

Project Report

Sannox View Retaining Wall

Ayr, Scotland

CLIENT	CONTRACTOR	DESIGNER
South Ayrshire Council	Hartmann Construction	Tellus Design

Requirement

Anchor Systems were specified to provide a ground anchoring solution to stabilise two existing brick retaining walls supporting service roads to the rear of residential properties at Sannox View in Ayr.

Both walls had experienced significant movement, including leaning, horizontal displacement along brick joint beds, cracking in the masonry, and differential settlement of nearby concrete slabs. Several factors were considered likely contributors to the instability, including hydrostatic pressure from poorly drained retained fill, potential damage to underground drainage pipes reducing bearing resistance, and additional loading from vehicles such as refuse trucks using the service road above.

Replacing the walls would have caused major disruption to residents and required significant cost. A strengthening solution was therefore required that could stabilise the existing structures in situ while limiting further movement and minimising disruption. Driven ground anchors were identified as the most suitable method to reinforce the retaining walls.

Testing

Prior to installation, validation testing was undertaken to confirm that the selected anchor specification could achieve the required performance within the site's ground conditions.

The ground profile consisted of made ground (fill) overlying glacial till, requiring anchors capable of achieving reliable load capacities within these conditions. Based on the design analysis and global stability assessment, AS-50 Vulcan Earth Anchors were specified.

Two different anchor configurations were used across the walls:

- Wall 1:
 - Anchors installed at 30° below horizontal
 - 5 m long, 16 mm diameter galvanised steel tendons
- Wall 2:
 - Anchors installed at 45° below horizontal
 - 4 m long, 16 mm diameter galvanised steel tendons

All anchors were proof load tested to 44 kN and subsequently locked off at 25 kN to ensure the required stabilising forces were achieved. Site validation testing confirmed that the AS-50 anchor size was suitable for achieving the required load capacities within the available ground conditions, giving confidence in the long-term performance of the system.

Solution

Anchor Systems supplied AS-50 Vulcan Earth Anchors with fully stainless-steel Grade 316 components, selected to meet the project's load requirements and long-term design life.

Installation was carried out by Hartmann Construction using machine-mounted equipment from the service road above the retaining walls. Several site constraints had to be considered, including buried services behind the wall and a required 400 mm exclusion zone around mains water services, which influenced anchor positioning and installation angles.

To accommodate these constraints, installation angles were increased compared with typical designs. In locations where buried services prevented standard anchor spacing, steel beams were used in place of recessed pattress plates, allowing wider spacing while maintaining effective load transfer.

Despite restricted access to the wall face, installation was completed in approximately two weeks, with the service road temporarily closed during the works. The installed Vulcan Earth Anchor ground anchor system now provides stabilising resistance to the retaining walls, preventing further displacement while avoiding costly reconstruction and minimising disruption to residents.

