**Inspection and Test Plan – Screw Piling**

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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:**  **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: | Yoongu Kang | | 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)** |
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|  |  | |  |  |  | **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 |  |  |  |  |  |  |
| **1.2** | Determine lot size | |  | Lots to be broken up accordingly and outlined on a lot map | Yes  No  N/A | S |  |  |  |  |  | Lot map  Piling Schedule |
| **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 |  |  |  |  |  | Material Certification |
| **1.4** | Geotechnical Engineer | |  | Proposed Geotechnical Engineer holds correct qualifications and Experience to provide Screw Pile design. | Yes  No  N/A | S |  |  |  |  |  | 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** |  | S |  | W |  | Calibration records |
|  | | **3.0 Piling** | | | | | | | | | | |
| **3.1** | Survey Setout | |  | Pile locations shall be set-out at locations shown on the drawings and specifications  Each pile is pegged by the surveyor and identified with a unique pile number. | Yes  No  N/A | H |  | H |  |  |  | Survey Report |
| **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 required machine torque.  Rate of penetration and torque vs depth to be recorded.  Each piles finish height is to be checked.  **Notice: 3 working days prior to excavation of test pile** | Yes  No  N/A | H |  | H |  | H |  | Geotechnical Engineer Sign Off Sheet  Pile Log Sheet |
| **3.3** | Concrete supply | | Spec. 0003 Pili  ng [Cl 3.9] | Verify:   * Concrete mix   A concrete delivery docket to be supplied with each batch delivered.  Concrete work shall be in accordance with the technical specification for concrete supply, construction and grouting and any other notes on drawings. | Yes  No  N/A | S |  | W |  |  |  | Material dockets Concrete Pour Record  Pile Log Sheet |
| **3.4** | Concrete Placement | | Spec. 0003 Piling [Cl 3.9] | Concrete to be placed as per the construction drawings in accordance with AS3600.  Prior to the pour ensure there is no water or debris at the base of the pile shaft.  **Notice: 1 working day prior to placing concrete for test pile** | Yes  No  N/A | S |  | W |  |  |  |  |
| **3.5** | Pile Cap Installation. | | Spec. 0003 Piling [Cl 3.9] | Reinforcement for pile cap to conform with drawings and specification. Reinforcement grade to be either 250N or 500N.  Formwork to conform with drawings and specification.  Concrete to be vibrated adequately during placement to ensure there are no voids or segregation.    **Notice: 1 working day prior to placing concrete for test pile** | Yes  No  N/A | S |  | W |  |  |  | Concrete Pour Record & Pile Log Sheet |
| **3.6** | Concrete sampling | |  | The nominal rate of sampling shall be taken:   1. Compressive strength: One set per pour or as otherwise directed by Superintendent; 2. Slump: One per batch of concrete (**xxx mm)**   Acceptance Testing shall be done at a NATA registered laboratory | Yes  No  N/A | S |  | W |  |  |  | Test report |
| **3.7** | Concrete RL and depth | | Drawings | Screw Piles depth, size, position, and concrete RL as per the Piling Pile Log Sheet and Drawings. | Yes  No  N/A | S |  | S |  |  |  | Pile Log Sheet |
|  | | **4.0 Conformance** | | | | | | | | | | |
| **4.1** | 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 |  |  |  | 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 |  | |