

INTERIM GUIDELINES FOR
HORIZONTAL DIRECTIONAL DRILLING (HDD) UNDER
UNION PACIFIC RAILROAD RIGHT-OF-WAY

Preface: The American Railway Engineering and Maintenance-of-Way Association (AREMA) has assigned a working committee to develop a recommended railroad industry practice for horizontal directional drilling (HDD) under railroad rights-of-way. These interim guidelines are issued by the Union Pacific Railroad (UPRR) pending completion of the AREMA recommended practice, at which time UPRR will review and determine whether to adopt it.

Scope: All pipelines proposed for installation under UPRR right-of-way and trackage using HDD. Fiber optics installation under the jurisdiction of the UPRR Information Technologies (IT) Department with 10 inch or smaller diameter casing pipe shall follow the guidelines outlined in the current version of the "Fiber Optic Engineering, Construction and Maintenance" Standard Manual.

1. For all liquid or gas pipelines, only steel pipe may be installed under tracks or UPRR right-of-way utilizing HDD. The pipe may be used as a carrier pipe or a casing pipe. Plastic carrier pipe, if used, must be installed in a steel casing.
2. For fiber optics (not under the jurisdiction of UPRR IT Department) or electrical installations, plastic (PVC or HDPE) pipe may be used as a conduit.
3. For all liquid or gas installations or for nominal pipe sizes exceeding 6 in., minimum cover (measured from base of rail to top of pipe) shall be 25 ft, regardless of product. For fiber optics or electrical installations, with casing/conduit nominal size of 6 in. or less, minimum cover shall be 15 ft. Applicant submittal shall include actual planned depth of pipe under each railroad track.
4. Applicant must provide pipe specifications. Pipe must satisfy AREMA recommendations and all applicable government and industry regulations.
5. Applicant must provide qualifications of drilling contractor including specific instances of previous successful experience in drilling under sensitive surface facilities.
6. Prior to commencement of drilling:
 - A. The contractor must submit an Installation Plan that describes the anticipated rig capacity, the proposed equipment and the method for advancing the borehole through expected soil conditions, angles, depth and exact location of the exit ditch, the pilot hole diameter, the proposed reaming plan, including the number and diameter of pre-reams/back-reams and diameter of the final reamed borehole, and the contingency equipment and plans for dealing with soil conditions that a soil engineer could reasonably expect to be encountered at the proposed HDD installation site. The Installation Plan will also address the anticipated hours of operation during the HDD borehole drilling and installation process, the minimum number of personnel, and their responsibilities on-duty and on-site during all HDD drilling operations.
 - B. The contractor must provide a detailed Fracture Mitigation (frac-out) Plan including method of monitoring and capturing the return of drilling fluids with particular attention to prevention of inadvertent escape of drilling fluids where they could undermine the Railroad tracks.
 - C. Establish a Survey Grid Line and provide a program of monitoring and documenting the actual location of the borehole during drilling operations.
7. A railroad observer and an applicant inspector are required to monitor the ground, ballast, and track for movement during the drilling, reaming, and pullback processes. All work within the Railroad right-of-way must be coordinated with the Railroad flagger. The installation process and all train movement must be immediately stopped if movement is detected. The damaged area must be immediately reported to the Railroad and immediately repaired subject to Railroad review and approval. The installation process must be reviewed and modified as required before the installation

may proceed. Applicant must pay Railroad's expenses for review, observation of installation, and flagging.

8. Upon completion of the HDD installation work, the contractor shall provide an accurate as-built drawing of the installed HDD segment. As-built drawings will include both horizontal and profile plans.

Union Pacific Railroad
Office of AVP Engineering Design
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