

# Encroachment Application Technical Guidelines

## EATG.001

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### Scope

This document provides guidelines for submission of encroachment requests and covers the requirements for land development, agriculture, excavation or construction activities in the vicinity of pipeline rights-of-way owned or operated by Enterprise Products Company or its affiliates (Company). The common encroachments on pipeline rights-of-way are identified and explained in the guidelines.

All development and construction projects that are being planned in the vicinity of Company rights-of-way are subject to formal review and approval by Company prior to performance of the work. Depending on the scope of each project and the resulting impact on Company facilities, pipeline inspection and reconditioning, protective measures, or pipeline adjustments may be required.

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## 1.0 GENERAL

- (1) No work shall be performed on Company Rights-of-Way without the prior consent of Company. Company reserves the right to station representatives along the right of way when any work is being performed.
- (2) To ensure timely completion of the encroachment application, Company requires pertinent design or construction drawing sheets that shall include the following:
  - (a) Cover Sheet – Contains project information
  - (b) Plan, profile, and/or cross-section drawings with Company pipeline(s) depicted in the profile/cross section sheets and with separations/clearances/covers to/from the affected pipeline(s)
  - (c) Existing and/or Proposed Typical drawings (for road resurfacing/re-structuring)
  - (d) Construction plan for pipelines requiring temporary support during excavation if pipeline(s) will be exposed
  - (e) Grading Plan, if there will be cut and/or fill over the pipeline(s)
  - (f) The pipeline labeled appropriately as "Enterprise Products Pipeline" including the pipe diameter size.
  - (g) A standard warning statement shall be conspicuously displayed on all prints that depict the pipeline(s). The statement shall contain the following language:

**WARNING**

**HIGH-PRESSURE PIPELINE(S)**

**Excavation and/or Construction Prohibited Without Written Permission From  
Enterprise Products Company**

- (3) Encroachment evaluation will require a minimum of 60 days to complete, from the time the complete project plans and information are received.
- (4) A Letter of No Objection (LONO) or a fully executed Encroachment Agreement (EA) will have to be in place prior to any encroachment to the existing Company right-of-way.

## 2.0 PIPELINE LOCATION AND DEPTH VERIFICATION

As required by law, the Encroaching Party shall contact the appropriate State One Call Center to arrange for field staking of the approximate pipeline location then provide the Company GPS coordinates of anticipated crossing(s) or pipeline cover cut locations so the Company will reasonably determine the pipeline depth of cover in the location(s). This will be provided to the Encroaching Party so the data will be used and reflected (updated) in the required design/construction drawings needed for evaluation by the Company. If the existing cover condition of the pipeline is rocky and/or the pipeline depth of cover is more than six (6) feet, the Encroaching Party shall have the responsibility to verify in-field the alignment and/or physical depth of the pipeline monitored by Company Field Representative, unless the Encroaching Party has compensatory rights. In cases where the Encroaching Party is acquiring additional right-of-way within the Company's easement, the Encroaching Party shall verify in-field the alignment and/or physical depth of the pipeline.

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### 3.0 STRUCTURES, FENCING AND LANDSCAPING

- (1) No buildings, houses, barns, garages, patios, swimming pools, reinforced concrete slabs, light poles, masonry, retaining walls, or other permanent structures will be permitted on the right-of-way.
- (2) Large debris, such as old cars, trailers, scrap metal, boulders, etc., shall not be permitted on the right-of-way. The right-of-way must be kept clear for maintenance and inspection.
- (3) Company must approve fence crossings prior to any fence construction on or over a Company pipeline and/or associated right-of-way. Fences may not be allowed to parallel the pipeline within associated right-of-way. Fence posts will not be allowed within 5 feet of the centerline of the pipeline. No fences shall be constructed of any type material that obstructs the line of sight between the pipeline marker signs. No fencing shall prevent access by pipeline personnel at any time. Drive-through gates (14-foot-wide minimum) may be required to provide access to the right-of-way.
- (4) Trees are not permitted on the right-of-way. Mature shrubs with an untrimmed height exceeding 18 inches and/or obstructing the view of the marker posts are not permitted on the right-of-way.
- (5) Irrigation systems, field drain lines, and sidewalks must cross Company pipelines at an angle as close to 90 degrees as possible, but not less than 45 degrees. No septic system lateral lines are permitted on the right-of-way.
- (6) Retaining walls are not permitted within the pipeline right-of-way.
- (7) Surface grade or elevation changes require review by Company, but in general, no cover may be removed from the right-of-way. No construction will be allowed that could result in the erosion of surface cover from the right-of-way.

