CONSTRUCTION ADMINISTRATION AND INSPECTION TASK MANUAL

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PART B: TASKS

INTRODUCTION

1.1 LEVELS OF INSPECTION

The following tables identify the required level of inspection noted at the bottom of each inspection task providing qualified personnel in accordance with agreement which includes all civil and non-civil related tasks such as electrical.

Table 1

LEVEL OF INSPECTION	MINIMUM FREQUENCY
A1	Continuous
B1	Twice Per Day
C1	Once Per Day
D1	Every Other Day
E1	Once Per Week

Table 2

LEVEL OF INSPECTION	TIME ON SITE
A2	100% of the time the Contractor is on site carrying out that task
B2	75% of the time the Contractor is on site per day carrying out that task
C2	50% of the time the Contractor is on site per day carrying out that task
D2	25% of the time the Contractor is on site per day carrying out that task
E2	10% of the time the Contractor is on site per day carrying out that task
F2	10% of the time Contractor is on site carrying out that task

Some tasks may consist of a combination of the above two (2) tables, with a statement to define the inspection effort. For example:

(i) Level of Inspection – C1/E2 means that Contract Administrator (or designee) shall be on site to inspect an operation once per day and inspect 10% of the day's production.

Where practical, for tasks that require less than full time inspection, the required time shall be interspersed throughout the day (i.e. for a task requiring a 25% time commitment, the inspection should not occupy the first quarter of the day, with no further inspection for the rest of the day).

The required levels of inspection are specified as **minimums**. If the Contractor is not performing well, or test results are continually poor, then the level of inspection may need to be increased to a higher level in order to check that the Contractor provides a quality end product. This situation must be reported to the Contract Services Administrator.

In conjunction with the inspection tasks outlined in this manual, the Contract Administrator shall provide qualified personnel to inspect all Work (including all non-civil related tasks such as electrical) as required to verify and document non-compliance to the Contractor's Quality Control Performance Measures.

Any inspection activity identified as a milestone requires a Contract Administrator (or designee) on site to inspect and document an operation(s) at predetermined critical phases (milestones). Subsequent Work on an operation shall not proceed until the milestone inspection is complete including corrective action if required. A milestone may be at an intermediate stage or at the final inspection stage.

A "milestone" is the component of the Work that is critical, prior to continuing with the remainder of the operation or the next operation.

All milestone inspections must be carried out and documented regardless of the levels of inspection specified. Obtain photographs of Milestone Inspections where practical (i.e. pile splices).

Milestones are indicated with an "M" beside the activity.

'W' indicates a warranty activity.

1.2 DOCUMENTATION

Documentation requirements related to inspection have not been specifically identified within the individual tasks in Part B of this manual. Various tasks state to verify operations and dimensions. Any findings shall be documented in the Inspector's Diaries.

Various tasks state "Check". All information/findings noted from that "Check" shall also be documented in the diary.

GD 1 CLEARING, CLOSE CUTTING, AND GRUBBING

Task #	Activity
GD 1.1	Check for proper installation of tree barrier protection prior to clearing, close cutting or grubbing activities.
GD 1.2	Check that clearing activities occur during permitted timing windows, if specified by the contract to avoid nesting periods of migratory birds (e.g. May 1 to August 1).
GD 1.3 M	**Check that all clearing, close cutting and grubbing debris is removed and managed in accordance with contract requirements.**
GD 1.4	Check that clearing, close cutting and grubbing is carried out to the limits given.
GD 1.5	Check that Grubbing is performed as specified (stumps, roots, embedded logs, debris, and secondary growth) and stripping depths are as indicated in the Contract Documents.

LEVEL OF INSPECTION – B1/E2

GD 2 BOULDER CLEAN-UP

Task #	Activity
GD 2.1	Record the location of disposal sites.
GD 2.2 M	**Confirm boulders one (1) cubic metre and greater in volume are measured and recorded for payment as rock excavation.**

LEVEL OF INSPECTION – B1/E2

GD 3 STRIPPING

Task #	Activity
GD 3.1 M	**Confirm stripping is completed in accordance with the construction sub-grade report widths and that proper depth of stripping is achieved.**
GD 3.2 M	**Check required amount of stripped organic material is stockpiled for topsoil as specified prior to disposal of surplus material. Record the location of the stockpile sites.**
GD 3.3	Check that erosion control measures are in place and functioning properly prior to stripping.
GD 3.4	Check that topsoil piles are positioned away from waterbodies.
GD 3.5	Check that sheetflow from stockpiles is intercepted using silt fence, straw bale or sandbag barriers.
GD 3.6M	**Verify and record that underfill stripping measurements have been obtained prior to fill replacement. Where actual depths and widths vary from design, keep proper documentation to carry out a recalculation.**

LEVEL OF INSPECTION – B1/D2

GD 4 SWAMP TREATMENT

Task # **Activity**

GD 4.1 Floating the road

M	**(i)**	**Check during construction that the integrity of the mat material is maintained.**
M	**(ii)**	**Check that no rockfill is in contact with the root mat.**
	(iii)	Check that care is taken in locating ditching and that root material is not disturbed.
	(iv)	Beware of culverts being inserted below the root mat.
	(v)	Swamp waves shall not be excavated or otherwise disturbed.
M	**(vi)**	**Confirm each layer is built using an outside to inside sequence by keeping the outer one third (1/3) portions of the layer a least 30 m ahead of the centre portion.**
	(vii)	Check that if geotextiles are used that they are placed in accordance with the specifications.
	(viii)	Check that the rate of embankment construction is carried out in accordance with Special Provisions (time, pore pressure dissipation levels, etc.).
	(ix)	If berms are being constructed check that that the berm is constructed appropriately during the construction of the embankment.
	(x)	Check that culverts are installed with specified articulation and or camber.

GD 4.2 Excavation

M	**(i)**	**Survey and record the limits and depth of the excavation and compare them to the design limits.**
M	**(ii)**	**Document daily all of the Contractor's excavation and disposal equipment (make, model, operating weights, bucket sizes, boom lengths), and the Contractor's production accomplished. Estimate weekly the projected completion of these operations, using the Contractor's current production rate.**
	(iii)	Check that during excavation, material removed is managed of as specified in the Contract Documents.
M	**(iv)**	**If using Truck Rental items for the disposal of swamp excavation, then hours are to be recorded for the time that the trucks are working, and verify the efficiency of operation to check if maximum productivity is achieved. Verify and record hours daily with the Contractor.**

(v) Check that excavation of displaced materials and backfilling is carried out simultaneously, and in such a way as to displace the muskeg and produce a mud wave (displacement method).

M (vi) If excavated material is being used for, or blended for use as topsoil, then check that the required amount of excavated organic material is stockpiled for topsoil as specified prior to disposal of surplus material. Record location of stockpile site.

M (vii) Check that backfill materials are as specified in the contract and are compacted to the target density.

GD 4.3 Surcharging – See Task GD 42

(i) Check construction staging and verify embankment and surcharge is constructed in accordance with staging details.

(ii) Check that surcharge is placed to the geometry shown on the contract drawings.

M (iii) Check that proper surcharge material is used and placed to height and limits specified in the contract. Check that surcharge is removed only after required time period, settlement, or pore water pressure is achieved.

LEVEL OF INSPECTION – A2

GD 5 EARTH CUT

Task #	Activity
GD 5.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 5.2 M	**Check the suitability of cut material for use as fill in other locations. Consult with Contract Services Administrator if anticipated volume of suitable earth material from individual cuts differs from the contract estimate.**
GD 5.3 M	**Watch for any seepage areas in earth cuts, and provide for appropriate treatments as required. Check that any advanced dewatering scheme to facilitate the excavation is carried out.**
GD 5.4 M	**Check that treatment of frost susceptible soil area is completed as specified in the Contract Documents. Verify that the disposition of material from each earth cut area is recorded.**
GD 5.5 M	**Boulders one (1) cubic metre and greater in volume are measured and recorded for payment as rock excavation.**
GD 5.6	Check for proper crown and that adequate drainage is maintained.
GD 5.7	Check that the excavation is carried out to the requirements of the Contract Documents.
GD 5.8 M	**Verify and record that grading tolerances are correctly applied and all slopes conform to the acceptance envelope.**
GD 5.9	Check that longitudinal and transverse transition treatments (cut to fill, fill to fill) are constructed correctly.
GD 5.10	Check that soil sloughing is avoided and controlled during excavation procedure.
GD 5.11 M	**Check that toe drains, slope drains and/or interceptor ditches are properly constructed.**
GD 5.12 M	**Record starting and ending dates of various earth operations for conformance with timing constraints.**

GD 5.13 Check that backfilling of overexcavated areas is carried out in accordance with the specification.

GD 5.14 Check that boulders on excavated slopes are removed in accordance with the specifications.

LEVEL OF INSPECTION – D2

GD 6 EARTH EMBANKMENT

Task #	Activity
GD 6.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 6.2	Check that any organic or deleterious material is sub-excavated prior to embankment construction.
GD 6.3 M	**Check that special embankment foundation and benching is carried out as specified in the Contract Documents.**
GD 6.4 M	**Check Contractor's required quality control tests to determine if target density is obtained.**
GD 6.5	Inspect embankment construction to check that the specified depth of layers are maintained, that oversize and frozen material is not used, that material is not placed on frozen ground or on ice or snow, and that the crossfall is adequate for drainage.
GD 6.6	Check that boulders are placed in accordance with the specifications.
GD 6.7	If a berm is required; check that it is constructed before the main fill is built to a level higher than the berm.
GD 6.8	If a surcharge is used, see task GD 42.
GD 6.9 M	**Verify and record that grading tolerances are correctly applied and all slopes conform to the acceptance envelope prior to placement of subbase material.**
GD 6.10 M	**Check that fill is placed and compacted according to the specifications – layer compaction or modified layer compaction.**
GD 6.11	Check that appropriate construction procedure is conducted for side hill or sloping sections.
GD 6.12	For embankments over soft ground, check that rate of embankment construction is carried out in accordance with the Special Provisions.

GD 6.13 Check that all field test results and information are received within 2 working days following completion of a lot.

LEVEL OF INSPECTION – D2

GD 7A ROCK EXCAVATION

Task #	Activity
GD 7.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 7.2	Check that the Contractor has removed all stumps, roots, vegetation and soil overlaying rock to be excavated to the width specified on the construction subgrade report.
GD 7.3 M	**Check that overburden is excavated from each transition treatment area prior to blasting.**
GD 7.4	Check that removal of overburden and earth is carried out sufficiently in advance to permit surveying of original rock cross-sections.
GD 7.5	Check that disposal of overburden material is as specified. Check that disposal sites are positioned away from waterbodies. Check that sheetflow from disposal is intercepted using silt fence, straw bale or sandbag barriers.
GD 7.6 M	**Survey for payment purposes all original and stripped rock cross-sections and check that zero rock stations are supported by field measurement prior to blasting operations. Zero rock stations shall be determined and recorded when the grade is checked or when the original cross-sections are obtained, and referenced in HDS/In-Roads or to the cross-section rolls. Check that the construction portion is being used to enter the original rock lines. When the original rock line differs from the rock line used in Design, then the quantities of rock and shatter, where appropriate, shall be re-calculated monthly to the lines of the grading standard. Revised cross-section templates shall be submitted to the Contractor. The original cross-section template must be signed by the Contractor to acknowledge the receipt of the report.**
GD 7.7 M	**Check that blasting design, blasting permit, and pre-construction survey have been submitted.**
GD 7.8	Check qualifications of the Blasting Designer.
GD 7.9 M	**Check that proper notifications are provided to the appropriate authorities. Check that appropriate notification is conducted prior to blasting.**

GD 7.10 M **Check that all safety precautions are observed prior to blasting, including the sounding of audible warning device before and after blasting as required. Check that protective measures to control fugitive flyrock, as specified, are used around private properties and/or utility locations. If flyrock leaves the designated blast area, complete MTO form PH-CC-808, Flyrock Incident Form - Part B and send to the distribution list as soon as Part A has been received from the Contractor.**

GD 7.11 Check that noise, vibration and dust levels are controlled as required.

GD 7.12 M **Check that a "Trial Blast" for drilling and blasting is carried out to verify the blasting design in general.**

GD 7.13 Check that drilling depth is sufficient to provide the required shatter and extra depth shatter is specified.

GD 7.14 M **Check that extra depth shatter is verified and drilling depths recorded. Check that drilling pattern is in accordance with the blasting design. Record type and amount of explosive material used. Record drilling depths, limits and pattern.**

GD 7.15 Check that drilling pattern is in accordance with the blasting design. Record type and amount of explosive material used. Record drilling depths, limits and pattern.

GD 7.16 M **Check that there is effective drainage to ditches and transition treatments by confirming that no undrained pockets are left in the road bed or ditches.**

GD 7.17 During and after scaling inspect rock face for potential rockfall hazard and discuss any concerns with the Contract Services Administrator. Check that any special rockfall hazard designs have been properly implemented, as indicated in the Contract Documents.

GD 7.18 M **Surface boulders one (1) cubic metre or greater in volume are measured and recorded as rock excavation.**

GD 7.19 M **Document the disposition of all rock excavation material showing how cut is excavated, type of equipment used, where it is being disposed including the equipment involved and the time and duration of the Work.**

GD 7.20 Check that a post construction survey is carried out by the Contractor.

GD 7.21 M **Verify and record that grading tolerances are correctly applied and all excavations conform to the acceptance envelope.**

GD 7.22 Coordinate with Rock Engineering Specialist (if applicable) to inspect rock face locations such as foundations founded on a rock ledge to determine rock mass stabilization.

GD 7.23 Check that blasting monitoring equipment, procedure and recording is conducted as specified.

GD 7.24 Check Contractor’s construction blasting records/blasting reports.

LEVEL OF INSPECTION – A2

GD 7B ROCK SURPLUS

Task # **Activity**

GD 7.1 Monitor at all times the location where the Contractor is hauling rock excavated from the contract.

GD 7.2 Verify the quantities of Rock Surplus removed.

GD 7.3 Record in diary all verification as described below:

Weighed Aggregate Production Quantity

(ii) Verify Rock Materials are only hauled to the on-contract crushing site (unless accounted for using another measurement method.
(iii) Verify Contractor calculations for material weighed as processed aggregate from on-contract location and properly converted to broken rock quantity.
(iv) Survey stockpile location prior to aggregate placement – identify any discrepancy with Contractor measurements.
(v) Survey stockpile location after all aggregate removal – determine any remaining aggregate volume. Identify any discrepancy with Contractor measure.
(vi) Check that any aggregate remaining unprocessed is measured by the Contractor and accounted for as rock surplus when disposed of (unless placed in embankment).

Stockpile Volume

(i) Receive list of stockpile locations from Contractor. Stockpile locations include rockfill/placement at offsite premises, stockpiles in pits and quarries, disposal within contract limits (widenings, slope flattening, etc.)
(ii) For any stockpile locations in compressible soils instruct the Contractor to provide monitoring devices in sufficient number to allow adequate assessment of stockpile settlement.
(iii) Verify the Contractor's initial ground surveys for one third (1/3) of the stockpile locations.
(iv) Monitor Contractor hauling operations to verify that Rock Surplus materials are only placed in the stated stockpile locations.
(v) Frequently monitor each stockpile location (3-4 times per day) for a minimum period of 15-20 minutes each. Verify all rock materials are placed in the stockpile and no rock materials are removed from stockpile.
(vi) When the stockpile is complete, survey the completed stockpile.

Weighed Broken Product

(i) Monitor that all rock materials are weighed prior to leaving contract limits.
(ii) Receive weight tickets from Contractor; verify all tickets have been accounted for against the daily material summary.

In-situ Measure of Distinct Rock Cut

(i) Verify that only rock materials from the distinct rock cut location as identified by the Contractor are removed from the contract.

LEVEL OF INSPECTION – A2

GD 7C ROCK SUPPLY

Task #	Activity
GD 7.1	Verify through survey the in-situ measurement for Rock Supply item at the source.
GD 7.2 M	**Verify through survey measurement any rock material remaining at the source when rock materials are supplied for completion of rock embankments.**
GD 7.3	Check locations where Rock Supply is obtained to the locations identified in the Rock Material Management Plan.

LEVEL OF INSPECTION – A2

GD 8 ROCK EMBANKMENT

Task #	Activity
GD 8.1 M	**Check that rockfill is built in accordance with OPSS 206, unless otherwise specified in the Contract Documents.**
GD 8.2 M	**Verify by survey, a minimum of 25% of the stations of the excavated base forming the bottom of each rock embankment, prior to embankment construction. Compare with contract plans. If there is a significant difference, verify all of the embankment stations, and make appropriate adjustments to the plan quantity.**
GD 8.3	Check that rockfill is not placed on frozen soil.
GD 8.4	If rockfill is used to displace soft underlying materials, the centre should be kept ahead of the sides or one (1) side on sidehill organic displacement.
GD 8.5	Check equipment type and size, number of passes, and lift thickness for the compaction of rock embankment.
GD 8.6 M	**Check that shale embankment materials are spread and compacted in uniform layers as specified in the Contract Documents.**
GD 8.7	Check that large particle sizes are within specified size restriction and are properly positioned within the rockfill embankment.
GD 8.8	Check that chinking is carried out to fill surface voids.
GD 8.9	Check that approved procedures are followed for surcharge loading. See Task **GD 42**.
GD 8.10 M	**Verify and record that grading tolerances are correctly applied and all fill slopes conform to the acceptance envelope. Where overbuilding is known to have occurred, notify the Contractor by Instruction Notice prior to placement of subbase material. Record the natural angle of repose before adjustments are made.**
GD 8.11 M	**Record daily, the construction of rockfill (location of source of material used, final disposition of the material, the equipment involved, and the time and duration of the Work).**

GD 8.12 Check that direction of rockfill placement is such that mud waves are displaced away from the embankment.

LEVEL OF INSPECTION – C2

GD 9 TRANSITION TREATMENTS IN ROCK OR EARTH

Task #	Activity
GD 9.1 M	**Verify and record that proper transition treatment is carried out during initial construction period, before fill placement interferes with the excavation. Verify and record that grading tolerances are correctly applied and all slopes conform to the acceptance envelope prior to backfilling. Backfill as specified in the Contract Documents.**
GD 9.2	Check that transition has positive drainage.

LEVEL OF INSPECTION – D2

GD 10 FROST HEAVE TREATMENT

Task # Activity

GD 10.1 M Check that material supplied by the Contractor is sampled as required. Check that the polystyrene complies with environmental specifications.

GD 10.2 M Record that frost susceptible soils are removed and replaced with acceptable material to the specified grades, lengths and tolerances. Adjust grades and limits depending on extent of frost susceptible soils. Verify transition between frost treatment and normal grading sections is constructed properly.

GD 10.3 Check to that the Contractor has provided adequate drainage from treated area.

GD 10.4 Check expanded polystyrene is installed as follows:

(i) Check that the sheets are properly placed with regards to tight and staggered joints;
(ii) Check that sheets are secured to prepared surface; and
(iii) Check that backfill is placed by dumping, spread and compacted in one lift, free of oversized material and is of sufficient depth to protect the polystyrene.

GD 10.5 M Check that backfill materials are compacted to the target density.

LEVEL OF INSPECTION – B2

GD 11 BASE AND SUBBASE

Task #	Activity
GD 11.1	Check for any evidence of contamination from subgrade pumping into subbase and have the Contractor take appropriate corrective action.
GD 11.2 M	**Check that quality assurance samples are obtained for testing as specified in the Contract Documents. Conduct visual inspection of material for contamination, including clay balls, clay coated particles or foreign material. Where contamination is observed or suspected take appropriate action.**
GD 11.3 M	**Check that subbase and base materials comply as specified in the Contract Documents. Check that no Blast Furnace Slag material is being placed in the base and subbase. Check that the material is being compacted as specified in the Contract Documents. Check the Contractor's compaction density readings to see that all the Work falls within the specified tolerances.**
GD 11.4 M	**Check that Contractor has obtained the required weigh scale certification in accordance with the Contract Documents.**
GD 11.5 M	**Verify and record horizontal and vertical grading tolerances prior to the placement of the next type of material or pavement.**
GD 11.6 M	**Check that material control, distribution and weighing conform to the Contract Documents.**
GD 11.7	Check that all field test results and information are received within 2 working days following completion of a lot.
GD 11.8	Check that all field test results and information are received prior to placement of Hot Mixed Asphalt (HMA).

