

Enhanced Drilling Performance with Complex42™

CHEMFORCE



Browns Piling – CDL Cremorne June / July 2024

Summary of results SR50 and SR60 drill rig using 1% Complex42™ though very hard high MPa basalt.

Parameter	Soilmec SR60	Soilmec SR60	Soilmec SR50	Soilmec SR50	Soilmec SR50	Soilmec SR50
Pile No. (600mm)	24	25	29	30	31	32
Total Depth mm	9300	10100	8400	8400	9000	9700
Duration/Hole Minutes	630	180	840	300	420	390
Rate of penetration	14.76 mm/min	48 mm/min	10 mm/min	48 mm/min	49 mm/min	50 mm/min
Fuel Consumed/Hole	436	216	400	144	180	108
Teeth Consumed	68	12	36	9	36	24
Complex42™ Consumed		5L		3L		3L

Introduction

In this case study, we compare the performance and cost-effectiveness of the Soilmec SR50 and SR 60 drilling rig using conventional methods against the same rig utilising Complex42™. The objective was to highlight the significant savings in fuel consumption, duration per hole, and wear on equipment achieved by using only 3 to 5 litres of Complex42™, per hole.

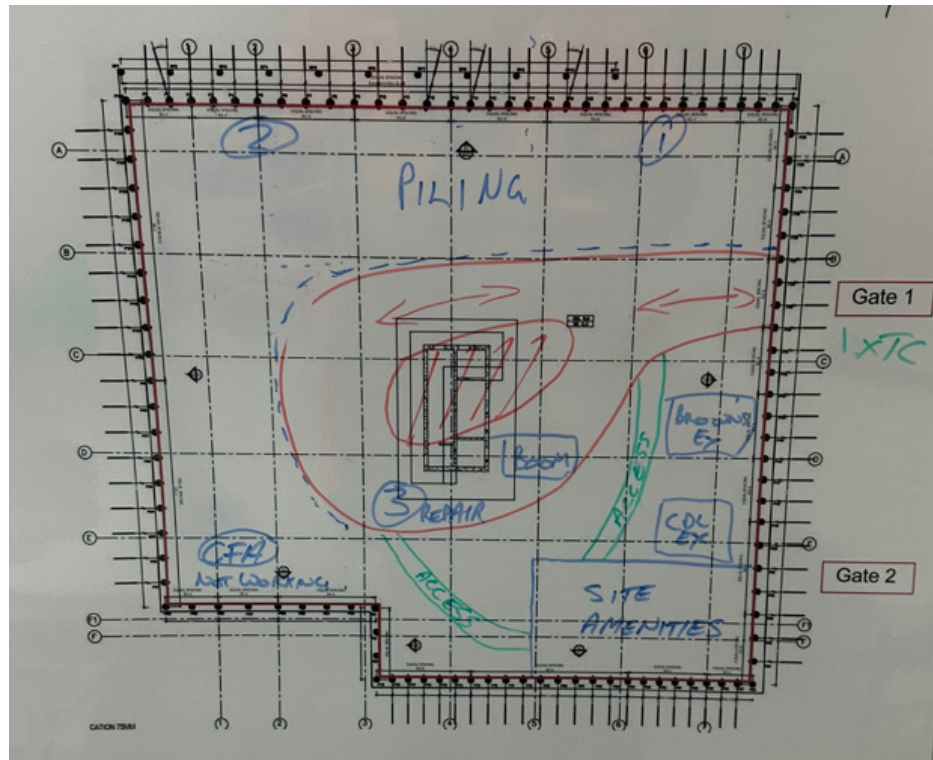
Methodology

Separate trials in close proximity were conducted using the Soilmec SR50 and SR60 rig to evaluate the effectiveness of Complex42™. The first trial used conventional drilling methods, while the second trial incorporated Complex42™ at a concentration of 1% in a water tank (Furfey). The made-up solution was fed into the hole at regular intervals. Key performance indicators measured included total depth, duration per hole, rate of penetration, fuel consumption per hole, teeth consumed.



Site Information:

- A CDL construction site.
- Approximately 121 pile holes 600mm and 750mm in diameter.
- Ground composition: High MPa basalt



Piling Scheme

Initial observations

In this case study, we initially explored the use of a Soilmec R516HD rig, employing conventional drilling techniques supplemented with Complex42™. Although the introduction of Complex42™ initially enhanced performance, it was found that the set of the teeth on the barrel was not optimal. To address this, the Brown's team switched to TEBCO barrels, which markedly improved both performance and the durability of the teeth. Furthermore, we optimised the use of Complex42™ by reducing the RPMs of the Kelly bar. This allowed the drill to operate on its own weight and free spool, which facilitated the formation of larger chips without additional feed. These modifications significantly enhanced the drilling process's efficiency and effectiveness, showcasing the potential adjustments in drilling operations for better outcomes.

Key Findings:

Cost per litre of diesel: \$2.50 (Delivered on site)
Operator Cost: \$200 Operator and offsider cost per (Approx rates)
Tooling Cost per tooth: \$10 (Assumed Cost)

	Pair 1		Pair2		Pair3	
	Dry	Complex42	Dry	Complex42	Dry	Complex42
	Soilmec SR60	Soilmec SR60	Soilmec SR50	Soilmec SR50	Soilmec SR50	Soilmec SR50
Labour Cost	\$2,100.00	\$600.00	\$2,800.00	\$1,000.00	\$1,400.00	\$1,300.00
Fuel Cost	\$1,090.00	\$540.00	\$1,180.00	\$360.00	\$450.00	\$270.00
Total Cost	\$3,190.00	\$1,195.25	\$3,980.00	\$1,393.15	\$1,850.00	\$1,603.15
Total Saving		\$1,994.75		\$2,586.85		\$246.85

Conclusion:

The use of Complex42™ significantly reduces both labour and fuel costs across different drilling scenarios. The largest savings were observed in Pair 2 with the Soilmec SR50 rig, where using Complex42™ led to a reduction of over \$2,500 per hole. Even in the least dramatic case (Pair 3), there was still a noticeable reduction in total costs. These findings underscore the efficiency and cost-effectiveness of incorporating Complex42™ into drilling operations, particularly in demanding drilling conditions such as high MPa basalt. This not only reduces operational costs but also speeds up the drilling process, making it an advantageous choice for construction and drilling projects.