**Inspection and test plan – Conduit Pits (In-situ)**

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| **Project no.** | CC0375 | | **Project name** | Hunter Power Project | | | | | | **Date** |  |
| **Symal ITP no.** | | CC0375-ITP-018 | **Revision no.** | 2 | **Revision date** | 21/06/2023 | **Plant and equipment used** | |  | | |
| **UGL ITP no.** | | 3200-0663-HPP-QA-ITP-033 | | | | | **SHL ITP no.** | HPP-UGL-QUA-GN-GEN-ITP-0052 | | | |
| **Lot no.** | |  | **Location (chainages, detailed description or marked up plan)** | | | | |  | | | |

Attach Dockets, Certificates and QA Documents to ITP

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| Contact Details | | Summary of Requirements | | | Principle Codes / Standards | | Records | |
| **Customer:**  **Construction Manager:**  **Project Engineer:**  **Quality Representative:**  Subcontractors    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: | | | **Client Specifications**  HPP-AEC-CIV-GN-GEN-SPT-0161\_0 QUALITY (CONSTRUCTION)  HPP-AEC-ELE-GN-GEN-SPT-0002 – GENERAL ELECTRICAL  HPP-AEC-CIV-GN-GEN-SPT-0319\_0 MINOR CONCRETE WORKS  **Engineering Procedures / WI** | | **(MDR Insert as marked 3 )**   * 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: | Joshua Fisicaro | | Date : 21/06/23 | Approved By: Joshua Fisicaro | | Date : 21/06/23 | |  |

