Sub-part 7501 - Maintenance

Chapter 04001 Underground Utility Crossings

Purpose

100 To establish a policy for underground utility line crossings, encroachments and tunneling permits and to establish the responsibility for construction and maintenance of all such work on Mississippi Department of Transportation Right of Way.

101 This rule sets forth the requirements for the construction and maintenance necessary for permitting underground utility line crossings under bridges, box bridges without floors, crossings of highways, roads, streets and frontage roads and for encasements and tunneling on Mississippi Department of Transportation Right of Way. Reference is made to Forms MND-002 and MND-005.

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USE OF DRAINAGE OPENINGS PROHIBITED

200 Underground utility lines crossing highways, frontage roads, and intersecting roads and streets within the right of way may not use the opening of a drainage structure as a means of obtaining the crossing, except that underground crossings may be placed in the proper depth trench under box bridges without floors and under bridges provided such locations will not be so near piers, piling or foundations that damage may occur or the line conflict with bridge supports, abutment fill slopes or slope paving.

JACKING, DRY BORING, BORING WITH DRILLING FLUIDS, TUNNELING AND DIRECTIONAL BORING REQUIREMENTS

300 Underground utility lines crossing dirt or gravel surfaced highways, frontage roads, intersecting roads and streets maintained by the Department may be accomplished by open trenching. After the encasement or the carrier pipe is laid, the trench will be immediately backfilled in lifts not exceeding six (6) inches thick, each lift being compacted to a density equal to or exceeding that of the adjacent material. The original surface will be restored. Where the facility to be crossed is open to traffic, one traffic lane will be kept open at all times. Underground utility lines crossing treated design soils, sub-bases, bases or pavements of highways, frontage roads, and intersecting roads and streets maintained by the Department will be accomplished by jacking, dry boring, boring with drilling fluids tunneling or directional boring in accordance with the requirements listed on Permit Form MND-002, Application for Permit to Construct Pipeline Along or Across State Highway, etc., Attachment A, Jacking, Dry Boring, Boring with Drilling Fluids, Tunneling and Directional Boring.

301 For all permits under this section, a Performance Bond, Form MND-603 may be required at the discretion of the District Engineer. The amount of the Performance Bond ($10,000 min. if required) shall be determined by the District Engineer based upon the proposed work.

DRIVEWAYS

400 The maintenance of paved driveway connections to abutting property is the responsibility of the abutting property owner and the utility owner is responsible to such person or persons for the method used in accomplishing the driveway crossing. The maintenance of private unpaved driveway connections to abutting property is the responsibility of the Department, but the utility owner is responsible to such person or persons for the method used in accomplishing the driveway crossing and for returning the driveway to a condition acceptable to the abutting property owner. (Reference is made to Rule 37.I.7501.03002, Construction and Maintenance of Driveway, ---Connections to State Highways).

CONSTRUCTION DETAILS - OPEN TRENCHES - ENCASEMENT LENGTHS

500 All lines required to be jacked or bored and not required to be encased will be of material of adequate strength and design for jacking or boring; in lieu thereof, an encasement of adequate strength and design may be jacked or bored and the carrier pipe inserted therein.

501 Encasements will extend at least six (6) feet from the toe of fill slopes and at least six (6) feet from the ditch line in ditch sections; however, all encasements will extend at least ten (10) feet from the roadway shoulder when shallow or no ditch sections; flat slopes, etc. are encountered. (See Attachment A for details). The required encasement lengths and limits for the specific permit shall be determined by the District on a case-by-case basis.

