



Winter Construction Plan

Enbridge Energy, Limited Partnership • Line 3 Replacement Project

November 2019

ENBRIDGE®

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ACRONYMS AND ABBREVIATIONS

ATWS	additional temporary workspace
BMPs	Best Management Practices
BWSR	Minnesota Board of Water and Soil Resources
EI	Environmental Inspector
Enbridge	Enbridge Energy, Limited Partnership
EPP	Environmental Protection Plan
HDD	Horizontal Directional Drill
L3R or Project	Line 3 Replacement Project
Plan	Winter Construction Plan
ROW	right-of-way

INTRODUCTION

The Winter Construction Plan ("Plan") provides an overview of the procedures that will be employed by Enbridge Energy, Limited Partnership ("Enbridge") should construction occur during winter conditions on the Line 3 Replacement Project ("L3R" or "Project"). Winter construction weather conditions assume the presence of frozen surface soils or frozen precipitation covering the ground surface, and an extended forecast of below freezing temperatures. Due to the variability in weather conditions and site-specific conditions along the Project route, Enbridge will determine if frozen or non-frozen conditions apply at a given site and will select the construction technique and associated Best Management Practices ("BMPs") as appropriate for the conditions at the time of crossing.

This Plan has been formatted to match Enbridge's Environmental Protection Plan ("EPP"). Only pertinent sections with winter construction methods that differ or are additive to the EPP are included in the Plan.

1.0 GENERAL MITIGATION MEASURES

1.1 IDENTIFICATION OF AVOIDANCE AREAS

During winter construction activities, Environmental Inspectors ("EI") will confirm that signage for avoidance areas has been maintained or replaced for visibility during winter conditions.

1.3 WET WEATHER SHUTDOWN

The transitional periods between fall and winter, and winter and spring may require a wet weather shutdown period. Weather conditions that fluctuate between above freezing temperatures during the day and below freezing temperatures at night often result in soils that are wet and "greasy," which are susceptible to rutting and soil mixing. Enbridge will follow the process described in Section 1.3 of the EPP to determine the need for and duration of a wet weather shutdown or other mitigative actions in these situations.

1.4 RIGHT-OF-WAY ACCESS

Construction of frost/ice roads may be needed to access the right-of-way ("ROW"). Development will begin as soon as weather conditions allow. Enbridge will clear all woody vegetation from areas where the frost/ice roads are to be located. After clearing, lightweight equipment such as snowcats and/or amphibious all-terrain vehicles (e.g., Argos) will be used to push and pack existing ice and snow together. This process is referred to as "snowpack." This initial snowpack provides the foundation for frost/ice roads. As the snowpack builds up and hardens, larger and heavier equipment will be used to progressively increase the thickness and density of the snowpack. Typically, a minimum of 30 inches of snow pack is necessary to safely support construction equipment. In some cases, water may be added to the surface to help build snow pack from the top. If there is insufficient snow pack to safely support construction activities, it may be necessary to lay construction mats in addition to snow pack.

No deicing products will be used on the Project; however, snow removal may be required to allow safe access to the ROW. Snow is typically pushed off of an access road with equipment such as a grader, snowplow, or bulldozer and then stockpiled along the edge of the access road. To minimize scraping off underlying soil or gravel during snow removal, snowblower attachments will

be installed on compatible equipment. All equipment will remain on the access road and snow will not be pushed or blown onto avoidance areas off ROW.

Enbridge will utilize the clear span or non-clear span bridge types described in the Summary of Construction Methods and Procedures (Appendix A of the EPP) and in Section 2.4.1 of the EPP. Enbridge may also utilize ice bridges to cross small waterbodies (see Table 1.4-1).

1.5 RIGHT-OF-WAY REQUIREMENTS

All construction equipment and vehicles will be confined to the approved construction workspace and additional temporary workspace ("ATWS"), except where landowners or land-managing agencies have given permission for construction dewatering activities outside of the construction workspace (see Section 5.0).

The width of the construction workspace for the Project will vary and is co-located with Enbridge's existing corridor, third-party (foreign) utilities, roads, railroads, or highways along the majority of the route. The construction workspace is inclusive of the permanent ROW, permitted temporary workspace, and site-specific extra workspaces (referred to as ATWS) as defined in Section 1.5 of the EPP. The construction workspace width will be reduced (i.e., necked down) in selected locations (e.g., wetlands, waterbodies, in/near sensitive features), as indicated on the Project construction alignment sheets and in the field by the use of staking. Appendix A illustrates the typical winter construction workspace configurations in wetlands where the Project is co-located with existing Enbridge pipelines, foreign utilities, and greenfield.

1.8 UPLAND CLEARING

Removal of snow from the construction workspace may be necessary to provide safe and efficient working conditions and to expose soils for grading and excavation. Snow is typically pushed off the working area with equipment such as a grader, snowplow, or bulldozer and then stockpiled along the outer portions of the workspace. To minimize scraping off underlying soil or gravel during snow removal, snowblower attachments will be installed on compatible equipment. All equipment will remain within the workspace, and snow will not be pushed or blown onto avoidance areas off ROW. When snow is stored on the ROW, a physical barrier such as mulch or separation of snow piles from spoil piles will be conducted to avoid mixing.

Construction of frost/ice roads to serve as travel lanes may be needed in upland areas within the construction workspace. Where needed, development will begin as soon as weather conditions allow following the process described in Section 1.4.

