

**CONTENTS**

Clause	Description	Page PS-13-
<b>13</b>	<b>SAFETY, SECURITY AND ENVIRONMENTAL PROTECTION.....</b>	<b>1</b>
<b>13.1</b>	General .....	1
<b>13.2</b>	Environmental Protection during Construction .....	4
<b>13.3</b>	Surface Water .....	4
<b>13.4</b>	Soil and Groundwater.....	4
<b>13.5</b>	Air and Dust.....	5
<b>13.6</b>	Airborne Noise.....	6
<b>13.7</b>	Ground-Borne Vibration .....	7
<b>13.8</b>	Complaint Handling and Corrective Plan during Construction.....	7
<b>13.9</b>	Deliverables.....	7
<b>13.10</b>	Enhanced Security Measures.....	9
<b>13.11</b>	Facial Recognition Biometric Authentication System (FRBAS) .....	10
<b>13.12</b>	Additional Safety Measures.....	16
<b>13.13</b>	Pandemic Safe Measures .....	17

## **13 SAFETY, SECURITY AND ENVIRONMENTAL PROTECTION**

### **13.1 General**

- 13.1.1 The Contractor shall comply with the Authority's General Specification Safety, Health and Environment requirements as documented on the Authority's website. The latest version of the specifications are available for download at: <http://www.lta.gov.sg> under "Industry Matters" → "Safety, Health and Environment" → "Construction Safety & Environment" → "Specifications for Safety, Health and Environment" and select: Safety, Health and Environment (General Specification **Appendix A**) (June 2022 Edition).
- 13.1.2 The Contractor may refer to **Appendix X** of the Particular Specification for the sample of the noise barrier along worksite.
- 13.1.3 The Contractor shall comply with the standards and conditions set out in the Environmental Monitoring and Management Plan (EMMP) and Construction Equipment List given in **Appendix BE** of the Particular Specification and the environmental considerations stated in **Appendix A** of the General Specification. In the event of discrepancy between the **Appendix BE** and the other relevant authorities' requirements, the more onerous requirements shall prevail.
- 13.1.4 An Environmental Management and Monitoring Plan (EMMP) is **given in Appendix BE** of the Particular Specifications. The Contractor shall review the EMMP and submit a contract-specific EMMP based on his detailed construction method three months after the award of tender. This contract-specific EMMP shall be submitted to the Engineer for approval prior to commencement of Works. The EMMP shall include but not be limited to the following:
- (a) mitigation measures to be implemented for the project construction;
  - (b) environmental monitoring (water, noise, air pollution and ground-borne vibration) to be conducted during the construction period;
  - (c) existing environmental legislation to be followed as well as environmental best practices to be implemented; and
  - (d) contingency planning in case of emergency situations.
- 13.1.5 The Contractor shall comply with National Environmental Agency (NEA)'s Code of Practice for environmental Control Officers ([NEA | Practices](#)).

13.1.6 Waste Management during Construction Phase

13.1.6.1 The Contractor shall ensure the following waste management strategies are implemented appropriately for Biodiversity:

- (a) Comprehensive waste management system at the worksite to ensure proper disposal of waste;
- (b) Illegal disposal of construction waste shall be strictly prohibited;
- (c) Littering of food waste and food packaging shall be strictly prohibited and enforced by the Contractor;
- (d) Disposal of construction wastes (wastewater and solid wastes) into streams, storm water channels or other waterbodies shall be strictly prohibited;
- (e) The Contractor shall provide sufficient fully covered food waste bins that are secured in a manner that is wildlife-proof;
- (f) All food waste shall be cleared from the worksite at least once a day;
- (g) Where fauna is found to be active around waste disposal areas, the Contractor shall implement measures to reduce the source of the attractant in consultation with the Ecologist;
- (h) The Contractor shall submit a Waste Management Plan as part of the contract-specific EMMP detailing the:
  - i. Types of waste generated
  - ii. Location and types of waste management facilities (e.g. food waste bins)
  - iii. Frequency of disposal
  - iv. Information of waste management contractors

13.1.7 Vector Control during Construction Phase

13.1.7.1 The Contractor shall ensure the following vector management strategies are implemented appropriately for Biodiversity, where the hierarchy of vector control shall be as follows:

- a) Source reduction, i.e., eradicate water ponding through proper housekeeping to eliminate potential breeding grounds;
- b) Monitor Dengue situation, i.e., regular screening of worker (temperature checks), quarantine measures, etc;
- c) Deter breeding, i.e., search and destroy efforts, inspections, Bti application, etc;
- d) Thermal fogging shall not be carried out to prevent unintended impacts to invertebrate fauna residing in the surrounding habitats;
- e) No chemical insecticides, pesticides and rodenticides shall be used for pest control;
- f) No sticky traps shall be used for pest control.

