BRIDGE CONSTRUCTION INSPECTION MANUAL

SUMMARY OF INSPECTION CHECK SHEETS

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1. Excavation Inspection Check Sheet

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| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the removal of material necessary for the construction of the Work as shown on the Drawings and as determined by the Project Manager. It also includes maintaining stability of slopes, fills, and/or existing structures; designing, constructing and maintaining temporary access berms, cofferdams and dikes; and the care of water, dewatering and maintenance of excavations, and disposal of excavated materials.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 1.1 | Did the Contractor maintain the integrity and stability of excavations at all times? |  |  |  |
| 1.1 | Did the Contractor provide acceptable provisions for the control and management of water and/or ice at all times? |  |  |  |
| 1.1 | For projects in which the existing asphalt concrete pavement (ACP) surfaces are to be retained, did the Contractor provide protection of the ACP during excavation, trimming, or other construction activities that was acceptable to the Project Manager? |  |  |  |
| 1.3 | Have soft or saturated bed materials been identified? |  |  |  |
| 1.1 | Was the Project Manager advised of any seepage during excavation? |  |  |  |
| 1.5 | Did the Project Manager review and accept the Contractor’s details of proposed excavated material disposal locations prior to disposing of materials? |  |  |  |
|  | Culvert and Bridge Structure Foundations |  |  |  |
| 1.3 | Were excavated surfaces for culvert and bridge structure foundations free of loose material, cleaned and cut to a surface condition acceptable to the Project Manager*?* |  |  |  |
| 1.3 | Have excavation limits that extend beyond required depth been surveyed*?* |  |  |  |
|  | Temporary Access Berms, Cofferdams and Dikes |  |  |  |
| 1.4.1 | Prior to the commencement of the Work, did the Project Manager review and accept the Contractor’s design notes, drawings, construction sequencing, and updated ECO plan for proposed temporary access berms, cofferdams, and dikes? |  |  |  |
| 1.4.1 | Were the drawings and work procedures signed and sealed by a Professional Engineer registered in the Province of Alberta*?* |  |  |  |
| 1.4.2 | Prior to construction, did the Contractor complete a detailed pre construction survey of the channel banks and streambed at all locations within the access berm and cofferdam footprint and a minimum 10 m beyond where materials will be placed? |  |  |  |
| 1.4.2 | Was the pre construction survey submitted to the Project Manager within 10 days of completion? |  |  |  |
| 1.4.3 | Was turbidity monitoring and testing carried out in accordance with the Contract documents? |  |  |  |
| 1.4.4 | Was fish salvage carried out in accordance with the Contract documents? |  |  |  |
| 1.4.5 | Did the Contractor make every attempt necessary to obtain a dry work area prior to commencement of foundation construction? |  |  |  |
| 1.4.5 | Was seepage water compliant with all environmental regulations by discharging it into settlement tanks or ponds, or by other methods acceptable to the Project Manager? |  |  |  |
| 1.4.5 | Were conditions encountered which, in the opinion of the Project Manager and the Department, made it impracticable to dewater the cofferdam before placing concrete? If so, was construction of a concrete cofferdam seal required below the elevation of the bottom of the foundation? |  |  |  |
| 1.4.6 | Have details for proposed cofferdam bracing intended to be left in the completed Work been reviewed and accepted by the Project Manager and the Department? |  |  |  |
| 1.4.7 | Have temporary access berms, cofferdams, and dikes been removed after completion of the Work in accordance with the Contract documents? |  |  |  |
| 1.4.7 | Was backfill material around the completed Work placed prior to removal of the temporary access berms, cofferdams, and dikes? |  |  |  |
| 1.4.2,  1.4.8 | Were the channel banks and streambed restored in accordance with the specifications prior to completing the post construction channel bank and streambed survey? |  |  |  |
| 1.4.2 | Did the Contractor complete a post construction survey within 5 days of restoration completion at the same locations as the pre construction survey? |  |  |  |
| 1.4.2 | Was the post construction survey submitted to the Project Manager within 10 days of completion? |  |  |  |
| 1.4.8 | Upon removal of temporary access berms, cofferdams and dikes, were the channel banks, streambed, and any disturbed areas from the construction of access roads restored to the composition and elevation that existed prior to construction and in accordance with the Drawings? |  |  |  |
| 1.4.8 | Was the completed site restoration reviewed and accepted by the Project Manager? |  |  |  |

**Details and Summary:**

Signature

Date

1. Backfill Inspection Check Sheet

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| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply and placement of backfill materials necessary to complete the Work. It includes backfilling of excavations and constructing approach fills, embankments, and channel banks as shown on the Drawings and as determined by the Project Manager.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time** of Inspection | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
| 2.2 | Materials |  |  |  |
| 2.2 | Did the Project Manager review details of and accept the backfill material? |  |  |  |
| 2.2 | Was material in a thawed state when placed and compacted and free from rocks, large or frozen lumps, wood, or other unsuitable material? |  |  |  |
| 2.2 | Was backfill material placed on frozen substrate? |  |  |  |
| 2.2.1 | Was non-granular material inorganic? |  |  |  |
| 2.2.1 | Were culvert clay seals highly plastic as defined by ASTM D2487, Classification of Soils for Engineering Purposes with a minimum Plasticity Index of 40? |  |  |  |
| 2.2.2 | Did crushed aggregate material consist of clean sand and gravel, complying with the requirement of  Table 2-1, Crushed Aggregate Material Requirements? |  |  |  |
|  | Material Testing |  |  |  |
| 2.2.3 | Did the Project Manager review and accept the Contractor’s sieve analysis, percent fracture, laboratory/proctor density, and plasticity index testing for proposed backfill materials prior to the commencement of the Work? |  |  |  |
| 2.2.3 | Was the Contractor's sampling and testing completed at least 90 days prior to usage? |  |  |  |
|  | Placing |  |  |  |
| 2.3 | Were all excavated spaces not occupied by permanent Work backfilled with compacted material up to the elevation indicated on the Drawings? |  |  |  |
| 2.3 | Were all backfill materials, regardless of type, placed in lifts not exceeding 150 mm in thickness of loose material? |  |  |  |
| 2.3 | Were crushed aggregate and non-granular materials compacted to a minimum of 95% Proctor density at optimum moisture content? |  |  |  |
| 2.2.3, 2.3 | Did the Contractor carry out quality control testing at the minimum frequencies shown in Table 2-2: Quality Control Testing Requirements? |  |  |  |
| 2.3 | Was the compaction equipment proposed by the Contractor reviewed and accepted by the Project Manager prior to commencement of the Work? |  |  |  |
| 2.3 | Did the Project Manager review and accept the proposed timing of backfill material placement against concrete elements? |  |  |  |
| 2.3 | Was backfill material around culverts and concrete elements placed simultaneously on both sides to the same elevation to avoid unbalanced loading? |  |  |  |
| 2.3 | Were special precautions taken to prevent wedging action against concrete and the slope bounding the excavation for abutments and wingwalls? |  |  |  |
| 2.3 | Were the slopes stepped to prevent wedge action? |  |  |  |

**Details and Summary:**

Date

Signature

1. Driven Piles Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply and installation of plain and galvanized steel H-piles and pipe piles. It includes driven piles and associated pile capacity test methods.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Materials |  |  |  |
| 3.2.1 | Did steel "H" piling meet the requirements of ASTM A36 or CSA G40.21M 350W? |  |  |  |
| 3.2.1 | Did steel pipe piling meet the requirements of ASTM 252 Grade 2, except that hydrostatic testing is not required? |  |  |  |
| 3.2.1 | Was the boron content of steel piling below 0.0008%? |  |  |  |
| 3.2.1 | If imperial dimensioned piling was proposed in substitution for specified metric dimensioned piling, did the imperial dimensioned piling have equivalent or greater sectional properties? |  |  |  |
| 3.2.1.1 | Were mill test reports reviewed and accepted by the Project Manager prior to commencement of the Work? |  |  |  |
| 3.2.1.1 | Were the mill test reports provided in English for all foundation pile components and if originated from a mill outside Canada or the United States of America, did the Contractor have the mill test reports verified by a certified laboratory in Canada? |  |  |  |
| 3.2.1.2,  6.2.7.3 | Was piling galvanized in accordance with the specifications? |  |  |  |
| 3.2.3,  4.4.4 | Was the Class Pile concrete mix design reviewed and accepted by the Project Manager? |  |  |  |
| 3.2.4,  5.0 | Did reinforcing steel meet the specified requirements? |  |  |  |
|  | Handling |  |  |  |
| 3.3 | Was piling handled, hauled and stored in a manner that prevented damage to the materials? |  |  |  |
| 3.3 | Was loading and unloading of piling done by crane, loader or other appropriate hoisting equipment? |  |  |  |
| 3.3 | Were fabric slings, wood blocking or other approved methods used to support and separate galvanized piling to prevent damage when handling, hauling or storing? |  |  |  |
| 3.3 | Were repairs to damaged galvanizing metallized in conformance with ASTM A780, Method A3 and to a thickness of 180 µm? |  |  |  |
|  | Driven Piles |  |  |  |
| 3.4.2 | Was the Contractor’s Pile Driving Plan reviewed and accepted by the Project Manager prior to commencement of the Work? |  |  |  |
| BCIM Vol.1 | Was the Department’s “Driven Pile Inspection Report” utilized to document the driving, inspection and testing? |  |  |  |
| 3.4.1 | Were all pile driving equipment details, driving methods, and procedures reviewed and accepted by the Project Manager before pile driving commenced? |  |  |  |
| 3.4.1 | Was a driving cap provided to maintain alignment of the pile and hammer, which was of adequate dimensions to allow driving without trimming or reducing the cross section of the pile? |  |  |  |
| 3.4.3 | Did the Contractor install a driving frame in accordance with the reviewed and accepted Pile Driving Plan drawings? |  |  |  |
| 3.4.3 | Did the Contractor use fixed leads? |  |  |  |
| 3.4.3 | Did the Contractor paint markings on each pile at 0.25 m intervals with a label at each 1.0 m interval starting from the toe of the pile? |  |  |  |
| 3.4.3.1 | Was the first driven pile for each foundation element considered a test pile? If the foundation element contained more than 15 piles, were the first two driven piles in that foundation element considered test piles? |  |  |  |
| 3.4.3.1 | Was pile driving set criteria as determined by the Project Manager’s geotechnical engineer provided to the Contractor? |  |  |  |
| 3.4.3.2 | Was pile tip reinforcement installed in accordance with Standard Drawing S-1850, Standard Steel Pile Details? |  |  |  |
| 3.4.3.2 | When pipe piles were driven closed ended, did pipe pile tips have welded end plates, installed in accordance with Standard Drawing S-1850 Standard Steel Pile Details? |  |  |  |
| 3.4.3.2 | When driving open-ended pipe piles, was the thickness of accumulated material in the pipe pile measured and recorded and were the interiors cleaned to the required elevation? |  |  |  |
| 3.4.3.2, 4.22 | Was all projecting reinforcing steel installed and secured? If water ingress occurred prior to concrete placement were the specification requirements followed? |  |  |  |
| 3.4.3.2 | Was pipe pile concrete placed after the pipe pile was reviewed and accepted? |  |  |  |
| 3.4.3.2 | Was there damage at the driving end of the pile or buckling at any location? |  |  |  |
| 3.4.3.2 | Did the Contractor cover all open pile holes until concrete or backfill is placed? |  |  |  |
| 3.4.3.5,  5 | Was reinforcing steel fabricated, shipped, handled, stored, placed, fastened and spliced in accordance with the specifications and as shown on the Drawings? |  |  |  |
| 3.4.3.6,  3.5.3.3,  4 | Was all pile concrete work completed in accordance with the specification requirements? (See Section 4 Inspection Check Sheet for class Pile concrete) |  |  |  |
| 3.4.3.8 | Were piles positioned horizontally within 150 mm of the position shown on the Drawings after driving for conventional abutments and piers? |  |  |  |
| 3.4.3.8 | For fully integral abutments, after driving were piles positioned horizontally within 50 mm of the position shown on the Drawings? |  |  |  |
| 3.4.3.8 | Were piles driven within a tolerance of 20 mm per metre from the vertical or the batter as shown on the Drawings? |  |  |  |
| 3.4.3.8 | Were piles in exposed bents within 50 mm of the specified position at the ground line or 25 mm at the pier cap after driving as shown on the Drawings? |  |  |  |
| 3.4.3.8 | At the completion of driving of each pile within a foundation element, was a control elevation established on the pile by the Contractor to determine if heave occurred after all piles for the foundation element had been driven? |  |  |  |
| 3.4.3.8 | If tolerances were not met, did the Contractor make immediate changes to his piling procedures? |  |  |  |
|  | Steel Piling Splices / Field Welding – Structural Members |  |  |  |
| 13.4,  6.2.5.1 | Did low hydrogen filler, fluxes and welding practices comply with the specification requirements? |  |  |  |
| 13.4 | If the air temperature was below 10°C, were piles and splice plates preheated to 100°C and sheltered for a distance of 80 mm beyond the weld? |  |  |  |
| 13.4 | If the air temperature was below 0°C, was welding performed within an acceptable hoarding structure and heat provided? |  |  |  |
| 13.4.1 | Were welders CWB approved in the applicable category and were their qualifications reviewed and accepted by the Project Manager? |  |  |  |
| 13.4.1 | Were welding procedures and welding procedure datasheets for each type of proposed weld reviewed and accepted by the Project Manager? |  |  |  |
| 13.4.1 | Was all welding, cutting and preparation done in accordance with the American Welding Society (AWS) – Bridge Welding Code D1.5 as confirmed by the independent visual inspector? |  |  |  |
| 3.4.3.3 | Were steel pile splices completed in accordance with Standard Drawing S-1850, Standard Steel Pile Details? |  |  |  |
| 3.4.3.3 | Were all final splices located 1 m below ground level, or at an elevation acceptable to the Project Manager? |  |  |  |
| 3.4.3.3 | When splicing within a galvanized portion was required, was the galvanizing removed to the extent required to complete the splice? |  |  |  |
| 3.4.3.4 | Did the Contractor have all steel piling splice welds visually inspected by an independent welding inspector certified to Level 3 of CSA W178.2? |  |  |  |
| 3.4.3.4 | If the visual inspection of the weld revealed the presence of potential defects, did the Contractor complete additional ultrasonic testing to confirm acceptability of the weld? |  |  |  |
| 3.4.3.4 | Did the Contractor complete ultrasonic testing for a minimum of 20% of all full penetration welded splices in compression and ultrasonic testing for 100% of full penetration welded splices in tension? |  |  |  |
| 3.4.3.4 | Was all ultrasonic testing completed by an independent testing company certified to CAN/CSA W178.1 and were ultrasonic testing technicians certified to Level 2 of Canadian General Standard Board (CGSB)? |  |  |  |
| 3.4.3.4 | Did the Contractor provide a copy of test results to the Project Manager for his review within three days of the testing? |  |  |  |
|  | Defective Driven Piles |  |  |  |
| 3.4.4 | Did the Contractor repair all piles damaged by driving, driven out of specified tolerance or orientation? |  |  |  |
| 3.4.4,  6.2.7.3 | Did the Contractor repair all damaged galvanized coating in accordance with the specification requirements? |  |  |  |
|  | Pile Capacity Testing and Reporting |  |  |  |
| 3.6.1 | If specified in the Contract, has static load testing been completed by an independent testing agency specializing in this type of work, in accordance with ASTM D1143 for piles subjected to axial loads and ASTM D3689 for piles subjected to axial tensile loads? |  |  |  |
| 3.6.1 | Was the Static load testing report submitted to the Project Manager within 7 days of completion of testing*?* |  |  |  |
| 3.6.2 | If specified in the Contract, was High Strain Dynamic Load Testing - Pile Driving Analysis (PDA Testing), completed by an independent testing agency that has specialized in this type of work for a minimum of 5 years? |  |  |  |
| 3.6.2.1 | Was the greater of 2 piles or 15% of the total production piles from each foundation element PDA tested in accordance with ASTM D4945? |  |  |  |
| 3.6.2.1 | Was testing carried out during installation of driven piles or upon re-strike as specified in the Special Provisions of the Contract? |  |  |  |
| 3.6.2.1 | Was additional PDA testing required because driven piles exhibited lower capacity and/or shorter penetrations than specified, or cast-in-place piles encountered ground water, or piling equipment or procedures changed? |  |  |  |
| 3.6.2.1 | If re-strike of the piles was specified, was the required set up time adhered to prior to pile re-strike? |  |  |  |
| 3.6.2.2 | Did the independent testing agency provide a daily field log to the Project Manager within 24 hours of testing, summarizing preliminary test results including driving stresses, transferred energy and estimated pile capacity? |  |  |  |

**Details and Summary:**

Signature

Date

1. Drilled Cast-In-Place Concrete Piles Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply and installation of cast-in-place concrete piles. It includes drilled cast-in-place concrete piles and drilled cast-in-place concrete/steel composite piles.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Drilled Cast-in-Place Concrete Piles |  |  |  |
| 3.5.2 | Has the Contractor’s Pile Drilling Plan been reviewed and accepted by the Project Manager? |  |  |  |
| BCIM Vol.1 | Was the Department’s “Drilled Cast-in-Place Concrete Pile Inspection Report” utilized to document the drilling and construction of each drilled pile? |  |  |  |
| 3.5.3 | Did the Contractor make every attempt necessary to obtain dry pile holes prior to placing pile concrete? Were casings of appropriate size and length, bailing buckets, final cleanout buckets and water pumps used? |  |  |  |
| 3.5.3 | Was the reviewed and accepted seepage water management strategy successfully implemented? |  |  |  |
| 3.5.3 | If temporary casings were used, was the internal diameter of casings the same size as the specified pile diameter to permit unimpeded drilling operations and was casing of sufficient length? |  |  |  |
| 3.5.3 | Where specified, was belling completed after the pile hole was drilled to an elevation acceptable to the Project Manager’s geotechnical engineer? |  |  |  |
| 3.5.3 | Were the walls and bottoms of the pile holes cleaned to remove all loose and extraneous material to the satisfaction of the Project Manager’s geotechnical engineer? |  |  |  |
| 3.5.3.1 | Did the Contractor cover all open drilled holes until concrete or backfill was placed? |  |  |  |
| 3.5.3.2 | Were shoes or spacers firmly attached to the reinforcing steel and did these serve to maintain position and cover specified? |  |  |  |
| 3.5.3.2 | Was projecting reinforcing steel placed within the specified tolerance of ± 10 mm or as determined by the Project Manager? |  |  |  |
| 3.5.3.3 | Were suitable forms used to maintain the specified dimensions of concrete piles above ground level? |  |  |  |
| 3.5.3.3 | Did the Contractor remove all laitance, unsound concrete, or other deleterious material from concrete surfaces to the satisfaction of the Inspector by chipping or other means acceptable to the Project Manager? |  |  |  |
| 3.5.3.3.1 | Was pile concrete placed by means of a hopper equipped with a center pipe drop tube with a minimum 200 mm diameter and 2 m length? |  |  |  |
| 3.5.3.3.1 | Was concrete in the upper 3 m of the piles consolidated by the use of an acceptable concrete vibrator? |  |  |  |
| 3.5.3.3.2 | Was the proposed placement of pile concrete underwater reviewed and accepted by the Project Manager and the Department? If so, was the Pile Drilling Plan updated by the Contractor and resubmitted for review and acceptance of the Project Manager? |  |  |  |
| 3.5.3.3.3 | Did the Contractor complete CSL testing in accordance with ASTM D6760, Standard Test Method for Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing and the specifications? |  |  |  |
| 3.5.3.4 | Were pile concrete placement requirements for Cold Weather Conditions met? |  |  |  |
| 3.5.3.5 | Did the drilled piles meet all installation tolerances as outlined in the specifications? |  |  |  |
| 3.5.4 | Were all piles drilled to the capacity and tip elevation shown on the Drawings or as determined by the Project Manager? |  |  |  |
| 3.5.5 | Were all defective and/or damaged piles repaired in accordance with the specification requirements? |  |  |  |

**Details and Summary:**

Signature

Date

1. Class Pile Cast-In-Place Concrete Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the production, handling, sampling and testing, transporting, placing, curing, and finishing of Class Pile cast-in-place concrete.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | **General** |  |  |  |
| 4.2 & 4.4 | Was the mix design reviewed and accepted by the Project Manager? |  |  |  |
| 4.4.4 | If in the Special Provisions of the Contract mass concrete mitigation measures were required, did the Project Manager review and accept the Contractor’s mass concrete plan? |  |  |  |
| 4.4.4 | For mix designs containing hydration stabilizing admixtures, and/or produced from a portable batch plant, was a trial batch performed a minimum of 35 days prior to placement of concrete at site? |  |  |  |
| 4.4.5.2 | Did the Project Manager review and accept the Contractor’s proposed placement, finishing, and curing for each element containing concrete with hydration stabilizing admixtures? |  |  |  |
| 4.4.5 | For multi-year projects were trial batches repeated annually? |  |  |  |
| 4.6.1 | If a portable batch plant proposed by the Contractor, was its use reviewed and accepted by the Project Manager and Department? |  |  |  |
|  | **Delivery** |  |  |  |
| 4.7 | Did the concrete supplier have sufficient plant capacity and satisfactory transporting equipment for continuous delivery at the rate required? |  |  |  |
|  | **Placement Schedules** |  |  |  |
| 4.8 | Did the Contractor provide a proposed placement schedule? |  |  |  |
| 4.8 | Were the proposed placement methods suitable for the volume of concrete to be poured? |  |  |  |
| 4.8 | Was the Contractor’s crew size adequate? |  |  |  |
| 4.8 | Did the Contractor have adequate lighting to facilitate proper placing, finishing and inspection if required? |  |  |  |
|  | **Inspection and Testing** |  |  |  |
| 4.9 | Did the Contractor provide full facilities for random quality assurance inspection and testing? |  |  |  |
| 4.9 | Were all site cast concrete cylinders compliant to the relevant specifications? |  |  |  |
| 4.9 | Did the Contractor utilize ACI or CCIL/CSA certified testers with extensive related experience and were the results of all tests provided to the Project Manager? |  |  |  |
| 4.9 | Were additional tests performed if the results were borderline or widely variable? |  |  |  |
| 4.9 | Did the certified testers personally cast the test cylinders? |  |  |  |
| 4.9 | Did the certified testers utilize the “Concrete Test Results” form and include the form with the concrete test cylinders delivered to the testing laboratory? |  |  |  |
| 4.9.1 | Did the "Strength Test" consist of the compression tests of 4 (1 – 7 Day and 3 – 28 Day) standard test specimens sampled, made, cured and tested in accordance with CSA Standard Specifications? |  |  |  |
| 4.9.1 | Did the Contractor take a strength tests to represent each bridge element and at a frequency in accordance with the specification requirements? |  |  |  |
| 4.9.2 | Was sampling of concrete carried out in accordance with CSA Standard A23.2-1C? |  |  |  |
| 4.4 | Was the concrete temperature between 10°C and 25°C, at discharge for Class Pile concrete? |  |  |  |
| 4.4.1 | Was the total air content of the pile concrete between 5 – 8% at the point of discharge for all batches? |  |  |  |
| 4.9.5 | Were air content and density tests conducted in accordance with CSA Standard A23.2-4C and A23.2‑6C, respectively? |  |  |  |
| 4.9.4 | Were slump tests conducted in accordance with CSA Standard A23.2-5C? |  |  |  |
| 4.6.3 | Was the time of hauling within 90 minutes for all batches? |  |  |  |
| 4.9.3 | Was the making and curing of concrete test cylinders carried out in accordance with CSA Standard A23.2‑3, with the exception that the time for cylinders to reach the testing laboratory was between 20 and 48 hours? |  |  |  |
| 4.9.3 | Were test cylinders cast by the Contractor in standard CSA approved heavy duty steel or plastic moulds? |  |  |  |
| 4.9.3 | Did the Contractor provide temperature-controlled storage boxes for test cylinders? |  |  |  |
| 4.9.3 | Was a max-min thermometer provided for each storage box and were site curing temperatures recorded for all test cylinders? |  |  |  |
| 4.9.3 | Was the storage facility provided, installed and accepted by the Inspector before any concrete was placed? |  |  |  |
| 4.9.3 | Did the Contractor deliver, handle and transport the test cylinders to an independent CSA-certified testing laboratory in accordance with CSA Standard A23.2‑3C? |  |  |  |
| 4.9.3 | Was a copy of the test results forwarded to the Project Manager and concrete producer within 2 days of the break date? |  |  |  |
| 4.9.6 | Were cylinders tested in accordance with CSA Standard A23.2-9C by an independent CSA certified engineering laboratory? |  |  |  |
| 4.9.7, 4.6.3 | In the event that slump and/or air content were outside the specified tolerance range, were adjustments made within the maximum time allowed as specified? |  |  |  |
|  | **Falsework and Formwork** |  |  |  |
| 3.5.3.3 | Were suitable forms used to maintain the specified dimensions of concrete piles above ground level? |  |  |  |
| 4.10.1 | After formwork installation and prior to concrete placement did the engineer who designed the formwork confirm, inspect, and accept the formwork? |  |  |  |
| 4.10.1 | Was all falsework and formwork fabricated in accordance with the Contractor’s engineered drawings? |  |  |  |
| 4.10.3 | Was proposed re-use of forms acceptable to the Department and Project Manager? |  |  |  |
|  | **Removal of Falsework, Forms and Housing** |  |  |  |
| 4.13 | Was the Contractor’s proposed timing of formwork, support, or hoarding removal reviewed and accepted by the Project Manager? |  |  |  |
| 4.13 | Was all formwork removed from the completed structure? |  |  |  |