TABLE 1.4-1
Ice Bridges

Type	Description	Applicability	Advantages	Disadvantages
Ice Bridge	Ice bridges are constructed over waterbodies on ice. Bridges can be strengthened by removing snow and flooding if needed.	Suitable over small waterbodies where the ice is thick and solid, generally on relatively shallow, low velocity and narrow watercourses.	• Limited sediment release • Can be easily constructed where needed	• Susceptible to winter thaw • Potential safety hazard

1.9 TEMPORARY EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES

Due to frozen conditions, installation of certain temporary BMPs (also referred to as erosion control devices ["ECDs"]) to minimize erosion and control sediment (e.g., silt fence and staked straw bales) may not be practicable. In this case, alternative BMPs (such as compost filter socks, erosion control blankets, or straw wattles) will be installed on bare frozen ground or snow (less than 2 inches deep) to mitigate erosion and sediment migration.

Certified weed-free straw or hay mulch will be applied and anchored (if possible) to exposed soils at all upland locations with a 5 percent or greater slope as described in Section 1.9.2 of the EPP. Mulch may be applied regardless of snow cover to cover at least 90 percent of the ground surface; sunlight will melt the straw into the snow to melt onto bare soil in the spring. Mulch will not be applied in wetlands or conveyance systems, except potentially in peatlands as described in Section 7.7.3 of the EPP or requested by applicable agencies.

Installed slope breakers and erosion and sediment control BMPs will be subject to inspection and repair requirements as outlined in Section 1.9 of the EPP and/or applicable permits. When thawing conditions begin, BMPs will be monitored and upgraded as needed to prevent sediment deposition into resources or off site. Should final grading and cleanup be completed the following spring, then temporary slope breakers and sediment barriers will be installed during backfill and/or rough grade activities.

BMPs will be installed as needed to provide a conduit for the concentrated flow of melt water to ensure that snow melt will not cause erosion and sediment loss.

1.10 UPLAND TOPSOIL SEGREGATION AND STORAGE

Once the frost road is established (as needed), crews will mobilize to the area where they will string, assemble, and install the pipeline. Special equipment, such as a trencher, ditching machine, or rock saw, will be used to cut down through the frost layer along both trench boundaries. Where frozen blocks have been cut, excavation equipment (e.g., a backhoe or excavator) will be used to remove the large frozen blocks and to place them adjacent to the trench. Depending on the depth of frost, trenching may be completed using conventional excavators. Trench topsoil will be segregated as practicable but modified dependent on depth of frost, thickness of topsoil, and the trenching method used.

Gaps will be left and erosion and sediment control BMPs installed where stockpiled topsoil, spoil piles, and snow piles intersect with water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage. Separation will be maintained between the topsoil, subsoil, and/or snow piles to prevent mixing. Where the separation cannot be maintained, the EI may approve the use of a physical barrier on a site-specific basis, such as a thick layer of certified weed-free straw or hay mulch or silt fence, between the spoil, topsoil, and/or snow piles to prevent mixing.

1.15 UPLAND BACKFILLING

After trench excavation, the assembled pipeline sections will be lowered into the trench. The amount of open excavation will be minimized during winter construction to reduce the amount of frozen backfill and facilitate restoration to pre-construction contours. Excavated soil material will

then be used to backfill the trench; the subsoil will be replaced first, and then the topsoil in cases where topsoil has been segregated (see Section 1.10).

In some situations, frozen upland topsoil will not be replaced during frozen conditions. This option will be implemented when the trench, subsoil backfill, and topsoil are frozen preventing proper replacement of soils and compaction of the trench. Instead, the trench will be backfilled with subsoil only, and topsoil replacement and final grading will occur during the subsequent spring or early summer. This option will prevent multiple trips into an area to reclaim an excessive topsoil crown or repair subsidence that has taken place over the trench line during the freeze/thaw cycle. The topsoil stockpile will remain temporarily stabilized with cover crop and/or mulch (in accordance with Section 1.9 of the EPP) throughout this period to prevent erosion and or sediment migration off the construction workspace. Adequate breaks or gaps in the topsoil stockpiles will be installed for drainage so that spring runoff and snow melt will not impact the topsoil piles and adjacent areas.

1.16 CLEANUP AND ROUGH/FINAL GRADING

In cases where topsoil has been segregated into a pile and becomes frozen into irregularly shaped chunks, Enbridge will add a crown of approximately 12 inches or more (depending on soil type and conditions) over the backfilled trench line. Periodic breaks or gaps in the crown will be installed (as necessary) to ensure water is able to move freely across the backfilled trench and not create nuisance conditions during a precipitation event or spring run-off conditions. Crowning will not extend beyond the previously excavated trench limits.

As the backfill material thaws in the spring and summer, there is potential that the original crown may not completely recede to pre-construction contours. If the crown does not full recede, additional grading will be performed once soils have thawed and conditions allow.

2.0 STREAM AND RIVER CROSSING GENERAL REQUIREMENTS

2.4 BRIDGES

Enbridge will utilize the clear span or non-clear span bridge types described in the Summary of Construction Methods and Procedures (Appendix A of the EPP) and in Section 2.4.1 of the EPP, and ice bridges as described in Section 1.4.

2.5 STREAM AND RIVER CROSSING CONSTRUCTION METHODS

2.5.1 Open Cut (Non-Isolated) Trench Method

If a waterbody that was permitted to cross using a dry crossing technique is dry or frozen at the time of construction, Enbridge will utilize the open cut (non-isolated) crossing method with agency approval.