**13.2 Environmental Protection during Construction**

- 13.2.1 The following **Clauses 113.3 to 13.9** highlight specific management measures for environment protection during construction. This list is not exhaustive and the Contractor shall refer to **Appendix BE** of the Particular Specifications for details.

**13.3 Surface Water**

- 13.3.1 The Contractor shall ensure effective Earth Control Measures (ECM) are designed and implemented for surface water runoff.
- 13.3.2 The Contractor shall carry out online real time monitoring for turbidity at all the discharge points of the construction site throughout the construction period.
- 13.3.3 The Contractor shall carry out monthly monitoring for in-situ parameters (i.e. temperature, pH and dissolved oxygen) and ex-situ parameters (i.e. biochemical oxygen demand, total suspended solids, nitrate, orthophosphate, oil & grease [total], oil & grease [hydrocarbon], lead, zinc and mercury) at all the discharge points of the construction site throughout the construction period.
- 13.3.4 The Contractor shall provide a fully sheltered storage area with storage volume to be 110% of the largest volume of chemical substances to be stored (kerb up and enclosed on at least 3 sides, covered and with adequate ventilation) for hazardous substances.
- 13.3.5 The Contractor shall monitor the quality of all discharge water against Singapore NEA's Allowable Limits for Trade Effluent Discharge to Watercourse/ Controlled Watercourse for the duration of construction.

**13.4 Soil and Groundwater**

- 13.4.1 All construction debris (under category of construction and demolition waste) shall be disposed of at the gazetted Government dumping grounds or at such other sites or locations as directed by NEA.
- 13.4.2 For the worksite at Clementi Forest, all construction wastewater shall be contained in containment tanks and transported to designated facility.
- 13.4.3 For the worksite at Clementi Forest, all wastewater for the tunneling shall be pumped back to Launched Shaft for treatment and discharge.

**13.5 Air and Dust**

- 13.5.1 Access roads shall be paved to minimize dust emissions. Any other unpaved site roads shall be kept damp by regular washing.
- 13.5.2 The Contractor shall implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable) for local access roads in all construction sites. The Contractor shall ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit.
- 13.5.3 The Contractor shall submit a detailed Air Pollution Control Plan. On-site stockpiling of spoil should be avoided. Where unavoidable, stockpile should be covered.
- 13.5.4 The Contractor shall ensure that all roads, pavements and public footpaths are kept clear of dust, silt and debris by regular street sweeping.
- 13.5.5 The Contractor shall ensure that on-site speed limits (i.e. maximum speed-limit of 25km/hr on paved roads such as roads with concrete survey, while 15 km/hr) on unpaved road such as muddy roads with soil surface) are applied as a mandatory standard within the worksite as well as local access roads leading to worksite and due diligence shall be given to any operations which are likely to create dust nuisance.
- 13.5.6 Singapore University of Social Sciences (SUSS) and 19 Clementi Crescent: The Contractor shall undertake the following monitoring regime:
- a) The Contractor shall conduct air quality (PM<sub>10</sub> and PM<sub>2.5</sub>) baseline before commencement for construction works on site at SUSS and 19 Clementi Crescent for 1 week (Refer to **Appendix BE** of the Particular Specifications for details);
  - b) Continuous monitoring of Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>) at SUSS and 19 Clementi Crescent during excavation and major construction works; and
  - c) At least one monitoring location near each worksite will be required. Please refer to the proposed monitoring locations in **Appendix BE**.

- 13.5.7 The Contractor shall implement dust control measures (e.g. dust screens etc.).
- 13.5.8 The Contractor shall use cutting, grinding and sawing equipment with dust suppression water spray mechanisms.
- 13.5.9 The Contractor shall erect hoarding around dusty activities and at site boundary of minimum 1.8m height as per BCA guideline.
- 13.5.10 The Contractor shall not burn any wastes on site.
- 13.5.11 The Contractor shall revegetate earthworks and exposed areas/soil stockpiles.

