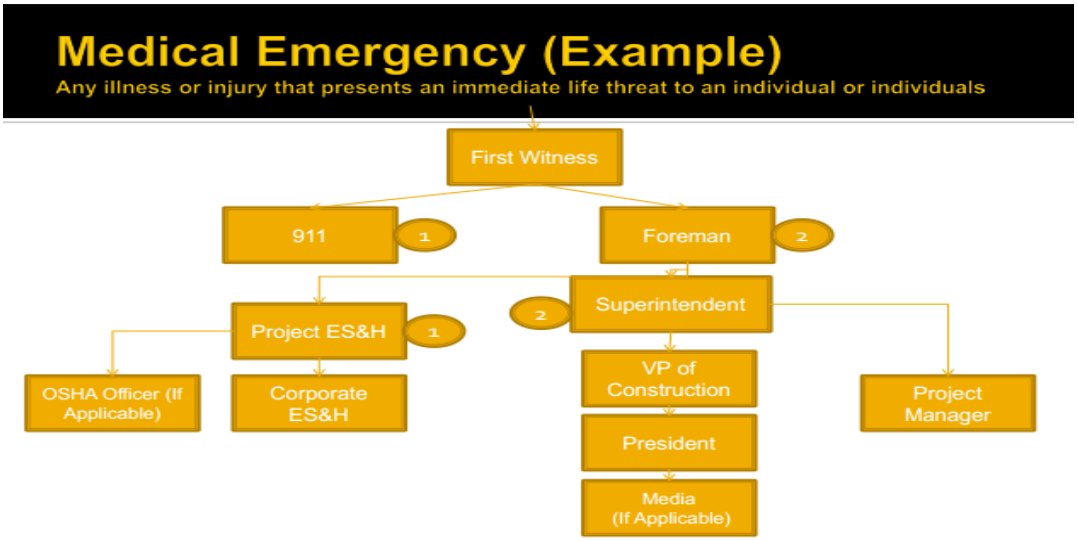
Minor injuries (illness, scrapes, sprains etc.), moderate care needed (stitches etc.), property damage, and any other incidents on the R-O-W, follow Base Notification Chain below:



Welded Construction Emergency Procedures for Crews

Call 911 and give specific instructions to the accident site (see project maps), **crew's competent and trained employee should administer First Aid/CPR as needed**. If victim can be transported safely without further injury by Welded crew (Or Subcontractor), and is deemed necessary, notify the Project ES&H Lead and transport to Reynolds Memorial Hospital or Wetzel County Hospital. (See attached Map).

Below is the Chain of Notification for a Medical Emergency:



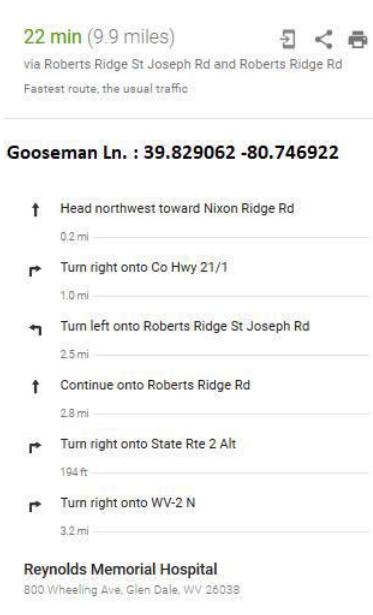
Marshall County Emergency Services

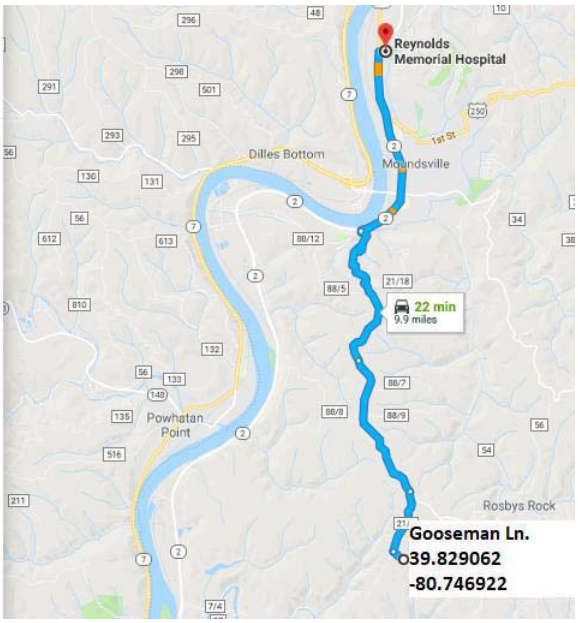
Hospitals/Emergency Room		
Reynolds Memorial Hospital	*800 Wheeling Ave – Glen Dale, WV 26038*	(304) 845-3211
Fire Department		
Moundsville F.D.	*800 6th St – Moundsville, WV 26041*	(304) 845-2050
Law Enforcement		
Marshall County Sheriff's Dept.	*601 7th St – Moundsville, WV 26041*	(304) 843-1500
West Virginia State P.D.	*1700 S. Lafayette Ave – Moundsville, WV 26041*	(304) 843-4100

Franklin District Road Crossing's

Road Crossing	Latitude & Longitude	Buried Utilities	Overhead Lines	Road Description	Closest Local Hospital
Gooseman Lane	39.829062 -80.746922	Y	Y	Gravel, Single Lane	Reynolds Memorial Hosp.
AR 001	39.838717 -80.745169	UK	Y	Gravel, Single Lane	Reynolds Memorial Hosp.
Cecil Ridge	39.830660 -80.732519	UK	Y	Gravel, Single Lane	Reynolds Memorial Hosp.

Gooseman Lane – Lat: 39.829062 Long: -80.746922





AR001 – Lat: 39.838717 Long: -80.745169

20 min (9.6 miles)

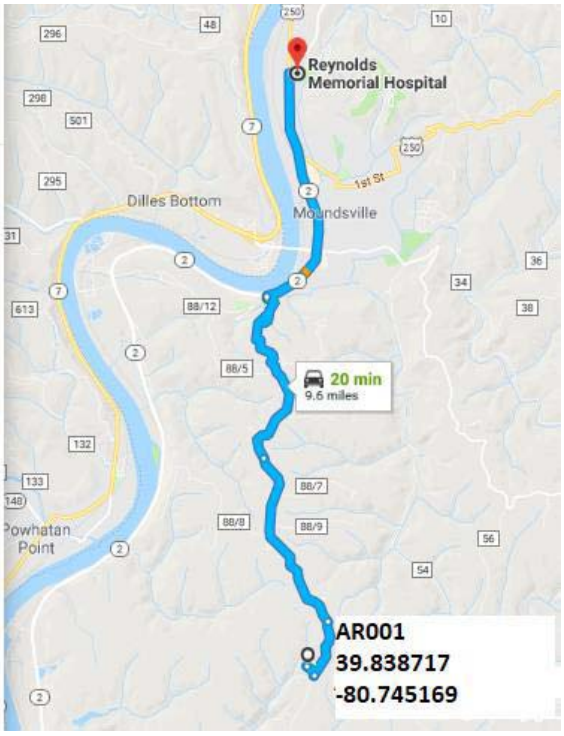
via Roberts Ridge St Joseph Rd and Roberts Ridge Rd

Fastest route, the usual traffic

AR001: 39.838717 -80.745169

- Head east toward Co Hwy 21/1 — 0.2 mi
- Turn left onto Co Hwy 21/1 — 0.8 mi
- Turn left onto Roberts Ridge St Joseph Rd — 2.5 mi
- Continue onto Roberts Ridge Rd — 2.8 mi
- Turn right onto State Rte 2 Alt — 194 ft
- Turn right onto WV-2 N — 3.2 mi

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



Cecil Ridge – Lat: 39.830660 Long: -80.732519

21 min (10.5 miles)

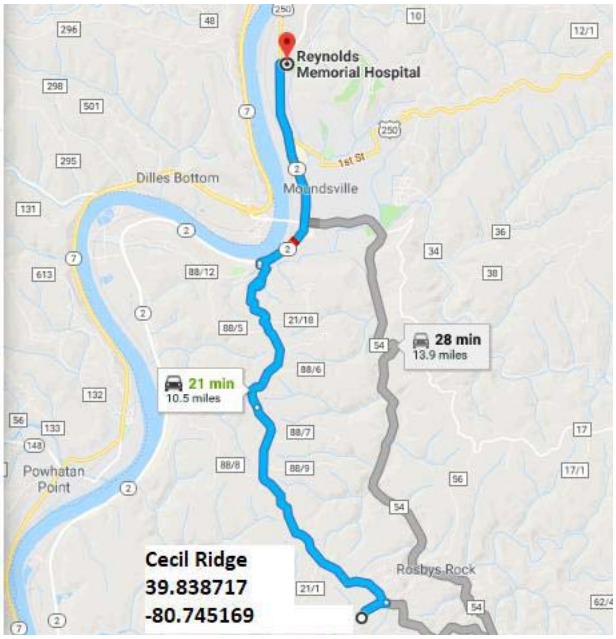
via Roberts Ridge St Joseph Rd and Roberts Ridge Rd

Fastest route, the usual traffic

Cecil Ridge: 39.830660 -80.745169

- Head northeast on Cecil Ridge toward Roberts Ridge St Joseph Rd — 0.4 mi
- Sharp left onto Roberts Ridge St Joseph Rd — 3.9 mi
- Continue onto Roberts Ridge Rd — 2.8 mi
- Turn right onto State Rte 2 Alt — 194 ft
- Turn right onto WV-2 N — 3.2 mi

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



Meade District Road Crossing's

Road Crossing	Latitude & Longitude	Buried Utilities	Overhead Lines	Road Description	Closest Local Hospital
Games Ridge	39.829062 -80.746922	Y	UK	Gravel, Dual Lane	Reynolds Memorial Hosp.
AR 002	39.838717 -80.745169	UK	Y	Gravel, Single Lane	Reynolds Memorial Hosp.
Roberts Ridge	39.827251 -80.710368	UK	Y	Asphalt, Dual Lane	Reynolds Memorial Hosp.
Blake Ridge	39.826533 -80.705242	Y	Y	Asphalt, Dual Lane	Reynolds Memorial Hosp.
AR 003 (Not Crossing)	39.820915 -80.705921	UK	Y	Asphalt, Dual Lane	Reynolds Memorial Hosp.
AR 004 (Not Crossing)	39.823935 -80.686732	UK	UK	Gravel, Single Lane	Reynolds Memorial Hosp.
Shephards Ridge	39.798780 -80.693260	Y	Y	Gravel, Single Lane	Reynolds Memorial Hosp.
EMR RT 2	39.790509 -80.690737	Y	UK	Asphalt, Dual Lane	Reynolds Memorial Hosp.
AR 005	39.779067 -80.691061	UK	Y	Gravel, Single Lane	Reynolds Memorial Hosp.
Fish Creek	39.772896 -80.690386	Y	Y	Asphalt, Dual Lane	Reynolds Memorial Hosp.
Pleasant Ridge	39.767889 -80.705911	Y	Y	Gravel, Single Lane	Reynolds Memorial Hosp.
AR 008	39.737283 -80.669986	UK	Y	Gravel, Single Lane	Reynolds Memorial Hosp.
Robinson Ridge	39.732104 -80.666828	Y	Y	Asphalt, Single Lane	Reynolds Memorial Hosp.

Games Ridge – Lat: 39.829062 Long: -80.746922

22 min (9.9 miles)

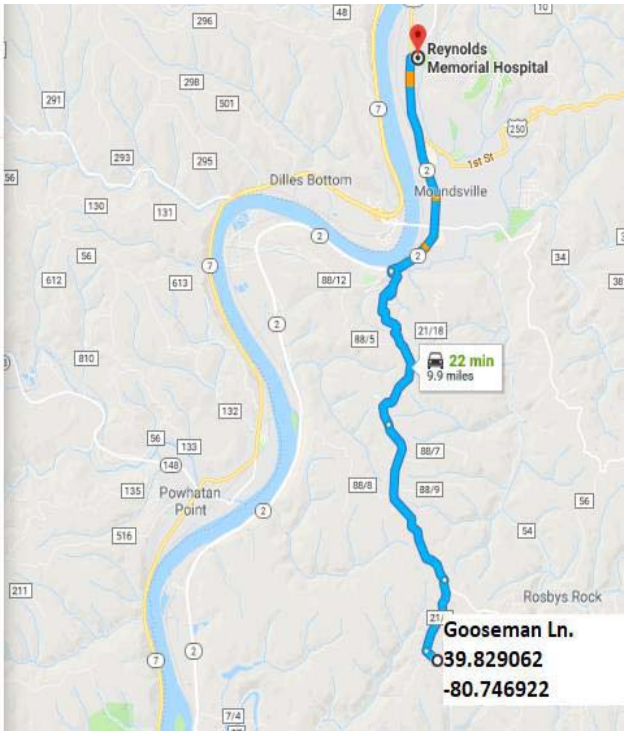
via Roberts Ridge St Joseph Rd and Roberts Ridge Rd

Fastest route, the usual traffic

Gooseman Ln. : 39.829062 -80.746922

- Head northwest toward Nixon Ridge Rd — 0.2 mi
- Turn right onto Co Hwy 21/1 — 1.0 mi
- Turn left onto Roberts Ridge St Joseph Rd — 2.5 mi
- Continue onto Roberts Ridge Rd — 2.8 mi
- Turn right onto State Rte 2 Alt — 194 ft
- Turn right onto WV-2 N — 3.2 mi

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



AR 002 – Lat: 39.838717 Long: -80.745169

22 min (10.9 miles)

via Roberts Ridge St Joseph Rd and Roberts Ridge Rd

Fastest route, the usual traffic

AR002: 39.838717 -80.745169

- Head north toward Roberts Ridge — 0.1 mi
- Turn left onto Roberts Ridge — 0.3 mi
- Continue onto Roberts Ridge St Joseph Rd — 4.4 mi
- Continue onto Roberts Ridge Rd — 2.8 mi
- Turn right onto State Rte 2 Alt — 194 ft
- Turn right onto WV-2 N — 3.2 mi

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



Roberts Ridge – Lat: 39.827251 Long: -80.710368

21 min (11.2 miles)

via Roberts Ridge St Joseph Rd and Roberts Ridge Rd

Fastest route, the usual traffic

Roberts Ridge: 39.827251 -80.710368

- Head southwest on Roberts Ridge toward Games Ridge Rd — 0.7 mi
- Continue onto Roberts Ridge St Joseph Rd — 4.4 mi
- Continue onto Roberts Ridge Rd — 2.8 mi
- Turn right onto State Rte 2 Alt — 194 ft
- Turn right onto WV-2 N — 3.2 mi

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



Blake Ridge – Lat: 39.826533 Long: -80.705242

23 min (11.9 miles)

via Roberts Ridge St Joseph Rd

Fastest route, the usual traffic

Blake Ridge: 39.826533 -80.705242

- Head north on Blake Ridge Rd toward Roberts Ridge — 0.2 mi
- Turn left onto Roberts Ridge — 1.1 mi
- Continue onto Roberts Ridge St Joseph Rd — 4.4 mi
- Continue onto Roberts Ridge Rd — 2.8 mi
- Turn right onto State Rte 2 Alt — 194 ft
- Turn right onto WV-2 N — 3.2 mi

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



AR 003 – Lat: 39.820915 Long: -80.705921

24 min (12.3 miles)
via Roberts Ridge St Joseph Rd
Fastest route, the usual traffic

AR 003: 39.820915 -80.705921

- Head northwest on Blake Ridge Rd toward Roberts Ridge — 0.7 mi
- Turn left onto Roberts Ridge — 1.1 mi
- Continue onto Roberts Ridge St Joseph Rd — 4.4 mi
- Continue onto Roberts Ridge Rd — 2.8 mi
- Turn right onto State Rte 2 Alt — 194 ft
- Turn right onto WV-2 N — 3.2 mi

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



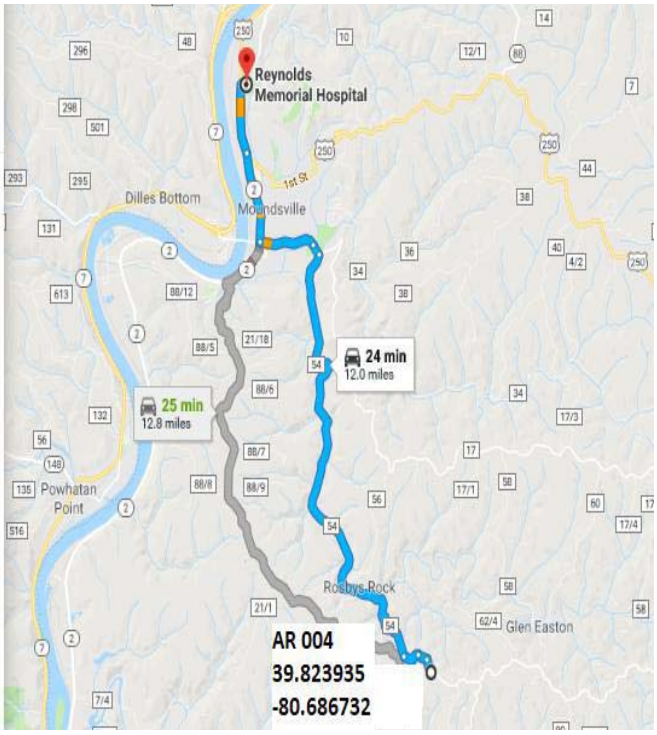
AR 004 – Lat: 39.823935 Long: -80.686732

24 min (12.0 miles)
via Big Grave Creek Rd
Fastest route

AR 004: 39.823935 -80.686732

- Head north on Co Hwy 21/11 toward Roberts Ridge St Joseph Rd — 4 s (95 ft)
- Continue on Roberts Ridge St Joseph Rd to Big Grave Creek Rd — 2 min (0.7 mi)
- Turn right onto Big Grave Creek Rd — 14 min (7.7 mi)
- Follow 12th St and Lafayette Ave to Wheeling Ave in Glen Dale — 8 min (3.6 mi)

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



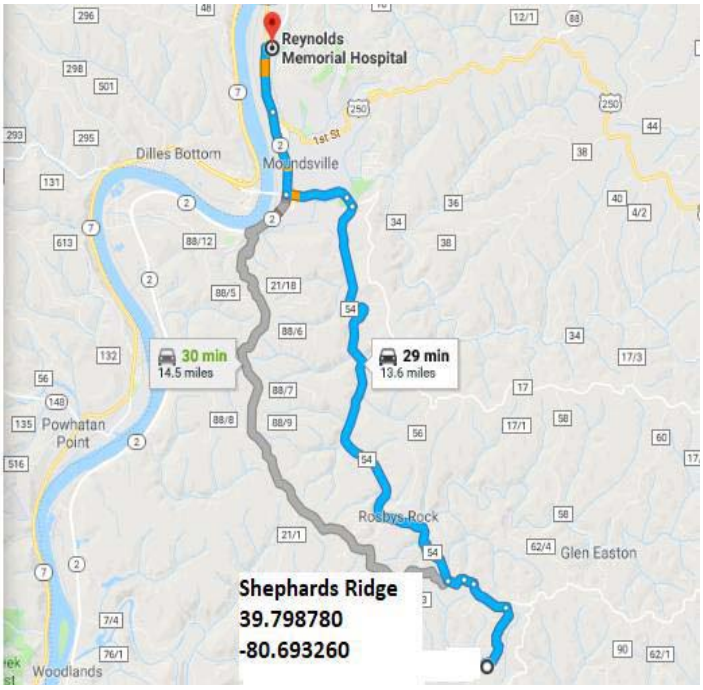
Shephards Ridge – Lat: 39.809020 Long: -80.683747

29 min (13.6 miles)
via Big Grave Creek Rd
Fastest route

Shephards Ridge: 39.798870 -80.693260

- Head northeast on Shephards Ridge toward Roberts Ridge St Joseph Rd
  4 min (1.1 mi)
- Continue on Roberts Ridge St Joseph Rd to Big Grave Creek Rd
  3 min (1.2 mi)
- Turn right onto Big Grave Creek Rd
  14 min (7.7 mi)
- Follow 12th St and Lafayette Ave to Wheeling Ave in Glen Dale
  8 min (3.6 mi)

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038



EMR RT 2 – Lat: 39.790509 Long: -80.690737

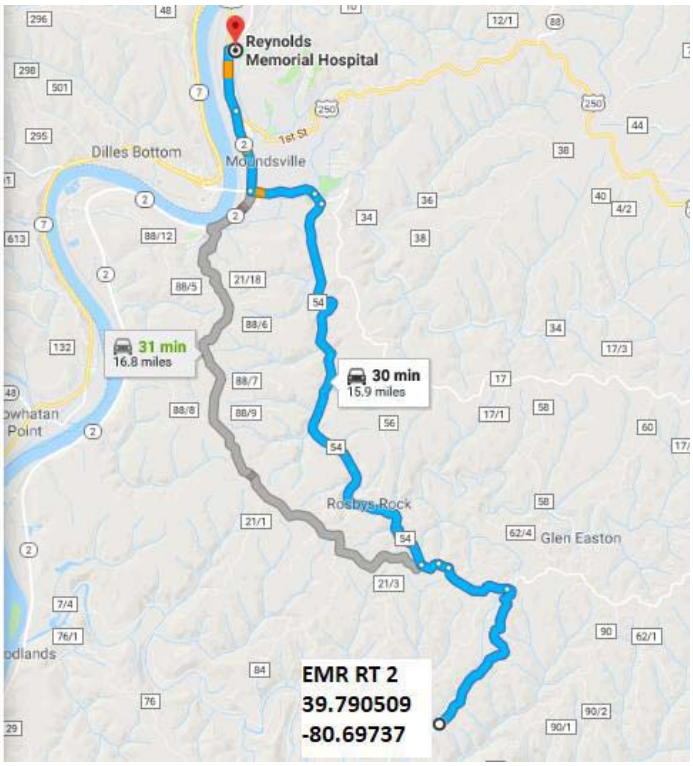
30 min (15.9 miles)
via Big Grave Creek Rd
Fastest route

EMR RT 2: 39.790509 -80.690737

- Take Emr Rt 2 and Roberts Ridge St Joseph Rd to Big Grave Creek Rd
  8 min (4.6 mi)
- Turn right onto Big Grave Creek Rd
  14 min (7.7 mi)
- Follow 12th St and Lafayette Ave to Wheeling Ave in Glen Dale
  8 min (3.6 mi)

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



AR 005 – Lat: 39.779067 Long: -80.691061

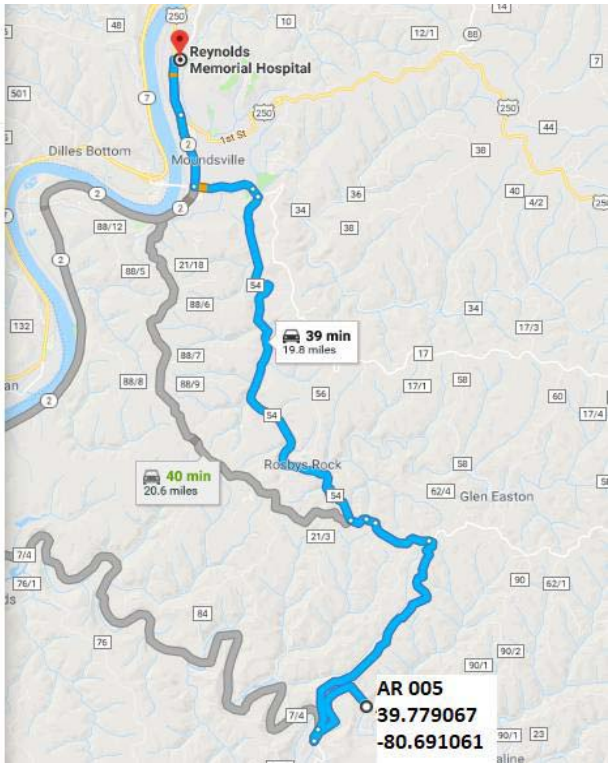
39 min (19.8 miles)
via Big Grave Creek Rd
Fastest route

AR 005: 39.779067 -80.691061

- Head north on Fish Creek Rd toward Emr Rte 2
  4 min (1.9 mi)
- Take Emr Rt 2 to Big Grave Creek Rd
  12 min (6.6 mi)
- Turn right onto Big Grave Creek Rd
  14 min (7.7 mi)
- Follow 12th St and Lafayette Ave to Wheeling Ave in Glen Dale
  8 min (3.6 mi)

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038

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Fish Creek – Lat: 39.772896 Long: -80.690386

40 min (20.4 miles)
via Big Grave Creek Rd
Fastest route

Fish Creek: 39.772896 -80.690836

- Head northwest on Fish Creek Rd toward Emr Rte 2
  5 min (2.5 mi)
- Take Emr Rt 2 to Big Grave Creek Rd
  12 min (6.6 mi)
- Turn right onto Big Grave Creek Rd
  14 min (7.7 mi)
- Follow 12th St and Lafayette Ave to Wheeling Ave in Glen Dale
  8 min (3.6 mi)

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



Pleasant Ridge – Lat: 39.767889 Long: -80.705911

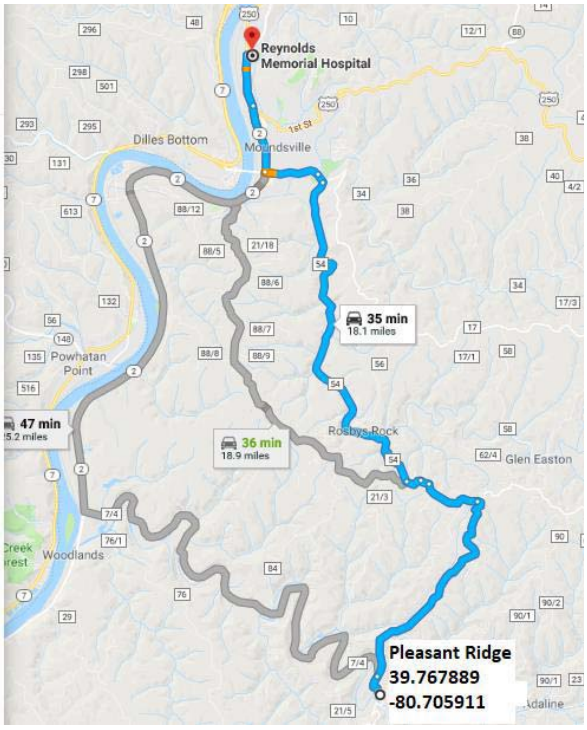
35 min (18.1 miles)
via Emr Rt 2 and Big Grave Creek Rd
Fastest route

Pleasant Ridge: 39.767889 -80.705911

- Head northwest toward Emr Rte 2
  19 s (384 ft)
- Take Emr Rt 2 to Big Grave Creek Rd
  13 min (6.7 mi)
- Turn right onto Big Grave Creek Rd
  14 min (7.7 mi)
- Follow 12th St and Lafayette Ave to Wheeling Ave in Glen Dale
  8 min (3.6 mi)

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



AR 008 – Lat: 39.737283 Long: -80.669986

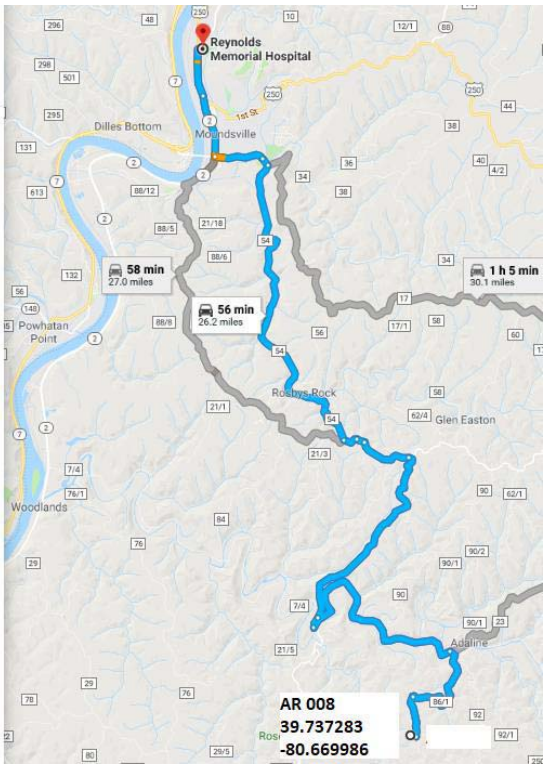
56 min (26.2 miles)
via Big Grave Creek Rd
Fastest route

AR 008: 39.737283 -80.669986

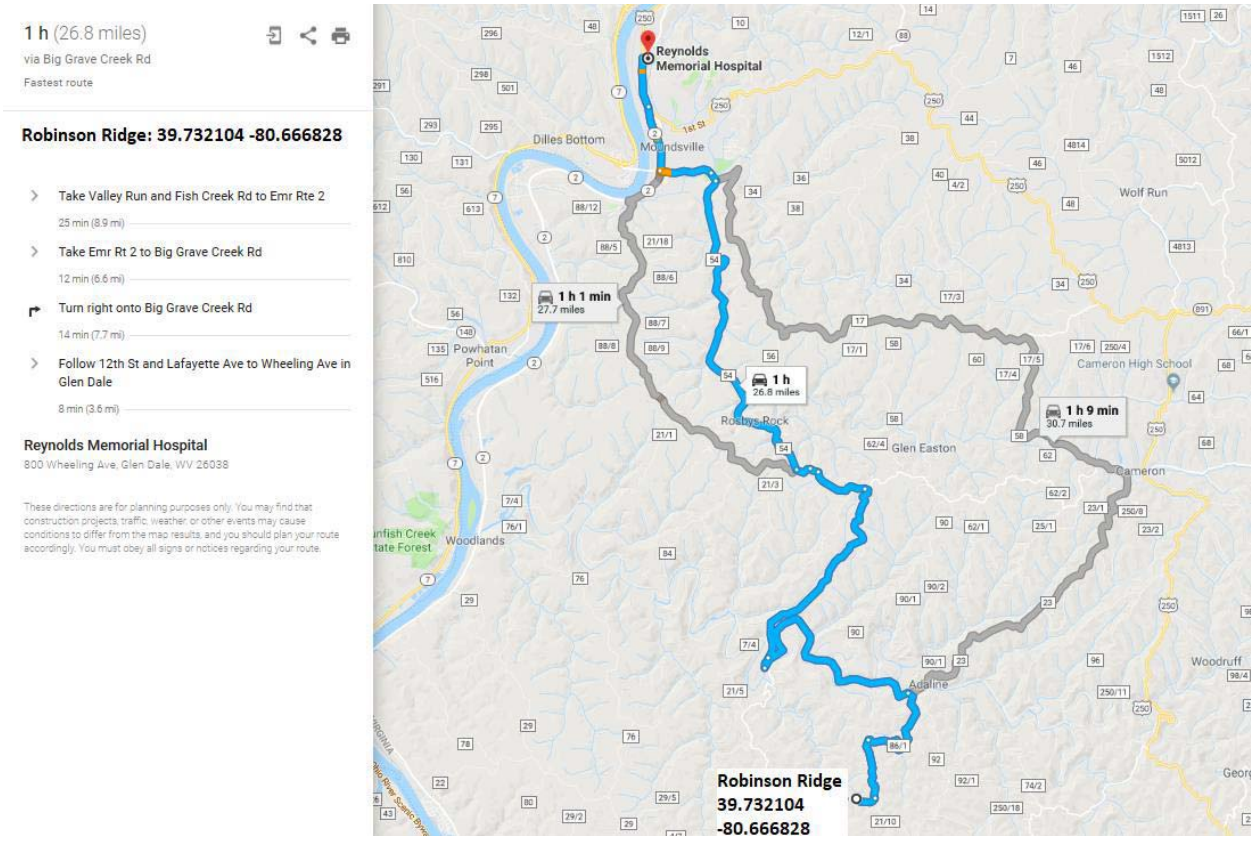
- Take Valley Run and Fish Creek Rd to Emr Rte 2
  22 min (8.3 mi)
- Take Emr Rt 2 to Big Grave Creek Rd
  12 min (6.6 mi)
- Turn right onto Big Grave Creek Rd
  14 min (7.7 mi)
- Follow 12th St and Lafayette Ave to Wheeling Ave in Glen Dale
  8 min (3.6 mi)

Reynolds Memorial Hospital
800 Wheeling Ave, Glen Dale, WV 26038

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



Robinson Ridge – Lat: 39.732104 Long: -80.666828



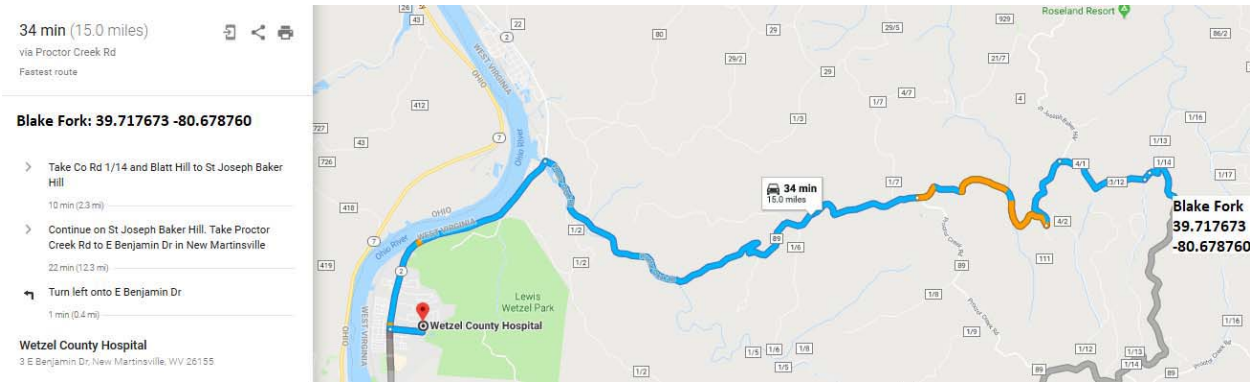
Wetzel County Emergency Services

Hospitals/Emergency Room		
Wetzel County Hospital	*3 E. Benjamin Dr – New Martinsville, WV 26155*	(304) 455-8000
Fire Department		
New Martinsville F.D.	*400 Ohio St – New Martinsville, WV 26155*	(304) 455-9115
Law Enforcement		
Wetzel County Sheriff's Dept.	*PO Box D – New Martinsville, WV 26155*	(304) 455-2430
West Virginia State P.D.	*7223 Veterans Hwy New Martinsville, WV 26155*	(304) 455-0913

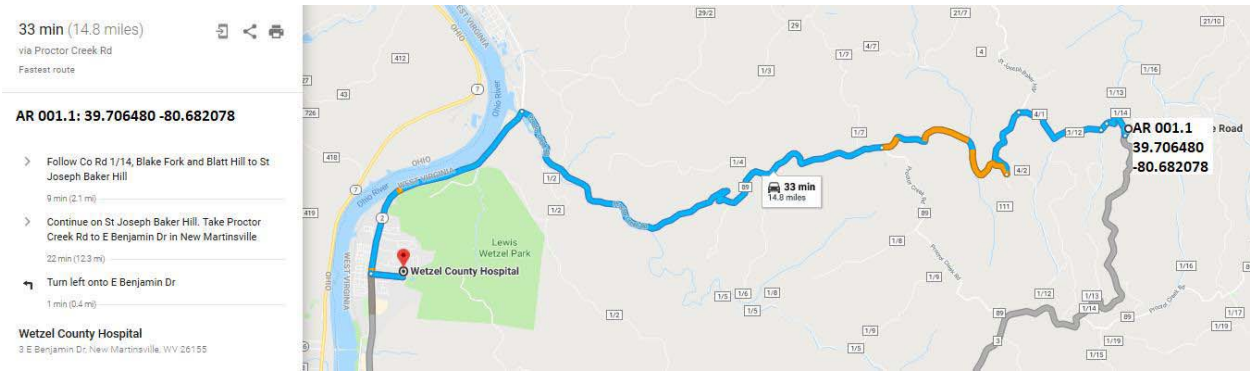
Proctor District Road Crossing's

Road Crossing	Latitude & Longitude	Buried Utilities	Overhead Lines	Road Description	Closest Local Hospital
Blake Fork	39.717673 -80.678760	Y	Y	Gravel, Single Lane	Wetzel County Hospital
AR 001.1 (Blake Ridge)	39.706480 -80.682078	UK	UK	Gravel, Single Lane	Wetzel County Hospital
AR 001.5 (Blake Ridge)	39.700920 -80.681550	Y	UK	Gravel, Single Lane	Wetzel County Hospital
AR 002 (Blake Ridge)	39.696192 -80.682784	UK	UK	Gravel, Single Lane	Wetzel County Hospital
Proctor Creek/ AR 004	39.672916 -80.680875	Y	Y	Gravel, Dual Lane	Wetzel County Hospital
Harian Ridge Rd	39.667097 -80.677124	Y	Y	Gravel, Single Lane	Wetzel County Hospital
Brock Ridge Rd/ AR 005	39.659307 -80.681539	Y	UK	Gravel, Single Lane	Wetzel County Hospital

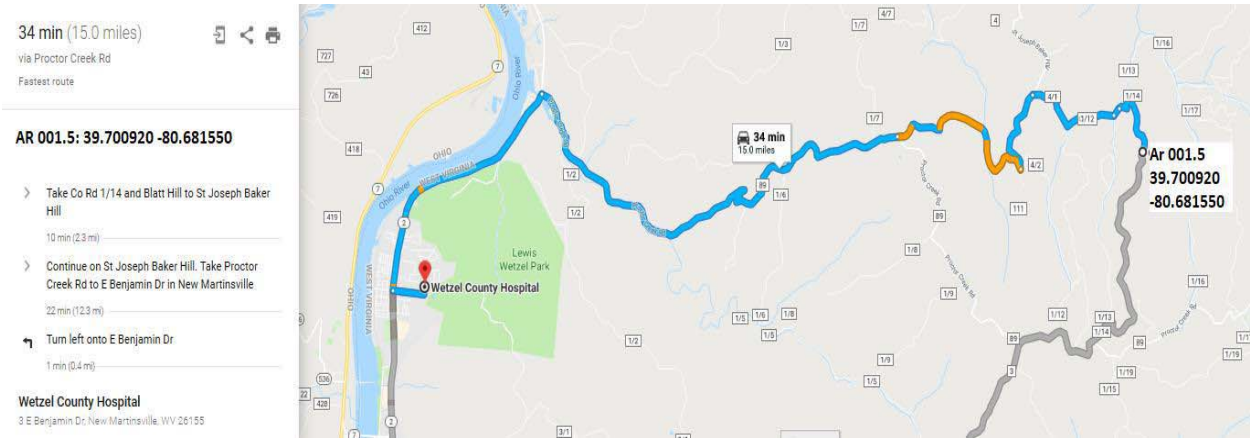
Blake Fork – Lat: 39.717673 Long: -80.678760



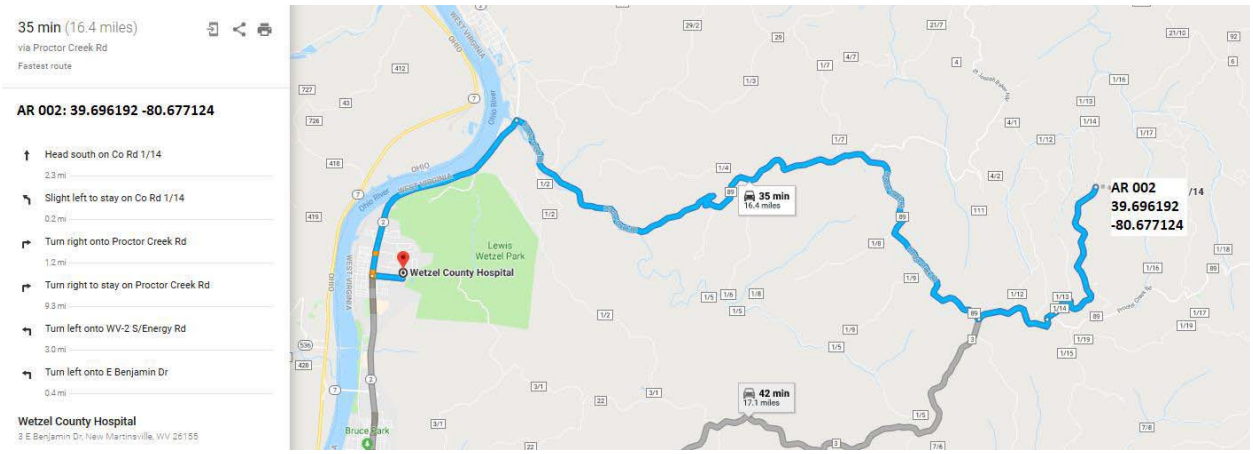
AR 001.1 – Lat: 39.706480 Long: -80.682078



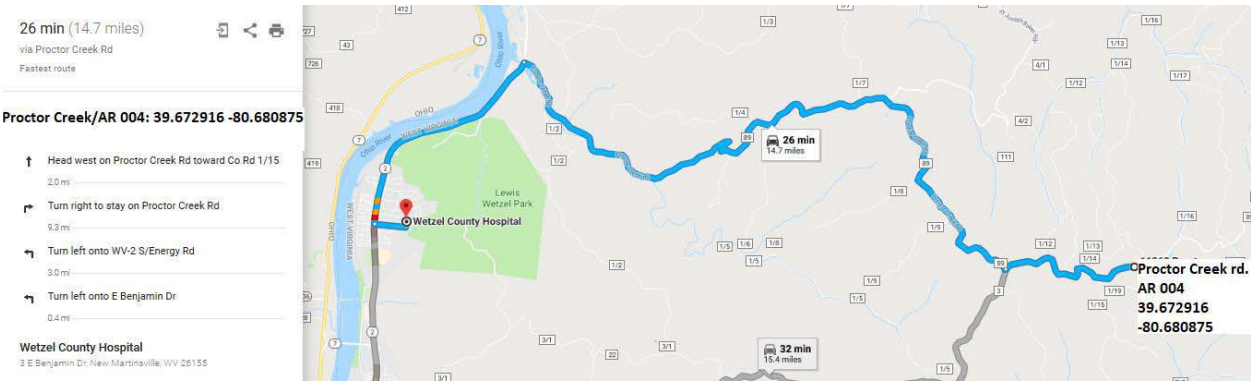
AR 001.5 – Lat: 39.700920 Long: -80.681550



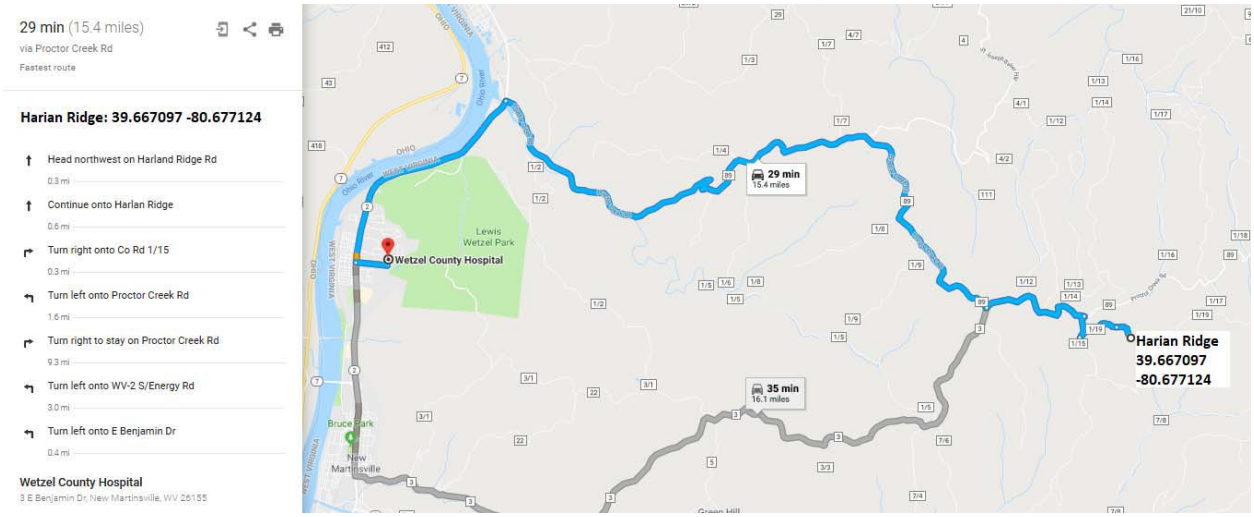
AR 002 – Lat: 39.696192 Long: -80.682784



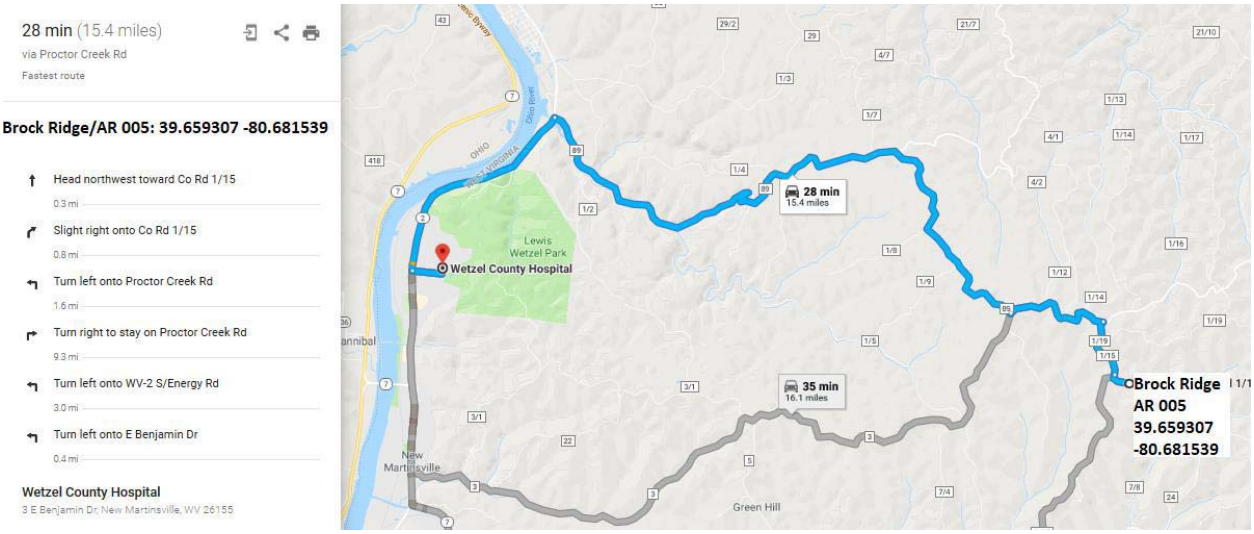
Proctor Creek/ AR 004 – Lat: 39.672916 Long: -80.680875



Harian Ridge Rd – Lat: 39.667097 Long: -80.677124



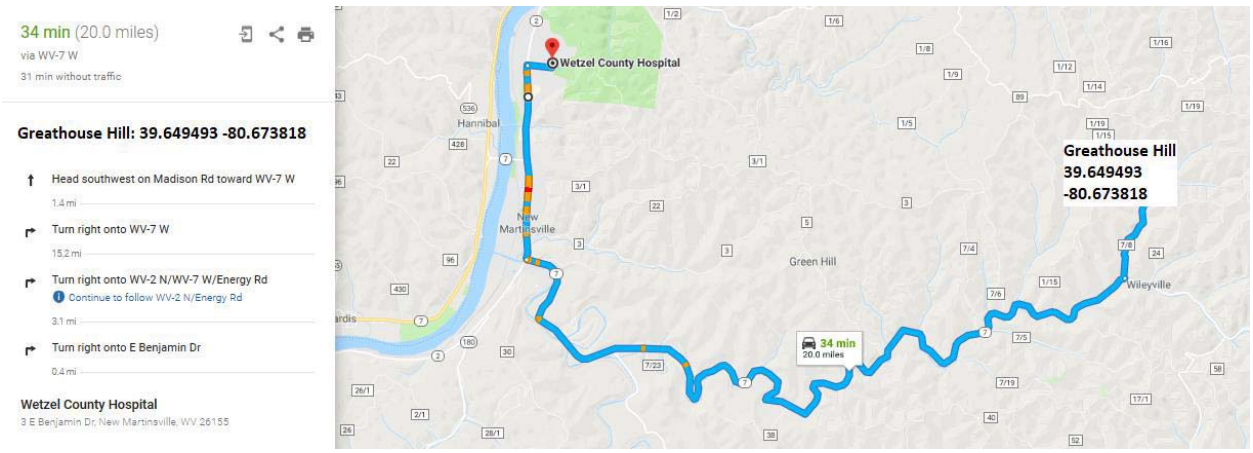
Brock Ridge Rd/ AR 005 – Lat: 39.660877 Long: -80.685237



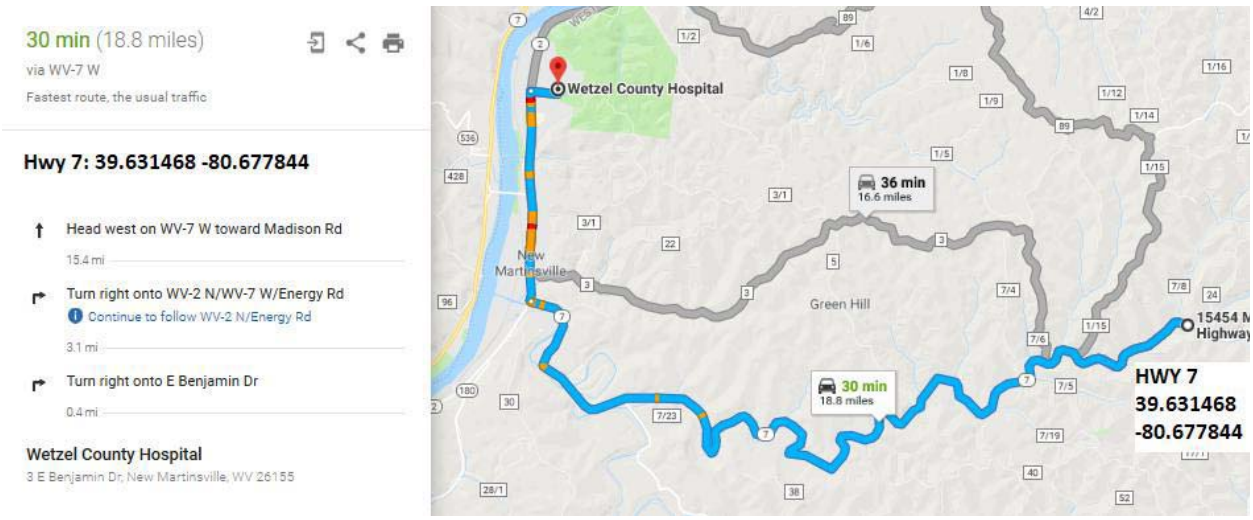
Center District Road Crossing's

Road Crossing	Latitude & Longitude	Buried Utilities	Overhead Lines	Road Description	Closest Local Hospital
Greathouse Hill	39.649493 -80.673818	Y	Y	Gravel, Single Lane	Wetzel County Hospital
HWY 7	39.631468 -80.677844	UK	Y	Asphalt, Dual Lane	Wetzel County Hospital

Greathouse Hill – Lat: 39.649493 Long: -80.673818



HWY 7 – Lat: 39.631468 Long: -80.677844



All light red boxes are marked for their difficult access/egress for Emergency Response capabilities

Emergency Response - Mock Drill Scenarios

In the event of an emergency, response time is critical to the health of the injured personnel. Understanding the closest medical facility to begin the day will be discussed every morning during the JSA. Cell phone service is going to be limited in many areas, and relying on them is not a realistic or intelligent choice. Welded Construction is going to identify and mark the areas were service is most likely to be reached on the R-O-W (near the road approaches typically). When cell phone service is not an option, what to do next is the important part to understand.

When cell phone service is not dependable, then we need our entire project to understand how we need to respond. Ideally, the field supervision, Foreman & Straw, will lead the emergency response, but they cannot be the sole competent response employee. Several things are:

- Everyone has a working radio and understands the emergency channel
- Muster Points and GPS Coordinates are present and are visible with signage
    - These points are documented every morning at the JSA
- CPR/First Aid and Emergency Response team is identified
    - Emergency Paramedic Responder is known and in the vicinity
    - Satellite phone owners are identified and present in the vicinity
- AED is present and functional
- Access/Egress to the R-O-W is available
- Helicopter landing areas are marked with signage and GPS coordinates and discussed in the morning

The purpose of these mock drills is clearly to be prepared for them in the case they occur, and for general review of difficult reception areas. Below are three mock drill scenarios:

Scenario 1 – A

Scenario 2 – B

Scenario 3 – C

Welded Construction, L.P.

Mountaineer XPress Project -Spread 1

Traffic Management Plan

January 2018

Introduction

Welded Construction, L.P. has developed this Traffic Management Plan to show what will be followed on the Mountaineer XPress Project for TransCanada. Welded will implement controls to limit the potential for any impact to the public on any public road during this MXP Project. The plan will cover how Welded minimizes worker and public exposure by preparedness and training of our employees. High risk exposure areas will be identified throughout the project, and emergency flagging response will be discussed to ensure a controlled and safe environment.

Traffic Control Execution

During the construction of MXP, any and all public roadways that may be crossed will have to follow the approved permit given by West Virginia Division of Highways (WVDOH) to TransCanada. TransCanada will provide Welded with the approved Haul Routes for the state of West Virginia, and these routes will be discussed and followed by all heavy hauling operations.

Standard traffic control procedure will include trained and competent flaggers in appropriate PPE attire, signage that complies with WVDOH. If special lighting, signage, traffic cones/barriers are required, Welded will ensure they are present. The flagger training will typically be conducted when the appropriate employees are initially hired, and the training will comply with the Department's minimum flagger training guidelines. Only employees who have successfully completed Welded Constructions flagger training, may flag on the MXP Project. Some oversized/overweight vehicles will require pilot trucks with trained flaggers.

With the majority of open cut road crossings, Welded will strive to maintain single lane traffic across the open cut road crossing. With some roads this will not be feasible, and traffic will be temporarily closed with traffic control in place. Traffic control will not restrict public travel for more than 15 minutes. Once this time limit is reached, Welded will place a road plate across the trench for traffic to continue. Barriers protecting the public from the open trench will be placed at the road crossing. These barriers will remain at the crossings until flowable fill has completed cured, and road plates have been removed for normal public travel.

Traffic Awareness and Restrictions

If there are any restrictions that change, then Welded will comply with the specific Haul routes or restrictions that occur. Communication for Nighttime, Holiday, Weekend or Emergencies will be discussed with Welded and TransCanada. If roads require dust suppression due to the rural areas, then Welded will comply with the WVDOH requirements.

All crews will have traffic exposures coming and leaving from the Right-Of-Way. General awareness will be discussed in the Welded orientation with all employees on the project. Distracted flaggers by cell phones, other employees, or any other form will not be accepted by Welded. Special flagging operations that require 24 hour monitoring will be subbed to a trained company that is available 24/7. Welded will assist in providing various supplies that are required for WVDOH compliance for the particular scenario.

In the event a road must be temporarily closed due to construction or environmental reasons, Welded Construction will coordinate with a trained company to assist in the planning and execution of this scenario. Details on a reroute plan will be gathered and submitted to the trained company, and then submitted to a West Virginia DOT/DOH representative. This WVDOH representative, along with Welded Construction, L.P., will contact all local parties that must be notified of the temporary road closure.

References

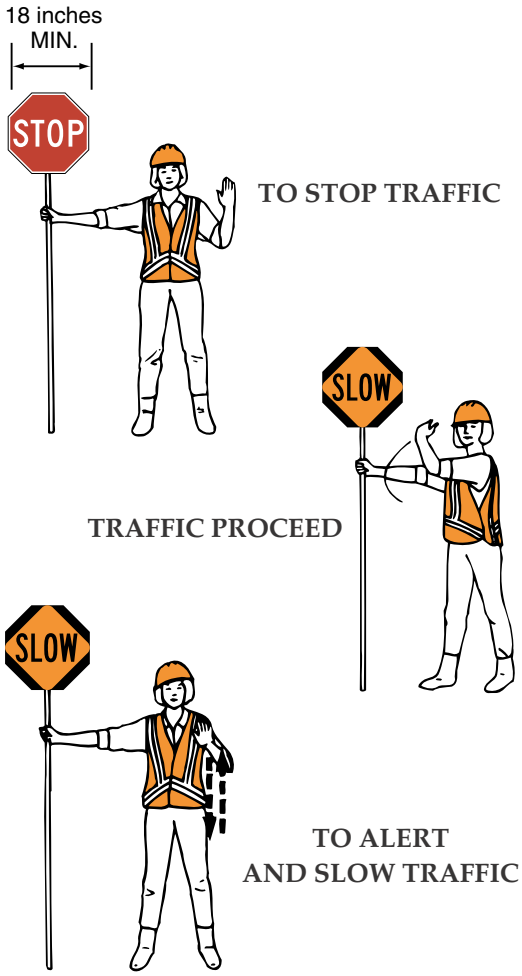
If questions throughout the project arise, then the information will be readily available for any approved requester. Welded will refer to the Welded Flagger training handout, TransCanada Permits and Traffic Management Plan, and the applicable Local, West Virginia, and Federal Agency laws and regulations.

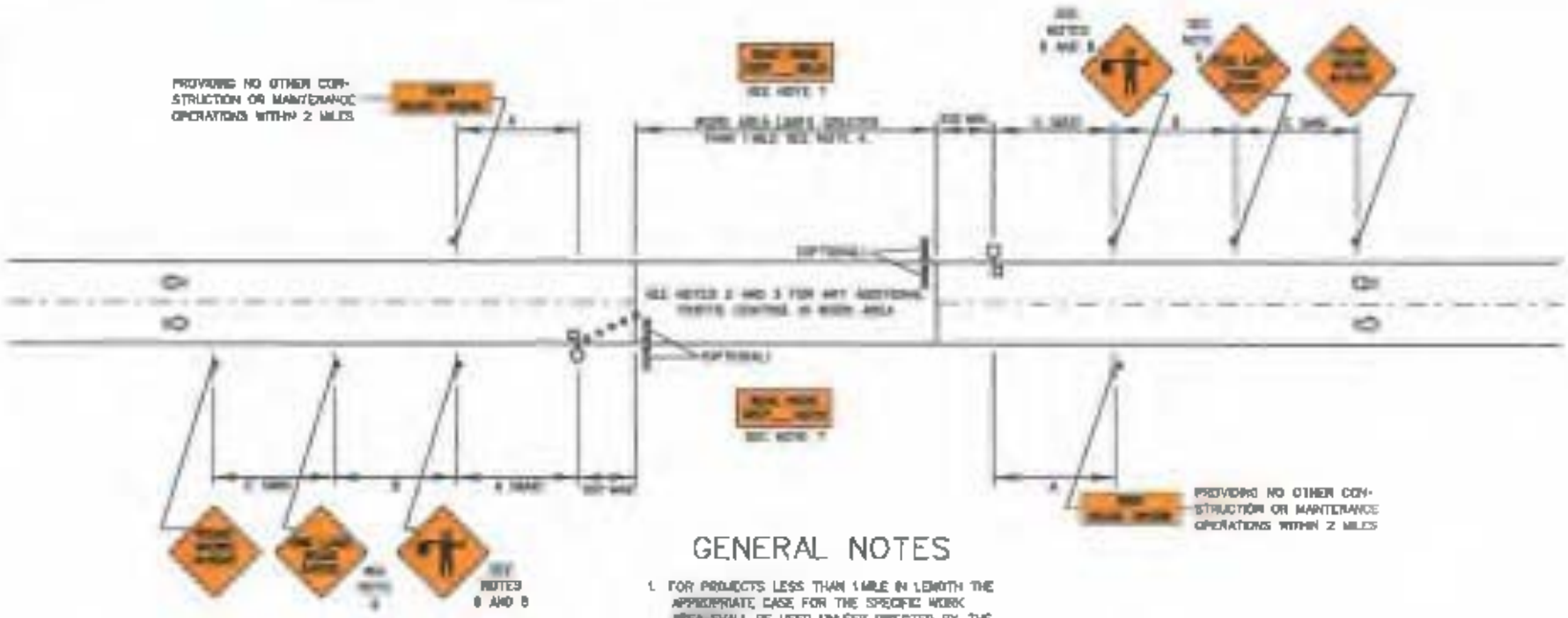
Diagrams

Below is a portion of our Flagger training with the description for what motions the flagger will use. Following the description, are diagrams of the set ups for our flagging operations per the West Virginia's MUTCD.

NOTE: These Figures are MUTCD Compliant

Figure 1
Hand Signaling Procedures
When Using A Stop/Slow Paddle





GENERAL NOTES

1. FOR PROJECTS LESS THAN 1 MILE IN LENGTH THE APPROPRIATE CASE FOR THE SPECIFIC WORK AREA SHALL BE USED UNLESS DIRECTED BY THE [redacted]
2. ADDITIONAL TRAFFIC CONTROL IN THE WORK AREA MAY BE NECESSARY. TYPE OF CONTROL WILL BE DETERMINED BY WORK BEING PERFORMED. REFER TO CASE THAT IS APPLICABLE. (EXAMPLE) CASE A(b).
3. WHERE THE WORK AREA EXTENDS THROUGH AN INTERSECTION, ADDITIONAL WARNING SIGNS AND TRAFFIC CONTROL (SUCH AS CASE A(c)) SHALL BE PROVIDED FOR THAT APPROACH.
4. THE MAXIMUM CLOSURE DISTANCE SHALL BE DETERMINED BY THE ENGINEER, BUT SHALL NOT EXCEED THE LENGTH OF ½ DAYS OPERATION OR TWO MILES, WHICHEVER IS LESS.
5. THE FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATIONS AT ALL TIMES.
6. WHEN SUCH SIGNS ARE NO LONGER FUNCTIONAL, E.G. NIGHTTIME, SUCH SIGNS SHALL BE COVERED OR REMOVED.
7. SUCH SIGNS SHALL BE ERECTED AS DIRECTED BY THE ENGINEER BUT NORMALLY SHALL BE ERECTED AT ½ MILE INCREMENTS FOR PROJECTS GREATER THAN 2 MILES IN LENGTH.
8. CONTROLS THE OPERATIONS OF PILOT TRUCK IF APPLICABLE.
9. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS NEEDED ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

SYMBOLS

- WORK AREA
- SIGN
- TYPE II BARRICADE
- SIGN ON PORTABLE OR PERMANENT SUPPORT.
- FLAGGER WITH PADDLE

TYPICAL APPLICATIONS

RESURFACING
WIDENING
ROADWAY STABILIZATION
SHOULDER STABILIZATION

SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,000	2,640

*SPEED CATEGORY TO BE DETERMINED BY RV DOT

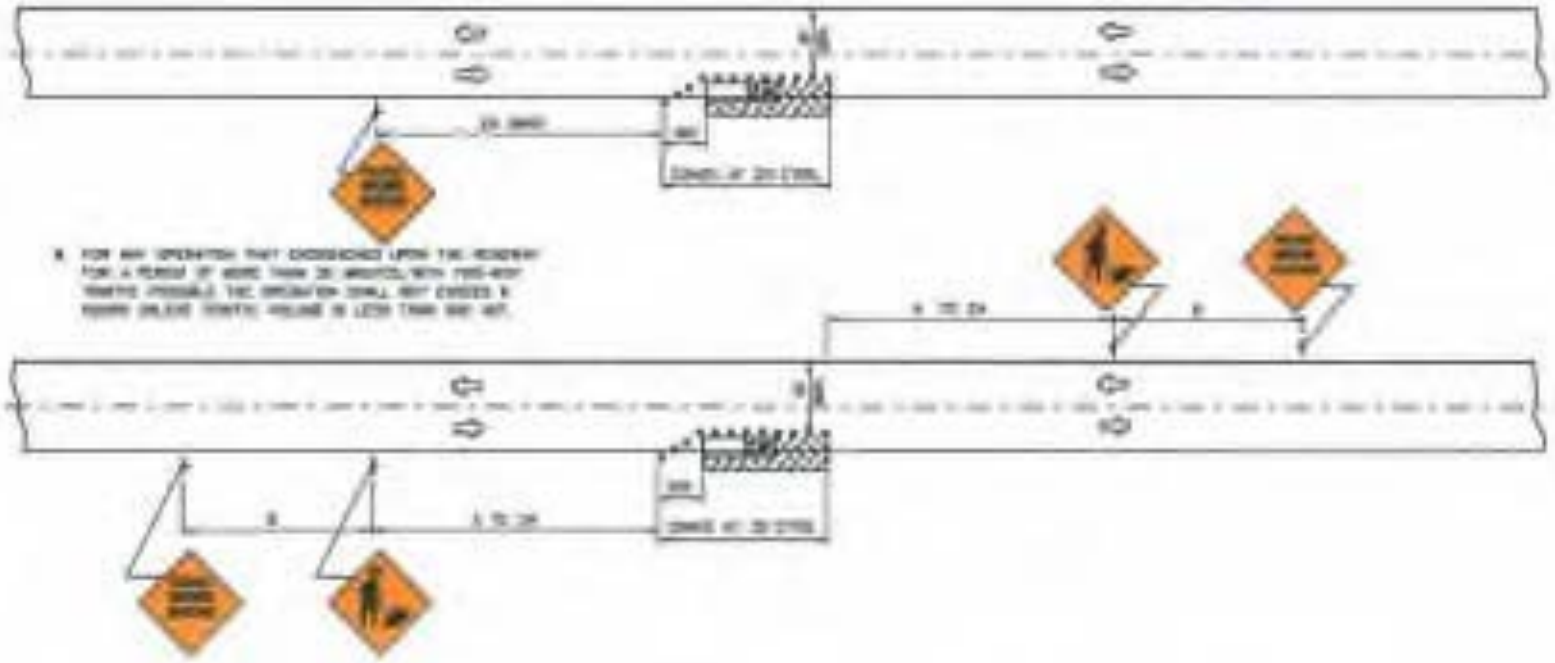
CASE A2

TWO-LANE, TWO WAY TRAFFIC DAY OPERATIONS ONLY(NIGHTTIME IF APPROVED BY THE ENGINEER)

WHERE, AT ANY TIME, THE PROJECT LIMITS ARE GREATER THAN 1 MILE

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A. FOR ANY OPERATION THAT ENCROACHES UPON THE ROADWAY FOR A PERIOD OF LESS THAN 30 MINUTES, WITH TWO-WAY TRAFFIC POSSIBLE.



B. FOR ANY OPERATION THAT ENCROACHES UPON THE ROADWAY FOR A PERIOD OF MORE THAN 30 MINUTES, WITH TWO-WAY TRAFFIC POSSIBLE, THE OPERATION SHALL NOT EXCEED A MAXIMUM UNLESS TRAFFIC VOLUME IS LESS THAN 500 ADT.

SYMBOLS

- WORK AREA.
- SIGN
- SIGN ON PORTABLE OR PERMANENT SUPPORT.
- CONES

GENERAL NOTES

1. IF THE WORK OPERATION REQUIRES THAT FOUR OR MORE WORK VEHICLES ENTER THE THROUGH TRAFFIC LANES IN A ONE HOUR PERIOD A FLAGGER SHALL BE PROVIDED AND THE FLAGGER SIGN SHALL BE USED OR SUBSTITUTED FOR THE SECOND ADVANCE SIGN.
2. ANY UNATTENDED OBSTACLE OR EXCAVATION IN THE WORK AREA SHALL BE PROTECTED BY TYPE I OR TYPE II BARRICADES, AND IF NIGHTTIME WITH FLASHING LIGHTS (TYPE "A").
3. ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE RESTRICTED AT ALL TIMES TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.
4. IF IT BECOMES NECESSARY TO OPERATE ONE LANE TRAFFIC, CASE A6 OR CASE A61 SHALL APPLY AS APPROPRIATE.
5. WORK VEHICLE SHALL HAVE DUAL FLASHERS AND FLASHING AMBER DOME LIGHT OPERATING.

TYPICAL APPLICATIONS

SIGNING OPERATIONS.
MAINTENANCE OPERATIONS.
GUARDRAIL MAINTENANCE.
SIGNAL AND LIGHTING MAINTENANCE.
UTILITY OPERATIONS.

SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN SLOW SPEED*	100	100	100
URBAN HIGH SPEED*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,000	2,640

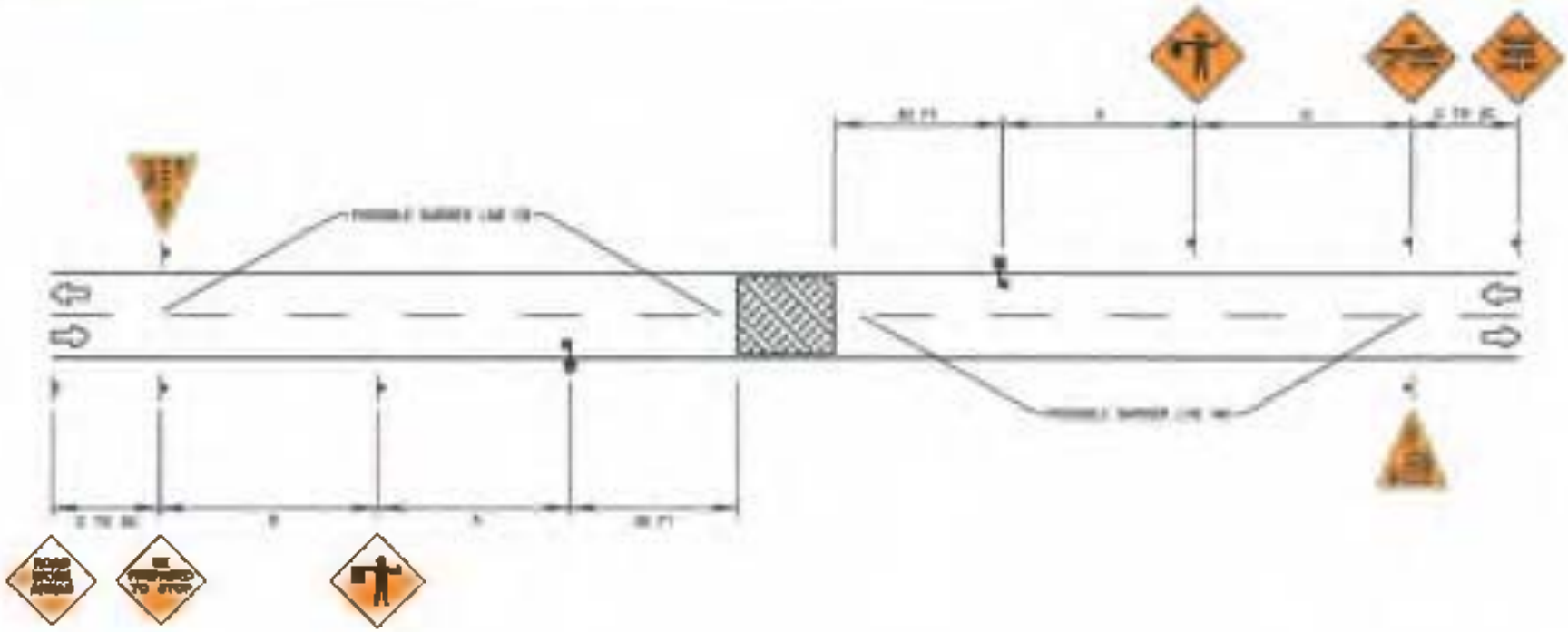
*SPEED CATEGORY TO BE DETERMINED BY WV DOH

CASE A4

TWO-LANE, TWO-WAY TRAFFIC, DAY OR NIGHT OPERATIONS. FOR LESS THAN 8 HOURS OR FOR LESS THAN 500 ADT

WHERE, AT ANY TIME, ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH UPON THE ROADWAY, MAINTAINING TWO-WAY TRAFFIC

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SYMBOLS

- WORK AREA.
- SIGN ON PORTABLE OR PERMANENT SUPPORT.
- FLAGGER WITH PADDLE.

GENERAL NOTES

1. CONDITIONS REPRESENTED ARE FOR A PLANNED CLOSURE NOT EXCEEDING 30 MINUTES DURING THE DAYTIME
2. THE FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
3. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS NEEDED ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,000	2,640

*SPEED CATEGORY TO BE DETERMINED BY WV DOH

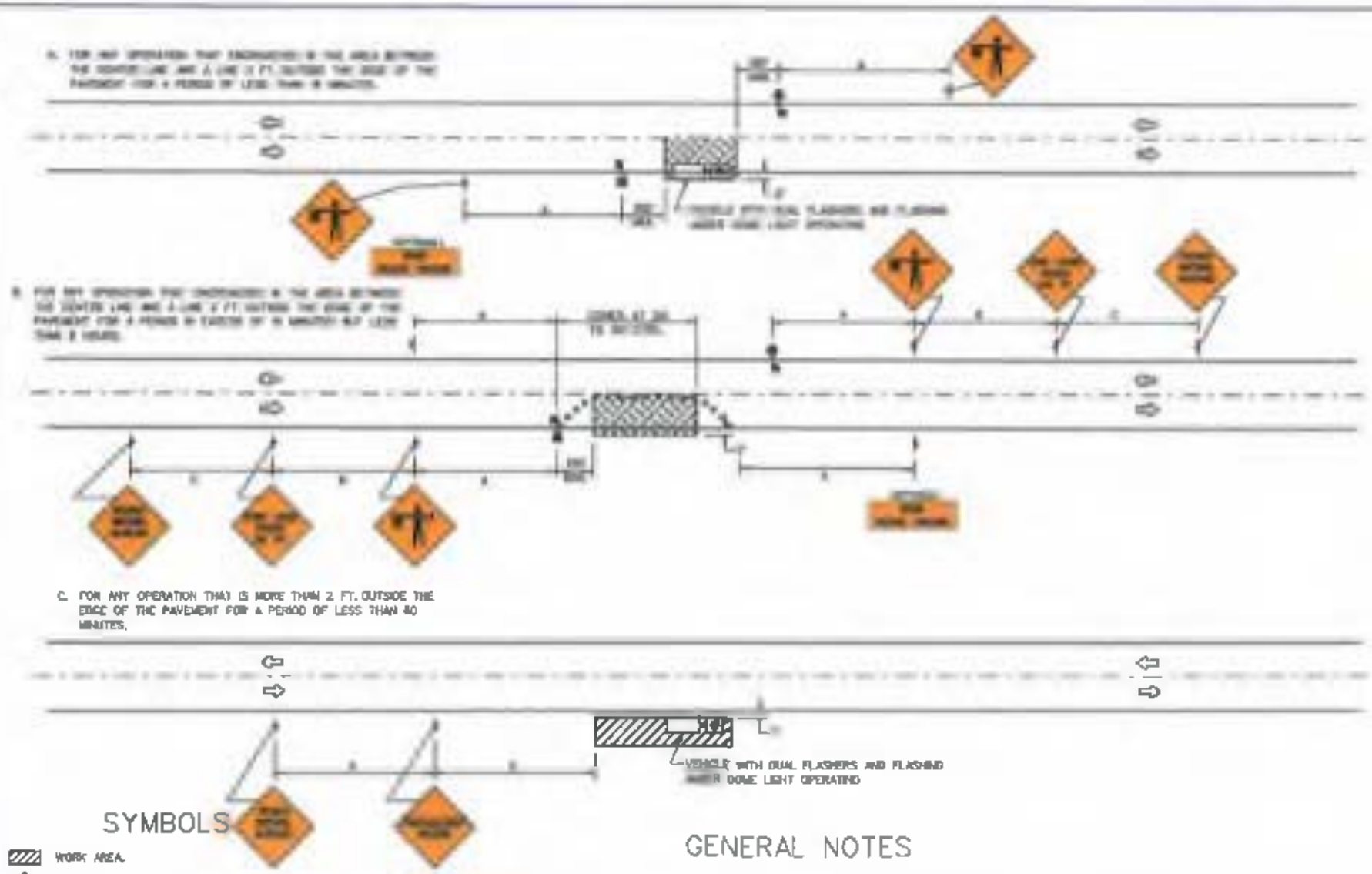
TYPICAL APPLICATIONS

SHORT TERM CLOSING
SHORT TERM UTILITY CROSSING FOR TWO OR THREE LANE ROADWAYS
HAUL ROADS

CASE A5

TWO-LANE, TWO-WAY TRAFFIC
SHORT TERM OPERATIONS
DAYTIME ONLY.

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C. FOR ANY OPERATION THAT IS MORE THAN 2 FT. OUTSIDE THE EDGE OF THE PAVEMENT FOR A PERIOD OF LESS THAN 60 MINUTES.

SYMBOLS

- WORK AREA
- SIGN
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- FLAGGER WITH PADDLE
- CONES

TYPICAL APPLICATIONS

PATCHING PAVEMENT.
FIELD SURVEY.
CLEANING UP DEBRIS ON PAVEMENT.
CROSSWALK PAINTING.

GENERAL NOTES

1. CONSTRUCTION OPERATIONS SHALL BE CONFINED TO ONE TRAFFIC LANE, LEAVING THE OPPOSITE LANE OPEN TO TRAFFIC. AT LEAST 500 FT. OF BOTH TRAFFIC LANES SHALL BE AVAILABLE FOR TRAFFIC MOVEMENT AT INTERVALS NOT GREATER THAN 1,000 FT. A COMPLETE TRAFFIC CONTROL PLAN MUST BE APPROVED FOR ANY PROJECT EXPECTING TO EXCEED 1,000 FT. IN LENGTH INCLUDING BOTH TAPER AND WORK AREAS.
2. FOR LOW-VOLUME SITUATIONS WITH SHORT WORK ZONES ON STRAIGHT ROADWAYS WHERE THE FLAGGER IS VISIBLE TO ROAD USERS APPROACHING FROM BOTH DIRECTIONS, A SINGLE FLAGGER POSITIONED TO BE VISIBLE TO ROAD USERS APPROACHING FROM BOTH DIRECTIONS, MAY [illegible]
3. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCE WARNING SIGNS.
4. [illegible] CATION AT ALL TIMES.
5. ALL SIGNS ARE TO BE REMOVED AT COMPLETION OF THE DAY'S OPERATIONS.
6. FOR MULTILANE DIVIDED ROADWAYS THE ADVANCE WARNING SIGNS FOR TRAFFIC APPROACHING FROM THE OPPOSITE DIRECTION MAY BE OMITTED IF APPROVED BY THE ENGINEER.

SUGGESTED ADVANCE WARNING SIGN SPACING

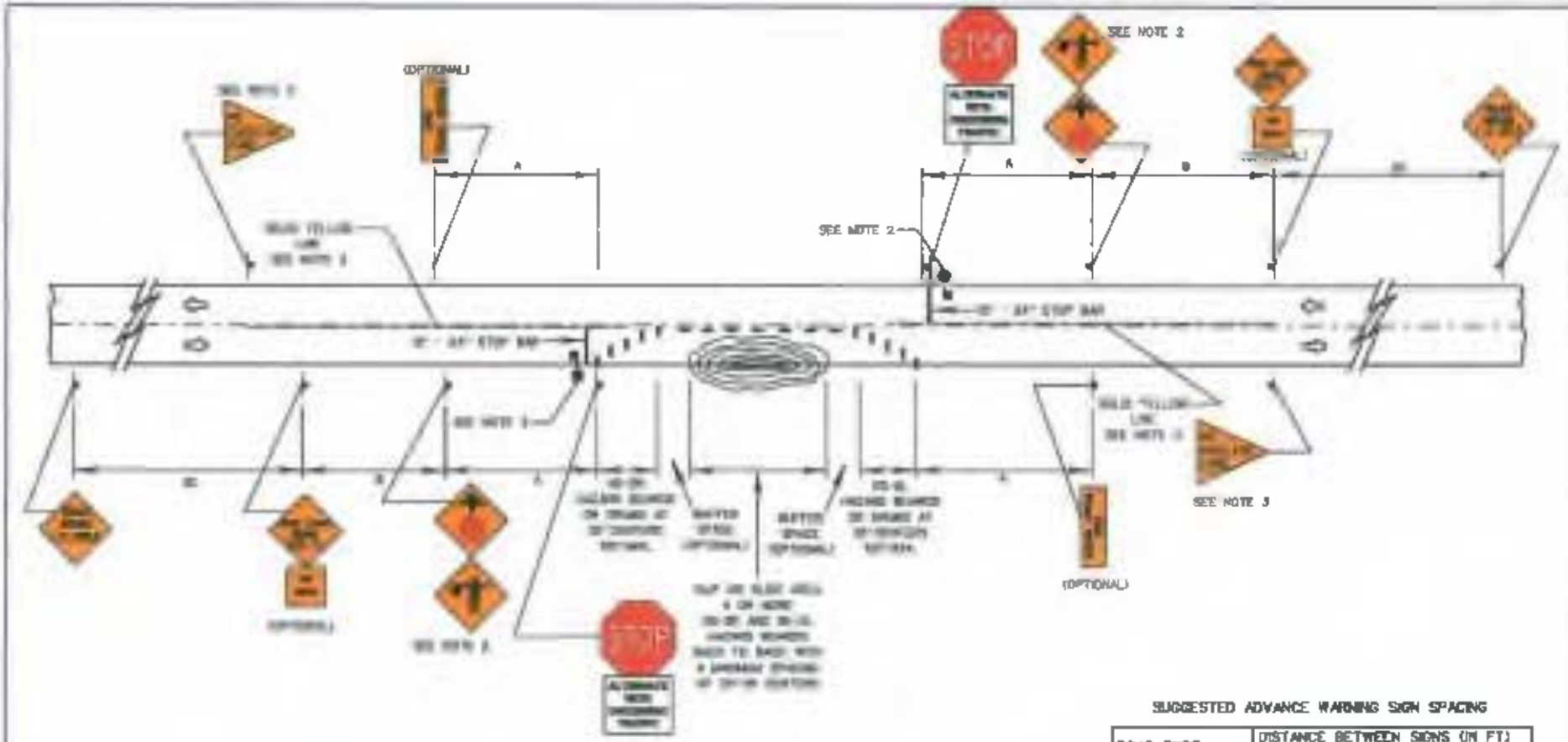
ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,500	2,640

* [illegible] ODH

CASE A6

TWO-LANE, TWO-WAY TRAFFIC
SHORT-TERM OPERATIONS
DAYTIME ONLY

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SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN SLOW SPEED*	100	100	100
URBAN FAST SPEED*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,000	2,640

*SPEED CATEGORY TO BE DETERMINED BY MV DOH

TYPICAL APPLICATIONS

SLIP AREA
SLIDE AREA

GENERAL NOTES

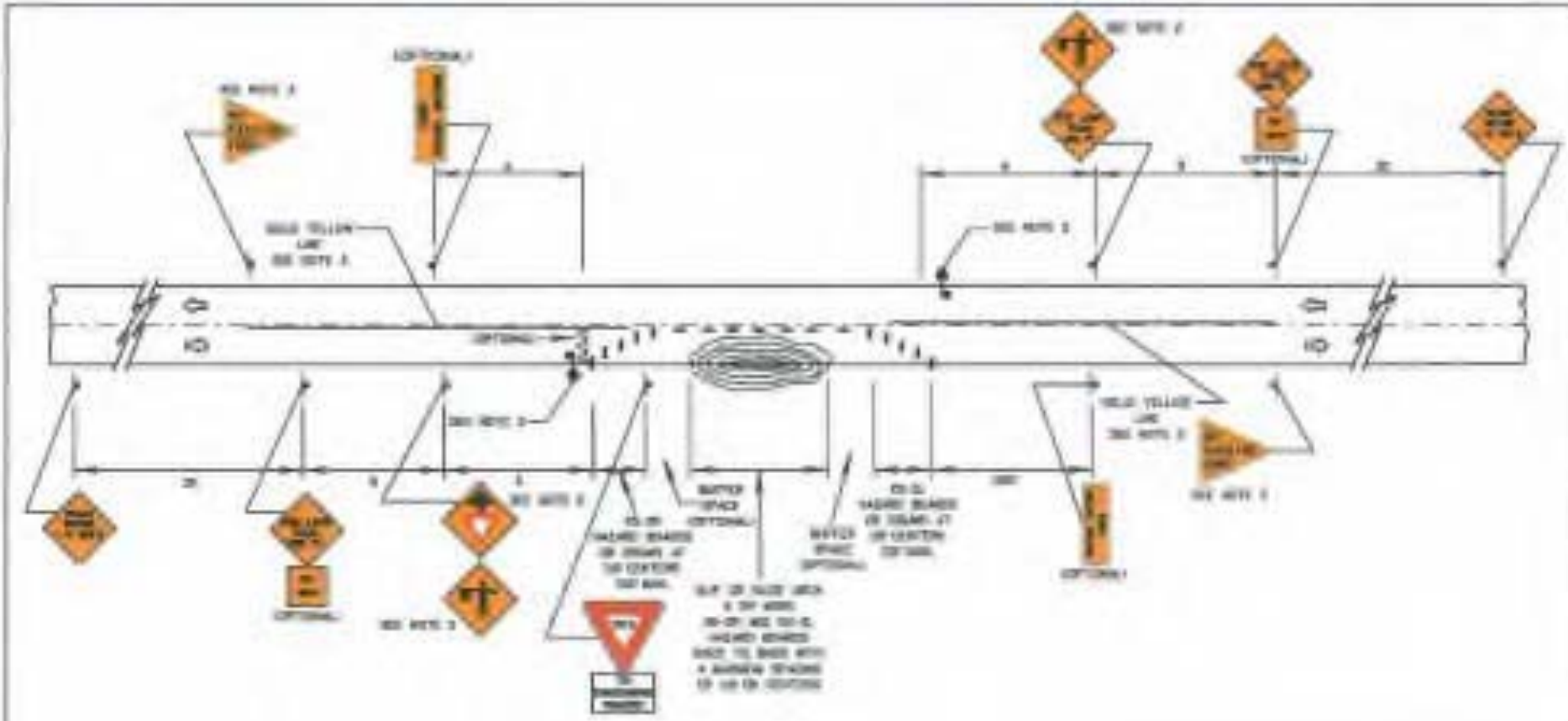
1. TO BE USED WHEN
   a. VEHICULAR TRAFFIC VOLUME IS SUCH THAT SUFFICIENT GAPS EXIST FOR VEHICULAR TRAFFIC THAT MUST YIELD
   b. ROAD USERS FROM BOTH DIRECTIONS ARE ABLE TO SEE APPROACHING VEHICULAR TRAFFIC THROUGH AND BEYOND THE WORK SITE AND HAVE SUFFICIENT VISIBILITY OF APPROACHING VEHICLES.
2. FLAGGERS MAY BE USED DURING DAYLIGHT WORKING HOURS BUT IF SO THEN
   A. COVER BOTH STOP SIGNS
   B. SUBSTITUTE FLAGGER SIGNS FOR BOTH STOP AHEAD SIGNS.
3. THE INSTALLATION OF THE YELLOW LINES AND NO PASSING ZONE SIGNS SHALL BE MADE IF THE ONE WAY CONDITION WILL EXIST FOR LONGER THAN 30 DAYS, OR IF DIRECTED BY THE ENGINEER.