LEVEL OF INSPECTION – D2

GD 12 RESTORING ROADWAY SURFACES

Task #	Activity
GD 12.1 M	**Check that all deleterious material is removed from grade prior to restoration.**
GD 12.2	Check that the restored roadway surface is compacted to the target density.
GD 12.3 M	**Check the Contractor's crossfall on the restored roadway surface for correctness prior to placement of the next type of material or pavement.**

LEVEL OF INSPECTION – E2

GD 13A GRADE

Task # **Activity**

GD 13A.1 M **A monitoring checking frequency of a minimum of 25% per day (but not limited to), is required to be recorded for all of Contractor's quality control grade checks to verify the Contractor's ability to ensure that the grades and cross sections are within the specified tolerances. When one half (1/2) of the Contractor's quality control operation has been successfully completed the monitoring frequency may be reduced to a minimum (but not limited to) of 5%, with the approval of the Contract Services Administrator.**

Quality Assurance checks for subgrade and granulars (prior to the placement of the next type of material or pavement) shall include the record of station, actual elevation and offset. This information is to be recorded at the specified intervals in a separate field book. The Consultant survey work will be separate and independent from the Contractor's Quality Control surveys.

During the grade check, the width of placement should be checked and recorded, and when the horizontal tolerances are exceeded, elevations and distances must be recorded.

LEVEL OF INSPECTION – D2

GD 13B COMPACTION

Task # Activity

GD 13B.1 M A testing frequency of a *minimum o*f 25% per day or in accordance with the Contractor's current testing amounts (but not limited to), is required to be recorded for all of Contractor's quality control testing requirements to verify the Contractor's ability to control compaction. This is to be done on an ongoing basis.

When one half (1/2) of the Contractor's quality control operation has been successfully completed the physical testing frequency may be reduced to a minimum (but not limited to) of 5%, with the approval of the Contract Services Administrator.

GD 13B.2 M Verify that, where compaction control strips are required (i.e. GD 48), but especially when the Contractor is using the Modified Layer Compaction Method (MLCM), that the Contractor is compacting the material using similar types of equipment of at least the same masses, the same vibration characteristics and the same number of passes that the Contractor had used when the most recent compaction control strip for that same material was constructed.

GD 13B.3 M Verify that all applicable QC and QA field test results, the associated compaction calculations and all other information relating to compaction testing are constantly being recorded and updated on MTO form PH-CC-009 at the time the testing is done and, for each tested lot, that the compaction calculations indicate the lot is acceptable before the Contractor is allowed to place another lift of material on top it.

LEVEL OF INSPECTION – D2

GD 14 BORROW PITS AND QUARRIES

Task # **Activity**

General: Refer to Special Provision No. 199S38 for details on the administration of aggregate sources. Excavations from within the ROW are not considered to be a pit or quarry operation under the Aggregate Resources Act (ARA) but are subject to OPSS 206.

GD 14.1 If the borrow source is permitted under the ARA or Letter of Approval then verify that site plan is submitted to Geotechnical Section showing operational and rehabilitation plans. The operational plan shall include the area to be excavated and stripping limits. The rehabilitation plan shall include final rehabilitation of depleted areas of the extraction area or safe sloping of faces for non-depleted areas. If the borrow source is within the ROW then no site plan submission is required.

GD 14.2 Verify that the Contractor confirms the limits of the pit and/or quarry boundaries and setback in accordance with the approved site plan.

GD 14.3 Check that the borrow pit or quarry is worked to the approved line and grade and appropriate measurements are taken to support payment.

GD 14.4 M Survey, for payment purposes, all original cross sections (after stripping) and final cross sections for the borrow pit or quarry (in bank volume).

GD 14.5 Check that stripping material does not contaminate the borrow.

GD 14.6 M Check that the operation of the pit and/or quarry is carried out in accordance with the Aggregate Sources List, site plan, and Aggregate Permit/Wayside Permit/Letter of Approval and associated conditions under the applicable aggregate extraction approval instrument. This is not required for sources within the ROW. If the Contractor does not operate in accordance with the site plan and/or the site plan standards and operational requirements, notify the Contractor by Instruction Notice and notify the Contract Services Administrator immediately. Any amendments to the site plan must be approved by the Regional Geotechnical Section prior to any Work reflecting those changes taking place.

GD 14.7 M Check that the rehabilitation of the pit and/or quarry, at the completion of the project, is in accordance with the Aggregate Sources List, site plan, and Aggregate Permit/Wayside Permit/Letter of Approval, as applicable.

GD 14.8 Verify that form PH-D-046 (Pit and Quarry After Use Report) has been submitted by December 31.

LEVEL OF INSPECTION – C1

GD 15 WAYSIDE PERMIT, AGGREGATE PERMIT, AND LETTER OF APPROVAL PITS AND QUARRIES

Task # **Activity**

General: Refer to Special Provision No. 199S38 for details on the administration of aggregate sources. Excavations from within the ROW are not considered to be a pit or quarry operation under the Aggregate Resources Act but are subject to OPSS 206.

GD 15.1 Verify that site plan is submitted to the Geotechnical Section showing operational and rehabilitation plans. The operational plan shall include such things as the area of permit to be worked, stripping locations, the locations of stockpiles, scales, asphalt plant, storage areas, etc., as applicable. The rehabilitation plan shall include final rehabilitation of depleted areas of the pit and/or quarry or safe sloping of faces for non-depleted areas.

GD 15.2 Verify that the Contractor confirms the limits of the pit and/or quarry boundaries and setback in accordance with the approved site plan.

GD 15.3 M Check that the operation of the pit and/or quarry is carried out in accordance with the Aggregate Sources List, site plan, and Aggregate Permit/Wayside Permit/Letter of Approval and associated conditions under the applicable aggregate extraction approval instrument. The site plan and Operational Standards along with any additional notes should be reviewed for each pit and/or quarry as they will be different for each approval instrument. The Prescribed Conditions on the site plan cannot be altered and must be followed as written. If the Contractor does not operate in accordance with the site plan standards and/or operational requirements, notify the Contractor by Instruction Notice and notify the Contract Services Administrator immediately. Any amendments to the site plan must be approved by the Regional Geotechnical Section prior to any Work operations reflecting those changes taking place.

GD 15.4 M Check that the rehabilitation of the pit and/or quarry at the completion of the project, is in accordance with the Aggregate Sources List, site plan, and Aggregate Permit/Wayside Permit/Letter of Approval, as applicable.

GD 15.5 Verify that form PH-D-046 (Pit and Quarry After Use Report) has been submitted by December 31.

LEVEL OF INSPECTION – C1

GD 16 EQUIPMENT RENTAL

Task #	Activity
GD 16.1 M	**Record that the equipment used meets the requirements specified in the Contract Documents (i.e. size, capacity, horsepower, etc.).**
GD 16.2	Check the efficiency of operation to verify productivity of rented equipment.
GD 16.3	Record and verify hours daily with the Contractor.
GD 16.4 M	**The CA shall issue one (1) equipment rental ticket daily for each type of equipment used and shall indicate the total number of hours. The tickets are to be signed by both the CA and the Contractor.**

LEVEL OF INSPECTION – A2

GD 17 DITCHING

Task #	Activity
GD 17.1	Verify and record that all fisheries related environmental mitigation measures have been installed and are functioning prior to the start of ditching.
GD 17.2 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 17.3 M	**Check that ditch grading tolerances are correctly applied and all slopes conform to acceptance envelope.**
GD 17.4	Check that suitable material excavated from ditches is utilized in fill areas.
GD 17.5	Check that unsuitable material is managed as specified in the Contract Documents.
GD 17.6 M	**Check for positive drainage from field tiles.**

LEVEL OF INSPECTION – E2

GD 18 SUBDRAINS

Task #	Activity
GD 18.1 M	**Check specified size of pipe, including filter material. Check that all the delivered material is stored properly and verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 18.2	Check that perforations are placed down when their purpose is to collect water and they are bedded in free draining filter material. Check that pipes without perforations are used when their purpose is to transport water.
GD 18.3	Check that couplings are suitable for and compatible with the class and type of pipe and installed correctly.
GD 18.4 M	**Check that granular materials comply with the specifications and are compacted to the target density.**
GD 18.5	If impervious clay cap is required, check that cap is properly built.
GD 18.6 M	**Check that proper connection to manholes, catchbasins, and ditch inlets (grouting and grade) are made.**
GD 18.7	Check that each outlet location is marked with an approved marker and is visible from the driving portion of the roadway.
GD 18.8	Check that outlet and collector pipers are not crushed during backfilling operations.
GD 18.9	Check that outlet and collector pipes are placed to required slope and grade to provide gravity flow.
GD 18.10	Check that rodent grates are installed securely and quickly after subdrain installation.
GD 18.11 M	**Check that the trenches are excavated to the width, grade and alignment specified in the Contract Documents.**
GD 18.12	Check for trench stability during excavation.
GD 18.13	Check that pipe bedding and backfilling is conducted as specified.

GD 18.14 Check that inspection report is completed by the Contractor for the excavation, bedding and backfilling.

GD 18.15 Check that a non-woven geotextile is used to wrap the trench when 19 mm clear stone is specified as backfill.

GD 18.16 M Check that video camera inspection is conducted as specified.

LEVEL OF INSPECTION – D2

GD 19 EXCAVATION FOR CULVERTS

Task #	Activity
GD 19.1	Verify and record that all fisheries-related environmental mitigation measures have been installed and are functioning properly prior to the start of excavation.
GD 19.2 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 19.3 M	**Check that the dewatering and flow passage arrangements comply with restrictions/provisions specified in the contract.**
GD 19.4 M	**Check that unwatering is not causing erosion of soil at the outlet and other environmental concerns (e.g. muddy water discharge). Check that the Contractor has the standby equipment (pumps, hose, etc.) on site as required in the environmental submission. Check that the Contractor has obtained a Permit to Take Water in accordance with Special Provision 100S59.**
GD 19.5	Check that dust and debris from construction operations is not entering a watercourse or Environmentally Sensitive Area.
GD 19.6	Confirm that any other relevant environmental constraints have been addressed.
GD 19.7	Check that the founding soil is sound and undisturbed. Check that all loosened, soft, organic and deleterious material and boulders at the foundation base are removed and replaced with suitable, compacted granular material or mass concrete.
GD 19.8	Investigate pipe relocation to avoid cutting the organic mat when the embankment rides the swamp.
GD 19.9 M	**Confirm and record limits of excavation (width and depth) to determine if they conform to Contract Documents. Confirm and record limits of frost tapers at shoulderline and centreline. Confirm that the specified taper slope continues until it intersects subgrade/bottom of roadbed granular. If the crossing is identified as a watercourse in the Contract Documents, limit disturbance beyond the end of the culverts.**
GD 19.10	For crossings identified as watercourses in the Contract Documents, survey existing streambed elevation prior to construction to determine if the new culvert

depth is at or below the exiting streambed elevation (i.e. a minimum 300 mm depression unless otherwise specified in the Contract Documents) to create low flow channel.

GD 19.11 Check for signs of basal heave due to unbalanced hydrostatic head conditions.

GD 19.12 Check for working slabs/working pads.

GD 19.13 Check that any temporary protection scheme to facilitate the excavation and construction of the culvert is carried out.

LEVEL OF INSPECTION – C2

GD 20 BACKFILLING FOR CULVERTS

Task #	Activity
GD 20.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 20.2 M	**Check all the delivered material to verify that it is as specified in the Contract Documents.**
GD 20.3	Check that all pipes are correct class and reject those that are damaged and cannot be repaired.
GD 20.4	Check that advanced dewatering is conducted as required to prevent soil sloughing, basal heave and boiling. Check that excavations are free of water at all times.
GD 20.5 M	**Check that alignment, invert and designed widths are adhered to, as loading on pipe is partially dependent on trench widths.**
GD 20.6 M	**Check that dewatering is not causing erosion of soil at the outlet and other environmental concerns (e.g. muddy water discharge). Check that the Contractor has the standby equipment (pumps, hose, etc.) on site as required in the environmental submission.**
GD 20.7	Check the foundation for transition from firm to soft material, high points, soft spots, stones or boulders under culvert; general foundation problems due to unstable soil conditions, prior to placing bedding or embedment material.
GD 20.8 M	**Check that backfilling materials are sampled as required, comply with the specifications, and are compacted to the target density or, depending on the circumstances, the % of the maximum dry density specified in the Contract Documents. Check that the proper compacted lift thickness is as specified. (Elevation not to exceed existing streambed elevation.)**
GD 20.9	If required, check that upstream end of the pipe is embedded and material is properly compacted to prevent seepage.
GD 20.10 M	**Check that the bedding and the backfilling materials are placed in the dry, and as specified in the Contract Documents.**
GD 20.11	Check that backfilling is compacted under the haunches.

GD 20.12 Check that proper gaskets and couplers are used. Check that all gaskets and joints are tight. Check for proper camber. Where applicable, check that joints are lapped in direction of flow.

GD 20.13 Check that pipes and connections are kept clean and free of foreign material.

GD 20.14 Check that the strutting requirements are met when required.

GD 20.15 Check that backfilling is brought up evenly on both sides of the pipe at the same time.

GD 20.16 Check that compaction equipment does not impose excessive vibrations on structure.

GD 20.17 Check that specified depth of cover is placed before heavy equipment is allowed over culvert location.

GD 20.18 Check that oversize particles are removed.

GD 20.19 M Record trench widths, type of bedding and type of backfilling.

GD 20.20 For crossings identified as watercourses in the Contract Documents, survey existing streambed elevation if not provided in the Contract Documents to check that the new culvert depth does not exceed the exiting streambed elevation (i.e. a minimum 300 mm depression unless otherwise specified in the Contract Documents) to maintain low flow channel.

GD 20.21 Update the culvert inventory list within project limits. Forward document to a Regional delegate for incorporation into our Asset Inventory.

GD 20.22 M Check that post installation inspection is done in accordance with Special Provision 104S02.

LEVEL OF INSPECTION – D2

GD 21 SEWER IN TRENCH

Task #	Activity
GD 21.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 21.2 M	**Check all the delivered material to verify that it is as specified in the Contract Documents.**
GD 21.3	Check that all pipes are correct class and reject those that are damaged and cannot be repaired.
GD 21.4	Check that advanced dewatering is conducted as required to prevent soil sloughing, basal heave and boiling. Check that excavations are free of water at all times.
GD 21.5 M	**Check that alignment, invert and designed widths are adhered to.**
GD 21.6	Check that unwatering is not causing erosion of soil at the outlet and other environmental concerns (i.e. muddy water discharge). Check that the Contractor has the standby equipment (pumps, hose, etc.) on site as required in the environmental submission.
GD 21.7	Check the foundation for transition from firm to soft material, high points, soft spots, stones or boulders under culvert; general foundation problems due to unstable soil conditions, prior to placing bedding or embedment material.
GD 21.8 M	**Check that backfilling materials are sampled as required, comply with the specifications, and depending on the circumstances are compacted to the target density or the % of the maximum dry density specified in the Contract Documents. Check that the proper compacted lift thickness is as specified (Elevation not to exceed existing streambed elevation).**
GD 21.9 M	**Check that the bedding and the backfilling materials are placed in the dry, and as specified in the Contract Documents.**
GD 21.10	Check that backfilling is compacted under the haunches.
GD 21.11	Check that proper gaskets and couplers are used. Check that all gaskets and joints are tight. Check for proper camber. Where applicable, check that joints are lapped in direction of flow.

GD 21.12 Check that pipes and connections are kept clean and free of foreign material.

GD 21.13 Check that the strutting requirements are met when required.

GD 21.14 Check that backfilling is brought up evenly on both sides of the pipe at the same time.

GD 21.15 Check that compaction equipment does not impose excessive vibrations on structure.

GD 21.16 Check that specified depth of cover is placed before heavy equipment is allowed over sewer location.

GD 21.17 Check that oversize particles are removed.

GD 21.18 M Record trench widths, type of bedding and type of backfilling.

GD 21.19 M Check that post installation inspection is done in accordance with Special Provision 104S03.

LEVEL OF INSPECTION – D2

GD 22 SEWER TUNNEL/JACK AND BORE

Task #	Activity
GD 22.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 22.2	Check that sufficient indicators are set up and maintained to detect and monitor any movements within and outside the tunnel.
GD 22.3	Check that techniques employed meet the specification.
GD 22.4 M	**Check that alignment and grade are maintained.**
GD 22.5 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 22.6	Check that permanent liners are supplied and installed.
GD 22.7	Check and verify the soil spoil.
GD 22.8	Check that grouting materials are properly supplied and placed.
GD 22.9	Report all ground movements, failures, seepage zones and changes in soil conditions to the Contract Services Administrator.
GD 22.10	Check that appropriate dewatering is conducted to avoid soil cave-in and sloughing during the tunnelling.
GD 22.11	Check to verify any obstructions attributable to boulders and cobbles.
GD 22.12	Check that a preconstruction survey has been conducted.
GD 22.13	Check that excavation shafts and shoring systems are stable.
GD 22.14	Check that stamped working drawings are submitted.
GD 22.15	Check for Tunnel Portal Work Plan.
GD 22.16	Check for Primary Support plans, including materials, connection details and method of installation.

GD 22.17 Check for Tunnel Excavation Work Plan including sequence, dimensions, methods, provisions for controlling line and grade, ventilation and muck handling methods.

GD 22.18 Check Secondary Liner materials, installation.

GD 22.19 Check criteria for assessment of Roadway subsidence.

GD 22.20 Check that instrument monitoring is installed in accordance with contract requirements.

LEVEL OF INSPECTION – C2

GD 23 WATERMAIN IN TRENCH

Task #	Activity
GD 23.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 23.2	Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.
GD 23.3	Check that excavations are free of water at all times.
GD 23.4 M	**Check that alignment and designed widths are adhered to as loading on pipe is partially dependent on trench widths.**
GD 23.5	Check that specified bedding is used and constructed in accordance with contract requirements.
GD 23.6 M	**Check that watermain is placed in trench to depth as specified in the contract for frost penetration.**
GD 23.7	Check that all pipes are correct type and class.
GD 23.8	During progress of Work check that pipes, connections and appurtenances are kept clean and free of foreign material.
GD 23.9	Check that all pipe ends are lubricated with material recommended by the pipe manufacturer prior to installation.
GD 23.10	Check that fabricated bends are used when changes in line or grade are required.
GD 23.11	Check that any connections, caps and bends are provided with thrust blocks and wedges.
GD 23.12 M	**Check that backfill materials are as specified in the Contract Documents and the required compaction checks are made.**
GD 23.13	Check that backfill is brought up evenly on both sides of the pipe at the same time.

GD 23.14 Check that oversize particles are removed.

GD 23.15 Check that appropriate equipment is used for compaction until the specified depth of cover over the pipe is achieved.

GD 23.16 M Observe all appropriate testing for approvals.

GD 23.17 Check that top of pipe elevations are recorded.

GD 23.18 Check that measurements of bends, ties, connections, etc. are recorded.

GD 23.19 M Check that watermains are flushed and disinfected as specified.

GD 23.20 Check that the founding soil is sound and undisturbed.

LEVEL OF INSPECTION – C2

GD 24 MANHOLES, CATCHBASINS, AND DITCH INLETS

Task #	Activity
GD 24.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 24.2	Check type, alignment, offset and grades of manholes, catchbasins and ditch inlets.
GD 24.3 M	**Check correct positioning and installation of ladder rungs and safety grates.**
GD 24.4	Visually check all materials used for quality and/or damage (Pre-Cast); i.e. honeycombing, cracks, voids, surface defects, etc.
GD 24.5 M	**Check that, backfill materials are as specified in the contract and are compacted to the target density.**
GD 24.6 M	**Check that poured in place manholes, catchbasins and ditch inlets conform to the contract standards.**
GD 24.7	Check that the frustum is located and constructed properly.
GD 24.8	Check for the correct placement of reinforcing steel.
GD 24.9	Check that specified compaction is obtained under pipes entering or exiting manholes, catchbasins and ditch inlets.
GD 24.10	Check for proper placement of weep-holes.
GD 24.11	Check for proper placement of pipe subdrain outlet in structures.
GD 24.12 M	**Check that manholes, catchbasins and ditch inlets are cleaned out. Check that excess materials from the Work are stored and disposed of as specified in the Contract Documents Check that honeycombed areas are parged and the grates and pipes are grouted upon completion.**

LEVEL OF INSPECTION – E2

GD 25 GEOTEXTILE

Task #	Activity
GD 25.1 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 25.2 M	**Check that material supplied by the Contractor is sampled as specified on form PH-CC-443 and OPSS 1860 and forwarded for testing to the Material Engineering and Research Office's (MERO) laboratory at 145 Sir William Hearst Avenue, Downsview, Ontario.**
GD 25.3 M	**Check that each roll to be used has a tag showing product name and number and it meets the design requirements (woven or non-woven, Class I or Class II, F.O.S.).**
GD 25.4	Check that the geotextile is contained in opaque (light blocking) wrapping.
GD 25.5	Check installation area for removal of sharp objects that may puncture the geotextile.
GD 25.6	Check that the proper overlap has been maintained during installation.
GD 25.7	Check that the geotextile is not exposed to sunlight for more than three (3) days.
GD 25.8	Check that drop height for material placed onto it is less than 1 m to prevent damage of geotextile.
GD 25.9	Check that sufficient geotextile is placed on the ditch sides to prevent erosion of the sides of the ditch.
GD 25.10	Check that all materials contaminated or damaged during installation are either replaced or repaired so that the geotextile will perform as intended.

