Northern Roads Upgrade Stage 5

Project: Northern Roads Upgrade Stage 5

Principal: Transport for NSW

Location: Western Sydney

Construction Contractor: Diona Pty Ltd.

Completion: July 2022

Supplied: 3.9km of 914OD & 960OD Sintalock I

Project Need

The Western Sydney Northern Roads Stage 5 Upgrade project provided an increased capacity enhancement of Western Sydney's major roads, including improvements with utilities and hydrology to create more resilient and enhanced transportation in response to increased population and traffic. This major road project included doubling a 13km section of one of Western Sydney's busiest arterial roads, to increase road capacity, reduce congestion and travel times, and support the region's growing population. Stretching from Glenmore Park to Luddenham, the project upgraded road infrastructure to a divided four lane alignment and created public transport lanes, ultimately creating transport links to the new Western Sydney Airport at Badgerys Creek.

The upgrade also included major improvements to stormwater infrastructure, with a focus on adjustments to existing water utility infrastructure to be maintained or relocated efficiently, as well as addressing flooding and drainage concerns.

The upgraded stormwater management incorporated drainage structures such as hydraulic box culverts to manage increased surface water due to the widened roadway. The relocation of existing public utilities through the installation of a slip-lined pipeline also allowed for effective maintenance beneath the road without extensive surface disruption. The pipeline plays a critical role in both the functional integrity of the transport corridor and the resilience of surrounding areas prone to flooding and utility interruptions.

Solution

Steel Mains was selected as the supplier of the pipeline for the Northern Roads Stage 5 Upgrade, supplying 3.9km of 914OD & 960OD Sintalock I MSCL pipe, as well as 160m of DN900 MSCL Sintakote carrier pipe for the slip-lining installation into DN1200 Jacking Pipe. The weight of the DN900 carrier pipe was 300kg/m during installation and 880 kg/m during hydrostatic testing, prior to grouting, with the load capabilities supported through micro-tunnelling installation-by means of Kwik-ZIP HDX-38 spacers. Due to the run length and weight of the pipe, the spacer rings were installed at 1m intervals for the first 30m of the pipe, and then at 2m intervals for the remaining 130m. The Kwik-ZIP spacer rings were able to support the carrier pipe installation on low friction wear pads that resist abrasion from the casing pipe surface, with the steel mains pipe successfully pushed the full distance.

Steel Mains Sintakote is a medium density polyethylene which is applied to the pipe by a fusion bonding process, providing high impact and load resistance, resistance to soil stresses, quality adhesion and low water absorption, making it the ideal coating for the Northern Roads upgrade. The decision to use Sintakote MSCL as the preferred material was based on the design flexibility, product quality and proven service life of Steel Mains pipes, providing a seamless laying experience. The use of Sintalock I welded rubber ring pipe joints allowed for fast installation of the pipe, as only external welding was required, enabling construction of a fully end restrained pipeline without the need for concrete thrust blocks. This approach significantly contributed to the success of the Northern Road Stage 5 upgrade by ensuring a durable, high-performance pipeline that could withstand heavy traffic loads and challenging soil conditions.

The combination of Sintakote's protective coating and the Sintalock joint system streamlined installation, reduced construction time, and eliminated the need for bulky thrust blocks, which minimized disruption and improved efficiency. These features supported the project's broader goals of enhancing road safety, improving drainage reliability, and delivering long-term infrastructure resilience for Western Sydney's growing transport network.

Achievement

Steel Mains partnered closely with the contractor to deliver a solution that not only preserved the functional integrity of Sydney's transport corridor but also strengthened the resilience of surrounding areas against flooding and utility disruptions. This collaboration played a critical role in enhancing the overall reliability and safety of the Northern Road upgrade, a key infrastructure project for Western Sydney.

By integrating essential water infrastructure seamlessly into the road design, the team was able to streamline construction processes, reduce project timelines, and minimize environmental impacts. The approach ensured that the pipeline system could withstand heavy traffic loads and extreme weather events, supporting long-term performance under challenging conditions such as flooding.

The successful installation of the pipeline was both a technical achievement and strategic contribution to the Northern Road upgrade's broader objectives. These included enabling sustainable growth and development across Western Sydney, improving connectivity, and guaranteeing dependable utility services for decades to come. Through this effort, Steel Mains helped provide infrastructure that meets today's demands while anticipating future needs, reinforcing the region's capacity for economic and community development.