RESTEK

Ground Stabilisation Bund Sealing July 2016

Client:
Tennants Fine Chemicals

The Project:
Ground Consolidation

The Problem:

Tennants Fine Chemicals Limited commissioned a ground survey carried out by BSL to determine ground conditions beneath part of a concrete floor slab which was showing signs of stress and cracking.

The subject part of the site where the investigation was carried out is located in the northern part of the property where a storage yard is present.

The yard is covered in concrete hard-standing

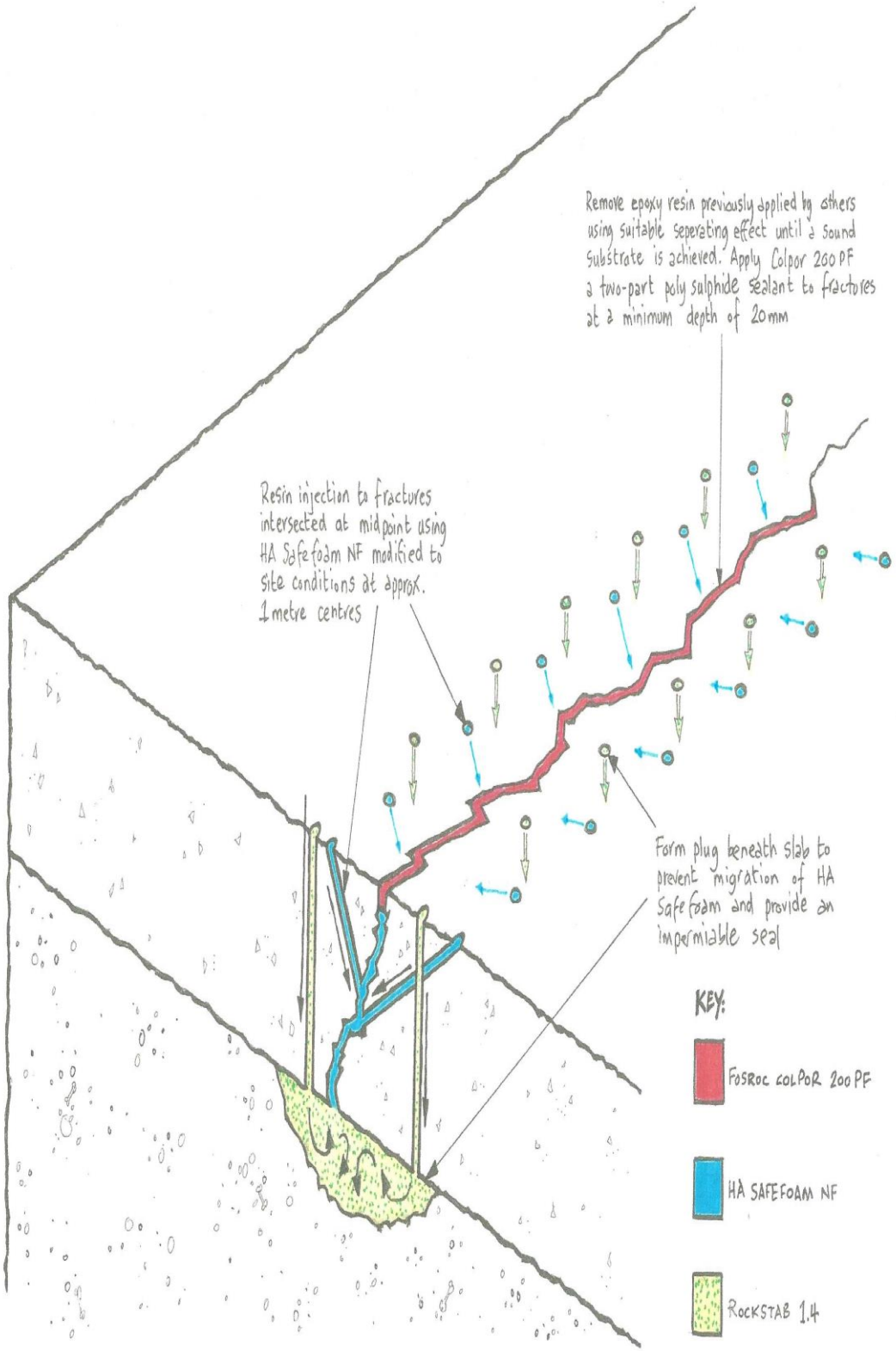
This area is used for storing intermediate bulk containers (IBC) and steel drums containing chemicals with them stacked in rows up to three high and seven in length. The IBCs and drums are generally stacked around the perimeter of the slab with central area free for access by forklift trucks.

Exploratory sample bore holes were positioned in the ground to establish ground conditions in the areas where the concrete slab was cracking.

During the drilling of the exploratory holes, in situ standard penetration tests (SPTS) were carried out at regular intervals in order to determine the strength of the underlying soils.

The tests carried out highlighted the need for consolidating soft peaty layers, void filling as well as the need to seal the bunded areas where cracks had allowed for possible migration of any spillages into the water course.

Injection procedure



The Solution

As a result of the problems that had been highlighted in BSL Survey, Tennants Fine Chemicals instructed Restek to advise on a cost-effective solution to stabilise the slab and prevent further movement.

We looked at the report carried out by Brownfield Solutions and their site investigation showing exploratory bore hole samples taken, highlighting soft under- laying soils and occasional peaty layers that looked to be the main cause of the movement resulting in fractures to the slab. We also noted a number of cracks appearing in the slab which needed to be sealed to prevent any chemicals entering the watercourse should a spillage occur.

It was also immediately apparent that the loads subjected to the slab from chemical containers stacked in rows of up to three in height were contributing to the problems that the client was experiencing.

As a result of the increased loads we would usually look to stabilise the hard-standing and increase the loading capacity of the slab. Although considering the movement to the slab had not affected the stability of the chemical containers and that the main purpose of the slab was to contain any potential spillages, the client asked that we looked at alternative options to create an impermeable slab and not necessarily stabilisation.

We came up with a solution that would allow for slight movement and provide three barriers to form an impermeable seal against any spillages whilst consolidating and void filling the soft underlaying soils that had subsequently formed voids and pockets under the slab where water infiltration through fractures had occurred.

All materials specified would need to be chemical resistant as well as forming a watertight seal.

Our system also needed to provide much needed support to the fractures and to prevent them from opening up in the future.

Installing Injection Probes:

Our mechanical packers serve as connection pieces between injection device and building component for the injection of various materials. Depending on the necessary pressure, the nature of the building component and the injection material.

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The System

Our specialist pressure injection systems were adopted for their ability to seal, bond and stabilise building components where movement is expected.

As a result of the resins low viscosity, high flexural strength and adhesive tensile strength, they can be injected into cracks of 0.25mm crack width and reach even the finest of micro-cracks through our pressure injection procedure.

This type of application enables the resins to permeate the finest of pores within the concrete thus binding the particles together.

There were added benefits of using this method of sealing the fractures with *HA Safefoam* resins and because of the resins ultra-low viscosity during the injection process we were able to concentrate the resin into the finest of micro-cracks thus displacing water from the fractures and providing a watertight seal to the bunded slab. In turn this prevents any further decay of the slab from water / chemical infiltration and frost due to the resin's ability to fill all cracks and cavities in the injection procedure.