LEVEL OF INSPECTION – E2

GD 26 GRANULAR BLANKET

Task #	Activity
GD 26.1 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 26.2 M	**Check that erosion and sediment control schemes are in place and functioning. Examine with the Contractor to determine if additional erosion control measures or additional locations may be required.**
GD 26.3	Check that granular materials comply with the specifications.
GD 26.4 M	**Check that slope to receive blanket is properly prepared. Excavate beyond finished surface such that the granular blanket will fit the theoretical cut slope line.**
GD 26.5	Check that granular blanket is placed as excavation progresses and completion of the blanket coincides with completion of the cut.
GD 26.6	Check construction of interceptor ditches.
GD 26.7	Check the placement of any subdrains below the ditch line.
GD 26.8	Check that care is taken in placement to minimize segregation, especially if placed under water.
GD 26.9	Check that thickness and evenness of placement will provide a stable free draining slope material.

LEVEL OF INSPECTION – E2

GD 27 RIP RAP

Task #	Activity
GD 27.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 27.2	Check that rip rap material is as specified in the Contract Documents.
GD 27.3	Check that rip rap has an adequate foundation.
GD 27.4 M	**When placed on slopes, check that rip rap is countersunk into the surface of the slope.**
GD 27.5	Check that rip rap is placed in a manner that will not tear or otherwise damage the geotextile.
GD 27.6	Check that rip rap is placed in accordance with any applicable timing restrictions.
GD 27.7	Check that the rip rap when placed on a slope is placed at the toe first and progresses up the slope.

LEVEL OF INSPECTION – C1/E2

GD 28 GABIONS

Task #	Activity
GD 28.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 28.2	Check that the water table level is managed as specified in the Contract Documents.
GD 28.3	If working in the water, check that Work is isolated from the water as specified. Check that timing restrictions are adhered to, as specified.
GD 28.4 M	**Confirm that any other relevant environmental constraints have been addressed.**
GD 28.5 M	**Check all delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 28.6 M	**Check that the founding soil is sound and undisturbed.**
GD 28.7	Check that bed is uniform, trimmed, not frozen and consolidated and check for the need of scour protection.
GD 28.8 M	**Check that gabions are installed to the lines and grades as specified in the Contract Documents.**
GD 28.9	Check proper assembly, positioning and tying.
GD 28.10	Check that gabions are placed in tension prior to filling to achieve proper alignment and compaction.
GD 28.11	Check that transverse and vertical joints between gabions are staggered.
GD 28.12	Verify the quality, size and proper placement of the stone.
GD 28.13	Check that the front face is hand packed to minimize voids.

LEVEL OF INSPECTION – C1/E2

GD 29 TOPSOIL

Task #	Activity
GD 29.1	Survey for payment purposes, original cross-sections on the topsoil stockpile prior to use and final cross-sections for payment.
GD 29.2	Check that topsoil stockpiles are positioned away from waterbodies.
GD 29.3 M	**Check that erosion and sediment control schemes are in place and functioning. Examine with the Contractor to determine if additional erosion control measures or additional locations may be required.**
GD 29.4 M	**Check that the quality of the native, imported, or blended topsoil meets contract requirements including the submission of applicable test results.**
GD 29.5	Check that topsoil is not used for filling depressions or wasted.
GD 29.6 M	**Check that topsoil is spread uniformly to the depth specified.**

LEVEL OF INSPECTION – B1/E2

GD 30 SODDING

Task #	Activity
GD 30.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 30.2 M	**Check that surface preparation of the areas designated for sodding has been completed prior to sodding.**
GD 30.3	Check application of fertilizer.
GD 30.4	Check placement of sod ensuring that placement is as specified.
GD 30.5	Check that the performance measures are met. If not, perform required activity under “Failure to Meet Performance Measures” section of the specification.

LEVEL OF INSPECTION – E2

GD 31 SEED AND COVER

Task #	Activity
GD 31.1 M	**Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.**
GD 31.2	Check that Certificate of Seed Analysis is provided by Contractor twenty-four (24) hours prior to application of seed. Review Certificate of Analysis for compliance with specification
GD 31.3 M	**Check that the surface preparation of areas to be seeded has been prepared in accordance with the specification.**
GD 31.4	Check that the Contractor does not apply seed and cover under adverse weather conditions as stated in the specification.
GD 31.5	Check that the Contractor has laid out all locations for various seed mixes and different cover types.
GD 31.6 M	**Check that the specified cover is applied as a separate operation immediately after the application of seed, fertilizer and water.**
GD 31.7 M	**Follow the inspection intervals and check that the performance measures are met. If not, perform required activity under "Failure to Meet Performance Measures" section of the specification.**

LEVEL OF INSPECTION – E2

GD 32 FENCE

Task #	Activity
GD 32.1 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 32.2	Check that preservative treated wood is identified with certification marks authorized by the Canadian Wood Preservers Bureau.
GD 32.3	Check the preservative treated wood to determine if the splits and checks are within specified limits.
GD 32.4	Check that all posts and rails are fabricated from galvanized steel pipe for chain link fence.
GD 32.5 M	**Check that fence is placed in accordance with the requirements of the property agreements and Contract Documents.**
GD 32.6	Check that all debris, trees, stumps, brush and logs have been removed and ground undulations have been corrected along the fenceline to obtain a smooth and uniform gradient prior to fence installation.
GD 32.7	Check that fence posts are the specified length.
GD 32.8	Check that all end, corner, anchor, line, straining and gate posts are properly installed with regard to depth, alignment, and spacing.
GD 32.9	Check all bracings are correctly installed.
GD 32.10	Check that loose material in the bottom of the posthole is tamped or removed prior to placing the posts.
GD 32.11	Check that all posts are vertical with the large end down and that the backfill is properly tamped.
GD 32.12	Check that steel wire for chain link fence fabric conforms to the requirements of the Contract Documents.
GD 32.13	Check that all fittings and accessories for chain link fences are galvanized.

GD 32.14 Check that all gates for chain link fence open approximately 180 degrees and that the gates for highway fence open into the owner's land and close by gravity.

GD 32.15 Check that all fences are maintained throughout the duration of the contract.

GD 32.16 Check that concrete footings are constructed properly with regards to forming and placement of concrete.

GD 32.17 Check that all abraded and damaged surfaces are repaired and coated with approved zinc pigmented paint.

LEVEL OF INSPECTION – E1

GD 33 GUIDE RAIL

Task # Activity

GD 33.1 M Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.

GD 33.2 Check that all preservative treated wood is identified with certification marks authorized by the Canadian Wood Preservers Bureau.

GD 33.3 Check a minimum of 10% of the guide rail during installation and record any deficiencies.

(i) Check that cable guide rail is never located behind a curb.
(ii) Check the guide posts to determine if the splits and checks are within specified limits.
(iii) Check that guide rail is erected at the specified location and offset.
(iv) Check that guide posts are the specified length.
(v) Check that loose material in the bottom of the post hole is tamped or removed prior to placing the posts.
(vi) Check that anchor blocks are constructed properly with regards to forming and placement of concrete.
(vii) CA to review guide rail layout in accordance with contract requirements.

GD 33.4 M Complete a detailed inspection of 25% of the guide rail recording any deficiencies.

(i) **Check that all posts are vertical and that the backfill is properly tamped.**
(ii) **Check the guide posts for cracks and splits.**
(iii) **Check that stretching, stapling and splicing are completed.**
(iv) **Check that posts are cut off correctly, chamfered and tops treated and mounting height is correct.**
(v) **Check that the steel beam mounting height is correct.**
(vi) **Check that Steel Beam guide rail in the vicinity of concrete surfaces is bolted to these surfaces.**
(vii) **Confirm placement of reflectorized strips.**
(viii) **Check that the Steel Beam guide rail elements are overlapped in the direction of adjacent traffic flow.**
(ix) **Check that where the steel beam guide rail is behind the curb, the offset is less than 250 mm.**
(x) **Check that all bolts, washers and nuts are placed and affixed securely to all plates, angles, posts and steel rail, as required.**

LEVEL OF INSPECTION – B1/D2

GD 34 ECCENTRIC LOADER BARRIER AND EXTRUDERS

Task # Activity

GD 34.1 M Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.

GD 34.2 Check that all preservative treated wood is identified with certification marks authorized by the Canadian Wood Preservers Bureau.

GD 34.3 Check the first two end treatments during installation and record any deficiencies. When deficiencies are identified, inspection frequencies may be increased with the approval of the Contract Services Administrator.

(i) Check the preservative treated wood to determine if the splits and checks are within specified limits.
(ii) Check that guide rail is erected at the proper locations.
(iii) Check that guide rail posts are the specified length.
(iv) Check that anchor posts, breakaway posts and offset blocks are properly installed with regards to depth, alignment and spacing. Check the holes drilled at the front of the posts are in the direction of traffic.
(v) Check foundation tubes and soils bearing plates are properly installed.
(vi) Check that loose material in the bottom of the posthole is tamped or removed prior to placing the posts.
(vii) Check that foreslope crossfall is graded properly to allow proper end treatment installation and positive drainage.

GD 34.4 M Complete a detailed inspection of 25% of the end treatments recording any deficiencies.

(i) **Check that all posts are vertical and that the backfill is properly tamped.**
(ii) **Check in the area 3 m wide and 30 m long behind the end treatment that the ground is not steeper than 4:1 and is traversable (protrusions, rip rap, etc. size below 75 mm are acceptable).**
(iii) **Check that the strut between foundation tubes at post one (1) and two (2) is attached properly.**
(iv) **Check that channels are installed at proper locations, elevations, and are terminated as required.**
(v) **Check that the steel beam mounting height is correct.**
(vi) **Check that cable is snug and the breakaway holes are the proper size and location.**

(vii) **Check that corrugated steel loader section is installed properly and all loader assembly installation details are adhered to.**

(viii) **Check that posts are cut off correctly, corner post (No. 1) is chamfered and all tops treated.**

(ix) **Check that guide rail cable is properly attached with clamps to steel beam, as required.**

(x) **Check that all bolts, washers and nuts are placed and affixed securely to all plates, angles, posts and steel rail, as required.**

GD 34.5 M Check that Certification of the Installation of Safety Item forms are received from the Contractor in accordance with the Contract Documents.

LEVEL OF INSPECTION – E1

GD 35 TEMPORARY CONCRETE BARRIER INSTALLATION AND RELOCATION

Task #	Activity
GD 35.1 M	**Check that barriers meet physical requirements as specified in the Contract Document including approved manufacturer.**
GD 35.2	Check for any defects in the barrier after installation.
GD 35.3	Check that the AI connector is always inserted in the channel end of adjacent unit.
GD 35.4 M	**Check that placement, end treatments and offsets are as specified in the Contract Documents.**
GD 35.5	During construction, periodically check for any misaligned or damaged barriers. Check that replacement or repair is carried out as required.
GD 35.6	Check that removal or relocation is carried out as specified in the Contract Documents.
GD 35.7 M	**Check that Certification of Temporary Precast Concrete Barrier Installations forms are received from the Contractor in accordance with the Contract Documents.**

LEVEL OF INSPECTION – E2

GD 36 INERTIAL BARRIER MODULE

Task #	Activity
GD 36.1 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 36.2	Check that sand/salt mixture is mixed at the approved rate.
GD 36.3	Check that module is assembled correctly, precisely in the configuration required and at the location as specified in the Contract Documents.
GD 36.4	Check that module is set firmly in a vertical position and filled correctly.

LEVEL OF INSPECTION – E1

GD 37 CRASH/CUSHION ATTENUATING TERMINAL BARRIER

Task # Activity

GD 37.1 M Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.

GD 37.2 Check that all preservative treated wood is identified with certification marks authorized by the Canadian Wood Preservers Bureau.

GD 37.3 Check the first two end treatments during installation and record any deficiencies. When deficiencies are identified, inspection frequencies may be increased with the approval of the Contract Services Administrator.

(i) Inspect the preservative treated wood to determine if the splits and checks are within specified limits.
(ii) Check that guide rail is erected at the proper locations.
(iii) Check that guide posts are the specified length.
(iv) Check that steel posts are properly installed with regards to depth, alignment and spacing.
(v) Check that loose material in the bottom of the posthole is tamped or removed prior to placing the posts.

GD 37.4 M Complete a detailed inspection of 25% of the end treatments recording any deficiencies.

(i) **Check that all posts are vertical and that the backfill is properly tamped.**
(ii) **Check that channels are installed at proper locations, elevations and are terminated as specified in the Contract Documents.**
(iii) **Check that the steel beam mounting height is correct.**
(iv) **Check that spacer channel is installed properly and all connection details for posts 1 through 6 are adhered to.**
(v) **Check that anchor cable is installed at the correct height.**
(vi) **Check that guide rail is properly attached as required.**
(vii) **Check that all bolts, washers and nuts are placed and affixed securely to all plates, angles, posts and steel rail as required.**

GD 37.5 M Check that Certification of the Installation of Safety Item forms are received from the Contractor in accordance with the Contract Document.

LEVEL OF INSPECTION – E1

GD 38 TREND END TREATMENT BARRIER

Task # **Activity**

GD 38.1 M **Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**

GD 38.2 Check the first two end treatments during installation and record any deficiencies. When deficiencies are identified, inspection frequencies may be increased with the approval of the Contract Services Administrator.

(i) Check that granular is placed to required length and width prior to forming concrete pad.
(ii) Check that reinforcing steel is installed as specified in the contract.
(iii) Check that posts are specified length prior to affixing to concrete pad.
(iv) Check that plastic sand/salt filled containers are installed correctly.
(v) Check that anchor block is constructed properly with regards to forming and placement of concrete.

GD 38.3 M **Complete a detailed inspection of 25% of the end treatments recording any deficiencies.**

(i) **Check that restraining cable is properly attached to post and anchor block.**
(ii) **Check that the steel beam mounting height is correct.**
(iii) **Check that all bolts, washers and nuts are placed and affixed securely to all plates, angles, posts and steel rail, as required.**
(iv) **Check that in the area 4 m wide behind the end treatment that the ground is not steeper than 4:1 and is traversable (protrusions, rip rap, anchor block, etc. size below 75 mm are acceptable).**

GD 38.4 M **Check that Certification of the Installation of Safety Item forms are received from the Contractor in accordance with the Contract Documents.**

LEVEL OF INSPECTION – E1

GD 39 GUIDE RAIL ENERGY ABSORBING TERMINAL BARRIER

Task # Activity

GD 39.1 M Check all delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.

GD 39.2 Check the first two end treatments during installation and record any deficiencies. When deficiencies are identified, inspection frequencies may be increased with the approval of the Contract Services Administrator.

(i) Check that the minimum number of bays are constructed to suit design speed.
(ii) Check that the length of the concrete pad constructed matches the design number of bays.

GD 39.3 M Complete a detailed inspection of 25% of the end treatments recording any deficiencies.

(i) **Check that the restraining cable is installed when a permanent system has four (4) or more bays or a temporary system has six (6) bays.**
(ii) **Check that delineator posts are installed where median hazards exist.**
(iii) **Check that reflectorized markers are mounted 45 degrees to centreline of median on both sides of delineator posts.**
(iv) **Check that the thrie beam fender panel height is correct.**
(v) **Check that all bolts, washers and nuts are placed and affixed securely to all plates, angles, posts and steel rail as required.**
(vi) **Check where two-way traffic is present that a deflector panel is attached to the system and back of concrete wall or barrier, to shield against wrong-way hits.**

GD 39.4 M Check that Certification of the Installation of Safety Item forms are received from the Contractor in accordance with the Contract Documents.

LEVEL OF INSPECTION – E1

GD 40 CONNETICUT IMPACT ATTENUATION SYSTEM BARRIER

Task # **Activity**

GD 40.1 M **Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**

GD 40.2 Check the first two (2) end treatments during installation and record any deficiencies. When deficiencies are identified, inspection frequencies may be increased with the approval of the Contract Services Administrator.

(i) Check that concrete pad and backwall are constructed as specified in the Contract Documents.
(ii) Check that granular pad constructed is a minimum 150 mm in depth and compacted.
(iii) Check that asphaltic concrete pad constructed as specified in the Contract Documents.

GD 40.3 M **Complete a detailed inspection of 25% of the end treatments recording any deficiencies.**

(i) **Check that cylinders A through N are positioned correctly in relation to each other by measuring wall thickness of cylinder.**
(ii) **Check that the system is placed along the designed centreline.**
(iii) **Check that the lids are supplied and attached to the cylinders with a chain.**
(iv) **Check that the portable (temporary) backwall is supplied when specified in the Contract Documents.**
(v) **Check that all bolts, washers and nuts are placed and affixed securely to all plates, angles, posts and steel rail, as required.**
(vi) **Check that the back row of cylinders is bolted to the backwall as specified in the Contract Documents.**

GD 40.4 M **Check that Certification of the Installation of Safety Item forms are received from the Contractor in accordance with the Contract Documents.**

LEVEL OF INSPECTION – E1

GD 41 NOISE BARRIER

Task #	Activity
GD 41.1 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
GD 41.2 M	**Check that grading and berm construction is completed as required in the contract drawings prior to footing construction.**
GD 41.3	Check that barrier for tree protection is in place as specified prior to commencement.
GD 41.4	Check that all loose material is removed from the bottom of the postholes or is compacted prior to post installation.
GD 41.5	Check that posts are installed to the proper alignment and depth.
GD 41.6	Check that earth and granular material comply with specification and are compacted to the target density.
GD 41.7	Check that each panel is installed in its proper location in the noise barrier system.
GD 41.8	Check bottom panels to determine that no voids are visible, required minor grading is carried out and installation matches ground profile.
GD 41.9	Check that tree pruning is carried out correctly and kept to a minimum.
GD 41.10 M	**Check that barrier is constructed within the tolerances of the lines and grades as specified in the Contract Documents.**
GD 41.11	Check all galvanized surfaces to determine that any abrasions are cleaned and painted with the required paint.
GD 41.12	Check that all side fences are reconnected in accordance with contractual requirements.
GD 41.13	Check the testing of the mounting bolts when attached to retaining walls to determine that specified torque has been applied.
GD 41.14	Check that all drainage requirements have been implemented.

LEVEL OF INSPECTION – E2

GD 42 SURCHARGING

Task # **Activity**

GD 42.1 Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.

GD 42.2 M Check that surcharge is built and removed to the requirements shown in the Contract Documents. Check that surcharge is removed only after required settlement is achieved, the specified time has elapsed, or the required pore water pressure has been achieved.

LEVEL OF INSPECTION – E2

GD 43 HAUL ROADS

Task #	Activity
GD 43.1 M	**Inspect and review haul road prior to construction use with Contract Services Administrator, Contractor and local road officials.**
GD 43.2	Obtain photographs or videos are taken prior to haul road being used.
GD 43.3	Check that haul road is upgraded, as required, prior to use.
GD 43.4	Check that Contractor adheres to load limits on existing structures and/or township roads.
GD 43.5	Periodically inspect haul road and to determine if safe conditions exist.
GD 43.6	In the case of a Contractor constructed haul road, check that erosion and sediment control schemes are in place and functioning. Determine if additional erosion control measures or additional locations may be required.
GD 43.7	Check that Contractor maintains haul road throughout the duration of contract, as required.
GD 43.8 M	**Inspect haul road upon completion of the contract to determine what repairs are required.**
GD 43.9 M	**Check that Contractor restores haul road to a safe condition.**

LEVEL OF INSPECTION – E1

GD 44 WICK DRAINS

Task #	Activity
GD 44.1	Check qualifications of specialized subcontractor.
GD 44.2	Check that the wick drain satisfies the physical and mechanical properties specified.
GD 44.3	Check that sample of wick drain is submitted prior to construction.
GD 44.4	Check that the wick drain is properly stored and protected from sunlight, dirt, dust, mud, debris and any other detrimental substances.
GD 44.5	Check the appropriate equipment is used to install the wick drains.
GD 44.6	Check if preaugering is required.
GD 44.7 M	**Check that material supplied by the Contractor is sampled as required and forwarded for testing.**
GD 44.8	Check that the installation procedure submission requirement is satisfied.
GD 44.9	Check that trial drains are installed.
GD 44.10	Check layout of drains.
GD 44.11	Check plumbness of drains.
GD 44.12	Check cut-off of drains.
GD 44.13	Check method for drain installation when obstructions are encountered.
GD 44.14	Check Tip Elevations.
GD 44.15	Check for artesian flows.

