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- 12.18.14 In executing any relocation works, the Contractor shall make good any deficiency in length, height, amount of materials (e.g. fence, boundary walls, etc.) with new materials. The Contractor shall also replace all damaged or corroded works, or works that cannot be relocated satisfactorily (e.g. foundations, walls, cables, etc.) without damaging the works and to the satisfaction of the Engineer.
- 12.18.15 The Contractor is required to reinstate all landscaping areas affected by the Works.
- 12.18.16 The Contractor shall note that any reconstruction, diversion, relocation and reinstatement works shall be carried out to current prevailing standards complying with the requirements of the relevant authorities.
- 12.18.17 The Contractor shall make up the existing ground within the Contract limits to the proposed finished ground level or existing ground level, whichever is higher, unless otherwise specified. The Contractor shall include in the Contract Price the design and construction of retaining walls to blend in with the adjacent development where required.
- 12.18.18 The Contractor shall address defects, comments and attend to all inspections by relevant authorities, private parties and operators leading to satisfactory completion, rectification and handing over of all works.
- 12.18.19 Unless otherwise stated, reinstatement means replacement to match the original condition, and/or to the prevailing standard. However, as a minimum, all open land shall be turfed upon Completion of the whole of the Works unless agreed otherwise by the Engineer. The Contractor shall also reinstate to the satisfaction of the Engineer, any defect caused by him during the course of the works. All costs incurred shall be borne by the Contractor.
- 12.18.20 The Contractor shall be responsible for the reinstatement of all sites occupied as worksites, including drains, sewers, slopes, roads, footpaths, tiles, turfing etc. These affected areas, after handing over to the relevant authorities shall be maintained by the Contractor for eighteen (18) months, unless occupied by others for development works.
- 12.18.21 For areas within the road reserve line and station boundary, or within NParks land/ State land managed by NParks, the Authority will issue a work order to NParks for NParks to carry out backfilling of trenches with approved soil mix and also planting of trees and shrubs. The Contractor shall coordinate with NParks and prepare trenches to the required extent and depth in compliance with NParks requirements. Any turfing shall be carried out by Contractor. For any other areas, the Contractor shall carry out full reinstatement including planting, etc and handover to the relevant agencies or parties.
- 12.18.22 In the event that the covered linkways are to be installed on PUB drain structures, the covered linkways shall be demountable and method of statement for demounting shall be submitted to PUB for their maintenance purposes and approval.

**12.42 Temporary Ventilation**

- 12.42.1 The Contractor shall be responsible for temporary ventilation. The Contractor's PE shall design and propose provisions for the temporary ventilation and shall comply with the Workplace Safety and Health (General Provisions) Regulations 2007 and Workplace Safety & Health (Confined Spaces) Regulations 2019 and SS 568: Code of Practice for confined spaces (2011), and any subsequent amendments.
- 12.42.2 The temporary ventilation design shall include the desired air flow rate. The Contractor's PE shall propose the locations and the numbers of air flow meters to monitor the actual air flow within the underground structures during construction. The Contractor shall also carry out regular air quality checks and keep such records for inspection by the Engineer as and when required.

**12.43 Public Relations**

- 12.43.1 Within 1 month of the Contract award, the Contractor shall prepare a newsletter for all residents within 150m of the Site, distributed to the letter box or other means as accepted by the Engineer. The Contractor shall engage a professional graphic designer to create high quality newsletters in colour. Thereafter, the newsletter shall be prepared on a quarterly basis and distributed to residents and stakeholders. The newsletters shall include a QR code which the public can scan to view more information about the project via digital posters, animations or videos.
- 12.43.2 The Contractor shall plan and prepare videos on the upcoming proposed works to explain the works and share with the Adviser, Grassroots and residents during regular public relation engagements. These are deemed to be included in the Contract Price. The Contractor shall prepare standalone information board(s) for example: 3-direction information board, subject to the acceptance of the Engineer, to be placed at strategic locations to update on the upcoming construction developments that would affect the public. The information board(s) shall include a QR code which the public can scan to view more information about the project via digital posters, animations or videos.
- 12.43.3 The Contractor shall plan and carry out public relations events such as ground breaking, tunnel launching and breakthrough, etc. as instructed by the Engineer. The provision of tentage, stage, tables, seating, ventilation, floral display, refreshment, posters, audio visual displays, transportation, video live streaming, virtual provisions, etc. are deemed to be included in the Contract Price.
- 12.43.4 The Contractor shall produce video/ animation to illustrate key measures adopted to minimize disturbance to key stakeholders around the construction site.

**12.44 Road Inventory System Remote**

- 12.44.1 The Contractor shall comply with the requirements of the Road Data Hub Data Collection Specification given in **Appendix N** of the General Specification, and shall submit the Road Inventory data as specified within three (3) months after completion of the Works.
- 12.44.2 The Contractor shall provide all necessary site records including all necessary photos, videos and other records. Where required, the Contractor's submissions shall be endorsed by Registered Surveyor.

**12.45 Registration of Excavator Operators**

- 12.45.1 The Contractor shall note that all excavation works carried out at the Site including those excavations carried out in connection with the detection/laying of utility services shall be done by PowerGrid Registered Excavation Operators (REOs) or Provisional Registered Excavation Operators (PREOs). This is to help minimize incidences of damage to underground service cables.
- 12.45.2 The Contractor shall ensure that excavator operators employed by him or any of his sub-contractors are licensed as REOs or PREOs. A copy of the relevant certificates shall be submitted to the Engineer before the commencement of excavation work.
- 12.45.3 Where required, the Contractor shall provide Registered Earthworks Supervisors (RES).

