**Inspection and test plan – Open drains**

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| **Project no.** | CC0375 | | **Project name** | Hunter Power Project | | | | | | **Date** |  |
| **Symal ITP no.** | | CC0375-ITP-007 | **Revision no.** | 6 | **Revision date** | 17/04/2023 | **Plant and equipment used** | |  | | |
| **UGL ITP no.** | | 3200-0663-HPP-QA-ITP-008 | | | | | **SHL ITP no.** | HPP-UGL-QUA-GN-GEN-ITP-0008 | | | |
| **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-CIV-GN-GEN-SPT-0161\_0 QUALITY (CONSTRUCTION)  HPP-AEC-CIV-DD-SWS-SPT-1121\_0 OPEN DRAINS INCLUDING KERB AND CHANNEL  **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: 17/04/23 | Approved By: Joshua Fisicaro | | Date: 17/04/23 | |  |

|  | |  | |  |  |  | **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** | | Determine lot size | | Spec. 0161 Quality [Cl 7.3] | Lots to be broken up accordingly and outlined on a lot of map | Yes  No  N/A | S |  | S |  | S |  | Lot map | |
| **1.3** | | Concrete Mix Design | | Spec. 1121 Open Drains [Cl 3.1] | Submission of Mix Design and compliance certificates for concrete constituents  **HOLD POINT** | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Material conformance certificate | |
| **1.4** | | Materials | | Spec. 1121 Open drain including K&C [Cl 3.0] | Submission of compliance certificates for joint fillers and sealants, proprietary products, wire mattresses, gabions, rock fill, and geotextile. | Yes  No  N/A | **H** |  | **H** |  | **H** |  | Material certification | |
| **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** | | Survey set out | | Drawings | Has the set-out alignment been reviewed by the Superintendent? | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.0 Open drain** | | | | | | | | | | | | | | |
| **2.1** | | Excavation | | Spec. 1121 Open drain including K&C [Cl 4.1] | Excavate to dimensions shown on drawings or where not shown to a depth of 300mm and minimum water way area of 0.2m2  Cross section: V-shaped or trapezoidal unless otherwise shown on drawings  Batter slope: Not steeper than 2:1 (H: V) | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.2** | | Unsuitable material | | Spec. 1121 Open drain including K&C [Cl 4.1] | Notify the Superintendent of any unsuitable material and seek direction for removal. Dispose and replace material as directed.  **WITNESS POINT**  **Notice: Progressive** | Yes  No  N/A | S |  | **W** |  | **W** |  |  | |
| **2.3** | | Embankment | | Spec. 1121 Open drain including K&C [Cl 4.1] | Construct embankment in compacted layers of max. depth 150mm.  Revegetate the embankment after completion if necessary | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.4** | | Embankment compaction | | Spec. 1121 Open drain including K&C [Cl 4.1] | Compact to a density equal to the naturally occurring material or alternatively to 95% standard compaction  **WITNESS POINT**  **Notice: Progressive** | Yes  No  N/A | **W** |  | **W** |  | **W** |  | Test report | |
| **2.5** | | Open Drain Construction | | Spec. 1121 Open drain including K&C [Cl 4.1] | Ensure free flow of water and minimum grade of 0.5%. Discharge into natural depressions, culverts or pits  Compact any surface to be lined to 90% relative compaction  **WITNESS POINT**  **Notice: Progressive** | Yes  No  N/A | **W** |  | **W** |  | **W** |  |  | |
| **2.6** | | Open Drain Lining | | Spec. 1121 Open drain including K&C [Cl 4.2] | Unless shown otherwise on the drawings use the following linings:  - Organic fibre mat and vegetation for grades 1-5%  - Concrete for grades <1% or >5% | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.7** | | Proprietary Channel Linings | | Spec. 1121 Open drain including K&C [Cl 4.2] | Install as per manufacturer’s instructions  **WITNESS POINT** | Yes  No  N/A | **W** |  | **W** |  | **W** |  |  | |
| **2.8** | | Concrete Lining Construction | | Spec. 1121 Open drain including K&C [Cl 4.2] | Minimum thickness of 100mm or as per design drawings. Free of humps or irregularities | Yes  No  N/A | **W** |  | **W** |  | **W** |  |  | |
| **2.9** | | Concrete Lining Weepholes | | Spec. 1121 Open drain including K&C [Cl 4.2] | As per design drawings or at 2m spacing in non-horizontal elements  **WITNESS POINT** | Yes  No  N/A | **W** |  | **W** |  | **W** |  |  | |
| **2.10** | | Concrete supply and placement | | Spec. 0319  Minor Concrete Works [Cl 4.8, 4.9, 4.10, 4.11]  Drawings | Check docket to ensure strength and slump is as per design requirements  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. | Yes  No  N/A | S |  | S |  | S |  | Delivery dockets | |
| **2.11** | | Concrete sampling | | Spec. 0319  Minor Concrete Works [Cl 4.2] | The nominal rate of sampling shall be taken as:   1. Compressive strength: See table below       Slump: One per batch of concrete | Yes  No  N/A | S |  | S |  | S |  | Concrete pour record | |
| **2.12** | | Concrete testing | | Drawings | Average compressive strength at 28 days meets minimum design requirements  Slump within tolerances specified in AS 1379 | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **2.13** | | Joints - Contraction | | Spec. 1121 Open drain including K&C [Cl 4.3] | Contraction joints to conform to the following:   * **Width:** 5mm min. * **Depth:** 20mm * **Intervals:** every 3m | Yes  No  N/A | S |  | S |  | S |  |  | |
