

- 7.3 Interface with Adjacent CRL Contractor: Contract CR205 King Albert Park Station
- 7.3.1.1 The Contractor shall interface with Contract CR205. The Contractor shall launch their Tunnel Boring Machine (TBM) driving towards CR205 and interface with the end wall of King Albert Park Station as indicated in the Drawings.
- 7.3.1.2 CR206 TBM cutterhead shall be docked outside the ERSS end wall of CR205. No provision has been made for the retrieval of the Contractor's TBM and all associated components from within CR205. The Contractor's TBM will be dismantled and retrieved from CR206 launch shaft. The shield skins shall be left in place and the Contractor shall construct the permanent in-situ lining and waterproofing within the shield to complete the tunnels.
- 7.3.1.3 The tunnel lining design, ERSS and the interface connection details with CR205 are developed based on following:
- a) The Contractor shall be responsible for completing the ground improvement works for TBM docking at CR205 interface area within four (4) months from the date of taking over the access or as mutually agreed and accepted by the Engineer. The Contractor shall coordinate, agree and sign off with CR205 for the actual date of completion work for ground improvement works and for planning of the sequence of the tunnel drives subject to the Engineer's acceptance. The Contractor shall refer to the Authority's Drawings for his scope and the interfacing details.
 - b) The Contractor shall be responsible for completing the permanent tunnel lining and waterproofing through the abandoned TBM shields up to the location of the Contract Limits as shown in the Authority's Drawings. This shall include temporary ground support to ensure the stability of the ground and the water tightness of the interface at the unsupported gap between ERSS and front shield once the cutter head is dismantled but before the permanent tunnel lining is completed. The Contractor shall prepare the inside surface of the tunnel eye at the interface wall such that the surface is acceptable for the installation of hydrophilic strip and ensure water tightness has been achieved. Upon completion of the permanent tunnel lining, CR205 will construct the cast-in-situ RC ring beam/tunnel eye, including waterproofing, between the permanent cast-in-situ lining and the permanent end wall of CR205 as shown in Drawings.

- c) The Contractor shall hack the ERSS tunnel eye at the interface as a base requirement unless any changes to the requirement is proposed by both Contractors jointly and accepted by the Engineer. The Contractor shall coordinate with CR205 for the access and working area required up to 10 m length for hacking of the ERSS end wall of CR205. The Contractor shall complete the required works at the interfacing area as shown in the Authority's Drawings within three (3) months from the date of taking over the access or as mutually agreed and accepted by the Engineer. The Contractor shall be responsible for the clearance of all muck and debris arising from ERSS hacking.
- d) CR205 will design and install his ERSS end walls with Glass Fibre Reinforced Polymer (GFRP) soft eyes. The Contractor shall coordinate with CR205 for the required size of the soft eyes. CR205 shall also provide recesses of up to 3 m within CR205 base slab as a standard requirement.

7.3.1.4 The Contractor shall coordinate the interfacing works and instrumentation limits of buildings and structures within the influence zone of both contractors. The Contractor shall be responsible to:

- a) Carry out the necessary impact assessment incorporating the impact of CR205 works and his Works on each other and the combined impact to the surroundings;
- b) Obtain the instrumentation plan from CR205 and review it together with the instrumentation provision in CR206 and assess the sufficiency of the instrumentation provision;
- c) Develop a combined instrumentation plan that provides all necessary information for CR205 works in order to differentiate responsibilities in the event that any instrumentation triggers the recommended limits and submit it to the Engineer for acceptance;
- d) Propose revision to any trigger limits of instrumentation installed by CR205 if it is deemed necessary, coordinate with and support CR205 to seek the necessary authorities' approvals for such revision. The Contractor shall be responsible for the proposed revision, including but not limited to the design assessments, producing drawings and liaising with relevant authorities, and bear all associated costs;

PS-7-8A

- e) Coordinate and compile all readings taken from the instrumentations installed by the IM contractors for both CR205 and CR206, assess in relation to the ongoing works and site conditions by both contractors, and submit a daily assessment report endorsed by the Contractor's QP(D) and QP(Geo), with recommendation on actions required wherever necessary, to QP(S) for approval and the Engineer for acceptance; and
- f) Coordinate with the adjacent contractor for works at the interface and ensure the proposed sequence of works does not compromise the safety of both CR205 and CR206 works.

7.3.1.5 Buildings, structures, facilities, utilities, etc., at the interfaces may be at risk of damage due to excessive settlement caused by the Contractor or CR205 whether individually or by a combination of these works as combined effects. The responsibility for re-analysis, re submission to the authorities, remedial and protection measures, subsequent repairs, etc., and the way forward as a result of the exceedance of the settlement limits due to the respective Contractors' works are summarised in Table 1 below:

Table 1: Summary of Possible Scenarios for Exceedance of Settlement Limits at Contract Interface CR205/CR206

