

Project Controls

Master Specification

PC-SI2 Site Investigations

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PC-SI 2 Site Investigations

1 General

- 1.1 This Standard Specification sets out the requirements for Site Investigations and subsequent reporting.
- 1.2 The Contractor must ensure all site investigations and assessment of the condition of the existing infrastructure and necessary for the execution of the Works and the Temporary Works are undertaken.
- 1.3 If previously completed relevant site investigations or assessments are known to exist and in the Principal's possession or have been undertaken by the Principal then these reports will be contained in Contract Appendices or provided during the course of the Contract.

2 Geotechnical and Hydrogeological Investigations

- 2.1 The Contractor shall review any Principal supplied reports, relevant publically available information (i.e. expected ground conditions) and subsequently develop and then undertake a suitable scope of works that will provide sufficient geotechnical and hydrogeological information to inform a concept or reference design, and subsequent detailed design of the works (if required by the Contract Documents).
- 2.2 The geotechnical reports shall be provided to the Principal with electronic borehole and test pit logs for all geotechnical and pavement investigations provided in the (gINT) program format and any necessary library files. The gINT files will be included into the Principal's Geotechnical gINT database.
- 2.3 Site investigations shall be sufficient to provide information for the design of structures, railway infrastructure, pavements and any associated earthworks and conform to the standards below:
 - a) AS 1726 Geotechnical Site Investigations.
 - b) AS 1289 Methods of testing soils for engineering purposes.
 - c) AS 5100 Bridge Design.
 - d) AS 2159 Piling Design and Installation.
 - e) AS 3798 Guidelines on Earthworks for Commercial and Residential Developments.
 - f) AS 4678 Earth Retaining Structures.
- 2.4 A geotechnical interpretive report (GIR) must be completed (if required by the Contract Documents) and provided to the Principal. The report must:
 - a) present all geotechnical and / or hydrogeological design parameters, factors of safety and accompanying assumptions;
 - b) identify any residual geotechnical and / or hydrogeological risks that may impact the ongoing design, construction or maintenance of the project;
 - c) provide sufficient detail (i.e. methods and calculations) to allow for review by a third party or the Principal.
- 2.5 The Contractor shall develop (where required under the terms and conditions of the contract and / or on a project specific basis) and implement any additional geotechnical, hydrogeological or trial investigations (if required) to confirm design parameters and assumptions (e.g. trial piling, soil nail, lime stabilisation trials, preloading and surcharging trials).
- 2.6 Where existing natural soils or fill are proposed to be reused then laboratory soil testing of representative layers shall be tested to classify the material types as per RD-EW-C1 "Earthworks".
- 2.7 All test locations are to be surveyed to the MGA 94 grid (0.1 metre accuracy) and for level to the Australian Height Datum (0.1 metre accuracy). Levels in both depth below the surface and RL to AHD shall be provided on all borehole / Test Pit logs and DCP test results. Hydrogeological

investigations may require an increased accuracy in RL and must be evaluated on a case by case basis.

- 2.8 Prior to Completion of the project the Contractor shall ensure that all (if any) groundwater monitoring wells installed for the project, and no longer required for ongoing monitoring, are decommissioned as per the requirements of National Uniform Drillers Licensing Committee (2012) Minimum Construction Requirements for Water Bores in Australia, Edition 3. Evidence of the decommissioning of wells (if required) must be provide to the Minister's Representative prior to the completion of the project.

3 Hydrology Investigations

- 3.1 The Contactor is to review any existing drainage and flood studies of the area, in consultation with the DPTI Stormwater Unit.
- 3.2 Where identified a potential flooding risk the Contactor shall conduct a hydrological investigation of the existing flooding characteristics and predicted flooding characteristics with construction of the project for both minor (5 year ARI) and major (100 year ARI) flood events.

4 Environmental Investigations

- 4.1 Where not undertaken in the Preliminary or Planning phases the following Environmental Investigations, as a minimum, shall be undertaken.
- 4.2 Where available preliminary and historic Environmental Assessment investigations will be provided in the Contract Appendices.
- 4.3 The Contractor shall review any available reports, scope and undertake all additional Environmental Investigations, to meet design requirements and obtain any Environmental Authorisations necessary to complete the works or operate / maintain the infrastructure.
- 4.4 The Contractor will be responsible for undertaking any further environmental investigations (including updates to previous investigations) to confirm design assumptions prior to the commencement of the Final Design.
- 4.5 Environmental Investigations are to undertaken by a suitably qualified specialists.
- 4.6 Environmental Investigation factual reports shall be provided to the Principal for review and acceptance.
- 4.7 Refer PC-ENV1 "Environmental Management" for responsibility for preparing and obtaining Environmental Authorisations.

