|  |
| --- |
| **Whatukooru Drive Hollowcore INSPECTION AND TEST PLAN** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S - Subcontractor | C - Constructor | D – Designer |  |  |
| 1 – Concrete Supplier | 2 – Concrete Supplier Audit Engineer | 3 – Laboratory | 4 – Reinforcing Supplier |  |

| **Item No.** | **Task Description**  *(Operation or Task to be Inspected or Tested)* | **Controlling Documents**  *(e.g list specifications & clause, drawing)* | **Acceptance Criteria**  *(clear pass/fail required e.g 28 day cylinder strength, > 50Mpa, etc.* | **Inspection or Test** | | | **Verifying Document**  *(e.g test result, pour record, material approval)* | *Records required for handover package: Yes/No* | **Inspection / Test Authority** | | | | **Hold Point** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Method  *e.g visual inspection, slump test* | Freq. | Responsible Person | S, C or D | | | | Y/N |
| Conduct | Witness | Produce Record | Approval |
| **1.0** | **Pre Construction Tests** | | | | | | | | | | | | |
| 1.1 | Concrete Mix Design Approval |  | - 60 MPa at 28 days (S6014PC) | Review | Once per Mix design / per supplier | PRECO | Confirmation of Approval | **Y** | 1 | D | 1 | D | **Y** |
| 1.2 | Reinforcement Supply |  | - Micro Alloying Deformed Bars Grade 500E (HD) | Review | Per Size, Per Supplier | PRECO | Supplier Mill Certificates | **Y** | 4 | D | C | D | **Y** |
| 1.3 | Strand Supplier Verification |  | - ACRS accredited supplier | Review | Per Supplier | PRECO | ACRS Accreditation | **Y** | 4 | D | C | D | **Y** |
| 1.4 | Strand Supply | NZS 3109 | 15.2mm diam. Prestressing superstrand | Review | Per Size, Per Supplier | PRECO | Supplier Mill Certificates | **Y** | 4 | D | C | D | **Y** |
| 1.5 | Strand Certification | AS/NZS 4672 | Conformance to AS/NZS 4672 in relation to:  - Chemical analysis  - Geometrical characteristics  - Breaking force or tensile strength  - Proof load or proof stress  - Elongation at maximum load  - Load extension diapgram  - Ductility  - Relaxation | Review | Per Size, Per Supplier | PRECO | Material Test Certificates | **Y** | 4 | D | C | D | **Y** |
| 1.6 | Shop Drawing Approval | IFC drawing | - Shop drawings including strand type, arrangement and stressing notes, details of debonding lengths, concrete strengths, surface finishes, location of cast in items and set-out information | Review | Once Prior to Casting | PRECO | Approved Shop Drawings, Issued for Construction | **Y** | C | D | C | D | **Y** |
| 1.7 | Stressing Calculations |  | - Force remaining in each 15.2 mm dia. strand at midpoint of beam immediately after release of tensioning jacks | Review | 5 Days Prior to Casting | PRECO | Approved Stressing Calculations | **Y** | C | D | C | D | **Y** |
| 1.8 | Jack Calibration |  | - Calibrated within tolerance | Certificate Inspection | Every 6 Months, Per Jack | PRECO | Calibration Certificate | **Y** | C | - | C | C | **Y** |
| 1.9 | Form Release Agent |  | - Not detrimental to the application of any subsequent finishes | Review | Once | PRECO | Material Data Sheet | **Y** | C | - | C | C | **Y** |
| **2.0** | **In Process Testing** | | | | | | | | | | | | |
| 2.1 | Reinforcement Traceability |  | - Mill Certificate, Heat Number and Bend Schedule traceability | Review | Per Unit | PRECO | Pre-Pour Check Sheet | **Y** | C | C | C | C | **N** |
| 2.2 | Reinforcement Fixing | NZS 3109 | - clear cover as per drawing to all reinforcing including stirrups and ties  - Steel to be securely tied and fixed with no movement | Inspect | Per Unit | PRECO | Pre pour checksheet, photos | **Y** | C | D | C | D | **N** |
| 2.3 | Pre Pour Inspection | - | - Completed pre-pour inspection (dimension/inserts/ reo) permission to commence concrete placement | Inspect | Per Beam, Per Pour | PRECO | Approved Pre-Pour Checksheet | ***Y*** | D | D | C | C | **Y** |
