

Central Kowloon Route (CKR) - Excavation and Lateral Support (ELS) Works Worksheet (Secondary School)

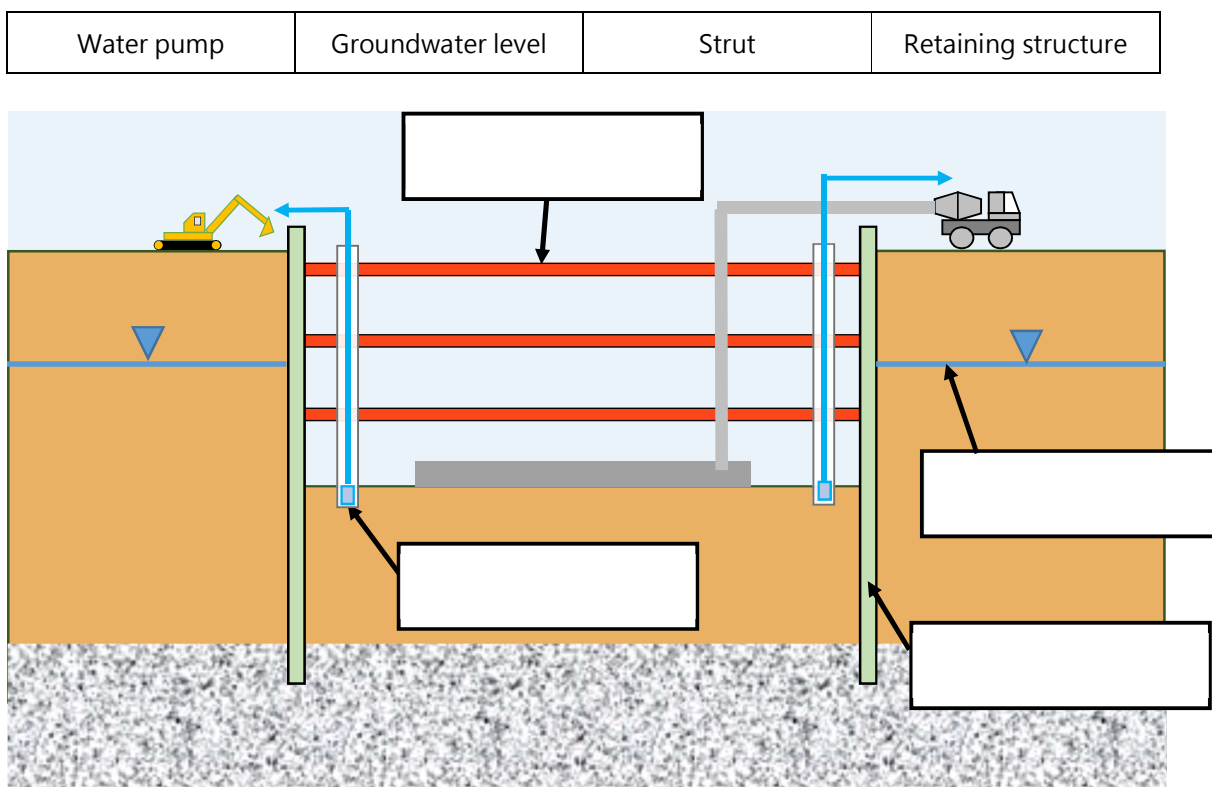


Name : _____ (____) Class : _____

Date : _____

ELS works are typically used to provide support for excavation of the existing ground for the purpose of construction of pile caps, basement and underground structures. Various works of the CKR Project, including the construction of depressed roads, cut-and-cover underwater tunnel and ventilation buildings, involve ELS works.

1) Fill in the blanks to finish the set-up.



