

CR208 ECM PROJECT AWARD

CCCC-SINOHYDRO JV

8 Nov 2024

CR208 - Design and Construction of Cross Island Line Clementi Interchange Station, Associated Additions and Alterations Works

- 1. Introduction**
- 2. Project Information**
- 3. ECM design and phasing**
- 4. Effective ECM Methods Practiced**
- 5. Innovative solutions/technologies**
- 6. Inspection, Monitoring & Maintenance Regime**
- 7. SIDS – Quality of Final Water Discharge from Worksite**
- 8. Additional Preventive Measures**
- 9. Challenges and Mitigation Measures**
- 10. Conclusion**

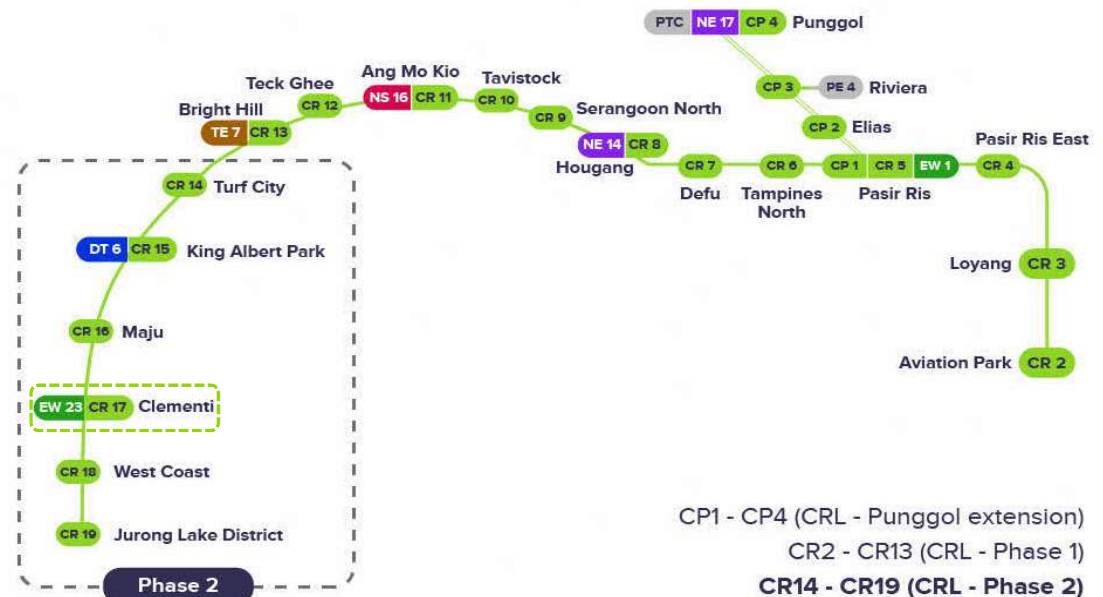
1. Introduction



CROSS ISLAND LINE CONNECTING ACROSS THE ISLAND

Our 8th MRT line, the Cross Island Line will be the longest fully underground line at more than 50km long. It will serve existing and future developments in the eastern, western and north-eastern corridors.

1. More alternative travel routes
2. Reduction in Travelling Time
3. Enhanced connectivity to North-East and Eastern part of Singapore



1. Introduction

Contract CR208 comprises the design and construction of **CR17** Clementi Station and Addition & Alteration works to the existing **EW23** Clementi Station.