CASE A10A

LOW VOLUME
TWO-LANE, TWO WAY TRAFFIC
DAY OR NIGHT OPERATION

WHERE A SLIP OR SLIDE RESULTS IN CLOSURE OF A LANE, RESULTING IN ONE-LANE TWO WAY TRAFFIC.

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SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,500	2,640

*SPEED CATEGORY TO BE DETERMINED BY MV DOH

GENERAL NOTES

1. TO BE USED WHEN:
   A. VEHICULAR TRAFFIC VOLUME IS SUCH THAT SUFFICIENT GAPS EXIST FOR VEHICULAR TRAFFIC THAT MUST YIELD.
   B. ROAD USERS FROM BOTH DIRECTIONS ARE ABLE TO SEE APPROACHING VEHICULAR TRAFFIC THROUGH AND BEYOND THE WORK SITE AND HAVE SUFFICIENT VISIBILITY OF APPROACHING VEHICLES.
2. FLAGGERS MAY BE USED DURING DAYLIGHT WORKING HOURS BUT IF SO THEN:
   A. COVER YIELD SIGN
   B. SUBSTITUTE FLAGGER SIGN FOR YIELD AHEAD SIGN.
   C. SUBSTITUTE FLAGGER FOR ONE LANE ROAD SIGN FT. SIGN.
3. THE INSTALLATION OF THE YELLOW LINES AND NO PASSING ZONE SIGNS SHALL BE MADE IF THE ONE WAY CONDITION WILL EXIST FOR LONGER THAN 30 DAYS, OR IF DIRECTED BY THE ENGINEER.

TYPICAL APPLICATIONS

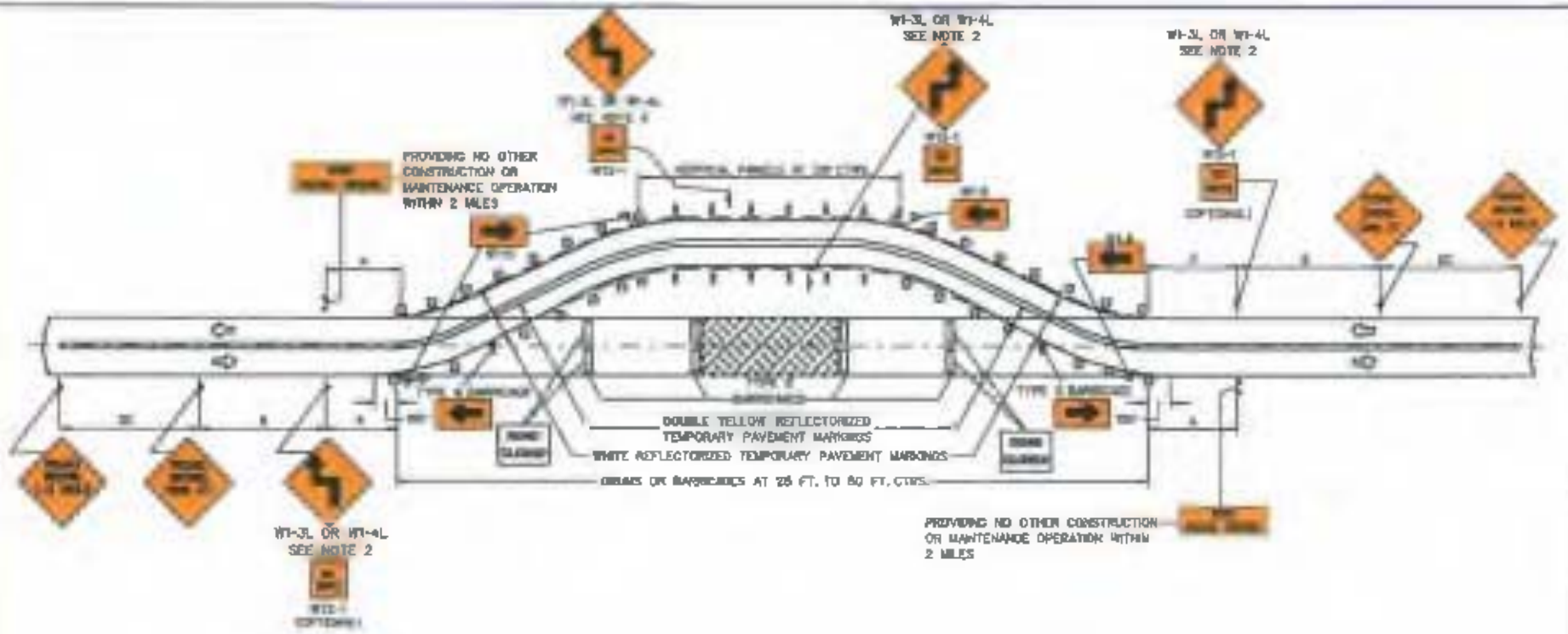
SLIP AREA
SLIDE AREA

CASE A11

LOW VOLUME
TWO-LANE, TWO WAY TRAFFIC
DAY OR NIGHT OPERATION

WHERE A SLIP OR SLIDE RESULTS IN CLOSURE OF A LANE, RESULTING IN ONE-LANE TWO WAY TRAFFIC.

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SYMBOLS

- WORK AREA
- SIGN
- TYPE III BARRICADES
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- DRUM
- VERTICAL PANELS

GENERAL NOTES

1. ON PAVED RUNAROUNDS, PAVEMENT MARKINGS SHALL BE USED WHEN THE CLOSURE TIME EXCEEDS SEVEN DAYS OR WHEN THE NORMAL POSTED SPEED OUTSIDE THE AREA OF OPERATIONS EXCEEDS 50 M.P.H. TEMPORARY PAVEMENT MARKINGS (TAPE OR PAINT) SHALL BE USED FOR MARKING TEMPORARY CENTER LINES AND EDGE LINES ON PAVED RUNAROUNDS. ALL EXISTING MARKINGS WHICH CONFLICT WITH THE REVISED TRAFFIC PATTERN WILL BE ERADICATED ON THE PAVED RUNAROUNDS.
2. WHERE CROSSOVER SPEEDS ARE GREATER THAN 30 MPH, THE REVERSE CURVE (W1-4) SHALL BE USED. WHERE CROSSOVER SPEEDS ARE 30 MPH OR LESS, THE REVERSE TURN (W1-3) SHALL BE USED.
3. THE ADVISORY SAFE SPEED TO BE SHOWN BELOW THE REVERSE CURVE (TURN) SIGNS SHALL BE DETERMINED AT THE SITE AND APPROVED BY DISTRICT ENGINEER OR TRAFFIC ENGINEERING DIVISION.
4. ALL SIGNS SHALL BE POST MOUNTED IF THE CLOSURE TIME EXCEEDS THREE DAYS.
5. WHEN A SIDE ROAD INTERSECTS THE HIGHWAY ON WHICH WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROL DEVICES SHALL BE ERECTED AS NOTED IN THE PLANS OR AS DIRECTED BY THE ENGINEER.
6. TEMPORARY RAISED PAVEMENT MARKERS MAY BE USED TO SUPPLEMENT PAVEMENT MARKINGS ON THE DETOUR AND APPROACHES.
7. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS NEEDED ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

TYPICAL APPLICATIONS

BRIDGE CONSTRUCTION.
CULVERT CONSTRUCTION.

SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,500	2,640

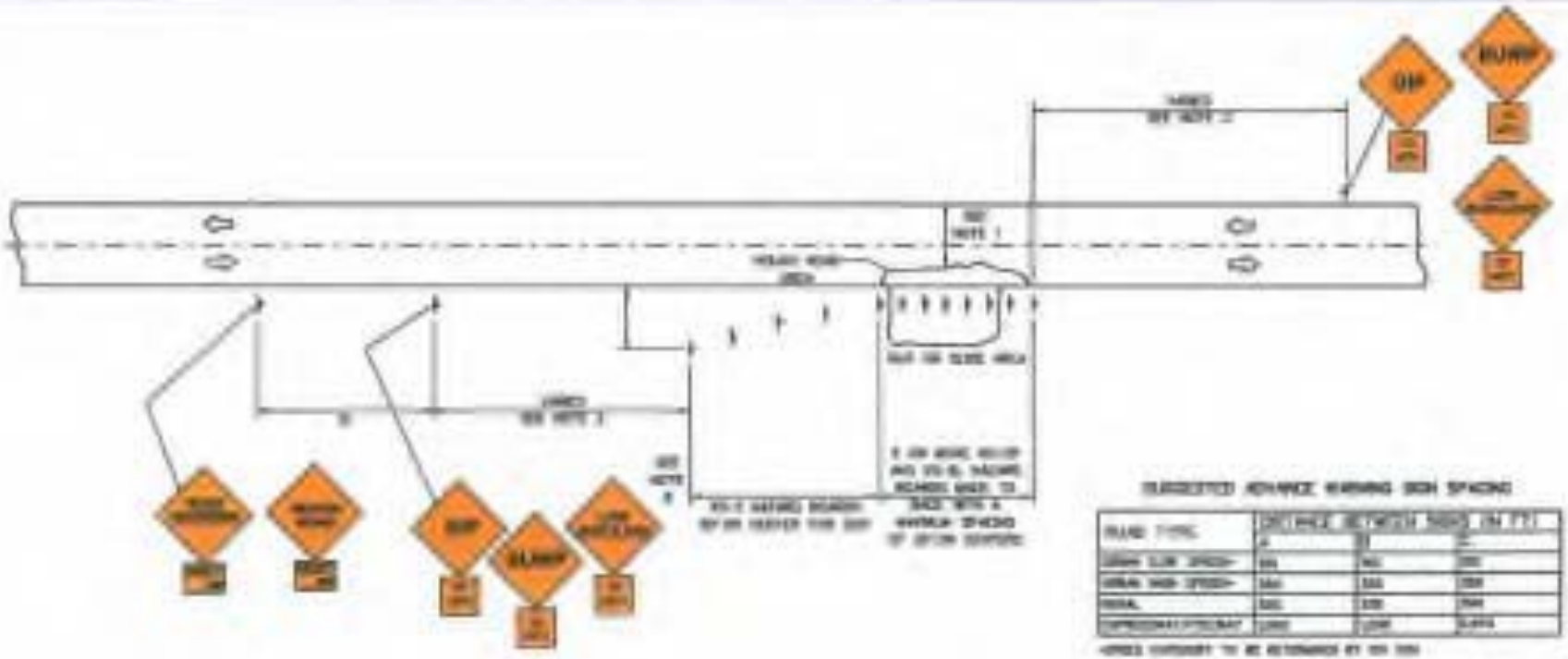
*SPEED CATEGORY TO BE DETERMINED BY WV DOH

CASE A12

TWO-LANE, TWO-WAY TRAFFIC.
DAY OR NIGHT OPERATIONS.
TEMPORARY RUNAROUND

WHERE, AT ANY TIME, ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF BOTH LANES AND A TEMPORARY RUNAROUND IS CONSTRUCTED.

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GENERAL NOTES

1. WHEN CONDITIONS REQUIRE THAT ONE LANE TRAFFIC OPERATE, CASE A16 OR CASE A11 SHALL APPLY. ALSO A MINIMUM ROADWAY WIDTH IS REQUIRED. IF WIDTH IS LESS THAN 16' THEN CASE A16 OR CASE A11 APPLIES.

2. WHEN A SERIES OF SLIPS AND SLIDES ARE PRESENT ON A ROADWAY, THE ROUGH ROAD SIGN CAN BE USED WITH A PLAQUE SHOWING THE LENGTH OF ROADWAY UNDER THESE CONDITIONS. ROAD NARROWS SIGN MAY BE SUBSTITUTED FOR ROUGH ROAD SIGN WHEN CONDITIONS WARRANT.

3. THE DISTANCE IN ADVANCE OF THE SLIDE OR SLIP TO BE USED FOR THE PLACEMENT OF THE WARNING SIGN IS RELATED TO THE APPROACH SPEED AND THE ADVISORY SPEED THROUGH THE SLIDE OR SLIP AREA. THE FOLLOWING CHART IS TO BE USED TO FIND THE MINIMUM DISTANCE TO THE WARNING SIGN.

SPEED REDUCTION M.P.H.	DISTANCE TO WARNING SIGN FEET (MIN.)
10	250
15	275
20	300
25	325
30	350
35	375
40	425
45	500
50	550

4. IF CONDITIONS EXIST IN BOTH LANES OR ON BOTH SIDES OF ROADWAY, THE HAZARD MARKER OM3-2 SHALL BE INSTALLED ON BOTH SIDES OF ROADWAY.

5. THE ADVISORY SPEED THROUGH THE AREA SHOULD BE DETERMINED BY TEST RUNS THROUGH THE AREA.

6. THE DIP SIGN SHALL BE USED FOR A DEPRESSION. THE BUMP SIGN SHALL BE USED FOR A SHARP RISE IN THE PAVEMENT. THE LOW SHOULDER SIGN SHALL BE USED WHEN SHOULDER AREA IS LOWER THAN THE PAVEMENT CREATING A HAZARDOUS CONDITION OTHER THAN A DIP OR BUMP.

7. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS NEEDED ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

TYPICAL APPLICATIONS

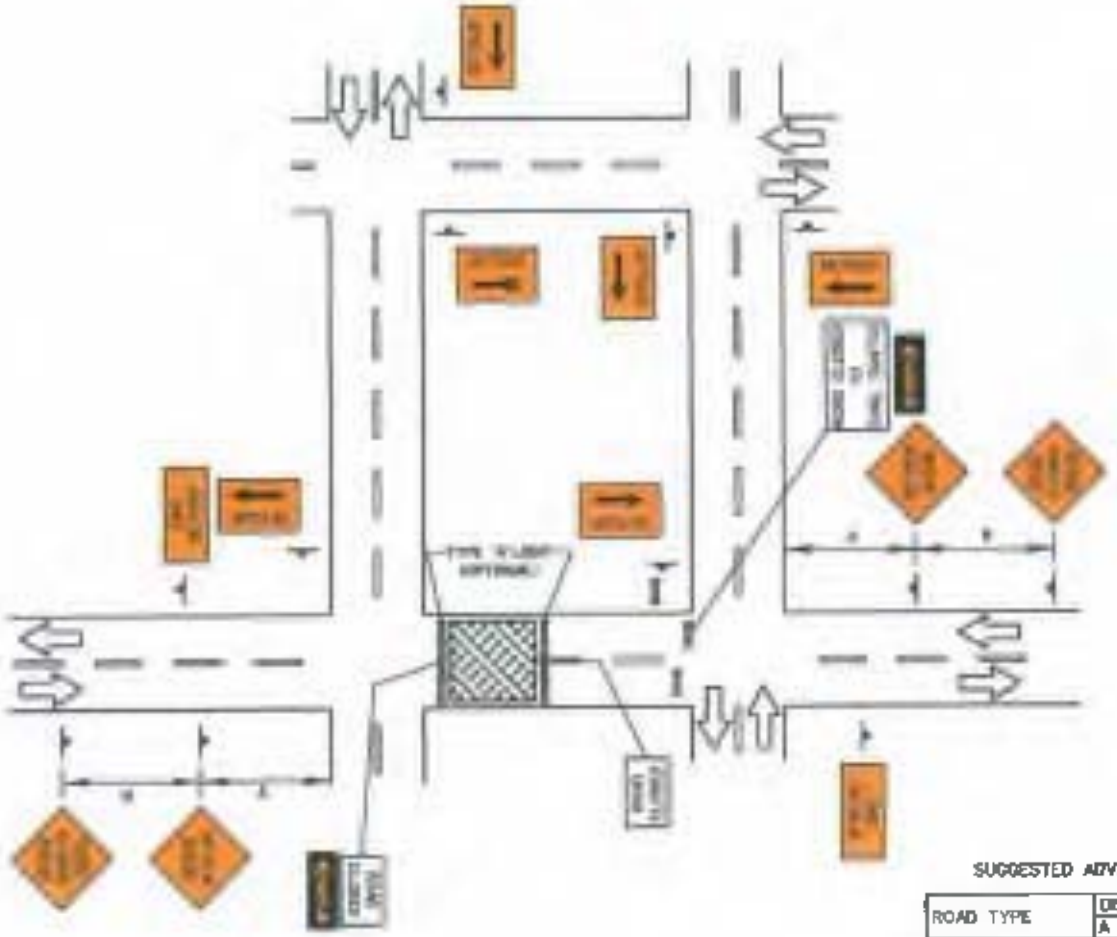
SLIP AREA
SLIDE AREA
LOW SHOULDER

CASE A16

TWO-LANE, TWO-WAY TRAFFIC
DAY OR NIGHT OPERATION

WHERE A SLIP OR SLIDE RESULTS IN CLOSURE OF A SHOULDER AREA, ROADWAY WIDTH IS SUFFICIENT FOR TWO WAY TRAFFIC.

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SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,000	2,640

*SPEED CATEGORY TO BE DETERMINED BY TRAFFIC ENGINEER

SYMBOLS

- WORK AREA
- SIGN
- TYPE III BARRICADE
- SIGN ON PORTABLE OR PERMANENT SUPPORT

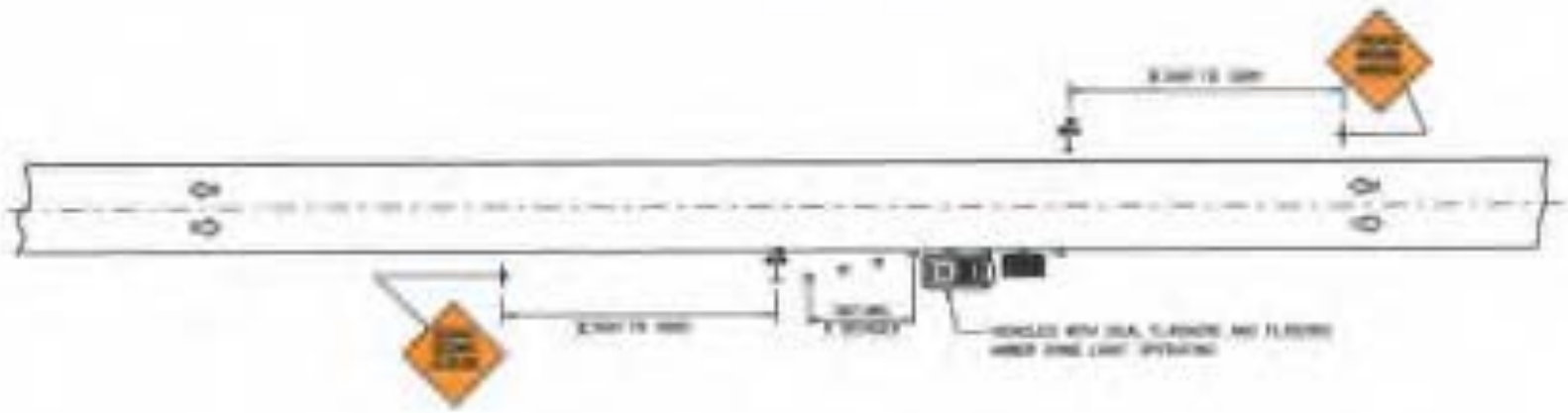
GENERAL NOTES

1. GENERALLY USED FOR CITY STREETS.
2. USE OF STREET NAME SIGN (PLATE) OPTIONAL. STREET NAME SIGN MAY BE EITHER BLACK ON ORANGE OR WHITE ON GREEN BUT WHEN USED SHALL BE PLACED ABOVE THE DETOUR SIGN.
3. ALL SIGNS SHALL BE POST MOUNTED IF THE DETOUR TIME EXCEEDS SEVEN DAYS.
5. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCE WARNING SIGNS AS NOTED ON THE PLANS AND/OR AS DIRECTED BY THE ENGINEER.
6. FLASHING WARNING LIGHTS MAY BE USED ON TYPE III BARRICADES.

CASE 87

TWO WAY TRAFFIC, URBAN,
DAY OR NIGHT OPERATION

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SYMBOLS

- WORK AREA
- SIGN
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- HIGH LEVEL WARNING DEVICE
- CONES ON 25' CENTERS MAX.

GENERAL NOTES

1. ROAD WORK AHEAD SIGNS ARE TO BE REMOVED WHEN NO WORK IS BEING PERFORMED. ANY UNATTENDED OBSTACLE OR EXCAVATION IN THE WORK AREA SHALL BE PROTECTED BY TYPE I OR TYPE II BARRICADES WITH FLASHING LIGHTS. (TYPE "A").
2. IF THE WORK OPERATION REQUIRES THAT FOUR OR MORE WORK VEHICLES ENTER THE THROUGH TRAFFIC LANES IN A ONE-HOUR PERIOD A FLAGGER SHALL BE PROVIDED AND THE FLAGGER SIGN SHALL BE ERECTED ACCORDINGLY.
3. ALL VEHICLES, EQUIPMENT, WORKERS (EXCEPT FLAGGERS) AND THEIR ACTIVITIES ARE RESTRICTED AT ALL TIMES TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.

TYPICAL APPLICATIONS

UTILITY OPERATIONS ONLY

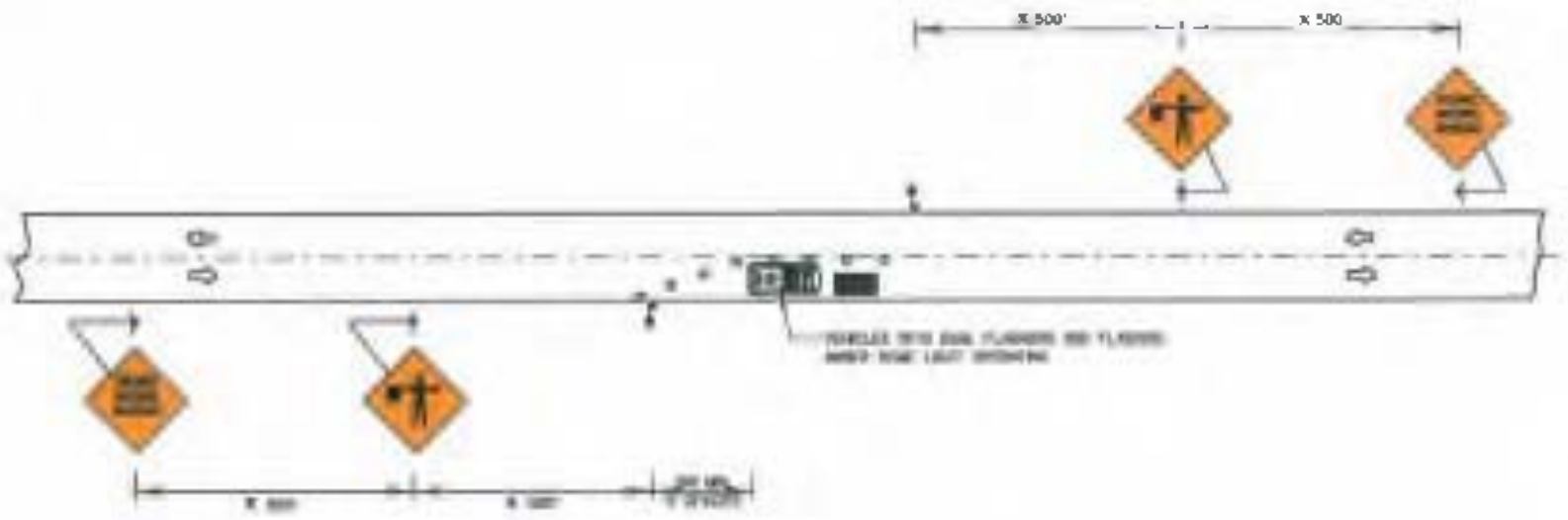
x - MAY BE DECREASED TO 200' TO 350' FOR URBAN AREA

CASE C1

TWO-LANE, TWO-WAY TRAFFIC
DAYLIGHT OPERATIONS ONLY

WHERE, AT ANY TIME, ANY VEHICLES, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH IN THE AREA BETWEEN 2 FT. AND 15 FT. FROM THE EDGE OF PAVEMENT.

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SYMBOLS

- WORK AREA.
- SIGN
- SIGN ON PORTABLE OR PERMANENT SUPPORT.
- FLAGGER WITH PADDLE.
- CONES ON 25' CENTERS MAX.

GENERAL NOTES

1. CONSTRUCTION OPERATIONS SHALL BE CONFINED TO ONE TRAFFIC LANE, LEAVING THE OPPOSITE LANE OPEN TO TRAFFIC.
2. IF THE WORK OPERATION DOES NOT EXCEED 30 MINUTES, TRAFFIC CONTROL WILL BE IN CONFORMANCE WITH CASE A6.
3. THE FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
4. IN LIGHT TRAFFIC WHEN THERE IS NO WORK BEING PERFORMED, FLAGGER SIGN(S) AND THE FLAGGER MAY NOT BE REQUIRED (AT THE OPTION OF THE ENGINEER). IN THIS CASE ONE LANE ROAD SIGN(S) SHALL BE INSTALLED IN PLACE OF THE FLAGGER SIGN(S).
5. WHEN A SIDE ROAD INTERSECTS THE HIGHWAY ON WHICH WORK IS BEING PERFORMED ADDITIONAL TRAFFIC CONTROL DEVICES SHALL BE ERECTED AS DIRECTED BY THE ENGINEER.
6. ALL VEHICLES, EQUIPMENT, WORKERS (EXCEPT FLAGGER) AND THEIR ACTIVITIES ARE RESTRICTED AT ALL TIMES TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.

X - MAY BE DECREASED TO 200' TO 350' FOR URBAN AREAS

TYPICAL APPLICATIONS

UTILITY OPERATIONS ONLY

CASE C2

TWO-LANE, TWO-WAY TRAFFIC
DAYLIGHT OPERATIONS ONLY

WHERE, AT ANY TIME, ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES WILL ENCROACH IN THE AREA BETWEEN THE CENTER LINE AND A LINE 2 FT. OUTSIDE THE EDGE OF PAVEMENT.

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Project Occupational Health, Safety Management Plan

Project Name:	**Mountaineer Xpress (MXP)**	
Project Number:	M.900095	**Phase:** Implementation
Project Sponsor:	Richard Prior	
Managing Director: :	Troy Tally	

Version No: 1	**Date:** 2017/10/17

Name	Signature	Date
Owner: Peter Hecht Safety Manager	BOARD OF CANADIAN REGISTERED SAFETY PROFESSIONALS – PETER HECHT – 01-1856	24.10.2017
Endorsed by: Jacob Frederick Pipeline Project Manager		Dec 01, 2017
Endorsed by: Jack Mallory Facility Sr. Project Manager		Dec 8, 2017
Endorsed by: Matt Franklin Facility Project Manager		12/11/17
Endorsed by: Terry Johnson Sr. Facility Construction Manager		12-15-17
Endorsed by: John Rinkus Sr. Pipeline Construction Manager		01.12.18
Approved by: Troy Tally Project Director		1-18-18

Document Control

Revision	Date	Description	Author
A	May 12th, 2017	Issued for review and comments	Peter Hecht
B	July 24th, 2017	Issued for implementation that includes comments from PMT and Stage Gate review.	Peter Hecht
C	Aug 18, 2017	Revisions including comments from PMT and Safety	LourRinda Renee
1	Oct 17, 2017	Ensured current EDMS reference number accuracy; updated risk matrix; sent for implementation.	LourRinda Renee

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Executive Summary

This Occupational Health and Safety Management Plan (OHSMP) has been developed for implementation on the Mountaineer XPress Project (MXP or The Project). The OHSMP is an integral component of the MXP's Phase Plan and has been developed in accordance with the Company's Project Development Standards (PDS) for Health, Safety, Security and Emergency Management (HSSEM) and Element 1 of the Contractor Safety Management Program (CSMP).

The OHSMP entails an initial planning process, and implementation of the OHSMP, followed by a process for verifying the performance of these activities and taking appropriate corrective actions. The next step (management review) involves a review of the plan for suitability, adequacy and effectiveness against the policy set for the Project and this plan. The complete cycle is repeated, resulting in continual improvement in the Project's management of occupational health and safety aspects and their associated inherent risks and exposures.

The OHSMP approach is characterized by an emphasis on continual improvement and systematically eliminating the underlying or root causes of incidents including near hits.

Section 1 provides context to this document.

Section 2 sets the level of intention and guidelines regarding the Project's occupational Health and Safety performance.

Section 3 provides the framework for identifying occupational health and safety (OHS) risks and hazards associated with the Project in addition to identifying legal and other requirements applicable to the Project. It also provides a method of establishing the Project's OHS goals and objectives, developing strategies for their achievement, and allocating resources to implement those strategies.

Section 4 provides the structure (i.e., practices, processes and procedures) and delineates the roles, responsibilities, authority, and accountability for executing the OHS aspects of the Project. This section also addresses the assurance of key Project employee competencies, the operational controls (i.e., TransCanada Operating Policies and Procedures (TOPS/TPPS), and/or legacy Columbia Pipeline Group (CPG) contractor safety management procedures. Procedures to be implemented in order to manage anticipated OHS risks and exposures and the Project's preparedness to respond to reasonable emergencies, should they occur during Project execution.

Section 5 provides the framework for identifying and correcting problems in the overall OHSMP. Checking and implementing corrective action keeps the Project on track relative to its goals and objectives.

Section 6 describes how the management review function helps to ensure the OHSMP continues to reflect and achieve the Project objectives over the duration of the Project.

In summary, the MXP OHSMP describes the structure implemented for the Project, including risk assessment, planning, training, programs, detailed procedures and monitoring systems, which will facilitate effective management of the occupational health and safety of the Project's engineering, design, procurement, construction, and commissioning phases.

1.0 INTRODUCTION

1.1 Purpose

This OHSMP has been developed for implementation on MXP. The OHSMP is an integral component of the MXP's Phase Plan and has been developed in accordance with the Company's Project Delivery Standard (PDS) for HSSEM and Element 1 of the Contractor Safety Management Program (CSMP). The OHSMP also satisfies TransCanada's Operating Management System (TOMS), Health, Safety and Environment Management System Program requirements, which conform to the international standards for occupational health and safety management systems (British Standards Institute [BSI]-OHSAS-18001). The OHSMP also meets and complies with applicable sections of the following:

- Title 29 Code of Federal Regulations (CFR) Part 1910 Occupational Safety and Health Administration Standards (OSHA) for General Industry; and,
- Title 29 CFR Part 1926 OSHA for Construction Industry Regulations.

The purpose of the OHSMP is to:

- Establish and maintain an OHSMP which facilitates a structured approach to the management of Project OHS risks and exposures;
- Provide adequate human, financial and time resources to ensure the effectiveness and sustainability of the OHSMP;
- Keep up-to-date and within compliance to relevant U.S. Federal Occupational Health and Safety Administration (OSHA) Laws, Regulations, industry consensus standards, and obligations;
- Promote a safety culture encouraging people to proactively manage Health and Safety risk through education, instruction, information, and supervision;
- Clearly define and communicate employee and Prime Contractor responsibilities in relation to Health and Safety;
- Proactively identifying and managing Health and Safety risk via a documented hazard identification, risk assessment, risk control, and monitoring process;
- Improve processes ensuring incidents and hazards are promptly reported, investigated where appropriate, and control measures are put in place to eliminate or minimize the chance of a repeat event; and,
- Routinely monitor and review OHS performance to achieve continuous improvement.

1.2 Scope

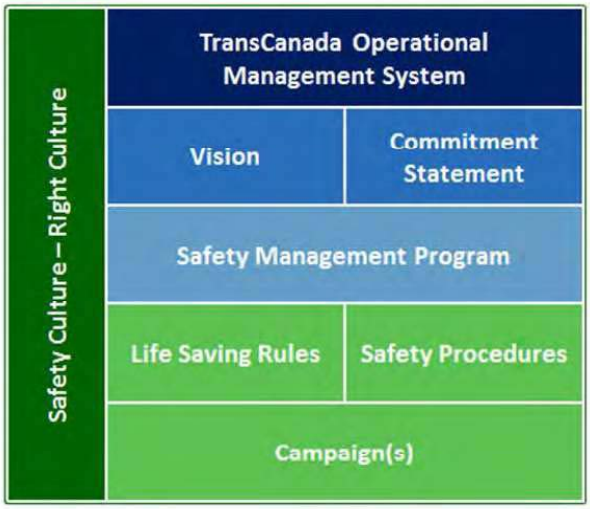
This OHSMP will apply to the Mountaineer XPress Project, which will be comprised of the following phases:

- Front End Engineering and Design (FEED);
- Procurement;
- Pre-Construction;
- Construction (see detailed Construction Management Plan);
- Commissioning (see detailed Commissioning Management Plan), and
- Right-of-Way Restoration.

This OHSMP is applicable to all designated Prime Contractors whom may be responsible for specific phases of the Project. Prior to any work activities taking place, the Prime Contractor will be required to develop for implementation a project, spread, or site-specific Occupational Health and Safety Plan (P/SSSP) aligned with the standards and requirements as set forth in this document.

The OHSMP is aligned with TransCanada's HSE governance hierarchy starting at the top with TOMS (ref.: EDMS ID#009964053), which is comprised of 9 key elements as illustrated in Figure 1 as a continual improvement cycle based on the recognized quality concept of "Plan-Do-Check-Act."

Figure 1 – Hierarchy of HSE Governance



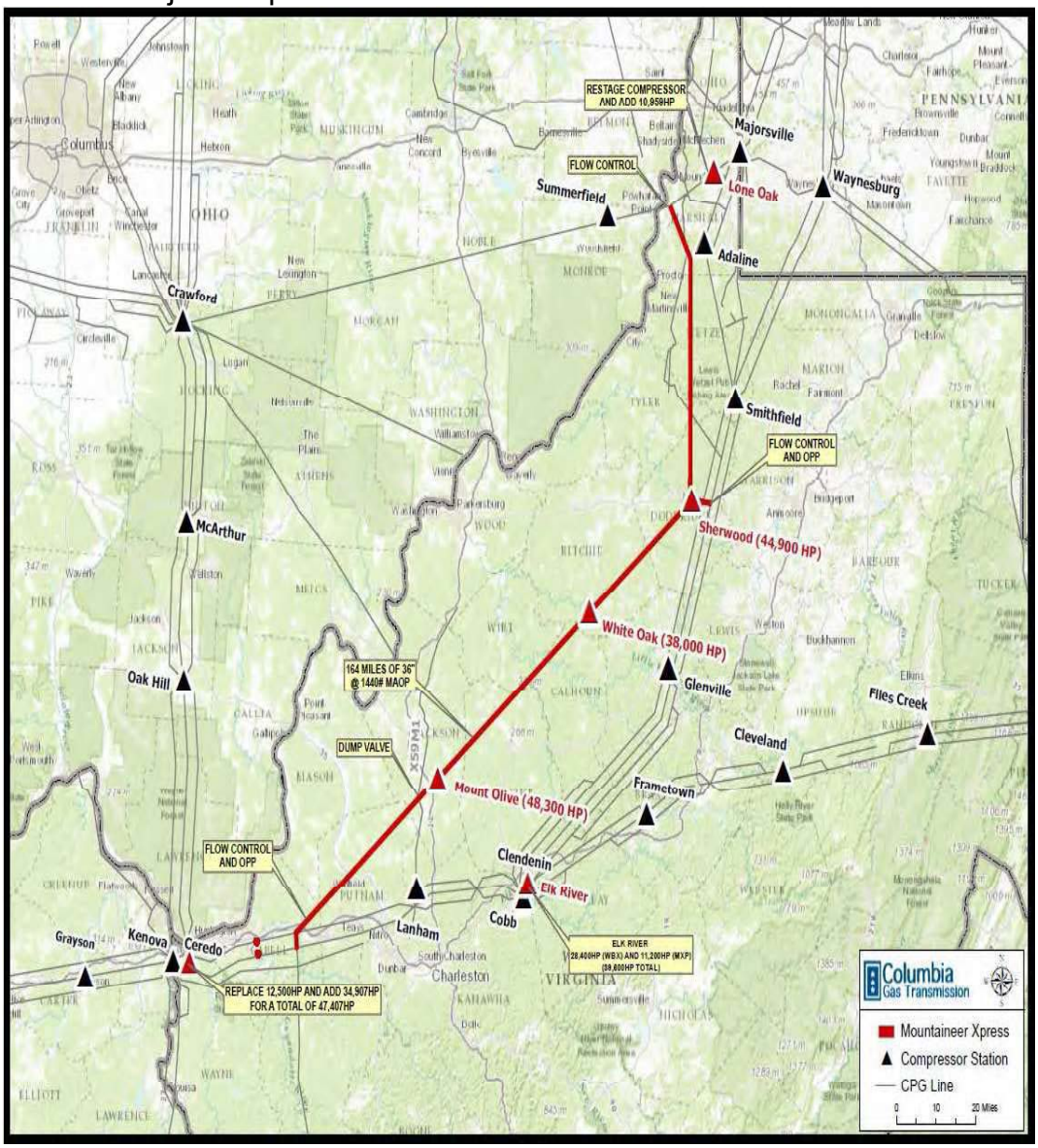
Based on the hierarchy framework, the Safety Vison and HSE Commitment (ref.: EDMS ID#003721955) both provide the guiding principles for the Safety Management Program (SMP). The SMP is a set of inter-related elements that reflect the Safety Vision and HSE Commitment and its objectives, providing mechanisms to achieve those objectives in order to continually improve HSE performance.

Safety related TransCanada Policies and Procedures (TPPs) are high-level HSE governance documents. TransCanada Operating Procedures (TOPS) are administrative controls designed to mitigate HSE risks associated with the operation and maintenance of Company facilities and equipment. TOPS are divided into three types: procedures, task packages and forms.

1.3 Project Overview

The Mountaineer XPress Pipeline Project ("MXP") will facilitate transportation of Marcellus and Utica shale gas production from the Appalachian supply basin. MXP will provide firm transportation service from major points of receipt in Ohio, Southwest Pennsylvania, and throughout West Virginia to the TCO Pool or other mutually agreeable delivery points (see Figure 2). Specifically, the MXP pipeline and facilities will include 164 miles of 36" "greenfield" pipeline from Leach Xpress (LXP) to the SM-System and 6.5 miles of 24" lateral pipeline from the new Sherwood CS to the T-System. In addition, it will include three (3) "greenfield" compressor stations, upgrades to two (2) "brownfield" compressor stations and replacement of 0.4 miles of special permit pipe. WB-System facilities will include upgrades to one (1) "brownfield" compressor station.

Figure 2: MXP Project Map



1.4 References

This document has been developed in accordance with the following references.

Reference	Description
CSMP	Contractor Safety Management Program (EDMS No.: 03800125)
PDS HSSEM Plan	Project Delivery Standard: Health, Safety, Security, and Emergency Management Plan – Deliverable Description (EDMS No.: 009967775)
PDS HSSEM Philosophy	Project Delivery Standard: Health, Safety, Security, and Emergency Management Philosophy – Deliverable Description

Reference	Description
	(EDMS No.: 009967774)
PDS HSSEM Procedure	Project Delivery Standard: Health, Safety, Security, and Emergency Management Procedure (EDMS No.: 013857262)
Title 29 Code of Federal Regulations (CFR) Part 1910	U.S. Department Of Labor (DOL), Occupational Health and Safety Administration (OSHA) General Industry Regulations.
Title 29 CFR Part 1926	U.S. DOL, OSHA Construction Industry Regulations.

1.5 Terms and Definitions

For the purposes of this document, the following terms and definitions will apply:

Term	Definition
Action Level	The level of a contaminant or hazardous agent at which specified actions or counter measures are to be taken. Also known as the “trigger” level.
ANSI	American National Standards Institute
Aspect	Any business activity, product or service having the potential to impact the health and safety of personnel or the environment. The aspect may be considered the “cause” of the impact.
Audit	A systematic and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.
Away from Work Case Rate	An incident that results in an injury or illness that prevents an employee from returning to work on the next scheduled shift. The number of Away from Work Cases, where the employee would have worked but could not because of occupational injury or illness, is related to a common exposure base of 100 full-time workers. This performance indicator is often referred to as the lost time case rate (ref.: U.S. Bureau of Labor Statistics, Record Keeping Guidelines for Occupational Injuries and Illnesses).
AWCR	Away From Work Case Rate
Breathing Zone	The area surrounding a worker’s nose and mouth from which he or she draws breathing air over the course of a work period.
Calibration	The process in which a comparison of an instrument’s response to that of a reference standard of known response and known accuracy is made.
Certified Industrial Hygienist (CIH)	A professional industrial hygienist who by education, experience, and demonstration of knowledge has satisfied the requirements of the American Board of Industrial Hygienists (ABIH), or international equivalent.
CFR	Code of Federal Regulations

Term	Definition
CHP	Certified Health Professional (United States)
CI	Critical Incident
CIRA	Comprehensive Industrial Risk Assessment
CM	Construction Manager
Commitment	Synonym for “policy.” All MXP guidelines and statements related to the performance of the Occupational Health and Safety Plan.
Consequence	The potential severity of an undesirable event (see IIT).
Contractor	The employer designated under the safe direction and hazard control of the Prime Contractor.
Controls	An engineered, administrative, or personal protective equipment (PPE) put in place to manage the potential impact or hazard.
CDL	Controlled Document Library
CPG	Columbia Pipeline Group
CPR	Cardiopulmonary resuscitation
CRSP	Canadian Registered Safety Professional
CSMP	Contractor Safety Management Program
CSP	Certified Safety Professional (U.S. certification designation)
CTS	Compliance Tracking System
DART	Days Away Restricted or Transferred
DOL	U.S. Department of Labor
EDMS	Electronic Document Management System
MRCS/M&R	Metering, Regulation and Control Station [Measurement and Regulation Station]
FCS	Flow Control Station /Regulation Station
FEED	Front End Engineering and Design
Hazard	A condition having the potential or practice of causing damage or any kind of harm to people, property, production, or the environment.
Hazardous Agents	A chemical, biological, or physical agent capable of causing harm to an employee, if they are exposed to it. Examples of hazardous agents are: chemical – benzene, carbon monoxide, asbestos; biological – blood borne pathogens; physical – noise, vibration, heat, cold, radiation.
HAZCOM	Hazard Communication
HSE	Health, Safety and Environment

Term	Definition
HSSEM	Health, Safety, Security, and Emergency Management
ID	Identification
IHRA	Industrial Hazard and Risk Assessment
IIT	Incident and Issue Tracking
IMCG	Incident Management Classification Guide
IMP	Incident Management Process
Impact	Any change, positive or negative, to the environment, or to the health and safety of personnel, as a result of the organizations activities, products or services. The impact may be considered the "effect" of the aspect.
Incident	Synonym for "Accident," an undesired event which leads to loss of life or injuries, property or environmental damage
Industrial Hygiene	The science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort among workers.
Initial Exposure Assessment	An exposure assessment performed at the start of an operation in order to collect baseline exposure data regarding the specific hazardous agents present in the workplace. Can be used to assess compliance with respect to applicable occupational exposure limits or to evaluate the effectiveness of engineering and other controls.
NIOSH	National Institute for Occupational Safety and Health
IRIMS	Integrated Recorded Information Management System
JHA	Job Hazard Analysis
JSA	Job Safety Analysis
KPI	Key Performance Indicator - Quantitative or qualitative measurements giving an indication of progress against a specific OHS objective or target.
LSR	Life Saving Rules
Maximum Limit	Maximum allowable limit of human exposure to an airborne substance, which may not be exceeded even momentarily.
MI	Major Incident
MMcf/d	Million Cubic Feet a Day
MSDS	Material Safety Data Sheets
Near Hit	An unplanned event, under slightly different circumstances, which could result in undesirable consequences.

Term	Definition
Negative Exposure Assessment	An exposure assessment which results in a finding that employee exposures to hazardous agents are not above action levels.
Objective	Overall OHS goal (quantifiable where practicable), arising from the Health, Safety and Environment Commitment statement and/or Occupational Health and Safety Policy that the Project sets itself to achieve.
Occupational Exposure Limit	A health-based workplace standard to protect workers from adverse effects of exposure to hazardous agents. Examples include Permissible Exposure Limits (PELs), Threshold Limit Values (TLVs), Short-Term Exposure Limits (STELs), and MAC (Maximum allowable Concentrations).
OHS	Occupational Health and Safety
OHS Legal Requirements (including other OHS requirements)	Legislation and NOMS, Standards, industry standards, and other guidance material related to occupational health and safety management.
OSHA	Occupational Health and Safety Administration (United States)
P/SSSP	Project / Site Specific Safety Plan
PD	Project Director
PDS	Project Delivery Standard
Planned Inspection	An examination of a workplace, selected work area, or particular hazards, machinery, tools, equipment and work practices and a comparison of what is found against applicable standards and best practices.
PMT	Project Management Team
Policy	Synonym for “Commitment.” All MXP guidelines and statements related to the performance of the Occupational Health and Safety Plan
POSH	Preventative Occupational Safety and Health Program
PPE	Personal Protective Equipment
PPSH	Preventative Safety and Health Programs – Methodology for their Preparation.
Prime Contractor	The employer who has been designated to have care and control or general supervisory authority over occupational Health and Safety at the worksite, including the power to correct OHS violations or requiring others to correct them.
Probability	The likelihood of an undesirable event occurring.
Process	A set of inter-related resources and activities which transforms inputs into outputs.
Program	Formalized, documented administrative control with a broad

Term	Definition
	application.
Qualitative Exposure Assessment	The qualitative determination or estimation of an employee's exposure to a hazardous agent, including magnitude, frequency, duration, and route of exposure.
Quantitative Exposure Assessment	The quantitative determination of an employee's exposure to a hazardous agent, including magnitude, frequency, duration, and route of exposure.
Risk	The chance of injury or loss as defined as a measure of the probability and severity of an adverse effect to human health and safety, property, reputation, or the environment.
Risk Assessment	The overall process of OHS risk analysis and OHS risk evaluation.
Risk Management	The systematic application of management policies, procedures, and practices to the tasks of analyzing, evaluating, controlling, and communicating about HSE risk issues.
SCAR	Supplier Corrective Action Request
SFAIRP	To reduce a risk to a level that is "So Far As Is Reasonably Practicable" involved balancing reduction in risk against the time, trouble, difficulty and cost of achieving it.
Short-Term Exposure Limit (STEL)	Maximum concentration allowable for an airborne substance for continuous 15-minute period. Allowed four times a day, with at least 60 minutes between exposures.
Sub-Process	A subset or portion of the process.
Tailgate Session	An informal onsite discussion with employees about safety issues.
Target	A detailed performance requirement (quantified where practicable) pertaining to the Project, arising from the OHS objectives and needs to be met in order for the objectives to be achieved.
Time-Weighted Average (TWA) Exposure	Average over a given working period (typically 8 hours) of a person's exposure, as determined by sampling at given times during, or throughout the period.
TLDSR	Total Lost Day Severity Rate
TOPs	TransCanada Operating Procedures
Total Lost Day Severity Rate	The sum of restricted work days and away from work days related to a common exposure base of 100 full-time workers
Total Recordable Case Rate	The number of recordable cases related to a common exposure base of 100 full-time employees. Recordable Cases are all work-related deaths and illnesses, and those work-related injuries resulting in: loss of consciousness, restriction of work or motion, transfers to another job, or require medical Management beyond first aid (ref.: U.S. Bureau of Labor Statistics, OSHA Record Keeping Guidelines for Occupational Injuries and Illnesses).

Term	Definition
TPPs	TransCanada Policies and Procedures
TRCR	Total Recordable Case Rate
TWA	Time-Weighted Average Exposure
TWA	A time weighted average (TWA) is the average exposure within the workplace to any hazardous contaminant or agent using the baseline of an **8 hour** per day or **40 hours** per week work schedule.
U.S.	United States
Vehicle Incident Frequency	The number of recordable vehicle incidents related to a common exposure base of 625,000 miles driven. A recordable vehicle incident is any incident (regardless of fault) involving a fleet or rental motor vehicle which results in an injury to any person or damage to any vehicle or property, unless the vehicle met the Gross Vehicle Weight (GVW), and was safely and legally parked at the time of the incident (ref.: ANSI standard D. 16.1 - 1989 *Manual on Classification of Motor Vehicle Traffic Accidents*- 5th Edition).
VIF	Vehicle Incident Frequency
GWP	General Work Permit
WHMIS	Workplace Hazardous Materials Information System
Work Authorization	A permit to work process, which is a written record that authorizes specific work, at a specific work location, over a specific period of time.

2.0 OCCUPATIONAL HEALTH AND SAFETY PHILOSOPHY

2.1 TransCanada's Commitment to Health, Safety and the Environment

Safety takes everyone's participation in order to be successful (STEPS). Whether you work in an office or field environment, you play an important role in our achievement of "Zero is Real." Our goal is to help employees and contingent workforce contractors to identify hazards in their workplace, and recognize the steps that they can put in place to ensure their safety and the safety of their co-workers.

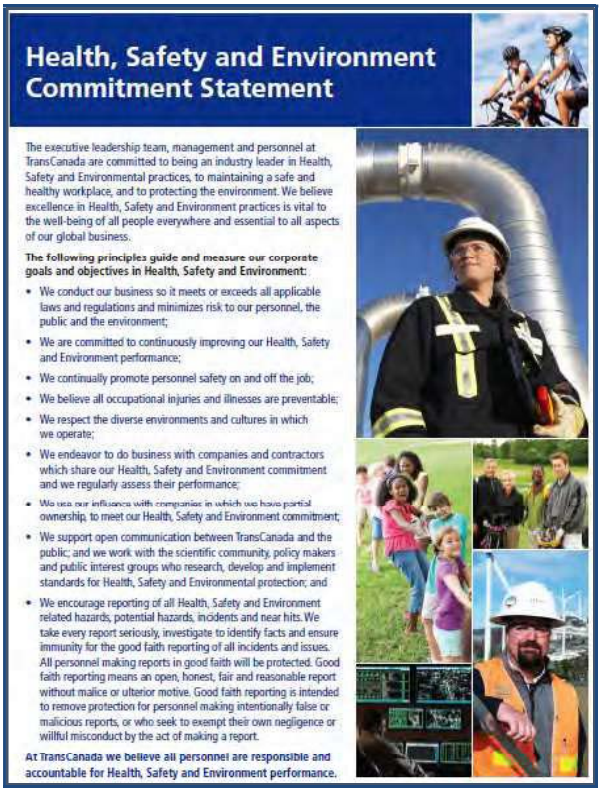
The Project Management Team (PMT) of MXP are committed to the principle that "all occupational injuries and illnesses are preventable." We believe everyone's occupational health and physical safety is an essential part of the project and we are all accountable and responsible to effectively implement this OHSMP to achieve success in injury and illness prevention and management.

For more information on the guiding principles, refer to the following TransCanada documents:

1. TransCanada's Health, Safety & Environment Commitment Statement (see Figure 3);
2. TransCanada's Life Saving Rules (LSR) Commitment Statement (see Figure 7);
3. Contractor Safety Management Guiding Principles;
4. PDS HSSEM Philosophy; and,

TCPL Contractor Safety Management Plan and new 2017 documents that have been incorporated into this document.

Figure 3 – TransCanada's Health, Safety & Environment Commitment Statement



The Health, Safety and Environment Commitment is clearly communicated to all MXP staff during their orientation and periodic continuous training, with copies posted at Project field office locations for both internal and external stakeholder display. As stated at the bottom of the Health, Safety and Environment Commitment, “At TransCanada, we believe all personnel are responsible and accountable for Health, Safety and Environment Performance.”

The Health, Safety and Environment Commitment statement is displayed in each Project and field office location, and is available on the TransCanada Corporate website where hardcopies may be downloaded.

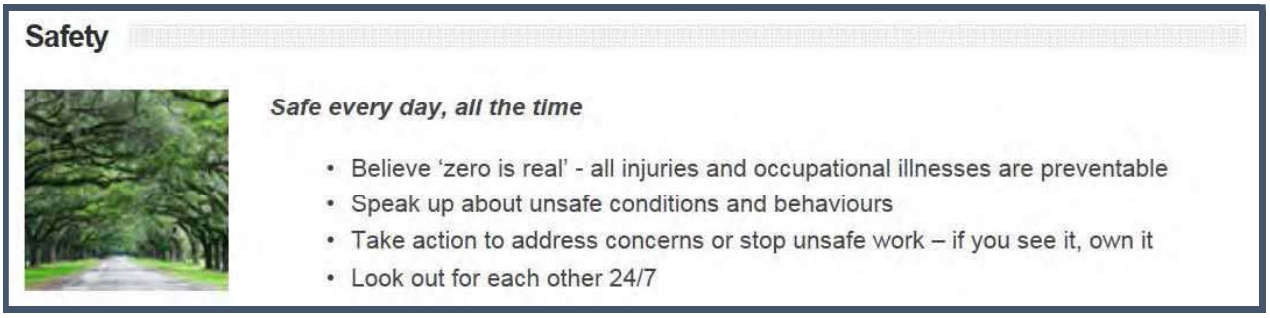
The statement is reviewed annually at a corporate level to ensure it remains relevant and appropriate to TransCanada’s occupational health and safety risks.

This Project must be executed in a manner to maintain and enhance the occupational health and safety of all personnel associated with the Project at the designated Worksite including, but not limited to, TransCanada employees, contractors and visitors. The Project will be conducted in a manner that meets or exceeds all applicable OHS laws and regulations.

2.2 Safety Vision

Safety is one of TransCanada’s four core values (see Figure 4). We are uncompromising in our commitment to the occupational health and safety of our employees and subcontractors. We will require individual accountability, expect all employees to adhere to our OHSMP requirements, and actively participate in and support the advancement of our occupational health and safety practices. Safety is the responsibility of all employees, including both top management and the individual craft worker. Everyone is responsible for taking the necessary STEPs in achieving zero incidents resulting in a SAFE worksite, a SAFE worksite, s SAFE project, and a SAFE career.

Figure 4 – TransCanada’s Safety Vision



2.3 Health, Safety and Environment Declaration

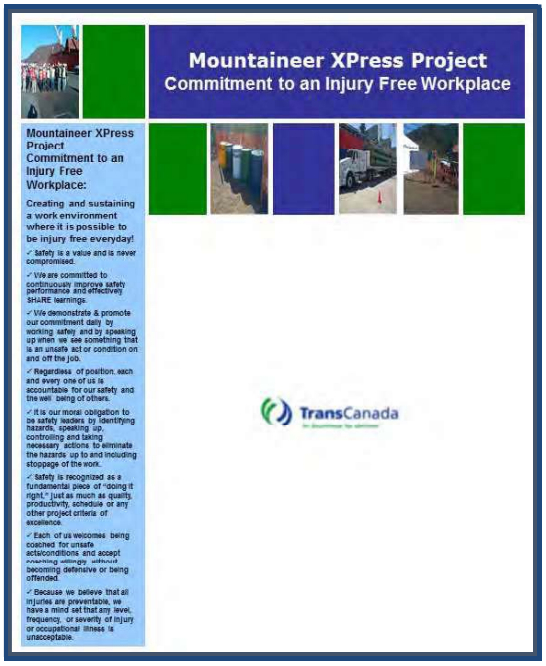
At the project level, management, supervisors and all employees of MXP and its contractors will commit themselves and sign a declaration on health, safety and the environment performance (see Figure 5).

The intention behind this statement is to:

- Collectively represent our HSE beliefs and values, which are applied to the construction work connected with the project;
- Create a sense of ownership and responsibility, both in terms of management and supervision of HSE performance;
- Be published in a visible area in order to illustrate the commitment of the administration to all employees for their safety while on the job, in addition to caring for the environment; and,

- Support the overall objective of "Zero is Real" and encourage continuous improvement of our leaders and the HSE performance indicators of underdevelopment.

Figure 5 Occupational Safety and Health Declaration



2.4 "Stop Work" Authority

The authority to stop work must be given through cards that will be distributed to each employee, when we believe that it is appropriate, which can also be included in the orientation received by each employee (see Figure 6). The intention of this card is to authorize the employees to exercise their rights to stop any work which will create unsafe conditions, or due to an unsafe action performed, or requested by a foreman or supervisor. There is a resolution process associated with this initiative to correct the unsafe situation, before work may continue.

2.5 TransCanada's Life Saving Rules

The Life Saving Rules (LSR) were created in response to the high consequence/high severity incidents that our employees and contractors are exposed to on the job. The nine rules complement this OHSMP by highlighting the mandatory procedures in place to control high-risk hazards and clearly outlining appropriate performance management measures, if the rules are not being followed (see Figure 7).

This LSR are recognized as best practice, set by many major oil and gas organizations across North America. With proper MXP leadership adoption and application they will support the Project's goal of **ZERO** incidents. The MXP PMT will be accountable for communicating, implementing and reinforcing the rules across the Project, to assure compliance and performance. This includes disciplinary action up to termination, if appropriate.

Figure 6 "Stop Work" Authority

Authority to "Stop Work"

We are committed to keeping the workplace safe, healthy and environmentally friendly for all employees, contractors and visitors. We believe that all incidents are preventable and we work towards a workplace without incidents or injuries. The conduct mentioned below allow us to fulfill our commitment:

1. Be responsible for your own safety and take into account the safety of others.
2. Recognize your limitations and ensure you are duly trained before beginning work.
3. Ensure all safety items and equipment are in place and functional.
4. Identify and minimize HSE risks.
5. Work in a safe and controlled environment.
6. Meet all HSE requirements.
7. Exercise your right and responsibility to stop or refuse to perform work in unsafe working conditions.
8. Use your PPE.
9. Keep your workplace clean and tidy.
10. Report all incidents.

Authority to "Stop Work"



1. "**Stop Work**" – "I am using my authority to stop work because…" explain your intention.
2. "**Notify**" – Notify the staff and supervisors affected of the reason for "Stopping Work".
3. "**Correct**" – If it is safe to proceed, thank the initiator for his or her concern. If the action is valid, all problems must be resolved before resuming work.
4. "**Resume**" – Give approval to all staff affected with regard to solving the "Stop Work" problem.

No one will be punished for stopping work they believe to be unsafe.

Figure 7 – TransCanada's Life Saving Rules

Life Saving Rules Commitment Statement:

"As a TransCanada employee or contractor performing work on behalf of TransCanada, I will adhere to the Life Saving Rules and all company procedures to ensure the safe operation of facilities, the protection of personnel, our environment, our customers and the people of the communities in which we do business"

We will:

1. Drive safely and without distraction
2. Use the appropriate Personal Protective Equipment
3. Conduct a pre Job Safety Analysis (JSA)
4. Work with a valid work permit when required
5. Obtain authorization before entering a confined space
6. Verify isolation before work begins
7. Protect ourselves against a fall when working at heights
8. Follow prescribed lift plans and techniques
9. Control excavations and ground disturbances

LIFE SAVING RULES

3.0 PLANNING

3.1 Hazard Identification, Risk Assessment and Determining Controls

Occupational health and safety hazards and risks, by definition, affect people. The identification and assessment process must, therefore, concentrate on jobs and tasks performed by employees, Contractors, and other parties affected by the hazards. Because people are involved, individual behaviour becomes a significant factor in both the probability of an incident happening and its consequences.

Identification of hazards and risks and their associated control measures is a vital step, since it forms the basis for most other actions within MXP's OHSMP. These items lead to the identification and prioritization of objectives and targets, assignment of responsibilities, definition of training needs, and development of operational controls. They also form the basis for determining key performance indicators to measure the overall success of OHSMP implementation.

The overall approach taken on MXP for the identification, assessment and control of OHS risks and exposures is described in Element 2 Health, Safety and Environment Risk & Regulatory Assessment of TransCanada's Occupational Health, Safety, and Environment Management System.

3.1.1 **Project Risk Assessment**

The Project has developed an Occupational Health and Safety Risk Registry (the Registry) or inventory that is organized by project phase representing the significant Health, Safety and Environment risks of the Project. The registry (see Appendix A) includes the likely impact of risks (see Table 2), cause and risk rating (Tables 3 and 4), as well as, the risk management strategies in place to minimize identified risks. The registry is updated quarterly and a report submitted to the Project's management review team.

The OHS Risk Registry will facilitate the proactive design and implementation of operational controls (i.e., TransCanada Policies and Procedures (TPPs) and TransCanada Operating Procedures (TOPs); designation of project OHS Health, Safety and Environment roles, accountabilities and responsibilities; and, definition of OHS training needs and requirements. This process forms the basis for identifying, setting and prioritizing key Health, Safety and Environment performance metrics (objectives and targets) which will measure the overall success of Health, Safety and Environment Management System implementation.

There are no designated, toxic and/or hazardous substances associated with this Project (e.g., lead, asbestos, mercury, polychlorinated biphenyl, benzene, toluene, ethyl benzene, and/or xylenes).

Table 2 – Occupational Health and Safety Significance

OHS Consequence Criteria	Probability	Score
Minor health & safety IMCG[1]. Negligible – Injuries/illnesses not resulting in hospitalization, temporary reversible illnesses requiring minor supportive management (first aid), or exposures below 20% of limits.	Probability of occurrence is virtually zero (1% or less chance). Awareness within the relevant industry.	**1**
Serious health & safety IMCG. Marginal – Injuries/illnesses resulting in hospitalization, acute or temporary reversible illnesses with short-term disability (<3 months), slight overexposure, or exposure near limits (20-30%).	Not likely to occur (10% or less chance). Occasional future occurrences are possible, but very unusual. Few noted within Industry. Has happened within the sector or more than once per year in their industry.	**2**
Major health & safety IMCG. Critical – Injuries/illnesses resulting in permanent partial disability or long-term disability (>3 months), or serious overexposure.	Likely to occur several times or occasionally, usually as isolated incidents (10% to 50% chance). Has happened at the facility or worksite or more than once per year across the sector.	**3**
Critical health & safety IMCG Catastrophic – Injuries/illnesses involving permanent disability, chronic or irreversible illnesses, extreme overexposure, or death.	Inherent in continuous activity and/or operations. Likely to occur repeatedly (more than 50% chance). Occurs often and may be considered expected or has happened more than once per year at the facility or worksite.	**4**

[1] IMCG –Incident Management, Follow-Up and Problems (Incident Management Classification Guide)

Table 3 – Occupational Health and Safety Risk Classification Matrix

Score	OHS	Probability Score 1 Unlikely	2 Remote	3 Occasional or Likely	4 Frequent
1	First Aid, No Health Effects	L	L	L	M
2	Medical Aid, Mild Health Effects	L	M	M	H
3	Recordable, Moderate Health Effects	L	M	H	VH
4	Catastrophic, Permanent Health Effects	M	H	VH	VH

[1] The source for safety criteria is the TransCanada Investment Valuation Tool Users Guide and Integrated Risk Assessment Process Matrix.
[1] Refer to the Health and Safety Event Type within the Incident Management Classification Guide for additional guidance on potential and/or actual consequences.

Table 4 – Risk Classification Categories

Risk Rating	Category	Description
Low (L)	Acceptable as is	No risk mitigation required. These risks require tracking on an annual basis to ensure that they remain low risk.
Moderate (M)	Acceptable with controls	Should verify that TPPs, TOPs or other appropriate controls are in place. Risk mitigation to risk level low is optional.
High[2] (H)	Undesirable	Should be mitigated with engineering and/or administrative controls to a risk ranking of moderate or less within 12 months.
Very High (VH)	Unacceptable	Should be mitigated with engineering and/or administrative controls to a risk ranking of moderate or less within 6 months.

[2] High and Very High risks require immediate review of controls to ensure that controls are adequately designed and performing as planned. If control measures cannot be implemented to manage the risks, take actions to transfer, reduce, or otherwise mitigate the risk.

3.1.2 General Work Permit and Job Safety Analysis

Where MXP has care and control over worksite OHS, TransCanada's General Work Permit and Job Safety Analysis TOPs (ref.: EDMS ID#006711297 and 006709222, respectively) will be implemented as its detailed process of hazard identification and assessment.

3.1.2.1 General Work Permit Procedure

A general work permit (GWP) is a permit to work process, which is a written record authorizing specific work, at a specific work location, for a specific period of time. The GWP is used for controlling and co-coordinating work to establish and maintain safe working conditions. They ensure all foreseeable hazards have been considered and the appropriate precautions are defined and carried out in the correct sequence.

The GWP is an agreement between the issuer and the receiver which documents the conditions, preparations, and limitations needed to be clearly understood before work begins.

For the Project, GWP TOP will only be utilized following the transfer of control of the project from the Prime Contractor in the construction phase to MXP during the commissioning phase of the Project. The GWP will then be issued under worksite circumstances to meet Section 4.1.1 of the GWP TOP.

3.1.2.2 Job Safety Analysis Procedure

The job safety analysis (JSA) essentially involves dividing a job into a reasonable number of tasks, and examining each task for the hazards presented either by the task itself or by the situation, in which the task is performed. This close analysis of tasks and associated hazards simplifies and organizes the hazard identification process. It ensures that significant hazards are not missed and provides an organizational framework for recording the hazards found, the frequency and probability estimates needed for assessment of risk, and information about potentially effective controls. As it involves estimating consequences and probabilities, in addition to identifying hazards, the JSA process can also be seen as the first phase of the broader or project risk assessment process.

For the Project, JSAs may be performed under the following worksite circumstances:

- Prior to executing "High Risk Activity". The employees responsible for conducting the work will determine if the scope of work involves high risk activity.
- When any individual involved with the work (employee, manager, worker, etc.) has identified the need or benefit of having a JSA regardless of the degree of risk.

High risk is defined as follows:

- Incident Severity Potential - Some jobs may not have a history of incidents, but may have the potential for causing severe harm to people, property, production and environment (i.e., Hot Work);
- New Jobs or Tasks unfamiliar to employees - Changes in equipment or in processes have no history of incidents, thus the incident potential may not be fully appreciated. A JSA should be developed for every new job as soon as the job is created;
- Large Workforce - When project activities require a large work force and/or significant resources (i.e., extensive use of Contractors), the potential for high risk situations increases awareness and a need for additional JSAs;
- Frequency of Incidents - If the job has a history of incidents, the greater the number of incidents associated with the job, the greater the priority claim for developing a JSA;

  - If you have previous experience with an incident you believe is associated with this job, take this learning into consideration as you develop the JSA for your current work activities.
- Change Management - At any time when the employees responsible for conducting the work are required to "manage change", the value of completing a JSA increases. Change management can include:
  - Unplanned change in the Scope of Work;
  - Significant change in the work site environment – that GWPs not anticipated and that change directly influences how work can proceed (changes scope); and,
  - Unplanned change in work crew personnel – particularly when experience, competency, and site orientation is affected.

All Contractors for the Project will be required to implement a JSA procedure which meets or exceeds MXP's stipulated minimum requirements.

3.1.3 Safety Inspection Procedure

Inspections are conducted to identify unsafe practices, procedures and processes. A continual, continuous inspection program will aid in early identification and correction of hazardous conditions and may prevent serious injury or other loss.

The following types of safety inspections/audits will take place during the Implementation Phase of the project:

Scenario 1: Where TransCanada is the Prime/General Contractor:

TransCanada is responsible for monitoring and measuring safety performance, as well as, identifying and implementing preventative and corrective measures, as required. This is accomplished through:

- **Informal Worksite Reviews** – Completed by the TransCanada CM/OM and his inspection staff on a daily basis and results discussed at the tailgate meetings and documented in the minutes.
- **Weekly Safety Inspections** – Conducted by the TransCanada CM/OM or designate. Recorded and discussed at weekly safety meetings. Ideally, takes place the day of, and before, the weekly safety meeting (Ref.: EDMS Id#. 003874294 TransCanada's Construction Worksite HSE Inspection TOP).
- **TransCanada HSE Inspection** – Follows a standard format and within a timeframe/frequency as stated in the Contractor Safety Management Program, Element 1 steps 4-6. These inspections are typically conducted by the Region, Department or Business Unit HSE Representative. Notification will be provided in advance to allow Contractor participation.
  - The inspection results upon completion must be distributed to TransCanada Project Teams within one week of the inspection with deficiencies noted as evaluated against the Project Safety Plan.
  - Any deficiencies noted are to be corrected immediately and documented for trending purposes. In the event trends are identified an Action Plan needs to be developed with associated accountabilities and timelines.

In addition to the above inspection, the following will also be required as per monthly (M1) and annual (M12) requirements:

1. M1 and M12 Vehicle Inspections (completed by employee); and,
2. M1 Office Fire and Safety Inspection. (completed by Joint Health, Safety & Environment Committee).

Scenario 2: Where TransCanada has designated a Prime/General Contractor:

The Prime/General Contractor has the primary responsibility for monitoring and measuring safety performance as well as identifying and implementing preventative and corrective measures, as required. In accordance with the contract terms and conditions, the Prime/General Contractor must conduct safety inspections and audits as set out in the P/SSSP and the Audit Protocol as attached to the P/SSSP. TransCanada is responsible for ensuring the Prime/General Contractor meets its contractual duties.

Prime/General Contractor led procedures may include:

- **Informal Worksite Reviews –** Conducted by the Prime/General Contractor on a daily basis and results discussed at the tailgate meetings and documented in the minutes.
- **Weekly Safety Inspections** – Conducted by the Prime/General Contractor and discussed at weekly safety meetings. Notification will be provided to the TransCanada Project Team in advance to allow TransCanada to participate in the inspection.
- **Prime/General Contractor Safety Audit** – Conducted and lead by the Prime/General Contractor following a standards format and within a timeframe/frequency as communicated in the Prime/General Contractor's P/SSSP and in accordance with its Audit Protocol. Notification will be provided to the TransCanada PMT in advance to allow TransCanada to participate in the audit.

Note: Where it has been deemed necessary, TransCanada may conduct an independent Health and Safety Field Audit or Inspection for the limited purpose of verifying that the Prime/General Contractor is meeting all OHS requirements and the requirements of its P/SSSP (Ref.: ID#006634514 Prime/General Contractor Management Safety Audits and Inspections – Guidance Notes). Where it is found that the Prime/General Contractor is not meeting its contractual/legislative obligations to ensure the health and safety of all workers on the site, deficiencies will be shared internally with the TransCanada Project Team. The TransCanada Project Team may hold subsequent discussions with the Prime/General Contractor aimed at informing the Prime/General Contractor of the general nature of the deficiencies so that the Prime/General Contractor can make an independent determination regarding the corrective action required.

3.1.4 Determining Controls Process

Following the identification of project risks and hazards through one of the hazard identification and assessment methods (i.e., OHS Risk Registry, JSA, and safety inspections), the hazards must be corrected through implementation of appropriate controls. After the appropriate measures are identified, they must be implemented and re-evaluated to determine their effectiveness in eliminating or controlling the hazard. Hazards may be controlled using a variety of tools engineered controls and redesign, administrative controls and personal protective equipment.

See Section 4.6 of this document for a discussion TransCanada Operational Controls.

3.2 Legal and Other Requirements Procedures

This section of the OHSMP describes the project's methodology or procedure for the:

- Identification and compliance with applicable Federal, State, and local OSHA and Labor Laws and Regulations;
- Inclusion of OHS legal requirements into the OHSMP;
- Evaluation and review of OHS legal requirements; and,
- Access to OHS legal requirements and information.

3.2.1 Access to OHS Legislation and other published OHS requirements

The Project will provide all employees access to up-to-date OHS legislation requirements through the provision of resources including:

- OHS personnel; and,
- Electronic and/or hard copy versions of relevant OHS legal requirements.

The register of Federal and State OHS laws, regulations voluntary industry consensus standards applicable to this Project are presented in Section 1.4 References, herein.

3.2.2 Identification and Monitoring of Occupational Health and Safety Legal Requirements

The content of this section of the OHSMS is consistent with TransCanada's corporate Legislative Management Process (ref.: EDMS ID#004238605).

The Safety Manager shall:

- Identify relevant OHS legal requirements applicable to the MXP Project;
- Influence and/or incorporate and publish relevant OHS requirements into the OHSMP including TPPS, TOPS, guidance material, and forms; and,
- Monitor and identify relevant changes to OHS legal requirements; and, where changes are identified, review and update (where required) TPPS, TOPS, guidelines and forms in accordance with TransCanada's TOPS management system procedure.

Changes in any of the applicable legal and other requirements will be actively monitored on a continual basis using the following sources of information:

- TransCanada's internal Industry Relations' Legislative Monitoring Bulletin;
- Regular review of the following OSHA websites:
  - Federal OSHA at OSHA Law & Regulations | Occupational Safety and Health Administration.
- Participation in any workshops, forums and programs offered by the OSHA; and,

3.2.3 Methodology for Maintaining Currency of OHS Legal Requirements

To ensure that OHS legal requirements remain current the Safety Manager will maintain resources and tools including:

- Personnel with associated responsibilities to monitor OHS legal requirements;
- Participation in professional associations and relevant industry groups; and,
- Participation in subscriptions to OHS legal requirements monitoring services.

The Safety Manager will develop and maintain a list identifying all relevant OHS legal requirements (see Section 1.4 References of this document).

The Safety Manager will review the OHS legal requirements matrix upon changes to OHS legislation or at intervals not exceeding one year.

3.3 Objectives and Programs

3.3.1 Objectives

The Project will use a mix of both leading and lagging safety key performance indicators (KPI) to measure overall OHSMP effectiveness and adequacy.

Leading indicators are designed to drive and measure critical OHS activities. When measured and monitored effectively, the data from leading KPIs enables effective intervention to address or reverse a negative trend, before it results in illness, injury, damage or loss.

Lagging indicators, such as illness and injury statistics, provide an overall estimate of the progress required to achieve MXP's commitment that "all occupational Health and Safety injuries and illnesses are preventable," but they do not measure the effective implementation of OHS management systems, programs, proactive action plans, and preventative activities in place. If lagging indicators are used as the only KPI of OHS achievement or failure, they can do more harm than good, as people are not empowered to take control of OHS and to develop an effective Project safety culture.

TransCanada corporate performance objectives may be reviewed at:

- http://pf2d3.tcpl.ca:7602/governance/performance_statistics.html.

3.3.1.1 Leading Indicators

All leading indicators are expressed as a frequency using a common exposure baseline of 100 full-time employees[2].

The leading or predictive KPIs set for employees associated with the Project are presented in Table 5.

Table 5 Leading Indicators for Employees

[redacted]	[redacted]	Target [redacted]
		Meets
[redacted]	[redacted]	1x
[redacted]	[redacted]	1x
Improve Safety Culture[3] Implementation of milestones related to safety culture plans	20%	Milestone
Leadership Commitment (Major Projects' leaders)[4] Number of safety meetings or inspections Leaders actively participate in	15%	164

[2] Bureau of Labor Statistics, Record Keeping Guidelines for Occupational Injuries and Illnesses.

[3] **Improve Safety Culture -** TransCanada participates in regular Industry Safety Culture surveys. These surveys help us identify areas to be strengthened around safety culture. Based on the results continual improvement plans are developed at the corporate and business unit levels. The Improve Safety Culture metric measures the completion of key milestones within these plans, demonstrating our journey towards on-going focus and improvement of safety culture. One of the milestones will include an annual survey to measure percent improvement in culture and effectiveness of plans.

[4] **Leadership Commitment** - The Leadership Commitment metric is a measure to demonstrate leadership (manager and above) commitment, visibility and support regarding safety. The metric measures the number of active participations in safety meetings or inspections by each leader within TransCanada. Each Field Operations and Project Leaders are to participate in at least 4 safety meetings or inspections per year. All remaining corporate or office Leaders are to participate in at least 2 safety meetings or inspections per year.

[redacted]	[redacted] Target	[redacted]
		Meets
Employee Participation (Major Projects' employees)[5] Number of Safe Acts, Unsafe Acts and Safety Events	15%	384

The following are additional leading KPIs that may be measured during the Project, but do not have an associated frequency:

- Number of safe acts, conditions and observations reported;
- Number of incident investigations (i.e., events affecting employee safety) conducted versus required (i.e., incident investigations are required for all incidents classified as major, critical and those incidents with a high potential);
- Number of JSA conducted versus planned JSAs for high risk Project activities;
- Number of MXP and Contractor employees provided both the general (i.e., TransCanada's Employee/Visitor/Contractor Health, Safety and Environment Orientation) and Project specific OHS orientations; and,
- Number of incidents reported and recorded within SAP EHSM within 24 hours of their occurrence.

Leadership teams from both MXP and its Prime Contractors are committed to OHS. Each leadership team member will actively contribute to the following:

- Attend at least 2 field safety meetings with field employees per quarter;
- Attend at least 2 field Tailgate Sessions and JSA sessions at field locations per quarter;
- Give at least 10 positive reinforcement messages delivered in the field per quarter; and,
- Submit at least 1 near hit per quarter.

Each leadership team member will provide the Safety Manager with a document, email or letter, stating the date, time, and nature of the safety activities completed on a monthly basis.

3.3.1.2 Lagging Indicators

All lagging indicators are expressed as a frequency using a common exposure baseline of 100 full-time employees[6].

The lagging or trailing KPIs set for employees associated with the Project are presented in Table 6.

[5] **Employee Participation** - The Employee Participation metric is a measure to demonstrate employee commitment and support regarding the proactive reporting of safe and unsafe acts and conditions. The metric measures the number of Safety Hazard Awareness Reporting Events (SHARE) reported through SAP. Each employee is expected to report at least 2 SHAREs per year.

[6] Bureau of Labor Statistics, Record Keeping Guidelines for Occupational Injuries and Illnesses.

Table 6 Lagging indicators for Employees

[redacted]	[redacted]	Target [redacted]
		Meets
		1x
TRCR (Employee) * Total number of work-related injuries or illnesses that require medical treatment.	4%	0.53
AWCR (Employee) * An incident that results in an injury or illness that prevents an employee from returning to work on the next scheduled shift.	6%	0.14
VIF (Employee) * A recordable vehicle incident involving a fleet or rental motor vehicle which results in an injury to any person or damage to any vehicle or property.	4%	3.06
HIPO		<1

The lagging or trailing KPIs set for Contractors associated with the Project are presented in Table 7.

Table 7 Lagging indicators for Contractors

[redacted]	[redacted]	Target [redacted]
		Meets
		1x
TRCR (Contractor) * Total number of work-related injuries or illnesses that require medical treatment.	3%	1.05
AWCR (Contractor) * An incident that results in an injury or illness that prevents a contractor from returning to work on the next scheduled shift.	5%	0.13
VIF (Employee) * A recordable vehicle incident involving a fleet or rental motor vehicle which results in an injury to any person or damage to any vehicle or property.	4%	3.06
High Potential - **HIPO**		<1

3.3.2 Achievement and Monitoring of Progress on Objectives

This OHSMP outlines the strategies, plans and procedures required to be undertaken to achieve the above established leading and lagging OHS objectives.

Progress towards the set objectives will be monitored by:

- Monthly measurement of the leading and lagging indicators on a scorecard;
- Monthly performance review committee meetings; and,
- Quarterly senior management review meetings.

3.3.3 Programs

3.3.3.1 Preventative Occupational Safety and Industrial Hygiene Program

The following sections have taken into consideration the programs, practices and procedures associated with TransCanada Corporate Health and Industrial Hygiene (ref.: http://pf2d3.tcpl.ca:7602/hih/).

3.3.3.1.1 Introduction

Preventative Occupational Safety and Industrial Hygiene is a science and art devoted to the recognition, evaluation and control of environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among project employees.

The environmental factors and stresses are typically characterized as one of the following:

- **Biological** - This includes bacteria, viruses and other living organisms that can cause acute and chronic infections by entering the body either directly or through breaks in the skin (e.g., West Nile, Hanta Virus, Lyme Disease, Blood Borne Pathogens, Mold, Fungus);
- **Chemical** - Exposure to harmful chemical compounds in the form of solids, liquids, gases, mists, dusts, fumes and vapours by inhalation, absorption, or ingestion that may cause adverse health effects (acute/chronic) (e.g., Asbestos, Hydrogen Sulfide, Lead, Lubricating Oil, Mercury, Solvents, Paints). For access to material safety data sheets or MSDS, please refer to the Health, Safety and Environment webpage at http://eservice.msds.com/servlet/SSMain;
- **Ergonomic (Office/Field)** - awkward postures, forceful exertions, and manual temperature and lighting; and,
- **Physical** - This refers to energy sources and includes excessive levels of noise, vibration, radiation (ionizing and non-ionizing), illumination and temperature (Heat/Cold Stress).

Appendix C will outline the procedure for conducting qualitative and quantitative exposure assessments for chemical, biological, ergonomic or physical agents in addition to training, record keeping and auditing of the Preventative Occupational Safety and Hygiene program.

This section, along with Appendix C and other referenced procedures, will ensure compliance with the following references:

Preventative Occupational Health and Hygiene Program	General Office for Occupational Health and Hygiene. Preventative Occupational Health and Hygiene Program- Methodology for its preparation-November 1997.

MXP's Preventative Occupational Health and Hygiene Program is applicable to MXP's employees only. All Contractors, including Prime Contractors, will meet the intent of the requirements in this section via their own Preventative Occupational Health and Hygiene Programs and Procedures.

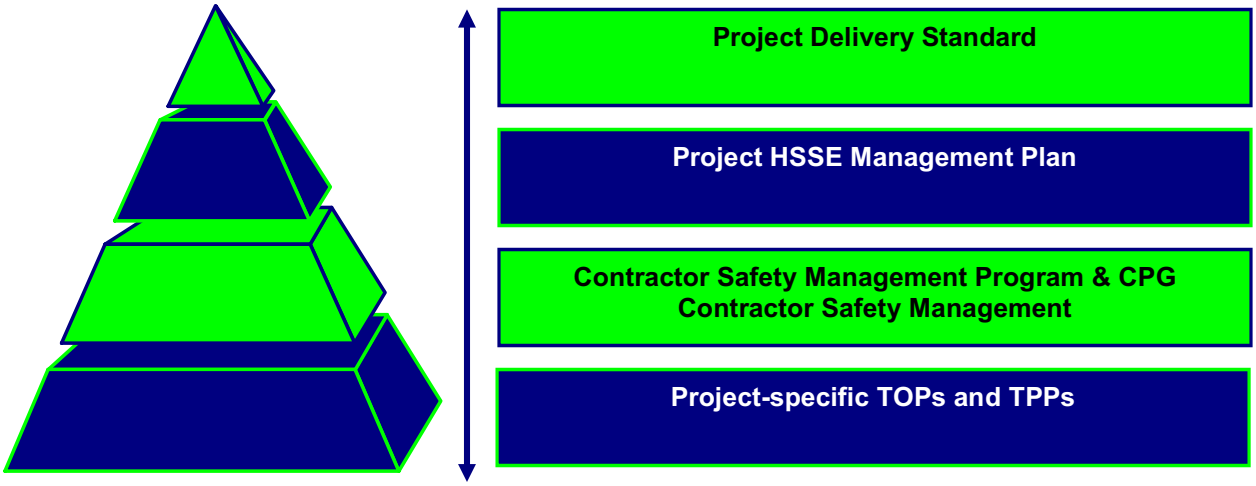
3.3.3.2 **Project HSSE Management Program (This SMP Only Covers Scope of Health and Safety; physical security and environment are handled under separate documents)**

3.3.3.2.1 Project Delivery Standard – HSSE Management Plan – Deliverable Description

The Safety Management Plan template (ref: EDMS ID#003798370) of TransCanada's Project Delivery Standards provides a structured and consistent guide for all Project safety management related requirements. This guide helps to ensure that OHS aspects are taken into consideration at the appropriate time during each of the Project's life cycle phases (i.e., initiation, planning, execution, and close-out).