2.5.2 Isolated Trench: Dam and Pump Method

Dry crossing techniques can be used in frozen conditions where there is water flow. The dam and pump method is preferred during winter construction and will proceed as outlined in Section 2.5.2 of the EPP with the following additional steps:

- Enbridge will remove ice downstream of the crossing location using hand and power tools to install in-water BMPs (e.g., turbidity curtains);

- Enbridge will mechanically remove ice at the crossing location and install the dam;

- Enbridge will proceed with the remaining procedures described in Section 2.5.2 of the EPP. Flowing water upstream of the dam will be pumped via a hose to the downstream location and discharged below the ice; and

- Measures will be taken to protect pumps from freezing to avoid disruption of water flow past the crossing location (e.g., place inside portable shelters with heaters). Backup pumps are required on site for each crossing.

2.5.4 Trenchless Methods: Horizontal Directional Drill Method (Pressurized)

The procedures for implementing the horizontal directional drill ("HDD") method outlined in Section 2.5.4 of the EPP will be implemented. Enbridge will complete a pre-construction visit at the site at least 2 weeks prior to initiating HDD setup and operations to determine if additional materials and equipment will be needed. Monitoring, containment, and response of inadvertent releases is described in Section 11.0.

3.0 WETLAND CROSSING GENERAL REQUIREMENTS

3.5 RIGHT-OF-WAY STABILIZATION

Construction of frost/ice roads to serve as travel lanes is typically required in winter conditions in wetlands within the construction workspace and will begin as soon as weather conditions allow following the process described in Section 1.4.

3.6 TRENCHING

3.6.1 Topsoil Segregation

Topsoil segregation in wetlands in frozen conditions will proceed as described in Section 1.10.

3.8 BACKFILLING

The area of open excavation will be minimized during winter construction to reduce amount of frozen backfill and facilitate restoration to pre-construction contours. The longer time that excavated materials from the trench are exposed to freezing temperatures, the more likely it is that backfill material will become frozen into irregularly shaped chunks of soil. During backfilling, the excavated subsoil will be replaced first, and then the topsoil in cases where topsoil has been segregated.

3.9 CLEANUP, ROUGH/FINAL GRADING, AND TEMPORARY RESTORATION

Enbridge will add a crown of approximately 12 inches or more (depending on soil type and conditions) over the backfilled trench line. Periodic breaks or gaps in the crown will be installed (as necessary) to ensure water is able to move freely across the backfilled trench and not create

nuisance conditions during a precipitation event or spring run-off conditions. Crowning will not extend beyond the previously excavated trench limits.

As the backfill material thaws in the spring and summer, the frozen soil clumps will begin to break apart and collapse into void spaces, resulting in subsidence of the material. There is potential that the original crown may not completely recede to pre-construction contours. However, this is preferred over not having enough material over the trench to restore original contours. If the crown does not fully recede, additional grading will be performed once soils have thawed and conditions allow using low ground pressure equipment or excavators working off timber mats so that damage to the resource will be prevented. Enbridge will monitor wetland areas after restoration as outlined in its Post-Construction Monitoring Plan.

5.0 CONSTRUCTION DEWATERING

5.1 TRENCH AND PIT DEWATERING

It is not anticipated that construction dewatering will be conducted during winter conditions. If construction dewatering is required, the procedures in Section 5.1 of the EPP will be followed, with the following additional considerations:

- Measures will be taken to protect pumps from freezing to avoid disruptions in dewatering and potential spills or leaks of lubricants or fuel (e.g., place pumps inside portable shelters with heaters);
- Dewatering structures may be installed early in the construction process before frozen ground conditions exist, where feasible;
- Locations of the filter bags placed off the ROW will be marked with lathe or a similar method to assist crews in relocating the filter bag for proper disposal; and
- Removal of dewatering structures will be conducted as soon as practicable after completion of dewatering in an attempt to remove the structure/filter bags before they are frozen.

5.2 HYDROSTATIC TEST DISCHARGES

5.2.4 Hydrostatic Testing Procedures

5.2.4.1 Mainline Hydrostatic Testing

If temperatures allow, mainline hydrostatic testing may be completed during winter conditions. The hydrostatic test water will be treated prior to discharge in accordance with Section 5.2 of the EPP, and in compliance with applicable permits. If the source waterbody is nearly or completely frozen to the bottom (minimal flow of water under ice) then the water will be discharged to the surface of the source waterbody on top of the ice to freeze. If there is minimal ice cover (sufficient base flow of water under ice) at the source waterbody, then ice augers will be used to drill several holes around a splash pup mounted on a barrier (e.g., construction mats, plywood) to allow the discharged water to slowly enter the waterbody under the ice without causing scour or concentrated flow to the waterbody bed. Determination on which discharge method to use will be made by Enbridge Construction Management, in collaboration with Enbridge Environment.

As discussed in Section 6.0, Enbridge will not appropriate from approved-groundwater sources during frozen conditions if soil conditions do not allow for infiltration during discharge activities. Enbridge will utilize an alternative agency-approved surface water source with adequate water flow and will follow the discharge measures outlined above.