Contractor – (CCCC-SINOHYDRO JV)

S/No	Name	Designation
1.	Dave Park Young Jun	Project Director
2.	Er. Ng Chew Chiat	QECP
3.	Mohammad Hafiiz	WSHE Manager
4.	Settukasinathan Prakash	ECMO



2. Project Information



LTA Contract CR208

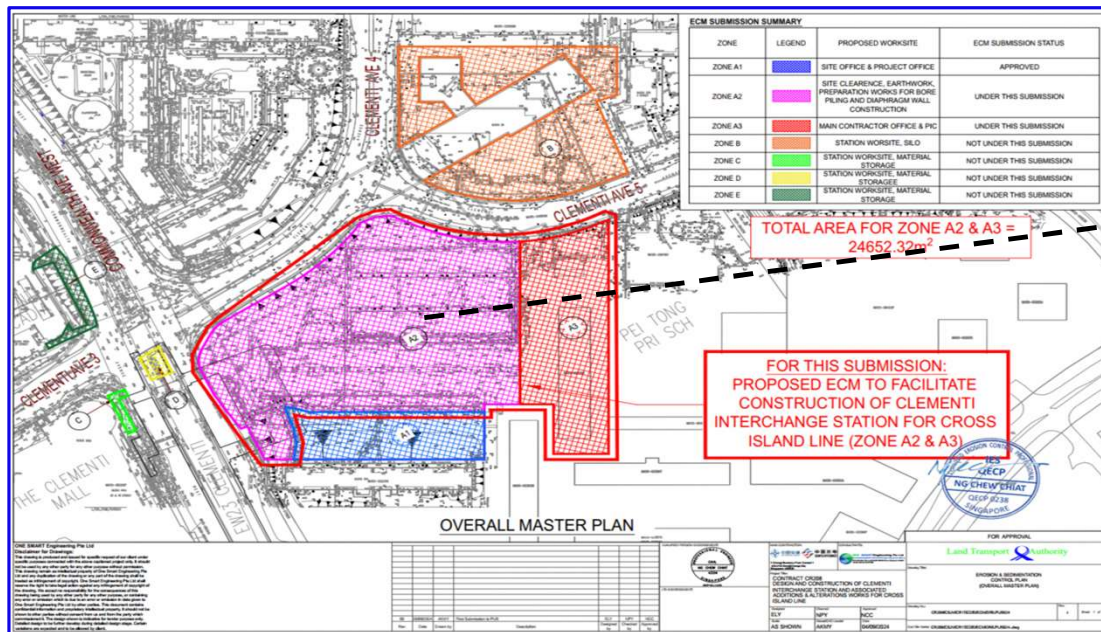
**Design & Construction of Clementi Interchange Station and
Associated Additions and Alterations Works for Cross Island Line**

Developer:	LAND TRANSPORT AUTHORITY
Contractor:	China Communications Construction Company – Sinohydro JOINT VENTURE (JV)
Project BCA Reference No.:	E5558-00001-2024
Location:	Clementi Ave 4 & Ave 5
Project Start Year:	2023
Project End Year:	2032

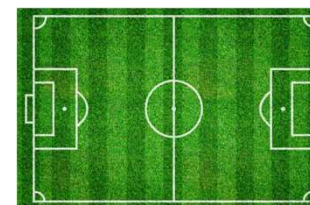
3. ECM Design and Phasing

PUB and LTA requires Earth Control Measures (“ECM Plan”) Plan as part of controlling the erosion or discharge of silty water during the entire duration of the project construction works.

QCECP from One Smart Engineering Pte Ltd had been engaged to prepare effective ECM plans for the Project.



Excavated area:
10,100 square meter
=
Size of 2 football pitches



Excavated volume:
40,200 cubic meter
=
Size of 16 Olympic sized swimming pool



4. Effective ECM Methods Practiced - Hardcore



Access ways are covered with hardcore and steel plates which minimizes the area of exposed bare earth and thereby, reduces the generation of silty water from the worksite.



Laid Hardcore to Access Paths Under Steel Plate to Minimize Silty Runoff



Laid Hardcore to Finalized Excavation Level Areas to Minimize Silty Runoff



4. Effective ECM Methods Practiced - ECB



Earth Control Blankets (ECB) are used to cover and protect exposed soil, reducing fire risk and protecting the surrounding areas near public spaces.



