



PETRONAS

GROUND DISTURBANCE STANDARD

Final

DOCUMENT AUTHORIZATION

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1. Summary Statement

The Ground Disturbance Technical Standard defines the technical specifications to manage the risks of ground disturbance activities to support the implementation of the Health, Safety, Security and Environment Policy.

2. Objectives

The objectives of this Technical Standard are to:

- Provide an overview of the process for ground disturbance activities;
- Define requirements for work planning and approval of work;
- Define requirements for communication to the public and regulators;
- Define requirements for ground disturbance and damage prevention;
- Outline roles, responsibilities for ground disturbance activities;
- Outline competencies for ground disturbance activities; and
- Outline the process measurement criteria.

3. Scope

This Technical Standard applies to all Employees, Contractors, and Consultants. It applies to all business activities of the Company where ground disturbance can occur.

4. Definitions

Capitalized terms used herein have their meanings set forth in the Master Glossary.

5. Requirements

5.1 Overview

Ground disturbance is any work, operation or activity, on or under the ground surface, resulting in a disturbance or displacement of the soil or ground cover, but not where the disturbance or displacement is a result only of:

- Routine, minor road maintenance;
- Agricultural cultivation to a depth of less than 45 centimeters (cm) below the ground surface over a pipeline;
- Hand digging to a depth of no more than 30 centimeters (cm) below the ground surface as long as it does not permanently remove cover over a buried facility; and
- Hand auguring to a depth of one meter (m) where no buried facilities are present (historically undisturbed areas) will not require a full ground disturbance procedure to be followed.

Ground disturbances can include, but are not limited to, the following:

- Digging;
- Excavation;
- Trenching;
- Ditching;
- Tunneling;
- Boring, drilling or pushing;
- Auguring;
- Topsoil stripping;
- Land leveling and grading;
- Hydrovaccing (daylighting);
- Plowing to install underground infrastructure;
- Tree planting;
- Clearing and stump removal;
- Sub – soiling;
- Blasting or use of explosives;
- Quarrying;
- Grinding and milling of asphalt or concrete;
- Seismic exploration;
- Driving fence posts, bars, rods, pins, anchors, signs or pilings; and
- Crossing of buried pipelines or other underground infrastructure by heavy loads.

5.2 Planning

5.2.1 Approval of Work

All activities including disturbance or displacement of the soil or ground cover must be approved through a Permit to Work in accordance with the Permit to Work Framework.

5.2.2 *Research the Work Area*

The Ground Disturbance Supervisor will ensure that the requirements for ground disturbance research are documented in the Ground Disturbance Checklist in accordance with control [G0801-052-000-001] and are as follows:

- The search of information sources must identify buried facilities within 30 meters (m) of pipelines and within the limits of disturbance for other facilities; and
- A review of all applicable information ground disturbance sources must be conducted, such as:
 - Provincial one-call services;
 - Easements or caveats registered against certificates of title to see if any encumbrances are listed on the title which would suggest possible things like buried cable or pipelines prior to excavating;
 - Regulator maps (e.g. British Columbia Oil and Gas Commission);
 - Commercial data and mapping services;
 - Municipal and rural utility companies;
 - As-built drawings, facility plot-plans or pipeline maps;
 - Survey plans;
 - Buried-facility owner area-operations personnel;
 - Land owners or residents; and
 - Visual indicators

The Ground Disturbance Supervisor will also ensure that any gaps that have been identified during the development of the Ground Disturbance Checklist have been mitigated prior to the start of the ground disturbance activity.

5.3 Communication

5.3.1 *Public*

Property owners and members of the public who may be impacted by a ground disturbance, including land owners, right-of-way holders, underground and surface facilities owners, and other stakeholders must be notified and consulted prior to commencing any ground disturbance planning. These notifications and communication must be completed by a Company representative in accordance with the Surface Land Management Policy and External Communications Policy.

5.3.2 Regulatory

The Ground Disturbance Supervisor will ensure that requirements for notifications have been completed in accordance with the Regulatory Management Policy.

The notification requirements are as follows:

- A verification for buried facilities within the area of a proposed disturbance must be conducted by notifying the owners of these facilities and provincial one-call at least two full working days and not more than ten working days before the ground disturbance takes place. This timeline may be altered by conditions of a crossing agreement or by specific jurisdictional requirements. National Energy Board (NEB) regulated pipelines require a minimum of three working days' notice;
- If facility owners are not registered with a provincial one-call service they must be contacted directly and provided with the same information submitted to a provincial one-call service. When working in proximity to NEB regulated pipelines the pipeline owner must be contacted directly prior to commencing any excavation, construction, or crossing. In some cases when working in proximity to NEB regulated pipelines or infrastructure, the pipeline or infrastructure owners must be present at the work site to supervise, witness, or consent to work; and
- If the buried facility owner has not responded with the required timeframe, the ground disturber can request a review of the situation with the responsible regulator to determine a suitable course of action.

