CASE STUDY

VELATOR ACCESS ROUTE

CLIENT: ENVOLVE INFRASTRUCTURE

LOCATION: DEVON

HIGHLIGHTS:

- Ground Investigation Specification & Geotechnical Design
- Access Infrastructure Design
- Drainage Design & SUDS

THE CHALLENGE

A South West Water Sewer Pumping Station (SPS), in North Devon, will imminently require upgrade with the installation of new equipment to meet modern requirements.

Arthian were requested to design the site access road, to provide suitable access for construction traffic, delivery vehicles and provide a long-term resilience to ensure access for on-going maintenance.

The site is located within the flood plain of the River Caen, adjacent to a Site of Special Scientific Interest (SSSI), and situated alongside an active military base, factors which needed to be considered in the design process.

info@arthian.com

www.arthian.com

+44 141 227 2300

Arthian

THE SOLUTION

The project was completed in several phases:

- Preliminary Route Design & feasibility
- Specification of Ground Investigation
- Detailed Design

The preliminary design that Arthian proposed was a geo-grid reinforced granular access track utilising the Client's preferred geogrid supplier and an alignment agreed with the landowner. As the proposed route is situated within a flood plain, it was discussed whether the finished levels should be set above the flood levels, to maintain access during storm events. It was however agreed with the client, that within the limits of the vertical geometry design, the track should be finished as close to existing ground as possible. The client's priority was to minimise the effect on the local scenery, and reduce the impact on the landowner, and accept the occasional loss of access during flood events.

Once the route was agreed, the geotechnical team designed the Ground Investigation (GI) scope. This comprised several trial pits in-situ testing (plate bearing test and dynamic cone penetrometer) and scheduling of relevant lab testing at representative intervals along the proposed route. This GI identified the ground conditions and informed the design build-up of the access track and the geo-grid specification.

On receipt of the GI, the detailed design was developed with consideration for the construction and operational vehicle movements, loading and required geometry. The GI results identified local areas of soft ground. Alternative designs were developed in case this soft ground is encountered more regularly along the proposed route.

The preliminary design that Arthian proposed was a geo-grid reinforced granular access track utilising the Client's preferred geogrid supplier and an alignment agreed

The detailed design also included surface water drainage design, which focussed on diverting existing land drains around the works whilst minimising the effect of the scheme on the local hydrology. The drainage design also aimed to reduce the ground water during construction, to reduce the risk of worsening the soft ground conditions. Arthian designed two culverts for the site, one upgraded and one new. Using InfoDrainage software, Arthian analysed the local rainfall criteria for the catchment area, identified a suitable pipe diameter and provided construction details to meet current best practice, including CIRIA SuDS guidance.

info@arthian.com
www.arthian.com
+44 (0) 3301 200 151

Arthian

The third option involved travelling along the NCN1, and the remainder of the route would be installed in the verge of several public highways and trunk roads through residential and industrial areas. This option was initially discarded as it would result in significant disruption to residential areas, involve major road works and was by far the longest cable route. This option was considered as it could minimise the effect on sustainable transport routes, and would be the simplest construction method as the entire route could be installed by open trenching with straightforward access and have a minimal effect on ecological constraints.

Arthian presented the feasibility of each option, and the influential factors that would affect the client's route selection for progression to planning stage. Arthian also included recommended on any further investigation including ground investigations, site investigation, topographical survey and culvert condition assessment as well as any environmental impact assessment works which may be required to ensure the client have all available information for the cable route option they select. Early engagement with utility and infrastructure operators as well as further engagement with HDD contractors was recommended to develop a site-specific designs and specifications to provide certainty on feasibility.