### 4.0 RIGHT-OF-WAY CLEARING

Company may at any time elect to remove obstructions, including but not limited to trees, brush, crops, and other vegetation from all or part of its right-of-way. Existing trees and/or shrubs may be cleared or side-trimmed by Company at the sole discretion of Company.

### 5.0 CHANGE OF LAND USE

- (1) The landowner or tenant shall notify Company if land use will be changed from pasture to cultivation, or if tilling depth will increase, or if terraces will be cut or re-cut.
- (2) Livestock ponds, lakes, detention ponds, retention ponds, or wetlands are not allowed on the pipeline right-of-way.

### 6.0 FOREIGN PIPELINE/UTILITY CROSSINGS AND PARALLELING

#### 6.1. General Requirements

- (1) Foreign lines shall cross as close to 90 degrees as possible, but not less than 45 degrees. Foreign lines shall preferably cross underneath Company pipelines. Foreign pipelines or utilities crossing above Company pipelines shall be reviewed and approved by Company on a case-by-case basis.
- (2) A vertical clearance of at least 24 inches between a foreign line and Company pipelines shall be provided. However, where 24 inches of vertical clearance is impracticable, the clearance may be reduced to not less than a minimum of 12 inches. Note: these vertical clearance requirements do not apply to trenchless technology construction; for details regarding those applications, refer to Section 6.3 of this document.

- (3) If during the course of the crossing, Company's pipeline is exposed and unsupported for a distance in excess of 15 feet, the pipeline must be properly supported temporarily in a manner that meets Company requirements. Company may reduce support distance to 10 feet depending on pipeline condition.

## **6.2. Metallic and Non-Metallic Utilities**

- (1) Foreign metallic pipe crossings shall be coated with a non-conductive coating for the full width of Company's right-of-way.
- (2) Non-metallic utility lines shall be wrapped with tracer wire and warning tape installed by the crossing party within the width of right-of-way to allow easy identification.

## **6.3. Trenchless Technology Construction**

- (1) A minimum vertical clearance of 36 inches or the diameter (inches) of the crossing utility being installed, whichever is greater, below the pipeline is required for boring, or directional drill or tunneling.
- (2) For directional drilling operations, a surface wire tracking system is required to verify the exact location of the drill head. Blind directional drill/boring is not permitted within pipeline right-of-way.
- (3) Inspection trenches or potholes excavated on both sides of the pipeline prior to crossing and the pullback are required. The depth of viewing window shall be at least 36 inches below the pipeline at the point of intersection for visual inspection of the drill stem/tool and pipeline to ensure the bore, drill, or tunneling does not impact the pipeline unless otherwise inspection holes are waived by Field Operations.

## **6.4. Electrical and Communication Cables (including Fiber-Optics)**

- (1) Buried electrical cables shall be installed in accordance with the National Electric Safety Code (NESC), National Electrical Code (NEC) or local electrical code. Additionally, buried electrical cables shall cross below Company pipelines with minimum clearances of 24 inches for 0 – 600 volts; 36 inches for all other voltages greater than 600 volts.
- (2) All electrical cables shall be installed in non-metallic or high impact PVC conduit. If the electrical cable crosses over or below a Company pipeline by open cut trench excavation, it shall be encased in a 6-inch envelope of red 2,500 psi concrete for the full width of the right-of-way. All power cables should be marked with red warning signs indicating "buried power cable."
- (3) Communication cables (telephone, cable TV, and other data lines) shall cross below Company pipelines with at least 24 inches of separation. Such cables shall be encased in a rigid, non-metallic conduit when crossing Company pipelines.
- (4) Utility poles and guy anchors shall not be placed within the pipeline right-of-way.
- (5) All overhead power cable crossings shall maintain a minimum height of 25 feet above grade for a distance of 25 feet each side of the pipeline for 22kV and less; 30 feet for over 22kV. Exceptions to these requirements will be reviewed on a case-by-case basis.

## **6.5. Parallel Construction**

No parallel pipelines within 25 feet of Company pipelines will be allowed unless otherwise permitted by Company. Reduction of the horizontal separation will be reviewed on case-by-case basis.