**13.6 Airborne Noise**

- 13.6.1 The Contractor shall use the noise baseline monitoring results from CR2016 baseline noise monitoring data and apply for construction works on site based upon NEA guidelines for human criteria.
- 13.6.2 The Contractor shall develop and implement Noise Pollution Management Plan based on actual inventory and construction phase planned by Contractor.
- 13.6.3 Continuous noise monitoring shall be conducted at least two (2) strategic locations around all worksites as detailed in the **Appendix BE** of the Particular Specifications.
- 13.6.4 Noise barriers and additional noise mitigation measures are recommended in **Appendix BE** of the Particular Specifications based on preliminary estimation of construction methodology. These barrier locations are described in the Clauses 13.6.5..
- 13.6.5 The Contractor shall install a 12m height noise barrier with minimum Sound Transmission Class (STC) of 20, along the west boundary of the construction worksite and LTA's standard TBM enclosure (one façade opening at northern side) 15m high at the boundary of Launch shaft worksite. The Contractor shall apply 6m high noise barrier along the south-east boundary of the construction worksite, 12m high noise barrier along the north-east boundary of the noise barriers and 9m high noise barrier at the entrance construction worksite near SUSS with minimum Sound Transmission Class (STC) of 20. The Contractor shall use the portable noise barrier close to the noisy equipment/ activities, whichever the equipment is applicable. Please refer to the **Appendix BE** of the

Particular Specifications. This shall be subject to the Engineer's acceptance.

### **13.7 Ground-Borne Vibration**

13.7.1 The Contractor shall develop a monitoring program to respond to community complaints about vibration throughout the construction phase and tunnel boring machine use.

13.7.2 The Contractor shall control construction vibration levels using best available techniques (BAT). The Contractor shall ensure that the vibration levels at Maju Forest and Clementi Forest (excluding the worksite area) do not exceed Peak Particle Velocity, PPV, 8 mm/s.

13.7.3 The Contractor shall ensure that the vibration levels at building receptors (excluding the worksite area) do not exceed Peak Particle Velocity, PPV, 15 mm/s, to prevent cosmetic damage.

### **13.8 Complaint Handling and Corrective Plan during Construction**

13.8.1 During the construction, upon receipt of complaints, complaint investigation shall be carried out. Complaint investigation report and corrective action plan should be prepared and approved by the Authority within 24 h upon receipt of complaints. Refer to the **Appendix BE** of the Particular Specifications for details.

### **13.9 Deliverables**

13.9.1 Plans/reports/records listed in the table below shall be documented by the Contractor and submitted to the Client on the frequency specified.

<b>Phases</b>	<b>Document</b>	<b>Submission Milestones and Frequency</b>	<b>Action by</b>
Pre-construction	Contract-specific EMMP (refer to <b>Clause 13.1.4</b> - inputs from the environmental team) should include the following plans (but not limited to): <ul style="list-style-type: none"> <li>Waste Management (<b>Clause 13</b>Error! Reference source not found.)</li> </ul>	Within one (1) month after award date	Environmental Consultant



Phases	Document	Submission Milestones and Frequency	Action by
	<ul style="list-style-type: none"> <li>• Vector Control (<b>Clause 13.1.7.1</b>)</li> <li>• Surface Water (<b>Clause 13.3</b>)</li> <li>• Soil and Groundwater (<b>Clause 13.4</b>)</li> <li>• Air and Dust (<b>Clause Error! Reference source not found.</b>)</li> <li>• Airborne Noise (<b>Clause Error! Reference source not found.</b>)</li> <li>• Ground-borne Vibration (<b>Clause Error! Reference source not found.</b>)</li> <li>• Complaint handling and corrective action plans (<b>Clause 13.8</b>)</li> </ul>		
	Site environmental control programme ( <b>Clause Error! Reference source not found.</b> )	As per latest requirement in Code of Practice for Environmental Control Officers from NEA.	
Construction	Monthly monitoring report for waste management, vector control ( <b>Clauses 13.1.6 and 13.1.7</b> ), surface water, soil and groundwater, air and dust, airborne noise, ground-borne vibration ( <b>Clauses 13.3 to Error! Reference source not found.</b> )	End of each month	Environmental Consultant