**Details and Summary:**

Date

Signature

1. Class C Cast-In-Place Concrete Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the production, handling, sampling and testing, transporting, placing, curing, and finishing of Class C cast-in-place concrete.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | **General** |  |  |  |
| 4.2 & 4.4 | Was the mix design reviewed and accepted by the Project Manager? |  |  |  |
| 4.4.4 | If in the Special Provisions of the Contract mass concrete mitigation measures were required, did the Project Manager review and accept the Contractor’s mass concrete plan? |  |  |  |
| 4.4.4 | For mix designs containing hydration stabilizing admixtures, and/or produced from a portable batch plant, was a trial batch completed a minimum of 35 days prior to placement of concrete? |  |  |  |
| 4.4.5.2 | Did the Project Manager review and accept the Contractor’s proposed placement, finishing, and curing for each element containing concrete with hydration stabilizing admixtures? |  |  |  |
| 4.4.4 | For multi-year projects were trial batches repeated annually? |  |  |  |
| 4.6.1 | If a portable batch plant proposed by the Contractor, was its use reviewed and accepted by the Project Manager and Department? |  |  |  |
|  | **Delivery** |  |  |  |
| 4.7 | Did the concrete supplier have sufficient plant capacity and satisfactory transporting equipment for continuous delivery at the rate required? |  |  |  |
|  | **Placement Schedules** |  |  |  |
| 4.8 | Did the Contractor provide a proposed placement schedule? |  |  |  |
| 4.8 | Were the placement methods proposed suitable for the volume of concrete to be poured? |  |  |  |
| 4.8 | Was the Contractor’s crew size adequate? |  |  |  |
| 4.8 | Did the Contractor have adequate lighting to facilitate proper placing, finishing and inspection if required? |  |  |  |
|  | **Inspection and Testing** |  |  |  |
| 4.9 | Did the Contractor provide full facilities for random quality assurance inspection and testing? |  |  |  |
| 4.9 | Were all site cast concrete cylinders compliant to the relevant specifications? |  |  |  |
| 4.9 | Did the Contractor utilize ACI or CCIL/CSA certified testers with extensive related experience and were the results of all tests provided to the Project Manager? |  |  |  |
| 4.9 | Were additional tests performed if the results were borderline or widely variable? |  |  |  |
| 4.9 | Did the certified testers personally cast the test cylinders? |  |  |  |
| 4.9 | Did the certified testers utilize the “Concrete Test Results” form and include the form with the concrete test cylinders delivered to the testing laboratory? |  |  |  |
| 4.9.1 | Did the "Strength Test" consist of the compression tests of 4 (1 – 7 Day and 3 – 28 Day) standard test specimens sampled, made, cured and tested in accordance with CSA Standard Specifications? |  |  |  |
| 4.9.1 | Did the Contractor take a strength tests to represent each bridge element and at a frequency in accordance with the specification requirements? |  |  |  |
| 4.9.2 | Was sampling of concrete carried out in accordance with CSA Standard A23.2-1C? |  |  |  |
| 4.4.3 | Was the concrete temperature between 10°C and 25°C, at discharge for Class C, D & S concrete for all batches? |  |  |  |
| 4.4.1 | Was the slump range and air content of the concrete at the point of discharge 100mm +-30mm and 5-8%, respectively for all batches? |  |  |  |
| 4.9.5 | Were air content and density tests conducted in accordance with CSA Standard A23.2-4C and A23.2-6C, respectively? |  |  |  |
| 4.9.4 | Were slump tests conducted in accordance with CSA Standard A23.2-5C? |  |  |  |
| 4.6.3 | Was the time of hauling within 90 minutes for all Class C batches except for those containing hydration stabilizing admixtures? |  |  |  |
| 4.9.3 | Was the making and curing of concrete test cylinders carried out in accordance with CSA Standard A23.2-3C, with the exception that the time for cylinders to reach the testing laboratory was between 20 and 48 hours? |  |  |  |
| 4.9.3 | Were test cylinders cast by the Contractor in standard CSA approved heavy duty steel or plastic moulds? |  |  |  |
| 4.9.3 | Did the Contractor provide and use properly designed temperature-controlled storage boxes and further protect cylinders from adverse weather until removed from the site? |  |  |  |
| 4.9.3 | Was a max-min thermometer provided for each storage box and were site curing temperatures recorded for all test cylinders? |  |  |  |
| 4.9.3 | Was the storage facility provided, installed and accepted by the Inspector before any concrete was placed? |  |  |  |
| 4.9.3 | Did the Contractor deliver, handle and transport the test cylinders to an independent CSA-certified testing laboratory in accordance with CSA Standard A23.2-3C? |  |  |  |
| 4.9.3 | Was a copy of the test results forwarded to the Project Manager and concrete producer within two (2) days of the break date? |  |  |  |
| 4.9.6 | Were cylinders tested in accordance with CSA Standard A23.2-9C by an independent CSA certified engineering laboratory? |  |  |  |
| 4.9.7 | In the event that slump and/or air content were outside the specified tolerance range, were adjustments for all batches made within the maximum time allowed as specified in Section 4.6.3 “Time of Hauling”? |  |  |  |
|  | **Falsework and Formwork** |  |  |  |
| 4.10.1 | Were detailed falsework and formwork drawings reviewed and accepted by the Project Manager before construction commenced? |  |  |  |
| 4.10.1 | After formwork installation and prior to concrete placement did the engineer who designed the formwork confirm, inspect, and accept the formwork? |  |  |  |
| 4.10.1 | Was all falsework and formwork fabricated in accordance with the Contractor’s engineered drawings? |  |  |  |
| 4.10.2 | Was falsework that could not be founded on a satisfactory footing instead supported on piling that was spaced, driven and removed in a manner acceptable to the Project Manager? |  |  |  |
| 4.10.1,  4.24.1 | Did the Contractor secure formwork against hardened concrete at construction joints so that there were no formwork misalignments? |  |  |  |
| 4.10.2 | Were all forms designed and built mortar-tight and of sufficient rigidity to prevent distortion? |  |  |  |
| 4.10.2 | Did the drawings for timber formwork specify the type and grade of lumber and show the size and spacing of all members? |  |  |  |
| 4.10.2 | Were removable panels provided at the bottom of narrow wall and column forms for inspection and clean out? |  |  |  |
| 4.10.3 | Were forms for exposed surfaces requiring a Class 1 “Ordinary Surface Finish” made of good quality plywood, or an acceptable equivalent? |  |  |  |
| 4.10.3 | Were forms for exposed surfaces requiring a Class 2 “Rubbed Surface Finish” or Class 3 “Bonded Concrete Surface Finish” all new material made of “Coated Formply”? |  |  |  |
| 4.10.3 | Was re-use of forms when proposed acceptable to the Department and Project Manager? |  |  |  |
| 4.10.3 | Were all forms for exposed surfaces mortar-tight, filleted at all inside corners, and given a bevel or draft in the case of projections? |  |  |  |
| 4.10.3 | Were chamfer strips used at the top edges of exposed surfaces? |  |  |  |
| 4.10.3 | Were metal bolts or anchorages within the forms so constructed as to permit their removal to a depth of at least 20 mm from the concrete surface? |  |  |  |
| 4.10.3 | Were all cavities created from ties or associated hardware removal filled with an approved concrete patching material? |  |  |  |
| 4.10.3 | When plastic sleeves and removable inner rods were used, was the plastic sleeve removed for a distance of 100 mm from the face of the concrete? |  |  |  |
| 4.10.5 | Did the Contractor use and comply with the standard details shown on Standard Drawings S-1412? |  |  |  |
|  | **Protection of Concrete Work and Bridge Components from Staining** |  |  |  |
| 4.12 | Did the Contractor take precautions to protect all concrete bridge elements from staining? |  |  |  |
| 4.12 | Was any staining of concrete bridge elements that occurred removed satisfactorily? |  |  |  |
|  | **Removal of Falsework, Forms and Housing** |  |  |  |
| 4.13 | Was the Contractor’s proposed timing of formwork, support, or hoarding removal reviewed and accepted by the Project Manager? |  |  |  |
| 4.13 | Was all formwork removed from the completed structure? |  |  |  |
|  | **Handling and Placing Concrete** |  |  |  |
| 4.14.1 | Did the Contractor give a minimum of two (2) days advance notice of a concrete pour date or a change to a pour date? |  |  |  |
| 4.14.1 | Was all equipment proposed for use in mixing, conveying, placing and compacting the concrete accepted by the Project Manager prior to its use? |  |  |  |
| 4.14.1 | Was all the necessary equipment for any particular placement proven to be in working condition before the placement commenced, with backup equipment on site? |  |  |  |
| 4.14.1 | Was all extraneous matter like sawdust, wood chips and other construction debris removed from the interior of forms prior to placing concrete? |  |  |  |
| 4.14.1 | Were temporary struts, spreaders, stays and braces in correct shape and alignment, and removed when the concrete placement reached an elevation rendering their service unnecessary? |  |  |  |
| 4.14.1 | Was concrete placed so as to avoid segregation of the materials and the displacement of the reinforcement? |  |  |  |
| 4.14.1 | Was concrete deposited by concrete pump, metal or plastic chute or other acceptable means when operations otherwise required free dropping concrete more than 1 metre? |  |  |  |
| 4.14.1 | Was concrete deposited in the forms in the order indicated on the Drawings? |  |  |  |
| 4.14.1 | Was each portion of concrete placed between construction joints placed in one continuous operation? |  |  |  |
| 4.14.2 | Was concrete consolidation done internally by mechanical vibration? |  |  |  |
| 4.14.2 | Were vibrators of an acceptable type and design? |  |  |  |
| 4.14.2 | Did the Contractor provide a sufficient number of vibrators to properly compact each batch, immediately after placing? |  |  |  |
| 4.14.2 | Were vibrators manipulated so as to thoroughly work the concrete around the reinforcement and embedded fixtures and into the corners and angles of the forms applying vibration at the point of deposit and in the area of freshly deposited concrete? |  |  |  |
| 4.14.2 | Was the vibrator inserted vertically and withdrawn out of the concrete slowly with application of the vibrator at points uniformly spaced and not farther apart than the radius over which the vibration was visibly effective? |  |  |  |
| 4.14.2 | Was vibration applied in a manner that prevented segregation of the concrete mix? |  |  |  |
| 4.14.2 | Did the Contractor avoid disturbing concrete after vibration? |  |  |  |
| 4.14.3 | Was all accumulation of concrete and concrete paste removed prior to becoming set? |  |  |  |
| 4.14.3 | Was concrete placed while fresh and before it had taken its initial set? |  |  |  |
| 4.14.3 | Was jarring or straining at ends of projecting reinforcing steel avoided after initial set of the concrete? |  |  |  |
| 4.14.3 | Did the Contractor take the necessary steps to prevent free water build-up in the event of unexpected rainfall or similar occurrences? |  |  |  |
| 4.14.3 | Was water used to clean equipment discharged clear of the structure and water crossing? |  |  |  |
| 4.14.4 | Did the concrete pump produce a continuous flow of concrete without air pockets? |  |  |  |
|  | **Concrete Slope Protection** |  |  |  |
| 4.19 | Was the Contractor’s detailed layout and forming plan reviewed and accepted by the Project Manager prior to commencing work? |  |  |  |
| 4.19 | Were the slopes to be covered with concrete slope protection trimmed and dressed by the Contractor to within 150 mm of the lines and grades shown on the Drawings? |  |  |  |
| 4.19,  2.0 | Did the Contractor place and compact Des. 2 Cl. 25 crushed aggregate material in lifts not exceeding 150 mm? |  |  |  |
| 4.19 | Was the Class C concrete placed in either horizontal or vertical courses, with one course being allowed to cure for at least 12 hours before the adjoining course was placed? |  |  |  |
| 4.19 | Was formwork provided below and above the reinforcing to ensure proper slab thickness, correct positioning, and the formation of proper cold joints between courses? |  |  |  |
| 4.19 | Were the concrete surfaces given a Class 5 finish and done prior to edging and grooving? |  |  |  |
| 4.19 | Were the vertical or horizontal joints grooved 50 mm to the depth of the reinforcing? |  |  |  |
|  | **Construction Joints** |  |  |  |
| 4.20.1 | Were proposed construction joint locations, other than where indicated on the Drawings or shown in the pouring schedule, reviewed and accepted by the Project Manager? |  |  |  |
| 4.20.1 | Were construction joints where, not detailed on the Drawings or in the case of emergency, installed in accordance with Standard Drawing S-1412 or as determined by the Project Manager? |  |  |  |
| 4.20.1 | Were construction joints located to allow a minimum of 60 mm concrete cover to reinforcing steel running parallel to the joint? |  |  |  |
| 4.20.2 | Were the forms retightened and was the surface of the hardened concrete thoroughly cleaned and saturated with water, with all free standing water removed, before depositing new concrete? |  |  |  |
| 4.20.2 | Was the placing of concrete carried out continuously from joint to joint and the face edges of all exposed joints carefully finished true to line and elevation? |  |  |  |
|  | **Concreting in Cold Weather** |  |  |  |
| 4.21 | Did the Project Manager review and accept the Contractor’s proposed cold weather concreting plan? |  |  |  |
| 4.21 | Was all aggregate and mixing water heated to a temperature of at least 20°C but not more than 65°C? |  |  |  |
| 4.21 | Was the temperature of the concrete in accordance with the specification requirements at the time of placing in the forms, or, in the case of mass pours, did the Contractor follow the specified temperature requirements? |  |  |  |
| 4.21 | Did the Contractor enclose the structure in such a way that the concrete and air within the enclosure was kept at or above 15°C during the protection period of 7 days after placing concrete? |  |  |  |
| 4.21 | Was the enclosure constructed with a minimum of 300mm clearance between the enclosure and concrete? |  |  |  |
| 4.21 | Was the relative humidity within the enclosure maintained at not less than 85%? |  |  |  |
| 4.21 | Were heaters kept well clear of the formwork housing, and was adequate ventilation provided for combustion and prevention of carbon dioxide accumulation? |  |  |  |
| 4.21 | Was adequate pre-heat provided to raise the temperature of formwork, reinforcing steel, previously-placed concrete and/or soil to between 10°C and 20°C before placing concrete? |  |  |  |
| 4.21,  4.23 | Was concrete curing in accordance with the specification requirements? |  |  |  |
| 4.21 | Was the adequacy of protection monitored and recorded? |  |  |  |
| 4.21 | Was protection and heating withdrawn so as not to induce thermal shock stresses in the concrete? |  |  |  |
| 4.21 | Did the Contractor measure the temperature of internal concrete, surface of the concrete and ambient air temperatures a minimum of every 4 hours, and make adjustments as necessary to keep the rate of cooling within the specified parameters? |  |  |  |
|  | **Placing Concrete under Water** |  |  |  |
| 4.22 | Was concrete placement under water reviewed and accepted by the Project Manager? |  |  |  |
| 4.22 | Was the Contractor’s modified concrete mix design for placement under water reviewed and accepted by the Project Manager prior to placement? |  |  |  |
| 4.22 | Was concrete placed acceptably in a compact mass, in its final position, by means of a concrete pump line and/or a tremie system to prevent segregation? |  |  |  |
| 4.22 | Was the concrete temperature at discharge between 10°C and 25°C? |  |  |  |
| 4.22 | Did the Contractor prevent the placement of concrete into water which was below 4°C or flowing at the point of discharge? |  |  |  |
| 4.22 | Did the Contractor remove all laitance or other unsatisfactory material from exposed concrete surfaces by scraping, chipping or other acceptable means? |  |  |  |
|  | **Curing Concrete** |  |  |  |
| 4.23.1 | Was freshly deposited concrete protected from freezing, abnormally high temperatures or temperature differentials, premature drying, water damage or moisture loss during the curing period? |  |  |  |
| 4.23.1 | Was concrete wet cured with 2 layers of Nilex 4504 white filter fabric or an approved equivalent placed on the concrete surface as soon as the surface would not be marred by its installation, and was the fabric pre-wet or a fine spray of clean water immediately applied once placed? |  |  |  |
| 4.23.1 | Was the filter fabric in a continuously wet condition throughout the curing period by means of soaker hoses or other means? |  |  |  |
| 4.23.1 | Did the Contractor provide protection to ensure that the temperature of the centre of the in-situ concrete did not fall below 10°C or exceed 70°C and the temperature difference between the centre and the surface did not exceed 20°C, as per the requirements of Table 21 of CSA A23.1? |  |  |  |
| 4.23.1 | Did the Contractor supply and install two thermocouples, one in the centre and one at the surface of the concrete, for a concrete element having a minimum dimension of 1.5 m? |  |  |  |
| 4.23.1 | Did the Contractor monitor and record the temperatures every 4 hours for the first 72 hours after concrete placement and every 8 hours thereafter for the specified cure period and until 24 hours after the maximum temperature has occurred? |  |  |  |
| 4.23.1 | For locations where formwork was removed prior to the completion of the specified curing period, were the resulting exposed concrete surfaces wet cured for the remaining days? |  |  |  |
| 4.23.2 | Did the concrete slope protection receive 2 coats of a Type 2 curing compound meeting the requirements of ASTM C309 or ASTM C1315? |  |  |  |
| 4.23.2 | Was the first coat applied immediately after finishing and the 2nd coat 3 hours after the first coat? Was it applied at the rate specified by the manufacturer? |  |  |  |
|  | **Repair Concrete Defects** |  |  |  |
| 4.24 | Were defects such as honeycomb, cavities, spalls, chips, cracking and other casting or construction defects immediately reported to the Inspector? |  |  |  |
| 4.24 | If concrete defects were identified, were repair procedures reviewed and accepted by the Project Manager prior to the commencement of the repairs? |  |  |  |
| 4.24 | Did the Contractor carry out repairs in strict accordance with the repair procedure reviewed and accepted by the Project Manager? |  |  |  |
| 4.24.1 | Were concrete elements with formwork misalignments exceeding the allowable tolerances removed and recast? |  |  |  |
| 4.24.2 | Were cracks with widths greater than or equal to 0.2 mm identified for repair prior to issuance of the construction completion certificate? |  |  |  |
| 4.24.2 | After cleaning and drying cracks with oil-free compressed air, were cracks repaired by epoxy injection and did the Project Manager review and accept the Contractor’s injection procedure? |  |  |  |
|  | **Concrete Surface Finish** |  |  |  |
| 4.25.1 | Were surface finishes completed on all exposed concrete surfaces to 600 mm below grade or, in the case of river piers, 600 mm below lowest water level? |  |  |  |
| 4.25.1 | Were wood or magnesium tools of an acceptable type and quality used? |  |  |  |
| 4.21 | Was concrete surface finishing completed when the concrete surface was a minimum of 5ºC? |  |  |  |
|  | **Class 1 Ordinary Surface Finish** |  |  |  |
| 4.25.2.1 | Unformed surfaces - was concrete screeded to conform to the required surface elevations, then floated to ensure that the surface was free from open texturing, plucked aggregate and local projections or depressions? |  |  |  |
| 4.25.2.2 | Formed surfaces - were all fins and irregular projections removed from all surfaces immediately following the removal of forms? |  |  |  |
| 4.25.2.2 | Were cavities produced by form ties, all other holes, honeycomb areas, broken corners or edges and other defects thoroughly chipped out, cleaned and filled with an approved concrete patching material listed on the Department’s Product List and placed in accordance with the manufacturer’s published product data sheet? |  |  |  |
| 4.25.2.2 | Were all repairs wet cured for a minimum of 72 hours? |  |  |  |
|  | **Class 2 Rubbed Surface Finish** |  |  |  |
| 4.25.3,  4.21.1 | Were all concrete fins and irregular projections removed and surfaces inspected for compliance immediately following the removal of forms? |  |  |  |
| 4.25.3 | Were all concrete surfaces, except watercourse piers, brush abrasive blasted to thoroughly expose surface voids in preparation for surface finishing? |  |  |  |
| 4.25.3 | Were all watercourse pier concrete surfaces, ground with diamond grinding wheels or similar tools to thoroughly expose surface voids in preparation for surface finishing? |  |  |  |
| 4.25.3 | Were surface voids greater than 19 mm diameter but less than 0.05 m2 in area or 30 mm deep filled with an approved concrete patching material listed on the Department’s Product list in the OH-V category and placed in accordance with the manufacturer’s published product data sheet? |  |  |  |
| 4.25.3 | Were surface voids less than 19 mm in diameter but less than 0.05 m2 in area and less than or equal to 30 mm deep filled with a pre-bagged sack rub material? |  |  |  |
| 4.25.3 | Were sack rub materials placed over the entire prepared surface in accordance with the manufacturer’s recommendations and wet cured for a minimum of 72 hours? |  |  |  |
| 4.25.3 | When the patching and sack rub materials were adequately cured, was a carborundum stone or approved equivalent method used to finish the surface to a smooth, uniform and closed texture? |  |  |  |
| 4.25.3 | Were all prepared surfaces, including all patching and sack rubbing, uniform in colour and texture, and did the Contractor apply sealer as required? |  |  |  |
|  | **Class 3 Bonded Concrete Surface Finish** |  |  |  |
| 4.25.4 | Was the colour reviewed and accepted by the Department and Project Manager prior to application of the coating? |  |  |  |
| 4.25.4 | Was initial surface preparation completed as specified for a Class 2 Rubbed Surface Finish with the exception that uniformity of color was not required? |  |  |  |
| 4.25.4 | Was the concrete surface pressure washed to remove all dust, dirt, laitance and all other bond breaking materials? |  |  |  |
| 4.25.4 | Did the concrete surface dry for a minimum of 24 hours before application of pigmented sealer? |  |  |  |
| 4.25.4 | After the surface dried, did the Contractor apply an approved pigmented concrete sealer meeting the requirements for a Type 3 sealer of the Material Testing Specifications for Concrete Sealers – B388 and in accordance with the manufacturer’s specifications? |  |  |  |
| 4.25.4 | Were a minimum of 2 coats of pigmented sealer applied? |  |  |  |
| 4.25.4 | If spray application was used, was the surface back rolled with no colour variation visible? Did the color match the previously sealed adjoining surfaces? |  |  |  |
|  | **Class 5 Floated Surface Finish, Broomed Texture** |  |  |  |
| 4.25.6 | Was the concrete surface floated as necessary to produce a smooth surface with no more than a 3 mm variance, under a 3 m long straightedge? |  |  |  |
| 4.25.6 | After the concrete had set sufficiently, was the surface given a transversely broomed finish using a coarse broom to produce regular corrugations to a maximum depth of 2 mm? |  |  |  |
| 4.25.6 | Was an edging tool used at all edges and expansion joints and, where indicated on the drawings, were median and sidewalk control joints installed with a bronze grooving tool to a depth of at least one quarter of the slab thickness? |  |  |  |
|  | **Type 1c Sealer** |  |  |  |
| 4.26 | Was an approved Type 1c sealer selected from the Alberta Transportation Products list applied to all concrete surfaces that received a Class 2 and Class 5 surface finish, including all concrete surfaces to 600 mm below grade or in the case of river piers 600 mm below lowest water level? |  |  |  |
| 4.26 | Was sealer purposely not applied to concrete diaphragms in the interior bay areas? |  |  |  |
| 4.26 | Was the sealer applied in accordance with the manufacturer's recommendations, except for a 30% application rate increased from that indicated on the Department’s Product List? |  |  |  |
| 4.26 | Was the substrate temperature at a minimum of 5°C prior to application of sealer? |  |  |  |
| 4.26 | Before applying the sealer had the concrete cured for at least 28 days? |  |  |  |
| 4.26 | Was the surface dried, air blasted to remove all dust, and accepted prior to application of sealer? |  |  |  |
| 4.26 | Did the Contractor measure volumes of sealer based on the concrete surface area using a minimum of 2 coats? |  |  |  |

