| **Item**  **No.** | **Task/Activity Description** | **Inspection/Test** | | | | | **Type** | **Responsibility** | **Checked/Verified by (initial/Date):** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Frequency** | **Acceptance Criteria** | **Reference Documents** | **Inspection/Test Method** | **Record of conformity** | **TfNSW** | **Fulton Hogan** | **PV** | **Date** |
| 1 | Type of open drain to be constructed:  ❑ Vegetated Channel drain  ❑ Concrete Catch Drain  ❑ Concrete Channel Drain  ❑LWQB | Per Area | As indicated on design drawing | Design DWGS |  | Verification  Checklist | IP | Site Engineer |  |  |  |  |
| 2 | Obtain and submit mix design documentation from concrete supplier for approval  R53-MIX Lot N0……  Hold Point No: ……. | Per Product /Per Supplier | N25 Concrete  Concrete mix design submitted to the PV 7 days prior to construction verifying the concrete, constituent materials and curing compounds comply with R53 specification | R53.1.4  Design DWGs |  | R53-GCW-Mix Lot’s | IP | Site Engineer |  | HP |  |  |
| 3 | Set out the works | Per Lot | Notification that set out of drainage system has been completed. The Nominated Authority will inspect the set out prior to authorising the release of the Hold Point.  Set out the location and level of open drains as shown on the Design Drawings. | R11.4.1.1  Design DWGs |  | Hold Point | HP | Site Engineer |  | HP |  |  |
| 4 | Excavation for Drainage Structures | Per Lot | Excavate to dimensions shown on drawings.  Where dimensions are not shown, excavate to:   * Min 300mm depth * Min waterway of 0.2 m² * Batter slope ≤ 2H:1V steep * Have a grade slope of ≥1% * Extend open drains as necessary to natural drainage depressions or to a drainage system. | R11.4.2.1 |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 5 | Construction of open drains with grade less than 1%. | Per Lot | Notification that 1% minimum grade cannot be achieved.  The PV will consider the matter, and will direct you further, prior to authorising the release of the Hold Point. | R11.4.2.1 |  | Hold Point | HP | Site Engineer |  | HP |  |  |
| 6 | Inadequate Foundation Material | Per lot | Notification to the PV that inadequate foundation material has been excavated to the extent required.  Replace inadequate foundation material with materials from cuttings, or with other conforming material, and compact to the requirements of Clause 4.9.2 of this Specification. | R11 4.3.3  R11 4.9.2 |  | Witness Point | WP | Site Engineer |  | WP |  |  |
| 7 | Trim and compact open drains | Per Lot  Q6/L.3.1 | Trim open drains to produce a uniform surface free of irregularities.  Trimmed surface of excavated open drains to a depth of 150 mm, before placing lining or spreading topsoil for vegetation or fill material in **embankments** of open drains  Min. Relative Compaction 95% | R11.4.2.1  R11.4.9.2 | T166 | Test Report | TP | Site Engineer |  |  |  |  |
| 8 | Line open drains with organic fibre mat (jute mesh) Lining | Per Lot | Unless otherwise shown on the Design Documentation drawings, line open drains with Jute Mesh and vegetation where the longitudinal grade of the completed drain lies between 1% and 5% inclusive   * Minimum 75mm topsoil with Jute mesh lining and bitumen emulsion, refer to landscape Dwg for vegetation details * Jute mesh is lined and pinned in accordance to manufacturer’s instructions * Minimum 75mm topsoil | R11.4.2.3 |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 9 | Line catch drains with 100mm concrete, line Type C channel with 150mm concrete | Per Lot | Only if longitudinal grade is <1% or >5% or shown on the drawings   * Install 20±5mm deep grooved movement joints to prevent cracking at 90°±5° to line of drain and spaced @ 3m intervals * Install expansion joint complying with D&C TfNSW 3204 & DR-01 Drawing Package for full depth spaced @ 12m intervals. * Carry out foundation inspection with GDR and determine if dowel detail at expansion joints can be removed as per RFI 384. * Concrete must be colour matched to surroundings | R11.4.2.3  R11.4.2.4 |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 10 | Inspection of formwork and reinforcement before placing concrete | Per Lot | The PV may