Blue Springs Missouri

Right-of-Way Permit

Horizontal Directional Drilling Guidelines Handbook

Updated: July, 2015

Introduction

This Handbook is intended to be used as a basic guide for Horizontal Directional Drilling (HDD) applications performed within the City of Blue Springs. The overall purpose is to provide guidelines that will help ensure public safety and protection of existing underground facilities. This protection effort is made up of many different aspects and each one has been addressed within this booklet.

This guideline handbook is not intended to be a step-by-step procedure manual, but rather a collection of fundamental elements of the HDD process.

By following these guidelines, all involved can better assure that all reasonable steps have been taken to ensure public safety and to protect existing underground facilities.

Any ideas for the improvement of this handbook and our protection effort are welcomed.

Contact Information

City Contacts:

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Other Contacts:

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USDA, NRCS- Soil Survey Division…… (573) 876-9409
Missouri Dept. of Natural Resorces (MDNR)..... (816) 622-7000
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Additional Contacts:

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Design Guidelines

Prior to submitting an application for a Right-of-Way Permit to the City of Blue Springs that will involve horizontal directional drilling (HDD), the Permittee (or its designer) shall undergo a thorough design process. At a minimum, the Permittee shall complete the following tasks prior to submitting a Right-of-Way Permit application:

- Prepare or obtain scaled mapping for the planned installation including all exiting surface facilities and improvements and including any indication of underground facilities or improvements.

- Collect existing underground utility information including the horizontal location of all known substructures (expected) and including the depth of all known substructures (whenever possible).

- Obtain Right-of-Way information through GIS, survey records, or other sources.

- Obtain general and/or specific geotechnical information (as required or deemed necessary by the Permittee or Engineer) including USDA Soil Conservation Service data for the project area -and possibly including site-specific geotechnical sampling and analysis.

- Prepare Construction Plans using the information noted above
  including the location of all planned improvements,
  including existing underground utility information, and
  including right-of-way limits and property ownership information (as required).

Design Guidelines (Continued)

In addition to the design requirements listed previously, the Permittee (or its designer) should perform the following:

- Consider the minimum horizontal and vertical clearance requirements (see HDD Minimum Clearances, pages 4 and 5) when determining the HDD alignment
  - including road setbacks and existing surface features,
  - and including exiting underground utilities and other underground facilities;

- Consider product pipe and reamer diameter requirements

Product Diameter	Reamer Diameter[1]
<8"	Product+ 4"
8" to 24"	Product * 1.5
>24"	Product + 12"

- Consider the bore geometry for the given ground profile including bore length(s) and depth requirements, and including bending radii for the final product pipe
  - (Typically 100' radius per 1 inch product diameter, with 600' to 1,000'
  - radius minimums depending on subsurface materials and equipment requirements);

- Consider drilling equipment requirements for the given geotechnical conditions, geometry and final product diameter
  - including thrust and pullback ratings
  - including mud motors vs. jetting heads and including wireline vs. walkover tracking systems;

- Consider equipment and material handling requirements including drilling fluid and drilling fluid containment and including drill operation and final product staging.

- Consider material strengths, capacities, and coupling methods.

1. HDD Consortium, Horizontal Directional Drilling, Good Practices Guidelines, May 2001, p. 2-4.

Right-of-Way Permit Application Requirements

- ❖ Provide proposed Project Information
  - including project type (communication, gas, etc.),
  - and including system capacities (types, pressures, etc.).

- ❖ Provide Construction Plans based on scalable mapping and in accordance with the city's Plans Submission Requirements
  - including the proposed alignment (dimensioned),
  - including existing utility information (within 25' of the proposed facility), and
  - including right-of-way information (from GIS, Utilities, survey records, or other sources).

- ❖ Provide proposed facility information and details
  - including final product material type and dimensions,
  - including proposed depths of cover and clearances, and
  - including all proposed above and below grade structures.

- ❖ Provide specific installation requirements or typical installation parameters indicating the design bending radii and diameter(s).

- ❖ Provide assumed subsurface geotechnical conditions based on experience, USDA Soil Survey data, or site-specific soils report.

