**Inspection and test plan – Drainage (pipe laying)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Project no.** | CC0375 | | **Project name** | Hunter Power Project | | | | | | **Date** |  |
| **Symal ITP no.** | | CC0375-ITP-002 | **Revision no.** | 6 | **Revision date** | 01/02/2023 | **Plant and equipment used** | |  | | |
| **UGL ITP no.** | | 3200-0663-HPP-QA-ITP-003 | | | | | **SHL ITP no.** | HPP-UGL-QUA-GN-GEN-ITP-0003 | | | |
| **Lot no.** | |  | **Location (chainages, detailed description or marked up plan)** | | | | |  | | | |

Attach Dockets, Certificates and QA Documents to ITP

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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.  **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-CIV-DD-SWS-SPT-1351\_0 STORMWATER DRAINAGE (CONSTRUCTION)  HPP-AEC-CIV-DD-SWS-SPT-1352\_0 PIPE DRAINAGE  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: | Steven Lee | | Date : 01/02/23 | Approved By: Joshua Fisicaro | | Date : 01/02/23 | |  |

|  | |  |  |  |  | **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** | | Drainage Pipe Material | Drawings | Has the correct class & type of drainage pipe been supplied and free of defects? | Yes  No  N/A | S |  | S |  | S |  | Material conformance certificate | |
| **1.4** | | Embedment material | Spec. 1352 Pipe Drainage [Cl 5.1] | Material has plasticity index less than 6. | Yes  No  N/A | S |  | S |  | S |  | Delivery dockets  Test reports | |
| **1.5** | | 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 | S |  | S |  | S |  |  | |
| **1.6** | | Temp. drainage during construction | Spec. 1351 Stormwater Drainage [Cl 2.1] | Adequate provision for runoff flows at drainage works under construction implemented and in good repair | Yes  No  N/A | S |  | S |  | S |  |  | |
| **1.7** | | Set out | Spec. 1351 Stormwater Drainage [Cl 2.2]  Drawings | Setout Culvert inlet/outlet and drainage structure positions to the location and levels on the drawings. This shall be presented for inspection by the superintendent. | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.0 Excavation and Pipe Laying** | | | | | | | | | | | | |
| **2.1** | | Excavation | Spec. 1352 Pipe Drainage [Cl 5.1, 5.2] | **DICL & Flexible Pipes:** | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.2** | | Unsuitable Material | Spec. 1351 Stormwater Drainage [Cl 2.3] | Any Unsuitable Material to be removed to the depth as directed by the Superintendent  **Notice: Prior to Placing Bedding**  **HOLD POINT** | Yes  No  N/A | **H** |  | **H** |  | **H** |  |  | |
| **2.3** | | Compaction – Foundation | Spec. 1351 Stormwater Drainage [Cl 2.5] | Trench foundation (including any unsuitable replacement) to be compacted to a relative compaction of 95% to a depth of 150mm below foundation level | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **2.4** | | Compaction – Embedment material | Spec. 1352 Pipe Drainage [Cl 5.1, 5.4] | **DICL and Plastic Pipe:**  **Bedding:**  Required relative compaction in the bedding zone shall be 95% (AS 1289.5.4.1 Standard Compaction) | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **2.5** | | Pipe Laying | Drawings  Manufacturer Specifications | Have correct pipes (size and type) been laid and jointing installed as per manufacturer specifications  Stormpro  GRP  PVC  **HOLD POINT** | Yes  No  N/A | **H** |  | **W** |  | **W** |  |  | |
| **BELOW ITEMS FOR CONCRETE ENCASED PIPE ONLY** | | | | | | | | | | | | |
| **2.6** | | Steel reinforcement | Drawings | Reinforcement installed as per drawings.  Concrete pre-pour inspection complete. **HOLD POINT** | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Pre-pour inspection | |
| **2.7** | | Concrete supply and placement | Drawings | Check concrete docket to ensure strength is as specified on the drawings.  Concrete placed in layers ≤ 300mm thick and adequately vibrated  Ensure pipe is adequately supported to prevent sinking or flotation. A minimum of 300mm encasement is achieved around all sides. | Yes  No  N/A | S |  | S |  | S |  | Delivery dockets | |
| **2.8** | | Compressive strength | Drawings | Average compressive strength at 28 days meets the minimum requirement specified on the drawings. | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **3.0 Filling and Compaction** | | | | | | | | | | | | |