## **7.0 ROADWAYS, DRIVEWAYS, SIDEWALKS AND PARKING LOTS**

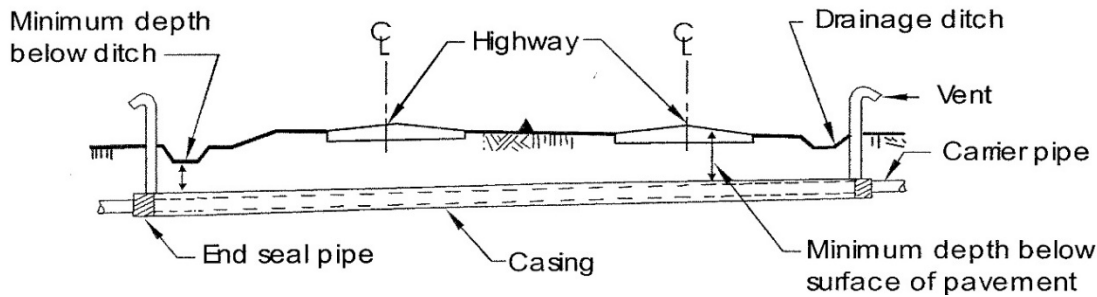
- (1) All plans for roadway, driveway, and sidewalk crossings shall be designed to be as close to perpendicular to the pipeline as possible, but no less than 45 degrees. Roadways and driveways will require stress analysis to be performed in accordance with API 1102 Steel Pipelines Crossing

Railroads and Highways. Stress analysis results that do not meet minimum requirements may require pipeline adjustment, modification or mechanical protection.

- (2) Roadways and driveways may not be permitted without a signed Letter of No Objection (LONO) or a fully executed Encroachment Agreement (EA) releasing Company from any and all future damages to the improvement due to pipeline maintenance and repair.
- (3) Resurfacing of existing roadways or driveways may not require adjustments to Company pipelines if widening and/or changes to the depth of cover are not planned.
- (4) Paved surfaces should not be allowed to cross a pipeline bend
- (5) Roadways shall be installed with a minimum compacted cover over the carrier pipe, where practicable, as measured from the top of the roadway surface to the top of the pipe, as follows: (see also Fig.11-1 and 11-2 below):

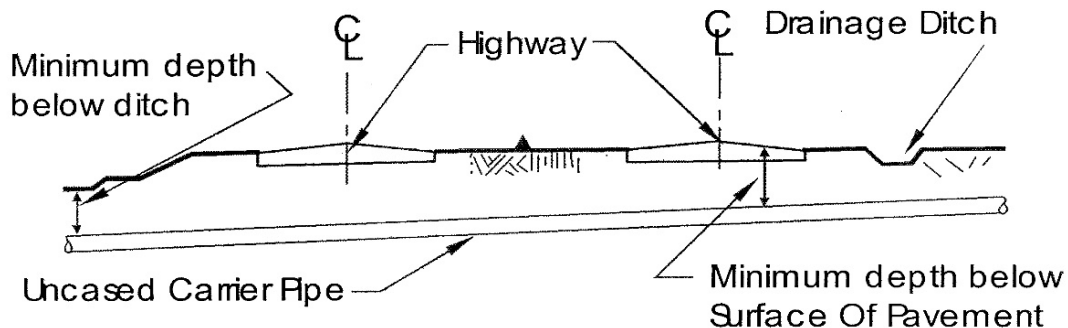
Location	Minimum Compacted Cover	
	Cased	Uncased
Under Roadway Surface Proper	4 feet	4 feet (Subject to Stress Analysis)
Under all other surfaces within the right-of-way or from the bottoms of ditches	3 feet (4 feet for High Volatile Liquid)	3 feet (4 feet for High Volatile Liquid)

Figure 11-1: Cased Highway Crossing



Source: API RP 1102 Steel Pipelines Crossing Railroads and Highways, 7th Edition

Figure 11-2: Uncased Highway Crossing



*Source: API RP 1102 Steel Pipelines Crossing Railroads and Highways, 7th Edition*