Open trenches approaching jacked, bored or tunneled crossings will not be excavated more than two (2) feet toward the highway from the end of the encasement. No open trench in cut sections or no ditch sections will encroach upon the pavement base, sub-base or treated design soil. Depth of cover will be sufficient to clear any pavement base, sub-base or treated design soil by at least one (1) foot and in no instance should the top of the encasement or the carrier pipe be less than thirty-six (36) inches below any ditch bottom. Crossing approaches and parallel lines shall have thirty-six (36) inches minimum cover. Where soil conditions, depth of trench, or other factors constitute a hazard to the roadway or to the highway user, the length of encasement and open trench restrictions will be increased as necessary. Where necessary, sheeting may be required. All fuel carrier pipes which are required to be encased or on which encasements are used will be vented. Vents will be placed on the right of way line or not more than one (1) foot inside the right of way and the top of the vent will be located three (3) feet above the ground as a minimum. In municipal or other built-up sections, there is often not enough street width to provide the required open trench clearances or sufficient space for boring, jacking or tunneling pits. These instances will be treated as special cases, each according to its merits. They should be fully documented and referred to the State Maintenance Engineer for disposition.

502 Unless there are overriding practical considerations, carrier pipes or encasements as required or used shall be jacked, bored or tunneled across the medians of all 4-lane conventional, partially controlled and fully controlled access highways in order that construction and maintenance equipment and personnel in the medians will be eliminated. Where encasements are required and permitted to be laid in open trenches, they will also be continued across these medians.

503 Where encasements are required or used under the through and/or auxiliary lanes or ramps of fully controlled access highways, such encasements shall extend from the through and/or auxiliary lanes or ramps a minimum distance of two (2) feet outside the control of access line.

PRESSURE PIPELINES CARRYING LIQUIDS - ENCASEMENT REQUIREMENTS

600 Pipelines that are subject to the requirements of the Mississippi Public Service Commission shall be constructed in accordance with its requirements.

601 Pressure pipelines carrying liquids such as water, sewage, crude oil and petroleum that cross under roads, streets, frontage roads, ramps, conventional highways, partially controlled and fully controlled access highways will be encased as required in paragraphs 2, 3 and 4 of Section D above; however, pressure pipelines carrying hazardous liquids (crude oil and petroleum products) will not require encasement provided the pipeline company meets the requirements listed in SECTION 602.

602 If the pipeline company wishes to place a pipeline that is not encased under Department roadways, the pipeline company shall be required to submit a letter, along with the permit application, from a registered professional engineer certifying that the pipeline to be

placed under Department roadways meets the standards set forth in the United States Code of Federal Regulations (CFR), Title 49, Part 195-TRANSPORTATION OF HAZARDOUS LIQUIDS BY PIPELINE. The pipeline company shall also submit pipeline design calculations along with the permit application and the above referenced certification.

603 When an existing casing for a water line(s) is extended due to highway improvements, the new and existing casing connection may be made using the welding process and/or the use of mechanical couplings designed for this type of work.

604 The encasement material shall be steel pipe. If requested and approved by MDOT, HDPE pipe may be substituted for the steel encasement. Should a Utility company request using HDPE Pipe in lieu of steel for a crossing, they must place it six (6) feet below the ditch bottom or three (3) feet lower than the requirement for a steel encasement. The utility company will certify, by a registered professional engineer, that the HDPE pipe encasement meets industry standards for highway crossings. An example certification can be found in SECTION 1200 - 1203.

GRAVITY FLOW PIPELINES CARRYING LIQUIDS - ENCASEMENT REQUIREMENTS

700 Gravity flow pipelines carrying liquids such as water, sewage, crude oil and petroleum products when crossing under roads, streets, frontage roads, ramps, conventional highways, partially controlled and fully controlled access highways will not be required to be encased other than as set out in SECTION 500. If encasements are used, they shall be in accordance with SECTIONS 501 – 503.

PRESSURE PIPELINES CARRYING GASES - ENCASEMENT REQUIREMENTS

800 Pipelines carrying gases that are subject to the requirements of the Mississippi Public Service Commission shall be constructed in accordance with its requirements.

801 Pipelines carrying gases with a pressure of forty-five (45) pounds per square inch or less will not be required to be encased under roads, streets, frontage roads, ramps, conventional highways, partially controlled and fully controlled access highways other than as set out in SECTION 500. If encasements are used, they shall be in accordance with SECTIONS 501 - 503.