- ❖ Provide a Traffic Control Plan in accordance with the City of Blue Springs, Design and Construction Manual and the latest edition of the Manual on Uniform Traffic Control Devices

- ❖ Provide a Storm Water Pollution Prevention Plan as required by MDNR for installations that will disturb greater than 5 acres. For installations that will disturb less than 5 acres, see Storm Water Pollution Prevention Best Management Practices, Page 10.

- ❖ Provide a Construction Schedule indicating the proposed start date(s), completion date(s), and restoration schedule.

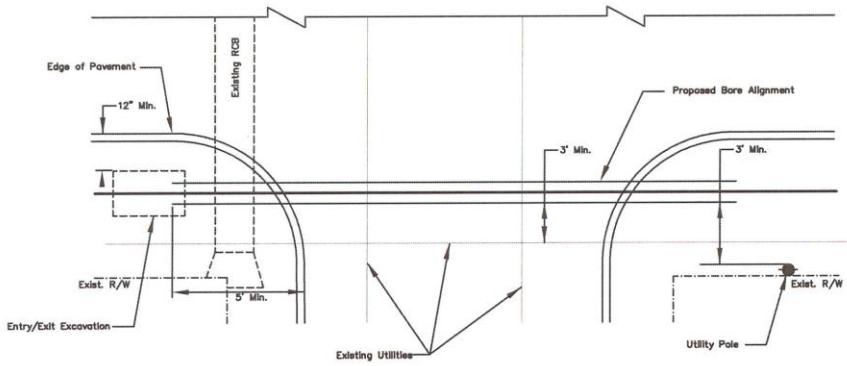
Blue Springs Missouri

STANDARD DETAILS

HORIZONTAL DIRECTIONAL DRILLING INSTALLATION

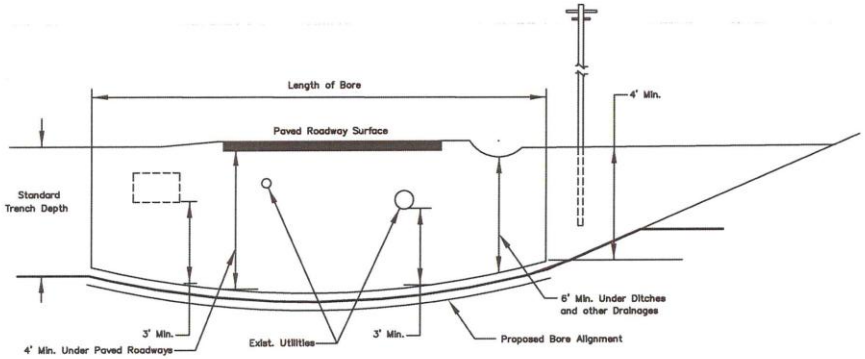
NO.	DATE	BY	REVISIONS REMARKS

DRAWN BY: PWC
DETAIL NO.: STR-08
APPROVED BY:
DATE: 07-08-15
SCALE: NO SCALE



Horizontal Minimum Clearances

Not to Scale



Vertical Minimum Clearances

Not to Scale

HORIZONTAL DIRECTIONAL DRILLING INSTALLATION

HDD Installation Notes:

1. Blue Springs Municipal Code and Blue Springs Design and Construction Manual are incorporated, except as otherwise noted.
2. All Horizontal Directional Drilling (HDD) installation activities shall be in compliance with the Blue Springs HDD Guidelines Handbook.
3. The permittee shall be responsible for notification of one-call services and coordination of all utilities prior to costruction.
4. Drilling fluids shall be contained and removed immediately upon bore completion.
5. All construction materials shall be removed from the site prior to restoration of disturbed areas.
6. All restoration work shall match existing or better condition. In restoring the right-of-way, the permittee guarantees its work and shall maintain it for 24 months following its completion.
7. Excavations under paved surfaces shall be restored in compliance with the Blue Springs standards for street trenching located in the Design and Construction Manual.

