**Inspection and test plan – HDPE Pipe Installation**

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| **Project no.** | CC0375 | | **Project name** | Hunter Power Project | | | | | | **Date** |  |
| **Symal ITP no.** | | CC0375-ITP-019 | **Revision no.** | 2 | **Revision date** | 20/07/2023 | **Plant and equipment used** | |  | | |
| **UGL ITP no.** | | 3200-0663-HPP-QA-ITP-067 | | | | | **SHL ITP no.** | HPP-UGL-QUA-GN-GEN-ITP-0061 | | | |
| **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.  **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-MEC-GN-GEN-SPT-0005 FABRICATION, ERECTION, & TESTING OF PIPEWORK - PIPING  HPP-AEC-MEC-GN-GEN-SPT-0001 PIPING MATERIAL SPECIFICATION – BALANCE OF PLANT PIPING SYSTEMS  HPP-AEC-CIV-DD-SWS-SPT-1352 PIPE DRAINAGE  **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: | Benjamin Summers | | Date : 20/07/2023 | Approved By: Joshua Fisicaro | | Date : 20/07/2023 | |  | |

|  | |  |  |  |  | **Verification of acceptance by** | | | | | | **Remarks / record (eg. test frequency, reports, certificates, checklist etc)** |
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|  | |  |  |  |  | **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** | | Pipe Material | Drawings | Has the correct class & type of drainage pipe been supplied. Has the pipe been inspected to be clean 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] | Embedment Material to be a cohesionless material with a plasticity index less than 6.    Alternatively, embedment material may be a drainage aggregate (10,14 or 20mm) as specified in AS/NZS 2566.2 | Yes  No  N/A | S |  | S |  | S |  | Delivery dockets  Test reports |
| **1.5** | | Welder Qualifications | PIPA TP003 | Have the workers involved in welding of HDPE pipes been trained by a Registered Training Organisation? | Yes  No  N/A | S |  | S |  | S |  | Welders Qualifications |
| **1.6** | | 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 |  |  |
| **.7** | | Set out | Drawings | Setout of water line alignment and level. This shall be presented for inspection by the superintendent, if requested. | Yes  No  N/A | S |  | S |  | S |  |  |
| **2.0 Excavation & Backfill** | | | | | | | | | | | | |
| **2.1** | | Excavation | Spec. 1352. Pipe Drainage [Cl 5.1]  Drawings | Has the Trench been excavated to the correct width and depth to allow for the pipe size being installed?  **PE Pipes:** | Yes  No  N/A | S |  | S |  | S |  |  |
| **2.2** | | Compaction –Bedding | Spec. 1352 Pipe Drainage [Cl 5.1, 5.4] | **Bedding:**  Has the correct thickness nominal of bedding been placed and adequately compacted below the pipe to achieve 70% Standard Compaction? (Compaction test N/A if drainage aggregate is used as bedding) | Yes  No  N/A | S |  | S |  | S |  | Test reports |
| **2.3** | | Pipe & Fittings Installation | Drawings  Manufacturer Specifications  Spec. 1352 Pipe Drainage | Have correct pipes (size and type), bends, risers, valves & junctions been welded and installed as per manufacturer specifications? All weld records to be recorded daily on the HDPE butt fusion checklist  **HOLD POINT** | Yes  No  N/A | **H** |  | **W** |  | **W** |  | HDPE Butt Welding Checklist |
| **2.4** | | Destructive Testing | PIPA TP003  PIPA POP014 | Destructive Testing to be carried out as per PIPA guidelines using the Tensile Test Method at a NATA accredited laboratory. Frequency of testing will be one test every 100 welds. If a test fails the frequency to be dropped to one test every 10 welds until at least 5 consecutive conforming tests are received.  **WITNESS POINT** | Yes  No  N/A | **W** |  | **W** |  | **W** |  | Test reports |
| **2.5** | | Flanged Joint Installation | AS/NZS 2033 Cl 4.5 | Flanged joints to be installed as per the drawings and manufacturer specifications. All flange joints to have a gasket or backing ring as nominated in the drawings. | Yes  No  N/A | S |  | S |  | S |  |  |
| **2.6** | | Backfill | Spec. 1352 Pipe Drainage [Cl 5.1] | The pipe must be backfilled with the correct material and nominal thickness as per the project drawings and specifications | Yes  No  N/A | S |  | S |  | S |  |  |