802 Polyethylene pipelines carrying gases for service lines operating under low pressure will be permitted outside the limits of the highway roadways without encasement. Any polyethylene gas pipeline that is permitted to be installed under the highway roadway must be encased and vented. Any encasement shall be in accordance with SECTIONS 501 – 503.

803 Gas pipelines carrying gases with a pressure in excess of forty-five (45) pounds per square inch crossing under roads, streets, frontage roads, ramps, conventional highways, partially controlled and fully controlled access highways shall be encased unless such

pipelines have regularly inspected and adequately maintained cathodic protection in accordance with the utility company's safety program and extra strength pipe is used for the length required to be encased in SECTION 500. Pipe will be considered extra strength when either the wall thickness is increased a minimum of ten (10) percent above that used for the design pressure of the subject line or the extra strength is achieved by use of pipe having ten (10) percent higher minimum yield strength. Pipe will also be considered extra strength when the combination of diameter, wall thickness and tensile properties is such that the internal pressure required to produce a hoop stress in the crossing pipe equal to its minimum yield strength is at least ten (10) percent higher than the internal pressure required to produce a hoop stress in the pipe on either side of the crossing equal to its minimum yield strength. If encasements are used, they shall be in accordance with SECTIONS 501 – 503.

805 When application is made to construct a gas line crossing, the application will show the maximum pressure under which the line will be operated. If the maximum pressure is in excess of forty-five (45) pounds per square inch and the line is not to be encased, the applicant will be required to make the following statement as a condition for the approval of the application:

(1) We/I _____ do hereby certify that the gas line crossing(s)
Applicant
shown on this application is/are to operate under a pressure in excess of forty-five (45) pounds per square inch and will have regularly inspected and adequately maintained cathodic protection in accordance with the company's safety program and extra strength pipe will be used under the roadway as shown herein.

I, also, hereby certify that I have the authority to make the certification herein and to bind _____ concerning such certification.
Applicant

Certified_____
Name of Company
Official

_____
Title

806 The encasement material shall be steel pipe. If requested and approved by MDOT, HDPE pipe may be substituted for the steel encasement. Should a Utility company request using HDPE Pipe in lieu of steel for a crossing, they must place it six (6) feet below the ditch bottom or three (3) feet lower than the requirement for a steel encasement. The utility company will certify, by a registered professional engineer, that the HDPE pipe encasement meets industry standards for highway crossings. An example certification can be found in SECTION 1200 - 1203.

807 Plastic pipe that is not encased requires a tracer wire. The tracer wire shall not come in contact with the plastic carrier pipe.

COMMUNICATION LINES - CABLES - DUCTS-ENCASEMENT REQUIREMENTS

900 Communication cables will not be required to be encased; however, encasements may be permitted at the request of the applicant. The cables shall be placed in bores where open trenching is not permitted. The bore diameter may not exceed the tolerances stated in Attachment A of Rule 37.I.7501.04005. If encasements are used, they shall be in accordance with SECTIONS 501 - 503.

901 Ducts will be required to be encased as set out in Sections B and D above. If encasements are used, they shall be in accordance with SECTIONS 501 - 503.

902 The method of construction will be that which will enable the line to be maintained without entering fully controlled access areas.

903 Unless there are overriding practical considerations, bores for placing cables under the Department's roadways will continue across the medians of all 4-lane conventional and partially controlled access highways in order that construction and maintenance equipment and personnel in the medians will be eliminated.

ELECTRICAL POWER LINES-ENCASEMENT REQUIREMENTS

1000 Electrical power lines that are subject to the requirements of the Mississippi Public Service Commission shall be constructed in accordance with its requirements.

1001 Electrical distribution power lines (7,200 to 13,000 Volts), when approved for crossing under roads, streets, frontage roads, ramps, conventional highways, partially controlled and fully controlled access highways, shall be encased throughout the entire highway right of way and extend a minimum distance two (2) feet outside the highway right of way lines. Underground transmission power lines will not be permitted to be installed parallel or crossing the highway right of way. Reference Rule 37.I.7501.04015, Parallel Utility Lines and Overhead Crossing Encroachment Permits.

