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FIELD DEPLOYMENT STANDARDS // CLASS: CRITICAL SITE OPS

SUBSURFACE HDD PRE-PLANNING & RISK ASSESSMENT

Comprehensive manual detailing soil sampling, geological mapping, and utility locate validation steps necessary before directional boring projects.

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This technical resource outlines the pre-excavation checks required for directional boring. It covers geological soil classifications, electromagnetic locator calibration, vacuum excavation cross-trenching parameters, and the mathematical calculation of bend radius limits for duct materials. Essential reading for project managers and municipal coordinators.

STEP 1: DESKTOP UTILITY REVIEW.

Gather all available historical maps, municipal records, and GIS data. This provides a baseline understanding of existing utilities and geographical features along the proposed route. This step is critical for identifying potential conflicts early in the design phase.

STEP 2: LOCATE VALIDATION & SUE SURVEYS.

Conduct on-site electromagnetic induction and GPR scanning to locate metallic and non-metallic utilities. Mark all lines according to national APWA color-coding standards. For critical crossings, utilize vacuum excavation (potholing) to visually verify the depth and location of the utility, ensuring Quality Level A precision.

STEP 3: GEOTECHNICAL CORE ANALYSIS.

Perform soil borings at regular intervals along the proposed bore path to determine soil density, stability, and water table levels. Classify the soil layers under the Unified Soil Classification System (USCS) and determine Standard Penetration Test (SPT) N-values. Choose appropriate drilling fluids and drill bit configurations based on these reports.

STEP 4: BORE PATH DESIGN.

Calculate entry/exit angles, clearance margins around existing lines, and minimum bend radii for the conduit bundle. Use the formula R_min = 100 x D for HDPE pipes and R_min = 1200 x D for steel pipes to prevent over-stressing the pipe materials. Develop a comprehensive risk mitigation dossier detailing frac-out control plans.