inspect the completed reinforcement and formwork prior to concrete placement   * Before commencing placement of concrete, remove all dirt, and other foreign matter from the forms. * Gaps which are to be filled with mortar must be free of all dirt and other foreign matter. * Prepare revetment mattresses, which are to be filled with grout, in accordance with the manufacturer’s recommendations. * Reference to RFI 384: DSGR to assess channel foundation if intending to remove the dowel sleeve from the concrete-lined channel expansion joint detail (refer RFI384) and, if required, confirmation of foundation suitability to be provided to PV prior to closure of this hold point.” | R53.6.1 |  | Hold Point | HP | Site Engineer |  | PV |  |  |
| 11 | Placing of Concrete | Per Lot | Notify the Project Verifier, not less than 24 hours and not more than 3 clear working days prior to the intended time of commencing to place concrete, mortar or grout, when fixing of the formwork and reinforcement in position  (if applicable) will be completed and when concrete, mortar or grout will be placed. | R53.6.1 |  | Witness Point | WP | Site Engineer |  | PV |  |  |
| 12 | Curing the concrete | Per Lot | * Only suitable curing compound used * After initial set of concrete apply curing and cure for at least 7 days * Curing compound applied according to manufacturer’s recommendations or at a spray rate min. 0.2L/m2 * Ensure all exposed surfaces receive a uniform cover of the curing compound. | R53.7 |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 13 | Construct rock lined channels | Per Lot | Use rock mattresses only where shown on the Dwg. Rock mattresses must comply with Specification TfNSW D&C R55   * Width and height to dimensions shown on Drawings * Place Geofabric as detailed * Rocks are placed in such a way to ensure good mechanical interlock | R11.4.2.3  R55 |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 14 | Construct LWQB | Per Lot | * Place Geofabric as detailed * Install Filter Media as detailed * Drainage Layer Specification | DR-01-0011 |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 15 | Construct LWQB inlets and spillways | Per Lot | Install Inlets and spillways as per drawings | Design Drawings |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 16 | LWQB Install pipes and fittings |  | Install ELLIS Pipes as per schedule, uPVC | Design Drawings |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 17 | LWQB Install Bitumen - Impregnated Dam board | Per Lot | For water resistant bitumen – impregnated damn board apply durable paint coating. Refer to paint manufacturer for suitable paint, durability and maintenance requirements (20 years durability) 4m Long, 230mm deep 18 mm thick. | Design Drawings |  | Verification Checklist | IP | Site Engineer |  |  |  |  |
| 18 | Construction tolerance & inspection | Per Lot | Verify catch drains have been constructed to tolerance in table R11.4   * Level is within 50 mm of the design level at any point provided that there is a continuous downgrade in the direction of flow not less than 1% at any point. * Waterway area is not less than 95% of the design cross sectional area at any point. | R11.5.1 |  | Verification Checklist | IP | Site Engineer |  |  |  |  |

**Legend:**

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| **HP** | Hold Point | Work shall not proceed past the HP until released by the Project Verifier | **IP** | Inspection point | Formal Inspection to be done and recorded |
| **HP\*** | Fulton Hogan Hold Point | Work shall not proceed past the HP\* until released by Fulton Hogan | **TP** | Test Point | Product compliance test to be undertaken and recorded/reported |
| **WP** | Witness Point | An inspection which must be witnessed by the Project Verifier | **SU** | Survey conformance point | A qualified surveyor to check product/section/structure and report |
| **AP** | Approval Point | Written or verbal approval given by the Project Verifier | **SC** | Survey Check | |
| **AP\*** | Fulton Hogan Approval Point | Written or verbal approval given by Fulton Hogan’s nominated personnel | PV | Project Verifier | |

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| **Notes** |  |