5.2.4.2 HDD Hydrostatic Testing

If temperatures allow, hydrostatic testing may be completed at HDD sites during winter conditions. At these locations, the pipe will be hydrostatically tested on-site prior to installation. Enbridge will either infiltrate if ground conditions allow (i.e., not frozen), discharge water back to the source, or haul off-site. The HDD hydrostatic test water will be treated prior to discharge in accordance with the Section 5.2 of the EPP, and in compliance with applicable permits. If the source waterbody is nearly or completely frozen to the bottom (minimal flow of water under ice) then the water will be discharged to the surface of the source waterbody on top of the ice to freeze. If there is minimal ice cover (sufficient base flow of water under ice) at the source waterbody, then ice augers will be used to drill several holes around a splash pup mounted on a barrier (e.g., construction mats, plywood) to allow the discharged water to slowly enter the waterbody under the ice without causing scour or concentrated flow to the waterbody bed. Determination on which discharge method to use will be made by Enbridge Construction Management, in collaboration with Enbridge Environment.

Enbridge may appropriate from approved-groundwater sources during frozen conditions and haul water off-site if conditions do not allow for infiltration. Alternatively, Enbridge may utilize an alternative agency-approved surface water source with adequate water flow, or haul water on-site for smaller volumes. Discharge to surface water will proceed as outlined above, or if water hauled on-site, water will be hauled off-site for disposal.

6.0 WATER APPROPRIATION

Water may be drawn from local sources, such as lakes, streams, and private or municipal wells, for construction activities such as HDD drilling mud, buoyancy control, trench dewatering, and hydrostatic testing during frozen conditions. The Project will follow applicable permit conditions for the appropriation of water and will only utilize sources approved by the applicable agencies.

For appropriation from surface waters during frozen conditions, if the source waterbody is nearly or completely frozen to the bottom (minimal flow of water under ice) and does not have adequate water flow, an alternative agency-approved source will be used. If there is minimal ice cover (sufficient base flow of water under ice) at the source waterbody, then ice augers will be used to drill holes to allow the intake hose to enter the waterbody under the ice. The intake hose will be managed to minimize sediment intake from the waterbody bed. Enbridge will install a mesh screen sized 1-inch or less as approved by the applicable agencies on the intake hose to prevent fish entrainment. During withdrawal, adequate waterbody flow rates and volumes will be maintained to protect aquatic life and allow for downstream uses. The volume and rate of withdrawal will be monitored to comply with applicable permit conditions. Measures will be taken to protect pumps from freezing and to avoid potential spills or leaks of lubricants or fuel (e.g., place pumps inside portable shelters with heaters).

For large volumes of water, Enbridge will likely not appropriate from approved-groundwater sources during frozen conditions if soil conditions do not allow for infiltration during discharge activities (see Section 5.2.4.1). For smaller volumes, Enbridge may appropriate from approved-

groundwater sources and haul water off-site for disposal (see Section 5.2.4.2). Alternatively, Enbridge will utilize an alternative agency-approved surface water source with adequate water flow, or haul water on-site for smaller volumes.

7.0 REVEGETATION AND MONITORING

7.3.1 DORMANT/WINTER SEEDING

Winter or snow seeding can be implemented during early or late winter when there is less than 1 foot of snow and on a sunny day when seed can move into the soil surface (Minnesota Board of Water and Soil Resources ["BWSR"], 2019). The freeze/thaw action helps to set the seed firmly in the soil to prepare for spring growth. The seed bed must have been previously prepared for winter seeding to be successful, and it is not recommended for areas prone to spring flooding or running water (BWSR, 2014). Refer to Section 7.0 of the EPP for the discussion of the procedures for site preparation, seeding methods, and seed mixes by habitat.

7.11 MANAGEMENT AND MONITORING

Enbridge will maintain EIs and environmental labor crew(s) on-site or on-call through the periods of thaw and spring melt to monitor erosion and sediment control BMPs and stabilization efforts and to make adjustments or repairs as needed, and as ROW conditions allow. The EI will determine the most effective means of dealing with identified problems, taking into consideration the suitability of access to the ROW, potential equipment damage to the ROW, and the urgency of the issue to be addressed.

11.0 DRILLING FLUID RESPONSE, CONTAINMENT, AND NOTIFICATION PROCEDURES

11.1 ON-SITE OBSERVATION DURING CONSTRUCTION

Early detection is key to minimizing the area of potential impact from an inadvertent release. Enbridge will monitor the drill path by observing land surfaces and the waterbodies for surface migration during drilling, reaming, and pipe installation procedures. Enbridge will also walk the drill path to monitor for surface seepage, sinkholes, and settlement. In addition, a flowing stream will be monitored both upstream and downstream of the drill path. If an observer notices inadvertent release conditions or lowered pressure readings on the drilling equipment, shutdown will occur immediately. The on-site observation notification process during construction is further described in Section 11.1 of the EPP.

If drilling is performed during frozen conditions, holes shall be established in the frozen portion of a waterbody to monitor for fluid release. The following shall apply:

- Upstream of the drill path – holes (6-inch minimum diameter) will be drilled within the waterbody 10 feet upstream of the drill path at intervals starting 10 feet from the existing bank with a minimum of one hole (if the waterbody is less than 20 feet wide). These holes will be monitored throughout the duration of drilling operations.

- Downstream of the drill path – holes (6-inch minimum diameter) will be drilled within the waterbody 25 feet downstream of the drill path at intervals starting 10 feet from the existing bank with a minimum of one hole (if the waterbody is less than 20 feet wide). In addition,

a second set of holes will be located 75 feet downstream of the drill path at intervals starting 10 feet from the existing bank with a minimum of one hole (if the waterbody is less than 20 feet wide). All downstream holes will be monitored throughout the duration of drilling operations.

- Equipment such as portable shelters may be used as needed to increase underwater visibility.