**12.46 Anchor Bolts**

- 12.46.1 The Contractor shall comply with the anchor bolts requirements stated in **Appendix D** of the Particular Specification.
- 12.46.2 It is essential that anchors used in ultimate load tests shall be installed specifically for the tests only. Proof tests shall be carried out on the installed anchors to show that they have been installed correctly.
- 12.46.3 A PE endorsed test report for the load test shall be submitted to the Engineer for acceptance.

**12.47 Reinstatement of Existing Drains and Box Culverts**

- 12.47.1 The Contractor shall reinstate all affected drains and box culverts to their original / revised alignment and sizes to PUB and the Engineer's acceptance, including drop inlet chambers and scupper pipes.
- 12.47.2 The Contractor shall also construct new cut-off drains and box culverts to the alignment and sizes accepted by PUB and the Engineer.

- 12.47.3 The Contractor shall make good and/or reinstate any adjoining boundary walls, paving, fencing, gates, etc. disturbed and/or damaged during the course of works, subject to the Engineer's acceptance. The Contractor shall coordinate with the affected stakeholders on the detailed requirements and obtain approval for the reinstatement. The Contractor shall bear all costs of reinstatement of adjacent property disturbed and/or damaged by the Works.
- 12.47.4 The Contractor shall engage Professional Engineer(s) for the earth retaining or stabilising structure associated with the design and supervision of drains and culvert construction. The Contractor shall note that drains along the edge of excavation must be designed to resist lateral earth and traffic surcharge.
- 12.47.5 The construction activities and method statements to be submitted to the Engineer shall comply with the requirements as stipulated in the Code of Practice which can be downloaded from PUB's website <http://www.pub.gov.sg/home/index.aspx>.
- 12.47.6 All existing drains affected by the Works shall not be demolished or interfered with until their replacement of temporary or permanent drains have been constructed and functioning satisfactorily to PUB standards and accepted by the Engineer.
- 12.47.7 The Contractor shall liaise closely with PUB's Catchment & Waterways Department and obtain all necessary approvals on the temporary decking over existing drains and the reinstatement. During the construction of the temporary decking, the flow capacity of the existing drains must be maintained at all times.
- 12.48 Site Video Recording**
- 12.48.1 A professional company, specialising in video recording, shall be engaged by the Contractor to provide a high quality colour video record of the progress of the Works. Each month, the Contractor shall schedule (to the acceptance of the Engineer) the professional company to complete one (1) hours of video recording of major site activities in all areas where major works are in progress. The video shall be timed, where possible, to coincide with major project events and favourable weather.
- 12.48.2 The Contractor shall provide and utilize a drone with HD video recording capability and high-resolution camera to record the site progress and activities on a quarterly basis. The Contractor shall propose the coverage and presentation format for the Engineer's acceptance. The Contractor shall also comply with all regulations on the use of drones.
- 12.48.3 The Contractor shall provide time-lapse HD recording of the work site on 24/7 basis and provide the edited footage to the Engineer on quarterly basis.

- 12.48.4 Each quarter, the professional company shall edit the videos taken in the previous quarter and prepare a 15-minute narrated video of the progress of the Works including special events. The Contractor shall upload these videos at the PIC.
- 12.48.5 Each year, the professional company shall prepare a 30-minute narrated video of the progress of the Works to-date including special events.
- 12.48.6 The professional company shall complete additional video recording for special events, such as ground breaking and dedication ceremonies and incorporate them into the summary videos.
- 12.48.7 At the end of the Contract, the professional company shall prepare the following separate narrative videos (of approximately 15-30 minutes) of the whole of the Works:
- (a) Technical presentation video – for example major challenges, major construction sequence and provisions, stages of traffic and canal diversions, etc.
  - (b) General non-technical information video – for example major construction sequence and provisions, stages of traffic and canal diversions, public engagement, noise and pollution control measures, etc.
- 12.48.8 The Contractor shall provide three (3) copies of each type of video (in HD format) as specified in the above clauses to the Engineer. The Contractor shall note that the videos recorded and any copy made shall remain as the property of the Authority. The copyright of the videos shall reside with the Authority. The Contractor and the professional company shall not use any part of the videos without approval of the Authority.
- 12.48.9 The video/portable hard disk/DVD format/system shall be subject to the acceptance of the Engineer.
- 12.49 Project Execution Report**
- 12.49.1 The Contractor shall submit to the Engineer project execution report of all construction activities/traffic diversion within 2 months after the completion of the respective activity. The Contractor shall also submit the project execution report of any topics related to his works as requested by the Engineer.
- 12.49.2 The Contractor shall propose the project execution report format to the Engineer for his acceptance. This report shall be of narrative format and include but not limited to the methodology, site/activity records, instrumentation records/ assessment, illustrations, photographs, lesson learnt, etc.
- 12.49.3 Within 3 months after each BSC date, the Contractor shall submit a report for the completed works which shall include the highlights of all construction activities/traffic diversions and details of complex activities.

**12.50 Completion of Works**

- 12.50.1 Upon Completion of the whole of the Works or such other period that the Engineer shall instruct, the Contractor shall remove from the site his site offices, workshops, storage sheds and other temporary structures including temporary piles and temporary foundations and turf the areas where required.
- 12.50.2 The Contractor shall also reinstate, to the acceptance of the Engineer, any defect caused by him during the course of the Works. All costs incurred shall be borne by the Contractor.

**12.51 Construction Quality Assessment**

- 12.51.1 The Contractor shall note that the Authority would be assessing the construction quality at various stages of the project.
- 12.51.2 The Contractor shall provide necessary support and documentation for the assessment to be carried out successfully.