5.4 Ground Disturbance and Damage Prevention

During the execution of the ground disturbance work, the Ground Disturbance Supervisor is responsible to ensure that the following activities as outlined below are to be completed.

5.4.1 Notice of Project (WorkSafeBC)

A notice of project for excavation must be initiated by the Ground Disturbance Supervisor to ensure WorkSafeBC receives, in writing or by fax, at least 24 hours before starting an excavation that:

- Includes a trench more than 1.2 m (4 ft.) in depth and over 30 m (100 ft.) in length; or
- Includes another type of excavation more than 1.2 m (4 ft.) in depth, which a worker may be required to enter.

5.4.2 Line Locating and Marking and Exposure

Requirements for line locating and marking are as follows:

- Line locating and marking must only be conducted by a qualified line locate service;
- In circumstances where there are three lines or more within 30 meters (m) of the limits of disturbance for other facilities, a second locate must be conducted. If a discrepancy is noted on the second locate then a third must be performed;
- Hand expose or expose with a hydrovac all underground facilities within a five meters (m) radius of the ground disturbance area according to crossing agreements and regulations;

- Expose each underground pipeline in a minimum of two places within the excavation area to properly determine the horizontal orientation of each pipeline as well as the depth of cover;
- The line locate service must identify and mark the facility using the uniform color code established by the American Public Works Association:
 - **Red** - electrical
 - **Yellow** - gas, oil petroleum, steam or gaseous material
 - **Orange** - communications cables (e.g., telephone, TV)
 - **Blue** - water, irrigation
 - **Green** - sewers, culverts or drains
 - **Pink** - temporary survey marks
 - **Purple** - irrigation, reclaimed water, slurry lines or pipes
 - White - limits of proposed excavation
- Different colors or types of markers, fences or barricades must be used to show existing facility rights-of-way or right-of-way outlines and ensure all marked facilities are documented on site plans and surveys;
- A Company representative must be on site when NEB regulated pipelines or infrastructure are being located to ensure that markers, stakes, and flags are clearly placed and understood;
- Control work area access to the site by erecting temporary fencing on the right-of-way; and
- If a trench is left open, ensure the area is barricaded and warning signs are posted.

5.4.3 Emergency Notification

Requirements for emergency notification are as follows:

- Workers must be aware of the site emergency muster procedure and that all emergencies will be managed through the HSE Incident Management Framework and the Crisis Management Technical Standard;
- Direct contact information for the facility owner, one-call and appropriate regulatory agencies must be available to Workers in case of contact with an underground facility; and
- Work must be stopped immediately if any contact is made with an underground pipeline or facility.

5.4.4 Exposure and Mechanical Excavation Equipment

Requirements for exposing facilities or using mechanical equipment are as follows:

- Double-check site drawings for the placement of markers prior to mechanical excavation;
- Keep all pipeline warning signs and markers visible and legible for the duration of the ground disturbance. If stakes have been removed or knocked down prior to excavation, a re-stake must be completed;

- Ensure the pipeline owner's representative is present when the pipeline is being exposed, or if the owner is not present, that the owner has provided written confirmation in advance of the work being carried out that it does not need a representative to be present during the exposure, and the reason for this decision;
- Do not use mechanical excavation equipment within 60 centimeters (cm) of a located pipeline except under the direct supervision of the owner's representative;
- Do not excavate a live line with mechanical excavation equipment except under the direct supervision of the owner's representative;
- Expose each pipeline at the start of the excavation and at least once more near the end of the excavation;
- If there are bends in the pipeline, elevation changes or other variations along the pipeline's path, expose the pipeline by way of hydrovac in additional spots as needed to clearly identify its location relative to the planned mechanical excavation; and
- If the pipeline is too deep to be visually identified by a hydrovac and a mechanically assisted hand excavation is required, a site-specific procedure must be developed and approved by the supervisor before the work is done

5.4.5 Sloping and Shoring

Sloping and shoring during excavations must be done in accordance with provincial regulatory requirements which can be found as noted below.