	Case 1 (CR205 Contractor)		Case 2 (CR206 Contractor)		Case 3 (CR205 and CR206 Contractor)	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
WSL	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded
Exceedance Due To	CR205 works	CR205 works	CR206 works	CR206 works	Concurrent works by CR205 and CR206	Concurrent works by CR205 and CR206
Damage	No	Yes	No	Yes	No	Yes
Actions	(i) CR205 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR206 works to proceed.	(i) CR205 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR206 works to proceed.	(i) CR206 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR205 works to proceed.	(i) CR206 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR205 works to proceed.	(i) Both CR205 and CR206 contractors to reassess and establish new WSL/limits to allow both works to proceed.	(i) Both CR205 and CR206 contractors to reassess and establish new WSL/limits to allow both works to proceed.
	(ii) CR205 Contractor to submit revised WSL to BCA.	(ii) CR205 Contractor to assess damage and propose remedial and protective measures.	(ii) QPs of the respective ST submissions to submit revised WSL to BCA)	(ii) CR206 Contractor to assess damage and propose remedial and protective measures.	(ii) QPs of the respective ST submissions to submit revised WSL to BCA)	(ii) Both CR205 and CR206 contractors to assess damage and propose remedial and protective measures.
		(iii) CR205 Contractor to submit revised WSL to BCA. (iv) CR205 Contractor shall be fully responsible for the remedial and protective measures, any resultant and further damage and repairs to be carried out up to completion of the Works.		(iii) QPs of the respective ST submissions to submit revised WSL to BCA) (iv) CR206 Contractor shall be fully responsible for the remedial and protective measures, any resultant and further damage and repairs to		(iii) QPs of the respective ST submissions to submit revised WSL to BCA) (iv) Both CR205 and CR206 contractors shall be jointly responsible for the remedial and protective measures, any resultant and further damage and repairs to be carried out up to completion of the Works.

- 7.3.1.6 The Contractor shall liaise with CR205 to establish and obtain access into the required working area within CR205 boundary (not limited to ground level) to carry out the tunnel interface works. The Contractor shall coordinate with CR205 contractor regarding the actual access dates for the works.
- 7.3.1.7 The Contractor shall be fully responsible to provide all the temporary provisions required for his works, such as, but not limited to, power, ventilation, lighting, access scaffolding, working platforms, drainage pumps, lifting equipment, formwork and falsework to facilitate his works at the interface.
- 7.3.1.8 The Contractor shall indemnify the Authority against all costs, charges and expenses resulting from his failure to properly coordinate the Works and the interfaces with CR205.
- 7.3.1.9 The Contractor shall coordinate with CR205 to ensure the structural finishes levels of the tunnel base slab, structural connections and waterproofing details are consistent at the interface.
- 7.3.1.10 In the event that the Contractor needs to make specific structural provisions to cater for his loading or method of construction, the Contractor shall liaise, coordinate and agree on the cost and time for such provisions with CR205.
- 7.3.1.11 The Contractor shall coordinate with CR205 for all loading and TBM operating parameters pertaining to TBM docking and or break in.
- 7.3.1.12 The Contractor shall coordinate with CR205 for his site investigation findings and all geotechnical site investigation information. This provision does not relieve the Contractor of the responsibility to undertake the necessary site investigation for his Works.
- 7.3.1.13 The Contractor shall provide his site investigation findings and all geotechnical site investigation information to CR205 within one (1) month of completion of the site investigation.
- 7.3.1.14 The Contractor shall coordinate with CR205 for the delivery, storage and removal of materials and equipment necessary for the CR205 end wall hacking.
- 7.3.1.15 Unless otherwise specified, the worksite occupied by the Contractor shall be reinstated back to its original condition before handing back to CR205. For any proposed changes to the condition of worksite for handing back, the Contractor shall liaise and agree directly with CR205 subject to the Engineer's approval.
- 7.3.1.16 The Contractor shall remove all temporary provisions that relate to his works, except those that are required to be left in for attendance to the

SWC prior to handing back to CR205 or are otherwise agreed to be left in by the Engineer.

- 7.3.1.17 The Contractor shall convene a joint inspection with CR205 and the Engineer upon completion of the tunnelling works and prior to handing back of worksite to CR205. Any remedial works agreed shall be completed by the Contractor prior to the handover.
- 7.3.1.18 The Contractor shall coordinate with CR205 on the integration of the bored tunnel lining with the ring beam. The Contractor shall be responsible for the waterproofing between the tunnel lining and the ring beam as shown on the interface drawings.
- 7.3.2 The above clauses in no way absolve the Contractor of his responsibilities in relation to providing a safe worksite with all necessary temporary provisions. Any additional temporary provisions that the Contractor needs to provide shall be deemed included in the Contract Price.
- 7.3.3 The Contractor shall coordinate with CR205 Contractor to ensure compliance with Code of Practice for Fire Precautions in Rapid Transit Systems for the tunnel fire escape and obtain approval from Fire Safety and Shelter Department (FSSD) and relevant authorities.
- 7.4 **Interface with Adjacent CRL Contractor: Contract CR207**
 - 7.4.1.1 The completion of ERSS wall at interface is deemed to be in the critical path, the Contractor shall plan and schedule the construction of this interface ERSS wall as one of his early construction activities and demonstrate how he is able to achieve and meet the handing-over interface key date to CR207 contractor timely according to the key dates in **Appendix B** of the Particular Specification. This shall include the concept traffic diversion, the machinery and resources required to complete and handover to CR207 contractor.
 - 7.4.1.2 The Contractor shall coordinate with CR207 for the detailed construction sequence at the interface area and provide access for CR207 ground improvement works at the interface. CR207 shall complete the ground improvement works for a time period of up to four (4) months or a mutually agreed date accepted by the Engineer with due consideration for mobilisation and demobilisation where staged access is provided.
 - 7.4.1.3 In the event that CR207 tunnels reach and dock CR206 end wall before the station excavation reaches the formation level, the Contractor shall ensure
 - a) Blasting design for the station rock removal account for the consideration of stability and vibration limit of bored tunnels. The Contractor shall obtain the relevant design requirements from CR207.