1002 The encasement material shall be steel pipe. If requested and approved by MDOT, HDPE pipe may be substituted for the steel encasement. Should a Utility company request using HDPE Pipe in lieu of steel for a crossing, they must place it six (6) feet below the ditch bottom or three (3) feet lower than the requirement for a steel encasement. The utility company will certify, by a registered professional engineer, that the HDPE pipe encasement meets industry standards for highway crossings. An example certification can be found in SECTION 1200 - 1203.

REPAIRS OF LEAKS

1100 Where leaks occur in unencased pipelines or failures occur in other lines within areas where access or excavation is not permitted, a parallel crossing or loop line shall be installed in accordance with these regulations and the faulty line plugged at both ends; where conditions warrant, the faulty line may be required to be filled with grout or other acceptable material. Such leaks shall be promptly repaired or bypassed upon request of the Department. Leaks in any other line will be promptly repaired upon request of the Department.

ENCASEMENT PIPE SPECIFICATIONS

1200 Encasements of corrugated metal pipe and pipe with flanges or protuberances that violate the tolerances allowed in Attachment A of Rule 37.I.7501.04005 will not be permitted.

1201 Corrugated metal and flanged pipe meeting the Mississippi Standard Specifications For Road and Bridge Construction, Current Edition, may be used as encasements or carrier pipes when laid in open trenches in areas having acceptable soil conditions.

1202 Steel pipe encasements twelve (12) inches in diameter or greater shall be new or in good condition and shall conform to ASTM Specification A-252 Gr. 2 or better. Such pipe will be of thickness required to withstand all external and internal stresses and will be of a thickness not less than the following:

12" diameter . . . . . .0.188"
14" diameter . . . . . .0.188"
16" diameter . . . . . .0.188"
18" diameter . . . . . .0.188"
24" diameter . . . . . .0.250"
30" diameter . . . . . .0.250"
36" diameter . . . . . .0.250"
60" diameter . . . . . .0.250"

1203 Should a Utility company request using HDPE Pipe in lieu of steel for a crossing they shall certify by a registered professional engineer the following. "I,_____, P.E. hereby certify that the proposed High Density Polyethylene Pipe to be used as an encasement contained in this permit meets all industry standards for certified HDPE pipe and that the design meets the requirements for its use for underground highway crossings or parallel installations."

REFERENCES (All references herein to other materials are as to the most current version of that particular document.)

1300 37.I.7501.04002, "Right of Way Encroachment Permits," including references

1301 37.I.7501.03002, "Construction and Maintenance Driveways, County Roads and Municipal Street Connections to State Highways"

Mississippi Public Service Commission Rules and Regulations

United States Code of Federal Regulations (CFR), Title 49, Part 195-Transportation of Hazardous Liquids by Pipeline

Mississippi's Standard Specifications for Road and Bridge Construction, Current Edition

37.I.7501.04015, Parallel Utility Lines and Overhead Crossing Encroachment Permits

37.I.7501.04005, Application for Permit to Construct Pipeline, Form MND-002, Attachment A

37.I.7501.04009, Instructions for Processing Form MND-012, Agreement and Form MND-603, Performance Bond