LEVEL OF INSPECTION – C2

GD 45 TREE AND SHRUB PLANTING

Task #	Activity
GD 45.1 M	**Check prior to delivery that the specified plantings are per design requirements including that species are suitable for the zone specified on applicable landscape planting plan.**
GD 45.2	Check the location of all landscape plantings before planting.
GD 45.3	Check that all planting occur within the specified operational time constraints.
GD 45.4	Check that planting operation has met all applicable contract requirements.
GD 45.5 M	**After planting check and verify all quantities, sizes, materials and locations are supplied according to the specifications.**
GD 45.6 W	**Check that the end results meet the Provisions of the maintenance and warranty requirements including winter protection of conifers. Follow the inspection interval specified in the Contract.**

LEVEL OF INSPECTION – E2

GD 46 GROUND MOUNTED SIGN PLACEMENT

Task #	Activity
GD 46.1	Record location of those signs, which are not identified in the contract as requiring replacement, relocation or removal (i.e. existing signs which should be in original location at the end of the contract). Record the signs' condition and take pictures.
GD 46.2	Verify that Contractor is properly storing signs, which have been removed for construction activities, to be reinstalled at the end of the contract (Signs should be removed from posts and stored neatly).
GD 46.3 M	**Within 2 weeks of sign pickup by Contractor, verify that all signs have been received and that their sizes and messages are correct. Report sign errors to CCO, as soon as possible, to facilitate their timely replacement.**
GD 46.4	Verify that new signs are being stored in a proper manner (i.e. off the ground and protected from the elements).
GD 46.5	Check that each sign installation is at its designated location and lateral offset, and placed to the proper depth. Record the reason for field adjustment (utilities, public complaint, conflict with another sign or object).
GD 46.6	Verify that metal posts are galvanized and that wood posts are pressure-treated in accordance with relevant OPSS's.
GD 46.7	Check that the sign support is correct size and type. Check that posts are plumb and oriented to approaching traffic. Check that steel posts are not bent and that wood posts are not cracked, twisted or warped significantly.
GD 46.8	Check that correct sign message is mounted on the support. Verify sequence of sign boards on support with contract drawings. Verify that sign is mounted level and to the height listed in the Sign Work Tables. Check that sign has not been damaged during installation.
GD 46.9	Verify that all sign and support removals have been completed. Check that all materials (signs and posts) have been removed from site.
GD 46.10	Check that sign is not obstructed by another sign or object. This is especially important for signs such as Stop, Stop Ahead and Checkerboards

GD 46.11 Check that the new sign installation in the vicinity of an intersection does not restrict the view of approaching highway traffic from the intersecting road.

GD 46.12 M Check that constructed unit is in accordance with design requirements.

GD 46.13 Check that applicable submissions are received by Contractor.

LEVEL OF INSPECTION – E2

GD 47 COMMERCIAL VEHICLE INSPECTION FACILITY

Task #	Activity
GD 47.1 M	**Check that the Contractor has obtained required permits prior to proceeding with associated Work.**
GD 47.2	Maintain a separate Inspector's Diary to clearly document the progress of all Work at the facility including, but not limited to, the following operations; demolition, excavation, foundation, septic systems, structural steel, building construction, HVAC, electrical, plumbing, site services, weight scales, finishes and related site Works.
GD 47.3 M	**Check the construction conforms to the contract requirements, Ontario Building Code, municipal bylaws and associated regulations.**
GD 47.4 M	**Check that delivered material is in compliance with contract requirements.**
GD 47.5 M	**Check that inspections required of the local building authority are carried out and documented prior to proceeding with subsequent Work.**
GD 47.6	Perform joint inspections of the Work with the Contractor, building inspectors and MTO staff.
GD 47.7	Receive shop drawings, proposals and other Contractor submissions providing applicable recommendations.
GD 47.8 M	**Prepare deficiency lists and check that all defects in the Work are corrected.**
GD 47.9	Provide required sampling and testing in accordance with contract documents.

LEVEL OF INSPECTION – C1/D2

GD 48 COMPACTION CONTROL STRIP

Task #	Activity
GD 48.1	Check that a new control strip is established at the time of initial use of each source, when there is a perceptive change in the appearance and/or gradation of materials, at least once per calendar year on all carry-over contracts, after each 10 QC lots of material have been completed for earth, or when backfilling only, after each 2500 tonnes of earth have been placed and after each 25 QC lots of material have been completed for granulars (base, subbase and select subgrade applications only) or, when backfilling only, after each 5000 tonnes of granulars have been placed.
GD 48.2	Check that a suitable location has been selected for the control strip.
GD 48.3	Check that all required laboratory test results have been received prior to construction of the control strip.
GD 48.4	Check that the type of compaction equipment to be used is suited to the material to be compacted, the degree of compaction required and space available.
GD 48.5	Check that the field moisture content of the material is within the allowable tolerances being specified, before any compaction is allowed to begin and that the target density that has been established upon completion of the control strip has also been determined at a field moisture content within those same allowable tolerances.

LEVEL OF INSPECTION – A2

CS 1 CONCRETE MATERIAL, PRODUCTION AND TESTING

Task #	Activity
CS 1.1	Obtain Form A portion of the concrete mix design along with any supporting documentation required by the contract at least seven (7) days prior to placement of concrete and review it to determine if it meets the contract requirements. Check that the concrete plant supplier is certified. Check that all materials are from approved lists and meet the requirements of the Contract Documents. Issue written confirmation that the concrete mix design submission meets the contract requirements or advise the Contractor of any requirements that have not been met. Check that the Regional Quality Assurance Section has received Form B portion of the concrete mix design from the concrete supplier prior to placement of concrete.
CS 1.2	Check that the required quality assurance samples of aggregates, water, admixtures, and cementing materials are taken and delivered to the appropriate laboratories and that the test results meet all of the requirements of the Contract Documents.
CS 1.3	Identify which method of acceptance will be used for compressive strength. For acceptance method A, determine lot and sublot sizes and generate random numbers
CS 1.4	Check that the technician performing the testing of plastic concrete is certified by American Concrete Institute (ACI) or Canadian Council of Independent Laboratories (CCIL).
CS 1.5 M	**Check concrete delivery tickets are checked for correct class of concrete, mix design number and batching time, and record the discharge time, and other information required by the Contract Documents. Check that the Contractor records the amount of any material added after batching, rejection of a load or part thereof, time truck arrived on site and the time when the truck finished discharging.**
CS 1.6	Check that plastic concrete is sampled and tested according to the contract requirements. Identify to the Contractor concrete loads from which performance cylinders, or other cylinders for information purposes, are to be cast as the loads arrive on site.
CS 1.7	Check that test cylinders are handled, cured and transported in accordance with C.S.A. and/or contract documents.

CS 1.8 Check that the appropriate curing regime is used for curing of concrete.

CS 1.9 Check that the required quality assurance samples of curing compound, as applicable, are taken and delivered to the testing laboratory.

CS 1.10 Obtain submission for “Plastic Concrete Test Results” after each day’s Work. The submission shall include copies of delivery tickets for each load of concrete and a summary of testing, adjustments, rejections, as specified in the contract.

CS 1.11 Obtain submissions for “Cylinder Curing Records” at the completion of the field curing period.

CS 1.12 Determine the quantity of concrete in lots using the dimensions in the Contract Documents, for the purpose of calculating payment adjustment for air void system and rapid chloride permeability.

CS 1.13 Identify random locations for coring specimens for AVS and RCP. Upon removal of the core samples, verify that cores are properly labelled and place in the security bags provided by the MTO. Immediately take possession of the cores and deliver them to the designated laboratory for testing by the MTO.

CS 1.14 Forward compressive strength, AVS and RCP test results and add payment adjustment information to the Contractor as the results become available. For compressive strength forward analysis of results at a minimum of monthly intervals.

CS 1.15 Check appropriateness of material selected to fill in core holes.

CS 1.16 Obtain the Contractor’s written intent to invoke compressive strength, AVS or RCP referee testing within five (5) Business Days of the Contractor receiving the test results for the sublot or lot, as applicable.

LEVEL OF INSPECTION – A1

CS 2 CONCRETE STRUCTURES

Use this task in conjunction with CS 1

Task #	Activity
CS 2.1	Obtain submission for "**Bridge Deck Placement Plan**", when applicable, a minimum of one (1) week prior to the commencement of placing concrete in bridge decks.
CS 2.2	Obtain submission for "**Temperature Control Plans**" for concrete subject to cold weather, high performance concrete, bridge decks and large concrete components where the smallest dimension is 1.5 m and verify that they meet the contract requirements for control of temperature and temperature difference.
CS 2.3	Check that the "**Notification of Placement of Structural Concrete**" form letter is issued, prior to each placing operation and that the form is signed by the Contractor.
CS 2.4	Check that the datalogger temperature records and records of any action taken to maintain control of temperature and temperature difference are submitted at the end of each working day during the temperature monitoring period.
CS 2.5	Obtain information related to curing compound application specified in the Contract Documents, at least one (1) week prior to the application.
CS 2.6	Review details of "pre-placement" meeting regularly for compliance.
CS 2.7	Check that deck finishing equipment is as specified in the Contract Documents.
CS 2.8	Check that deck finisher dry run is conducted.
CS 2.9	Check transferring systems (concrete pumps, belts, runways, etc.).
CS 2.10	Check that curing materials and, in cold weather, all protection materials have been delivered to the site before any concrete is placed.
CS 2.11	Check that the thermocouples for temperature and temperature difference control are installed in accordance with the Contractor's plan.
CS 2.12	Check that the concrete and concrete testing is in accordance with **CS 1**.
CS 2.13	Check that placement operations are as specified in the Contract Documents.

CS 2.14 Check that vibratory equipment is in good operating condition and meets specification requirements.

CS 2.15 Check for adequate consolidation and proper use of vibrators.

CS 2.16 Check that finishing of plastic concrete is as specified in the Contract Documents.

CS 2.17 Check that finished concrete is within tolerances specified in the Contract Documents.

CS 2.18 Check that specified curing is carried out. For HPC check structure decks, approach slabs, curbs and sidewalks, to check that fog mist is applied continuously from the time concrete is deposited in the deck until it is covered with burlap. Check that burlap is prevented from freezing during cold weather.

CS 2.19 Check that temperature control requirements for cold weather, bridge deck and large concrete components are carried out as specified in the Contract Documents, where applicable.

CS 2.20 Take random readings of thermocouples installed in bridge deck and substructure and compare to the datalogger temperature records submitted by the Contractor, to verify thermocouple function and readings.

CS 2.21 M Carry out the covermeter survey on the top surface of decks (including medians and sidewalks) and front face of concrete barrier/parapet walls. Results are to be submitted to the Quality Assurance Section electronically within four (4) days of completing the survey.

CS 2.22 Check that cracks are identified, documented and a proposal for remedial action submitted for review and acceptance.

CS 2.23 Give or deny permission to waterproof following completion of a bridge deck repair based on verification that the repair has been completed satisfactorily and the deck has dried for three (3) days.

CS 2.24 Accept components with formed and unformed surfaces based on verification that the cracks in the completed Work were treated as required by the specification.

CS 2.25 M Obtain and submit to Regional Structural Office Final Clearance/Restriction measurements.
Vertical Clearances – Gathering minimum clearance measurements along each edge of lane, in metres to 2 decimal places.

Horizontal Clearances – Clearance to be measured at right angles to the centre line of the travelled portion of the highway or edge of lane.

LEVEL OF INSPECTION – A1

– B1/E2 during curing operation and after the initial set

CS 3 TREMIE CONCRETE

Use this task in conjunction with CS 1 and CS 2

Task #	Activity
CS 3.1	Check that erosion and sediment control schemes are in place and functioning prior to placement of Tremie concrete.
CS 3.2	Check that unwatering is not carried out prior to when it is specified in the Contract Documents.
CS 3.3 M	**Check that unwatering is not causing erosion of soil at the outlet and other environmental concerns (e.g. muddy water discharge). Check that the Contractor has the standby equipment (pumps, hoses, filter bags, etc.) on site as required in the environmental submission. Check that the Contractor has obtained a Permit to Take Water in accordance with Special Provision 100S59 before unwatering is carried out.**
CS 3.4	Check that placement operations are as specified.
CS 3.5	Check that concrete material, production and testing is in accordance with **CS 1** and that placement, consolidation, finishing and curing operations are in accordance with **CS 2**.
CS 3.6	Check elevation at which the placement is terminated.
CS 3.7 M	**Check proper removals, cleaning and soundness of top surface prior to placing additional concrete.**
CS 3.8	Check that the formed enclosure meets water tightness specified in the Contractor's submission, when placement is required next to a watercourse.

LEVEL OF INSPECTION – A1

CS 4 CURB AND GUTTER

Use this task in conjunction with CS 1

Task #	Activity
CS 4.1	Check that proper type of curb is constructed in accordance with the Contract Documents.
CS 4.2	Check for proper alignment, grade and proper granular base preparation.
CS 4.3	Check for proper positioning of joints.
CS 4.4	Check for proper positioning of manhole frames and grates.
CS 4.5	Check that concrete material, production and testing are in accordance with **CS 1**.
CS 4.6	Check that placement, consolidation, finishing and curing operations are as specified in the Contract Documents.
CS 4.7	Check for proper drop curb at entrances and at Traffic Signal locations.

LEVEL OF INSPECTION – E2
– A1 During concrete placement

CS 5 CONCRETE SIDEWALK

Use this task in conjunction with CS 1

Task #	Activity
CS 5.1	Check for proper alignment, grade, granular base preparation and extra thickness at entrances.
CS 5.2	Check for proper positioning of construction joints and expansion joints.
CS 5.3	Check that concrete material, production and testing are in accordance with **CS 1**.
CS 5.3	Check that placement, consolidation finishing and curing operations are as specified in the Contract Documents.
CS 5.4	Check that a chase is installed on structures where a chase is specified in the Contract Documents.

LEVEL OF INSPECTION – E2
– A1 During concrete placement

CS 6 CONCRETE BARRIER WALLS

Use this task in conjunction with CS 1 and CS 2

Task #	Activity
CS 6.1	Check that the method of construction is as specified in the Contract Documents.
CS 6.2	Conventional Wooden or Steel Form Method (i) Check for correct alignment, grade and granular base preparation. (ii) Check for correct joint detail and spacing. (iii) Check that the inside face of formwork is clean and in good order, to produce a smooth cast face. (iv) Check that the barrier wall forms are adequately restrained to prevent uplift. (v) Check that railing mounts/anchorages are correctly installed (Location, elevation, flushness, and anchor bolt protrusion is adequate for tube rails). (vi) Check that concrete material, production and testing is in accordance with **CS 1**. (vii) Check that concrete placement, consolidation and finishing operations are as specified in **CS 2**. (viii) Check that specified curing requirements are carried out. (ix) Check for surface tolerances and cracking.
CS 6.3	Extruded Method (Not allowed on bridge decks) (i) Check for correct alignment, grade and granular base preparation. (ii) Check that specified percentage of air is being maintained. (iii) Check that construction joints, isolation joints and contraction joints are constructed in accordance with the contract requirements. (iv) Check that specified curing requirements are met. (v) Check for surface tolerances and cracking. (vi) Check that the E.R.S. requirements have been met where applicable.
CS 6.4	Pre-Cast (Not allowed on bridge decks) (i) Check that the foundation is prepared for acceptance of pre-cast units. (ii) Check that pre-cast units are as specified and supplied from the approved list. (iii) Check for correct installation of interlocking devices and check that no damaged units are installed. (iv) Check for correct alignment and grade.

LEVEL OF INSPECTION – B1/D2

CS 7 CONCRETE BASE AND PAVEMENT

Use this task in conjunction with CS 1

Task #	Activity
CS 7.1	Obtain a plan detailing curing and protection when concrete is placed in cold weather conditions. Check that the plan includes the method by which in-place minimum concrete temperatures are maintained.
CS 7.2	Obtain Form A portion of the concrete mix design along with the supporting documentation at least seven (7) days prior to placement of concrete and review it to determine if it meets the contract requirements. Check that the Regional Quality Assurance Section has received Form B of the concrete mix design from the concrete supplier prior to placement of concrete.
CS 7.3	Check that all the delivered material is supplied from the approved list, is properly stored, sampled, tested and the test results meet all of the requirements of the contract.
CS 7.4	Issue written confirmation that the concrete mix design submission meets the contract requirements or advise the Contractor of any requirements that have not been met.
CS 7.5	Check that the tie bars and dowel bars are the proper length and diameter. Check that the tie bars and dowel bars are properly stored on-site and the amount of damage to the epoxy coated. Reject any bars not meeting the contract requirements.
CS 7.6	Check for proper alignment, grade and base preparation.
CS 7.7	Check that the dowel bars are entirely coated with bond breaker prior to installing them.
CS 7.8	Check that the dowel bars and tie bars are placed and remain in the specified location. Check that load transfer devices are placed on the proper skew and staked in place. Check that the spacer wires are cut on the load transfer devices prior to placing concrete. Check that the location of the dowel bars is visibly marked on the side of the concrete for joint cutting.
CS 7.9	Check the temperature of the existing surface to receive the concrete, to determine that it is not above 35ºC or below 5ºC. Check the air temperature to

determine that it is not below 0ºC or above 32ºC prior to or during the concrete placing operation.

CS 7.10 Load transfer devices should be checked following paving operations to determine that they have not been moved.

CS 7.11 Check that concrete placement, consolidation, finishing and curing operations are in accordance with the contract requirements.

CS 7.12 Check that the specified trial run of the paving equipment is made when specified. After the first day's production, check cut-out to determine that the position and alignment of the dowel bars is according to the contract requirements. Check that repair is according to the contract requirements.

CS 7.13 When fixed form pavers are used, check that hand held vibrators are used properly to supplement consolidation.

CS 7.14 Check that specified finishing and texturing procedures are adhered to. Check the width, centres and depth of grooves to determine that they meet the contract requirements.

CS 7.15 Check that timing of form removal is as specified and any honeycombed areas are properly repaired.

CS 7.16 Check that the joints are the correct type and are cut at the proper location.

CS 7.17 Check that the initial sawcut is made to the depth specified in the Contract Documents. Check that this initial sawcut is done within the constraints specified in the Contract Documents, without damaging the concrete surface.

CS 7.18 Inspect hardened concrete surface for cracks outside of the joints and to determine that it is within surface tolerance.

CS 7.19 M Check that traffic is not permitted on the concrete pavement/base until the concrete has attained a compressive strength of 20 MPa.

CS 7.20 Check that Quality Assurance cores are obtained and properly labelled and placed in the security bags provided by the MTO. Immediately take possession of the cores and deliver them to the designated laboratory for testing by the MTO.

CS 7.21 Calculate the Percent Within Limits for the criteria of strength and thickness.

CS 7.22 Check that the Profile Measuring Device (PMD) meets the contract requirements and that it has been correlated with the Owner's PMD.

CS 7.23 Check that the measuring of the concrete surface for roughness is carried out in accordance with the Contract Documents in the presence of the Contract Administrator.

CS 7.24 M Check profile traces and check that scallops are ground prior to sealing joints, where specified.

CS 7.25 Calculate the Percent Within Limits for the criteria of surface roughness.

CS 7.26 Check that the contract has an effluent containment system in place.

CS 7.27 Check that reservoir cuts are made to specified widths and depths.

CS 7.28 Check that the reservoir cuts are immediately flushed with water to remove slurry in accordance with the contract requirements.

CS 7.29 Check that all the joint faces are abrasive blast cleaned according to the Contract Documents immediately prior to joint sealing and are blown clean and dry.

CS 7.30 Check that reservoir cuts are sealed according to the contract requirements.

CS 7.31 Forward all ERS test results electronically to Quality Assurance Section within four (4) days of receiving results.