The OHSMP for the Project has been prepared in accordance with the Safety Management Guide.

Figure 6 Project Delivery Standard (PDS) Hierarchy



3.3.3.2.2 Contractor Safety Management Program

Various types of Contractors (i.e., Prime Contractor and Contractor) will be utilized to complete specific scopes of work for each phase of the Project. In managing these Contractors, MXP will be implementing TransCanada's Contractor Safety Management Program (CSMP) (ref.: EDMS ID#003800125). Implementation of the CSMP on the Project.

The CSMP is divided into two (2) implementation phases: Strategic and Tactical. The strategic phase defines the front end activities taking place during the prospecting, proposal and definition stages of a defined scope of work associated with the Project. Normally, these activities are limited to intellectual scopes of work (i.e., front end engineering, design and procurement) where no physical work is being executed at the worksite. The tactical phase defines activities that take place during the execution and operations stages of a defined scope of work associated with a Project. A transition occurs from the intellectual aspects of the scope of work to physical on-site work activities (i.e., pipeline construction and commissioning) involving the selected Prime Contractor.

The CSMP is comprised of the following six elements:

- Planning;

- Pre-qualification;
- Selection;
- Pre-Job Safety Activities;
- On the Job Safety Activities; and,
- Post-Job Safety Activities.

The degree and extent to which the CSMP is applied for the Project will be in proportion to the nature, scale, level of safety risks and exposures inherent in any scopes of work to be completed by Contractors. Complex scopes of work have high safety risk exposures, multiple Contractors on-site, and for moderate to long duration (e.g., weeks or months) will be expected to conform to each element within the CSMP. Simple scopes of work have low safety risk exposure, short duration (e.g., hours or days) and will be expected to conform to only those elements that are determined applicable.

Legacy CPG had a contractor safety management procedure, and the MXP Project was let to Prime Contractors to bid against Element 3.4 Contractor Project HSE Requirements. In general, there are not many differences between legacy CPG and TC's CSMP requirements.

These departures are as follows:

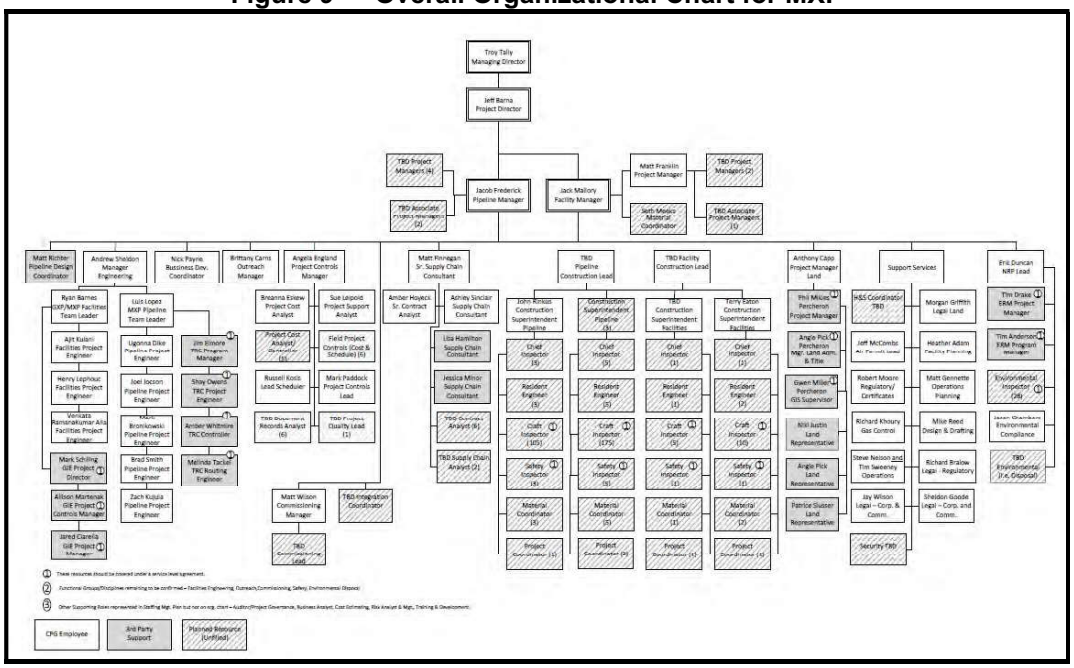
1. Requirement for Prime Contractor to develop and implement a Project or Site Specific Safety Plan;
2. Development of an Emergency Preparedness and Response Plan, including first aid and medical aid provisions;
3. Submission of exposure data (hours worked and miles driven) by the 5th of each month (currently states 7th day which does not match with our monthly reporting deadline);
4. Alignment with TC Life Saving Rules within Prime Contractor's own LSR program;
5. Use of legacy CPG pre-job safety briefing, when it should be their own program;
6. No mention of the requirement to conduct job safety analysis (JSA) before commencement of work activities;
7. Personal protective equipment (PPE) does not specify side impact hard hats or safety boots that are 6" in height;
8. No mention of additional permitting requirements other than for hot work and confined space;
9. Hours and days consecutively worked is not addressed; and,
10. Detailed specifications provided by TCPL regarding Overhead Power-lines, Access Roads, and Slopes and Excavations.

4.0 IMPLEMENTATION AND OPERATION

4.1 Resources, Roles, Responsibilities, Accountability and Authority

The Project has identified and allocated financial and physical resources to enable the effective implementation of this OHSMP for the Project. The Project's detailed OHS management structure is represented by Figures 9 and 10.

Figure 9 Overall Organizational Chart for MXP



4.1.1 Project Management Team (PMT)

The PMT seeks to provide a reasonable duty of care in evaluating and managing Project safety. A Project organizational chart can be found within the Project Phase Plan.

The PMT's safety role will be as follows:

- Complete a high level evaluation of potential safety risk or exposure issues associated with the Project;
- Incorporate potential mitigating solutions into Project design, specification, and schedule;
- Coordinate collaborative safety concerns for each phase of the Project;
- Provide reasonable evaluation of the Prime/General Contractor's safety compliance and potentially issue stop work orders should significant or imminent safety concerns be identified; and,
- Lead by example by exhibiting proactive behaviors and attitudes.

4.1.2 Project Director and Project Managers/Facility Manager

The Project Director and Pipeline/Facility are accountable for the implementation and success of the safety program for this Project. The MD and PM function as the primary window for engineering and planning functions. Following is a summary of the MD and PM's roles and responsibilities for the Project.

- Ensure health and safety, as per TOMS and Project Delivery Standard process.
- Review the Prime/General Contractor's P/SSSP in consultation with the assigned Project Safety Designate;
- Create, publish, approve, distribute, and communicate the SMP and modify accordingly for continuous improvement;
- Review and ensure each key member of the Project Team is aware of and complies with the requirements of this SMP to ensure safe practices and conditions are maintained;
- Maintain effective communication with all key members of the Project Team;

- Ensure all incidents are reported in a timely manner, as per TransCanada's Incident Management Process, review all incidents and near hits with the MXP Management Team, and when required develop appropriate corrective action plans;
- Ensure all emergency events as described in the Emergency Management System are reported to emergency line 1-800-447-8066 for the United States;
- Act as a liaison between the MXP Management Team and TransCanada Corporate/Houston Emergency Response/Operations Centre (EOC) as required;
- Lead and participate in major or critical investigations and/or special construction site safety meetings to re-enforce the PMT's safety commitment;
- Provide the PMT with appropriate support and resources as required to effectively manage the health and safety at the construction site;
- Complete a minimum of one site visit per quarter and lead/participate in at least one formal site inspection per year;
- Request HSE support from Regional/Department/Business Unit Safety Representative/Designate and Corporate HSE, when required;
- Monitor Project safety performance, identify safety trends and address issues;
- Coordinate a monthly meeting with the PMT (contractor, if required) to review Project safety performance;
- Ensure Contractor Monthly Health & Safety Report is submitted by Prime/General Contractor;
- Coordinate a meeting with senior management representatives from TransCanada and the Prime/General Contractor following a major/critical incident and/or inadequate Prime/General Contractor safety performance;
- Stop or suspend work activities, if through observations, it is reasonably believed work activities are placing personnel, facilities or the environment at risk or are otherwise in breach of the contract; and,
- Coordinate a post-construction evaluation with the PMT and the Prime/General Contractor to review and discuss the Project safety performance, identify safety trends and/ or "lessons learned."

4.1.3 **Construction Manager**

The Construction Managers (CM) act as the primary window for construction implementation functions. Following is a summary of the Construction Manager/Owners Manager roles and responsibilities for the Project.

- Understand all applicable health and safety requirements identified in TransCanada TOPs, TPPs, SMP Prime/General Contractor P/SSSP and/or relevant documentation, applicable laws, regulations and industry standards as listed in this SMP;
- Represent the Company at the construction site and verify all applicable safety requirements are being adequately managed by the Prime/General Contractor;
- Participate in safety related meetings (Pre-Job, Tail-gates, JSAs, JSA Review Meetings, Weekly Safety Meetings, etc.);
- Maintain communication with the Prime/General Contractor and if required, help identify all health and safety issues;
- Participate in formal/ informal OHS inspections of work area and inform the PM of inspection results;
- Act as initial contact for Prime/General Contractor on incident reporting, along with the safety representative. Ensure all incidents and near hits are reported in the IIT system according to Company policy, following an incident, investigate all details and file a complete investigation report with the PM;
- Participate in incident investigations when required;
- In the event of a major, critical, high-potential incident, to secure/freeze the Worksite, and immediately notify the PM;

- Clearly understand individual and team responsibilities and accountabilities prior to commencing work. Adequately communicate these expectations with the Project Team at the construction site. Immediately seek additional clarification when required;
- Establish/implement incident reporting/emergency response process with contractors;
- Stop or suspend work activities if through observations it is reasonably believed work activities are placing personnel, facilities or the environment at risk or are otherwise in breach of the contract; and,
- Maintain files of applicable safety documentation (i.e. inspections reports, site observation, etc.).

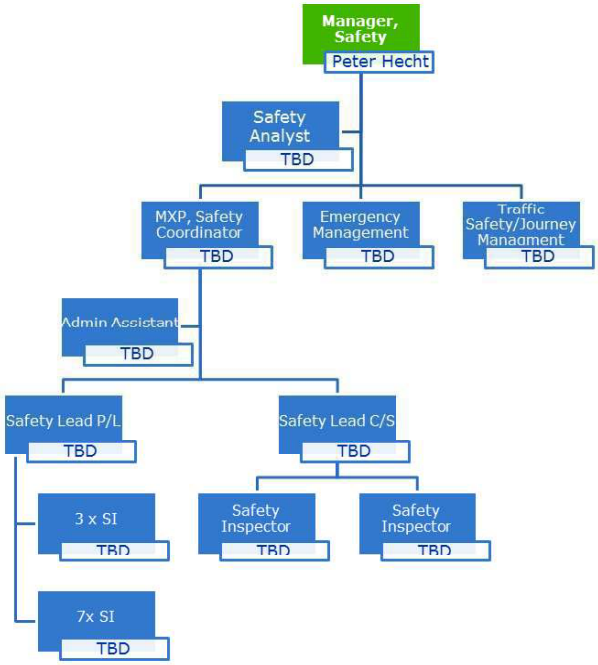
4.1.4 **Project Safety Support – Safety Coordinator**

The designated OHS Safety Coordinator for the Project will provide a high level review of HSE expectations and metrics, interfacing directly with the PM, CM, and Project Safety Manager.

Following is a summary of the OHS Manager's role and responsibilities for the Project.

- Provide input into the SMP and all aspects of the CSMP;
- Understand all applicable health and safety requirements identified in legislation, TransCanada TOPs, TPPs, SMP, P/SSSP and/or relevant documentation;
- Participate in all Project related safety meetings and discuss safety performance issues;
- Act as a consultant/resource for the PMT;
- Liaise with the Prime/General Contractor's safety professionals to verify effective safety management;
- Review all Project incidents and near hits with PMT and assist with the development of appropriate corrective action plans;
- Review the Prime/General Contractors P/SSSP prior to work commencement;
- Ensure formal site health and safety inspections and/or audits are completed and findings documented. Verifying the Prime/General Contractor adequately develops and implements effective corrective measures whenever deficiencies have been identified;
- Provide on-going safety support/monitoring of the Project;
- Participate in review of the Prime/General Contractor's Investigation process if found to be inadequate provide coaching and mentoring to the Prime/General Contractor; in order to determine incident prevention through Root Cause Analysis (e.g., TapRoot® or equivalent) the development and preparation of reports associated summary documents, hazard alerts, presentations, etc.
- Provide the Prime/General Contractor with any relevant (internal/external) OHS bulletins related to Project activities;
- Stop or suspend work activities if through observations it is reasonably believed work activities are placing personnel, facilities or the environment at risk or are otherwise in breach of the contract;
- Participate in Prime/General lead formal site health and safety inspections and/or audits; and,
- Participate in PMT meetings and any other Project related meetings that discuss safety performance issues.

Figure 10 Occupational Health and Safety Organizational Chart for MXP



4.1.6 TransCanada Site Safety Leads and Inspectors

The TransCanada Site Safety Inspectors for this Project and are responsible for all aspects of the safety and environment compliance and non-conformance reporting for the Project. The following is a summary of the roles and responsibilities.

- Understand all applicable health and safety requirements identified in applicable legislation, TransCanada TOPs, TPPs, SMP, Prime/General Contractor P/SSSP and/or relevant documentation.
- Ensure all applicable safety requirements are being adequately managed by the Prime/General Contractor per their P/SSSP;
- Participate in safety related meetings (Pre-Job, Tail-gates, special safety meetings etc.);
- Liaise with the Prime/General Contractor's head office, safety professional, construction site safety specialist;
- Ensure all incidents are reported in a timely manner, review all incidents and Near Hits with TransCanada's CM and Prime/General Contractor Safety Specialist and when required develop appropriate corrective action plans;
- Review Prime/General Contractors Emergency Response Plan; validate appropriate First Aid equipment/qualified/assigned First Aid coverage for work crews;
- Provide ongoing support/monitoring of the Project and continually monitor, trend, and analyze project safety performance;
- Complete formal site health and safety inspections/audits and document findings;
- Verify Prime/General Contractor adequately develops and implements effective corrective measures whenever deficiencies have been identified;
- Participate in incident prevention, investigation, analyses, and preparation of reports and summaries;
- Provide contractors with any TransCanada (internal/external) OHS bulletins related to construction activities;

- Assist in the identification of potential hazards, hazardous work, or work hazards to the environment or facilities through the Hazard Management Process (e.g., Job Safety Analysis, Task Hazard Analysis, Job Hazard Analysis, etc.);
- Maintain files of applicable safety documentation (i.e., inspections reports, site observation, etc.); and,
- Review the Project safety performance with the Prime/General Contractor safety representative prior to demobilizing from site and collaboratively issue Construction Safety review/report.

4.1.7 TransCanada Chief/Utility Inspectors

During the construction process the Company will utilize inspection resources at each of the construction sites. The Inspectors will report to and be under the direct oversight to TransCanada's CM and provide support as required. The Inspectors will be present during construction observing and documenting daily Prime/General Contractor activities, participating in select collaborative activities and documenting Project tasks.

Following is a summary of the Inspectors roles and responsibilities.

- Understand all applicable health and safety requirements identified in TransCanada's TOPs, TPPs, SMP, Prime/General Contractor's P/SSSP and/or relevant documentation. Successfully complete any required TOP, TPP training programs/LMS;
- Represent the Company at the construction site and verify all applicable safety requirements are being adequately managed by the Prime/General Contractor;
- Participate in safety related meetings (Pre-Job, Tail-gates, Daily JSA Review, Weekly Safety Meeting, etc.);
- Provide ongoing monitoring of the Project;
- Notify CM, if requested to complete tasks that you are not trained/competent to undertake and develop appropriate controls; and,
- Assist in the identification of potential hazards, hazardous work, or work hazards to the environment or facilities through the Hazard Management Process.

4.1.8 Prime/General Contractor

The Prime/General Contractor and their select subcontractors will complete the Project.

Following is a summary of the Prime/General Contractor's roles and responsibilities.

- Control of the Worksite;
- Coordinating, organizing and overseeing the performance of all work and the occupational health and safety programs of all employers and contractors at the Worksite to ensure no person is exposed to risks to their health or safety;
- Overall responsibility for OHS at the Worksite including, but not limited to, the protection of the general public and protection of all workers including those employed by:
    - TransCanada;
    - The Contractor;
    - Any Subcontractors;
    - Any vendors;
    - Any suppliers; and,
    - Any other contractors.
- Develop a P/SSSP and submit to TransCanada's Project Manager a minimum of thirty days (30) prior to mobilization. The P/SSSP will outline exactly how the Prime/General Contractor will implement its HSE processes onsite.
- Adhering to and enforcing the requirements of the P/SSSP;
- Maintaining all safety programs, including certification if applicable;

- Maintaining Workers Compensation Board proof of good standing (i.e. Clearance Certificate), or jurisdictional equivalent if any throughout the duration of the Work;
- Protection and preservation of TransCanada's property and the property of all third parties on, along, adjacent to or near the Worksite from damage resulting from the performance of the Work, including exercising suitable precautions necessary to prevent property damage;
- Ensuring compliance with and implementation by all organizations and individuals that have duties imposed upon them under all applicable OHS laws and regulations including all orders, directives, codes, guidelines, permits, licenses;
- Monitoring activities at the Worksite to ensure the health and safety system is functioning properly and provide such records as TransCanada may require verifying the health and safety system is functioning;
- Schedule and conduct formal health and safety inspections and audits with notification to the TransCanada Project Team 30 days prior to conducting such inspections and audits; and,
- Receive from each employer at the Worksite the name of the person who has been designated to supervise the employer's workers at the Worksite.

4.1.9 Project Control Manager, Contracts Manager, and Supply Chain

The Contracts Manager will be responsible for the contractual aspects of the Project.

The following is a summary of the Contract Manager's occupational health and safety role and responsibilities:

- Ensure that occupational health and safety is included with the request for proposal stage and OHS is used as a criterion to select the successful bidder;
- Ensure that occupational health and safety is included in the contract terms and conditions binding the Contractor to specific performance expectations and standards;
- Populate and monitor the Compliance Tracking System (CTS) to ensure Contractors are fulfilling their occupational health and safety contract terms and conditions; and,
- Manage the non-compliance reporting system in the event the Contractor does not conform to the occupational health and safety requirements of the contract.

4.1.10 Visitors

- During the construction phase, the Prime Contractor will be required to ensure all visitors report to the designated onsite representative and complete the appropriate Occupational Health and Safety orientation to be prepared and given by the Prime Contractor;
- Visitors will be signed in/signed out of the worksite (once orientation has been given to site-specific, they will be issued the appropriate HSE orientation verification card);
- Visitors must be equipped with proper Personal Protective Equipment before entering the work-site, as determined by the Prime Contractor;
- Visitors are not allowed on work site without authorization.
- Visitors must follow the instructions provided at the orientation;
- Visitors must comply with the applicable Occupational Health and Safety programs, practices and procedures;
- Visitors must also comply with the Contractor's Project's Specific Health and Safety Program and their Corporate Safety Manual;
- They must understand their right and obligation to reject and report work they consider imminently dangerous for the environment, themselves or other workers.

4.2 Competency, Training, Preparedness, and Awareness

The Project will ensure employees under its care and control who are performing tasks which may have a OHS impact are competent on the basis of education, training or experience.

The Project will determine its training needs (e.g., training profile and matrix) based on the job description of each employee and the OHS risks and exposures associated the Project in addition to other training that may be defined by TransCanada's Learning Management System (i.e., Success Factors) and Project Training Procedure.

At a minimum, training for the Project's employees will include:

- Both MXP's and the Prime Contractor's OHSMP;
- TransCanada's most current version of the Employee/Visitor/Contractor Health, Safety and Environment Orientation, available in Spanish (if needed);
- Office specific OHS orientations for employees, who are working exclusively in offices located across the project;
- Field specific OHS orientations for employees working in field locations, other than in one of the office locations;
- Communication Plan, availability or means of communication on rural sites, facilities, and remote areas (satellite phones, radios, other means of reliable communication);
- At least two persons in the office locations to be trained in first aid and cardiopulmonary resuscitation (CPR) and/or AED; (cover first aid, medical incidents—bee stings, diabetic awareness, etc.); ANSI qualifying First Aid Kit Type;
- Working Alone Plans;
- Defensive Driving Training (for employees who operate a motor vehicle on the Project's behalf and training proof is to be provided for suitable defensive driving training); and,
- The designated Prime Contractor's Project specific Health, Safety and Environment Orientation, including the Project's Emergency Response Plan (ERP).

Training will be documented (i.e., Training Record Form hardcopy on site or within an electronic format within EDMS) and verified through testing when appropriate.

Contractors, including any Prime Contractors, will be responsible to ensure their employees who are under their care and control are competent.

4.3 Communication, Participation and Consultation

4.3.1 Communication Procedure

This section of the OHSMP has been developed to ensure effective and appropriate Occupational Health and Safety information is disseminated and communicated to the Project's employees and other interested parties.

The Project's Occupational Health and Safety Commitment statement, OHS documentation and all other relevant OHS information is communicated to internal MXP staff, external Contractors, and visitors through the following means:

- TransCanada Safety website (ref.: http://pf2d3.tcpl.ca:7602/cse/);
- Emails directed to personnel;
- Orientation in Health, Safety and Environment (EVC HSE) (ref.: EDMS ID#a);
- TPPs;
- TOPs;

- Major, Critical, and HIPO Incident Notification—Bulletins and location to share that information;
- Hazard Advisories (ref.: EDMS ID#003878519);
- Incident Summaries; and,
- Safety signage.

A bulletin board will be established upon which relevant Occupational Health and Safety information will be posted, maintained, and kept up to date.

Relevant communications from external interested parties are received, documented and responded to using the Document Control Procedure and the Project's Communications/Document Management Flowchart.

4.3.2 Participation and Consultation Procedure

Participation and consultation are processes that encompass:

- Exchange of occupational health and safety information in a timely manner;
- Providing a reasonable opportunity for participants to express their views and provide feedback to the Project Management Team; and,
- The Project Management Team taking into account the participants' views prior to making a decision.

Consultation does not necessarily constitute an agreement between the participants and the Project Management Team.

Regular meetings are the cornerstone of HSE communications. Occupational health and safety meetings offer opportunities to share information among MXP employees, Contractors and Subcontractors. There will be two main types of HSE meetings used on the Project:

- Pre-job HSE meetings, which are held at the beginning of the Project to discuss the task-specific hazards, identify hazard controls, work and emergency procedures, safety precautions, and other topics related to the job and are attended by employees, Contractors, Subcontractors, and Vendors; and,
- General safety meetings, which are held according to a predetermined schedule to discuss predetermined topics and provide employees with updates and information on re-occurring or current safety issues.

General safety meetings could include management review meetings, Safety Stand Down, joint workplace health, and safety committee meetings.

Safety Stand Down (i.e., NAOSH Week) is a designated time for TransCanada senior management to talk about safety issues directly with frontline workers. It usually is a weeklong activity normally taking place the first week of May each year. However, this time frame is only a suggestion. A date will be chosen which best fits the time frame of the Project.

The primary method of consultation is through direct communication with the Safety Manager, Safety Coordinator, and Safety Inspectors for the Project. One of the Health and Safety Specialists is designated as a representative to the Joint Health, Safety and Environment Committee for the Project.

Records will be kept of attendance and discussions from all Occupational Health and Safety meetings, including Safety Stand Down. They will highlight key discussions and follow-up activities, as well as responsibilities assigned and target dates for completion. Records will be maintained as per section 5.4 of this document.

4.4 Documentation

The Project has an extensive range of OHSMP documentation available to Project Management Team on the SharePoint Collaboration Portal (Collaboration Portal) and TransCanada's Safety website (http://pf2d3.tcpl.ca:7602/cse/).

The core elements of the OHSMP and their interaction are described in this OHSMP document. (http://pf2d3.tcpl.ca:7602/governance/).

Direction to related Occupational Health and Safety documentation is provided through the Project's SharePoint Collaboration Portal (Collaboration Portal).

4.5 Document Control Procedure

All Project OHSMP documentation is prepared using standard templates and document control processes (as per the Document Control Procedure). Occupational Health and Safety documents are maintained on the Project's Collaboration Portal.

Corporate OHS documents are maintained within TransCanada's Corporate Policy and Procedure (TPPs) website and the TransCanada Operating Procedures (TOPs) Management System website.

Changes or updates to any TPPs and TOPs are communicated by company-wide emails on a monthly basis.

Any hard copies are considered uncontrolled.

4.6 Operational Control

Section 3.1 of the OHSMP includes a list of Project activities associated with identified risks where control measures may need to be applied. Using this list, controls are established using a risk-based approach to address the identified hazards and their associated risks.

Operational controls are available through both the TransCanada Corporate Policy and Procedures website and TOPs management system.

Controls for Project activities with identified risks will be monitored continually for effectiveness and reviewed on an annual basis.

Tables 8 A and B present TransCanada operational controls applicable to the Project in addition to those identified in the Preventative Occupational Safety and Health Programs.

Table 8 List of Operational Controls

Control Type	Document Title	Reference
Guiding Principles	1. TransCanada Health, Safety and Environment Commitment	EDMS ID#003985951
Policies (TPPS)	1. Alcohol and Drug Policy	EDMS ID#003743046
	2. Alcohol and Drug Policy for Contractors	EDMS ID#005839568
	3. Personal Protective Equipment Policy	EDMS ID#003721958
	4. Tobacco Policy	EDMS ID#003985869
	5. Vehicle Fleet Policy	EDMS ID#004489982
Programs (TPPS)	1. Project Delivery Standard	N/A
	2. TransCanada Occupational Health, Safety & Environmental Management System	EDMS ID#003721961
	3. Manual Materials Handling	EDMS ID#003879368
	4. Employee/Visitor/Contractor Health, Safety and Environment Orientation	EDMS ID#003721952
	5. Incident Management Program	EDMS ID#008945995 & 003722183
	6. Contractor Safety Management Program	EDMS ID#003800125
	7. Hearing Conservation Program	EDMS ID#005405301
	8. Ergonomic Hazard Control Program	EDMS ID#003721953
	9. Personal Protective Equipment	EDMS ID#003721958
	10. Respiratory Protective Equipment Program	EDMS ID#003773677
	11. Response Program for Occupational Injuries and Illnesses	EDMS ID#003985998
	12. Working Alone Program	EDMS ID#003743627
Procedures (TOPS)	1. General Work Permit and Job Safety Analysis (as previously referenced)	-
	2. Tier 3 Audit	EDMS ID#003872155
	3. Hazard Advisories	EDMS ID#003878519
	4. Calibration and Inspection of Portable Gas Detector	EDMS ID#003835656
	5. Detection of Portable Gas in the Atmosphere	EDMS ID#003835957

Control Type	Document Title	Reference
	6. Use and Storage of Gas Cylinders	EDMS ID#003849807
	7. Standards for Identification of Pipe Systems	EDMS ID#003954290
	8. Portable Work Platforms, Scaffolding and Stairs	EDMS ID#003837617
	9. Evacuation Procedure	EDMS ID#003672343
	10. Pre-Job Planning Procedure	EDMS ID#003834914
	11. Active Control Procedure	EDMS ID#003671854
	12. Procedure for Lifting, Raising, Towing and Pulling	EDMS ID#003837440
	13. Procedure for Mobile Heavy Equipment	EDMS ID#003865275
	14. Procedures Related to Stress due to Heat and Cold.	EDMS ID#003871937
	15. Use of Electric and Manual Tools	EDMS ID#003875039
	16. Procedure for Overhead Power Lines	EDMS ID#003672640
	17. Health, Safety and Environmental Worksite Inspection	EDMS ID#003874294
	18. Project Safety Management Audit	EDMS ID#003872155

4.7 Emergency Preparedness and Response (See MXP Worksite Emergency Response Plans)

4.7.1 TransCanada's Emergency Preparedness and Response Procedure

Potential emergency events have been identified and emergency response procedures (ERP) are in place. The procedures relating to emergency preparedness are detailed in:

- Emergency Response Plan for Pre-Construction, Construction, Hydrostatic Tests, and Commissioning.
- Occupational Injury and Illness Response Program (ref.: EDMS ID#003721951); and,
- TransCanada's Emergency Management System Manual.
- **Medi-Vac Procedures/Helicopter Medical Response

If applicable, **TransCanada's ERP may be enacted by contacting the following emergency number 1-800-447-8066 for the United States.**

At a minimum the Project will conduct an annual tabletop exercise to test the adequacy and effectiveness of the established procedures.

4.7.2 Contingency and Emergency Response Plan

The designated Prime Contractor for the Project will provide the Emergency Response Plan for Pre-Construction, Construction, Hydrostatic Tests and Commissioning.

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All TransCanada employees will be covered under the Prime Contractor's ERP during the construction phase of the Project. The Prime Contractor's ERP will form an integral component of the OHSMP, and will include travel to and from, and hauling to and from the work site. This ERP will be communicated to all employees during the Project specific Health, Safety, and Environment orientation. The Prime Contractor will make the ERP readily accessible at the work site and ensure all site personnel are familiar with and understand incident management protocols.

5.0 VERIFICATION

5.1 Performance Measurement and Monitoring

The Project will implement a program for the monitoring and measurement of key aspects of its project activities. The program includes monthly review of leading and lagging indicators, tailgate sessions, job safety analysis, tracking, trending and analysis of IIT, safety and general inspection reports, and non-compliance reports.

See Section 3.1.3 Safety Inspection Procedures for additional details concerning the construction worksite Occupational Health and Safety program.

5.2 Evaluation of Compliance and Conformance with Standards

Conformance refers to the level of adherence to Project specified requirements such as the OHSMP, contractual terms and conditions, Prime Contractor's OHSMP, specific TPPs, TOPs, and good industry practices.

Assurance of compliance and conformance with external and internal requirements will be achieved through the implementation of the Construction Worksite Occupational Health and Safety inspection (ref.: EDMS ID#003874294), Audit Procedure, and Tier 3 Project Safety Management Audit Procedure (ref.: EDMS ID#003872155).

Both procedures provide a standardized approach to conduct planned and unplanned inspections and audits. Through the identification of unsafe acts, practices and conditions, preventative and corrective actions can be implemented to eliminate and/or minimize personal illnesses and injuries, property damage, and environmental impacts. In addition, these activities will ensure the effectiveness, adequacy and continuous improvement of the OHSMP and its operational controls.

Records will be maintained of each inspection and Tier 3 safety audit conducted on the Project.

5.3 Incident Investigation, Nonconformity, Corrective, and Preventive Action.

5.3.1 Incident Investigation Procedure

TransCanada's Incident Management Process (IMP) details the procedures for notifying, reporting, investigating, documenting, and following-up on any incidents that may occur during the execution of the Project. Records of incidents are maintained within the SAP EHSM system, and are used for analysis and populating of the Project scorecard.

Incident analysis information is reported monthly to the Project Management Team and other MXP and TransCanada management committees and personnel.

5.3.2 Nonconformity, Corrective and Preventive Action Procedure

Where Occupational Health and Safety nonconformities are recorded a Non-Conformance Report (NCR) will be issued to the Prime Contractor in accordance with the Project's NCR procedure.

Nonconformities requiring corrective and/or preventive measures will be documented on the most current version of the Non-Conformance Report (Non-Conformance Procedure).

All retained NCRs and related correspondence will be managed in accordance with the Project Document Control Procedure.

5.4 Records Control Procedure

The records associated with the OHSMP are maintained in accordance with the documents control procedure of the Project.

SharePoint will be the designated database that will contain a master list of OHS records to be maintained, and should note the records and the period of time for which they should be maintained.

5.5 Internal Audit

Health and safety audits (both with internal and external auditors) are a point-in-time verification method used to monitor the Project's OHSMP. An effective audit should identify OHS strengths and areas for improvement and address the following:

- The effectiveness of the OHSMP implementation;
- The need for OHSMP adjustments or updates;
- The effectiveness in fulfilling the OHSMP, performance objectives and policies;
- Level of conformance with safe work policies, practices and procedures.

The Project will use Audit Procedure for the purposes of managing and executing Occupational Health and Safety audits on the Project.

An Occupational Health and Safety audit will be conducted at least once for the construction phase of the Project.

6.0 MANAGEMENT REVIEW

Project management will review the Project's OHSMP on an annual basis, to ensure its continuing suitability, adequacy and effectiveness. The reviews will include assessing opportunities for continuous improvement and the need for changes to the Project's OHSMP, including the OHS policy of the Project and the leading and/or lagging Occupational Health and Safety performance indicators.

During the reviews, the following will be taken into consideration:

- Results of audits and inspections performed in the field at selected worksites focusing on compliance the applicable OSHA occupational health and safety laws, regulations and other requirements associated with the Project;
- Results of participation and consultation through the Project's joint Health, Safety and Environment committee;
- The Occupational Health and Safety performance of the Project;
- Extent to which the leading and lagging indicators have been met;
- Status of SAP EHSM investigations, corrective and preventive actions;
- Follow-up actions from previous management reviews;
- Changing circumstances, including any developments in OHS legislation, Recommendations for improvement.

This review will be documented in an Occupational Health and Safety Improvement Plan. This plan will outline any decisions and actions related to possible changes to:

- Occupational Health and Safety performance;
- Occupational Health and Safety policy and objectives;
- Resources; and,
- Other elements of the Project OHSMP.

7.0 APPENDICES

APPENDIX A	Occupational Health and Safety Risk Classification-Pipeline Construction To Commissioning
APPENDIX B	Occupational Health and Safety Risk Classification-Facilities Construction To Commissioning
APPENDIX C	Preventative Occupational Health and Hygiene Procedure
APPENDIX D	Exposure Assessment Decision Tree
APPENDIX E	Industrial Hygiene Checklist
APPENDIX F	Employee Notification Form

Appendix A - Occupational Health and Safety Risk Classification **– Pipeline Construction to Commissioning**

The following risk registry addresses each phase of the project. This process is not all inclusive, but does cover pipeline construction to commissioning aspects of the work and its risks. The FEED, procurement, pre-construction survey, clearing & grading, trenching, pipe stringing and bending, welding, pipe coating, and quality, lowering pipe and backfilling, testing, restoration of the environment, and commissioning; including the identification of likely risks, an analysis of classifiable risks, as well as, risk management strategies implemented to minimize identified risks. Once controls are implemented the identified risks have been lessened, where work can safely proceed.

The risk registry will be updated on a quarterly basis to reflect the actual and anticipated OHS risks and exposures and a report submitted to the Project Management Review Team.

Front-End Engineering Design (FEED) Phase

Risk Identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Control(s)
FEED	• Material and Energy Balance • Equipment Layout and Design • Equipment Specifications • Project Execution Plan • Electrical Equipment • Geotechnical design	• Constructability and operability issues • Lack of safety considerations and specifications in equipment, machinery and facilities	Moderate/Low Moderate/Low	Implement TransCanada's engineering specifications and procedures. Implement safety Management Guide of Project Management System.

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Procurement Phase

Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Control(s)
Pre-qualification	• Supplier Information Questionnaire • Level of Safety Evaluation • Evaluation of Contractor's OHS Documentation	• Misalignment with Contractor OHS attitudes, behaviors and programs • Unqualified or improper qualification of Contractors	Low/Low Low/Low	Implement Element 2 of the CSMP and Supply Chain Management's prequalification process. Focus on contracted services and the designated Prime Contractors for the Project.
Selection	• Request for Proposal (RFP) • RFP Safety Criterion • Contract Terms and Conditions • Performance Management	• Lack of OHS specifications and performance expectations • Increased costs, resources and time impacts	Moderate/Low Moderate/Low	Implement Element 3 of the CSMP and Supply Chain Management's selection process. Focus on contracted services and the designated Prime Contractors for the Project.

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Pre-construction Phase

Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Control(s)
Right-of-Way Acquisition	• Landowners	• Motor vehicle • Violence	Low/Low	Implement MXP OHSMP and the Contractor's OHSMP. Focus on motor vehicle operation and conflict resolution.
Engineering and Legal Survey	• Establishing the route • Running the survey line • Contour chaining • Line profile	• Insects, animals, reptiles and poisonous plants • Rough terrain and heavy bush/brush • Overhead Power lines • Electric fences • Hand tools • Trips, slips and falls	Low/Low	Implement MXP OHSMP and the Contractor's OHSMP. Focus on flora (poisonous plants) and fauna (spiders, snakes, and scorpions), PPE, fire prevention and suppression, safe hand tool use.

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Construction Phase

Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
General – Use of primary, secondary and tertiary access roads for work site(s) **Note:** The roads are in poor with narrow stretches, curves, roads closed, narrow and wide curves to areas without an emergency stopping area, and are not well marked with traffic signals.	• Transport of employees to the work site(s) • Transport of equipment and machinery to and from temporary storage locations throughout the project. • Transport of pipe joints, block valves and other materials to support the natural gas pipeline	• Vehicular incidents of varying types and severities.	High/Low	Ensure the contractor implements a detailed traffic OHSMP for the project. Ensure all employees operating motorized vehicles take a certified course in defensive driving. Consider installing a GPS to track and ensure the safety and driving habits of all employees.
General – Crosses under and/or involves working under overhead power lines.	• Transport throughout right-of-way of employees, equipment, machinery and materials • All construction activities	• Contact, hitting, or arcing overhead power lines	High/Low	Ensure the contractor implements a procedure for crossing under or tracking over power lines, including safeguarding and/or identification of overhead controls, JSA, power connectors, safety joints, signage, barriers, flags, entry and exit registration documents, etc.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
	located near or directly under overhead power lines			
General- Ascent, crossing, or descent on slopes with pitch greater than 17 degrees.	• Applicable to all construction activities, especially those in the remote areas of the right of way	• Breakdown or rollover of motorized vehicles and/or mobile heavy equipment resulting in property damage, environmental impact and various personal injuries.	High/Low	Ensure the contractor implements a procedure for construction on steep slopes taking into consideration the following: engineering risk assessment, expanded and improved job safety analysis, and assignment of trained and competent resources implementing a protocol of communication, expanded daily safety meetings and JSA, implemented with lists of daily inspections, review and certify each piece of machinery and equipment.
General – Provision of housing, restroom facilities and eating areas in remote project locations	• Applicable to all remote construction activities	• Personnel injuries and illnesses due to sub-standard drinking supplies, sanitary conditions, sleeping	High/Low	Ensure the contractor implements a health and safety plan for camps taking into consideration drinking supplies, quality food, drug and alcohol abuse, physical fitness and recreation, violence in the workplace, provision of medical services and first aid, as well as

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
		areas, and violence.		emergency evacuation, communication, working hours, changes in work hours and rotations.
General – Provision and maintenance of a communication system	• Remote and rough terrain areas do not have 100% cellular telephone coverage	• Personnel injuries and illnesses requiring medical care and/or first aid • Security issues throughout the area, which has known security risks due to criminal activities. • Vehicular incidents and breakdowns requiring emergency and/or mechanical assistance	High/Low	Ensure the contractor implements a communication plan and system through and within these areas of the right of way where conventional forms of communication are inadequate.

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Risk Identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
General – Provision of medical care and first aid	• Personnel injuries or illnesses which may require medical assistance and/or first aid	• Personnel injuries or illnesses requiring medical assistance and/or first aid	High/Low	Ensure the contractor implements a medical and first aid program for the entire project, including the provision of ambulance services, paramedics, doctors and nurses in the areas of remote work sites, emergency transport/ helicopter services. Ensure all key personnel take the First Aid and CPR Course.
Pre-Job Meeting and OHS Orientations	• Field Office based	• Inadequate performance expectations • Incompetence of supervision, foreman, workers, and operators	Moderate/Low High/Low	Implement Element 4 of the Contractor Safety Management Program. Require implementation of the OHS Management Program from the Prime Contractor selected to address each OHS impact, to reduce risk. Concentrate on initial and continuous OHS orientation with a training matrix for specific work.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
Equipment Mobilization	• Transportation of heavy equipment: side-booms, dozers, backhoes, pickups, office and storage trailers, skids, fencing, and lighting.	• Surface encumbrances • Struck by/Pinch Points • Road conditions/limited access for wide or heavy loads • Equipment loading, binding, and off-loading • Improper routing • Fatigue from traveling • Overhead Power lines • Unforeseen mechanical defects • Motor vehicle incidents • Trips, slips and falls	High/Low	Require selected Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Surface encumbrances shall be moved, removed, or supported as needed to safeguard the team. Focus on traffic safety OHSMP and overhead power-line safety. All non-essential workers will remain out of the work area during loading/unloading processes. Essential personnel will remain in a location that can be visible by the operators and driver's. All equipment will have operational back-up alarms.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
Equipment Maintenance	• Repairs and Servicing • Air hoisting devices/jacks • Welding and Cutting torches • Hydraulic Equipment • Fueling requirements and areas	• Trips, slips and falls • Site conditions • Falling objects • Lifting hazards • Chemical and fume exposure • Eye exposure • Hand / arms / leg / foot exposures • Flying objects • Crush points/pinch-between • Noise	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on heavy equipment inspection and maintenance in addition to hazardous materials or controlled products handling (i.e., HMIS).
Clearing and Grading	• Right-of-Way Acquisition and Survey • Fencing • Clearing • Grading	• Moving equipment • Tree limbs and brush • Flying and falling objects • Insects, animals, reptiles, and poisonous	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on flora (poisonous plants) and fauna (spiders, snakes,

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
		plants • Rough terrain and heavy bush • Overhead Power lines • Chain saw hazards • Trips, slips, and falls • Slopes		scorpions) management, fire prevention and suppression. Also address moving heavy equipment and operation.
Ditching (Rock-Free)	• Centerline Survey of Ditch • Excavation	• Ditch cave-ins/collapse • Moving equipment • Falling objects • Dust and flying objects • Rotating equipment • Falling into the ditch • Weather conditions • Temperature extremes • Width of right of way/usable space • Parking plans	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on excavation safety and heavy equipment operation.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
Ditching (Rock)	• Centerline Survey of Ditch • Ditching (Rock) • Drilling and Blasting • Padding Ditch Bottom	• Trips, slips and falls • Incidental explosion/un-detonated explosives (bootlegs / cut-offs) • Dust / noise • Vibration • Flying objects • Un-shunted blasting caps • Static electricity / electrical storms / overhead Power lines • Hazardous material handling and storage • Unauthorized personnel with the blast zone • Drilling too close to loaded holes and extremes	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts, to reduce the risk. Focus on detailed blasting permits and procedures in addition to proper PPE. Proper hearing protection. Proper respiratory protection. Proper work radius to prevent struck by or flying debris from striking equipment, vehicles, teams.

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Risk Identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
Pipe Hauling and Stringing	• Unloading Pipe from Shipper • Loading Pipe onto Pipe Trucks, securing loads • Staging area locations • Hauling and Unloading at the Stockpiling Site • Hauling, Stringing and Set-Up on Right-of-Way	• Moving equipment • Traffic / congested ROW • Falling objects • Swinging pipe hooks • Temperature extremes • Pinch points • Overhead Power lines • Rolling / falling pipe / load shifts including in storage/pipe racks • Site conditions • Skid handling • Trips, slips and falls	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on traffic safety OHSMP, pipe loading and off-loading procedures, and safe pipe storage at the designated stockpile sites and along the ROW. Pipe lifting equipment and devices are properly maintained and inspected. Spotters.
Pipe Bending	• Loading pipe into the bending machine	• Moving equipment • Trips, slips and falls • Riding on pipe / struck by pipe • Pinch points/crush	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on material handling and proper PPE.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
		between • Loose clothing being caught in equipment • Hydraulic line ruptures • Flying objects • Skid handling • Caught between (equipment, truck, trailers, vehicles) • Rolling or traveling trailers on hills or by gravity.		Review of travel and access roadways/conditions. Chocking parked loads. Identify and stay out of swing radius for ground personnel.
Front End Welding	• End Prep • Line-up, Stringer Bead, and Hot Pass	• Metal shavings • Sharpness of transitioned/prepped pipe (proper PPE gloves and tools to remove shavings) • Spark Arrestors • Welding fumes	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on compressed gas cylinders, electrical safety, respiratory protective equipment, hearing and ear canal protection, and other PPE. Also focus on cleaning, ROW traffic

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
		• Heat exposure and Sunburn • Dehydration • Moving equipment • Noise • Pinch points/crush between • Overhead hazards • Slips, trips and falls • High pressure hydraulic devices • Congested work areas • Electrical shock • Exposure to dust, fumes, vapors, and gases		management, fire prevention, and suppression.
Back End Welding	• Fill and Cap Weld	• Heat exposure/sun burns • Dehydration • Welding Fumes • Stuck by/Crush injuries	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
		• Congested work areas • Falling / flying objects • Slips, trips and falls • Respiratory exposure • X-ray exposure/radiation • Noise • Fire hazards • Compressed air exposure		Focus on radiation, compressed gas cylinders, electrical safety, respiratory protective equipment, spark arrestors, and PPE. Also focus on cleaning/housekeeping, ROW traffic management, and fire suppression/prevention.
Pipe Welding	• Same aspects as front and back end welding	• Pinch points/crush between • Heat exposure • Welding fumes • Overhead hazards • Slips, trips and falls • High pressure hydraulic devices • Exposure to dust, fumes and gases	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Identify and limit radiation exposures. Respiratory protection by engineering and follow-up with respiratory PPE. Proper housekeeping.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
				Ear canal protection. Proper arm and body protection from slag and sparks. Fire suppression/prevention.
Coating	• As-Built Footage • X-ray and Weld Testing • Coating Field Welds • Inspection (Jeep) and Repair Coating • Wet work areas, dew, frost on pipe or equipment.	• Chemical exposure, dermal or respiratory concerns • Respiratory exposure • Noise • Trips, slips and falls • Electrocution/Electrical Shock	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on Respiratory Protection. Cleaning supplies and equipment. Identify and limit hazardous materials handling, storage and disposal.
Backfill	• Pad and Backfill • Pigging and Hydrostatic Test • Final Tie-In	• Moving equipment • Slips, trips and falls • Unplanned Cave-In of Excavations	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on moving heavy equipment,

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
				operation, maintaining, and cleaning. Identify and protect top soil from sub-soil during backfill. Entry into excavations shall require the proper slopes, benches, or shielded. Stairways, ladders, ramps if entry is needed. No use of metal ladders. A warning system to notify operators of impending hazards. Utility lines protected during backfill. Excavations inspected before entry by Competent Persons. Atmospheric testing as needed. No worker allowed under loads, nor in swing radius of equipment. No foreign materials in the backfill.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
Railway, Highway, and Road Crossings	• Drilling equipment • Support of the rail, highway, and roadways as construction occurs. • Identification and support of utilities throughout process. • Communication with the infrastructure owners and/or representatives.	• Confined spaces, • Ditch cave-in/collapse, • Atmospheric conditions, • Rotating equipment, • Congested work site and parking areas, • Slips, trips and falls; • Contacting underground facilities, • Proper signage and alert systems in place,, • Water in ditch, • Infrastructure inspectors and proper communication with their manpower. • Spotters. • Emergency notification of parties readily available.	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on excavation, machine guarding, and cleaning. Proper PPE as required by the Infrastructure Owners and Communication Measures to immediately notify of emergency or concern to their integrity. Support of infrastructure. Identify and mark all work radius and work zone areas per infrastructure policies and procedures (work and hazard zones). Open communication with all involved parties in the operations and all contractors/sub-contractors.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
Watercourse Crossings	• Drilling equipment • Horizontal directional drilling • Combination of construction activities • Multiple work tasks occurring at one time	• Water hazards • Drilling fluids • Heavy equipment • Ditch cave-ins • Congested worksite • Support of infrastructure and flow of water. • Drowning. • Flooding of work areas.	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on Water safety and hazardous materials exposures. Ensure personnel have proper PPE and flotation devices for work areas. Rescue equipment on site and knowledge of its use.
Restoration, Returning the right-of-way to pre-existing conditions	• Ensure sub-soil and top soil are separate for the backfill processes. • Replace Topsoil, Restore the soils and ensure the proper environmental control devices are implemented.	• Moving equipment • Overhead Power lines • Underground utilities are protected during right-of-way travel. • Trips, slips and falls. • Identify proper method and access to right-of-way and use of right-of-	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on moving heavy equipment. Access to right-of-way and egress is properly maintained and identified. Install environmental control devices to protect work areas and streams.

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Risk Identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Controls (s)
	• Return the environment and confirm clean-up is complete.	way as restoration is completed.		
Equipment Demobilization	• Transportation	• Poor road conditions • Equipment loading, binding, and offloading • Improper routing • Fatigue from traveling • Overhead Power lines • Unforeseen mechanical defects • Motor vehicle incidents • Trips, slips and falls	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on traffic safety OHSMP and overhead power-line safety.

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Commissioning Phase

Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Control(s)
Mechanical Completion	• Manufacture, Construction, As-Builts, Clean-up and Integrity Tests	• High pressure water, air or gas • Poor lighting • Trips, slips and falls	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce the risk. Focus on a specific testing procedure for the medium used.
Pre-Commissioning Completion	• Settings, Calibrations, Servicing, Operability Checks	• Trips, slips and falls • Motor vehicles	High/Low	Develop for implementation a detailed commissioning plan taking into consideration OHS risks, exposures, and their mitigation measures.
Commissioning Activities and Completion	• Purge, Pressure, Equalize, Final Calibration and Operability Checks	• High pressure gas • Explosion and fire hazards • Noise	High/Low	Develop for implementation a detailed commissioning plan taking into consideration OHS risks and exposures and their mitigation measures.

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Risk Identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS Impact(s)	Pre & Post Risk Rating	Control(s)
				Focus on portable gas detection and monitoring, emergency preparedness and response (EPR).

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Appendix B - Occupational Health and Safety Risk Classification – Facilities Construction to Commissioning

The following risk registry addresses each phase of the project. This process is not all inclusive, but does cover pipeline construction to commissioning aspects of the work and its risks. The FEED, procurement, pre-construction survey, clearing & grading, trenching, pipe stringing and bending, welding, pipe coating, and quality, lowering pipe and backfilling, testing, restoration of the environment, and commissioning; including the identification of likely risks, an analysis of classifiable risks, as well as, risk management strategies implemented to minimize identified risks. Once controls are implemented the identified risks have been lessened, where work can safely proceed.

The risk registry will be updated on a quarterly basis to reflect the actual and anticipated OHS risks and exposures, and a report will be submitted to the Project Management Review Team.

Front-End Engineering Design (FEED) Phase

Risk Identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
FEED (Front-End Engineering Design)	• Material and Energy Balance • Equipment Layout and Design • Equipment Specifications • Project Execution Plan • Electrical Equipment • Geotechnical design	• Constructability and operability issues • Lack of safety considerations and specifications in equipment, machinery and facilities	Moderate/Low Moderate/Low	Implement TransCanada's engineering specifications and procedures. Implement the Safety Management Guide of Project Management System.

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Construction Procurement Phase

Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Pre-qualification	• Supplier Information Questionnaire • Level of Safety Evaluation of Contractor's OHS Documentation	• Misalignment with Contractor OHS attitudes, behaviors, and programs. • Unqualified or improper qualification of Contractors.	Low/Low Low/Low	Implement Element 2 of the CSMP and Supply Chain Management's prequalification process. Focus on contracted services and the designated Prime Contractors for the Project Deliverable Documents
Selection	• Request for Proposal (RFP) • RFP Safety Criterion • Contract Terms and Conditions • Performance Management • Ensure correct safety documents are given to the bidders. • Review of Preliminary SSSP Contractor	• Lack of OHS specifications and performance expectations. • Increased costs, resources, and time impacts.	Moderate/Low Moderate/Low	Implement Element 3 of the CSMP and Supply Chain Management's selection process. Focus on contracted services and the designated Prime Contractors for the Project.

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Risk Identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	Templates • ISN NetWorld Safety Record			

Pre-construction Phase

Risk identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Work site access	• Highway • Composition of access road • High voltage overhead lines • Fiber optic cables • Water pipes/lines/or other utilities • Identify Additional access roads • Saunder's Creek Access specific concerns with existing lines, re-routes	• Vehicle accidents • Rollovers • Driving off the road, narrow roads or roads in dis-repair • Electric shock • Damages to third parties (property owners, etc.) • Damage to buried gas pipeline or utilities • Conflicts with neighboring landowners • Conflicting work	High/Low	Obtain the necessary permits before commencing activity. Adequate signage (speed bumps, indications, flagmen, access, non-access, Do Not Enter, etc.). Mark utilities. Installation of electric arc protection on Overhead powerlines. Emergency Response Plan Vehicle Operation Program. Use appropriate and identified access roads.

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Risk identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	of lines, recently disturbed ground concerns, protecting existing pipelines. • Shared access with pipeline contractor. • Public Impacts at Schools and Recreation. • Co-location with Mark West Contracting. • Existing Gas Wells at Sherwood and Mt. Olive • Mount Olive will be plugged, if purchased.	• Mt. Olive Grade School will be passed with all equipment and material transports. • Staging area at Mt. Olive is across the street from the Grade School. • Substantial tree clearing at sites and access points. • Brownfield sites at Ceredo and Lone Oak. • Pipeline crossings at Sherwood construction in the area and region. • NGO and environmental consciousness with protesting activities and security concerns.		Appropriate coordination with the highway commission and affected construction companies, contractors, sub-contractors. Columbia and TCPL has a good reputation for environmental controls and environmental consciousness with the public.

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Risk identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
During Environmental, Culture, and Archaeological survey	• Excavations with hand tools • Visually Identify Utilities	• Using proper tools • Work/Rest Cycles • Inclement weather conditions. • Insects, animals, reptiles, and poisonous plants. • Falls to a different level • Hand tools • Heat stroke/Sun stroke • High altitude illness • Rain • Vehicle operation and personnel transportation	Low/Low	Orientation sessions, to include Five-minute talks, Safe Work Analysis, and Continuous supervision in the area of safety. Appropriate use of PPE. Contractor's Heat Stroke Procedure. Contractor's excavation procedure. Emergency Response Plan. Vehicle Operation Procedure. Mitigation has been identified in selection of areas.
Engineering and land surveys	• Install the survey line • Marking of topographic profiles • Reconciliation of survey data	• Insects, animals, reptiles, and poisonous plants • Pesticides • Rain • Rough terrain • Overhead power lines	Low/Low	Implement MXP's OHS Management Program and Contractor's OHS Management Program. Focus on flora (poisonous plants) and fauna (spiders, snakes and scorpions), PPE according to the activity, prevention and extinguishing of fires, and safe use of hand tools.

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Risk identification			**Risk Estimate**	**Risk Management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		• Hand tools • Trips and falls • Slope identification • Public concerns during surveys (schools, access points, slopes, etc.). • Line locating and marking of utilities		Survey markers, environmental control devices, and boundaries set.

Construction Phase

Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
CIVIL				
Pre-Job Meeting and OHS/HSE Orientations	• Field Office based	• Inadequate performance expectations • Incompetence/ competence of supervision, foreman, workers, and equipment	Low/Low	Implement Element 4 of the Contractor Safety Management Program. Require implementation of the OHS Management Program from the Prime Contractor selected addressing each OHS impact to reduce risk. SSSP will direct site specific concerns.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		operators. • Appropriate conditions within the facility. • Ensure we reach all employees, contractors, sub-contractors. • Specific training to Brownfield Sites—Lone Oak and Ceredo Worksites (specific hard hat stickers). • Project Stickers for Greenfield, specific hard hat stickers. • Slips/trips/falls. • Lone Workers • Isolated Work and Driving Areas • Contact with		Focus on initial and continuous OHS orientation, and in training matrix for specific work roles.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		landowners, whether compliant or non-compliant to the work tasks of workers. • Roadways and access points to the work sites areas.		
Plotting and leveling of the land/grade	• Fence installation • Leveling • Earth moving equipment • Environmental Control Devices Blasting Plans and Programs 24/7 operations for preparing the worksites Noise abatement concerns Light Plants for lighting work areas, shadowing, containment, and third party drivers (roadway).	• Mobile Equipment • Insects and animals, reptiles • Rough terrain • Slips, trips and falls • Crush between/Pinch Points • Equipment collisions	Moderate/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk.. Focus on management of fauna (spiders, snakes, scorpions). Prevention and extinguishing of fires. Address the operation of heavy mobile equipment. Night time working: (1) Spotters for backing and work areas; (2) Shadowing from light plants; (3) recognizing hazards associated with night work and lighting of

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
				worksite and off-site lighting concerns to adjacent roadways or other workers. Earth movement during daylight Rock crushing at nighttime hours. Be concerned for noise concerns at nighttime work. Limit traffic and equipment movement, travel. Ensuring proper travel plans of transportation of materials and equipment. Fueling to occur during daylight hours, if at all possible.
Equipment Mobilization	• Transportation of heavy equipment – side-booms, dozers, backhoes, pickups, office and storage trailers, skids,	• Poor road conditions • Equipment loading and binding • Improper routing • Fatigue from	Moderate/Low	Require selected Prime Contractor to implement a OHSMP addressing each of the OHS impacts and as a result will lower risk.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	fencing and lighting. • Ensuring equipment, materials, and vehicles are in proper working maintenance. • Proper drivers and equipment operators are used for mobilization. • Ensure the flaggers and MUTCD requirements are in place before the transportation to destination is enforced.	traveling • Overhead Power lines • Unforeseen mechanical defects • Motor vehicle incidents • Trips, slips and falls from equipment and/or vehicles, trailers.		Focus on traffic safety OHSMP, MUTCD Roadway compliance, and overhead power-line safety. Inspection of slings, belts and accessories for securing/fastening equipment. Adequate signage in transportation of equipment (excess size when applicable), pilot car if necessary, communication availability. Motor vehicle operation program. MUTCD marked roadways and flaggers, as necessary. Fire extinguishers. Spill Kits. First Aid Kits. Emergency Response Plans. Clean equipment and trailers, before movement.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Equipment Maintenance	• Repairs and servicing • Cutting, welding, and polishing equipment • Crane maneuvers • Equipment should be in good working order, maintenance, and locked/tagged out and disabled if non-working or in need of maintenance.	• Trips, slips and falls • Pinch/Crush Points • Hydraulic or Sustained/Stored energy • Bruising, fractures, and amputations • Site conditions, use level ground for maintenance areas • Falling objects • Dangers of working at height • Exposure to chemicals, vapors, and gases. • Eye Exposure to welding process light. • Flying objects, Richet/Flying material concerns,	Low/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts and as a result will lower risk. Focus on heavy equipment inspection/maintenance in addition to hazardous materials or controlled products handling (i.e., HMIS). Keep access roads clear and well-kept Have adequate accessories for handling fuels containment and fueling processes Use of PPE appropriate to work activity. Have fire-fighting equipment, if trained and adequate for the situation. Call for Fire Department assistance. Chocking equipment during maintenance.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		and airborne particles • Noise exposures • Rupture of polishing discs/grinder disc • Explosion of cutting torch equipment/cylinder/ tanks • Oxygen cylinder valve release		Lock Out/Tag Out Processes Spill Kits Proper storage and containment of cylinders, materials, and supplies.
Ditching (Rock-Free)	• Excavation with diggers and manual work • Earth moving with equipment	• Ditch cave-ins/collapses • Trapped workers • Moving equipment • Flying objects, debris, and dust • Rotating equipment • Fall of personnel and equipment into the trench • Weather conditions	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts and as a result will lower risk.. Focus on excavation safety and heavy equipment operation. Cordoning-off/fencing of excavations near roadways and access points. Equipment with reverse alarm. Have PPE appropriate to work

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		• Extreme temperatures • Vehicle accidents		activity. Motor vehicle operation program.
Ditching (Rock)	• Excavation with perforation • Movement of material away from excavation, and proper placement/distance from ditch line/excavation.	• Slips, trips and falls of personnel; including equipment or vehicles entering the trench • Current and forecasted weather conditions • Extreme temperatures • Ground water accumulation • Properly park or securing equipment, trailers, vehicles, or UTV that may roll. • Removing rock that may roll.	High/Low	Require Prime Contractor to implement a OHS addressing each impact, to reduce risk. Cordoning-off of excavations. Equipment with reverse alarm. Have PPE appropriate to work activity. Take the necessary steps to the presence of electrical storms. Overhead powerline plans and mitigation programs. Blasting plans and programs. Hammer-hoe equipment usage plans and procedures.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		• Vehicle accidents • Dust / noise / debris both airborne and walking/traveling hazards. • Vibration • Flying objects • Electrical storms		
Steel Framework and forms at the base for equipment	• Transporting of material to the work site • Equipment maneuvers • Steel cutting with bank cutter • On-site framework • Transporting of wood for the forms • Base forms to be poured • Wood cutting with manual saw • Overhead Powerline and High Voltage concerns.	• Injuries • Slips, Falls, trips • Fall of materials due to inappropriate maneuvers • Activities beneath suspended loads • Rupture of cutting disc • Amputations • Serious or potentially fatal injuries	Moderate/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Use of PPE appropriate to work activity. Personnel trained to use electrical equipment. Tidiness and cleanliness of the site/ housekeeping. A/C Mitigation Plans for working around electrical power and nearby conductive materials.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
				Proper Personal Protective Equipment, face protection, double eye-protection, machine guarding. Limitation/Direction of airborne dust and particles from work activities. Awareness of suspended loads and working overhead.
Pouring bases for equipment	• Positioning of the concrete mixers and booster pump • Concrete pouring • Routing of trucks into and out of worksite. • Excessive weight of concrete trucks and proper protection of underground facilities (mat lines/use air bridging/utilities)	• Crush/Pinch Point Hazards • Hit by pump handle • Clogged equipment • Injuries due to concrete burns • Eye injuries • Hand/dermal injuries due to concrete • Falls and/or slips • Potential for Cuts from rebar, casing, and forms. • Airborne	Moderate/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Tidiness and cleanliness of the site. Use of PPE appropriate to work activity. Appropriate accessories for concrete pouring. Appropriate cleaning of equipment and containment area. Spotters.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		contaminants. • Tripping hazards from supports • Excessive usage of roadways and access due to travel.		Proper PPE Cap rebar and fence posts Proper protection of utilities and foreign lines for travel of equipment and concrete trucks.
Filling and compacting soils inside excavations	• Transporting of filler materials • Compacting with vibro-compactor • Compacting with manual compactor	• Slips, Trips and falls • Pinch Points/Crush Points • Fueling machines, potential for burn injuries • Auditory injuries • Vibration and potential injuries • Sprains • Heavy equipment working near excavations • Equipment working near excavations • Cave-Ins of	Moderate/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Use of PPE appropriate to work activity. Tidiness and cleanliness. Equipment with reverse alarm. Personnel trained in operation of the equipment. Let machines cool, before refueling

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		Excavation • Vibration caused by nearby equipment or machinery and excavation stability		
Final Gravel & Grading	• Transporting and pouring of gravel at work site • Manual work to spread gravel • Facility located nearby equipment supplying the gravel to work areas	• Trips and falls • Personnel run over • Back injuries due to overexertion	Low/Low	Require Prime Contractor to implement a OHSMP that addressing each of the OHS impacts to reduce risk. Use of PPE appropriate to work activity. Tidiness and cleanliness.
Placement of asphalt on roads (if applicable)	• Clearing and preparation of roads • Laying of sealant • Laying of asphalt pavement • Compacting with vibro-compactor or Roller Equipment	• Personnel run over • Dehydration • Burns • Back injuries due to overexertion	Low/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Use of PPE appropriate to work activity.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Assembling perimeter wall and/or security booth	• Transporting and off-loading of materials/supplies • On-site preparation/mixing of concrete • Work at different levels • Uneven walking/working surfaces • Temporary/Permanent Retaining walls • Fence Tightening and Securement • Fence post installation	• Back injuries • Eye injuries • Hand injuries • Trauma, falls, and fractures	Low/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk. Use of PPE appropriate to work activity. Appropriate assembly and disassembly of scaffolding, if needed.
MACHINERY				
Pre-Fab Shop and Onsite Fabrication	• Transporting of material and off-loading • Equipment and Crane maneuvers • Steel cutting with oxy-cut equipment • Grinding and cutting with manual polisher	• Falling materials • Slips, trips, falls • Transportation of materials, pipe • Pinch Points/Crush Between • Burns, fire	Low/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Focus on handling of materials. Have fire-fighting equipment. Use of PPE appropriate to work activity. Use of partitions for welding

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	• Welding • Manual work • Handling of compressed gas cylinders • Sandblasting • Coating • X-Ray	• Eye damage • Cuts to hands and body • Explosion and fire • Dust and other airborne hazards • Dermal concerns with sandblasting and coating • X-ray exposures		areas. Tidiness and cleanliness. Designated Parking and Staging Areas Follow manufacturers guidelines on PPE for processes Proper exclusion areas for x-ray activities
Transporting, lowering and coupling of pipes and accessories in excavation	• Equipment and Crane maneuvers • Manual work • Securing and rigging of loads	• Transportation of pipes / Crush by and Pinch between • Falling materials • Slips, trips, falls • Moving equipment • Tight workspaces • Balancing of pipe load • Extreme temperatures	Moderate/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Focus on safety OHSMP for transport, pipe loading and unloading procedures, and safe storage of pipes. Use of hoisting equipment and adequate accessories. Tidiness and cleanliness. Cordoning-off of exclusion areas.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Manual welding in trenches	• Aligning pipes • Working with Pipe Clamps • Beveling joints with polisher and/or oxycut • Heating weld joints with propane • Application of solder • Grinding of weld • Use of polisher • Skidding of pipe	• Metal shavings (skin burns and eye damage) • Moving equipment (personnel run over and falls to a different level) • Slips, trips and falls (fractures, cuts) • Congested work areas (conflicting work) • Electrical discharge (electrocution) • Exposure to dust, gases and vapors (damage to respiratory system) • Flashburn and proper eye protection • Support skids	Moderate/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk. Focus on compressed gas cylinders, electrical safety, respiratory protective equipment (RPE) and other applicable PPE. Tidiness and cleanliness. Have fire-fighting equipment. Adequate use and handling of oxy-cut equipment. Coordination between different activities. Proper access and egress of the excavation. Securement of propane tanks at top of ditchline.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		• Trip hazards of welding leads and equipment/supplies • Pre- and post heat treatment use of propane		
Welding at height	• Assembly and disassembly of scaffolding • Work at height • Aligning pipes • Beveling of joints with polisher and/or oxycut • Heating weldable joins with gas • Application of solder • Use of polisher/grinder • Use of proper equipment for workers to reach work area (scaffolding, man-basket). • Sandblasting • Coating	• Falls to a different level (fractures and fatal injuries) • Eye damage • Burns, flashburn, and slag exposure. • Ergonomic positioning • Use of weed burners to dry pipe, prep pipe.	High/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Use of PPE appropriate to work activity. Protect ear canal. Fall Protection as required. Assembly and disassembly of scaffolding. Arrange work processes to complete tie-in at appropriate work level.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
X-ray/Non-Destructive Testing	• Assembly and disassembly of scaffolding, if used. • Work at height or in excavations • Non-destructive testing (x-ray) • Use of pneumatic platforms	• Falls to a different level (fractures or serious injuries) • Radiation • Rollovers • Collisions • Radiation exposure	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk SFAIRP. Use of Geiger counter. Appropriate cordoning-off and signage for the activity. Emergency Directory available on-site. Personnel certified for the activity.
Coating	• Assembly and disassembly of scaffolding, if used • Work at height, if applicable • Inspection (electrical testing), jeeping pipe, and	• Falls to a different level (fractures and fatal injuries) • Exposure to chemicals • Respiratory exposure	High/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Use of PPE appropriate to the activity (appropriate clothing for insulation materials, masks).

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	repair coating (Holiday) • Use of toxic materials	• Slips, trips, falls • Electrical discharge, stored energy concerns • Falling tools		Tidiness and cleanliness Fastening of tools. Adequate assembly and disassembly of scaffolding. Housekeeping of worksite. Proper disposal of materials/supplies/tools. Appropriate handling, storage, disposal of hazardous materials.
Tightening of studs in retainers (if applicable at heights; multiple levels)	• Assembly and disassembly of scaffolding, if applicable. • Work at height or lower levels • Use of torque and spanner wrenches	• Falls to a different level (fractures and fatal injuries) • Fall of tools or materials to a different level • Trauma by the torque • Pinch or crush points	High/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Use of PPE appropriate to the activity. Fastening of tools. Adequate assembly and disassembly of scaffolding.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
				Tidiness and cleanliness, good housekeeping.
Mechanical cleaning	• General cleaning of the site of all waste generated by mechanical work	• Moving equipment/crush between/pinch point (personnel run over) • Trips, slips and falls (fractures or cuts) • Falling material (damages to personnel) • Chemical use • Dermal exposures • Airborne and dust exposures • Cleaning of tools, equipment, and supplies. • Drop of tools or	Low/Low	Require Prime Contractor to implement a OHSMP that addresses each of the OHS impacts to reduce risk. Use of PPE appropriate to the activity. Appropriate final waste disposal. Focus on heavy moving equipment. Proper PPE Waste disposal. End caps, protection of materials from entry of insects, reptiles, animals, etc. Secure and return tools.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		supplies at worksites (whether at height or lower)		
Crane Equipment Assembly	• Crane assembly. • Traveling to ensure Stops are installed properly. • Crane placement. • Working at various levels	• Pinch Point/Crush Between • Cuts and Laceration from sharp edges and/or metal shavings.	High/Low	Ensure proper assembly location and working area, radius work area. Use certified and trained personnel to assemble and operate a crane. Proper barriers and exclusion zones. Spotters. Use of proper rigging points and use of trainer rigger. Use of proper tie-off points. Use of manufacturer's guidelines for assembly. Use of Kevlar or similar protective sleeves and PPE.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Machinery and Equipment Assembly	• Placement and arrangement of machinery prior to assembly • Lifting and rigging of equipment to the machinery installation process	• Pinch Point/Crush between • Cuts and laceration from sharp edges and/or metal shavings.	High/Low	Proper lifting equipment and rigging procedures. Proper barriers and exclusion zones. Spotters. Use of proper rigging points and use of trained rigger. Use of proper tie-off points. Use of manufacturer's guidelines for assembly. Use of Kevlar or similar protective sleeves, PPE.
Assembly of Compressor Building	• Conduit trays, installed. • Material delivery scheduling and loading and unloading activities. • Securement of materials and supplies.	• Multi-employer worksite, between trades and contractors/sub-contractors. • Pinch point and crush between areas. • Laceration and cut potentials.	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk. Assembly and fastening of beams/rafters/joints. Identify Prime Contractor and all sub-contractors and workers are aware of worksite activities

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		• Suspended loads and exclusion areas. • Insulation hazards.		(multiple employer worksite concerns). Safety first, project planning to include priority task work areas. Exclusion areas for lifting and work activities where falls could occur. PPE as required from the tasks. Good communication between contractors on work activities. Proper housekeeping for work sites. Travel routes and parking areas designated.
Equipment Dis-assembly and Demobilization.	• Equipment disassembly • Transportation	• Poor road conditions • Loading and fastening of equipment • Unexpected mechanical defects • Motor vehicle incidents	Moderate/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk. Appropriate fastening of equipment.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		• Trips, slips, and falls. • Pinch points and crush between. • Overhead powerline concerns. • Pipeline, below surface, protection for demobilization.		Signage for transport and pilot car, if applicable. Use of appropriate PPE. Tidiness and cleanliness of the site. Focus on safety OHSMP for transport. Spotter use for travel and equipment usage. MUTCD Flaggers and Road Signage as needed for demobilization.
ELECTRICAL				
Underground Utility Installation (communication, electrical, power, and control cables)	• Line-Locate before Excavation • Manual excavations • Utility location and marking of utility • Placement of conduit and/or PVC pipe • Pouring/Marking installed lines	• Trips, slips and falls • Eye damage due to concrete exposure • Sharp edges •	Moderate/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk. Use of appropriate PPE. Tidiness and cleanliness.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Placement of Conduit Pipe and Supports At Height	• Assembly and disassembly of scaffolding • Work at height • Placement of supports on pneumatic platforms • Welding for supports • Grinding • Ladders • Scaffolds • Cable Trays	• Falls to a different level (fractures and fatal injuries) • Rollovers • Collisions • Eye damage due to metallic particles and shavings • Burns • Cuts/laceration • Potential falls from height • Cable pulls • Uneven surfaces and working areas for equipment and workers. • Drop of materials or supplies from height.	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk. Use of PPE appropriate to the activity. Appropriate use of ladders in good condition. Appropriate assembly and disassembly of scaffolding. Trained equipment operation personnel. Use of appropriate tie-offs and equipment training. Spotters.
Cabling (including SCADA System install)	• Assembly and disassembly of scaffolding • Work at height • Use of pneumatic	• Falls to a different level (fractures and fatal injuries) • Cuts and laceration	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk.

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	platforms • Maneuvers for movement of reels • Pull of different sized cables/wiring • Pull long distance and maneuvering wiring from damage.	• Ergonomics, awkward positioning • Unrolling wire/cable to install into conduit or trays • Rollovers • Collisions • Personnel run over by reels/crush between/pinch points • Overexertion (lumbar injuries) from pulling higher tension cables		Use of PPE appropriate to the activity. Appropriate use of ladders in good condition. Adequate assembly and disassembly of scaffolding. Personnel trained in equipment and maneuvers.
Lighting install and camera system for Compressor Buildings and Control Room	• Assembly and disassembly of scaffolding • Work at height • Use of pneumatic platforms • Hanging lighting fixtures from supports	• Falls to a different level (fractures and serious injuries) • Tip-Over • Contact with surroundings, equipment, ceilings.	High/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk. Use of PPE appropriate to the activity. Appropriate use of ladders;

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Risk Identification			**Risk Estimate**	**Risk management**
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	• Lateral movement of equipment			ladders in good condition. Appropriate assembly and disassembly of scaffolding. Personnel trained to operate equipment.
Instrumentation				
Cutting, Bending, and Install of Tubing, including fire suppression systems.	• Material handling • Manual transporting • Pipe countersinking • Placing of pipes • Manual bending machine • Multi-employer worksites and activities	• Trips, slips and falls • Cuts/Lacerations • Pinch points and crush points. • Ergonomic • Falls	Moderate/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk SFAIRP. Use of PPE appropriate to the activity.

Commissioning phase

Risk identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
Mechanical Completion/ Commissioning	• Manufacture, Construction, As-Builts, Clean-up and Integrity	• High pressure Water, air or gas. • Poor lighting.	Moderate/Low	Require Prime Contractor to implement a OHSMP addressing each of the OHS impacts to reduce risk..

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Risk identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
	Tests • Settings, Calibrations, Servicing, Operability Checks • Purge, Pressure, Equalize, Final Calibration and Operability Checks • Venting • Energizing	• Trips, slips and falls. • Noise • Install blocks and labels, where necessary • Electrical equipment energized • Relief Valves can be energized • Unexpected release of gas • Equipment and accessory failures • Hydraulic or stored energy sources • Unexpected release of energy sources or stored energy. • Gas and ignition systems for heaters. • Install blocks and labels, where necessary • High pressure gas • Explosion and fire		Focus on a specific testing procedure for the medium used. Adequate or limited lighting during nighttime operations. Preparation and awareness for potential of stored, hydraulic, water, gas, or air system sources. Use of whip-checks. Proper PPE Proper Securement of hoses and lines. Shift changes of workers and changing activities. Completion of tasks alone or with few personnel on task. Communication plans (cellular vs intrinsically safe communication. Four-gas monitoring systems and sufficient 24/7 battery operations of atmospheric monitoring equipment.

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Risk identification			Risk Estimate	Risk Management
Process	Aspect(s)	OHS impact(s)	Pre & Post Risk Rating	Control(s)
		hazards • Emission of gas into the atmosphere		Exclusion zones. Work permits. Arc Flash Study.

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Appendix C – Preventative Occupational Health and Hygiene Program Procedure

1.0 Detailed Procedure

At minimum, qualitative exposure assessments will be performed on the Project to provide baseline exposure data or whenever changes are made to processes or equipment that have the potential to expose employees to hazardous chemical, biological or physical agents (see decision tree in Appendix D describing the exposure assessment process).

Quantitative exposure assessments, including personal monitoring, will be performed, evaluated and reviewed by, or under the direction of a Certified Industrial Hygienist (CIH) or United States Certified Safety Professional (CSP).

1.1 Performing the Qualitative Exposure Assessment

First, the goals of the exposure assessment must be clearly defined so that the scope of the assessment may be determined. Assessment results may be used to determine the needs, priority, or effectiveness of health hazard controls, to provide baseline exposures or exposure histories, or to demonstrate regulatory compliance. The qualified person in charge of the assessment will tailor the assessment to meet the defined goals.

Second, personnel performing the assessment will familiarize themselves as possible with the process, job or task that is to be the focus of the assessment. This includes compiling information about facilities; chemical, biological or physical agents; job activities; work procedures; controls; and personal protective equipment (PPE). It may involve observation, interviews, and review of documents.

This familiarization with the process, job or task will be used in the qualitative exposure assessment, or survey. As a minimum, a walk-through survey will identify Project activities that have the potential to produce hazardous chemical, biological, ergonomic or physical agents, and employee exposures to such agents will be estimated qualitatively (see Appendix E for an example of the Industrial Hygiene Checklist).

If the results of the qualitative exposure assessment indicate that there is potential for Project employee exposure, a quantitative exposure assessment will be conducted so that the level of exposure to chemical or physical agents can be documented.

If the results of the qualitative exposure assessment indicate that there is no potential for employee exposure, this negative exposure assessment will be documented. No further action is required, unless changes are made to Project activities that have the potential to expose employees to hazardous chemical, biological, ergonomic or physical agents. Such changes will require the performance of a new qualitative exposure assessment.

1.2 Performing the Quantitative Exposure Assessment

If the results of the qualitative exposure assessment indicate there is a need for quantitative exposure assessment based on the potential for employee exposure, the Health, Safety and Environment Manager of the Project will select a qualified professional, as described in Section 3.3.3.2, to perform the quantitative exposure assessment. The following is an outline of the steps involved in the quantitative exposure assessment.

- Step 1 - Prioritize the chemical or physical agents to be evaluated in terms of probability of overexposure and the consequence of overexposure should it occur.
- Step 2 - Estimate the range of contaminant concentrations so that appropriate equipment, sampling media, etc. can be selected.
- Step 3 - Select sampling and analysis method(s). Whenever available, validated methods will be used, such as those developed by the National Institute for Occupational Safety and Health (NIOSH)). Method selection must take into account the required duration of sampling relative to exposure limits, the sensitivity and interferences of the method, timeliness of

results reporting, and the intrusiveness of the method with regard to the employee's actions and work habits.

- Step 4 - Select the laboratory to perform analysis of samples, if necessary, and consult with the laboratory so that the specific requirements of sampling and analysis can be coordinated.
- Step 5 - Select the sampling instrument, taking into account the type of information or analysis required, the efficiency and reliability of the instrument, and its portability and ease of use. All instrumentation must be calibrated according to manufacturer's instructions prior to use. The calibration must be documented and be traceable to a common standard.
- Step 6 - Prepare a sampling strategy and conduct the survey so that sampling efforts collect exactly those samples that will enable the decisions about controls to be made at the required level of confidence.
- Step 7 - Where to Sample - Sampling can be performed at a specific Project worksite, in the general workroom air, or in the breathing zone or personal space of the employee. The choice will be dictated by the type of information required. Frequently, exposure assessment sampling is performed to determine the levels of employee exposure to a given agent throughout a work day. In this case it is necessary to sample in the employee's breathing zone or very near his or her person.
- Step 8 - When to Sample - The type of information required and the particular operations under study will determine when sampling will be done. If an operation continues for more than one shift, sampling will be collected during each shift. Time-weighted average (TWA) exposures for the full shift will be collected. Peak exposures or other short-term exposures will be monitored when applicable (e.g., to compare to ceiling or short-term exposure limits (STELs).
- Step 9 - Who to Sample - Groups of employees can be identified based on their direct exposure to specific agents in common Project areas, and selected individuals from each group can be monitored. If this approach is used, the number and selection of individuals must be chosen so that exposure measurements are representative of the entire group. Another approach that can be used is to monitor each employee who is directly exposed to the agent. In some cases, it may be necessary to perform area monitoring in place of, or in addition to, personal monitoring. Regardless of the approach, quality assurance samples will be taken, which may include field blanks, duplicates, or spiked samples.

1.2 Performing the Quantitative Exposure Assessment

If the results of the qualitative exposure assessment indicate there is a need for quantitative exposure assessment based on the potential for employee exposure, the Health, Safety and Environment Manager of the Project will select a qualified professional, as described in Section 3.3.3.2, to perform the quantitative exposure assessment. The following is an outline of the steps involved in the quantitative exposure assessment.

- Step 1 - Prioritize the chemical or physical agents to be evaluated in terms of probability of overexposure and the consequence of overexposure should it occur.
- Step 2 - Estimate the range of contaminant concentrations so that appropriate equipment, sampling media, etc. can be selected.
- Step 3 - Select sampling and analysis method(s). Whenever available, validated methods will be used, such as those developed by National Institute for Occupational Safety and Health (NIOSH). Method selection must take into account the required duration of sampling relative to exposure limits, the sensitivity and interferences of the method, timeliness of results reporting, and the intrusiveness of the method with regard to the employee's actions and work habits.
- Step 4 - Select the laboratory to perform analysis of samples, if necessary, and consult with the laboratory so that the specific requirements of sampling and analysis can be coordinated.
- Step 5 - Select the sampling instrument, taking into account the type of information or analysis required, the efficiency and reliability of the instrument, and its portability and ease of use. All instrumentation must be calibrated according to manufacturer's instructions prior to use. The calibration must be documented and be traceable to a common standard.

- Step 6 - Prepare a sampling strategy and conduct the survey so that sampling efforts collect exactly those samples that will enable the decisions about controls to be made at the required level of confidence.
- Step 7 - Where to Sample - Sampling can be performed at a specific Project worksite, in the general workroom air, or in the breathing zone or personal space of the employee. The choice will be dictated by the type of information required. Frequently, exposure assessment sampling is performed to determine the levels of employee exposure to a given agent throughout a work day. In this case it is necessary to sample in the employee's breathing zone or very near his or her person.
- Step 8 - When to Sample - The type of information required and the particular operations under study will determine when sampling will be done. If an operation continues for more than one shift, sampling will be collected during each shift. Time-weighted average (TWA) exposures for the full shift will be collected. Peak exposures or other short-term exposures will be monitored when applicable (e.g., to compare to ceiling or short-term exposure limits (STELs)).
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2.0 Training

The Project Director or their designee will identify and schedule any employee training or retraining that may be required as a result of the identification of hazards by the exposure assessment. This training will be incorporated into the training database (i.e., Training Procedure QA02-04 and/or Success Factors/Learning Management Systems for the Project. Such training might include, but not be limited to, hazard communication training, workplace hazardous materials information systems, hearing conservation training, or specific chemical agent training for such contaminants as lead, asbestos, or benzene.

All training will be documented in accordance with Success Factors/LMS and Section 4.2 of this document.

3.0 Record Keeping

All exposure records will be maintained for a minimum of 30 years. These records include the following:

- Qualitative and quantitative exposure assessments, including job exposure assessments, and personal monitoring results:
  - Related medical surveillance or biological monitoring results;
  - Related training records; and,
  - Documentation of the implementation of mitigation measures and any follow-up evaluation or further exposure assessments.

4.0 Auditing

The POSH program will be reviewed once during the Project.

Exposure assessments should be performed in conjunction with the detailed procedure review as per the details in this document (see Section 3.3.3.2).