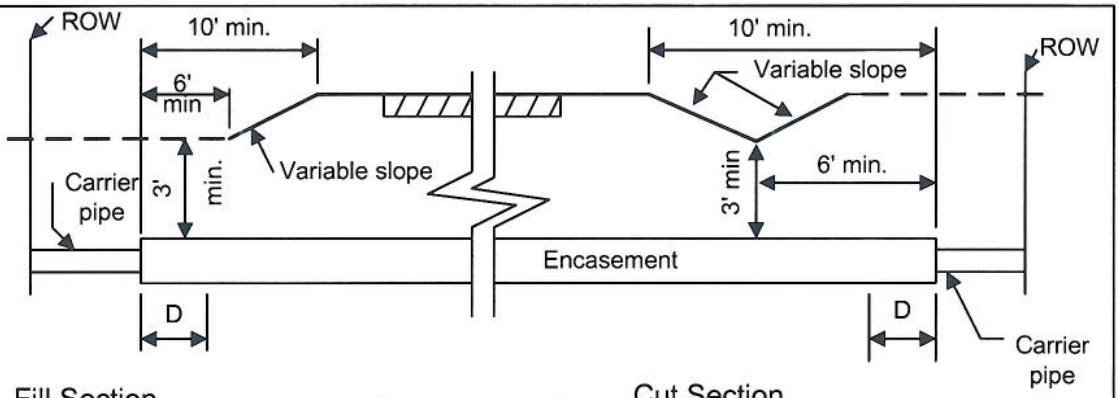
Attachment A, Encasement Typical Sections

For Mississippi Code see www.state.ms.us

For Federal Government U.S. Code see www.gpoaccess.gov or www.dot.gov

MDOT specific rules, forms, publications, SOPs, and other support documentation are available for review at MDOT

Attachment 'A'
Encasement
Typical Sections



Fill Section

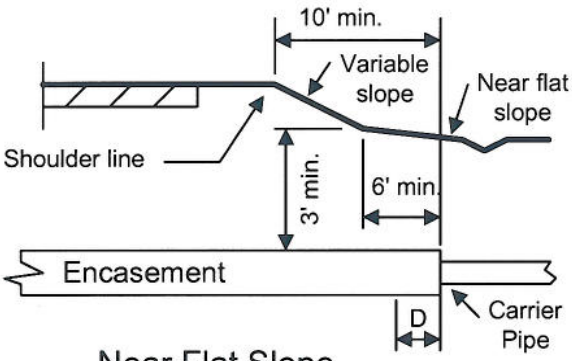
NOTE: Vents are required on encasements carrying fuel products

Encasement Typical Section

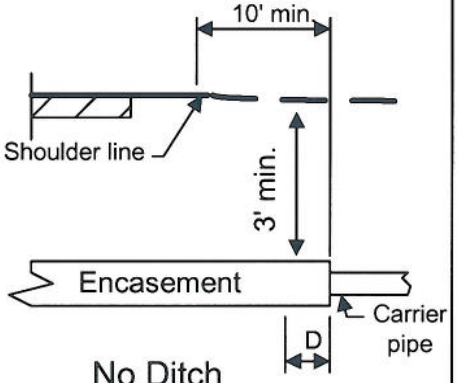
NOTE: D=2' Max for all installations

Cut Section

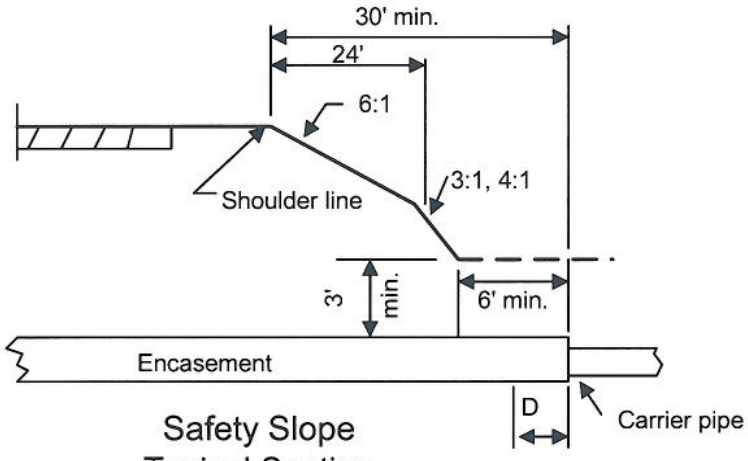
NOTE: Open trenches will not be excavated more than two (2') feet from end of encasement toward the highway.



Near Flat Slope Typical Section



No Ditch Typical Section



Safety Slope Typical Section