Phases	Document	Submission Milestones and Frequency	Action by
	Complaint investigation report and corrective action plan ( <b>Clause 13.8</b> )	Within 24 h upon receipt of complaints	Environmental Consultant
	Site environmental control report ( <b>Clause</b> Error! Reference source not found.)	As per latest requirement in Code of Practice for Environmental Control Officers from NEA	

**13.10 Enhanced Security Measures**

- 13.10.1 The Authority will appoint an Enhanced Security (ES) contractor to provide for enhanced security measures in addition to the requirements stated in **Appendix A** of the General Specification. These enhanced security provisions will remain in place until the Completion of the whole of the Works (CWW) or commencement of revenue operation by the railway operator, whichever is later.
- 13.10.2 The Contractor shall not reduce his security guards being deployed under the approved security plan upon the incorporation of the enhanced security measures by the Authority.
- 13.10.3 The Authority's ES contractor will have the authority to record details of all vehicles entering or leaving the station site. Details such as vehicle registration number, time and date, company name and the drivers' particulars will be recorded. The Authority's ES contractor will check for unauthorised removal of construction equipment or materials of all goods vehicles leaving the station site. The Authority's ES contractor will also conduct security patrols at the Site.
- 13.10.4 The Contractor shall provide the necessary attendance, coordinate and cooperate with the Authority's appointed security agency to work out a security plan to enhance the existing approved security plan which shall not be reduced after the incorporation of the enhanced security measures. The Contractor shall work with the additional security guards from the Authority appointed security agency and treat them as an integral part of the overall security plan for the Contract and shall include updating the existing security plan with specific patrolling routes.
- 13.10.5 The Contractor shall provide, maintain, and remove suitable satellite security posts with access control facilities for the Authority's ES contractor. The Contractor shall liaise with the Engineer and the Authority's ES contractor for this provision.
- 13.10.6 The Contractor shall coordinate with the Authority's ES contractor and arrange, provide, install and maintain all services to the ES contractor's office facilities, central security post, and satellite security posts. All costs including operating costs shall be deemed to be included in the Contract Price. Such services shall include but not be limited to the followings:
- (a) Power supply;
  - (b) Air conditioning for the central security post;
  - (c) Lightning protection system;

- (d) Garbage / waste disposal;
- (e) Vector control and pest control on weekly basis in accordance with NEA guidelines;
- (f) Fire protection; and
- (g) Temporary toilet facilities.

13.10.7 The central security post shall be manned at all times by a competent uniformed supervising security guard and an assistant from a licensed Security Agency shall be established at an agreed location. It shall be possible to communicate between each satellite security posts and the central security post.

13.10.8 At each entrance to the station structure, the Contractor shall install new signs after Station Basic Structure Completion stage that highlight the enhanced security arrangements.

**13.11 Facial Recognition Biometric Authentication System (FRBAS)**

13.11.1 As part of the industry productivity initiative and in line with the latest Building Control (Buildability) Regulations, the BCA collects productivity and other related data of construction projects on a regular (monthly and other period) basis using the Electronic Productivity Submission System (ePSS).

13.11.2 The Contractor shall implement and deploy Facial Recognition Biometric Authentication System (FRBAS) in the form of access control system, for the purpose of line-wide manpower data collection for the Cross Island Line (CRL). The Contractor shall refer to **Clause 28** of the Particular Specification.