|  | |  | |  |  |  | **Verification of acceptance by** | | | | | | **Remarks / record (eg. test frequency, reports, certificates, checklist etc)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | |  |  |  | **Symal** | | **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. | Yes  No  N/A | S |  | S |  | S |  |  | |
| **1.2** | | Lot Traceability | | Spec. 0161 Quality [Cl 7.3] | Prepare a lot map for traceability of the work area | Yes  No  N/A | S |  | S |  | S |  | Lot map | |
| **1.3** | | Underlying Lot Conformance | | Underlying Lot ITP | Underlying services and/or assets have been installed prior to commencing works over and/or above.  Refer underlying lot ITP(s) | Yes  No  N/A |  |  |  |  |  |  |  | |
| **1.4** | | Set out | | Drawings | Setout pits to the location and levels on the drawings | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.0 Excavation and Bedding** | | | | | | | | | | | | | | |
| **3.102.1** | | Excavation | | Spec. 0002 General Electrical  [Cl 6.6] | Excavate to the depths and widths of the design drawings | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.2** | | Place Bedding | | Spec. 0002 General Electrical  [Cl 6.11]  Drawings | Pits to be installed on a 100mm thick compacted sand base.  Alternatively, a 150mm thick 20mm crushed rock layer can be used if the pit floor is below the water table. | Yes  No  N/A | S |  | S |  | S |  | Material Dockets | |
| **2.3** | | Blinding | | Drawings | Blinding (15MPa) for Pit Bases to be a 50mm thick mass concrete layer. | Yes  No  N/A | S |  | S |  | S |  |  | |
| **3.0 Cast in-situ structures** | | | | | | | | | | | | | | |
| **3.1** | | Formwork (Base) | | Spec. 0319  Minor Concrete Works [Cl 4.3]  Drawings | Formwork installed as per drawings and adequately supported.  Completed formwork to be inspected by the Superintendent prior to concrete placement  **HOLD POINT**  **Before Placing Concrete** | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Pre-pour inspection | |
| **3.2** | | Steel reinforcement (Base) | | Spec. 0319  Minor Concrete Works [Cl 4.5]  Drawings | Reinforcement installed as per drawings, ensuring sufficient lap length and cover is achieved on all bars.  Concrete pre-pour inspection complete.  **HOLD POINT**  **Before Placing Concrete** | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Pre-pour inspection | |
| **3.3** | | Formwork (Walls) | | Spec. 0319  Minor Concrete Works [Cl 4.3]  Drawings | Formwork installed as per drawings and adequately supported.  Completed formwork to be inspected by the Superintendent prior to concrete placement  **HOLD POINT**  **Before Placing Concrete** | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Pre-pour inspection | |
| **3.4** | | Steel reinforcement (Walls) | | Spec. 0319  Minor Concrete Works [Cl 4.5]  Drawings | Reinforcement installed as per drawings, ensuring sufficient lap length and cover is achieved on all bars.  Concrete pre-pour inspection complete.  **HOLD POINT**  **Before Placing Concrete** | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Pre-pour inspection | |
| **3.5** | | Bell-mouths | | Spec. 0002 General Electrical  [Cl 6.11] | All conduit entries are to be fitted with proprietary bell-mouths installed flush with the pit wall as per manufacturer specifications | Yes  No  N/A | S |  | S |  | S |  |  | |
| **3.73.6** | | Concrete supply and placement | | Spec. 0319  Minor Concrete Works [Cl 4.8, 4.9, 4.10, 4.11]  Drawings | Concrete strength of cast in-situ units shall be min. Grade **N32** or as otherwise stated on drawings.  Ensure the temperature of freshly mixed concrete is maintained in between 5°C and 35°C. Ensure elapsed time between batching and discharge of the mix complies with the below table.   |  |  | | --- | --- | | **Concrete temp at discharge (°C)** | **Max elapsed time (hours)** | | 10-24 | 2.00 | | 24-27 | 1.50 | | 27-30 | 1.00 | | 30-32 | 0.75 |   Concrete placed in layers ≤ 300mm thick and adequately vibrated avoiding over-vibration. | Yes  No  N/A | S |  | S |  | S |  | Delivery dockets | |
| **3.7** | | Concrete sampling | | Spec. 0319  Minor Concrete Works [Cl 4.2] | The nominal rate of sampling shall be taken:   1. Compressive strength: One set per pour or as otherwise directed by the Superintendent; 2. Slump: One per batch of concrete | Yes  No  N/A | S |  | S |  | S |  | Concrete pour record | |
| **3.8** | | Concrete testing | | Drawings | Average compressive strength at 28 days meets minimum design requirements. Slump within tolerances specified in AS 1379  **Table 5.1**  **PERMISSIBLE TOLERANCE ON SLUMP**   |  |  | | --- | --- | | **Specified Slump (mm)** | **Tolerance (mm)** | | <60 | ± 10 | | ≥60 ≤80 | ± 15 | | >80 ≤110 | ± 20 | | >110 ≤150 | ± 30 | | >150 | ± 40 |   *Testing to be in a NATA accredited test facility* | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **3.9** | | Curing | | Spec. 0319  Minor Concrete Works [Cl 4.13] | From completion of finishing; cure continuously with either curing compound, wet curing or form retention for a min period of 7 days or as directed by the Superintendent. | Yes  No  N/A | S |  | S |  | S |  |  | |
| **4.0 Finishing Works and Backfilling** | | | | | | | | | | | | | | |
| **4.1** | | Pit Backfill | | Spec. 1354 Earthworks [Cl 3.7] | Pits to be backfilled in 150mm thick layers for a horizontal distance of 300mm as per RFI-069  Backfill to be with a thermally rated compacted sand as per the design drawings up until the top of the conduit bank. The remaining backfill above the conduits to be Select fill for material within 1.5m of pavement and General Fill below 1.5m deep.  Select backfill material to be a granular material with a maximum particle size of 50mm and a PI between 2 & 12  Backfill shall not commence until concrete compressive strength reaches 15MPa unless approved otherwise by superintendent  **HOLD POINT** | Yes  No  N/A | **H** |  | **W** |  | **W** |  | Material Test Report | |
| **4.2** | | Compaction - Backfill | | Spec. 0002 General Electrical Installation [Cl 6.6]  Spec. 1112 Earthworks [Cl 4.13] | Each layer to be compacted to a density that is no less than the density of the existing adjacent material. If the existing material density is unknown, minimum relative compaction to be:   * 95% for pit bedding and conduit embedment * 97% for select fill areas * 92% for general fill areas | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **4.3** | | Access Covers & Grates | | Spec. 1354 Stormwater Drainage Structures [Cl 3.3] | Access covers, grates and frames to be installed as per AS 3996 | Yes  No  N/A | S |  | S |  | S |  |  | |
| **4.4** | | Step Irons | | Spec. 1354 Stormwater Drainage Structures [Cl 3.3] | Pits deeper than 600 to be fitted with galvanised plastic-coated step irons as per AS1657 | Yes  No  N/A | S |  | S |  | S |  |  | |
| **4.5** | | Brass Marker Plates | | Spec. 0002 General Electrical Installation [Cl 6.11]  Drawings | Brass marker plates to be installed at each pit showing cable/conduit routes, contact phone number, organisation & drawing number. | Yes  No  N/A | S |  | S |  | S |  |  | |
| **5.0 Conformance check** | | | | | | | | | | | | | | |
| **5.1** | | Survey Report | | Spec. 0161 Quality [Cl 3.13] | An as-built survey of the drainage system been completed to ensure all structures are within construction tolerances.  Plan: +/- 200mm  Level: +/- 20mm  **HOLD POINT** | ☐ Yes ☐ No ☐ N/A | **H** |  | **W** |  | **W** |  | Survey report | |
| **5.2** | | Acceptance and closure of non-conforming items | | Spec. 0161 Quality [Cl 3.8] | NCRs to be opened for non-conforming items and closed prior to closing construction lot. **HOLD POINT** | ☐ Yes ☐ No ☐ N/A | **H** |  | **H** |  | **H** |  |  | |
|  |  | | **Comments**: | | | | | | | | | | |  |
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| **Lot acceptance:**   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Acceptance of works:** | | | | |  | | | Symal Infrastructure representative name |  |  | Symal Infrastructure representative signature |  | Date |  | | UGL representative name |  |  | UGL representative signature |  | Date |  | | SHL representative name |  |  | SHL representative signature |  | Date |  | |