Vegetation Surveys

- 4.8 Vegetation Surveys are required for the clearance of native vegetation, the survey and required reporting for approvals are to be undertaken in accordance with requirements under the Native Vegetation Act 1991 and regulations.
- 4.9 Vegetation Surveys where the Native Vegetation Act 1991 does not apply shall be undertaken in accordance with DPTI: Vegetation Survey Guidelines, this shall include completion of a Vegetation Data Sheet and Vegetation Survey Report.
- 4.10 Where vegetation assessments are required under the Environment Protection and Biodiversity Conservation Act 1999 these shall be undertaken in accordance with relevant legislation, regulations, standards and guidelines.

Fauna Survey

- 4.11 The Contactor it to review the requirement for a Fauna Survey in accordance with the DPTI Fauna Impact Assessment Guidelines.

- 4.12 Where fauna surveys are required under the Environment Protection and Biodiversity Conservation Act 1999, these shall be undertaken in accordance with relevant legislation, regulations, standards and guidelines.
- 4.13 Where it is determined that a Fauna Survey is required, or may be required, the Fauna Survey in accordance with the Guidelines.

Noise Investigations

- 4.14 The Contactor shall undertake an investigation of existing and predicted noise levels and the impact of the project in accordance with:
- a) for road traffic noise – the DPTI: Road Traffic Noise Guidelines;
 - b) for rail noise – the EPA: Guidelines for the assessment of noise from railway infrastructure (EPA GANRI);
 - c) for night works – Management of Noise and Vibration: DPTI Construction and Maintenance Activities, Operational Instruction 21.7;
 - d) for construction noise and any other noise sources – in accordance with the Environment Protection Act 1993 and Environment Protection Policy requirements; and
 - e) PC-ENV4 “Noise Assessment, Treatment Design and Implementation”.
- 4.15 The Contractor shall identify the need to undertake noise monitoring to determine the existing conditions of the project area or to validate the noise model. Monitoring at or adjacent to residential properties shall be undertaken at locations which provide an adequate level of information on the existing situation.
- 4.16 The monitoring location selection shall be undertaken in accordance with Australian Standards 1055 and EPA requirements.
- 4.17 Existing and post-construction noise monitoring shall be undertaken as required for the assessments required under this Contract.
- 4.18 Noise monitoring shall be undertaken for a minimum of 7 days at each location, outside of school holidays, and in accordance with relevant Australian Standards and EPA requirements.

Vibration Investigations

- 4.19 The Contractor shall undertake vibration assessment for the construction and operation of the infrastructure. This may require undertaking vibration measurements pre, during and post construction.
- 4.20 The vibration monitoring shall be undertaken in accordance with appropriate Australian and / or International Standards at location(s) with similar characteristics to the project area for both structural and human exposure.

Air Quality Investigations

- 4.21 The Contractor shall undertake a detailed air quality assessment in accordance with:
- a) DPTI Environmental Instruction 21.9 “Assessment of air quality impacts from road and rail infrastructure projects” (EI21.9); and
 - b) for any other air emission sources – in accordance with the Environment Protection Act 1993 and Environment Protection Policy requirements.
- 4.22 The Contractor shall determine the need for and if necessary, undertake site specific air quality monitoring in accordance with EI 21.9. When determining the need for monitoring the Contractor shall assess other available background data (e.g. EPA air quality monitoring data) and determine its adequacy for undertaking the air quality assessment.

5 Aboriginal and Non-Aboriginal Heritage Investigations

- 5.1 If the work under the Contract will affect areas that have not been included in any Aboriginal or Non-Aboriginal heritage survey provided by the Principal (where provided), the Contractor shall undertake surveys in accordance with:
- a) PC-H1 "Aboriginal Heritage and Native Title"; and
 - b) PC-H2 "Non-Aboriginal Heritage".

6 Site Contamination Investigations

- 6.1 The Contractor shall undertake site contamination investigations in accordance with PC-SC1 "Site Contamination".
- 6.2 Contamination Specialists who undertake assessments, modelling, monitoring or design must be suitably qualified to undertake the required investigations.
- 6.3 Any site contamination investigations / reports that will require submission to the EPA are required to be written, signed or endorsed by a certified site contamination practitioner.
- 6.4 The Contractor shall review existing preliminary and detailed site contamination investigations (if available) for the project area.
- 6.5 The Contractor shall undertake the necessary site contamination assessments for areas affected by the project, if not previously completed. The assessments shall be conducted in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) (ASC NEPM) and the SA EPA Guidelines for the assessment and remediation of site contamination (GAR). These documents shall form the framework for determining the necessary steps required for the site contamination assessment;
- 6.6 The Contractor shall report on the nature and risks of site contamination within the area to be affected by the project and determine the need for further assessment and remediation, in the context of the overall project.
- 6.7 If required, further investigations shall determine the extent and nature of contamination (soil, soil vapour and / or groundwater), identify required remedial actions to prevent risk to human health and the environment (during and post-construction) from identified contamination including appropriate disposal classification and address the required management in the Contamination Remediation Management Plan (CRMP).
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