Construction Safety Guidelines

Prior to performing work involving HDD under a Right-of-Way Permit, the Permittee (or its Contractor) shall consider the following safety guidelines:

- Perform all operations in compliance with OSHA guidelines and insure that all personnel are properly trained and equipped to work in the public right-of-way;

- Insure that the approved traffic control plan (required with the permit application) is implemented and followed at all times;

- Insure that all storm water pollution prevention measures (required with the permit application) are implemented and followed at all times;

- Insure all setbacks, offsets, and clearances are maintained;

- Insure that utility Locates and City or other utility coordination requirements have been met (See page ii);

- Positively identify (by potholing) all crossed utilities that are expected to be
  - above and within 5' of the proposed vertical alignment,
  - below and within 3' of the proposed vertical alignment,
  - and additionally as requested by the City Engineer;

- Positively identify (by potholing) all parallel utilities at the beginning and ending of all bores and
  - every 200' if it is within 5' of the proposed alignment,
  - every 50' if it is within 3' of the proposed alignment,
  - and additionally as requested by the City Engineer.

- The HDD Contractor shall have a planned response in the event of a utility strike including utility owner notification and
  - avoiding electrocution in the event of an electric strike,
  - avoiding combustion in the event of a gas line strike,
  - avoiding contamination in the case of a sewer strike.

Drilling Fluid Containment and Disposal Requirements

The HDD Contractor shall contain, handle, and dispose of drilling fluids in accordance with the following requirements:

- ❖ All drilling fluid and fluid additives shall be disclosed, and Material Safety Data Sheets (MSDS) shall be provided to the City Engineer upon request.

- ❖ Excess drilling fluid shall be confined in a containment pit at the entry and exit locations until recycled or removed from the site.

- ❖ Precautions shall be taken to insure that drilling fluid does not enter roadways, streams, municipal storm or sanitary sewer lines, and/or any other drainage system or body of water.

- ❖ Unintended surfacing of drilling fluid shall be contained at the point of discharge and recycled or removed from the site.

- ❖ Drilling fluids that are not recycled and reused shall be removed from the site and disposed at an approved disposal site.

- ❖ Drilling fluids shall be completely removed from the construction site prior to back filling or restoring the site.

- ❖ Collection, transportation, and disposal of drilling fluids shall be environmentally safe and comply with local ordinances and government regulations.

Construction Requirements

All construction work shall be performed in accordance with the City of Blue Springs Municipal Code, Chapter 13, and as outlined below. For all work involving horizontal directional drilling under a Right-of-Way Permit, the Permittee (or its Contractor) shall perform the following:

Prior to Construction:

- The HDD Contractor shall familiarize itself with the work area and the technical requirements of the plans;

- The Permittee (or its Contractor) shall establish construction marking/staking, prior to construction, to indicate
  - HDD entry and exit locations, and
  - proposed HDD alignment at 50 foot (max) intervals;
- Provide the city with a contact list of all crew foremen;

During Construction:

- The HDD Contractor shall calibrate its tracking and locating equipment at the beginning of each work day;

- The HDD Contractor shall monitor and record the alignment and depth readings provided by the tracking system
  - every 25 to 30 feet (8 to 9 meters) for normal conditions,
  - every 5 to 10 feet (2 to 3 meters) where precise alignment control is necessary;

- The HDD Contractor shall complete the HDD installation as designed and permitted both horizontally and vertically unless otherwise authorized by the Director of Public Works;

- The HDD Contractor shall attempt to maintain drilling fluid circulation throughout the HDD process
  - during the initial pilot hole installation, and
  - during the reaming and back pull process(es)
    (Do not out pull the fluid circulation rate).

Construction Requirements (Contd.)

- The HDD Contractor shall not expand the bore hole by more than six inches (6") using only compaction reamer(s).

