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| **This ITP has been prepared by** |  |  |  | **Reviewed by [as applicable]** | | | **Approved by [as applicable]** | | |
| **Name** | **Rev** | **Date** | **Signature** | **Name** | **Signature** | **Date** | **Name** | **Signature** | **Date** |
| Thomas Puxley | 1 | 23/05/22 |  | Danny Beasant | A picture containing masher, insect  Description automatically generated | 01/07/22 | **Gary Budden** |  |  |
| Krystyna Penkala | 2 | 15/07/2022 |  | Robert Buckle |  |  | **ITP Issued to [Superintendent / Supervisor / PE]** | | |
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| **ITP No: 001** | | | **Project: Cableway Works** | | | **Method Statement Ref:** | | | | | | **Rev.00** | |  |  | | |  | |  | |
| **Verification Method:** **Hold [H]** – work will not proceed past Hold Point until released by organisation imposing hold;  **Inspection [I]** – formal inspection activity to be undertaken and recorded; ensure correct verifying records are in place; **Witness [W]** – an inspection that may be witnessed by organisation imposing hold; allow reasonable notification period;  **Review [R]** – review of reports, records or other evidence of compliance. | | | | | | **Responsibilities**  **PE** = MTM Alliance Construction  **DSR** = MTM Design Site Representation | | | | | | | | |  | | |  | |  | |
| **Activity/Specification: Cableway** | | | | | | **Area Location / Work Breakdown: Cableway** | | | | | | | | |  | | |  | |  | |
| Item | Material or Construction Step | Applicable Standard  or Specification | | Acceptance criteria and testing | | | | Verification method and responsible inspectorate for hold points | | | | | Verifying Records  Checklists, Test and Supplier Certificates | | | Project Engineer approved | | MSQA Engineer verification | | Certified Complete  (Date, relevant checklist title/lab report number etc) | |
| Method  I,W,R | Responsible [tick] | | | |
| Description | Method | | Frequency | PE | MSQA/DSR | Lab | |  | |  | |  | |  | |
| **Planning and Documentation** | | | | | | | | | | | | | | | | | | | | | |
| 1.1 | Design of Temporary Works | Design Standards | | Temporary works design complete | Review of design | | Prior to use | R | ✓ |  |  | | Temporary works design | |  | |  | | Drawing of anchor block formwork uploaded. Any other works? | |
| 1.2 | Set up traffic management | TMP | | In accordance with approved plan | Visual | | Ongoing | I | ✓ |  |  | | TM Plan | |  | | N C Boag | | 4/10/22 TMP R850878 | |
| 1.3 | Confirmation of waste site location | SCWMP | | Ecological confirmation area is acceptable | Ecological team confirmation | | Prior to Topsoil and Spoil removal | H | ✓ |  |  | | SCWMP | |  | | N C Boag | | 12/10/22 | |
| 1.4 | CWP Approved for use | Internal | | CWP reviewed and approved | Review of documentation | | Prior to Works starting | H | ✓ |  |  | | Signed CWP | |  | |  | | On 4/10/22 Email to Krystyna said only CP-STR-018 is required. Email to KP on 11/10/22 to scan and send. | |
| 1.5 | Post-Tension Strand and Anchors | Design Drawings | | Proposed tensioning hardware submitted to the design engineer for review | Contractor to issue specification from supplier to designer for approval | | 0nce | R | ✓ | ✓ |  | | Jack Calibration Record and Specification to be Provided by Supplier. | |  | |  | | Jack Calibration and Gauge Calibration record has been uploaded. No supplier specification, emailed Sam Singh on 4/10/22. Email on 11/10/22 to PCM to confirm calibration details as details may be for smart anchors only. Email to Sam Singh about jack calibration – he said only one jack. | |
