



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

October 1, 2018

MEMORANDUM

TO: ALL DISTRICT ENGINEERS/MANAGERS

**FROM: THOMAS J. SMITH, P. E.
SECRETARY OF TRANSPORTATION/
COMMISSIONER OF HIGHWAYS**

A handwritten signature in blue ink, appearing to read "Thomas J. Smith", written over the printed name and title.

SUBJECT: OIL AND GAS PIPELINE CROSSING REQUIREMENTS

This memo will provide additional guidance for preparation of permit requests to construct facilities for pipelines that carry natural gas, petroleum products or other similar materials produced and carried through pipelines, along with the requirements found in the latest edition of the *ACCOMMODATION OF UTILITIES ON HIGHWAY RIGHT OF WAY AND ADJUSTMENT AND RELOCATION OF UTILITY FACILITIES ON HIGHWAY PROJECTS MANUAL*. In any instance where discrepancies exist between this guidance and the manual, these guidelines shall prevail.

A. CONTROLLED/LIMITED ACCESS (CA) HIGHWAYS

1. GENERAL

CA highways include interstates, APD, (Appalachian Development Highway System routes) and any other sections of highway that use fence lines as a means to mark Division of Highways (DOH) Right of Way and to control or limit access. Longitudinal pipeline installations are not permitted within the DOH Right of Way. Coring requests, access to work areas from the travel lane or shoulder, parking, equipment loading or unloading, or material loading and unloading will not be permitted from any travel lane or shoulder of the roadway. No interference with the traveling public shall be permitted. If an unexpected circumstance creates the need for traffic control, then the proper case from the latest edition of

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the *MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS* shall be used, with the approval of the District Engineer/Manager.

2. LOCATION

It is expected that all borings shall originate and terminate outside of controlled access right of way. Crossings are expected to be made perpendicular to the centerline of the highway. Small angular deviations (maximum skew of 15 degrees) may be approved as special circumstances are encountered.

Crossings should be planned for regions below fill areas; crossings may not disturb the fill slope, or place drill or bore pits within the fill slope limits. Areas such as cut slopes, drainage structures, and bridge structures are to be avoided. Some cut to fill transition areas have special rock fills or drainage blankets which must be considered. Drill or bore pits shall be located outside of the road right of way and as a minimum, 15 feet from the toe of the fill. All areas to be disturbed need to be reviewed for potential slip areas. Any evidence of prior slip activity must be considered when proposing a crossing location.

Crossings on level or gently sloping ground shall be constructed so their depth shall be sufficient to obtain the minimum ten feet cover required. In some instances, a slope stability analysis and/or a geotechnical report may be required prior to approval of the crossing location, depending upon the topography and the planned disturbance of the natural ground.

Once crossing is preliminarily approved at the District, DOH must get approval from FHWA before final approval can be given.

3. COVER

The minimum required vertical depth of cover for a crossing is 10 feet. The critical control point for cover on a pipeline crossing is the low point in the highway cross-section; usually the bottom of the roadway drainage ditch. When measuring cover over pipes, the commonly specified reference points are the bottom of the pavement base, natural ground, or the flow line of drainage ditches, whichever is lowest. A protective coating is considered part of the pipe. When the carrier is encased, cover is measured to the top of the casing. Minimum depth should be carried to the right of way line.

B. NON-CONTROLLED/LIMITED ACCESS HIGHWAYS

1. GENERAL

Non-CA highways include 1-lane, 2-lane or multi-lane roadways with no type of access control, such as US, WV, County Routes, HARP (Home Access Road

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Program routes) and State Forest routes under the control of DOH. Longitudinal pipeline installations are not permitted within the DOH Right of Way. Coring requests, access to work areas from the travel lane or shoulder, parking, equipment loading or unloading, or material loading and unloading will not be permitted from any travel lane or shoulder of the roadway. No interference with the traveling public shall be permitted. If an unexpected circumstance creates the need for traffic control, then the proper case from the latest edition of the *MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS* shall be used, with the approval of the District Engineer/Manager.

2. LOCATION

Subject to express authorization otherwise, it is anticipated that all borings shall originate and terminate outside of DOH right of way. Crossings are expected to be made perpendicular to centerline of the highway. Small angular deviations (maximum skew of 30 degrees) may be approved as special circumstances are encountered, with proper documentation.

3. COVER

Maximum pipe depth is desired under the roadway at all crossings. The minimum required vertical depth of cover for a crossing is 5 feet. The critical control point for cover on a pipeline crossing is the low point in the highway cross-section; usually the bottom of the roadway drainage ditch. When measuring cover over pipes, the commonly specified reference points are the bottom of the pavement base, natural ground, or the flow line of drainage ditches, whichever is lowest. A protective coating is considered part of the pipe. When the carrier is encased, cover is measured to the top of the casing. Minimum depth should be carried to the right of way line.

4. OPEN CUTS

Open cuts may be considered on these roadways on a case-by-case basis. New pavement and pavements in good condition should not be requested for open cutting. Backfill and compaction requirements, as found in the *ACCOMMODATION OF UTILITIES ON HIGHWAY RIGHT OF WAY AND ADJUSTMENT AND RELOCATION OF UTILITY FACILITIES ON HIGHWAY PROJECTS MANUAL* will be required. When reviewing open cut requests, consideration will be given to road condition, traffic volume and type of vehicles using the route, school and mail routes, the detour length and condition, the duration of a closure and if an overnight closure is involved. An on-site detour is preferred in all cases, for the health and emergency needs of the traveling public, and the residents served by the route. Approval of each location will be at the discretion of the District Engineer/Manager.

