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|---------------------------|----------------------------|--|--------------------|----------------------------------|
| CLIENT:                   | Watercare Services Limited | <div>INSPECTION AND TEST PLAN FOR:</div> <div>WORK DESCRIPTION: Air Valve Install at Creamery and Effluent Channel</div> <div>CONTRACTOR NAME: GAJV</div> <div>SUBCONTRACTOR/S NAME: TBC</div> | ITP No:            | GAJV-ITP-00102_4.0               |
| CONTRACT No. #            | 6661                       |  | JOB/ITP TITLE:     | Air Valve Install                |
| CONTRACT:                 | Central Interceptor        |  | PACKAGE No:        | N/A                              |
| WORKPLACE NAME / ADDRESS: | Mangere Pump Station       |  | CHAINAGE (if any): | Click or tap here to enter text. |
| DATE:                     | 23/09/2022                 |  | WORK AREA:         | Rising Main                      |
| ENGINEERS NAME:           | Waris Mohamad              |  | RELATD CEP No:     | GAJV-CEP-00252                   |
|                           |                            |  | SWMS No (if any):  | N/A                              |

The purpose of this Inspection and Test Plan is for identifying and tracking stages of completion and product traceability during all phases of construction.

ISSUED FOR CONSTRUCTION

**Packages:** - Discrete components or work areas.

**Inspection and Test Plan:** A sequential work method statement capturing quality related requirements that provide evidence of conformance to specifications.

**Inspection Check Sheet:** A document detailing specific criteria to be checked and recorded, often developed to meet testing requirements of standards and / or technical specifications.

**Punch List / Defects List:** A list of minor rectification type tasks which need to complete to satisfy the term of the contract.

**Surveillance:** Ongoing monitoring

**Hold Point:** A notice of the event must be provided and shall not proceed with the work without the client or its representative being present unless authority to proceed has been provided by the client in writing. Signature required

**Witness Point:** A notice of the event must be provided. If the client representative is not present at the designated time and place, work may proceed.

|         |                   |                |                 |  |                     |                               |
|---------|-------------------|----------------|-----------------|--|---------------------|-------------------------------|
| LEGEND: | W = WITNESS POINT | H = HOLD POINT | S= SURVEILLANCE | GAJV = GHELLA ABERGELDIE JOINT VENTURE | S/C = SUBCONTRACTOR | WSL = ENGINEER REPRESENTATIVE |
|---------|-------------------|----------------|-----------------|--|---------------------|-------------------------------|

| ACTIVITY<br>No. #             | DESCRIPTION          | RESPONSIBILITY | REQUIREMENTS / REFERENCE       | CONFORMANCE CRITERIA  | METHOD                        | FREQUENCY/PROCESS<br>HELD | HOLD/WITNESS<br>REQUIREMENTS |                        | RECORDS OR CHECKLISTS |
|-------------------------------|----------------------|----------------|--------------------------------|---|-------------------------------|---------------------------|------------------------------|------------------------|-----------------------|
|                               |                      |                |                                |   |                               |                           | TYPE                         | ATTENDANCE<br>REQUIRED |                       |
| 1.0 Preliminaries             |                      |                |                                |   |                               |                           |                              |                        |                       |
| 1.1                           | Drawing              | GAJV           | IFC drawing                    | Latest issue of IFC drawings to be used for construction.   | Review construction drawings. | Prior to construction.    | H                            | GAJV                   | Drawing register.     |
| 2.0. Fabrication and Material |                      |                |                                |   |                               |                           |                              |                        |                       |
| 2.1                           | Stainless steel pipe | GAJV           | Drawing no. 2012034.038 Rev E. | SS316L seamless SCH.80 pipe.  | Review material certificate.  | Upon delivery.            | H                            | GAJV                   | Material certificate. |
| 2.2                           | Flanges              | GAJV           | Drawing no. 2012034.038 Rev E. | DN450, AS2129 table D flange with hole as per detail E of drawing 2012034.038.<br><br>DN150, EN1092 PN16 RF flange, SS316L. | Review material certificate.  | Upon delivery.            | H                            | GAJV                   | Material certificate. |
| 2.3                           | Gaskets              | GAJV           | Drawing no. 2012034.038 Rev E. | DN450 3mm EPDM gasket to AS2129.<br><br>DN150 2mm James Walker INCA or approved to suit EN1092.                             | Review material certificate.  | Upon delivery.            | H                            | GAJV                   | Material certificate. |



