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| --- | --- | --- |
| Client: AIAL | Subcontractor: TBC | Work Area: Civils – HOSR and SCH |
| Project Name: Domestic Jet Terminal | Job No: HA0423 | Subcontractor Representative: TBC |

**1. ITP Element: Stormwater**

**2. Revision Records**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Rev No.** | **Revision Description** | **Name of Author** | **Authorised by:** | **Date** |
| 1 | For Review | Matt Cheyne | Matt Cheyne |  |
|  |  |  |  |  |

**3. Relevant Documents**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Doc** **No.** | **Specification/ Drwgs/ Standards** | **Additional Info** | **Document No.** | **Specification/ Drwgs/ Standards** | **Additional Info** |
| 1 | DP001-MMD-SPC-CV-Z-Z-0001 | Rev 02 | 6 | DP001-MMD-DRW-SW-F-Z-3270 - 3273 | Rev 02 |
| 2 | Watercare Civil Construction Standard |  | 7 | DP001-MMD-DRW-SW-G-Z-3200 - 3202 | Rev 01 |
| 3 | DP001-MMD-DRW-SW-B-Z-3051 - 3064 | Rev 02 | 8 | DP001-MMD-DRW-SW-F-Z-3210 - 3212 | Rev 01 |
| 4 | DP001-MMD-DRW-SW-D-Z-3100 - 3110 | Rev 02 | 9 |  |  |
| 5 | DP001-MMD-DRW-SW-F-Z-3240 - 3242 | Rev 01 | 10 |  |  |