| 1.6 | Drive Station Shelter cladding system | Design Drawings/Project Structural Spec | | Proprietary system meeting drawing requirements | Review of manufacturer’s documentation | | Once | R | ✓ |  |  | | Manufacturer’s documentation | |  | |  | | Not received yet. Email to Sam Singh on 11/10/22 about progress. Reply from KP on 11/10/22 said no details yet | |
| **Material Supply** | | | | | | | | | | | | | | | | | | | | | |
| 2.1 | Concrete Material | Design Specification/ Specification for Concrete - General | | Mix to be the same as design drawings and specification  (Grout and Concrete) | Approval of Mix Design | | Once | R | ✓ | ✓ |  | | Mix Design and Designer Acceptance - RFI | |  | | N C Boag | | 12/10/22 40MPa mix design for Allied Concrete, 40MPa/50MPa mix design for Taranaki Mix - Designer approved.  Mix design for grout/s. Designer approved | |
| 2.2 | Reinforcement | Specification for Reinforcing Steel | | Mill Certs to be collected during ordering. All Reinforcement to be 500E | Mill Certs obtained from supplier of IANZ accredited lab | | All Elements | R | ✓ |  |  | | Mill Certs and Detail Sheets | |  | | N C Boag | | 12/10/22 Mill Certificates and detail sheets added | |
| 2.3 | Anchor (Plus associated misc items) Purchase | Drawings | | Length, quality and tensile strength to match designers’ requirements  Tendons shall comprise 15.2mm diameter low relaxation super grade wire stands (minimum breaking load = 261 kn each strand). | Confirmation they match design drawings | | All Anchors | H | ✓ | ✓ |  | | Mill Certs and Designer Order | |  | |  | | Mill Certificate uploaded for anchor tendons only. Email to Sam Singh on 4/10/22 to send details of “Designer Order” Email to Danny Beasant on 12/10/22 about “Designer Order” and strand anchor info. | |
| 2.4 | Structural steel mill test reports | Specification for Structural Steelwork | | Mill test reports supplied in accordance with specification | Testing on mill certificates per specification | | For each consignment, covering each heat | R | ✓ |  |  | | Mill test reports | |  | |  | | Mill Certificate for Structural steelwork on Tower legs uploaded. Email to Croucher and Crowder for details about welder Tony Willis as revalidation has expired. No mill certificates for 310UB40 etc. Email to Sam on 13/10/22.about missing information for Drive shed structural steel | |
| **Construction** | | | | | | | | | | | | | | | | | | | | | |
| **Earthworks** | | | | | | | | | | | | | | | | | | | | | |
| 3.1 | Removal of Topsoil and Vegetation | Drawings | | Confirm when topsoil and vegetation stop | Visual Checks | | Ongoing | I | ✓ |  |  | | N/A | |  | |  | |  | |
| 3.2 | ESC Measures | ESCP | | Environmental controls to be installed as per ESCP prior to removal of topsoil | Visual Checks | | Ongoing | I | ✓ |  |  | | N/A | |  | |  | |  | |
| 3.3 | Cut to Waste – Bulk earthworks removal | Drawing | | Level of cut matches drawings  Global Position of cuts  Inspection by MSQA | Survey Checks  Survey Checks  Visual Inspection | | Daily  Daily  3 x visit per location | I  I  H | **✓**  **✓** | **✓** |  | | Survey Records, As Built (3a)  Survey Records, As Built, 3D mapping to be provided (3b)  Site Report (3c) | |  | |  | | 3a No details received  3b No details received  3c Tower Site – 13/10/22 Three site reports uploaded for Tower Site. NAB – 1 site report unloaded – missing two reports. SAB – missing 3 reports | |
| **MSQA HOLD POINT – DO NOT PROCEED PAST THIS POINT UNTIL THE ENGINEER HAS SIGNED OFF THE ABOVE** | | | | | | | | | | | | | | | | | | | | |
