

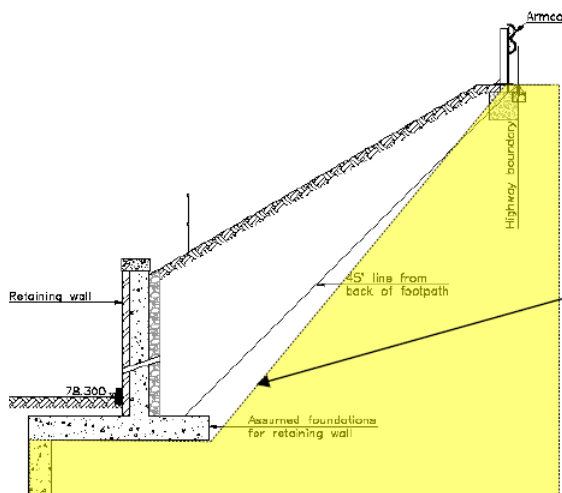
## Ravenside Retail Park, Chesterfield

**Client:** Land Securities/ASDA  
**Contractor:** Morgan Sindall  
**Eng/Checker:** Nolan Associates/RNP Associates  
**Supply:** 102No. Galvanised Duckbill®  
 Ground Anchors  
**Date:** Installed June-Sept 2013



### Requirement

Land Securities had decided to increase their retail development to accommodate a 19,000 sq ft unit for the ASDA retail chain. The location within the existing development required the ASDA store and car park to be situated approximately two metres below existing road level on two faces of the development. Markham Road (A619) to the south and Park Road to the West. Both roads are existing roads and were in continued use during the development.

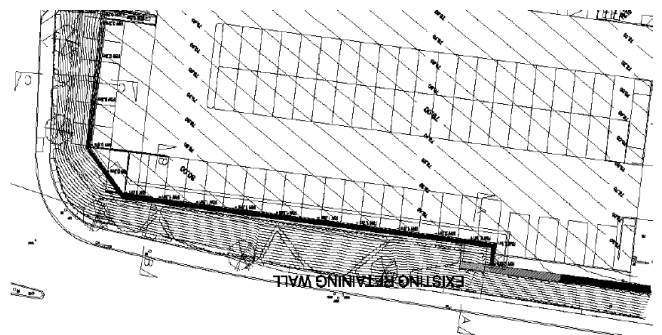


As a result of the two metre depth between existing road level and car park level the cuttings formed needed to be pinned back to ensure slope stabilisation. The slopes were up to 53 degrees and required a temporary works solution prior to erection of the permanent reinforced concrete retaining walls approximately 1.2 metres in front of the existing road footpaths.

### The Solution

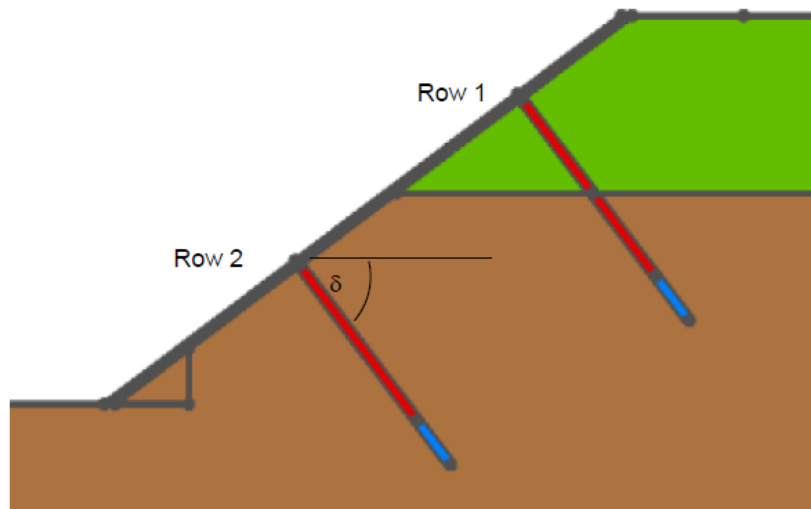
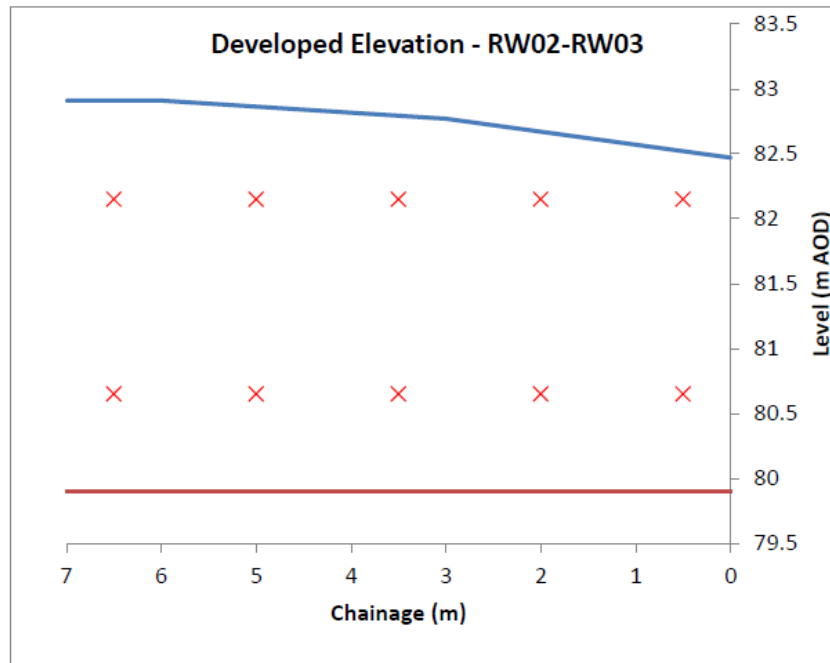
Anchor Systems (Europe) Ltd (ASEL) were approached to design and supply the Duckbill® anchoring system to stabilise the soil slopes as part of the temporary works solution. ASEL after a minimal design input first sent a team to site to install two test anchors at differing levels to

ensure that the soils data was correct and proposed anchors could be used to maintain the load. ASEL then supplied the complete design of the Duckbill ground anchor system through our consultant design team and then supplied the Duckbill® anchor system as per the solution. ASEL attended design and site meetings to ensure good collaboration on site and provided valuable design and installation input during the project installation phase. The site was found to be built on an existing housing site where there were once cellars and therefore voids in the ground. Some of the anchors were required to be adjusted in their installation positions to allow for these voids. This project was a demonstration of a successful collaboration between supplier and contractor to achieve a predetermined finish date.



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### Sample Design Output for Construction



Chainage (m)	Row 1 – 23kN			Row 2 – 23kN		
	Level (m)	Angle (°)	Length (m)	Level (m)	Angle (°)	Length (m)
0.5	82.15	55	2.50	80.65	55	2.25
2.0	82.15	55	2.50	80.65	55	2.25
3.5	82.15	55	2.50	80.65	55	2.25
5.0	82.15	55	2.50	80.65	55	2.25
6.5	82.15	55	2.50	80.65	55	2.25

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