Exposed Areas Covered With ECB



Exposed Areas Near to Public Area's/Walkways
Covered With Fire Retardant Type ECB



4. Effective ECM Methods Practiced - Drainage



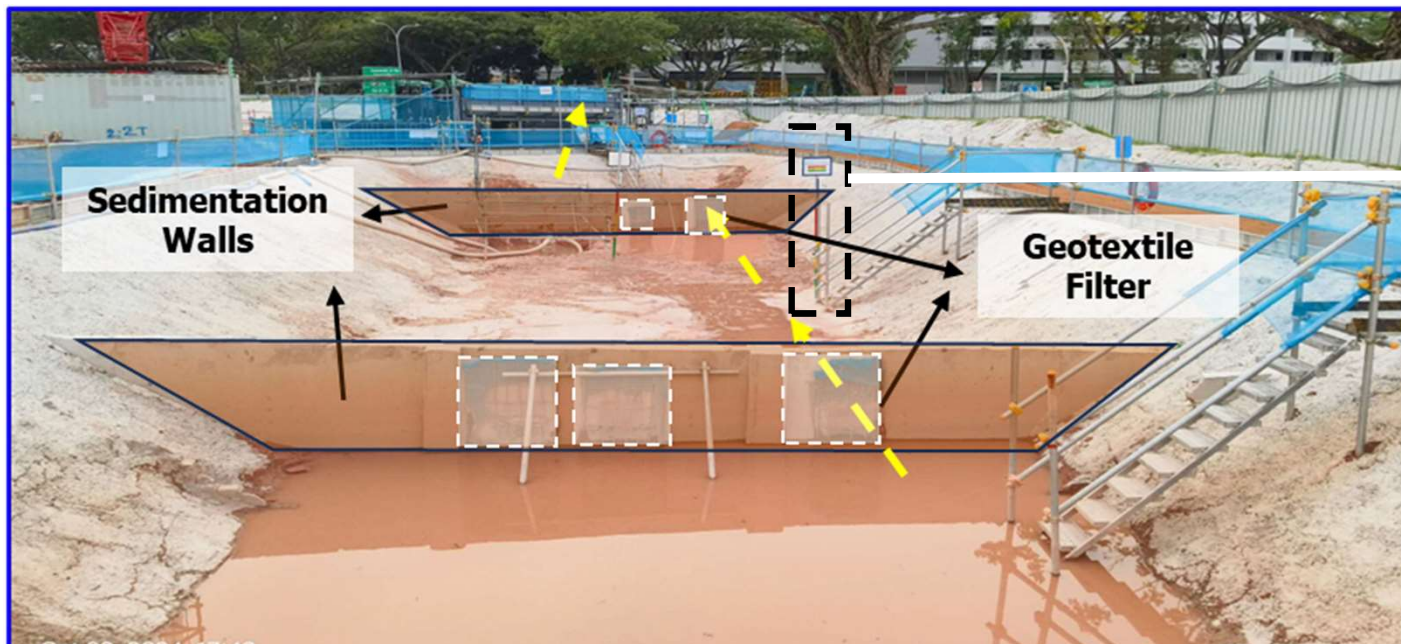
Silt Fence and Silt Trap

Perimeter Cut-off Drain With Silt Fence and Silt Trap Installed

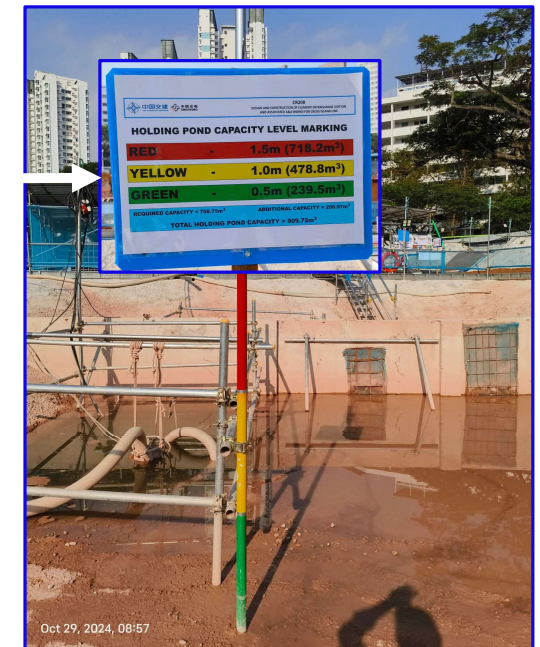


4. Effective ECM Methods Practiced – Holding Pond

ECM Holding Pond



ECM Holding Pond With Geotextile Filter Sedimentation Walls



Holding Pond Level Marking



4. Effective ECM Methods Practiced - Recycling



Usage of Treated Water



Vehicle Wheel Washing



Dust Control Spraying



4. Effective ECM Methods Practiced – Treatment Plant