LEVEL OF INSPECTION – A1/A2

CS 8 CONCRETE BASE AND PAVEMENT – FULL DEPTH REPAIR

Task #	Activity
CS 8.1	Obtain Form A portion of the concrete mix design along with the supporting documentation at least seven (7) days prior to placement of concrete and review it to determine that it meets the contract requirements. Check that the Regional Quality Assurance Section has received Form B of the concrete mix design from the concrete supplier prior to placement of concrete.
CS 8.2	Issue written confirmation that the concrete mix design submission meets the contract requirements or advise the Contractor of any requirements that have not been met.
CS 8.3 M	**Obtain documentation certifying that the superplasticizer meets the Special Provision requirements.**
CS 8.4 M	**Obtain the Contractor's linear shrinkage test results within forty (40) days of the mix design submission and forward a copy to the Quality Assurance Section and a copy to the Concrete Section.**
CS 8.5 M	**Check that all supporting test data is not more than twelve (12) months old from the date the concrete mix design was submitted.**
CS 8.6 M	**Obtain the Contractor's details of the method of concrete removal at least two (2) weeks prior to start of any Work and check that it is according to the Special Provision.**
CS 8.7	Obtain and review submissions for Cold and Hot Weather Concrete.
CS 8.8	Check that removal limits shown in the contract drawings are appropriate to existing field conditions.
CS 8.9	Check that the sawcuts are full depth.
CS 8.10	Check Contractor is using proper equipment to remove the concrete slabs.
CS 8.11	Check that the concrete removal operation does not damage the subbase or adjacent concrete surfaces. If the subbase is disturbed, check that disturbed material is removed.
CS 8.12	Check that the dowels, tie bars and load transfer devices are placed as specified in the Contract Documents.

CS 8.13 Check that gang drills are used to drill holes for dowel bars.

CS 8.14 Check that all dowel bars are completely encased by epoxy for the full depth of the hole and that a grout retention disk is attached.

CS 8.15 Check preparation Work, concrete placement, consolidation, finishing and curing procedures are according to the Contract Documents.

CS 8.16 Check that the technician performing the testing of plastic concrete is certified by A.C.I. or C.S.A.

CS 8.17 Check concrete delivery tickets for correct class of concrete, mix design number and batching time.

CS 8.18 Check that the concrete is sampled and tested in accordance with the Special Provision.

CS 8.19 Check the completed Work for any of the defects listed in the Special Provision. Check that surface of the concrete meets the surface tolerances stated in the Special Provision.

CS 8.20 Calculate the Percent Within Limit for the 28-day compressive strength.

CS 8.21 Check that the contract has an effluent containment system in place.

CS 8.22 Submit all supporting documentation to the Quality Assurance within four (4) days of receiving results.

LEVEL OF INSPECTION – A2 until Contractor demonstrates satisfactory performance of operation then reducing to E2.

CS 9 CONCRETE BASE AND PAVEMENT – FULL DEPTH REPAIR (FAST TRACK)

Use this task in conjunction with CS 8

Task #	Activity
CS 9.1	Obtain fast track repair submission at the time of the mix design submission and verify that it meets the requirements of the Special Provision for both the Autogenous Method and the Maturity Method.
CS 9.2	Review and approve or reject the Contractor's proposed location for the trial area, if location is not designated in the Contract Documents.
CS 9.3	Check the Contractor's ability to adequately complete the trial repair area within the time frame of the closure as defined in the Contract Documents.
CS 9.4	Check repair trial area for deficiencies such as poor finish and cracks.
CS 9.5	Check that the Contractor has verified the calibration charts.
CS 9.6 M	**Give or deny permission to proceed with repairs to the contract.**
CS 9.7	Check that mid-lane longitudinal joints are in accordance with the Special Provision.
CS 9.8	Check that autogenous cylinders are made and tested according to the Special Provision.
CS 9.9	Check that the Contractor has installed two (2) thermocouple wires for early strength determination in the final full depth repair area for each closure according to the Special Provision.

LEVEL OF INSPECTION – A1

CS 10 CONCRETE BASE AND PAVEMENT – PARTIAL DEPTH REPAIR

Task #	Activity
CS 10.1	Obtain Form A portion of the concrete mix design along with the supporting documentation at least seven (7) days prior to placement of concrete and review it to determine that it meets the contract requirements. Check that the Regional Quality Assurance Section has received Form B of the concrete mix design from the concrete supplier prior to placement of concrete.
CS 10.2	Issue written confirmation that the concrete mix design submission meets the contract requirements or advise the Contractor of any requirements that have not been met.
CS 10.3 M	**Obtain documentation certifying that the superplasticizer meets the Special Provision.**
CS 10.4	Obtain the Contractor's linear shrinkage test results within forty (40) days of the time the mix design submission and forward a copy to the Quality Assurance Section and a copy to the Concrete Section.
CS 10.5	Check that all supporting test data is not more than twelve (12) months old from the date the concrete mix design was submitted.
CS 10.6	Obtain the Contractors' details of the method of concrete removal at least two (2) weeks prior to start of any Work and check that it is according to the Special Provision.
CS 10.7	If the Contractor submits a proposal to use a proprietary product instead of concrete, check if material is on the MTO's approval list and that the dimension of the repair area(s) are less than 300 mm.
CS 10.8	Delineate the limits of the areas to be repaired.
CS 10.9	Check that the perimeter of the repair area is sawcut vertically to a depth of 25 mm.
CS 10.10	Check that concrete removals are carried out using a chipping hammer to a minimum depth of 50 mm and up to a maximum depth of one third (1/3) the thickness of the existing concrete slab.

CS 10.11 Check that preparation Work, prior to placing concrete is carried out according to the Contract Documents (i.e. abrasive blast cleaning, pre-wetting, and application of bonding agent).

CS 10.12 Check that joints are formed in the repair area, where the repair includes an existing pavement joint or working crack. Check joints are formed according to the contract.

CS 10.13 Check concrete placement, consolidation, finishing and curing procedures are according to the Contract Documents.

CS 10.14 Check the Work for any of the defects listed in the Special Provision.

CS 10.15 Calculate the Percent Within Limit for the 28-day compressive strength.

CS 10.16 Submit all supporting documentation to the Quality Assurance Section within four (4) days of receiving results.

LEVEL OF INSPECTION – A1

CS 11 STRUCTURE REHABILITATION – REMOVAL OF WATERPROOFING SYSTEM FROM DECK SURFACE

For deck to be subsequently rehabilitated by patch/waterproofing and paving

Task #	Activity
CS 11.1 M	**Check that all old waterproofing membrane is completely removed from the concrete surface without any damage to the existing surface of the deck. Identify any damage to the deck surface due to removal operation of waterproofing and all repairs and remedial Work that needs to be carried out prior to waterproofing.**
CS 11.2	Check that all repairs and remedial Work to the concrete deck have been completed.
CS 11.3	Check that dust and debris from exposed Work, and from construction operations such as concrete cutting/grinding, abrasive blast cleaning of concrete and steel, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not entering a watercourse or Environmentally Sensitive Area.

LEVEL OF INSPECTION – D2

CS 12 STRUCTURE REHABILITATION – CONCRETE REMOVALS

Task # **Activity**

CS 12.1 Inspection of concrete removal work in progress shall address the following:

(i) Check that concrete removal is being done correctly and as specified in the Contract Documents, including location and depth of removals.
(ii) Check that hammer size and stroke length meet specification requirements for all hammers more specifically for chipping hammers. Verify that the hammers being used match the manufacturer's published specifications for weight and piston stroke.
(iii) Check the size and weight of hammers, verify that specified hammers have not been modified to increase or decrease stroke length or provide additional power/energy and verify weight of equipment does not exceed the limit specified.
(iv) Check that staging of removal and strength of adjacent new concrete is according to contract documents.
(v) Check that existing reinforcing steel, post-tensioned cables, adjacent concrete, hardware and components to remain in place are not damaged during concrete removal.
(vi) Check that existing concrete to remain in place has not been contaminated.
(vii) Check that environmental protection enclosures or containment systems are in place and functioning.

CS 12.2 Obtain from the Contractor an identification of equipment and manufacturer's published specification for concrete removals.

CS 12.3 Obtain **Working Drawings** for "Concrete Removal – Structural Component" and "Concrete Removal – Complete Deck" at least one (1) week prior to the commencement of the concrete removals and verify that it meets the contract requirements and that it has been sealed and signed by the Design Engineer and Design Check Engineer.

CS 12.4 M Obtain a Certificate of Conformance upon completion of the designated concrete removal for each structural component and/or the complete deck in accordance with requirements of the Contract Documents.

CS 12.5 Obtain notification from the Contractor, twenty-four (24) hours prior to, the commencement of the scarifying operation.

CS 12.6 Upon receipt of written notification from the Contractor to carry out all applicable concrete survey(s), check that all Work requirements identified in the contract have been completed by the Contractor prior to commencing concrete surveys.

CS 12.7 Notify the Quality Assurance Section and the Regional Structural Section as soon as the Contractor submits notification to commence with the concrete surveys.

CS 12.8 Carry out a covermeter survey (if applicable) for all asphalt covered decks after the first pass of the scarifying equipment where concrete removals from the top surface of the deck are specified. Grid points shall be the same as the ones on the corrosion potential survey, where specified. Plot readings on a separate drawing other than the concrete removal survey drawing.

CS 12.9 Carry out, in accordance with the contract requirement, the following concrete removal surveys as part of determining and demarcating the actual location and extent of removals:

(i) Visual and Delamination Survey – Identify areas of scaling, honeycombing and delaminated concrete.
(ii) Corrosion Potential Survey (Half-Cell) (if applicable) – where concrete is to be removed based on corrosion potential criteria when specified in the Contract Documents. Grid points shall be the same as the ones for the original bridge deck condition survey.

CS 12.10 Carry out concrete removal survey(s) for the soffit when Type B or localized full depth removals in the deck are specified in the Contract Documents.

CS 12.11 Determine full depth localized removal areas in the deck by performing the following:

(i) Complete the concrete removal surveys on both the top surface of the deck and the soffit.
(ii) Superimpose both the concrete removal surveys on the original bridge deck condition survey.

CS 12.12 Determining areas of removal on structures where the existing concrete overlay will not be completely removed by performing the following:

(i) Complete the concrete removal survey(s) on the top surface of the overlay.
(ii) Complete a second delamination survey on the top surface of the original deck within the removal area, after the concrete has been removed.
(iii) Demarcate removal areas where the concrete is delaminated in the second survey.

CS 12.13 Superimpose all concrete removal surveys on original bridge deck condition surveys. Clearly identify all delaminations and actively corroding areas in different colours.

CS 12.14 M Immediately after completion of surveys, deliver coloured copies of the covermeter survey and the concrete removal survey(s), along with revised estimated quantities, to the Regional Structural Section for review and approval.

CS 12.15 M After permission to remove concrete and/or further direction has been received from the Regional Structural Section; the Contract Administrator shall square off and clearly identify all removal areas with spray paint.

CS 12.16 M Provide the Contractor with written permission to proceed with the concrete removals.

CS 12.17 Demarcate all areas of exposed reinforcing steel prior to scarifying operation. For scarifying greater than 10 mm, demarcate areas of low cover.

CS 12.18 Check portion of the structure to be scarified and depth of scarifying are according to the Contract Documents.

CS 12.19 Check portion of curb face, barrier wall or parapet wall which will be covered by an overlay is roughened according to the Contract Documents.

CS 12.20 M After concrete removals are completed, check within the demarcated areas and along the perimeter for soundness of concrete and delamination to determine if additional removals are required.

CS 12.21 Notify the Quality Assurance Section and Regional Structural Section if the concrete is delaminated beyond 25 mm of the first layer of reinforcing steel; or if the Contractor has removed concrete more than the specified depth.

CS 12.22 Check reinforcing steel to remain in place for bar loss and heavy rust. Notify the Regional Structural Section if bar loss is greater than 20% or heavy rust exists in any location.

CS 12.23 Check that the Contractor does not damage the top flange of steel girders. If damage does take place, all relevant details, including size and location of the damage shall be documented and reported to the Regional Structural Section within forty-eight (48) hours.

CS 12.24 For full depth removal with full depth sawcut construction joint, check that the sawcut surfaces are roughened.

CS 12.25 Measure concrete removal volume to determine quantities.

CS 12.26 Check that dust and debris from exposed Work, and from construction operations such as concrete cutting/grinding, abrasive blast cleaning of concrete and steel, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not entering a watercourse or Environmentally Significant Area.

LEVEL OF INSPECTION – B1

CS 13 STRUCTURE REHABILITATION - SURFACE PREPARATION

Task #	ACTIVITY
CS 13.1	Check surface of deck to determine whether extra Work is required (i.e. to correct scaling).
CS 13.2 M	**Check that surface preparation is as specified in the Contract Documents.**
CS 13.3	Check that dust and debris from exposed Work, and from construction operations such as concrete cutting/grinding, abrasive blast cleaning of concrete and steel, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/ institutional properties, and is not entering a watercourse or Environmentally Sensitive Area.

LEVEL OF INSPECTION - D2

CS 14 STRUCTURE REHABILITATION – NORMAL CONCRETE OVERLAY

Use this task in conjunction with CS 1 and CS 2

Task #	Activity
CS 14.1	Check that concrete material, production and testing is in accordance with **CS 1**.
CS 14.2	Obtain documentation certifying that the superplasticizer meets the requirements of the Special Provision.
CS 14.3	Obtain the Contractor's linear shrinkage test results within forty (40) days of the mix design submission and forward to the Quality Assurance Section within four (4) days of receiving results.
CS 14.4	Check that all supporting test data is not more than twelve (12) months old from the date the concrete mix design was submitted.
CS 14.5	Check that the screed rails have been installed outside the area to be waterproofed.
CS 14.6 M	**Check that the Contractor's trial run has been completed before each placing operation and determine that the minimum thickness of the overlay can be achieved.**
CS 14.7 M	**Check that the Contractor has verified that the screed rails and finishing machine have been set to allow the thickness of the overlay to meet the requirements of the Contract Documents before proceeding with the placement of the overlay.**
CS 14.8 M	**Check that all full depth patches have been repaired prior to placing the overlay, unless otherwise specified in the Contract Documents**.
CS 14.9 M	**Check that concrete for all partial depth removal areas in the deck are placed at the same time as the overlay.**
CS 14.10	Check that overlay is not placed adjacent to any new concrete less than forty-eight (48) hours old. If the ambient air temperature falls below 10°C within the first forty-eight (48) hours after placement of concrete, the forty-eight (48) hour time requirement is extended to ninety-six (96) hours.

CS 14.11 Check the temperature of the air and existing concrete surface to receive the overlay, to determine that it meets contract requirements prior to and during concrete operations

CS 14.12 If the air temperature drops below 5ºC during curing, check that cold weather protection is provided according to the specifications.

CS 14.13 Check equipment and runways for the concrete transporting equipment to check that they are not supported by reinforcing steel.

CS 14.14 Check that only the finishing machine and buggies used to place concrete are allowed on the abrasive blast cleaned portions of the deck. No other vehicles or equipment, including concrete ready mix trucks shall be permitted.

CS 14.15 Check that heavy vehicles such as concrete ready mix trucks or dump trucks are not permitted on the deck where concrete removal has taken place.

CS 14.16 Check that concrete surface and reinforcing steel have been abrasive blast cleaned according to **CS 43.**

CS 14.17 Check that removal of all dust and loose material is carried out by oil-free compressed air.

CS 14.18 Check that the prepared surface is maintained in a wet condition for six (6) hours prior to placing concrete.

CS 14.19 Check that excess water is removed by oil-free compressed air immediately prior to application of bonding agent.

CS 14.20 Check that areas of reinforcing steel and prepared concrete surface are protected from oil leaks and dropping grout or concrete from placing equipment.

CS 14.21 Check that all vertical and horizontal surfaces against which the overlay will be placed receive a thorough, even coating of bonding grout, with no excess left in place.

CS 14.22 Check that the application of grout is such that the brushed material does not become dry before it is covered with overlay concrete. Check that bonding grout, which is not used within thirty (30) minutes after mixing, is discarded.

CS 14.23 Check that concrete placement, consolidation, finishing and curing procedures are in accordance with **CS 2** unless specified otherwise in the Contract Documents.

CS 14.24 Check that the overlay is cured with burlap and water regardless of ambient temperature. Check that the burlap is maintained in a continuously wet condition throughout the curing period by means of a soaker hose. The soaker hoses shall be placed on the burlap prior to placing the moisture barrier.

CS 14.25 Check that the burlap is prevented from freezing during cold weather.

CS 14.26 Obtain temperature-monitoring data to check that the concrete temperature does not fall below 10ºC within seven (7) days following concrete placement.

CS 14.27 Check that the construction joints are placed as specified in the Contract Documents.

CS 14.28 Define the lots and determine core locations for air void system and tensile bond strength test.

CS 14.29 Check that the tensile bond strength cores and air void system cores are carried out in accordance with the contract requirements. Check that the core holes have been filled according to the contract requirements.

CS 14.30 Obtain and review tensile bond strength results within four (4) business days of testing and forward the results to the Quality Assurance Section.

CS 14.31 Check the overlay for any areas of debonding, honeycombed areas or cracks.

CS 14.32 Obtain and verify Contractor's crack inspection report and review Contractor's crack treatment proposal if applicable.

CS 14.33 Check that permission to waterproof is not issued until cracks are treated (if applicable) and the deck is air dried for three (3) days.

LEVEL OF INSPECTION – A1

CS 15 STRUCTURE REHABILITATION – IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM FOR BRIDGE STRUCTURES

Use this task in conjunction with CS 1 and CS 14

Task #	Activity
CS 15.1 M	**Check that all delivered material, equipment and cabinets are supplied from the approved list in the Contract Documents.**
CS 15.2	Review all required submissions for conformance with Contract Documents.
CS 15.3	Verify the credentials of the Corrosion Specialist according to the Contract Documents.
CS 15.4	Forward one (1) copy of all required submissions to the Bridge Office.
CS 15.5	Observe pre-installation pull tests of anode mesh and distribution bar weld samples. Observe or perform random pull tests of mesh to distribution bar welds and distribution bar to distribution bar welds during installation.
CS 15.6	Check that all patch repair has been completed in accordance with Contract Document before any wiring, reference cells and anode mesh is placed.
CS 15.7	Check that the top surface of all patched areas has been scarified or roughened in accordance with Contract Document before anode mesh is placed. Under no circumstances shall the anode mesh be subjected to abrasive blast cleaning.
CS 15.8	Contact the MTO when changes to the layout of anode mesh rows or the location of cathode connections or reference cells are required outside of tolerances specified in the Contract Documents.
CS 15.9	Check that all sawcuts for wiring, cathode connections and reference cells installation are within the specified tolerance for depth, width and locations, and are properly cleaned and filled with specified material afterwards without any voids.
CS 15.10	Check placement and anchoring of anode mesh, welding of distribution bars, and verify tests for short circuits between anode mesh, rebars and other metallic appurtenances.
CS 15.11	Check that concrete material, production and testing is in accordance with CS 1.

CS 15.12 Check that the anode mesh and distribution bars are protected prior to and during placement of overlay according to the Contract Documents.

CS 15.13 Check that permission to waterproof is not issued until short circuit testing is completed and shorts corrected (if applicable) in accordance with the Contract Documents.

CS 15.14 Check that all electrical equipment, including CP cabinets, junction boxes, etc. is properly located as specified in the Contract Documents.

CS 15.15 M Notify the Bridge Office when acceptance testing is scheduled. Attend and check that the acceptance testing is performed in accordance with the Contract Documents including minimum 5^{o}C air temperature requirements; review the acceptance testing report and forward a copy to the Bridge Office.

LEVEL OF INSPECTION – C2

CS 16 STRUCTURE REHABILITATION – SILICA FUME CONCRETE OVERLAY

Use this task in conjunction with CS 1, CS 2 and CS 14

Task #	Activity
CS 16.1	Verify that the concrete mix and materials meet the requirements of the Special Provision for rapid chloride permeability at twenty-eight (28) days.
CS 16.2	Check that the trial run procedures are in accordance with **CS 14** and that the Contractor has demonstrated their ability to fog mist using the same equipment to be used for the overlay.
CS 16.3	Check that fog mist is applied continuously from the time of screeding until concrete is covered with burlap.
CS 16.4	Define the lots and determine core locations for air void system, tensile bond strength and rapid chloride permeability test.
CS 16.5	Obtain and review rapid chloride permeability results within four (4) business days of testing and forward the results to the Quality Assurance Section.
CS 16.6	Check that dust and debris from exposed Work, and from construction operations such as concrete cutting/grinding, abrasive blast cleaning of concrete and steel, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not entering a watercourse or Environmentally Sensitive Area.

LEVEL OF INSPECTION – A1

CS 17 STRUCTURE REHABILITATION – LATEX-MODIFIED CONCRETE OVERLAY

Task #	Activity
CS 17.1 M	**Check that all the delivered material is being supplied from the approved list and stored properly. Check that material supplied by the Contractor is sampled and tested as specified in the Contract Documents.**
CS 17.2 M	**Check that fine and coarse aggregate (enough for each stage) are stockpiled at the site three (3) weeks prior to placing concrete. Sample in accordance with contract requirements and deliver to designated lab for mix design purposes. Check that sufficient latex modifier to complete each stage is delivered at least seven (7) days prior to placing concrete**.
CS 17.3 M	**Check that the concrete mix design is available prior to the material discharge test on the mixing unit.**
CS 17.4	Check that the aggregate discharge test and the test for flow rate of latex modifier are carried out as specified in the Contract Documents.
CS 17.5 M	**Check that Contractor carries out a yield test as specified in the Contract Documents. Check dimensions of yield box and verify that data is being recorded accurately.**
CS 17.6	Check that the trial run procedures are in accordance with CS 14.
CS 17.7	Check that the placement and quality assurance procedures are in accordance with **CS 14** unless otherwise specified in the Contract Documents.