- 13.11.3 This system will operate to monitor the manpower under respective trades, skills or professions of the Contractor's workforce and it will generate the required data and output in the required format for uploading by the Contractor to the BCA's ePSS.
- 13.11.4 The implemented FRBASsystem will track the movement of each worker (general workers, skilled personnel, site and management staff, etc.) entering and exiting the Works Areas according to the trade type as shown in **Appendix V** of the Particular Specification, the working hours per day of each worker and the mandays worked on the Works Areas (one (1) manday is defined as one (1) man working for eight (8) hours). The system will also generate the manpower report in Microsoft Excel format (sample as shown in **Appendix W** of the Particular Specification). The BSMDC system contractor will provide the raw data to the Contractor, who shall process, compile, and submit the required information to BCA at monthly intervals or other frequencies as and when required by the BCA.
- 13.11.5 The Contractor shall interface and co-ordinate with the FRBAScontractor to provide all pertinent information related to the requirements of the biometric system and the Contractor's ePSS submissions. The Contractor shall provide all attendances, including those as specified in **Tables 1** and **2** below, as necessary to facilitate the complete implementation of BSMDC system for the entire duration of the Contract.
- 13.11.6 The Contractor shall coordinate with the FRBAScontractor to obtain, process, compile, and submit manpower usage data in the required format as and when required by the Engineer.
- 13.11.7 The Contractor shall at all times allow access to the FRBASsystem, either by the FRBAScontractor or by the Engineer's appointed personnel, for system maintenance, troubleshooting, audit or retrieval of manpower data.
- 13.11.8 The Contractor shall work closely with the FRBAS contractor to commence the implementation of the FRBASsystem at the Works Areas either within three (3) months of award of the Contract or the Authority's award of the BSMDC contract, whichever is later and prior to commencement of Works on site.
- 13.11.9 The Contractor shall set up site procedures to support the FRBAScontractor and shall exercise strict control in ensuring that all his workers and site staff comply fully with such procedures. Any lapse in maintaining such control will be considered as a security violation which will be taken into account in the monthly ESS assessment.

- 13.11.10 For the avoidance of doubt, the Contractor shall note that the implementation of the BSMDC system shall not alleviate the Contractor from his obligations to maintain adequate site security and access control as specified in the Authority's Requirements.

**Table 1** Attendances to be provided by the Contractor for the BSMDC contractor for Manpower Data Collection

	Location	Attendances
1	FRBASsystem enrolment station at Contractor's Site Office	<p>To provide a dedicated air-conditioned room to house the FRBASsystem enrolment station complete with the following:</p> <ul style="list-style-type: none"> <li>(a) Electrical lighting;</li> <li>(b) 4 nos. 13A twin power sockets;</li> <li>(c) Office desk with cable management system and chair;</li> <li>(d) Desktop computer (Windows operating system and web browser included), LCD monitor and HD web cam for registration purpose;</li> <li>(e) Network cabling connection with broadband internet access; and</li> <li>(f) Uninterruptible Power Supply/Back up battery</li> </ul>
2	FRBASsystem recognition reader unit at QPS staff's office	<ul style="list-style-type: none"> <li>a) To provide 4 nos. 13A twin power sockets; and</li> <li>b) To provide network cabling connection with broadband internet access</li> </ul>
3	FRBASsystem recognition reader unit at each site ingress/egress gate	<p>Fixed Site Ingress/Egress Gate Location</p> <ul style="list-style-type: none"> <li>a) To provide a sheltered enclosure for the BSMDC system at site ingress/egress gates and a security guard post or CCTV monitoring unit (for remote site);</li> </ul> <p>or</p> <p>Unfixed Site Ingress/Egress Gate Location</p>

	Location	Attendances
		<p>b) To provide a sheltered 10ft x 8 ft open concept container for the BSMDC system at site ingress/egress gates and a security guard post or CCTV monitoring unit (for remote site)</p> <p>complete with:</p> <ul style="list-style-type: none"> <li>(i) electrical lighting &amp; switches;</li> <li>(ii) 4 nos. 13A twin power sockets;</li> <li>(iii) ELCB/MCB board with junction box;</li> <li>(iv) roof shelter with insulation;</li> <li>(v) painted chequered plate flooring;</li> <li>(vi) lightning protection system;</li> <li>(vii) interior and exterior painting;</li> <li>(viii) sheltered partitioned walkway; and</li> <li>(ix) PE endorsement</li> </ul> <p>The Contractor shall liaise with the FRBAS contractor to provide trenching for cables and to make provision for under floor cabling works for the construction of the sheltered ingress/egress gates as required by the BSMDC system.</p> <p>The Contractor shall work closely and coordinate with the access control system contractor on the design of the sheltered enclosure and/or protection housing for the biometric access system to be installed at the Authority's office and the worksite. He shall submit his design of the sheltered enclosure and/ protection housing for the Engineer's acceptance taking account of the position of system reader in his design such that the performance of the biometric access system will not be affected by lighting and weather conditions in the normal operation of the biometric access system, in particular the biometric readers. All costs shall be deemed included in the Contract Price.</p>