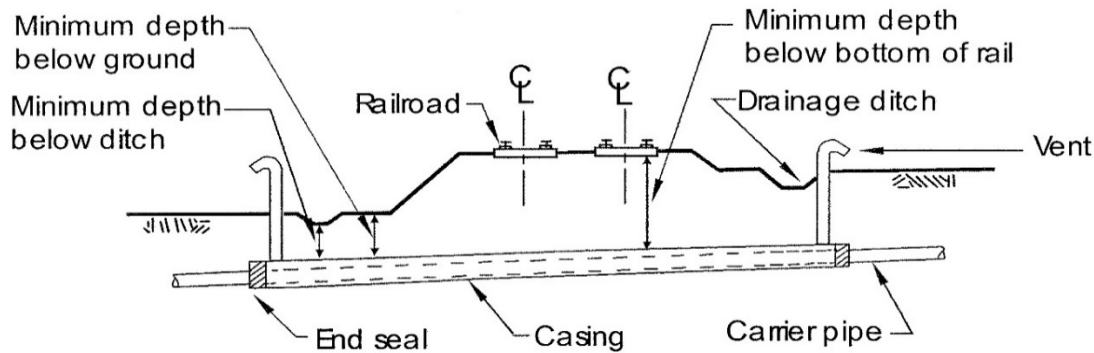
- (6) If the minimum coverage set forth in Section 7.0(5) of this document cannot be provided and/or stress analysis results do not comply with API 1102, mechanical protection shall be installed, such as a 6 inch thick (minimum) steel-reinforced (or load transfer) concrete slab along/across entire right-of-way width.
- (7) Casing pipe on an existing crossing may be extended to accommodate additional road surface or newly acquired right-of-way widths.
- (8) Sidewalks and parking lots will not be permitted without a fully executed Encroachment Agreement releasing Company from any and all future damages to the improvement due to pipeline maintenance and repair. A minimum final cover of 3 feet from the top of the pipeline must be maintained at all points. Parking lots may require additional cover subject to acceptable stress load calculation due to anticipated vehicle/equipment type used on proposed pavement structure. All paved lots installed on the right-of-way shall consist of a flexible surface not to exceed 4 inches in thickness. Concrete paved lots or surfaces will be considered in some cases, if the area covered is limited to 50 feet or less. If approved, concrete surfaces shall include vent holes every 10 feet to allow for periodic leak surveys, and/or expansion joints every 10 feet along the pipeline right-of-way.
- (9) All parking lots planned within the Company's right-of-way should incorporate green areas (areas where surface access is not impeded by improvements) over the pipeline at intervals of approximately 60 feet but no more than 100 feet, measured along the pipeline centerline, may be covered by the paved parking surface. Green areas constructed at said 60 feet intervals should be a minimum of 9 feet wide, extending approximately 9 feet on each side of the pipeline.

## 8.0 RAILROAD CROSSINGS

Railroads should be installed with a minimum compacted cover over the carrier pipe, as measured from the base of the rail to the top of the pipe, as recommended by the American Railway Engineering and Maintenance-of-Way Association (AREMA), as follows: (see also Fig.12-1 and 12-2 below):

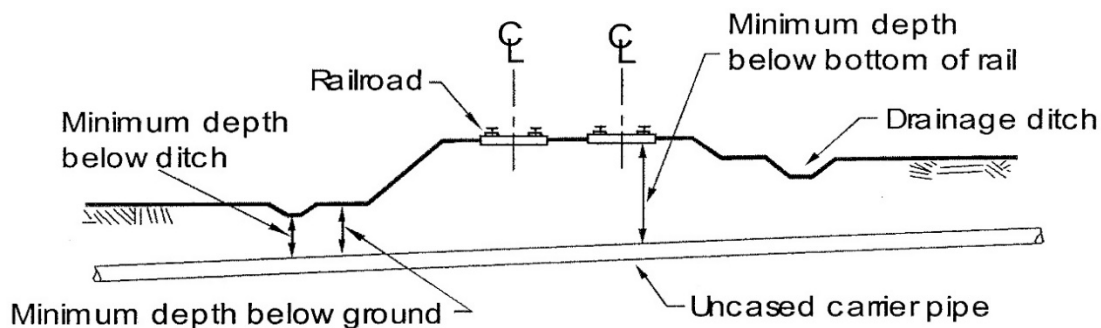
Location	Minimum Compacted Cover	
	Cased	Uncased
Under Track Structure Proper	6 feet	10 feet
Under all other surfaces within the right-of-way or from the bottoms of ditches	3 feet (4 feet for High Volatile Liquid)	6 feet

Figure 12-1: Cased Railroad Crossing



Source: API RP 1102 Steel Pipelines Crossing Railroads and Highways, 7th Edition

Figure 12-2: Uncased Railroad Crossing



Source: API RP 1102 Steel Pipelines Crossing Railroads and Highways, 7th Edition

## 9.0 TEMPORARY ACCESS ROADS AND HEAVY EQUIPMENT CROSSINGS

### 9.1. Temporary Access Roads

A minimum cover of 4 feet over the pipeline should be planned for temporary access road or temporary crossings for heavy equipment, subject to meeting the Company's evaluation of the load stress impact to the pipeline(s). Timber matting maybe required depending on the duration of the anticipated use of the access road.

### 9.2. Heavy Equipment Crossings

The Encroaching Party shall furnish the heaviest equipment type (make and model), size, weight and maximum axle load / track load proposed to cross Company's right-of-way (Timber matting or air-bridge over the pipeline maybe required).

## 10.0 WATERWAY CROSSINGS

- (1) New drainage channels and irrigation canals must have a minimum of 5 feet of cover from the bottom of the channel or canal to the top of the pipeline. Drainage channels and irrigation canals having less than 5 feet of cover must be concrete-lined or installed with concrete slab over the pipeline to withstand anticipated external loads and anticipated scour using an approved method and material.



