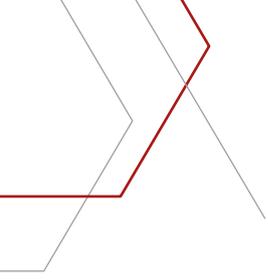


# CASE STUDY

Carbontech Case study 014

48" Raw water leak

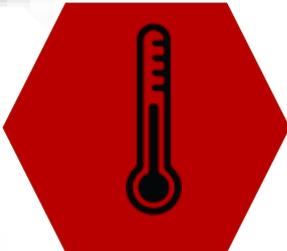




# TABLE OF CONTENT

PAGE	CONTENT
1	Cover Page
2	Table of content
3	Project Details
4	Anomaly description Integrity concerns
5	The Carbontech Solution Conclusion
6	Contact Details

## PROJECT DETAILS

	Case Study Number CTCS:014	Design Pressure 25 Bar	
	Repair Summary 48" Raw water	Operating Pressure 17 Bar	
	Client Umgeni Water	Design Temperature 50°C	
	Service Type Raw water	Operating Temperature 25°C	
	Line Size 48"	Base Material Not available	
	Line Class Not available		



## ANOMALY DESCRIPTION

A water leak was reported on a 48" pipe (see *Figure 1&2*). After closely examining the leaking area, it was noted that the leaking water was coming out of the defected longitudinal weld that runs along the length of the pipe. Severe external corrosion was also noted around the leaking area. This might have been caused by the leaking service coming into contact with metal pipe therefore causing corrosion over time. Figure 1 also reveals signs of pitting corrosion.

Figure 1:



Figure 2:



## INTEGRITY CONCERNS

Defected longitudinal weld is a huge structural concern in pipes since circumferential forces(stresses) are usually greater than axial forces(stresses). In pipe design, longitudinal welds must withstand circumferential forces and therefore a defected longitudinal weld poses greater risk on structural integrity of the pipe



## THE CARBONTECH SOLUTION

Using bristle blaster, sand paper and paint stripper(eco-friendly), the pipe was cleaned to a bare metal finish (see **Figure 3&4** below).

After pipe cleaning, the surface profile was examined using testex tape to ensure the surface finish falls within acceptable standard. The pipe was then cleaned with acetone to remove any undesirable contaminants from the metal surface. **Figure 5** shows the pipe surface after cleaning with acetone.

The defect weld area was covered and profiled with quick-setting putty (see **Figure 6** above) to fill in the holes left by pitting corrosion and also to completely stop the water from escaping through the defect before the pipe was wrapped. Although the line was isolated, small quantities of water were still present on the defected weld hence the use of quick-setting putty to completely eliminate any water leaks. The profiled putty also helped in achieving a smooth wrap over the defected weld.

Revowrap, engineered to ASME PCC-2 2015, was applied over the defected weld and cleaned pipe surface to successfully complete the installation (see **Figures 7&8**). 12 layers of composite wrap were installed on this repair.

Surface Preparation achieved: SA2.5

Product used: Revowrap 110

Engineering calculations: ASME PCC2

Layers used: 4 layers

Post cured: Not Required - however cure time was 48 hours due to the cold pipe temperatures

Figure 3: Bristle blasting



Figure 4: SA 2.5 surface standard



Figure 5: Pitting



Figure 6: Revofill repair of leak



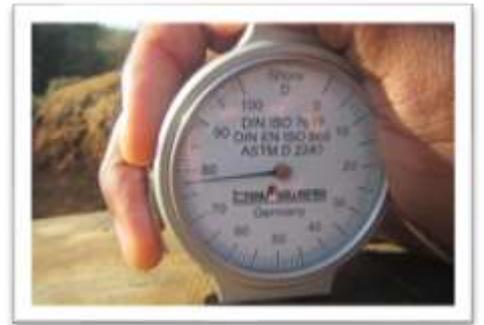
Figure 7: Completed repair



Figure 8: Completed repair



Figure 9: Hardness test



## CONCLUSION

The Revofill putty was key to achieving a successful repair since it completely eliminated water leaks therefore enabling the wrap to be installed without any concerns. It is vital for the wrap to cure before operating the line back to full service and the Shore D hardness test results confirmed that the wrap was cured successfully. After switching the line to full service, no leaks were noted concluding a successful repair



## CARBONTECH

The place chemistry, engineering and global expertise are brought together to drive progressive innovation in advanced composite technologies for the emergency repair of critical assets "There is nothing generic about us" we don't just sell pipe wraps; we provide accurate engineering backing to deliver tailored solutions

Sound and responsible engineering is the basis on which we build our company, products and services. It is the core to our success and it is the foundation on which we have engineered and manufactured our innovative and bespoke products

We strive by a zero-failure philosophy and warrant our engineered composite solutions are tested, proven and validated. We vow to provide dependable, responsible and accurate information regarding the capabilities of our systems

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