- The HDD Contractor shall plan its reaming and back pulling operations carefully to insure that, once started, all reaming and back pulling operations can be completed without stopping and within the permitted work hours;

- The HDD Contractor shall at all times and for the entire length of the HDD alignment be able to demonstrate
  the horizontal and vertical position of the alignment,
  the fluid volume used, return rates, and pressures;

- The HDD Contractor shall inspect the work and surrounding area to insure that no construction-related damage has occurred
  including heaving or humping of paved surfaces, yards, and
  including drilling fluid fractures or releases

- At the request of the City Engineer, the Contractor shall provide access for inspection of the HDD operations;

Following Construction:

- The Permittee shall notify the Director of Public Works upon completion of the authorized work;

- Prior to the start of backfilling excavations under paved surfaces, the Permittee shall notify the Director of Public Works to schedule an inspection. Upon completion of all right-of-way restoration activities, the Permittee will schedule a closeout inspection.

- The Permittee (or its Contractor) shall insure that all cleanup and restoration is in compliance with the city's Design and Construction Manual.

- The Permittee's 4 year maintenance period will not begin until any corrective actions required have been completed and inspected to the Director of Public Works satisfaction.

Storm Water Pollution Prevention Best Management Practices

All construction activities shall be performed in accordance with the National Pollution Discharge Elimination System (NPDES) as regulated by the Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (MDNR), and the City of Blue Springs.

The Permittee (or its Contractor) shall implement Best Management Practices (BMPs) to insure that storm water runoff is not contaminated by sediment caused by land disturbances associated with construction activities. For a full list and discussion of recommended BMPs, please see the following BMP publications:

Publication: .....*Construction Site Storm Water Runoff Control*
Source: .....*http:llwlFw.epa.gov/npdeslmenuofhmps/menu.htm*

Publication: .....*Protecting Storm Water*
Source: .....*http://www.dnr.state.mo.us/wpscd/wpcp/wpcp-guide. htm*

The following seven goals (or "Golden Rules") shall be applied for all Storm Water Pollution Prevention planning:

- ❖ Insure that sediment controls are in place prior to disturbance.
- ❖ Maintain sediment controls throughout the construction and restoration processes.
- ❖ Minimize the overall disturbance whenever possible.
- ❖ Protect disturbed areas throughout the construction process.
- ❖ Prevent storm water runoff from entering disturbed areas.
- ❖ Never intentionally discharge construction contaminants directly into creeks, rivers, ditches, or storm systems.
- ❖ Complete permanent restoration as soon as possible.

Storm Water Pollution Prevention Best Management Practices (Contd.)

In addition to those overall goals stated previously, the contractor shall, at a minimum, implement the following specific Best Management Practices:

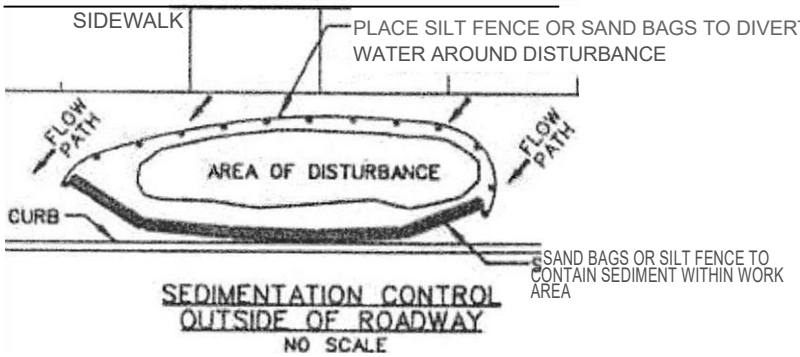
- Provide temporary erosion protection whenever possible:
  - Mulch, seed, or gravel may be applied even if a disturbed area may and/or will be disturbed again or other permanent measures of stabilization are to follow;
    - Cover spoil piles with a tarp or contain with a sediment barrier.

- Contain disturbed sediment on site:
  - Use sediment barriers such as silt fence, sand bags, straw bails, rock checks and/or sediment traps to contain sediment on the construction site;
  - Existing vegetation may be used as a sediment filter where minimal grades and sheet flow runoff will occur;
  - Insure that all sediment barriers are installed and functioning properly.