**Details and Summary:**

Date

Signature

1. Class HPC and HPC with Steel Fibre Cast-In-Place Concrete Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the production, handling, sampling and testing, transporting, placing, curing, and finishing of Class HPC and Class HPC with steel fibres cast-in-place concrete.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 4.2 & 4.4.4 | Was the mix design reviewed and accepted by the Project Manager? |  |  |  |
| 4.4.5 | Were trial batch(es) performed a minimum of 35 days prior to placement of concrete and did the Contractor produce evidence satisfactory to the Project Manager and the mix design reviewing Professional Engineer that the proportions selected will produce concrete of the quality specified? |  |  |  |
| 4.4.5 | Did the Contractor’s quality representative attend the trial batches to assess workability and finishing characteristics? |  |  |  |
| 4.4.5 | On multi-year projects, were trial batches repeated annually? |  |  |  |
| 4.4.3 | Was the concrete temperature between 10°C and 20°C at discharge for Class HPC and Class HPC with steel fibres for all batches? |  |  |  |
| 4.4.1 | Was the total air content of the HPC concrete between 5 – 8% at the point of discharge for all batches? |  |  |  |
| 4.6.3 | Was the Time of Hauling within 70 minutes for all batches? |  |  |  |
| 4.6.1 | If a portable batch plant proposed by the Contractor, was its use reviewed and accepted by the Project Manager and Department? |  |  |  |
|  | Delivery |  |  |  |
| 4.7 | Did the concrete supplier have sufficient plant capacity and satisfactory transporting equipment for continuous delivery at the rate required? |  |  |  |
|  | Placement Schedules |  |  |  |
| 4.8 | Did the Contractor provide a proposed placement schedule? |  |  |  |
| 4.8 | Were the placement methods proposed suitable for the volume of concrete to be poured? |  |  |  |
| 4.8 | Was the Contractor’s crew size adequate? |  |  |  |
| 4.8 | Did the Contractor have adequate lighting to facilitate proper placing, finishing and inspection during night pours? |  |  |  |
|  | Inspection and Testing |  |  |  |
| 4.9 | Did the Contractor provide full facilities for random quality assurance inspection and testing? |  |  |  |
| 4.9 | Were all site cast concrete cylinders compliant to the relevant specifications? |  |  |  |
| 4.9 | Did the Contractor utilize ACI or CCIL/CSA certified testers with extensive related experience and were the results of all tests provided to the Project Manager? |  |  |  |
| 4.9 | Were additional tests performed if the results were borderline or widely variable? |  |  |  |
| 4.9 | Did the certified testers personally cast the test cylinders? |  |  |  |
| 4.9 | Did the certified testers utilize the “Concrete Test Results” form and include this form with the concrete test cylinders delivered to the testing laboratory? |  |  |  |
| 4.9.1 | Did the "Strength Test" consist of the compression tests of four (4) standard test specimens sampled, made, cured and tested in accordance with CSA Standard Specifications? |  |  |  |
| 4.9.1 | Did the Contractor take a strength tests to represent each bridge element and at a frequency in accordance with the specification requirements? |  |  |  |
| 4.9.2 | Was sampling of concrete carried out in accordance with CSA Standard A23.2-1C? |  |  |  |
| 4.9.4 | Were slump tests conducted in accordance with CSA Standard A23.2-5C? |  |  |  |
| 4.9.5 | Were air content and density tests conducted in accordance with CSA Standard A23.2-4C and A23.2-6C, respectively? |  |  |  |
| 4.9.3 | Was the making and curing of concrete test cylinders carried out in accordance with CSA Standard A23.2-3C, with the exception that the time for cylinders to reach the testing laboratory was between 20 and 48 hours? |  |  |  |
| 4.9.3 | Were test cylinders cast by the Contractor in standard CSA approved heavy duty steel or plastic moulds? |  |  |  |
| 4.9.3 | Did the Contractor provide temperature-controlled storage boxes for test cylinders? |  |  |  |
| 4.9.3 | Was a max-min thermometer provided for each storage box and were site curing temperatures recorded for all test cylinders? |  |  |  |
| 4.9.3 | Was the storage facility provided and accepted by the Inspector before any concrete was placed? |  |  |  |
| 4.9.3 | Did the Contractor deliver, handle and transport the test cylinders to an independent CSA-certified testing laboratory in accordance with CSA Standard A23.2-3C? |  |  |  |
| 4.9.3 | Was a copy of the test results forwarded to the Project Manager and concrete producer within 2 days of the break date? |  |  |  |
| 4.9.6 | Were cylinders tested in accordance with CSA Standard A23.2-9C by an independent CSA certified engineering laboratory? |  |  |  |
| 4.9.7,  4.6.3 | In the event that slump and/or air content were outside the specified tolerance range, were adjustments made within the maximum time specified? |  |  |  |
|  | Falsework and Formwork |  |  |  |
| 4.10.1 | Did the Project Manager review and accept the Contractor’s falsework and formwork drawings? |  |  |  |
| 4.10.1 | Was all falsework and formwork fabricated in accordance with the reviewed and accepted drawings? |  |  |  |
| 4.10.1,  4.24.1 | Did the Contractor secure formwork against hardened concrete at construction joints to prevent any formwork misalignments? |  |  |  |
| 4.10.2 | Were all forms designed and built mortar-tight and of sufficient rigidity to prevent distortion? |  |  |  |
| 4.10.2 | Did the drawings for timber formwork specify the type and grade of lumber and show the size and spacing of all members, ties or other hardware, and the type, size and spacing of all bracing? |  |  |  |
| 4.10.3 | Were forms for exposed surfaces requiring a Class 1 “Ordinary Surface Finish” made of good quality plywood, or an acceptable equivalent? |  |  |  |
| 4.10.3 | Were forms for exposed surfaces requiring a Class 2 “Rubbed Surface Finish” or Class 3 “Bonded Concrete Surface Finish” all new material made of “Coated Formply”? |  |  |  |
| 4.10.3 | Were all forms for exposed surfaces mortar-tight, filleted at all corners, and given a bevel or draft in the case of projections? |  |  |  |
| 4.10.3 | Were chamfer strips used at the top edges of exposed surfaces? |  |  |  |
| 4.10.3 | Were metal bolts or anchorages within the forms so constructed as to permit their removal to a depth of at least 20 mm from the concrete surface? |  |  |  |
| 4.10.3 | When plastic sleeves and removable inner rods were used, was the plastic sleeve removed for a distance of 100 mm from the face of the concrete and removed entirely for curbs, barriers and medians? |  |  |  |
| 4.10.5 | Did the Contractor comply with the standard details shown on Standard Drawings S-1412, Standard Construction Joints, S-1838, Standard Waterproofing System For Deck and Abutments ‐ Sheet 1, S-1839, Standard Waterproofing System For Deck and Abutments ‐ Sheet 2, and S-1840, Standard Waterproofing System For Deck and Abutments ‐ Sheet 3? |  |  |  |
| 4.10.6 | Were formwork hangers or ties for exposed surfaces of decks, including underside surfaces, a removable threaded type, and were all cavities resulting from threaded rod removal along the underside of deck overhangs adequately prepared and filled with an approved concrete patching material? |  |  |  |
| 4.10.6 | Were deck overhang patches true to adjacent surfaces and similar in colour? |  |  |  |
| 4.10.6 | Were cavities resulting from threaded rod removal for interior bays filled with Sikaflex 15LM or an approved equivalent which was placed true to adjacent surfaces and similar in colour? |  |  |  |
| 4.10.6 | Was the formwork for decks, curbs, sidewalks and parapets fabricated so that the lines and grades shown on the Drawings were achieved? |  |  |  |
| 4.10.6 | Did the Contractor design and install support brackets such that no damage to girder flanges and webs occurred? Were timber or neoprene softeners used where support brackets were in contact with girders? |  |  |  |
| 4.10.6 | Did the Contractor check the effects of concentrated loads on thin webs and where necessary and provide sufficient means to distribute or carry such concentrated loads to the supporting flanges or stiffeners? |  |  |  |
| 4.10.6 | Did the Contractor calculate the girder haunch dimensions required to achieve the specified gradeline? |  |  |  |
| 4.10.6 | Were girder haunch dimensions reviewed and accepted by the Project Manager prior to commencing any deck formwork? |  |  |  |
| 4.10.6 | Did the actual girder camber vary significantly from the estimated values on the Drawings? If so, were proposed gradeline modifications reviewed and accepted by the Project Manager? |  |  |  |
|  | Protection of “Weathering” Steel Girders |  |  |  |
| 4.11 | Did the Contractor exercise utmost care and protection to prevent marking or staining of the girders? |  |  |  |
| 4.11 | Were all joints between deck formwork and steel members (including interior girders, and diaphragms) sealed to prevent leakage of cement paste or concrete? |  |  |  |
| 4.11 | Did the Contractor clean off, wash and sandblast any contaminated girder areas to the satisfaction of the Inspector, and in the case of an exterior girder becoming stained, did the Contractor lightly sandblast and “weather” the entire exterior face of the girder line so that uniformity of girder colour was achieved? |  |  |  |
|  | Protection of Concrete Work and Bridge Components from Staining |  |  |  |
| 4.12 | Did the Contractor take precautions to protect all concrete bridge elements from staining? |  |  |  |
| 4.12 | Was any staining of concrete bridge elements removed satisfactorily? |  |  |  |
|  | Removal of Falsework, Forms and Housing |  |  |  |
| 4.13 | Was the Contractor’s proposed timing of formwork, support, or hoarding removal reviewed and accepted by the Project Manager? |  |  |  |
| 4.13 | Was all formwork removed from the completed structure? |  |  |  |
|  | Handling and Placing Concrete |  |  |  |
| 4.14.1 | Did the Contractor give a minimum of 2 days advance notice for a concrete pour date or a change to a pour date? |  |  |  |
| 4.14.1 | Was all equipment used in mixing, conveying, placing and compacting the concrete accepted by the Project Manager prior to its use? |  |  |  |
| 4.14.1 | Was all the necessary equipment for any particular placement proven to be in working condition before the placement commenced, with backup equipment on site? |  |  |  |
| 4.14.1 | Was all extraneous matter like sawdust, wood chips and other construction debris removed from the interior of forms prior to placing concrete? |  |  |  |
| 4.14.1 | Was concrete placed so as to avoid segregation of the materials and the displacement of the reinforcement? |  |  |  |
| 4.14.1 | Was concrete deposited by concrete pump, metal or plastic chute or other acceptable means when it otherwise would have been dropped by more than 1 metre? |  |  |  |
| 4.14.1 | Was concrete deposited in the forms in the order indicated on the Drawings? |  |  |  |
| 4.14.1 | Was each portion between construction joints placed in one continuous operation? |  |  |  |
| 4.14.1 | Was acceptance provided by the Project Manager before working off of or transporting directly over concrete that was previously placed? |  |  |  |
| 4.14.2 | Was concrete consolidation done internally by mechanical vibration? |  |  |  |
| 4.14.2 | Were vibrators of an acceptable type and design? |  |  |  |
| 4.14.2 | Did the Contractor provide a sufficient number of vibrators to properly compact each batch immediately after placing? |  |  |  |
| 4.14.2 | Were vibrators manipulated so as to thoroughly work the concrete around the reinforcement and embedded fixtures and into the corners and angles of the forms applying vibration at the point of deposit and in the area of freshly deposited concrete? |  |  |  |
| 4.14.2 | Were the vibrators inserted vertically and withdrawn out of the concrete slowly with application of vibrators at points uniformly spaced and not farther apart than the radius over which the vibration was visibly effective? |  |  |  |
| 4.14.2 | Was vibration supplemented by spading as necessary to ensure smooth and dense concrete along form surfaces and in corners? |  |  |  |
| 4.14.2 | Did the Contractor avoid disturbing concrete after vibration? |  |  |  |
| 4.14.3 | Was all accumulation of concrete and concrete paste removed prior to becoming set? |  |  |  |
| 4.14.3 | Was concrete placed while fresh and before it had taken its initial set? |  |  |  |
| 4.14.3 | Was jarring, straining, or impacting projecting reinforcing steel avoided after the initial set of the concrete? |  |  |  |
| 4.14.3 | Did the Contractor take the necessary steps to prevent free water build-up in the event of unexpected rainfall or similar occurrences? |  |  |  |
| 4.14.3 | Was water used to clean equipment discharged clear of the structure and water crossing? |  |  |  |
| 4.14.4 | Did the pump produce a continuous flow of concrete without air pockets? |  |  |  |
|  | Handling and Placing Deck and Deck Overlay Concrete |  |  |  |
| 4.16.1 | Did the Contractor’s project manager and field superintendent attend a pre-construction meeting prior to commencement of any site Work? |  |  |  |
| 4.16.1 | Did concrete placing occur when the air temperature was between 5°C and 25°C, and not during detrimental conditions? |  |  |  |
| 4.16.1 | Was concrete placed between the hours of 6:00 pm and 10:00 am of the following day, unless otherwise reviewed and accepted by the Department and Project Manager? |  |  |  |
| 4.16.1 | Was concrete placed when the evaporation rate was less than 0.5 kg/m2/hr as determined using Figure D.1 of CSA A23.1 – Annex D? |  |  |  |
| 4.16.1 | Was acceptable lighting provided for night pours? |  |  |  |
| 4.16.1 | Was the temperature of the concrete during discharge between 10°C and 20°C? |  |  |  |
| 4.16.1,  4.2 | Were substrate surfaces brought to a saturated surface dry condition with clean water, and were substrate surfaces free of standing water during concrete placement? |  |  |  |
| 4.16.1 | Was screeding for all deck concrete and deck overlay concrete completed using a placing/finishing machine acceptable to the Department?  - Terex Bidwell Models: 2450, 3600, 4800;  - Gomaco Models C450 and C750 or  - Allen Models: 4836 B, 6036 B, 6048 B. |  |  |  |
| 4.16.1 | Did the Contractor provide 2 work bridges, separate from the placing/finishing machine with adequate length to completely span the width of the pour? |  |  |  |
| 4.16.2 | Were acceptable steel screed guide rails installed to suit the profile of the required surface, to ensure a smooth and continuous surface from end to end of the bridge, located outside of the finished surface of the pour, and extending beyond the end of the bridge to accommodate finishing of the entire concrete surface with the deck finishing machine? |  |  |  |
| 4.16.3 | Was the finishing machine set up to match the skew angle of the bridge (when the skew angle exceeds 15°), and were the finishing machine and guide rails adjusted so that the height of the screed finished the concrete to the design gradeline and crown? |  |  |  |
| 4.16.3 | Did the Contractor pre-load a test section of the cantilevered formwork on each side of the bridge to determine deflections that will occur during concrete placement? Were the formwork, machine and/or screed rails adjusted to compensate for the expected formwork deflection? |  |  |  |
| 4.16.3 | Was the screed dry-run prior to the pour to confirm the adjustment of the machine and guiderails, with clearance measurements taken at each of the girder points corresponding to the camber diagram? |  |  |  |
| 4.16.3 | Was re-setting of the machine and/or screed rails done as necessary to obtain an acceptable dry-run? |  |  |  |
| 4.16.3 | Were dry-run measurements reviewed and accepted by the Project Manager? |  |  |  |
| 4.16.4 | Was concrete placed as close as practical ahead of the finishing machine and at no time more than 6 m in front of the trailing end of the finishing machine’s roller? |  |  |  |
| 4.16.4 | Did the screed move slowly and at a uniform rate maintaining a roll of concrete along the entire front of the screed to ensure the filling and consolidation of the concrete surface? |  |  |  |
| 4.16.4 | Did the Contractor ensure that the required concrete thickness was being placed by continually probing the concrete behind the finishing machine? |  |  |  |
| 4.16.4 | Were no more than 2 passes of the screed needed for completion, and was finishing done from work bridges? |  |  |  |
| 4.16.5 | Was the concrete surface behind the finishing machine manually bull floated with a magnesium bull float? Was the surface free from open texturing, plucked aggregate and local projections or depressions? |  |  |  |
| 4.16.5 | Was bull floating and surface texturing done as close as practically possible behind the screed? |  |  |  |
| 4.16.5 | Was the surface such that, when checked with a 3 m long straight edge placed anywhere in any direction on the surface (except across the crown), there were no gaps greater than 3 mm between the bottom of the straight edge and the surface of the deck concrete? Did the Contractor make corrections to any concrete surfaces that did not meet the surface tolerances described in Section 4.16.6 while the concrete was still plastic and before curing procedures were implemented? |  |  |  |
| 4.16.6 | Did the finished surface of the concrete conform to the design gradeline profiles as indicated on the Drawings and/or as determined on site? |  |  |  |
| 4.16.6 | Was the surface free from open texturing, plucked aggregate and local projections? |  |  |  |
| 4.16.6 | Were any areas higher than 3 mm but lower than 10 mm ground down to the reviewed and accepted surface elevation? |  |  |  |
| 4.16.6 | Were any areas with greater than 10 mm deviation from the reviewed and accepted surface elevation repaired in accordance with specification requirements? |  |  |  |
| 4.16.6 | Did the Project Manager and Department review and accept the Contractor’s proposed repair procedure for any corrective work prior to commencing repairs? |  |  |  |
|  | Concreting Shear Keys and Diaphragms |  |  |  |
| 4.18 | Was formwork for shear keys and diaphragms designed to accommodate variations in girder dimensions, positioning, alignment, camber and sweep? |  |  |  |
| 4.18 | Were girder keyways and diaphragms brought to a saturated surface dry condition prior to concrete placement with saturation not less than 30 minutes prior to blowing free of standing water? |  |  |  |
| 4.18 | Was concrete placed in the keyways adequately consolidated and finished smooth and level with the top surfaces of the girders? |  |  |  |
| 4.18 | Immediately after finishing, were two layers of clean Nilex 4504 white coloured filter fabric or an approved equivalent placed on the shear keys and kept continuously wet for 72 hours? |  |  |  |
|  | Construction Joints |  |  |  |
| 4.20.1 | Were proposed construction joint locations, other than where indicated on the Drawings or shown in the pouring schedule, accepted by the Project Manager? |  |  |  |
| 4.20.1 | Were construction joints, where not detailed on the Drawings or in the case of emergency, installed in accordance with Standard Drawings S1412 or as determined by the Project Manager? |  |  |  |
| 4.20.1 | Were construction joints located to allow a minimum of 60 mm concrete cover to reinforcing steel running parallel to the joint? |  |  |  |
| 4.20.2 | Were the forms retightened and was the surface of the hardened concrete thoroughly cleaned and saturated with water, with all free standing water removed, before depositing new concrete? |  |  |  |
| 4.20.2 | Was the placing of concrete carried out continuously from joint to joint and the face edges of all exposed joints carefully finished true to line and elevation? |  |  |  |
|  | Concreting in Cold Weather |  |  |  |
| 4.21 | Did the Project Manager review and accept the Contractor’s proposed cold weather concreting plan? |  |  |  |
| 4.21 | Was all aggregate and mixing water heated to a temperature of at least 20°C but not more than 65°C? |  |  |  |
| 4.21,  4.4.3,  4.4.4 | Was the temperature of the concrete in accordance with the specification requirements at the time of placing in the forms, or, in the case of mass pours, did the Contractor follow the temperature requirements? |  |  |  |
| 4.21 | Did the Contractor enclose the structure in such a way that the concrete and air within the enclosure was kept above 15°C during the protection period of 17 days after placing the concrete? |  |  |  |
| 4.21 | Was the enclosure large enough to comfortably accommodate the men and equipment necessary to place, finish and cure the concrete? |  |  |  |
| 4.21 | Was the underside of the deck suitably protected? |  |  |  |
| 4.21 | Was the relative humidity within the enclosure maintained at not less than 85%? |  |  |  |
| 4.21 | Were heaters kept well clear of the formwork housing, and was adequate ventilation provided for combustion and prevention of carbon dioxide accumulation? |  |  |  |
| 4.21 | Was adequate pre-heat provided to raise the temperature of formwork, reinforcing steel, previously-placed concrete and/or soil to between 10°C and 20°C before placing concrete? |  |  |  |
| 4.21,  4.23 | Was concrete curing in accordance with the specification requirements? |  |  |  |
| 4.21.6 | Was the adequacy of protection monitored and recorded? |  |  |  |
| 4.21.7 | Was protection and heating, where used, withdrawn so as not to induce thermal shock stresses in the concrete? |  |  |  |
| 4.21 | Did the Contractor measure the temperature of internal concrete, surface of the concrete and ambient air temperatures a minimum of every four (4) hours, and make adjustments as necessary to keep the rate of cooling within the specified parameters? |  |  |  |
|  | Curing Concrete |  |  |  |
| 4.23.1 | Was freshly deposited concrete protected from freezing, abnormally high temperatures or temperature differentials, premature drying, water damage or moisture loss during the curing period? |  |  |  |
| 4.23.3 | Did the Project Manager review and accept the Contractor’s proposed curing procedures prior to the scheduled pour date, including a description of equipment, materials and work methods/techniques? |  |  |  |
| 4.23.3 | Did the Contractor provide protection to ensure that the temperature of the centre of the in-situ concrete did not fall below 10°C or exceed 70°C and the temperature difference between the centre and the surface did not exceed 20°C, as per the requirements of Table 21 of CSA A23.1? |  |  |  |
| 4.23.3 | Did the Contractor supply and install two thermocouples, one in the centre and one at the surface of the concrete, for every 100 m2 of deck? |  |  |  |
| 4.23.3 | Did the Contractor monitor and record the temperatures every 4 hours for the first 72 hours after concrete placement and every 8 hours thereafter for the specified cure period and until 24 hours after the maximum temperature has occurred? |  |  |  |
| 4.23.3 | Did the Project Manager review and accept the daily temperature records? |  |  |  |
| 4.23.3 | Immediately after final bull floating and/or surface texturing, was an evaporation reducer applied by a hand sprayer with a misting nozzle at the manufacturer’s recommended concentration and application rate? |  |  |  |
| 4.23.3 | Was concrete wet cured with 2 layers of Nilex 4504 white filter fabric or an approved equivalent placed on the concrete surface as soon as the surface would not be marred by its installation, and was the fabric pre-wet or a fine spray of clean water applied during its placement such that fabric fibres would not bond to the concrete surface? |  |  |  |
| 4.23.3 | Was the filter fabric in a continuously wet condition throughout the curing period by means of soaker hoses or other means? |  |  |  |
| 4.23.3 | Was curing with filter fabric and water maintained for 14 days for new bridge construction or 7 days for rehabilitation projects? |  |  |  |
| 4.23.3 | In cold weather, was curing with filter fabric and water maintained for a minimum of 14 days, followed by 3 days of air drying for both rehabilitation and new bridge construction projects? |  |  |  |
| 4.23.3 | Was curb/barrier formwork removed no later than 72 hours after concrete placement and did wet curing of commence immediately after formwork removal? |  |  |  |
| 4.23.3 | For locations where formwork was removed prior to the completion of the specified curing period, were the resulting exposed concrete surfaces wet cured for the remaining days? |  |  |  |
| 4.23.3 | Was curing acceptable for all surfaces during the curing period? |  |  |  |
|  | Repairing Concrete Defects |  |  |  |
| 4.24 | Were defects such as honeycomb, cavities, spalls, chips, cracking and other casting or construction defects immediately reported to the Inspector? |  |  |  |
| 4.24 | If concrete defects were identified, were repair procedures reviewed and accepted by the Project Manager prior to the commencement of the repairs? |  |  |  |
| 4.24 | Did the Contractor carry out repairs in strict accordance with the repair procedure reviewed and accepted by the Project Manager? |  |  |  |
| 4.24.1 | Were concrete elements where formwork misalignments exceeded the allowable tolerances removed and recast? |  |  |  |
| 4.24.2 | Was the deck concrete jointly inspected with the Contractor to identify all cracks after the curing period and before opening to traffic? |  |  |  |
| 4.24.2 | Were the width and length of cracks plotted and reported to the Department? |  |  |  |
| 4.24.2 | Were cracks with widths greater than or equal to 0.2 mm identified for repair prior to issuance of the construction completion certificate? |  |  |  |
| 4.24.2 | Was a gravity fed crack filling repair method completed for cracks that did not extend the full depth of the deck, barriers/curbs or cracks extending partial depth of decks cast to grade? |  |  |  |
| 4.24.2 | Was the epoxy crack injection repair method used for cracks extending the full depth of the deck, barriers/curbs, cracks extending partial depth of decks cast to grade, or cracks identified in all other classes of concrete? |  |  |  |
| 4.24.2 | Did epoxy resins meet the specified requirements based on the crack filling repair method and did the Project Manager review and accept the Contractor’s injection procedure? |  |  |  |
|  | Concrete Surface Finish |  |  |  |
| 4.25.1 | Were surface finishes completed on all exposed concrete surfaces to 600 mm below grade or, in the case of river piers, 600 mm below lowest water level? |  |  |  |
| 4.25.1 | Were wood or magnesium tools of an acceptable type and quality used? |  |  |  |
| 4.21 | Was concrete surface finishing completed when the concrete surface was a minimum of 5ºC? |  |  |  |
|  | Class 1 Ordinary Surface Finish |  |  |  |
| 4.25.2.1 | Unformed surfaces - was concrete screeded to conform to the required surface elevations, then floated to ensure that the surface was free from open texturing, plucked aggregate and local projections or depressions? |  |  |  |
| 4.25.2.2 | Formed surfaces - were all fins and irregular projections removed from all surfaces immediately following the removal of forms? |  |  |  |
| 4.25.2.2 | Were cavities produced by form ties, all other holes, honeycomb areas, broken corners or edges and other defects thoroughly chipped out, cleaned and filled with an approved concrete patching material listed on the Department’s Product List and placed in accordance with the manufacturer’s published product data sheet? |  |  |  |
| 4.25.2.2 | Were all repairs wet cured for a minimum of 72 hours? |  |  |  |
|  | Class 2 Rubbed Surface Finish |  |  |  |
| 4.25.3,  4.21.1 | Were all concrete fins and irregular projections removed and surfaces inspected for compliance immediately following the removal of forms? |  |  |  |
| 4.25.3 | Were all concrete surfaces, except watercourse piers, brush abrasive blasted to thoroughly expose surface voids in preparation for surface finishing? |  |  |  |
| 4.25.3 | Were all watercourse pier concrete surfaces ground with diamond grinding wheels or similar tools to thoroughly expose surface voids in preparation for surface finishing? |  |  |  |
| 4.25.3 | Were surface voids greater than 19 mm diameter but less than 0.05 m2 in area or 30 mm deep filled with an approved concrete patching material listed on the Department’s Product list in the OH-V category and placed in accordance with the manufacturer’s published product data sheet? |  |  |  |
| 4.25.3 | Were surface voids less than 19 mm in diameter but less than 0.05 m2 in area and less than or equal to 30 mm deep filled with a pre-bagged sack rub material? |  |  |  |
| 4.25.3 | Were sack rub materials placed over the entire prepared surface in accordance with the manufacturer’s recommendations and wet cured for a minimum of 72 hours? |  |  |  |
| 4.25.3 | When the patching and sack rub materials were adequately cured, was a carborundum stone or approved equivalent method used to finish the surface to a smooth, uniform and closed texture? |  |  |  |
| 4.25.3 | Were all prepared surfaces, including all patching and sack rubbing, uniform in colour and texture, and did the Contractor apply sealer as required? |  |  |  |
|  | Class 3 Bonded Concrete Surface Finish |  |  |  |
| 4.25.4 | Was the colour reviewed and accepted by the Department and Project Manager prior to application of the coating? |  |  |  |
| 4.25.4 | Was initial surface preparation completed as specified for a Class 2 Rubbed Surface Finish with the exception that uniformity of color was not required? |  |  |  |
| 4.25.4 | Was the concrete surface pressure washed to remove all dust, dirt, laitance and all other bond breaking materials? |  |  |  |
| 4.25.4 | Did the concrete surface dry for a minimum of 24 hours before application of pigmented sealer? |  |  |  |
| 4.25.4 | After the surface dried, did the Contractor apply an approved pigmented concrete sealer meeting the requirements for a Type 3 sealer of the Material Testing Specifications for Concrete Sealers – B388 and in accordance with the manufacturer’s specifications? |  |  |  |
| 4.25.4 | Were a minimum of 2 coats of pigmented sealer applied? |  |  |  |
| 4.25.4 | If spray application was used, was the surface back rolled with no colour variation visible? Did the color match the previously sealed adjoining surfaces? |  |  |  |
|  | Class 4 Floated Surface Finish |  |  |  |
| 4.25.5 | Unless otherwise noted on the Drawings, were concrete surfaces receiving a waterproofing membrane and a final wearing surface manually bull floated as necessary to provide a smooth surface? |  |  |  |
|  | Class 5 Floated Surface Finish, Broomed Texture |  |  |  |
| 4.25.6 | Was the concrete surface floated as necessary to produce a smooth surface with no more than a 3 mm variance, under a 3 m long straightedge? |  |  |  |
| 4.25.6 | After the concrete had set sufficiently, was the surface given a transversely broomed finish using a coarse broom to produce regular corrugations to a maximum depth of 2 mm? |  |  |  |
| 4.25.6 | Was an edging tool used at all edges and expansion joints and, where indicated on the Drawings, were median and sidewalk control joints installed with a bronze grooving tool to a depth of at least one quarter of the slab thickness? |  |  |  |
|  | Class 6 Floated Surface Finish, Surface Textured |  |  |  |
| 4.25.7 | After manual bull floating, was the concrete given a texture with a “flat wire” texture broom having a single row of tines, and was the textured surface uniform and consistent? |  |  |  |
| 4.25.7 | Did grooving widths and depths meet the specified requirements? |  |  |  |
| 4.25.7 | Following texturing, was a 300 mm width adjacent to the curb, barrier or median trowelled smooth with the surface left closed? |  |  |  |
|  | Surface Finish under Baseplates |  |  |  |
| 4.25.9 | Were the concrete surfaces of grout pad recesses bush hammered to a depth of 3 mm including all air voids prior to the installation of bridgerail post? |  |  |  |
|  | Type 1c Sealer |  |  |  |
| 4.26 | Was an approved Type 1c sealer selected from the Alberta Transportation Products list applied to all concrete surfaces that received a Class 2, Class 5 and Class 6 surface finish, including all concrete surfaces to 600 mm below grade or in the case of river piers 600 mm below lowest water level? |  |  |  |
| 4.26 | Was sealer purposely not applied to surfaces receiving waterproofing membrane, underside of bridge decks, concrete diaphragms in the interior bay areas? |  |  |  |
| 4.26 | Was the sealer applied in accordance with the manufacturer's recommendations, except for a 30% application rate increased from that indicated on the Department’s Product List? |  |  |  |
| 4.26 | Was the substrate temperature at least 5°C prior to application of sealer? |  |  |  |
| 4.26 | Before applying the sealer had the concrete cured for at least 28 days? |  |  |  |
| 4.26 | Was the surface dried and air blasted to remove all dust, and accepted by the Inspector prior to application of sealer? |  |  |  |
| 4.26 | Did the Contractor measure volumes of sealer based on the concrete surface area using a minimum of 2 coats? |  |  |  |
| 4.26 | Were asphalt concrete pavement surfaces and other elements adequately protected from overspray and runoff during sealer application? |  |  |  |

