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## **24 SIGNAGE AND INFORMATION PANELS**

### **24.1 General**

- 24.1.1 The scope of works for signage includes the design, supply and installation of a signage system for CR206's CR16 Maju Station and Tunnels and the surrounding areas.
- 24.1.2 This Clause deals in particular with public transit signs, operational and statutory signs. For other signages, the Contractor shall refer to the Materials & Workmanship Specification for Architectural Works.
- 24.1.3 All operational, safety and warning signage located within and along the platform trackside etc, are deemed included in the Contract Price. The Contractor shall design, supply and install all necessary operational, safety and warning signage to the Engineer's acceptance.
- 24.1.4 The Contractor shall design and coordinate all signage works (internal and external) in accordance with the Architectural Design Criteria and Transit Signage Manual (TSM). The supply and installation shall be carried out by the Architectural Provisional Sum (APS) subcontractor.
- 24.1.5 The Contractor shall be responsible for all statutory signage design (including braille) and provision; as deemed required by their Qualified Person (QP) or resulting from Registered Inspector (RI) and other authority inspections. This includes but not limited to non-lit exit signage, barrier-free plan, loading diagram, handicap signs, Fire Safety & Shelter Department (FSSD) signs, etc.
- 24.1.6 Signage shall be located and sized to coordinate with finishes and cladding, as well as to minimise the number of signs required to provide effective way-finding. Signage mounting heights shall be consistent through the stations.
- 24.1.7 Signs shall be inclusive of all components of the sign hardware and the graphics.
- 24.1.8 Unless otherwise specified, the Contractor shall furnish all labour, supervision, materials, tools, equipment, storage, permits, certificates, drawings, temporary works, inspection, testing and other incidentals necessary to complete the work in a proper, thorough and skilful manner.

- 24.1.9 The Contractor shall make allowances for all materials and work that may or may not be expressly specified, but which are necessary for the satisfactory completion of the Works. The Contractor shall take into account of any difficulties arising when working in conjunction with the System-Wide contractors (SWC).
- 24.1.10 The signage design intents and guidelines are outlined in the Transit Signage Manual in **Appendix G** of the Particular Specification. The Contractor is to closely follow the design guidelines in his pre-final, final and detailed design based on the Transit Signage Manual.

## **24.2 Scope of Works**

- 24.2.1 The Contractor's scope of works shall include all but are not limited to the following:
- (a) Detailed design development of a conforming design, supply, manufacture and installation of a complete signage system in the public and non-public areas etc., for both internal and external areas of the station(s). All signage shall meet all building regulations and statutory requirements, as well as complying with the Transit Signage Manual.
  - (b) Liaise and co-ordinate the design, layout and installation, obtain information relevant to signage, and programme the works in co-ordination with the Interfacing Contractors, various System-wide Contractors, external authorities and other organisations.
  - (c) Coordinate entrance signage and fare line signage with SWC providing Passenger Information Display (PID) to ensure fully coordinated and no conflict of sight-lines/ viewing angles.
  - (d) Submit design calculations for installation, specifications, design/installation drawings and a design programme, for all station(s).
  - (e) Design, supply and install signage graphic artwork for all the signs using the Transit Signage Manual.
  - (f) Submit schedule for signage elements and their installation, for all station(s).
  - (g) Engage Professional Engineers in the respective disciplines (civil and electrical) to cover all aspects of the design and installation of the signs.

- (h) The Contractor shall connect the signs to the power outlets provided by the System-wide Contractors. All cabling/electrical connections shall be concealed. For suspended signage, the power outlets are generally within false ceilings areas/lighting boom.
- (i) Supervise and protect all works related to the signage until hand-over to the Authority. Any damages/scratches to the installed signage shall be rectified before handing over to the Authority.
- (j) Prepare detailed co-ordinated CCSM, drawings and building works BIM models and drawings for the signage system.
- (k) Prepare As-Built Model (ABM), As-Built Asset Model (ABAM), As-built drawings for the signage after completion of the Installation.

24.2.2

The following summarises the general requirements of the scope of work:

- (a) Detailed layout and setting-out of signage according to the Transit Signage Manual.
- (b) Detailed design development of the signage structures according to the Transit Signage Manual. Adjustment to the guidelines outlined by the Authority may be required to compliment the architecture of the station(s).
- (c) Detailed design of the signage graphics according to the Transit Signage Manual or as directed by the Authority.
- (d) Final co-ordination of station(s) signage layouts with the Interfacing Contractors and System-wide Contractors. Positions of the signage may be adjusted and fine-tuned according to site conditions.
- (e) Co-ordination with the Interfacing Contractors and System-wide Contractors on the mounting and switching/power arrangements of the signage shall be during both design and installation phases.
- (f) Preparation of programme for design, manufacture and installation of the signage.
- (g) Preparation of sign graphics drawings.