Automated SMART Switch Control System



Setting up of ECM – Treatment Plant



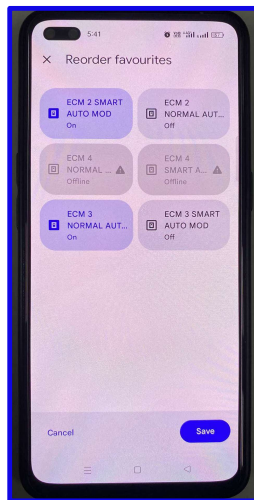
TSS/CCTV Monitoring



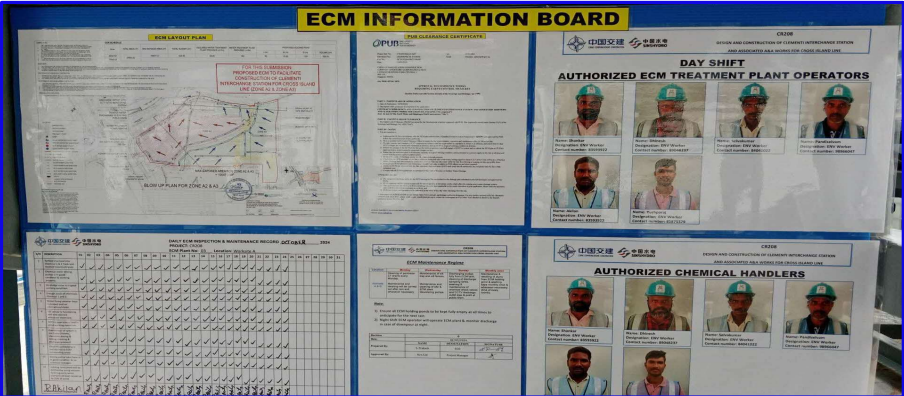
5. INNOVATIVE SOLUTIONS/TECHNOLOGIES

Smart Switch Control System & Functions:

- Panel connected with Treatment Plant & TSS Unit.
- Shuts downs the treatment plant and stops silty discharge automatically when TSS Limit Exceeds 50mg/l.
- Ability to remotely operate the Treatment Plant using a Mobile App (with internet connection).
- Sends notification alerts to ECM personnel upon exceedance of TSS Limits.
- Additional Smart System CCTVs are fixed at the Sampling Tank to monitor the discharge internally.