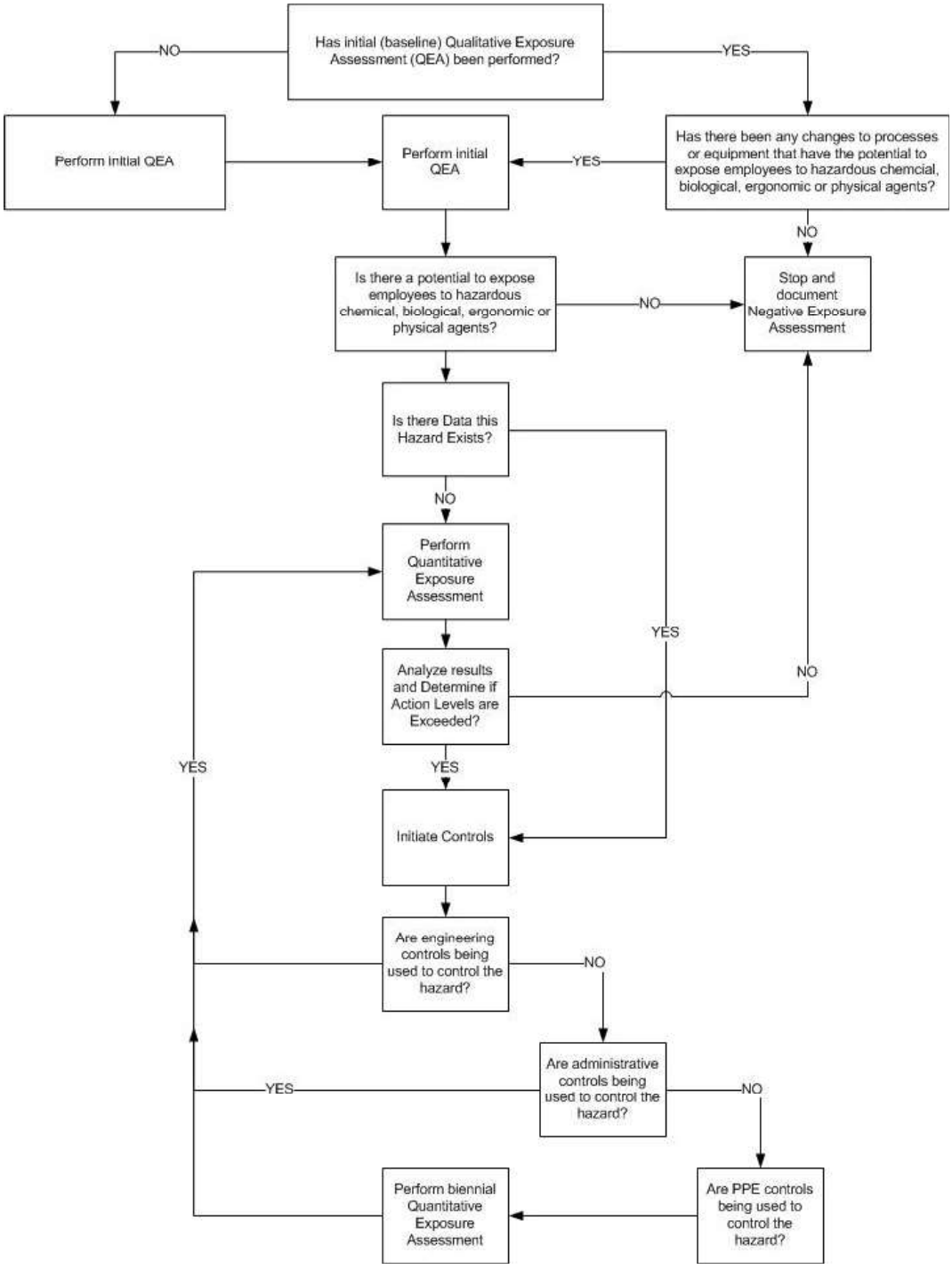
5.0 POSH Specific Operational Controls

The Project's POSH is comprised of the following TOPs:

- Asbestos Exposure Control (ref.: EDMS ID# 003864096);
- Blood borne Pathogens (ref.: EDMS ID#003890854);
- Conducting chemical inventories (ref.: EDMS ID#003887957);
- Ergonomic Hazard Control (ref.: EDMS ID#003721953);
- Hearing conservation (ref.: EDMS ID#005405301);
    - Facility occupational noise dosimetry measurements; and,
    - Facility occupational sound level measurements;
- Heat Cold Stress Control (ref.: EDMS ID#003871937):
    - Heat stress information booklet.
- Manual Materials Handling (ref.: EDMS ID#003879368);
- Mercury Exposure Control (ref.: US version EDMS ID#003873976);
- Naturally Occurring Radioactive Materials (ref.: US version EDMS ID#005486462);
- Prevention of Lead Exposure (ref.: US version EDMS ID#003886482);
- Product/Chemical Approval and Handling (ref.: EDMS ID#003839083 & Spanish EDMS ID#003954017);
- Respiratory Protection (ref.: EDMS ID#003773677);
- Rodent Infestation and Hanta Virus Control (ref.: EDMS ID#003835898 & Spanish EDMS ID#003953891); and,
- Workplace Hazardous Materials Information System (WHMIS)/Hazard Communications (HAZCOM) through 3E-Service.

Other TOPs will be developed based on the qualitative and/or quantitative exposure assessments for chemical, biological, ergonomic or physical agents.

Appendix D - Exposure Assessment Decision Tree



Appendix E - Industrial Hygiene Checklist

INDUSTRIAL HYGIENE CHECKLIST

On the Project, is there a potential for employees to be exposed to any of the following:

	Yes	No
Asbestos or other fibres	❑	❑
Lead or lead-based paint	❑	❑
PCBs	❑	❑
Benzene or other organic vapours	❑	❑
Welding fumes	❑	❑
Paint, paint thinner or other solvents	❑	❑
Compresses gases	❑	❑
Other hazardous chemicals	❑	❑
Blood borne pathogens	❑	❑
Noise	❑	❑
Ergonomic stresses (e.g., repetitive motion, lifting)	❑	❑
Extreme hot environment	❑	❑
Extreme cold environment	❑	❑
Vibration	❑	❑
Other potentially harmful physical agents (e.g., radiation)	❑	❑
Biohazardous agents (e.g., insects, viral pathogens)	❑	❑

- Are OHS procedures in place for the Project that covers any of the above items?

- Which Project tasks involve the items checked above?

- Which employees might be expressed to the items checked above? How often and for how long?

Appendix F – Employee Notification Form

EMPLOYEE NOTIFICATION OF EXPOSURE ASSESSMENT RESULTS

Employee Group Name or Individual

Employee Name: _____ Identification Number: _____

Project Name: _____ Project Location: _____

Exposure Assessment Monitoring

Monitoring Date(s): _____

Hazardous substance or agent being monitored:

_____
_____
_____
_____
_____

Results of Monitoring:

_____
_____
_____
_____
_____

Remarks/Corrective Actions:

_____
_____
_____
_____

TES-PROJ-ACC Temporary Access Roads Specification (CDN-US-MEX)

TransCanada
In business to deliver

EDMS No.: 008960813 | Rev.: 00 | Status: Issued | Effective Date: 2015-Apr-09

APPROVALS

Originator: Roger Lemieux, Project Manager Construction Services	Signature	Date: April 10, 2015
Reviewer: Alejandro Iriarte MX Pipeline Engineering & Inspection	Signature	Date: April 10, 2015
Reviewer: David Penning, Manager Construction Quality Programs	Signature	Date: 10 APR. 2015
Reviewer: Peter Hecht, Manager Mexico HS&E	Signature	Date: 16.04.2015
Responsible Engineer (Document Contact): Brian Yeung, P.Eng Construction Quality Programs	Signature Date: Apr 20, 2015	APEGA Permit to Practice P7100
Management Endorsement: Jon Draeger, Director Construction Management Services	Signature	Date: April 20, 2015

SUMMARY

This Access Road Specification (Specification) describes TransCanada's (the Company) minimum requirements for planning, building and use of temporary access roads for the purpose of the work on construction projects. The Specification will be attached as a schedule to the contract between the Company and the Contractor

DOCUMENT HISTORY

Rev. No.		
00	**Description**	**Effective Date**
	New document.	2015-Apr-09
	Rationale Statement	**Responsible Engineer**
	This document was developed in order to address the following requirements: • minimum requirements for planning, building and use of temporary access roads for the purpose of the work on construction projects.	Brian Yeung
	Impact Assessment Summary	**Team Owner**
	N/A	Construction Quality Programs

BRIEF DESCRIPTION OF CHANGE

REGULATORY	
Section	**Description of Change**
	N/A.
INDUSTRY STANDARDS	
Section	**Description of Change**
	N/A.
GENERAL	
Section	**Description of Change**
	This is a new Specification.

DEVIATION FROM THIS SPECIFICATION

TransCanada Engineering Standards and Specifications must be followed by internal and external users to ensure a safe, reliable and technically correct design.

Deviations to this standard may be acceptable if a technical assessment approved by TransCanada Engineering & Asset Reliability shows that the deviation meets the intent of this specification, does not compromise safety and also complies with applicable industry standards, regulatory requirements and is consistent with sound engineering judgment.

Any deviation must follow the appropriate TransCanada management of change variance procedure.

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DEFINITIONS

Term	Definition
Company	TransCanada Pipelines, partially owned entities and joint Ventures where TransCanada has operational control.
Company Authorized Representative	The person assigned on behalf of the Company to act in the Company's best interests and ensure the Contractor adherence to this Specification. This person will be the Project Manager or a designate.
Competent	Adequately qualified, suitably trained and with sufficient experience to safely perform the work as outlined, independently or with a minimal degree of supervision.
Competent Employee	One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate the hazard(s).
Contractor	Any person, firm or corporation contracting with the Company to perform the Work as set out in the contract.
Danger Zone	The area existing 6 meters / 20 feet around Mobile Equipment including attachments, implements and booms at furthest extension.
Crossing Agreement	Documented Company approval for crossing, construction and excavation activities on or near our right-of-ways, in accordance with legislation, in order to protect the public, and reduce the risk of pipeline damage.
Equipment Operator	The Competent Employee assigned to operate Mobile Equipment. This individual must work closely with the Signaler / Spotter to accept and understand the signals and directions given.
Mobile Equipment	Operator-driven vehicles other than normal transport vehicles (e.g. cars, trucks) used to perform work at a worksite whether electric, gasoline, CNG, diesel, or propane powered. Includes but is not limited to tractor trailer units, forklift trucks, front-end loaders, tracked vehicles, cranes, dump trucks, etc.
Excavation Checklist	Document used in the planning, execution, and ongoing evaluation of ground disturbance/excavation activities.
Heavy Equipment Exclusion Zone	The specific/unique area around each individual piece of Heavy Equipment where there is an immediate/imminent danger to life due to the high potential for contact during heavy equipment operation or function.
Excavation Procedure	The written excavation procedure, standard operating practice or work practice, as the case may be, complying with all regulations, and industry standards.
Excavation Safety Plan	A plan developed to address all hazards related to the excavation. This plan must be reviewed and authorized by the Company Authorized Representative.
Personal Protective Equipment	Equipment designed and worn to protect employees from exposure to work site hazards (i.e. respirator, fall protection, side impact hard hat, ear plugs, muffs, safety goggles, fire-retardant clothing.

Term	Definition
Pilot Vehicles	A Pilot vehicle is also known as an escort vehicle and is marked with warning signs and lights that operates in front of or behind a large vehicle that exceeds normal vehicle dimensions in height, length, width and/or overhang.
Powerline Procedure	The written procedure, standard operating practice or work practice, as the case may be, developed and executed by the Contractor and complying with all regulations and industry standards.
Signaler / Spotter	A Competent Employee assigned and dedicated to manage the work and traffic near overhead powerlines and congested areas for the purpose of ensuring defined clearances are maintained. The Signaler is responsible for providing hand and verbal signals to guide the Equipment Operator.
Traffic Control	The use of signs, traffic arrow boards, sign boards, buffer or shadow vehicles, barricades, cones, barriers, detours, traffic lights, traffic control persons (TCPs), or other techniques and devises to manage the control of traffic.
Traffic Risk Assessment	A traffic risk assessment is a thorough look at your workplace to identify those things, situations, processes, etc. that may cause harm, particularly to people, equipment or facilities while in the vicinity of traffic. . After identification is made, you evaluate how likely and severe the risk is and then decide what measures should be in place to effectively prevent or control the harm from happening.
Work	All activities concerning the project contemplated by the contract.

1 PURPOSE

This Access Road Specification (Specification) describes TransCanada's (the Company) minimum requirements for planning, building and use of temporary access roads for the purpose of the work on construction projects. The Specification will be attached as a schedule to the contract between the Company and the Contractor

2 SCOPE

This specification applies to Contractors that are designated as the "Prime Contractor" (British Columbia, Alberta, Manitoba), "Constructor" (Ontario), "Maitre d"Oeuvre" (Quebec) or where the Contractor has control of the work site whether as an "employer" or 'contractor" (Saskatchewan) or as a "controlling employer", "creating employer", "exposing employer" or "correcting employer" (United States) for OHS or "Contratista" o "Contratista EPC" in Mexico. All aspects of this Specification must be reflected in the Contractors Travel Management Plan that will form part of the Contractor's Site Specific Safety Plan (SSSP) for the Work. In addition, it remains the Contractor's sole responsibility to ensure that all applicable legal requirements and relevant industry standards have been identified and will be met by the Contractor's Travel Management Plan. By providing these minimum specifications for Temporary Access Roads, the Company is not assuming control over OHS nor agreeing to correct deficiencies.

3 REFERENCES

3.1 Regulations, Codes and Standards

3.1.1 Compliance to Regulatory Requirements

The following jurisdictional regulations, codes and standards apply to this specification:

Canada:

- WorkSafeBC *OHS Regulation Part 18, Section 18.1 to 18.17 Traffic Control*
- WorkSafe BC *OHS Regulation Part 18, Section 23.24 Roads*
- Saskatchewan Forestry Resources Management Act (S.S.1996, c.F19.1) – *Roads and Railroads, Section 57, Construction of Roads*
- Ontario Bridges Act, *S.O. 1996, c. 33; 2006, c. 19, Section 2, Approval of Minister.*
- Quebec EnviroOHS Legislation, *Regulation respecting health and safety in forest development work (O.C. 499-2013), Division 3, Section 9 - 11 Forestry Road,*

Mexico:

- NOM-012-SCT-2-2008, On the maximum weight and dimensions with which the motor transport vehicles that transit in the general routes of communication under Federal jurisdiction.
- NOM-040-SCT-2-2012, For the transport of indivisible objects of great weight and/or volume, weight and dimensions of vehicular combinations and of industrial cranes and their transit over roads and bridges under federal jurisdiction.
- Federal SCT Regulation on the weight, dimensions, and capacity of the motor transport vehicles that transit on the highways, and bridges under federal jurisdiction.

US:

- Federal OSHA 29 CFR 1926 *Safety and Health Regulations for Construction, Subpart G - Signs, Signals, and Barricades*
- 2009 Edition including *May 2012 revisions of the Department of Transportation (DOT) Federal Highway Administration Manual of Uniform Traffic Control Devices (MUTCD)* (ref.: *http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm*)
- Oregon Administrative Rules (OAR Chapter 437), *Division 7, Subdivision F, Roads, Flagging and Vehicles 437-007-0500 Roads*

Helpful Links:

- *Manual of Uniform Traffic Control Devices for Canada* for use by Canadian Jurisdictions: *http://tac-atc.ca*
- The Ministry of Transportation of Ontario (MTO) has replaced their MUTCD with the Ontario Traffic Manual (MTO) *http://www.pdfpedia.com/download/6373/ontario-traffic-manual-pdf.html*
- Us jurisdictions us *Manual on Uniform Traffic Control Devices (MUTCD) - FHWA*
- Go to *http://mutcd.fhwa.dot.gov/resources/state_info/* for an image of states with their own MUTCD and those states that have adopted the National MUTCD. The page also has links to the individual state requirements.

3.1.2 TransCanada Specification

The following TransCanada standards are referenced in this Specification

- TES-PROJ-OHP *Overhead Powerline Specification (CDN-US-MEX)* (EDMS No. 006179816)
- TES-PROJ-EXC *Excavation Specification (CDN-US-MEX)* (EDMS No. 005890120)
- *OHS Specifications for Prime / General Contractors* (EDMS No. 007646679)

4 GENERAL REQUIREMENTS

4.1 Planning

4.1.1 Contractor's Project Manager is accountable and responsible to assign all personnel involved in the assessment of hazards, improvement and management of Temporary Access Roads including, but not limited to, the following key roles:

a) Construction Supervisor;
b) Foreman;
c) Professional Engineers (e.g., Mechanical, Geotechnical, & Civil);
d) Surveyors;
e) Equipment Operator;
f) Signaler / Spotter;
g) Safety Representative;
h) Land/Permit Agent; and,
i) Environmental Representative.

j) Safety and or Traffic Safety Representative (to Coordinate the loading unloading and transporting of various construction related items such as pipe, heavy equipment and employees).

4.1.2 Identify all access roads by reviewing maps, drawings, images and conducting site visits and through site/area assessments prior to all construction related activity.

4.1.3 Exercise caution in the selection of locations for marshaling yards, storage facilities and camps in order to reduce the traffic on existing or public access routes.

4.2 Training

4.2.1 Ensure regulatory training and qualification requirements for working on temporary and permanent Access Roads are identified and in place to ensure all personnel performing, monitoring and/or supervising construction activities associated with access roads are competent for the role assigned. All training, qualifications and competency verifications shall be documented and provided to the Company.

4.2.2 For work performed on access roads in the US, the Contractor shall ensure individuals performing any tasks considered "covered tasks" have been qualified as required under the Company's and Contractor' Operator Qualification (OQ) Program.

4.3 Authorization:

4.3.1 Provide written notification for Company authorization when a variance is required from this specification.

4.3.2 Permits must be granted by the applicable authorities before starting any construction activity on either new or existing roads.

4.4 Traffic Management Plan

4.4.1 The Contractor shall develop a Traffic Management Plan for all access roads utilized on the project.

The Traffic Management Plan will include but not be limited to the following;

- Map showing the locations of the access roads being used on the project including kmz google files.
- Identified, documented and communicated hazards and control measures for each access road.
- Training requirements.
- Environmental impact of each access road (e.g. travel restrictions due to weather).
- Preconstruction photos and videos to document the original conditions of the road. It is recommended to notarize this material in case of future conflicts with the roads owners or users.
- Location and identification of known facilities affected by each access road.
- Copies of all relevant permits associated with the access road.
- Documentation to indicate the condition of the access roads prior to construction activities (e.g. photos or video documentation).
- Procedures used to clearly identify and control overhead hazards (power lines, debris rolling off steep slopes).

- Traffic control plan – (single lane, one way, radio communication protocols, signalers, etc.)
- Access roads that will be used as emergency routes
- Inspection and Maintenance plan
- Signage and barriers to be used on access roads
- Use of pilot vehicles
- Flag persons
- Speed limits
- Dust control / snow removal/ Plowing frequency
- Layby, turning and parking areas
- Rutting / Damage repair frequency during construction activities

5 PERMITTING

5.1.1 Once the roads to be used, upgraded or built are defined, Company or Contractor (depending on the contractual Scope of Work (SoW)) must prepare and submit the applications for the required permits.

5.1.2 In general the permits for upgrading or building roads are divided into:

- Environmental permits (either central/federal and local levels)
- Construction permits (commonly at local levels)
- Community agreements
- Crossing agreements

5.1.3 Permit matrix should include any permits required for the use and creation of access roads, and environmental / cultural evaluations of the access road.

5.1.4 Contractor is responsible to obtain permits unless otherwise identified in the contract that it is the responsibility of the Company.

5.1.5 For cases where the Company is responsible for obtaining Permits and Land Rights, consult the Company Authorized Representative to verify:

- All landowners and other parties affected by the proposed access road work have been contacted; and,
- Facility owners have been notified as required by the applicable provincial, state and federal regulatory jurisdictions.

5.1.6 It is the Contractor's responsibility to obtain all permits to erect signs if applicable

6 SIGNAGE

6.1.1 All access roads must have highly visible reflective signage, indicating the name of the project and/or Company and the legend "access to KP/MP xx" or "access to camp xx", or pipe yard, etc.

6.1.2 Signs must indicate any hazards associated with the access road, e.g. narrow bridge, steep hills, slippery one way traffic and speed etc.

6.1.3 Contractor must maintain the access signs along the construction period and remove them at the completion as per the requirements identified in traffic plan(s).

7 CONSTRUCTION AND IMPROVEMENTS

7.1.1 Conduct a site visit(s) to determine availability of existing access roads to obtain access into such areas as:

- Stockpile sites
- Camp locations
- Steep slopes
- Right-of-Ways
- Creek and River crossings
- Helicopter pads
- And in general to all work places

7.1.2 Determine if existing access roads will need to be modified to accommodate the construction activities.

- Assess and identify hazards associated with all access roads with consideration to the following:
- Overhead powerlines
- Access and egress on to intersecting roadways (e.g. highways)
- Steep slopes
- Single or double lanes (road width)
- Blind corners
- Ground conditions – effects of weather and geological events on the road condition (Frost Law restrictions)
- Terrain (paved, gravel, muskeg, wetland, waterbodies etc.)
- Local traffic
- Emergency routes
- Emergency response in the event of an access road incident involving transportation
- Vehicle containment (barriers, guard rails etc.)
- Wild life
- Types of equipment that will be hauled on the road (wide or long loads)
- Construction zones
- Falling objects from steep slopes
- Community restrictions or risks of blockades
- Permitted Loads - width and load requirement limitations
- Bridges (may require an engineering assessment)
- Overpasses and underpasses
- Local or regional driver behaviors
- Cultural sensitive areas
- Commercial use (hauling timber)

7.1.3 Assess and identify hazards associated with the creation of new access roads with consideration to the following:

- Environmental impacts (rivers, creeks, low areas, culverts)
- Overhead powerlines
- Location of utilities (gas, water, power, sewer)
- Soil conditions
- Terrain
- Wildlife
- Falling objects from steep slopes
- Purpose of the road (small vehicles, large vehicles, long and over width loads)
- Effects on local activates (logging, hunting, recreational)
- Effects of weather conditions (rain, snow)
- Effects of geological events.
- Access and egress on to intersecting roadways (e.g. highways, bush roads)
- Feasibility to return the access road back to original use (forest, pasture etc.)
- Emergency routes
- Permitting conditions
- Community restrictions or risks of blockades

8 RESTORATION OF ACCESS ROADS

8.1.1 All access roads used on the project (existing, private and new) will remain in good working condition; all damage to the access road shall be repaired immediately.

8.1.2 At the end of the project access roads must be returned to a condition acceptable to the regulatory agencies and users (communities).

8.1.3 All access roads shall be constructed, maintained and returned to a level that does not adversely impact the environment

8.1.4 Some regulations require that temporary access roads must be closed and restored after construction. This needs to be taken into consideration by the Contractor and the Company Operations & Maintenance groups

-END OF DOCUMENT-

PURPOSE

This Specification defines requirements for planning and conducting work activities and the associated infrastructure required for work in proximity to overhead powerlines. This Specification will be attached as an appendix to the contract between the Company and the Contractor.

This Specification applies to pipeline construction and maintenance activities in proximity to overhead high voltage electric transmission lines. It provides minimum requirements only for powerline right-of-ways (RoW) where personnel may be exposed to high voltage hazards. It is intended to be a guideline to make the Contractor aware of the hazards involved when completing construction activities in close proximity to overhead powerlines (i.e., hazards related to induced voltage and fault current in regards to inadvertent contact with high voltage overhead AC electric transmission lines).

The Prime/General Contractor will develop their own Contractor's powerline procedure incorporating all applicable regulatory requirements and the requirements set out in this Specification. The Contractor's powerline procedure will form part of the Contractor's site-specific safety plan (SSSP) for the work. If the requirements of this Specification cannot be met (e.g., ground rods cannot be driven due to working on rock) the Contractor will contact Engineering Services with a proposed solution prior to creating the SSSP.

SCOPE/APPLICABILITY

This Specification applies to Contractors that are designated as follows:

- the "Prime Contractor" (British Columbia, Alberta, Manitoba)
- "Constructor" (Ontario)
- "Maître d'Oeuvre" (Quebec)

This Specification also applies where the Contractor has control of the work site as follows:

- an "employer" (work site regulated by the Canada Labour Code)
- either an "employer" or "contractor" (Saskatchewan)
- a "controlling employer", "creating employer", "exposing employer", "correcting employer" or "General Contractor" (United States) for Occupational Health and Safety (OHS)

This Specification applies to all divisions of the Company and its wholly owned subsidiaries, and all operated entities/facilities in Canada, the United States (U.S.), and Mexico.

Note: It is the Prime/General Contractor's sole responsibility to ensure that all applicable legal requirements and relevant industry standards have been identified and will be met in performance of the work. By providing these minimum expectations related to working around powerlines, the Company is not assuming control over Occupational Health and Safety (OHS) nor agreeing to correct deficiencies.

Within this Specification, TransCanada is referred to as the Company.

Unless specified, all statements in this Specification are "shall" requirements, as defined below.

Within this Specification, the following terms and definitions apply for requirements:

- Shall—expresses a requirement, i.e., a provision that the user is obligated to satisfy in order to comply with the standard. Shall is not a recommendation but a requirement.
- Should—expresses a strong preference, recommendation or that which is advised, but not required.
- Must—denotes a requirement of the Company, for which no deviation or variance would be granted.
- May—expresses an option or that which is permissible within the limits of the standard.
- Consider—assumes that a qualified person will evaluate options to fulfill the intent of the requirement and make a documented decision supported by evidence to ensure protection of people, equipment and the environment by achieving the appropriate level of functional integrity.

Wherein the Manufacturer's literature, governmental or regulatory requirements conflict with this Specification, the more stringent requirement shall govern.

If further information is required, review *NACE International SP0177, Section 7 "Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems".*

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APPENDIX A MINIMUM CLEARANCE DISTANCE METERS (FEET).....24

1 GLOSSARY

Auto-reclosure

A circuit breaker equipped with a mechanism that can automatically close the breaker after it has been opened due to a fault, and automatically restores power after a momentary fault or potential contact.

Company authorized representative

The person assigned on behalf of the Company to act in the Company's best interests and ensure Contractor adherence to this Specification. This person will be the project manager or a designate.

Contractor

Any person, firm or corporation contracting with the Company to perform the work as set out in the contract.

Danger zone

The area extending 6 m (20 ft) around mobile equipment including attachments, implements and booms at their furthest extension.

Data logger

A handheld field collection data logger for collecting potential measurements that are date and time stamped with corresponding GPS coordinates (e.g., MC Miller G1 or Gx, or American Innovations Allegro).

Electric utility representative

A qualified person representing the electric utility company that is the owner/operator of the powerlines, who shall advise of the necessary safe clearance limits (distances) and other required information respecting the overhead powerline.

Equipment operator

The qualified person assigned to operate mobile equipment. This individual must work closely with the signaller to accept and understand the signals and directions being given.

High voltage

750 VAC and above

Mobile equipment

Operator-driven vehicles other than normal transport vehicles (e.g., cars, trucks) used to perform work at a worksite whether electric, gasoline, CNG, diesel or propane powered (e.g., tractor trailer units, forklift trucks, front-end loaders, tracked vehicles, cranes, dump trucks).

Pipe-to-ground AC voltage

The potential difference between the surface of a buried or submerged metallic structure and the electrolyte that is measured with a reference electrode in contact with the electrolyte. A voltmeter is required and the AC reading shall be selected.

Powerline procedure

The written procedure, standard operating practice or work practice, as the case may be, developed and executed by the Contractor, and complying with all regulations, industry standards and this Specification.

Qualified person

One who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify and avoid the hazards involved.

Personnel who have met the requirements of the State, Inter-State, Provincial or Federal standards, or have been identified by local management as being competent by training or experience. Electrical work is to be performed by personnel adequately qualified, suitably trained and with sufficient experience to safely perform work as outlined, with or without only a minimal degree of supervision.

Reference electrode

A portable or permanently installed half-cell, usually Cu-CuSO4, which is used to take coupon or pipe-to-electrolyte potentials from grade, inside the coupon test station’s reference tube, or from a permanently installed buried location.

Safe clearance limit

Threshold limit (distance) established in all directions around an overhead powerline in which encroachment of any portion of equipment, loads, rigging or attachments, or the approach of personnel is prohibited. Unless otherwise established in writing by an electric utility representative, the minimum safe clearance limit (distance) is as per Table provided in Appendix A.

Signaller

A qualified person assigned and dedicated to manage the work and traffic near overhead powerlines to ensure defined clearances are maintained. The signaller is responsible for providing hand and verbal signals to guide the equipment operator.

Unique pole identifier

An alphanumeric naming convention utilized by the utility company to identify the pole location.

2 PRACTICES REQUIREMENTS

The Contractor shall meet the following practices requirements.

2.1 Documentation Requirements

2.1.1 Develop the Contractor's powerline procedure as part of the Contractor's site-specific safety plan (SSSP) for the work. Include all aspects of this Specification in the Contractor's powerline procedure.

2.1.2 Receive approval from the Company representative for the Contractor's powerline procedure and Contractor's SSSP prior to implementation.

2.2 Planning Requirements

2.2.1 Specify accountabilities and responsibilities for all personnel involved in planning, supervising and executing work activities in proximity to overhead powerlines including, but not limited to, the following key roles:

- signallers
- mobile equipment operators
- truck drivers
- brush clearers

2.2.2 Ensure training and qualification requirements are in place to ensure personnel performing, monitoring, and supervising work activities in the vicinity of overhead powerlines are qualified persons for the role assigned, and suitably trained as per the Contractor's powerline procedure. Include in the training measures to be followed after inadvertent contact with a powerline. Document all training, qualification and competency verifications, and provide to the Company on request.

2.2.3 Identify all overhead powerlines prior to any construction related activity. Identify powerlines through review of drawings and crossing agreements as well as site visits and site/area assessments. This includes equipment-offloading sites, access routes to/from worksites, and material storage areas, in addition to the actual worksites. Mark the locations of powerlines on plans and drawings as applicable.

2.2.4 Exercise caution in the selection of locations for marshalling yards, storage facilities, and camps in order to prevent and eliminate potential equipment contact with overhead powerlines. Consult with equipment operators and delivery drivers to identify and confirm that equipment offloading and staging areas will be situated away from overhead powerlines.

2.2.5 Consult the Company authorized representative to verify all required crossing agreements are in place for the construction and installation of new infrastructure as applicable.

2.2.6 Provide the electric utility companies with minimum of 72 hours' notice, or as otherwise stipulated in the Contractor agreement, before undergoing any operations within the safe clearance limit of an overhead powerline. Longer lead-time may be

required if on-site support from the electric utility company is necessary. Prior to commencing work, at a minimum, obtain the following information from the electric utility company:

- line voltages for duration of project
- safe clearance limit (distance)
- height of applicable powerlines

  Note: The actual height of overhead powerlines may be less than the original installed height (e.g., road improvements/grading, snow pack, line sag).
- procedures to obtain on-site electric utility representation or actions, if necessary
- presence of and disablement of auto-reclosures
- unique pole identifier
- abnormal operating conditions (i.e., unbalanced loads)

2.2.7 Determine and document the height of overhead powerlines at the planned crossing locations. Mark the height of crossings on survey stakes at the location of the crossing, or by other comparable means. Survey Contractors may be used to verify crossing heights if required.

2.2.8 Plan in advance for resource requirements such as additional personnel, signage, non-conductive ropes and guard poles (“goalposts”), appropriate communication devices for use by the signaller, and electric utility representation or action.

2.2.9 Identify, document, and communicate all hazards and the applicable hazard control measures. Ensure that a copy of the hazard assessment is on site. Hazards may include, but are not limited to, the following:

- equipment offloading and equipment and/or materials staging near powerlines
- spoil piles
- dump trucks travelling with raised boxes
- poor visibility due to rain, snow, or fog
- proximity to power poles and guy wires
- changes to scope of work
- brushing and felling activities or requirements

2.2.10 Evaluate all worksites including offloading sites, material storage areas, and access routes to predetermine requirements for signage, barriers, and/or signallers, including the following considerations:

- Signage and barriers are required if an overhead powerline encroaches or travels parallel to the proposed worksite and potential exists for the danger zone of any mobile equipment to encroach on the safe clearance limit (distance).
- Designated signallers are required to guide the movement of equipment any time potential exists for the danger zone of mobile equipment to encroach on the safe clearance limit of an overhead powerline.
- Crossing locations assessments are required to ensure crossing location terrain will not cause mobile equipment or components to weave or bob resulting in potential encroachment on the safe clearance limit or contact with the overhead powerline.

2.2.11 Prior to commencing work each day, hold a pre-job meeting to review the Contractor's powerline procedure and relevant hazard assessments. Update the Contractor's powerline procedure accordingly when new hazards are identified, or tasks or site conditions change.

2.2.12 Ensure all "One-Call" requirements are met prior to any ground disturbance (e.g., excavation, driving of ground rods).

2.3 Signs and Barriers Requirements

2.3.1 Post adequate signage warning of possible electrical hazards at each access to the RoW, using warning signs of standard design at least 60 cm × 60 cm (24 in. × 24 in.) in size.

2.3.2 Place warning signs on each side of the overhead powerlines, and in plain view of those travelling in either direction under, or adjacent to, the lines. Ensure visibility of warning signs by placing them at a height of 1.8 m (6 ft) and approximately 1m (3 ft) outside the applicable safe clearance limit as illustrated in Figure 2-1. Do not place warning signs inside the safe clearance limit.

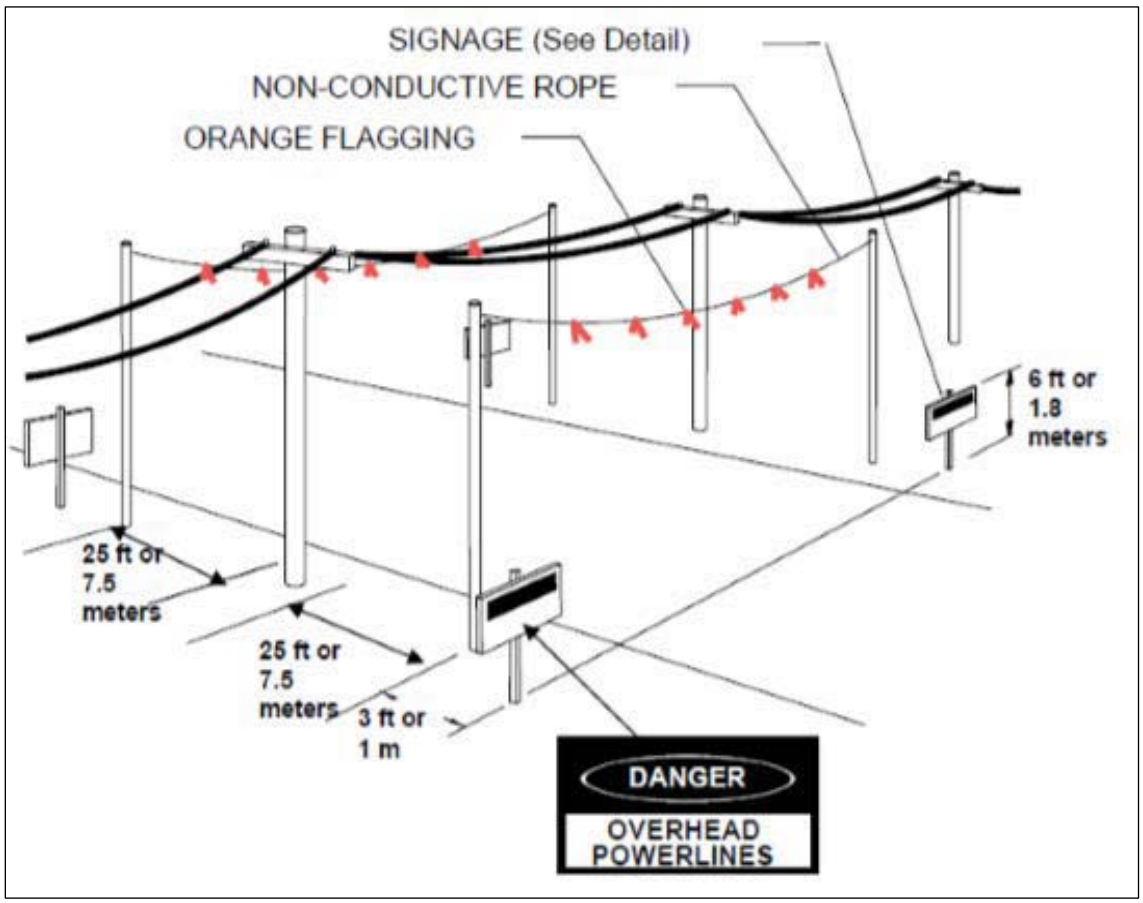


Figure 2-1: Signage Placement

2.3.3 Place non-conductive guard poles ("goalposts") and connect them with non-conductive rope at the applicable safe clearance limit distance from the overhead powerline, as illustrated in Figure 2-1. Do not use metal guard poles/goalposts or guy wires. Use non-conductive polypropylene rope and enhance rope visibility by attaching short pieces of surveyor's ribbon intermittently along its length.

Note: Install goalposts at an appropriate elevation to maintain vertical separation between the powerline and equipment travelling underneath.

2.3.4 Place signs and barriers, as illustrated in Figure 2-1, before work begins and keep them in place until all work is completed. Inspect condition and effectiveness of barriers and signage daily whenever work is being conducted around overhead facilities.

2.3.5 See Figure 2-2 detailing the signage and signaler requirements for danger zone encroachment and safe clearance limit for up to and including 500kV. For Utility line voltages above 500kV - see the amended ** Occupational Health and Safety Administration (OHSA) table provided in Appendix A.

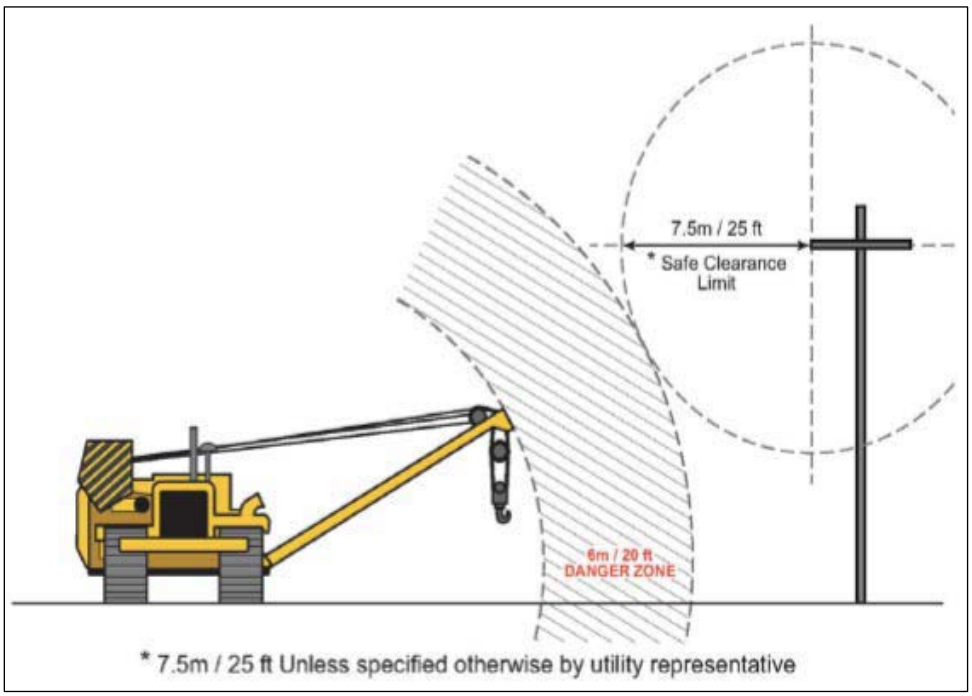


Figure 2-2: Signage and Signaler Requirement for Danger Zone Encroachment and Safe Clearance Limit (Distance) for up to and including 500kV

2.4 Equipment Operator and Signaller Requirements

2.4.1 Establish a protocol for the equipment operator to review the scope of work, drawings and hazard assessment to ensure potential site hazards are identified and addressed prior to beginning work.

2.4.2 Provide a designated signaller to guide the equipment operator where there is potential for the danger zone of the mobile equipment to encroach on the safe clearance limit. The designated signaller will assume responsibility to guide the equipment operator, and to signal for discontinuation of mobile equipment operation when anyone signals an emergency stop or an emergency stop is required for any reason.

Note: The approach of any equipment within 3 m (10 ft) of an energized powerline is prohibited in all circumstances.

2.4.3 Provide the signaller with a high visibility vest, harness, markings or other method of identification to be worn at all times during signaller work, such that it is clear they are the designated signaller and distinguished from other workers.

2.4.4 Provide the signaller with full authority and responsibility to stop work if safe clearance limits are encroached upon or unsafe conditions are identified. This requires the signaller to have full understanding of the following:

- true height, width and maximum reach of the mobile equipment
- safe clearance limits

2.4.5 Establish a protocol for the equipment operator and the signaller to review together and come to common understanding of the height, width and maximum reach of the mobile equipment prior to beginning work.

2.4.6 Task the equipment operator and signaller with responsibility to provide continuous control and monitoring of potential risks (e.g., workers entering the area, potential to contact aboveground facilities) related to the mobile equipment's danger zone.

2.4.7 Establish a protocol for establishment and verification of recognizable hand signals to be used for non-verbal communication between the equipment operator and the signaller during the work (i.e., industry standards such as those published by construction safety associations).

2.4.8 Establish and maintain reliable communication between the equipment operator and the signaller using additional means of communication where necessary (e.g., horn, intercom, two-way radios) throughout the work.

2.4.9 Task the equipment operator with the responsibility to immediately discontinue mobile equipment operation until communication is restored and understood, if the following situations ever occur:

- communication with the signaller is lost
- visibility of the signaller is lost
- the signaller's directions are not clear
- anyone signals an emergency stop

2.4.10 Provide a signaller to signal for a maximum of one piece of mobile equipment at a time. This includes the following:

- Ensure the signaller does not perform any other duties except communicating with and directing the equipment operator.
- Provide a separate signaller where a signaller is required for guidance for excavating or operating taglines.

2.4.11 Task the signaller with the responsibility for the following:

- remaining within view of the equipment operator at all times while the mobile equipment is operating
- maintaining an unobstructed view of the mobile equipment as it passes under the overhead powerline
- planning to ensure his location is at all times within the operators line of sight
- planning to ensure his/her location safety at all times (i.e., clear of ditches, excavations, other potential risk locations)

2.5 General Work Requirements

2.5.1 Complete work around powerlines only during daylight hours or with adequate artificial lighting. Modify or stop work as required and as dictated by poor visibility conditions (e.g., rain, snow, fog).

2.5.2 Do not allow dump trucks and track hoes to travel with a raised box or upright booms within the safe clearance limit of overhead powerlines.

2.5.3 Presume all powerlines to be energized unless the electrical utility owner/operator confirms that the powerline has been, and continues to be, de-energized and visibly grounded at the worksite.

2.5.4 Do not offload or store material under or in the vicinity of overhead powerlines unless immediately prior to work or installation of the material. Cordon off any areas within marshalling yards, storage facilities or RoW that are within proximity to overhead facilities and therefore at risk for being inadvertently utilized for storage. Erect signage around the cordoned off area to warn of the overhead powerline hazard.

2.5.5 Instruct all workers in the vicinity of heavy equipment working near overhead powerlines to remain clear and out of contact with the frame of the equipment, hoisting lines or hoisted load.

2.5.6 Do not allow parking, fueling, or servicing of machinery and/or equipment under or within the safe clearance limit of overhead powerlines.

2.5.7 Make every effort to park heavy equipment away from overhead powerlines as such vehicles parked on a powerline RoW can collect a considerable charge of static electricity. In order to avoid this build-up of static electricity the following procedures are required:

- Park vehicles no closer than 30.48 m (100 ft) from the base of electric Utility line towers.
- Equip all vehicles parked on the RoW with a connecting cable assembly and a static strap attached to the vehicle.
    - The connecting cable assembly shall be at least AWG #8 with insulated clips capable of completing an electrical bond between the ground rod and the vehicle while the vehicle is parked.
    - The static strap is for heavy equipment in use on the right of way in order to avoid a build up of static charge.
- Ground all vehicles parked on the powerline RoW as follows:
    - Drive ground rod (1.27 cm (½ inch) in diameter) to a minimum depth of 1.22m (4 ft).
    - Using insulating clips, attach the vehicle cable connecting assembly to the driven ground rod. Maintain the bond as long as the vehicle is parked on the powerline RoW. As an industry best practice, it is recommended to use mechanically tightened clamps.

2.5.8 Utilize taglines made of non-conducting material such as dry rope.

2.5.9 Mechanically fell any tree located within 1.5 times its height from safe clearance limit. Do not use conventional hand falling to fell trees within this perimeter. Employ specialized fallers or certified utility arborists if required in circumstances where the terrain or conditions do not permit the use of machines for mechanically felling trees. Use specialized falling techniques with the use of tree jacks, lines or other specialized felling practices as required.

3 REQUIREMENTS FOR ELECTRICAL SAFETY DURING CONSTRUCTION

The Contractor shall meet the following requirements for electrical safety during construction.

3.1 General Requirements

3.1.1 Review the project and determine any additional requirements necessary to ensure the safety of persons and property when steel pipelines share a common RoW with high-voltage AC powerlines. This includes, but is not limited to, prevention of the following:

- conductive coupling, capacitive coupling, inductive coupling, lightning and power surges
- shock hazards to humans and livestock, and/or physical damage to the coating or pipe due to high-voltage arcing

3.1.2 Make all Company and contract personnel aware of the potential for hazardous AC voltages on the pipeline or equipment including the following:

- inductive coupling occurring primarily with existing pipelines
- resistive coupling occurring as a result of a fault current from the power line grounds or towers due to a fault along the power line or lightning
- capacitive coupling occurring primarily with piping on sleepers (skids) or equipment operating near power lines

3.1.3 Ensure the pipe-to-ground AC voltage and/or current is monitored where the pipeline is installed, or maintenance work is undertaken, as follows:

- Monitor any pipeline located within a powerline RoW or pipeline RoW.
- Monitor any pipeline where the pipeline RoW and a powerline RoW are parallel to each and have adjacent boundaries within 100 m (330 ft) of each other.
- Monitor 500 m (1640 ft) of any lateral pipeline, from the junction or discontinuity with the powerline, where pipeline laterals tie into another pipeline that parallels a powerline.
- Monitor 500 m (1640 ft) of any portion of pipeline that veers, from the junction or discontinuity with the powerline, where pipelines parallel a high-voltage power line and veers from the parallel path.

3.1.4 Deem any pipe-to-ground AC voltage exceeding 15 volts (RMS) with respect to a saturated $Cu/CuSO_4$ reference cell unsafe for human contact, as per the National Electrical Code or Canadian Electrical Code as applicable.

3.1.5 Furnish all safety equipment and grounding devices required to comply with this Specification.

3.1.6 Provide a qualified person to be in charge of electrical safety where applicable, having the following:

- full awareness of proper grounding procedures and of the dangers associated with inductive and electrolytic coupling, power arc, lightning, fault currents, etc.
- knowledge of the proper safeguards for the construction equipment being used and the safe limit (distance) from overhead conductors required
- the instrumentation, equipment and authority required to maintain safe working conditions
- responsibility to communicate, at least daily, with the dispatcher controlling the involved electric lines, to ascertain any changes in loading or switching which might be expected during the work period

3.2 Temporary Grounding Crew Personnel Requirements

3.2.1 Provide a grounding crew, if not provided by the Company, consisting of two personnel with the following credentials:

- familiar with the applicable codes, standards and regulations
- training and experience to be deemed qualified in carrying out the necessary testing and mitigation procedures

3.2.2 Develop, and receive approval from the Company authorized representative for, grounding procedures and devices to be employed by the Contractor grounding crews.

3.2.3 Equip each Contractor grounding crew with the following:

- two pairs of rubber insulating gloves or mitts, in accordance with ASTM D120 (i.e., a minimum of Class 1 HV gloves with leather gauntlets)
- a digital multimeter capable of measuring root mean square (RMS) within ± 2% accuracy, voltage range up to 1000, and input impedance greater than 10 MΩ and certified CAT IV
- an AC clamp-on ammeter capable of accurate measurement from 1.0 amperes to 100.0 amperes and certified CAT IV
- 19 mm (¾ in) diameter x 1.82 m (6 ft) long galvanized steel McGraw Edison #9706-W or equivalent ground rods
- Burndy #GAR-6426 or equivalent ground rod clamps
- one ground rod driving device for installing and removing the ground rods

- AWG # 2- 7 Stranded bare copper conductor
- AWG #2/1665 strand copper, HMWPE #2, neoprene insulated, welding cable or equivalent grounding cable for temporary grounds and bonding
- two steel pipeline ground clamps suitable for the diameter of the pipeline as per *CSA-C22.3 (Appendix A)*

  Note: *CSA-C22.3* is a Canadian requirement and a recommended industry best practice for the U.S. and Mexico.

3.3 AC Voltage Measurement Requirements

3.3.1 Adhere to the guidelines outlined in *NACE International SP0177, "Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems",* for the procedure to measure induced or capacitive AC voltage.

3.3.2 Ensure the grounding personnel have measured the pipe-to-ground voltages for all pipe sections in close proximity to high voltage powerlines each day before beginning construction activity and immediately following construction activity, and have recorded the following information:

- pipeline station (chainage)
- date and time
- weather conditions
- pipe-to-ground potential

3.3.3 Ensure the grounding personnel measure the pipeline AC voltage-to-ground using a portable voltmeter as follows:

- Connect one terminal of the portable voltmeter to a copper-copper sulphate reference electrode placed on the earth.
- Connect the other terminal of the portable voltmeter to a sharp instrument (e.g., an awl) which is used to penetrate the coating to make contact with the underlying steel.
- Use rubber insulating gloves (i.e., minimum class 1 HV gloves) at all times for this measurement.
- Take caution, prior to measuring the pipeline AC voltage-to-ground, to make sure no one contacts the pipeline directly.

3.3.4 Proceed with work on the pipeline only if the pipe-to-ground induced AC voltage on the pipeline in the vicinity of the work site is equal to or less than 5 volts. If the pipe-to-ground AC voltage is greater than 5 volts, take special precautions relating to the induced AC voltage before proceeding with the work including:

- Use a recording AC voltmeter (i.e., data logger) to monitor the pipe-to-ground induced AC voltage at all times throughout the work.

- Mitigate the electrical hazard if the measured pipe-to-ground induced AC voltage becomes 10 volts or greater as per section 3.4.

3.4 Mitigation of Pipe-to-Ground Induced AC Voltage Hazard (i.e., AC Voltage exceeding 10 Volts) Requirements

3.4.1 Ensure grounding personnel wear high voltage rubber gloves in accordance with *CSA Standard Z259 4-M1979, Rubber Insulating Gloves and Mitts*.

Note: *CSA Standard Z259 4-M1979, Rubber Insulating Gloves and Mitts,* is a Canadian requirement and a recommended industry best practice for the U.S. and Mexico.

3.4.2 Complete thermite welding on exposed pipelines in accordance with the standard thermite weld procedure.

3.4.3 Install a pipe grounding clamp or attach a thermite connection to the pipeline at the work location wherever additional work beyond the thermite welding is required.

3.4.4 Connect an AWG # 2 bare copper cable between the pipeline grounding clamp and the grounding facility if there is an existing grounding facility in place at the work site and complete re-measurement of the pipe-to-ground AC voltage.

3.4.5 Proceed with the work if the pipe-to-ground AC voltage is less than 10 volts, but use a data logger to monitor the AC voltage at all times throughout the work.

3.4.6 Install four ground rods vertically in unfrozen earth if the pipe-to-ground AC voltage is greater than 10 volts. Arrange and connect the grounding rods as follows:

- in a square pattern
- symmetrically around the cable attachment location
- in series to a AWG #2 bare copper cable
- spaced 2m to 3m

3.4.7 Connect the grounding cable to the pipe grounding clamp and measure the pipe-to-ground AC voltage, and take the following actions:

- Proceed with the cable attachment work if the resulting pipeline voltage is less than 10 volts but continue to monitor the AC voltage.
- Place a grounding mat near the pipeline riser and connect to the pipeline grounding clamp if the pipe-to-ground voltage remains greater than 10 volts with ground rods driven at least 1.5m into the earth. Ensure all personnel stand on the mat during the cable attachment process.

3.5 Pipeline Grounding Requirements

3.5.1 Ground each piece of equipment used to handle pipe in any way (e.g., unloading, picking up, transporting, bending, or “setting-in”), where applicable, and equip it with a cable assembly capable of grounding the joints of pipe to the piece of equipment handling that pipe as illustrated in Figure 3-1, including the following:

- Complete the ground between the joint of pipe and the equipment involved with handling that joint of pipe, before any joint of pipe is picked up or moved in any way.
- Equip “setting-in” booms with ground cable, where applicable, and maintain the ground at least until the stringer bead is completed.

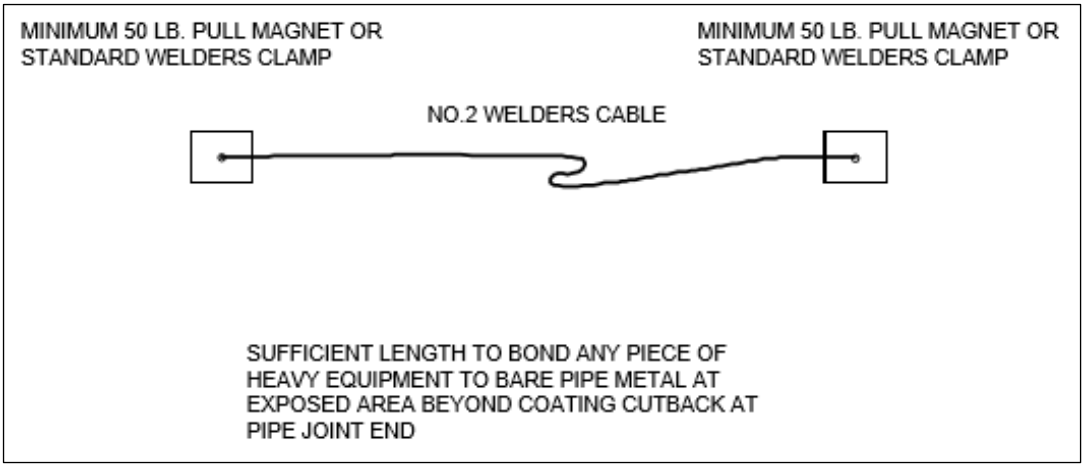


Figure 3-1: Approved Bonding Cable for Heavy Equipment, Fuel Trucks and General Use

3.5.2 Unload pipe from stringing trucks using equipment with grounding cable as described in requirement 3.5.1. Complete a ground between all joints of pipe to be unloaded and equipment unloading cables or slings attached to the pipe in areas of potential influence from electric lines.

3.5.3 Haul pipe to the RoW, stack according to the requirements of *TES-PROJ-STK Specification for the Temporary Stockpiling of Steel Pipe (CDN-US)* (EDMS No. 005415573) in 10 (or less) joint stacks in areas of electrical influence and complete the following:

- Ground each joint of pipe in the stack with a minimum size of 1.59 cm (5/8 in.) ground rod driven into the ground at least 1.22 m (4 ft) as illustrated in Figure 3-2.
- Maintain ground at all times until all individual joints of pipe are removed from the stack.
- Drive the ground rod and make the connection between the ground rod and ground cable before connecting the pipe and ground cable, when grounding joints or strings of pipe.
- Remove all cables in reverse order (i.e., disconnect the cable from the pipe first).
- Use single conductor AWG. # 2, 1715 strand welding cable, or equivalent, with mechanical strength and high conductivity for temporary grounding attachments.

- Attach cable attachments to the temporary grounding systems to achieve a current carrying capacity of at least 200 amperes. Apply firm pressure to the pipe metal and grounding to ensure a good electrical contact or achieve connections using the thermite weld process.

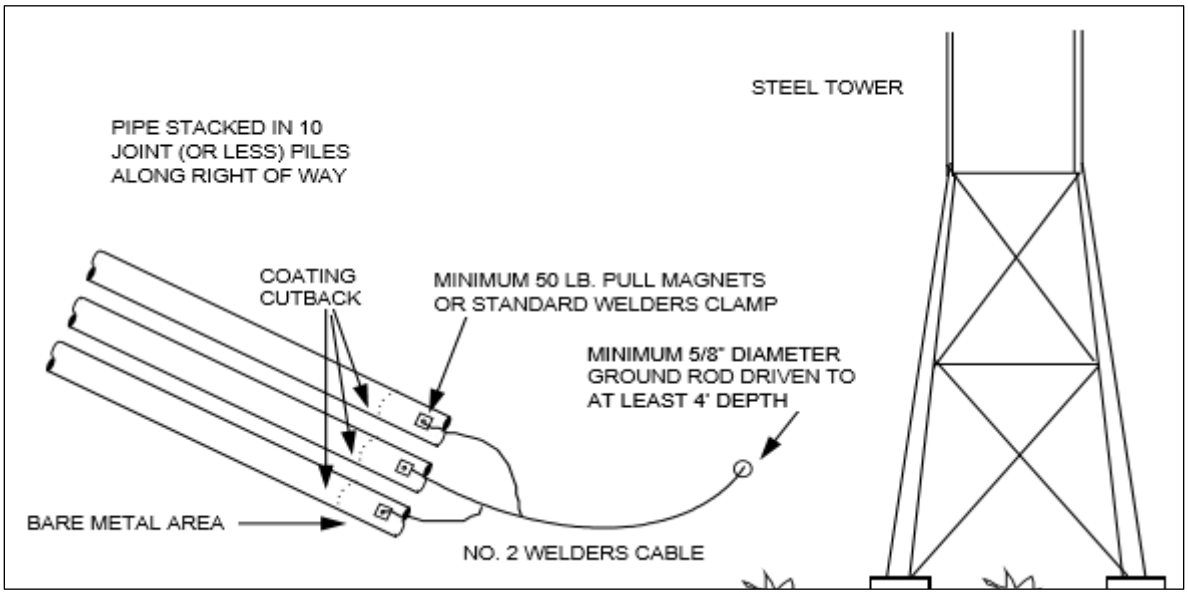


Figure 3-2: Approved Method of Stacking Pipe

Note: Magnets may also be placed on bare metal inside pipe joints. Remove all magnets prior to welding and backfill activities.

3.5.4 Make all grounding attachments or removals by, or under the direct supervision of, the person in charge of electrical safety (as identified in requirement 3.1.6).

3.5.5 Temporarily ground, where applicable, each string of welded pipe, between loose ends, to a ground rod at least 1.59 cm (5/8 in.) in diameter and driven to a depth of at least 1.22 m (4 ft) as illustrated in Figure 3-3, including:

- Ground at least two times, any string of continuously welded pipe in excess of 609.6 m (2,000 ft) on powerline RoW, such that grounds are no more than 304.8 m (1,000 ft) apart.
- Limit strings of pipe to 914.4 m (3,000 ft) in length unless longer lengths are authorized by the Company authorized representative.
- Maintain temporary grounds until the sections are tied into portions of line that have permanently been grounded with mitigation devices and backfilled.
- Bond together both sections of pipe when making tie-ins, and test to ensure that each is effectively grounded by measuring the potential between each loose end and ground. If this potential exceeds 15 volts AC, do not proceed with work until supplementary grounding is installed to reduce the potential to less than 15 volts AC.

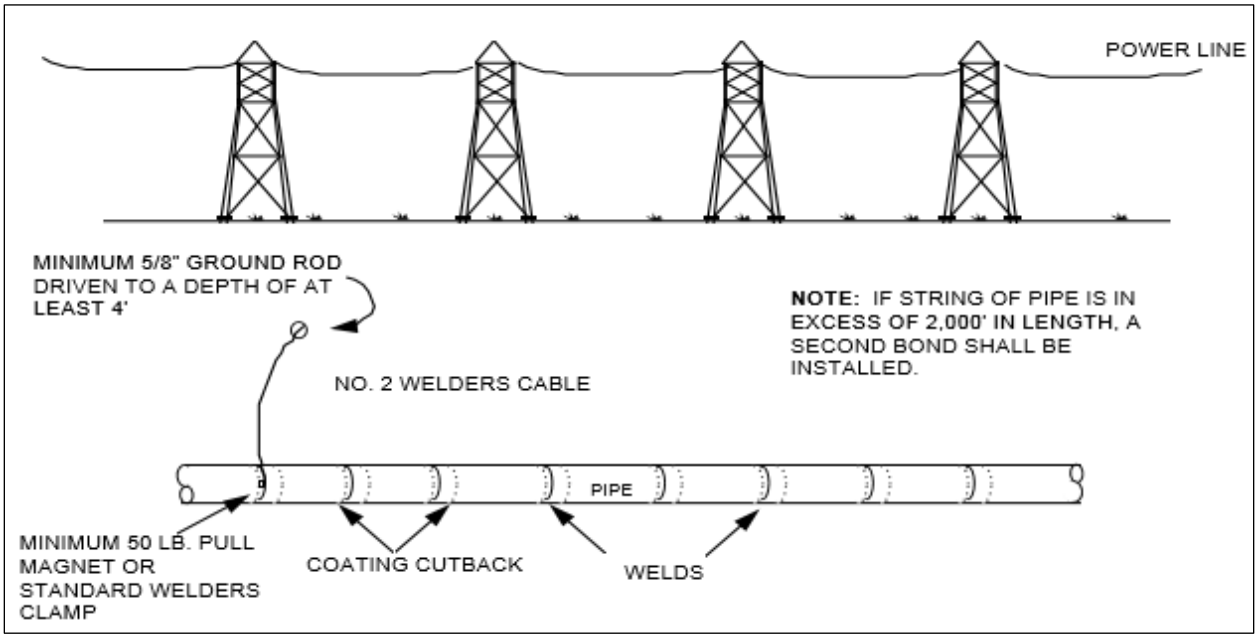


Figure 3-3: Approved Method of Grounding Welded Strings of Pipe

3.5.6 Measure the pipe-to-ground induced AC voltage of any string of pipe exposed to contact by personnel before any work starts, and periodically read the voltage between the pipe and a copper-copper-sulfate half-cell or steel pin (clean screwdriver at least 25.4 cm (10 in.) in the ground, or equivalent). Suspend work on the pipe string and use supplementary grounding until potentials are reduced to less than 15 volts AC if the pipe-to-ground AC voltage reaches 15 volts. Have the person in charge of electrical safety issue appropriate warnings in the event measured pipe-to-ground AC voltage exceeds 15 volts.

3.5.7 Unless specified differently in scope of work, consider use of bare road casings for additional grounding during construction by attaching a bond cable between any exposed metallic surface of the pipeline and the bare casing. Remove any bonds made for this purpose before backfilling.

3.5.8 Suspend work in the area of overhead high voltage powerlines during any thunderstorm activity. Ensure adequate communication with all personnel on site regarding work suspension and duration.

3.5.9 Ground each fuel truck and equip with a cable assembly capable of completing an electrical bond between the truck and any piece of equipment to be fueled. Create this bond every time prior to any part of refueling operation, and do not remove it until all refueling operations are completed. Take care to establish good electrical continuity where cable attachments are made.

4 VARIANCES

Any deviation shall follow the TransCanada Management of Change (MOC) Variance Procedure. External vendors shall contact the TransCanada Project Engineer for variance approval.

5 REFERENCES

This document relies on a number of references to regulation, industry codes and standards, general industry guidance as well as internal references. These documents are listed in Table 5-1, Table 5-2 and Table 5-3. Use the latest document revision, unless otherwise approved by TransCanada.

Table 5-1: Regulatory References

Organization/Document No.	Title
Canadian Standards Association (CSA)	Z259 4-M1979, Rubber Insulating Gloves and Mitts
NACE International	SP0177, Section 7, Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems.
Occupational Health and Safety Administration	1926.1408, Safety and Health Regulations for Construction, Power line safety (up to 350 kV) equipment operations

Table 5-2: External Industry References

Organization/Document No.	Title
For this Specification, there are no specific External Industry references.	

Table 5-3: Internal References

Document No.	Title
EDMS No. 005415573	TES-PROJ-STK Specification for the Temporary Stockpiling of Steel Pipe (CDN-US)

6 DOCUMENT HISTORY

Rev.		
01	**Description**	**Effective Date**
	New document.	2017-Aug-03
	Rationale Statement	**Responsible Engineer**
	This document was developed in order to address the following requirements: • Consolidation of specifications. The following specifications/documents have been combined into this document: – TES-PROJ-OHP Overhead Powerline Specification (CDN-US-MEX) – 70.002.055 Minimum Requirements for Pipeline Construction in Close Proximity of High Voltage AC Overhead Electric Power Lines	Paul Shaffer and Mike Fitzpatrick
	Impact Assessment Summary	**Document Owner**
		Paul Shaffer

7 DESCRIPTION OF CHANGE

Section	Description of Change
Regulatory	
N/A	N/A
Industry Standards	
N/A	N/A
General	
N/A	This Specification is a new document.

8 APPROVALS

APPROVALS		
Originator: Paul Sheffer / Manager of Compliance Construction Management Services	Signature	7/11/17 Date
Reviewer: Michael Spencer, P. Eng. / Principal Engineer Reliability Electrical	Signature	08/01/2017 Date
Reviewer: Richard Patry, PI CMS Projects	Signature	Aug 01, 2017 Date
Reviewer: Pat Petrie, / Electrical Lead TCPL COE	Signature	July 13/17 Date
Reviewer: Mike Fitzpatrick, P.Eng TCPL COE	Signature	Aug 2/2017 Date
Reviewer: Nathan Slanker / Safety U.S. Projects	Signature	8-1-17 Date
Reviewer: Mike Ferenchick, P. Eng. / Senior Engineer Corrosion	Signature	7/13/2017 Date
Reviewer: Antonio Cordido, Mexico Projects Implementation	Signature	AUG - 1st / 2017 Date
Responsible Engineer: Paul Shaffer / Manager of Compliance Construction Management Services	Signature 8/2/17 Date	
Management Endorsement: Roderic Egert, Director Commissioning and Construction Management Services	Signature	8/3/17 Date

APPENDIX A MINIMUM CLEARANCE DISTANCE METERS (FEET)

(Modified: See ** below)

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
Up to 50	7.5m (25ft)**
Over 50 to 200	7.5m (25ft)**
Over 200 to 350	7.5m (25ft)**
Over 350 to 500	7.5m (25ft)
Over 500 to 750	10.7m (35ft)
Over 750 to 1000	13.7m (45ft)
Over 1000	(as established by the utility owner/ operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)

Note:

The value that follows “to” is up to and including that value (e.g., over 50 to 200 means up to and including 200kV).

** Based upon OSHA Occupational Health and Safety Administration Minimum Safe Clearance Distances Table with minimum distance increased to 7.5m (25 ft) to meet TransCanada standard.

Exhibit 1

ENVIRONMENTAL CONSTRUCTION STANDARDS

WEST VIRGINIA PROJECTS - 2016

January 2016 (Revised February 2018 for the Mountaineer Xpress Project)

Columbia Pipeline Group
Charleston, West Virginia

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I. Introduction

Columbia is committed to complying with the applicable environmental rules and regulations of federal, state, and local governments. Columbia's goal is to meet these requirements in the pursuit of a cleaner, safer environment for future operations.

Recognizing this goal, it is Columbia's policy that all construction, operation and maintenance activities be conducted in a safe manner that minimizes impacts on stream and wetland ecosystems, wildlife habitat, cultural resources and the human environment.

To this end, Columbia has prepared these Environmental Construction Standards (ECS). The ECS provides the minimum requirements to be applied to all construction, operation and maintenance activities.

The general objective of this ECS is to provide Columbia personnel and Columbia's contractors with instructional information, complete with a practical approach to environmental concerns which can arise before, during and after facility construction. More specific objectives include:

- Minimize impacts to environmentally sensitive areas;
- Use the minimum land required for safe and efficient construction, operation, and maintenance of the facilities;
- Prevent erosion and sedimentation during construction; and
- Complete construction in a safe and timely manner.

Words and/or phrases which have special meaning (shown in **bold** at first occurrence in text) and acronyms have been defined in Section VIII (Definition of Terms).

The intent of the ECS is to confine project-related disturbance to the identified **construction work areas (CWA)** and to minimize erosion and enhance re-vegetation in those areas. Any project-related ground disturbance (including erosion) outside of these areas is subject to compliance with all applicable survey[1] (see superscript note in Section VI) and mitigation requirements.

The ECS is focused primarily on pipeline related construction, operation, and maintenance. However, it can be equally applied to all Columbia facilities, for example, storage facilities including well locations, compressor stations, horizontal directional drill locations and measurement/regulation stations. This ECS shall be used as the base document from which Columbia will build individual project-specific Environmental Management and Construction Plans (EM&CP) as called for in Columbia's Policy and Procedure, Plan 120-10. The EM&CP may include written recommendations from the local soil conservation authorities or land management agencies for both temporary and permanent erosion control and re-vegetation specifications. Federal, State, and local

agencies with regulations more stringent than this ECS shall supercede[2] (see superscript in Section VI).

II. Upland Construction

A. General

This chapter describes typical upland pipeline construction.

The upland pipeline construction spread operates as a moving assembly line performing specialized procedures in an efficient, planned sequence. Figure 1 presents the typical upland pipeline construction sequence. In addition, special construction crews install and alter fences, bore under roads and railroads, install stream and wetland crossings that are not done by conventional upland techniques, and construct valve settings and meter/regulator stations.

While construction work is ongoing, the construction work area will be kept clean of all rubbish and debris resulting from the work. Excess construction materials and debris will be collected, contained, and disposed of at regular intervals. This includes timber, slash, mats, garbage, drill cuttings and fluids, as well as excess rock. Non-hazardous materials and waste shall be disposed of in an approved landfill. Hazardous waste shall be disposed of in accordance with Columbia policies (Plan 120.03 and 120.04) and federal, state and local regulations.

The required public notice/entrance sign will be posted at or near the entrance to the site within 24 hours of submitting the application, and kept posted for the duration of the project. Given the linear nature of most of Columbia's construction, one point along the project will be chosen to install and maintain the public notice/entrance sign. See Figure 27 for public notice/entrance sign template.

B. Right-of-Way Width

For 14-inch or larger diameter pipelines on new alignments, Columbia typically utilizes a 50-foot wide permanent right-of-way (ROW plus a 25-foot wide temporary construction ROW as illustrated in Figure 2). After the construction work area is restored, the temporary work areas are allowed to revert to their previous uses. The permanent ROW is maintained as Columbia's permanent ROW for the facility. Figure 2 also illustrates the typical pipeline construction work area when paralleling existing facilities.

In addition, there may be instances where extra work areas are needed for topsoil conservation, side hill construction, equipment staging, pipe and material storage, borrow and disposal areas, temporary and permanent access, and related construction activities. Such areas will be identified in the project plan and will undergo all required environmental and cultural resources reviews prior to use. In contrast, pipelines may be constructed through confined areas such as extremely steep and narrow ridges. Alternate construction methods may be required in

narrow construction work area situations to safeguard workers, equipment, the pipeline, and the environment.

For 12-inch and smaller diameter pipelines, a 50-foot wide ROW is typically used due to a narrower trench and the use of smaller equipment. The typical 50-foot ROW is illustrated in Figure 3. In addition, there may be areas where extra construction work areas are needed as described above.

For non-pipeline construction activities, such as storage well locations and station projects, the construction work area and permanent ROW may vary and can be dependent on property lease, property owner agreements, and/or local topography. For example, the construction work area for a typical storage well is 200 feet by 200 feet and the permanent ROW is a 300 foot radius around the well.

All project-related ground disturbance shall be limited to the construction right-of-way, extra workspace areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the FERC's Orders, and/or other federal/state/local environmental permits. This does not apply to activities needed to comply with the FERC Plan and Procedures (i.e. slope breakers, energy-dissipating devices, dewatering structures, drain tile system repairs) or minor field realignments and workspace shifts per landowner needs and requirements that do not affect other landowners or sensitive environmental resource areas. All construction or restoration activities outside of the approved limit of disturbance detailed in the EM&CP are subject to all applicable survey and permit requirements, as well as landowner easement agreements and must be cleared through the Natural Resource Permitting Group prior to that activity.

C. Clearing

The construction work area is cleared to the width specified in the ROW agreements or EM&CP, whichever is less. During clearing operations, all brush and trees will be felled into the construction work area to prevent off-construction work area damage to trees and structures.

The clearing crew and related equipment, as well as equipment necessary for installation of equipment crossings, will be permitted a single pass through streams prior to equipment crossing installation. Federal, State and local agencies having regulations more stringent than this shall supercede[2] (see superscript note 2).

Should substantial soil disturbance take place during clearing, install temporary erosion and sedimentation controls as described in section D-3.

1. Wood Products

Wood Products (i.e., saw logs, pulpwood or cordwood) are the property of the landowner unless otherwise specified. They will not be used for any purpose unless permission is first obtained from the landowner. When the landowner

requests the salvage of these materials or approves wood products to be stockpiled and left on site, they will be stockpiled just off the edge of the construction work area, but not within 50 feet of streams, floodplains, or wetlands. Equipment stacking the wood products will not leave the construction work area. Usable timber that measures at least 10 inches in diameter at the butt will be cut into pole lengths (12-14 feet) or as otherwise negotiated with the landowner. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey; landowner approval and mitigation requirements.

2. Brush

All cleared brush will be disposed of by one of the following methods:

- Brush may be piled just off the edge of the construction work area but not within 50 feet of streams, floodplains or wetlands. Equipment stacking the brush will not leave the construction work area. Brush piles will be constructed a maximum of 12 feet wide and compacted to approximately 4 feet high, with periodic breaks at a minimum of every 200 feet to permit wildlife travel. Breaks should be no smaller than 4 feet wide to allow wildlife travel. Brush piles will be kept separate from usable timber and care will be taken to prevent mixing of soil and brush. The landowner should be consulted to determine acceptable brush pile locations along the construction work area. Landowner approval is required for this method.

- Brush may be burned where permitted by law. The necessary burning permits will be obtained. Fires will be of reasonable size and located and patrolled so that they will not spread off the construction work area.

- The brush may be chipped and given away, buried, or thinly spread (less than 2 inches thick) over the construction work area or blown off the construction work area (per landowner agreement and approvals) except in **agricultural lands** or within 50 feet of streams, floodplains, or wetlands. Chipping will be limited to those areas where agreed to with the landowner. If wood chips are used as mulch, do not use more than 1 ton/acre (One ton of chips spread 1 inch thick cover approximately $^1/_4$ acre.). During **restoration**, soil will be augmented by the addition of 11 pounds of nitrogen per ton of chips to aid re-vegetation, at least half of which must be slow release.

- Brush may be hauled off-site; off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner approval, and mitigation requirements.

3. Fence Crossings

Where it is necessary to remove fences, adequate temporary fences or gates as illustrated in Figure 4 will be installed immediately or in accordance with landowner agreement. Such temporary fences or gates will be kept closed, except when necessary for construction purposes per landowner agreement. Once construction is completed, permanent fence repairs will be completed. All fences that have been cut or removed will be permanently repaired during restoration to match the original type of the fence as much as possible. Where there is any doubt as to the usability of old fence material, new material will be used in making repairs. Fence repairs will be subject to the approval of the landowner.

D. Grading

Grading is necessary to provide a smooth and even surface for safe and efficient operation of construction equipment. Grading will be the minimum amount necessary and includes installation of erosion control devices such as interceptor diversions, **sediment filter devices**, and equipment crossings at streams to minimize soil loss and subsequent sedimentation.

1. Tree Stump and Rock Removal and Disposal

Tree stumps and large rocks will be cut, graded, or removed as necessary to permit construction and to provide adequate clearance for mechanical equipment and other vehicles. Tree stumps that are adjacent to roads will be cut close to the ground or removed.

Stumps and large rocks will be disposed of in the following manner with landowner approval. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner approval, and mitigation requirements.

- Buried within the construction work area except in agricultural, residential, or wetland areas;
- Windrowed just off the edge of the construction work area with landowners' permission. Windrows will be a maximum of 12 feet wide with periodic breaks a minimum of 200 feet apart;
- Hauled from the site and disposed of in an approved landfill or other suitable area.

2. Topsoil Conservation

Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus

soil side method) in:

- Actively cultivated or rotated croplands and pastures;
- Residential areas;
- Hayfields; and
- Other areas at the landowner's or land managing agency's request.

In deep soils (more than 12 inches of topsoil), segregate at least 12 inches of topsoil. In soils with less than 12 inches of topsoil make every effort to segregate the entire topsoil layer. Segregated topsoil may not be used for padding the pipe, constructing temporary slope breakers or trench plugs, improving or maintaining roads, or as fill material. Figure 5 illustrates topsoil conservation techniques.

The topsoil will be stockpiled separately from all subsoil and will be replaced last during backfilling and **final grading**. Where topsoil is stripped from the entire construction ROW, an additional 25-foot wide temporary work area may be used for topsoil storage with landowners' permission and appropriate environmental approvals. The controls used along the right-of-way will also serve these additional areas, where practicable. The **Environmental Inspector** will determine if additional erosion control devices, aside from those indicated in the details, are needed in topsoil storage areas. Stabilize topsoil piles and minimize loss due to wind and water erosion with the use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary and/or required by environmental permits.

In residential areas, topsoil replacement (i.e., importation of topsoil) is an acceptable alternative to topsoil segregation.

3. Erosion Control Devices

Temporary erosion controls will be installed prior to or during the initial disturbance of soil. The most effective and versatile erosion control devices are interceptor diversions (temporary slope breakers) and sediment filter devices as illustrated and described in Figures 6A, 6B, 7A, 7B, and 7C, as well as other approved devices. Temporary diversions will be maintained during the construction phase until final diversions are installed. Where required grading has significantly reduced the slope, the Environmental Inspector may require fewer temporary diversions consistent with the table on Figure 6A. On steep slopes or other areas of special concern which may be prone to landslides, the spacing of the interceptor diversion shall be adjusted in accordance with the table on Figure 6A.

Jute netting as illustrated in Figures 12A and 12B or equivalent approved by the Environmental Inspector may be used on **steep slopes** to help stabilize the construction work area. Do not use coconut fiber erosion control blanket/netting.

Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way. Install belted silt retention fence or equivalent at the end of each slope breaker in accordance with Figure 7C. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive environmental resource areas. Slope breakers may extend slightly (about 5 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area if the appropriate state or local governing agency allows the extension.

Sediment barriers may also be necessary and are intended to stop the flow of sediments and to prevent the deposition of sediments beyond approved workspaces or into sensitive resources. At a minimum, install and maintain temporary sediment barriers across the entire 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 a waterbody, wetland, or road crossing until vegetation is successful. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary, to prevent sediment flow into the wetland or waterbody.

For silt fence installation, the bottom will be buried 4-6 inches deep, backfilled and compacted with stakes placed 8 feet apart (see Figure 7A). Silt fence and belted silt fence will be cleaned out when sediment builds up to half its height or maintained/ replaced if damaged. Super silt fence installation and maintenance will be in accordance with Figure 7B.

All temporary erosion control devices, including roadside ditches, will be inspected near the end of each work day or after each storm (rain) event of 1/2 inch or greater, to ensure proper functioning. Any devices damaged beyond functioning will be repaired **promptly**.

4. Temporary Road Entrances

Temporary road entrances illustrated in Figure 8 will be installed during grading where the construction work area crosses paved public roads when needed to maintain safe conditions and to prevent tracking soil and mud onto public roads. These installations are designed to remove mud from vehicle tires and tracks before accessing the road. Minimize the use of tracked equipment on public roadways. Geotextile fabric will be used as illustrated in Figure 8. The

roadbed should be cleared of small stubs which tend to puncture the fabric, thereby allowing fine particles to mix with the gravel. If necessary, up to 6 inches of soil will be removed prior to installation of the temporary road entrance to ensure a hard base for geotextile fabric and rock placement. Geotextile fabric is not required at existing, graveled access road entrances. If gravel is to be left after construction, landowner approval is required. In addition, public roads will be inspected, swept, shoveled and/or scraped as necessary to keep the road surface safe and remove any debris originating from the project. If the public road is gravel, the temporary entrance is still required to be graveled. Any damages to roadway surfaces, shoulders, and bar ditches will be repaired. Typical erosion control measures at road crossings are illustrated in Figure 9. If no access is required onto the roadway the installation of a construction entrance is not required, however, safety fencing may be installed across the ROW and signs designating “no entrance” may be erected to avoid any unintentional entrances.

E. Access Roads

Typically, Columbia requires access roads to the construction and staging areas. New access roads will be built only if existing access is inadequate. The access roads will be a maximum 25 feet wide with additional width in tight turns and at intersections with public roads (this additional width must be included in the environmental surveys). Approximate location and alignment of these access roads will be shown on the project map submitted with the application. These roads will either be temporary (used for access during construction only) or permanent (used during and after construction for operation and maintenance of the facilities). All public roads are available for use as access roads without further environmental review however; all private access roads intended for use are subject to environmental reviews. Safe and accessible conditions will be maintained at all roadway crossings and access points during construction and restoration.

If tree clearing is needed for access road use, trees will be felled into the CWA of the access road itself. All trees and brush will be windrowed at the edge of the access road, with usable timber kept separate. Access road gradient will be as flat as local topography will practically allow. By breaking or changing grade frequently, fewer erosion problems will be encountered than on long, straight, continuous gradients. Interceptor diversions and/or other erosion and sediment control devices will be installed where practicable. All access roads will be maintained to provide safe access, as well as sediment control.

Roads will cross streams and wetlands as close as possible to right angles. Road gradients approaching these crossings may be flattened to decrease runoff velocity. Runoff may be dispersed just prior to the crossing by means of an interceptor diversion with a sediment filter device (compost filter sock) at the outlet. See Figures 25 and 30 for detail. Where conditions permit, new roads will be located at least 25 feet from any stream or wetland except at crossing locations. Culverts will be sized and placed to permit water flow under the access road.

Additional culverts will be placed at intervals along roadside ditches to capture and manage runoff draining by sheet flow to the access roads. The cross-drain culverts will be spaced a maximum of 300 feet apart and used to convey runoff underneath the access road to a stabilized outlet structure. Rock check dams will be placed at intervals along the roadside ditches to decrease water velocity. See Figures 23A, 23B, 31A, and 31B for details.

Broad-base dips will be installed to decrease runoff velocity along the surface of the access road. Broad-base dips will be spaced a maximum of 300 feet apart. Broad-base dips are not required along sections of access roads that will have roadside ditches and cross-drain culverts (see above). See Figure 35 for details.

After construction, temporary access roads (including any additional width used for construction) will be graded and left intact for the landowner's benefit or removed and the area restored using the same specifications as applied to the rest of the construction work area.

F. Residential Areas

The following mitigation measures will be implemented for all residences within 50 feet of the construction work area:

- Mature trees and landscaping will not be removed from within the edge of the construction work area unless necessary for safe operation of construction equipment or as specified in landowner agreements;

- Immediately after backfilling the trench, all lawn and landscaping will be restored to final restoration, or temporary restoration pending weather and soil conditions;

- While the trench is open, the edge of the construction work area adjacent to the residence will be safety fenced for a distance of 100 feet on either side of the residence to ensure that equipment, materials and spoil remain within the construction work area;

- A minimum of 25 feet will be maintained between the residence and construction work area for a distance of 100 feet on either side of the residence. If the facility must be within 25 feet of a residence, it must be installed such that the trench does not remain open overnight.

If seasonal or weather conditions prevent compliance with these time frames, temporary erosion controls must be monitored and maintained until conditions allow completion of restoration.

G. Trenching

1. Trenching Specifications

Typically, the trench will not remain open for more than 30 days in any area unless authorized by the Environmental Inspector (additional restrictions for stream and wetland areas are provided in Section III).

- As the trench is completed, trench line breakers, as illustrated in Figure 10, will be installed promptly at every second temporary interceptor diversion at a minimum, or at increased intervals as approved by the Environmental Inspector. Topsoil will not be used to construct the breakers. The breakers reduce water velocity and erosion of the trench bottom. The breakers will be maintained promptly.

- Sediment filter devices will be installed around spoil storage areas before digging bore pits, stream crossings, and wetland crossings.

- If it is necessary to pump water from the trench or bore pits, the water will be pumped into a heavily vegetated upland area where the water will filter back into the ground, a sediment filter bag as illustrated in Figure 29, and/or through a sediment filter device such as a series of sediment logs at least 10 feet from any stream or wetland in order to minimize erosion and subsequent sedimentation of streams or wetlands. If little vegetation is present, filter sock containment will be added around the filter bag for additional sediment control. Water impounded in the trench will not be released directly or by overland flow into any **waterbody** or wetland. Dewater the trench in a manner that does not cause erosion and does not result in silt laden water flowing into a waterbody or wetland.

When the trench must remain open for a greater length of time, appropriate erosion controls and safety measures will be employed as directed by the Environmental Inspector.

2. Blasting

All drilling and blasting will be done in a cautious manner. Suitable precautions will be taken to avoid injury or damage to persons, livestock, or other property.

If blasting is necessary within 150 feet of residential or commercial buildings, an independent contractor will be hired to perform pre- and post-blast structural inspections and, if necessary, seismographic monitoring.

In those instances where blasting has the potential to affect water quantity/quality from domestic or agricultural wells or springs in the proximity of the construction work area, Columbia will conduct pre- and post-blasting (within two months of construction work restoration) testing of water wells within an

appropriate distance (typically 150 feet) of the pipeline with landowner permission. These tests may include a pump inspection, flow rate, and bacteriological cultures. If a water well is damaged as a result of Columbia's activities, Columbia will provide a temporary source of water and/or compensate the owner.

3. Temporary Construction Access over the Trench Line

Where access across the trench line is required, temporary facilities such as trench plugs and fences, wooden mats or steel plates will be constructed or installed to permit safe crossing of livestock, vehicles, equipment, and persons from one side of the trench to the other.