	Location	Attendances
4	-	<p>Others:</p> <ul style="list-style-type: none"> <li>(a) To protect the FRBASsystem equipment at Works Areas against any damage or loss from vandalism, fire, weather condition, mishandling, water, theft, power outage and not to tamper with and/or change the configuration of the FRBAS system equipment. In the event of loss or damage to the FRBAS system equipment, the Contractor shall indemnify the Authority of any costs and expenses incurred in repair, keeping the FRBAS system equipment in good condition and working order or the replacement of the FRBAS system equipment or any part thereof;</li> <li>(b) To ensure the Contractor's computer designated as the FRBASsystem enrolment station shall not be used for any purpose other than for registration;</li> <li>(c) To provide stable power supply and network infrastructure;</li> <li>(d) To ensure all user records, especially those designated as mandatory fields, are inserted;</li> <li>(e) To carry out periodic maintenance of user records by deleting records of inactive users and purging obsolete user records; and</li> <li>(f) To record and update the site work quantities done into the FRBAS system for the respective trade level/project level data on a monthly basis or at other intervals as required by the Engineer.</li> </ul>



**Table 2** – Minimum Biodata Fields required by the FRBAS System

No	Fields
1	Name
2	FIN/NRIC No.
3	Work Permit No.
4	Work Permit Expiry Date
5	Permit Type
6	Nationality
7	Employer
8	Safety Orientation Course Date
9	Date of Birth
10	Period of Employment
11	Skill level
12	MYE Certificate No.
13	Staff ID
14	Staff Photo
15	Core Trade Registration ID

**13.12 Additional Safety Measures**

- 13.12.1 The Contractor shall provide LED temporary lighting at all worker's access ways within the station and at all staircases, both at temporary and permanent staircases at all stages of the Works and shall maintain these LED lights until CWW or when permanent lighting are accepted to be used by the Engineer. The LED lighting shall have an equivalent luminance at least 100 lux measured at floor level in accordance with BS 6164. The colour temperature of the LED lighting shall fall within the warm color range between 3500 kelvin (k) to 4500k and the color rendering index shall be above 80. The Contractor shall ensure the glare of the LED lights is within satisfactory level and not causing discomfort and inconvenience to the workers and adjacent stakeholders.
- 13.12.2 The LED lights shall be protected against dust and water with heavy-duty IP65 casing and fitted with polycarbonate diffusers or a similar system to the acceptance of the Engineer and shall be mechanically robust to at least IK 07 to withstand adverse site conditions. All connectors shall be of Bi-pin moulded plastic type non-flammable, with quick connect sockets for the connection of cabling, to BS EN 1875-3, EN60400 and designed to retain positively the lamp caps independently of the contact springs. Terminal block used shall be spring clamp with high contact pressure type which can accommodate various wire sizes. All LED lights shall be such that it allows ease of component replacement. The LED lights shall comply with IEC 62031, IEC 60598-1, IEC 62384 and IEC 61347 requirements as a minimum or equivalent standards for performance and safety specifications. The Contractor shall repair or replace any faulty LED lights immediately and at his own cost.
- 13.12.3 LED lights samples shall be submitted to the Engineer for acceptance followed by site mock-up for acceptance by the Engineer.

**13.13 Pandemic Safe Measures**

**13.13.1 General**

13.13.1.1 The Contractor shall enhance public health measures as specified in the following clauses.

13.13.1.2 Notwithstanding the requirements specified in the following clauses, the Contractor shall comply with any law, regulation, by-law or the latest requirements of authorities (including but not limited to BCA, MOM and MOH) that are/may be in force before or after the award of the contract. All provisions shall be deemed included in the Contract Price.

13.13.1.3 The Contractor shall comply with the regulations but not limited to Covid-19 (Temporary Measures) (Control Order) Regulations 2020 and including other Covid-19 related measures and tests required by BCA, MOM and other relevant agencies, at his own cost.

13.13.1.4 The Contractor shall implement effective pandemic-safe measures (such as for Covid-19) through 4 broad categories: Workplace, Workforce, Workers' Accommodation and Recreational & Rest Days, such that the Contractor is able to easily identify, segregate and control the workforce and their activities. Such measures include the use of technology such as temperature scanners, tracers, etc.