**Details and Summary:**

Date

Signature

1. Reinforcing Steel Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, fabrication, handling and placing of plain reinforcing steel, epoxy coated reinforcing steel, corrosion resistant reinforcing steel (CRR), and stainless reinforcing steel. No substitution of bars or changes to bar details are permitted without the review and acceptance of the Project Manager.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
| 5.2 | Materials |  |  |  |
| 5.2.1 | Was all plain reinforcing steel Grade 400, and did it meet the requirements of CSA Standard G30.18M? |  |  |  |
| 5.2.3 | Was corrosion resistant reinforcing steel (CRR) either low carbon/chromium reinforcing steel or stainless reinforcing steel? |  |  |  |
| 5.2.3 | If low carbon/chromium reinforcing steel was used, did it meet the requirements of ASTM A1035? |  |  |  |
| 5.2.3 | Unless otherwise specified, was only one type of CRR used throughout the project? |  |  |  |
| 5.2.4 | Was stainless reinforcing steel S31653, S31803, or S32304 as defined by the Unified Numbering System (UNS)? |  |  |  |
| 5.2.4 | Did the stainless reinforcing steel meet the requirements of ASTM A276 and ASTM A955/A955M (including Annex 1.2 or 1.3)? |  |  |  |
| 5.2.4 | Did austenitic grades meet the requirements of ASTM A262, Practice E and did Duplex grades meet the requirements of ASTM A1084, Method C by demonstrating no presence of detrimental phases? |  |  |  |
| 5.2.4 | Was all mill scale and surface oxidation from stainless reinforcing removed by shotblasting and pickling at the production mill? |  |  |  |
| 5.2.4 | Unless otherwise specified, was only one type of stainless reinforcing steel supplied for use throughout the project? |  |  |  |
| 5.2.5 | Did plain and deformed welded wire reinforcement meet the requirements of ASTM A1064? Grade 70 (Fy = 485 MPa) with a minimum yield strength of 485 MPa based on 0.2% offset? |  |  |  |
| 5.3 | Manufacture |  |  |  |
| 5.3 | Were mill test reports legible and in English? |  |  |  |
| 5.3 | Were mill test reports for each heat number submitted at least 2 weeks prior to shipping to site? |  |  |  |
| 5.3 | Were the mill test reports authenticated by the manufacturer and did they include the following information: heat number, date, and location of production, compliance with production standards, chemical analysis, mechanical properties, and pickling process details for stainless reinforcing steel? |  |  |  |
| 5.3 | Did the materials originate outside Canada or the USA? If so, did the Contractor have the mill test reports verified by a certified laboratory in Canada in accordance with specification requirements? |  |  |  |
|  | Fabrication |  |  |  |
| 5.4 | Were hooks and bends fabricated using the pin diameters and dimensions recommended by the Reinforcing Steel Institute of Canada (RSIC) Manual of Standard Practice? |  |  |  |
| 5.4 | Were all bars bent at the fabrication facility? |  |  |  |
| 5.4 | Were bars cut by shearing or with fluid cooled saws (torch cutting is not permitted)? |  |  |  |
| 5.4 | Were stainless reinforcing steel bar surfaces free from contamination from deposits of iron or other non stainless steels? |  |  |  |
| 5.4 | Were stainless reinforcing steel bars free from damage due to straightening from coils or from fabrication bending processes? |  |  |  |
| 5.4 | Were all reinforcing steel bars free from laminations or burrs? |  |  |  |
| 5.5 | Shipping, Handling, and Storage |  |  |  |
| 5.5 | Was reinforcing steel covered and protected at all times during transportation? |  |  |  |
| 5.5 | Were stainless steel reinforcing bar bundles covered with polyethylene wrap? |  |  |  |
| 5.5 | Was lifting of stainless steel reinforcing done with nylon strapping? |  |  |  |
| 5.5 | Were equipment contact points used in the handling of stainless reinforcing steel covered with stainless steel, nylon, or steel of a minimum 35 Rockwell hardness? |  |  |  |
| 5.5 | Was reinforcing steel of differing material types stored separately? |  |  |  |
| 5.5 | Did bar tags identifying the material type remain visible and intact until installation of the material? |  |  |  |
| 5.5 | Was all reinforcing steel stored on platforms, skids, or other suitable means of support to keep the material above the ground surface? |  |  |  |
| 5.5 | Was CRR or stainless steel reinforcing steel covered if storage exceeded 120 days? |  |  |  |
| 5.3 | Did all reinforcing steel bundles have tags and markings that matched the accepted mill test certificates? |  |  |  |
| 5.4 | Did the bars conform accurately to the dimensions shown on the Drawings, and were they within the fabricating tolerances detailed in the RSIC Manual of Standard Practice? |  |  |  |
| 5.5 | Were stored bundles adequately protected? |  |  |  |
| 5.5 | Were bundles unloaded separately to prevent bar-to-bar abrasion? |  |  |  |
| 5.5 | Did bars exhibit laminations, burrs, or damage to deformations from fabrication or handling operations? |  |  |  |
| 5.9 | Did bars exhibit staining, discolouration, corrosion, iron contamination (for stainless bars) or any other foreign contamination? |  |  |  |
|  | **Placing** |  |  |  |
| 5.6 | Did bar counts comply with Drawings? |  |  |  |
| 5.6 | Did bar sizes and lengths comply with Drawings? |  |  |  |
| 5.6 | Was reinforcing steel free from all loose rust, scale, dirt, paint, oil, concrete, concrete paste and other foreign materials? |  |  |  |
| 5.6 | Were bars placed accurately? |  |  |  |
| 5.6 | Were bars tied securely at the specific spacing and with the appropriate tie wire? |  |  |  |
| 5.6 | Were support chairs seated firmly against forms? |  |  |  |
| 5.6.1 | Were support chairs of adequate strength, frequency and correct type used? |  |  |  |
| 5.6.1 | Were plastic bolster slab type support chairs Aztec Strong Back Slab / Beam Bolster manufactured by Dayton Superior or an equivalent acceptable to the Department? |  |  |  |
| 5.6.1 | Did concrete support chairs have equivalent properties to the concrete in which they would be embedded? |  |  |  |
| 5.6.2 | Were any bars specified to be field cut or bent, and if so were these bars cut and bent in a manner acceptable to the Project Manager? |  |  |  |
| 5.6.3 | Did placement of reinforcing steel conform to the appropriate tolerances for cover and positioning? |  |  |  |
| 5.7 | Did lapped splice lengths comply with Drawings? |  |  |  |
| 5.7 | Were splices staggered? |  |  |  |
| 5.9 | Did the Contractor replace or repair stainless steel reinforcing bars that were contaminated by grinding or cutting slag? |  |  |  |
| 5.8 | Were all damaged areas of epoxy coating repaired or replaced? |  |  |  |
| 5.6 | Were all non-compliant conditions rectified prior to concrete placement? |  |  |  |
|  | Post-pour Inspection |  |  |  |
| 5.6 | Was concrete cover as specified? |  |  |  |
| 5.6 | Was concrete paste removed from projecting bars? |  |  |  |
| 5.7 | Did bars meet the necessary projection requirements? |  |  |  |

**Details and Summary:**

Date

Signature

1. Structural Steel Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, fabrication, delivery and erection of structural steel. Structural steel includes steel girders, trusses, diaphragms, bracing, fasteners, splice plates, deck drains, anchor rods, dowels, deck joint assemblies, buffer angles, connector angles, anchor rod sleeves, curb, barrier, and median cover plates, trough plates, pier nose plates, steel caps, capitals, pier bracing, miscellaneous components and associated materials.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Supply and Fabrication |  |  |  |
| 6.2.2 | Did the Contractor notify the Department and Project Manager of any subcontractors (fabricators) in his employ? |  |  |  |
| 6.2.2 | Did the fabricator possess the specified qualifications? |  |  |  |
| 6.2.3.3 | Were the shop drawings submitted in electronic unlocked PDF format and did they include the Department’s shop drawing identification block and have a sufficient blank space for the Project Manager’s review stamp? |  |  |  |
| 6.2.3 | Were shop drawings, mill test reports, weld procedures and welder qualifications reviewed and accepted by the Project Manager? |  |  |  |
| 6.2 | Was a pre-fabrication meeting held after the shop drawings, mill test reports, weld procedures and welder qualifications were reviewed and accepted by the Project Manager and prior to the commencement of any fabrication? |  |  |  |
| 6.2.8.14 | Did the Contractor notify the Project Manger 72 hours prior to shipment to facilitate final fabrication inspection and acceptance? |  |  |  |
|  | Transportation, Handling, and Storage |  |  |  |
| 6.3.1 | Were the girders transported with webs in the vertical position? |  |  |  |
| 6.3.1 | If girders were not transported in the vertical position, did the Project Manager review and accept the Contractor’s girder transportation assessment? |  |  |  |
| 6.3.1 | Was structural steel protected from dirt, road salts, slush, and other contaminants during transportation? |  |  |  |
| 6.3.1 | Upon arrival to site and prior to erection, did the Contractor inspect all components in presence of the Inspector to verify that all components had no damage? |  |  |  |
| 6.3.1 | If damage of structural steel was noted, did the Contractor provide an engineering assessment report? |  |  |  |
| 6.3.1 | Was structural steel stored upright, shored on timber blocking, and kept clean? Was the storage area properly drained? |  |  |  |
| 6.3.1 | Were deck joint assemblies supported on sufficiently spaced timber blocking to prevent damage from deflection? |  |  |  |
| 6.3.1,  12.2 | Was galvanized material handled and stored in accordance with the specification requirements? |  |  |  |
|  | Girder Erection |  |  |  |
| 6.3.2 | Were the substructure elements surveyed prior to development of the girder erection procedure? |  |  |  |
| 6.3.2 | Did the Project Manager review and accept the Contractor’s detailed girder erection procedure? |  |  |  |
| 6.3.2.2 | Did the Contractor's project manager, field superintendent, and representatives directly involved in the supervision of the work attend a construction milestone meeting prior to commencement of the Work? |  |  |  |
| 6.3 | Was the substructure concrete cured for a minimum of 3 days and did it achieve 80% of the 28 day specified concrete strength prior to girder erection? |  |  |  |
| 6.3.2.2 | Did the Project Manager review and accept the Contractor’s traffic accommodation strategy and was it acceptably implemented? |  |  |  |
| 6.3.2.2 | Were all aspects of the Contractor’s girder erection procedure followed during the Work? |  |  |  |
| 6.3.2.3 | Did the Project Manager review and accept the Contractor’s fall protection and a safe work procedure? |  |  |  |
|  | Bolted Connections |  |  |  |
| 6.3.2.5 | Were faying surfaces cleaned before the members were assembled? |  |  |  |
| 6.3.2.5 | Did splices and field connections have 1/2 of the holes filled with bolts and cylindrical erection pins before bolting? |  |  |  |
| 6.3.2.6 | Were bolts in exterior girders installed with the heads on the outside face of the girder webs and on the bottom faces of lower flanges? |  |  |  |
| 6.3.2.6 | For bolts that were partially embedded in concrete, were the nuts located on the side of the member that was encased in concrete? |  |  |  |
| 6.3.2.6 | Were connections assembled with a hardened washer under the bolt head or nut (whichever element is turned during tightening)? |  |  |  |
| 6.3.2.6 | Were surfaces of bolted parts in contact with the bolt head and nut parallel? |  |  |  |
| 6.3.2.6 | Was the smooth side of hardened washers placed against structural steel? |  |  |  |
| 6.3.2.6 | Were bevelled washers used for sloped surfaces, and were all bolts of new quality stored in weatherproof containers to prevent loss of lubrication or accumulation of dirt? |  |  |  |
| 6.3.2.6 | Were all girder elevations and alignments checked, reviewed and accepted by the Inspector prior to any bolt tightening? |  |  |  |
| 6.3.2.6 | Were enough bolts brought to a “snug tight” condition to ensure that the parts of the joint were brought into full contact with each other? |  |  |  |
| 6.3.2.6 | Were bolts marked in accordance with Figure 6-1 after the “snug tight” condition? |  |  |  |
| 6.3.2.6 | Was tightening completed to the specified nut rotation as shown in Table 6-1 – Bolt Tension? |  |  |  |
| 6.3.2.6 | Was bolt tension verified in accordance with the specification requirements? |  |  |  |
| 6.3.2.6.5 | Were wrenches calibrated at least once each working day with equipment acceptable to the Project Manager? |  |  |  |
| 6.3.2.6 | Were high strength bolts tensioned only once and not reused? |  |  |  |
| 6.3.2.7 | If misfit repairs were required, were they immediately reported to the Department and the Inspector, and did the Project Manager review and accept the Contractor’s repair procedure? |  |  |  |
|  | Strip Seal, Cover Plated V-Seal and Finger Plate Deck Joints |  |  |  |
| 6.2.8.16 | Were the specified gap tolerances of finger plate and cover plated v-seal deck joints measured and recorded at specified inspection hold points? |  |  |  |
| 6.3 | Were the deck joint gaps set according to the installation requirements noted on the Drawings and Standard Drawings? |  |  |  |
| 6.3 | Was the girder temperatures and thermal behavior of the bridge monitored and documented in advance of scheduled concrete placement for deck joint blockout concrete as required by the Standard Drawing? |  |  |  |
| 6.3 | Was the Contractor’s proposed timing for deck joint blockout concrete placement reviewed and accepted by the Project Manager? |  |  |  |
| 6.3 | Did the deck side of the joint blockout concrete placement occur at the time when the bridge had fully contracted and begun to expand? |  |  |  |
| 6.3 | Did the Contractor comply with the Drawing and Standard Drawing installation procedure requirements? |  |  |  |
| 6.4 | After strip seals and v-seals have been installed, were they tested by the Contractor for leakage in the presence of the Inspector? |  |  |  |
| 6.4 | Did the Contractor provide a five year written warranty to the Project Manager for the performance of the deck joint assemblies? |  |  |  |

**Details and Summary:**

Date

Signature

1. Precast Concrete Units Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, delivery, erection, and post-tensioning of precast concrete units. The terms ‘unit’ and ‘girder’ are interchangeable throughout this inspection check sheet.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Precast Concrete Girder Erection |  |  |  |
| 7.2.2 | Did the Contractor notify the Department and Project Manager of any subcontractors (fabricators) in his employ? |  |  |  |
| 7.2.2 | Did the fabricator possess the specified qualifications? |  |  |  |
| 7.2.3.1 | Were the shop drawings submitted in electronic unlocked PDF format and did they include the Department’s shop drawing identification block and have a sufficient blank space for the Project Manager’s review stamp? |  |  |  |
| 7.2.3.2 | Were shop drawings, concrete mix design, design notes, and independent check notes of stressing calculations reviewed and accepted by the Project Manager? |  |  |  |
| 7.2 | Was a pre-fabrication meeting held after the shop drawings, concrete mix design, design notes, and independent check notes of stressing calculations were reviewed and accepted by the Project Manager and prior to the commencement of any fabrication? |  |  |  |
| 7.2.6.7 | Did the Contractor notify the Project Manger 72 hours prior to shipment to facilitate final fabrication inspection and acceptance? |  |  |  |
|  | Transportation, Handling and Storing Materials |  |  |  |
| 7.3.2 | Upon arrival to site and prior to erection, did the Contractor inspect all components in the presence of the Inspector and verify that all components had no damage? |  |  |  |
| 7.3.2 | Were the precast concrete units stored upright, shored on timber blocking, and kept clean? Was the storage area properly drained? |  |  |  |
| 7.3.2 | Were precast concrete units protected from dirt, road salts, slush and other contaminants during transportation? |  |  |  |
|  | Girder Erection |  |  |  |
| 7.3.4 | Were the substructure elements surveyed prior to development of the girder erection procedure? |  |  |  |
| 7.3.4 | Did the Project Manager review and accept the Contractor’s detailed girder erection procedure? |  |  |  |
| 7.3.4 | Did the Contractor's project manager, field superintendent, and representatives directly involved in the supervision of the Work attend a construction milestone meeting prior to commencement of the Work? |  |  |  |
| 7.3.1 | Was the substructure concrete cured for a minimum of 3 days and did it achieve 80% of the 28 day specified concrete strength prior to girder erection? |  |  |  |
| 7.3.4 | Did the Project Manager review and accept the Contractor’s traffic accommodation strategy and was it acceptably implemented? |  |  |  |
| 7.3.4 | Were all aspects of the Contractor’s girder erection procedure checked or in place prior to girder erection and did the Contractor follow his procedure during the Work? |  |  |  |
| 7.3.4 | Were all aspects of the Contractor’s Girder Erection Procedure explicitly followed during the Work? |  |  |  |
| 7.3.5 | Did the Contractor provide 100% fall protection and a safe work procedure designed and certified by an individual who is competent in this specialized work? |  |  |  |
| 7.3.6 | Did the Contractor minimize any differential camber and sweep by providing the necessary temporary attachments to hold the girders in position? |  |  |  |
| 7.3.7 | After the erection of the girders, were all lifting hooks cut off and acceptably filled with an approved patching material? |  |  |  |
|  | Post-Tensioning – General |  |  |  |
| 7.3.8.3 | Did the Contractor or the subcontractor have extensive experience in this work and utilize only fully trained, competent and experienced personnel? |  |  |  |
| 7.3.8.3 | Were the site supervisor’s qualifications reviewed and accepted by the Project Manager? |  |  |  |
| 7.3.8.4 | Did the Project Manager review and accept the Contractor’s mill test reports and stress strain curves for the stressing strand prior to stressing? |  |  |  |
| 7.3.8.4 | Were the design notes, independent check notes, and post-tensioning shop drawings reviewed and accepted by the Project Manager prior to commencement of the Work? |  |  |  |
|  | Post-Tensioning – Stressing |  |  |  |
| 7.3.8.6.1 | Were stressing gauges calibrated in the past six months? |  |  |  |
| 7.3.8.6.1 | Were the stressing forces to be measured within 25% and 75% of the total graduated capacity of the gauge? |  |  |  |
| 7.3.8.7.1 | Did the Contractor demonstrate that all ducts were unobstructed prior to placing post-tensioning tendons? |  |  |  |
| 7.3.8.7.3 | Did the Contractor carry out stressing operations in strict accordance with the girder erection procedure that was reviewed and accepted by the Project Manager? |  |  |  |
| 7.3.8.7.3 | Were stressing tails of post-tensioned tendons kept intact until the recorded gauge pressures and tendon elongations were reviewed and accepted by the Project Manager? |  |  |  |
| 7.3.8.7.3 | Were records of the post-tensioning stressing operations kept for each installed tendon? |  |  |  |
|  | Post-Tensioning – Grouting |  |  |  |
| 7.3.8.5.5 | Was the grout supplied and stored in accordance with specification requirements? |  |  |  |
| 7.3.8.5.1 | Was water-soluble corrosion inhibitor used when the stressing and grouting operations were not completed within 20 calendar days of the installation of the stressing strand? |  |  |  |
| 7.3.8.6.2 | Did the grouting equipment meet the specification requirements? |  |  |  |
| 7.3.8.7.3 | Did the Contractor carry out grouting operations in strict accordance with the girder erection procedure that was reviewed and accepted by the Project Manager? |  |  |  |
| 7.3.8.7.5 | Was all grout sampled and tested in accordance with the specification requirements? |  |  |  |

**Details and Summary:**

Date

Signature

1. Bearings Inspection Check Sheet

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| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, fabrication, delivery and installation of plain and laminated elastomeric bearings, pot bearings and fixed steel plate rocker bearings.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Supply and Fabrication |  |  |  |
| 8.3.2 | Did the Contractor notify the Department and Project Manager of any subcontractors (fabricators) in his employ? |  |  |  |
| 8.3.2 | Did the fabricator possess the specified qualifications? |  |  |  |
| 8.3.3.2 | Were the shop drawings submitted in electronic unlocked PDF format and did they include the Department’s shop drawing identification block and have a sufficient blank space for the Project Manager’s review stamp? |  |  |  |
| 8.3.3 | Were the shop drawings, mill test reports, design notes, independent check notes, and weld procedures reviewed and accepted by the Project Manager? |  |  |  |
| 8.3.6 | Was a pre-fabrication meeting held after the shop drawings, mill test reports, design notes, independent check notes and weld procedures were reviewed and accepted by the Project Manager and prior to the commencement of any fabrication? |  |  |  |
| 8.3.7.5 | Did the Contractor notify the Project Manager 72 hours prior to shipment from fabrication facility to facilitate inspection and acceptance of the bearings? |  |  |  |
|  | Abutment Seat and Pier Cap Inspection |  |  |  |
| 4.25 | Were the top surfaces of concrete sloped so that water did not pond at the bearing locations? |  |  |  |
| 4.25 | Were the bearing pad recesses constructed to the design dimensions and accurately positioned relative to the centre of bearing and bearing alignment? |  |  |  |
| 4.25 | Were the bearing pad recesses level in both the longitudinal and transverse directions and constructed to the correct elevation to achieve the design thickness of grout? |  |  |  |
|  | Concrete Finishing Under Bearings |  |  |  |
| 4.25.8 | Was concrete finished or ground to a smooth and even surface where bearing plates, pads or shims were installed? |  |  |  |
| 4.25.8 | Were air voids at grout-pad recesses filled with an approved patching material a minimum of seven days in advance of girder erection? |  |  |  |
| 4.25.8 | In cold weather conditions, was this work completed while the substrate concrete was at or above 5ºC? |  |  |  |
| 4.25.8 | If the filling of air voids did not occur while the substrate concrete was at or above 5ºC, was it completed in accordance with the requirements for concreting in cold weather? |  |  |  |
|  | Installation |  |  |  |
| 8.4.1 | Did the Project Manager review and accept the Contractor’s bearing installation procedure prior to the scheduled start of installation? |  |  |  |
| 8.4.2 | Were bearings set on the finished concrete surface, level in their specified position, and have full and even bearing? |  |  |  |
| 8.4.2 | Were tapered sole plates orientated in accordance with the Drawings? |  |  |  |
| 8.4.2 | Were expansion bearings set in the specified position based on girder temperatures? |  |  |  |
| 8.4.2 | Did the galvanized shim plates have at least 75 mm of cover from the shims to the edge of grout pads? |  |  |  |
| 8.4.2 | Was anchor rod void forming material acceptably removed? |  |  |  |
| 8.4.2 | At the time of grouting were base plates set to the positions indicated on the Drawings and anchor rods positioned in accordance with the bearing setting tables shown on the Drawings? |  |  |  |
| 8.4.2 | Were the nuts on the anchor rods at expansion bearings adjusted to allow for thermal movement of the girders? |  |  |  |
| 8.4.2 | Were tops of bearing sole plates within a tolerance of +/- 3 mm of design elevation prior to girder erection? |  |  |  |
| 8.4.2 | If sole plates were welded to flanges, were they welded in the longitudinal direction only? |  |  |  |
| 8.4.2,  8.3.6.7 | Was any damaged galvanizing (less than 100 mm2 in area) metalized as per ASTM A780 Method 3? |  |  |  |
| 8.4.3 | Was grout mixed, placed and cured as per the manufacturer’s recommendations? |  |  |  |
| 8.4.3 | Were testers certified to ACI or CSA utilized by the Contractor to test the compressive strength of the grout in accordance with CSA A23.2-1B? |  |  |  |
| 8.4.3 | Was grout wet cured for a minimum of 3 days with two layers of clean, saturated Nilex 4504 white coloured filter fabric or an approved equivalent? |  |  |  |
| 8.4.3,  4.26 | Was sealer acceptably applied to the exposed grout pad surfaces? |  |  |  |
| 8.4.3.1 | Were cold weather grouting procedures implemented when the daily minimum air temperature was at or below 5°C during the placing and curing period of the grout? |  |  |  |