Voice contact shall be maintained at all times between all drill personnel to ensure that any operational changes are communicated immediately and effectively between observation personnel and drilling rig operators. Enbridge shall provide handheld two-way radio communications for this purpose.

11.3 RESPONSE

If an inadvertent release occurs in a waterbody with frozen ice, Enbridge will mechanically remove the ice downstream of the release, assuming ability to access the waterbody, and will install in-water BMP(s). Enbridge will then remove ice at the location of the upstream inadvertent release in order to contain drilling mud at that location and prevent any further downstream migration. The in-water BMPs selected will correspond with the site-specific conditions as described in Table 11.3-1 of the EPP. These response materials will be on-site and available for rapid deployment in the event of an inadvertent release.

11.5 CLEAN-UP

Drilling fluid recovery methodology is not as variable as containment measures. When such measures effectively isolate the release from the stream flow, pumps or other appropriate measures are used to recover drilling fluid. When the release location cannot be isolated after initial in-water containment installation, drilling fluid that has settled from the water column typically collects in the acute upstream angle of the containment tool, and recovery efforts will be localized to that location.

12.0 REFERENCES

The INGAA Foundation, Inc. 2013. Planning Guidelines for Pipeline Construction during Frozen Conditions. Prepared for The INGAA Foundation, Inc. by Natural Resources Group, LLC. December 2013. INGAA Foundation Final Report No. 2013.04. Available on-line at: https://www.ingaa.org/File.aspx?id=21144.

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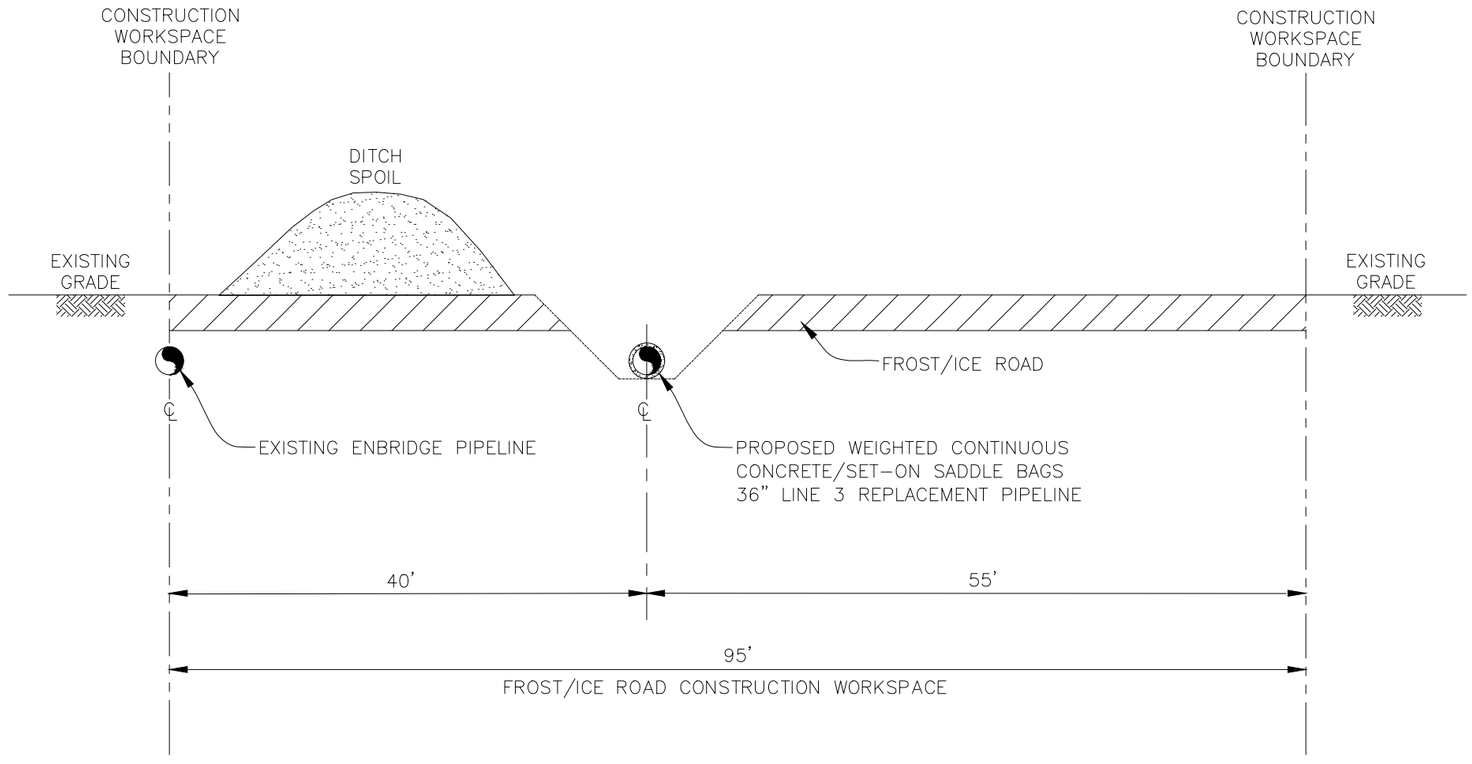
Appendix A

Line 3 Replacement Project Typical Workspace Configurations



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CLIENT APP.		