- WorkSafeBC Part 20.81 Sloping and Shoring Requirements

5.4.6 Inspection and Backfill

Requirements for inspection and backfill are as follows:

- Pipeline owners must be notified at least 24 hours before backfilling work begins;
- Verify that facility owner inspects the backfill of the buried facility. If unable to obtain an inspection from the facility owner, consult the regulator and ensure the conditions during backfilling are documented with a report and photographs; and
- A Backfill Inspection Report Form must be prepared in accordance with control [G0801-052-000-002] and provided as part of the ground disturbance records

5.5 Roles and Responsibilities

As per the Health, Safety, Security and Environment Policy, Permit to Work Framework, Work Site Management Framework and jurisdictional requirements, the Company's Management is committed to enduring the diligent and safe operations of all of the Company's work initiatives which may pose a risk to personnel.

Other individuals have responsibilities to follow integrity requirements pertinent to their job function. A summary of the positions relevant to ground disturbance management can be found in the sections following.

5.6 Permit Issuer (Ground Disturbance Supervisor)

The Ground Disturbance Supervisor is assigned by Management and those in a supervisory capacity and is the person in charge of coordinating and performing the Ground Disturbance. The Ground Disturbance Supervisor will be the Person in Charge or Permit Issuer in accordance with the Permit to Work Framework and Work Site Management Framework.

The Ground Disturbance Supervisor is responsible for the following:

- Working with the HSSE group to assess the proposed excavation in identifying potential for confined space work as per any applicable jurisdictional requirements;
- Coordinating the work activities of all workers involved in ground disturbance activities, including confirming that effective energy isolation has been established;
- Verifying through active monitoring that the requirements of this Technical Standard are complied with;
- Stopping all work if the requirements of this Technical Standard are not being followed or if there is a failure of any of the installed devices;
- Permit issuer must follow all requirements for permitting in accordance with the Permit to Work Framework including completion of the Ground Disturbance Checklist;
- Leading the Confined Space Pre Entry Meeting as per the Confined Space Entry Framework where applicable;
- Being familiar with the worksite or facility and all aspects of the work activities (i.e., plot plans, line locates, excavation methods, etc.) related to ground disturbance;
- Being knowledgeable and ensuring Contractors who perform Ground Disturbance on behalf of PETRONAS Canada are following:
 - All regulations related to conducting a ground disturbance for the jurisdiction; and
 - Company policies, practices and procedures required for conducting a ground disturbance
- Ensuring there is a copy of the Crossing Agreement in possession at all times during the ground disturbance work, from the Facilities Project Manager, in accordance with the Facilities Delivery Framework. Review the Crossing Agreement in conjunction with the worksite or facility, and all aspects of the work activities (i.e., plot plans, line locates, excavation methods, etc.) related to a ground disturbance.

The requirements for crossing agreements and approvals include the following:

- Regulated pipelines;
- Non-regulated pipelines;
- Utility rights-of-way;
- Road allowances;
- Approvals for crossings;
- Proximity agreements;

- Right-of-entry agreements;
 - Right-of-access agreements; and
 - Reciprocal agreements
- Ensuring that when conducting work activities involving excavation, construction, or crossing activities near NEB regulated pipelines, written approval and related instructions must be received from the pipeline owner prior to the commencement of the work. All conditions in the crossing agreement and written instructions must be followed before work begins, during the work, and following the completion of the work;
 - Ensuring that all workers have the necessary training and experience for their assigned tasks in accordance with the Operations Competency Technical Standard;
 - Ensuring all personnel and equipment operators understand and follow the agreed-to entry procedures when entering the property and contact the landowner if required. Landowner communication should be conducted in accordance with the Surface Land Management Technical Standard;
 - Inspecting the search/controlled area for company right-of-way markers and visible indicators of a previous ground disturbance;
 - Ensuring all spoil piles are sloped 45° or less from the horizontal and are located a minimum of 1.2 metres (4 feet) from the edge of the excavation or trench in accordance with jurisdictional requirements;
 - Ensuring machinery or heavy objects are not placed or working within a distance equal to the depth of the trench in accordance with jurisdictional requirements;
 - Ensuring if the trench is adjacent to or abutting a building or structure, additional shoring that has been certified by a Professional Engineer is required in accordance with jurisdictional requirements;
 - Ensuring that sufficient work space is available so equipment and materials are kept a minimum of 1.2 metres (4 feet) from the edge of an excavation or trench in accordance with jurisdictional requirements;
 - Where there is a potential to create a hazard to workers or the general public, ensuring excavations or trenches are guarded by railings or barriers to prevent workers, the public, wildlife and livestock from falling into them;
 - Ensuring shoring and bracing is constructed and installed in accordance with regulatory and jurisdictional requirements;
 - Completion of the Ground Disturbance Checklist, including the written approvals, and addressing deficiencies to complete the required control activity [G0801-052-000-001];
 - Initiating and managing the hand exposure of buried facilities;
 - Supervising all ground disturbance activities as per defined scope of work, applicable practices, and written approvals/permissions;
 - Ensuring the Backfill Inspection Report Form and required notifications for backfill inspection are completed in accordance with control [G0801-052-000-002];
 - Completing and submitting required documentation in accordance with the Ground Disturbance Checklist where required; and