LEVEL OF INSPECTION – A1

CS 18 STRUCTURE REHABILITATION – CONCRETE PATCHES

Use this task in conjunction with CS 1, CS 2 and CS 14

Task #	Activity
CS 18.1	Obtain documentation certifying that the superplasticizer meets the requirements of the Special Provision.
CS 18.2	Check that appropriate mix design is being used for depth of repair.
CS 18.3	Obtain the Contractor's linear shrinkage test results within forty (40) days of the mix design submission and forward to the Quality Assurance Section.
CS 18.4	Check that all supporting test data is not more than twelve (12) months old from the date the concrete mix design was submitted.
CS 18.5	For FORM AND PUMP placement method, obtain and review the Contractor's proposal at least one (1) week prior to commencement of the Work. Check that the proposal includes methodology and equipment to be used for this construction contract and that it is signed and sealed by a Professional Engineer.
CS 18.6	For FORM AND PUMP placement method, check that the pump is a positive displacement type pump and that it is capable of delivering adequate volumes of concrete to maintain a continuous placement.
CS 18.7	Check the temperature of the air and existing concrete surface to receive the patches, and verify it meets contract requirements prior to and during concrete operation.
CS 18.8	Check equipment and runways, vehicles for the concrete transporting/transferring equipment; verify they are not supported by reinforcing steel.
CS 18.9	Check that the concrete surface and reinforcing steel have been abrasive blast cleaned according to **CS 43**.
CS 18.10	Check removal of all dust and loose material is carried out by oil-free compressed air.
CS 18.11	Check that the prepared surface is maintained in a wet condition for six (6) hours prior to placing concrete.

CS 18.12 Check excess water is removed by oil-free compressed air immediately prior to application of bonding grout.

CS 18.13 Check that thermocouple wires have been installed in the concrete for cold weather protection as specified in the Special Provision.

CS 18.14 M Review Contractor's temperature records daily for cold weather protection (if applicable).

CS 18.15 Check that prior to seasonal shut down, all patches are completed in all areas of concrete removal.

CS 18.16 Check that no construction vehicles, equipment or traffic, with the exception of sawcutting equipment be permitted on the finished surface of the patches until the curing period has elapsed and a minimum of 80% of the specified compressive strength has been attained.

CS 18.17 Define the lots and determine core locations for air void system and tensile bond strength test.

CS 18.18 Check that the tensile bond strength testing is carried out in accordance with the contract requirement. Obtain and review tensile bond strength within four (4) business days of testing and forward the results to the Quality Assurance Section.

CS 18.19 Check that the core holes have been filled according to the contract requirement.

CS 18.20 Check patches for any areas of debonding by sounding. Also check for honeycombed areas or cracks.

CS 18.21 Obtain and verify Contractor's crack inspection report, review Contractor's crack treatment proposal if applicable.

CS 18.22 Check that permission to waterproof is not issued until the cracks are treated (if applicable) and the patches in the deck are dried for three (3) days.

CS 18.23 Obtain and review Contractor's air void system test results within three (3) weeks of concrete placement and forward the results to the Quality Assurance Section.

LEVEL OF INSPECTION – A1
– B2 During placement

CS 19 STRUCTURE REHABILITATION – CONCRETE REFACING

Use this task in conjunction with CS 1, CS 2 and CS 18

Task #	Activity
CS 19.1	Check that the welded steel wire fabric is welded galvanized steel and conforms to CSA G 30.5.
CS 19.2	Check that the anchors for the attachment of the wire fabric to the concrete surface are galvanized in conformance with the contract requirements.
CS 19.3	Check that the anchors are of adequate length and strength to resist a pull-out force of 1.0 kN.
CS 19.4	Check that the wire fabric is installed after the concrete surface and exposed reinforcing steel in the repair area have been abrasive blast cleaned. Check that the wire fabric is installed in accordance with the Special Provision in the locations shown on contract drawings using spacers and anchors.
CS 19.5	Check that the wire fabric is kept clean of any contamination.
CS 19.6	Check that concrete material, production and testing is in accordance with **CS 1.** Check that submissions, concrete placement, finishing, curing, and quality assurance procedures are in accordance with **CS 18** unless specified otherwise elsewhere in the Contract Documents.
CS 19.7	Check that the surface of the existing concrete is roughened according to the contract requirements.
CS 19.8	Check that burlap and water is applied immediately to the top of all exposed concrete surfaces, within 2 m to 4 m from the finishing operation. Check that burlap is kept continuously wet by means of a soaker hose placed along the top of the component being refaced. Check that the soaker is placed immediately after the concrete has set without causing fines to wash out.
CS 19.9	Check that the forms are removed according to the contract requirements and that the concrete is cured as specified in the Special Provision.
CS 19.10	Check that dust and debris from exposed Work, and from construction operations such as concrete cutting/grinding, abrasive blast cleaning of concrete and steel, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not

entering a watercourse or Environmentally Sensitive Area. Check that environmental protection enclosures or containment systems are in place and functioning.

LEVEL OF INSPECTION – C2

CS 20 APPLICATION OF SILICA FUME OR NORMAL SHOTCRETE

Task #	Activity
CS 20.1	Check that environmental protection enclosures or containment systems are in place and functioning prior to silica fume or shotcrete application.
CS 20.2	During silica fume or shotcrete application check that dust and debris from exposed Work, and from construction operations such as concrete cutting/grinding, abrasive blast cleaning of concrete and steel, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not entering a watercourse or Environmentally Sensitive Area.
CS 20.3	Obtain mix proportions and the name of the supplier of the prebagged shotcrete mix for approval at least one (1) week prior to the application of shotcrete.
CS 20.4	Obtain with the mix design submissions all the supporting documents in accordance with the Contract Documents.
CS 20.5	Check that all supporting test data is not more than twelve (12) months old from the date the mix design was submitted.
CS 20.6	Check shotcrete equipment submission is in accordance with the Contract Documents.
CS 20.7 M	**Check that the nozzle operator is currently certified with confirmation of picture and identification with MTO list of approved shotcrete nozzleman.**
CS 20.8	Obtain and check the curing submission which includes equipment and procedures to be used one (1) week prior to the commencement of the application of shotcrete.
CS 20.9	Check where applicable, cold weather protection and hot weather shotcreting descriptions are in accordance with the Contract Documents.
CS 20.10	Check that the shotcrete material supplied meets the contract requirements and that it is properly stored.
CS 20.11	Check Date of Manufacture to determine that shelf life has not expired.
CS 20.12 M	**Check that the following items meet specified requirements:**

(i) **Shotcrete mixing equipment;**
(ii) **Removal of concrete, abrasive blasting, placement and properly secured steel wire fabric ensure any contaminants are removed and protection of adjacent surfaces;**
(iii) **Pre-wetting of repair areas;**
(iv) **Mix proportions of material delivered to site;**
(v) **Temperature of mix water;**
(vi) **Application of shotcrete;**
(vii) **Temperature before, during and after application of shotcrete.**

CS 20.13 M Check that shotcrete is cured in accordance with the Contract Documents.

CS 20.14 M Sound for deficiencies in the repair areas.

CS 20.15 Randomly select locations for testing of compressive strength, tensile bond and rapid chloride permeability. Check for cracks that require remedial action.

CS 20.16 Obtain and review test results for compressive strength, tensile bond and rapid chloride permeability and forward results to the Quality Assurance Section within four (4) days of receiving them.

LEVEL OF INSPECTION – C2

CS 21 STRUCTURE EXCAVATION

Task # Activity

CS 21.1 M Verify that preconstruction survey of property and structures that may be affected by the Work is submitted.

CS 21.2 M Verify that protection schemes are constructed in accordance with working drawings.

CS 21.3 Check that erosion and sediment control schemes (and coffer dams if required) are in place and functioning prior to structure excavation such that the watercourse is isolated from the Work area. Determine if additional erosion control measures or additional locations may be required. Confirm that any other relevant environmental constraints have been addressed.

CS 21.4 Check that advanced unwatering is conducted as required to prevent soil sloughing, basal heave and boiling.

CS 21.5 Check that unwatering is not causing erosion of the soil at the outlet and other environmental concerns (e.g. muddy water discharge). Check that the Contractor has the standby equipment (pumps, hoses, sediment bags, etc.) on site as required in the environmental submission. Check that the unwatering/flow passage system complies with the contract provisions and any accepted Contractor's proposals, and that the system is not causing sedimentation of the watercourse downstream of the Work site.

CS 21.6 M Complete inspections at the milestones specified in the Contract Documents.

CS 21.7 M Submit milestone inspection reports and issue written notification to proceed at the completion of excavation for foundations, and for backfill and frost tapers.

CS 21.8 M Check the geometry of temporary slopes to facilitate excavation. Check that all footing excavations conform to size, shape, line, elevations and grades as specified in the Contract Documents.

CS 21.9 Check that loosened material, soft material, boulders and other deleterious material at the foundation base are removed and replaced with suitable compacted material or mass concrete. Check that any stockpiling of excavated material is done in an area that is isolated from any watercourses such that entry of sediment to watercourses is prevented.

CS 21.10 Record the depth, length, width, type of material used, and how it was placed, when the Contractor uses a working slab.

CS 21.11 Check that any adjacent utility/structure is not affected or undermined by the footing excavation.

CS 21.12 Check that the founding soil is protected and preserved.

CS 21.13 Check that excavation for frost tapers are carried out according to specifications.

CS 21.14 Check that any staged construction (excavation, backfilling sequence restrictions) is conducted.

LEVEL OF INSPECTION – D2

CS 22 COFFERDAMS, SHEET PILING, TIE BACKS, AND ROADWAY PROTECTION

Task #	Activity
CS 22.1	Check length and condition of all materials delivered to the site.
CS 22.2	Check that a pre-construction site condition survey has been carried out as required.
CS 22.3	Check that the Contractor's scheme is as specified in the contract or accepted proposal.
CS 22.4 M	**Verify that working drawings are submitted to the Contract Administrator.**
CS 22.5	Verify submissions bear the seal and signature of a design engineer and a design-checking engineer.
CS 22.6	Check that the information specified to be shown on the construction drawings has been included.
CS 22.7	Check that the Contractor's scheme is as specified in the Contract Documents for length.
CS 22.8	Check that all elements of the unwatering/flow passage system (e.g. coffer dams) are properly staged/installed to prevent any discharge of sediment to the watercourse.
CS 22.9	Check the alignment, depth and layout of the protection scheme.
CS 22.10	Check that any vibratory equipment to facilitate the installation does not disturb native soil or exiting utilities/structures.
CS 22.11	Check that anchor testing equipment and procedure is as specified in the Contract Documents.
CS 22.12	Check that the Contractor monitors the completed scheme for movement.
CS 22.13 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**
CS 22.14	Check that soil loss is not occurring during installation behind the shoring during excavation.

CS 22.15 Check that the corrosion protection has been provided as specified.

CS 22.16 Check that a record of each anchor hole excavation is submitted.

CS 22.17 Check that the quality of grout is being tested as specified.

CS 22.18 Check that the roadway protection/excavation sequence is properly executed.

CS 22.19 Verify Removal requirements for Temporary Roadway Protection.

CS 22.20 Contact the Foundations Office to develop awareness of shoring and for consultation.

CS 22.21 Consult with Foundations Office on concrete requirements for temporary shoring.

LEVEL OF INSPECTION – E2

CS 23 UNWATERING

Task #	Activity
CS 23.1	Check that erosion and sediment control schemes are in place and functioning prior to the start of unwatering such that the watercourse is isolated from the Work area and unwatering activities. Determine if additional erosion control measures or additional locations may be required.
CS 23.2	Check that the unwatering and flow passage systems required by the contract are in place and functional before disturbing the Work area.
CS 23.3 M	**Check that environmental Special Provisions and/or Contractor proposals for unwatering are adhered to.**
CS 23.4	Check operation of unwatering system.
CS 23.5	Check that groundwater drawdown levels are as designed and the 'natural flow' of the watercourse is maintained. Check that the Contractor is monitoring as specified in the Contract Documents.
CS 23.6	Check that pump inlet is not submerged in mud and is properly screened to prevent fish ingestion.
CS 23.7	Check that discharge is being managed in accordance with contract requirements.
CS 23.8	Check that unwatering is not causing erosion of soil at the outlet and other environmental concerns (e.g. muddy water discharge). Check that the Contractor has the standby equipment (pumps, hoses, filter bags, etc.) on site as required in the environmental submission.
CS 23.9 M	**Check that the Contractor's unwatering scheme is not causing loss of materials under adjacent founding elements or backfill.**
CS 23.10	Check that unwatering system is not removed until the backfilling is brought up to grade and the Work area is cleared of any debris or construction materials that could be washed downstream.
CS 23.11 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**

LEVEL OF INSPECTION – B1/E2

CS 24 PILING

Use this task in conjunction with CS 1

Task #	Activity
CS 24.1	Check that erosion and sediment control schemes are in place and functioning. If the control measures are not functioning or are insufficient the Contractor must be requested to review and take action.
CS 24.2 M	**Record and verify the pile type, length, condition of the pile splices and driving shoes and length to cut off. Verify straightness of piles.**
CS 24.3	Check that all the delivered material is supplied from the approved list, and handled and stored so as to prevent damage to the piles.
CS 24.4 M	**Check that the correct value of imported steel has been declared on the "Statement of Imported Content" form. Collect all mill certificates (test results should be from Canadian testing facilities). Check that mill certificates satisfy the requirements in general and specifically for imported steel.**
CS 24.5 M	**Check that pile driving equipment conforms to specified requirements. Monitor hammer performance.**
CS 24.6	Check that the end treatments are correctly applied (i.e. shoes, Oslo Points, Bearing Points, collars, etc.).
CS 24.7 M	**Check that pile installation sequence is in accordance with submission, and that layout of piles conforms to contract requirements.**
CS 24.8	Check that vertical and batter alignment of pile meets specified requirements.
CS 24.9 M	**Verify that piles are not overdriven and hence damaged during installation.**
CS 24.10 M	**Check that welder is certified. Check that welding of splicing conforms to specified requirements, and that pile splices are carried out properly.**
CS 24.11	Check that pile set and refusal criteria are satisfied. Check that actual tip elevation corresponds to design founding stratum.
CS 24.12	Check that the piles are cut off as specified.

CS 24.13 Check that retapping/redriving requirements are being satisfied.

CS 24.14 Check the Contractor's pile driving records.

CS 24.15 Check that noise control restrictions have been complied with.

CS 24.16 M Check that the piles are installed to the specified tolerances.

CS 24.17 For piles driven to refusal, check that the appropriate Dynamic Formula is used in accordance with the Contract Documents.

CS 24.18 Check that piles are not driven adjacent to fresh concrete as specified in the Pile Driving Restrictions and Requirements in the Piling Special Provision.

CS 24.19 M When driving piles to a set, contact Foundations Office immediately if ultimate axial resistance of pile is not achieved. Check that the Contractor doesn't drive pile beyond design tip elevation without consultation with Foundations Office.

CS 24.20 When retapping piles, check that piles are retapped at the previous set.

CS 24.21 M Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.

LEVEL OF INSPECTION – A1

CS 25 CAISSON FOUNDATIONS

Use this task in conjunction with CS 1

Task #	Activity
CS 25.1	Check type, length and condition of caisson liners.
CS 25.2 M	**Check that welder is certified.**
CS 25.3 M	**Check that installation equipment is as specified in the Contract Documents.**
CS 25.4	Check that erosion and sediment control schemes are in place and functioning. Determine if additional erosion control measures or additional locations may be required.
CS 25.5	Check that caisson is drilled to design tip elevation.
CS 25.6	Check that penetration and cut off are in accordance with design data.
CS 25.7	Check that sidewall and basal stability is maintained during the caisson foundation installation.
CS 25.8 M	**Check that caissons are cleaned out prior to placing reinforcing steel and concrete.**
CS 25.9	Check that the Contractor's cleaned out material containment location. Check that containment locations are placed away from watercourses and that erosion and sediment control measures are in place and functioning around them.
CS 25.10	Check that slurry properties are being tested and verified in accordance with contract requirements.
CS 25.11	Check that reinforcement steel is being properly placed in accordance with contract requirements.
CS 25.12	Check that vertical and batter alignment of caisson are as specified in the Contract Documents.
CS 25.13	Check that rock socketed caissons are installed to the appropriate depth, tip elevation and geometry.

CS 25.14 Check that any temporary slurry does not negatively impact shaft resistance design requirements. Temporary slurry needs to be adequately flushed.

CS 25.15 Check that concrete is placed within the specified time period following cleaning and inspection of caisson base.

CS 25.16 M Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.

LEVEL OF INSPECTION – B2

CS 26 STRUCTURE BACKFILLING

Task #	Activity
CS 26.1 M	**Check that erosion and sediment control schemes are in place and functioning. Determine if additional erosion control measures or additional locations may be required.**
CS 26.2 M	**Check that the structure excavation limits are verified and recorded prior to commencement of backfilling operations.**
CS 26.3 M	**Check that the concrete has reached the required percentage of the design strength prior to backfilling.**
CS 26.4 M	**Check that subdrains are placed as specified in the Contract Documents.**
CS 26.5	Check that proper procedures are used for weep holes and perforated pipe installation.
CS 26.6 M	**Complete inspections at the milestones specified in the Contract Documents.**
CS 26.7 M	**Submit milestone inspection report.**
CS 26.8 M	**Check that backfill is placed as specified in the Contract Documents, and that all backfill materials are free of waste.**
CS 26.9 M	**Check that appropriate compaction procedures, equipment and sequence are used in restricted and all other areas, as specified in the Contract Documents. Check that appropriate compaction testing is being conducted in the manner and frequency specified in GD 13B and in the Contract Documents.**

LEVEL OF INSPECTION – C2

CS 27 FORMWORK

Task #	Activity
CS 27.1	Check that dimensions of forms are as specified in the Contract Documents.
CS 27.2	Check that form release oil is applied to the forms before the installation of reinforcing steel.
CS 27.3	Check forms (several times) for alignment and possible deformation, during concrete placement.
CS 27.4 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the requirements of the Contract Documents.**

LEVEL OF INSPECTION – E2

CS 28 FALSEWORK

Task #	Activity
CS 28.1 M	**Check that stamped falsework drawings are on site. Check installed falsework against stamped working drawings prior to pour.**
CS 28.2	Check that the founding soil is prepared.
CS 28.3	Check that any foundation bearing pad is properly placed and compacted.
CS 28.4	Monitor falsework (several times) during concrete placement operation for deflection and settlement.
CS 28.5 M	**Check that the required concrete strength has been reached prior to removing falsework.**
CS 28.6 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**

LEVEL OF INSPECTION – E2

CS 29 INSTALLATION OF BEARINGS

Task #	Activity
CS 29.1 M	**Check that the Adjustment of Bearing drawings are supplied and reviewed in accordance with the time requirements of the Contract Documents.**
CS 29.2	Check that all the delivered material is being supplied from the approved list and properly stored.
CS 29.3	Check and record from elastomeric bearings, the size, name of manufacturer, part number and date of manufacture and also check that the bearing is not on the list of defective bearings put out by the Concrete Section.
CS 29.4	When specified, randomly select and then have the Contractor ship the sample bearing(s) for testing as specified.
CS 29.5	Check that surface and bedding of bearing seats are within tolerances and meet the requirements of the applicable specifications.
CS 29.6	Check that each bearing is installed at the correct location, elevation, and is properly aligned as specified in the Contract Documents.
CS 29.7	Check for removal of any shipping device or restraints from bearings as specified in the contract and/or shop drawings.
CS 29.8 M	**Upon completion of the structure, visually inspect the bearings to determine that they have full and uniform bearing at top and bottom, and that bearing components are not out of position.**
CS 29.9	Check the timing and procedure for jacking and re-alignment of bearings.
CS 29.10 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**

LEVEL OF INSPECTION – D2

CS 30 STRUCTURAL STEEL BEAM ERECTION

Task #	Activity
CS 30.1 M	**Check that the steel is supplied from a Designated Source and that the correct value of imported steel has been declared on the "Statement of Imported Content" form.**
CS 30.2 M	**Check that the stamped erection drawings are on site.**
CS 30.3	Check that beams have not been damaged and are set to the specified alignment and seated properly.
CS 30.4 M	**Collect steel mill certificates (coupon tags) and store on file in site office.**
CS 30.5 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**