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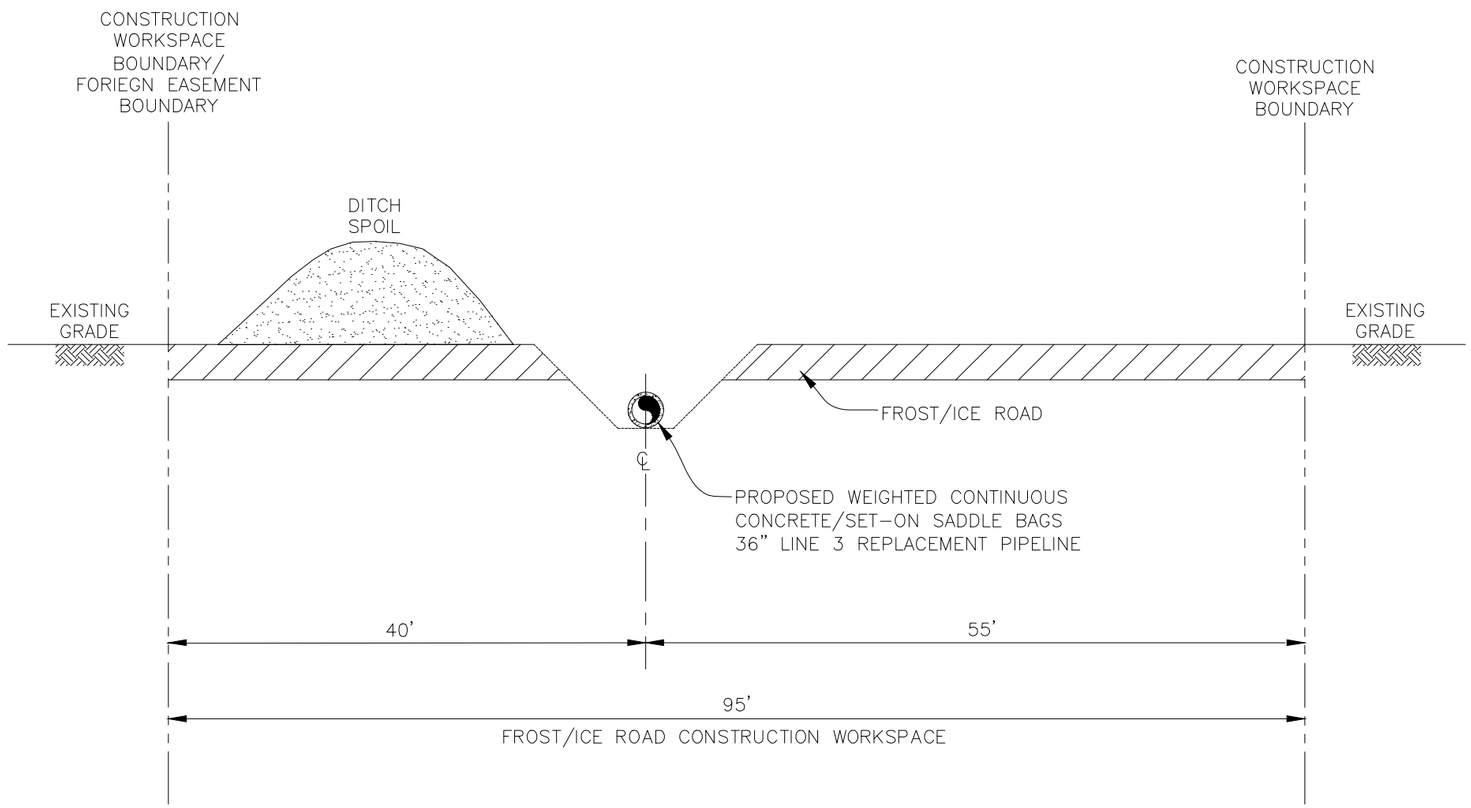
LINE 3 REPLACEMENT
TYPICAL WINTER FROST/ICE ROAD
CONSTRUCTION WORKSPACE
CO-LOCATED EXISTING ENBRIDGE PIPELINE