- b) Impact assessment of the blasting works induced onto the bored tunnels shall be carried out;
 - c) Coordination with CR207 such that there will be minimal disturbance/disruption to CR207 works prior to commencement of blasting works.
- 7.4.1.4 The Contractor shall propose on the instrumentation plan, including installation and monitoring of the instruments within CR207 bored tunnels. CR207 shall provide access to facilitate installation and monitoring of the instruments by the Contractor.
- 7.4.1.5 Corresponding to clause 7.4.1.3, the Contractor shall coordinate with CR207 to allow coring through of the end wall immediately and access into their station once it is practicable and safe to allow CR207 to confirm the wriggle survey of the CR207's bored tunnels.
- 7.4.1.6 The Contractor shall design and install his ERSS end walls with Glass Fibre Reinforced Polymer (GFRP) soft eyes. The GFRP shall be at least minimum tensile strength of 800MPa and designed to ACI 440 or equivalent. The Contractor shall coordinate with CR207 for the required size of the soft eyes. The Contractor shall also provide recesses of up to 3 m within CR206 base slab as a standard requirement.
- 7.4.1.7 CR207 TBMs Reach before CR206 Station Completes Base Slab
- (a) It is envisaged that CR207 TBMs will reach CR206 station before CR206 completes the base slab. In this case, CR207 contractor will dock at the CR206 Station with his TBM outside the end wall. Subsequent to the docking, the Contractor shall undertake all works necessary to remove the tunnel eyes along the entire thickness of the ERSS and complete the remaining lining including the necessary waterproofing installation up to the Contract Boundary indicated on the Authority's Drawings.
 - (b) The Contractor shall prepare the interface joints such that the surface is suitable for the installation of hydrophilic strips and re-injectable grout tubes and ensure water tightness has been achieved.
- 7.4.1.8 CR207 TBMs Reach after CR206 Station Completes Base Slab
- 7.4.1.8.1 CR207 shall hack the ERSS tunnel eye at the interface as a base requirement unless any changes to the requirement is proposed by both Contractors jointly and accepted by the Engineer. The Contractor shall coordinate with CR207 for the access and provide working area required up to 10 m for the break in of the ERSS end wall of Maju Station. CR207 will complete the required works at the interfacing area as shown in the Authority's Drawings within three (3) months from the date of taking over the access or as mutually agreed and accepted by the Engineer.
- 7.4.1.8.2 Notwithstanding the requirements in Clause 7.4.1.7 above, if the station base slab is completed early and ready for CR207 TBMs to break in the

tunnel eye, the Contractor shall coordinate with CR207 to allow access into their station to install the necessary preparation works such as eye seal, probing and grouting etc. before the TBM break-in. CR207 will subsequently complete the tunnel permanent lining including annulus grouting and waterproofing up to the Contract Boundary indicated on the Authority's Drawings. For avoidance of doubt, only the TBM cutterhead is allowed to bore through the tunnel eye but there is no provision for TBM to be removed from CR206 station.

- 7.4.1.8.3 The Contractor shall complete the remaining ring beam including the necessary waterproofing installation up to the Contract Boundary indicated on the Authority's Drawings.
- 7.4.1.8.4 The Contractor shall coordinate with CR207 for the access and provide working area required up to 10 m for CR207 contractor to break in the tunnel eye of CR206 ERSS with his TBM. The Contractor shall allow access to the CR207 contractor for tunnel break-in and final connection works on the date as specified in **Appendix B** for a period of up to four (4) months, or a mutually agreed date accepted by the Engineer. CR207 shall be responsible for the clearance of all muck and debris arising from break-in.
- 7.4.1.8.5 Upon completion of the permanent cast-in-situ lining by CR207, the Contractor shall construct the cast-in-situ reinforced concrete ring beam and first stage concrete, including waterproofing, between the permanent cast-in-situ lining and the permanent end wall of CR206 as shown in Authority's Drawings.
- 7.4.1.9 The Contractor shall liaise with CR207 when planning and implementing any traffic management scheme, including but not limited to traffic diversion to ensure the access and diversions are coordinated. The traffic consultant appointed by the Contractor shall plan and design the traffic management schemes to include a reasonable extent within the CR206 contract boundary to ensure the scheme is coordinated and feasible for both contracts.
- 7.4.1.10 The Contractor shall coordinate the interfacing works and instrumentation limits of buildings and structures within the influence zone of both contractors. The Contractor shall be responsible to:
- (a) Carry out the necessary impact assessment incorporating the impact of CR207 works and his Works on each other and the combined impact to the surroundings;
 - (b) Obtain the instrumentation plan from CR207 and review it together with the instrumentation provision for CR206 to assess the sufficiency of the instrumentation provision;

PS-7-14A

- (c) Develop a combined instrumentation plan that provides all necessary information for CR207 works in order to differentiate responsibilities in the event that any instrumentation triggers the recommended limits and submit it to the Engineer for acceptance;
- (d) Propose revision to any trigger limits of instrumentation installed by the adjacent contractor if it is deemed necessary, coordinate with and support CR207 to seek the necessary authorities' approvals for such revision. The Contractor shall be responsible for the proposed revision, including but not limited to the design assessments, producing drawings and liaising with relevant authorities, and bear all associated costs;
- (e) Coordinate and compile all readings taken from the instrumentations installed by the IM contractors for both the CR206 and CR207, assess in relation to the ongoing works and site conditions by both contractors, and submit a daily assessment report endorsed by the Contractor's QP(D) and QP(Geo), with recommendation on actions required wherever necessary, to QP(S) for approval and the Engineer for acceptance; and
- (f) Coordinate with CR207 for works at the interface and ensure the proposed sequence of works does not compromise the safety of both CR206 and CR207 works.

