

## Directional Drilling Planning and Mapping Nomenclature

## RATIONALE

Added definitions for Annular Drilling Fluid Pressure and Clock Position. and added As Built to 3.1.2.

## 1. SCOPE

This SAE Standard applies to planning and mapping various types of information associated with directional boring/drilling machines. This type of planning and mapping information is typically used with horizontal earthboring machines as defined by SAE J2022.

## 1.1 Purpose

This is a compilation of terms and definitions commonly associated with the planning and mapping of underground pipe and utility installation by using horizontal earthboring machines.

## 2. REFERENCES

## 2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

## 2.1.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA); [www.sae.org](http://www.sae.org).

SAE J2022 Classification, Nomenclature, and Specification Definitions for Horizontal Earthboring Machines

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## 2.2 Related Publication

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

### 2.2.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

SAE J2520 Classification, Nomenclature, and Specification Definitions for Directional Boring Tracking Equipment

## 3. DEFINITIONS

### 3.1 BORE PATH

The planned, pilot or installed route of the drilling from entry point to exit point.

#### 3.1.1 Planned Path

The planned location for the bore.

#### 3.1.2 Installed Path or As-Built

The centerline of the completed bore.

#### 3.1.3 Pilot Bore Path

The centerline location of the pilot bore.

### 3.2 BORE PATH LENGTH

The distance from the entry point to the exit point along the actual bore path.

### 3.3 DEPTH

The vertical distance from the surface to the transmitter.

### 3.4 HEIGHT

The vertical dimension above or below a horizontal reference plane.

### 3.5 ELEVATION

The vertical dimension above/below sea level.

### 3.6 HEADING

The azimuth or direction in the horizontal plane relative to true or magnetic north.

### 3.7 PILOT BORE

The initial hole created by the forward progress of the tool head.

### 3.8 DEVIATION

The distance offset from the planned path to the pilot bore or the installed path.

### 3.9 LEFT AND RIGHT STEERING INDICATOR

Display indicating amount of left/right steering required to proceed on the intended path to a target point given in degrees, distance or means of steering indication.

### 3.10 SURVEY PATH DISTANCE

Horizontal distance measured along the reference line to the point of interest.

### 3.11 BORE PATH DISTANCE

The distance from the entry point to the point of interest along the actual bore path.

### 3.12 REFERENCE LINE

A predetermined line or set of surface characteristics used to measure and document the location of the planned path, actual bore or installed path.

### 3.13 RUNNING LINE

The line on the ground surface along the planned bore path.

### 3.14 PATH REFERENCE LINE

A line along the path used to measure and document the location of the intended, pilot, actual bore or installed path.

### 3.15 (JOB) SITE REFERENCE LINE

A line or set of surface features along the ground surface against which the horizontal path (distance) is measured.

### 3.16 GEOGRAPHIC REFERENCE LINE

A line at a defined elevation and heading starting at a defined longitude and latitude.

### 3.17 POLYLINE

A series of lines and/or curves.

### 3.18 GROUND REFERENCE LINE

A polyline on the ground surface that is along the path that vertical measurements are taken from.

### 3.19 TOPOGRAPHY

The configuration of the ground surface including changes in elevation and the position of natural and man-made features.

### 3.20 FEATURES

Aboveground objects that are points of interest i.e., highways, railroads, rivers, buildings, etc.

### 3.21 GROUND PLANE

The plane of the topography where the drill rig is positioned.

### 3.22 ENTRY PIT

A hole dug at the point of pilot-bore-entry into the ground plane.

### 3.23 ENTRY POINT

The point at which the drill pipe enters the ground plane.

### 3.24 ENTRY ANGLE

The angle between the drill pipe and the ground plane with the machine in the operating or working position.

### 3.25 ENTRY PITCH

The pitch at which the drill pipe enters the ground plane.

### 3.26 ENTRY HEADING

The azimuth or direction of the drill pipe in the horizontal plane relative to true or magnetic north at the entry point.

### 3.27 ENTRY PIT OFFSET

The distance from the tip of the tool head to the entry point, with the first drill pipe fully retracted. If the tool head is above the surface with the first rod fully retracted, this distance is negative. If the drill head is below the surface with the first rod fully retracted, it is a positive value. The entry point offset is either added or subtracted from the first rod length.

### 3.28 CONNECTION START POINT

The first target point where the bore path is usable.

### 3.29 CONNECTION END POINT

The last target point where the bore path is usable.

### 3.30 TARGET POINTS

Defined points along the planned path.

### 3.31 INTERSECTING UTILITY/OBSTACLE

A buried utility or obstacle that crosses the planned, pilot or installed path.

### 3.32 NON-INTERSECTING UTILITY/OBSTACLE

A buried utility or obstacle that does not cross the planned, pilot or installed path.

### 3.33 UTILITY/OBSTACLE DIAMETER

The outside dimensions of the intersecting or non-intersecting pre-existing utility/obstacle.

### 3.34 MINIMUM CLEARANCE ZONE

The envelope around the pre-existing utility/obstacle that defines the zone that the pilot bore, back-ream and installed product should not intrude.

### 3.35 ALLOWABLE PLANNED PATH VARIANCE

In the planning process the defined maximum variance of the planned path.

### 3.36 MINIMUM COVER

Minimum amount of ground cover required over the product being installed.

### 3.37 MAXIMUM COVER

Maximum amount of ground cover required over the product being installed.

### 3.38 EASEMENT/RIGHT OF WAY ZONE

The width of the approved envelope in which the planned bore, pilot bore and installed product can be placed.

### 3.39 OBSTACLES

Non-utility in-ground items, i.e. concrete pillars, boulders, etc.

### 3.40 DRILL PIPE

Individual component used to connect the drill rig to the tool head, transmitter housing or reamer.

NOTE: The terms drill stem and drill rod are frequently used interchangeably.

### 3.41 DRILL STRING

The combined assembly of components including but not limited to drill pipe, tool head and/or transmitter housing connected to the drill rig.

### 3.42 DIAMETER OF DRILL PIPE

Minimum outside diameter of drill pipe excluding tool joint ends.

### 3.43 LENGTH OF DRILL PIPE

Nominal (made-up) length of drill pipe.

### 3.44 MINIMUM BEND RADIUS

The calculated bend limit of the specified drill string or installed product during the boring operation.

### 3.45 DESIRED BEND RADIUS

Preferred bend radius for the drill string and product during the drilling operation.

### 3.46 PRODUCT

The item or bundle of items being installed, i.e., pipes, cables etc.