**13.13.2 Workforce**

13.13.2.1 Where and when applicable, the Contractor's workforce shall be exclusively dedicated to one site at a time and workers shall not be engaged concurrently at different sites or on different projects.

13.13.2.2 The workforce shall be regularly briefed on the latest measures to be undertaken as advised by the various government agencies.

13.13.2.3 All site personnel are to be easily identified through means of colour coded armband and sticker prominently showing their postal code residential address on their helmet.

13.13.2.4 In addition, contingency measures are to be put in place to safeguard the delivery of the project, by either access to workers through other contingency sources, or float in the program timeline so as to mitigate reduction of workforce in the event of cases of workers' infection and/or quarantine / stay home notice being imposed.

13.13.3 Workplace

- 13.13.3.1 The Contractor shall effectively reduce the density of workers at each work zone, through segregation by spatial and temporal (work in shifts) means.
- 13.13.3.2 The Contractor shall clearly demarcate work zones to prevent mixing of different groups of workers, and workers residing in different sections of the dormitories.
- 13.13.3.3 The Contractor shall implement deliberate segregation of personnel on Site (e.g. rest areas, training facilities) and during common activities (e.g. mass toolbox meetings, rest time and meal time). Workers of the same trade should reside in separate rooms to minimise the chances of exposure to infection.
- 13.13.3.4 In compliance with prevalent regulations, The Contractor shall also provide the ancillary facilities such as Antigen Rapid Test (ART) test centre, isolation room and separate for quarantine and toilet for delivery personnel at the main site office. The Contractor shall if applicable, apply separate safe entry for different parts of the worksites and site offices.
- 13.13.3.5 The Contractor shall set up adequate rest areas in different work zones to minimise mingling of the workers during rest time.
- 13.13.3.6 The Contractor shall control his workers and those of his sub-contractors to ensure that they do not loiter in public areas or facilities and do not disturb or cause inconvenience the public. In particular, strict enforcement measures shall be implemented to prevent the entry of workers into the compounds and premises of private properties.
- 13.13.3.7 The Contractor shall make suitable provisions for and shall control vehicles that provide transport for his workers and/or vehicles accessing the Works Areas, including those of SWC, such that public roads are not blocked and no inconvenience is caused to the public.
- 13.13.3.8 The Contractor shall give access to his Works Areas to other contractors as and when required for their works.

13.13.4 Workers' Accommodations & Transport

- 13.13.4.1 The Contractor shall submit the details of the workers' accommodation of all workers employed by him, either directly or indirectly, to the Engineer.
- 13.13.4.2 The Contractor shall appoint a representative to regularly liaise with the provider of the workers' accommodation, visit the accommodation to

check that standards are being upheld and report on the conditions to the Engineer.

- 13.13.4.3 The Contractor shall check and ensure that the workers are housed such that there is a maximum occupancy of no more than the relevant authorities recommendation per room and the bed spacing is minimum one metre apart, or as advised by the relevant authorities. The Contractor shall if applicable, provide dedicated transport between Worksites and accommodation to reduce mixing of workers at places of accommodation and prevent outbreaks at the Worksite.
- 13.13.4.4 The Contractor shall check and ensure that the workers' accommodation is adequately ventilated. The Contractor shall require the provider of the accommodation to install mechanical ventilation when natural ventilation is considered inadequate for daily living activities.
- 13.13.4.5 The Contractor shall check and ensure sufficient segregation and in the event of residents being infected, arrangements are in place for them to be isolated by the bunks, floors or blocks as necessary, without affecting others.
- 13.13.4.6 The Contractor shall require the provider of the accommodation to have a sick bay, equipped with en-suite toilet/shower in compliance with the authorities' requirements.
- 13.13.4.7 The Contractor shall check that the workers' accommodation is well maintained, clean, hygienic and livable for the workers.
- 13.13.5 Recreation and Rest Days
  - 13.13.5.1 Measures are to be implemented such that workers are not exposed to risk of infection through their interaction with other workers either on or off site. Such measures include segregation through different rest days, wearing of masks, use of sanitizer, engaging the workers to work during their off days for light work activities such as housekeeping or organize in-house sports and recreational activities such as movie screening, spatial sport activities that do not require close contact, etc.
- 13.13.6 Localised Stop Work Order
  - 13.13.6.1 In the event that localised stop work order is issued by the relevant authorities due to the outbreak of pandemics (such as Covid-19) at project site, the Contractor shall work with relevant authorities on the recovery measures. The Contractor shall coordinate and cooperate with ongoing investigations such as contact tracing. The Contractor is

deemed to have included all cost and expenses in the Contract Price for recovery measures.