| **3.1** | | Compaction – Embedment material | Spec. 1352 Pipe Drainage [Cl 5.1, 5.4] | **DICL and Plastic Pipe:**  **Side and Overlay:**  Required relative compaction in the side and overlay zone shall be 70% for trafficable areas and 60% for non-trafficable areas (AS 1289.5.4.1 Standard Compaction)    *Layers not to exceed* ***150mm*** *compacted thickness.* | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **3.2** | | Compaction – General Fill | Spec. 1352 Pipe Drainage [Cl 5.4] | For sections of the trench above the overlay zone; backfill with general fill if in verges, medians or greater than 1.5m from top of pavement.  Minimum relative compaction to be 92% | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **3.3** | | Compaction – Select Fill | Spec. 1352 Pipe Drainage [Cl 5.4] | For sections of the trench above the overlay zone and within 1.5m of top of pavement; backfill with Select fill.  Minimum relative compaction to be 97%  *Layers not to exceed* ***150mm*** *compacted thickness.* | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **3.4** | | Moisture Content | Spec. 1352 Pipe Drainage [Cl 5.4] | Moisture Content for Backfill material to be within 60% to 95% OMC unless otherwise approved by Superintendent | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **4.0 Conformance check** | | | | | | | | | | | | |
| **4.1** | | Survey Report | Spec. 0161 Quality [Cl 3.13]  RFI-026 | An as-built survey of the drainage system been completed to ensure all pipes are within construction tolerances.  Plan: +/- 200mm  Level: +/- 20mm  **HOLD POINT** | ☐ Yes ☐ No ☐ N/A | **H** |  | **H** |  | **H** |  | Survey report | |
| **4.2** | | 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**: | | | | | | | | | | |
|  |  |  | | | | | | | | | | |
|  |  |  | | | | | | | | | | |
|  |  |  | | | | | | | | | | |
|  |  |  | | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **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**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Project no.** | CC0375 | **Project name:** | Hunter Power Project | | **Date:** |  |
| **Symal ITP no.** | CC0375-ITP-002 | | | | | |
| **UGL ITP no.** | 3200-0663-HPP-QA-ITP-003 | | **SHL ITP no.** | | HPP-UGL-QUA-GN-GEN-ITP-0003 | |
| **Symal Lot no.** |  | | | | **Symal Sub Lot no.** |  |
| **Location (chainages, detailed description or marked up plan)** | | | |  | | |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **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** |  | |
| Yes | No | NA |
| **Preliminaries** | | | | | | | | | | | | | | | | | | |
| 1. | Documentation | 1.1 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 2. | Lot Traceability | 1.2 |  |  |  |  | | S | |  | S | |  | S | |  | Lot map | |
| 3. | Drainage Pipe Material | 1.3 |  |  |  |  | | S | |  | S | |  | S | |  | Material conformance certificate | |
| 4. | Embedment material | 1.4 |  |  |  |  | | S | |  | S | |  | S | |  | Delivery dockets  Test reports | |
| 5. | Underlying Lot Conformance | 1.5 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 6. | Temp. drainage during construction | 1.6 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 7. | Set out | 1.7 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| **Excavation and Pipe Laying** | | | | | | | | | | | | | | | | | | |
| 8. | Excavation | 2.1 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 9. | Unsuitable Material  **HOLD POINT** | 2.2 |  |  |  |  | | **H** | |  | **H** | |  | **H** | |  |  | |
| 10. | Compaction – Foundation | 2.3 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| 11. | Compaction – Embedment material | 2.4 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| 12. | Pipe Laying  **HOLD POINT** | 2.5 |  |  |  |  | | **H** | |  | **W** | |  | **W** | |  |  | |
| 13. | Steel reinforcement  **HOLD POINT** | 2.6 |  |  |  |  | | **H** | |  | **H** | |  | **H** | |  | Pre-pour inspection | |
| 14. | Concrete supply and placement | 2.7 |  |  |  |  | | S | |  | S | |  | S | |  | Delivery dockets | |
| 15. | Compressive strength | 2.8 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| **Filling and Compaction** | | | | | | | | | | | | | | | | | | |
| 16. | Compaction – Embedment material | 3.1 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| 17. | Compaction – General Fill | 3.2 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| 18. | Compaction – Select Fill | 3.3 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| 19. | Moisture Content | 3.4 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| **Conformance Check** | | | | | | | | | | | | | | | | | | |
| 20. | Survey pick-up  **HOLD POINT** | 4.1 |  |  |  |  | | **H** | |  | **H** | |  | **H** | |  | Survey report | |
| 21. | Acceptance and closure of non-conforming items **HOLD POINT** | 4.2 |  |  |  |  | | **H** | |  | **H** | |  | **H** | |  |  | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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. | | | | |
|  |  |  |  |  |
| **Symal Representative** |  | **Signature** |  | **Date** |
|  | | | | |
|  |  |  |  |  |
| **UGL Representative** |  | **Signature** |  | **Date** |
|  | | | | |
|  |  |  |  |  |
| **SHL Representative** |  | **Signature** |  | **Date** |
| **Comments:** | | | | |
|  | | | | |
|  | | | | |
|  | | | | |