4. Drainage Tile and Irrigation Facilities

Attempt to locate existing drain tiles and irrigation systems. Columbia personnel will contact landowners and/or the local National Resource Conservation Service (NRCS) to determine the locations of future drain tiles that are likely to be installed within 3 years of the authorized construction, if planned, the pipeline will be installed at a sufficient depth to accommodate the drainage tile. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s) and within US Department of Transportation (DOT) specifications. Mark locations of drain tiles damaged during construction.

Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the project area, if available. Drainage tile removed, cut, broke, or otherwise damaged during construction will be repaired or replaced as illustrated in Figure 11. Temporary measures approved by the Inspector will be taken to provide suitable drainage until permanent repairs are made. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and landowner agrees.

Water flow will be maintained in crop irrigation systems unless shutoff is coordinated with affected parties.

H. Backfilling Specifications

Backfilling will follow pipe lowering as closely as practical. Topsoil will not be used to pad the pipe. Soil that has been excavated during construction and not used for backfill will be evenly spread over the cleared construction work area or removed from the site and properly disposed of at an approved disposal area. All waste materials such as barrels, cans, drums, stumps, coating and wrap, rubbish, or other refuse will not be placed in the trench.

Trench line barriers, as illustrated in Figure 10, will be placed in the trench prior to

backfilling to prevent water movement and subsequent erosion. An engineer or similarly qualified professional shall determine the need for and spacing of trench line barriers. Otherwise, trench line barriers shall be installed at the spacing illustrated in Figure 10 and up-slope of any permanent interceptor diversions. Trench line barriers may be constructed of materials such as sand bags or polyurethane foam. Foam barriers can be used if the appropriate State or Local governing agencies allow.

Excess rock, including blast rock, may be used to backfill the trench to the top of the existing bedrock profile. Care should be taken to not damage the pipeline.

I. Final Grading, Restoration and Stabilization

After construction activities, all disturbed areas will be stabilized with either (1) final grading and restoration; or (2) **temporary stabilization** measures, in order to prevent erosion and sedimentation until final grading and restoration can be completed. If construction or restoration unexpectedly continues into the winter season when conditions could delay successful de-compaction, topsoil replacement, or seeding until the following spring, file with the Secretary for review and written approval of the Director, a winter construction plan. This does not apply to projects constructed under the automatic authorization provisions of FERC's regulation.

1. Final Grading

Final grading will be completed within 20 calendar days of backfilling (10 days in residential areas), weather and soil conditions permitting. Should unsuitable soil conditions persist, or be expected to persist, for more than 20 calendar days (10 days in residential areas), the Environmental Inspector will record the conditions and require the installation of temporary stabilization measures, and final grading and restoration will be delayed. In no case shall final grading be delayed beyond the end of the next recommended seeding season.

If final grade can be established, but conditions are not ideal for permanent seeding, the Environmental Inspector will specify application of temporary stabilization measures (including temporary seeding and mulching) and may also consider concurrent application of final seed mix and mulch as provided in Table 2A, or per the local conservation authority. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed, inspected, and maintained. When access is no longer needed, the travel lane must be removed and the right-of-way restored to pre-construction contours.

During final grading, soil over the trench may be mounded to allow for future settling. Where fill in the trench or major depressions have settled below ground level, additional fill will be added as needed, and the area brought to final grade. The Environmental Inspector may approve a temporary travel lane in the construction work area, where needed, to facilitate the remainder of construction and/or restoration. This travel lane must be restored when access

through the area is no longer required. Conserved topsoil will be returned during final grading.

Excess rock will be removed from at least the top 12 inches of soil, to the extent practicable, in all actively cultivated or rotated agricultural land, hayfields, pastures, residential areas, and other areas at the landowner's request. The size, density, and distribution of rock on the construction work area should be similar to adjacent areas not disturbed by construction. Diligent efforts will be made to remove rocks greater than 4 inches if off- construction work areas do not contain rocks greater than 4 inches. The landowner may approve other rock size provisions in writing. Rock that is not returned to the trench is considered construction debris, unless approved for use as mulch or for some other use on the construction work area by the landowner or land managing agency. All construction debris from all work areas must be removed unless the landowner or land managing agency approves leaving materials onsite for beneficial reuse, stabilization, or habitat restoration.

Final erosion control devices including interceptor diversion/slope breakers will be installed during final grading. Sediment filter devices needed to protect off-construction work area resources will be re-installed or rebuilt promptly after final grading. See Figures 6A and 6B for installation and spacing details. Final diversions will be constructed such that water does not pond in them and is conveyed off the right-of-way. Final interceptor diversions will not be installed in agricultural or pasture land without landowner's consent.

2. Soil Compaction Testing

Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to identify approximate preconstruction conditions. Use U.S. Army Corps of Engineers-style cone penetrometers or other appropriate devices to conduct tests.

Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil. Alternatively, make arrangements with the landowner to plant and plow under a "green manure" crop, such as alfalfa, to decrease soil bulk density and improve soil structure. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

Perform appropriate soil compaction mitigation in severely compacted residential areas.

3. Restoration

Restoration as defined in Section VIII (Definition of Terms), will begin within 6 days of final grading, weather and soil conditions permitting. Fertilizer and lime will be disked into the soil (except rocky soils) to a depth of 3 to 4 inches to prepare a seedbed. In rocky soils, fertilizer and lime may be incorporated into the soil with tracked equipment. Seeding and mulching the construction work area will promptly follow seedbed preparation. Ensure that mulch is adequately anchored to minimize loss due to wind and water. Mulch tackifiers used in accordance with the manufacturers recommendations may be used as an alternative. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies.

The typical application rates for lime, fertilizer, seed, and mulch are listed in Table 2A. They will be used unless the right-of-way agreement, permit or local NRCS provides project-specific recommendations. If tall fescue is used, plant endophyte free certified seed.

If hydroseeding is utilized, lime and fertilizer applications should be equivalent to Table 2A unless ROW agreement, permit, or the local NRCS provides project specific recommendations.

Hay or straw mulch shall be applied in accordance with Table 2A over hydroseeding. Hydromulch can be used in conjunction with (for texture purposes) but not substituted for hay or straw mulch. **Scarify** the seedbed to facilitate lodging and germination of seed.

Uniformly apply and cover seed in accordance with the written recommendations of the local soil conservation authorities or land management agencies.

Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing. Treat legume seed with an inoculate specific to the species using the manufacturer's recommended rate of inoculant appropriate for the seeding method. If the above recommendations are not available for conventional seeding, use 4 times the manufacturers recommended rate of inoculate. For hydroseeding, use 10 times the manufacturer's recommended rate of inoculate.

In the absence of recommendations from the local conservation authority, a seed drill equipped with a cultipacker is preferred for application, but broadcast or hydroseeding can be used at double the recommended seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker, roller or other suitable means after seeding. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be approved by the Environmental Inspector.

Restoration will not be performed in agricultural lands from the beginning of the spring thaw through May 15 unless requested by the landowner. Restoration will be coordinated with the landowner's planting schedule. Grazing deferment

plans will be developed with willing landowners, grazing permittees, and land management agencies as appropriate to minimize grazing disturbance of re-vegetation efforts.

Permanent seeding, liming, and fertilizing may be performed by the landowner. The Environmental Inspector will ensure that the restoration is satisfactory and consistent with the regulatory requirements.

Restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

Jute netting as illustrated in Figures 12A and 12B or equivalent approved by the Environmental Inspector may be used on **steep slopes** to help stabilize the construction work area. Do not use coconut fiber erosion control blanket/netting.

Synthetic monofilament mesh/netted erosion control materials should not be used in areas designated as sensitive wildlife habitat, unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.

Restoration shall be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris removed (unless requested otherwise by the landowner or land managing agency), re-vegetation is successful, and proper drainage has been restored.

Re-vegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, re-vegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.

4. Temporary Stabilization

Seeding and mulching rates are provided in Table 2B. Consideration will be given to the following when determining if temporary stabilization measures are to be implemented:

- If final grading and installation of permanent interceptor diversions or slope breakers will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas);

- Anticipated weather conditions;

- Resources on and off the construction work area to be protected. If temporary stabilization measures are utilized, final grading and/or

restoration must commence once weather and soil conditions permit;

- Construction or restoration activity is interrupted or won't take place for extended periods (greater than 21 days).

Apply mulch in accordance with the specifications outlined in this section, however; during temporary restoration increase mulch application on all slopes (8 percent or more) within 100 feet of waterbodies and wetlands to a rate of 6,000 lbs/acre (3 tons).

5. Restoring Man-Made Structures

All existing man-made installations that are disturbed or damaged during construction along new ROW will be repaired or replaced and left in equivalent or better condition than they were found prior to construction, unless alternative arrangements made with landowners dictate otherwise. Man-made installations on existing ROW that are disturbed or damaged during construction will be addressed consistent with Columbia's encroachment policy.

6. Off-Road Vehicle (ORV) Control

Columbia will discuss with each landowner and park manager along new ROW (not adjacent to existing ROW) in forest lands the need for ORV control. If requested, one or more of the following ORV control measures will be installed:

- Plant conifers (pine trees) across the construction work area. The spacing of trees and length of construction work area planted should provide for adequate facility maintenance but should be sufficient to limit access and to screen the ROW from view. Trees will not be planted directly over the pipeline.

- Install a slash and timber barrier, a pipe barrier, or a line of boulders across the construction work area to restrict vehicle access.

- Install a locking gate with fencing extending a reasonable distance to prevent bypass.

- Install "No Trespass" signs.

J. Noise Impact Mitigation and Dust Control

Construction equipment will be properly muffled and maintained to avoid producing excessive noise near **noise sensitive areas**.

Efforts will be made to control fugitive dust along all portions of the project including at sensitive areas such as residential areas and road crossings. Water trucks will be used, at a minimum, to dampen the work area if dust becomes a problem.

K. Other Controls

All projects will be maintained as clean and orderly. All solid wastes and construction/demolition, material will be disposed of in accordance with the Code of West Virginia and Legislative Rule Title 33, Series 1 (Solid Waste Management Rule).

All erosion and sediment controls on the site will be inspected at least once every seven calendar days and within 24 hours after any storm event greater than 0.5 inches of rain per 24-hour period. Inspections will be documented. Records of these inspections will be kept on-site and made available for review by regulatory personnel.

Employees will be trained on the components and goals of the SWPPP including spill response, housekeeping, and routine inspection of E&S controls.

L. Hydrostatic Testing

Typically, Columbia verifies a facility's integrity by hydrostatic testing. Water can be drawn from local sources (streams, ponds, public water supplies) in a manner that will minimize impacts to the environment and other existing users, while maintaining adequate stream flow. Water from state designed *high quality streams* or *exceptional value waters*, waterbodies which provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies will not be used unless other water sources are not readily available and the appropriate federal, state, or local agency permits its use.

Intake hoses will be screened.

Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

All required federal, state, and local approvals for the withdrawal and/or discharge of hydrostatic test water will be obtained prior to such activities.

Comply with all approval/permit conditions which may include notifying the appropriate state agency of withdraw/discharge, collection of samples in accordance with permit conditions where required and discharging in a manner to meet all discharge parameters where required.

Maintain adequate flow rates to protect aquatic life and provide water for downstream withdrawals by existing users.

All welds will be radiographically inspected or hydrostatically tested before pipe installation under waterbodies or wetlands.

The discharge of the hydrostatic test water will be performed in a manner that

minimizes erosion. The energy of the released test water will be dissipated by discharging the water:

- Into a well-vegetated upland area;
- Into a tank(s);
- Into a body of water (with all required permits and meeting all conditions); or
- Through a sediment filter device and/or a sediment trap to filter out various particulate matter or allow it to infiltrate through the soil. See Figure 33 for details.

If necessary, regulate the water discharge rate, use energy dissipation device(s); and/or install sediment barriers to prevent erosion, scour, suspension of sediments, or excessive stream flow. During the discharge, the Environmental Inspector must ensure that erosion and sedimentation are properly controlled.

Do not discharge into waters from state designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies unless the appropriate federal, state, or local agency grants permission.

Methanol may be injected after discharging the water, to dry the pipe. Excess methanol will be retrieved from the facility and used during subsequent operation of Columbia's facilities.

This guidance is for hydrostatic testing of new pipe. Permitting requirements associated with hydrostatic testing of used pipe can be extensive. Contact the NRP Group prior to testing any used pipe.

M. Post Construction Activities and Reporting

Follow up inspections must be conducted of all disturbed areas, as necessary, to determine the success of re-vegetation and address landowner concerns, at a minimum, follow up inspections must be conducted after the first and second growing seasons. If re-vegetation is unsuccessful, continue re-vegetation efforts until adequately restored.

Quarterly reports must be filed with the Secretary documenting the results of follow up inspections; any problem areas, including those identified by the landowner; and corrective actions taken for at least 2 years following construction. This does not apply to project construction under automatic authorization, prior notice, or advanced notification provisions in the FERC's regulations.

N. Slip Prevention Measures

Additional controls will be implemented to protect slopes at 3:1 grade or steeper and minimize further soil erosion and/or slips due to seeps, springs, and surface runoff that can percolate into the soil strata during and/or after earth disturbance and excavation. Seeps, springs, and surface runoff have potential to cause slips by saturating the soil, resulting in lower resistance to movement. A combination of erosion and sediment controls and good work practices will minimize the potential for slips and other impacts from surface runoff, seeps, or springs.

Erosion and sediment controls may include, but are not necessarily limited to, rock-lined channels, silt fence, compost filter socks, temporary or permanent seeding, erosion control blanketing, rip-rap outlets, and side hill construction practices. Installing horizontal drains (i.e., subsurface drains, trench plug/trench breaker drains, and/or bleeder drains) to passively dewater these areas is an effective way to minimize the potential for slips. Figures 32A, B, C, D, E, F, and G contain additional information on slip prevention.

III. Stream and Wetland Crossings

A. Stream Crossings

1. General

The main objective of any waterbody crossing is to construct the pipeline in a manner which minimizes erosion and subsequent sedimentation into the waterbody. Crossings will be constructed as close as possible to right angles with the waterbody channel. Adequate downstream flow rates will be maintained at all times to protect aquatic life and prevent the interruption of existing downstream uses. Each waterbody crossing will be treated as a separate construction entity, such that trenching, pipe installation, backfilling and temporary stabilization or final restoration are completed in the minimum number of consecutive calendar days possible.

Whenever a time limit is imposed on a crossing procedure, that time limit is only applicable to trenching (except blasting), lowering in, and backfilling. Clearing, grading and equipment crossing installation and removal activities are not included as part of the separate construction entity. Construction equipment will not be allowed in the water except as provided in this Section.

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

- Coldwater Fisheries: June 1 through September 30
- Coolwater and Warmwater Fisheries: June 1 through November 30

Columbia will notify authorities responsible for potable water supply intakes located within 3 miles downstream, at least one week before beginning work in the waterbody, or as required by state or local regulation.

When water levels are temporarily high, the Environmental Inspector will direct that starting any waterbody crossing be postponed until water levels subside.

Any extra work areas will be located at least 50 feet away from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. Where topographic conditions do not permit a fifty-foot setback, contact the Natural Resources Permitting Group for approval. All extra work areas must be located at least 10 feet from the water's edge and limited to the size needed to construct the crossing. Pipe assembly for the waterbody crossing is usually performed in the extra work areas prior to or concurrently with trenching.

Standards relating to spill prevention at waterbodies are contained in Section IV, (Spill Prevention).

If the facility parallels a waterbody, attempt to maintain at least 15 feet of undisturbed vegetation between the waterbody and the right-of-way except at the crossing location. Where waterbodies are adjacent to the construction right-of-way, install sediment barriers along the edge of the construction right-of-way to contain spoil and sediment within the right-of-way.

In Total Maximum Daily Load (TMDL) watersheds, the sediment barriers must be belted silt retention fence (BSRF) or equivalent. Figure 7C contains details on BSRF and Figures 34A, 34B, 34C, 34D, and 34E identify the TMDL watersheds along the alignment of the Mountaineer Xpress Project.

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 completed.

2. Crossing Techniques

Columbia typically utilizes either the dry-ditch (flume pipe), dam and pump, or wet ditch techniques to install pipelines across waterbodies. Figures 14, 15, and 16 illustrate these methods. **Upland construction** techniques may be used for **intermittent waterbody** crossings without perceptible flow at the time of the crossing, provided that a culvert is **promptly** installed to carry stormwater flow across the trench area and the erosion and sediment control devices illustrated in Figure 13 are installed.

The wet ditch method may be used when the following conditions are met:

- When the distance across the flume pipes becomes too wide for a backhoe to dig from both sides and connect the trench underneath the pipes. This measurement would vary according to the number of flume pipes, the height of the stream banks, the size and digging angle of the backhoe, the depth to bed rock, and ease of digging.

- When the crossing can be accomplished within 72 hours, however; every effort should be made to complete the crossing in one working day. All disturbed stream banks will be stabilized the same day the construction is finished.

- When the crossing is at right angles (±5º) to the stream channel.

- If water is pumped during the installation of the pipe it must be treated as per the dewatering specifications indicated in detail on Figure 29.

a) Minor Waterbodies

Minor waterbodies will be considered those which are 10 feet wide or smaller at the top of the bank. For crossings of coldwater fisheries and coolwater and warmwater fisheries considered significant by the state, install the pipeline using the dry-ditch method or dam and pump method, unless approved otherwise, in writing, by the appropriate state agency.

For other **minor waterbody** crossings, complete in-stream construction in the waterbody using the wet ditch method within 24 hours (except for blasting and pneumatic chipping; see Section III.A.6). Limit use of equipment operating in the waterbody to that needed to construct the crossing.

b) Intermediate Waterbodies

Intermediate waterbodies will be considered those which are 10-100 feet wide at the top of the bank. The wet ditch method will be used for all **intermediate waterbody** crossings. Only the equipment necessary for excavating the trench, lowering-in the pipe, and backfilling the trench is allowed in the waterbody. Columbia will attempt to complete trenching and backfill work in the waterbody within 48 hours, unless site-specific conditions make completion within 48 hours infeasible.

For crossings of coldwater fisheries and coolwater and warmwater fisheries considered significant by the state 10 to 30 feet in width, install the pipeline using the dry-ditch method or dam and pump method, unless approved otherwise in writing by the appropriate state agency.

c) Major Waterbodies

Major waterbodies will be considered those which are 100 feet wide or larger at the top of bank. Major waterbodies could also include waterbodies that are smaller, if there are special conditions that warrant a site-specific plan be created, such as threatened or endangered species habitat, stream classification, or other factors. Due to their sensitive nature, **major waterbody** crossings will have site-specific construction plans approved by the Natural Resource Permitting group. Horizontal Directional Drilling may be considered as an alternative for these crossings.

3. Clearing

Tree and brush clearing will be performed as previously described in Section II, "Upland Construction". All cleared materials will be disposed of at least 50 feet from the water's edge.

4. Grading

Grading equipment will not enter the water to grade the banks. Waterbody banks will be graded only where, and as much as, necessary to permit safe and efficient operation of construction equipment. During grading operations, sediment filter devices will be installed across the entire construction right-of-way promptly and as close to the water as practical.

Removable sediment filter devices must be installed across the travel lane. These removable sediment filter devices, if removed during the day, must be re-installed by the end of the work day or when precipitation is imminent. All disturbed areas within 50 feet of the water's edge will be promptly mulched. The mulch will be maintained until the waterbody crossing restoration is complete. Spoil from grading will be piled at least 10 feet from the stream banks and immediately protected with sediment filter devices so that it will not erode into the waterbody. On waterbody crossings with approaches sloped 5 percent or greater, interceptor diversions will be installed 50 feet from the water's edge to divert surface runoff into adjacent vegetation. If vegetation is sparse or nonexistent, a sediment filter device (not including silt fence) will be installed at the discharge of the diversion. Install a sediment filter device across the entire construction right-of-way at the base of slopes 5 percent or greater where the base of the slope is less than 50 feet from a stream. Leave adequate room between the sediment filter device and base of the slope for sediment deposition.

Construction equipment bridges consisting of culvert(s) with clean rock fill of non-erodible material or equipment pads/timber mats, as illustrated in Figures 18 and 19, will be installed during grading operations at all waterbodies. For proper culvert installation, the Environmental Inspector may permit

grading/excavating equipment to enter the water. Equipment bridges are not required at minor waterbodies that don't have a state-designed fishery classification (for example, agricultural or intermittent drainage ditches). However, if an equipment bridge is used, it must be constructed in accordance with this ECS. Construct equipment bridges to maintain unrestricted flow and to prevent soil from entering the stream.

5. Trenching

Notifications to applicable jurisdictional agencies will be made at least 2 days prior to any trenching in waterbodies, or as specified in permits.

Prior to trenching within the waterbody, water impounded in the upland trench will be pumped into a properly installed filter bag (Figure 29) and/or a series of sediment logs, or a heavily vegetated upland area where the water can filter back into the ground. Prevent the flow of spoil or silt-laden water into any waterbody.

Sediment filter devices for trench spoil will be installed prior to or during commencing trenching activities. Sediment filter devices can be temporarily removed from the trench line to allow trenching activities to proceed and then promptly replaced.

All spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, must be placed in the construction ROW at least 10 feet from the water's edge or in additional extra work areas. For all new construction activities, the minimum depth of cover for all waterbody crossings is 48 inches in normal soils and 24 inches in consolidated rock.

Trench plugs will be used at all non-flumed waterbody crossings to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs must be of sufficient size to withstand upslope water pressure.

For dry ditch method crossings, 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 to achieve an effective seal). In addition, do not remove flume pipe during trenching, pipe laying, backfilling activities, or initial streambed restoration efforts.

6. Blasting

During the pre-planning of waterbody crossings, an evaluation will be made concerning the need for blasting. If the evaluation is inconclusive, the waterbody bed will be tested for consolidated rock prior to trenching.

Blasting will not be done within waterbody channels without prior approval from applicable government authorities having jurisdiction and at least 2-day notice to the authority, or as specified in permits.

If the waterbody bottom is consolidated rock, it can be drilled and shot at any time prior to commencing the crossing. However, removal of shot rock, and any additional drilling, shooting and material removal, must be completed within the minimum number of consecutive calendar days practical. The time frame for completing the crossing will immediately commence once a trench of appropriate dimensions is established.

7. Backfilling

Waterbody bottoms will be returned as near as practical to their original contours. Spoil from the trench will be used as backfill. Clean gravel or native cobbles will be used for the final one foot of fill in the backfilled trench in all coldwater fisheries.

The sediment filter devices removed at the stream, during active construction activity, will be promptly reinstalled after backfilling.

8. Restoration

The preferred restoration method is to achieve final grade and restore the waterbody, its banks, and 50-foot buffers within 24 hours of backfilling. In the absence of site-specific seeding recommendations, the specifications listed in Table 2A will be used. If conditions do not permit the preferred method, the construction work area not in use for access will be promptly rough graded and stabilized in accordance with Table 2B. Stabilize waterbody banks and install permanent sediment barriers/sediment filter devices within 24 hours of completing the crossing. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.

Liquid mulch binders will not be used within 100 feet of waterbodies. For each waterbody crossed, install a permanent interceptor diversion/slope breaker and a trench breaker at the base of slopes near the waterbody. Locate the trench breaker immediately upslope of the interceptor diversion/slope breaker. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.

All equipment bridges will be removed once access in the area is no longer required.

Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector. If the waterbody banks are such that an unstable final soil grade would result and vegetative

stabilization is inadequate, the Environmental Inspector will require mechanical stabilization of the waterbody banks. Mechanical stabilization includes riprap, gabions, jute netting, etc.

Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques, such as seeded erosion control fabric.

Re-vegetate disturbed riparian areas with conservation grasses and legumes or native plant species, preferable woody species.

Application of riprap must comply with the US Army Corps of Engineers (COE) or its delegated agency permit terms and conditions. In general, riprap will be of field or quarry run stone, which is hard and durable. The riprap will be large enough to prevent normal waterbody current from moving it, typically 6-inch rock for slow moving waterbodies and 12-inch or larger rock for others. The riprap will be placed at least 18-inches thick and generally thicker at the base. The riprap slope will be no steeper than 1:1 and should conform to the remainder of the waterbody bank slopes where they are flatter than 1:1.

Install erosion control fabric, Figures 12A and 12B, such as jute netting or bonded fiber blankets at a minimum, on waterbody banks at the time of final bank re-contouring. Synthetic monofilament mesh/netted erosion control blanket cannot be used in areas designated as sensitive wildlife habitat unless the product is specifically designed to minimize harm to wildlife. Anchor the erosion control fabric with staples or other appropriate devices.

Sediment filter devices will be removed once permanent re-vegetation is successful.

B. Wetland Crossings

1. General

The main objective of any wetland crossing is to construct the pipeline and restore the original contour of the wetland. Wetlands will be marked in the field by a knowledgeable person prior to the start of construction with signs and/or highly visible flagging until construction is complete. The Environmental Inspector will maintain these field markings during construction. A maximum 75-foot wide construction work area may be used through wetlands. Mulch will not be used as a temporary erosion control measure in wetlands.

Aboveground facilities won't be located in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with US DOT regulations.

When water levels are temporarily high, the Environmental Inspector will direct that starting construction in the wetland will be postponed until after the water levels subside.

Standards relating to spill prevention at wetlands are contained in Section IV, (Spill Prevention).

2. Crossing Techniques

For wetland crossings without standing water or saturated soils, upland construction techniques can be used provided the top 12 inches of soil taken from the trench is stockpiled separately from the remaining excavated material. If standing water or saturated soils become present during construction activities in wetlands that were initially dry, construction will revert back to standard wetland crossing techniques as outlined in this section. 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 or matting), 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.

Wetland crossings in non-saturated soil wetlands will be constructed in a manner that will minimize the amount of time construction activities are occurring in the wetland, such as the length of time the topsoil is segregated, and the trench is open.

Wetland crossings with standing water or saturated soils will be constructed as separate construction entities, such that trenching, pipe installation, backfilling, and restoration are completed in the minimum number of consecutive calendar days necessary. Clearing, grading and equipment crossing installations are not included as part of the separate construction entity. The “push-pull” or “float” technique of pipe installation will be utilized whenever water and other site conditions permit. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.

If standing water or saturated soils are present or if construction equipment causes ruts or mixing of the topsoil and subsoil, use **low- ground-weight** construction equipment, or operate normal equipment on timber matting (only 2 layers), or mats. Timber matting must be in good condition and not have large holes in it where sediment could enter the wetland. Tree stumps, rock, gravel, soil imported from outside the wetland or brush will not be used to stabilize the construction work area or as equipment pads in wetlands. Remove all equipment mats, and timber matting during restoration of the wetland.

Staging areas will be located at least 50 feet from the wetland edge except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land and will be limited to the minimum necessary to construct the crossing. If topographic conditions do not permit a 50-foot setback, these areas must be located at least 10 feet from the wetland's edge with prior approval from the Natural Resources Permitting group.

The only access roads, other than the construction work area, that can be used in wetlands without FERC approval are those existing roads that can be used with no modification and no impact on the wetland.

Limit construction equipment operating in wetland areas to that needed to clear the construction work area, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the ROW. All other construction equipment shall use access roads located in upland areas to the maximum extent practicable. 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 work area.

A typical wetland crossing is illustrated in Figure 19.

3. Clearing

Tree and brush clearing will be performed as previously described in Section II, (Upland Construction). Cut vegetation off at ground level, leaving existing root systems in place, and remove (vegetation) from the wetland for disposal.

4. Grading

Grading in wetlands will consist of the minimum necessary for safe and efficient equipment operation. Limit pulling of tree stumps and grading activities to directly over the trench line. Do not grade or remove stumps or root systems from the rest of the construction work area in wetlands unless the Chief Inspector and **Environmental Inspector** determine that safety-related construction constraints require removal of tree stumps from under the working side of the construction work area. Areas where stumps are removed will be noted by the Inspector so, if necessary, those areas can be replanted with woody vegetation as described in wetland restoration.

Where wetlands are adjacent to the construction right-of-way and right-of-way slopes towards the wetland, install sediment barriers along the edge of the construction work area to prevent sediment flow into the wetland. Remove these sediment barriers after successful restoration has occurred.

Sediment filter devices will be installed promptly across the construction work area prior to or during grading at any wetland edge and maintained until

construction work area re-vegetation is complete. Temporary interceptor diversions will be installed adjacent to wetlands. Locations for these devices are illustrated in Figure 19.

5. Trenching

Sediment filter devices can be temporarily removed from the trench line to allow trenching activities to proceed. Spoil piles will be protected with sediment filter devices to prevent the flow of spoil off the construction work area.

6. Blasting

During the pre-planning of crossing wetlands with standing water or saturated soils, an evaluation will be made concerning the need for blasting. If the evaluation is inconclusive, the wetland will be tested for consolidated rock prior to trenching. If the wetland has consolidated rock, it must be drilled and shot as part of the single construction entity.

7. Backfilling

If trench dewatering is required, the water will be filtered and discharged through a sediment filter bag (Figure 29) and/or a series of sediment logs or into a heavily vegetated area outside of the wetland (where the water will filter back into the ground), so that no silt-laden water enters directly into a wetland or waterbody. Remove any dewatering structure as soon as possible after the completion of dewatering activities. Spoil from the trench will be used as backfill. The surface will be re-contoured as closely as practical to the original so that drainage patters will not be changed. In wetlands without standing water or saturated soils, the conserved topsoil layer will be returned to the surface during backfilling.

Sediment filter devices will be promptly re-installed after backfilling. Where the pipeline trench may drain a wetland, construct trench line barriers and/or seal the trench bottom as necessary to maintain the original wetland hydrology. For each wetland crossed, install a permanent interceptor diversion and trench line barriers at the base of slopes near the boundary between the wetland and adjacent upland areas. Locate the trench line barriers immediately upslope of the interceptor diversion.

Concrete coating activities will not take place within 100 feet of any wetland.

8. Restoration

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/interceptor diversion across the construction right-of-way at the base of a slope 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/sediment filter devices as shown in Figure 19. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

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 re-vegetation and weed control efforts.

Upon completion of construction in wetland areas with standing water or saturated soils, all access improvements will be promptly removed. In the absence of specific recommendations from conservation authorities, the seed mix and rate specified in Table 2B will be used. Fertilizer, lime, or mulch will not be used, unless required in writing by a jurisdictional agency.

Fertilizer, lime, or mulch will not be used in wetlands unless required in writing by the appropriate federal or state agency. Asphaltic emulsions will not be used to stabilize mulch within 100 feet of wetlands. Liquid mulch binders will not be used within 100 feet of wetlands.

IV. Spill Prevention, Containment and Control

A. General

Spills of any amount of petroleum products or polluting materials are to be prevented. All employees handling fuels and other hazardous materials must be properly trained. All equipment must be in good operating order. Fuel trucks transporting fuel to on-site equipment must travel on approved access roads. The following will be followed to help avoid spills and minimize the impact of spills which accidentally occur:

- Bulk quantities up to 5,000 gallons of diesel fuel and 5,000 gallons of gasoline will be stored in one location (the fuel depot) for the Project. Adequate spill containment measures, such as containment dikes, combined with impervious lining will be installed before fuel storage tanks are filled, and will be maintained throughout the Project. Bulk quantities of hazardous liquids (e.g., solvents and lubricants) will be stored at the fuel depot locations.

- Fuel can be stored at the equipment staging areas and as much equipment as practical will be refueled there. Any equipment that must be refueled in the field will be fueled from tanks carried to the work site. Fuel carriers (greater than 110 gallons capacity) will not be permitted to cross wetlands or ford

waterbodies. Equipment refueling will not be performed within 100 feet of any body of water or wetland, except by hand-carried cans (5-gallon maximum capacity), when necessary. If construction equipment must be refueled within 100 feet of a waterbody, follow the procedures outlined in the project-specific SPCC Plan. Care will be taken during refueling not to overfill or spill fuel onto the housing of equipment.

- Lesser quantities of fuel (up to 500 gallons) and solvents and lubricants (e.g., motor oils, hydraulic fluid) may be stored along the construction work area as necessary to service equipment used on the Project (quantities vary depending on the size of the construction spread being used), provided that this storage does not conflict with other parts of this plan. Sorbent booms and clean-up kits will be kept at all storage locations and will be readily available at all times.

- All fuel storage areas will be located at least 100 feet from streams, ponds, or wetlands; at least 200 feet from active private water wells, and at least 400 feet from municipal water wells, unless using an operational fuel storage area established on Columbia property. All fuel storage areas will not be located within any designated municipal watershed area (except at locations designated for these purposes by an appropriate governmental authority): Equipment servicing, lubricating and refueling will also be in accordance with these requirements whenever possible (i.e., except when stationary equipment such as drilling rigs is being used). Where these conditions cannot be met, the Environmental Inspector will prepare a supplemental SPCC plan, based on field conditions, to protect these resources.

  Use of hazardous materials for vehicle maintenance will follow the same requirements mentioned above for equipment refueling. Impervious or sorbent materials will be placed under the work area before the work begins. Additional sorbent materials will also be readily available. Waste materials created during maintenance (e.g., used oil) will be collected for proper disposal. The work site and the vehicle will be checked by a Columbia inspector after the maintenance work is complete to ensure that all hazardous materials are properly contained. All waste material, including partially used or empty containers, discarded parts, clean up rags, and used sorbent materials, as well as discarded hazardous materials containers (e.g., oil cans, grease tubes), will be collected for proper disposal.

- All motor fuel, lube oil, chemicals, and other polluting substances will be tightly sealed and clearly labeled during transportation and storage.

- Fuel trucks, pumps, mechanic's vehicles, the contractor's foremen's vehicles, Columbia Environmental Inspector vehicles, and each construction crew will be equipped with appropriately sized spill kits containing absorbent materials approved for petroleum products and have sufficient tools and material to stop leaks.

- Construction equipment will not be washed in any body of water or wetland, nor will runoff resulting from washing operations be permitted to directly enter any body of water or wetland area.

- Construction equipment, vehicles, materials, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products will not be parked, stored, or serviced within 100 feet of all bodies of water and wetlands. These activities can occur closer if the Environmental Inspector determines there are no reasonable alternatives and appropriate steps are taken to prevent spills and provide prompt cleanup in the event of a spill.

- Pumps operating within 100 feet of a waterbody or wetland boundary must utilize appropriate secondary containment systems.

- Concrete coating activities cannot be performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use. These activities can occur closer only if the Environmental Inspector determines there is no reasonable alternative and appropriate steps (including secondary containment structures) are used to prevent spills and provide for prompt cleanup in the event of a spill.

- All equipment will be checked, by a Columbia inspector, daily for leaks prior to beginning work in bodies of water or wetlands. Steps will be taken to repair leaks or remove the equipment from service, if necessary.

If barge mounted equipment is to be employed, the contractor will develop specific spill-prevention plans to be reviewed and approved by Natural Resource Permitting group.

B. Spill Cleanup

Spills occurring during construction, operation and maintenance are to be reported immediately to the Monitoring Center at 1-800-835-7191 in accordance with Columbia policies, plans and procedures (Plan Number 120.02.01). Columbia's Environmental Health and Safety department will be responsible for contacting the appropriate agencies, except as provided for below.

If the call to the Monitoring Center is not returned within 30 minutes *and* the spill has impacted water, the person discovering the spill or release will contact the National Response Center at 1-800-424-8802 and the West Virginia Department of Environmental Protection at 1-800-642-3074 and report the release. That person will continue calling the Monitoring Center until a representative is reached.

If a spill should occur, Columbia will ensure immediate action is taken to minimize the impact of the spill and see that appropriate cleanup action is immediately undertaken.

In the event of a spill into or in the vicinity of bodies of water or wetlands, the following will occur immediately:

- Source will be immediately stopped;
- Spill will be contained by placing sorbing booms or constructing dikes;
- Spill will be collected with sorbing materials, skimmed off water surfaces with booms, and/or the contaminated soil will be excavated;
- Waste materials will be properly stored and disposed in accordance with Columbia policy.

The affected areas will be restored as closely as possible to their previous condition.

If the spill is such that Columbia personnel or the on-site contractor cannot immediately and effectively respond, Columbia's environmental contractor, who specializes in spill cleanup, will be employed.

V. Environmental Construction Management and Inspection

A. General

Columbia is responsible for compliance with the environmental conditions contained in the project's EM&CP, which include all permits and other approvals. One or more Environmental Inspectors will be assigned to every project and will report to the Natural Resources Permitting group. At least one Environmental Inspector is required for each construction spread during active construction or restoration. Environmental Inspectors shall have peer status with all other activity inspectors.

B. Environmental Inspector

The Environmental Inspector is responsible for assuring that the construction activity is performed in accordance with the environmental conditions of the EM&CP and landowner requirements and has the authority to stop work and order appropriate corrective action as outlined in Section V.E. For construction activities that are found by the Natural Resource Permitting group to have minimal environmental impacts, the Environmental Inspector may also serve to monitor other construction functions. At a minimum, the Environmental Inspector(s) shall be responsible for:

- Inspecting construction activities for compliance and ensuring compliance with the requirements of the EM&CP, ECS, and any permits, landowner agreements or FERC certificates obtained for the Project;
- Identifying, documenting and overseeing corrective actions, as necessary to bring an activity back into compliance;
- Verifying that the limits of authorized construction work areas and locations of

access roads are properly marked before clearing and maintained throughout construction;

- Verifying the location of drainage and irrigation systems;
- Identifying erosion/sediment control and stabilization needs in all areas;
- Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive environmental resource areas, including cultural resource sites, wetlands, waterbodies, and sensitive species habitat;
- Verifying that trench dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment near the point of discharge into wetlands or waterbodies, cultural resource sites, and sensitive habitats. If such deposition is occurring, the dewatering activity shall be stopped, and the design of the discharge shall be changed to prevent reoccurrence; and verify that dewatering structures are removed after completion of dewatering activities;
- Verifying the testing of subsoil and topsoil in agricultural and residential areas to measure compaction and determine the need for corrective action;
- Advising the Chief Inspector when conditions (such as wet weather or frozen soils) make it advisable to restrict construction activities in agricultural areas;
- Ensuring restoration of contours and topsoil;
- Verifying that the soils imported for agricultural or residential use are noxious weed and soil pest free, unless otherwise approved by the landowner;
- Ensuring that temporary erosion controls are properly installed and maintained;
- Inspecting temporary erosion control measures at least on a daily basis in areas of active construction or equipment operation, on a weekly basis in areas with no construction or equipment operation, and within 24 hours of each 0.5 inch of rainfall. This responsibility may be transferred to field operations after construction is complete but before restoration is successful;
- Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts;
- Keeping records of compliance with the environmental conditions of the (EM&CP and any certificates) and other federal or state environmental permits during active construction and restoration;

- Keeping records of the mitigation measures proposed or approved as part of the FERC Order, and/or other federal, state, or local environmental permits during active construction and restoration;

- Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase;

- Establishing a program to monitor the success of restoration;

- Implementation of this program may be transferred to (Field Services) upon completion of construction and restoration activities;

- Looking for evidence of contamination and, if found, cease activities in that area and notify the Environmental Health & Safety department and the Natural Resource Permitting group and wait for further instruction. If the contamination is determined to be hazardous, an experienced hazardous waste contractor will be mobilized to handle the waste; the hazardous waste contractor will follow a site-specific health and safety plan and standard operating procedures for working in hazardous environments, which is maintained by the Environmental Health & Safety department;

- Verifying the location of signs and visible flagging marking the boundaries of wetlands, waterbodies other sensitive resource areas, or areas with special requirements along the construction work area; and

- Verifying the locations for any disposal of excess construction materials for beneficial reuse comply with applicable laws and regulations.

C. Environmental Training

The Engineering & Construction Project Manager assigned to the construction activity and/or the Columbia employee in responsible charge, will be responsible for assuring that the Environmental Inspector(s), other inspectors and any contractor's foreman have been trained in all environmental aspects of the activity, and fully understands the environmental conditions contained in the activity's EM&CP.

The Natural Resource Permitting group staff will conduct training for construction personnel when sensitive resources are present, when permit/certificate conditions mandate, or when requested by the Team Leader.

D. Contractor's Environmental Compliance Specialist (Environmental Foreman)

For construction activities that utilize an outside contractor, the contractor will be required to provide at least one qualified environmental compliance specialist. This specialist will become thoroughly familiar with Columbia's EM&CP for the activity.

The specialist will be responsible for the contractor's efforts to correctly install and

maintain environmental control devices and for construction in environmentally sensitive areas. Contractor's specialist will work in cooperation with Columbia's employees responsible for environmental compliance.

The Contractor's Environmental Foreman must be available at all times during the project and have the appropriate number of available employees to adequately implement the project's EM&CP.

E. Environmental Construction Management

The Environmental Inspector and each functional inspector shall have the authority to stop work on a particular construction function to which they are assigned if it deviates from the environmental conditions of the activity's EM&CP, as well as FERC Orders, stipulations of other environmental permits or approvals, or landowner easement agreements. The deviation shall be reported immediately to the Columbia employee in responsible charge of the activity and the Environmental Inspector. The Columbia employee in responsible charge, the Engineering & Construction Team Leader and the Natural Resource Permitting group department will be responsible for the resolution of the deviation. The Environmental Inspector shall also have the authority to order appropriate corrective action.

Stop work authority for the entire construction activity rests with the Columbia employee in responsible charge or the Engineering & Construction Team Leader.

The Natural Resource Permitting group may, from time to time, perform inspections of construction activities to review the implementation of the EM&CPs. The Natural Resource Permitting group will have stop work authority during these inspections should deviations from the activity's EM&CP occur. Any corrective actions that are required shall be taken as directed by the Natural Resources Permitting Group.

F. Environmental Variances/Modifications

Unapproved variances from or modifications to the EM&CP and this ECS are not permitted. Any proposed variance from the EM&CP will require approval from the EM&CP preparer, prior to commencing the activity. The approval for a variance will be in writing. In instances where written approval is not practical (i.e., emergencies and weekends), verbal approval may be given provided that written confirmation is provided as soon as possible.

Any proposed variance from this ECS will require approval from the Natural Resource Permitting group prior to commencing the activity.

VI. Emergency Construction

In the event of an emergency, the Company employee in responsible charge will take such action as is necessary to contain the emergency giving due regard to minimizing environmental impact. In conjunction with other Columbia policies, the requirements

contained in this ECS will be followed as close as possible. Columbia will notify DEP if such circumstances arise.

[1]Will include all environmental and regulatory mandated surveys such as but not limited to, threatened and endangered species surveys, archeology surveys, wetland delineations etc.

[2]Deviations that involve measures different from those contained in this ECS will only be permitted by written approval from the Natural Resource Permitting group. The Natural Resource Permitting group may be required to obtain written approval from the Director of the Office of Pipeline Regulation (OPR) (Federal Energy Regulatory Commission), or his/her designee, unless specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land. The Natural Resource Permitting group shall coordinate the filing of other agency requirements with the Secretary of the Commission (Secretary). This filing shall be prior to construction.

VII. Winter Season Construction Plan

A. General

Columbia will typically initiate a winter season construction plan for projects taking place on or after November 1 of each season, as well as projects where all construction activities (including restoration) haven't been completed prior to November 1 of each season. For the purposes of this plan, the winter season will be defined as from November 1 – March 15 of each year. The Natural Resource Permitting group, in conjunction with the Environmental Inspector, will determine if soil temperatures, depth of soil freezing, snow accumulation, historical regional conditions, or pending weather forecast dictate initiating the winter season construction plan prior to these dates, or allow for extending these dates. If a project's primary regulatory agency has winter construction regulations or permit conditions, Columbia will defer to those, rather than this winter season construction plan.

The winter season construction plan will apply to projects taking place within the portions of the Columbia's pipeline system where adverse winter conditions could be expected. Typically, this will include New York, New Jersey, Pennsylvania, Maryland, Delaware, West Virginia, Ohio, and Kentucky.

1. Snow Removal and Storage

Removal of snow from the construction workspace may be necessary to provide safe and efficient working conditions, as well as to expose soils for grading and excavation. Snow may also need to be removed along access roads to allow safe access to the ROW.

Snow storage will take place within ROW or approved workspace. Care will

be taken to avoid mixing snow with soil. Gaps will be provided in snow stockpiles to allow for site drainage or existing drainage patterns, with the appropriate erosion and sediment control devices installed. Snow can also be blown off ROW, with landowner approval, and spread evenly to minimize damage to woody vegetation or other resources off ROW.

Snow may be used for beneficial uses, such as insulation over the trench line prior to excavation, if practical, or to reduce frost penetration along the trench line. Snow can also be used to build frost roads through wetlands and other saturated or otherwise unstable areas. Temp gates/fence crossings will occur prior to or concurrent with snow removal activities and in accordance with landowner requirements.

Construction signage will be used to designate sensitive areas, cultural resource sites, protected species habitat, or other avoidance areas to prevent inadvertent damage during snow removal activities.

2. Temporary Erosion and Sediment Control

In areas where there is shallow freezing that occurs in the morning and evening followed by a daytime thaw, different construction activities may be approved or restricted by the Chief Inspector or Environmental Inspector, depending on the time of day. Columbia will attempt to install the necessary temporary erosion and sediment control devices in advance of the winter season, where possible. All erosion and sediment controls will be inspected on a weekly basis, within 24 hours of a 0.5-inch rainfall event, and within 24 hours of a large snowmelt event. Columbia will keep an Environmental Inspector and environmental labor crew on site or on call through the winter season and periods of thaw to monitor erosion control structures and stabilization efforts and make adjustments or repairs as necessary and as ROW conditions allow. Crews will have the proper equipment available to allow access to the ROW under soft soil conditions, such as all-terrain vehicles with oversized tires, to prevent rutting, topsoil mixing, and damage to other temporary erosion controls such as drivable berms.

3. Topsoil Segregation

Topsoil will be segregated during winter construction in the same locations and manner as during non-winter construction. Long-term topsoil stockpiling to manage the topsoil and accomplish more effective seeding and restoration may be necessary after the spring thaw.

When topsoil is frozen at the time of topsoil stripping, multiple passes (vs. a single pass) with a bulldozer or other specialized equipment may be necessary to remove only the topsoil and not the subsoil.

Restoration of topsoil will ideally occur after both the stockpiled topsoil and the

exposed subsoil have thawed, the ground has dried following the spring melt, and the soils are more easily worked. Right-of-way stabilization measures will be implemented regardless of whether topsoil restoration occurs under frozen conditions or is delayed until spring thaw. Some options for temporary stabilization of the ROW and segregated topsoil pile include mulching and dormant seeding. Frozen topsoil may be placed over the disturbed areas if the Environmental Inspector determines it reasonable to do so.

If a landowner requests permanent stabilization be initiated within the winter season, Columbia will comply with the landowner request and/or relevant terms of the landowner agreement.

4. Backfilling

The longer time that excavated materials from the trench are exposed to freezing ambient air temperatures, the more difficult it can become to properly backfill the trench with these materials. This may give the perception that there is significant excess spoil material left after trench backfill is completed. Rather than removing the “excess” material, a slight crown could be created over the trench line to allow for subsidence once the material has thawed.

Crowning material over the trench or ditch line may be a suitable practice where trench subsidence is anticipated. The crown will be constructed directly over the backfilled trench with native material. Subsoil used to build the crown should not extend above natural surface grade. The crown will be capped with native topsoil material to ensure elevations will be restored with topsoil at the surface. If the topsoil layer has been removed as a block of frozen material, the blocks will be placed on top of the trench line as part of the crown and be pieced together to the extent practicable to prevent large gaps following thawing of the material. Small gaps will be left in the crown to allow for natural surface drainage before the material is fully settled during spring and summer thaw. Columbia will monitor for subsidence and excessive crowning conditions.

Columbia will minimize the amount of open trench during frozen conditions to reduce the risk of freezing excavated spoil materials. Outer layers of a frozen spoil pile will be stripped of in order to use unfrozen inner subsoil first during backfilling. The remaining frozen subsoil will be broken into smaller pieces prior to backfilling to reduce the size of voids in the backfilled trench. Specialized equipment may be needed to break up frozen backfill material to minimize future subsidence.

5. Restoration

The Natural Resource Permitting department, in conjunction with the Project Manager and Environmental Inspector, will determine whether the project can be completely restored during the winter season or if permanent restoration

activities will be delayed until after the spring thaw. If permanent restoration will take place during the winter season, the steps shown in the upland portion of this ECS will be followed, along with Table 2A. If permanent restoration will be delayed, subsoil will be left in a roughened condition to slow the sheet flow of water. All open areas will be backfilled or provided safety fencing for protection. The exception to this practice will be pipelines left uncovered for longwall mining activities.

All disturbed areas that are unable to have permanent restoration completed will be mulched or have soil tackifiers applied. See Table 2B for temporary stabilization application rate.

To ensure adequate vegetation growth when seeding during the winter season, higher seeding rates will be considered, to account for lower germination success, on a case by case basis. Cold weather grasses will also be utilized.

B. Wetland and Waterbody Crossing

Wetland and waterbody crossings during winter construction will be constructed in the same manner as non-winter construction. Spoil material with high water content (e.g., non-cohesive soils) can freeze to the ground surface in its storage location. If this occurs, separation of wetland and other soils will take place to the maximum extent practicable.

The environmental inspector can delay wetland or waterbody crossings when winter conditions warrant such delay.

C. Dewatering

When dewatering activities are necessary during freezing conditions, pumps may have to be installed in small, heated shelters to prevent the pumps from freezing and becoming non-operational or causing damage to the pumps that could result in a spill or leak of lubricants or fuel. Dewatering activities performed during frozen conditions should be continuously monitored and adjusted as necessary. Discharge locations will be carefully evaluated and selected based on site conditions including vegetation cover, soil type, and topography. Columbia will attempt to install dewatering structures (e.g., filter bags) earlier in the construction process when ground conditions are favorable for installation, where feasible. Dewatering structures will be promptly removed after use to prevent freezing and proper cleanup. All spill prevention measures described in Section IV (Spill Prevention, Containment, and Control) of this ECS will also be followed during winter season construction.

VIII. Definition of Terms

AGRICULTURAL LANDS: Permanent or rotated croplands, hayfields, and pastures.

COLUMBIA: Columbia Gas Transmission Corporation

COE: U.S. Army Corps of Engineers

CONSTRUCTION WORK AREA (CWA) Construction work areas include permanent and temporary ROW, contractor's yards, pipe and materials storage yards, staging areas, and access roads.

ECS: Environmental Construction Standards

ENVIRONMENTAL INSPECTOR: The Inspector responsible for environmental compliance on a construction project.

EPA: Environmental Protection Agency

FWS: U.S. Fish and Wildlife Service

EM&CP: Environmental Management and Construction Plan

FINAL GRADING: Includes returning the construction work area as closely as practical to its original contour, redistributing conserved topsoil, soil compaction testing in agricultural lands, and installing final interceptor diversions.

IMMEDIATELY: Without interval of time; "right now".

INSPECTOR: Collectively: the Chief Inspector, Environmental Inspector, Environmental Coordinator, Utility Inspector, or any other inspector assigned to do an environmental task.

INTERMITTENT WATERBODY: A waterbody channel which generally carries water in the spring or immediately after a rain event; designated on topographic maps and environmental construction drawings with a broken line.

INTERMEDIATE WATERBODY: A waterbody greater than 10 feet at the water's edge at the time of construction but less than or equal to 100 feet wide.

LOW-GROUND-WEIGHT: Construction equipment that is designed "specifically for" or "frequently used in" areas where compaction and sinking is to be minimized. This equipment can be less than 5lbs/in^2 or contain wider tracks than the standard minimum size width tracks for the model equipment to be used.

MAJOR WATERBODY: A waterbody greater than 100 feet wide at the water's edge at the time of construction.

MINOR WATERBODY: A waterbody less than or equal to 10 feet wide at the water's edge at the time of construction.

MSDS: Material Safety Data Sheet

NRCS: Natural Resource Conservation Service

NOISE SENSITIVE AREA: Includes residences, schools, churches, cemeteries, hospitals, farms, camping facilities and outdoor amphitheaters and playgrounds.

ORV: Off-road vehicle.

PERENNIAL WATERBODY: A waterbody which generally flows all year in years of normal rainfall; waterbody level is generally lowest in the fall, highest in the spring; designated with a solid line on topographic maps and environmental construction drawings.

PROMPTLY: By the end of the work day.

REMOVABLE SEDIMENT FILTER DEVICES: Compost filter socks, Erosion Eels, straw wattles, or other similar BMPs.

RESTORATION: Includes fertilizing, liming, disking, seeding and mulching, and crimping mulch.

RIVER: A waterbody which is 100 feet wide or more.

ROW: Right-of-way.

SCARIFY: To make shallow cuts into the soil surface. This should be accomplished with a disk, rake, tracked equipment (grousers) or other suitable means.

SEDIMENT FILTER DEVICE: Properly embedded silt fence, erosion control logs, or other approved device.

SPCC: Spill Prevention Control and Countermeasure Plan

STEEP SLOPE: Slope of approximately 33% or greater.

TEMPORARY STABILIZATION: Includes installing temporary interceptor diversions and sediment filter devices, mulching critical areas and at times, seeding to hold soil in place until final grading and restoration can be accomplished.

UPLAND CONSTRUCTION: All areas which are not waterbodies, rivers, streams, or wetlands.

WATERBODY: Includes any natural or artificial waterbody, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes.

WETLAND: An area of special concern with soils prone to holding water for long periods of time, generally also characterized by distinctive plants such as rushes, sedges, cattails, or certain trees. Includes any area that satisfies the requirements of the current Federal methodology for identifying and delineating wetlands.

IX. Tables

Table 2A – Permanent Seed Mix for Upland Row and Waterbody Crossings
Table 2B – Seed Mix for Temporary Stabilization
Table 2C – Seed Mix Requirements in Wetlands

TABLE 2A – PERMANENT SEED MIX FOR UPLAND ROW AND WATERBODY CROSSINGS	
TYPE	RATE (lbs/ACRE)
SEED[1]	
ORCHARD GRASS AND/OR TALL FESCUE[2]	29
BIRDSFOOT TREFOIL (EMPIRE)[3]	9
ANNUAL RYE	12
FERTILIZER	
10–10–10 (OR EQUIVALENT)	600[4]
MULCH	
HAY OR STRAW	4,000
AGRICULTURAL LIME	4,000

[1] PURE LIVE SEED WITHIN 12 MONTHS OF TESTING

[2] IF TALL FESCUE IS USED, PLANT ENDOPHYTE–FREE CERTIFIED SEED

[3] LEGUMES TO BE INOCULATED BY MANUFATURER'S RECOMMENDATIONS, IF NOT AVAILABLE LEGUMES ARE TO BE INOCULATED AT 4 TIMES RECOMMENDED RATE FOR CONVENTIONAL METHODS AND 10 TIMES RECOMMENDED RATE FOR HYDRO SEEDING

[4] WHERE WOOD CHIPS ARE SPREAD, ADDITIONAL NITROGEN (12 TO 15 lbs/TON OF CHIPS) WILL BE SPREAD

[5] SEED RATE MUST BE DOUBLED FOR BROADCAST SEEDING.

TABLE 2B – SEED MIX FOR TEMPORARY STABILIZATION	
TYPE	RATE (lbs/ACRE)
SEED	
ANNUAL RYE	40
MULCH	
HAY OR STRAW	6,000

TABLE 2C – SEED MIX REQUIREMENTS IN WETLANDS	
TYPE	RATE (lbs/ACRE)
SEED[1]	
ANNUAL RYE	40

[1] ANNUAL RYE IS USED AS TEMPORARY RE–VEGETATIVE MEASURE UNTIL INDIGENOUS PLANTS RE–ESTABLISH COVER. A MONITORING PROGRAM WILL BE IN EFFECT TO INSURE ADEQUATE COVER IS ESTABLISHED.

X. Figures

Figure 1 – Typical Upland Pipeline Construction Sequence

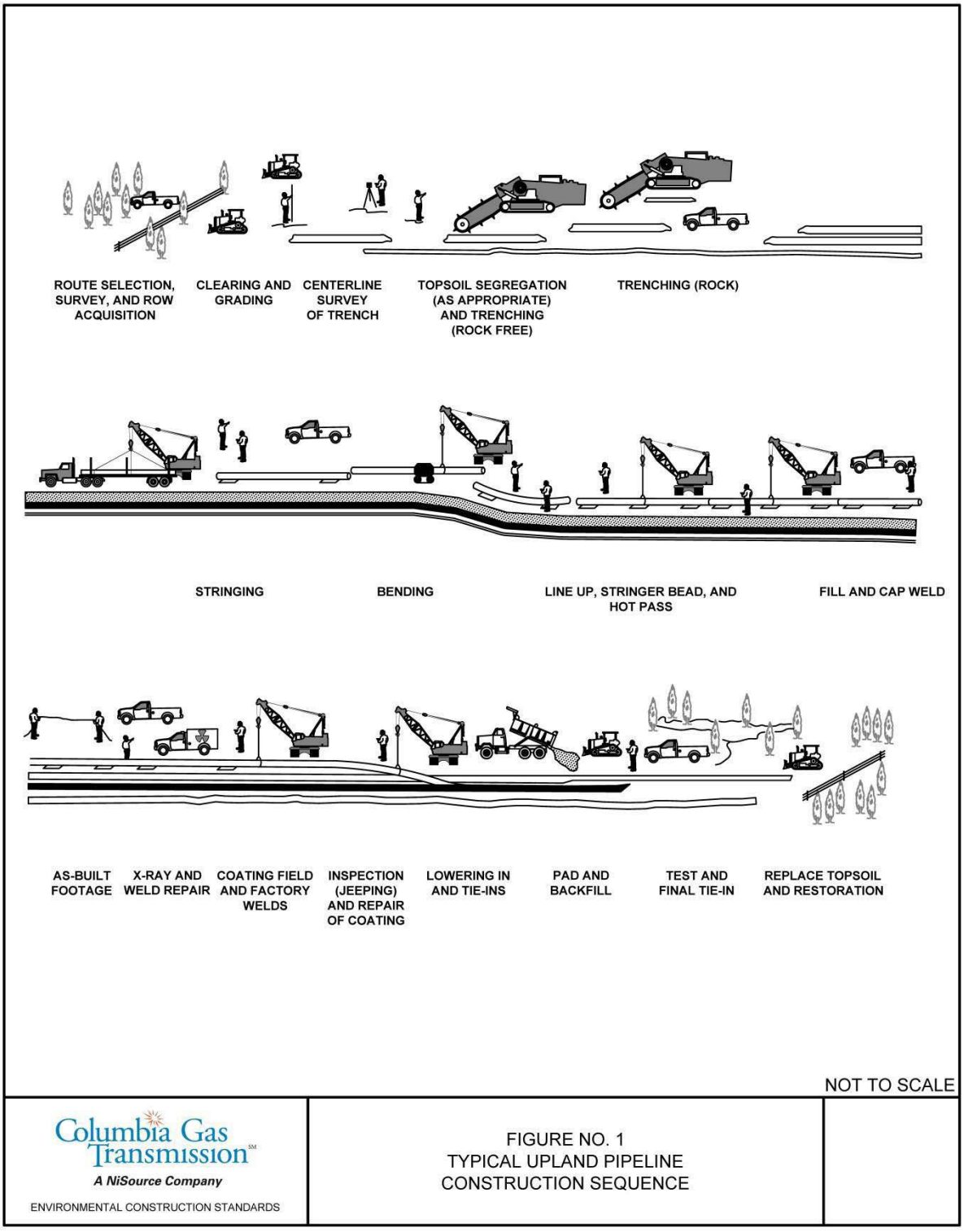


Figure 2 – Typical 75ft. Construction Right-of-Way

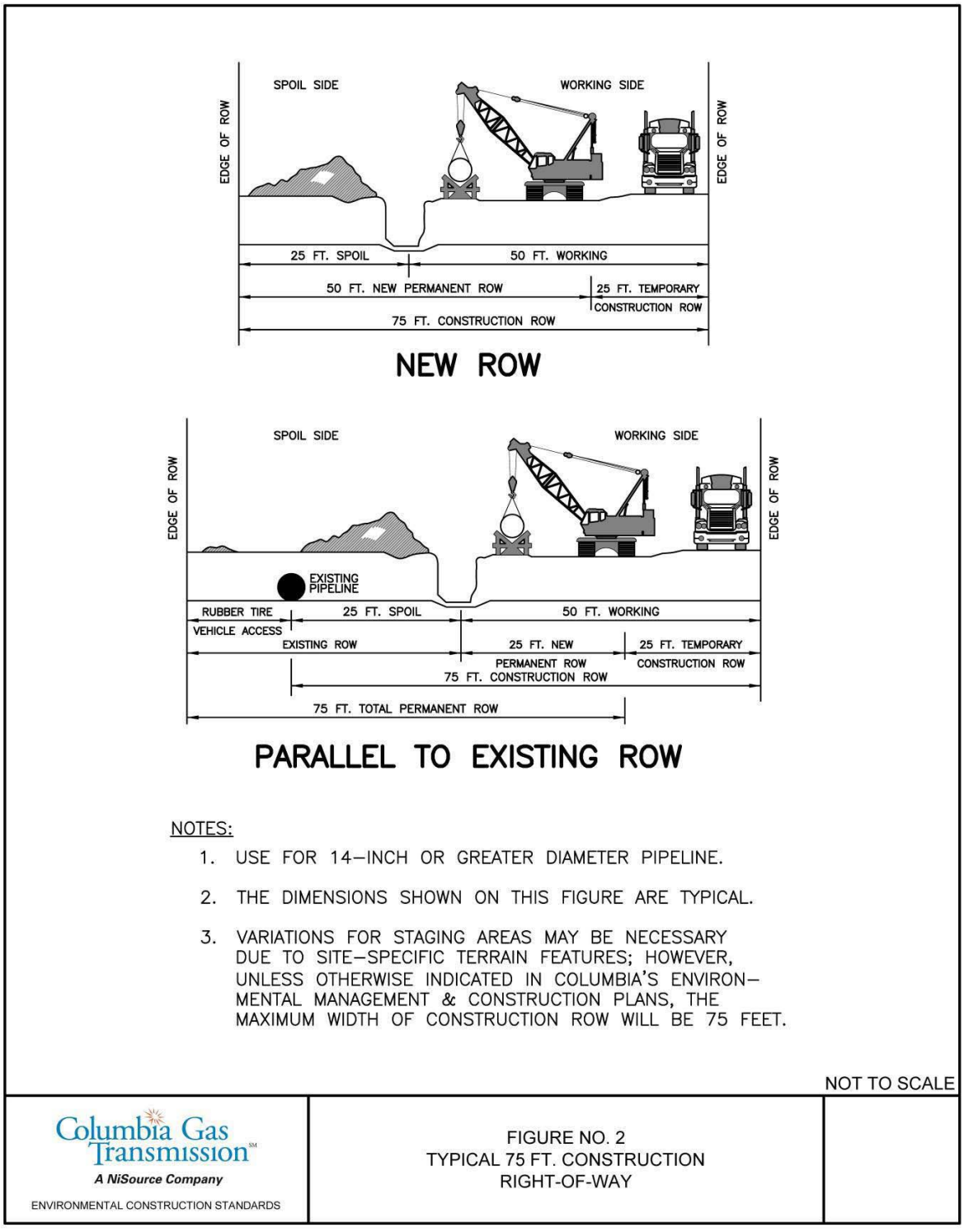


Figure 3 – Typical 50ft. Construction Right-of-Way

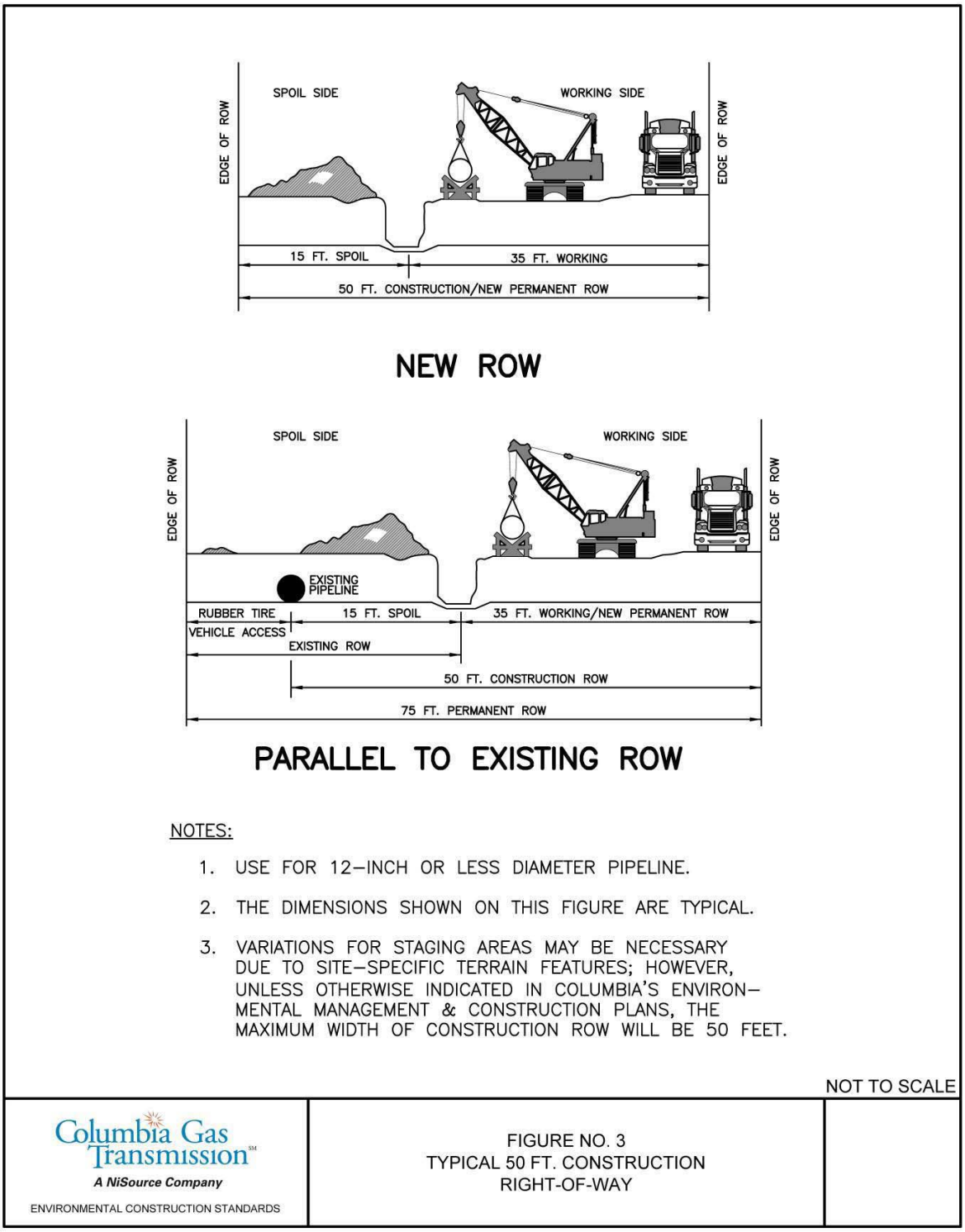


Figure 4 – Temporary Construction Gate

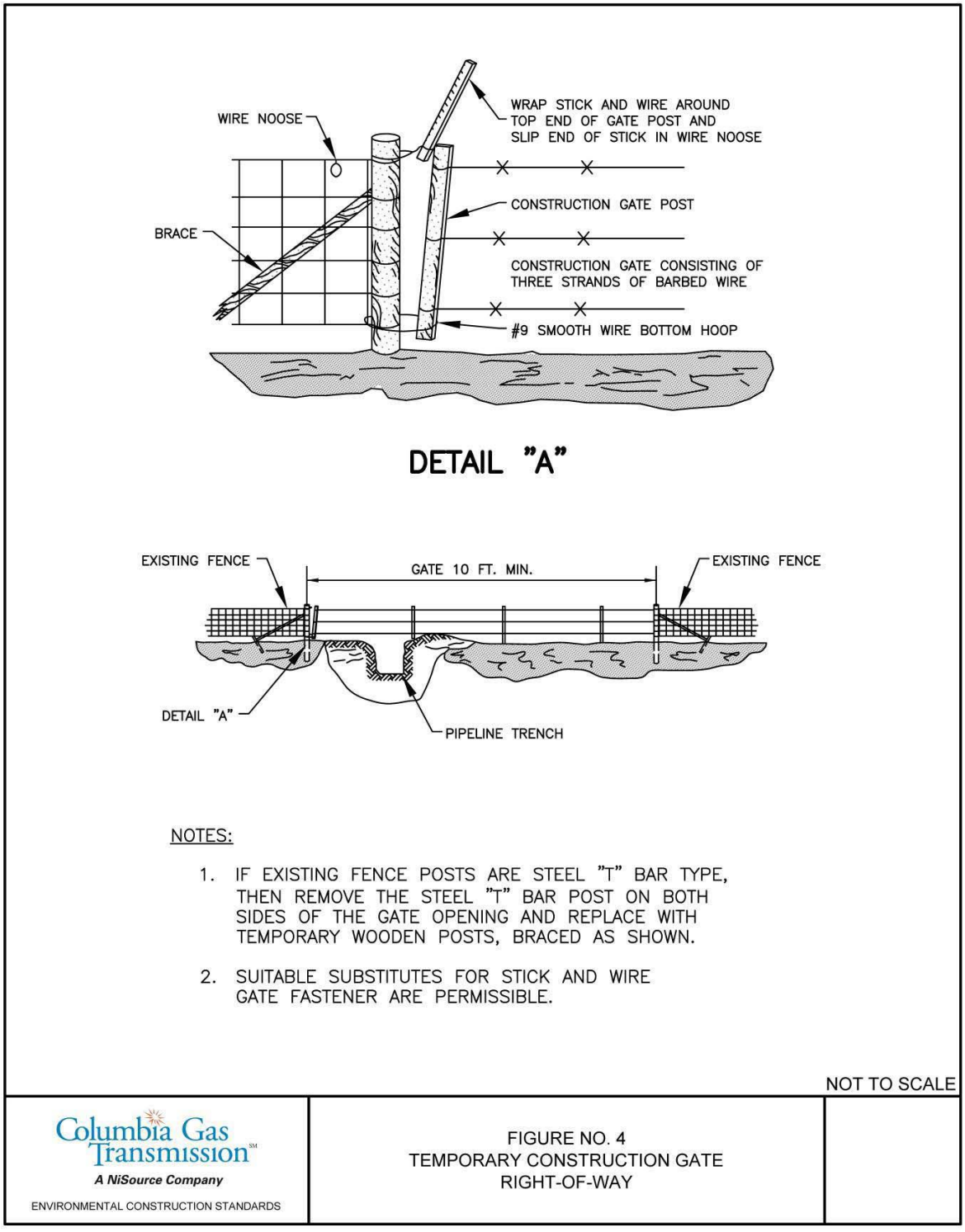


Figure 5 – Typical Topsoil Conservation

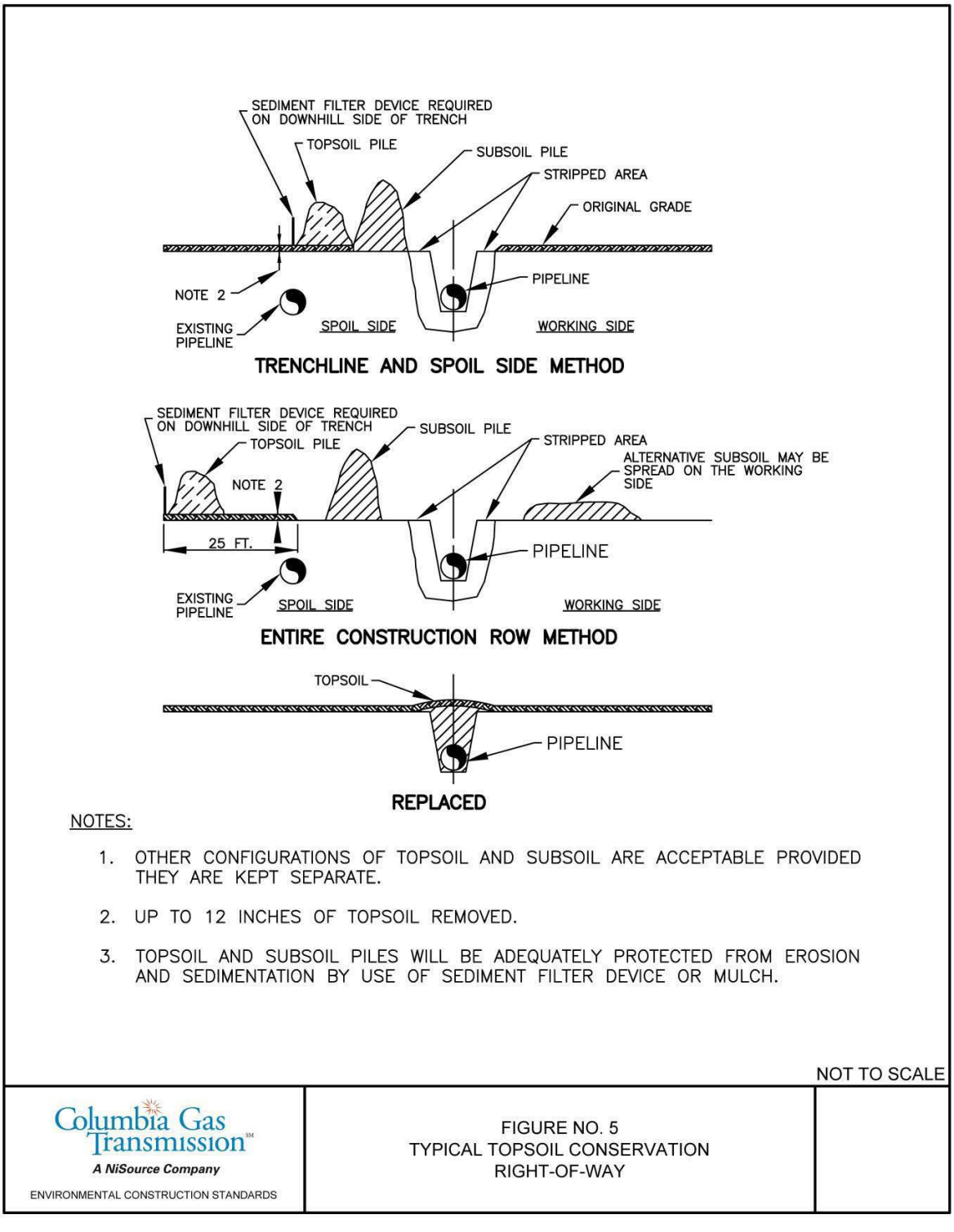
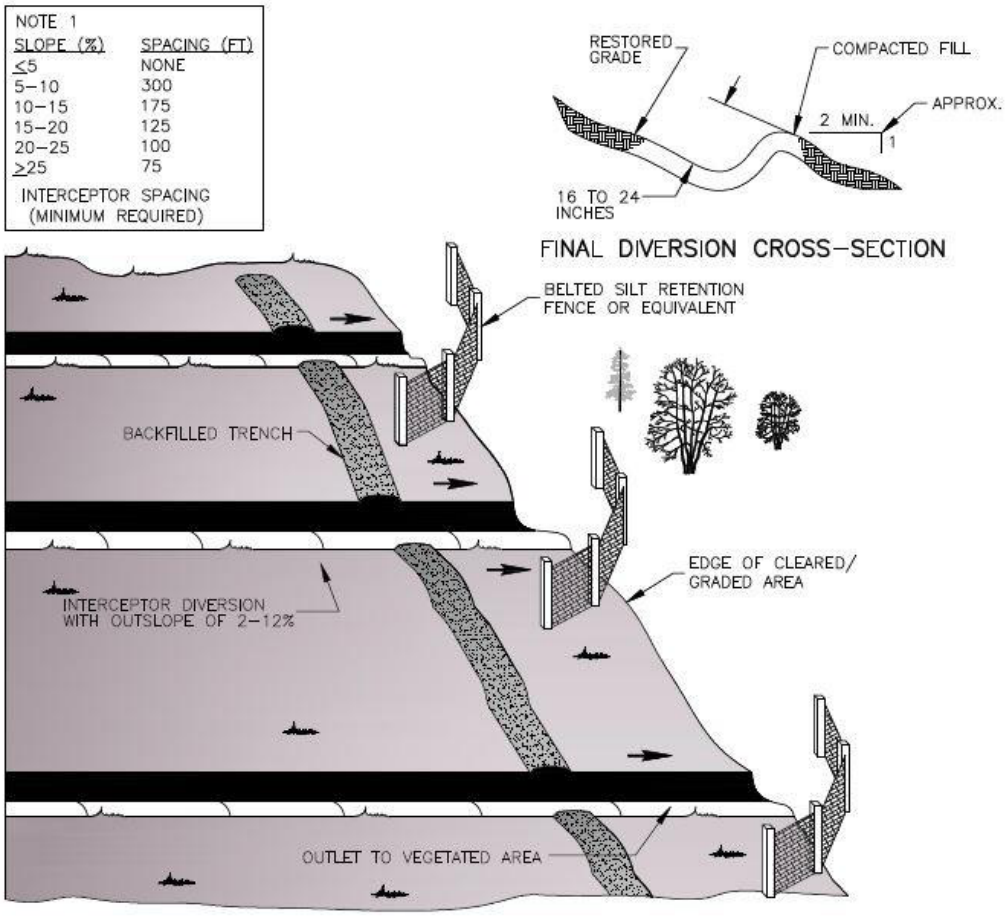


Figure 6A – Interceptor Diversions/Slope Breakers



NOTES:

1. SPACING USED FOR BOTH TEMPORARY AND FINAL INTERCEPTOR DIVERSIONS.
2. TEMPORARY INTERCEPTOR DIVERSIONS WILL BE MAINTAINED DURING THE CONSTRUCTION PHASE UNTIL FINAL INTERCEPTOR DIVERSIONS ARE INSTALLED.
3. IF EXISTING GROUND COVER IS SPARSE, SECURE SEDIMENT FILTER DEVICE IN OUTLET.
4. THE DIVERSION MAY BE EXTENDED UP TO 5 FEET OFF THE ROW, IF NECESSARY, TO PROVIDED AN ADEQUATE OUTLET.
5. DIVERSION OUTLETS WILL ALTERNATE FROM SIDE TO SIDE WHENEVER POSSIBLE.
6. THE MAXIMUM ALLOWABLE DRAINAGE AREA IS ONE (1) ACRE.
7. WATERBAR SPACING IN THE ABOVE DETAIL SHALL SUPERCEDE THE SPACING REQUIREMENTS IN THE PREVIOUS VERSION OF THE COLUMBIA ECS.

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 6A INTERCEPTOR DIVERSIONS/SLOPE BREAKERS	

Figure 6B – Interceptor Diversions

INTERCEPTOR DIVERSIONS ARE THE MOST COMMON AND EFFECTIVE DEVICE USED FOR EROSION CONTROL ON CONSTRUCTION ROW. DURING CONSTRUCTION, TEMPORARY DIVERSIONS ARE INSTALLED TO CONTROL WATER ON THE GRADED ROW. DURING RESTORATION FINAL DIVERSIONS ARE INSTALLED TO PROTECT THE ROW FROM EROSION UNTIL THE VEGETATION RE–ESTABLISHES ON THE DISTURBED AREAS.

TEMPORARY DIVERSIONS ARE GENERALLY MADE BY BUILDING A CURB 8 TO 14 INCHES HIGH ACROSS THE ROW. THE CURBS ARE SHAPED TO ALLOW PASSAGE OF CONSTRUCTION EQUIPMENT AND INSPECTOR VEHICLES. THE DIVERSION SHOULD HAVE A GRADIENT OF 2% – 12%, AND MUST DRAIN EITHER INTO THE TRENCH OR OFF THE ROW. WHERE WATER IS DIRECTED OFF THE ROW, THE OUTLET WILL BE PROTECTED BY HEAVY VEGETATION. TEMPORARY DIVERSIONS MAY BE BROKEN DOWN BY CONSTRUCTION EQUIPMENT DURING THE WORKDAY, BUT WILL BE RESTORED BY THE END OF EACH DAY. TEMPORARY DIVERSIONS WILL BE SPACED ALONG THE ROW IN ACCORDANCE WITH FIGURE 6A. THE ACTUAL NUMBER OF TEMPORARY DIVERSIONS MAY VARY FROM THAT OF FINAL DIVERSIONS BECAUSE THE CONSTRUCTION ROW'S ARTIFICIAL GRADE MAY REDUCE THE SLOPE. POSITION THE OUTFALL OF EACH TEMPORARY SLOPE BREAKER TO PREVENT SEDIMENT DISCHARGE INTO WETLAND, WATERBODIES, OR OTHER SENSITIVE AREAS.

FINAL DIVERSIONS TYPICALLY CONSIST OF A CURB 16 TO 24 INCHES HIGH BELOW A SHALLOW SWALE. THE CURB IS CONSTRUCTED OF COMPACTED EARTH FILL WITH SIDE SLOPES OF 2:1 OR FLATTER TO ALLOW PASSAGE OF MAINTENANCE EQUIPMENT. THE DIVERSIONS SHOULD EXTEND ACROSS THE ENTIRE ROW AND DRAIN WATER WITH A 2% TO 12% GRADIENT. THE OUTLETS OF FINAL DIVERSIONS MAYBE STABILIZED WITH SEDIMENT FILTER DEVICES. FINAL DIVERSIONS WILL BE SPACED ALONG THE ROW IN ACCORDANCE WITH FIGURE 6A (OR AS SHOWN ON THE ENVIRONMENTAL CONSTRUCTION DRAWINGS), AND WILL TIE INTO EXISTING DIVERSIONS WHERE PRESENT. IN PLACES WHERE FINAL GRADE CREATES SIDE SLOPES OR SLOPES WHICH BREAK IN MORE THAN ONE DIRECTION, DIVERSION INSTALLATION MAY NEED TO VARY TO CREATE AN OUTSLOPE OF 2% TO 12% WHICH WILL CARRY WATER OFF THE ROW.

