PROJECT PROFILE
N14 U116

mainmark

Pre-excavation Protection of a Pipeline

INDUSTRY
Infrastructure

STRUCTURE
Pipeline

PROBLEM
Void Filling and Sealing

LOCATION
Sydney, Australia

DURATION / YEAR
5 days / 2014

TECHNOLOGY
Tampur 117

BUSINESS UNIT
Mainmark Australia

Summary

Injecting an expansive, plural-component, polymeric, intrusion grout, Mainmark carried out pre-excavation contactgrouting as temporary protection of a sewer pipeline against excavation on a major Sydney site.

Objectives

The objectives were to provide complete temporary protection of the sewer line prior to the placement of piles adjacent to the sewer alignment and a transfer slab above the pipeline.

Solution

Expanding resin was injected to fill voids along the crown of the pipeline. The resin selected was urea silicate, which forms a silicate polyurethane foam and acts as a chemical, expansive, intrusion grout.

The injected grout expanded immediately to fill the interconnecting matrix of voids and fissures local to each injection point. The target zone was taken as the crown of the sewer tunnel, where transfer structures were required to be constructed later over and adjacent to the sewer alignment.

The resin was injected under low pressure, filling voids within the crown of the sewer pipe tunnel. 34 injection points were created. As a fail safe against build up of excessive pressures within the crown of the tunnel, bleed and venting holes were drilled with communication established between each injection point and vent point, prior to injection of the grout.

The grout was pumped under relatively low pressures, effectively gravity-feeding the grout in liquid/creaming form into the tunnel crown voids. This, in addition to the bleed and vent holes, ensured no build up of hydraulic pressure within the voids and no pressure applied on the sewer main within the brick tunnel.

The resin grout material is not an aggressively expanding, polymeric grout and has a relatively low expansive force. It has a foaming factor of approximately 1:20 and cured almost instantaneously. When cured it has an unconfined compressive strength of between 150kpa and 180kpa.

As the materials foamed almost immediately following injection, the mobility of the grout was limited to 2m to 3m from each of the injection points.

Operations required five days on site, injecting approximately 60m^3 of grout via the 34 points. All drilling was in shale at depths of between 1.8m and 2.1m.

The contact polymeric grouting program was carried out on time, providing the required temporary protection for the sewer pipeline, as a precursor to the building construction planned for the site.