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Coordination will be required with emergency services, county school systems, local law enforcement, and news media on closure times or expected delays due to construction or detours.

C. CASING

1. GENERAL

It is recognized that a definite policy on the encasement of pipelines must take into account many inconclusive variables, not the least of which is the progressive improvements being made in the pipeline industry for strengthening and protecting carrier pipes. An arbitrary policy of requiring casing for all highway crossings is too expensive for both the utility consumer and the highway user. As an alternative to casing, the Operator or the Operator's contractor may increase the minimum depth of cover in lieu of placing casing, if proper stress calculations are performed. However, if the Operator or Operator's contractor wishes to use this method, they must first obtain approval from the DOH for each location this method is to be used. Casing will only be required in certain locations that the District Engineer/Manager determines are required to maintain the safety of the traveling public.

2. CASED CROSSING DESIGN

For cased road crossings, the calculated wall thickness required for the maximum allowable operating pressure shall be determined using the following:

**Liquid Pipeline - 0.72 Design Factor
Class 1 (Gas) - 0.72 Design Factor
Class 2 (Gas) - 0.60 Design Factor
Class 3 (Gas) - 0.50 Design Factor
Class 4 (Gas) - 0.40 Design Factor**

The wall thickness shall meet or exceed the Title 49 CFR 192,193 and 195 current requirements for road crossings. DOH will require one class higher than the calculated required thickness for all major road crossings.

3. UNCASED CROSSING DESIGN

For uncased road crossings, the calculated wall thickness required for the maximum allowable operating pressure shall be determined using the following:

**Liquid Pipeline - 0.50 Design Factor
Class 1, 2, 3 (Gas) - 0.50 Design Factor
Class 4 (Gas) - 0.40 Design Factor**

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The wall thickness shall meet or exceed the Title 49 CFR 192, 193 and 195 current requirements for road crossings. DOH will require one class higher than the calculated required thickness for all major road crossings.

D. PERMIT APPLICATION SUBMITTAL

1. GENERAL

An individual crossing permit shall be required for each location at which the pipeline crosses the State Highway Right of Way. The permit for the crossing may include accesses from the State Highway Right of Way on each side of the road within the crossing's limits, only within non-CA right of way areas.

2. PERMIT APPLICATION FORMS

The Oil & Gas Information Data Sheet will contain all information needed for DOH personnel to initiate a new permit in the database. It must include contact personnel for permit questions and for personnel in charge of field construction. All necessary hauling route information will also be included on the Data Sheet.

3. SITE PHOTOS

Photos in the four directions of each entrance/crossing should be included with the submittal. These need to be captioned and have a recognizable land mark shown or referenced in the photo. The proposed site needs to be staked before submitting the permit application.

4. MAP

A site-specific map showing the location of the proposed project should include the hauling routes used. The DOH prefers a portion of the latest County Maps be used for this. When the pipeline crossing is a part of a larger pipeline project with multiple crossing and accesses, it is recommended to provide an overview map showing the centerline of the entire project on the County Maps. This is helpful for the District personnel to plan site and route reviews more efficiently in order to minimize the time needed to approve the permit.

5. PROPOSED PLANS

Plan, profile and cross-sectional views of proposed plans are to be included with each application showing depth of cover and original ground slopes for both sides of the roadway extending at least to the Right of way limits. No access or break of controlled access will be permitted from within the roadway right of way.

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When the cut or fill slope is steeper than 2:1, a slope stabilization plan shall be included in the plan submittal.

6. PIPE CALCULATIONS

High pressure pipelines with an operating pressure over 150 psi will be considered individually to determine if they will present a danger to the traveling public. The pipe thickness under the roadway shall be increased 1 class above the calculated required thickness. The pipe wall thickness under the roadway shall be as calculated in C.2 or C.3 above. The application for permits for these lines shall include the operating pressure, the maximum allowable operating pressure and safety calculations signed by a WV licensed Professional Engineer which shall comply with the Title 49 Code of Federal Regulations Part 192.

7. METHOD OF REPAIR

The submitted application shall include a general plan for repair or replacement of this pipeline crossing structure, in case of a leak or defect.

8. TRAFFIC CONTROL PLAN

If traffic control is required, then the proper case from the latest edition of the *MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS* shall be used, and included with the original application. If an open cut is approved by the District Engineer/Manager, a traffic control plan specifically for an open cut will be included. As a general rule, the DOH would prefer not to detour traffic at a pipe crossing, unless absolutely necessary. Any detour routes used by the Operator will be maintained by the Operator.

E. INSPECTION

The DOH will make every effort to provide proper inspection of the pipeline crossing work with in-house workforce. The Contractor will provide the DOH with as-built notes, plans, or other documentation that verifies the pipeline was constructed at the proper location and grade, unless directed otherwise.

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TJS:Mb

cc: SEC, CC, CA, CL, CW, CB, CM, AC, AL, CH, HO, HD, OM