| **2.7** | | Compaction – Embedment material | Spec. 1352 Pipe Drainage [Cl 5.1, 5.4] | **PE 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 |
| **2.8** | | 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 |
| **2.9** | | 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 |
| **2.10** | | 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 |
| **2.11** | | Marker Tape | Design Drawings | Detectable Marker Tape to be installed a minimum of 300mm above the pipe. Tape to be red and labelled “Danger – Bured Fire Main Below” |  | S |  | S |  | S |  |  |
| **3.0 Testing, Commissioning and Conformance** | | | | | | | | | | | | |
| **3.1** | | Preliminary Pressure Test | AS/NZS 3500 Cl 17.3.1. | Subjecting the pipe to 1500kPa for 30 minutes and checking for any leak. | Yes  No  N/A | **H** |  | **W** |  | **W** |  |  |
| **3.2** | | Hydrostatic Pressure Test | AS/NZS 2033 Cl 7.2 | Has the line undertaken a hydrostatic pressure test in accordance with AS/NZS 2033 Clause 7.2 achieving at least 1.25 times the maximum working pressure of the pipeline?  **HOLD POINT** | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Test reports |
| **3.3** | | Survey Report | Spec. 0161 Quality [Cl 3.13]  RFI-026 | Has an as-built survey of the system been completed to ensure all pipes are within construction tolerances.  Plan: +/- 200mm  Level: +/- 50mm  **HOLD POINT** | ☐ Yes ☐ No ☐ N/A | **H** |  | **H** |  | **H** |  | Survey report |
| **3.4** | | 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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| **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-019 | | | | | |
| **UGL ITP no.** |  | | **SHL ITP no.** | |  | |
| **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** | |  |
| Yes | No | NA |  |  | |
| **Preliminaries** | | | | | | | | | | | | | | | | |
| 1. | Documentation | 1.1 |  |  |  |  | | S |  | S | |  | S |  |  | |
| 2. | Lot Traceability | 1.2 |  |  |  |  | | S |  | S | |  | S |  | Lot map | |
| 3. | Pipe Material | 1.3 |  |  |  |  | | S |  | S | |  | S |  | Material conformance certificate | |
| 4. | Embedment material | 1.4 |  |  |  |  | | S |  | S | |  | S |  | Delivery dockets  Test reports | |
| 5. | Welder Qualifications | 1.5 |  |  |  |  | | S |  | S | |  | S |  | Welder qualifications | |
| 6. | Underlying Lot Conformance | 1.6 |  |  |  |  | | S |  | S | |  | S |  |  | |
| 7. | Set out | 1.7 |  |  |  |  | | S |  | S | |  | S |  |  | |
| **Excavation & Backfill** | | | | | | | | | | | | | | | | |
| 8. | Excavation | 2.1 |  |  |  |  | | S |  | S | |  | S |  |  | |
| 9. | Compaction –Bedding | 2.2 |  |  |  |  | | S |  | S | |  | S |  | Test reports | |
| 10. | Pipe & Fittings Installation | 2.3 |  |  |  |  | | **H** |  | **W** | |  | **W** |  | HDPE Butt Welding Checklist | |
| 11. | Destructive Testing | 2.4 |  |  |  |  | | **W** |  | **W** | |  | **W** |  | Test reports | |
| 12. | Flanged Joint Installation | 2.5 |  |  |  |  | | S |  | S | |  | S |  |  | |
| 13. | Backfill | 2.6 |  |  |  |  | | S |  | S | |  | S |  |  | |
| 14. | Compaction – Embedment material | 2.7 |  |  |  |  | | S |  | S | |  | S |  | Test reports | |
| 15. | Compaction – General Fill | 2.8 |  |  |  |  | | S |  | S | |  | S |  | Test reports | |
| 16. | Compaction – Select Fill | 2.9 |  |  |  |  | | S |  | S | |  | S |  | Test reports | |
| 17. | Moisture Content | 2.10 |  |  |  |  | | S |  | S | |  | S |  | Test reports | |
| 18. | Marker Tape | 2.11 |  |  |  |  | | S |  | S | |  | S |  |  | |
| **Conformance Check** | | | | | | | | | | | | | | | | |
| 19. | Preliminary Pressure Test | 3.1 |  |  |  |  | | **H** |  | **W** | |  | **W** |  |  | |
| 20. | Hydrostatic Pressure Test  **HOLD POINT** | 3.2 | ☐ | ☐ | ☐ |  | | **H** |  | **H** | |  | **H** |  | Test reports | |
| 21. | Survey Report  **HOLD POINT** | 3.3 |  |  |  |  | | **H** |  | **H** | |  | **H** |  | Survey report | |
| 22. | Acceptance and closure of non-conforming items **HOLD POINT** | 3.4 |  |  |  |  | | **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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