ALTERNATIVE DIVERSION CONSTRUCTION MAY BE USED IN AREAS WHERE AN EARTHEN DIVERSION IS IMPRACTICAL

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 6B INTERCEPTOR DIVERSIONS	

Figure 7A – Sediment Filter Device Silt Fencing

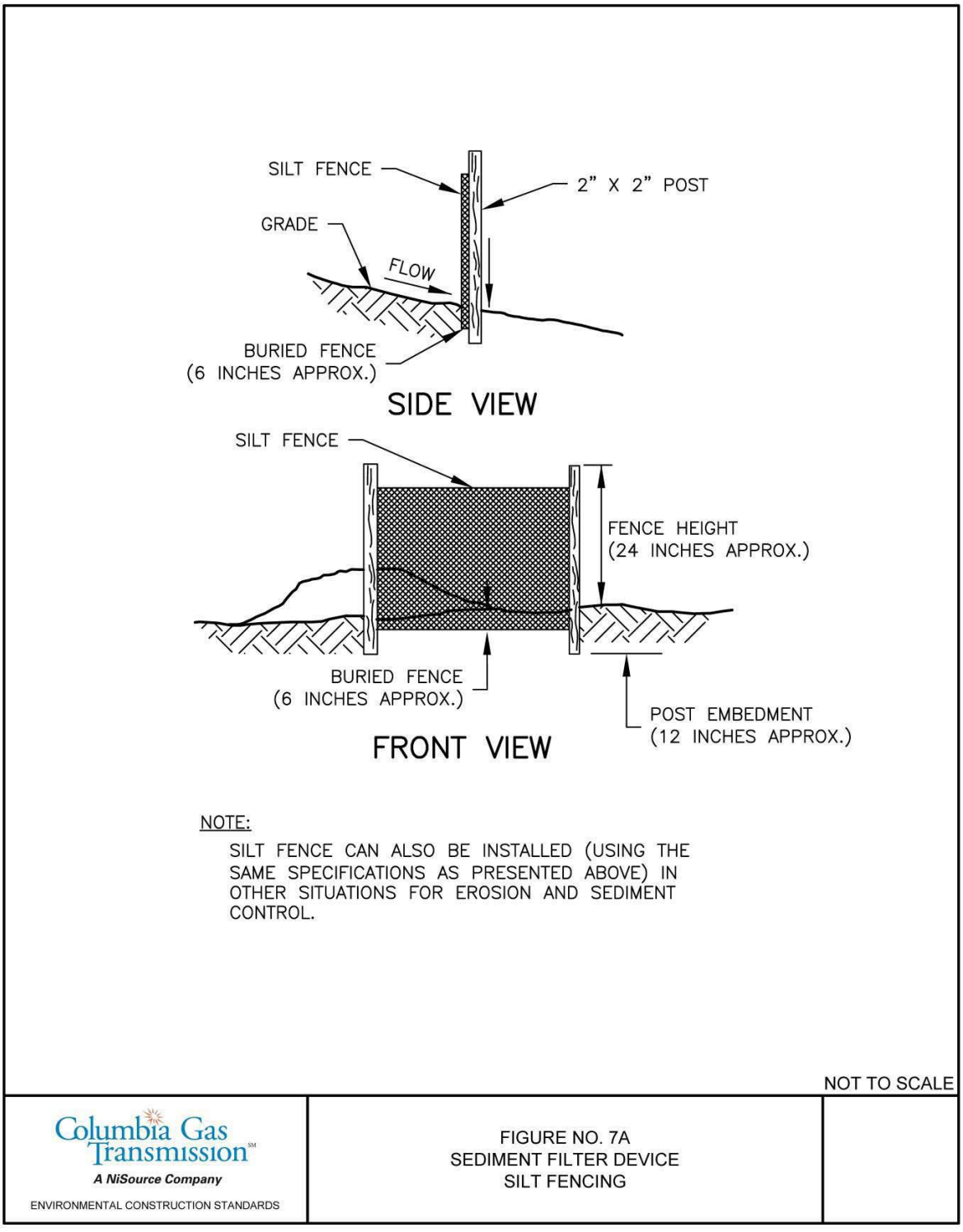
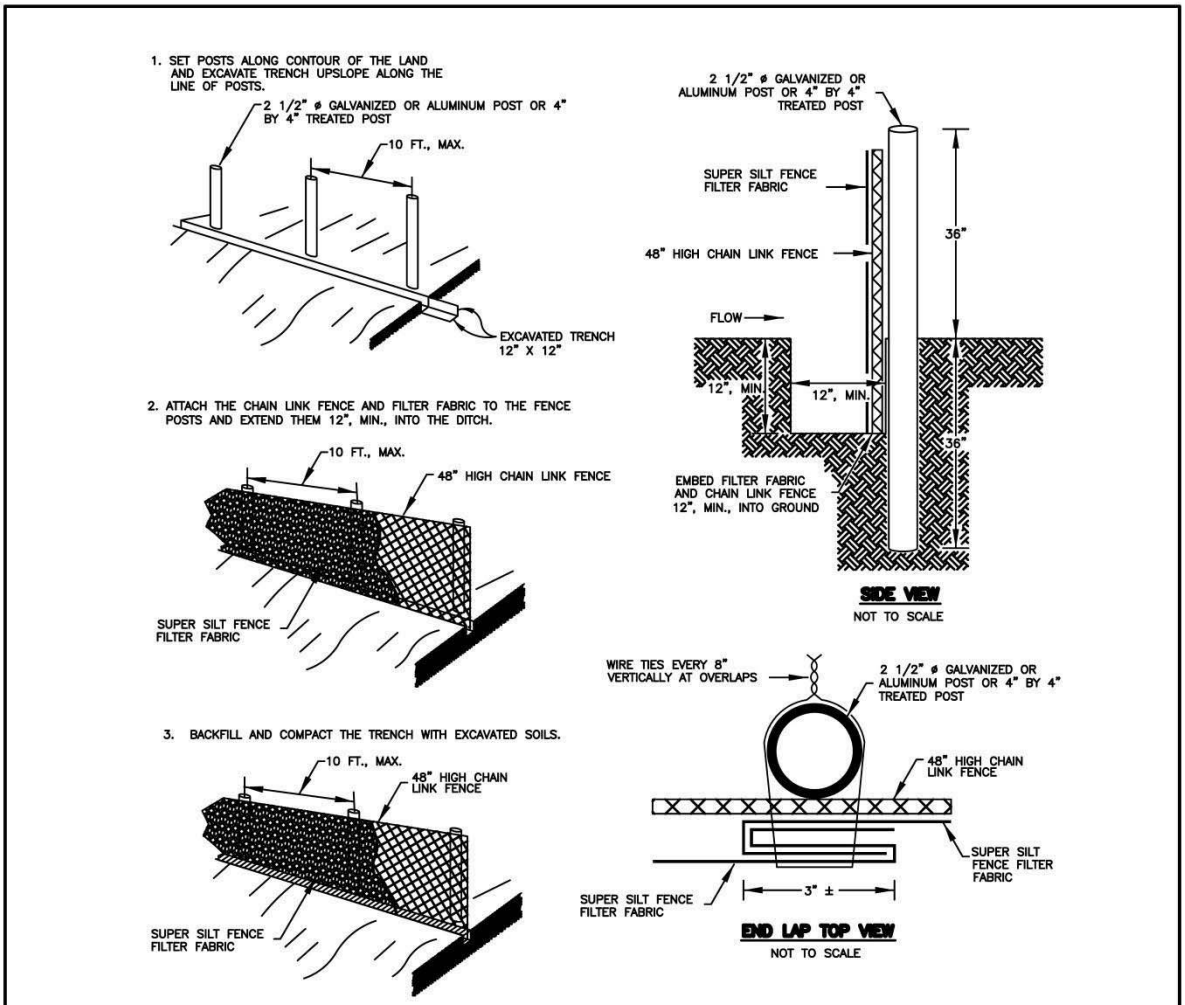


Figure 7B – Sediment Filter Device Super Silt Fencing



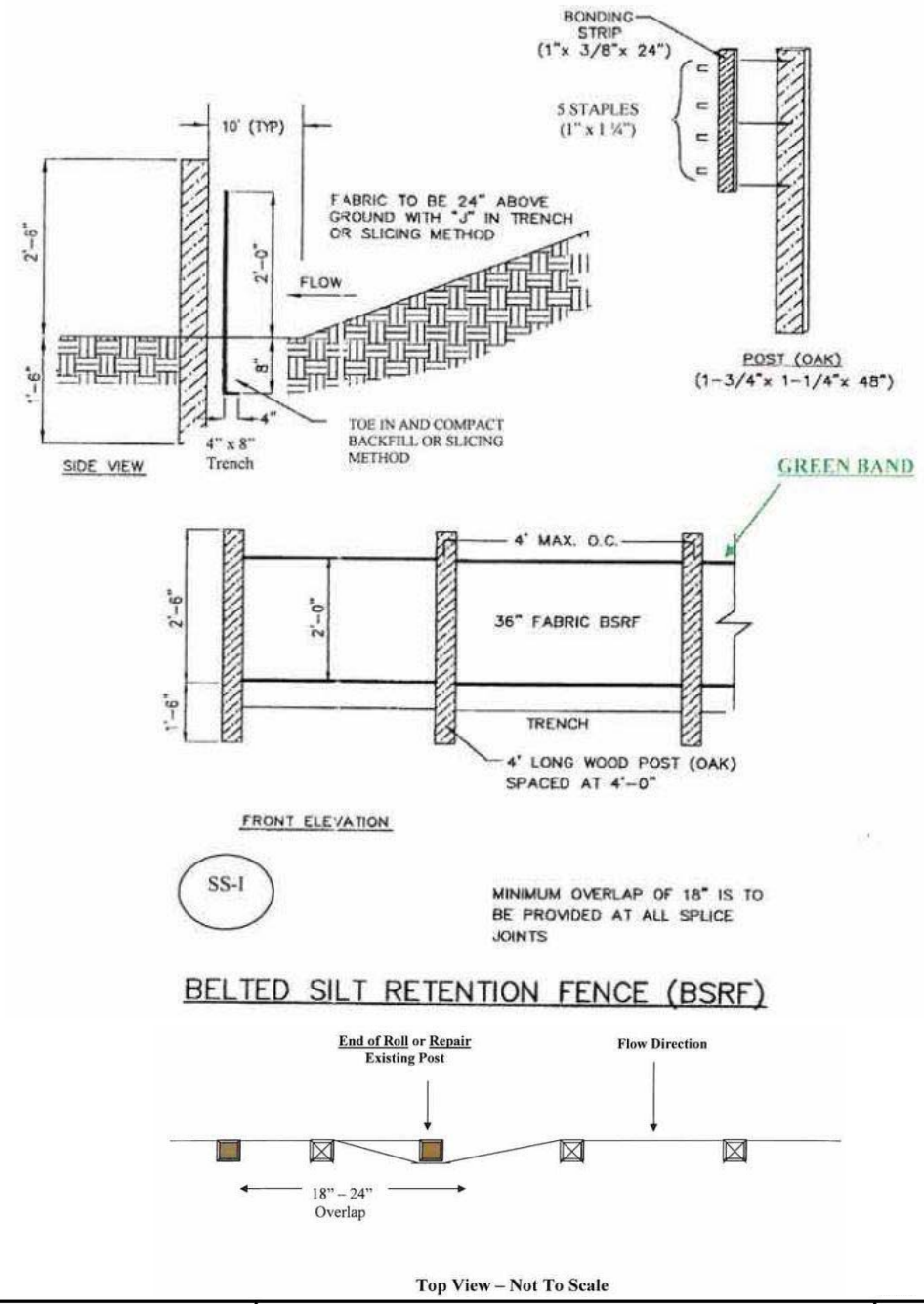
SUPER SILT FENCE NOTES:

1. CHAIN LINK FENCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 608 OF THE WVDOH SPECIFICATIONS. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE POSTS WITH WIRE TIES OR STAPLES.
2. POSTS NEED NOT BE SET IN CONCRETE.
3. THE FILTER FABRIC SHALL BE FASTENED TO THE CHAIN LINK FENCE WITH TIES EVERY 24" AT THE TOP AND MID SECTION.
4. FABRIC AND FENCE SHALL BE EMBEDDED 12", MINIMUM, INTO THE GROUND.
5. A 6", MINIMUM, OVERLAP SHALL BE PROVIDED WHERE TWO SECTIONS OF FABRIC ADJOIN. THE OVERLAPPED FABRIC SHALL BE FOLDED TOGETHER AND ATTACHED TO THE CHAIN LINK FENCE.
6. 4" BY 4" PRESSURE TREATED POSTS MAY BE SUBSTITUTED FOR METAL FENCE POSTS WITH THE APPROVAL OF THE ENGINEER.
7. THE LENGTH OF SLOPE ABOVE THE FENCE SHALL NOT EXCEED 400 FEET IN STEEP TERRAIN. IN FLATTER AREAS THE LENGTH CAN BE EXTENDED WITH THE APPROVAL OF THE ENGINEER.

NOT TO SCALE

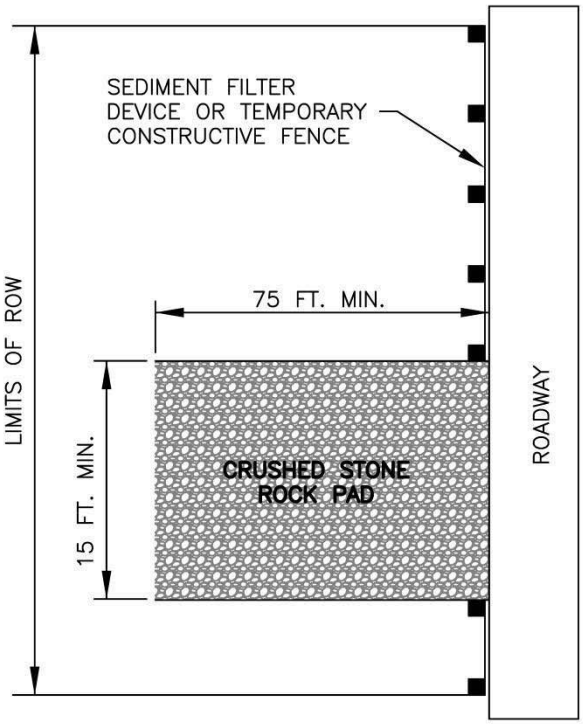
Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 7B SEDIMENT FILTER DEVICE SUPER SILT FENCE	

Figure 7C – Sediment Filter Device Belted Silt Retention Fence



Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 7C SEDIMENT FILTER DEVICE BELTED SILT RETENTION FENCE	

Figure 8 – Temporary Road Entrance Rock Pads



NOTES:

1. CRUSHED STONE SIZE WILL BE AASHTO NUMBER 1 COARSE AGGREGATE OR EQUIV. (4 INCH DIAMETER MIN.)
2. ROCK PAD WILL BE AT LEAST 6 INCHES THICK.
3. THE ROAD ENTRANCE WILL HAVE A GEOTEXTILE FABRIC BENEATH THE ROCK PAD.
4. IF ROCK PAD BECOMES COVERED WITH MUD SO AS TO BECOME INEFFECTIVE, ADDITIONAL STONE WILL BE ADDED.
5. ALL STONE AND FABRIC MUST BE REMOVED DURING ROW RESTORATION.
6. THE ROCK PAD MAY BE ENLARGED TO INCLUDE A TURNING RADIUS.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 8 TEMPORARY ROAD ENTRANCE ROCK PADS	

Figure 9 – Typical Erosion Control Measures at Road Crossings

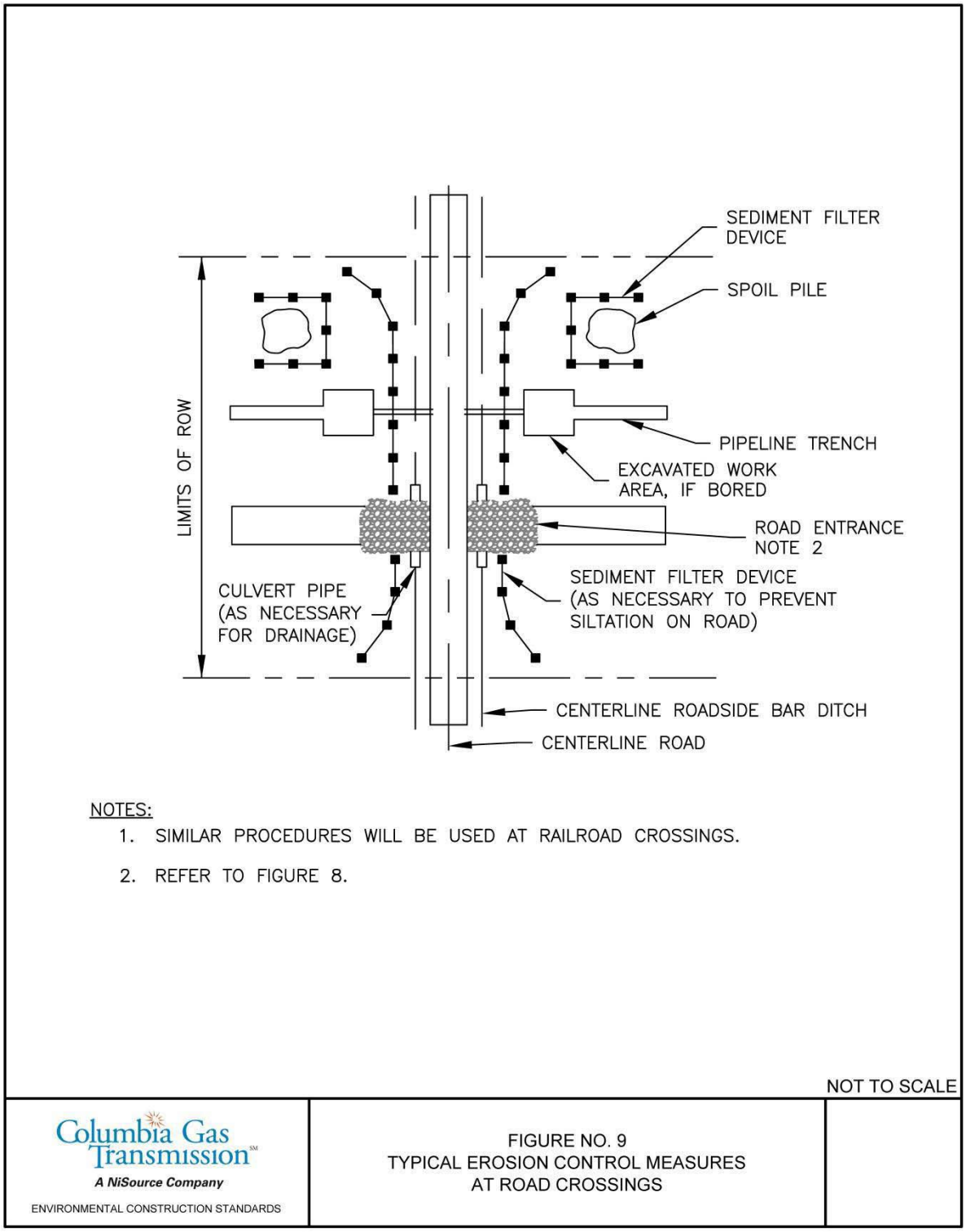


Figure 10 – Trench Line Barriers and Breakers

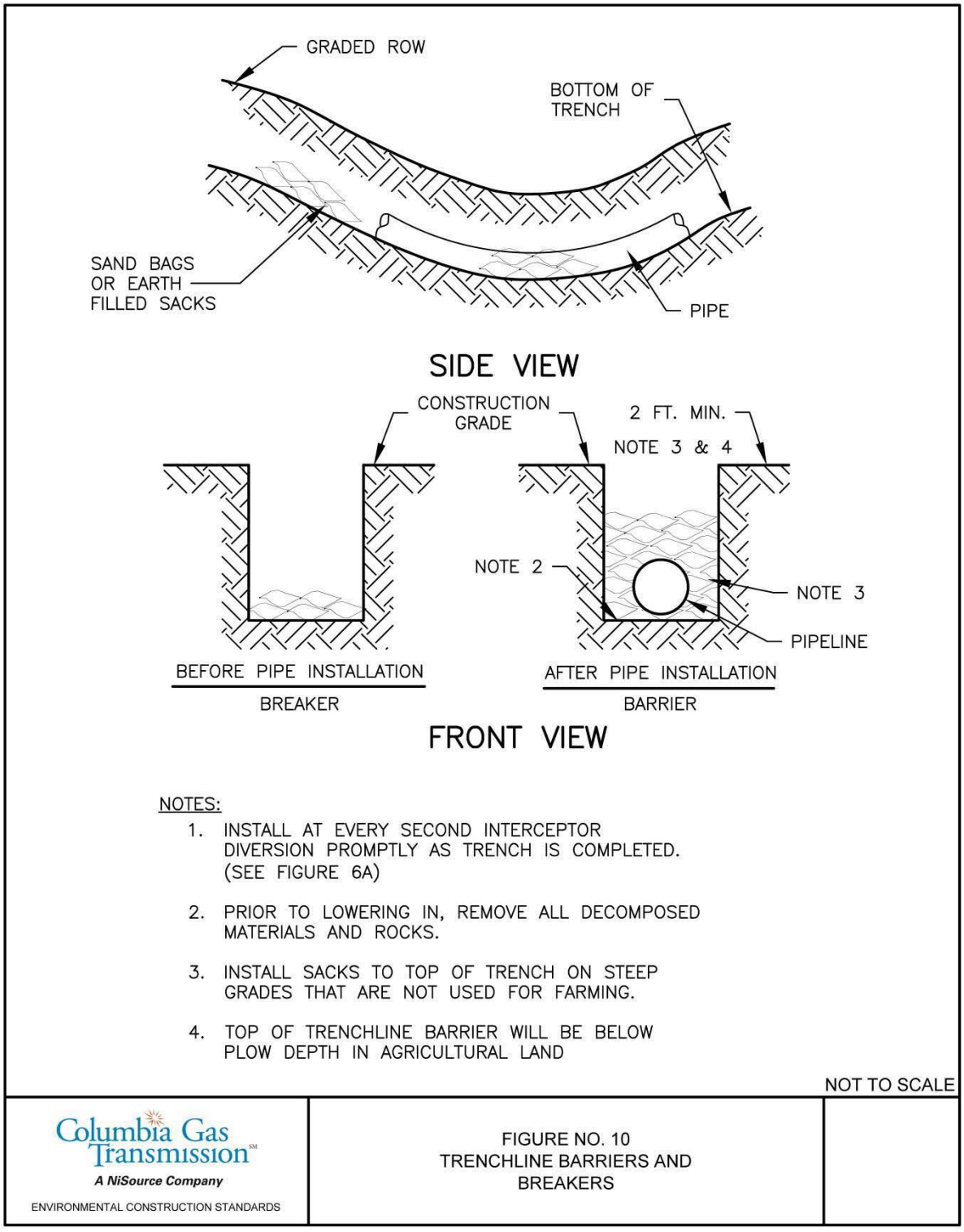


Figure 11 – Field Tile Replacement Method

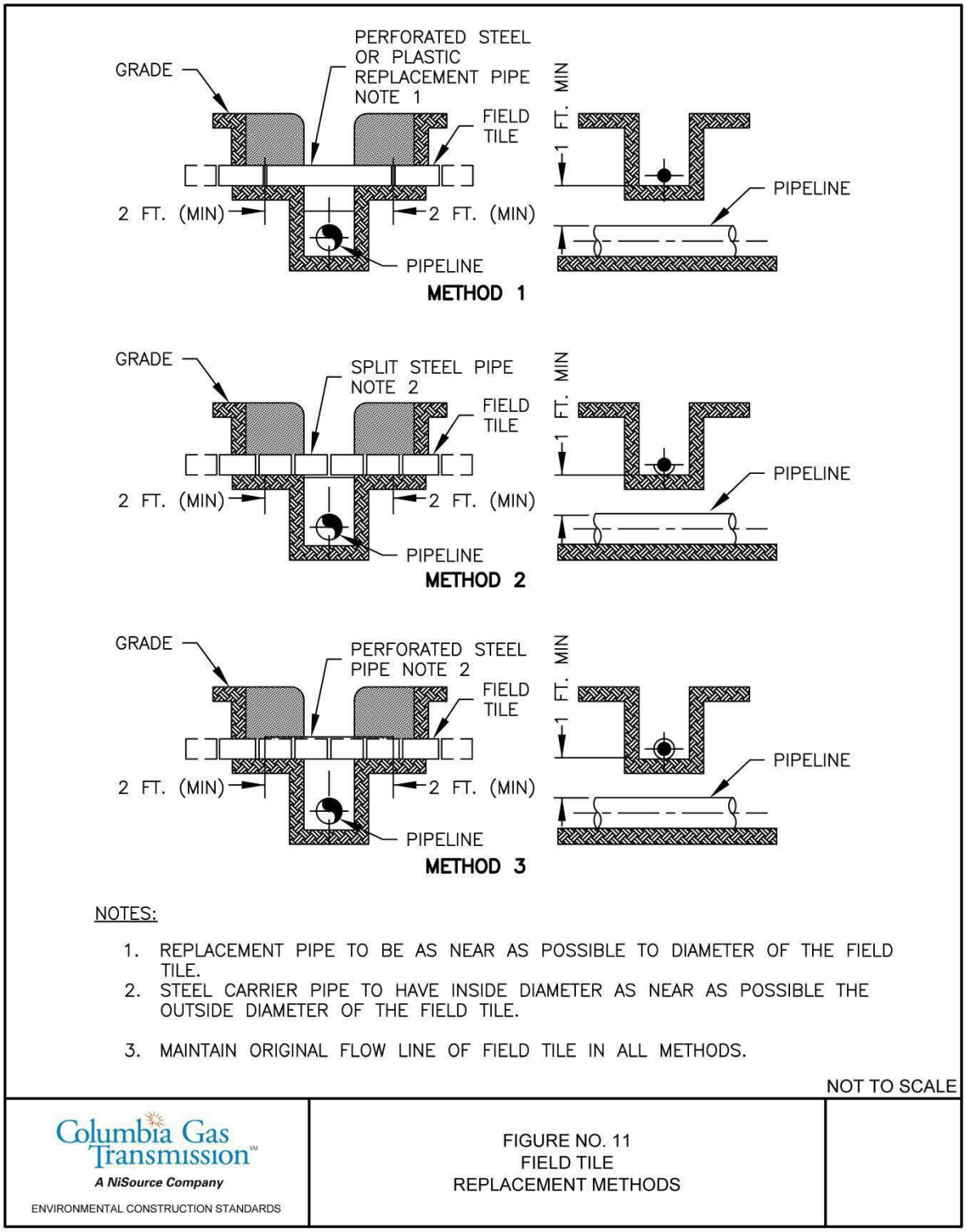
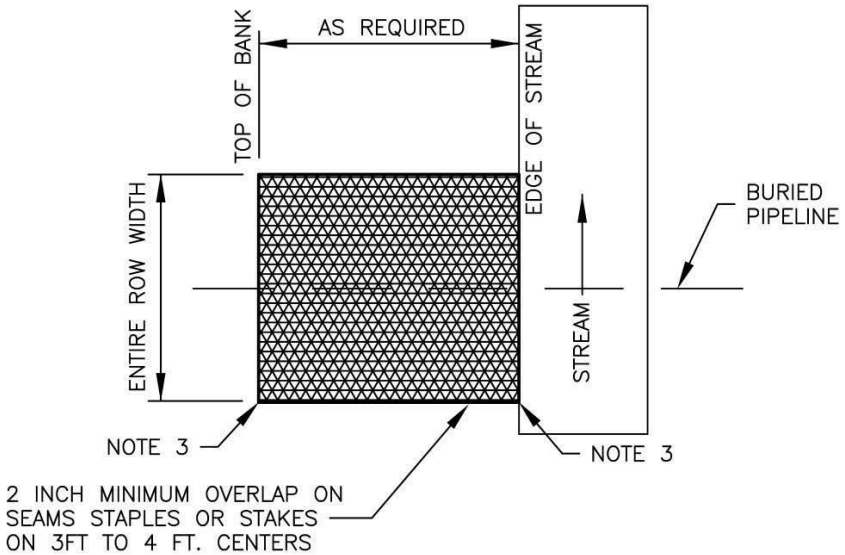


Figure 12A – Erosion Control Blanket



NOTES:

1. INSTALL JUTE NETTING DURING RESTORATION.
2. LIME FERTILIZE, SEED AND MULCH AREA TO BE JUTE NETTED.
3. TRENCH IN AND BURY UPHILL AND UPSTREAM EDGE OF JUTE NETTING.
4. AN INTERCEPTOR DIVERSION WILL BE INSTALLED IMMEDIATELY ABOVE JUTE NETTING ON SLOPED BANKS.
5. ON SHORT BANKS (LESS THAN 10'), JUTE NETTING CAN BE PERPENDICULAR TO BANK SLOPE.
6. INSTALL ON STEEP SLOPES OR ON THE BANKS OF FLOWING STREAMS, OR IN UPLAND AREAS.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 12A EROSION CONTROL BLANKET	

Figure 12B – Rolled Erosion Control Products

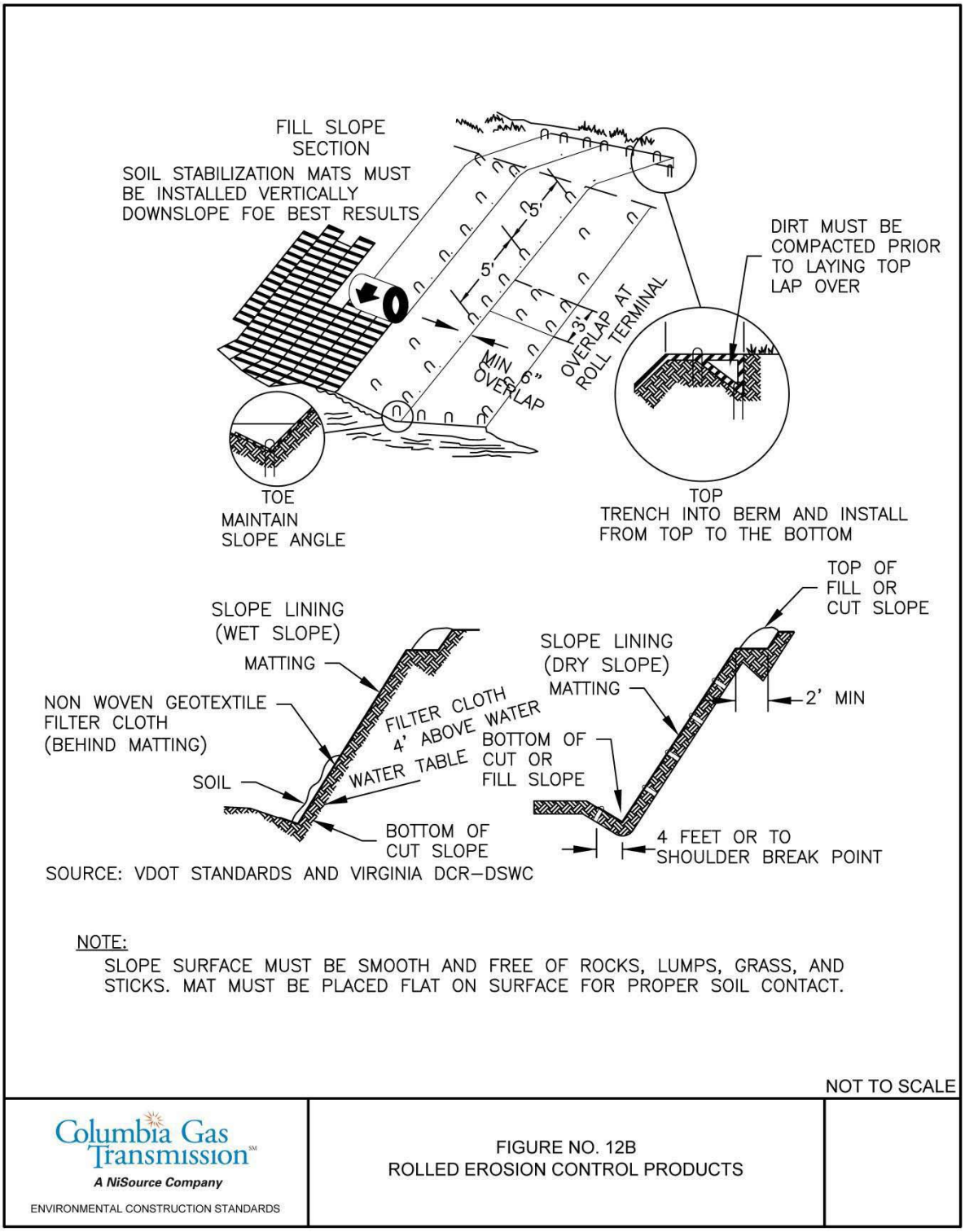
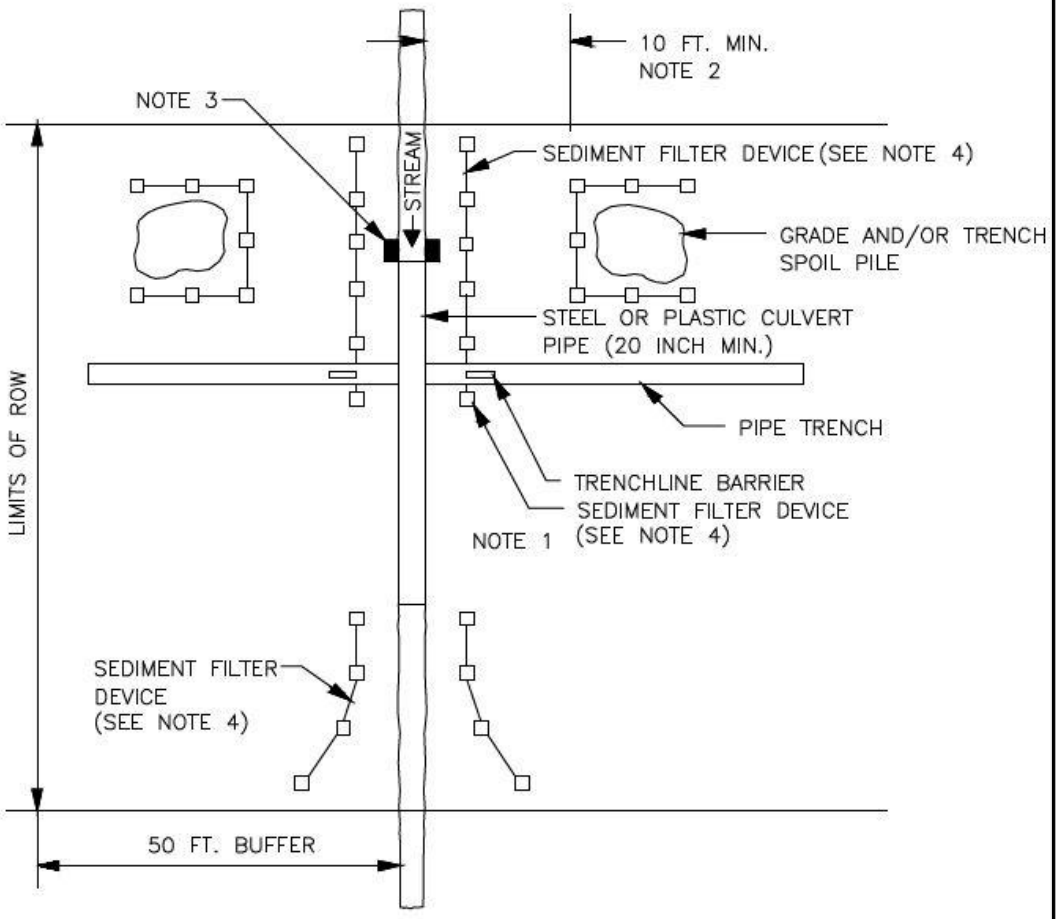


Figure 13 – Typical Stream Crossing Intermittent Stream



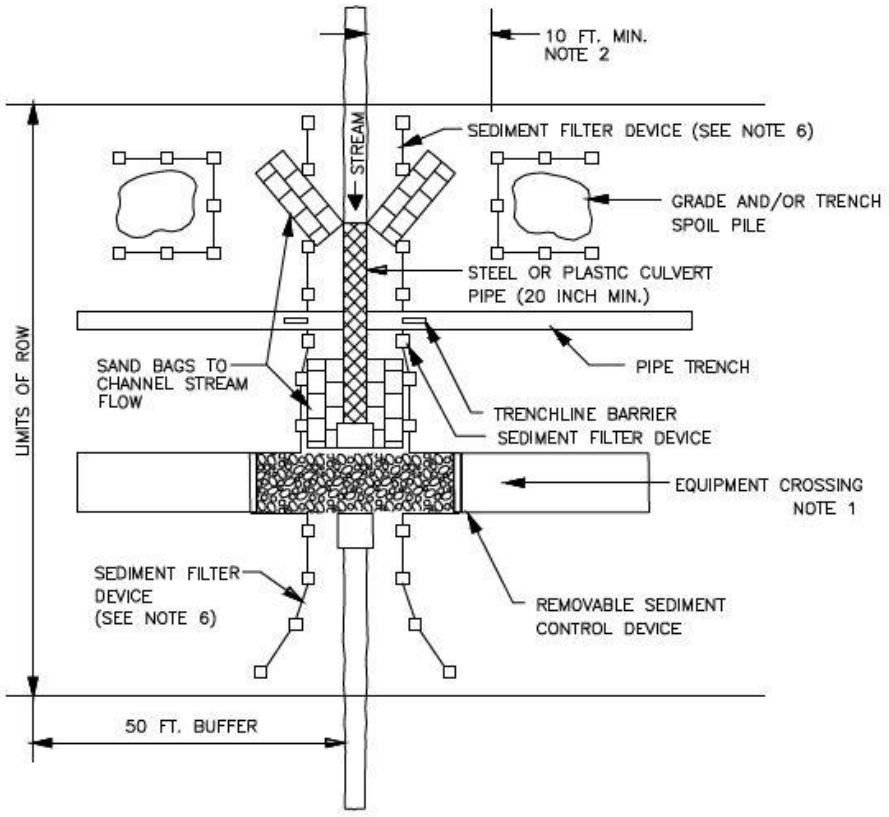
NOTES

1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 AND 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE, TOPOGRAPHY PERMITTING.
3. SAND BAGS OR GRAVEL FILLED SACKS WILL BE PLACED AT UPSTREAM END OF CULVERT TO CHANNEL FLOW.
4. BELTED SILT RETENTION FENCE (BSRF) OR EQUIVALENT SHALL BE USED IN TMDL WATERSHEDS. REFER TO FIGURES 34A, 34B, 34C, 34D, AND 34E FOR LOCATIONS OF TMDL WATERSHEDS

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 13 TYPICAL STREAM CROSSING INTERMITTENT STREAM	

Figure 14 – Typical Stream Crossing Dry-Ditch



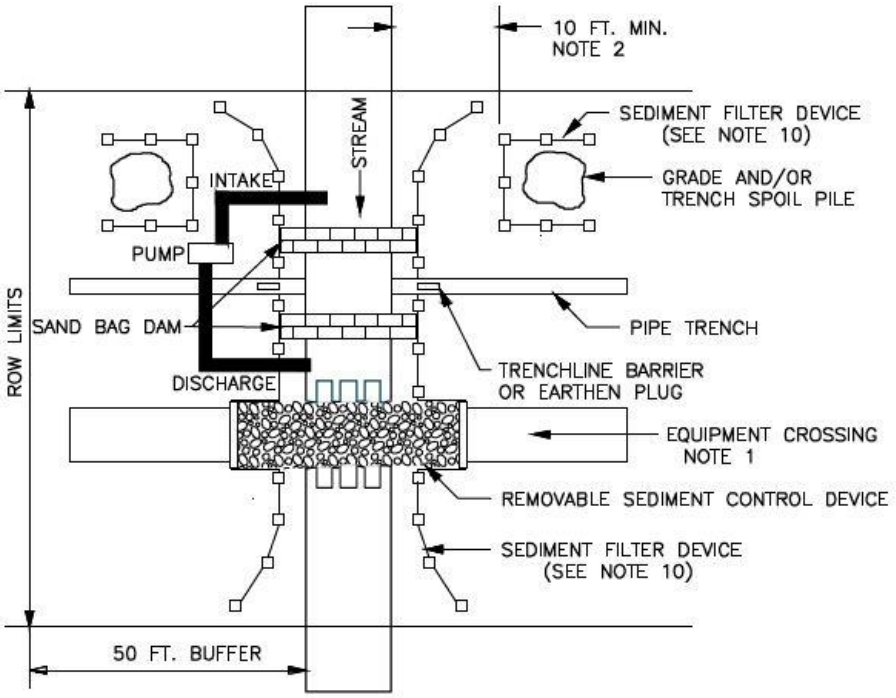
NOTES

1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 AND 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE.
3. INSTALL FLUME PIPE AFTER BLASTING (IF NECESSARY), BUT BEFORE TRENCHING.
4. PROPERLY ALIGN FLUME PIPE(S) TO PREVENT BANK EROSION OR STREAM BED SCOUR.
5. COMPLETE STREAMBED AND BANK STABILIZATION BEFORE RETURNING FLOW TO THE WATERBODY CHANNEL.
6. BELTED SILT RETENTION FENCE (BSRF) OR EQUIVALENT SHALL BE USED IN TMDL WATERSHEDS. REFER TO FIGURES 34A, 34B, 34C, 34D, AND 34E FOR LOCATIONS OF TMDL WATERSHEDS

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 14 TYPICAL STREAM CROSSING DRY DITCH	

Figure 15 – Typical Stream Crossing Dam and Pump



NOTES

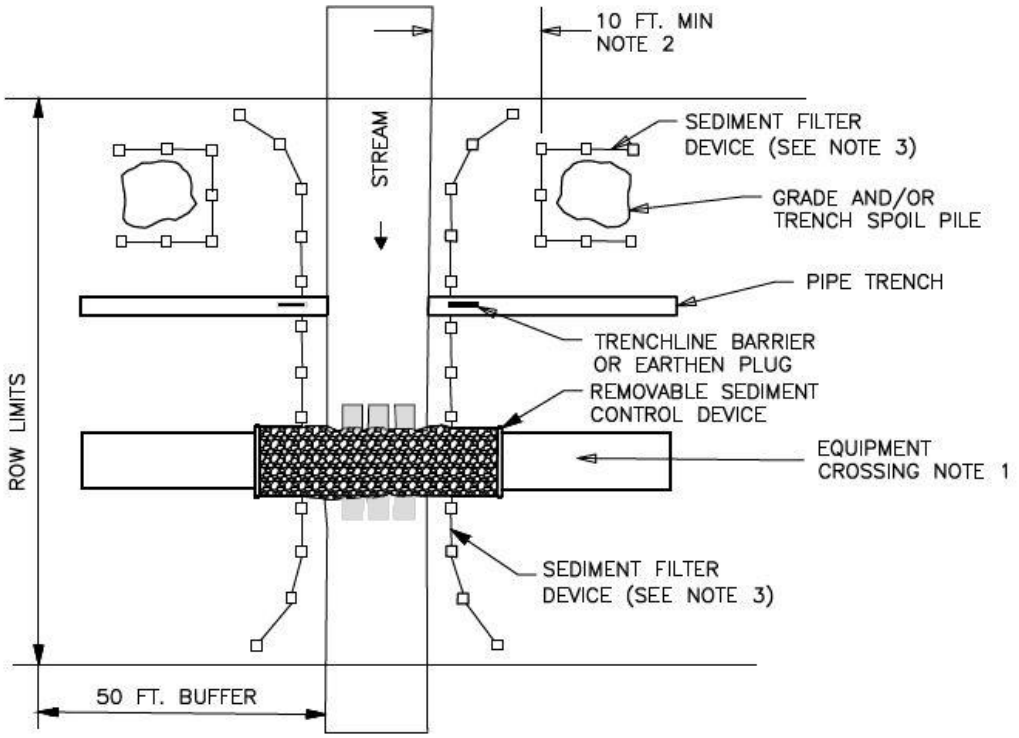
1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 AND 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE, TOPOGRAPHY PERMITTING.
3. PUMP INTAKES WILL BE SCREENED, PREVENT STREAMBED SCOUR AT DISCHARGE.
4. SUFFICIENT PUMP CAPACITY WILL BE USED TO MAINTAIN STREAM FLOW AT ALL TIMES UNTIL BACKFILL AND REMOVAL OF SANDBAG DAM.
5. BACKUP PUMPS (AS SAME NUMBER AND CAPACITY AS ACTIVE PUMPS) WILL BE READILY AVAILABLE IN WORKING CONDITION ON SITE AT CROSSING.
6. CONSTRUCT DAMS WITH MATERIAL THAT PREVENT SEDIMENT AND OTHER POLLUTANTS FROM ENTERING THE WATERBODY.
7. MONITOR THE DAM AND PUMPS TO ENSURE PROPER OPERATIONS THROUGHOUT THE WATERBODY CROSSING.
8. PROVIDE SECONDARY CONTAINMENT FOR PUMPS.
9. COMPLETE STREAMBED AND BANK STABILIZATION BEFORE RETURNING FLOW TO THE WATERBODY CHANNEL.
10. BELTED SILT RETENTION FENCE (BSRF) OR EQUIVALENT SHALL BE USED IN TMDL WATERSHEDS. REFER TO FIGURES 34A, 34B, 34C, 34D, AND 34E FOR LOCATIONS OF TMDL WATERSHEDS

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 15
TYPICAL STREAM CROSSING
DAM AND PUMP

Figure 16 – Typical Stream Crossing Wet-Ditch



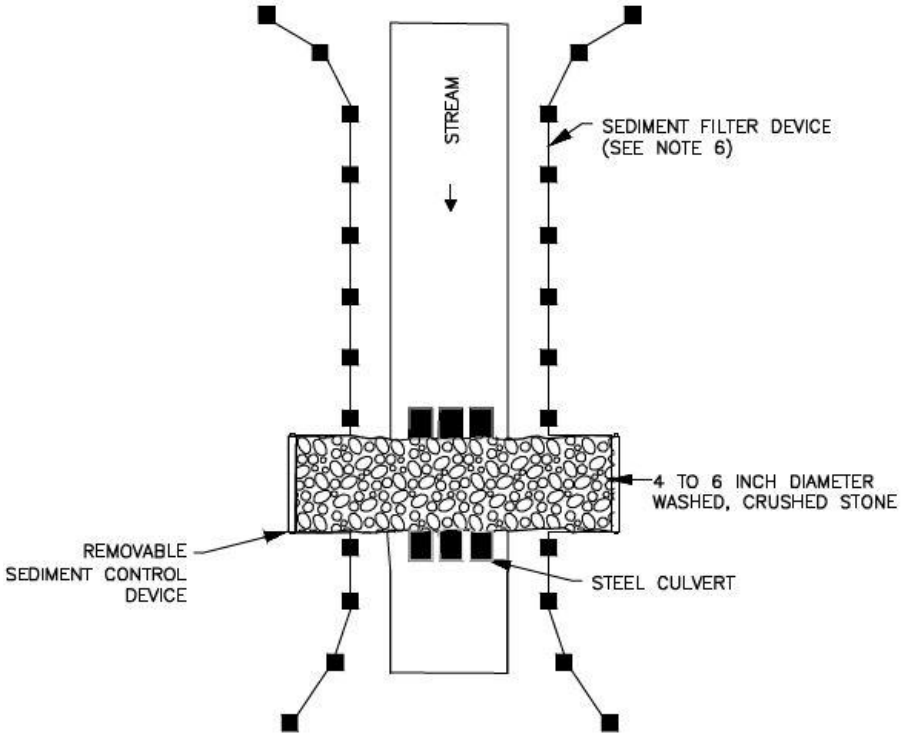
NOTES

1. EQUIPMENT CROSSINGS ARE TO BE PREPARED AS ILLUSTRATED IN FIGURES 17 AND 18.
2. GRADE AND TRENCH SPOIL WILL BE STOCKPILED AT LEAST 10 FEET FROM THE WATER'S EDGE.
3. BELTED SILT RETENTION FENCE (BSRF) OR EQUIVALENT SHALL BE USED IN TMDL WATERSHEDS. REFER TO FIGURES 34A, 34B, 34C, 34D, AND 34E FOR LOCATIONS OF TMDL WATERSHEDS

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 16 TYPICAL STREAM CROSSING WET-DITCH	

Figure 17 – Temporary Equipment Crossing Culvert and Stone



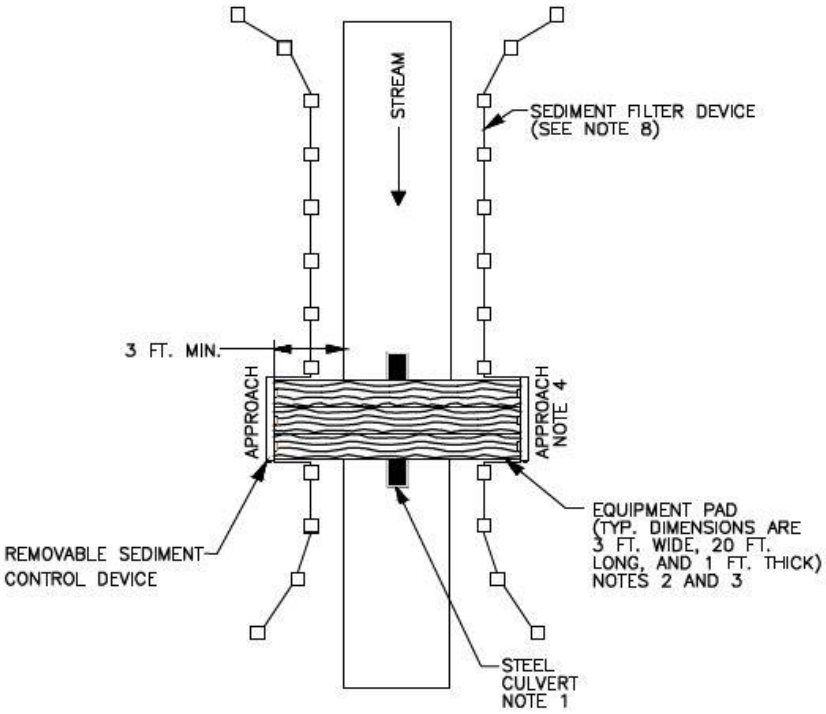
NOTES

1. MINIMUM CONTOURING OF THE BOTTOM NECESSARY TO LAY THE CULVERTS LEVEL MAY BE DONE.
2. USE AS MANY CULVERTS AS REQUIRED TO SPAN ENTIRE STREAM BED (CULVERTS SHALL BE PLACED SIDE BY SIDE).
3. MINIMUM CULVERT DIAMETER 20 INCHES.
4. MAINTAIN ROCK SO AS NOT TO ALLOW MUD TO ENTER THE STREAM.
5. ALIGN CULVERTS TO PREVENT BANK EROSION.
6. BELTED SILT RETENTION FENCE (BSRF) OR EQUIVALENT SHALL BE USED IN TMDL WATERSHEDS. REFER TO FIGURES 34A, 34B, 34C, 34D, AND 34E FOR LOCATIONS OF TMDL WATERSHEDS

NOT TO SCALE

Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 17 TEMPORARY EQUIPMENT CROSSING CULVERT AND STONE	

Figure 18 – Temporary Equipment Crossing Equipment Pads



NOTES

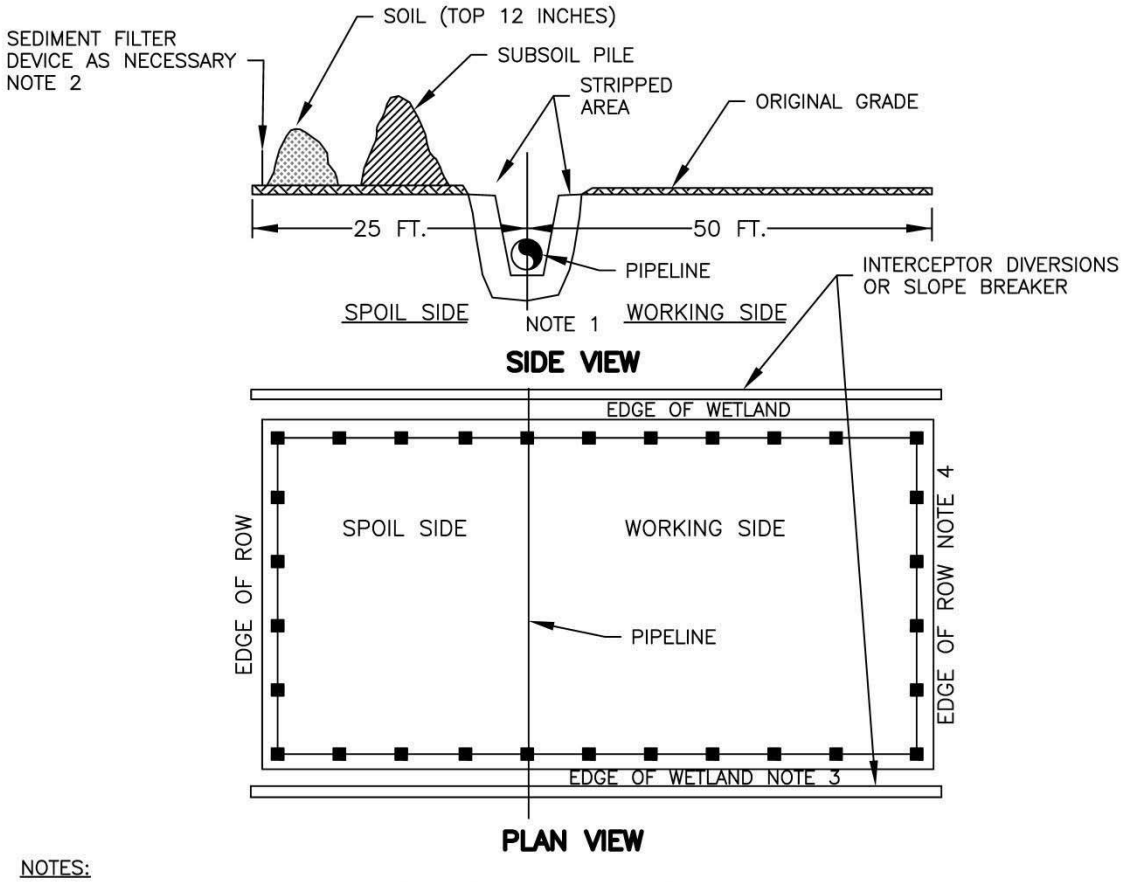
1. CULVERT PIPE UTILIZED IF ADDITIONAL SUPPORT IS REQUIRED.
2. ADDITIONAL PADS CAN BE PUT SIDE BY SIDE IF EXTRA WIDTH IS REQUIRED.
3. EQUIPMENT PAD TYPICALLY CONSTRUCTED OF HARDWOOD; MUST ACCOMMODATE THE LARGEST EQUIPMENT USED.
4. RAMP APPROACHES CAN EITHER BE GRADED OR DUG INTO GROUND. IF NECESSARY, WASHED, CRUSHED STONE WILL BE USED TO RAMP UP TO THE EQUIPMENT PADS.
5. MINIMUM CULVERT DIAMETER 20 INCHES.
6. MAINTAIN PADS SO AS NOT TO ALLOW MUD TO ENTER THE STREAM.
7. EQUIPMENT CANNOT INTERFERE WITH STREAM FLOW.
8. BELTED SILT RETENTION FENCE (BSRF) OR EQUIVALENT SHALL BE USED IN TMDL WATERSHEDS. REFER TO FIGURES 34A, 34B, 34C, 34D, AND 34E FOR LOCATIONS OF TMDL WATERSHEDS

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 18
TEMPORARY EQUIPMENT CROSSING
EQUIPMENT PADS

Figure 19 – Typical Wetland Crossing



NOTES:

1. FOR WETLAND CROSSINGS WITHOUT STANDING WATER OR SATURATED SOILS, UPLAND CONSTRUCTION TECHNIQUES CAN BE USED. IF STANDING WATER OR SATURATED SOILS BECOME PRESENT DURING CONSTRUCTION ACTIVITIES IN WETLANDS THAT WERE INITIALLY DRY, OPERATE PER REQUIREMENTS IN SECTION III.B.2. OF THIS ECS (SEE NOTE 2).
2. WETLANDS WITH STANDING WATER, SATURATED OR FROZEN SOIL, OPERATE EQUIPMENT PER REQUIREMENTS IN SECTION III.B.2. (ECS).
3. IN WETLAND AREAS WHICH CONTAIN NO STANDING WATER OR IF SOILS ARE SATURATED OR FROZEN, TOPSOIL (TOP 12 INCHES) AND SUBSOIL WILL BE STOCKPILED SEPARATELY WITHIN THE WETLAND CONSTRUCTION ROW.
4. A SEDIMENT FILTER DEVICE WILL BE PLACED ACROSS THE ROW AT THE WETLAND'S EDGE, IMMEDIATELY UPSLOPE OF THE WETLAND BOUNDARY.
5. A SEDIMENT FILTER DEVICE WILL BE PLACED AT THE EDGE OF THE ROW AND AROUND SOIL AND SUBSOIL PILES AS NECESSARY.

NOT TO SCALE

Columbia Gas Transmission℠
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 19
TYPICAL WETLAND CROSSING

Figure 20 – ROW Maintenance Perennial Streams

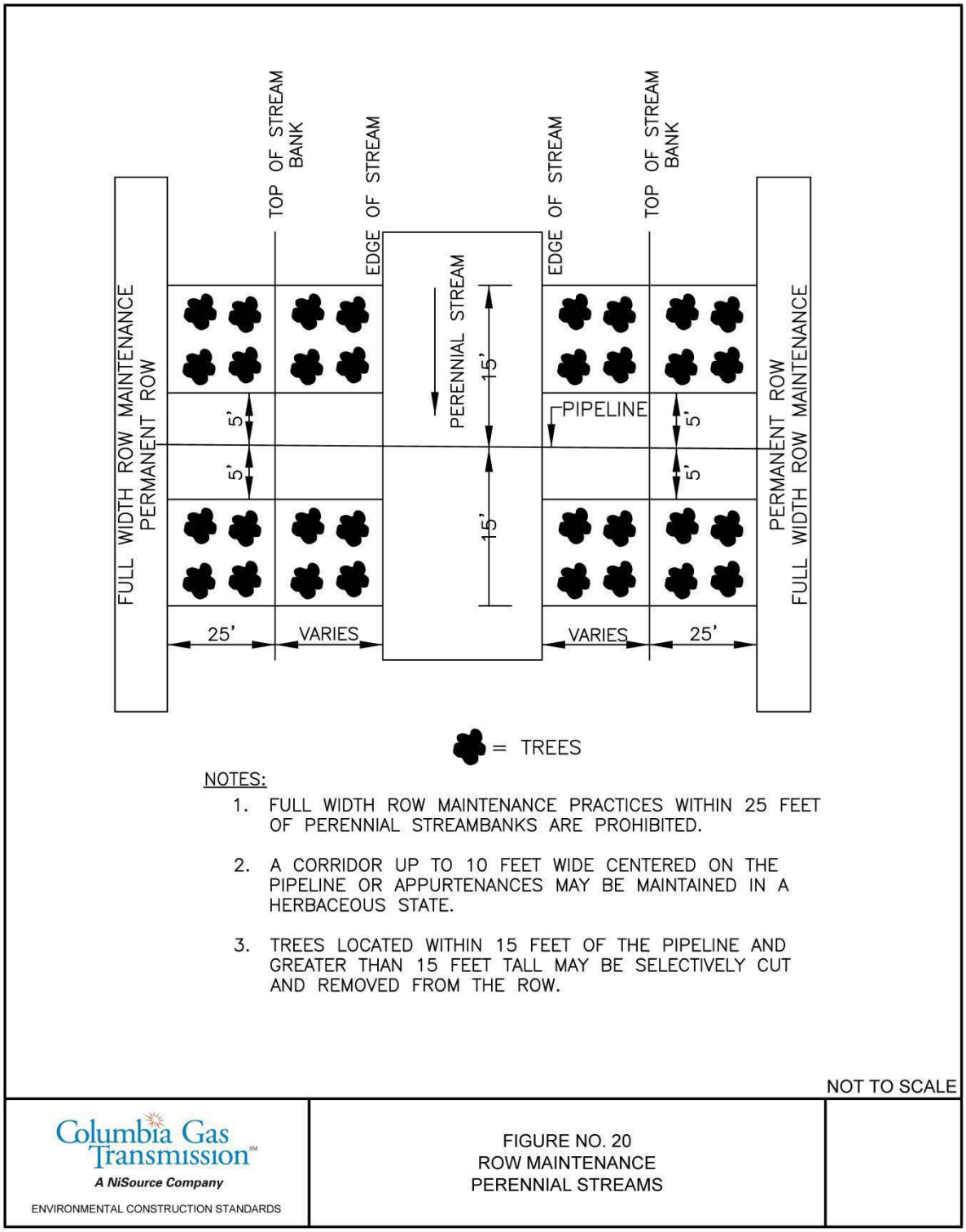


Figure 21 – Typical Staging/Storage Area

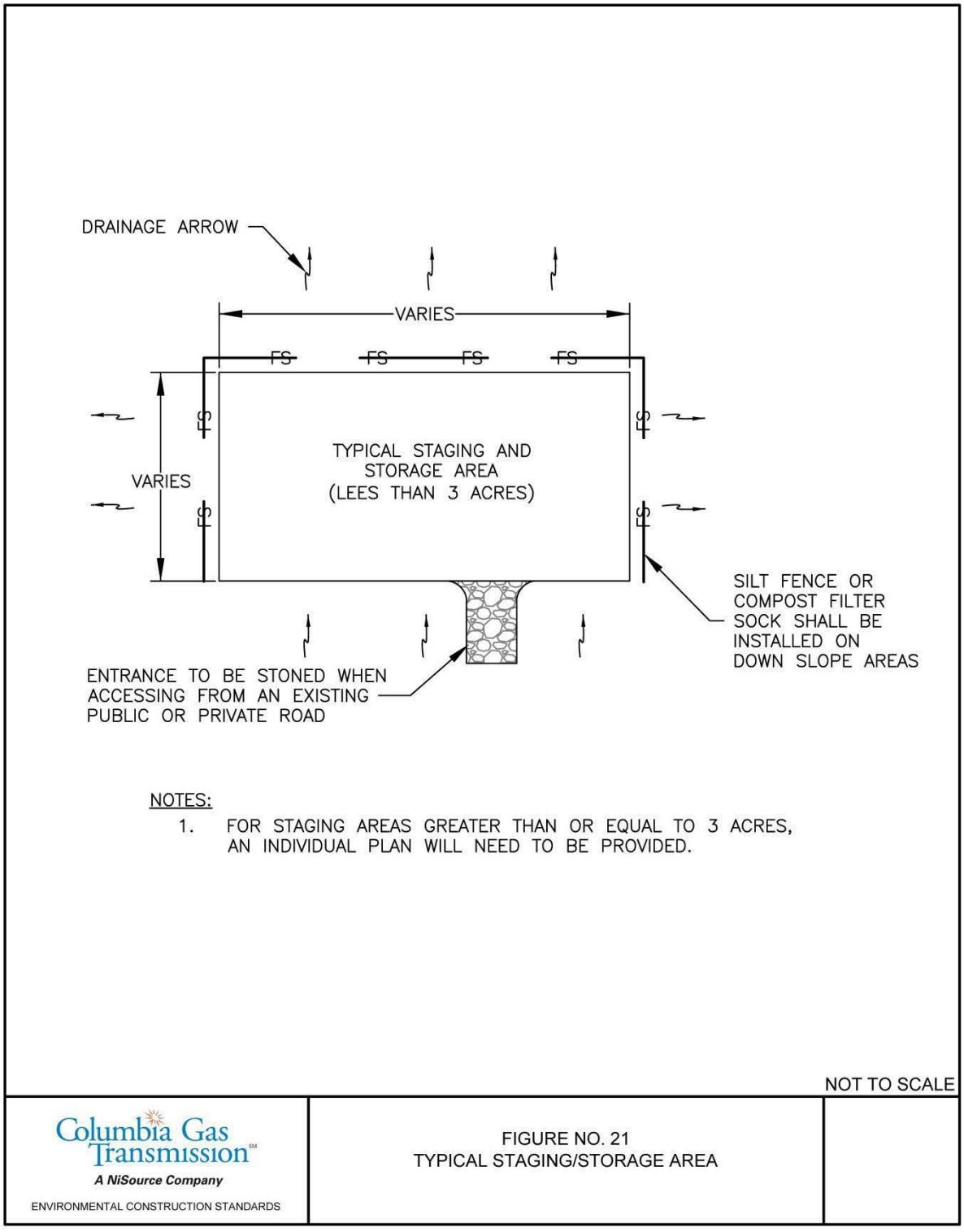


Figure 22 – Typical Earthen Berm

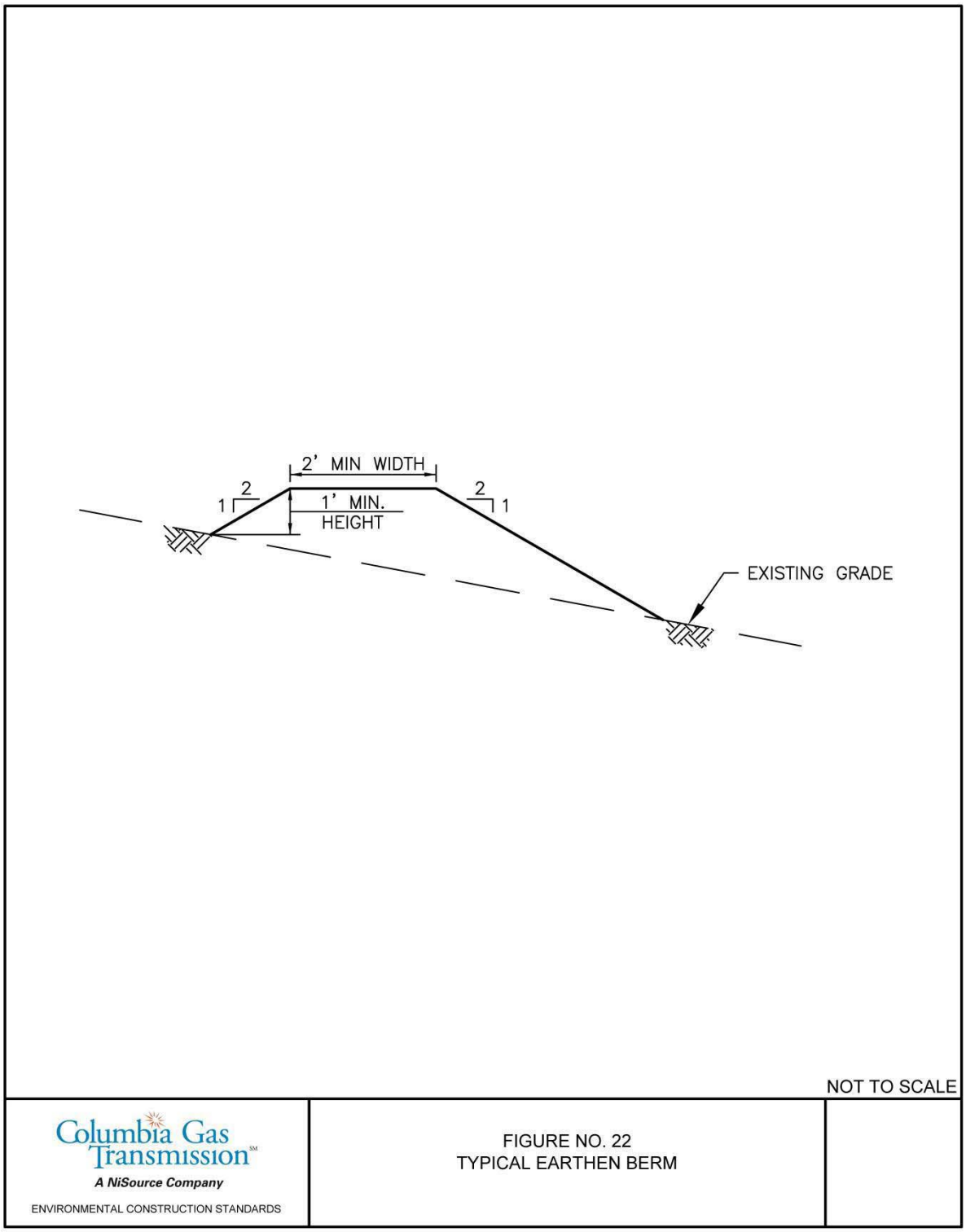


Figure 23A – Typical Newly Constructed Access Road

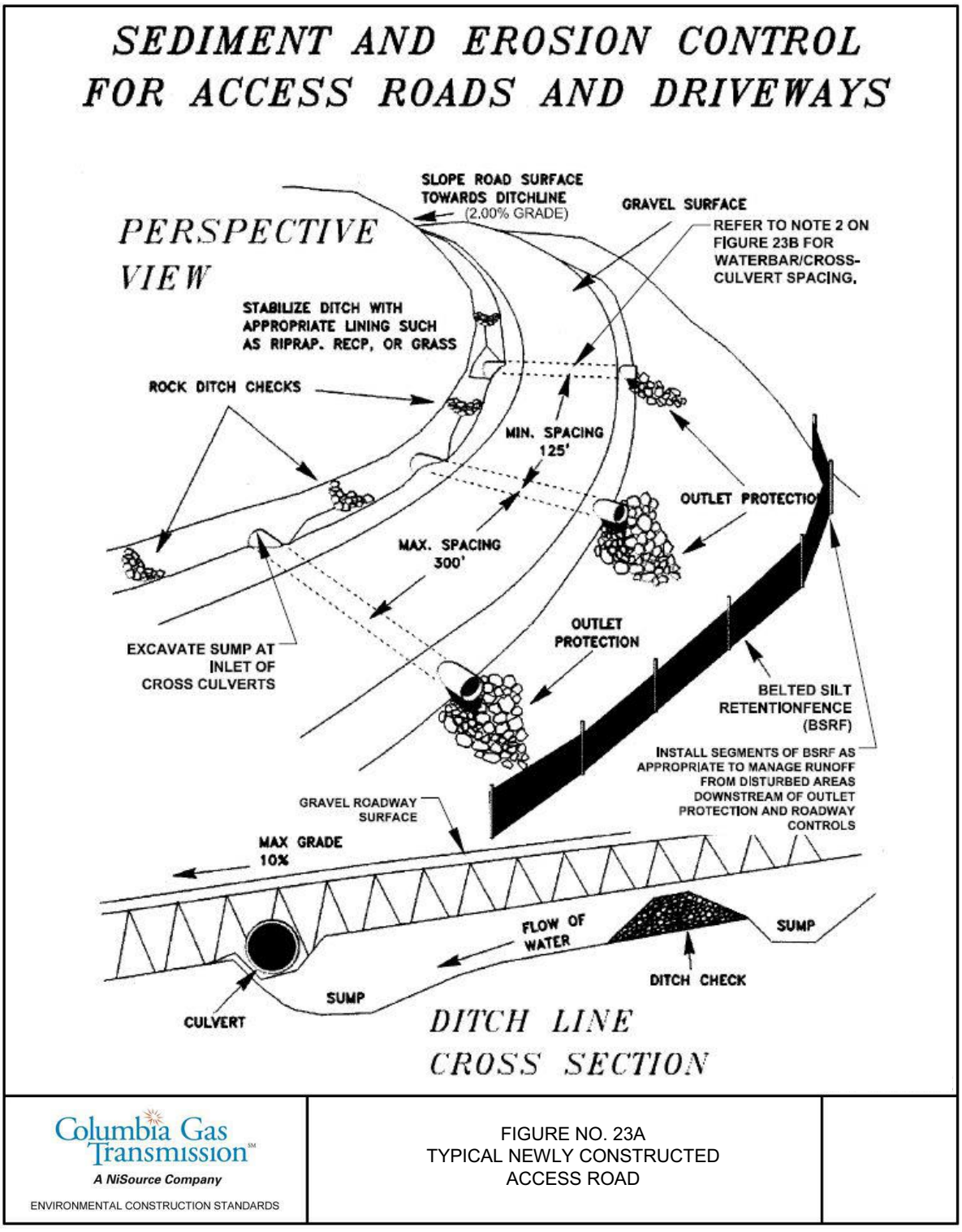


Figure 23B – Typical Newly Constructed Access Road

NOTES:

1. DRAINAGE CHANNELS (WHERE NECESSARY) SHALL HAVE PROTECTIVE LINING MATERIALS AND APPROPRIATE OUTLET PROTECTION INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF COLUMBIA'S APPROVED ENVIRONMENTAL CONSTRUCTION STANDARDS AND WEST VIRGINIA'S EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.

2. CULVERT SPACING = 400 / %GRADE + 75'. DO NOT SPACE CULVERTS FURTHER THAN 300' APART. CULVERTS SHALL BE SPACED A MINIMUM OF 125' APART.

3. ANY ROAD THAT HAS OR MAY NEED CONSTRUCTION ACTIVITIES MUST HAVE APPROPRIATE EROSION AND SEDIMENT CONTROLS INSTALLED IN ACCORDANCE WITH COLUMBIA'S APPROVED ENVIRONMENTAL CONSTRUCTION STANDARDS AND WEST VIRGINIA'S EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES MANUAL. THIS INCLUDES DRAINAGE DITCHES, CULVERTS, OR ANY OTHER APPLICABLE CONTROL DEEMED APPROPRIATE AT THE TIME OF CONSTRUCTION.

4. DRAINAGE DITCHES WILL HAVE A MINIMUM OF 2.5' DEPTH AND SIDESLOPES AT 2:1 OR FLATTER. CULVERTS WILL HAVE A MINIMUM 24" INNER DIAMETER.

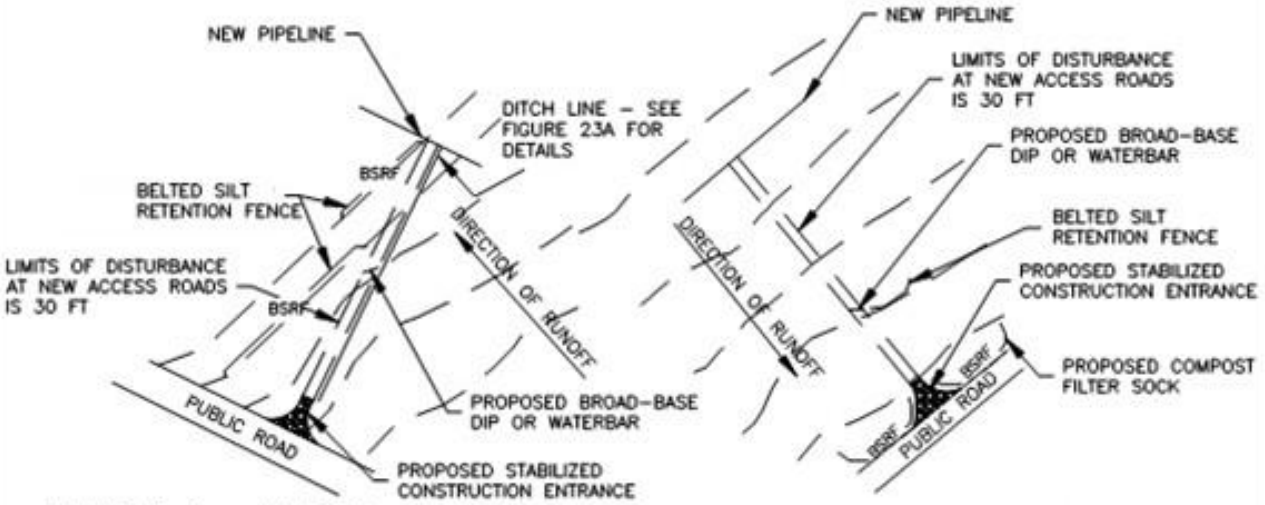
5. BSRF IS THE PREFERRED CONTROL TO MANAGE SEDIMENT LADEN WATER DOWNGRADIENT OF ROADWAY CONTROL FEATURES SUCH AS WATER BARS OR CROSS CULVERTS. IF BEDROCK/OBSTRUCTION IS ENCOUNTERED WITHIN 6 INCHES OF GRADE OR OTHER FIELD CONDITIONS PROHIBIT INSTALLATION OF BSRF, CFS MAY BE USED IN LIEU OF BSRF.

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 23B TYPICAL NEWLY CONSTRUCTED ACCESS ROAD	

Figure 24 – Typical Access Road E&S Control

STABILIZED CONSTRUCTION ENTRANCE:

1. USE TWO TO FOUR INCH (2–4") STONE LOW VOLUME ENTRANCES. LARGER STONE (4–6") FOR HEAVY USE OR MATERIAL DELIVERY ENTRANCES.
2. LENGTH IS AS REQUIRED, BUT NOT LESS THAN FIFTY (50') (EXCEPT ON SINGLE RESIDENCE LOT WHERE A THIRTY FOOT (30') MINIMUM LENGTH WOULD APPLY).
3. THICKNESS SHOULD NOT BE LESS THAN SIX INCHES (6").
4. THE WIDTH SHALL BE A MINIMUM OF TWENTY FEET (20') BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE FABRICS SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO THE PACING OF STONE.
6. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF A CULVERT IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES SHALL BE USED.



EXAMPLE A – HILLSIDE

EXAMPLE B – RIDGETOP

NOTES:

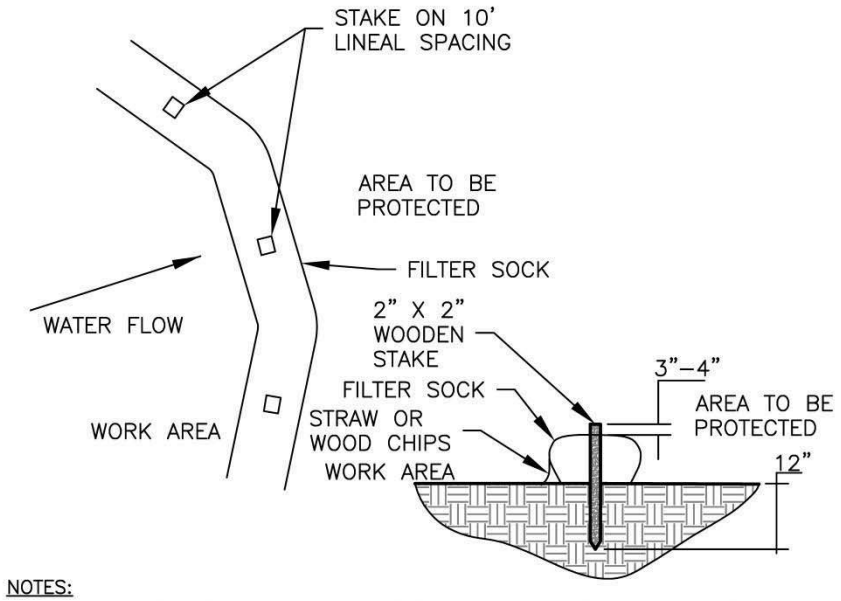
1. APPROPRIATE E&S CONTROLS SUCH AS BELTED SILT RETENTION FENCE WILL BE LOCATED DOWN SLOPE OF CONSTRUCTION.
2. AS NOTED IN FIGURE 23B, NOTE 5, BSRF IS THE PREFERRED E&S CONTROL. IF BEDROCK/OBSTRUCTION IS ENCOUNTERED WITHIN 6 INCHES OF GRADE OR OTHER FIELD CONDITIONS PROHIBIT INSTALLATION OF BSRF, CFS MAY BE USED IN LIEU OF BSRF.
3. USE THIS DETAIL FOR ALL CONSTRUCTION ACTIVITY ROADS OR DISTURBED AREAS ON INCIDENTAL CONSTRUCTION ACTIVITY ROADS.

NOT TO SCALE

Columbia Gas Transmission
A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 24
TYPICAL ACCESS ROAD
E & S CONTROL

Figure 25 – Typical Compost Filter Sock



NOTES:

1. COMPOST FILTER SOCK TO BE FILTREXX SILTSOXX OR APPROVED EQUIVALENT.
2. 8", 12" 18" AND 24" COMPOST FILTER SOCK TO BE USED. SEE PLAN SHEET FOR SIZES AND LOCATIONS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE COMPOST FILTER SOCK.
4. COMPOST FILTER SOCK SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED COMPOST FILTER SOCK SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

FILTER SOCK SIZING CHART

SLOPE PERCENT	8 IN (200 mm) SiltSoxx™ 6.5 IN (160 mm)**	12 IN (300 mm) SiltSoxx™ 9.5 IN (240 mm)**	18 IN (450 mm) SiltSoxx™ 14.5 IN (360 mm)**	24 IN (600 mm) SiltSoxx™ 19 IN (480 mm)**	32 IN (800 mm) SiltSoxx™ 26 IN (650 mm)**
2 (OR LESS)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (120)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

* BASED ON FAILURE POINT OF 36 IN (0.9 m) SUPER SILT FENCE (WIRE REINFORCED) AT 1000 FT. (303 m) OF SLOPE, WATERSHED WIDTH EQUIVALENT TO RECEIVING LENGTH OF SEDIMENT CONTROL DEVICE, 1 IN/24 hr (25 mm/24 hr) RAIN EVENT.

** EFFECTIVE HEIGHT OF SiltSoxx ™AFTER INSTALLATION AND WITH CONSTANT HEAD FROM RUNOFF AS DETERMINED BY OHIO STATE UNIVERSITY.