6. INSPECTION, MONITORING & MAINTENANCE REGIME



Daily Checks by Authorized ECM Plant Operator and Weekly ECM Maintenance Regime



Monthly QECP ECM Inspection with LTA & QPS

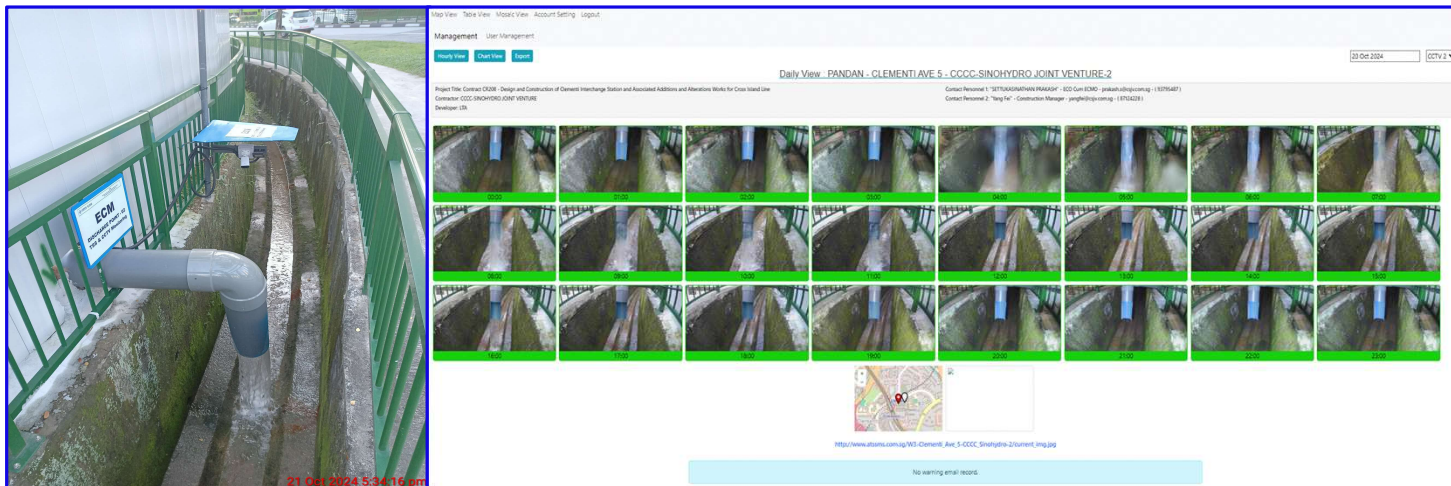


Weekly Joint ECM Inspection by QPS and ECMO



Quarterly LTA Senior Management Site Walk

7. SIDS - QUALITY OF FINAL DISCHARGE FROM SITE



21 Oct 2024 5:34:16 am

Silty Imagery Detection System (SIDS):

- Uses image analytics technology to detect silt discharge and CCTV downtime.
- SIDS extracts and analyses real-time images from CCTVs, and automatically sends alerts to various parties involved upon detection of silt discharge or image problems.
- Enables prompt rectification action to be taken through the real-time monitoring system, preventing for any silty discharge into public drains.

8. Additional Preventive Measures of Silty Water Discharge



Additional Measures Implemented:

1. Sufficient and additional storage of ECM silty water treatment plant chemicals for uninterruptable operation of ECM during continuous long hours downpour.
2. Stockpiling of ECM materials such as Dewatering pumps with hoses, ECB's (both ordinary and fire retardant type), Silt fences with installation materials, Canvas sheets in case of sudden downpour during excavation.
3. Deployment of manpower for both day and night shift ECM workers on site for close monitoring of ECM.

9. Challenges and Mitigation Measures



S.No	Challenges	Mitigation Measures
1.	<u>Worksite Constraints</u> The CR208 project worksite was initially situated at a higher ground profile where it was challenging to control the surface runoff during intense heavy downpours. The project worksite is also surrounded by public roads, Clementi MRT Station, Schools, HDB residential buildings, shop houses and public drainage.	- Implemented bund walls & pump sumps with concrete lining at lowest points around the worksite, to control and hold water rushing towards low lying areas and to public drains along worksite boundaries, as an interim measure. - Constructed temporary scupper drains with concrete lining as an interim perimeter cut off drain. - Erected firm and effective silt fence around inner side of site hoarding along temporary scupper drains.
2.	<u>Future Slope Cutting Works</u> There will be upcoming major excavation works to cut down the existing high ground level of 3m, hence it was challenging to construct C7 perimeter cutoff drains during the interim phase.	- Constructed temporary concrete lined perimeter cutoff scupper drains with intermediate pump sumps as an interim measure to channel the water into the holding pond. - Erected firm and effective silt fence around the inner side of the site hoarding along the temporary scupper drains.

ECM Layout Plan



CR208 ECM PROJECT AWARD
CCCC-SINOHYDRO JV
8 Nov 2024

Thank You

On Behalf of CR208