|      |                               |      |  |   |                              |                     |   |      |  |
|------|-------------------------------|------|--|---|------------------------------|---------------------|---|------|--|
| 2.4  | Bolts/nuts/washers            | GAJV | Drawing no. 2012034.038 Rev E.   | Stainless steel bolt set, bolt with hex nut and 2 washers, M20×8/set.<br>Bolt: A4-70.<br>Nut: A4-80.<br>Washer: Class 100 HV. | Review material certificate. | Upon delivery.      | H | GAJV | Material certificate.                              |
| 2.5  | Gate valve                    | GAJV | Drawing no. 2012034.038 Rev E.<br>MS-15, MS-15P.   | Clockwise closing gate valve with EN1092, PN16 flange.  | Review material certificate. | Upon delivery.      | H | GAJV | Material certificate.                              |
| 2.6  | Air relief valve              | GAJV | Drawing no. 2012034.038 Rev E.<br>MS-40P.  | RF, EN1092 PN16, Vent-O-Max RGX or approved equivalent.   | Review material certificate. | Upon delivery.      | H | GAJV | Material certificate.                              |
| 2.7  | Welding procedure             | GAJV | General Mechanical Construction Standard - Section 6.<br>ASME 9.   | Procedure Qualification Record (PQR).   | Review procedure.            | Before delivery.    | H | GAJV | Approved WPS and PQR.                              |
| 2.8  | Weld cleaning                 | GAJV | ASME B31.3   | Pickling and passivation to be done on all welds prior to delivery.   | Review procedure.            | Before delivery.    | H | GAJV | Pickling and passivation procedure.<br>Supplier QA |
| 2.9  | Welding consumable            | GAJV | General Mechanical Construction Standard - Section 6.<br>ASME II.  | As per ASME II, Part C.   | Review certs.                | Before delivery.    | H | GAJV | Consumable certificates.                           |
| 2.10 | Welder qualification          | GAJV | General Mechanical Construction Standard - Section 6.<br>ASME IX.  | Qualification approved as per ASME IX.  | Review qualification.        | Before fabrication. | H | GAJV | Welder qualification certified.                    |
| 2.11 | Non-destructive testing (NDT) | GAJV | General Mechanical Construction Standard - Section 6.<br>ASME V.<br>ASME B31.3.  | ASME V and ASME B31.3.  | Review test certificates.    | Before delivery.    | H | GAJV | NDT report.  |
| 2.12 | NDT operator qualification    | GAJV | General Mechanical Construction Standard - Section 6.<br>ASME V.   | Valid qualification.  | Review qualification.        | Before test.        | H | GAJV | Qualification record.                              |
| 2.13 | PE pipe                       | GAJV | Drawing no. 2012034.038 Rev E, 2012034.090 Rev A, 2012034.091 Rev A, 2012034.092 Rev A.<br>203 The Supply of Polyethylene (PE) Pipes and Fittings and 203P The Supply of Polyethylene (PE) Pipes and Fittings. | PE 100 pipe. SDR as per drawing 2012034.038, 2012034.090, 2012034.091, 2012034.092.<br>Pipe size: DN160.                      | Review material certificate. | Upon delivery.      | H | GAJV | QA record of the pipe.                             |