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A NiSource Company
ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 25
TYPICAL COMPOST FILTER SOCK

Figure 26 – Typical Outlet Marker

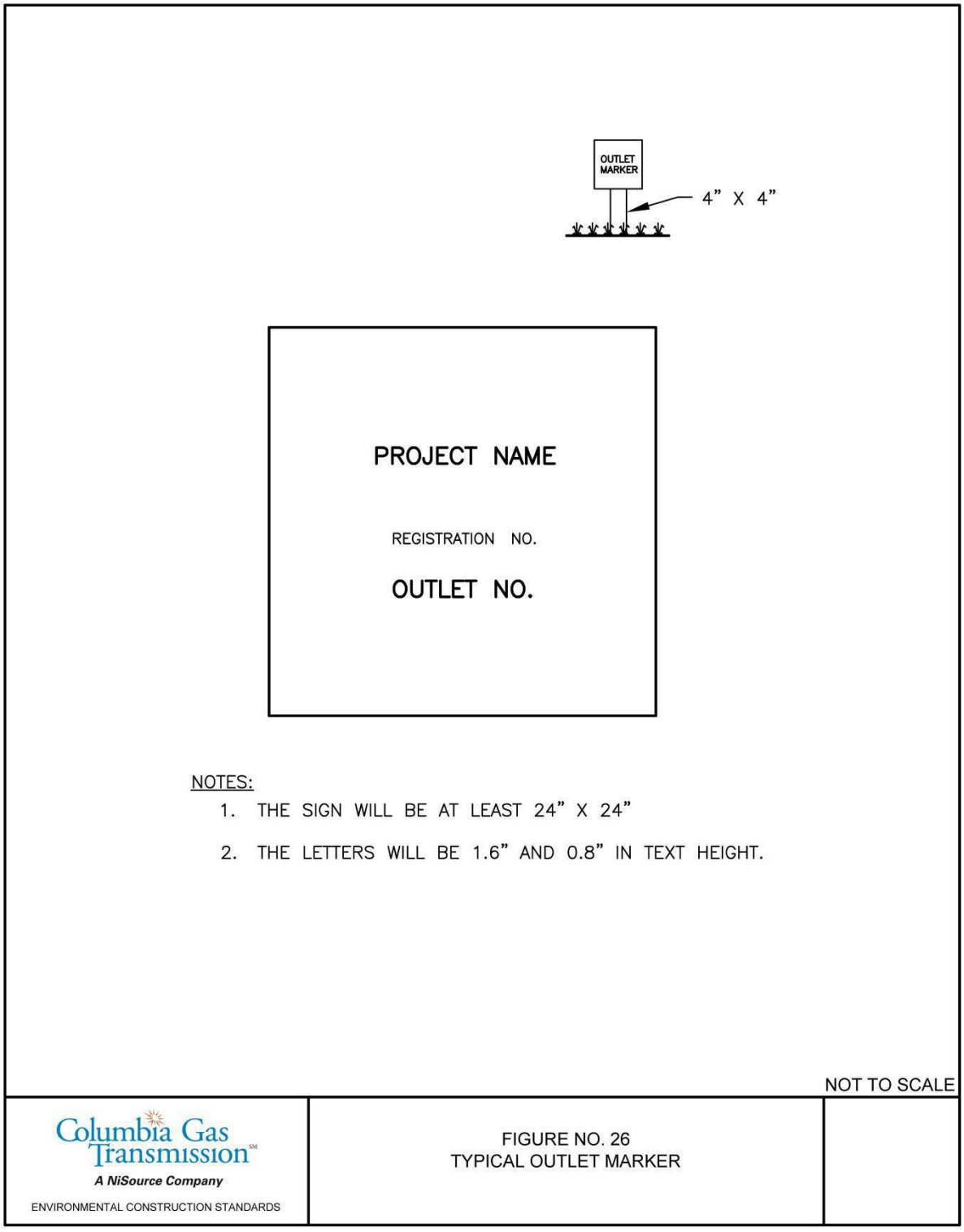


Figure 27 – Typical Public Notice/Entrance Sign

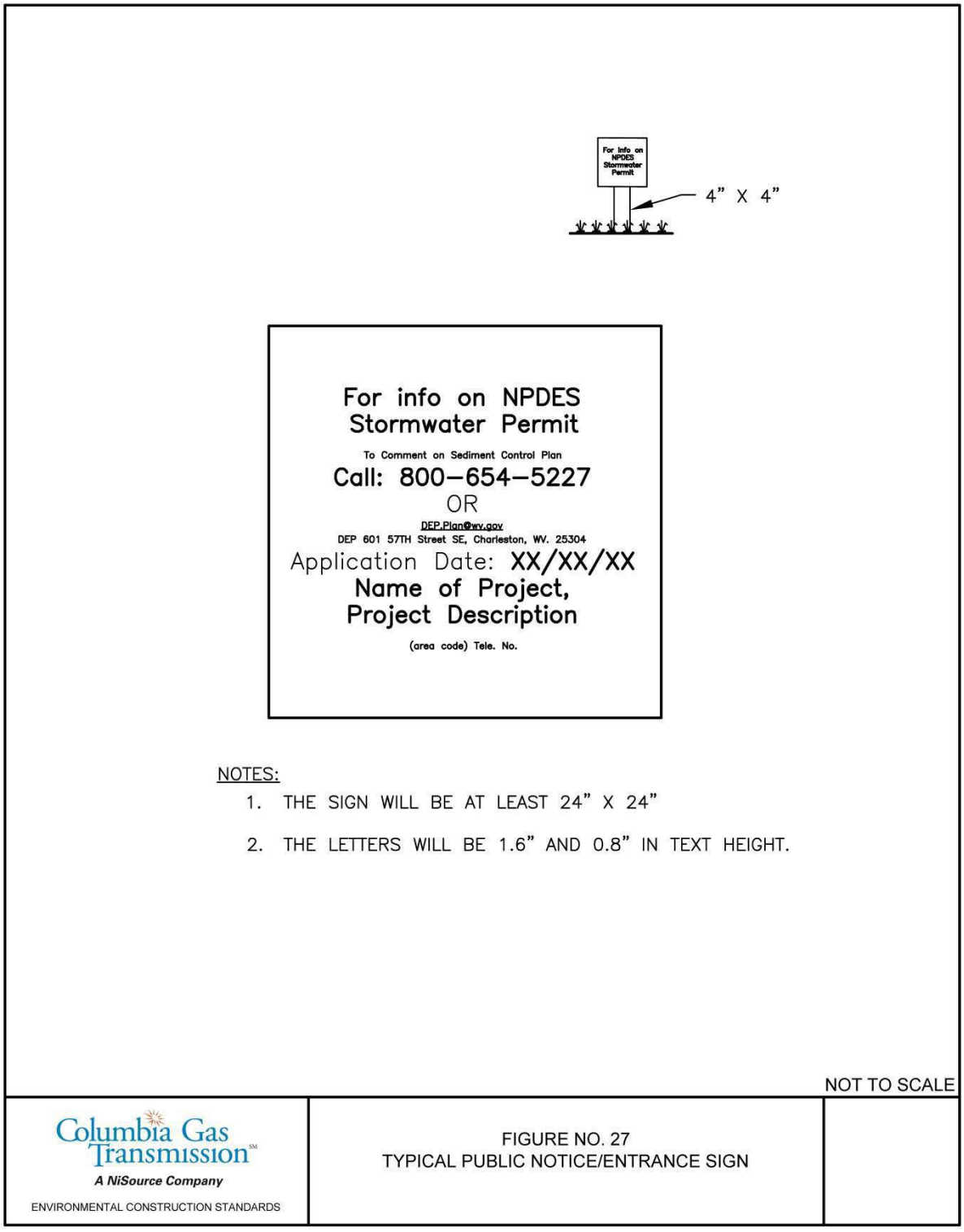
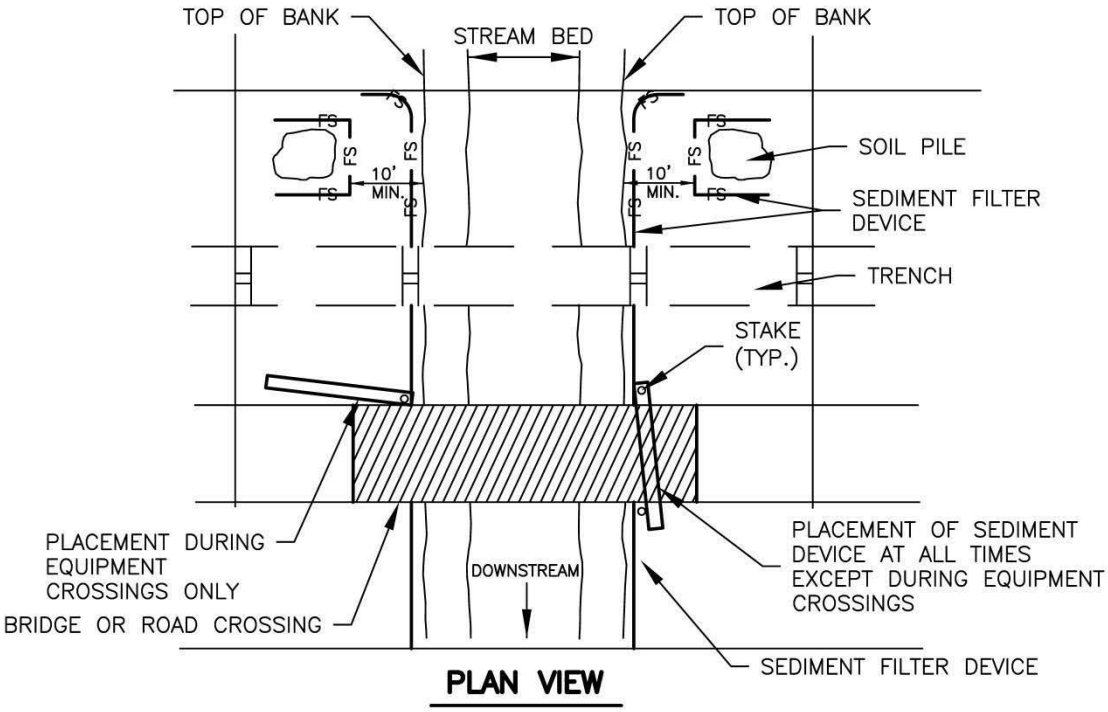


Figure 28 – Typical Removable Sediment Filter Device



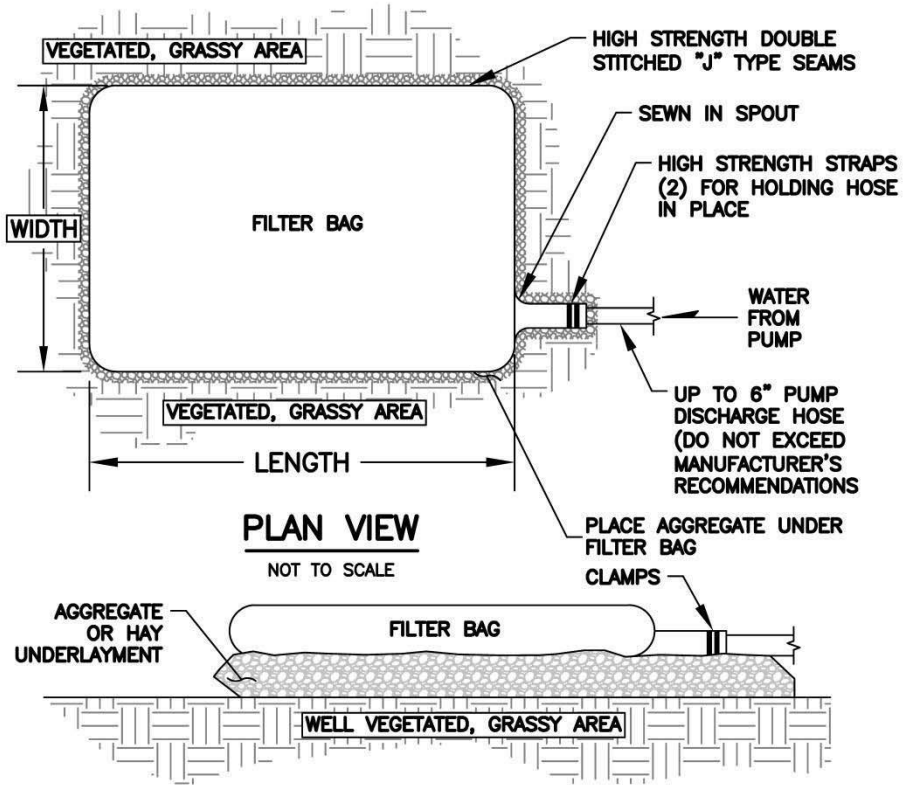
NOTES:

1. SEDIMENT FILTER DEVICE (COMPOST FILTER SOCK, SILT FENCE, OR OTHER APPROVED EQUIVALENT), SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SEDIMENT FILTER DEVICE SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
2. SEDIMENT FILTER DEVICE AT ENTRANCES SHALL BE IN PLACE FROM START OF DAY, DURING CONSTRUCTION ACTIVITIES AND AT END OF DAY. SEDIMENT FILTER DEVICE MAY BE TEMPORARILY MOVED AS SHOWN ON THE LEFT DURING EQUIPMENT CROSSING ACTIVITIES BUT MUST BE REPLACED IMMEDIATELY UPON COMPLETION OF CROSSING.
3. COMPOST FILTER SOCK TO BE FILTREXX SILTSOXX OR APPROVED EQUIVALENT.

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Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 28 TYPICAL REMOVABLE SEDIMENT FILTER DEVICE	

Figure 29 – Typical Water Filter Bag



NOTES:

1. FILTER BAGS SHALL BE MADE FROM NON–WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS.
2. BAGS MUST BE PLACED WITHIN THE PERMITTED AREA IF ACCESSING THE BAG WITH MACHINERY IS REQUIRED FOR DISPOSAL PURPOSES. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED.
3. BAGS SHOULD BE LOCATED IN WELL–VEGETATED (GRASSY) AREAS, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH CAN BE PROVIDED OR ALLOW DISCHARGE FROM BAG TO FLOW THROUGH A SERIES OF SEDIMENT LOGS ETC.... BAGS CAN BE USED INSIDE SEDIMENT TRAPS.
4. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. DO NOT ALTER OR CUT BAGS.
6. AGGREGATE OR HAY SHALL BE PLACED UNDERNEATH FILTER BAGS.
7. SEDIMENT FILTER DEVICE (COMPOST FILTER SOCK, HAY BALE OR APPROVED EQUIVALENT) SHALL BE PLACED WHERE WARRANTED OR AS DETERMINED BY THE EI.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 29 TYPICAL WATER FILTER BAG	

Figure 30 – Typical Stream Crossing Surface Flow Diversion

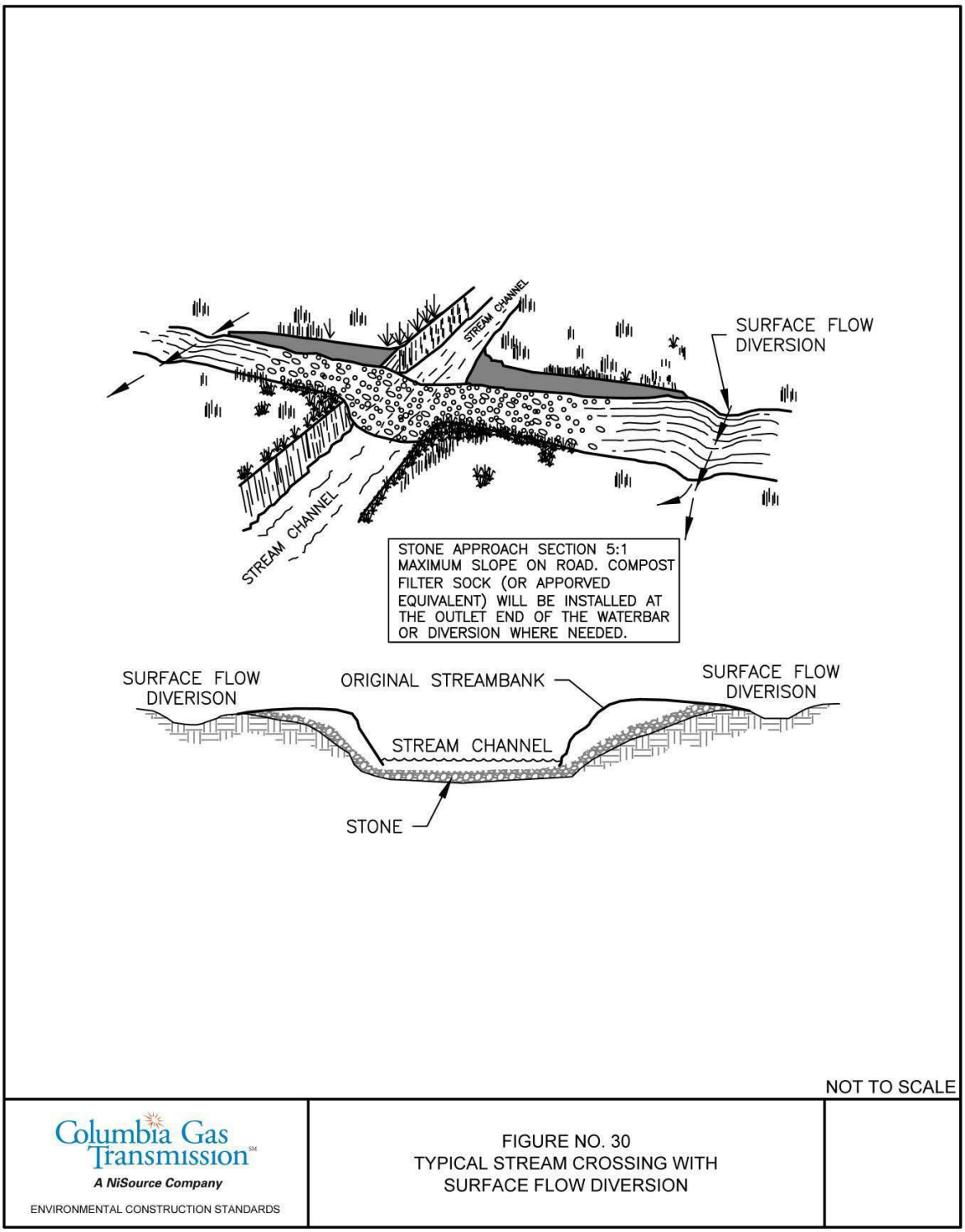


Figure 31A – Rock Check Dam

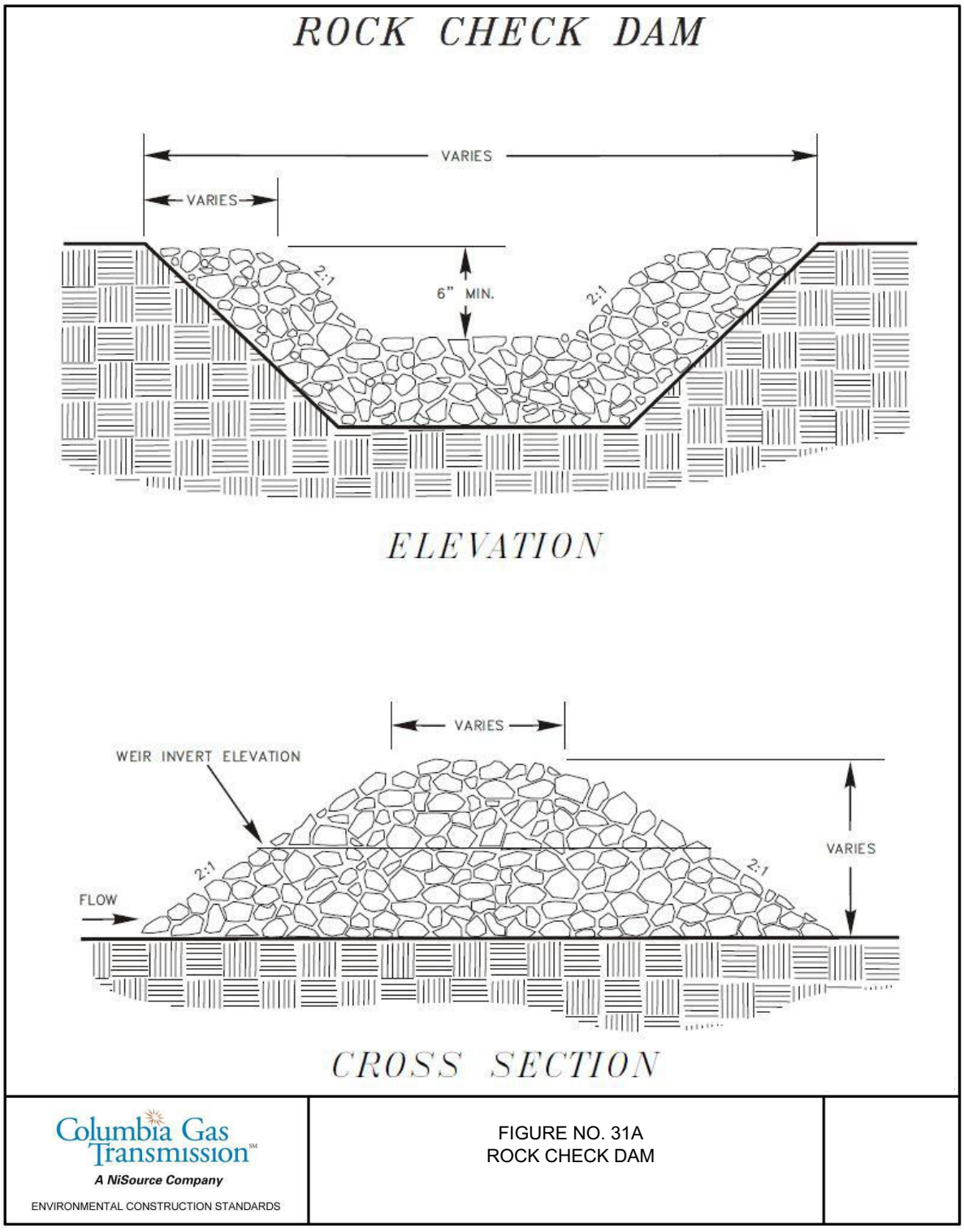


Figure 31B – Rock Check Dam

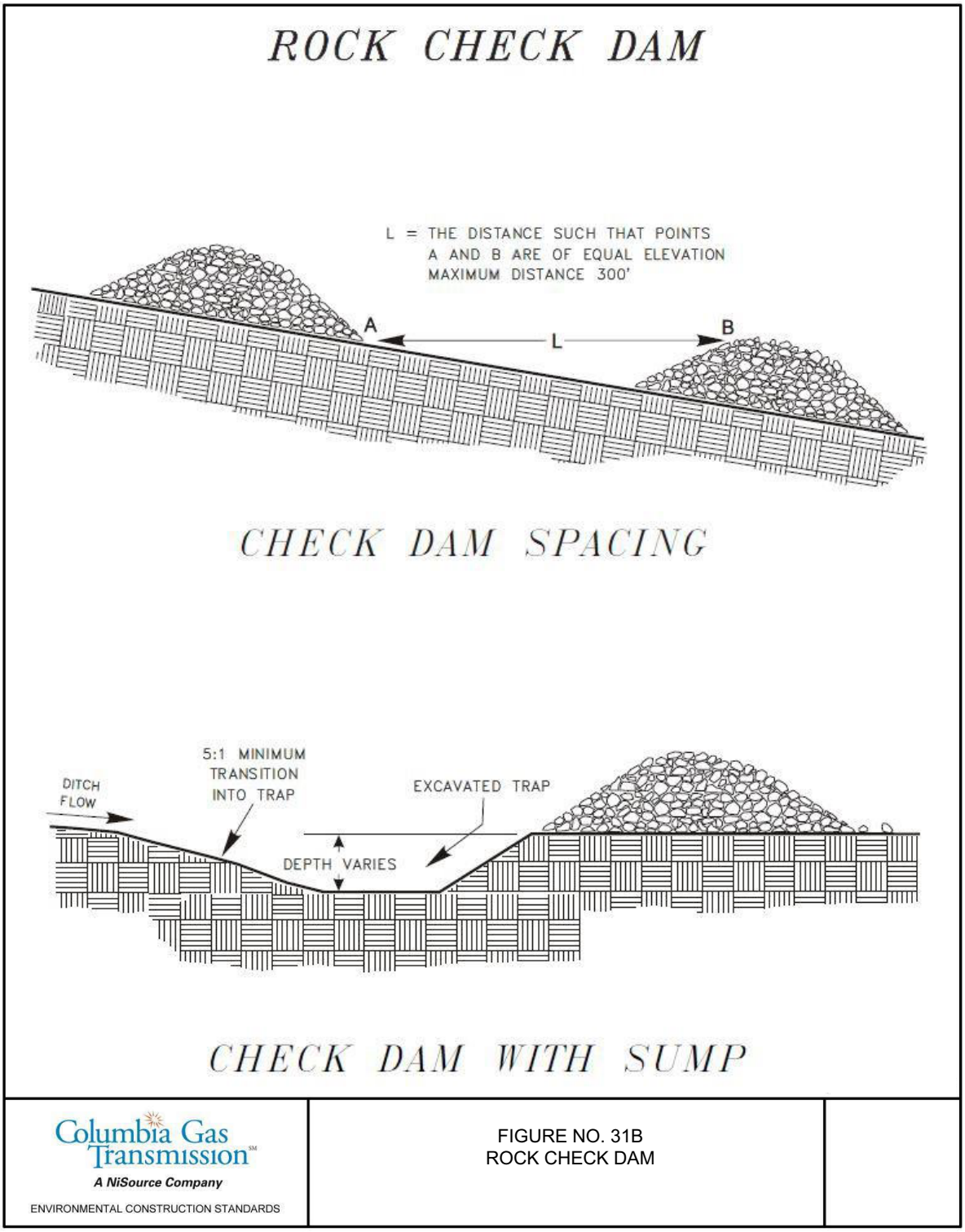
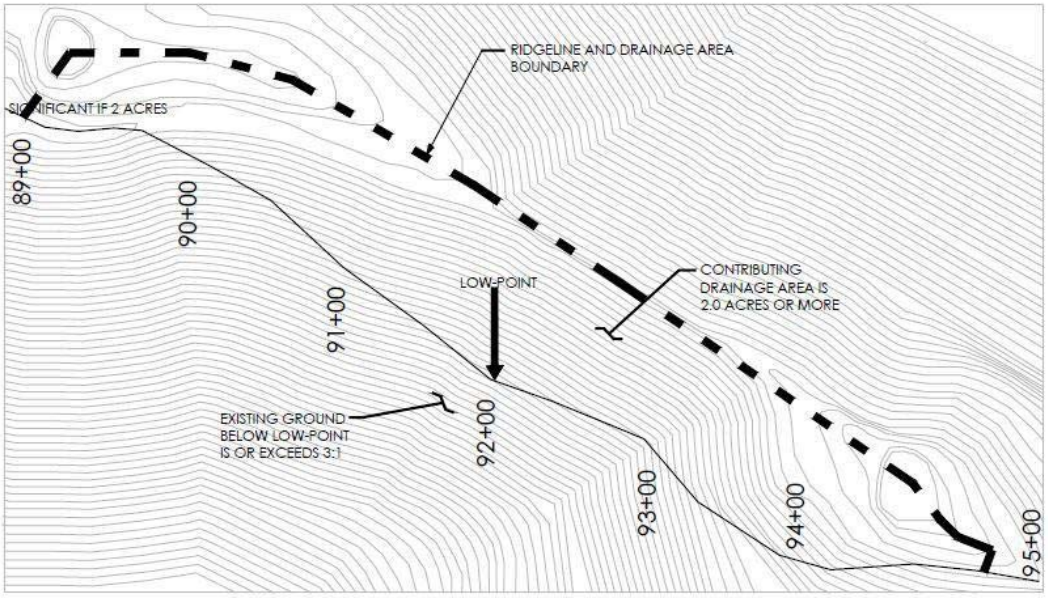
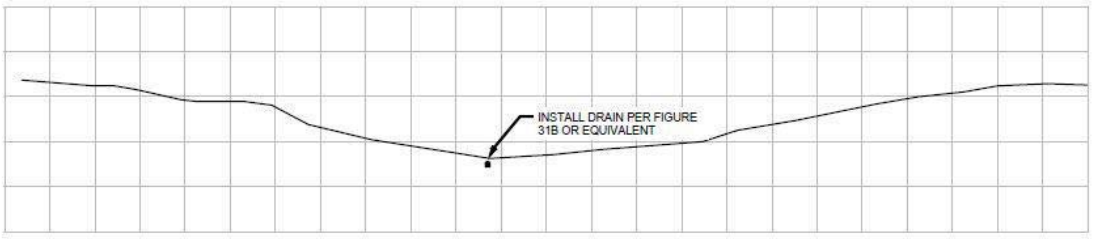


Figure 32A – Slip Prevention Side Hill Construction



PROPOSED PIPELINE PLANVIEW



89+00 90+00 91+00 92+00 93+00 94+00 95+00

PROPOSED PIPELINE PROFILE

NOTES

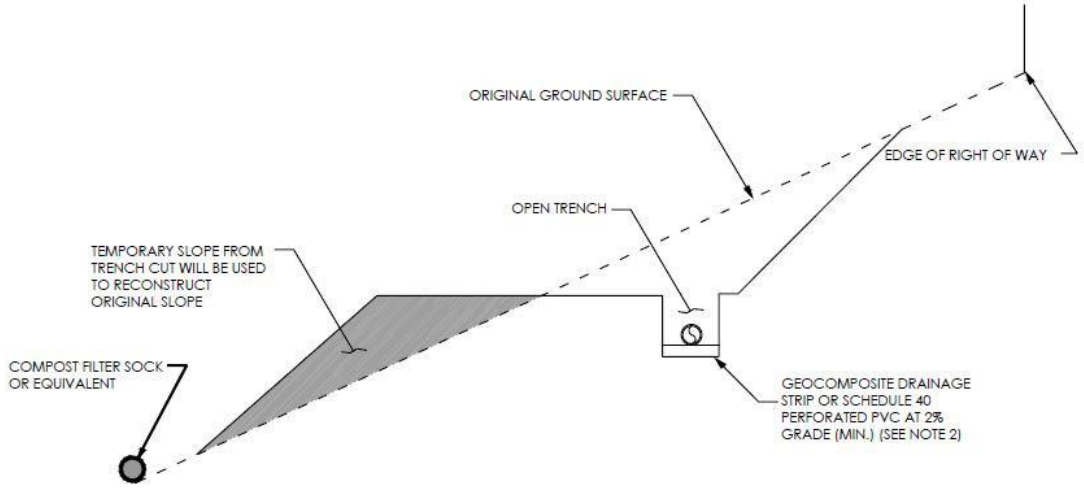
1. SIDE HILL CONSTRUCTION DRAINS SHALL BE INSTALLED AT LOW TOPOGRAPHICAL AREAS WHERE THE EXISTING GROUND SLOPES PERPENDICULAR TO THE ROW ARE GREATER THAN 3:1 AND WITH SIGNIFICANT DRAINAGE AREA OF TWO (2) ACRES OR MORE.

NOT TO SCALE

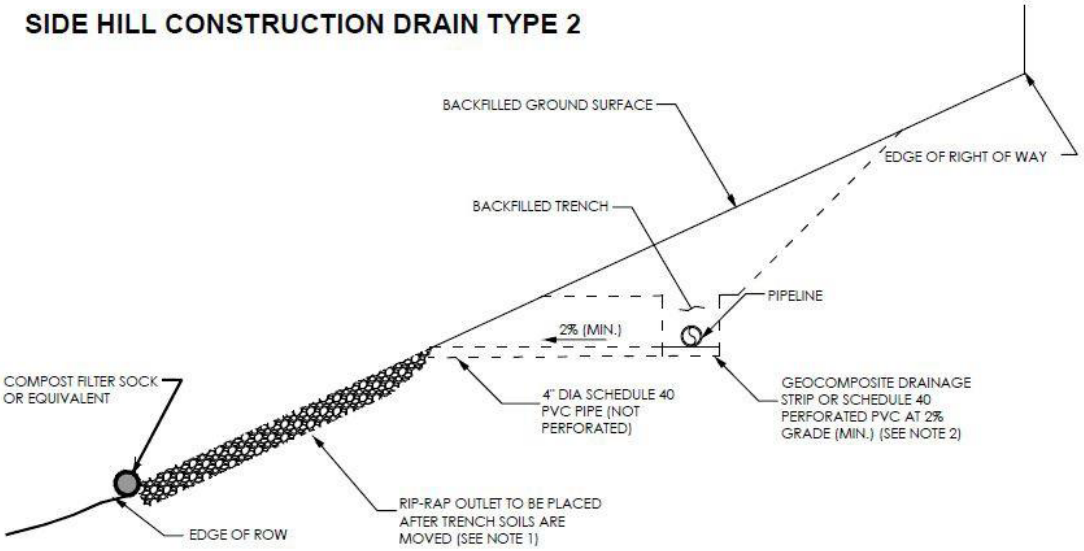
Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 32A SLIP PREVENTION SIDE HILL CONSTRUCTION	

Figure 32B – Slip Prevention Side Hill Construction Drain

SIDE HILL CONSTRUCTION DRAIN TYPE 1



SIDE HILL CONSTRUCTION DRAIN TYPE 2



NOTES

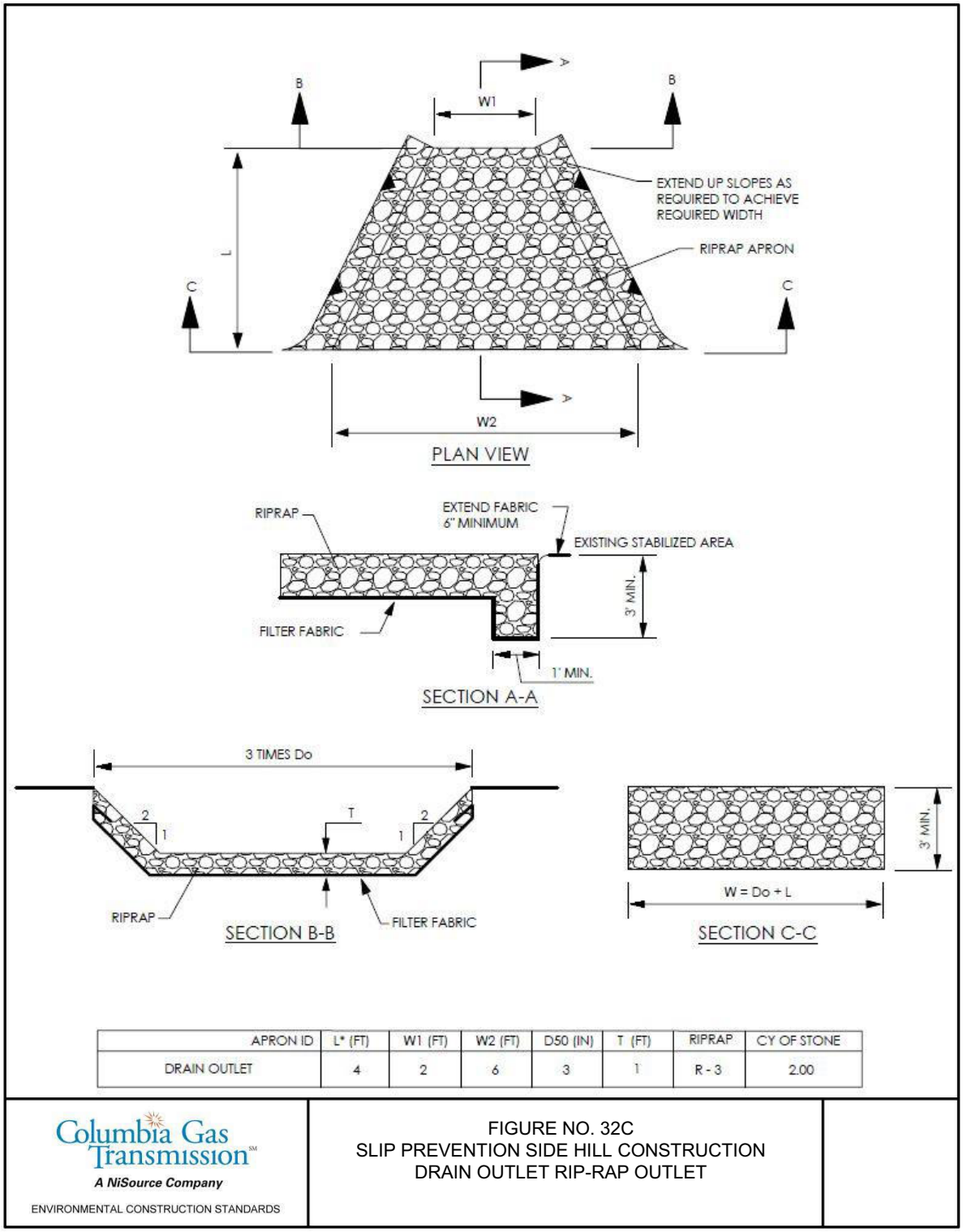
1. REFER TO FIGURE 32C FOR ADDITIONAL INFORMATION.

2. THE GEOCOMPOSITE DRAINAGE STRIP OR SCHEDULE 40 PERFORATED PVC WILL BE INSTALLED ALONG THE TRENCH BETWEEN THE TWO HIGH POINTS AT THE EDGES OF THE DRAINAGE AREA.

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Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 32B SLIP PREVENTION SIDE HILL CONSTRUCTION DRAIN	

Figure 32C – Slip Prevention Side Hill Construction Drain Outlet Rip-Rap Outlet

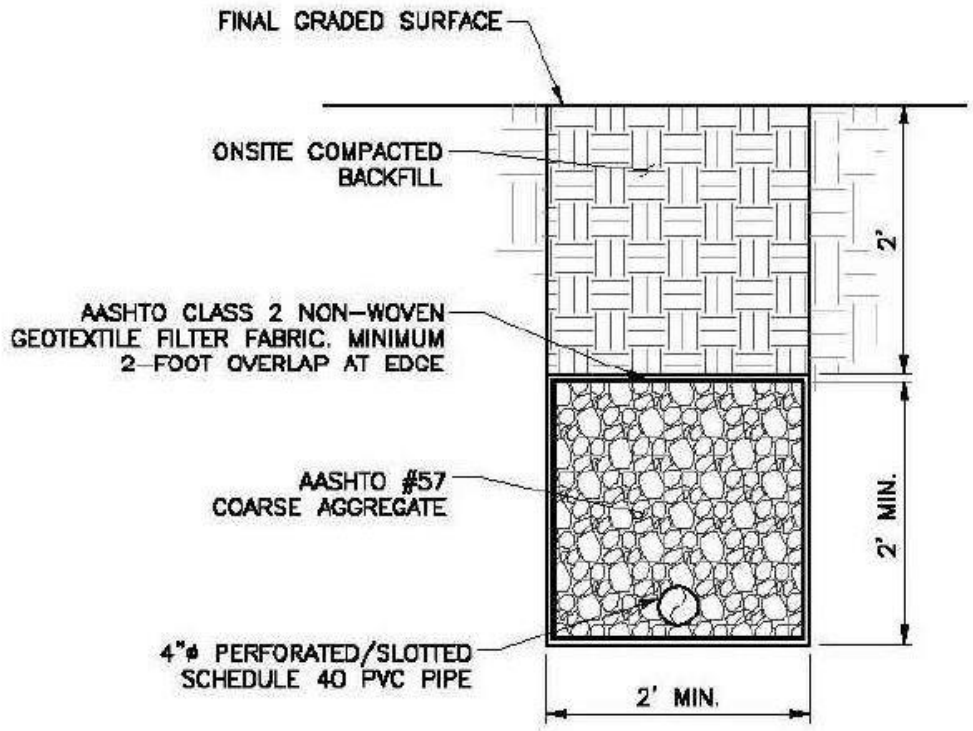


APRON ID	L* (FT)	W1 (FT)	W2 (FT)	D50 (IN)	T (FT)	RIPRAP	CY OF STONE
DRAIN OUTLET	4	2	6	3	1	R - 3	2.00

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ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 32C
SLIP PREVENTION SIDE HILL CONSTRUCTION
DRAIN OUTLET RIP-RAP OUTLET

Figure 32D – Slip Prevention Subsurface Drain



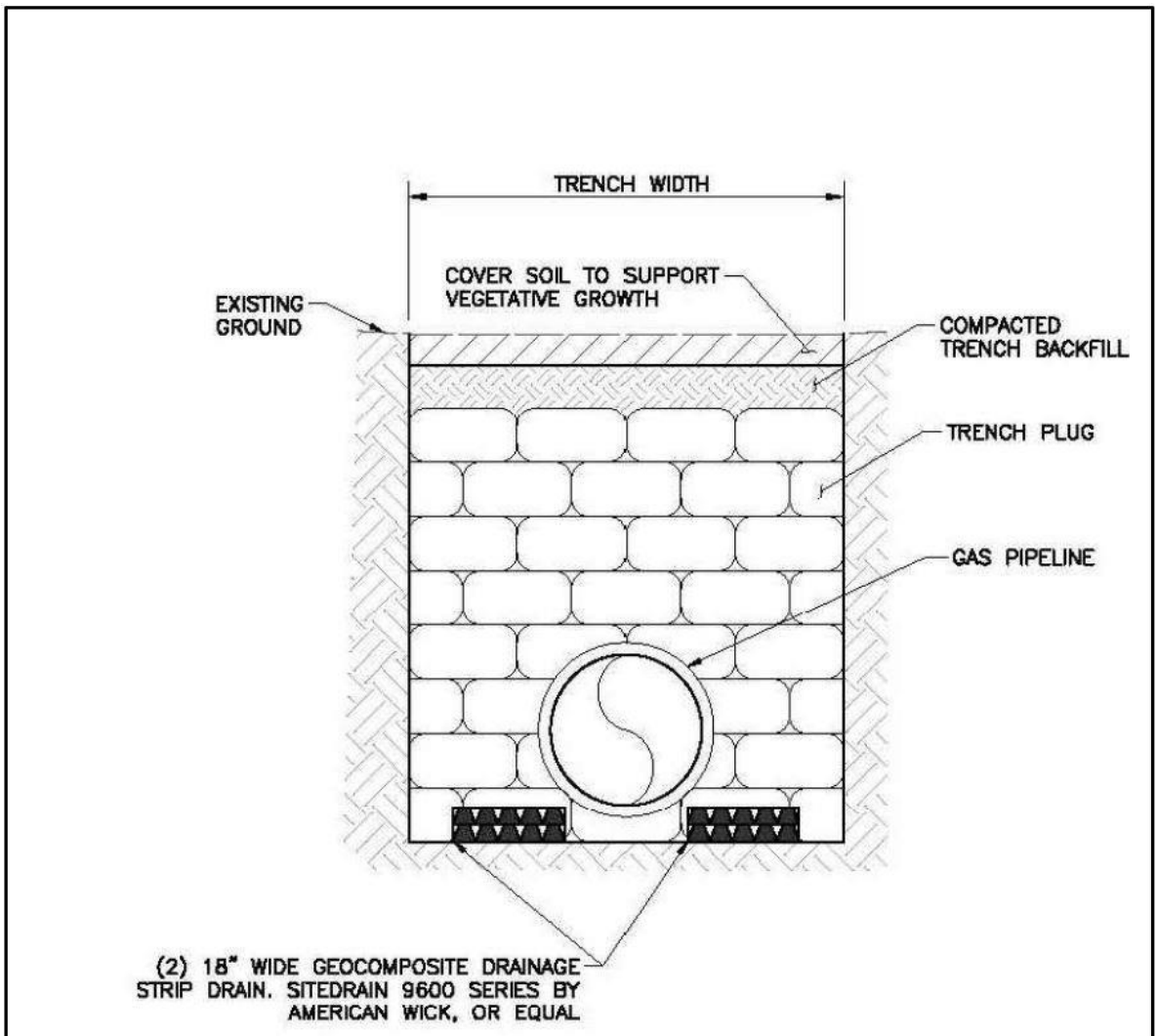
NOTES

1. INSTALL DRAINS AT SEEPAGE AREAS ENCOUNTERED DURING CONSTRUCTION. SLOPE DRAINS AT MINIMUM 2% TO COLLECTOR DRAINS, OR OUTLET LOCATION.
2. WHERE DRAIN CROSSES PIPELINE, DO NOT EXCAVATE BELOW PIPELINE.
3. INSTALL RIP-RAP AT OUTLET LOCATIONS PER FIGURE 32C.

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Columbia Gas Transmission℠ *A NiSource Company* ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 32D SLIP PREVENTION SUBSURFACE DRAIN	

Figure 32E – Slip Prevention Trench Plug Drain



NOTES:

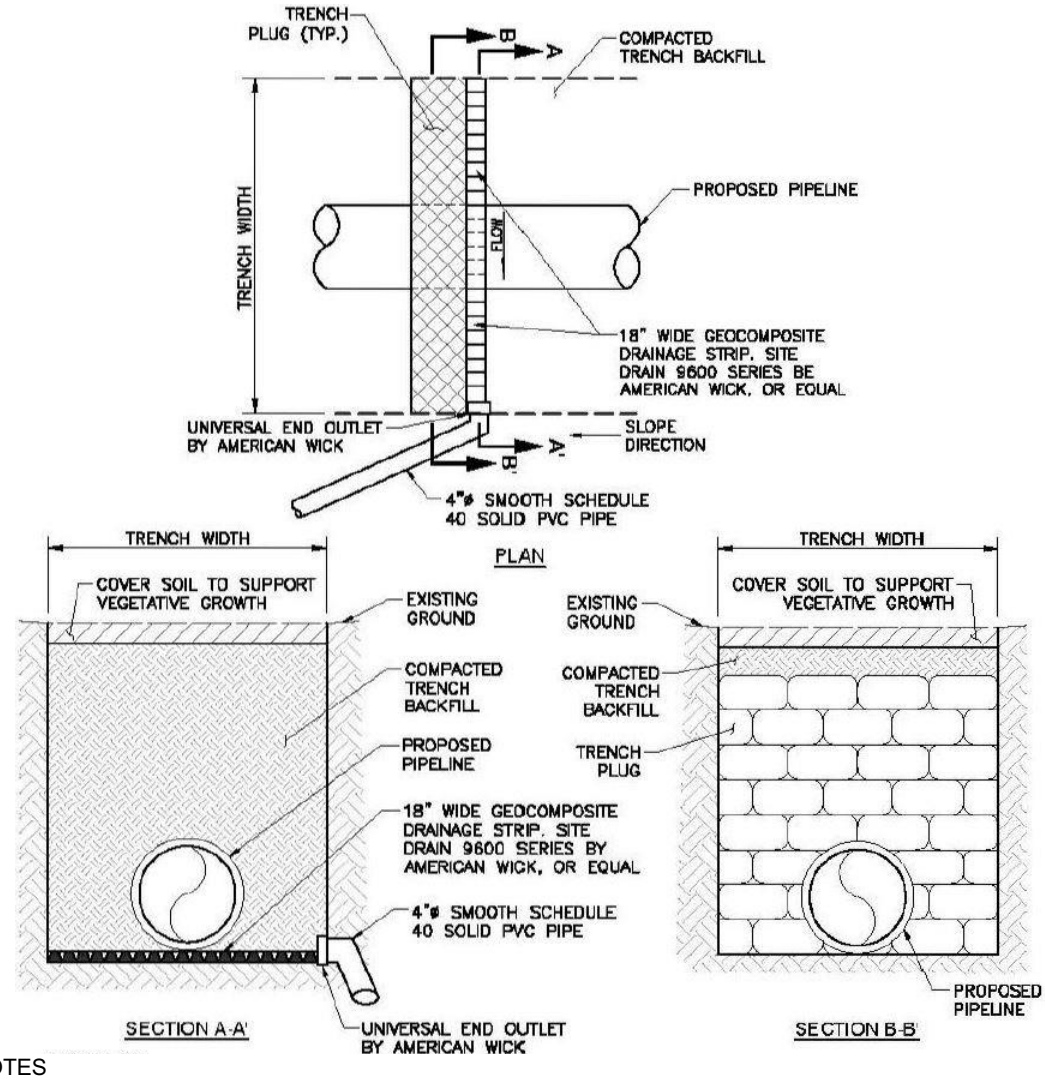
1. INSTALL DRAINS AT TRENCH PLUGS WHERE EXISTING GROUND SLOPES ARE GREATER THAN 3:1.

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FIGURE NO. 32E
SLIP PREVENTION TRENCH PLUG DRAIN

Figure 32F – Slip Prevention Bleeder Drain Outlet



NOTES

1. INSTALL BLEEDER DRAIN AT EVERY 2ND TRENCH PLUG WHERE EXISTING GROUND SLOPES ARE GREATER THAN 3:1.
2. SLOPE BASE OF PIPE TRENCH, AT THE UPSLOPE SIDE OF TRENCH PLUG TOWARDS THE OUTLET PIPE AT A MINIMUM 2% GRADE.
3. DAYLIGHT DISCHARGE PIPE TO A WELL VEGETATIVE AREA AND INSTALL RIP-RAP AT OUTLET LOCATION PER FIGURE 32C.

NOT TO SCALE

Columbia Gas Transmission℠ A NiSource Company ENVIRONMENTAL CONSTRUCTION STANDARDS	FIGURE NO. 32F SLIP PREVENTION BLEEDER DRAIN OUTLET	

Figure 32G – Slip Prevention Bleeder Drain Outlet Detail

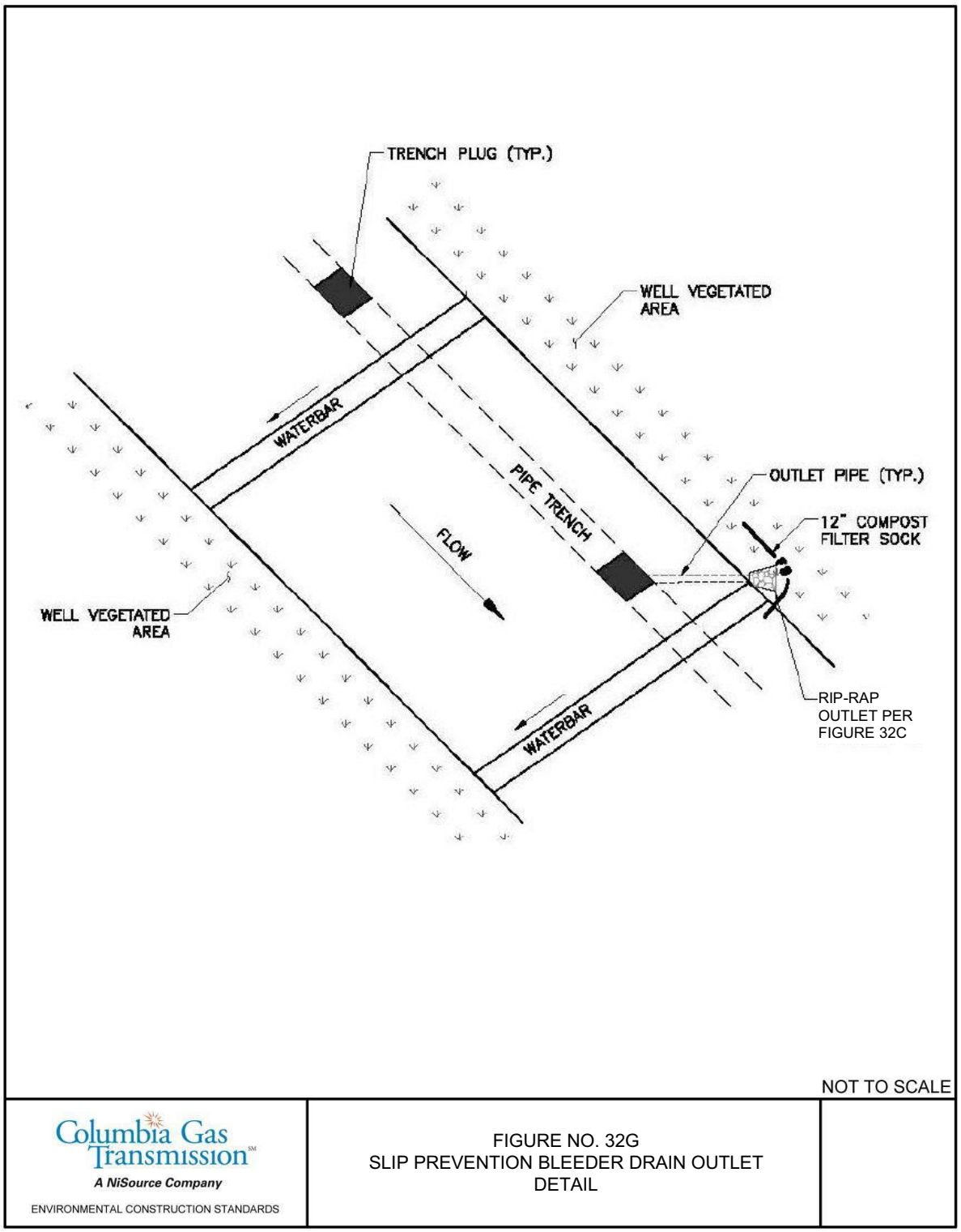
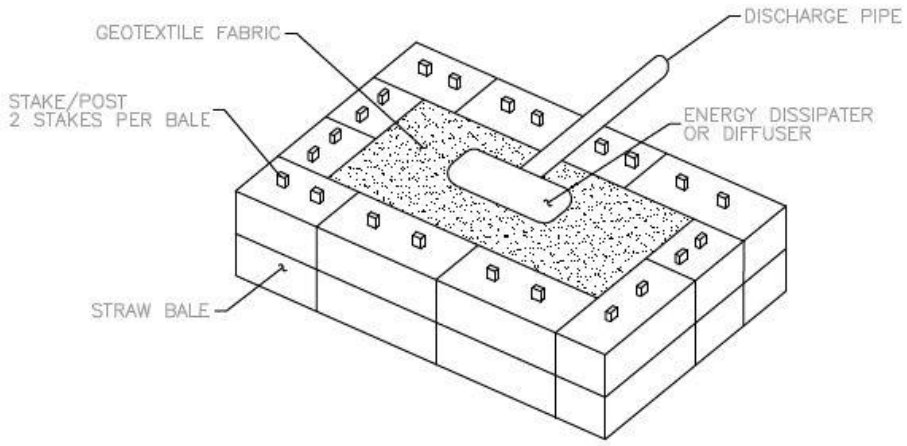


Figure 33 – Hydrostatic Test Dewatering Pit



ISOMETRIC VIEW

NOT TO SCALE

STAKE/POST

FIGURE NO. 32C
SLIP PREVENTION SIDE HILL CONSTRUCTION
DRAIN OUTLET RIP-RAP OUTLET



PROFILE VIEW

NOT TO SCALE

NOTES:

1. ALL DEWATERING ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH PERMIT CONDITIONS.
2. DISCHARGE SITE SHOULD BE WELL VEGETATED, WHERE POSSIBLE, AND LOCATED AT LEAST FIFTY (50) FEET FROM ANY WATERBODY. THE TOPOGRAPHY OF THE SITE SHOULD BE SUCH THAT WATER WILL FLOW INTO THE DEWATERING STRUCTURE AND AWAY FROM ANY WORK AREAS.
3. DIRECT THE PUMPED WATER ONTO A STABLE SPILL PAD CONSTRUCTED OF STRAW BALES OR GEOTEXTILE FABRIC STAKED TO THE GROUND SURFACE.
4. DISCHARGE RATES SHOULD BE SUCH THAT THE STRUCTURE WILL NOT OVERFLOW.
5. DRIVE TWO (2) STAKES OR POSTS INTO EACH BALE TO ANCHOR THEM IN PLACE.
6. FILTER BAGS ARE A SUITABLE ALTERNATIVE TO STRAW BALE STRUCTURES FOR TRENCH DEWATERING. STRAW BALES OR FILTER SOCK CAN BE ADDED AROUND THE FILTER BAG TO PROVIDE ADDITIONAL SEDIMENT CONTROL WHERE NEEDED.
7. STAKES OR POSTS SHOULD BE 2"x2" WOOD OR SUITABLE ALTERNATIVE.
8. SIZE OF DEWATERING STRUCTURE WILL BE DETERMINED BASED ON VOLUME OF DISCHARGE.

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ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 33
HYDROSTATIC TEST DEWATERING PIT

Figure 34A – TMDL Subwatersheds Crossed By Centerline Sheet 1 of 5

Mountaineer XPress Project
TMDL Subwatersheds Crossed by the Centerline

Route / SWS Code	Hydrologic Unit Code (HUC)-8	TMDL Project Watershed Name	Stream Name	West Virginia Stream Code	Final TMDL Stream Code	Milepost Range	Total Miles Crossed
MXP - 100							
OUS_708	05030106	Upper Ohio South	Big Tribble Creek	WVO-77-D	WV-OUS-1-F	0 - 1.56	1.56
OUS_714	05030106	Upper Ohio South	Lower Bowman Run	WVO-77-F	WV-OUS-1-N	1.56 - 2.27, 2.28 - 4.92	3.34
OUS_538	05030106	Upper Ohio South	UNT/Grave Creek RM 7.82	None	WV-OUS-10-L	2.27 - 2.28	0.02
OUS_715	05030106	Upper Ohio South	Middle Bowman Run	WVO-77-G	WV-OUS-1-O	4.92 - 5.58	0.66
OUS_724	05030106	Upper Ohio South	Upper Bowman Run	WVO-77-I	WV-OUS-1-Q	5.58 - 5.93, 6.02 - 6.38	0.71
OUS_723	05030106	Upper Ohio South	Fish Creek	WVO-77	WV-OUS-1	5.93 - 6.02	0.09
OUS_725	05030106	Upper Ohio South	Fish Creek	WVO-77	WV-OUS-1	6.38 - 7.52, 7.53 - 7.74, 7.89 - 7.99, 8.02 - 8.03, 8.09 - 8.1, 8.21 - 8.34	1.60
OUS_717	05030106	Upper Ohio South	Lynn Camp Run	WVO-77-H	WV-OUS-1-P	7.52 - 7.53, 7.74 - 7.89, 7.99 - 8.02, 8.03 - 8.09, 8.1 - 8.21, 8.34 - 9.5	1.53
OUS_718	05030106	Upper Ohio South	Lynn Camp Run	WVO-77-H	WV-OUS-1-P	9.5 - 11.26	1.75
OUS_719	05030106	Upper Ohio South	Lynn Camp Run	WVO-77-H	WV-OUS-1-P	11.26 - 11.78, 11.83 - 11.92	0.61
OUS_722	05030106	Upper Ohio South	Blake Fork	WVO-77-H-1	WV-OUS-1-P-9	11.78 - 11.83, 11.92 - 12.02, 12.11 - 12.24, 12.25 - 12.47	0.50
OUS_721	05030106	Upper Ohio South	Middle Fork/Lynn Camp Run	WVO-77-H-2	WV-OUS-1-P-11	12.02 - 12.11, 12.24 - 12.25, 12.47 - 15.29	2.92
OMN_4523	05030201	Middle Ohio North	Rush Run	WVO-69-C-7	OMN-45-H-24	15.29 - 17.44, 17.47 - 18.07, 18.1 - 18.19	2.83
OMN_4524	05030201	Middle Ohio North	Little Fishing Creek	WVO-69-C	OMN-45-H	17.44 - 17.47, 18.07 - 18.1, 18.19 - 18.8	0.68
OMN_4522	05030201	Middle Ohio North	Little Fishing Creek	WVO-69-C	OMN-45-H	18.8 - 19.41	0.61
OMN_4518	05030201	Middle Ohio North	Little Fishing Creek	WVO-69-C	OMN-45-H	19.41 - 20.43, 20.44 - 20.59	1.17
OMN_4560	05030201	Middle Ohio North	Shenango Creek	WVO-69-M	OMN-45-AE	20.43 - 20.44, 20.59 - 22.56	1.98
OMN_4559	05030201	Middle Ohio North	Fishing Creek	WVO-69	OMN-45	22.56 - 23.83, 23.87 - 24, 24.32 - 24.33, 24.84 - 25.01	1.59
OMN_4549	05030201	Middle Ohio North	Reader Creek	WVO-69-I	OMN-45-Z	23.83 - 23.87	0.04
OMN_4553	05030201	Middle Ohio North	Fishing Creek	WVO-69	OMN-45	24 - 24.32, 24.33 - 24.56	0.55
OMN_4554	05030201	Middle Ohio North	Piney Fork	WVO-69-K	OMN-45-AC	24.56 - 24.84, 25.01 - 28.29	3.56
OMN_4555	05030201	Middle Ohio North	Piney Fork	WVO-69-K	OMN-45-AC	28.29 - 29.91	1.62
OMN_4556	05030201	Middle Ohio North	UNT/Piney Fork RM 5.40	WVO-69-K-1.7	OMN-45-AC-13	29.91 - 30.73, 30.98 - 31.03	0.87

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ENVIRONMENTAL CONSTRUCTION STANDARDS

FIGURE NO. 34A
TMDL SUBWATERSHEDS CROSSED
BY CENTERLINE
SHEET 1 OF 5

Figure 34B – TMDL Subwatersheds Crossed By Centerline Sheet 2 of 5

Mountaineer XPress Project
TMDL Subwatersheds Crossed by the Centerline

Route / SWS Code	Hydrologic Unit Code (HUC)-8	TMDL Project Watershed Name	Stream Name	West Virginia Stream Code	Final TMDL Stream Code	Milepost Range	Total Miles Crossed
OMN_4557	05030201	Middle Ohio North	Piney Fork	WVO-69-K	OMN-45-AC	30.73 - 30.98, 31.03 - 32.44	1.66
OMN_4009	05030201	Middle Ohio North	Stackpole Run	WVOMI-29-H	OMN-13-CG-20	32.44 - 34.6	2.16
OMN_4065	05030201	Middle Ohio North	Broad Run	WVOMI-30-L	OMN-13-CH-28	37.22 - 37.44	0.21
OMN_4064	05030201	Middle Ohio North	McElroy Creek	WVOMI-30	OMN-13-CH	37.44 - 38.97, 39.05 - 39.11	1.59
OMN_4063	05030201	Middle Ohio North	Riggins Run	WVOMI-30-K	OMN-13-CH-22	38.97 - 39.05, 39.11 - 39.98, 40.37 - 40.96, 41.05 - 41.43	1.92
OMN_4062	05030201	Middle Ohio North	McElroy Creek	WVOMI-30	OMN-13-CH	39.98 - 40.37, 40.96 - 41.05	0.48
OMN_4044	05030201	Middle Ohio North	Flint Run	WVOMI-30-H	OMN-13-CH-16	41.43 - 42.38	0.95
OMN_4046	05030201	Middle Ohio North	Flint Run	WVOMI-30-H	OMN-13-CH-16	42.38 - 42.39	0.01
OMN_4047	05030201	Middle Ohio North	Neds Run	WVOMI-30-H-4	OMN-13-CH-16-M	42.39 - 43.32, 43.32 - 43.35, 43.4 - 43.41	0.97
OMN_4048	05030201	Middle Ohio North	Flint Run	WVOMI-30-H	OMN-13-CH-16	43.32 - 43.32, 43.35 - 43.4, 43.41 - 44.45, 44.48 - 44.76	1.38
OMN_4045	05030201	Middle Ohio North	Israel Fork	WVOMI-30-H-3	OMN-13-CH-16-K	44.45 - 44.48, 44.76 - 45.32	0.59
OMN_4154	05030201	Middle Ohio South	Morgans Run	WVOMI-47-B	OMN-13-DW-4	45.32 - 46.33, 46.99 - 47.12, 47.32 - 47.5, 47.57 - 47.9	1.64
OMN_4153	05030201	Middle Ohio South	Buckeye Creek	WVOMI-47	OMN-13-DW	46.33 - 46.99, 47.12 - 47.32, 47.5 - 47.57, 47.9 - 49.01, 49.22 - 49.35	2.17
OMN_4182	05030201	Middle Ohio South	Meathouse Fork	WVOMI-46	OMN-13-DV	0.55 - 0.67, 1.05 - 1.81, 1.94 - 1.96, 49.01 - 49.22, 49.35 - 49.44, 49.83 - 50.04, 51.1 - 51.16	1.49
OMN_4180	05030201	Middle Ohio South	Meathouse Fork	WVOMI-46	OMN-13-DV	0 - 0.55, 0.67 - 1.05, 49.44 - 49.83, 50.04 - 51.1, 51.16 - 51.83	3.05
OMN_4181	05030201	Middle Ohio South	Georgescamp Run	WVOMI-46-0.8A	OMN-13-DV-4	51.83 - 52.82, 52.92 - 52.93, 52.99 - 53.17	1.17
OMN_4148	05030201	Middle Ohio South	Bluestone Creek	WVOMI-43	OMN-13-DO	52.82 - 52.92, 52.93 - 52.99	0.17
OMN_4149	05030201	Middle Ohio South	Bluestone Creek	WVOMI-43	OMN-13-DO	53.17 - 55.01, 55.58 - 55.66, 55.67 - 55.69, 55.77 - 55.93	2.10
OMN_4133	05030201	Middle Ohio North	Left Fork/Arnold Creek	WVOMI-40-J	OMN-13-DA-19	55.01 - 55.58, 55.66 - 55.67, 55.69 - 55.77, 55.93 - 57.18, 57.29 - 57.33	1.95
OMS_2186	05030202	Middle Ohio South	Buffalo Creek	WVO-32-N-6	OMS-24-BI-17	108.74 - 109.15, 109.39 - 109.48, 109.58 - 109.65, 109.75 - 110.22, 110.35 - 110.84	1.53
OMS_2182	05030202	Middle Ohio South	Little Creek	WVO-32-N-5	OMS-24-BI-12	109.15 - 109.39, 109.48 - 109.58, 109.65 - 109.75, 110.22 - 110.35	0.58

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FIGURE NO. 34B
TMDL SUBWATERSHEDS CROSSED BY CENTERLINE
SHEET 2 OF 5

Figure 34C – TMDL Subwatersheds Crossed By Centerline Sheet 3 of 5

Mountaineer XPress Project
TMDL Subwatersheds Crossed by the Centerline

Route / SWS Code	Hydrologic Unit Code (HUC)-8	TMDL Project Watershed Name	Stream Name	West Virginia Stream Code	Final TMDL Stream Code	Milepost Range	Total Miles Crossed
OMS_2180	05030202	Middle Ohio South	Little Creek	WVO-32-N-5	OMS-24-BI-12	110.84 - 110.92, 110.95 - 110.98, 111.32 - 111.33, 111.37 - 111.45, 111.48 - 111.57, 111.85 - 112.31, 112.38 - 112.39	0.75
OMS_2184	05030202	Middle Ohio South	Buffalo Creek	WVO-32-N-6	OMS-24-BI-17	110.92 - 110.95, 110.98 - 111.32, 111.33 - 111.37, 111.45 - 111.48, 111.57 - 111.85	0.71
OMS_2183	05030202	Middle Ohio South	Little Mill Creek	WVO-32-N	OMS-24-BI	112.31 - 112.38, 112.39 - 113.82, 113.9 - 114.06, 114.12 - 114.13, 114.2 - 114.2	1.69
OMS_2172	05030202	Middle Ohio South	Left Fork/Frozencamp Creek	WVO-32-N-3-B	OMS-24-BI-9-I	113.82 - 113.9, 114.06 - 114.12, 114.13 - 114.2	0.20
OMS_2171	05030202	Middle Ohio South	Frozencamp Creek	WVO-32-N-3	OMS-24-BI-9	114.2 - 116.15	1.95
OMS_2150	05030202	Middle Ohio South	Elk Fork	WVO-32-M	OMS-24-BH	116.15 - 117.3	1.14
OMS_2151	05030202	Middle Ohio South	Elk Fork	WVO-32-M	OMS-24-BH	117.3 - 119.97	2.68
OMS_2122	05030202	Middle Ohio South	Tug Fork	WVO-32-L	OMS-24-BA	119.97 - 120.09, 120.92 - 120.98, 121.04 - 121.31, 121.5 - 121.71, 121.91 - 122.83	1.58
OMS_2121	05030202	Middle Ohio South	Buffalolick Run	WVO-32-L-2	OMS-24-BA-9	120.09 - 120.92, 120.98 - 121.04, 121.31 - 121.5, 121.71 - 121.91	1.28
OMS_2130	05030202	Middle Ohio South	Grasslick Creek	WVO-32-L-7	OMS-24-BA-20	122.83 - 124.42	1.59
OMS_2131	05030202	Middle Ohio South	Grasslick Run	WVO-32-L-7-C	OMS-24-BA-20-H	0 - 0.06, 124.42 - 125.38	1.02
OMS_2132	05030202	Middle Ohio South	Grasslick Creek	WVO-32-L-7	OMS-24-BA-20	125.38 - 126.23	0.86
OMS_2087	05030202	Middle Ohio South	Parchment Creek	WVO-32-H	OMS-24-AF	126.23 - 127.67	1.44
OMS_2085	05030202	Middle Ohio South	Wolfe Creek	WVO-32-H-8	OMS-24-AF-27	127.67 - 128.29	0.62
OMS_2086	05030202	Middle Ohio South	Wolfe Creek	WVO-32-H-8	OMS-24-AF-27	128.29 - 129.04, 129.08 - 129.3	0.97
KL_30224	05050008	Lower Kanawha	Thirteenmile Creek	WVK-12	KL-19	129.04 - 129.08, 129.3 - 129.62	0.37
KL_30225	05050008	Lower Kanawha	Peppermint Creek	WVK-12-M	KL-19-AM	129.62 - 131.55	1.93
KL_30200	05050008	Lower Kanawha	Mudlick Fork	WVK-12-E	KL-19-M	131.55 - 134.01	2.46
KL_30198	05050008	Lower Kanawha	Mudlick Fork	WVK-12-E	KL-19-M	134.01 - 134.67, 134.79 - 134.83	0.70

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FIGURE NO. 34C
TMDL SUBWATERSHEDS CROSSED BY CENTERLINE
SHEET 3 OF 5

Figure 34D – TMDL Subwatersheds Crossed By Centerline Sheet 4 of 5

Mountaineer XPress Project
TMDL Subwatersheds Crossed by the Centerline

Route / SWS Code	Hydrologic Unit Code (HUC)-8	TMDL Project Watershed Name	Stream Name	West Virginia Stream Code	Final TMDL Stream Code	Milepost Range	Total Miles Crossed
KL_30292	05050008	Lower Kanawha	Sulug Branch	WVK-16-L	KL-27-AA	134.67 - 134.79, 134.83 - 135.48, 135.62 - 135.66, 135.72 - 136.68	1.77
KL_30290	05050008	Lower Kanawha	Spring Valley Branch	WVK-16-K	KL-27-Y	135.48 - 135.62, 135.66 - 135.72, 137.21 - 137.29, 137.33 - 137.36, 137.37 - 137.42, 137.5 - 137.53, 137.69 - 137.71, 137.81 - 137.84, 137.86 - 138.24	0.83
KL_30291	05050008	Lower Kanawha	Eighteenmile Creek	WVK-16	KL-27	136.68 - 137.21, 137.29 - 137.33, 137.36 - 137.37, 137.42 - 137.5, 137.53 - 137.69, 137.71 - 137.81, 137.84 - 137.86	0.93
KL_30282	05050008	Lower Kanawha	Eighteenmile Creek	WVK-16	KL-27	138.24 - 138.31, 138.4 - 140.29	1.95
KL_30289	05050008	Lower Kanawha	Eighteenmile Creek	WVK-16	KL-27	138.31 - 138.4	0.09
KL_30281	05050008	Lower Kanawha	Buffalo Branch	WVK-16-I	KL-27-S	140.29 - 141.36, 141.89 - 142.16, 142.33 - 142.45	1.46
KL_30280	05050008	Lower Kanawha	Eighteenmile Creek	WVK-16	KL-27	141.36 - 141.89	0.53
KL_30269	05050008	Lower Kanawha	Isaacs Branch	WVK-16-C	KL-27-K	142.16 - 142.33, 142.45 - 143.65	1.38
KL_30402	05050008	Lower Kanawha	UNT/Hurricane Creek RM 1.64	None	KL-42-D	147.66 - 148.67, 148.68 - 148.71, 148.78 - 148.88	1.14
KL_30403	05050008	Lower Kanawha	Hurricane Creek	WVK-22	KL-42	148.67 - 148.68, 148.71 - 148.78, 148.88 - 148.93, 149 - 149.04, 149.51 - 149.55	0.22
KL_30327	05050008	Lower Kanawha	Five And Twenty Mile Creek	WVK-19	KL-35	148.93 - 149, 149.04 - 149.51	0.53
KL_30329	05050008	Lower Kanawha	Left Fork/Five And Twenty Mile Creek	WVK-19-C	KL-35-F	149.55 - 152.21	2.66
KL_30331	05050008	Lower Kanawha	Five And Twenty Mile Creek	WVK-19	KL-35	152.21 - 152.75	0.54
KL_30441	05050008	Lower Kanawha	Poindexter Branch	WVK-22-C-1	KL-42-N-1	152.75 - 154.07, 154.24 - 154.34	1.42
KL_30440	05050008	Lower Kanawha	Trace Creek	WVK-22-C-2	KL-42-N-2	154.07 - 154.24, 154.34 - 155.78, 155.82 - 155.88	1.66
OGL_1213	05070102	Lower Guyandotte	Under Review [3]	Under Review [3]	Under Review [3]	155.97 - 162.16	6.20
OGL_1215	05070102	Lower Guyandotte	Under Review [3]	Under Review [3]	Under Review [3]	162.16 - 163.12	0.96
OGL_1214	05070102	Lower Guyandotte	Under Review [3]	Under Review [3]	Under Review [3]	163.12 - 164.5	1.39
MXP - 200							
OMN_4183	05030201	Middle Ohio North	Lick Run	WVOMI-46-B	OMN-13-DV-9	1.81 - 1.94, 1.98 - 2.62, 2.65 - 2.66, 2.79 - 2.81	0.80

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FIGURE NO. 34D
TMDL SUBWATERSHEDS CROSSED BY CENTERLINE
SHEET 4 OF 5

Figure 34E – TMDL Subwatersheds Crossed By Centerline Sheet 5 of 5

Mountaineer XPress Project
TMDL Subwatersheds Crossed by the Centerline

Route / SWS Code	Hydrologic Unit Code (HUC)-8	TMDL Project Watershed Name	Stream Name	West Virginia Stream Code	Final TMDL Stream Code	Milepost Range	Total Miles Crossed
OMN_4185	05030201	Middle Ohio South	Meathouse Fork	WVOMI-46	OMN-13-DV	2.62 - 2.65, 2.66 - 2.79, 2.81 - 3.2	0.56
OMN_4186	05030201	Middle Ohio South	Toms Fork	WVOMI-46-E	OMN-13-DV-13	3.2 - 4.09, 4.24 - 4.27, 4.32 - 4.41, 4.45 - 4.58	1.15
OMN_4195	05030201	Middle Ohio North	Meathouse Fork	WVOMI-46	OMN-13-DV	4.09 - 4.24, 4.27 - 4.3	0.17
OMN_4197	05030201	Middle Ohio North	Meathouse Fork	WVOMI-46	OMN-13-DV	4.3 - 4.32, 4.41 - 4.45, 4.58 - 5.97	1.45
SM-80 Loop Line							
OGL_1007	05070102	Lower Guyandotte	Under Review [a]	Under Review [a]	Under Review [a]	20.59 - 20.75	0.16
SM-80 Line							
OGL_1008	05070102	Lower Guyandotte	Under Review [a]	Under Review [a]	Under Review [a]	20.95 - 20.97, 20.98 - 21.2	0.24

[a] TMDLs in the Lower Guyandotte Watershed (HUC-8 05070102) are currently under review by the West Virginia Department of Environmental Protection.

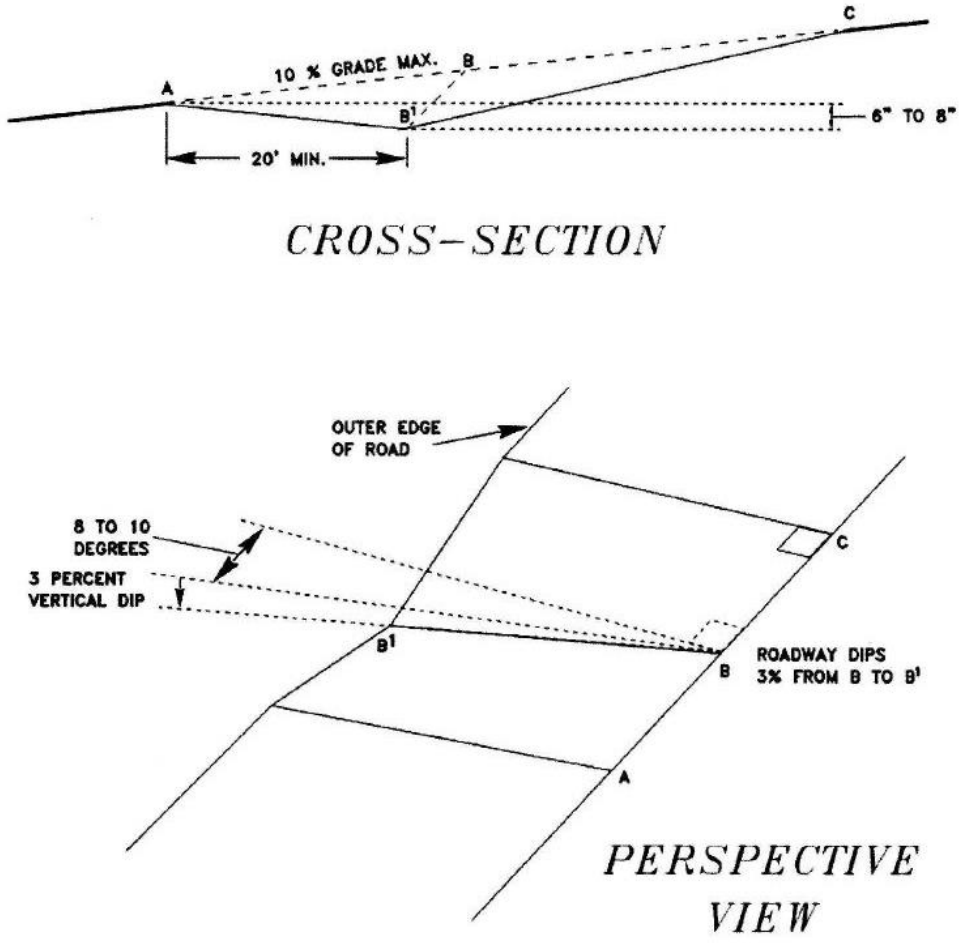
RM=River Mile
SWS= Subwatershed
TMDL= Total Maximum Daily Load

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FIGURE NO. 34E
TMDL SUBWATERSHEDS CROSSED BY CENTERLINE
SHEET 5 OF 5

Figure 35 – Typical Broad-Base Dip



SPACING = 400/% GRADE + 75'

NOTES

1. BROAD-BASE DIPS SHALL BE INSTALLED ON ANY ROAD THAT HAS OR MAY NEED CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH COLUMBIA'S APPROVED ENVIRONMENTAL CONSTRUCTION STANDARDS AND WEST VIRGINIA'S EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES MANUAL.
2. FOR THE MOUNTAINEER XPRESS PROJECT, BROAD BASED DIPS SHALL BE INSTALLED AT THE SPACING INDICATED IN TABLE 1.

TABLE 1

PERCENT SLOPE	DIP SPACING
0–2%	300 FEET
2–5%	150 FEET
5–15%	100 FEET
>15%	75 FEET

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FIGURE NO. 35
TYPICAL BROAD-BASE DIP

Columbia Pipeline Group

Standards Title: **Pipeline Construction Standard**

Standard No.: **CS.220.001** Effective Date: **6/21/2016**

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1 General

The Pipeline Construction Standard is intended to cover the various operations required for pipeline construction in a general manner and to briefly outline the kind, character, and quality of work required by Columbia Pipeline Group companies also known as the Company.

1.1 Specifications and Regulations

Direct any question regarding conflicts or omissions in this general standard or other documentation to the authorized company representative.

Each facility shall be constructed and inspected to ensure that it meets the requirements of Company, Federal, and State specifications, regulations, and laws.

All codes and standards referenced in this standard and incorporated by reference in 49 CFR Part 192, Part 193, or Part 195 shall be at a minimum the edition referenced in PHMSA regulations. If there is a more current edition of an industry standard, the Company may use that one if it meets or exceeds the most current Federal standard.

Use the most current edition for standards not incorporated by reference in 49 CFR Part 192, Part 193, or Part 195.

The design, construction, testing, operation, maintenance, and abandonment/removal of all facilities shall conform to applicable Federal, State and Local environmental regulations and requirements.

When construction is near a high voltage power line, follow the requirements in Procedure 70.002.055 - *OHAC Minimum Requirements for Pipeline Construction in Close Proximity of High Voltage AC Overhead Power Lines*.

1.2 Verification of Facilities

The Contractor shall verify all dimensions, elevations, pipe support locations and adjust to properly support and align piping. The locations and elevations of pipe supports shown on drawings are approximate.

The location of existing underground facilities if shown on drawings is approximate. Additional underground facilities may also exist and are not shown on the drawing. For location of buried facilities, both Company and non-Company owned, call the State One Call System 811.

1.3 Environmental Standards

Refer to the current CPG Environmental Construction Standards (ECS) and project specific CPG Environmental Management and Construction Plans (EM&CP) for specific environmental requirements.

2 Noise Impact Mitigation

To avoid producing excessive noise near noise sensitive areas, properly muffle and maintain construction equipment.

3 Temporary Facilities

3.1 Erosion Control

For specific details, refer to CPG Environmental Construction Standard (ECS) and/or project-specific Environmental Management and Construction Plan (EM&CP).

3.2 Temporary Utilities

All construction utilities, including but not limited to, water, electric power, gas (except for purging lines), compressed air, heating, ventilation air, telephones (used by Contractor only), etc., shall be arranged for, provided, maintained, and removed if necessary by Contractor.

If for construction purposes, the Contractor finds it necessary to move or relocate any of the Company's existing poles, facilities, and/or utilities, then it shall be done at the Contractor's expense. If required by the Company, return items relocated during construction to their original location on completion of the project.

Utility services shall not be interrupted except as approved by the Company.

If the Company determines its plant water supply is sufficient to provide Contractor water for use in hydrostatic testing of pipe, mixing of concrete, and/or general utility purposes, the Contractor shall make the necessary connections and furnish the pumps and equipment necessary for obtaining and handling.

3.3 Temporary Construction Buildings/Facilities

Contractor shall provide proper trailer facilities and/or furnish all labor, material, and equipment required for the construction/erection of suitable temporary construction buildings and office space for Contractor (and Company personnel if so specified) and storage/warehousing facilities for Company materials. Included in facilities furnished by the Contractor will be sanitary facilities, heating, lighting, ventilation, and drinking water for all Company and Contractor personnel as required.

Contractor shall be responsible for dismantling and removing all such temporary building and facilities furnished by Contractor if requested by Company. The exception to this is that such facilities shall remain available at the plant site for a period of 2 weeks after completion of construction when directed by Company to enable Company personnel to complete inventories.

For large projects, Contractor shall provide portable toilet facilities in locations accessible to personnel and the sanitary contractor where people are working. This could include road crossings, parking areas, meeting places, construction trailers, etc.

3.4 Temporary Fences and Barricades

Temporary fences or barricades may be required to protect the public and employees, and to prevent livestock from entering the work area.

Contractor shall move and re-install sections of the permanent fence or barriers as may be required to move material and equipment on and off the job site during retirement, replacement, and/or construction work.

As specified by the Company, OSHA and/or any other applicable regulatory agencies, the Contractor shall provide and maintain; all temporary barricades, covers, fences, scaffolds, lighting, and required protection against accidents or the loss and damage of both Company and Contractor personnel, material, equipment, etc.

3.5 Temporary Roads, Parking Lots, and Storage Areas

3.5.1 General

Contractor shall furnish all labor, material, and equipment required to install and maintain temporary roads and parking areas for Contractor and Company personnel. This includes stone and gravel, wooden walkways, handrails or other materials required to provide reasonable and safe access to trailers, buildings, and work areas for Contractor and Company personnel and equipment. All expenses for installing stone will be borne by the Company.

At no time during construction will driving accesses or parking facilities at construction locations be blocked or denied to Company personnel.

3.5.2 Storage Areas

Contractor shall construct and maintain material storage areas to the satisfaction of the Company. The Contractor shall provide adequate

protection for equipment and material stored outside, whether furnished by the Contractor or the Company. Such protective material may include stone, gravel, docks, platforms, cribbing, skids, pallets, tarpaulins, rust preventives and other protective coatings and/or coverings.

Container boxes or trailers may be used where material needs to be protected from the weather and for security.

All storage areas shall have the necessary drains and culverts installed and properly maintained during project construction to be fully usable and passable at all times.

The storage area must comply with all environmental and archaeological requirements per the Environmental Construction Standards (ECS).

4 Upland Construction

4.1 General

The upland pipeline construction spread operates as a moving assembly line performing specialized procedures in an efficient, planned sequence. See the Environmental Construction Standards for the typical upland pipeline construction sequence. In addition, special construction crews install and alter fences, bore under roads and railroads, install stream and wetland crossings that are not done by conventional upland techniques, and construct valve settings and meter/regulator stations.

While construction work is ongoing, keep the construction work area clean of all rubbish and debris resulting from the work. Non-hazardous materials and waste shall be disposed of in an approved landfill.

The contractor is responsible for dumpsters or roll offs used to dispose of trash and non-hazardous materials.

Hazardous materials and waste shall be stored and disposed of in accordance with all applicable Company policies and federal, state and local regulations. The Company is responsible for roll offs or other means of disposal of hazardous materials.

4.2 Surveys

The Company shall survey and mark the centerline of the pipeline route, unless otherwise specified. The edge of the right-of-way shall also be marked.

The Contractor shall lay the pipeline along the route as surveyed and marked. If this route parallels Company's existing pipeline, Contractor shall take care not to damage the existing line.

The Contractor shall be responsible for the preservation of all property corner monuments, stakes, benchmarks, and markers. Costs of replacing property corner monuments, stakes, benchmarks and markers destroyed or disturbed by Contractor shall be borne by the Contractor.

4.3 Wood Products

If requested by the landowner, the Company may be responsible for removal of wood products; this can be accomplished by chipping or grinding. Disposal of wood products shall be in accordance with local regulations.

When the landowner requests salvage of these materials, they will be stockpiled just off the edge of the construction work area, but not within 50 feet of streams, floodplains, or wetlands.

Equipment used to stack the wood products will not leave the construction work area.

4.4 Trenching

Determine the locations and elevations of underground utility lines or other obstructions before starting work in excavation or fill areas by using the State One Call System (811).

Underground utility lines temporarily exposed during excavation shall be adequately supported and/or protected to the satisfaction of the Company or operator of the utility.

4.4.1 Trenching Specifications

Perform all trenching and shoring in accordance with OSHA requirements in 29 CFR 1926, Subpart P - Excavations.

The trench will not remain open for more than 30 days in any area unless authorized by the Inspector (additional restrictions for stream and wetland areas are provided in the permit requirements).

- As the trench is completed, trench line breakers as illustrated in the CPG Environmental Construction Standards will be installed at every second temporary interceptor diversion. Do not use topsoil to construct the breakers. The breakers reduce water velocity

and erosion of the trench bottom. The breakers will be maintained.

- Install sediment filter devices around spoil storage areas before digging bore pits, stream crossings, and wetland crossings as necessary and per the ECS, EM&CP, and permits.
- Water pumped from the trench or bore pits will be pumped into a heavily vegetated upland area, a sediment trap, a sediment filter bag, or through a sediment filter device, as illustrated in the Environmental Construction Standards, at least 10 feet from any stream or wetland in order to minimize erosion and subsequent sedimentation of streams or wetlands. Water impounded in the trench will not be released directly or by overland flow into any water body or wetland.

When the trench must remain open for a greater length of time, employ appropriate erosion controls and safety measures as directed by the Inspector and the ECS, EM&CP, or permits.

Open trench installation shall employ “box construction” (horizontal pipe sections between 2-sag bend) as shown on profile drawings for such pipeline crossings of drainage ditches, creeks and canals, etc.

4.4.2 Trench Width

Unless otherwise specified in the Job Data or construction drawings, excavate the trench for the pipe to a width not less than the minimum indicated in Table 1.

Table 1 - Minimum Width of Pipe Trench Excavation

Outside Diameter of Pipe	Minimum Trench Width in Excess of Outside Diameter
Twenty (20) Inches and Up	Twelve (12) Inches
Ten (10) Inches and Up To Twenty (20) Inches	Twelve (12) Inches
Under Ten (10) Inches	Twelve (12) Inches

4.4.3 Trench Depth

Unless otherwise specified in the Job Data or construction drawings, the trench for the pipe shall be excavated to a depth that, exclusive of fill,

shall provide not less than the minimum depth of cover over the top of the pipe indicated in Table 2.

"Extra Depth of Trench" is where the trench is excavated and graded to a depth that results in cover in excess of forty-eight (48) inches for a distance exceeding 100 lineal feet in any one location. "Extra Depth of Trench" does not apply unless:

- directed by the Company,
- specified in the Job Data,
- indicated on construction drawings, or
- required at highway, railroad, waterway crossings, or other locations to meet minimum cover requirements.

The Company's authorized representative shall designate the location of valve settings and drips. Excavation of the trench at such locations shall be to the depth required for such installations and shall not involve "Extra Depth of Trench". The Company will specify the depth of cover requirements; follow Table 2 at a minimum.

Table 2 - Minimum Depth of Cover for Buried Pipelines

	Cover – Inches	
	Normal Excavation	Consolidated Rock Excavation
Class 1	36	24
Classes 2, 3, & 4	36	24
Drainage Ditches of Public Roads and Railroad Crossings	36	24
Rivers, Creeks and Canal Crossings	48	24

4.4.4 Clearance

The trench shall be excavated by hand when, in the opinion of Company's authorized representative, machine excavation could cause damage to existing pipelines or other underground installations.

There shall be a minimum clearance of 24 inches between the pipeline being laid and any other pipeline or underground structure. Other clearances may be specified in permits. If these clearances cannot be

attained, other suitable precautions to protect the piping shall be taken, such as the installation of protective material, installation of casing, etc. to withstand external loads and shall be approved in writing by the Company's authorized representative.

4.4.5 Special Consideration

When advised that a property owner contemplates the installation of a new drain tile line, the extension of his present tiling system or the tiling of the land not presently tiled, excavation of the trench shall be of a depth sufficient to meet the above clearance requirements.

Where lawns, cultivated shrubs, trees, orchards, or valuable growing timber are encountered on the right-of-way, special construction procedures may be required to eliminate or minimize damage or injury to the plantings. Any cultivated shrubs, trees, orchards, or valuable growing timber that does not meet the Minimum Guidelines shall not be allowed on the right-of-way.

Where the trench is excavated through land where livestock is confined, through fields under cultivation, across lanes or driveways, or where the trench is open cut through roads, temporary facilities shall be constructed to permit the safe crossing of livestock, vehicles, equipment and persons from one side of the trench to the other.

Additional cover shall be provided to prevent damage to all buried pipelines where deep plowing or grading operations are anticipated or where the area is subject to erosion.

The bottom of the trench shall be on undisturbed earth and shall provide a uniform support for each joint of pipe. The bottom of the trench shall be flat with no humps or rocks. There shall be 12" between the bottom of the trench and bottom of the pipe.

Follow cover requirements in Table 2.

