



HDD Stability Checklist

Ensure your Horizontal Directional Drilling project stays safe, constructible, and on schedule.

1. Pre-Design Data Gathering

- ☐ **Geotechnical investigation complete** - Sufficient borehole samples taken at correct intervals.
- ☐ **Soil/rock type identified** - Includes cohesion, strength, and stability characteristics.
- ☐ **Groundwater data collected** - Water table location and seasonal variations considered.
- ☐ **Existing infrastructure mapped** - Utilities, crossings, and environmental features documented.

2. Drill Path & Alignment

- ☐ **Bend radius verified** - Within pipe manufacturer's allowable minimum radius.
- ☐ **Entry/exit angles appropriate** - Avoids excessive curvature that increases stress.
- ☐ **Path avoids unstable zones** - Steers clear of loose fill, voids, or high-fracture rock.

3. Borehole Stability Analysis

- ☐ **Downhole pressures modeled** - Accounts for soil strength, pore pressure, and drilling fluid weight.
- ☐ **Risk of hydrofracture assessed** - Using pressure threshold analysis.
- ☐ **Annular pressure management plan** - Monitoring and control procedures established.

4. Pipe & Material Considerations

- ☐ **Pipe wall thickness verified** - Meets both internal pressure and pulling load requirements.
- ☐ **Material properties confirmed** - Yield strength, ovality tolerance, and coating type suitable for HDD.
- ☐ **Pulling head and swivel selection complete** - Matches load capacity and safety factor.

5. Drilling Fluid Program

- ☐ **Fluid properties optimized** - Correct viscosity, gel strength, and density for soil type.
- ☐ **Loss prevention plan in place** - Includes additives or techniques to prevent fluid loss.
- ☐ **Containment and disposal strategy ready** - Complies with environmental regulations.

6. Construction Risk Mitigation

- ☐ **Weather and flood risks assessed** - Seasonal and site-specific hazards addressed.
- ☐ **Contingency plan developed** - Includes alternate entry/exit points or re-drill strategies.
- ☐ **Monitoring plan in place** - Real-time torque, pull force, and pressure tracking.

7. Post-Drill Verification

- ☐ **As-built profile documented** - Actual bore path compared to design.
- ☐ **Pipe integrity tested** - Hydrotest, pressure test, or other validation method completed.
- ☐ **Restoration plan executed** - Site returned to pre-construction condition.



Tip for Better Results:

Integrate this checklist with **HDD design and stability software** like Technical Toolboxes' HDD PowerTool. This allows you to:

- Run stability calculations for your specific soil profile.
- Predict downhole pressures and prevent frac-outs.
- Optimize bend radius and alignment before mobilizing equipment.