SCALE	DWG. NO.
NTS	L3R-B-TYP-WNT-CO-EN



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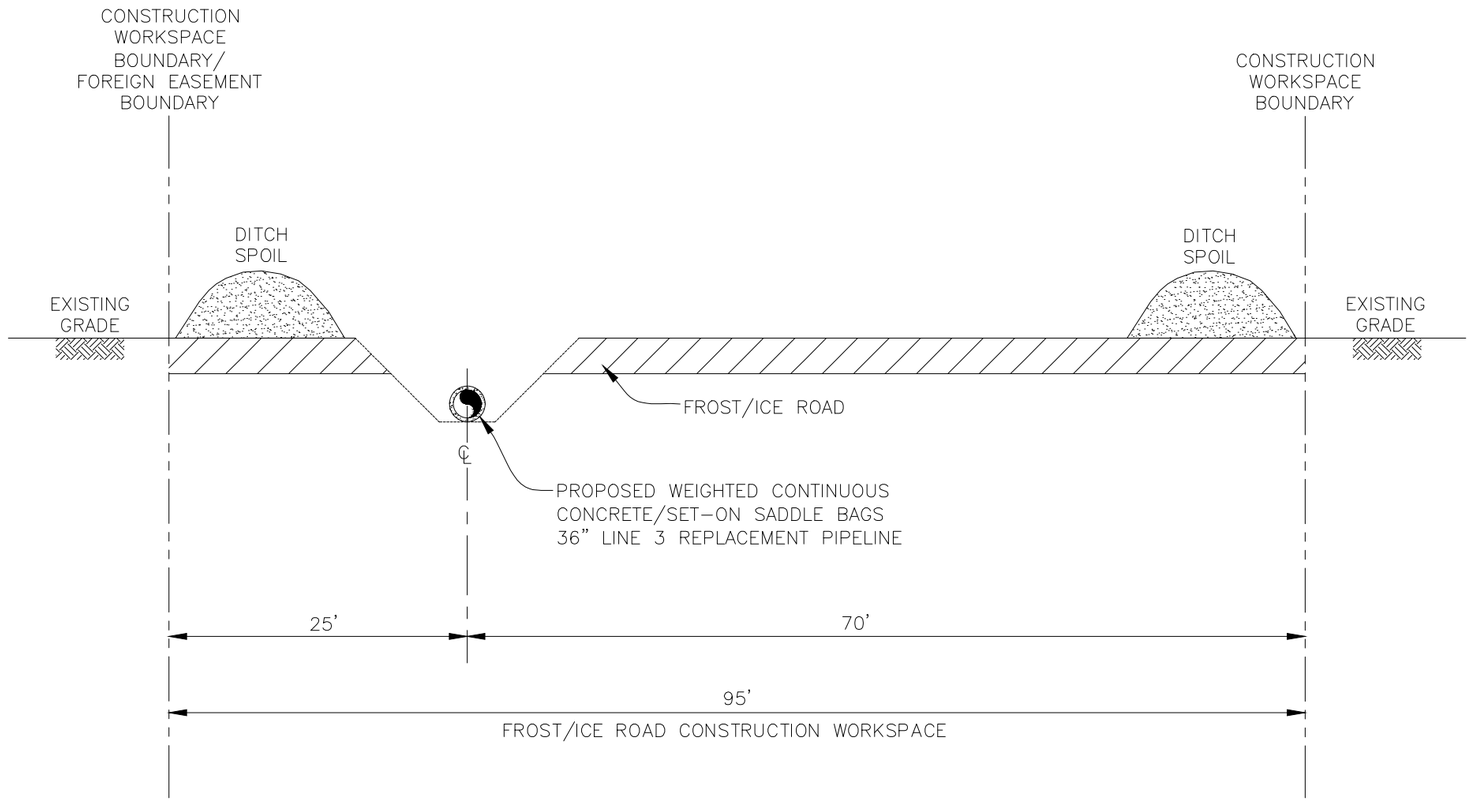
LINE 3 REPLACEMENT
TYPICAL WINTER FROST/ICE ROAD
CONSTRUCTION WORKSPACE
CO-LOCATED WITH FORIEGN UTILITY
EAST OF SWATARA

SCALE	DWG. NO.
NTS	L3R-B-TYP-WNT-ULTY-E



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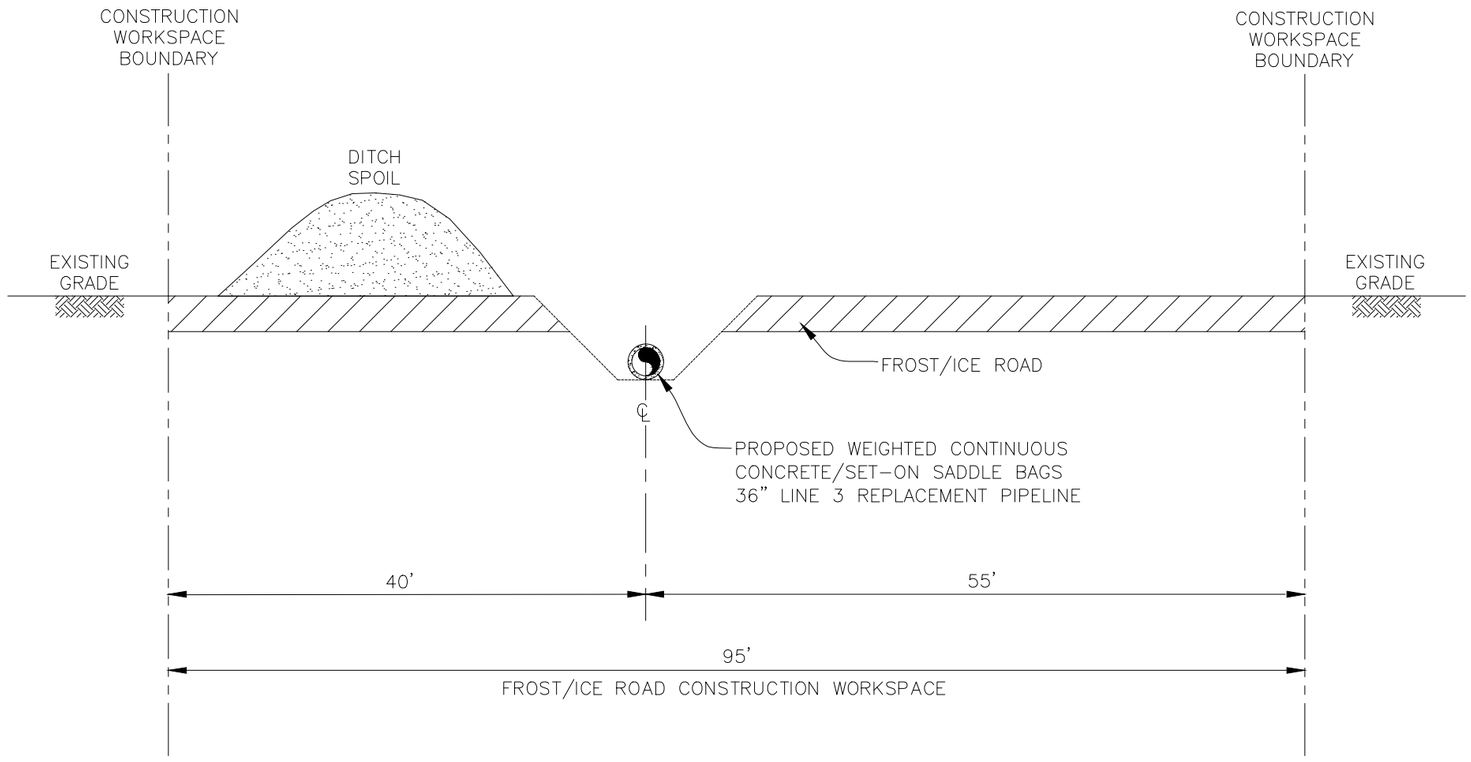
LINE 3 REPLACEMENT
TYPICAL WINTER FROST/ICE ROAD CONSTRUCTION WORKSPACE CO-LOCATED WITH FOREIGN UTILITY WEST OF SWATARA