**Details and Summary:**

Date

Signature

1. Drain Troughs Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the construction of concrete or heavy rock riprap drain troughs including drain trough collectors; terminal protection; and all excavation, trimming and backfill, and restoration necessary to complete the Work as shown on the Drawings and Standard Drawings S-1841, S-1842, and S-1843.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 9.1,  2 | Were the slopes receiving the concrete drain troughs excavated, trimmed and backfilled to the lines and grades shown on the Drawings or as determined by the Inspector, and was the subgrade placed and compacted in accordance with the specification requirements? |  |  |  |
| 9.1 | Did the Project Manager review and accept the Contractor’s detailed layout and forming plan prior to the commencement of the Work? |  |  |  |
|  | Concrete |  |  |  |
| 9.2,  4 | Was Class C concrete used for the drain troughs and did it meet all specification requirements? |  |  |  |
|  | Reinforcing Steel |  |  |  |
| 9.3,  5 | Did reinforcing steel meet all specification requirements? |  |  |  |
|  | Heavy Rock Riprap |  |  |  |
| 9.4,  10 | Did Class 1M and Class 1 Heavy Rock Riprap meet all specification requirements? |  |  |  |
|  | Geotextile Filter Fabric |  |  |  |
| 9.5 | Did non-woven geotextile filter fabric meet all specification requirements? |  |  |  |
|  | Site Restoration |  |  |  |
| 9.6 | Upon completion of the drain trough, did the Contractor restore the site to the original condition determined by the Inspector? |  |  |  |

**Details and Summary:**

Date

Signature

1. Heavy Rock Riprap Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, delivery and installation of heavy rock riprap. This includes all necessary trimming, excavation, and backfill required.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 10.2 | Did the Contractor obtain all the necessary permits, agreements and authorizations prior to loading heavy rock riprap? |  |  |  |
| 10.2 | Did the Contractor advise the Project Manager of any special provisions required under such permits and provide satisfactory evidence that the requirements of the permits were fully complied with? |  |  |  |
|  | Heavy Rock Riprap Material |  |  |  |
| 10.3 | Was the supplied heavy rock riprap hard, durable and angular in shape, resistant to weathering and water action, free from overburden, spoil, shale or shale seams and organic material, and did it meet the gradation requirements for the class specified? |  |  |  |
| 10.3 | Was the minimum dimension of any single rock not less than one third of its maximum dimension for the class specified? |  |  |  |
| 10.3 | Was the minimum acceptable unit weight of the rock 2.5 t/m3? |  |  |  |
| 10.3 | Did the Contractor provide evidence of the acceptability of the heavy rock riprap material? |  |  |  |
| 10.3 | Did the Contractor submit samples of Class 2 and Class 3 heavy rock riprap for which no performance records were available? |  |  |  |
| 10.3 | Was the proposed material sent to an independent certified testing laboratory, and was a written report of the test results reviewed and accepted by the Project Manager? |  |  |  |
| 10.3 | Did the material provided meet the requirements of Tables 10-1, Gradation Requirements and Table 10-2, Specific Gravity, Absorption and Durability Index Requirements? |  |  |  |
| 10.6 | Did the Contractor provide a minimum of two samples of rock of the minimum sample size specified at the jobsite? |  |  |  |
| 10.6 | Did the samples conform to the required gradation requirements of Table 10-4, Heavy Rock Riprap Inspection Sample Size Requirement? |  |  |  |
|  | Non-Woven Geotextile Filter Fabric |  |  |  |
| 10.4 | Was the slope receiving heavy rock riprap graded to provide a smooth, uniform surface free of stumps, large rocks, brush or other debris, and were holes and depressions filled prior to placing filter fabric? |  |  |  |
| 10.4 | Was loose or unstable soil replaced prior to placing rock riprap? |  |  |  |
| 10.4 | Did the non-woven geotextile filter fabric meet the specifications and physical properties as outlined in Table 10-3, Non-Woven Geotextile Filter Fabric Requirements? |  |  |  |
| 10.4 | Was the filter fabric laid parallel to the slope and placed in a loose fashion, with folds and wrinkles being avoided? |  |  |  |
| 10.4 | Were adjacent lengths of non-woven geotextile filter fabric placed with 400 mm laps, and where placed underwater was the minimum lap 1 m? |  |  |  |
| 10.4 | Were non-woven geotextile overlaps properly pinned using 6 mm diameter steel pins fitted with washers and spaced at 1 m interval? |  |  |  |
| 10.4 | Was the top edge of the non-woven geotextile filter fabric anchored into a 300 mm deep trench? |  |  |  |
| 10.4 | Was the non-woven geotextile filter fabric free of punctures and tears? If not was the damage repaired using patches that extended at least 1 m beyond the perimeter of the tear or puncture? |  |  |  |
| 10.4 | Was the heavy rock riprap placed on the filter fabric within the time specified so as to avoid ultraviolet damage? |  |  |  |
| 10.4 | Did the heavy rock riprap placement commence at the base of the blanket area and proceed up the slope? |  |  |  |
|  | Placing of Heavy Rock Riprap |  |  |  |
| 10.5 | Was the final heavy rock riprap surface reasonably uniform, free from bumps or depressions, and with no excessively large cavities below or individual stones projecting above the general surface? |  |  |  |
| 10.6 | Was continuous visual inspection completed by the Inspector during the placement of heavy rock riprap? |  |  |  |
| 10.6 | Did the Inspector and Contractor make frequent reference to the two reviewed and accepted samples to judge the gradation and placement of the heavy rock riprap? |  |  |  |

**Details and Summary:**

Date

Signature

1. Ducts and Conduit Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply and installation of all ducts and conduits, associated hardware, junction boxes, and anchorage assemblies as shown on the Drawings.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 11.2 | Were all ducts and conduits made of rigid PVC type DB2 and meeting the requirements of CSA C22.2 No. 211.1 and in accordance with the Rules of the Canadian Electrical Code, Part 1? |  |  |  |
| 11.2 | Were solvent bell ends (SBE) used for coupling? |  |  |  |
| 11.2 | Were Scepter type ‘O’ ring expansion joints or an approved equivalent used for expansion assemblies? |  |  |  |
|  | Installation |  |  |  |
| 11.3 | Were ducts and conduits firmly secured and supported on duct chairs to prevent floating during concrete placement? |  |  |  |
| 11.3 | Did the Contractor avoid placing ducts and voids directly onto hardened concrete and did the Contractor avoid tying ducts directly to reinforcing steel? |  |  |  |
| 11.3 | Did the Contractor ensure ducts placed across deck joints precisely followed the deck gradeline and not be skewed relative to the direction of expansion? |  |  |  |
| 11.3 | Were continuous pull wires installed in all ducts and conduits unless specified otherwise? |  |  |  |
| 11.3 | Were the pull wires 12-gauge galvanized steel, unspliced, extended with a tight fit through the duct end caps, and terminated one metre beyond in 300 mm loops? |  |  |  |
| 11.3 | If the duct was greater than 75 mm in diameter, was 8 mm mono-poly rope or equivalent used, and if so, was the rope unspliced with the extra length of 300 mm each end coiled up inside the duct and the duct end caps secured in place? |  |  |  |
| 11.3 | Was the installation of electrical components carried out by a fully qualified electrician? |  |  |  |
| 11.3 | Were all runs of ducts and conduits proven in the presence of the Inspector to be clear by passing a round object, no less than 75% of the conduit area, through the entire length? |  |  |  |

**Details and Summary:**

Date

Signature

1. Bridgerail Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, fabrication, and installation of bridgerail. It includes steel tube type bridgerail, thrie beam bridgerail, approach rail transition, and pedestrian/bicycle barriers.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Supply and Fabrication |  |  |  |
| 12.2.2 | Did the Contractor notify the Department and Project Manager of any subcontractors in his employ? |  |  |  |
| 12.2.3.2 | Were the shop drawings submitted in electronic unlocked PDF format and did they include the Department’s shop drawing identification block and have a sufficient blank space for the Project Manager’s review stamp? |  |  |  |
| 12.2.3 | Were shop drawings, mill test reports, and weld procedures reviewed and accepted by the Project Manager? |  |  |  |
| 12.2 | Was a pre-fabrication meeting held after the shop drawings, mill test reports, and weld procedures were reviewed and accepted by the Project Manager and prior to the commencement of any fabrication? |  |  |  |
| 12.2.7.4 | Did the Contractor notify the Project Manger 72 hours prior to shipment to facilitate final inspection and acceptance of the bridgerail? |  |  |  |
|  | Material Handling and Storage |  |  |  |
| 12.2.8 | Was all lifting and handling done using devices that do not mark, mar, damage or distort the galvanized members and assemblies in any way? |  |  |  |
|  | Erection |  |  |  |
| 12.3 | Were anchor rods checked for type, location and elevation, minimum projection of two threads above the top anchor rod nut after tightening is complete, overall alignment, and adequate attachment to forms? |  |  |  |
| 12.3,  6.3.2.6 | Were all structural bolts tightened acceptably by the turn-of-nut method? |  |  |  |
| 12.3 | Was the bridgerail checked for secure attachment, horizontal and vertical alignment, location, and expansion joint gaps? |  |  |  |
| 12.3 | Were all alignment nuts snug tightened to the underside of the baseplates prior to tightening anchor rods? |  |  |  |
| 12.3,  6.3.2.6 | Were all anchor rods bolts tightened by the turn-of-nut method? |  |  |  |
| 12.3.1 | Did the Project Manager review and accept the method of forming and pouring the grout for base plates? |  |  |  |
| 12.3.1 | Was grout packaged in waterproof containers with the production date and shelf life of the material shown and was it mixed in required proportions as per manufacture’s specifications? |  |  |  |
| 12.3.1 | Did the Contractor utilize experienced ACI or CSA certified testers to test the compressive strength of the grout in accordance with CSA A23.2-1B? |  |  |  |
| 12.3.1,  4.2.6 | Was grout wet cured for a minimum of 3 days with two layers of clean, saturated, Nilex 4504 white coloured filter fabric or an approved equivalent prior to applying Type 1c sealer? |  |  |  |
| 12.3.1.1 | If the air temperature was below 5°C during the placement of grout, did the Project Manager review and accept the Contractor’s cold weather grouting plan prior to grout placement? |  |  |  |
| 12.3.1.1 | If a cold weather grouting plan was utilized, did the Contractor comply with all aspects of the plan? |  |  |  |
| 12.3.2,  14 | Was the approach rail transition installed in accordance with Section 14, Guardrail? |  |  |  |

**Details and Summary:**

Date

Signature

1. Miscellaneous Iron Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, fabrication, and installation of Miscellaneous Iron. Miscellaneous Iron includes any of the following items as well as those listed in the Special Provisions of the Contract:

* *Steel drain troughs;*
* *Pier drip sheets;*
* *Deck buffer angles;*
* *Dowels;*
* *Connector angles;*
* *Anchor bolt sleeves;*
* *Identification plaques;*
* *Identification tags for culvert and overhead sign structures; and*
* *Bench mark tablets.*

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 13.1, 13.2,  6 | Was Miscellaneous Iron supplied, fabricated, and installed by the Contractor in accordance with the Contract documents? |  |  |  |
|  | Galvanizing |  |  |  |
| 13.3 | Was all lifting and handling for galvanized steel completed using devices that did not mark, mar, and damage or distort the galvanized members and assemblies in any way? |  |  |  |
| 13.3 | Was galvanized material stacked or bundled and stored to prevent wet storage stain, as per the American Hot Dip Galvanizers Association (AHDGA) publication “Wet Storage Stain”? |  |  |  |
| 13.3 | Was all damage to galvanized surfaces repaired in accordance with ASTM A780, Method A3 “Metallizing”, or Method A1 “Repair Using Zinc-Based Alloy” for repair areas less than 100 mm2? |  |  |  |
| 13.3 | Did the repair coating have a thickness of at least 180 µm and was it tested for adhesion? |  |  |  |
|  | Field Welding |  |  |  |
| 13.4 | When the air temperature was below 10°C, was all material to be welded preheated to 100°C for a distance of 80 mm beyond the weld and was it sheltered from the wind? |  |  |  |
| 13.4 | Did the Contractor provide acceptable heating and hoarding when welding occurred at an air temperature below 0°C? |  |  |  |
|  | Field Welding of Structural |  |  |  |
| 13.4.1 | Did the Project Manager review and accept the welding procedures prior to welding? |  |  |  |
| 13.4.1 | Did the Project Manager review and accept the qualifications of the welders performing the weldments for that particular category? |  |  |  |
| 13.4.1 | Was all welding, cutting and preparation done in accordance with the American Welding Society (AWS) Bridge Welding Code D1.5 as confirmed by the visual inspector? |  |  |  |
|  | Field Welding of Non-Structural Members |  |  |  |
| 13.4.2 | Did the Project Manager review and accept the welding procedures prior to welding? |  |  |  |
| 13.4.2 | Did journeyman welders with Class B tickets perform the weldments and were their qualifications current and available for examination? |  |  |  |
|  | Identification Plaques |  |  |  |
| 13.2  S1847 | Were identification plaques installed in the specified location, prior to concrete placement and acceptably protected from contamination? |  |  |  |

**Details and Summary:**

Date

Signature

1. Guardrail Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, fabrication, delivery, and installation of guardrail. It includes modified thrie beam guardrail, strong post w-beam guardrail, weak post w-beam guardrail, connections, treated timber posts, steel posts, spacers, transitions, end terminals, Department approved crash-worthy end treatments, miscellaneous components and associated materials.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 14.1 | Were the specified details provided on the Alberta Transportation reference drawings from Appendix B of the Roadside Design Guide for approach guardrails, Bridge Engineering Standard Drawings for bridgerails and bridgerail/approach rail transitions, drawings in the AASHTO-AGC-ARTBA publication “A Guide to standardized Highway Barrier Hardware”, and other Drawings provided in the Contract followed? |  |  |  |
| 14.2 | Did all rail sections and other components match the design profiles and dimensions of the AASHTO/ARTBA hardware requirements for full interchangeability of similar components regardless of the source of manufacture? |  |  |  |
| 14.2,  12.2.6.7 | If holes were punched after galvanizing, was the galvanizing around the hole repaired in accordance with the specification requirements? |  |  |  |
|  | Inspection of Materials |  |  |  |
| 14.2.2 | Did the Project Manager review and accept the mill test reports for nuts, bolts, washers and steel posts? |  |  |  |
| 14.3.1 | Was the finished thickness of material 2.82 mm and within a tolerance of 0.23 mm? |  |  |  |
|  | Was the finished thickness of material 3.58 mm and within a tolerance of 0.23 mm? |  |  |  |
| 14.2.3 | Were timber guardrail posts adequately date stamped at the top of either side of the post with the last two digits of the year of installation? |  |  |  |
| 14.3.2 | For timber guardrail posts, was testing of the penetration of the preservative carried out? |  |  |  |
|  | Installation |  |  |  |
| 14.4 | Was the permissible tolerance for plumb and grade of posts (20 mm maximum) achieved? |  |  |  |
| 14.4,  2 | Was any unsuitable material at the bottom of the holes excavated and replaced with compacted crushed aggregate material in accordance with the specification requirements? |  |  |  |
| 14.4 | Did the Contractor thoroughly compact the bottom of the hole? |  |  |  |
| 14.4 | Did the guardrail posts rest directly and solidly on the bottom of the hole at the time of installation? |  |  |  |
| 14.4 | Was the backfill material thoroughly compacted using pneumatic tampers in layers not exceeding 150 mm for the full depth of the excavation? |  |  |  |
| 14.4,  17 | For posts installed on paved surfaces, was the top 150 mm of backfill completed using ACP in accordance with the specification requirements? |  |  |  |
| 14.4 | Was any guardrail material requiring field modification reported to the Project Manager before the Work was carried out? |  |  |  |
| 14.4 | Were adequate edge distances of guardrail material maintained during the modification process? |  |  |  |
| 14.4 | Were guardrail sections lapped in the direction of traffic flow? |  |  |  |
| 14.4 | Were bolts tightened to a torque of 100 Nm? |  |  |  |
| 14.4 | Were metal reflectors (Scotchlite or equivalent) supplied and attached to the top of every third guardrail post with two 50 mm ring nails? |  |  |  |
| 14.4 | Did the Contractor take all necessary precautions to eliminate damage to galvanizing? |  |  |  |
| 14.4 | Were minor abrasions and exposed steel areas resulting from cold cutting repaired in accordance with ASTM A780 Method A2 Repair Using Paints Containing Zinc Dust? |  |  |  |
| 14.4 | Were major abrasions and exposed steel areas, as determined by the Project Manager, replaced with new material? |  |  |  |
|  | If required, was the guardrail connected to bridgerail, parapets or existing guardrail as shown on the Drawings? |  |  |  |

**Details and Summary:**

Date

Signature

1. Non-Skid Polymer Overlay Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for resurfacing concrete bridge decks with non-skid polymer wearing surface. This includes the repair of deck concrete, and application of a thin, flexible, multi layered, polymer aggregate wearing surface.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 15.7.8 | Did the Project Manager receive the results of the Contractor’s infrared and gas chromatography analysis for each polymer component, compressive strength of the polymer mortar, modulus elasticity of the polymer and grain size analysis of the aggregate tests? |  |  |  |
| 15.6.2 | Was chain drag and hammer sound testing done to locate and mark delaminated areas? |  |  |  |
| 15.8 | Were areas surveyed for payment? |  |  |  |
| 15.7.3 | Was the deck surface dry prior to repair? |  |  |  |
| 15.7.3 | Were air, deck and polymer temperatures within specified limits? |  |  |  |
| 15.7.8 | Were cube specimens for compressive strength testing cast by the Contractor? |  |  |  |
| 15.7.8 | Was a pull test for bond strength performed by the Contractor? |  |  |  |
|  | Patching Materials – Installation |  |  |  |
| 15.4 | Prior to the application of polymer overlay were all repairs tested for moisture in accordance with the specification requirements? |  |  |  |
|  | Crack Repair |  |  |  |
| 15.5 | Were all deck cracks more than 2 metres in length and greater than 0.3 mm wide treated with a Type 1c sealer meeting the current Material Testing Specifications for Concrete Sealers (B388)? |  |  |  |
|  | Bridge Deck Repair |  |  |  |
| 15.6.1 | Were surface voids and depressions in excess of 6 mm patched acceptably by the Contractor? |  |  |  |
| 15.6 | Did the Contractor make the necessary repairs to the bridge deck? |  |  |  |
| 15.6.1 | Was the surface to be patched shot blasted and/or sandblasted in accordance with Clause 15.7.1 of the SSBC prior to placement of the polymer mortar? |  |  |  |
| 15.6.1 | Were the areas to be patched primed with a 75 mm wide band of liquid polymer along their perimeter while the liquid polymer primer was liquid or tacky and to the original gradeline? |  |  |  |
| 15.6.2 | Was all concrete cured for 28 days and tested for moisture in accordance with Clause 15.7.3 of the SSBC prior to the application of polymer overlay? |  |  |  |
| 15.6.3 | Were all patches and levelling areas accepted by the Inspector prior to commencing the overlay? |  |  |  |
|  | Polymer Construction |  |  |  |
| 15.7 | Did the Contractor obtain the Project Manager’s acceptance prior to increasing the minimum polymer coverage requirements? |  |  |  |
| 15.7.1 | Did the Contractor properly prepare the surface prior to placement of overlay? |  |  |  |
| 15.7.1 | Did the Contractor install 10 mm deep by 10 mm wide grooves cut by router or saw and sandblasted in close proximity and parallel to all deck joints, snow slots, deck drains and all other transverse edges? |  |  |  |
| 15.7.1 | Was re-blasting required due to rain, delay in applying overlay or leakage of contaminants onto the deck performed as necessary? |  |  |  |
| 15.7.2 | Did the Contractor submit a sketch to the Project Manager showing the deck surface to be covered by each polymer batch divided into segments? |  |  |  |
| 15.7.2 | Did the Contractor apply masking tape to the boundaries of the work areas, as shown on the submitted sketches? |  |  |  |
| 15.7.3 | Were weather conditions and temperatures suitable for mixing, placing and curing of polymer overlay, and was the concrete substrate completely dry? |  |  |  |
| 15.7.3 | Did the Contractor test for the presence of moisture by the modified ASTM D4263, “Standard Test Method for Indicating Moisture in Concrete by Plastic Sheet Method”? |  |  |  |
| 15.7.4 | Were the batching and mixing of the polymer done in accordance with the manufacturer's instructions? |  |  |  |
| 15.7.4 | Were the deck and adjacent areas protected from spillage of polymer, solvents and other materials by the Contractor? |  |  |  |
| 15.7.5 | Was the polymer applied in accordance with the manufacturer's instructions after acceptance of the prepared deck surface and completion of layout? |  |  |  |
| 15.7.5 | Were all cold joints in the overlay offset 25 mm from cold joints of previous layers of the overlay? |  |  |  |
| 15.7.5 | Did the Contractor spread the polymer uniformly over the premeasured area using a squeegee and roller brush to carefully work the polymer into the surface and obtain the required coverage? |  |  |  |
| 15.7.5 | Was spreading and levelling of fresh polymer completed while the material was in a state of low viscosity, and within seven minutes of batching? |  |  |  |
| 15.7.5 | Was the application of the third layer of polymer (tie coat) done by airless spraying and without the cut back with any solvents? |  |  |  |
| 15.7.6 | Did the Contractor seed the first and second layer of polymer for Class A and B wearing surfaces and the first layer for Class C wearing surfaces? |  |  |  |
| 15.7.6 | Did the Contractor seed the basecoat layer when a Degussa Degadur System (MMA) was used? |  |  |  |
| 15.7.6 | After acceptance by the Inspector of the previously placed cured overlay, did the Contractor remove all excess aggregate prior to placing a subsequent layer of polymer? |  |  |  |
| 15.7.6 | Did the Contractor do vertical pull out tests to confirm the adequacy of the material when any layer of polymer material was subjected to rain or any other form of damage? |  |  |  |
| 15.7.6 | Did the Contractor repair all bond test locations? |  |  |  |
| 15.7.7 | Was roughness (attributable to the overlay) tested with a 3 m long straight edge? |  |  |  |
| 15.7.8 | During placement of the polymer, were samples of the mixed polymer material randomly selected by the Inspector for compressive strength testing in accordance with test method  ASTM C-109? |  |  |  |
| 15.7.8 | Did the Inspector determine the test location of each test, and did the Contractor cast a set of three (3) cubes to the frequency specified? |  |  |  |
| 15.7.9 | Did the polymer overlay reach a minimum of 60% of the seven-day compressive strength or 3.0 MPa of tensile strength achieved, based on the last batch of the day, prior to opening to traffic? |  |  |  |