- (h) Preparation of shop drawings including setting-out signage on final architecture drawings.
- (i) Supply, fabricate and install signs, including masking and/or unmasking of temporary sticker(s), as shown on Drawings and Specification.
- (j) Manufacture of the signage.
- (k) Installation of the signage.
- (l) Commissioning of the signage.
- (m) Preparation and handing over of ABAM, ABM, As-built drawings, operation and maintenance manuals.
- (n) Carry out all design, calculations, drawing, specifications and co-ordination in Singapore.

### **24.3 Design**

- 24.3.1 The Contractor is responsible for developing, providing and completing the signage design.
- 24.3.2 The Contractor shall accurately locate and position the signs, develop the signage members, design the construction and fixing detailing and specify the materials and finishes according to guidelines and to suit the performance requirements as stipulated in the Transit Signage Manual.
- 24.3.3 The Authority's Drawings do not include the detailed interface for the signage system. The detailed interface shall be developed and coordinated by the Contractor in co-ordination with the station's Interfacing Contractors and System-wide Contractors.
- 24.3.4 The Contractor is solely responsible for the coordination of all signage works, which includes taking site surveys and measurements prior to the preparation of any shop drawings for the Engineer's acceptance before commencing fabrication.
- 24.3.5 The Contractor shall design and develop all graphics according to the Transit Signage Manual, or guidelines as directed by the Authority. A change in the graphic layout as directed by the Authority during design stage, before final design acceptance shall not be deemed a variation.

- 24.3.6 The Contractor shall insert text and graphic information obtained from external parties', including but not limited to bus service information from Transit Link or fare information from train operator onto location-specific or station-specific sign graphics as directed by the Authority. This shall be part of design development and preparation of sign graphics drawings.
- 24.3.7 The Contractor shall draw and layout all graphic information of the Locality Map according to the Transit Signage Manual. The Contractor is responsible to check his own design thoroughly for graphical errors such as spelling, layout of graphics and orientation of map, before and after printing. A change in the graphic layout as directed by the Authority during design stage, before final design acceptance shall not be deemed a variation.
- 24.3.8 The Contractor shall engage a registered PE(Civil) to prepare endorsed design calculations and drawings for the installation and be responsible for the structural integrity of the signage, its components, and the mounting support system for the signage.
- 24.3.9 The Contractor shall engage a registered PE(Electrical) or LEW to prepare endorsed designs with calculations and electrical schemes and be responsible for the electrical system of illuminated sign and its components, including electrical work for connection to the signs. This scope includes Lightning Protection System for high outdoor signs.

#### **24.4 Design Submission**

- 24.4.1 The design submission requirements are outlined in **Appendix AF** of the Particular Specification.
- 24.4.2 Drawing and artwork submissions shall be in A3 size, colour prints and softcopy in a DVD-Rom.
- 24.4.3 The Contractor may, at appropriate/ relevant stages of the design development process, present the signage proposal/ strategy for review/ approval at Architectural Design Review (DR) session(s).

#### **24.5 Co-ordination**

- 24.5.1 The Contractor shall co-ordinate all interfaces of all signage including its associated components with other elements within the works. Co-ordination with other contractors during the design stage is required in order that the required interface of the signage system is attained in all aspects.

- 24.5.2 The Contractor shall pay particular attention to the interfaces with the Interfacing Contractors and System-wide Contractors.
- 24.5.3 All cost for related abortive work by other contractors and System-wide Contractors for rectification or un-timely installation of signs, as a result of poor co-ordination shall be borne by the Contractor.

## **24.6 Dimensions and Interfaces**

- 24.6.1 The Contractor shall be responsible for the dimensional accuracy for all parts of the works. Any additional work carried out by other contractors due to inaccuracy of the Contractor's drawings, dimensions or setting-out shall be borne by the Contractor.
- 24.6.2 The Contractor shall co-ordinate all interfaces of the signs with other associated components within the works. Signs shall be neatly set-out according to the ceiling and wall layouts to the Engineer's acceptance.
- 24.6.3 Sign dimensions and its related components as stipulated in the Transit Signage Manual and Signage Schedules are nominal. Adjustments to the sizes may be required during design development to suit site conditions, architectural, or mechanical and electrical components. Such adjustment shall be part of the Contractor's co-ordination with the other contractors.

## **24.7 Material and Workmanship**

- 24.7.1 The Contractor shall comply with the Transit Signage Manual Volume 2 for Material and Workmanship requirements.

## **24.8 Warranty**

- 24.8.1 Warranties shall be provided by the Contractor as outlined in the-Transit Signage Manual Volume 2.

## **24.9 Prototypes and Samples**

- 24.9.1 Prototype
  - 24.9.1.1 The Contractor shall submit a full-scale working prototype of each sign type with specification as stipulated in the Transit Signage Manual.
  - 24.9.1.2 The prototypes shall be produced after pre-final design submission to test the sign hardware specification and function.
- 24.9.2 Samples

- 24.9.2.1 The Contractor shall submit actual samples of each material to be used for the fabrication of each sign.