SCALE	DWG. NO.
NTS	L3R-B-TYP-WNT-ULTY-W



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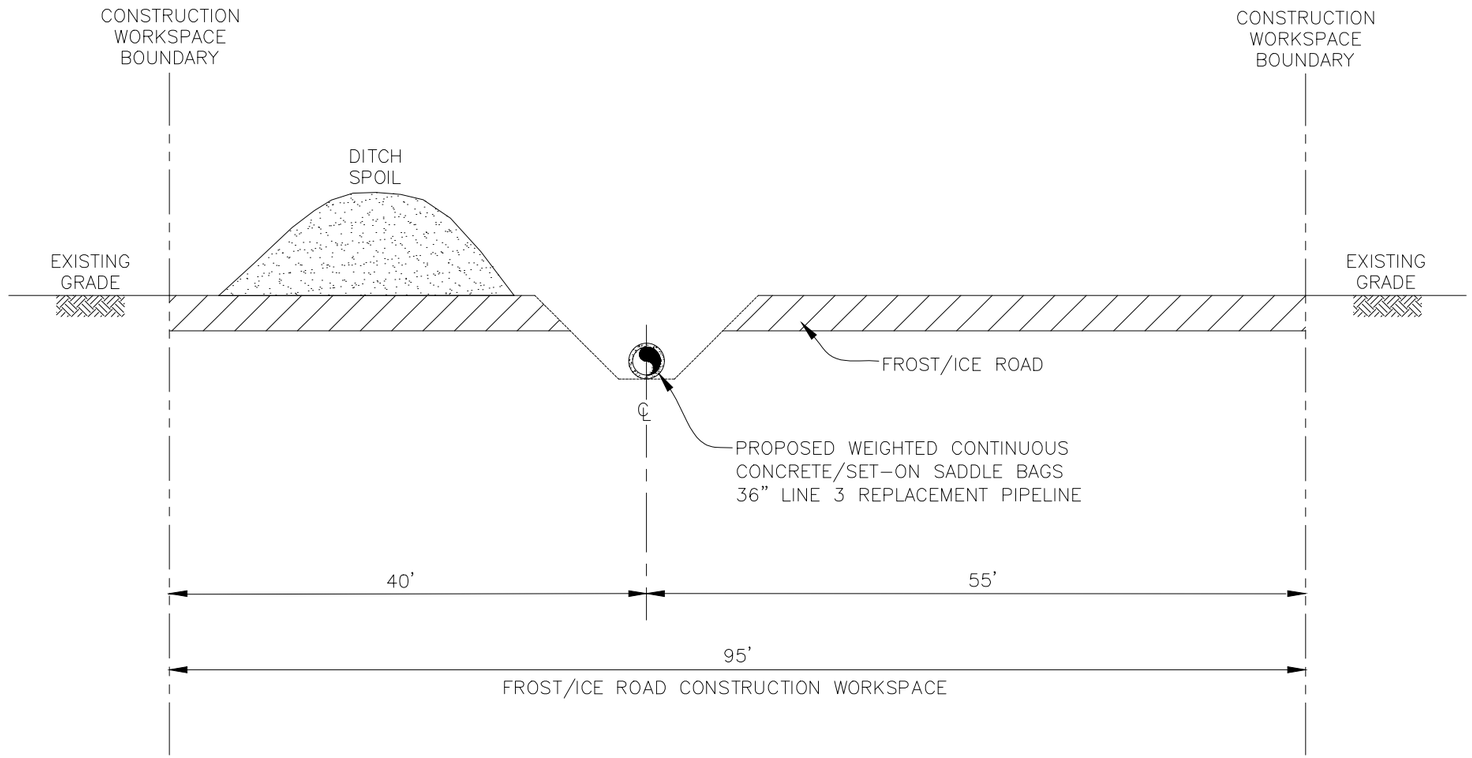
LINE 3 REPLACEMENT
TYPICAL WINTER FROST/ICE ROAD
CONSTRUCTION WORKSPACE
GREENFIELD – EAST OF SWATARA

SCALE: NTS

DWG. NO.: L3R-B-TYP-WNT-GN-E



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LINE 3 REPLACEMENT
TYPICAL WINTER FROST/ICE ROAD
CONSTRUCTION WORKSPACE
GREENFIELD – WEST OF SWATARA

SCALE	DWG. NO.
NTS	L3R-B-TYP-WNT-GN-W