| **2.14** | | Joints – Expansion | | Spec. 1121 Open drain including K&C [Cl 4.3] | Expansion joints to conform to the following:   * **Width:** 15mm * **Depth:** Full thickness * **Intervals:** Max interval 15m | Yes  No  N/A | S |  | S |  | S |  |  | |
| **3.0 Rock Mattresses and Gabions** | | | | | | | | | | | | | | |
| **3.1** | | Foundation | | Spec. 1121 Open drain including K&C [Cl 4.5] | Shape and compact foundation material to 95% standard compaction | Yes  No  N/A | S |  | S |  | S |  | Test reports | |
| **3.2** | | Geotextile | | Spec. 1121 Open drain including K&C [Cl 4.5] | Place geotextile between the foundation and any wire cages | Yes  No  N/A | S |  | S |  | S |  |  | |
| **3.3** | | Assembly | | Spec. 1121 Open drain including K&C [Cl 4.5] | Assemble and lace the rock mattress or gabion cage as per manufacturer’s instructions.  Secure the end of a new cage to completed works or with galvanised star pickets driven in to the ground. | Yes  No  N/A | S |  | S |  | S |  |  | |
| **3.4** | | Filling | | Spec. 1121 Open drain including K&C [Cl 4.5] | Fill boxes whilst under tension and only release tension once fully laced. Ensure cages are fully filled and uniform. | Yes  No  N/A | S |  | S |  | S |  |  | |
| **3.5** | | Completion | | Spec. 1121 Open drain including K&C [Cl 4.5] | Inspect rock filled mattresses or gabions upon completion | Yes  No  N/A | **W** |  | **W** |  | **W** |  |  | |
| **4.0 Conformance check** | | | | | | | | | | | | | | |
| **4.1** | | Survey Report | | Spec. 1121 Open drain including K&C [Cl 4.6] | Survey report verifying open drains have been constructed within tolerance:  **Finish levels of channel/gutter surface:** within ± 10mm of design level.  **Surface deviation of kerb face and channel surface:** ±5 mm from edge of a 3m straight edge, except at laybacks, grade changes or curves, or at gully pits requiring channel/gutter depression. | Yes  No  N/A | S |  | S |  | S |  | 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**: | | | | | | | | | | |  |
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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-007 | | | | | |
| **UGL ITP no.** | 3200-0663-HPP-QA-ITP-008 | | **SHL ITP no.** | | HPP-UGL-QUA-GN-GEN-ITP-0008 | |
| **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. | Determine lot size | 1.2 |  |  |  |  | | S | |  | S | |  | S | |  | Lot map | |
| 3. | Concrete Mix Design | 1.3 |  |  |  |  | | **H** | |  | **H** | |  | **H** | |  | Material conformance certificate | |
| 4. | Materials | 1.4 |  |  |  |  | | **H** | |  | **H** | |  | **H** | |  | Material certification | |
| 5. | Underlying Lot Conformance | 1.5 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 6. | Survey set out | 1.6 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| **Open Drains** | | | | | | | | | | | | | | | | | | |
| 6. | Excavation | 2.1 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 7. | Unsuitable material | 2.2 |  |  |  |  | | S | |  | **W** | |  | **W** | |  |  | |
| 8. | Embankment | 2.3 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 9. | Embankment compaction | 2.4 |  |  |  |  | | **W** | |  | **W** | |  | **W** | |  | Test report | |
| 10. | Open Drain Construction | 2.5 |  |  |  |  | | **W** | |  | **W** | |  | **W** | |  |  | |
| 11. | Open Drain Lining | 2.6 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 12. | Proprietary Channel Linings | 2.7 |  |  |  |  | | **W** | |  | **W** | |  | **W** | |  |  | |
| 13. | Concrete Lining Construction | 2.8 |  |  |  |  | | **W** | |  | **W** | |  | **W** | |  |  | |
| 14. | Concrete Lining Weepholes | 2.9 |  |  |  |  | | **W** | |  | **W** | |  | **W** | |  |  | |
| 15. | Concrete supply and placement | 2.10 |  |  |  |  | | S | |  | S | |  | S | |  | Delivery dockets | |
| 16. | Concrete sampling | 2.11 |  |  |  |  | | S | |  | S | |  | S | |  | Concrete pour record | |
| 17. | Concrete testing | 2.12 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| 18. | Joints - Contraction | 2.13 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 19. | Joints – Expansion | 2.14 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| **Rock Mattresses and Gabion** | | | | | | | | | | | | | | | | | | |
| 20. | Foundation | 3.1 |  |  |  |  | | S | |  | S | |  | S | |  | Test reports | |
| 21. | Geotextile | 3.2 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 22. | Assembly | 3.3 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 23. | Filling | 3.4 |  |  |  |  | | S | |  | S | |  | S | |  |  | |
| 24. | Completion | 3.5 |  |  |  |  | | **W** | |  | **W** | |  | **W** | |  |  | |
| **Conformance Check** | | | | | | | | | | | | | | | | | | |
| 25. | Survey Report | 4.1 |  |  |  |  | | S | |  | S | |  | S | |  | Survey report | |
| 26. | Acceptance and closure of non-conforming items | 4.2 |  |  |  |  | | **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** |
|  | | | | |
|  |  |  |  |  |
| **SHL Representative** |  | **Signature** |  | **Date** |
| **Comments:** | | | | |
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