| 3.4 | Install Fill Retaining Area (North Anchor Block only) | Temp works design | | Level and Position | Survey Checks  Visual Checks | | Each Temp works  Daily | W  H | **✓**  **✓** |  |  | | N/A  Temp works sign off | |  | |  | |  | |
| 3.5 | Cut Access Track (South Anchor Block) | Temp works design | | Level and Position | Survey Checks | | Each Temp works | W | **✓** |  |  | | Survey Record | |  | |  | |  | |
| 3.6 | Trim to Grade (Compound Only) | As required | | Grade to control water | Survey Checks | | Daily | W | **✓** |  |  | | Survey Record | |  | |  | |  | |
| **Structures** | | | | | | | | | | | | | | | | | | | | | |
| **Piling Works incl Micro Piles (Central Tower Only)** | | | | | | | | | | | | | | | | | | | | | |
| 4.1 | Set Out Piles | Drawings and Survey Model | | Position and Depth | Survey | | All Piles | I | ✓ |  |  | | Pile Record Sheet | |  | |  | |  | |
| **4.2** | Drill Piles | Drawings & Spec (TBI) | | Piles drilled to set and/or required depth as per design drawings. Location within +/-75mm. Verticality of 1 in 75 | Visual Inspection | | All Piles | H | ✓ | ✓ |  | | Pile Record Sheet  Site Report | |  | |  | |  | |
| **4.3** | Inspection of ground conditions | Drawings | | Confirm as expected | Visual Inspection | | 1st Pile | H |  | ✓ |  | | Site Report | |  | |  | |  | |
| **MSQA HOLD POINT – DO NOT PROCEED PAST THIS POINT UNTIL THE ENGINEER HAS SIGNED OFF THE ABOVE** | | | | | | | | | | | | | | | | | | | | |
| 4.4 | As-built | Drawings & Spec (To be issued) | | Cut off level correct for follow on connections. | Survey | | Once per pile | I | ✓ |  |  | | As built  Pile Record | |  | |  | |  | |
| 4.5 | Install Reinforcement | Drawings & Spec (To be issued)  NZS3101 & NZS3109 | | Reinforcement is fixed to design of IFC Drawing. Correct reinforcement used that is not damaged.  All cover block/wheels installed to achieve minimum 50mm cover.  Confirm all reinforcement matches drawings | Visual inspections | | Each reinforced cage | I | ✓ |  |  | | Concrete Pour Inspection Check sheet  As built | |  | |  | |  | |
| **4.6** | Pre-Pour MSQA Inspection | Drawings | | All above is as drawings | Visual | | All Piles | H | ✓ | ✓ |  | | Site Report | |  | |  | |  | |
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| 4.7 | Concrete supply | Drawings & Project Spec | | Request a minimum of 3no cylinder test on all structural items, 7 day, 28day.  Concrete cures to strength (40MPa). | Concrete sampling and cylinder crushing | | Each Pour (or 1no set every 75m3) | R | ✓ | ✓ | ✓ | | Concrete Test Result Register  Compressive crush lab test results | |  | |  | |  | |
| 4.8 | Concrete Finish | Drawings & Project Spec | | As per drawing request, type B joint on top | Visual | | Each joint | I | ✓ |  |  | | Post-pour inspection record. | |  | |  | |  | |
| **Formwork and Steel Fixing (NAB, SAB, Central Tower Footings, misc)** | | | | | | | | | | | | | | | | | | | | | |
| 5.1 | Install Footings for Temp Works | As per Drawings | | As per the formwork design | Level Check by Engineer | | Per Element | W | ✓ |  |  | | Concrete Pour Inspection Check sheet | |  | |  | |  | |
| 5.2 | Install Blinding | As per Drawings | | Blinding thickness and level to be as per drawings/required | Level Check by Engineer | | Per Element | W | ✓ |  |  | | Concrete Pour Inspection Check sheet | |  | |  | |  | |