7.4.1.11 Buildings, structures, facilities, utilities, etc., at the interfaces may be at risk of damage due to excessive settlement caused by the Contractor or CR207 whether individually or by a combination of these works as combined effects. The responsibility for re-analysis, re submission to the authorities, remedial and protection measures, subsequent repairs, etc., and the way forward as a result of the exceedance of the settlement limits due to the respective Contractors' works are summarised in Table 2 below:

Table 2: Summary of Possible Scenarios for Exceedance of Settlement Limits at Contract Interface CR206/CR207

	Case 1 (CR206 Contractor)		Case 2 (CR207 Contractor)		Case 3 (CR206 and CR207 Contractor)	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
WSL	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded
Exceedance Due To	CR206 works	CR206 works	CR207 works	CR207 works	Concurrent works by CR206 and CR207	Concurrent works by CR206 and CR207
Damage	No	Yes	No	Yes	No	Yes
Actions	(i) CR206 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR207 works to proceed.	(i) CR206 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR207 works to proceed.	(i) CR207 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR206 works to proceed.	(i) CR207 Contractor to reassess and establish new WSL to allow works to proceed; establish new limits for CR206 works to proceed.	(i) Both CR206 and CR207 contractors to reassess and establish new WSL/limits to allow both works to proceed.	(i) Both CR206 and CR207 contractors to reassess and establish new WSL/limits to allow both works to proceed.
	(ii) CR206 Contractor to submit revised WSL to BCA.	(ii) CR206 Contractor to assess damage and propose remedial and protective measures.	(ii) QPs of the respective ST submissions to submit revised WSL to BCA)	(ii) CR207 Contractor to assess damage and propose remedial and protective measures.	(ii) QPs of the respective ST submissions to submit revised WSL to BCA)	(ii) Both CR206 and CR207 contractors to assess damage and propose remedial and protective measures.
		(iii) CR206 Contractor to submit revised WSL to BCA. (iv) CR206 Contractor shall be fully responsible for the remedial and protective measures, any resultant and further damage and repairs to be carried out up to completion of the Works.		(iii) QPs of the respective ST submissions to submit revised WSL to BCA) (iv) CR207 Contractor shall be fully responsible for the remedial and protective measures, any resultant and further damage and repairs to		(iii) QPs of the respective ST submissions to submit revised WSL to BCA) (iv) Both CR206 and CR207 contractors shall be jointly responsible for the remedial and protective measures, any resultant and further damage and repairs to be carried out up to completion of the Works.

- 7.4.1.12 The Contractor shall liaise with CR207 to establish the required working area within CR206 contract boundary (not limited to ground level) and provide access for CR207 contractor to carry out their tunnel interface works. The Contractor shall coordinate with CR207 contractor regarding the actual access dates for the works.
- 7.4.1.13 Respective contractors shall be fully responsible to provide for themselves all the temporary provisions required, such as, but not limited to, power, ventilation, lighting, access scaffolding, working platforms, drainage pumps, lifting equipment, formwork and falsework to facilitate their own works at the interface.
- 7.4.1.14 The Contractor shall indemnify the Authority against all costs, charges and expenses resulting from his failure to properly coordinate the Works and the interfaces with CR207.
- 7.4.1.15 The Contractor shall coordinate with CR207 to ensure the structural finishes levels of the tunnel base slab, structural connections and waterproofing details are consistent at the interface.
- 7.4.1.16 The Contractor shall coordinate with CR207 for all loading and TBM operating parameters pertaining to TBM docking and/or break-in.
- 7.4.1.17 The Contractor shall provide his site investigation findings and all geotechnical site investigation information to CR207 within one (1) month of completion of the site investigation.
- 7.4.1.18 The Contractor shall coordinate with CR207 for the delivery, storage and removal of materials and equipment necessary for the tunnel break in.
- 7.4.1.19 The Contractor shall convene a joint inspection with CR207 and the Engineer upon completion of the tunnelling works and prior to handing back of worksite to CR206.
- 7.4.1.20 The Contractor shall design and construct the ring beam to enclose the face of the bored tunnel lining. The Contractor shall coordinate with CR207 on the integration of the bored tunnel lining with the ring beam. The Contractor shall be responsible for the waterproofing between the tunnel lining and the ring beam as shown on the interface drawings.
- 7.4.2 The above clauses in no way absolve the Contractor of his responsibilities in relation to providing a safe worksite with all necessary temporary provisions. Any additional temporary provisions that the Contractor needs to provide shall be deemed included in the Contract Price.

7.7.9 Interface with Ki Residences developer

7.7.9.1 The Contractor shall note that Ki Residences developer will be carrying out road works for the construction of Brookvale Drive junction. The Contractor shall coordinate with Ki Residences developer on, but not limited to, sharing of site access, access into worksite and road reinstatement interfaces.

7.7.9.2 The Contractor shall ensure smooth interface when tying-in the road levels and furniture between his temporary traffic scheme and Brookvale junction.