| 2.4 | Concrete Placement | NZS-3109 | - Slump within target 120 +/-40, all concrete to be properly vibrated | Inspect | Per Concrete Delivery / Per Placement | PRECO | In-Pour Checksheet / Delivery Docket | ***Y*** | C | C | C | C | **Y** |
| 2.5 | Concrete Sampling/Testing |  | Compressive test 1 x 7d and 3 x 28d results + 2 stress transfer cylinder (1 for test + 1 spare) stored at curing temperature  - 60 MPa at 28 days | Concrete Sampling/  Testing | One set per precast beam with an additional set taken from any truck which has water added after leaving the plant | Subcontractor | Concrete Sample Test Results (IANZ Accredited Laboratory for 7 & 28days test) | **Y** | C | C | 3 | C | **Y**  Designer to be notified immediately if specimen fails |
| 2.6 | Heat Curing | Approved Heat Curing Methodology | - Concrete core temperature shall not exceed 70 degrees  - Steady state inlet and outlet water temperatures recorded | Temperature Monitoring | Per Beam | PRECO | In Pour Checksheet  Hot Water Curing Methodology | **Y** | C | C | C | C | **Y**  Designer to be notified if anomalous temperature readings encountered |
| 2.7 | Concrete Curing | NZS 3109 | - 7 days wet curing required following completion of accelerated curing | Inspect | Per Beam | PRECO | Post Pour Checksheet | **Y** | C | C | C | C | **Y**  Designer to be notified immediately if water supply interrupted |
| 2.8 | Type B Construction Joint | NZS 3109 | - 5mm amplitude and free of latinece, cut with water blaster and with use of High Strength Spray on Retarder  - Top surface of all beams and end blocks of integral beams | Inspect | Per Beam | PRECO | Post Pour Checksheet | **Y** | C | C | C | C | **N** |
| 2.9 | Post Pour Inspection / Draw-in Measurement | IFC Drawings | Surface Finish Requirements- (F5 for seen faces) /  Dimension  /inserts/cut-outs as per drawing | Inspect | Per Beam | PRECO | Post Pour Checksheet | ***Y*** | C | C | C | C | **Y** |
| **3.0** | **Stessing Related Operations** | | | | | | | | | | | | |
| 3.1 | Strand Positioning |  | - +/- 3 mm in any direction | Inspect | Per Beam | PRECO | Pre Pour Checksheet | ***Y*** | C | C | C | C | **N** |
| 3.2 | Stressing |  | - Collation of stressing records incl unit ID, strand extention, jack pressures and general comments | Review | Per Beam | PRECO | Stressing Checksheet | **Y** | C | C | C | C | **Y**  All anomalous readings not in line with Stressing calculations to be submitted |
| 3.3 | Stress Transfer |  | - Concrete Cylinder Tests to be minimum 40MPa  - Cylinder to be kept in similar conditions to beam | Cylinder Compressive Strength Test | Once Per Beam | PRECO | Cylinder Compressive Strength Report  (In-house) | **Y** | S | S | S | C | **Y**  No Stress transfer before 30MPa |
| **4.0** | **Final Documentation** | | | | | | | | | | | | |
| 4.2 | Producer Statement (PS3) | - | - Signed PS3 | Report Production | Once | PRECO | Signed PS3 | **Y** | C | C | C | D | **N** |

|  |  |  |
| --- | --- | --- |
| **3. CLOSEOUT** | | |
| **Comments by Designer** (List any significant or important issues relating to this ITP, where objectives (Quality) achieved?) | | |
|  | **Date** |  |
|  | **Name** |  |
|  | **Signature** |  |
|  |
| **Comments by Engineer** (List any significant or important issues relating to this ITP, where objectives (Quality) achieved?) | | |
|  | **Date** |  |
|  | **Name** |  |
|  | **Signature** |  |
|  |
| **Comments by Construction Manager** (List any significant or important issues relating to this ITP, where objectives (Quality) achieved?) | | |
|  | **Date** |  |
|  | **Name** |  |
|  | **Signature** |  |
|  |
| **Comments by Quality Manager** (List any significant or important issues relating to this ITP, where objectives (Quality) achieved?) | | |
|  | **Date** |  |
|  | **Name** |  |
|  | **Signature** |  |
|  |