The pipe shall be placed on sacks placed on the bottom of the trench filled with soft material such as soft dirt. The sacks will be made of material that will not damage the pipe or coating. Burlap sacks are recommended rather than polypropylene for friction purposes. Place sacks a minimum of 15 feet apart along the bottom of the trench.

When the nature of the terrain requires drainage, the Company's authorized representative shall designate the location and the Contractor shall excavate the drainage ditch.

4.5 Blasting

4.5.1 General

Contractor personnel shall be familiar with blasting and use of explosives and agrees that it is relying upon no statement, representation, or advice of the Company concerning the propriety or manner of such use.

Perform all drilling and blasting in a cautious manner and take suitable precautions to avoid injury or damage to persons, related area livestock, or other property.

In no event shall explosives be used where, in the opinion of Company, such use will endanger existing facilities.

The Contractor shall be responsible for obtaining all required permits and for all damage resulting from the use of explosives on or off the construction site.

Contractor shall promptly remove rocks or other debris scattered on adjacent land by blasting operations. The Contractor's responsibility under this paragraph shall apply without regard to negligence, due care, or lack thereof.

4.5.2 Blasting Plan

The Contractor shall provide the Company with a copy of the blasting plan for review. If there are live Company facilities in the right-of-way or within 300 feet of a live Company facility, the Plan will be reviewed by a Company Pipeline Engineer per Procedure 220.006.003 - *Blasting Analysis*. This review will not absolve the Contractor from any and all responsibility for blasting impacts.

4.5.3 Blasting Regulatory Requirement

All blasting shall be performed in accordance with 29 CFR 1926 Subpart U - Blasting and the Use of Explosives.

Where governmental authorities require licensed "shooters" and blasting permits, such requirements shall be observed. In certain locations, the Company may require matting or spoil dirt covering. The use of ammonium nitrate is prohibited.

Explosives shall be stored in a locked magazine in accordance with requirements of the U. S. Bureau of Alcohol, Tobacco and Firearms, 27 CFR Part 555. Detonating caps shall **not** be stored with explosives, but shall be stored in a separate place in accordance with 27 CFR Part 555. Explosives shall not be primed or fused until immediately before use.

If blasting is necessary within 150 feet of residential or commercial buildings, an independent contractor will be hired to perform pre- and post-blast structural inspections and, if necessary, provide seismographic monitoring.

4.5.4 Blasting Inspections

Blasting shall not be done within or near stream channels without prior consultation with federal and state conservation authorities to determine what protective measures should be taken to minimize damage to fish and other aquatic life. The ECS has details on blasting requirements near streams.

The Company will conduct pre- and post-blasting (within two months of construction work restoration) testing of water wells within an appropriate distance (typically 150 feet) of the construction site with landowner permission where blasting has the potential to affect water quantity/quality from domestic or agricultural wells or springs in the proximity of the construction work area. These tests may include a pump inspection, flow rate, and bacteriological cultures. If a water well is damaged due to construction activities, the Company will provide a temporary source of water and compensate the owner.

4.6 Temporary Construction Access Across the Trench line

Where access across the trench line is required, temporary facilities such as trench plugs and fences, or steel plates will be constructed or installed to permit safe crossing of livestock, vehicles, equipment, and persons from one side of the trench to the other.

4.7 Drainage Tile and Irrigation Facilities

Company personnel will contact landowners and/or the local National Resource Conservation Service (NRCS) to locate drainage tile facilities and irrigation systems. When advised by the landowner or NRCS that a landowner contemplates (within three years) the installation of drainage tile in areas crossed by the pipeline, the pipeline will be installed at a sufficient depth to accommodate the drainage tile. For

adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s) and within PHMSA specifications.

All drainage tiles crossed by construction activities will be marked and probed to determine if damage has occurred. Drainage tile removed, cut, broke, or otherwise damaged during construction will be replaced or repaired as illustrated in the Environmental Construction Standards, to a condition as good as before and at the original location and grade. Qualified personnel will be used for all testing and repairs. Temporary measures, approved by the Inspector, will be taken to provide suitable drainage until permanent repairs are made.

Water flow will be maintained in crop irrigation systems unless shutoff is coordinated with affected parties.

Tile shall be removed for a sufficient distance from the trench to ensure a satisfactory joint, adequate support and to prevent the tile from becoming clogged after replacement is made. Replace damaged tile with tile of the same size.

Troughs or conduits shall be placed to adequately support the replaced tile. Such troughs or conduits shall penetrate sufficient solid ground to insure that alignment and correct grade is maintained when the backfill settles.

5 Transporting, Unloading & Handling, Storing & Stacking & Stringing Of Line Pipe

5.1 General

The transporting, handling, and storing of pipe shall meet the requirements of Procedure 70.001.028 - *Handling, Storage and Shipping Pipe* and the following.

5.2 Transporting

Loading of pipe with a diameter to thickness ratio (D/t) of 70 to 1 or greater for railroad transportation shall conform to API RP 5L1, marine transportation shall be in accordance with API RP 5LW and truck transportation shall be in accordance with API RP 5LT.

The shipper shall have a complete shipping procedure with the necessary calculations, stacking arrangements, bearing strip locations, spacers, tie-down straps, etc. All pipe transportation equipment shall be free of foreign materials or appurtenances that may damage or cause abrasion of the pipe or coating during shipment.

Trucks transporting pipe shall comply with state laws concerning load weight, gross weight, bridge load, overhang, and height. In addition, they shall comply with 49

CFR Part 393.100 - *Parts, and Accessories Necessary for Safe Operation, Subpart I - Protection Against Shifting or Falling Cargo* with the following additions:

- When a flatbed trailer is used to haul coated pipe, at least four 4" x 6" hardwood bearing pieces (bed of truck) shall be used. A minimum of two 4" x 6" x 8" hardwood chock blocks, either cut to fit the pipe or wedge shaped, shall be secured on either side of each bearing piece or separator. For coatings other than Fusion Bonded Epoxy (FBE), any bolster, bearing piece, separator, and chock block surface must have a dense padding material (example: strip of rubber or old tire tread) securely fastened to it. FBE may not require any such padding.

- All tie down assemblies used on coated pipe will be nylon or polyester straps. **The use of chains for tie down assemblies is prohibited.** The hooks, winches, or ratchets must have strength equal to or greater than the static breaking strength of the tie down assembly. All flatbed trailers must have at least one (1) tie down assembly for every 10 feet of linear load.

- All pole trailers must have at least two (2) tie downs on both the front and back bolsters. The total static breaking strength of the tie down assemblies must equal or exceed 1½ times the weight of the load of pipe. If separators are used between the tiers of pipe, then each tier of pipe must have at least two (2) tie down assemblies.

- The tension on each tie down assembly will be rechecked no more than 2 - 3 miles from the point at which the truck was loaded and several times throughout the trip to ensure no shifting of the load occurs.

Before thin film (FBE) coated pipe directly from the coating mill is handled, it shall have 5/8" polypropylene rope encirclements evenly spaced throughout the joint of pipe. The minimum number of rope encirclements is listed in Table 3.

Table 3 - Rope Encirclements

Pipe diameter	# of 5/8" rope encirclements per 40 ft. joint	# of 5/8" rope encirclements per 60 ft. joint
36"	5	6
30"	4	5
26"	4	4
24" and less	4	4

The maximum height of FBE coated pipe shall not exceed those listed in Table 4.

5.3 Unloading & Handling

Upon arrival of pipe and other materials at points of delivery, such material shall be promptly unloaded from the delivery vehicles and hauled to a designated warehouse, pipe yard, or to the right-of-way. The unloading and handling of all materials shall be accomplished in a careful workmanlike manner by the use of adequate equipment, labor and in accordance with 29 CFR 1926, Subpart H - Material Handling, Storage, Use & Disposal.

Handle pipe in a manner to prevent damage to pipe walls, beveled ends, and coating. All pipe handling shall be done using nylon slings, a Newco No. 3 pipe hook or equivalent with soft metal (excluding copper alloys) inserts, or forklifts with blades adequately padded to prevent damage. If the pipe has a concrete coating, then use an Asco aluminum pipe hook. When using a forklift to unload or unstack the coated pipe, utilize extreme caution not to damage the coating and pipe by wedging the tips of the fork into the pipe stack.

Bare cables, chains, hooks, metal bars, narrow skids, and other non-padded devices are not permitted.

All coated pipe, whether nestled or stacked on skids, shall be picked up from the top of the stack in a manner not to disturb the rest of the joints of pipe in the stack.

Coated pipe shall be handled in a manner to protect the coating. Coated pipe shall not be run down skid ways from cars or permitted to ram other pipe sections but shall be lifted from cars only with padded handling devices, by cranes or other suitable equipment and placed on padded truck bolsters or

stockpiles. FBE coated pipe does not require padding on skids unless directed by the Company.

Buffers or other suitable means of protection shall be used where suitable unloading equipment is not available. Pipe shall not be thrown or dropped from railroad cars or trucks.

A Company representative will visually inspect the pipe coating during removal of the pipe from the original carrier at the destination. The pipe may also be randomly electronically inspected with a holiday detector.

5.4 Storage/Stacking

Stacking of coated pipe in the yard shall be in accordance with good safety practices. The maximum height of coated pipe shall not exceed those listed in Table 4.

Table 4 - Pipe Stacking

Pipe Diameter	Height of Pipe Stack
6" to 8"	9 tiers
10" to 12"	7 tiers
14" to 20"	5 tiers
24" & above	4 tiers

The bottom row of the pipe in storage shall be laid on skids or soft earth berms. Non-FBE coated pipe will require padding.

With the exception of FBE coated pipe, any skids used must have a dense padding material (example: strip of rubber or old tire treads) which will prevent coating damage. Earth berms shall be free of rocks, glass, metal objects, and any other material, which could cause damage to the pipe or coating.

At least three (3) skids or three (3) earth berms shall be used to store pipe. The coated pipe shall be elevated far enough off the ground by either the skids or the earth berms to prevent water from entering the pipe or washing dirt and debris into the pipe. Each row of coated pipe, except for pipe coated with thin film, must have at least three 2" x 6" hardwood strips separating it from the next row. Each hardwood strip shall have a 4" x 6" x 8" hardwood chock block, either cut to fit the pipe or wedge shaped, secured to both ends. For pipe smaller than 4", a 2" x 6" x 4" chock block can be used.

Any pipe walls, beveled ends, or coating damage incurred while being handled or during storage shall be repaired in accordance with the appropriate Company Specification and to the satisfaction of the Company representative at no additional cost to the Company. Any coating that has been repaired shall be given sufficient time to cure before it can be handled.

Pipe stored for a significant period shall be stacked in a manner to prevent deformation and minimize conditions conducive to corrosion. For guidance on long-term storage, contact Engineering Services – Corrosion.

The pipe storage methods shall be sufficient to minimize induced residual magnetism.

5.5 Stringing

Pipe shall be strung upon the right-of-way with due consideration to topographic conditions for line up, welding and crossings where multiple lengths and special handling may be required.

In general, the pipe shall be strung end-to-end on the right-of-way, but in some cases may be placed in piles for welding or coating.

In the cases where pipe is strung end-to-end, leave sufficient space to provide for livestock crossings or for necessary access.

Valves, casing, and other large and durable materials may be hauled and strung on the right-of-way provided such practice shall not result in their loss or damage. Small materials or materials easily lost or damaged shall be stored at convenient points in designated warehouses.

When stringing or handling pipe near a high voltage power line, follow the requirements in Procedure 70.002.055 - *OHAC Minimum Requirements for Pipeline Construction in Close Proximity of High Voltage AC Overhead Power Lines*.

5.6 Pipe/Coating Damage

Repair any pipe wall, beveled ends, or coating damage incurred during transportation, handling, or storage in accordance with the appropriate Company Specification and to the satisfaction of the Company's representative.

Before making field repairs of pipe manufacturing defects or transportation related damage or any other defect, contact the Pipeline Engineering for coordination with the manufacturer or transportation party.

The contractor shall be responsible for the cost of replacement, and/or repair of materials and associated cost resulting from damages from loading, transporting, unloading, handling, storing/stacking, or stringing line pipe or other materials.

Any coating, which has been repaired shall be given sufficient time to cure before it is handled.

5.7 Qualification of Pipe

5.7.1 Steel Pipe of Unknown or Unlisted Specification

Do not install steel pipe of unknown or unlisted specification without prior written approval and direction from the Company.

5.7.2 Steel Pipe Manufactured Before November 12, 1970

Do not install steel pipe manufactured before November 12, 1970 without prior written approval and direction from the Company.

6 Bending and Laying

6.1 Bending

6.1.1 Bend Characteristics

The method employed in making pipe bends in the field shall be subject to the approval of Company's authorized representative.

All field bends made with or without the use of a bending machine shall be made without heating and the completed bend shall not impair the serviceability of the pipeline. Each bend must have a smooth contour and be free from buckling, cracks, wall thinning, or any other mechanical damage.

Out-of-roundness tolerances shall not exceed those in API 5L 45th edition, Table 10.

The vertical height of any ripple (measured from peak to valley), shall not exceed 1.0% of the pipe OD per ASME B31.8 paragraph 841.2.3(a)(8) for gas service and ASME B31.4 paragraph 451.6.2.8 for liquid service. Wrinkles, buckles, humps, indentations, or bulges are not permitted.

The completed bend shall conform to and match the grading of the bottom profile of the completed trench.

The Contractor shall determine the optimum bend procedure for the pipe provided. The Company shall not be responsible for any variation in bending characteristics that may be encountered.

6.1.2 Bending Practices

Wrinkle and Miter bends are prohibited.

Ripples per ASME B31.4 para. 451.6.2.8 (liquid), Plan 400.017.504 - *Liquid Pipeline Repair Plan* and B31.8 para. 841.2.3 (gas) and Plan 220.02.01 - *Pipeline Repair* are permitted.

All new and replaced pipe bends will have a minimum bend radius of at least three times the diameter (3D) of the pipe in order to permit passage of in-line inspection tools unless approved by Engineering Services.

Where welded seam pipe is used, place the longitudinal seam at or near the top of sidebends, and at or near the side of sag and overbends so the seam is located near the neutral axis. This is to minimize the stresses to the longitudinal weld. Normally, the seam is to be in the top quarter. The seams on adjacent pipe lengths should not be in line, but the edges of the seam weld are to be offset a minimum of 1".

The minimum tangent distance between the start/end of the bend as measured along the longitudinal axis to the pipe end shall be at least 1½-pipe diameters.

For 12-inch nominal pipe and larger, the permanent deflection as measured along the longitudinal axis of the pipe shall not exceed 1 ½ degrees in a length equal to one pipe diameter.

Example:

20" pipe 40 ft joint:

L = Actual pipe length in feet
D = Pipe nominal OD in ft (OD in /12)
MT = Minimum tangent (1.5 D)
MB = Max bend in deg

MB = (L-2MT)/(D/1.5)
= [40ft- 2(1.5*1.67)] / [(1.67ft/bend-seg)]/1.5 Deg/bend-seg)
= 31.51 degrees

Max. bend in 40 ft. joint = 31.51 degrees

1) Minimum required distance from end of pipe to nearest bend is 1.5 x D (diameter)
2) Field bending off coated pipe is permitted if coating is less than 20 mils thick. (Refer to Specification MS.70.002 *Mill Applied External Thin Film Coatings Specification*)

Note: The actual length of pipe being bent determines the maximum angle of the bend.

Proper bending may require smaller increments of approximately ½ degree per pull within this length to minimize pipe distortion. Where it can be demonstrated that more severe deflections are acceptable, the Company representative may approve bends in excess of this limit.

Where bending of pipe with an existing circumferential weld is required, no increment of the bend shall be made within 2 ½ feet of the weld. If, in the opinion of the Company representative, excessive distortion is evident in the weld area, a radiograph of the weld shall be required at Contractors expense or the joint shall be rejected.

The bending procedure shall be designed to prevent distortion of the pipe ends.

Bending procedures and equipment shall not cause damage to external and/or internal coatings. If, in the opinion of the Company representative, coating protection is required, padded bending dies for bending machines shall be furnished at no additional cost.

Miter cuts are prohibited. Deflections up to 3 degrees are permitted within the restrictions found in the Plan 290.01.05 - *Company Welding Manual* - Part 1, Section 1.5.3.

When bending machines with internally expanded mandrels are used, care shall be exercised to assure that the pipe diameter is not increased.

6.1.3 Bending Equipment

Use field-bending machines for all bends on 12-inch nominal and larger pipe.

Use an internal mandrel for all bends on 16-inch nominal and larger pipe.

For 10-inch nominal and smaller pipe, field bending may be done by machine, bending block/shoe or other Company approved method.

6.1.4 Bending Inspection and Disposition

The Contractor and a Company representative shall inspect each bend to assure compliance with the requirements in Section 6.1.1 - Bend Characteristics and 6.1.2 - Bending Practices of this specification.

The Contractor shall replace unacceptable bends at no expense to the Company. The Contractor will be charged the delivered cost of the pipe and coating for any rejected bends. The Contractor shall also be responsible for the repair or replacement of coatings damaged by the bending process.

A Company representative will determine the acceptability of bends.

A Company representative in consultation with appropriate Company Engineering personnel may approve deviations from these requirements.

6.1.5 Hot Bend Limitations

Factory hot bends, including induction bends, are prohibited in pipe that has been cold expanded or heat-treated to enhancing the mechanical properties.

6.1.6 Elbow Requirements

Forged, fabricated, or cast steel elbows, and elbow segments, must have a minimum arc length measured along the crotch of at least 1" between weld edges. If the pipeline is piggable, the minimum bend radius for a forged elbow is 3D with 6D recommended.

Minimum allowable angles for segmented elbows are provided in the table:

NPS	Min. Allow. Angle (Deg) Std. Rad.	Min. Allow. Angle (Deg) Short Rad.	NPS	Min. Allow. Angle (Deg) Std. Rad.	Min. Allow. Angle (Deg) Short. Rad.
2"	31	70	12"	5	10
3"	20	45	14"	4	8
4"	16	32	16"	3	7
6"	10	21	18"	3	6
8"	7	15	20"	3	5.5
10"	6	12	≥24"	3	5

Any deviations from this table must be approved by the appropriate engineering resource.

6.2 Laying

6.2.1 Laying

Company's authorized representation may require that pipe bends be set in the trench in advance of the laying crew, to test the bend radii and the grading of the trench.

The open end or ends of the line shall be securely closed at the end of each day's work to prevent the entrance of small animals or the introductions of foreign matter of any kind and shall not be reopened until work is resumed at that point.

6.2.2 Inspection

Before pipe joints are lined up for welding, examine the interior for the presence of foreign debris. The interior of all pipe joints shall be carefully examined for the presence of foreign matter before they are lined up for welding. All such matter shall be removed by swabbing or other means.

Each length of pipe and each other component must be visually inspected at the site of installation to ensure that it has not sustained any visually determinable damage that could impair its serviceability.

Any imperfection or damage that impairs the serviceability of a length of steel pipe must be repaired or removed.

Each gouge, groove, arc burn, or dent that is removed from a length of pipe must be removed by cutting out the damaged portion as a cylinder.

NOTE: For the purpose of this section, a "dent" is a depression that produces a gross disturbance in the curvature of the pipe wall without reducing the pipe wall thickness. The depth of a dent is measured as the gap between the lowest point of the dent and prolongation of the original contour of the pipe.

6.2.2.1 Repairs by Grinding

Repairs by grinding must be approved by Pipeline Engineering and follow Section 3 of Plan 220.02.01 - *Pipeline Repairs* or 400.017.504 - *Liquid Pipeline Repairs*. Defects may be cut out at the discretion of the Company representative.

6.2.2.2 Dents in Pipe Operating Above 20% SMYS

Through the completion of commissioning, each of the following dents must be removed from steel pipe to be operated at a pressure that produces a hoop stress of 20%, or more of SMYS:

- A dent that contains a stress concentrator such as a scratch, gouge, groove or arc burn; or
- A dent that affects the longitudinal weld or a circumferential weld.

6.2.2.3 Dents in Pipe Operating Above 40% SMYS

Through the completion of commissioning, each of the following dents must be removed from steel pipe to be operated at a pressure that produces a hoop stress of 40% or more SMYS:

- A dent that meets one or more of the criteria in 6.2.2.2; or
- A dent that is more than one-quarter inch in pipe 12-¾ inches or less in outer diameter; or
- A dent that is more than two percent of the nominal pipe diameter in pipe over 12-¾ inches in outer diameter.

6.2.2.4 Patching or Pounding

Pounding out or insert patching a gouge, groove or dent is prohibited.

6.2.3 Welding Requirement

Refer to Plan 290.01.05 *Company Welding Manual* and Welding Procedure Specifications for detailed welding and nondestructive testing requirements.

Before performing any work, all welders used by the Contractor shall undergo a welding qualification test per the Plan 290.01.05 *Company Welding Manual* and given by the Company or their designee. The Contractor agrees that only those welders who pass such qualification tests shall be used to perform welding.

Contractor shall remove and replace all welds or partial welds that are not satisfactory at their own expense.

6.2.4 Joining Pipe by Methods other than Welding

Where pipe is joined by a procedure other than welding, all joints must be designed and installed to sustain the longitudinal pullout or thrust forces caused by contraction or expansion of the piping or by anticipated external or internal loading. Each joint must be made in accordance with written procedures that have been proven by test or experience to produce strong gas-tight joints. Inspect each joint to ensure compliance with these written procedures.

7 Coating and Wrapping Specifications

7.1 General

This section shall apply to the transportation, handling, coating, and wrapping of weld ends and fittings, and patching of mill coated pipe.

Should field or yard coating of pipe be utilized it shall be performed in accordance with the appropriate Company procedure specified for the project and the coating being applied.

The work required under this specification includes the furnishing of all labor, equipment, and services necessary for application of coating and wrapping materials by the contractor.

Contractor shall furnish all abrasive blasting equipment, including, abrasive, carpet, rags, brushes, and miscellaneous tools and equipment required for application of the coating and wrapping materials.

Equipment, both as to type and condition, employed by Contractor for application of the coating and wrapping materials shall be subject to the approval of Company.

All weld joints and underground appurtenances, including valves, drips, and fittings, connected to a coated pipeline shall be coated, and all coating damage repaired in accordance with the appropriate Company procedure for the coating used.

The transition area (6" above and 18" below grade) where pipe or fittings extend above ground shall be protected from mechanical and UV damage with the appropriate epoxy over coating installed over the corrosion protection coating.

7.2 Coating Materials Storage and Handling

Coating and wrapping materials shall be handled in such a manner as to prevent damage to the materials.

Coating, wrapping and reinforcing materials shall be stored under cover in a dry place and kept from contact with dampness. Do not use any coating material, which shows evidence of or is damaged, deteriorated, or out of date. Do not allow epoxy coating material to freeze. Select epoxy materials for the temperature range when the construction is taking place.

7.3 Cleaning and Priming

7.3.1 Cleaning

All surfaces to be coated shall be free of foreign matter such as dirt, grease, mill scale, rust, etc. Perform surface preparation per the appropriate Company procedure. Abrasive blasting to a near white metal surface may be required for specific types of coating.

7.3.2 Priming

Apply primer compatible to the specified coating immediately after cleaning.

Do not apply primer to moist, frosted, or excessively hot pipe surfaces.

Application rates and drying times will be those specified by the manufacturer.

Primer shall be applied per the manufacturer's instructions and free of floods and runs.

Primer thinner shall be used under the direction of a Company Corrosion Engineering representative and as specified by the primer manufacturer.

If the primer coat is unsatisfactory due to age, then clean and re-prime the surface.

7.4 Coating and Wrapping Application

Coatings and wrapping application and coating repair shall be as specified by the Company in accordance with the latest referenced Procedure. A listing may be obtained from the Corrosion Engineering. The Company will specify the type of coating used for the project.

7.4.1 General

Inspect protective coatings in accordance with Company procedures at the time of application and when the pipe is installed. In addition to the requirements of 49 CFR 192.461, the following shall also apply to coating inspection:

- The girth welds shall be inspected for irregularities that could protrude through the pipe coating material. Any such irregularities must be removed at the direction of the Company representative.

- Coating personnel shall be suitably instructed in proper application techniques and provided with all equipment necessary to coat the pipe, and to evaluate the completed application of coating and patching.

- Where backfilling does not follow directly behind the lowering in of the pipe, the protective coating shall be inspected just before backfilling.

7.4.2 Electrical Coating Inspection

The coating shall be completely tested with a holiday detector per Procedure 70.001.013 - *Inspect Pipe Coating (with Holiday Detector)* just before lowering. All defects detected will be clearly marked and appropriate repairs made during construction.

Testing the coating with the holiday detector will be repeated as often as necessary to ensure satisfactory coating repair to the satisfaction of the Company representative. The holiday detector will be used to test the coating a minimum of three times.

Properly ground the pipe during electrical inspection.

A continuing visual inspection shall be made of all coated surfaces during construction.

The holiday detector will be verified to be in working condition per Procedure 70.001.013 - *Pipe Coating – Holiday Detection Procedure.*

7.4.3 Over-wrap Material

When mechanical tamping equipment is used during the backfill operation, use over-wrap material (rock shield, rock jacket, etc.) or ditch padding for all corrosion coatings.

When non-select backfill is used at the discretion of the corrosion inspector, when specified in the corrosion plan or specified by the construction supervisor, install overwrap material (rock shield, rock jacket, etc.) for all corrosion coatings. Refer to Procedure 70.001.032 - *Over Coatings and Overwraps for Protecting Coated Pipe*.

8 Lowering of Pipe

If required, the number and location of slack loops shall be as designated by the Company authorized representative.

Side bends and sag bends shall be lowered first when possible and weighted if necessary to serve as anchorage when lowering the pipe into the trench.

Side bends shall be placed to bear against the outside wall of the trench in a manner not to damage the coating. Sag bends shall bear firmly against the bottom of the trench, and over bends shall have a minimum space of 4 to 8 inches between bottom of the pipe and bottom of the trench. The intent is to lower the pipe in such a manner that a maximum amount of pipe shall be in the trench. Loose ends shall be left at any over bend if required to permit the sag bend to be lowered and anchored before making the cut and tie in weld.

If the pipe is cradled-in, do so in such a manner to secure proper slack and not damage the pipe coating.

The pipe shall be laid in compression. The Company's authorized representative may require that the line be cut at any point to determine if it has been laid under compression. After cutting, if the two (2) ends separate, it shall be concluded that the line is not in compression. In such case, the Contractor shall bear all expenses in excavation, stripping, cutting the pipe, lining up, re-welding, backfilling, coating, etc. However, after the line is cut, if it is necessary to cut out a section in order to re-weld and/or is necessary to move the slack away from the cut, then the line shall be considered as being laid in compression, and the Company will bear all expenses.

Soil shall be used where rock is encountered to pad the bottom of the ditch to protect coated pipe from damage. Apply rock shield to the pipe before the lowering-in operation. Biodegradable sacks filled with a soft material such as dirt will be used to keep the pipe off the bottom of the trench and can be inspected with a holiday detector. If rock shield is applied only to the top half of the pipe, the bottom of the ditch shall be padded with a minimum of 4 inches of earth, and rock shielding may be applied after the pipe has been lowered into the ditch prior to the backfilling operation.

Coated pipe shall be handled with equipment, which will not damage the coating. Wide padded skids may be used at the discretion of the Company representative with the exception of epoxy coatings. Padded skids may be necessary when transporting the pipe due to potential movement.

Bare metal cables, chains, hooks or metal bars shall not be permitted to contact the coating. The pipe shall be lowered in such a manner as to prevent damage to the coating from abrasions, scuffing, or cracking.

At all locations where the pipe's protective coating is damaged, the coating shall be removed from the area of damage and pipe surface carefully examined. Gouges, grooves, and notches in the pipe shall be repaired or replaced in accordance with Section 7 and Company policy. The damaged area shall be recoated per Company procedures after evaluation.

9 Cleaning

Procedures 220.001.030 – *Pipeline Purging Procedures* and 220.001.037 – *Hydrostatic Testing of Pipelines* shall be complied with for cleaning and de-watering.

Each completed section of the line designated for cleaning shall be cleaned by running pigs through the entire length of the line and until the line is free of water and other

foreign matter. Methanol or other chemical batches may also be employed. See Procedure 70.003.013 – *Hydrostatic Test Water Treatment and Chemical Treatment of Pipelines after Hydrostatic Testing*. Blowing the line out with air may also be used with short sections of pipe or fabrications that cannot be pigged.

10 Appurtenances

10.1 General

All necessary fabrications, drips, valves, farm taps, tie-ins, and other connections shall be installed at locations designated on construction drawings or in the Job Data by Company approved methods. Test sections and other appurtenances may need to be segmented out to not interfere with the cleaning and testing of a section of the line. The Test Plan shall be followed.

All fabrication shall be cleaned and coated per Company procedures and specific job data requirements. If specified, the facilities shall be electrically isolated from the pipeline and as directed by the Company.

When the Contractor elects to perform its fabricating work or any part thereof at a location other than the Company's plant site, it shall do so at no additional cost to the Company, including the labor escalation, accounting, and transportation, and handling. All gas piping welds performed offsite shall be radiographically inspected per Company requirements. Any repairs or replacement of defective welds shall be performed at the Contractor's expense.

10.2 Temporary Piping Systems

Temporary piping systems and their supports shall be designed according to the temporary service operating conditions, and to place no detrimental forces on the permanent piping system. Special precautions shall be taken to absorb loads due to expansion, cyclic actions, thrusts, etc., on both the temporary and permanent piping systems. Temporary piping shall be removed before any operation of the permanent piping system.

10.3 Internal Cleaning

All piping, unless otherwise specified, shall be cleaned internally by sweeping, brushing, pigging, scrubbing, or blowing with compressed air or natural gas to the satisfaction of the Company. The removal and subsequent reinstallation of miscellaneous equipment may be required, as identified by the Company, to avoid damage to critical internal parts. The removal of equipment, reinstallation, the fabrication of spool pieces, etc., shall be the Contractor’s

responsibility. Cleaning may be terminated when the interior cleanliness is satisfactory to the Company representative.

In the event that more extensive pipe cleaning is required such as pickling or abrasive blasting, the individual project specifications shall be followed.

10.4 Joining Methods

10.4.1 Welded Connections

All welding qualifications, materials, installation, inspection, etc., shall conform to the applicable Company specifications and Plan 290.01.05 - *Company Welding Manual*.

Socket weld and slip-on type fittings may be used only when and as specified by System Integrity or Pipeline Engineering.

Refer to Design Standard DST-101 – *Design of Welded Branch Connections* to include In-Service Connection when using reinforced fittings such as Thread-o-lets, Weld-o-lets, etc.

The bore of welding neck flanges shall be that of the inside diameter of the pipe being used. When this is not the case, the difference shall be brought to the attention of the Company for resolution.

The reuse of weld neck flanges and welded fittings may only be done when approved by the Company and per Company specifications.

10.4.2 Bolted Connections

Refer to Standard Material Standard MS.50.001 - *Bolts, Nuts and Washers Specification,* Reference Standard REF.220.002 *Pipeline Torque Specifications* and Procedure 220.010.001 - *Flange Assembly* for bolt torque values, selection of nut, bolt, flange, and gaskets, approved lubricant and information related to bolting dissimilar flanges, etc.

The Contractor shall perform the following as applicable:

Verify that the bolts/studs, nuts and gaskets are the required diameter, length, grade, etc., for the specified service. If the stud length is not adequate for the width of the two flanges plus any additional length needed for insulation kits, (at least one full thread showing from the top of the nuts) the studs need to be replaced.

Check for thread damage and cracks. Nuts should run freely on the bolt/stud by hand.

Clean all bolt/stud and nut threads, nut faces, and bearing surfaces before tightening.

NOTE
A minimum of one full thread of stud length shall extend through the nuts when properly torqued. **On new construction, use form FRM.220.011 – *Bolt Torque Inspection Log* to record the torque values. This form will be included in the project documentation package.**

All flange bolts/studs shall extend completely and equally through the nuts.

Verify complete and uniform contact between the flange faces and gaskets.

On new construction, use a facility drawing to number the flanges. These flange numbers will be recorded on form FRM.220.011 *Bolt Torque Inspection Log* when listing the final torque values. Include the marked up drawing with Form FRM.220.011 in the project documentation package.

Thread engagement in tapped holes shall be at least 7/8 times the nominal thread diameter.

Corrective measures, such as replacing the nut and/or the bolt shall be taken when a nut does not make uniform contact with the bearing surface.

Washers may be used when approved by the Company.

Flanges will be electrically isolated as specified.

Buried flange connections are discouraged but necessary under certain circumstances. Approval from Pipeline Engineering is required prior to installation.

Use line up pins when installing flanges to avoid stresses on the flanges, pipe, and other equipment.

Use flange spreaders when changing gaskets or installing different equipment.

10.4.3 Threaded Connections

The use of threaded pipe in buried transmission lines and appurtenant facilities is not permitted unless approved in writing by the Company.

Teflon seal tape is preferred for screwed connections. Other thread compounds or lubricants shall be approved by the Company before use.

No thread compound or lubricant shall be used on a joint that is to be seal welded. The Company must approve seal welding of threads, in advance.

All threads on piping components shall be NPT tapered pipe threads.

Screwed connections shall not be backed off to provide pipe alignment.

11 Backfilling Specifications

11.1 General

Backfilling shall follow the laying and lowering of the pipe as closely as possible and shall be done so no excavated material remains scattered on adjoining ground. Soil excavated and not used during construction should be evenly filled back onto the cleared area or removed from the site. The soil should be graded to conform to terrain of the adjacent land and vegetation planted and fertilized according to the Environmental Construction Standards or EM&CP.

The trench shall be backfilled above ground level and heaped over the center of the trench to a height, which will ensure complete filling of the trench after settlement. Backfill through cultivated field or fields suitable for cultivation shall be rounded off so not to interfere with farming operations.

If the right-of-way was graded for equipment (two-toned), backfill and level, the right-of-way so the original contour of the ground will be restored unless otherwise directed.

Return excavated rocks whose largest dimension is less than 10 inches to the trench. Any rocks returned to the pipe trench shall be prevented from contacting the pipe by the use of rock shield or earth padding. Rocks in the trench shall have a dirt cover of not less than 12 inches through cultivated field or fields suitable for cultivation.

When rock shield is not used, the coated pipe shall be protected by earth padding of not less than 4 inches around the entire pipe circumference. No trash, cans, drums, stumps, wood, rubbish, waste, welding rods, metal, or refuse shall be placed in the pipe trench.

On sloping ground, use sack breakers, bags filled with earth, bags filled with a soil-cement mixture or other approved materials in the trench to prevent the backfill from sliding or washing. Burlap sacks are preferred for ditch breakers. When required, the backfill shall be protected by placing stone rip-rap, sack breakers or other appropriate materials with prior approval from a Company representative to prevent sliding or erosion.

Protective coating shall be protected during backfill operations.

Any backfilling omitted because of installation of breakers, farm taps, tie-ins, etc., shall be finished after such installations have been completed.

Open-cut highway and railroad crossings shall be installed in accordance with the highway and/or railroad-crossing permit. As a minimum the backfill material shall be so placed or compacted to prevent settling. If permitted, flowable fill is preferred.

Trench line barriers (or sack breakers) as illustrated in the Environmental Construction Standards shall be installed up-slope of any permanent interceptor diversions and placed in the trench before backfilling to prevent water movement and subsequent erosion. An engineer or similarly qualified professional shall determine the need for and the spacing of trench line barriers.

11.2 Warning Tape

Warning tape shall be placed over the pipe whenever a pipeline is being installed or replaced. A minimum 6-inch wide tape that follows A.P.W.A. Uniform Color Code, shall be placed directly above the buried pipeline. The tape will be buried at least one foot below the surface of the ground and at least one foot directly above the pipeline." This applies to both natural gas and hazardous liquids pipelines. The only exception is for trenchless installation.

12 Hangers, Anchors, and Supports

Hangers, anchors, and supports for all piping shall be installed or fabricated and installed by the Contractor and approved by the Company. Whenever these items are

to be field designed and fabricated, provisions shall be made for expansion, contraction, or other movement of the pipe.

When identified by the Company, approved coating, padding and coated U-bolts shall be included as a part of the support installation. Engineering Services - Corrosion shall be consulted for final designs.

No supports, anchors, hangers, wear plates, lifting lugs, line up clamps, etc., are to be welded to pipe regardless of service, except those shown on construction drawings. In most instances, welding onto pipe on the atmospheric vent side of relief valves and to exhaust lines may be approved by the Company.

No temporary underground timber supports shall be buried with pipe when the pipe is backfilled, although temporary supports made of soil-filled burlap sacks may be left in place.

Temporary supports shall be erected to the satisfaction of the Company for support of pipe or pipe assemblies during testing operations.

Install hanger rods as directed by the Company.

12.1 Support

Uniform and adequate support of the pipe in the trench is essential. Unequal settlements may produce added bending stresses in the pipe. Lateral thrusts at branch connections may greatly increase the stresses in the branch connection itself, unless the fill is thoroughly consolidated or other provisions are made to resist the thrust.

Where vertical branch connections, such as blow-offs, are used, thrust blocks should be installed to absorb reaction thrusts. Thrust blocks shall be installed at the direction of the Company.

12.1.1 Underground

Underground concrete supports (sleepers) shall be constructed on undisturbed or compacted soil and no more than halfway up the side of the pipe. No load shall be placed on the pipe by the concrete.

Below grade piping resting on concrete supports shall be coated with a Company approved and specified coating from a point 6” from the edge of concrete support to a point 6” past the other edge of concrete support. Engineering Services - Corrosion will approve the coating to be used. The approved coating may be applied directly over existing fusion bonded epoxy

(FBE) coating. For other below ground coatings, the coating must be removed and the approved coating applied to clean bare pipe. After the approved coating has cured, the original coating should be reapplied at the edge of the approved coating, but shall not be applied such that the original coating is located over top of the concrete supports

When sleepers are cast in place and surrounding piping, then the piping corrosion coating shall be over-coated with a Company approved over-coating.

12.1.2 Aboveground

Aboveground pipe supports require an epoxy coating as specified by the Company.

All above grade supports shall have chock blocks to allow the inspection of pipe.

13 Concrete

The following applies to concrete for valve boxes, blocks, weights, foundations, supports and anchors:

The cement and aggregates shall comply with applicable ASTM specifications. Water shall be clean and free from harmful amounts of acids, alkalis, or organic materials.

All concrete shall be mixed, deposited, puddled, and finished in accordance with the best practices in the industry for similar work per Specification CON-101 - *Concrete Construction Specification*.

14 Railroad, Highway and Road Crossings

The construction of railroad, highway, and road crossings shall comply with the specifications and requirements of the permit issued by the agency having jurisdiction and be accomplished in a manner satisfactory to the authorized representatives of such agency.

If possible, casings are to be avoided. Where casing is required at railroad and road crossings, the installation shall be as shown on the construction drawings and crossing permit.

The casing shall have an even slope from end-to-end if at all possible. If the crossing requires more than one joint, then the joints shall be welded to provide a crossing that will withstand necessary leak test.

Insulating spacers shall be attached to the pipe at the proper spacing for the weight and as indicated on the construction drawings prior to the installation of coated pipeline in the casing. Centering cradles shall be placed between the casing and pipeline at the ends of the casing to support the pipe.

Seal the space between the pipeline and casing at the ends. Casing seal installations shall be inspected and tested before backfill.

Install casing vents as indicated on the construction drawings. Vents will be installed to prevent water from entering the casing. Vents shall be 3" minimum and a full opening hole.

Check the casing for electrical shorts both prior to backfill and after cleanup of the area. Should the casing and carrier pipe be shorted (electrically connected), the condition shall be corrected. Casing installations shall not be considered completed until all electrical shorts are eliminated.

Support the carrier pipe with bags of earth or other suitable means where it exits from the casing on both ends and for a sufficient distance to prevent the carrier pipe from deflecting and breaking the casing seal.

All casings where steel pipe is inserted shall be filled immediately after installation and not be electrically shorted. Casings shall be filled per Procedure 70.001.049 – *Filling of Pipeline Casings* with a Company approved di-electric filler such as wax. Casing grease is not recommended.

14.1 Backfill and Compaction

If specified or approved by the Company, backfill shall be placed in horizontal layers and each layer shall be thoroughly compacted by a mechanical tamping process. If available, backfill shall be placed in accordance with a subsurface investigation report. Thickness of layers shall normally range from 4 to 12 inches depending upon type of soil, compaction method, and density required. The degree of compaction shall be consistent with good engineering practice for the type of soil, moisture content during compaction and location with respect to equipment, structures, and roads. Backfill shall be compacted to a minimum 95% density at optimum moisture content in critical locations such as: footings, foundations, equipment, and piping supports, roads, walkways, and other areas described in the Job Specifications or on the construction drawings. The Company may employ an independent testing agent to determine the degree of compaction by means of accepted ASTM procedures.

Flowable fill is an option in areas where compaction is critical or mechanical tamping is not practical. See Specification MS.50.005 *Flowable Fill*. Flowable fill may not be used on uncoated pipe including casings.

Sand, gravel or rock are **not** to be used for pipeline backfill.

15 Stream and Wetland Crossings

15.1 General

The construction of all stream and river crossings shall comply with the requirements of the permit issued by the governing agency having jurisdiction, and be accomplished in a manner satisfactory to the agency and the requirements of the EM&CP.

River weights shall be installed at locations designated on the plans or as required. See Procedure 220.001.025 - *Weight Requirements for Pipelines Crossing Rivers and Wetlands*. Where weights are installed on long sections of pipe, care shall be taken in handling to prevent buckling of the pipe or damaging the coating.

Filling the pipe with water shall not be used as a substitute for river weights.

The cover over the weights shall not be less than the minimum cover specified in Section 4.4 (Trenching), unless specifically designated on construction drawings.

Erosion control shall be provided on stream banks to prevent erosion as determined necessary by the permits, Company inspector, and the EM&CP. Excess earth shall be disposed of in a manner not to block the flow of streams, interfere with other construction or maintenance operations, cause damage or inconvenience to property owners or others.

Take care to avoid oil spills and other types of pollution while work is performed in streams and other bodies of water and in their immediate drainage areas. The EM&CP provides information on fuelling areas.

Where navigable rivers or other streams under the jurisdiction of any governmental agency are crossed, construction shall conform to all applicable regulations.

Use rock shield, concrete coating, epoxy type coatings, or other appropriate methods to protect coating.

Overhead crossings may be installed if specified and designed by the Company. A Company approved coating suitable for ultraviolet (UV) protection shall be applied on overhead crossings. If required by the Company, measures such as gates, barriers or other means shall be installed to prevent people from traversing the pipe.

Replacement of earth adjacent to water crossings should be at slopes equal to or less than the normal angle of repose for the soil type involved. Sandbagging, seeding, or other methods of soil stabilization should be accomplished without undue delay per the requirements of the EM&CP or ECS.

16 Hydrostatic Testing

16.1 General

Upon completion of the line or a substantial part, the line shall be cleaned in accordance with the instruction in Section 9 (Cleaning) of this Specification and Procedure 220.001.030 - *Pipeline Pigging and Cleaning Operations* then tested in accordance with 49 CFR 192 (192.501-192.515) Subpart J, Company Plan 220.03.10 - *Piping Testing Requirements*, Procedure 220.001.037 - *Hydrostatic Testing of Pipelines*, or Plan 400.017.301 – *Liquid Pipeline Pressure Testing Program* and requirements in the Job Data if applicable.

Road, railroad, river, stream, or creek crossings may be individually hydrostatically pretested before installation either in sections or as a unit. Where such crossings are hydrostatically pretested, the entire crossing shall be tested as a unit following installation.

All welds will be radiographically inspected and hydrostatically tested before pipe is installed under water bodies or wetlands.

The Contractor shall locate and repair all leaks or line ruptures, or both, which occur during the test. The Company's authorized representative shall approve all line repairs. The Contractor shall furnish the necessary equipment to make immediate repairs.

Leaks or ruptures, or both, which are the result of defective workmanship in the construction of the pipeline or defective manifolding and/or gauge connections to the test segments shall be repaired at the sole cost and expense of the Contractor. In such case, the Contractor shall bear the cost of refilling and retesting the line.

Except for sections not pretested, leaks or ruptures, or both, which occur during a test and which are the result of defective material, shall be repaired at the sole cost of the Company. The Company shall bear the cost of refilling and retesting the line up to the pressure at which it failed.

16.2 Fabrications and Short Sections of Pipe

For fabrications and short sections of pipe where post installation tests are impractical, a pre-installation hydrostatic strength test may be conducted per Plan 220.03.10 - *Piping Testing Requirements* or Plan 400.017.301 – *Liquid Pipeline Pressure Testing Program*.

With prior approval from a Company Pipeline Engineer, air or inert gas may be used as a test medium if any of the following conditions exist.

- If water might freeze during the test and the use of antifreeze is not practical:
- If water of satisfactory quality is not available in sufficient quantity; or,
- Due to the special conditions, the use of water is not feasible.
- Plastic pipe testing is typically done with air.

16.3 If Water is the Test Medium

Municipal water should be used for hydrotesting unless otherwise approved by Corrosion Services and Natural Resources Permitting. The pH of the test water shall be 5 or greater (pH should be as close to 7 as possible). If the pH value of the water is less than 5, it shall be chemically treated until the above pH requirement is satisfied.

Filter water prior to its being introduced into the line unless taken from municipal supplies.

The fill pump shall have an adequate capacity to supply a solid column of water to the test section to prevent air locks. The rated capacity of the pressure pump shall be at least equal to 110% of the maximum test pressure at the pump.

Run a pig or sphere ahead of the water when necessary to provide a solid column of water.

Take water used for pipeline testing from streams or other bodies of water in a manner to minimize harm to the ecology, fish and wildlife resources or aesthetic values of the areas. When testing water is released, it should be done in such a manner as not to cause erosion, siltation, or damage to the ecology of the area.

16.4 Pretest Requirements

Backfill the test segment throughout its length before starting the hydrostatic test except for necessary bell holes.

Place all valves in the section being tested with a WOG pressure rating less than the test pressure in the open or partially opened position during the test. The test pressure shall not exceed 1.5 times the rated pressure of the valve, without written permission from the valve manufacturer.

16.5 Test Procedures

See Plan 220.03.10 - *Piping Testing Requirements* or Plan 400.017.301 – *Liquid Pipeline Pressure Testing Program*.

In no case will the test pressure exceed 110 percent of the specified minimum yield strength (SMYS) of the pipe material except when approved by the Company because of terrain and location. The line shall be tested in sections as necessary to ensure that the entire line is subjected to the specified minimum test pressure. Upon satisfactory completion of testing, test manifolds shall be removed and the necessary tie-ins made.

Take every reasonable precaution to protect employees and the public during the test. Take all practicable steps to keep persons not working on the test outside of the test area while the test pressure exceeds 50 percent SMYS.

Stop the pressure pumps after the maximum test pressure is reached and the pressure decay rate recorded and analyzed.

Increase the line pressure again to the maximum test pressure, record and analyze the decay rate.

Record successive pressure decay rates and analyze the data for a total period not to exceed 24 hours.

If the pressure decay rate analysis indicates a leak, suspend the test until the leak is located and repaired. Leaks of small magnitude, which cannot be located during the test shall be located and repaired as necessary after the pipeline is in operation.

Repeat the test if necessary.

Record test data per Plan 220.03.10 - *Piping Testing Requirements*, Plan 400.017.301 – *Liquid Pipeline Pressure Testing* Program or as directed by the

Company. Test data is life of the facility documentation and shall maintain in the facility permanent record file and GIS.

16.6 Dewatering and/or Cleaning Procedures

This guidance is for hydrostatic testing of new pipe. Permitting requirements associated with hydrostatic testing of used pipe can be extensive. Contact the Natural Resources Permitting Coordinator prior to testing any used pipe.

Municipal water should be used for cleaning unless otherwise approved by Corrosion Services and Natural Resources Permitting. Water drawn from local sources (streams, ponds, public water supplies), must be approved by Corrosion Services and Natural Resources Permitting and used in a manner that will minimize impact to the environment and other existing users, and maintaining adequate stream flow.

Water from state designed *high quality streams* or *exceptional value waters*, water bodies that provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies will not be used unless other water sources are not readily available and the appropriate federal, state, or local agency permits its use.

Do not locate test headers within 50 feet of streams or wetlands with standing water or saturated conditions unless topographic conditions dictate otherwise. If test headers must be installed within 50 feet of streams and wetlands, additional sediment filter devices must be installed to prevent sediments from entering into the stream or wetland during discharge. Intake hoses will be screened.

Obtain and follow all required federal, state, and local approvals for the withdrawal and/or discharge of hydrostatic test water prior to such activities.

Jurisdictional agencies will be notified of the intent to withdraw water from streams. Notify appropriate state agencies of intent to use specific sources at least 48 hours before testing activities unless they waive this requirement in writing.

Comply with all approval/permit conditions, which may include notifying the appropriate state agency of withdraw/discharge and collection of samples in accordance with permit conditions where required.

Release water as noted in the Environmental Construction Standard or as stated in the permit(s).

Discharge the hydrostatic test water in a manner that minimizes erosion. The energy of the released test water will be dissipated by discharging the water:

- into a well-vegetated upland area;
- into a tank(s)
- into a body of water (with all required permits); or
- through sediment filter devices or a sediment trap to filter out various particulate matter or allow it to infiltrate through the soil.

If necessary, regulate the water discharge rate, use energy dissipation device(s); and/or install sediment barriers to prevent erosion, streambed scour, suspension of sediments, or excessive stream flow. During the discharge, the Inspector must ensure that erosion and sedimentation are properly controlled.

Run squeegees, spheres, pigs, or scraper pigs through test segments to completely dewater and clean the line.

Do not discharge into waters from state designated exceptional value waters, water bodies that provide habitat for federally listed threatened or endangered species, or streams utilized as public water supplies unless the appropriate federal, state, or local agency grants permission.

Inject methanol after discharging the water to dry the pipe. Retrieve excess methanol from the facility for use during subsequent operation of Company facilities or proper disposal. Post-chemical treatment of pipelines shall be at the direction of Corrosion Services.

17 In Line Inspection

As a best management practice, an in-line inspection should be completed on long sections of new pipe installed using a caliper/deformation tool to assess for dents and wrinkles. Any wrinkles found should be removed. Dents found should be repaired or removed in accordance with the requirements of Section 6.2.2. In some cases, it may also be advantageous to couple the caliper/deformation tools with an inertial mapping unit (IMU) to collect detailed data on the location of the pipeline. Data collected from in-line inspections should be provided to the CPG System Integrity Group.

18 Purging

When a pipeline is being purged of air by use of natural gas or of natural gas, the purging medium must be released into one end of the line in a moderately rapid and continuous

flow. If the purging medium cannot be supplied in sufficient quantity to prevent the formation of a hazardous mixture of natural gas and air, a slug of inert gas shall be released into the line before the purging medium.

A Purge and Blowdown Plan will be developed by the Company Pipeline Engineer or designee for each project. Any deviations from this Plan must be approved by the Company. Procedure 220.001.034 - *Pipeline Purging Procedures*, shall be used in determining the proper method of purging pipelines.

For Liquid Pipelines, see Plan 400.017.008 - *Liquid Pipeline Purging* or Plan 400.017.009 - *Blowdown, Isolation, Purging and Return to Service*.

19 Spill Prevention, Containment and Control

19.1 Spill Cleanup

Spills occurring during construction, operation and maintenance are to be reported immediately to the Company Monitoring Center 304 – 357- 2008 or 1-800-835-7191. The Company Environmental will make all determinations on spill reporting and are responsible for contacting the appropriate agencies as required.

If a spill should occur, the Company and Contractor will ensure immediate action is taken to minimize the impact of the spill, and see that appropriate cleanup action is immediately undertaken.

In the event of a spill into or near bodies of water or wetlands, the following will occur immediately:

- Stop the source immediately;
- Contain the spill by placing absorbing booms or constructing dikes;
- Collect the spill materials with absorbing materials, skimmed off water surfaces with booms, and/or the contaminated soil will be excavated;
- Properly store and dispose of the waste materials in accordance with Company procedures.

Restore the affected areas as closely as possible to their previous condition.

If the spill is such that Company personnel or the on-site contractor cannot respond immediately and effectively, the Company's environmental contractor specializing in spill cleanup will be employed.

20 Environmental Construction Management and Inspection

Environmental construction management and inspection requirements are included in the site specific permits, i.e., Environmental Construction Standards, Environmental Management, and Construction Plan

21 Definitions

Company: operating companies under the Columbia Pipeline Group umbrella including Columbia Gas Transmission LLC, Columbia Gulf Transmission LLC, Crossroads Pipeline Company, Millennium Pipeline Company, Columbia Midstream Group, Hardy Storage LLC, and Central Kentucky Transmission Company.

ECS: Environmental Construction Standards

EM&CP: Environmental Management and Construction Plan

NCRS: National Resource Conservation Service

PEIF: Project Environmental Information Form

22 References

22.1 Company Plan Documents

290.01.05	CPG Welding Manual
220.02.01	Pipeline Repair
220.03.01	Piping Testing Requirements
400.017.301	Pressure Testing Program
400.017.504	Liquid Pipeline Repair
FAPL-1	Pipeline Design Guideline
400-017-008	Liquid Pipeline Purging
REF.220.002	Pipeline Torque Specification
MS.50.001	Bolts, Nuts and Washer Specification
MS.70.002	Mill-Applied External Thin Film Coatings Specification

22.2 Company Procedures

70.003.013	Hydrostatic Test Water Treatment and Chemical Treatment of Pipelines after Hydrostatic Testing
70.001.026	External Coating – Underground Facilities-New Construction or Maintenance Application
70.002.040	Installation of Link Seals in Casings
70.001.041	Filling and Over Wrapping Flanges

70.001.045	Corrosion Control Standard Drawings
70.001.046	Field Procedures for Setting Holiday Detector Voltages
70.001.049	Filling of Pipeline Casings
70.001.053	Corrosion Control Plan for New Construction
70.002.055	OHAC Minimum Requirements for Pipeline Construction in Close Proximity of High Voltage AC Overhead Power Lines
400.017.009	Blowdown, Isolation, Purging and Return to Service
220.001.025	Weight Requirements for Pipelines Crossing Rivers and Wetlands
220.001.028	Polyethylene Plastic Pipe Installation and Repair Manual
220.001.030	Pipeline Pigging and Cleaning Operations
220.001.037	Hydrostatic Testing of Pipelines
220.001.034	Pipeline Purging Procedures
220.006.003	Blasting Analysis
220.010.001	Pipeline Torque Specifications

22.3 Operator Qualification Tasks

As required for the task.

22.4 Other References or Specifications

Environmental Construction Standards (ECS)
Environmental Management and Construction Plan (EM&CP)
CON-101 *Concrete Specification*
MS.50.005 - *Flowable Fill Specification*
API RP 5L1 - *Recommended Practice for Railroad Transportation of Line Pipe* 7th Edition
API RP 5LW - *Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels* 3rd Edition.
API RP 5LT- *Recommended Practice for Truck Transportation of Line Pipe* First Edition
API 5L *Specification for Line Pipe* 45th Edition

23 Regulatory Citations

23.1 Federal Requirements

29 CFR 1926, Subpart P - *Excavations*
29 CFR 1926 Subpart U - *Blasting and the Use of Explosives*.
29 CFR 1926, Subpart H - *Material Handling, Storage, Use & Disposal*.
27 CFR Part 555
49 CFR Part 192
49 CFR Part 193
49 CFR Part 195

49 CFR Part 393.100, *Parts and Accessories Necessary for Safe Operation*, Subpart I - *Protection Against Shifting or Falling Cargo*

24 Change Log

Date	Change Location	Change By	Brief Description of Change
09/02/2014	Entire document	Construction Standards Team (Dave Anderson, Rick Meeks, Dave Watson, Juanita Scaggs, Keith Hedges, John Rinkus)	Major revision and complete update of this document. All sections were revised.
09/23/2014	Environmental sections	Jon Adamson and Jason Chambers	Removed large sections of Environmental language because they are redundant- readers should refer to the ECS, specific permits and EM&CP.
9/24/2014	Entire document	Dave Anderson	Clean up of formatting , typos, edits.
10/10/2014	6.2.2.2 & 6.2.2.3	Greg Lago	Revised section to make section consistent with regulatory requirements concerning dents.
10/10/2014	New Section 17	Greg Lago	Added new Section 17 concerning in line inspection
10/27/2014	References	Dave Anderson	Added reference to FAPL-1
11/20/2014	3.5.1, 4.2	Dave Anderson	Revised 3.5.1 per R Meeks, removed Field Surveying Procedures (will be in another document), added pothole requirement to 4.2 per R. Meeks,
01/21/2015	Throughout	Juanita Scaggs	Accepted changes, updated formatting, added plan or procedure titles not specified. Document number changed from PLS – 101 to CS.50.001 to conform to the new standard numbering system.
2/24/2015	Footer	Juanita Scaggs	Correct page numbering.

Date	Change Location	Change By	Brief Description of Change
6/9/2015	Section 6.1.2 Section 22.1	Juanita Scaggs	Updated formula per TSWR 7658 from Stan Parrish. Added MS.70.002 Mill-Applied External Thin Film Coatings Specification to Section 22.1 also Per TSWR 7658. Added comment for discussion)
06/26/2015	Sections 5.2 and 6.1, references, Section 14	Dave Anderson	Added ripple language to 6.1. Added requirement to use API RP 5LT in Section 5.2. Revises References and specification section to add API 5LT and MS.50.005 Flowable Fill. Added Flowable Fill to Section 14.
07/02/2015	Sections 5, 7.4.2, 10.4.2 and 14.1	Dave Anderson	Addressed bending machine comment, added references to MS.50.001, REF.220.002, 220.010.001. Fixed several typos and other editorial work. Clarified Section 5 – transportation of pipe. Corrected reference to 70.001.013. Strengthened language on buried flange use in 10.4.2.
07/17/2015	References	Dave Anderson	Added number to CPG Welding Plan in Reference section, other editorial corrections.
07/28/2015	Section 12.1.1	Chris Legg	Changed overcoating requirement (3" past the edges of concrete supports) to 6" past the edges to match 70.001.052 Corrosion Control for New Construction standard.
08/26/2015	Various, 14.1	Dave Anderson	Changed "sand" to "soil" for backfill. Added line about Sand, gravel or rock is not to be used for pipeline backfill.
10/13/2015	Section 6.1.2	Russ Safreed	Made correction to Maximum Bend Radius formula.
10/29/2015	Section 10.4	Randy Sturgill	Added reference to new form: FRM.220.001 Torque Inspection Log Form
12/22/2015	Section 6.2.2 and throughout	Dave Anderson	Addressed two comments and made editorial changes.
6/21/2016	Section 11.2	Beth Reed	Added section dealing with installation of Warning Tape, per Gary Estep request.

EXHIBIT B

Mechanical Clearing Subcontract

CONSTRUCTION SUBCONTRACT

Subcontract Number: **2018-01-01.2 Mechanical Clearing**

Subcontractor: **EARTH PIPELINE SERVICES, INC.**
Address: 135 Technology Drive, Suite 100, Canonsburg, PA 15317

Contact: Joshua Roberts
jroberts@earthpipelines.com
Office: 724-243-3699
Cell: 412-737-3442

Work Locations: Marshall County and Wetzel Counties, WV

Yard Address: 169 Distribution Road, Triadelphia, WV 26059

This subcontract is effective as of the 20th the day of March 2018, by and between **Welded Construction, L.P.**, a Delaware Limited Partnership (CONTRACTOR) and the above named SUBCONTRACTOR (the "Parties"). The Parties hereby agree that all Work specified below shall be performed by the SUBCONTRACTOR understanding that CONTRACTOR is committed to safety, health and the protection of the environment as core values reflected in all aspects of its operations. SUBCONTRACTOR shall perform all activities in accordance with these principles and all provisions of this Subcontract Agreement that consists of this Subcontract Agreement, the following documents and the attachments, appendices, drawings, specifications, documents and exhibits specified therein and hereby incorporated herein (Subcontract):

Subcontract Form of Agreement 2018-01-01.2 Mechanical Clearing
Exhibit "A" – Labor and Equipment Rates – Extra Work (see attachment to subcontract 2018-01-01.1)
Exhibit "B" – Administrative Forms (see attachment to subcontract 2018-01-01.1)
Exhibit "C" – Insurance Requirements (see attachment to subcontract 2018-01-01.1)
Exhibit "D" – Additional Insured (see attachment to subcontract 2018-01-01.1)
Exhibit "E" – Baseline Schedule (see attachment to subcontract 2018-01-01.1)
Exhibit "F" – Subcontractor Proposal (see attachment to subcontract 2018-01-01.1)
Exhibit "G" – General Terms & Conditions (see attachment to subcontract 2018-01-01.1)
Exhibit "H" – Safety Requirements (see attachment to subcontract 2018-01-01.1)
Exhibit "I" – CPG Environmental Standards – West Virginia (see attachment to subcontract 2018-01-01.1)
Exhibit "J" – CPG Pipeline Construction Standard CS.220.001 (2016) (see attachment to subcontract 2018-01-01.1)

A. WORK TO BE PERFORMED (Work): Except as specified elsewhere in the subcontract, SUBCONTRACTOR shall furnish all union labor; materials; tools; supplies; equipment; transportation; supervision; technical, professional and other services; and shall perform all operations necessary and required to satisfactorily perform the following:

Mechanical Clearing of the pipeline construction right-of-way (ROW), all extra work spaces and access roads *(the "Work") for the above-described project in Marshall and Wetzel Counties in West Virginia, subject to* all applicable environmental guidelines and Construction Stipulations including but not limited to the following:

- TREES: Trees will be cut in standard log lengths and placed adjacent to the ROW.
- BRUSH: Brush may be windrowed inside of and adjacent to the Limits of Disturbance ("LOD"), chipped and broadcast on and/or off ROW in upland areas, or burned. There is to be no hauling of material.
  - Timber/Brush may be processed, windrowed, chipped and broadcast, or burned.
- STUMPS: Stumps to be ground and incorporated into the soil (per the EMCP and Environmental Construction Standards) or burned
- MULCHING/MOWING: Any brush, tops, etc., remaining after skidding, chipping and/or burning activities may be mulched and incorporated into the soil (in accordance with the EMCP and Environmental Construction Standards).

See attached Exhibit F (Subcontractor's proposal dated March 5, 2018) for additional details, assumptions and exclusions.

The Work is a portion of the goods and services to be provided by CONTRACTOR to Columbia Gas Transmission, LLC (OWNER) for **Spread 1** of the **Mountaineer Express Pipeline Project in Marshall and Wetzel Counties in West Virginia.**

B. SCHEDULE: The Work shall be performed in accordance with the dates set forth in the Exhibit "E".

- Work (Mechanical Clearing) to begin on or about March 19, 2018, but no later than March 30, 2018.
- Subject to the date Work actually begins, the Work is to be completed on or about May 20, 2018 unless time period is specifically extended in writing. The Baseline Schedule reflected in Exhibit E and the anticipated completion date will be adjusted/extended to correlate with the date Work actually begins.

C. COMPENSATION: As full consideration for the satisfactory performance by SUBCONTRACTOR of this subcontract, CONTRACTOR shall pay to SUBCONTRACTOR compensation in accordance with the prices set forth in Exhibits F and A and with the payment provisions of this subcontract (Exhibit G), it being specifically understood and acknowledged by the Parties that invoicing under this subcontract 2018-01-01.2 specifically excludes any and all quantities or amounts already/previously invoiced under subcontract 2018-01-01.2.

This subcontract embodies the entire agreement between CONTRACTOR and SUBCONTRACTOR and supersedes all other writings. The parties shall not be bound by or be liable for any statement, representation, promise, inducement or understanding not set forth herein.

CONTRACTOR:

Welded Construction, L.P.

Authorized Signature:

Print Name: Matt Carroll

Print Title: PM

SUBCONTRACTOR:

Earth Pipeline Services, Inc.

Authorized Signature:

Print Name: Joshua D. Roberts

Print Title: Chief Executive Officer

45-4611593

(Federal Tax Payer I.D. Number)

EXHIBIT C

Statement of Account

Check Number	Invoice Number	Invoice Date	Invoice Amount	Transaction Type	Clear Date	Total Amount Paid
004312	WELD-MXP-08	05/21/2018	$143,574.00	EFT	08/10/2018	$143,574.00
004312	WELD-MXP-09	05/29/2018	$332,784.00	EFT	08/10/2018	$332,784.00
004312	WELD-MXP-10	06/05/2018	$265,878.00	EFT	08/10/2018	$83,642.00
004319	WELD-MXP-10	06/05/2018	$265,878.00	EFT	08/17/2018	$182,236.00
004319	WELD-MXP-12	06/12/2018	$378,378.00	EFT	08/17/2018	$378,378.00
117779	WELD-MXP-07Rev	05/15/2018	$442,695.53	ACH	07/25/2018	$442,695.53
117779	WELD-MXP-6A	05/12/2018	$447,819.77	ACH	07/25/2018	$247,819.77
TOTAL						**$1,811,129.30**

EXHIBIT D

Claim No. 592

Fill in this information to identify the case:

Debtor Welded Construction, L.P.

United States Bankruptcy Court for the: _____ District of Delaware (State)

Case number 18-12378

Official Form 410
Proof of Claim

04/16

Read the instructions before filling out this form. This form is for making a claim for payment in a bankruptcy case. Do not use this form to make a request for payment of an administrative expense. Make such a request according to 11 U.S.C. § 503.

Filers must leave out or redact information that is entitled to privacy on this form or on any attached documents. Attach redacted copies or any documents that support the claim, such as promissory notes, purchase orders, invoices, itemized statements of running accounts, contracts, judgments, mortgages, and security agreements. **Do not send original documents;** they may be destroyed after scanning. If the documents are not available, explain in an attachment.

A person who files a fraudulent claim could be fined up to $500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Fill in all the information about the claim as of the date the case was filed. That date is on the notice of bankruptcy (Form 309) **that you received.**

Part 1: Identify the Claim

1. **Who is the current creditor?**
   Earth Pipeline Services, Inc.
   Name of the current creditor (the person or entity to be paid for this claim)
   Other names the creditor used with the debtor _____

2. **Has this claim been acquired from someone else?**
   ☑ No
   ☐ Yes. From whom? _____

3. **Where should notices and payments to the creditor be sent?**
   Federal Rule of Bankruptcy Procedure (FRBP) 2002(g)

   Where should notices to the creditor be sent?
   Earth Pipeline Services, Inc.
   Mark A. Lindsay, Esq.
   707 Grant Street
   Suite 2200
   Pittsburgh, PA 15219, USA

   Contact phone 412-456-8100
   Contact email mlindsay@bernsteinlaw.com

   Where should payments to the creditor be sent? (if different)
   Contact phone _____
   Contact email _____

   Uniform claim identifier for electronic payments in chapter 13 (if you use one):
   _____

4. **Does this claim amend one already filed?**
   ☑ No
   ☐ Yes. Claim number on court claims registry (if known) _____ Filed on _____ MM / DD / YYYY

5. **Do you know if anyone else has filed a proof of claim for this claim?**
   ☑ No
   ☐ Yes. Who made the earlier filing? _____

1812378190228000000000037

Part 2: Give Information About the Claim as of the Date the Case Was Filed

6. **Do you have any number you use to identify the debtor?**
   - ☑ No
   - ☐ Yes. Last 4 digits of the debtor's account or any number you use to identify the debtor: ___ ___ ___ ___

7. **How much is the claim?** $ 3,650,300.42 . **Does this amount include interest or other charges?**
   - ☑ No
   - ☐ Yes. Attach statement itemizing interest, fees, expenses, or other charges required by Bankruptcy Rule 3001(c)(2)(A).

8. **What is the basis of the claim?**
   Examples: Goods sold, money loaned, lease, services performed, personal injury or wrongful death, or credit card.
   Attach redacted copies of any documents supporting the claim required by Bankruptcy Rule 3001(c).
   Limit disclosing information that is entitled to privacy, such as health care information.
   Contracted Services Provided

9. **Is all or part of the claim secured?**
   - ☑ No
   - ☐ Yes. The claim is secured by a lien on property.

   Nature or property:
   - ☐ Real estate: If the claim is secured by the debtor's principle residence, file a *Mortgage Proof of Claim Attachment* (Official Form 410-A) with this *Proof of Claim*.
   - ☐ Motor vehicle
   - ☐ Other. Describe: _____

   Basis for perfection: _____
   Attach redacted copies of documents, if any, that show evidence of perfection of a security interest (for example, a mortgage, lien, certificate of title, financing statement, or other document that shows the lien has been filed or recorded.)

   Value of property: $_____
   Amount of the claim that is secured: $_____
   Amount of the claim that is unsecured: $_____ (The sum of the secured and unsecured amount should match the amount in line 7.)

   Amount necessary to cure any default as of the date of the petition: $_____

   Annual Interest Rate (when case was filed)_____%
   - ☐ Fixed
   - ☐ Variable

10. **Is this claim based on a lease?**
    - ☑ No
    - ☐ Yes. **Amount necessary to cure any default as of the date of the petition.** $_____

11. **Is this claim subject to a right of setoff?**
    - ☑ No
    - ☐ Yes. Identify the property: _____

1812378190228000000000037

12. **Is all or part of the claim entitled to priority under 11 U.S.C. § 507(a)?**

A claim may be partly priority and partly nonpriority. For example, in some categories, the law limits the amount entitled to priority.

	Amount entitled to priority
☑ No	
☐ Yes. *Check all that apply:*	
☐ Domestic support obligations (including alimony and child support) under 11 U.S.C. § 507(a)(1)(A) or (a)(1)(B).	$_____
☐ Up to $2,850* of deposits toward purchase, lease, or rental of property or services for personal, family, or household use. 11 U.S.C. § 507(a)(7).	$_____
☐ Wages, salaries, or commissions (up to $12,850*) earned within 180 days before the bankruptcy petition is filed or the debtor's business ends, whichever is earlier. 11 U.S.C. § 507(a)(4).	$_____
☐ Taxes or penalties owed to governmental units. 11 U.S.C. § 507(a)(8).	$_____
☐ Contributions to an employee benefit plan. 11 U.S.C. § 507(a)(5).	$_____
☐ Other. Specify subsection of 11 U.S.C. § 507(a)(__) that applies.	$_____

* Amounts are subject to adjustment on 4/01/19 and every 3 years after that for cases begun on or after the date of adjustment.

13. **Is all or part of the claim pursuant to 11 U.S.C. § 503(b)(9)?**

☑ No

☐ Yes. Indicate the amount of your claim arising from the value of any goods received by the debtor within 20 days before the date of commencement of the above case, in which the goods have been sold to the Debtor in the ordinary course of such Debtor's business. Attach documentation supporting such claim.

$_____

Part 3: Sign Below

The person completing this proof of claim must sign and date it. FRBP 9011(b).

If you file this claim electronically, FRBP 5005(a)(2) authorizes courts to establish local rules specifying what a signature is.

A person who files a fraudulent claim could be fined up to $500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Check the appropriate box:

☐ I am the creditor.

☑ I am the creditor's attorney or authorized agent.

☐ I am the trustee, or the debtor, or their authorized agent. Bankruptcy Rule 3004.

☐ I am a guarantor, surety, endorser, or other codebtor. Bankruptcy Rule 3005.

I understand that an authorized signature on this *Proof of Claim* serves as an acknowledgement that when calculating the amount of the claim, the creditor gave the debtor credit for any payments received toward the debt.

I have examined the information in this *Proof of Claim* and have reasonable belief that the information is true and correct.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on date 02/28/2019
MM / DD / YYYY

/s/Mark A. Lindsay
Signature

Print the name of the person who is completing and signing this claim:

Name: Mark A. Lindsay
First name Middle name Last name

Title: Attorney

Company: Bernstein-Burkley, P.C.
Identify the corporate servicer as the company if the authorized agent is a servicer.

Address

Contact phone _____ Email _____



KCC ePOC Electronic Claim Filing Summary

For phone assistance: Domestic (888) 830-4648 | International (310) 751-2642

Debtor:
18-12378 - Welded Construction, L.P.
District:
District of Delaware

Creditor:
Earth Pipeline Services, Inc.
Mark A. Lindsay, Esq.
707 Grant Street
Suite 2200
Pittsburgh, PA, 15219
USA
Phone:
412-456-8100
Phone 2:
Fax:
412-456-8135
Email:
mlindsay@bernsteinlaw.com

Has Supporting Documentation:
Yes, supporting documentation successfully uploaded
Related Document Statement:

Has Related Claim:
No
Related Claim Filed By:

Filing Party:
Authorized agent

Other Names Used with Debtor:

Amends Claim:
No
Acquired Claim:
No

Basis of Claim:
Contracted Services Provided

Last 4 Digits:
No

Uniform Claim Identifier:

Total Amount of Claim:
3,650,300.42

Includes Interest or Charges:
No

Has Priority Claim:
No

Priority Under:

Has Secured Claim:
No
Amount of 503(b)(9):
No
Based on Lease:
No
Subject to Right of Setoff:
No

Nature of Secured Amount:
Value of Property:
Annual Interest Rate:
Arrearage Amount:
Basis for Perfection:
Amount Unsecured:

Submitted By:
Mark A. Lindsay on 28-Feb-2019 2:43:19 p.m. Pacific Time
Title:
Attorney
Company:
Bernstein-Burkley, P.C.

VN: C902FEAAE834AD8285D3CED649DBF8F5

Your claim can be filed electronically on KCC's website at https://epoc.kccllc.net/welded.

United States Bankruptcy Court for the District of Delaware	
Indicate Debtor against which you assert a claim by checking the appropriate box below. (**Check only one Debtor per claim form.**)	
☒ Welded Construction, L.P. (Case No.18-12378)	☐ Welded Construction Michigan, LLC (Case No. 18-12379)

Official Form 410
Proof of Claim

04/16

Read the instructions before filling out this form. This form is for making a claim for payment in a bankruptcy case. Other than a claim under 11 U.S.C. § 503(b)(9), this form should not be used to make a claim for an administrative expense arising after the commencement of the case.

Filers must leave out or redact information that is entitled to privacy on this form or on any attached documents. Attach redacted copies or any documents that support the claim, such as promissory notes, purchase orders, invoices, itemized statements of running accounts, contracts, judgments, mortgages, and security agreements. **Do not send original documents;** they may be destroyed after scanning. If the documents are not available, explain in an attachment.

A person who files a fraudulent claim could be fined up to $500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Fill in all the information about the claim as of the date the case was filed.

Part 1: Identify the Claim

1. Who is the current creditor?

Earth Pipeline Services, Inc.
Name of the current creditor (the person or entity to be paid for this claim)

Other names the creditor used with the debtor _____

2. Has this claim been acquired from someone else?

☒ No

☐ Yes. From whom? _____

3. Where should notices and payments to the creditor be sent?

Federal Rule of Bankruptcy Procedure (FRBP) 2002(g)

Where should notices to the creditor be sent?

Mark A. Lindsay, Esq.
Name

707 Grant Street, Suite 2200
Number Street

Pittsburgh PA 15219
City State ZIP Code

USA
Country

Contact phone 412-456-8100

Contact email mlindsay@bernsteinlaw.com

Where should payments to the creditor be sent? (if different)

Name

Number Street

City State ZIP Code

Country

Contact phone _____

Contact email _____

Uniform claim identifier for electronic payments in chapter 13 (if you use one):

_____

4. Does this claim amend one already filed?

☒ No

☐ Yes. Claim number on court claims registry (if known) _____ Filed on _____ MM / DD / YYYY

5. Do you know if anyone else has filed a proof of claim for this claim?

☒ No

☐ Yes. Who made the earlier filing? _____

Part 2: Give Information About the Claim as of the Date the Case Was Filed

6. **Do you have any number you use to identify the debtor?**
   - [X] No
   - [ ] Yes. Last 4 digits of the debtor's account or any number you use to identify the debtor: ___ ___ ___ ___

7. **How much is the claim?** $ 3,650,300.42 . **Does this amount include interest or other charges?**
   - [X] No
   - [ ] Yes. Attach statement itemizing interest, fees, expenses, or other charges required by Bankruptcy Rule 3001(c)(2)(A).

8. **What is the basis of the claim?**
   Examples: Goods sold, money loaned, lease, services performed, personal injury or wrongful death, or credit card.
   Attach redacted copies of any documents supporting the claim required by Bankruptcy Rule 3001(c).
   Limit disclosing information that is entitled to privacy, such as health care information.
   Contracted Services Performed

9. **Is all or part of the claim secured?**
   - [X] No
   - [ ] Yes. The claim is secured by a lien on property.

   Nature of property:
   - [ ] Real estate: If the claim is secured by the debtor's principal residence, file a *Mortgage Proof of Claim Attachment* (Official Form 410-A) with this *Proof of Claim*.
   - [ ] Motor vehicle
   - [ ] Other. Describe: _____

   Basis for perfection: _____
   Attach redacted copies of documents, if any, that show evidence of perfection of a security interest (for example, a mortgage, lien, certificate of title, financing statement, or other document that shows the lien has been filed or recorded.)

   Value of property: $_____
   Amount of the claim that is secured: $_____
   Amount of the claim that is unsecured: $_____ (The sum of the secured and unsecured amount should match the amount in line 7.)

   Amount necessary to cure any default as of the date of the petition: $_____

   Annual Interest Rate (when case was filed)_____%
   - [ ] Fixed
   - [ ] Variable

10. **Is this claim based on a lease?**
    - [X] No
    - [ ] Yes. **Amount necessary to cure any default as of the date of the petition.** $_____

11. **Is this claim subject to a right of setoff?**
    - [X] No
    - [ ] Yes. Identify the property: _____

12. **Is all or part of the claim entitled to priority under 11 U.S.C. § 507(a)?**

A claim may be partly priority and partly nonpriority. For example, in some categories, the law limits the amount entitled to priority.

Amount entitled to priority

- [X] No
- [ ] Yes. *Check all that apply:*
  - [ ] Domestic support obligations (including alimony and child support) under 11 U.S.C. § 507(a)(1)(A) or (a)(1)(B). $_____
  - [ ] Up to $2,850* of deposits toward purchase, lease, or rental of property or services for personal, family, or household use. 11 U.S.C. § 507(a)(7). $_____
  - [ ] Wages, salaries, or commissions (up to $12,850*) earned within 180 days before the bankruptcy petition is filed or the debtor's business ends, whichever is earlier. 11 U.S.C. § 507(a)(4). $_____
  - [ ] Taxes or penalties owed to governmental units. 11 U.S.C. § 507(a)(8). $_____
  - [ ] Contributions to an employee benefit plan. 11 U.S.C. § 507(a)(5). $_____
  - [ ] Other. Specify subsection of 11 U.S.C. § 507(a)(__) that applies. $_____

* Amounts are subject to adjustment on 4/01/19 and every 3 years after that for cases begun on or after the date of adjustment.

13. **Is all or part of the claim pursuant to 11 U.S.C. § 503(b)(9)?**

- [X] No
- [ ] Yes. Indicate the amount of your claim arising from the value of any goods received by the debtor within 20 days before the date of commencement of the above case, in which the goods have been sold to the Debtor in the ordinary course of such Debtor's business. Attach documentation identifying which of the Debtors such goods were shipped to and the date such goods were received by such Debtors, stating whether the value of the goods asserted herein represents a combination of goods and services and, if applicable, the percentage of alleged value related to services and related to goods, and attach any documentation identifying the particular invoices for which the section 503(b)(9) claim is being asserted.

  $_____

Part 3: Sign Below

The person completing this proof of claim must sign and date it. FRBP 9011(b).

If you file this claim electronically, FRBP 5005(a)(2) authorizes courts to establish local rules specifying what a signature is.

A person who files a fraudulent claim could be fined up to $500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Check the appropriate box:

- [ ] I am the creditor.
- [X] I am the creditor's attorney or authorized agent.
- [ ] I am the trustee, or the debtor, or their authorized agent. Bankruptcy Rule 3004.
- [ ] I am a guarantor, surety, endorser, or other codebtor. Bankruptcy Rule 3005.

I understand that an authorized signature on this *Proof of Claim* serves as an acknowledgement that when calculating the amount of the claim, the creditor gave the debtor credit for any payments received toward the debt.

I have examined the information in this *Proof of Claim* and have reasonable belief that the information is true and correct.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on date 2/28/2019
MM / DD / YYYY

Signature

Print the name of the person who is completing and signing this claim:

Name: Mark (First name) A (Middle name) Lindsay (Last name)

Title: Attorney

Company: Bernstein-Burkley, P.C.
Identify the corporate servicer as the company if the authorized agent is a servicer.

Address: 707 Grant Street, Suite 2200
Number Street

Pittsburgh (City) PA (State) 15219 (ZIP Code) USA (Country)

Contact phone: 412-456-8100 Email: mlindsay@bernsteinlaw.com

SUMMARY ADDENDUM TO PROOF OF CLAIM OF EARTH PIPELINE SERVICES, INC.

The instant claim filed by Earth Pipeline Services, Inc. is summarized as follows:

Invoice #	Amount
WELD-MXP-11	$85,649.90
WELD-MXP-13	$44,550.00
WELD-MXP-14	$28,134.00
WELD-MXP-15	$597,396.00
WELD-MXP-16	$344,534.03
WELD-MXP-17	$2,250,627.00
WELD-MXP-18	$223,938.12
WELD-MXP-19	$69,960.00
TOTAL	**$3,650,300.42**

Documentation provided in support of each referenced invoice is voluminous and may contain confidential and/or proprietary information and, accordingly, is not attached hereto. However, any and all such supporting documentation has been provided to the Debtors and any interested parties. Additional copies of such supporting documentation will be provided upon request to parties entitled thereto.

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
6/11/2018	WELD-MXP-11

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 Work from Apr 6 to May 19 2018		
2,410	Mechanized Clearing - AR - Perform	12.00	28,920.00
18,661	Hand Felling - AR - Perform	3.55	66,246.55
	Retainage - 10%	-9,516.65	-9,516.65

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $85,649.90

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
6/20/2018	WELD-MXP-13

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 Work from Jun 10 to Jun 16 2018		
500	Mechanized Clearing - ROW - Perform	52.00	26,000.00
600	Mechanized Clearing - AR - Perform	12.00	7,200.00
31	Timber Mats - 18' - Provide & Install	300.00	9,300.00
2	Perm. Bridge<30' (incl Sideboards & Geotextile Fabric)	3,500.00	7,000.00
	Retainage 10%	-4,950.00	-4,950.00

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $44,550.00

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
7/3/2018	WELD-MXP-14

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 Work from Jun 17 to Jun 23 2018		
2.605	Mechanized Clearing - AR - Perform	12.00	31,260.00
	Retainage 10%	-3,126.00	-3,126.00

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $28,134.00

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
8/7/2018	WELD-MXP-15

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 Stand-By Jun 15 thourgh & including Jun 18 2018 SEE ATTACHED COST SHEET		
4	Stand-by	149,349.00	597,396.00

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $597,396.00

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
8/6/2018	WELD-MXP-16

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 Retainage Held * This is the changed retainage invoice. The only change is the Invoice Number *		
1	Retainage Held on Invoice 01	13,410.38	13,410.38
1	Retainage Held on Invoice 03	5,837.06	5,837.06
1	Retainage Held on Invoice 04	50,173.61	50,173.61
1	Retainage Held on Invoice 05	37,599.05	37,599.05
1	Retainage Held on Invoice 06	48,438.93	48,438.93
1	Retainage Held on Invoice 07	47,063.97	47,063.97
1	Retainage Held on Invoice 08	15,246.00	15,246.00
1	Retainage Held on Invoice 09	36,976.00	36,976.00
1	Retainage Held on Invoice 10	29,542.00	29,542.00
1	Retainage Held on Invoice 11	10,129.03	10,129.03
1	Retainage Held on Invoice 12	42,042.00	42,042.00
1	Retainage Held on Invoice 13	4,950.00	4,950.00
1	Retainage Held on Invoice 14	3,126.00	3,126.00

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $344,534.03

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
9/4/2018	WELD-MXP-17

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 CORN-001-REV1		
1	Change in Steep Slope Work Spec.	2,250,627.00	2,250,627.00

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $2,250,627.00

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
9/4/2018	WELD-MXP-18

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 CORN-003		
1	Stand-by - Mech. - Access Road 7.8 Delay	223,938.12	223,938.12

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $223,938.12

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699

EARTH
PIPELINE SERVICES
LAND ⇄ CONSTRUCTION
135 Technology Drive, Suite 100
Canonsburg, PA 15317
www.earthpipelines.com

INVOICE

Date	Invoice #
9/4/2018	WELD-MXP-19

Bill To

Welded Construction, L.P.
26933 Eckel Road
Perrysburg, OH 43551

P.O.	Project	AFE No.	Billing Period	Terms
81198	E-04-18			Net 30

Quantity	Description	Rate	Amount
	Welded - MXP1 CORN-004		
1	Timber Removal on WV-WZ0004.000	69,960.00	69,960.00

Please remit payment to: **Earth Pipeline Services, Inc.**

Total $69,960.00

THANK YOU FOR YOUR BUSINESS!

Phone: (724) 243-3699