7.7.10 Interface with MINDEF and DSTA Maju Camp

7.7.10.1 The Contractor shall coordinate and interface with MINDEF and DSTA Maju Camp on the works that affect their premises and amenities. The Contractor shall interface and coordinate with MINDEF and DSTA on the possession of worksite as indicated in the Authority's Drawings. The Contractor shall refer to **Appendix BH** of the Particular Specification for the requirement to carry out of works within Maju Camp.

7.7.10.2 The Contractor shall construct temporary and permanent retaining structure to facilitate the construction of Entrance 3. The Contractor shall relocate and maintain the security fence and all other related amenities affected by Entrance 3 worksite and reinstate the security fence and related amenities upon completion of the Works. The location of the temporary and permanent security fence shall be agreed with the Engineer, MINDEF and DSTA. The Contractor shall ensure that access to and from Maju Drive shall be maintained at all times during construction.

7.7.10.3 Prior to the modification/ temporary diversion affecting Maju Drive, the Contractor shall construct additional access way from Maju Camp carpark towards Brookvale Drive as shown in the Authority's Drawings or any other alternative way to the acceptance of MINDEF, DSTA and the Engineer. The Contractor shall liaise with MINDEF and DSTA on the requirement of the access. The detailed design of the access way shall be submitted to relevant LTA division for review and approval. This access shall be maintained at all times during construction works and reinstated upon completion of the Works.

7.7.10.4 The Contractor shall coordinate with MINDEF and DSTA for the relocations and reinstatement of all ancillary structures affected by Entrance 3 works including but not limited to bulk water meter chamber, internal sewer inlet chambers (IC), sentry post, carpark lots, drainage, landscaping, lamp post, trees, CCTVs, surveillance and networks equipment, etc. The final locations of the ancillary structures shall be

agreed with the Engineer, MINDEF and DSTA. The Contractor shall engage MINDEF and DSTA appointed contractor for the relocation of Maju Camp's security systems (e.g CCTVs, surveillance and networks equipment, etc). All ancillary structures, facilities, amenities, landscaping, etc, removed for the purpose of the Works shall be fully reinstated to Maju Camp's satisfaction upon the completion of the Works.

- 7.7.10.5 The Contractor shall liaise with MINDEF and DSTA to obtain information for the existing structures, facilities, utilities, and services that will be affected by his Works. When such information is not available, the Contractor shall plan and conduct suitable site investigations, including but not limited to trial trenches, geophysical surveys to obtain such information.
- 7.7.10.6 The Contractor shall adhere to the security requirement imposed by MINDEF and DSTA.
- 7.7.10.7 The Contractor shall coordinate and seek approval from MINDEF and DSTA to confirm the fencing design and any security measures
- 7.7.10.8 The site hoarding shall be independent from Maju Camp security fence.
- 7.7.10.9 The Contractor shall obtain NParks' written approval before felling any affected trees within Maju Camp.
- 7.7.10.10 The Contractor shall ensure that his works will not cause any adverse impact to Maju Camp's camp operations. Construction access via Maju Drive is not allowed.
- 7.7.10.11 Upon completion of Entrance 3 at Maju Camp, the Contractor shall arrange site inspection with the Engineer, DSTA/MINDEF, SLA and the relevant authorities before commencement and after completion of the reinstatement works. The Contractor shall reinstate the work areas with the following considerations:
- All temporary works shall be removed and the reinstated area shall be free of encumbrances;
 - The reinstated driveway, green verge, carpark lots, etc shall tie-in with existing Maju Camp level.
 - The reinstated structures and ancillary facilities affected by works shall meet DSTA and MINDEF's requirement for operations and activities; and

- The reinstatement works shall not result in any remnant land outside MINDEF's fence.

7.7.11 **Interface with MOE and SIM/SUSS**

7.7.11.1 The Contractor shall note that some of the work areas for the construction of the Entrance 2, are located close to and/or within SIM/SUSS. The Contractor shall only take site possession of the Entrance 2 worksite on the date specified in **Appendix B** of the Particular Specification. The Contractor shall interface and coordinate with SIM/SUSS on the possession of worksite as indicated in the Drawings.

7.7.11.2 The Contractor shall coordinate and interface with SIM/SUSS on the works that are affecting their premises and amenities including but not limited to the following:

- a) The Contractor shall relocate all ancillary structures affected by Entrance 2 worksite including but not limited to bulk meter chamber, fire hydrant, internal sewer inlet chambers (IC), carpark variable message sign (VMS), drainage, landscaping, lamp post, trees, CCTVs, bus stop lightning protection system and street furniture. The location of the ancillary structures shall be agreed with the Engineer and SIM/SUSS.
- b) The Contractor shall remove the Pedestrian Overhead Bridge (POB), staircases, lifts and other associated structures along Clementi Road as shown in the Authority's Drawings. The Contractor shall coordinate with SIM/SUSS for the removal of POB. The Contractor shall be required to provide a temporary at-grade signalized pedestrian crossing to the acceptance of the Engineer prior to the demolition of the POB and shall maintain this temporary facility until the underpass is open for public access.
- c) The Contractor shall liaise and coordinate with SIM/SUSS to remove the existing canopy shelter connecting the existing POB to SUSS. The Contractor shall decommission, remove and/or divert any affected utilities services, lightings, lightning conductors, CCTVs, etc. The Contractor shall provide temporary shelter to replace the canopy shelter.
- d) The Contractor shall design, coordinate, and construct a new canopy shelter to ensure a seamless connection between the new PUDO, the existing covered linkway along the ramp and SIM/SUSS Blk C. The Contractor shall also reinstate any

existing structures that are affected by his demolition and reconstruction works of the Canopy.