|                         |  |      |   |  |                                   |                                 |   |      |  |
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| 2.14                    | PE pipe fitting  | GAJV | Drawing no. 2012034.038 Rev E, 2012034.090 Rev A, 2012034.091 Rev A, 2012034.092 Rev A. 203 The Supply of Polyethylene (PE) Pipes and Fittings and 203P The Supply of Polyethylene (PE) Pipes and Fittings. | PE 100 pipe. SDR as per drawing 2012034.038, 2012034.090, 2012034.091, 2012034.092. Pipe size: DN160.  | Review material certificate.      | Upon delivery.                  | H | GAJV | QA record of the pipe fitting.                                 |
| 2.15                    | Electrofusion test sample  | GAJV | Section 225 - Installation of PE Pipelines, Section 225.16.   | Pre-construction test weld results pass.   | Review test certificates.         | Before site works.              | H | WSL  | Passed test results.   |
| 2.16                    | Trench bedding and surround  | GAJV | Drawing no.2010070.005 Rev C.   | Trench bedding and surround to be SAP7.  | Submit MAR to WSL.                | Before site works.              | H | WSL  | Material certificate, approved MAR.                            |
| <b>3.0 Construction</b> |  |      |   |  |                                   |                                 |   |      |  |
| 3.1                     | Compaction test for backfill   | GAJV | General Civil Construction Standard.  | Backfill compacted to 95% MDD.   | Nuclear density meter (NDM) test. | Before fixing reinforcing.      | H | GAJV | NDM test results.  |
| 3.2                     | Formwork install   | GAJV | Drawing no. 2012034.038 Rev E.  | Dimensions are as per drawing 2012034.038.   | Visual inspection.                | Pre-pour.                       | W | GAJV | Concrete inspection checksheet.                                |
| 3.3                     | Reinforcing placement  | GAJV | Drawing no. 2012034.038 Rev E.  | Reinforcing to have minimum 75mm cover at the bottom and 50mm cover at the top.  | Visual inspection.                | Once reinforcing is placed.     | W | GAJV | Concrete inspection checksheet.                                |
| 3.4                     | Concrete testing   | GAJV | Cylinder for compression strength testing.  | To be 30MPa in 28 days.  | Cylinder test.                    | Requested at the time of order. | W | WSL  | Concrete test results.   |
| 3.5                     | Concrete pour  | GAJV | Concrete pour complete.   | Concrete finish to be U5.  | Visual inspection.                | Pre-pour and post pour.         | H | WSL  | Concrete inspection checksheet.                                |
| 3.6                     | Gasket install   | S/C  | Drawing no. 2012034.038 Rev E. General Mechanical Construction Standard - Section 8.  | Correct size and correct gasket in place.  | Visual inspection.                | During and post install.        | W | GAJV | Flanged connection checklist.                                  |
| 3.7                     | Bolts lubricated prior to install  | S/C  | Drawing no. 2012034.038 Rev E. General Mechanical Construction Standard - Section 8.  | Bolts have lubrications. Lubrication to be nickel anti-seize compound.   | Visual inspection.                | During and post install.        | W | GAJV | Flanged connection checklist.                                  |
| 3.8                     | Pipes and instruments assembled in the correct position and orientation                    | S/C  | Drawing no. 2012034.038 Rev E.  | Pipe and instruments installed in correct order as per drawing no. 2012034.038 Rev E.  | Visual inspection.                | Post install.                   | W | GAJV | Flanged connection checklist.                                  |
| 3.9                     | Valve operational (before and after installation)  | S/C  | Valve manual.   | Valve opens and closes fully.  | Visual inspection.                | Pre and Post install.           | W | GAJV | Flanged connection checklist.                                  |
| 3.10                    | All flanges to have correct number of bolts and bolts to be tightened to specified torque. | S/C  | Drawing no. 2012034.038 Rev E – Note 3. General Mechanical Construction Standard - Section 8.3.2.   | All flanges have the correct number of bolts required. DN450 flanges to be torqued to 250Nm in 110Nm increments. DN150 flanges to be torqued to 138Nm. | Visual inspection.                | Post install.                   | W | GAJV | Flanged connection checklist. Torque meter calibration record. |



|      |  |      |  |  |                                   |                            |          |      |   |
|------|--|------|--|--|-----------------------------------|----------------------------|----------|------|---|
|      |  |      |  | Torque meter calibration record.   |                                   |                            |          |      |   |
| 3.11 | Weld surface preparation                         | S/C  | PIPA POP001 – Electrofusion Jointing of PE Pipes and Fittings for Pressure Applications - Issue 8.1 August 2021. | Surface cleaned before peeling pipe.<br>Correct pipe peeling tool used - Metal files, rasps, emery paper etc are <u>NOT</u> to be used.<br>Surface cleaned with an authorised Isopropanol impregnated pipe wipe. | Visual inspection.                | During pipe peeling.       | <b>H</b> | WSL  | PE pipe install checklist.                                    |
| 3.12 | Electrofusion construction weld test             | S/C  | Section 225 - Installation of PE Pipelines, Section 225.16.  | Construction test weld results pass.   | Weld test result.                 | During pipe welding.       | <b>W</b> | WSL  | PE pipe install checklist.                                    |
| 3.13 | Trench bedding                                   | GAJV | Drawing no.2010070.005 Rev C.  | Trench bedding as per 2010070.005 - Rev C, Granular Surround. Bedding to be minimum 150mm.<br>Compaction to be 95% MDD or 32CIV.<br>Backfill in 230mm layers   | Visual inspection.<br>Clegg test  | Prior to pipe laying.      | <b>W</b> | GAJV | PE pipe install checklist. Clegg value recorded on checklist. |
| 3.14 | Pipe install                                     | GAJV | Drawing no.2012034.090 Rev A.  | Pipe installed at the correct invert level.  | Visual inspection.                | Prior to trench fill.      | <b>W</b> | GAJV | PE pipe install checklist.                                    |
| 3.15 | Trench surround                                  | GAJV | Drawing no.2010070.005 Rev C, General Civil Construction Standards.  | Trench surround as per 2010070.005 - Rev C, Granular Surround. Pipe surround to be 150mm cover.<br>Compaction to be 95% MDD or 32CIV.<br>Backfill in 230mm layers  | Visual inspection.<br>Clegg test. | Prior to backfill.         | <b>W</b> | GAJV | PE pipe install checklist. Clegg value recorded on checklist. |
| 3.16 | Tracer wire and label strip                      | GAJV | AS/NZS 2033.   | Tracer wire and label strip installed the trench surround.   | Visual inspection.                | Prior to backfill.         | <b>W</b> | GAJV | PE pipe install checklist and photo.                          |
| 3.17 | Trench backfill                                  | GAJV | AS/NZS 2033, General Civil Construction Standards.   | Backfill over pipe surround as per AS/NZS 2033 - Section 5.<br>Compaction to be 95% MDD or 32CIV.<br>Backfill in 230mm layers  | Visual inspection.<br>Clegg test  | Once backfill is complete. | <b>W</b> | GAJV | PE pipe install checklist. Clegg value recorded on checklist. |
| 3.18 | As-builts  | GAJV | -  | As Built surveys to be completed   | Record any changes.               | During construction.       | <b>W</b> | WSL  | Asbuilt Survey  |
| 3.19 | Install Odour Bed 3 South ARV Leacheate Pipework | GAJV | As per DWG2012034.114  | Pipe support clamps to be spaced at maximum 2m centres.<br>DN50 PN12 PVC pipe to be used<br>Proposed PVC pipe to be fixed at a minimum grade of 1:180  | Visual inspection                 | During installation        | <b>W</b> | WSL  | Delivery Dockets,<br>Pipe installation checksheet             |
| 3.20 | Connection to Manhole                            | GAJV | As per DWG2012034.114<br>As per DWG2001151.018   | 150mm concrete surround to 160dia uPvc   | Visual inspection                 | During installation        | <b>W</b> | WSL  | Pipe installation checksheet                                  |