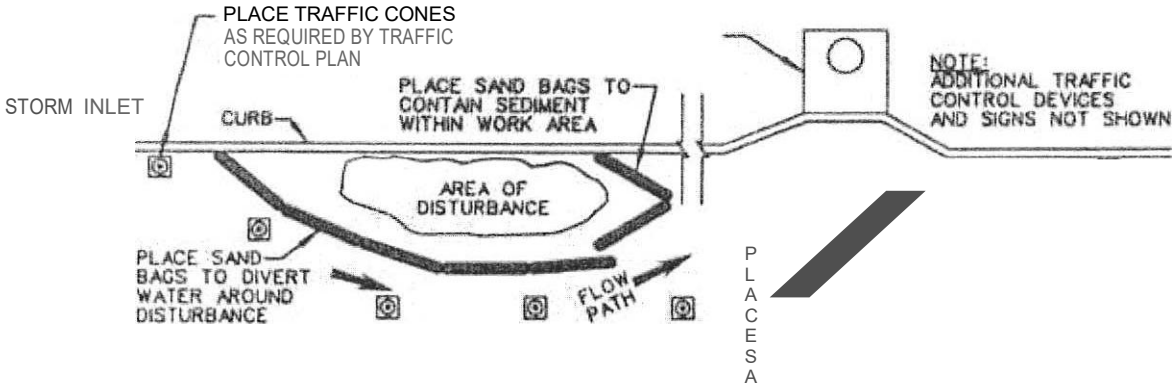
- Avoid causing flooding in roadways and adjacent right-of-way:
  - Do not block existing culverts and storm inlets except as a last resort;
  - Insure that sediment is removed from sediment traps and filters after all storm events.

Storm Water Pollution Prevention Best Management Practices (Contd.)

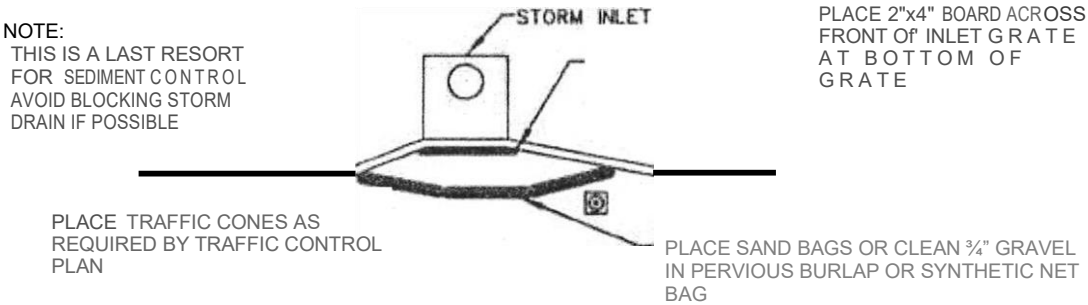
The following details may be used where applicable to achieve storm water pollution prevention goals:



SEDIMENTATION CONTROL OUTSIDE OF ROADWAY
NO SCALE



SEDIMENTATION CONTROL WITHIN ROADWAY
NO SCALE



SEDIMENTATION BARRIER AT STORM INLET
NO SCALE

Construction Records and As Built Plan Requirements

The HDD Contractor shall keep detailed and accurate records of all activities associated with the HDD process. Upon completion of HDD installations, the Permittee shall provide the city of Blue Springs with As Built plans and any supporting documents within 60 days of project completion. As Built plans are preferred in AutoCAD format but may be submitted in paper form. HDD construction records and As Built plans shall include the following:

- HDD tracking data and operator logs shall be maintained daily and shall be made available upon request from the City Engineer. These field records and operator notes shall specify:
  - the type of tracking equipment used,
  - the length and depth of the HDD installation,
  - additional information that may include steering adjustments and other equipment performance parameters;

- As Built plans shall be derived from the tracking data and operator logs. At a minimum, the drawings shall indicate:
  - horizontal and vertical HDD alignment,
  - existing utility horizontal locations and depths at all exposed or potholed locations, and
  - existing utility horizontal locations where indicated with field locates.

- As Built plans shall conform to the same Blue Springs Plans Submission
  - Requirements for Right-of-Way Permits included previously.