LEVEL OF INSPECTION – D2
– A2 during erection

CS 31 REINFORCING STEEL PLACEMENT

Task #	Activity
CS 31.1M	**Check reinforcing steel schedule and drawings.**
CS 31.2	Check for proper site storage and handling.
CS 31.3M	**Check mill certificates to confirm that the reinforcing steel is supplied from one of the specific mills listed on the Designated Sources List**
CS 31.4M	**Check all reinforcement tags on bar bundles to verify that the correct grade, type and size of steel has been supplied, from one of the fabricators listed on the Designated Source List (both mills and fabricators are shown on the same list). The Bill of Lading for the steel will also show the name and location of the fabricator.**
CS 31.5M	**Check that the size, grade and type of steel shown on the mill certificates, is the same as shown on the tags, and both are consistent with the material supplied.**
CS 31.6 M	**Check that the correct value of imported steel has been declared in the "Statement of Imported Content" form.**
CS 31.7 M	**Obtain a sample of stainless steel reinforcement and the supporting documentation in accordance with the Contract Documents.**
CS 31.8 M	**Check that the installation of the mechanical connectors is in accordance with the Contract Documents and issue written notification of acceptance. The inspection shall be completed within 2 Business Days of the Contractor providing notice that the connector installation is completed. Photo documentation is required.**
CS 31.9M	**Check that the correct grade/type and size of steel has been placed in accordance with the Contract Documents and issue written notification of acceptance prior to placing concrete. The inspection shall be completed within 2 Business Day of the Contractor providing notice that the reinforcement placement is completed. Photo documentation is required.**

LEVEL OF INSPECTION –D2

CS 32 POST-STRESSING SYSTEMS

Task #	Activity
CS 32.1	Check type, size and condition of prestressing materials delivered to the site.
CS 32.2	Check for proper site storage of prestressing materials.
CS 32.3	Check that material supplied by the Contractor is sampled and tested as required.
CS 32.4	Check installation of prestressing sheaths, support cables, and anchorages.
CS 32.5	Check the elevation and alignment of cable sheaths.
CS 32.6	Check that cable sheaths are secured firmly in place.
CS 32.7	Check that grout vent hoses are installed at all the proper locations.
CS 32.8 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**

LEVEL OF INSPECTION – B2

CS 33 POST-TENSIONING STRESSING OPERATION

Task #	Activity
CS 33.1 M	**Check that stressing working drawings are on site.**
CS 33.2	Check that the correct calibration tests have been carried out by an approved authority in the last six (6) months.
CS 33.3 M	**Check that void hold-downs are released prior to stressing.**
CS 33.4 M	**Check that concrete is up to specified strength prior to stressing.**
CS 33.5	Check that cables are stressed in proper sequence.
CS 33.6	Check that cables are marked and measured and that elongation, gauge pressure and slip are recorded.
CS 33.7 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**

LEVEL OF INSPECTION – C2

CS 34 GROUTING OF POST-TENSIONING DUCTS

Task #	Activity
CS 34.1 M	**Prior to the grouting operations, check that the test batch has been mixed in the presence of the Quality Verification Engineer and that the quality of the grout meets the specified requirements.**
CS 34.2	After completion of post-tensioning operation, obtain the Contractor's records of elongation, calibrated jacking pressure readings, slippages and strand bandages.
CS 34.3	Verify that the Quality Verification Engineer carries out Interim Inspection of post-tensioning system, witnesses stressing and issues written permission to the Contractor to proceed with grouting. Check that grouting does not proceed until permission is given.
CS 34.4	Check that ducts are blown out with oil free air and, when required, with water.
CS 34.5	Check that all vent tubes are free from blockage.
CS 34.6	Check that dry grout mix components meet the Contract Document requirements.
CS 34.7	Check that the concrete temperature of the deck is as specified in the Contract Documents.
CS 34.8	Check the mixer and pump. Check that pressure gauge at pump or intake, water measures, and timer are accurate.
CS 34.9	Check that grouting is carried out within the specified time limits of tensioning and receipt of permission to grout.
CS 34.10	Check that the grout is being tested and meets the specified requirements.
CS 34.11	Identify batch(es) of grout from which grout cubes for determination of compressive strength will be made.
CS 34.12	Check that grout cubes are taken for testing and delivered as required to the specified testing facility.
CS 34.13	Check that grouting operation is continuous and hoses are topped-up prior to tying off as specified in the Contract Documents.

CS 34.14 Check that the Contractor's placing schedule such that placement of sidewalks, curbs, median curbs, etc., is done after the grouting of post tension grout tubes.

CS 34.15 M Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.

LEVEL OF INSPECTION – A1

CS 35 BRIDGE DECK WATERPROOFING

Task #	Activity
CS 35.1 M	**Check that the deck meets the requirement for surface tolerance and surface finish of the contract requirements.**
CS 35.2	Identify all repairs and remedial Work that needs to be carried out prior to waterproofing including texture surfaces, sawcut grooves and scaling.
CS 35.3	Check that all repairs and remedial Work to the concrete deck have been completed.
CS 35.4 M	**Check that the air and concrete surface temperatures are 5°C or higher. Deck must be dry and application performed under dry conditions.**
CS 35.5	Check that Contractor performing the waterproofing is from the Owner's list of applicators approved by the waterproofing membrane manufacturer. This list can be obtained from the Regional Quality Assurance Section.
CS 35.6 M	**Permission is given to Contractor to proceed after verifying that the deck surface, face of the curbs and barrier walls were completely treated by abrasive blast cleaning to expose sound, laitance-free concrete and that the concrete surface has been cleaned with a jet of oil-free compressed air to remove all dust and other foreign material.**
CS 35.7	Check that no traffic other than the construction equipment directly associated with the waterproofing operation is allowed on the abrasive blast cleaned deck.
CS 35.8	Check that tack coat is applied uniformly at the required rate when the concrete is surface dry and clean.
CS 35.9	Check that the Contractor takes adequate protective measures to mask concrete, prevent over-spray of tack coat materials onto adjacent concrete surfaces (curb face, barrier wall, abutments, columns, etc.) and to prevent waterproofing material from entering a watercourse.
CS 35.10 M	**Check that all delivered waterproofing membrane, protection board, primer and reinforcement fabric materials are from the manufacturer's approved sources.**

CS 35.11 For each lot, measure and record protection board thickness and waterproofing membrane thickness following the procedure in the “Field Guide for the Acceptance of Hot Mix and Bridge Deck Waterproofing”.

CS 35.12 Check that tack coat is cured completely and free of any surface moisture and dirt before waterproofing membrane is applied.

CS 35.13 Check that the mixing kettle is completely empty prior to commencement of melting cakes of asphalt membrane.

CS 35.14 Check that temperature of waterproofing membrane at time of placing is as specified by the manufacturer and that the temperature does not exceed the manufacturer’s recommended safe heating temperature at any time during the waterproofing operation.

CS 35.15 Check for correct placement of membrane reinforcement over joints. Check for correct placing of protection boards. Check proper lapping of waterproofing at construction joint and staging boundaries.

CS 35.16 For each lot, measure and record protection board thickness and waterproofing membrane thickness following the procedure in the “Field Guide for the Acceptance of Hot Mix and Bridge Deck Waterproofing”.

CS 35.17 M Compute payment adjustment factor and have the Contractor sign form PH-CC-129 A prior to paving. Submit the “Waterproofing Membrane and Protection Board Thickness Report” to the Quality Assurance Section within four (4) days of completing it.

CS 35.18 If the Contractor submits a proposal for an alternative to removal and replacement for waterproofing membrane thickness which exceeds 6mm, consult with the Regional Structural Section.

CS 35.19 Check that containers for sampling of waterproofing materials are made of metal. Check the sample containers prior to sampling and verify they are new, clean and free of debris.

CS 35.20 Check that waterproofing membrane is sampled during application of each lot.

CS 35.21 Check that all test results have been received and price adjustments calculated and applied as appropriate.

CS 35.22 Check that asphalt drainage tubes are open.

CS 35.23 Check tack coating of protection boards just prior to paving.

LEVEL OF INSPECTION – B2

CS 36 PRECAST AND PRESTRESSED CONCRETE ELEMENT (NORMAL AND HIGH PERFORMANCE CONCRETE)

Task # **Activity**

CS 36.1 M **Check that submissions are in accordance with the contract requirements. Check that Working Drawings are submitted and contain the information listed in the Contract Documents.**

CS 36.2 Check that the concrete mix design submission contains the information required by the Contract Documents. Obtain Form A portion of the concrete mix design along with any supporting documentation at least seven (7) days prior to placement of concrete and review it to determine that it meets the contract requirements. Check that all materials are from approved lists and meet the requirements of the Contract Documents. Issue written confirmation that the concrete mix design submission meets the contract requirements or advise the Contractor of any requirements that have not been met. Check that the Regional Quality Assurance Section has received Form B portion of the concrete mix design from the concrete supplier prior to placement of concrete.

CS 36.3 Check that the precast element are fabricated at a precast plant certified according to the Contract Document requirements. If concrete will be supplied by a ready-mixed concrete supplier check that documentation has been submitted verifying that the plant is certified by the Ready-Mixed Concrete Association of Ontario.

CS 36.4 Check that the concrete temperature control plan is submitted one week prior to commencement of fabrication of precast element.

CS 36.5 Review and provide a written response of acceptability within 10 Business Days for any design proposals that are submitted.

CS 36.6 Check that the Contractor provides written notification a minimum of 7 Days prior to commencement of precast element fabrication.

CS 36.7 Check the temperature dataloggers, prior to use on the contract, to verify thermocouple function, readings and that they shall provide unalterable records during the recording period. Provide written notification to the Contractor that the temperature monitoring and recording system is deemed acceptable to the MTO. Verify that the thermocouple wires are placed according to Contract requirements.

CS 36.8 Identify which precast elements make up each Lot (as defined in the Contract Documents).

CS 36.9 After all the precast elements in the Lot have been fabricated, randomly select one member from each lot for acceptance testing, and randomly select a location for core removal within that precast element. Advise the Contractor which element is to be cored and the coring location.

CS 36.10 Obtain from the Contractor the planned time and site of coring (job site or precast plant) for each Lot. (Note: One precast element type in each lot is to be cored at an age of 4-14 days, to remove 6 cores, for air void system, rapid chloride permeability and compressive strength testing respectively. Coring may take place at the job site or at the precast plant, wherever the precast element is 4 to 14 days of age.)

CS 36.11 M Arrange to be present for the removal of cores when core removal is to take place on site. When coring is conducted at the precast plant, arrange to be present or have a representative present for the coring.

CS 36.12 Upon removal of the core samples, verify that cores are properly labelled and place in the security bags provided by the MTO. Immediately take possession of the cores and deliver them to the designated laboratory for testing by the MTO.

CS 36.13 Check that written notification of delivery of precast elements is provided 3 Business Days prior to delivery.

CS 36.14 M Check that prior to shipment of precast elements, a precast report is submitted. Check the precast report to verify it meets the requirements of the Contract Documents.

CS 36.15 Check that written notification of installation of precast elements is provided 3 Business Day prior to commencement of field installation operations. Check that the stamped Workings Drawings are on site during installation of the precast elements.

CS 36.16 Randomly select a minimum of two precast elements from each lot delivered to the site for verification of concrete cover measurements. If the concrete cover measurements of any of the precast elements measured does not meet the tolerances of the Contract Documents, inform the MTO immediately.

CS 36.17 Verify dimensional tolerances according to the Contract Documents.

CS 36.18 Obtain and review acceptance test results for compressive strength, air void system and rapid chloride permeability.

CS 36.19 If referee testing of rapid chloride permeability is invoked, witness the removal of the core(s) for referee testing from the same precast element from which the disputed acceptance core was obtained. Check that the referee core is properly labelled. Take possession of the core and deliver it to the referee laboratory designated by the MTO.

CS 36.20 Check that defects and deficiencies repairable by standard methods are repaired according to the Contract Documents.

CS 36.21 Check that precast elements with defects and deficiencies causing rejection according to the Contract Documents, are not included in the Work.

CS 36.22 For all other defects and deficiencies, check that a repair proposal meeting the requirements of the Contract Documents is submitted. Review the proposal and provide a written response to the Contractor indicating whether the proposal has been accepted.

CS 36.23 Check that the members are temporarily braced immediately after erection.

CS 36.24 M Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.

LEVEL OF INSPECTION – D2

CS 37 INSTALLATION OF EXPANSION JOINTS

Use this task in conjunction with CS 1

Task #	Activity
CS 37.1	Check that no damage occurs during handling.
CS 37.2 M	**Check all delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract. Check that material supplied by the Contractor is sampled as required. Check for proper storage of the joints.**
CS 37.3 M	**Check that field splices in steel components are located and welded in accordance with shop drawings and are performed by a certified welder.**
CS 37.4	Check that the dimensions of the block-out to receive the joint assembly are in accordance with the contract drawings and standard drawings.
CS 37.5	Check that the block-out area to receive the joint is abrasive blast cleaned, without damaging the epoxy coated steel.
CS 37.6	Check that all debris in the block-out has been removed and the area is coated with a cement paste prior to placing concrete.
CS 37.7 M	**Check that the proper gap or "j" dimension of the unit has been established prior to placing concrete, and check that the constant gap is achieved throughout the total length.**
CS 37.8 M	**Check that clamping angles or channels are removed as specified in the Contract Documents.**
CS 37.9	Check that holes left from removal of clamping angles or channels are cleaned and grouted with approved epoxy.
CS 37.10	Check for concrete blockages in the expansion joint opening.
CS 37.11	Check that seal is properly installed with no damage, wrinkles or splices.
CS 37.12	Check that sliding plates on sidewalk, curbs and median have been installed properly with regards to the direction of traffic.

CS 37.13 Check that formwork including styrofoam has been removed below expansion joint assembly between deck and ballast wall.

CS 37.14 Check for cracks in the concrete adjacent to the expansion joint.

CS 37.15 Check that end dam concrete has been cured for a minimum of seven (7) days and has reached 25 MPa prior to epoxy injection.

CS 37.16 M Check that traffic is not allowed on the deck joint assembly until the epoxy injection has been completed and cured and clamping bars are installed for Type A expansion joints.

CS 37.17 Check that the injection method is in accordance with the contract documents and injected by the supplier of the expansion joint system, or an agent approved by the supplier.

CS 37.18 M Sound the steel armour for voids. If voids are detected, check that proper procedures are taken to fill the voids.

CS 37.19 M Check that a water test has been carried out.

CS 37.20 Check that all waste material (Styrofoam) is disposed of in accordance with the Contract Documents.

CS 37.21 M Check that the Certificate of Conformance is supplied and reviewed for each task and in accordance with the time requirements of the Contract Documents.

LEVEL OF INSPECTION – C2

CS 38 TEMPORARY MODULAR BRIDGES

Task #	Activity
CS 38.1	Check that erosion and sediment control schemes are in place and functioning prior to start of modular bridge installation. Determine if additional erosion control measures or additional locations may be required.
CS 38.2	Check that all environmental constraints have been complied with (fisheries approvals, Work on the banks, etc.) prior to installation.
CS 38.3 M	**Visually check foundations are in accordance with Contract Documents.**
CS 38.4	Check that layout and elevations of the launching and construction rollers have been approved. Check that founding elements, cribs, and footings are located in accordance with plan.
CS 38.5 M	**Check that all bracing bolts, chord bolts and transom clamps remain fully tightened.**
CS 38.6	Check that base plates and bearings are free of debris.
CS 38.7	Inspect base plates and cribs for settlement.
CS 38.8	Visually check timber for soundness and specified requirements.
CS 38.9	Check material control is as specified in the Contract Documents.

LEVEL OF INSPECTION – E2

CS 39 STRUCTURAL STEEL COATING

Task #	Activity
CS 39.1	Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.
CS 39.2	Check that material supplied by the Contractor is sampled as required.
CS 39.3	Check that all requirements of the manufacturers' product data sheets are met.
CS 39.4	Check that individual coating products used in the coating system come from the same manufacturer and are compatible.
CS 39.5	Check that environmental operations including enclosure systems, negative pressure, management including sampling, testing, storage, documentation/manifesting, transportation and disposal of spent blast medium and removed coating material are as specified in contract and/or Contractor's approved proposal. Check that a copy of all test results and manifests are provided to the Environmental Planner.
CS 39.6 M	**Check that surface preparation is carried out as specified in the Contract Documents and meets the specified SSPC standard.**
CS 39.7	Check sample(s) of spent blast medium is obtained as specified in the Contract Documents.
CS 39.8 M	**Check that coating of structural steel follows cleaning within the time as specified in the Contract Documents.**
CS 39.9	Check air temperature and dew point restrictions.
CS 39.10	Check that the coat application is carried out as specified in the Contract Documents.
CS 39.11	Check that the dry film thickness gauge and any DFT gauge utilized by the Contractor are calibrated to SSPC PA-2 and any Special Provision requirements. Only type two (2) gauges are to be used.
CS 39.12 M	**Check that each coat meets the dry film thickness requirements. Test frequencies and acceptance to be in accordance with SSPC PA-2, including the requirements in Appendix 3 for girder structures.**

Acceptance of multiple coats will be based on the cumulative minimum and maximum requirements after each coat application. Deficiencies to be corrected before acceptance and proceeding with subsequent coat.

CS 39.13 Check that all blast abrasive, dust and other debris are removed from the steel surface and each coating surface prior to the application of the subsequent coat.

CS 39.14 Complete Daily Inspection Report Forms PH-CC-782A and/or PH-CC-782B each day and Summary Form PH-CC-783 after the completion of the Work on each structure.

CS 39.15 Check condition of galvanized components during installation. Check that repairs are as specified in the Contract Documents.

CS 39.16 M Check that the consultant or sub-consultant inspecting the structural steel coating holds the appropriate certifications.

LEVEL OF INSPECTION – A1

CS 40 STEEL PARAPET RAILING

Task #	Activity
CS 40.1 M	**Check type, size, length and condition of materials (including protective coatings) delivered to the site. Check that all the delivered material is being supplied from the approved list and is properly stored.**
CS 40.2 M	**Check that installation is as specified in the Contract Documents.**
CS 40.3	Check the condition of completed posts and rails. Check that damaged areas are properly repaired.
CS 40.4 M	**Check that the Certificate of Conformance is supplied and reviewed for each task and in accordance with the time requirements of the Contract Documents.**

LEVEL OF INSPECTION – E2

CS 41 OVERHEAD SIGN PLACEMENT

Use this task in conjunction with CS 1

Task #	Activity
CS 41.1	Check that erosion and sediment control schemes are in place and functioning prior to start of overhead sign placement. Determine if additional erosion control measures or additional locations may be required.
CS 41.2 M	**Check that the foundations for the overhead signs are installed to the depth, size and procedures specified in the Contract Documents.**
CS 41.3	Check footings with regards to “as constructed” elevations and type, plumbness of footing, alignment between two founding elements and the distance between the two founding elements (C/C footings).
CS 41.4 M	**Check all delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
CS 41.5 M	**Check that the correct value of imported steel has been declared on the “Statement of Imported Content” form.**
CS 41.6 M	**Check overhead sign structure to determine that installation is in accordance with the contract drawings and shop drawings.**
CS 41.7 M	Check that correct sign message is mounted on the support.
CS 41.8 M	**Check full bearing of all base plates.**
CS 41.9	Check that sign structure is installed facing in the proper direction and that the required number of sign clamps have been supplied.
CS 41.10	Check for cracking of erected sign structure.
CS 41.11	Check that exposed anchorage threads do not exceed three (3) diameters.
CS 41.12	Check the top of footing for surface finish and levelness.
CS 41.13 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.**

CS 41.14 M **Obtain and submit to Regional Structural Office Final Clearance/Restriction measurements.**
Vertical Clearances -Gathering minimum clearance measurements along each edge of lane, in metres to 2 decimal places.
Horizontal Clearances –Clearance to be measured at right angles to the centre line of the travelled portion of the highway or edge of lane.

LEVEL OF INSPECTION – E2

CS 42 RETAINED SOIL SYSTEMS

Task # Activity

CS 42.1 M Check that all submissions bear the seal and signature of the Design Engineer and the Design Check Engineer.

CS 42.2 M Check that the Contractor has selected a Retained Soil System (RSS) designated as A (Accepted) or DE (Demonstration) on the DSM List that meets the specified contract requirements.

CS 42.3 M Check that the Contractor has a copy of the stamped working drawings on site at all times.