| 5.3 | Formwork Placement | Drawings & Spec (To be issued)  Formshore Temp Works  Doppelmayr Drawings | | Formwork as per temporary works drawing if relevant.  Position, orientation, dimensions checked.  Oiled, Area cleaned of all debris, Cover correct as per spec and drawing requirements.  All inserts inserted, block outs, dross backs, bolt clusters etc See temporary works design.  Confirm any inserts are included as per drawings.  Ground anchor drossbachs critical –placement takes president over all over items. | Onsite Visual Inspection | | Per Element | I, R, **H** | ✓ |  |  | | Concrete Pour Inspection Check sheet Photographic evidence  Survey Checks pre pour | |  | |  | |  | |
| 5.4 | Earthing | As per requirements | | Each concrete element TO BE ELECTRICALLY  GROUNDED BY AN APPROPRIATELY QUALIFIED  CONTRACTOR. | Visual Inspection | | Per element | H | ✓ |  |  | | Report, Photo | |  | |  | |  | |
| 5.5 | Reinforcement Placement | Drawings & Spec (To be issued)  NZS3101 & NZS3109 | | Reinforcement as per relevant design IFC and standards NZS3101 & NZS3109  Grade, number, diameter, spacing, starters, cover, welds, lap length and position all checked. | Visual Inspection | | Per Element | I, W | ✓ |  |  | | Concrete Pour Inspection Check sheet  Photos taken and stored in QA File | |  | |  | |  | |
| 5.6 | Cableway SAB/NAB Williams bolts | IFC Drawings | | Size, length and position of the bolts to be as per the design | Visual Inspection | | Per bolt | H | ✓ | ✓ |  | | As-built | |  | |  | |  | |
| 5.7 | MSQA Pre Pour Inspection | Drawings | | Confirmation of all above, reinforcement, dimensions, inserts, finish | Visual Inspection | | Per Element  Holmes provided 48hour notice to inspect. | H | ✓ | ✓ |  | | Site Report | |  | |  | |  | |
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| **Concreting** | | | | | | | | | | | | | | | | | | | | | |
| 6.1 | Concrete Delivery | Drawings & Project Spec | | Supply to match design drawings and specification. | Docket Checked on site for correct Concrete type. | | Per Element / Per Pour (minimum) | W | ✓ |  | ✓ | | Concrete Pour Inspection Check sheet  Concrete Test Result Register  Docket checked onsite/Filed | | |  | |  | |  | |
| 6.2 | Concrete Finish | Drawings & Project Spec | | Concrete finish to be as per on drawing, U1-5 or F1-5 (inline with relevant NZS standard 3109 and NZS3101)  Concrete checked for any cracks and other irregularities. | Visual | | Per Element | W | ✓ |  |  | | Concrete Pour Inspection Check sheet  Photographic evidence | | |  | |  | |  | |
| 6.3 | Concrete Strength | Drawings & Project Spec | | Compressive strength results to match design drawings and specification. | Review of 7day and 28day strength results. | | Per Pour (minimum) or 1no set of 7day, 2no 28days taken for every 50m3 + | R | ✓ | (✓) | ✓ | | Concrete Test Result Register  Compressive Strength Results. | | |  | |  | |  | |
| 6.4 | Construction Joint Creation – Type B | Drawings & Project Spec | | Construction Joint type B | Visual | | Per joint | H | ✓ | ✓ |  | | Prepour inspection | | |  | |  | |  | |
| 6.5 | Curing | Drawings & Project Spec | | Wet curing method  or  As per approved alternative curing method | Approved curing method | | Per Element | W | ✓ |  |  | | Concrete Pour Inspection Check sheet | | |  | |  | |  | |
| **Anchor Install (NAB & SAB)** | | | | | | | | | | | | | | | | | | | | | |
| 7.1 | Drill Anchor Hole | MMA-DES-GEO-E1-DRG-4081 | | Inclination angle of anchor 13deg North & South  4no Anchors at each anchor block – 2 contingences if required  Length – 18m North (TBC), 15m South  Tolerance on drilling angle is ±2° both horizontal and vertical. | Onsite Checks by Engineer  Inspection by MSQA Checker | | All Anchors  One Anchor per anchor block | W  H | ✓ | ✓ |  | | Drill Log/Anchor Install Check sheet  Site Report | | |  | |  | |  | |
