|  |  |  |  |
| --- | --- | --- | --- |
| Project: |  | Tender:  |  |
| Location: | . . |
| General Contractor: |  | CP Sub-Contractor: |  |

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| --- |
| Approval/Signoff |
| Prepared by: |  |  |  |  |  |  |  |
|  |  | *Print Name* |  | *Signature* |  | *Date (mm/dd/yy)* |  |
| Approved by:(City of Calgary) |  |  |  |  |  |  |  |
|  |  | *Print Name* |  | *Signature* |  | *Date (mm/dd/yy)* |  |

Instructions for use of this document:

1. After the below-ground CP work has been completed and prior to backfill, the ITP first needs to be initiated and dated by the CP sub-contractor up to the Hold point (H) for each section. This is stating that the CP sub-contractor has correctly completed each step in the ITP.
2. The General Contractor must notify Inspection Services Cathodic Protection a minimum of 24 hours before both the CP installation and backfill for sign off approval. If the City Representative is unable to be on site during the installation, the CP sub-contractor must fill out the ITP and submit to the City Representative before the next hold point.
3. Once the City Representative Witnesses (W) or Visually Checks (V) each item up to the **Hold Point (H)**, and all the requirements are met – they can sign off and release the **Hold** for backfill.
4. Post backfill - When the CP sub-contractor returns to site for final testing and test lead terminations, the same procedure will apply for the remainder of the ITP.

| Item No. | Installation / Inspection / Test Stage | Specification Reference | Acceptance Criteria | Verification Action \* | Inspection Signoff |
| --- | --- | --- | --- | --- | --- |
| CP Sub-Contractor | City Representative |
| Action\* | Initial | Date | Action\* | Initial | Date |
| **1.0** | **Installation & Re-coating of Thermite Welds** |
| 1.1 | Verify materials: cable color, size & rating |  |  | V, I |  |  |  |  |  |  |
| 1.2 | Strip coating down to bare steel and hand file or polish to bright shiny finish.  |  |  | V, I |  |  |  |  |  |  |
| 1.3 | Strip wire insulation and crimp sized copper sleeves to test leads with required crimping tool.Thermite weld test lead cablesaccording to IFC drawings and ensure mechanical integrity of weld. |  |  | V, I |  |  |  |  |  |  |
| 1.4 | Recoat the thermite weld connections and all exposed steel with handicaps or approved coating product according to manufacturer's specifications |  |  | V, I |  |  |  |  |  |  |
| 1.5 | Confirm test lead continuity by measuring resistance between the end of each test lead – Record measurement for each pipeline and encasement in Sections 6.1 & 6.2. Also complete the remainder of Section 6.0 at this time. |  |  | V, I |  |  |  |  |  |  |
| 1.6 | **Hold point** release by the City of Calgary representative prior to backfill  |  |  | **H** |  |  |  |  |  |  |
| **\*Verification Legend: H (Hold), V (Visual Check), R (Measurement/Document Review), I (Inspection) and W (Witness)** |

| Item No. | Installation / Inspection / Test Stage | Specification Reference | Acceptance Criteria | Verification Action \* | Inspection Signoff |
| --- | --- | --- | --- | --- | --- |
| CP Sub-Contractor | City Representative |
| Action\* | Initial | Date | Action\* | Initial | Date |
| **2.0** | **Anode Installation** |
| 2.1 | Ensure anode number, size, weight, and type meet IFC drawing and COC specification requirements |  |  | V, I |  |  |  |  |  |  |
| 2.2 | Ensure anode-anode spacing as per IFC drawings |  |  | V, I |  |  |  |  |  |  |
| 2.3 | Ensure anodes have adequate separation from pipelines |  |  | V, I |  |  |  |  |  |  |
| 2.4 | Complete cable splicing of anodes to header cable as per IFC drawing |  |  | V, I |  |  |  |  |  |  |
| 2.5 | Cover anodes with screened moisture retaining soil. Not to be backfilled with gravel or rock |  |  | V, I |  |  |  |  |  |  |
| 2.6 | Ensure anodes have been thoroughly soaked and activated with potable water within 4 hours of commencing backfill  |  |  | V, I |  |  |  |  |  |  |
| 2.7 | **Hold point** release by City of Calgary representative prior to backfill  |  |  | **H** |  |  |  |  |  |  |
| **\*Verification Legend: H (Hold), V (Visual Check), R (Measurement/Document Review), I (Inspection) and W (Witness)** |

| Item No. | Installation / Inspection / Test Stage | Specification Reference | Acceptance Criteria | Verification Action \* | Inspection Signoff |
| --- | --- | --- | --- | --- | --- |
| CP Sub-Contractor | City Representative |
| Action\* | Initial | Date | Action\* | Initial | Date |
| **3.0** | **AC & DC Coupon / Reference Electrode Installation (product & serial # required)** |
| 3.1 | Install the DC coupon(s) adjacent to the buried pipeline according to IFC drawing (where required) |  |  | V, I |  |  |  |  |  |  |
| 3.2 | Install the AC coupon(s) adjacent to the buried pipeline according to IFC drawing (where required) |  |  | V, I |  |  |  |  |  |  |
| 3.3 | Install the reference electrode(s) adjacent to the buried pipeline according to IFC drawing (where required) |  |  | V, I |  |  |  |  |  |  |
| 3.4 | AC/DC coupons and reference electrodes installed at adequate distance from anodes |  |  | V, I |  |  |  |  |  |  |
| 3.5 | Cover reference electrodes and coupons with minimum 150 mm of screened moisture retaining soil or according to manufactures specifications. Not so be backfilled with gravel or rock. |  |  | V, I |  |  |  |  |  |  |
| 3.6 | **Hold point** release by City of Calgary representative prior to backfill  |  |  | **H** |  |  |  |  |  |  |
| **\*Verification Legend: H (Hold), V (Visual Check), R (Measurement/Document Review), I (Inspection) and W (Witness)** |