**Inspection Checklist Report**

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| **Project no.** | CC0375 | **Project name** | Hunter Power Project | | **Date** |  |
| **Symal ITP no.** | CC0375-ITP-18 | | | | | |
| **UGL ITP no.** | 3200-0663-HPP-QA-ITP-033 | | **SHL ITP no.** | | HPP-UGL-QUA-GN-GEN-ITP-0052 | |
| **Symal Lot no.** |  | | | | **Symal Sub Lot no.** |  |
| **Location (chainages, detailed description or marked up plan)** | | | |  | | |

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|  | **Verify of acceptance by** | | | | | | **Remarks / records** |
|  | **Symal** | | **UGL** | | **SHL** | |
| **ID No.** | **Activity to be verified** | **ITP Step No.** | **Items conforms?** | | | **NCR / Test Report No.** | **Key** | **Sign Date** | **Key** | **Sign Date** | **Key** | **Sign Date** |  |
| Y | N | NA |
| **Preliminaries** | | | | | | | | | | | | | |
| 1. | Documentation | 1.1 |  |  |  |  | S |  | S |  | S |  |  |
| 2. | Lot Traceability | 1.2 |  |  |  |  | S |  | S |  | S |  | Lot map |
| 3. | Underlying Lot Conformance | 1.3 |  |  |  |  | S |  | S |  | S |  |  |
| 4. | Set Out | 1.4 |  |  |  |  | S |  | S |  | S |  |  |
| **Excavation and Bedding** | | | | | | | | | | | | | |
| 5. | Excavation | 2.1 |  |  |  |  | S |  | S |  | S |  |  |
| 6. | Place Bedding | 2.2 |  |  |  |  | S |  | S |  | S |  | Material Dockets |
| 7. | Blinding | 2.3 |  |  |  |  | S |  | S |  | S |  |  |
| **Cast In-situ Structures** | | | | | | | | | | | | | |
| 8. | Formwork (Base)  **HOLD POINT** | 3.1 |  |  |  |  | **H** |  | **H** |  | **H** |  | Pre-pour inspection |
| 9. | Steel reinforcement (Base)  **HOLD POINT** | 3.2 |  |  |  |  | **H** |  | **H** |  | **H** |  | Pre-pour inspection |
| 10. | Formwork (Walls)  **HOLD POINT** | 3.3 |  |  |  |  | **H** |  | **H** |  | **H** |  | Pre-pour inspection |
| 11. | Steel reinforcement (Walls)  **HOLD POINT** | 3.4 |  |  |  |  | **H** |  | **H** |  | **H** |  | Pre-pour inspection |
| 12. | Bell-mouths | 3.5 |  |  |  |  | S |  | S |  | S |  |  |
| 13. | Concrete supply and placement | 3.6 |  |  |  |  | S |  | S |  | S |  | Delivery dockets |
| 14. | Concrete sampling | 3.7 |  |  |  |  | S |  | S |  | S |  | Concrete pour record |
| 15. | Concrete testing | 3.8 |  |  |  |  | S |  | S |  | S |  | Test reports |
| 16. | Curing | 3.9 |  |  |  |  | S |  | S |  | S |  |  |
| **Finishing Works and Backfilling** | | | | | | | | | | | | | |
| 17. | Pit Backfill  **HOLD POINT** | 4.1 |  |  |  |  | **H** |  | **W** |  | **W** |  |  |
| 18. | Compaction - Backfill | 4.2 |  |  |  |  | S |  | S |  | S |  | Test reports |
| 19. | Access Covers & Grates | 4.3 |  |  |  |  | S |  | S |  | S |  |  |
| 20. | Step irons | 4.4 |  |  |  |  | S |  | S |  | S |  |  |
| 21. | Brass Marker Plates | 4.5 |  |  |  |  | S |  | S |  | S |  |  |
| **Conformance Check** | | | | | | | | | | | | | |
| 22. | Survey Report  **HOLD POINT** | 5.1 |  |  |  |  | **H** |  | **W** |  | **W** |  | Survey reports |
| 23. | Acceptance and closure of non-conforming items | 5.2 |  |  |  |  | **H** |  | **H** |  | **H** |  |  |

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| I certify that this Lot conforms to the requirements of the design and specifications; that all associated NCRs have been closed out: and all survey, conformance testing and inspections have been undertaken in accordance with the specified requirements. | | | | |
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| **Symal Representative** |  | **Signature** |  | **Date** |
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| **UGL Representative** |  | **Signature** |  | **Date** |
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| **SHL Representative** |  | **Signature** |  | **Date** |
| **Comments:** | | | | |
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