**4. Process**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Description  Inspection / test | Frequency | Spec/standard | Acceptance Criteria | Measuring Devices | Reporting Format | Inspected by\* | | | Hold Points Sign off | *Remarks* |
| HCL | SC | Consult |
| **1** | **Material Compliance** | | | | | | | | | | |
| **1.1** | **Fill Materials** | | | | | | | | | | |
| 1.1.1 | Bedding material  GAP 20 for Concrete Pipes  PAP 7 for PE pipes | Per Batch | CIV Spec - S9.3.11  AS/NZS 3725 | Accept/  Reject | N/A | Dockets / Material Data Sheets | R | SUB | R | Hold Point |  |
| 1.1.1 | Backfill Material  GAP65 or GAP40 or AP40 | Per Batch | CIV Spec - S9.3.12  CIV Spec - S4.4.5 | Accept /  Reject | N/A | Dockets / Material Data Sheets | R | SUB | R | Hold Point |  |
| **1.2** | **Manholes + Pipes** | | | | | | | | | | |
| 1.2.1 | Pre-Cast Manholes | Each Unit | CIV Spec - S9.3.7 | Dockets/ Visual Checks | N/A | Dockets / Material Data Sheets | R | SUB | R | Hold Point |  |
| 1.2.2 | Concrete Pipes:  375Ø RCRRJ Class 4  300Ø RCRRJ Class 4  225Ø RCRRJ Class 4 | Each Pipe | CIV Spec - S9.3.1  DP001-MMD-DRW-SW-D-Z-3100 to 3110 | Dockets/ Visual Checks | N/A | Dockets / Technical Data Sheets | R | SUB | R | Hold Point |  |
| 1.2.3 | PE Pipes  280Ø ODPE 100 PN16 | Each Pipe | CIV Spec - 10.3.2  DP001-MMD-DRW-SW-B-Z-3051 to 3052 | Dockets/ Visual Checks | N/A | Dockets / Technical Data Sheets | R | SUB | R | Hold Point | Pipe colour tbc |
| 1.2.4 | Access covers and frames  Landside: 240 kN Class D  Airside: 900 kN Class G | Each unit | CIV Spec - S9.3.8 | Shop drawings, Dockets/ Visual Checks | N/A | Dockets / Technical Data Sheets | R | SUB | R | Hold Point |  |
| **1.3** | **Concrete** | | | | | | | | | | |
| 1.3.1 | Insitu Concrete Mix Design | Each structure | CIV Spec - S13.3.1.2 | Accept / Reject | N/A | Design Mix | R | SUB | R | Hold point |  |
| **1.4** | **Reinforcement** | | | | | | | | | | |
| 1.4.1 | In-situ Reinforcement | Each Structure | CIV Spec - S14.3.1 | Accept/Reject | N/A | Dockets/ Technical Data Sheets | R | SUB | R |  |  |
| **1.5** | **Waterproofing** | | | | | | | | | | |
| 1.5.1 | Pipe & Pit Waterproofing – Hydrotite CJ 0725 or Similar | Each Pipe and Structure | DP001-MMD-DRW-SW-F-Z-3211 Rev 1 | Accept/Reject | N/A | Dockets/ Technical Data Sheets |  |  |  |  |  |
| **2** | **Construction** | | | | | | | | | | |
| **2.1** | **Pre-Condition Assessments** | | | | | | | | | | |
| 2.1.1 | Existing pipes / manholes to be removed or retained | Each pipe | CIV Spec - S9.4.1 | Removed and disposed OR sealed and capped off | N/A | Photos / Asbuilts | I | SUB | R | RFI if any found that are not expected | Survey on site/ asbuilts review  capped off any found |
| 2.1.2 | Survey Setout  Pipe alignments, Position, Manholes Position and Heights | Each Manhole | N/A | Survey Setout records and Setout pegs | GPS, Total Station | Setout CSV file, Photos/Visual |  |  |  |  |  |
| **2.2** | **Pipeline Construction** | | | | | | | | | | |
| 2.2.1 | Excavation Extents | Each element installed | CIV Spec - S9.4.2  CIV Spec - S4.5.9 (earthworks section) | -20mm to +0mm o | Rotating level and GPS | N/A | M |  |  |  | Watercare Civil Construction  Standard C2 referenced |
| 2.2.2 | Drainage manholes/ pits subgrade testing | Drainage manholes and pits: 2 tests at the base of excavation | CIV Spec - S4.6.2.2 (earthworks section) | Bearing Capacity 100kpa Shear Vane tests at 0.5m below the base and 1.0m below the base or Scala Penetrometer tests to 1.0m below the base | Shear Vane Test or  Scala Test | Photos, Excel & pdf | M | SUB | W |  | If ground failing, Undercut 400mm and fill with 5Mpa flowable fill |
| 2.2.3 | Pipe Trench subgrade testing | Each trench at every 5m | CIV Spec – S9.5.2.1 | Minimum CBR 3% | Scala Test | Excel & pdf | M | SUB | R | Witness point | If failing Undercutting required. Engineer to confirm the Undercut details |
| 2.2.4 | Bedding, surround | Per installation | As per drwgs min/ max fill  CIV Spec - S9.4.3 DP001-MMD-DRW-SW-F-Z-3270 Rev 2  DP001-MMD-DRW-SW-F-Z-5031 Rev 1 | 0mm / +3mm | Rotating level / tape / staff | Photos, QVC | M | \* |  |  | PAP7 for PE & PVC  GAP 20 For Concrete Pipes |
| 2.2.5 | Pipe installation, Connection and jointing | Each pipe | CIV Spec - S9.4.4  CIV Spec - S9.4.9  Watercare General Construction Standards Section 9-C3  DP001-MMD-DRW-SW-F-Z-3270 Rev 2  DP001-MMD-DRW-SW-F-Z-5031 Rev 1 | Position tolerance +/- 10mm  Level Tolerance +/-5mm Pipe grade as per design | Observation | QVC,  Long section Check sheets,  As-Builts | I |  |  | Witness Point | Caps to be used if lines not complete, Chases dug out for belled socket joints  Rubber seals |