- (2) River, creeks, and streams shall have a minimum cover of 20 feet, as measured from the waterway bottom/flow line elevation to the top of the pipeline.
- (3) Crossings should be at an angle as close to 90 degrees to Company pipelines as possible, but not less than 45 degrees.
- (4) Pipelines to be crossed shall have sufficient weight added to create negative buoyancy. This can be achieved by using concrete coating, bolt-on concrete anchors, or mechanical auger anchors.
- (5) Navigable Waterway dredging operations shall provide a minimum 75 feet of horizontal clearance between pipeline and closest mechanical, vacuuming or spudding down operations. Dredging operations shall provide a minimum of 20 feet of vertical cover between the waterway bottom/flow line elevation and the top of pipeline.

### 11.0 LOGGING OPERATIONS

No trees shall be felled on, over, or across Company's right-of-way. No trees or timber shall be stored on said right-of-way. No trees shall be trucked or skidded over or down the right-of-way without first obtaining approval from Company.

### 12.0 CONSTRUCTION-INDUCED VIBRATIONS

- (1) Construction activities that generate ground vibrations, including, but not limited to, concrete pile driving, steel sheet driving, soil compaction, pavement material compaction, hydraulic jack hammering, or any type of surface impact that will induce vibrations, shall be reviewed and approved by the Company prior to the activity.
- (2) If the Encroaching Party anticipates this type of activity within 100 feet from the pipeline, then continuous testing monitored by a seismograph located directly over the pipeline at its closest point to the activity should be conducted. The Encroaching Party shall provide, at their expense, the monitoring service contractor and equipment.
- (3) The Encroaching Party shall provide the make and model of the vibratory or compaction equipment. If construction-induced vibrations are associated with using pile driving or vibratory driving equipment, then the specifications of the equipment and the maximum anticipated energy shall be provided to Company.
- (4) The Encroaching Party shall determine and limit the maximum peak force allowed under continuous seismographic vibration monitoring such that the peak particle velocity will not exceed 5.0 inches per second. The peak particle velocity results shall be provided to Company or field representative. If results are above 5 inches per second, Company reserves the right to halt seismic activities to evaluate the integrity of the pipeline.

### 13.0 SEISMIC SURVEYING OPERATIONS

- (1) Third party planning to conduct seismic surveying operations within 300 feet from Company right-of-way for pre-blasting survey or to explore the presence of oil and gas, geothermal energy and other mineral deposits underneath the earth surface shall be reviewed and approved by the Company. Seismic surveying energy sources that generate seismic vibrations generally include shot hole blasting (refer to Section 14.0 Blasting Operations), seismic vibrators (vibroiseis trucks) or thumper truck (weight-drop truck).
- (2) Seismic Survey operations within 300 feet of the pipeline right-of-way:
  - (a) The third party must submit a seismic survey plan to Company for review and approval.



- (b) Seismic survey plans, when using vibroseis trucks to radiate ground vibrations, must include a seismic vibroseis survey report performed using vibroseis truck to determine safe distance and peak particle velocity results from above ground structures and underground pipelines. This survey report should include information on soil conditions, the anticipated number of vibrations, make and model of the vibroseis truck, anticipated peak particle velocity results, map layout of vibroseis truck locations with the anticipated closest horizontal distance to the pipeline right-of-way, safety measures and a copy of the permit approval to perform seismic operations.
- (c) The third party shall also arrange for a Company on-site inspector to be present to witness the seismic survey operations.
- (d) Seismic vibrations shall be monitored by seismograph instruments located directly over the pipeline at its closest point to the vibroseis trucks that provide peak particle velocity results. The third party shall provide, at their expense, the monitoring service contractor and equipment.
- (e) The encroaching party shall determine and limit the maximum peak force allowed under continuous seismographic vibration monitoring such that the peak particle velocity will not exceed 5 inches per second. The peak particle velocity results shall be provided to Company or a field representative. If results are above 5 inches per second, Company reserves the right to halt seismic activities to evaluate the integrity of the pipeline.
- (f) Seismic surveys shall not be conducted closer than 25 feet to the pipeline.
- (g) The Encroaching Party shall install sheet piling and/or open trench channels to protect the pipeline during seismic vibrating operations, as required by the Company.

#### 14.0 BLASTING OPERATIONS

Encroaching Party proposing blasting operations within 1/4 mile (1320 feet) of the pipeline right-of-way shall submit a comprehensive blasting plan to Company for review and approval.