**Inspection and Test Plan – Screw Piling Load Testing**

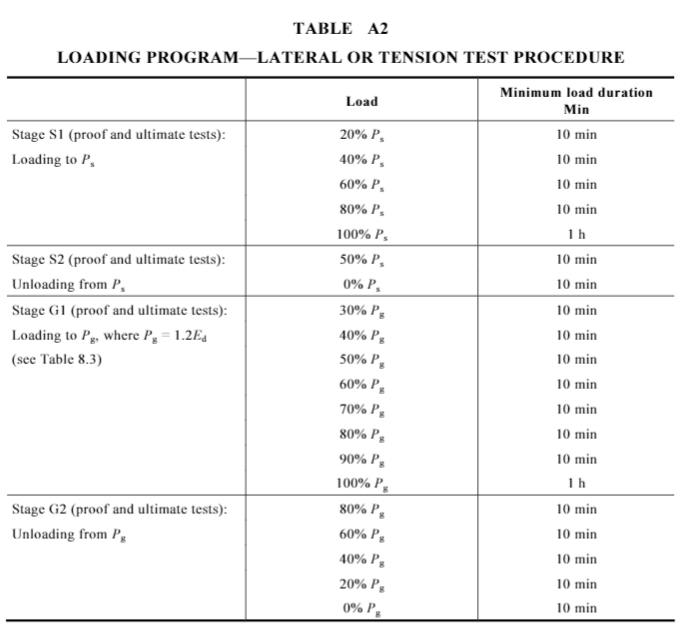
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| **Project no.** | CC0375 | | **Project name** | Hunter Power Project | | | | | **Date** | **15/06/2023** | |
| **Symal ITP no.** | 019 | | **Revision no.** | 3 | **Revision date** | 05/06/2023 | **Plant and equipment used** | | | | **xxx** | |
| **UGL ITP no.** | 3200-0663-HPP-QA-ITP-019 | | |  | | **SHL ITP no.** | | HPP-UGL-QUA-GN-GEN-ITP-0019 | | | | |
| **Symal Lot no.** |  |  | | | | | | Symal Sub Lot no. | | |  | | |
| **Estimated qty** |  | **Location (chainages, detailed description or marked up plan)** | | | | | |  | | |  | | |

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| Contact Details | | Summary of Requirements | | | Principle Codes / Standards | | Records | |
| **Customer: UGL**  **Construction Manager: Alex Daffy**  **Project Engineer: Mitchell Hoggs**  **Quality Representative:**  Subcontractors  **Piling: Australia Piling Experts**  **Concrete pumping:**  **Geotechnical:**  Surveillance / Inspection Key  **HOLD POINT (H):** Nominated point beyond which work shall not proceed without verified acceptance by nominee.  **WITNESS POINT (W):** Points at which the nominee shall be notified and invited to witness an activity, but further work may proceed without the presence of the nominee.  **REVIEW (R): Verify** by examination of documentary evidence that inspection / tests have been satisfactorily conducted.  **SURVEILLANCE (S): Continuing** evaluation of the status of methods, analysis of records and monitoring of activities on a random basis to ensure quality requirements will be met.  **VISUAL (V): 100**% Visual Inspection of work / item to ensure compliance with code / specification.  **DIMENSIONAL (D): Measurement** of critical dimensions to ensure work / item is within tolerance. | | **Process Qualifications**  **Traceability:**  Material:  Alloy Verification  Heat Treatment:  Pressure Testing  Consumable:  NDT:  Welder ID:  WPS:  Electrical:  Instruments  **Heat Treatment:**  **Dimensional Control:**  **Testing (NDT):**  **Acceptance Specification:**  **Pressure Testing:**  **Elect. / Instrumentation:**  Notes: | | | * AS2159-2009 Piled Footing Design & Installation   **Client Specifications**   * HPP-AEC-CIV-ST-GEN-SPT-0003\_B PILING * HPP-AEC-GEO-GN-GEN-SPT-0001 * HPP-SHL-CIV-ST-PIL-SPT-0001   **Engineering Procedures / WI** | | **(MDR Insert as marked )**   * Inspect Release Certs. * Deviations/Concessions * Material Certificates * Conformance Certificate * Welding Records * Welder Qual. Register * NDT Reports * Report on Repairs * Heat Treatment Records * Dimensional Records * Non-Conformance Rpts * Pressure Test Records * Drawings & Data Sheets * Misc Verification Records * Electrical Test Sheets | |
| Prepared by: | Steven Lee | | Date : 6/9/22 | Approved By: Mitchell Hogg | | Date : 7/9/22 | |  |