| **MSQA HOLD POINT – DO NOT PROCEED PAST THIS POINT UNTIL THE ENGINEER HAS SIGNED OFF THE ABOVE** | | | | | | | | | | | | | | | | | | | | |
| 7.2 | Camera/Inspection of Drill Hole | MMA-DES-GEO-E1-DRG-4081 | | Anchor to be open and clean of debris. | Visual Inspection | | All Anchors | W,R | ✓ |  |  | | Drill log/Anchor Install Check sheet  Video footage | | |  | |  | |  | |
| 7.3 | Install Anchor Tendon | MMA-DES-GEO-E1-DRG-4081  BS 8081:2015+A2:2018 | | 11strand Anchor for North Anchor Block  10strand anchor for South Anchor Block  Anchors to be installed with fixed length and free length indicated on drawings. Centralisers (internal and external) should be in accordance with manufacturer’s instructions.  Anchors to be kept clean and free of any detritus materials. Anchor strand stick-out to be sufficient for wedge removal during future maintenance/re-stressing.  Anchor corrosion protection in accordance with design drawings.  The anchor head shall be protected with a galvanised end cap, fixed to the bearing plate and filled with grease. | Visual inspection  MSQA Inspection | | All Anchors  One Anchor Per Block | W  H | ✓ | ✓ |  | | Drilling log and Anchor install check sheet  Site Report | | |  | |  | |  | |
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| 7.4 | Place Stage 1 Grout | MMA-DES-GEO-E1-DRG-4081 | | Holes to be grouted within 3 hours of flushing hole/completion of drilling.  Confirm 10m Bond Length grouted and top of grout is behind anchor block.  Grout for anchorages to have 30 MPa compressive strength at 28 days and a maximum water/cement ratio of 0.45.  Grout shall not be used more than one hour after mixing. | MSQA Check | | One Anchor per anchor block  Take grout samples for each grout batch. Review laboratory documentation for all anchors | W  H |  | ✓  ✓ | ✓ | | Anchor install check sheet  Photographic evidence of grout pouring  Grout strength results  Site Report | | |  | |  | |  | |
| **MSQA HOLD POINT – DO NOT PROCEED PAST THIS POINT UNTIL THE ENGINEER HAS SIGNED OFF THE ABOVE** | | | | | | | | | | | | | | | | | | | | | |
| 7.5 | Stressing Jack Calibration | MMA-DES-GEO-E1-DRG-4081 | | All jacks and Pressure gauges used need to have current (within 12 months) calibration sheets. | Contractor to get calibration sheets from sub-contractor | | Once – prior to work starting | W | ✓ |  | ✓ | | Photo graphic evidence  Anchor install check sheet | | |  | |  | |  | |
| 7.6 | Smart Cell installation | MMA-DES-GEO-E1-DRG-4081  Manufacturer Instructions | | Need to be appropriately installed and calibrated. | Physical testing | | Prior to working and after pre-load | W | ✓ | ✓ |  | | Contractor records.  Site diary. | | |  | |  | |  | |
| 7.7 | Stress and Lock off Anchor | MMA-DES-GEO-E1-DRG-4081  ISO 22477-5:2018 | | Confirm RC block concrete and anchor grout have achieved a  strength of minimum 30 Mpa.  All anchors shall be stressed and locked off at the lock off load shown on design drawing.  Acceptance test Proof Loads:   * NAB -1500kN, * SAB – 1350kN   Anchor Lock off loads:   * NAB – 1350kN * SAB – 1230kN   All anchors to be acceptance tested in accordance with ISO 22477-5 and Table 2 of design drawing.  If anchors pass acceptance criteria on design drawing (displacement, creep, and apparent tendon free length) they can be locked off. If fail these criteria must inform Engineer immediately for instruction on how to proceed. | Visual Inspection, grout tests, stressing records.    Acceptance test reports prepared in accordance with ISO 22477-5:2018 are to be provided to the designer's representative within 48 hours of completing each test. Results to be provided in electronic format, including raw data in .xls or similar format for ease of interrogation. | | Each Pour by PE & One Acceptance Anchor per anchor block by MSQA | I, H | ✓ | **✓** | ✓ | | Grout test Results  Stressing Acceptance Test  Stressing Record  Anchor install check sheet  Site Report | | |  | |  | |  | |