- e) The Contractor shall coordinate with SIM/SUSS and the Authority to design and construct a sheltered shared path between the new PUDO and Entrance 2, including a Pedestrian Priority Zone (PPZ) at the existing bus stop. He shall consider the interfacing requirements between the sheltered shared path, PPZ, existing bus stop and barrier-free pedestrian access to SIM/SUSS.
- f) The Contractor shall coordinate with SIM/SUSS and the Authority to design and construct a new sheltered barrier-free pedestrian connection between Entrance 2 (Level 2) and SIM Blk A.
- g) Any addition and/or alteration works that arise from the above-mentioned scope shall be deemed included in the Contractor's Works and to the Engineer's acceptance as well as to SIM/SUSS's satisfaction.
- h) All facilities, amenities and landscaping, etc. removed for the purpose of the Works shall be fully reinstated to SIM/SUSS's satisfaction upon the completion of the Works;
- i) The Contractor shall carry out an impact assessment of structures adjacent to SIM/ SUSS including canopy at the bus stop and to ensure that no impact caused to the structures and its users at all times.

7.7.12 Interface with Far East Flora

- 7.7.12.1 The Contractor shall coordinate with Far East Flora for any works affecting their area. The access to Far East Flora shall be maintained at all times during construction works.

7.8 Interfaces with Adjacent Stakeholders: General Requirements

7.8.1 Interface with All Stakeholders/Landowners

- 7.8.1.1 The Contractor shall engage and keep all stakeholder/landowners apprised of the status of the Works. Such stakeholders/landowners include Utility Agencies on the utility gap, PUB(WRN) crossing over/under sewer pipes, RWRL on the roadwork and furniture, NParks, restaurants, schools, childcare, condominiums, church and all other stakeholders/landowners as necessary.

- 7.8.1.2 The Contractor shall keep the stakeholders/landowners' accesses open and safe at all times.
- 7.8.1.3 The Contractor shall take in feedback from above stakeholders/landowners and address their concerns as required.
- 7.8.1.4 Where the nearest row of glass facade, partitions and doors of the adjacent building is deemed to be within the zone of influence of the excavation worksite, the Contractor shall coordinate with the stakeholder for permission to install necessary measures to prevent the glass from shattering, for example with the use of suitable lamination. The Contractor shall arrange to replace any damaged glass panels as soon as possible, at his own cost.
- 7.8.1.5 The Contractor shall liaise and coordinate with all future developer/contractors/agents in all aspects of Works, including but not limited to, worksite access, working arrangement, construction sequence, temporary traffic management and all other interfacing requirements to ensure full compatibility at all stages of the Works.
- 7.9 **Interface with NParks Contractors**
- 7.9.1 The Contractor and his landscape architect shall be responsible for the design of the location of planting areas and obtain NParks' approval for Planning and Building Plan submissions.
- 7.9.2 NParks shall complete the planting within state land, including the road reserve, where the planting is maintained by NParks. The Contractor shall be responsible for all planting in private land, and state land where the planting will not be maintained by NParks.
- 7.9.3 The Contractor shall carry out all enabling works to facilitate NParks to carry out the planting works. Such provisions shall include but are not limited to the following:
- a) Site clearance and excavation within the verge area and centre median along the proposed road;
 - b) Compaction of ground in preparation for receiving of trees from NParks/term contractor(s), including excavation of holes to receive tree species, in accordance with NParks' requirements;
 - c) Carry out close turfing;
 - d) Design and construction of trellises in accordance with **Clause 9** of the Particular Specification;

- e) Provide access to NParks and his contractor for the planting works and provision of excavation for tree plantings where instructed by the Engineer;
- f) Design, construction, completion and commissioning of irrigation systems;
- g) Coordinate with authorities and relevant agencies for associated works involving landscaping including but not limited to installation of CCTVs, external works such as lamp-posts, OG boxes and underground services to avoid clashing with the landscaping works; and
- h) All necessary enabling works carried out by the Contractor for the landscaping and planting shall be deemed to be included in the Contract Price.

- 7.9.4 The Contractor shall indemnify the Authority against all costs, charges and expenses resulting from his failure to properly coordinate the Works and the interfaces with the NParks contractor in a timely manner.
- 7.9.5 Upon completion of the landscaping and tree planting works, the Contractor shall coordinate with NParks contractor or LTA term contractor to ensure timely handover of the completed works to NParks. The Contractor shall comply with the **Appendix AB** of the Particular Specification on the handing over of horticulture and hardscape. The Contractor shall indemnify the Authority against all costs, charges and expenses resulting from his failure to properly coordinate and hand over the Works and the interfaces to NParks in a timely manner.
- 7.9.6 For reinstatement works at Clementi Forest, the Contractor shall be responsible for the design and construction of overall drainage system and contractor shall ensure adequate drainage provisions are provided at all times.
- 7.9.7 The Contractor shall refer to **Table 3** below for a summary of scope of works for planting between the Contractor and NParks.