**Details and Summary:**

Date

Signature

1. Waterproofing Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply and installation of hot applied asphalt waterproofing system. Waterproofing must be carried out in accordance with the specifications; as shown on the Drawings and Standard Drawings S-1838, Standard waterproofing System for Deck and Abutments - Sheet 1, S-1839, Standard Waterproofing System for Deck and Abutments – Sheet 2, S-1840, Standard Waterproofing System for Deck and Abutments – Sheet 3.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 16.2.2 | Did the Project Manager review and accept the Contractor’s submission indicating specification compliance of his proposed materials prior to the commencement of waterproofing operations? |  |  |  |
|  | Materials and Equipment |  |  |  |
| 16.2.2 | Were the products on site identifiable and identical to those reviewed and accepted by the Project Manager? |  |  |  |
| 16.2.4 | Did asphaltic primer meet the requirements of CGSB-37-GP-9MA? |  |  |  |
| 16.2.4 | Were asphalt membrane cakes supplied in sealed packages and labelled by the manufacturer? |  |  |  |
| 16.2.4 | Did asphalt membrane materials meet the requirements of Ontario Ministry of Transportation's Specification OPSS 1213? |  |  |  |
| 16.2.4 | Did rubber membrane consist of butyl and ethylene propylene diene monomer (EPDM) rubber that met the requirements of CGSB-37.52M and had a thickness of 1.2 mm? |  |  |  |
| 16.2 | Was membrane reinforcing fabric supplied in widths of 300 mm and did the material consist of a spun bonded sheet structure composed of 100% continuous filament polyester fibres bonded together at their crossover points? |  |  |  |
| 16.2 | Did wick drains have dimensions of 3.6 mm total thickness and 100 mm width and was puncture strength of wick drain material 45 N in accordance with ASTM D4833? |  |  |  |
| 16.2 | Did waterproofing protection board meet Ontario Ministry of Transportation's Specification OPSS 1215? |  |  |  |
| 16.2 | Were the supplied protection boards durable and free of distortion, warping or other damage? |  |  |  |
| 16.3 | Was the heating and mixing kettle a double boiler oil-transfer type with a built-in agitator and dial thermometer? |  |  |  |
| 16.3 | Was a separate and calibrated thermometer with an accuracy of +/- 2°C provided by the Contractor to verify the kettle thermometer accuracy? |  |  |  |
| 16.3 | Was the unit capable of keeping the contents continuously agitated, free flowing and lump free until the material was drawn for application? |  |  |  |
|  | Installation |  |  |  |
| 16.4.1 | Did the Contractor provide the Inspector with 48 hours advance notice prior to commencing any waterproofing operations? |  |  |  |
| 16.4.1 | Has the Contractor scheduled and confirmed placement of asphalt concrete pavement will commence within 7 days of waterproofing installation or as determined by the Project Manager? |  |  |  |
| 16.4.1 | Was the air and concrete deck surface temperature 5°C or higher at the commencement of waterproofing operations? |  |  |  |
| 16.4.1 | Did the Contractor carry out the waterproofing operations in sequential order, and in such a manner that there were no delays between individual operations? |  |  |  |
| 16.4.2 | Once surface preparation operations commenced, did the Contractor restrict all traffic from traveling over the prepared areas other than the construction equipment directly associated with waterproofing and bridge paving operations? |  |  |  |
| 16.4.3,  16.4.5 | Were P/T grout tubes cut flush with the deck surface and was a 450 mm by 450 mm piece of membrane reinforcing fabric installed over P/T grout tubes? |  |  |  |
| 16.4.3 | Were concrete surfaces to receive waterproofing cured for at least 14 days and exposed to drying conditions for three (3) additional days? |  |  |  |
| 16.4.3 | Did sandblasting or shotblasting result in a uniformly sound, laitance and dust-free surface? |  |  |  |
| 16.4.3 | For a bridge rehabilitation projects, was the concrete cured for at least seven (7) days and exposed to drying conditions for three (3) additional days and did grinding, scabbling or bush hammering result in a surface texture profile with a 3 mm amplitude or less prior to sandblasting or shotblasting? |  |  |  |
| 16.4.4 | Did all concrete surfaces have less than 6% moisture prior to application of the asphaltic primer? |  |  |  |
| 16.4.4 | Was the concrete surface blown clean with oil and water free compressed air to remove all dust and other foreign material? |  |  |  |
| 16.4.4 | Was the asphaltic primer cut back with an equal volume of gasoline type solvent compatible with the asphalt membrane? |  |  |  |
| 16.4.4 | Was the asphaltic primer consistently applied at a rate of approximately 0.25 litres/m2? |  |  |  |
| 16.4.4 | Was the asphaltic primer absorbed into the concrete, as evidenced by a dull black appearance? |  |  |  |
| 16.4.5 | For waterproofing of joints and cracks, was a coat of hot asphalt membrane 3 mm to 4 mm thick and wide enough to extend 200 mm on either side of each joint or crack applied? |  |  |  |
| 16.4.5 | Was a strip of membrane reinforcing fabric material wide enough to extend 150 mm on both sides of the construction joints, lift hook pockets, grout tubes, patches and cracks applied while the asphalt membrane was still hot and tacky? |  |  |  |
| 16.4.5 | Was the membrane reinforcing fabric covered with an additional layer of 2 mm to 3 mm thick asphalt membrane? |  |  |  |
| 16.4.5 | For areas along curbs, barrier walls, and deck drains, was the asphalt membrane applied to the height of the top of the hot mix ACP surface course and 150 mm onto the deck with rubber membrane being applied into the first coat of asphalt membrane while it was still hot and tacky? |  |  |  |
| 16.4.6 | Was the application temperature of asphalt membrane within the range recommended by the manufacturer and applied in a uniform film having a minimum thickness of 4 mm and a maximum thickness of 6 mm? |  |  |  |
| 16.4.6 | Was the application of the asphalt membrane carried out in a continuous manner to the extent practicable and if joints were unavoidable, were they overlapped by a minimum of 150 mm? |  |  |  |
| 16.4.7 | Were wick drains installed along the full lengths of the gutters when the asphalt membrane was still hot and tacky? |  |  |  |
| 16.4.8 | Were protection boards that were warped, distorted, or damaged replaced with new material? |  |  |  |
| 16.4.8 | Were protection boards laid on the asphalt membrane while the membrane was still hot and tacky with the length of the board running perpendicular to the curbs/barriers? |  |  |  |
| 16.4.8 | Were protection boards lapped to produce a shingling effect in both the longitudinal and transverse directions? |  |  |  |
| 16.4.8 | Were protection boards placed with the longitudinal (direction of traffic flow) joints staggered a minimum of 150 mm and rolled using a linoleum or lawn type roller while the membrane is still warm to ensure good contact with the membrane? |  |  |  |
| 16.4.8 | Were holes cut through the protection board to allow water to drain freely through to deck and/or wick drains? |  |  |  |
| 16.4.8  S-1839 | At deck drains and PVC drain pipes was the wick drain filter fabric cut open 300 mm at the connection, corrugated plastic insert trimmed flush with the inside wall of the drain, and remaining fabric folded and inserted into the drain? |  |  |  |

**Details and Summary:**

Date

Signature

1. Asphalt Concrete Pavement Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for supply and placement of ACP on:

* *Bridge deck waterproofing described in Section 16, Waterproofing;*
* *Polymer waterproofing membranes; and*
* *Approach road transitions.*

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 17.1 | Did the Project Manager review and accept the Contractor’s ACP Mixing and Placement Plan for each bridge and associated approach transition prior to commencement of the Work? |  |  |  |
| 17.1 | After the ACP Mixing and Placement Plan was been reviewed and accepted by the Project Manager, was a preconstruction meeting held with the Contractor’s project manager, paving superintendent and foreman prior to the start of any paving operations ? |  |  |  |
|  | Materials |  |  |  |
| 17.2 | Was the asphalt cement and aggregate supplied in accordance with reviewed and accepted ACP Mixing and Placement Plan? |  |  |  |
| 17.2 | Did the tack coat consist of SS-1 liquid asphalt? |  |  |  |
| 17.2 | Was SS-1 liquid asphalt diluted with an equal volume of water? |  |  |  |
| 17.2 | Did the tack coat materials meet the specified requirements listed in Tables ASPH6 and ASPH7 of Specification 5.7 of the Standard Specifications for Highway Construction? |  |  |  |
| 17.2 | If the haul time was greater than 1 hour, was a chemical warm mix asphalt additive from the Department’s Products List included in the ACP Mixing and Placement Plan? |  |  |  |
|  | Sampling and Testing |  |  |  |
| 17.4 | Was QA testing completed on two 6 kg samples per lift of ACP to determine the uncorrected asphalt content and aggregate gradation, using the Contractor’s measured correction factor to establish the actual asphalt content? |  |  |  |
| 17.4 | Was the actual asphalt content of the two 6 kg samples determined by test method ATT-12 or ATT-74 and did it include the correction factor for asphalt binder lost due to absorption by the aggregate or aggregate loss? |  |  |  |
| 17.4.1 | Was QA testing done on projects with more than 50 tonnes of ACP and in accordance with Table 17‑1, Quality Control Testing Requirements? |  |  |  |
| 17.4.1 | Was all testing completed by an independent third party testing agency prequalified by the Department in the category of QA Testing Services (Grading, Base Paving? |  |  |  |
| 17.4.1 | Were the test results received by the Project Manager within 7 days of test completion? |  |  |  |
|  | Equipment and Methods |  |  |  |
| 17.5.1 | Were the equipment and methods used adequate to place and compact the ACP as specified? |  |  |  |
| 17.5.2 | Did the asphalt mixing plant used by the Contractor conform to the requirements of Section 3.50.5.1.2 of the Standard Specifications for Highway Construction? |  |  |  |
| 17.5.2 | Did the Contractor provide a certificate of calibration certifying that the plant was calibrated to produce a uniform mixture in accordance with the Job Mix Formula? |  |  |  |
| 17.5.3 | Was the mixture transported to the worksite in trucks with clean smooth metal boxes in good and leak proof condition? |  |  |  |
| 17.5.3 | Was each end-dump truck equipped with a tarpaulin of suitable material and size to overhang the vehicle box when fully loaded which was only removed immediately prior to discharging ACP into the paver hopper? |  |  |  |
| 17.5.3 | Were preventative measures taken so that truck box lubricants, such as detergent or lime solutions, did not contaminate the mix? |  |  |  |
| 17.5.4 | Did pavers maintain required levels, cross-falls and joint matching? |  |  |  |
| 17.5.4 | Were bridge structures with more than 3 travel lanes or longer than 75 m in length paved with two or more pavers operating in simultaneous echelon such that the entire width of the ACP lift was completed at one time? |  |  |  |
| 17.5.5 | Was there sufficient self-propelled equipment to obtain the required degree of compaction of the asphalt concrete mixture? |  |  |  |
| 17.5.5 | Was the compaction equipment operated such that uniform and complete compaction was achieved throughout the entire width, depth and length of the ACP being placed? |  |  |  |
| 17.5.5 | Did rollers leave a smooth, properly finished surface, true to grade and cross-section without ruts or other irregularities and were the roller tires or drums wet to prevent adhesion or pickup of ACP? |  |  |  |
| 17.5.5 | Was a minimum of one rubber tired roller, one smooth steel drum type roller, one compact tandem articulating smooth steel drum type roller and other specialized equipment provided for ACP compaction? |  |  |  |
| 17.5.5 | Did the Contractor ensure that vibratory modes of compaction were not activated on bridge decks, roof and approach slabs, or within 1 metre of any structural element? |  |  |  |
|  | Construction |  |  |  |
| 17.6.1 | Were longitudinal joints of successive ACP mats offset by a minimum of 0.3 m, unless otherwise reviewed and accepted by the Project Manager, and were longitudinal joints of the final lift ACP not located within wheel paths? |  |  |  |
| 17.6.1 | Did the Contractor saw cut construction joints between existing ACP and new ACP for transition and/or approach road paving and on a 15° left hand forward (LHF) skew? |  |  |  |
| 17.6.1 | Was the construction joint protected to prevent spalling, raveling, or other damage? |  |  |  |
| 17.6.2 | Were all bridge components protected to prevent splatter or staining from asphaltic materials? |  |  |  |
| 17.6.2 | Did the Contractor provide temporary protection measures for deck joint concrete paving lips? |  |  |  |
| 17.6.4 | Was asphalt tack coat applied to all surfaces that receive ACP other than bridge waterproofing wick drains? |  |  |  |
| 17.6.4 | Were surfaces to be tacked dry and free of loose or deleterious material when the tack coat was applied? |  |  |  |
| 17.6.4 | Was the asphalt tack coat applied in a uniform manner at an application rate of 0.5 ℓ/m2 and at a suitable asphalt temperature? |  |  |  |
| 17.6.4 | Was the ambient air temperature at the time of application 5°C or higher? |  |  |  |
| 17.6.4 | Did the Contractor re-tack all areas where the tack coat was damaged by traffic? |  |  |  |
| 17.6.5.1 | Was ACP placed on clean, dry, frost free substrate, onto cured tack coat, and only when the ambient air temperature was 5 °C or higher? |  |  |  |
| 17.6.5.1 | Did the Contractor take care to avoid damaging any bridge and associated elements? |  |  |  |
| 17.6.5.1 | Was each layer placed, finished, and compacted and then allowed to cool down to 50°C or lower prior to placing the subsequent lift? |  |  |  |
| 17.6.5.1 | Were the crown of the bridge deck and approach profiles maintained and did the Contractor avoid operating compaction equipment on or across the crown? |  |  |  |
| 17.6.5.2 | During spreading, was the ACP mix temperature sufficient to achieve the specified compaction and finishing requirements? |  |  |  |
| 17.6.5.2 | Were the longitudinal and transverse edges of each mat straight and uniform in alignment, and of the same thickness as the adjoining pavement mat? |  |  |  |
| 17.6.5.3 | Was the ACP compaction measured and monitored using the Control Strip Method as detailed in the reviewed and accepted ACP Mixing and Placement Plan? |  |  |  |
| 17.6.5.3 | Were control strip test locations properly marked out on the ACP surface and was a nuclear density reading taken following each pass of compaction equipment? |  |  |  |
| 17.6.5.3 | Was all compaction testing completed by an independent third party testing agency prequalified by the Department in the category of QA Testing Services (Grading, Base Paving)? |  |  |  |
| 17.6.5.3 | Was the minimum average density of each mat 98% of the control strip density? |  |  |  |
| 17.6.5.4 | Was ACP for the standard hot-applied rubberized asphalt waterproofing membrane system placed and compacted in two nominal 40 mm lifts? |  |  |  |
| 17.6.5.4 | Was the first lift of ACP spread by the asphalt paver in the (downhill) direction of the protection board laps? |  |  |  |
| 17.6.5.4 | Did all equipment perform turning movements only off the bridge and was ACP dumped directly into the paver hopper and not onto protection boards? |  |  |  |
| 17.6.5.4 | Was the temperature of the ACP during compaction in accordance with Table 17-2? |  |  |  |
| 17.6.5.5 | Was the ACP wearing surface placed in one lift of 50 mm nominal thickness on top of the polymer waterproofing membrane? |  |  |  |
| 17.6.5.5 | Was the temperature of the second lift of ACP between 123°C and 138°C at the start of compaction? |  |  |  |
| 17.6.5.6 | Was ACP placed on transition or approach roads, as shown on the Drawings, in the Special Provisions of the Contract, or as determined by the Project Manager? |  |  |  |
| 17.6.5.6 | Was the ACP temperature at the start of compaction of ACP for approach road transitions at least 123°C? |  |  |  |
| 17.6.6.1 | Was the ACP surface checked for smoothness by the Contractor immediately after the final rolling using a 3 m long straightedge? |  |  |  |
| 17.6.5.3 | Did the Project Manager receive the Contractor’s Average Mat Density test results on the same day of testing? |  |  |  |
| 17.6.6.1 | Were all final lift pavement surfaces not meeting the smoothness requirements repaired by the Contractor? |  |  |  |
| 17.6.6.2 | Did the Contractor make every effort to achieve a finished surface with a uniform closed texture and free of segregated areas? |  |  |  |
| 17.6.6.2 | If segregation was present, did the Contractor make immediate corrective actions to the paving process to prevent any further occurrence of segregation? |  |  |  |
| 17.6.6.2 | Did the Contractor repair segregated areas identified at the end of paving each day by following the procedure outlined in the specifications? |  |  |  |
| 17.6.6.2 | Did the Contactor repair any obvious defects promptly and in an acceptable manner? |  |  |  |
| 17.6.6.3 | Were all lifts of ACP smooth, true to cross section, and grade, and free from ruts, depressions, bumps, or other irregularities? |  |  |  |
| 17.6.6.4 | Was the average asphalt content confirmed to be within ± 0.50% of the reviewed and accepted ACP mix design? |  |  |  |
| 17.6.6.5 | Did the difference between the average gradation and the Job Mix Formula gradation meet the specified tolerance? |  |  |  |
| 17.6.7 | Did the Project Manager review and accept the Contractor’s proposed methods of repair or removal and replacement of ACP before the commencement of repair or removal Work? |  |  |  |
| 17.6.9 | Did the Contractor achieve the design gradeline of the finished ACP surface provided by the Project Manager? |  |  |  |
| S-1840 | Were sawcuts at approach slabs ends completed immediately after placement of ACP and filled with an approved hot pour rubberized crack sealant? |  |  |  |

**Details and Summary:**

Date

Signature

1. CSP and SPCSP Structures Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, fabrication, delivery and installation of Corrugated Steel Pipe (CSP) and Structural Plate Corrugated Steel Pipe (SPCSP) with an equivalent diameter of 1500 mm or greater. All work must be carried out as shown on the Drawings as well as Standard Drawings S-1418, Installation of CSP and SPCSP Structures, S-1847, Standard Identification Plaques and Benchmark Tablet, and S-1848, Standard Identification Tags.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Supply and Fabrication – General |  |  |  |
| 18.2.2 | Did the Project Manager confirm that all CSP and SPCSP supplied and fabricated by a fabricator certified to CSA G401 and that Certification was completed by an independent agency accredited by the Standards Council of Canada? |  |  |  |
| 18.2.4 | Was all pipe material new and marked in accordance with CSA G401? |  |  |  |
| 18.2.4.1 | Did the Project Manager review and accept the mill test reports and product data sheets prior to the commencement of fabrication? |  |  |  |
| 18.2.3.1 | Did the Project Manager review and accept the shop drawings for SPCSP structures, and details for beveled ends, elbows and all other component specified in the Special Provisions of the Contract prior to the commencement of fabrication? |  |  |  |
| 18.2.5.3 | Were standard identification plaques and identification tags supplied and installed? |  |  |  |
| 18.2.6.2 | Did the Contractor notify the Project Manager a minimum of 72 hours prior to shipment of CSP or SPCSP to facilitate inspection? |  |  |  |
|  | Supply and Fabrication – CSP |  |  |  |
| 18.2.5.1.1 | Were end sections for each CSP culvert sloped in accordance with Table A and B? |  |  |  |
| 18.2.5.1.2 | For CSP pipes 1500 mm diameter or larger, did all lock seams terminating at the cut edges of a sloped or square end section have a 75 mm length of fillet weld run along both sides of the lock seam at a 300mm stagger, and was the weld and surrounding area zinc coated in accordance with CSA G401? |  |  |  |
| 18.2.9.1,  18.2.9.2 | Were all cut edges of a sloped or square end section made smooth by grinding and was all damage to protective coatings repaired in accordance with specification requirements? |  |  |  |
| 18.2.5.1.4 | Were all pipe ends re-corrugated to provide annular corrugations for couplers? |  |  |  |
| 18.2.5.1.5 | Were only annular corrugated couplers used? |  |  |  |
|  | Supply and Fabrication – SPCSP |  |  |  |
| 18.2.5.2.1 | Were end sections for each culvert sloped in accordance with Table C? |  |  |  |
| 18.2.3.2 | Were bolts in the corrugation valley of each longitudinal seam closer to the visible plate edge than bolts located on the corrugation crest? |  |  |  |
| 18.2.3.2 | Were longitudinal seams staggered a minimum of 2N, except where otherwise reviewed and accepted by the Project Manager? |  |  |  |
|  | Handling and Storage of Material |  |  |  |
| 18.2.7.1 | Prior to assembly, were materials stockpiled neatly and in such a manner as to facilitate inspection and inventory? |  |  |  |
| 18.2.7.2 | Were SPCSP plates stockpiled in the concave-down position to prevent wet storage stains? |  |  |  |
| 18.2.8 | Were materials handled carefully to prevent damage to the coating? |  |  |  |
| 18.2.8 | Where damage to the coating occurred, were the affected plates or sections set aside by the Contractor for further inspection? |  |  |  |
| 18.2.9.1 | Was all damage to galvanized surfaces repaired in accordance with CSA G401? |  |  |  |
| 18.2.9.2 | Was all damage to polymer coating repaired in accordance with specification requirements? |  |  |  |
|  | Installation |  |  |  |
| 18.3.2 | Did Project Manager review and accept the Contractor’s care of water plan? |  |  |  |
| 18.3.3 | Were the excavation walls competent, and did they meet requirements for safety? |  |  |  |
| 18.3.3 | Was the excavation completed to the neat lines shown on the Drawings? |  |  |  |
| 18.3.3  1.3  2.4.2 | When foundation conditions were determined to be soft or unstable, were the limits of excavation reviewed and accepted by the Project Manager? |  |  |  |
| 18.1,  18.3.4 | Was woven geotextile filter fabric placed, and did it meet the physical properties specified? |  |  |  |
| 18.3.4 | Was the bedding fill material compacted to 95% standard proctor density from the 600mm level below the pipe invert? |  |  |  |
| 18.3.4 | Where camber was specified did the top of bedding have a gradual crest curve profile with no sudden breaks in the grade? |  |  |  |
| 18.3.4 | Was pre-shaping of bed material done where specified? |  |  |  |
| 18.3.4 | Was the material within 150 mm of the bottom of pipe placed in a loose uncompacted state? |  |  |  |
| 18.3.5 | Was the cross-sectional shape of CSP and SPCSP structures maintained within 2% of design dimensions? |  |  |  |
| 18.3.5.1 | Were CSP barrel sections placed so that the ends were in close contact and couplers were well fitted and evenly tightened all around the pipe? |  |  |  |
| 18.3.5.1 | Were CSP couplers completely wrapped with a 2 m wide layer of non-woven geotextile, centered over the coupler prior to backfilling? |  |  |  |
| 18.3.5.2 | Were SPCSP bolted seams properly lapped with adjacent plates and were they in full contact for the full width and length of the lap? |  |  |  |
| 18.3.5.2 | Was the SPCSP assembled in the sequence that was accepted by the Project Manager? |  |  |  |
| 18.3.5.2 | At longitudinal seams of SPCSP, were all bolts nearest to the visible plate edge properly located at corrugation valleys and not in the corrugation crests? |  |  |  |
| 18.3.5.2 | After loose bolting of 2 SPCSP rings, were the vertical dimensions checked, and were adjustments using mechanical means made where necessary? |  |  |  |
| 18.3.5.2 | Did the Contractor avoid causing local plate distortion when using tie cables to make dimensional adjustments? |  |  |  |
| 18.3.5.2 | Were the longitudinal seams of the SPCSP straight, and was the vertical axis upright? |  |  |  |
| 18.3.5.2 | Were all SPCSP bolts torqued between 200 Nm and 340 Nm? |  |  |  |
|  | Backfilling |  |  |  |
| 18.3.6,  2.0 | Complete Section 2 Backfill Inspection Check Sheet. |  |  |  |
| 18.3.6 | Was bedding material crushed aggregate Des 2 Class 25? |  |  |  |
| 18.3.6 | Was backfilling completed in accordance with Standard Drawing S-1418? |  |  |  |
| 18.3.6 | Was backfilling completed only when the air temperature was above 0°C? |  |  |  |
| 18.3.6 | Were all backfill materials in an unfrozen state at the time of placement? |  |  |  |
| 18.3.6 | Was backfill material placed on an unfrozen substrate? |  |  |  |
| 18.3.6 | Did backfill completely fill all the corrugations at the haunches? |  |  |  |
| 18.3.6  2.3 | Was the backfill material placed so that the elevation difference on either side of the pipe did not exceed 300 mm? |  |  |  |
| 18.3.6, | Was backfill placed and compacted in lifts not exceeding 150 mm? |  |  |  |
| 18.3.6 | Was acceptable compaction equipment and proper techniques used? |  |  |  |
| 18.3.6 | Was clay seal material highly plastic clay with a minimum plasticity index of 40 and classified in accordance with ASTM D2487? |  |  |  |
| 18.3.8 | Was the shape of CSP and SPCSP structures within 2% of design dimensions during all stages of the Work and at construction completion? |  |  |  |
|  | Concrete Work |  |  |  |
| 18.4,  4 | Complete Section 4, Cast-in-Place Concrete Inspection Check Sheet and Section 5, Reinforcing Steel Check Sheets. |  |  |  |
|  | Heavy Rock Riprap |  |  |  |
| 18.6,  10 | Complete Section 10, Heavy Rock Riprap Inspection Check Sheet. |  |  |  |
| 18.6 | Was all heavy rock riprap placed at the location shown on the Drawings, including provisions for geotextile filter fabric, gradation, thickness and depth? |  |  |  |

**Details and Summary:**

Date

Signature

1. Painted Roadway Markings Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply of material and painting of roadway markings on bridges and approach transitions.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Materials |  |  |  |
| 19.2.1 | Did the Contractor submit written confirmation from the manufacturer that the materials supplied meet all specified requirements? |  |  |  |
| 19.2.1 | Did the Contractor advise the Project Manager of any change in paint formulation and if so, did the Department review and accept the proposed change? |  |  |  |
| 19.2.1 | Did the Contractor take all necessary steps to prevent contamination of the materials? |  |  |  |
| 19.2.1 | Was the paint protected from freezing? |  |  |  |
| 19.3 | Did the Contractor take all precautions against damaging the structure and did he protect the structure from overspray, splashes of paint? |  |  |  |
|  | Application |  |  |  |
| 19.4 | Did the Contractor paint lines or directional arrows on the roadway and bridge deck surfaces, either restoring what existed prior to the construction work or as shown on the Drawings, or as otherwise specified? |  |  |  |
| 19.4 | Did the Contractor match the painted lines to the existing lines? |  |  |  |
| 19.4 | Was the substrate surface clean, dry and at least 10°C in temperature during the water borne paint application? |  |  |  |
| 19.4 | Were painted lines and messages applied at the rate of 38 litres/km of solid 100 mm wide line and 0.4 ℓ/m2 of actual painted area for painted messages, and were glass beads applied immediately following the paint application at a uniform application rate of 600 g/ℓ of paint? |  |  |  |
| 19.4 | Were all painted markings uniform in thickness with no spatter, excessive overspray or other defects? |  |  |  |
| 19.4 | Did the paint sufficiently cure prior to any traffic being permitted to travel on the painted markings? |  |  |  |
| 19.4.1 | Did the Contractor provide quality assurance samples and the manufacturer’s quality control test results to the Project Manager when requested to do so? |  |  |  |