- Submitting the red lines in accordance with the Facilities Delivery Framework and Drawing Technical Standard

5.6.1 Permit Receiver

During Ground Disturbance activities, the Permit Receiver is responsible for:

- Following the ground disturbance requirements detailed in this Technical Standard;
- Stopping all work and informing the Permit Issuer if the requirements of this Technical Standard are not being followed or if there is a failure of any of the installed devices;
- Placing a personal lock and tag on the associated lockbox if performing work on an isolated system where required;
- Ensuring all Incidents, Near Misses, Unsafe Acts, and Unsafe Conditions are reported in accordance with the HSE Incident Management Framework and HSE Investigation Framework; and
- Permit Receiver must also follow all requirements for permitting in accordance with the Permit to Work Framework.

5.6.2 Worker

The Worker responsibilities are as follows:

- Participating in the Job Hazard Assessment with the Permit Receiver;
- Participating in the isolation verification walk down;
- Placing a personal lock and tag on the associated lockbox, where required, for work on the isolated system in accordance with the Lockout Tagout Framework;
- Following the requirements of the JHA Form, Procedures and Permit to Work;
- Meeting the requirements where applicable for Confined Space Entry as per applicable regulations for the jurisdiction and the Confined Space Entry Framework; and
- Stopping all work if the requirements of this Technical Standard are not being followed, or if there is a failure of any of the installed devices.

5.7 Competency

All personnel will receive training appropriate to the roles they are required to fill. Training provided will include an assessment of competency to conduct a Ground Disturbance. Competency will be assessed in accordance with the Operations Competency Technical Standard.

5.7.1 Permit Issuer (Ground Disturbance Supervisor)

The Permit Issuer's training for Ground Disturbance activities will include the following:

- The requirements of this Technical Standard, and the Lockout Tagout Framework;

- The requirements on how to complete the Ground Disturbance Checklist, Backfill Inspection Report Form, Lockout Tagout Isolation Plan Form and Isolation Assessment Form where required in accordance with the Lockout Tagout Framework, Work Site Management Framework and Permit to Work Framework;
- Confined Space Entry training as per the Confined Space Entry Framework where applicable;
- Obtaining required third party Ground Disturbance Supervisor Training Certificate which must include at a minimum:
 - Introduction to Safe Digging;
 - Legislation and Damage Prevention;
 - Stakeholders and Damage Prevention;
 - Information Sources and Visual Inspection;
 - Hazards, Obstacles and Safety;
 - Locating and Marking;
 - Hydrovaccing and Facility Verification;
 - Safe Excavation;
 - The proper Phases of Safe Digging; and
 - Type of Incidents and How to Prevent Them
- The specific types and magnitude of hazardous energy encountered in the workplace.

5.7.2 Permit Receiver

The Permit Receiver's training for ground disturbance activities will include the following:

- The requirements for the ground disturbance activities as per applicable regulations for the jurisdiction; and
- The requirements for the specific work activity to be performed

5.7.3 Worker

The Worker's training for the ground disturbance activities will include the following:

- The requirements for the ground disturbance activities as per applicable regulations for the jurisdiction; and
- The requirements for the specific work activity to be performed

5.8 Process Measurement Criteria

5.8.1 Assurance Activities

The Ground Disturbance Verification Form is used as a self-assessment tool for managing conformance to this Technical Standard in accordance with the HSSE Assurance Technical Standard.

5.8.2 Performance Indicators

Performance will be managed in accordance with the HSSE Performance Management Framework.

Assessment Category	Required Performance Indicators
Planning and execution	<ul style="list-style-type: none"> • Monthly total site number and percentage of <u>JHA Form</u> and <u>PTW Template</u> reviewed for quality; and • Monthly total site number and percentage of quality improvement opportunities identified from <u>JHA Form</u> and <u>PTW Template</u> quality reviews.

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