## **24.10 Benchmarks**

- 24.10.1 The Contractor shall provide full-scale samples of each sign type which show the construction and the workmanship. The samples are “Control” samples and shall act as the benchmark for the workmanship of all the signs as stipulated in the Transit Signage Manual.

## **24.11 Transit Signage Manual**

- 24.11.1 The current Transit Signage Manual and Reference Manual provided in **Appendix G** of the Particular Specification for this Contract contains the following:

<b>S/No</b>	<b>Description</b>
1	Transit Signage Manual Volume 1: Graphic Standards
2	Transit Signage Manual Volume 2: Signage Hardware
3	Transit Signage Manual Volume 3: Submittals
4	Reference Manual: Operational/ Statutory Signage at Escalator/ Travelator
5	Reference Manual: Bus Shelter
6	Reference Manual: Taxi Stand, Shelter and Pick-Up/ Drop-Off
7	Reference Manual: Walk2Ride

## **24.12 Specific Requirements**

- 24.12.1 The Contractor’s detailed design for all public closet doors (especially louvered doors) should make allowance for flat surface for the mounting of all required signage, including room name signage, pictograms as necessary, ironmongery and break glass as necessary.
- 24.12.2 The Contractor shall provide room name signage for locations facing the public as stipulated in the Transit Signage Manual and submit mock-up sample for the Engineer’s acceptance.



- 24.12.3 Unless otherwise specified, ceiling mounted signage shall follow recessed strips in the ceiling and is to be indicated on all coordination drawings.
- 24.12.4 Signage stickers mounted onto non-opaque glass shall have a corresponding translucent sticker of matching dimensions to the other glass face to obscure fixing, unless otherwise agreed by the Engineer.
- 24.12.5 The Contractor shall liaise with the electrical SWC on the required range of lit exit signs. Graphic standards shall be in accordance with the Transit Signage Manual. Sign position shall take into consideration minimising the number and length of ceiling mounted poles in high spaces, and all public area wall mounted signage shall be integrated with cladding and aligned with other adjacent elements.
- 24.12.6 The Escalator SWC shall provide all relevant escalator signage, to be coordinated by the Contractor, except for escalator warning/ cautionary sign which shall be provided by the Contractor.
- 24.12.7 Sign-boxes mounted in exposed or semi-exposed areas shall be designed and fabricated to comply with IP-rating and water tightness as stipulated in the Transit Signage Manual.

### **24.13 Glazing**

- 24.13.1 The Contractor shall refer and comply with the Materials and Workmanship Specification for Architectural Works for the requirements of architectural glazing.
- 24.13.2 All sign-boxes with glazing, which are mounted above 2.1 metres in height, shall have the tempered glass laminated with an approved safety film which shall hold the glass in place for 72 hours.
- 24.13.3 All glass shall comply with Singapore Standard: SS 341.

### **24.14 Commuter Facilities Signage**

- 24.14.1 Information panels for bus stops, taxi stands and drop off/pick up shelters are to be compliant with the standard details of the LTA. The Contractor shall make all necessary submissions to Commuter and Road Infrastructure to determine signage requirements to bus stop, taxi stand and PUDO's (or combinations thereof).
- 24.14.2 Shelter road height limit signs shall be provided with minimum 3 chains such that failure of one does not result in free-swinging sign.

- 24.14.3 Signage shall be coordinated and integrated with the Station design.
- 24.14.4 The Contractor shall, at all appropriate/relevant stages of the design development process, present the signage proposal for review at meetings, design reviews, steering comms, or forums as requested by the Authority.
- 24.15 A&A Works to Existing Station(s)**
- 24.15.1 The Contractor shall design, supply and install signage in the adjoining existing station(s) and its surrounding area for changes in signage arising from the A&A Works necessitated by the interfacing and construction of the CRL station(s). The A&A Works may include changes such as relocation of existing signage, addition of new signage and replacement of sign graphics etc., for both internal and external areas of the existing station(s).
- 24.15.2 The Contractor shall coordinate with SWC and operator to ensure signage within the existing station and A&A area is well-integrated with the overall station design to avoid conflict with station operations.
- 24.15.3 The Contractor shall design and develop seamless station signage works (internal and external and at-grade signages which are part of transit system) and advertisement panels in accordance with the Authority's Requirements.
- 24.16 Masking & Unmasking Works**
- 24.16.1 Signage information pertaining to the new station shall be masked in advance with temporary sticker(s) and unmasked on the night before the actual opening of the new station. Removal of the masking stickers shall be the responsibility of the Contractor and deemed included in the Contract Price.
- 24.16.2 Where required, the Contractor shall standby and/or deploy more manpower and resources to remove the temporary masking for readiness of the new and adjoining station.
- 24.17 Temporary Signage for Inspection**
- 24.17.1 The Contractor shall provide temporary signs for inspection purpose. The temporary signs are for the final checking of public transit signage prior to mass fabrication and installation. A change in the graphic layout as directed by the Authority during the inspection shall not be deemed a variation.