- 7.10 **Interface with SingPost**
- 7.10.1 The Contractor shall coordinate and obtain approval from the Authority's Public Transport Security (PTS) department, SingPost and any other authorities and/or agencies for positioning/relocation of the post boxes/letter boxes affected by the Works, subject to acceptance from the Engineer.
- 7.11 **Interfacing with Street Lighting and Traffic Signals Contractors**
- 7.11.1 The Contractor shall carry out coordination, supply, installation testing and commissioning of street lighting and traffic signals, including new and diverted lighting and signals, laying of underground power and communication cables, installation of OG and control boxes etc. The Contractor shall engage LTA's specialist term contractors via the respective LTA divisions for the works. All costs associated with the works shall be deemed to be included in the Contract Price.
- 7.12 **Interface with Authority's Consultants and Others**
- 7.12.1 **Interface with Contract M&E Consultants & Authority's In-house Designers**
- 7.12.1.1 The Authority has appointed Authority's In-house Designers to carry out M&E design which includes the design of the Environmental Control System (ECS), Fire Protection System (FPS) and Electrical Services (ES) for station, tunnels, etc.
- 7.12.1.2 The Contractor shall coordinate and interface with Authority's In-house Designers on the design requirement of the ECS, FPS and ES. The Contractor shall interface with SWC in accordance with Clause 11 of the Particular Specification.
- 7.12.1.3 The Contractor shall coordinate and interface with Authority's In-house Designers on the design requirements and the development of lighting design for all the public areas and above-ground structures. The lighting design shall be integrated with the overall architectural design of the station.
- 7.12.1.4 The Contractor shall coordinate and interface with Authority's In-house Designers on the design requirements for air circulation fans (e.g. High Volume Low Speed (HVLS) fans, ceiling fans, wall-mounted fans) at station concourse and platform public area. The Contractor shall design, supply and install the necessary support for the air circulation fans.

- 7.12.1.5 The Contractor shall interface with ECS SWC on the installation of the HVLS fans. The Contractor shall incorporate and take into consideration the requirement of ceiling height and ceiling panel cut out for the HVLS safety/stabilization cables secure to the structure, in the design development of the ceiling height and ceiling panels.
- 7.12.1.6 The Contractor shall coordinate with Authority's In-house Designers and the SWC to incorporate all structural requirements, not limited to imposed loads, support systems, foundations and connections of Thermal Storage (TES) Tank to the permanent structure, in Contractor's design. The TES tank will be supported on the main structural slab which is to be designed and built by the Contractor. The TES tank will be supplied and installed by the SWC.
- 7.12.1.7 The Contractor shall interface and coordinate with the Authority's In-house Designers for the Tunnel Ventilation System and Power Supply System (High Voltage & Traction Power) on the design requirements for station and tunnels.
- 7.12.1.8 The Contractor shall incorporate and take into consideration the M&E requirements in the design development of the station.
- 7.12.1.9 The Contractor shall coordinate and interface with Authority's In-house Designers to obtain the required design interfacing information to enable him to meet his Pre-Final, Final and Updated Final Design Submission key dates.
- 7.12.1.10 The Contractor shall interface and coordinate with Authority's In-house Designers for the Tunnel Ventilation System on the TVS design requirement for station and tunnels including Tunnel Booster fan niche locations and details.
- 7.12.2 **Interface with Environmental Monitoring and Management Programme (EMMP) Auditor (CR2009)**
- 7.12.2.1 The Authority will be appointing Consultancy Services (Auditor) to carry out environmental audits (for all assessed environmental parameters) throughout the construction and commissioning phases to assess the Contractor's EMMP performance and to verify that the Contractor is implementing and complying with the mitigation measures outlined in the EMMP, Authority's requirements and authorities' and/or agencies' requirements. The environmental audit shall comprise of on-site, documentation and system audit of Contractors' EMMP works.

- (a) The Contractor shall lead and be responsible for detailed coordination of his construction activities with those of the SWC, adjacent civil contractors, other interfacing contractors, Authority's Consultants and in-house designers, utility companies, statutory authorities, all other third parties like private contractors and private owners whether or not specifically mentioned in the Contract;
- (b) The Contractor's Project Coordinator shall be responsible for the coordination of the SWC and other Interfacing Contractors in respect of their activities within the Works area; and
- (c) The Contractor shall ensure that works are sequenced such that completed works are not disturbed or damaged by subsequent works. The Contractor shall ensure that his programme reflect the sequence of works and interfaces with SWC.

7.13.5.2 The Contractor shall develop and implement procedures for the management, operation and maintenance of the facilities provided to SWC's and other Interfacing Contractors to the acceptance of the Engineer. The Procedures shall include but not be limited to the following:

- (a) Site safety and security including emergency services;
- (b) Roads, signage, lighting and site access;
- (c) Environmental control;
- (d) Drainage;
- (e) Waste disposal;
- (f) Services and supply of water and electricity utilities;
- (g) Communications (directory);
- (h) Fire Drill and Casualty Evacuation;
- (i) Welfare facilities;
- (j) Car Park; and

- (k) Organized site visits for guests and the media, as invited by the Engineer.

7.13.5.3 The procedures shall be submitted to the Engineer for acceptance at least two (2) months prior to the installation of the facilities for the SWC. Comments from the Engineer on the procedures shall be incorporated into the procedures and the revised procedures shall be submitted within one (1) month of receipt of the comments. The procedure shall be updated and revised as required during the course of the Works.

7.13.6 Tunnel and Trainway Washing

7.13.6.1 The Trackwork contractor will be carrying out the washing of the tunnels and trainways during the period between the completion of TRIP and Traction Power on. The Contractor shall coordinate with the Trackwork contractor for the tunnel washing and provide five (5) workers, as and when requested by Trackwork contractor, to support the washing of the completed tunnels within the Contract Limit including supply of water and removal of contaminated water. In addition, the Contractor shall also be responsible for clearance of all sump pits and clearing all waste and surplus materials until the Completion of the whole of the Works.