13.13.7 Provisional Quantity for Swab Test

13.13.7.1 A Provisional Quantity item for swab tests has been included in Attachment 5 to Form of Tender. In the event where the Government stops subsidizing the cost of swab tests, the Authority shall reimburse the Contractor for the cost of swab tests [including but not limited to mandatory Polymerase Chain Reaction (PCR) tests and Antigen Rapid Test (ART)] chargeable during the period where periodic swab tests are mandated by the relevant Authorities. The Contractor shall comply with the testing regime, modality and frequency applicable to the vaccinated and unvaccinated workers and staff as required by relevant authorities.

13.13.7.2 The Provisional Quantity for swab tests is exclusively limited to the workers for various trades under the Contract engaged by the Contractor and his sub-contractor, the Contractor's staff and any full-time vendors deployed and dedicated on site. The list of personnel covered and not covered by the Provisional Quantity is shown in the following **Table 3**.

**Table 3 - List of Personnel**

Personnel covered under Provisional Quantity	Personnel not covered under Provisional Quantity
<p>1. Vaccinated workers and site office staff deployed to site</p> <p>2. Unvaccinated workers and staff deployed to site with valid medical reasons</p> <p>3. Full-time vendors (e.g. security guards, WSHO, etc.) – personnel dedicated to the project</p>	<p>4. Unvaccinated workers/ staff without valid medical reasons</p> <p>5. Delivery/courier personnel (material / logistics / food / office supplies) – transient personnel</p> <p>6. Suppliers' personnel – transient personnel</p>

	7. VIP Guests / Visitors / Authority related visits (RI, BCA TOP inspectors)
--	--

13.13.7.3 For the purpose of claiming reimbursement for the cost of swab tests, the Contractor shall keep all records (including but not limited to records in Swab Registration System V2 (SRS V2) for Singapore Citizen/ Permanent Residents, FWMOMCare for Work Pass Holders and electronic Productivity Submission System (ePSS)) showing the necessary details and particulars of the swab tests carried out and to submit all necessary supporting documents that may be required by the Engineer for verification purposes. The Contractor shall also submit payment responses/ evidence of payment issued to subcontractors as proof of passing down the swab tests payment to its sub-contractor.

13.13.7.4 For workers and the Contractor's staff who are not deployed more than 50% of time for the payment month, the reimbursement of the quantity of swab tests shall be on a pro-rated basis as illustrated in table below:

<b>Worker and staff deployed to project site</b>	<b>Reimbursement by the Authority</b>
Scenario 1: Full time or ≥50% of the time (see note)	100% of costs incurred by the Contractor
Scenario 2: <50% of time	50% of costs incurred by the Contractor

Note: ≥50% of the time refers to actual hours spent on site (including overtime) is ≥104 hours.  
Base working duration of 104 hours is computed based on average 8 hours x 26 days x 50%, excludes overtime

13.13.7.5 The swab test quantities as stated in the Provisional Quantity bill are for tendering purposes. The Contractor shall not be entitled to any claim for whatever reason if the actual quantities carried out are substantially more or less than those stated in this Bill. Payment for the swab test shall be based on quantities as carried out and paid

according to the unit rate as priced in the Bill. The unit rates entered by the Contractor shall include everything necessary for compliance with all the specifications and provisions in the Contract.

- 13.13.7.6 All other cost and expenses incurred due to pandemic-safe measures are excluded from the Provisional Quantity and shall be deemed included in the Preliminaries - Item 31, COVID-19 (Temporary Measures) (Control Order) Regulations 2020 and other COVID-19 related measures from BCA, MOM and other relevant agencies.
- 13.13.7.7 The reimbursement of the cost of swab tests shall be nett of any overheads and profits. In addition, any swab tests carried out due to any default of the Contractor (e.g. Contractor failed to observe Safe Management Measure (SMM) that led to Covid-19 outbreak on Site) and/or for any period of delay caused by the Contractor shall not be reimbursed by the Authority.