CASE STUDY - PUMPJACK FOUNDATION LIFT

THE PROBLEM

A pumpjack foundation in an active oilfield experienced significant differential settlement, resulting in an out-of-level condition that risked operational efficiency and long-term structural performance.

The structure had settled 5.9 inches on the "T" (heavier) side, creating a major elevation imbalance. The total load on the foundation was extreme—approximately 130,000 lbs from the pumpjack and equipment, plus an additional ~55,000 lbs from the slab, for a combined load near 185,000 lbs.

Several critical challenges defined the project:

- Extreme Load Conditions: ~185,000 lbs total load required lifting and stabilization.
- Severe Settlement: 5.9-inch differential settlement on the heavy side.
- High Precision Requirement: Final lift needed to be within tight tolerances to prevent misalignment or structural stress.
- Active Jobsite Constraints: Work had to be performed around installed equipment with limited access and confined working space.

A local contractor was engaged to perform the lift using polyurethane injection, with HMI providing technical guidance and support to ensure a controlled and successful outcome under these demanding conditions.

THE SOLUTION

The contractor utilized 4lb/ft3 density structural polyurethane foam in conjunction with an HMI polyurethane system, supported by HMI's technical expertise in injection strategy and lift control.

Key project specifications:

- Material: 4lb/ft3 density structural polyurethane foam
- Volume: Approximately ½ tote set injected
- Equipment: HMI polyurethane system
- Project Duration: ~7 hours

Injection points were strategically installed around the slab perimeter and beneath critical load-bearing zones, working within confined spaces around the pumpjack structure.

The lift was executed using a staged injection approach, allowing for:

- Real-time monitoring of slab movement
- Incremental adjustments during lifting
- Controlled and uniform elevation gain despite uneven load distribution

This method ensured that the structure could be raised safely and precisely under extreme loading conditions.

THE SUMMARY

The project was raised back to level within a 1/10th inch tolerance, far exceeding the clients expectations.

Results:

- Lift Achieved: 5.9 inches.
- Final Elevation Accuracy: Within 0.1 inches.
- Load Managed: ~185,000 lbs successfully lifted and stabilized.
- Operational Efficiency: Completed in a single day (~7 hours) without removing the pumpjack.

With HMI's technical guidance, the contractor delivered a high-load, high-precision lift in a constrained, active jobsite environment. The project demonstrates the effectiveness of polyurethane injection for lifting extremely heavy, concentrated loads while maintaining tight tolerances.

It also highlights the importance of proper injection strategy and expert support in achieving reliable results, minimizing downtime, and avoiding disruption to critical operations.