**Details and Summary:**

Date

Signature

1. Deck Overlay and Concrete Rehabilitation Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for deck overlay and concrete rehabilitation work. The Work must be completed in accordance with the Contract documents and as determined by the Department and the Project Manager.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 4.2 & 4.4.4 | Was the mix design reviewed and accepted by the Project Manager? |  |  |  |
| 4.4.5 | Were trial batch(es) performed a minimum of 35 days prior to placement of concrete and did the Contractor produce evidence satisfactory to the Project Manager and the mix design reviewing Professional Engineer that the proportions selected will produce concrete of the quality specified? |  |  |  |
| 4.4.5 | Did the Contractor’s quality representative attend the trial batches to assess workability and finishing characteristics? |  |  |  |
| 20.2 | Was the traffic accommodation strategy implemented in accordance with the plan that was reviewed and accepted by the Project Manager? |  |  |  |
| 20.1 | Were details of proposed material disposal locations reviewed and accepted by the Project Manager prior to disposal? |  |  |  |
|  | Surface Preparation for Concrete Overlay |  |  |  |
| 20.3.2 | Did the Project Manager review and accept the Contractor’s surface removal methods? |  |  |  |
| 20.3.2 | Was surface removal carried out as close as possible to all curbs, medians, barriers, drains, deck joints and other bridge components without causing damage? |  |  |  |
| 20.3.2 | Did the Contractor saw cut through the wearing surface at both ends of the bridge or at the transition paving limits where specified? |  |  |  |
| 20.3.2 | At areas where the specified removal depth was more than 5 mm, did the Contractor use small milling machines having a maximum removal width of 1.2 m? |  |  |  |
| 20.3.2 | Did the Contractor remove milling debris from behind the cold-milling machine and clean the milled surface on a continuous basis? |  |  |  |
| 20.3.2 | Was all reinforcing steel that was damaged as a result of the Contractor’s surface removal operations identified for repair or replacement? |  |  |  |
| 20.3.2 | Was the milled surface inspected to identify unsound concrete? |  |  |  |
| 20.3.2,  20.4 | Were repairs carried out in accordance with the specification requirements? |  |  |  |
| 20.3.3 | Did the Contractor abrasive blast the entire deck surface and the specified vertical faces of barrier/curb, median and parapet? |  |  |  |
| 20.3.3 | Did the Contractor clean the sandblasted area and dispose of debris at an acceptable location? |  |  |  |
| 20.3.3 | Did the Contractor maintain the cleaned deck in satisfactory condition until placement of deck overlay concrete? |  |  |  |
|  | Concrete Repair – General |  |  |  |
| 20.4.1 | Were the perimeters of all repair areas saw cut with neat, perpendicular, 25 mm deep cuts? |  |  |  |
| 20.4.1 | Did the Contractor remove all areas of unsound concrete by chipping, scabbling or other acceptable means? |  |  |  |
| 20.3.1 | Were jack hammers and chipping hammers used for concrete removal rated at a class less than 14 kg and 7 kg, respectively? |  |  |  |
| 20.4.1 | Did the Contractor contain all debris resulting from concrete removal operations and were existing bridge components and surrounding areas protected from damage? |  |  |  |
|  | Concrete Repair – Partial Depth Repair |  |  |  |
| 20.4.2 | Did the Project Manager review and accept all proposed repair materials and repair locations? |  |  |  |
| 20.4.2 | When approved concrete patching products were extended with aggregate, did the aggregates meet the requirements of CSA 23.1 or ASTM C33? |  |  |  |
| 20.4.2 | When specified, was a rubber paddled mortar mixer of adequate size used for mixing? |  |  |  |
| 20.4.2 | Was reinforcing steel fully exposed and concrete removed beyond the reinforcing steel to a depth the greater of 35 mm or 1.5 times the maximum aggregate size contained in the repair material? |  |  |  |
| 20.4.2 | Was reinforcing steel abrasive blasted to a white metal finish? |  |  |  |
| 20.4.2 | Where epoxy coated reinforcing steel existed within the repair area, was the coating completely removed by abrasive blasting and repaired in accordance with the specified requirements? |  |  |  |
| 20.4.2 | Was additional reinforcing steel installed at locations where sectional loss of the existing reinforcing steel was greater than 20%? |  |  |  |
| 20.4.2 | Were the splicing and/or development requirements met, as determined by the Project Manager? |  |  |  |
| 20.4.2 | Did the Contractor saturate the repair area with clean water for a minimum of 30 minutes then blow the repair area free of all water with compressed air prior to commencing repair material placement? |  |  |  |
| 20.4.2 | Were all repair areas located on the deck surface poured monolithically with placement of deck overlay concrete? |  |  |  |
| 20.4.2 | Were the repairs finished smooth, levelled flush to adjacent surfaces and given the appropriate concrete surface finish? |  |  |  |
| 20.4.2 | Were repair areas wet cured for a minimum of 7 days? |  |  |  |
| 20.4.2 | Was compressive strength testing completed for approved concrete patching materials and concrete? |  |  |  |
|  | Concrete Repair – Full Depth Repair |  |  |  |
| 20.4.3 | Did the Project Manager review and accept all proposed repair materials and the locations for use? |  |  |  |
| 20.4.3 | Was all unsound concrete removed where concrete deterioration extended completely through the deck, curbs or other elements? |  |  |  |
| 20.4.3 | Was exposed reinforcing steel abrasive blasted to a white metal finish? |  |  |  |
| 20.4.3 | Where epoxy coated reinforcing steel existed within the repair area, was the coating completely removed by abrasive blasting and repaired in accordance with the specified requirements? |  |  |  |
| 20.4.3 | Was additional reinforcing steel installed at locations where sectional loss of the existing reinforcing steel was greater than 20%? |  |  |  |
| 20.4.3 | Were the splicing and/or development requirements met, as determined by the Project Manager? |  |  |  |
| 20.4.3 | Was the underside of the deck, curbs and other areas requiring full depth repair formed to neatly restore the original lines of the concrete? |  |  |  |
| 20.4.3 | Did the Contractor saturate the repair area with clean water for a minimum of 30 minutes then blow the repair area free of all water with compressed air prior to commencing repair material placement? |  |  |  |
| 20.4.3,  4.0 | Were the repairs vibrated, finished smooth, levelled flush to adjacent surfaces, and given the appropriate concrete surface finish? |  |  |  |
| 20.4.3 | Were full depth repairs located on the deck surface recast monolithically with placement of deck overlay concrete? |  |  |  |
| 20.4.3 | When conditions did not permit a monolithic pour with the deck overlay concrete, was the repair area recast such that the specified overlay thickness would be achieved? |  |  |  |
| 20.4.3 | Was Compressive strength testing completed for each batch of concrete? |  |  |  |
| 20.4.3,  4.23 | Was the concrete cured in accordance with the specified requirements? |  |  |  |
|  | Deck Overlay |  |  |  |
| 20.5.3 | Did the Contractor use the deck overlay gradelines provided by the Project Manager to determine the height of screed at each control point? |  |  |  |
| 20.5.3 | Did the Contractor perform a complete dry-run? |  |  |  |
| 20.5.3 | Did the Contractor locate longitudinal overlay construction joints only at locations accepted by the Project Manager? |  |  |  |
| 20.5.4 | Did the Contractor saturate the deck overlay area with clean water for a minimum of 3 hours and then blow the deck overlay areas free of any water prior to cement/silica fume slurry grout application? |  |  |  |
| 20.5.4 | Was slurry grout mixed and applied in accordance with the specification requirements and was slurry grout continuously mixed to prevent segregation, and applied within 45 minutes of initial mixing? |  |  |  |
| 20.5.4 | Was the cement/silica fume slurry grout applied to all saturated surface dry areas surfaces immediately prior to the commencement of deck overlay concrete placement? |  |  |  |
|  | Deck Overlay Concrete Placement |  |  |  |
| 20.5.8.1 | Was adequate lighting provided? |  |  |  |
| 20.5.5 | When concrete mixer trucks were permitted by the Project Manager to travel on prepared concrete surfaces, were they protected with plywood, tarps or other acceptable devices? |  |  |  |
| 20.5.7,  4.9 | Was deck overlay concrete sampled, inspected and tested in accordance with the specification requirements? |  |  |  |
| 20.5.6.2 | Was concrete discharged within 70 minutes after initial introduction of water? |  |  |  |
| 20.5.8.2 | Did the deck overlay concrete receive a Class 6 surface finish with a 400 mm wide strip adjacent to the curb troweled smooth? |  |  |  |
| 20.5.8.4 | Did the Contractor construct acceptable bulkheads at each longitudinal or transverse construction joint location? |  |  |  |
| 20.5.8.4 | Did the Contractor tool longitudinal construction joints to a depth of 12 mm and a width of 3 mm? |  |  |  |
|  | Deck Overlay Concrete Curing and Sealing |  |  |  |
| 20.5.8.5,  4.23.3 | Was the curing of overlay concrete completed in accordance with the specification requirements? |  |  |  |
| 20.5.8.6 | Did the Contractor apply a Type 1c sealer to the deck overlay surface after concrete had cured at least 14days? |  |  |  |
| 20.5.8.4 | Did the Contractor fill the tooled longitudinal grooves with a proven epoxy resin type gravity flow concrete crack filler listed on the Alberta Transportation Product List? |  |  |  |

**Details and Summary:**

Date

Signature

1. Demolition, Disposal and Salvage of Bridge Structures Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the demolition, disposal, and salvage of bridge structures. The Work must be completed in accordance with the Contract documents and as determined by the Department and the Project Manager.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Demolition and Disposal |  |  |  |
| 21.2.1 | Did the Project Manager review and accept the Contractor’s detailed demolition and disposal plan including drawings and supporting documents, prior to the construction milestone meeting? |  |  |  |
| 21.2.1 | Was a construction milestone meeting for demolition, disposal and salvage work conducted with the Contractor’s project manager, field superintendent, and all specialty Subcontractors? |  |  |  |
| 21.2.1 | Was the limit of bridge structure removal, including excavation, to an elevation of 0.6 metres below streambed for bridge piers and 1.0 m below existing ground for bridge abutments and all other bridge elements, or as specified in the special provisions of the Contract? |  |  |  |
| 21.2.2, 1 | Did the excavation work conform to the specification requirements? |  |  |  |
| 21.2.3 | Upon completion of the demolition, disposal and salvage, did the Contractor restore the site to a condition similar to the natural ground as determined by the Inspector, including disposing of all surplus excavated materials, backfilling, supplying and placement of 50 mm minimum thickness of organic material, and seeding? |  |  |  |
|  | Salvage |  |  |  |
|  | Was the condition of bridge material to be salvaged reviewed, documented, and photographed? |  |  |  |
| 21.3 | Did the Contractor perform his Work in a manner that prevented damage to or loss of bridge structures and/or materials listed for salvage? |  |  |  |
| 21.3 | Were SPCSPs dismantled to yield lengths not exceeding eight (8) metres? |  |  |  |
| 21.3 | Were CSPs dismantled by removing the couplers to achieve the original fabricated lengths? |  |  |  |
| 21.3 | Were precast concrete units individually removed by disconnecting the units, removing the grout from shear keys and connector pockets, and removing connector bolts, drift pins and other hardware? |  |  |  |
| 21.3 | Did the Contractor transport salvaged bridge structures and/or materials to the location designated in the Special Provisions of the Contract and in a manner that did not damage the salvaged bridge structures and/or materials in any way? |  |  |  |
|  | Did the Contractor acceptably restore all disturbed areas? |  |  |  |

**Details and Summary:**

Date

Signature

1. Painting Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for field painting of structural steel bridges and for shop painting of newly fabricated structural steel for bridges.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 22.3 | Did the Contractor meet the minimum competency levels as specified in the Special Provisions of the Contract? |  |  |  |
| 22.7 | Did the Project Manager review and accept the Contractor’s Work Proposal? |  |  |  |
| 22.7 | Did the Project Manager review and accept the Contractor’s drawings which detail his containment structure, scaffolding, platforms, swing stages and attachments? |  |  |  |
|  | Environmental Considerations |  |  |  |
| 22.5.2 | Did the Project Manager review and accept the Contractor’s ECO Plan and did it comply with all Federal, Provincial and Municipal air, soil and water pollution control regulations? |  |  |  |
| 22.5.6 | Was an Environmental Auditor retained by the Project Manager to verify Contractor compliance with the Environmental Permits and/or Screening Report? |  |  |  |
| 22.5.7 | Did the Contractor collect background soil, water/snow and air samples prior to commencement of the work at locations identified in the Work Proposal and in the presence of the Inspector? |  |  |  |
| 22.5.7 | Did the Project Manager receive the analysis and results of soil, water/snow and air sample laboratory testing? |  |  |  |
| 22.5.5 | Did the Contractor take all necessary precautions to fully protect the environment during the Work? |  |  |  |
| 22.5.7 | Did the Project Manager review and accept the Contractor’s analysis of at least two post-construction soil, water/snow and air samples? |  |  |  |
|  | Work Site Health and Safety |  |  |  |
| 22.8 | If the existing paint system being removed contained lead, did the Contractor implement a Lead Health and Safety Program (LHASP) that met all the requirements of the Occupational Health and Safety Act and Regulations? |  |  |  |
| 22.8 | Did the Contractor provide shower and change facilities for all personnel associated with the Contract? |  |  |  |
| 22.8 | Were respirators furnished by the Contractor when necessary to protect the health of employees? |  |  |  |
| 22.8 | Were extra protective clothing and clean respirators available for use by visitors to the work site? |  |  |  |
| 22.8 | Did the Contractor designate a Health and Safety officer to act as the primary on-site monitor of the LHASP? |  |  |  |
|  | Quality Control / Quality Assurance |  |  |  |
| 22.4.3 | Prior to the commencement of painting operations did the Project Manager review and accept the Contractor’s quality control tests for colour, gloss, and formulation for each batch of paint used? |  |  |  |
| 22.4.3 | Was the paint delivered in sealed, originally labelled containers bearing the Manufacturer’s name, type of paint, brand name, colour designation, batch number and instructions for mixing and/or reducing? |  |  |  |
| 22.18 | Did the Contractor have an experienced quality control person solely dedicated to monitoring and correcting the Work? |  |  |  |
| 22.18 | Did the NACE certified quality assurance inspector, who was appointed by the Project Manager, monitor and accept the Work? |  |  |  |
| 22.18 | Was all cleaning and surface preparation reviewed and accepted by the NACE inspector prior to the application of paint? |  |  |  |
|  | Protection of Surfaces |  |  |  |
| 22.10 | Did the Contractor take precautions against damaging or disfiguring any portion of the bridge? |  |  |  |
| 22.12.1 | Were temporary clamps or other devices attached to the structure padded or designed so they did not mark or damage the surface? |  |  |  |
| 22.11 | Were the surfaces left unpainted as specified in the Special Provisions of the Contract? |  |  |  |
|  | Surface Cleaning |  |  |  |
| 22.13 | Did the Contractor carry out surface cleaning on all steel designated to receive a coating system in accordance with specification requirements? |  |  |  |
| 22.13 | Was oil, grease and road tar removed manually by solvent cleaning in accordance with SSPC Specification SP1? |  |  |  |
| 22.13 | Were all areas to be coated washed clean of road spatter, chlorides and other contaminates using water of sufficient pressure and volume to flush the contaminants from the structure? |  |  |  |
| 22.13 | Were areas of cleaned steel tested for chloride contaminants, soluble ferrous ions and sulphate contaminants? |  |  |  |
| 22.13 | Did the Project Manager review and accept the Contractor’s surface contaminant test results prior to commencing surface preparation operations? |  |  |  |
| 22.13 | Was wash water captured, filtered and acceptably disposed of? |  |  |  |
|  | Containment System Monitoring |  |  |  |
| 22.12.4 | Was the ventilation system used as specified in the Special Provisions of the Contract and as described in the SSPC-Guide 6? |  |  |  |
| 22.12.5 | Did the Contractor have monitoring equipment to ensure that the containment was performing to the required level as specified in the Special Provisions of the Contract and as described in the SSPC-Guide 6? |  |  |  |
| 22.12.3.1 | Did the Contractor maintain a documented reporting system to provide gross weights, tare of containers and the calculated weight of the material provided to and removed from the structure in accordance with the Work Proposal? |  |  |  |
| 22.12.3.1 | Did the Contractor take whatever measures were necessary to prevent the release of dust or spent blast media from the containment enclosure? |  |  |  |
| 22.12.3.1 | Was debris that collected on temporary work platforms, ground cloths or walls of the containment structure removed each workday with a vacuum and filtration system? |  |  |  |
|  | Surface Preparation |  |  |  |
| 22.14.1 | Did the Contractor demonstrate that compressed air was moisture free and lubricated air tools did not contaminate the surface being prepared? |  |  |  |
| 22.14.1 | Where required, was compressed air cleaning acceptably completed before the application of paint? |  |  |  |
| 22.4.2 | Was blasting grit free of corrosion producing contaminates, moisture, oils, greases or other elements? |  |  |  |
| 22.14.1 | Was blast cleaning of steel surfaces completed in accordance with the SSPC Surface Preparation Standards specified in the Special Provisions of the Contract? |  |  |  |
| 22.14.1 | Did the Contractor prepare only as much surface as could be coated with primer that same day? |  |  |  |
|  | Treatment of Pack Rust |  |  |  |
| 22.15 | Did the Project Manager review and accept the type of penetrant and caulking? |  |  |  |
| 22.15 | Were pack rust areas of the plates cleaned and treated with an approved penetrant and caulked along the top edge and two sides plate involved? |  |  |  |
|  | Priming and Painting |  |  |  |
| 22.18 | Did the Contractor obtain the NACE inspector’s acceptance of all cleaning and surface preparation before painting? |  |  |  |
| 22.17.1 | Did the Contractor apply stripe paint along all sharp changes in steel surfaces? |  |  |  |
| 22.17.1 | Was stripe coat that was applied over the primer or intermediate coat tinted to contrast the underlying coat? |  |  |  |
| 22.17.2 | Was paint applied in accordance with the manufacturer’s instructions? |  |  |  |
| 22.17.2 | Was paint applied at the manufacturer’s specified air and/or steel temperatures? |  |  |  |
| 22.17.2 | Was paint applied to dry, frost-free surfaces and was the ambient temperature rising? |  |  |  |
| 22.17.2 | Was only the anticipated quantity of paint required for one day’s work opened on that day? |  |  |  |
| 22.17.2 | Was the paint mixed in a manner that ensured breaking up of all lumps, complete dispersion of settled pigment and a uniform composition? |  |  |  |
| 22.17.2 | Was any paint that was left overnight in spray pots, painter’s buckets, etc., discarded? |  |  |  |
| 22.17.2 | Did the Contractor store paint safely in a location that maintained its temperature between 10°C to 25°C? |  |  |  |
| 22.17.2 | Was paint applied by spraying, brushing, rolling or a combination of these methods? |  |  |  |
| 22.17.2 | Was touched-up primer dry before finish coat paint was applied? |  |  |  |
| 22.17.2 | Was the range of film thicknesses for all portions of the paint system within the approved thicknesses stated on the Department’s Product List? |  |  |  |
| 22.17.2 | Was the wet film thickness checked at the time the paint was applied to ensure that the proper dry film thickness was obtained? |  |  |  |
| 22.17.2 | Was dry film thickness verified with a Type 2 constant pressure probe magnetic gauge calibrated in accordance with SSPC-PA 2? |  |  |  |
| 22.21 | Were all painted surfaces free of defects? |  |  |  |
| 22.21 | Were areas requiring repair completed in accordance with the specification requirements and satisfaction of the NACE inspector? |  |  |  |
| 22.21 | Were support points for work platforms or containment structures painted with the accepted paint system, or did the Project Manager review and accept the Contractor’s proposed alternate application procedure for the painting of touch points? |  |  |  |
| 22.10 | Did the Contractor protect and maintain the painted surfaces until final acceptance by the Project Manager and the Department? |  |  |  |
|  | Disposal of Blasting Spoil |  |  |  |
| 22.16 | Was the collection, storage and disposal of blasting residue carried out in compliance with Federal, Provincial and Municipal laws? |  |  |  |
| 22.16 | Was all waste residue collected during the surface preparation process stored at the site in acceptable containers with waterproof covers? |  |  |  |
| 22.16 | Was stored waste sampled and tested by the Contractor in accordance with the Toxic Characteristic Leachate Procedure (TCLP) test? Before disposal of waste, did the Project Manager and the Department receive test results for each batch of blasting residue? |  |  |  |
| 22.16 | Did the Project Manager receive acceptable documentation from the Contractor confirming that all hazardous waste was disposed of in conformance with all applicable regulations? |  |  |  |
|  | Site Clean-Up |  |  |  |
| 22.22 | Did the Contractor leave the entire site in an acceptable neat and tidy condition? |  |  |  |
|  | 5 Year Bridge Painting Warranty |  |  |  |
| 22.23 | Did the Project Manager receive the Contractor’s 5 year written warranty for the Work? |  |  |  |

**Details and Summary:**

Date

Signature

1. Structural Lumber and Piling Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply and treatment of dimensional structural lumber and round timber piles.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Material |  |  |  |
| 23.3 | Was all material full sawn unless otherwise noted in the Contract? |  |  |  |
| 23.3.1 | Were planks (S1S1E strip deck) Hemlock-Fir and did they meet the requirements of NLGA paragraph 124 b) "No. 1" - Structural Joists and Planks? |  |  |  |
| 23.3.2 | Were sheeting, retainers, nailers and S1S1E subdeck Coast Douglas Fir or Pacific Coast Hemlock and did they meet the requirements of NLGA paragraph 124 b) "No. 1" - Structural Joists and Planks? |  |  |  |
| 23.3.3 | Were rough caps Coast Douglas Fir and did they meet the requirements of NLGA paragraph 131 a) "Select Structural" - Posts and Timbers? |  |  |  |
| 23.3.4 | Were the framed subcap coast Douglas Fir and did they meet the requirements of NLGA paragraph 131 a) "Select Structural" - Posts and Timbers? |  |  |  |
| 23.3.5 | Were wheelguards Coast Douglas Fir or Pacific Coast Hemlock and did they meet the requirements of NLGA paragraph 130 b) "No. 1" - Structural Beams and Stringers? |  |  |  |
| 23.3.6 | Were rough stringers Coast Douglas Fir and did they meet the requirements of NLGA paragraph 130 a) "Select Structural" - Beams and Stringers? |  |  |  |
| 23.3.7 | Were struts and handrail posts Coast Douglas Fir or pacific coast hemlock and did they meet the requirements of NLGA paragraph 131 a) "Select Structural" - Posts and Timbers? |  |  |  |
| 23.3.8 | Were S1S1E cleats Coast Douglas Fir or Pacific Coast Hemlock and did they meet the requirements of NLGA paragraph 124 c) "No. 2" - Structural Joists and Planks? |  |  |  |
| 23.3.9 | Were railings Coast Douglas Fir or Pacific Coast Hemlock and did they meet the requirements of NLGA paragraph 124 b) "No. 1" - Structural Joists and Planks and be surfaced four sides (S4S)? |  |  |  |
| 23.3.10 | Were all piles cut from sound trees of Douglas Fir or Pine and did they meet all specification requirements? |  |  |  |
| 23.4 | Was air seasoning completed prior to treatment in accordance with the specification requirements? |  |  |  |
| 23.5 | Was kiln drying completed in accordance with the specification requirements? |  |  |  |
| 23.6 | Was material incised on all four sides and all around piles prior to treatment? |  |  |  |
| 23.7 | Was the specified creosote treatment retention achieved? |  |  |  |
| 23.8 | Was the specified chromate copper arsenate treatment retention achieved? |  |  |  |
|  | Inspection of Material |  |  |  |
| 23.10 | Did the Project Manager review and accept the written report and certificate of compliance? |  |  |  |
| 23.10 | Did the independent inspector produce a report indicating his acceptance of all materials both prior to and after the treatment? |  |  |  |
| 23.10 | Did the independent inspector stamp and date all materials to indicate that the material meets specification requirements? |  |  |  |
|  | Handling, Storage and Care of Wood |  |  |  |
| 23.9 | Were materials kept free of dirt and stored in an acceptable location? |  |  |  |
| 23.9 | Were cuts, abrasions and holes treated in accordance with the specified requirements? |  |  |  |