|  |  | |  |  |  | **Verification or test by** | | | | | | **Remarks / record (e.g. test frequency, reports, certificates, checklist etc)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | |  |  |  | **Symal Infrastructure** | | **UGL** | | **SHL** | |
| **Item no.** | **Activity** | | **Ref docs** | **Acceptance criteria** | **Acceptance** | **Key** | **Sign date** | **Key** | **Sign date** | **Key** | **Sign date** |  |
|  | | **1.0 Preliminaries** | | | | | | | | | | |
| **1.1** | Documentation | | Issued drawings / Site copy drawings | Check that you have the latest site and engineering drawings BEFORE starting each task/set of tasks.  UGL to confirm current IFC Drawings & Spec | Yes  No  N/A | S |  | R |  |  |  |  |
| **1.2** | Determine lot size | |  | Lots to be broken up accordingly and outlined on a lot map | Yes  No  N/A | S |  | R |  |  |  | Lot map |
| **1.3** | Material Certification | |  | All Materials Certificate for all materials that are part of this works to be submitted to the client and approved | Yes  No  N/A | S |  | R |  |  |  | Material Certification |
| **1.4** | Geotechnical Engineer | |  | Proposed Geotechnical Engineer holds correct qualifications and Experience to provide Screw Pile design. | Yes  No  N/A | S |  | R |  |  |  | Bore Hole Log |
|  | | **2.0 Materials & Equipment** | | | | | | | | | | |
| **2.1** | Screw Piles Shop Drawing | | Spec. 0003 Piling  [Cl 3.3.2] | Shop Drawings based on BH-308 to be submitted, reviewed, and approved by UGL.  Shop Drawings to include.   * Dimensional Requirement including tolerances if applicable. * Sections designation and material grade * All Welds and weld procedure * Corrosion protection requirements | Yes  No  N/A | H |  | H |  | H |  | Shop Drawings |
| **2.2** | Manufacturing of Steel Screw. | | Spec. 0003 Piling  [Cl 3.3.2] | **Fabrications**  Where CHS is cut using a mechanical saw, cuts to be straight and at an angle as the drawings, ±1%. The height difference does not exceed 5mm. There is to be no excessive gapping.  **Welding** All welding to be in accordance with AS/NZA 1554. Welding procedure specification to be submitted, reviewed, and approved by UGL.  **Helices.**  Pitch at the inside of the helix must be equal, (±4% and no greater than 10mm). Gradients of the helices to be constant. Any radial measurements of helices should be perpendicular (±4% and no greater than 10mm). | Yes  No  N/A | H |  | H |  | H |  | Material Certification |
| **2.3** | Piling Machine | | Drawings | Details and calibration records of the Piling machine and any other tools that may be required shall be provided for approval by the Superintendent.  Calibration records for piling rig monitoring instruments to be submitted to Superintendent | Yes  No  N/A | **R** |  | H |  | W |  | Calibration Records |
|  | | **3.0 Piling** | | | | | | | | | | |
| **3.1** | Survey Setout | |  | Pile locations shall be set-out at locations shown on the drawings and specifications – 3 test/ centre piles to be located as per the markup.  Each pile is pegged by the surveyor and identified with a unique pile number.  *Static Load Test Compression: 4 Reaction piles to be marked out as per the dimensions of the I beam that is to be used*  *Static Load Test Tension: 2 Reaction piles to be marked out as per the dimensions of the I beam that is to be used* | Yes  No  N/A | H |  | H |  | H |  | Survey Report  Test Setout Plan |
| **3.2** | Screw Pile Installation | | Spec. 0003 Piling  [Cl 3.4] | Each screw piles shall be inspected as the works proceeds.  Rate of penetration to be monitored, if one helix pitch per revolution, it needs to be recorded and designer notified.  Screw piles installed as per design and with min driving torque of 48,000NM  Rate of penetration and torque vs depth to be recorded.  Each piles finish height is to be checked.  Testing piles to be 300 mm off the ground level, Reactive Piles to be made to suit ground level.  **Notice: 2 working days prior to excavation of test pile** | Yes  No  N/A | H |  | H |  | H |  | Geotechnical Engineer Sign Off Sheet  Pile Log Sheet |