7.13.7 Interface with Environmental Control System (ECS) Contractor

7.13.7.1 The Contractor shall coordinate and interface with ECS SWC on the installation of the air circulation fans (e.g. High Volume Low Speed (HVLS) fan, ceiling fan, wall-mounted fan). The Contractor shall incorporate and take into consideration the requirement of ceiling height and ceiling panel cut out for the HVLS/ceiling fan safety/support/stabilization cables (where applicable) which will be secured to the structure, in the design development of the ceiling height and ceiling panels.

7.13.7.2 The Contractor shall coordinate and interface with Authority's in-house designer on the design requirements for Centralized Ceiling Fan (CCF) at station entrances. The Contractor shall design, supply, and install the necessary support to facilitate the installation of CCF by ECS SWC.

7.13.7.3 The Contractor shall interface with ECS SWC on the installation of CCF. The Contractor shall incorporate and take into consideration the requirements of ceiling panel cut-out for the CCF safety / support / stabilization cables (where applicable), secure to the structure, in the design development of the ceiling panels.

- 7.13.7.4 The Contractor shall coordinate and interface with Authority's in-house designer and the ECS SWC to incorporate all structural requirements, not limited to imposed loads, support systems, foundations and connections of Thermal Energy Storage (TES) tank to the permanent structure, in the Contractor's design. The TES tank will be supported on the main structural slab which is to be designed and built by the Contractor. The TES tank will be supplied and installed by the SWC.
- 7.13.8 Interface with Facility for Commercial Info-communication Services (FCIS) Contractor**
- 7.13.8.1 The Contractor shall coordinate and interface with FCIS SWC for the Mobile Installation Spaces (MISs) to comply with the latest relevant statutory requirements such as CPFRTS, COPIF and etc.
- 7.14 Works Train Operations and Track Related Installation Programme (TRIP)**
- 7.14.1 The Engineer is responsible for the control and management of access and safe working within the Defined Area (DA). The rules and procedures for working in the Defined Area will be specified in the Works Train Manual. These rules and procedures for working in the Defined Area will be based on the Works Train Manual (Generic) which is available for reference and viewing only at the Authority's Tender Division.
- 7.14.2 "Defined Area" refers to tracks that are controlled by the Authority's Works Train Office for running consist or electric trains. For mainline, it comprises of the track way and includes the area one metre from the station's platform edge. The mainline is divided into sectors to control track access.
- 7.14.3 All requests for access to the Defined Area shall be submitted by a Lead Person-In-Charge (LPIC), who has been trained and qualified by the Works Train Office. The application for DA access shall be discussed through regular weekly meetings held at the Works Train Office which the Contractor's LPIC shall attend. The Works Train Office will then publish a weekly Notice prior to access for Defined Area works. Priority will be given generally in accordance with the TRIP indicated in Schedule B and the Test Running Programme to be developed with the Contractor. Access to Defined Area will also be restricted due to operation of consist or Train Test Running activities.

- 7.14.4 The Contractor's Lead Person-In-Charge (LPIC)/ Person-In-Charge (PIC) shall be responsible for the conduct and safety of his work party in the Defined Area. The Engineer will maintain a register of the LPICs/ PICs. LPICs/ PICs found contravening the requirements of the Works Train (WT) Manual published by the Engineer will have their names removed from the register. All work platforms/temporary fixtures erected within the Defined Area shall be such that they can be removed easily and quickly (within 15 to 20 minutes) for consists and Testing train to pass.
- 7.14.5 The Contractor shall have sufficient staff to attend the Works Train Manual Course conducted by the Authority's Works Train to qualify them as Lead Person-In-Charge (LPIC) and Person-In-Charge (PIC). This is to facilitate the LPIC to coordinate with the Authority's Works Train Office, interfacing contractors and scheduling his PICs to carry out their installation works within the DA accordingly.
- 7.14.6 Only one consist will be allowed to operate within one sector at any one time. When no works train is deployed in a sector, non-exclusive

TABLE 7A - Clarification of Design, Supply and Fix Items (Civil/System-wide Interface - Station and Trainway)

ITEM NO.	DESIGN	SUPPLY	FIX	DESCRIPTION (C = Civil Contractor) (E = Engineer) (SWC = System-Wide Contractors) (TW = Trackwork Contractor)	REMARKS
54	SWC	SWC	SWC	Drilling in tunnels for the Overhead Conductor Rail (OCR) supports and/or equipment fixings.	SWC shall use a proper drilling jig, the depth of drilling shall be discussed and agreed with C. SWC to coordinate and agree with C for the location and method statement. If any drilled location is not used, SWC shall made good with a concrete mix or equivalent material to be specified by C.
55	C	C	C	Permanent lifting hooks/ beams for WHE to be supplied and installed by the C.	SWC to confirm requirements. C to coordinate with SWC for the locations. C to engage Accredited Agencies to carry out testing of the lifting hooks/ beams, supervised and endorsed by Mechanical PE engaged by C, before BSC.
56	C	C	C	Design, supply and fixing of Totem Poles for integrate of exit signage /CCTV/PID/ESC signage where mounting of exit sign location happen to be without ceiling or at high void ceiling.	SWC to confirm requirement. C to coordinate, provide and install as per requirement.
57	C	C	C	Design, supply and fix of dog house for services penetration to slab of roof top.	C to coordinate with SWC on location of roof top opening and provide protection ensure water tightness to station.