| Item No. | Installation / Inspection / Test Stage | Specification Reference | Acceptance Criteria | Verification Action \* | Inspection Signoff |
| --- | --- | --- | --- | --- | --- |
| CP Sub-Contractor | City Representative |
| Action\* | Initial | Date | Action\* | Initial | Date |
| **4.0** | **Test Post Installation and Backfill** |
| 4.1 | Ensure there is 2m extra cable for each test lead coiled at the test post base for repositioning if required.  |  |  | V, I |  |  |  |  |  |  |
| 4.2 | **Hold point** release by City of Calgary representitive prior to backfill |  |  | **H** |  |  |  |  |  |  |
| 4.3 | Confirm test station height at final grade. 4x4 treated post to be used in loose or unstable soil where required to keep vertical |  |  | V, I |  |  |  |  |  |  |
| 4.4 | Ensure correct termination and identification (labeling) of test leads to test head terminals per IFC drawings. Ring terminal connectors (Eyelets) must be used for cable connection to test head terminals.  |  |  | V, I |  |  |  |  |  |  |
| **\*Verification Legend: H (Hold), V (Visual Check), R (Measurement/Document Review), I (Inspection) and W (Witness)** |

| Item No. | Installation / Inspection / Test Stage | Specification Reference | Acceptance Criteria | Verification Action \* | Inspection Signoff |
| --- | --- | --- | --- | --- | --- |
| CP Sub-Contractor | City Representative |
| Action\* | Initial | Date | Action\* | Initial | Date |
| **5.0** | **General** |
| 5.1 | Take and label photos of CP installation. |  |  | V, I |  |  |  |  |  |  |
| 5.2 | Final location of anodes, reference electrodes, and coupons recorded (GPS) |  |  | V, I |  |  |  |  |  |  |
| 5.3 | Electrical Continuity Testing (Section 6) completed |  |  | R, I |  |  |  |  |  |  |
| 5.4 | **Hold point** release by City of Calgary representative prior to backfill |  |  | **H** |  |  |  |  |  |  |
| 5.5 | Provide As-built drawing showing anode quantity, type, weight and placement, reference electrode/coupon placement, test station placement and cable routing |  |  | R, I |  |  |  |  |  |  |
| 5.6 | Final location of test stations, recorded (GPS) |  |  | R, I |  |  |  |  |  |  |
| 5.7 | Conduct native potential measurements (Section 7) once backfill has been completed and anodes have been activated |  |  | R, I |  |  |  |  |  |  |
| **\*Verification Legend: H (Hold), V (Visual Check), R (Measurement/Document Review), I (Inspection) and W (Witness)** |

| Item No. | Installation / Inspection / Test Stage | Specification Reference | Acceptance Criteria | Measurement | Inspection Signoff |
| --- | --- | --- | --- | --- | --- |
| CP Sub-Contractor | City Representative |
| Initial | Date | Action\* | Initial | Date |
| **6.0** | **Electrical Continuity Testing – \*One Sheet Per Pipeline** |
| **Carrier Pipe Description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .** | **Encasement Description:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .** |
| 6.1 | Pipeline Leads Continuity TestMeasure Resistance between both pipeline test leads  | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ Ω |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ Ω |  |  |  |  |  |
| 6.2 | Encasement Leads Continuity Test Measure Resistance between both pipeline test leads  | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ Ω |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ Ω |
| 6.3 | Resistance at transition to Existing Line Measure Resistance between new and existing pipeline (Use test leads or lift pins for concrete pipe) | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ Ω |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ Ω |
| 6.4 | Resistance between Encasement and Carrier PipeMeasure Resistance between Encasement and carrier pipe leads | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ Ω |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ Ω |
| 6.5 | Resistance across electrical insulating device (if present)Measure Resistance from one side of insulating device to the other | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ Ω |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ Ω |
| 6.6 | Concrete Pipe pin-to-pin resistanceMeasure Resistance between far west lift pin to far east lift pin | End-to-end Resistance |  |  | \_\_\_\_\_\_\_\_\_\_ Ω |  |  |  |  |  |
| **\*Verification Legend: H (Hold), V (Visual Check), R (Measurement/Document Review), I (Inspection) and W (Witness)** |

| Item No. | Installation / Inspection / Test Stage | Specification Reference | Acceptance Criteria | Measurement | Inspection Signoff |
| --- | --- | --- | --- | --- | --- |
| CP Sub-Contractor | City Representative |
| Initial | Date | Action\* | Initial | Date |
| **7.0** | **Test Station Native Potentials, Voltage measured in mVDC w.r.t Cu/CuSO4 RE – \*One Sheet Per Pipeline** |
| **Carrier Pipe Description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .** | **Encasement Description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .** |
| 7.1 | Pipeline Potential  | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ mV |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ mV |
| 7.2 | Encasement Potential | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ mV |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ mV |
| 7.3 | Anode Potential | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ mV |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ mV |
| 7.4 | Reference Electrodes | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ mV |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ mV |
| 7.5 | DC Coupon | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ mV |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ mV |
| 7.6 | AC Coupon | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ mV |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ mV |
| 7.7 | Existing Pipeline Potential(if applicable) | 1. West End |  |  | \_\_\_\_\_\_\_\_\_\_ mV |  |  |  |  |  |
| 2. East End | \_\_\_\_\_\_\_\_\_\_ mV |
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| **\*Verification Legend: H (Hold), V (Visual Check), R (Measurement/Document Review), I (Inspection) and W (Witness)** |
| ADDITIONAL COMMENTS OR MEASUREMENTS: |