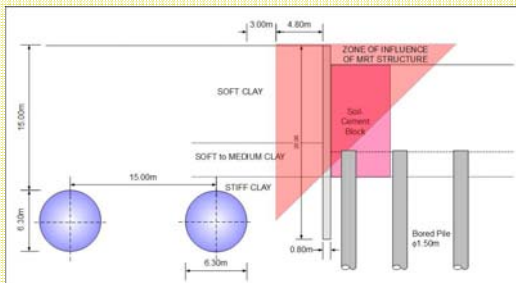




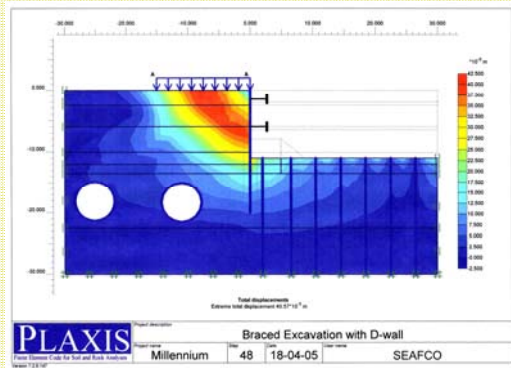
Deep Excavation adjacent to MRTA Tunnels



Layout of the project.



Typical cross-section of the project.



Finite element computer modeling for a deep excavation adjacent to tunnels.

BACKGROUND: A hotel tower was constructed with two basements using cast-in-situ diaphragm wall located 7.8m to 9.6m away from the southbound tunnel of the Mass Rapid Transit Authority. The specified total movement of tunnel induced by excavation must be less than 6.0mm. In order to meet the specified technical requirements for engineering work adjacent to the MRTA structure, control of lateral movement of diaphragm wall to minimum level is necessary.

SUBSOIL CONDITIONS:

Top soil or fill	0-2.0m
Soft clay	2.0-12.0m
Medium stiff clay	12.0-15.0m
Stiff to very stiff clay	15.0-19.5m
Medium dense sand	19.5-22.0m
Very stiff clay	22.0-42.5m
Dense sand	42.5-50.0m
Hard clay/silty clay	50-.054.0m
Dense to very dense sand	54.0-66.0m

CONSTRUCTION DETAILS:

- 66 bored piles (1.5m diameter) and 7 barrettes (1.0x3.0m) embedded to -60.0m in dense sand layer.
- Diaphragm walls (0.8m thick, 20m deep) with two level of temporary bracing were used for general excavation to -10.5m.
- Soil improvement (5.5m wide 13.5m deep) with overlapping soil-cement columns (1.10m diameter) along the diaphragm wall adjacent to the tunnel to increase the passive resistance of the soil for basement excavation.



Diaphragm wall and bored pile construction in progress.



Improvement of soft clay with soil-cement column construction.



Deep Excavation adjacent to MRTA Tunnels



Excavation work with temporary bracing in progress.



Exposed soil-cement columns below 2nd bracing layer.



Excavation reached to the final depth of about -11.0m.

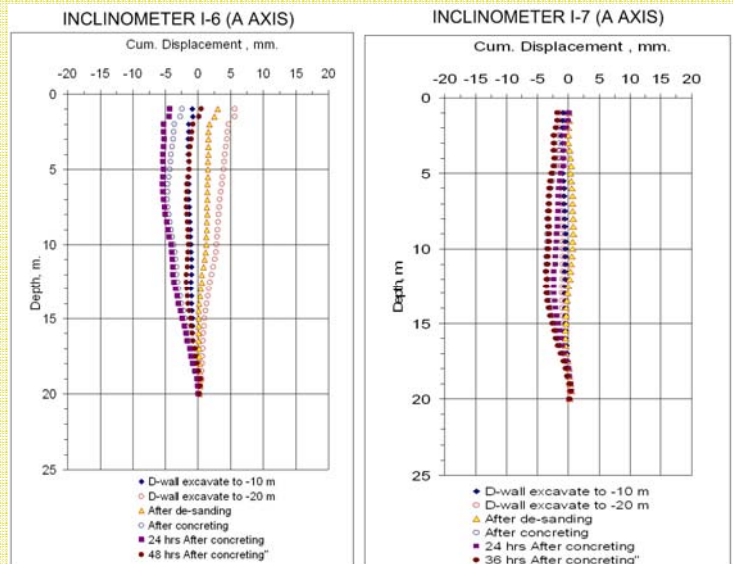
INFORMATION:

SEAFCO PUBLIC COMPANY LIMITED
 Tel. (662) 919-0090 to 97
 Fax. (662) 919-0098
 Home page: www.seafco.co.th
 Email: seafco@seafco.co.th

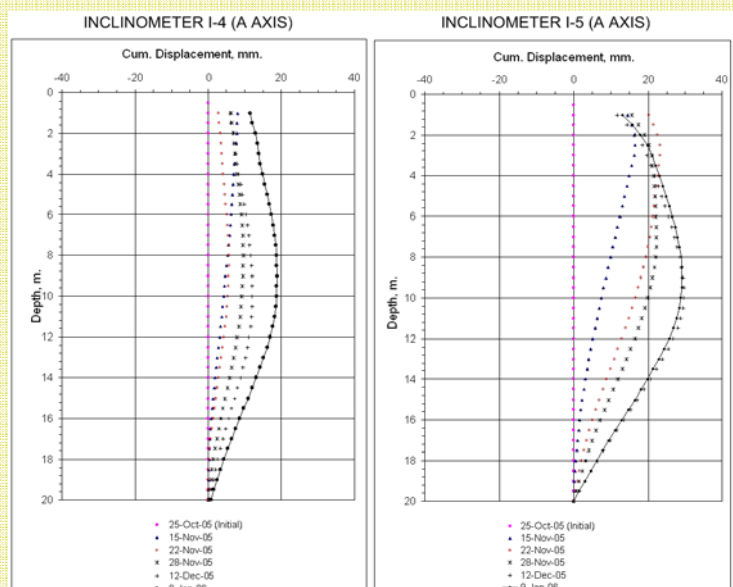
INSTRUMENTATION

- Two inclinometer tubes in the soil: between diaphragm wall trench and tunnel for monitoring the soil movement during diaphragm wall panel construction.
- Five inclinometer tubes in the wall
- Settlement points
- Convergent bolts on tunnel rings

MONITORING RESULTS



Soil movement indicated by inclinometers during diaphragm wall panel construction.



Diaphragm wall movements with and without soil improvement (I-4 and I-5 respectively).