**Details and Summary:**

Date

Signature

1. Overhead Sign Structures and Panels Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the design, supply, fabrication, and erection of bridge support or cantilever type overhead sign structures and sign panels.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 24.1 | Did the Contractor identify conflicts between underground and overhead utilities and sign bases and support structures and did he communicate these to the Project Manager before construction? |  |  |  |
| 24.2.1.2,  24.2.3.1 | Did the Project Manager review and accept the Contractor’s geotechnical investigation for foundation design? |  |  |  |
|  | Design, Supply and Fabrication |  |  |  |
| 24.2.2.2.1 | Did the Contractor notify the Department and Project Manager of any subcontractors (fabricators) in his employ? |  |  |  |
| 24.2.2.2.1 | Did the fabricator possess the specified qualifications? |  |  |  |
| 24.2.2.3.2 | Were the shop drawings in electronic unlocked PDF format and did they include the Department’s shop drawing identification block and have a sufficient blank space for the Project Manager’s review stamp? |  |  |  |
| 24.2.2.3.2, 24.2.2.3.4 | Were shop drawings, design notes, independent check notes, mill test reports, product data sheets, and weld procedures reviewed and accepted by the Project Manager? |  |  |  |
| 24.2.2.6.1 | Was a pre-fabrication meeting held after the shop drawings, design notes, independent check notes mill test reports, product data sheets, and weld procedures were reviewed and accepted by the Project Manager and prior to the commencement of any fabrication? |  |  |  |
| 24.2.2.9 | Did the Contractor notify the Project Manger 72 hours prior to shipment to facilitate final fabrication inspection and acceptance? |  |  |  |
|  | Materials |  |  |  |
| 24.2.1.2,  5.0 | Did all reinforcing steel conform to the specified requirements? |  |  |  |
| 24.2.1.2,  4.0 | Was the concrete mix design reviewed and accepted by the Project Manager? |  |  |  |
|  | Transportation, Handling and Storing Materials |  |  |  |
| 24.2.4.1 | Did the Contractor replace all materials that were damaged in shipping or during erection? |  |  |  |
|  | Foundation Construction |  |  |  |
| 24.2.3.1,  3.0 | Were foundation piles constructed in accordance with the specification requirements? |  |  |  |
| 24.2.3.2 | Were anchor rods installed true and plumb in one complete assembly and accurately positioned and secured to prevent movement or displacement during concrete placement? |  |  |  |
|  | Erection |  |  |  |
| 24.2.4.1 | Did the Project Manager review and accept the Contractor’s traffic accommodation strategy? |  |  |  |
| 24.2.4.1 | Were traffic accommodation strategy requirements maintained until anchor rod nut tightening and baseplate grouting was completed, reviewed, and accepted by the Inspector? |  |  |  |
| 24.2.3 | Was the foundation concrete acceptably cured and did it achieve an acceptable strength prior to erection? |  |  |  |
| 24.2.1 | Was the overhead sign structure set in accordance with the specification requirements? |  |  |  |
| 24.2.3 | Was the sign structure erected in a manner acceptable to the Project Manager, including the interim period between erection grouting and final tightening of anchor rod nuts? |  |  |  |
| 24.2.4.3 | Were contact surfaces clean and free of defects? |  |  |  |
| 24.2.4.3 | Did bolted parts fit solidly together when assembled? |  |  |  |
| 24.2.4.3 | Were connections assembled with a hardened washer under either the bolt head or nut, whichever was the element turned in tightening? |  |  |  |
| 24.2.4.3.1,  6.3.2.6 | Were all structural bolts tightened using the specified turn of nut method? |  |  |  |
|  | Grouting and Sealing |  |  |  |
| 24.2.4.2 | Were the grout pads constructed as shown on the shop drawings and in accordance with the specification requirements? |  |  |  |
| 24.2.4.2 | Did the Project Manager review and accept the Contractor’s forming and pouring method for grout? |  |  |  |
| 24.2.4.2 | Was the grout packaged in waterproof containers with the production date and shelf life shown? |  |  |  |
| 24.2.4.2 | Was the grout mixed and placed in accordance with the manufacturer’s recommendations? |  |  |  |
| 24.2.4.2 | Did the Contractor sample and test the grout in accordance with the specification requirements? |  |  |  |
| 24.2.4.2 | Did the Project Manager receive all compressive strength test results for grout? |  |  |  |
| 24.2.4.2 | Was grout wet cured for a minimum of 3 days with two layers of clean filter fabric meeting the specification requirements? |  |  |  |
| 24.2.4.2.1 | If grouting occurred when the air temperature was below 5 °C, was a cold weather grouting plan implemented in accordance with the specification requirements? |  |  |  |
| 24.2.4.2 | Was a Type 1C sealer applied to the exposed grout pad surfaces in accordance with the specification requirements? |  |  |  |
|  | Anchor Rod Nut Tightening |  |  |  |
| 24.2.4.4 | Were anchor rod nuts tightened after the grout has attained sufficient strength using the specified turn of nut method to 1/3 turn past the snug-tight condition? |  |  |  |
| 24.2.4.4 | Were all voids including the slots and annular space around anchor rods in the base plate filled with an acceptable corrosion inhibiting paste? |  |  |  |
|  | Sign Panels |  |  |  |
| 24.3.3 | Did the Contractor install the sign panels onto the sign structures as shown on the Drawings and in accordance with the specification requirements? |  |  |  |
| 24.3.3 | Did the Contractor connect the sign panels to the sign structure, as detailed on Alberta Transportation drawing TCS-A4-335A and as shown on the shop drawings? |  |  |  |
| 24.3.3 | Were individual extruded aluminum sign sub panels fastened together using stainless steel bolts, nylon insert lock nuts, and washers under both the bolt head and the nut? |  |  |  |
| 24.3.3 | Was the bolting of the joint between the extruded aluminum sections staggered between the rows of slots? |  |  |  |
| 24.3.3 | Were sign panels attached to the T stiffeners using J clip assemblies? |  |  |  |
| 24.3.3 | Were stainless steel slip arresting bolts installed in accordance with the specification requirements? |  |  |  |
| 24.3.3 | Did the stainless steel slip arresting bolts and nuts meet the specified requirements? |  |  |  |
| 24.3.3 | Were slip arresting bolts tightened to a torque of 181 Nm? |  |  |  |
| 24.3.3 | Were all joiner bolts and J clip nuts tightened to a torque of 26.5 Nm? |  |  |  |
| 24.3.3 | Were the faces of the sign panels acceptably cleaned? |  |  |  |

**Details and Summary:**

Date

Signature

1. Mechanically Stabilized Earth Walls Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the design, supply, fabrication and construction of single stage mechanically stabilized earth (MSE) retaining walls with precast concrete fascia panels.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | General |  |  |  |
| 25.4,  7.2.2 | Did the Contractor notify the Department and Project Manager of any subcontractors (fabricators) in his employ? |  |  |  |
| 25.2.9 | Were the shop drawings submitted in electronic unlocked PDF format and did they include the Department’s shop drawing identification block and have a sufficient blank space for the Project Manager’s review stamp? |  |  |  |
| 25.2.9 | Were design notes, independent check notes, and shop drawings reviewed and accepted by the Project Manager prior to the commencement of any fabrication? |  |  |  |
|  | Materials |  |  |  |
| 25.3.1 | Did the Project Manager review and accept the Contractor’s mill test reports for steel soil reinforcement, connections, and hardware prior to being incorporated in the Work? |  |  |  |
| 25.3.1 | Did the Project Manager review and accept the Contractor’s material test reports for geosynthetic soil reinforcement, connections, and impermeable geomembrane prior to being incorporated in the Work? |  |  |  |
| 25.3.2,  4.0 | Did the Project Manager review and accept the Contractor’s proposed aggregates, aggregate gradations, suitability of materials and concrete mix designs? |  |  |  |
| 25.3.2,  4.0 | Did the Project Manager accept the Contractor’s mix design and trail batch results? |  |  |  |
| 25.3.3, 5.0 | Did the Project Manager receive and accept the Contractor’s mill test reports for reinforcing steel? |  |  |  |
| 25.3.3,  5.0 | Did reinforcing steel meet the specified requirements? |  |  |  |
| 25.3.4 | Did steel soil reinforcement meet the specified requirements? |  |  |  |
| 25.3.4.1 | Was galvanizing of steel soil reinforcement in accordance with the specified requirements? |  |  |  |
| 25.3.5 | Did geosynthetic soil reinforcement meet the specified requirements? |  |  |  |
| 25.3.6,  12.0 | Did safety railings meet the specified requirements? |  |  |  |
| 25.3.8 | Did non-woven geotextile filter fabric meet the specified requirements? |  |  |  |
| 25.3.9 | Did impermeable geomembrane meet the specified requirements? |  |  |  |
| 25.3.10 | Did Type 1c sealer meet the specified requirements? |  |  |  |
| 25.3.11 | Did precast concrete fascia panel installation shims meet the specified requirements? |  |  |  |
|  | Backfill Materials |  |  |  |
| 25.3.7 | Did the proposed backfill material within 2 m of face of precast concrete fascia panels conform to the specified requirements? |  |  |  |
| 25.3.7 | Did the proposed backfill material beyond 2 m from face of panels conform to the specified requirements? |  |  |  |
| 25.3.7 | Were samples for testing from proposed stockpiles taken at the top, middle, and bottom portions? |  |  |  |
| 25.3.7 | Did backfill materials meet or exceed the minimum acceptable limit specified for resistivity? |  |  |  |
| 25.3.7 | Did backfill materials meet the acceptable range specified for pH? |  |  |  |
| 25.3.7 | Did backfill materials fall below the maximum acceptable chloride content specified? |  |  |  |
| 25.3.7 | Did backfill materials fall below the maximum acceptable magnesium sulphate soundness specified? |  |  |  |
| 25.3.7 | Did backfill materials fall below the maximum acceptable sulphate specified? |  |  |  |
| 25.3.7 | Did backfill materials fall below the maximum organic content specified? |  |  |  |
|  | Material Storage |  |  |  |
| 25.5 | Was the storage area properly drained? |  |  |  |
| 25.5.10 | Were precast concrete fascia panels stored safely and uniformly supported on timber bearing blocks with acceptable separators? |  |  |  |
| 25.5.10 | Was soil reinforcement stored above ground? |  |  |  |
| 25.5.10 | Were precast concrete fascia panels acceptably stored, shored on timber blocking, and kept clean? |  |  |  |
| 25.5.10 | Were precast concrete fascia panels stored in a manner to prevent staining of the panel face? |  |  |  |
|  | MSE Precast Concrete Fascia Panel Fabrication |  |  |  |
| 25.4,  7.2.2 | Did the Contractor notify the Department and Project Manager of any subcontractors (fabricators) in his employ? |  |  |  |
| 25.4,  7.2.3.1 | Were the shop drawings submitted in electronic unlocked PDF format and did they include the Department’s shop drawing identification block and have a sufficient blank space for the Project Manager’s review stamp? |  |  |  |
| 25.2.9,  25.4,  7.2.3.2 | Were shop drawings, concrete mix design, design notes, and independent check notes reviewed and accepted by the Project Manager? |  |  |  |
| 25.4  7.2 | Was a pre-fabrication meeting held after the shop drawings, concrete mix design, design notes, and independent check notes were reviewed and accepted by the Project Manager and prior to the commencement of any fabrication? |  |  |  |
| 25.4,  7.2.6.7 | Did the Contractor notify the Project Manager 72 hours prior to shipment to facilitate final inspection and acceptance of the precast concrete fascia panels? |  |  |  |
|  | MSE Precast Concrete Fascia Panel Transportation, Handling and Storage |  |  |  |
| 25.4,  7.3.2 | Were precast concrete fascia panels protected from dirt, road salts, slush and other contaminants during transportation? |  |  |  |
| 25.4,  7.3.2 | Upon arrival to site and prior to erection, did the Contractor inspect all components in presence of the Inspector and verify that all components had no damage? |  |  |  |
| 25.5.2 | Did the Contractor and MSE Wall design engineer of record provide formalized documentation for the on-site delivery of MSE wall components indicating compliance with all Contract requirements? |  |  |  |
|  | Construction – General |  |  |  |
| 25.5.1 | Was a milestone construction meeting for MSE wall construction held prior to the commencement of the Work? |  |  |  |
| 25.5.1 | Did the Contractor employ qualified personnel experienced in constructing MSE walls to supervise and perform the Work? |  |  |  |
| 25.5.1 | Did the MSE wall supplier provide a full time representative on site during construction? |  |  |  |
|  | Construction – Excavation |  |  |  |
| 25.5.3,  1.0 | Was the MSE wall area excavated to the elevation shown on design and shop drawings and in accordance with the specification requirements? |  |  |  |
| 25.5.11 | Did the Contractor construct, maintain and modify temporary drainage features to prevent adverse amounts of surface run-off from entering the MSE wall construction area? |  |  |  |
| 25.5.3 | Was the area proof rolled after excavation and was all soft or unsuitable material removed and replaced with compacted crushed aggregate material? |  |  |  |
| 25.5.3 | Did the Project Manager and his geotechnical engineer review the formalized documentation for excavation, ground improvements, and foundation base preparation? |  |  |  |
| 25.2.2 | Were weep drains installed near the front and back corners of MSE soil mass? |  |  |  |
|  | Construction – Levelling Pads |  |  |  |
| 25.5.4 | Were the levelling pad formwork elevations set by instrument and constructed in accordance with the design profile? |  |  |  |
| 25.2.3 | If levelling pads were stepped, did they conform to the specification requirements? |  |  |  |
| 25.2.3 | Did levelling pads project 75 mm minimum beyond either side of the precast concrete fascia panels? |  |  |  |
|  | Construction – Precast Concrete Fascia Panel Installation |  |  |  |
| 25.5.6 | Were precast concrete fascia panels installed in accordance with the specified tolerances? |  |  |  |
| 25.2.5 | Was the soil reinforcement installed in accordance with the reviewed and accepted shop drawings and specification requirements? |  |  |  |
| 25.2.6 | Was filter fabric properly installed on the back side of panels at both vertical and horizontal joints? |  |  |  |
| 25.2.3 | Was the MSE wall battered back against the retained soil at 50:1? |  |  |  |
| 25.5.6 | Were all precast concrete fascia panels exhibiting cracks, spalls, and corner breaks removed and replaced? |  |  |  |
| 25.2.8 | Were inspection wires installed at the locations shown on the reviewed and accepted shop drawings and in accordance with the specification requirements? |  |  |  |
| 25.2.8 | Were inspection access holes in the precast concrete fascia panels patched with an approved concrete patching product and was a survey target anchored into the patching material? |  |  |  |
| 25.5.8 | Were the seams of impermeable geomembrane placed parallel to the MSE Wall, lapped in the direction of positive drainage to produce a shingle effect, and installed in accordance with the manufacturer’s recommendations? |  |  |  |
| 25.2.2 | Were concrete swales constructed in accordance with the reviewed and accepted shop drawings and the specification requirements? |  |  |  |
| 25.5.7,  4.0, 5.0 | Was the cast in place coping constructed in accordance with the reviewed and accepted shop drawings and the specification requirements? |  |  |  |
| 25.5.7 | Were galvanized anchor bolts for safety railing cast into the coping? |  |  |  |
| 25.5.2 | Did the Project Manager receive the Contractor’s and MSE Wall design engineer of record’s formalized documentation for the alignment of precast concrete fascia panels indicating compliance with all Contract requirements? |  |  |  |
| 25.5.2 | Did the Project Manager receive the Contractor’s and MSE Wall design engineer of record’s formalized documentation for wall alignment and tolerance measurements indicating compliance with all Contract requirements? |  |  |  |
| 25.5.9,  12.0 | Was safety rail installed in accordance with the reviewed and accepted shop drawings and the specification requirements? |  |  |  |
|  | Construction – Backfilling |  |  |  |
| 25.5.5 | Was wall backfill material compaction performed in such a manner that equipment ran parallel to the wall panels? |  |  |  |
| 25.5.5 | Was backfill material placed and compacted such that soil reinforcement was fully supported for its entire length, except for small, localized depressions or pockets, acceptable to the Project Manager, required to facilitate connection hardware installation? |  |  |  |
| 25.5.5 | Was only hand operated compaction equipment used within 1000 mm of the precast concrete fascia panels? |  |  |  |
| 25.5.5,  2.0 | Was the backfill material placed and compacted in loose 150 mm lifts? |  |  |  |
| 25.2.3 | Did the backfill material extend a minimum of 500 mm beyond the end of soil reinforcement? |  |  |  |
| 25.5.5 | Was compaction testing of the backfill material completed using the specified method and frequency? |  |  |  |
| 25.5.5 | Were separate sieve analyses completed on backfill material placed at the beginning and at the end of each day for each zone of backfill containing soil reinforcing? |  |  |  |
| 25.5.5 | Were sieve analysis test results provided to the Inspector/Project Manager at the end of each day? |  |  |  |
| 25.5.5 | Were all backfill lifts compacted to a minimum of 98% of the control strip density? |  |  |  |
| 25.5.5 | Were compaction test results provided to the Inspector at the end of each day? |  |  |  |

**Details and Summary:**

Date

Signature

1. RCP and PBC Structures Inspection Check Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Project/Hwy/Location: |  | Consultant: |  |
| Bridge File No: |  | Inspector: |  |
| Contract No: |  | Bridge Element/Phase of Construction: |  |

This inspection check sheet is for the supply, manufacturing, delivery, and installation of Reinforced Concrete Pipe (RCP) and Precast Box Culvert (PBC) structures.

| **SSBC Reference** | **Item** | **Compliance** (Y/N) | **Date & Time  of Inspection** | **Comments**  ***(Noted Deficiencies / Date and Time of Re-Inspection)*** |
| --- | --- | --- | --- | --- |
|  | Supply and Manufacture |  |  |  |
| 26.2.3 | Were the RCP and PBC sections supplied and manufactured by a certified precast fabricator? |  |  |  |
| 26.2.4 | Were shop drawings, mill test reports, product data sheets and concrete mix design reviewed and accepted by the Project Manager? |  |  |  |
| 26.2.5 | Was a pre-fabrication meeting held after the shop drawings, mill test reports, product data sheets, and concrete mix design were reviewed and accepted by the Project Manager and prior to the commencement of any fabrication? |  |  |  |
| 26.2.1 | Were indirect designed RCP including flared end pipe sections supplied and manufactured in accordance with CSA A257 or ASTM C76M and the specification requirements? |  |  |  |
| 26.2.1 | Were direct designed RCP structures supplied and manufactured in accordance with ASTM C1417M and the specification requirements? |  |  |  |
| 26.2.2 | Were PBC supplied and manufactured in accordance with ASTM C1433M and the specification requirements? |  |  |  |
|  | Materials |  |  |  |
| 26.2.6.1 | Did hydraulic cement type HS or HSB conform to the requirements of CSA A3001? |  |  |  |
| 26.2.6.2 | Did reinforcing steel for RCP structures conform to ASTM C76 or ASTM C1417M? |  |  |  |
| 26.2.6.2, 5.0 | Did reinforcing steel for PBC structures conform to ASTM C1433M and the specification requirements? |  |  |  |
| 26.2.6.3 | Did rubber gaskets for RPC structures conform to CSA A257.3? |  |  |  |
| 26.2.6.3 | Did flexible joint sealants for PBC structures conform to ASTM C990? |  |  |  |
| 26.2.6.3 | Did rubber gaskets for PBC structures conform to ASTM C1619? |  |  |  |
|  | Testing and Inspection |  |  |  |
| 26.2.7.1 | Did the Contractor provide suitable facilities for the inspection of the Work? |  |  |  |
| 26.2.7.3 | Did the Contractor set up inspection stations for all witness points specified? |  |  |  |
| 26.2.7.3 | At each of the witness points specified, did the Contractor check the Work and was it reviewed and accepted by the Project Manager’s fabrication inspector? |  |  |  |
| 26.2.7.4 | Did the Contractor undertake sampling, casting, curing and testing of concrete specimens to demonstrate specification compliance? |  |  |  |
|  | Identification Markings |  |  |  |
| 26.2.8.1 | Were all classed and indirect designed RCP sections marked in accordance with specification requirements? |  |  |  |
| 26.2.8.1 | Were all direct designed RCP sections marked in accordance with specification requirements? |  |  |  |
| 26.2.8.2 | Were all PBC sections marked in accordance with specification requirements? |  |  |  |
| 26.2.9,  13.0 | Were standard identification plaques supplied and installed in accordance with specification requirements? |  |  |  |
|  | Defects |  |  |  |
| 26.2.10 | Were all defects immediately reported to the Inspector? |  |  |  |
| 26.2.10,  26.2.10.1 26.2.10.2 | Did the Project Manager and the Department review and accept the Contractor’s repair procedures prior to the commencement of repairs? |  |  |  |
|  | Handling, Storage and Shipping |  |  |  |
| 26.2.11 | Were rubber gaskets and sealants stored in accordance with the manufacturer’s recommendations? |  |  |  |
| 26.2.11 | Were RCP and PBC sections stockpiled at ground height with acceptable supports? |  |  |  |
| 26.2.11 | Were all RCP and PBC materials handled carefully to prevent cracking, gouging, chipping or any other damage to the concrete surfaces? |  |  |  |
| 26.2.12 | Was the Project Manager notified 72 hours prior to shipment to facilitate inspection? |  |  |  |
|  | Construction/Installation |  |  |  |
| 26.3.1 | Were RCP and PBC structures constructed in accordance with Subsection 7.8.15, Construction, of CSA S6 Canadian Highway Bridge Design Code, and the specification requirements? |  |  |  |
| 26.3.1 | Were RCP structures constructed in accordance with ASTM C1479M? |  |  |  |
| 26.3.1 | Was the excavation dewatered for the full extent of structure until all backfilling was completed? |  |  |  |
| 26.3.2 | In addition to the ECO Plan submission requirements, did the Project Manager review and accept the Contractor’s separate care of water plan prior to the pre-construction meeting? |  |  |  |
| 26.3.3,  1.0 | Was excavation completed to the lines and grades as shown on the Drawings, in accordance with the specification requirements, or as determined by the Project Manager? |  |  |  |
| 26.3.4 | Did the Project Manager review and accept the Contractor’s detailed erection procedure for RCP structures with a diameter 2 m or greater and for all PBC structures? |  |  |  |
| 26.3.1 | Was a crane used to handle and erect RCP and PBC sections that were 2.0 m or larger? |  |  |  |
| 26.3.5.1 | Was the excavation, foundation, and bedding material placement reviewed and accepted prior to the installation of RCP and PBC structures? |  |  |  |
| 26.3.5.1 | Did the Contractor install RCP and PBC sections to the lines and grades shown on the Drawings, in accordance with the manufacturer’s instructions, and as determined by the Inspector? |  |  |  |
| 26.3.5.1 | Did the Contractor install the RCP and PBC sections from the lowest elevation to the highest elevation? |  |  |  |
| 26.3.5.1 | Did the Contractor maintain the grades within the specified tolerance as shown on the Drawings or established by the Inspector? |  |  |  |
| 26.3.5.1 | Were the ends of each precast section clean before being joined together? |  |  |  |
| 26.3.5.1 | Were precast sections acceptably drawn together in a manner that resulted in a continuous, watertight conduit with a smooth and uniform interior surface? |  |  |  |
| 26.3.5.1 | Were joint gaps within the allowable range specified? |  |  |  |
| 26.3.5.1 | Did all installed sections meet the specified alignment requirements? |  |  |  |
| 26.3.5.2 | Was the installation of the rubber gasket in accordance with the manufacturer’s installation requirements for each joint? |  |  |  |
| 26.3.5.2 | Did the Contractor use lifting clutches for RCP sections with a diameter of 1050 mm or greater? |  |  |  |
| 26.3.5.3 | Was the installation the flexible joint sealant or rubber gasket for PBC structures for each joint completed in accordance with the manufacturer’s installation requirements? |  |  |  |
| 26.3.5.3 | Did the Contractor use embedded lifting anchors, lugs, or pins for PBC section installation? Were all lifting cavities filled with an approved OH-V concrete patching material? |  |  |  |
| 26.3.6, 2.0 | Was backfilling completed with the specified backfill materials, in accordance with the Drawings and specification requirements? |  |  |  |
| 26.3.6 | Was the ambient air temperature above 0°C during all backfilling operations? |  |  |  |
| 26.3.6 | Was backfill compaction under the haunches completed to the density specified? |  |  |  |
| 26.3.6 | Was backfill material placed such that the level of fill on one side did not exceed the level of fill on the other side of the structure by more than 300 mm? |  |  |  |
| 26.3.6 | Was the backfill material placed and compacted by equipment moving parallel to the longitudinal axis of the structure? |  |  |  |
| 26.3.6 | Did large earth moving and compaction equipment maintain a distance of 1 m from the structure at all times? |  |  |  |
| 26.3.6 | Was the first 300 mm of backfill material placed over the structure levelled and compacted without vibration? |  |  |  |
| 26.3.6 | Did the Project Manager review and accept the Contractor’s proposed methods of placement and compaction for non-granular backfill materials? |  |  |  |
| 26.3.6 | Was clay seal material highly plastic with a minimum plasticity index of 40? |  |  |  |
| 26.4 | Were substrate holders fabricated, installed, and constructed as shown on the Drawings and as outlined in the Special Provisions of the Contract? |  |  |  |
| 26.5,  10.0 | Did the Project Manager review and accept heavy rock riprap material requirements prior to placement? |  |  |  |
| 26.5,  10.0 | Was heavy rock riprap placed as shown on the Drawings and the specification requirements? |  |  |  |
|  | Post-Installation Inspection |  |  |  |
| 26.6 | Did the Contractor and the Project Manager jointly complete a post-installation inspection after all backfilling was completed? |  |  |  |
| 26.6 | Were all cracks identified, measured in width and length, and recorded? |  |  |  |
| 26.6 | Were all defects noted, recorded, and repaired or replaced by the Contractor to the satisfaction of the Project Manager? |  |  |  |

**Details and Summary:**

Date

Signature

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**BCIM Title and Edition – Footer of chapters are completed from here**

Bridge Construction Inspection Manual – Edition 3, 2019: Volume 2