| **MSQA HOLD POINT – DO NOT PROCEED PAST THIS POINT UNTIL THE ENGINEER HAS SIGNED OFF THE ABOVE** | | | | | | | | | | | | | | | | | | | | | |
| 7.8 | Place Stage two grout | MMA-DES-GEO-E1-DRG-4081 | | Grout for anchorages to have 30 MPa compressive strength at 28 days and a maximum water/cement ratio of 0.45.  Grout shall not be used more than one hour after mixing. | Visual Inspection - MSQA | | One Anchor per anchor block | W, H |  | ✓ | ✓ | | Anchor install check sheet  Photographic Evidence of grout pouring  Grout test results  Site Report | | |  | |  | |  | |
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| 7.8 | Finishing Works | MMA-DES-GEO-E1-DRG-4081 | | Install Rubber Gasket  Strand to be left (100mm or more) as advised by contractor beyond anchor head to allow for wedge withdrawal and future re-stressing.  Top Cap (HDG) Installed and Packed with Grease  Bearing Plate and anchor head detail to be in accordance with drawings. | Visual Inspection | | All Anchors | W | ✓ |  |  | | Mill Certs for Plate  Anchor install check sheet | | |  | |  | |  | |
| **Structural Steelwork Fabrication and Erection (Drive Station Shelter Building and Tower Footings)** | | | | | | | | | | | | | | | | | | | | | |
| 8.1 | Weld Inspections | Structural Steel Work Specification, AS/NZS 1554.1 | | 100% Visual Inspection  100% Visual Examination  100% NDT (Ultrasonic or Radiographic Inspection) for butt welds | Visual Inspection/NDT | | All welds | I | **✓** |  |  | | Weld Inspection Report | | |  | |  | |  | |
| 8.2 | Weld Inspector | Structural Steel Work Specification, AS/NZS 1554.1 | | Weld Inspector to be independent of Fabricator | Review of Qualifications | | Once | R | **✓** | **✓** |  | | Inspectors qualifications/Certification | | |  | |  | |  | |
| 8.3 | Shear Studs | Structural Steel Work Specification, AS/NZS 1554.2 | | All studs to be ring tested in accordance with AS/NZS 1554.2  Any studs that fail the ring test to be bend tested in accordance with AS/NZS 1554.2  Bend tests to be performed on 1st and 2nd Stud from production run followed by 1 in 50 there after | Bend/Ring Test | | Ring Test all  Bend test 1st and 2nd, 1/50 and then as required | I | **✓** |  |  | | Test Report | | |  | |  | |  | |
| 8.4 | Inspection of Bolted Connections | Structural Steelwork Specification, AS/NZS 5131 | | Designer/DSR to inspect min 10% of bolted connections | Visual Inspection | | Minimum 10% but no fewer than 2 per connection | I, H | **✓** | **✓** |  | | DSR Inspection | | |  | |  | |  | |
| 8.5 | Inspection of Fabricated/Erected Steel Work | Structural Steel Work Specification, AS/NZS 5131 | | Designer/DSR to inspect fabricated steel work | Visual Inspection | | Per Element | I, H | **✓** | **✓** |  | | DSR Inspection | | |  | |  | |  | |

# **Completion Verification**

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| --- | --- | --- | --- | --- |
| **Work under this ITP has been Certified complete by:** | | **Reviewed by [as applicable]** | **Reviewed by [as applicable]** | **Approved by [as applicable]** |
| Name | Thomas Puxley |  |  |  |
| Signature |  |  |  |  |
| Date |  |  |  |  |