| 2.2.6 | Backfilling | Each Pipe | CIV Spec - S4.4.4  Table 4.3 (Earthworks Section)  DP001-MMD-DRW-SW-F-Z-3270  DP001-MMD-DRW-SW-F-Z-5031 Rev 1 | CIV > 25  Clegg Test corelated to an NDM | Clegg Hammer | Photos, QVC,  Clegg Sheets | M | SUB |  | Witness Point | Engineer to inspect before backfilling |
| **2.3** | **Manholes and structures installation** | | | | | | | | | | |
| 2.3.1 | Pre- Cast Manholes | Each Unit | CIV Spec - S9.4.6  Watercare General Civil Construction Standard 9C.4 | Position tolerances +/- 10mm  Level Tolerance -0mm to + 3mm.  Manufacturers installation guidelines | As-Builts | Photos |  |  |  |  |  |
| 2.3.2 | Mass Concrete Stormwater Manholes (Thickening) | Each Unit | CIV Spec - S13.4.3.2  DP001-MMD-DRW-SW-F-Z-3211 | 20MPa concrete | As-Builts | Photos |  |  |  |  | Refer to Table 2 for dimensions in DP001-MMD-DRW-SW-F-Z-321 Rev 3 |
| 2.3.3 | Insitu Manholes | Each Unit | CIV Spec - S13.3.1.2  Watercare Standard Section C4. Concrete | Position tolerances +/- 10mm  Level Tolerance -0mm to + 3mm | As-Builts | Photos, QA check sheets |  |  |  |  |  |
| 2.3.4 | Trench Excavation | Each Unit | CIV Spec - S13.4.1 | Scala test Min 3% CBR or Min Bearing capacity 100kPa | Shear Vane/Scala test | Photos, test Results PDF | R | SUB | R | Witness point |  |
| 2.3.5 | Formwork | Each unit | CIV Spec - S13.4.2 | Shop drawings, | N/A | Photos, QC check Sheet, Engineer Inspection | M | SUB | I | Witness point |  |
| 2.3.6 | Reinforcing Steel | Each Unit | CIV Spec - S14.4.2  CIV Spec - S14.4.8  CIV Spec - S14.4.11  CIV Spec - S13.5.1  DP001-MMD-DRW-SW-F-Z-3210 | Plans and Shop drawings | N/A | Photos, QC check Sheet, Engineer Inspection |  |  |  | Hold Point | Engineer to inspect before concreting |
| 2.3.7 | Pipe Connection to Manholes | Each Unit | CIV Spec - S10.4.5  DP001-MMD-DRW-WW-F-Z-3203 Rev 2  DP001-MMD-DRW-SW-F-Z-5034  Watercare Standards WW11 | Plans and Shop drawings | N/A | Photos, QVC |  |  |  |  | For HDPE pipe connection refer to WW11 drawing |
| 2.3.8 | Backfilling | Each Unit | CIV Spec - S13.4.4  Table 4.3 (Earthworks Section) | CIV > 25  Clegg Test corelated to an NDM | Clegg Hammer | Photos, QVC,  Clegg Sheets | M | M |  | Witness Point | Engineer to inspect before backfilling |
| 2.3.9 | Benching | Each Unit | DP001-MMD-DRW-F-Z-3200 | Material Dockets | N/A | Drainage QVC. Photos |  |  |  |  | Benching Rendered to  Min 1 in 12 grade |
| 2.3.10 | Manhole Throat, Lid | Each Unit | WaterCare Standard  WW6 and WW 7  DP001-MMD-DRW-SW-F-Z-3210  DP001-MMD-DRW-SW-F-Z-3211 | Materials Dockets,  Shop Drawings | N/A | QVC, Photos |  |  |  |  | Reference to Watercare General Construction drawings |
| **3** | **Post Construction** | | | | | | | | | | |
| **3.1** | **As-Builts** | | | | | | | | | | |
| 3.1.1 | As built Works | Each pipe | CIV Spec - S9.4.10 | Position tolerance +/- 10mm  Level Tolerance +/- 5m | Surveyor Equipment, Total Station | Certified As-built PDF and DWG file | R | Sub | R |  |  |
| **3.2** | **Pipeline Condition** | | | | | | | | | | |
| 3.2.1 | CCTV Survey | Each new pipe and Manholes | CIV Spec - S9.5.2.4 | Accept / Reject | CCTV | Video and Report | R | Sub | R | Hold point | Shall be carried out prior to final pavement surfacing for new and remaining pipes |

**5 Document Deliverables *(The documents listed below shall be completed and compiled during the course of the construction)***

|  |  |
| --- | --- |
| Results of Compactions | EPD Certificate if applicable |
| Material Certificates |  |
| QC records |  |
| As Built |  |
| CCTV |  |

**6. Distribution Records**

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| --- | --- | --- | --- |
| **Name** | **Position** | **Company** | **Date** |
| TBA |  | MMD |  |
| TBA |  | BECA |  |
| TBA |  | AIAL |  |
|  |  |  |  |

* Inspect (I) – To visually examine or measure an item or contracted work operation to verify its conformance to predetermined quality requirements
* Review (R) – To examine any form of documentation to establish its acceptability against specified requirements
* Surveillance (S) – To observe in-process activities to the degree necessary to be assured that they comply with the established criteria
* Test (T) – To subject a component, structure, or system to a controlled set of physical, chemical, environmental or operational conditions to determine or verify its capability to meet specified requirements
* Witness (W) – To watch over, observe or visually examine a specific work operation or test performed by others under Contractor supervision
* Monitor (M) – General oversight of work in progress with no need to document formally.
* Submission (Sub) – Submission of a document

EFC- Eastern Forecourt

HOSR- Head of Stand Road

SCH – Super Cargo Highway