|  | **4.0 Static Load Testing** | | | | | | | | | | | |
| **4.1** | Static Load Testing Set up | |  | Australian piling Experts Static Load test Method Statement for set up of both Compression test & Tension test configuration.  Place I Beam on the Test/ Reactive piles. Pile Stubs to be facing the same direction as the inner beam.  Place Hydraulic Jack and the Dial Gauge, allowing the dial gauges to slightly touch the reference beam and securing it into place.  Circular black casing to be turned until the reading is zero at 12’0 position. | Yes  No  N/A | W |  | W |  | S |  | Photos |
| **4.2** | Static Load Test Acceptance Criteria | | Spec. 0003 Piling [Cl 3.13] | **Test piles 1 & 2**  Test results to conform to the following: | Yes  No  N/A | H |  | H |  | W |  | Static Load Test Reports |
| **4.3** | Static Load Conformance | | Spec. 0003 Piling  [Cl 3.3.2] | The testing piles to conform with the following.   * The loading system shall have a capacity of at least 500kN. * The overall loading and measuring system shall be capable of accommodating a pile movement of at least 25mm. * Movements shall be measured with a system capable of delivery an accuracy of 0.1mm * Test piles to have a min spacing of 2.5m * Test piles top be min 5.0m from location of permanent piles. * After UGL review of the Test report, the test piles to be removed and kept on site to facilitate inspection by UGL to determine their suitability for reuse. | Yes  No  N/A | H |  | H |  | W |  |  |
| **4.4** | Test Method & Loading Sequence - Compression | | AS2159-2009 8.4 | Schedule of Lod Test Requirements from AS2159 Figure A1 Completed prior to commencement of loading.  Loading & recordings to be carried out in accordance with AS2159 Table A1 (Attached as rear of ITP for reference) | Yes  No  N/A | S |  | S |  | S |  | Load vs Displacement Records |
|  | Test Method & Loading Sequence - Tension | | AS2159-2009 8.4 | Schedule of Lod Test Requirements from AS2159 Figure A1 Completed prior to commencement of loading.  Loading & recordings to be carried out in accordance with AS2159 Table A1 (Attached as rear of ITP for reference) | Yes  No  N/A | S |  | S |  | S |  | Load vs Displacement Records |
| **4.5** | Reporting | |  | Test reports forwarded to UGL/Snowy for Review/Acceptance in accordance with AS2159 A4 | ​​☐​ Yes  ​☐​ No  ​☐​ N/A | H |  | H |  | H |  | ​​☐​ Test Reports |
|  | | **5.0 Conformance** | | | | | | | | | | |
| **5.1** | Survey | | Spec. 0003 Piling [Cl 3.10] | All piles shall be constructed within the tolerance specified below:    The centreline at the top of the piles shall be within 75mm of the specified position.  The inclination of the pile shaft shall be within ± 4% of the nominated inclination.  The tolerance on the level of the top of the piles shall be ± 20mm. | Yes  No  N/A | H |  | H |  | H |  | As-Built Survey Conformance |

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| **Acceptance of works:** | | | | | | | |
| Piling representative name | |  | |  | Piling representative signature |  | |
| Symal Infrastructure representative name | | |  |  | Symal Infrastructure representative signature | |  |
| UGL representative name |  | | |  | UGL representative signature |  | |
| SHL representative name |  | | |  | SHL representative signature |  | |

A picture containing text, screenshot, receipt, number

Description automatically generated

A paper with writing on it

Description automatically generated with low confidence 