

# Solids Control for Underground Construction Applications



## About the Course

Drilled solids can be extremely detrimental to operations if not properly managed. Solids Control equipment is the most cost effective way to remove drilled solids. Learners will be guided through the slurry system and the implications as they relate to drilled solids. Emphasis is placed on optimizing equipment that removes sequentially finer drill solids. Overall, this is a comprehensive course designed to enhance an individual's knowledge of solids control operations.

## Main Areas of Focus

- Purpose and history of solids control equipment and processes.
- Instruction on the design, operation and application for the following equipment: Primers, Shale Shakers, Hydrocyclones, Centrifuges, Agitators and Pumps.
- Guidance and theory on basic slurry fluid, mud testing, and solids control analysis.

## Who Should Attend

The course is designed for new hires, rig personnel, civil and underground operators, mud engineers, service technicians, and any other personnel who work directly with solids control equipment.

## Course Specifics

### Instructor:

Matt Wiggins

### Course Length:

1-3 days\*

\*Includes test tank and lab sessions

### Time:

8:30 AM – 4:00 PM\*

\*Breakfast, snacks, and lunch are provided

### Price:

TBD

### Class Limit:

30 students

### Required Attire:

- Jeans or Long Pants
- Shirt: No Vulgarity
- Closed-toed shoes

\*Safety equipment & tools are provided

**Schedule subject to change  
based on enrollment**

# Civil & Underground Construction - Course Outline

|       | Course Name                        | Learning Targets  | Solids Control Key Outcomes   | Engagement  |
|-------|------------------------------------|---|---|---|
| Day 1 | Derrick Equipment Company Overview | <ul style="list-style-type: none"> <li>✓ History</li> <li>✓ Locations</li> <li>✓ Services</li> </ul>  | <ul style="list-style-type: none"> <li>• Derrick key contacts &amp; information</li> </ul>  |   |
|       | Drilled Solids                     | <ul style="list-style-type: none"> <li>✓ Formation</li> <li>✓ Particle Sizing</li> <li>✓ Detrimental Effects</li> </ul>                                 | <ul style="list-style-type: none"> <li>• Understanding rock &amp; clay</li> <li>• Cuttings examination</li> <li>• Solids sizing</li> </ul>  | <ul style="list-style-type: none"> <li>• Identify cutting shapes/sizes – create a visual of micron ranges</li> <li>• Calculate specific gravity &amp; LGS% Targets</li> <li>• Corn viscosity demonstration</li> </ul> |
|       | Slurry Fluids                      | <ul style="list-style-type: none"> <li>✓ Brief history</li> <li>✓ Functions</li> <li>✓ Rheology</li> <li>✓ Mud testing</li> </ul>                       | <ul style="list-style-type: none"> <li>• Basic mud design</li> <li>• Filter cake, fluid loss</li> <li>• Contaminants</li> <li>• How does it all relate to Solids Control</li> </ul> | <ul style="list-style-type: none"> <li>• Mud lab: build and correct a WBM</li> <li>• Calculate &amp; graph mud properties</li> <li>• Build a filter cake</li> <li>• Hardness control &amp; inhibition</li> </ul>      |
|       | Primer                             | <ul style="list-style-type: none"> <li>✓ Use &amp; importance</li> </ul>  | <ul style="list-style-type: none"> <li>• Specifications &amp; use on rig</li> </ul>   | <ul style="list-style-type: none"> <li>• Visual tour, training bay hands on tour</li> </ul>   |
|       | Mud Agitators                      | <ul style="list-style-type: none"> <li>✓ Agitator specifications</li> </ul>   | <ul style="list-style-type: none"> <li>• Basic operation</li> <li>• Tank selection</li> </ul>   | <ul style="list-style-type: none"> <li>• Mud tank agitator sizing</li> <li>• Classroom agitator model</li> </ul>  |
| Day 2 | Shale Shaker Overview              | <ul style="list-style-type: none"> <li>✓ Parts of a shaker</li> <li>✓ Dynamics &amp; efficiency</li> <li>✓ Troubleshooting &amp; maintenance</li> </ul> | <ul style="list-style-type: none"> <li>• Shaker optimization</li> <li>• Competitive Comparison</li> </ul>   | <ul style="list-style-type: none"> <li>• Labeling parts of a shaker game</li> <li>• Measure and calculate G force</li> <li>• Hands on test tank demo</li> </ul>   |
|       | Screen Technology                  | <ul style="list-style-type: none"> <li>✓ Brief history</li> <li>✓ API RP 13 C</li> <li>✓ Screen comparisons</li> <li>✓ Screen performance</li> </ul>    | <ul style="list-style-type: none"> <li>• Screen sizing</li> <li>• Cut points</li> <li>• Screen analyzing</li> <li>• Issues</li> <li>• Care</li> </ul>                               | <ul style="list-style-type: none"> <li>• Screen change on Derrick &amp; competitive shakers</li> <li>• Screen Microscope</li> <li>• Screen Animation</li> <li>• Screen Testing</li> </ul>                             |
|       | Pumps                              | <ul style="list-style-type: none"> <li>✓ Design &amp; specifications</li> </ul>   | <ul style="list-style-type: none"> <li>• Suction &amp; operating basics</li> </ul>  | <ul style="list-style-type: none"> <li>• Test tank pump sizing activity</li> <li>• Feet/head &amp; pressure calculations</li> </ul>   |
| Day 3 | Hydrocyclones                      | <ul style="list-style-type: none"> <li>✓ Hydrocyclone design</li> <li>✓ Factors affecting cones</li> <li>✓ Troubleshooting</li> </ul>                   | <ul style="list-style-type: none"> <li>• Feet/head requirements</li> <li>• Optimization</li> <li>• Maintenance</li> </ul>   | <ul style="list-style-type: none"> <li>• Hydrocyclone troubleshooting activity</li> </ul>   |
|       | Centrifuge                         | <ul style="list-style-type: none"> <li>✓ Stokes law</li> <li>✓ Centrifuge overview</li> </ul>   | <ul style="list-style-type: none"> <li>• General operating guidelines in weighted &amp; unweighted mud</li> </ul>   | <ul style="list-style-type: none"> <li>• Centrifugal force video</li> <li>• Stokes Law demo</li> <li>• Centrifuge test tank demo</li> </ul>   |
|       | Solids Removal System Design       | <ul style="list-style-type: none"> <li>✓ Mud tank arrangement</li> <li>✓ Suction &amp; flow</li> </ul>  | <ul style="list-style-type: none"> <li>• Understanding weirs &amp; suction</li> <li>• Setting up your optimal processing line</li> </ul>  | <ul style="list-style-type: none"> <li>• Installation challenge (classroom)</li> <li>• Animated tour</li> </ul>   |
|       | Drilled Solids Calculations        | <ul style="list-style-type: none"> <li>✓ Hole volume</li> <li>✓ Dilution basics</li> <li>✓ Solids Removal</li> </ul>                                    | <ul style="list-style-type: none"> <li>• Importance of basic solids removal efficiency</li> </ul>   | <ul style="list-style-type: none"> <li>• Calculating drilled solids &amp; Removal Efficiency</li> </ul>   |
|       | Solids Control Review              | <ul style="list-style-type: none"> <li>✓ Quick quiz</li> <li>✓ References</li> <li>✓ Zip drive</li> <li>✓ Course evaluation</li> </ul>                  | <ul style="list-style-type: none"> <li>• Assessment for learning</li> </ul>   | <ul style="list-style-type: none"> <li>• Recap &amp; discussion</li> </ul>  |