| ITEM | QA DOCUMENT CHECKLIST                               | TICK APPROPRIATE BOX     | COMMENTS | ITEM | QA DOCUMENT CHECKLIST                             | TICK APPROPRIATE BOX     | COMMENTS |
|------|---|--------------------------|----------|------|---|--------------------------|----------|
| 1    | Completed Inspection and Test Plan                  | <input type="checkbox"/> |          | 12   | Check sheets Completed and signed                 | <input type="checkbox"/> |          |
| 2    | Material Delivery Dockets (if applicable)           | <input type="checkbox"/> |          | 13   | Independent Reviewer Report                       | <input type="checkbox"/> |          |
| 3    | Incoming Material Inspection Checklist              | <input type="checkbox"/> |          | 14   | Operation and Maintenance Manuals (if applicable) | <input type="checkbox"/> |          |
| 4    | All Aconex Mails Closed-Out - Related to Lots       | <input type="checkbox"/> |          | 15   | Warranties / Guarantees (if applicable)           | <input type="checkbox"/> |          |
| 5    | Conformance Certificates (if applicable)            | <input type="checkbox"/> |          | 16   | Producer Statements                               | <input type="checkbox"/> |          |
| 6    | Test Reports  | <input type="checkbox"/> |          | 17   | Compliance Statement                              | <input type="checkbox"/> |          |
| 7    | Engineers Red-Line mark ups                         | <input type="checkbox"/> |          | 18   | Relevant RFIs -                                   | <input type="checkbox"/> |          |
| 8    | As Built Survey                                     | <input type="checkbox"/> |          | 19   | Instructions -                                    | <input type="checkbox"/> |          |
| 9    | Photos  | <input type="checkbox"/> |          | 20   | Factory Acceptance Test (if applicable)           | <input type="checkbox"/> |          |
| 10   | Geotechnical Site Inspection Report (if applicable) | <input type="checkbox"/> |          | 21   | Other -   | <input type="checkbox"/> |          |
| 11   | QA Engineer Site Inspection Report                  | <input type="checkbox"/> |          | 22   | Other -   | <input type="checkbox"/> |          |

CONFORMANCE / VERIFICATION STATEMENT

This closed lot conforms in all respects with the standards and requirements specified in the Contract Documents. The lot verification records are complete, and any non-conformances have been closed out in accordance with the Projects requirements.

|   |            |                                  |           |             |      |                               |
|---|------------|----------------------------------|-----------|-------------|------|-------------------------------|
| Construction Lot checked by the Senior Project Engineer responsible for the works | PRINT NAME | Click or tap here to enter text. | SIGNATURE | <div></div> | DATE | Click or tap to enter a date. |
| Construction Lot verified and closed by Quality Management Representative         | PRINT NAME | Click or tap here to enter text. | SIGNATURE | <div></div> | DATE | Click or tap to enter a date. |
| Independent Verification Review (if required) by:                                 | PRINT NAME | Click or tap here to enter text. | SIGNATURE | <div></div> | DATE | Click or tap to enter a date. |