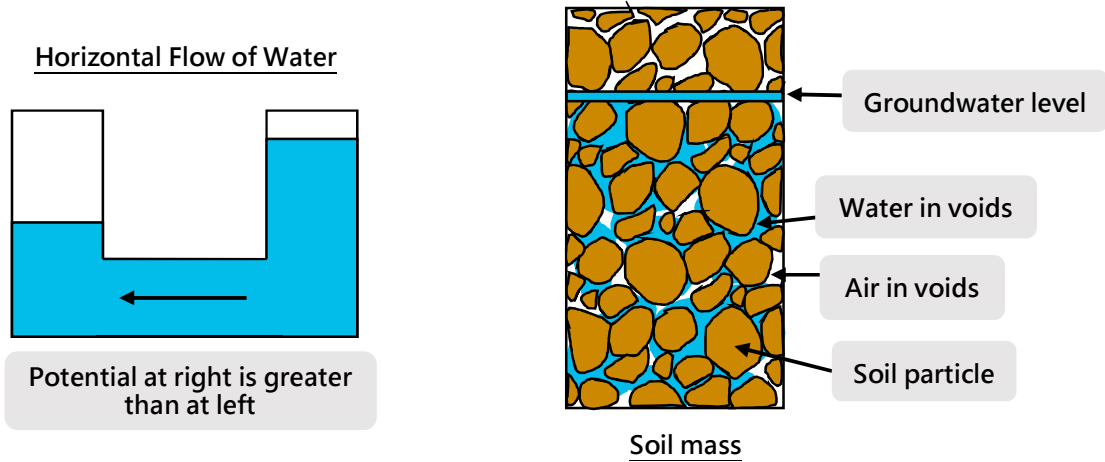
2) Prioritise the construction sequence of ELS works.

	<p>Excavation – To Remove soil from the excavation area to make room for further construction work</p>
	<p>Installation of vertical retaining structures – To avoid collapse of soil outside the excavation area</p>
	<p>Installation of struts (lateral support) – To support the retaining structures</p>
	<p>Removal of water from the soil within the excavation area – To reduce soil moisture to facilitate excavation work</p>

Works Characteristics - Settlement

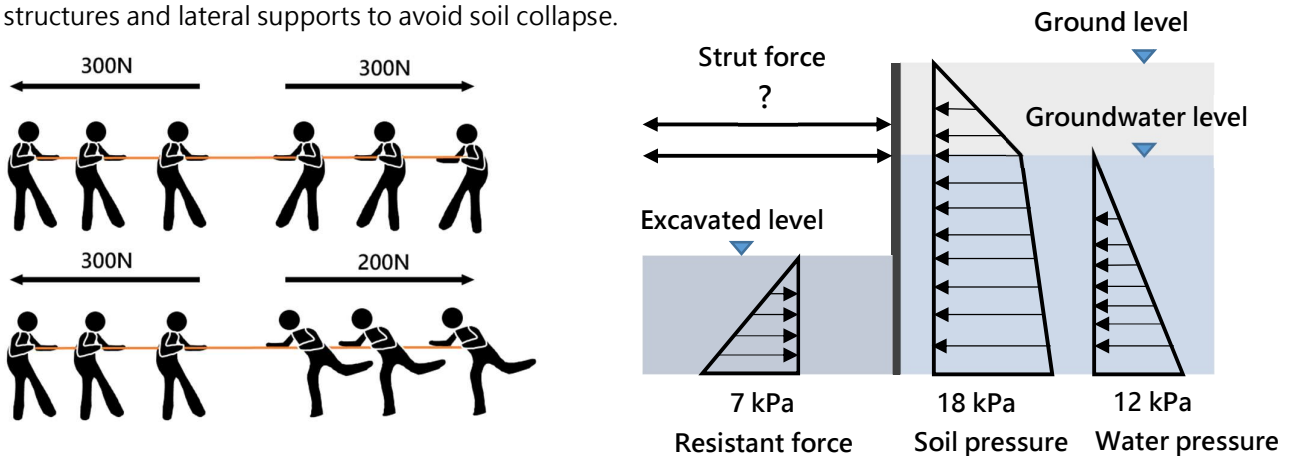
When designing ELS works, engineers need to consider different factors such as excavation depth, soil pressure and groundwater level to minimise the impact on the surrounding environment. Ground settlement is a common phenomenon during ELS works. Monitoring points will be set up at the site to ensure that the settlement values are within a safe range.

Briefly describe the causes of settlement based on the set-up diagram on page 1 and the diagrams below.



Works Characteristics – Lateral Support

Excavation works will cause a difference in ground level inside and outside the excavation area, resulting in a higher soil pressure outside the excavation area. Therefore, it is necessary to install vertical retaining structures and lateral supports to avoid soil collapse.



Please circle the struts (more than one answer) to be installed according to the figure above.

5 kPa

9 kPa

6 kPa

12 kPa

8 kPa

18 kPa