CS 42.4 M Check that the working drawings include at least the following:

(i) **All design, fabrication and construction drawings and specifications for the RSS**
(ii) **Details of all excavation, unwatering, drainage and backfilling required to construct the RSS, including type and source of associated backfill**
(iii) **Details at joints and connections to other structures where shown in the contract drawings**
(iv) **Details of all protection systems**
(v) **Statement of bearing resistance required by the RSS foundation, and the bearing resistance provided in accordance with the CHBDC**
(vi) **Statement of satisfactory internal and external stability**
(vii) **All design, fabrication and construction drawings and specifications for traffic barriers and base, and finishing caps, where applicable**
(viii) **Details of how all relevant Operational Constraints and Environmental Constraints, as specified elsewhere in the contract, will be adhered to**
(ix) **A copy of the Approved Product Drawings covering material and construction details.**

CS 42.5 M Forward one (1) set of the stamped working drawings to the Pavements and Foundations Section, Ministry of Transportation, Downsview, for information purposes and an RSS Inventory.

CS 42.6 Check that all loose, softened, deleterious material at the founding elevation of the RSS is removed.

CS 42.7 M Verify that foundation preparation is carried out in accordance with the contract drawings and documents.

CS 42.8 M **Verify that the backfill type is as indicated on the working drawings and that the Contractor is placing the backfill in accordance with the manufacturers' recommendations, working drawings and Contract Documents.**

CS 42.9 Check that backfill quantities are not part of the lump sum item.

CS 41.10 Check that concrete barrier is not part of the lump sum item.

CS 41.11 Check excavation limits in backfill zone.

CS 42.12 M **Check alignment such as stations, lines and grades, cross-sections, verify levelling pad elevation and other constraints as specified in the contract drawings.**

CS 42.13 M **Check for Out-of-Tolerance Geometry, Performance and Aesthetics Conditions/Deficiencies in accordance with working drawing requirements.**

For walls: visible distress in wall, differential settlement, tilting or rotating facing elements, bulging, panel/block contact resulting in spalling or chipping, wall facing out of vertical (plumb) or horizontal alignment.

For slopes: lack of vegetation, sloughing, lack of erosion protection, maximum slope angle exceeds that specified in the contract.

CS 42.14 M **Check that Warranty requirements are satisfied.**

CS 42.15 M **Perform Interim Inspections and issue written notification of acceptance to proceed to next operation of the work as per Contract Documents.**

LEVEL OF INSPECTION – A2

CS 43 ABRASIVE BLAST CLEANING OF CONCRETE SURFACES AND REINFORCING STEEL

Task #	Activity
CS 43.1	Check that Environmental containment systems are in place and functioning prior to start of abrasive blast cleaning.
CS 43.2 M	**Check that concrete surface and reinforcing steel are abrasive blast cleaned according to the Contract Documents.**
CS 43.3	Check that dust and debris from exposed Work, and from abrasive blast cleaning of concrete and steel, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not entering a watercourse or Environmentally Sensitive Area.
CS 43.4 M	**Check that the subsequent concrete is placed within the time limit specified in the Contract Documents.**
CS 43.5 M	**Verify Contract Document requirement for removal of epoxy coating from existing epoxy coated reinforcing steel.**
CS 43.6	Check that all new epoxy coated reinforcing steel in the vicinity of the abrasive blast cleaning is protected.

LEVEL OF INSPECTION – C2

CS 44 LIGHTWEIGHT FILL MATERIALS

Task # **Activity**

Slag

CS 44.1 M **Check that the Contractor has submitted the Certificates of Conformance for the material properties prior to placement.**

CS 44.2 Check that the Contractor submits Quality Control Test Results.

CS 44.3 M **Check that the Contractor has retained a laboratory accepted by the MTO to conduct testing of the physical, mechanical and chemical properties of the material.**

CS 44.4 Check that the trial area is properly constructed.

CS 44.5 Check that the in-situ unit weight requirements and overcrushing restrictions are satisfied during the trial and also during construction.

CS 44.6 Check that the Contractor's compaction equipment and procedure satisfies the requirements of the specification.

CS 44.7 M **Check that the Contractor has submitted Certificate of Conformance stating that the material satisfies the requirements of the specification, and the Work has been carried out in general conformance with the Contract Documents.**

Expanded Poly Styrene (EPS)

CS 44.8 Check that the shop drawings are reviewed, signed and sealed by the Quality Verification Engineer prior to commencement of Work.

CS 44.9 Check that the materials satisfy the requirements of the Special Provisions.

CS 44.10 Check that foundation excavation and preparation is conducted to remove any loosened or deleterious materials.

CS 44.11 Check that the levelling pad is properly placed and compacted.

CS 44.12 Check that the EPS are properly installed.

CS 44.13 M **Check that the EPS blocks are properly covered with polyethylene.**

CS 44.14 Check that the concrete slab is properly constructed on top of the EPS blocks.

CS 44.15 Check that side slope material is placed without damage to the blocks.

CS 44.16 M Check that a final Certificate of Conformance signed and sealed by the Quality Verification Engineer is submitted.

LEVEL OF INSPECTION – C2

CS 45 PRECAST CONCRETE CULVERTS

Task #	Activity
CS 45.1 M	**Check the manufacturer is on the MTO's approved list.**
CS 45.2 M	**Check that applicable contract required submissions are received and reviewed prior to fabrication.**
CS 45.3	Check maximum concrete strength specified on contract drawings is provided on submitted shop drawings.
CS 45.4 M	**Check dimensions of units as arriving on site until consistency of units is confirmed checking every third (1/3) unit from there on prior to any installation operations. Reject any units that do not meet the dimension tolerances outlined in Contract Documents.**
CS 45.5	Check that all environmental and dewatering schemes are in place and working in an acceptable manner.
CS 45.6	Check the condition, limits and elevation etc., of subgrade has been approved prior to and placement of granular base material.
CS 45.7	Check granular base limits, material meets contract requirements.
CS 45.8	Confirm bedding materials, elevations and levelness.
CS 45.9	Check that apron walls are aligned properly and applicable grout is installed in accordance with contract requirements
CS 45.10 M	**Check the installation of the units is in accordance with Contract Document requirements (shop drawings and manufacturer's recommendations).**
CS 45.11 M	**If gaps are larger than specified the Contractor should not proceed with the installation of the remainder of the units until an acceptable proposed solution has been received.**
CS 45.12	Check gasket or seals have been installed in accordance with the contract requirements and that gaps do not exceed the specified requirements.
CS 45.13	Confirm streambed substrate in accordance with the Contract Documents.

CS 45.14 M Check that structure excavation limits have been verified and recorded prior to backfilling operations.

CS 45.15 Check that external joint requirements, recesses, lifting lugs and holes are filled in accordance with contract related requirements prior to backfilling.

CS 45.16 Check that the backfilling operation and material etc., meet contract related requirements and CS 26.

CS 45.17 Check that applicable post tensioning is per contract requirements (see applicable post tension inspection task).

CS 45.18 M Check that all applicable Certificates of Conformance including installation are submitted in accordance with the Contract Documents and reviewed.

LEVEL OF INSPECTION – C2 during placement of the units
– C1 during non-placement operations

CS 46 DOWELS IN CONCRETE

Task #	Activity
CS 46.1M	**For all dowels, not limited to those selected for testing, check that concrete in the vicinity of the dowel location is sound and free of cracks.**
CS 46.2	Schedule dowel pull testing with the independent laboratory and check that the testing is completed within five (5) business days of Contractor notice.
CS 46.3	Review equipment calibration documentation and that calibration test data is not more than twelve (12) months old.
CS 46.4 M	**Check that dowel adhesive being used is on the MTO's approved Designated Sources list.**
CS 46.5	Select dowels for in-situ testing.
CS 46.6	Select location for Proof of Process Installation when in-situ testing cannot be done.
CS 46.7 M	**Check that the hole drilled is correct size, depth and free of all dust, debris and water prior to placing the applicable bonding material.**
CS 46.8	Check that all applicable manufacturer's recommendations and written instructions are adhered to.
CS 46.9	Check that the gel time of dowel adhesive is long enough to allow proper dowel installation.
CS 46.10	Check that dowels are maintained in the proper position during the setting period and that excess epoxy is removed.
CS 46.11	Check that pull-testing is completed as specified in the Contract Documents.

LEVEL OF INSPECTION – C1/D2

CS 47 STEEL BREAKAWAY SIGN PLACEMENT

Task #	Activity
CS 47.1 M	**Check that support is laid out at the correct station and offset.**
CS 47.2 M	**Check that designed footing elevations match the as constructed grade (footings shall be level with surrounding grade). Report deviations to designer for correction prior to installation.**
CS 47.3 M	**Check that support parts are supplied by a Designated Source. Verify that all support parts are new.**
CS 47.4	Check that support is constructed according to contract drawings and relevant Special Provisions.
CS 47.5	Check that all hardware is in place and that the hardware is secure.
CS 47.6	Check that correct sign is mounted on the support. Check that the sign is not damaged during installation.
CS 47.7	Check that the support footings or disturbed ground – the result of installation activities – do not obstruct drainage.
CS 47.8 M	**Check that foundations for the breakaway signs are installed to the depth, size and procedures specified in the contract drawings.**
CS 47.9 M	**Check that applicable submissions are received.**

LEVEL OF INSPECTION – E2

CS 48 TIMBER BREAKAWAY SIGN PLACEMENT

Task # Activity

CS 48.1 M Check that support is laid out at the correct station and offset. The offset is measured relative to edge of pavement, which is the nearest pavement lane edge line.

CS 48.2 M Check that support is constructed according to contract drawings and requirements. Check that the posts are plumb in both directions. Verify that all cut and drilled surfaces have been treated with wood preservative.

CS 48.3 Check that correct sign is mounted on the support. Check that the sign is level and has not been damaged during installation.

CS 48.4 Check that the support footings or disturbed ground – the result of installation activities – do not obstruct drainage.

CS 48.5 Check that all hardware is in place and that the hardware is secure.

CS 48.6 M Check that applicable submissions are received.

LEVEL OF INSPECTION – E2

CS 49 DOWELS INTO BEDROCK

Task #	Activity
CS 49.1	Check the hole is drilled to correct size, depth and cleaned prior to placement of dowel.
CS 49.2	Check dowel size.
CS 49.3 M	**Verify that cementitious non shrinking grout is used to fill the annular space.**
CS 49.4	Check that dowels are maintained in the proper position during the setting period.
CS 49.5 M	**Verify that the dowel pull out tests are conducted in accordance with the specifications.**

LEVEL OF INSPECTION – E2

CS 50 FOUNDTION INSTRUMENTATION FOR MONITORING SETTLEMENTS, PORE PRESSURES, LATERAL DISPLACEMENTS

Task #	Activity
CS 50.1 M	Check that instrumentation supply is in accordance with the contract drawings and specifications.
CS 50.2 M	Check that the installation is per the contract drawings and specifications. Check that the sequence of installation is per the contract drawings and specifications.
CS 50.3 M	Check that baseline readings are obtained in accordance with the contract specifications.
CS 50.4 M	Check that the required installation data, readout units and other is transferred to the Monitoring Consultant in accordance with the contract drawings and specifications.

LEVEL OF INSPECTION – E2

CS 51 MASS CONCRETE ON BEDROCK

Use this task in conjunction with CS 1

Task #	Activity
CS 51.1	Check that any dewatering is carried out prior to mass concrete placement
CS 51.2 M	**Check that the surface of the founding rock is exposed, cleaned and any loose or fractured parts removed so that rock is exposed. Check that the mass concrete is placed on the exposed cleaned sound founding rock surface in accordance with the contract drawings and documents.**
CS 51.3	Check that that the minimum thickness of mass concrete is achieved.

LEVEL OF INSPECTION – E2

CS 52 PRESTRESSED CONCRETE – PRECAST GIRDERS

Task #	Activity
CS 52.1 M	**Check that submissions are in accordance with the contract requirements.**
CS 52.2	Check that Working Drawings are submitted and contain the information listed in the Contract Documents.
CS 52.3	Check that the concrete mix design submission contains the information required by the Contract Documents. Obtain Form A portion of the concrete mix design along with any supporting documentation at least seven (7) days prior to placement of concrete and review it to determine that it meets the contract requirements. Check that all materials are from approved lists and meet the requirements of the Contract Documents. Issue written confirmation that the concrete mix design submission meets the contract requirements or advise the Contractor of any requirements that have not been met. Check that the Regional Quality Assurance Section has received Form B portion of the concrete mix design from the concrete supplier prior to placement of concrete.
CS 52.4	Check that the girders are fabricated at a precast plant certified according to the Contract Document requirements. If concrete will be supplied by a ready-mixed concrete supplier check that documentation has been submitted verifying that the plant is certified by the Ready-Mixed Concrete Association of Ontario.
CS 52.5	Check that the concrete temperature control plan is submitted one week prior to commencement of fabrication of girders.
CS 52.6	Review and provide a written response of acceptability within 10 Business Days for any design proposals that are submitted.
CS 52.7	Check that the Contractor provides written notification a minimum of 7 Days prior to commencement of girder fabrication.
CS 52.8	Check the temperature dataloggers, prior to use on the contract, to verify thermocouple function readings and verify they provide unalterable records during the recording period. Provide written notification to the Contractor that the temperature monitoring and recording system is deemed acceptable to the MTO. Verify that the thermocouple wires are placed according to Contract requirements.
CS 52.9	Identify which girders make up each Lot (as defined in the Contract Documents).

CS 52.10 After all the girders in the Lot have been fabricated, randomly select one girder from each lot for acceptance testing, and randomly select a location for core removal within that girder (noting the restrictions on location in Section 909.07.25.03.03 Coring of OPSS 909). Advise the Contractor which girder is to be cored and the coring location.

CS 52.11 Obtain from the Contractor the planned time and site of coring (job site or precast plant) for each Lot. (Note: One girder in each lot is to be cored at an age of 7-10 days, to remove 2 cores, for air void system and rapid chloride permeability testing, respectively. For selected contracts an NSSP will be included, requiring an additional 3 cores to be removed from the same girder for determination of compressive strength which will be used for information purposes. Coring may take place at the job site or at the precast plant, wherever the girder is 7 to 10 days of age.)

CS 52.12 M Arrange to be present for the removal of cores when core removal is to take place on site. When coring is conducted at the precast plant, arrange to be present or have a representative present for the coring.

CS 52.13 Upon removal of the core samples, verify that cores are properly labelled and place in the security bags provided by the MTO. Immediately take possession of the cores and deliver them to the designated laboratory for testing by the MTO.

CS 52.14 Obtain early rapid chloride permeability test results from QA laboratory, (tested for information purposes) after delivery of cores, and provide results to the Contractor immediately.

CS 52.15 Check that written notification of delivery of girders is provided 3 Business Days prior to delivery.

CS 52.16 M Check that prior to shipment of girders, a precast report is submitted. Check the precast report to verify it meets the requirements of the Contract Documents.

CS 52.17 Check that written notification of installation of girders is provided 3 Business Day prior to commencement of field installation operations. Check that the stamped Workings Drawings are on site during installation of the girders.

CS 52.18 M Check that the girders are temporarily braced immediately after installation.

CS 52.19 M Check that the Certificate of Conformance is submitted within 5 Business Days of installing all the girders within a stage.

CS 52.20 M Randomly select a minimum of one girder from each 5 girders delivered to the site for verification of concrete cover measurements. If the concrete cover measurements of any of the girders measured does not meet the tolerances of the Contract Documents, inform the MTO immediately.

CS 52.21 M Randomly select a minimum of one girder from each 5 girders delivered to the site for verification of dimensional tolerances according to the Contract Documents.

CS 52.22 Obtain and review acceptance test results for compressive strength, air void system and rapid chloride permeability.

CS 52.23 If referee testing of rapid chloride permeability is invoked, witness the removal of the core(s) for referee testing from the same girder from which the disputed acceptance core was obtained. Check that the referee core is properly labelled. Take possession of the core and deliver it to the referee laboratory designated by the MTO.

CS 52.24 Check that defects and deficiencies repairable by standard methods are repaired according to the Contract Documents.

CS 52.25 Check that girders with defects and deficiencies causing rejection according to the Contract Documents are not included in the Work.

CS 52.26 For all other defects and deficiencies, check that a repair proposal meets the requirements of the Contract Documents is submitted. Review the proposal and provide a written response to the Contractor indicating whether the proposal has been accepted.

CS 52.27 M Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the Contract Documents.

LEVEL OF INSPECTION – D2

CS 53 GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BAR

Task #	Activity
CS 53.1 M	**Receive and check material Quality Control (QC) test reports and verify that the supplier and specific product are pre-qualified as per Contract Documents.**
CS 53.2	Receive Working Drawings and supporting documentation as per Contract Documents.
CS 53.3	Receive and check the protection plan.
CS 53.4	Receive and check change proposals for substitution of Grade I bars with Grade III bars and forward to Owner for approval.
CS 53.5 M	**Receive from the Contractor a letter from the Quality Verification Engineer (QVE) giving the Contractor permission to proceed with placement of the GFRP reinforcement. Verify that the letter conforms to the Contract Documents.**
CS 53.6 M	**Random sampling of Quality Assurance (QA) test samples will be as per Contract Documents. Verify proper sampling against definition of a lot and lot size. Verify that the QA samples are properly tagged and sent in a timely manner to a lab designated by the MTO.**
CS 53.7	Check for proper site storage, handling, and transportation.
CS 53.8	Check that bar placement conforms to the grade, size, shape, and location as described in the Contract Documents. Verify that there is no mixing of products from different manufacturers in the same component unless permitted by the Contract Drawings.
CS 53.9	Check that GFRP bars are tied, supported and secured in accordance with the Contract Documents. Verify that bars have been secured to resist settlement, floating upward, or movement in any direction during concrete placement.
CS 53.10	Check for proper use of associated hardware. Verify the use of tie types are as per Contract Documents for connections between different types of reinforcing materials, e.g. GFRP, stainless steel, black steel.

CS 53.11 Check for proper workmanship and finish of bars using the Guidelines for Inspection and Acceptance of Glass Fibre Reinforced Polymer (GFRP) Reinforcing Bars available from the Materials, Engineering and Research Office (MERO). Check that the surface condition of bars is free of contaminants and other defects. Check for any damage from placement, handling, or transportation. Condition of bars should be as per Contract Documents.

CS 53.12 Check that GFRP bars are protected from fresh (plastic) concrete splatter on the surface of bars that will later be embedded in new concrete, caused by adjacent concrete placements. Any concrete splatter shall be removed immediately while the concrete is still fresh without damaging the GFRP bars.

CS 53.13 Participate in the marking and removal of damaged GFRP bars as per Contract Documents.

CS 53.14 For placed or partially embedded bars, check that the time period for unprotected exposure is less than the limit as per Contract Documents.

CS 53.15 Check that lot numbers for placed bars match those of the material QC test reports referred to by the QVE's letter giving permission to proceed with placement.

CS 53.16 Check that bars exposed to construction traffic and foot traffic are protected according to Contract Documents.

CS 53.17 M Check that the Certificate of Conformance for bar placement is supplied and reviewed in accordance with the requirements of the Contract Documents. For components where different types of reinforcing material are present, verify that Certificates of Conformance clearly describe which type of reinforcement was verified, e.g. GFRP or steel.

LEVEL OF INSPECTION – E2

CS 54 SELF-CONSOLIDATING CONCRETE (SCC)

Use this task in conjunction with CS 1

Task #	Activity
CS 54.1	Check that a proposal to use SCC has been accepted by the Owner.
CS 54.2	Check that SCC use is indicated on Form A.
CS 54.3	Check that the trial batch test data has been submitted, according to the contract requirements and that it is not more than 12 months old at any time during placement.
CS 54.4	If use of mineral filler is indicated on Form A, check that it meets the material specifications outlined in the contract requirements.
CS 54.5	If use of a viscosity modifying admixture is indicated on Form A, check that a certificate from the manufacturer was received verifying that it contains no chlorides.
CS 54.6	Check that a summary of plastic concrete test results is submitted after each day's work and that results meet specification requirements.
CS 54.7	Check that plastic concrete is sampled and tested according to the contract requirements. Check that all test specimens for plastic and hardened tests are not rodded or tamped and are filled in one layer.
CS 54.8	For the slump flow test (MTO LS-438): (i) Check that the slump board is smooth and made of a suitable non-absorbent material such as steel, plastic, or is plastic-coated. (ii) Verify that all excess water on the base plate is removed using a squeegee or a sponge. Removing excess water is important in order to determine the Visual Stability Index (VSI). Excess water will inhibit the accurate assessment of the outside edge of the slump flow patty. (iii) Verify that the Visual Stability Index (VSI) is determined and recorded in accordance with MTO LS-438 each time the slump flow test is performed.
CS 54.10	Check that during placement, vibrators are not used to consolidate SCC.
CS 54.11	Check that during placement, the maximum horizontal distance between the discharge point of the SCC and its final position does not exceed 10 m.

CS 54.12 Check that during transportation, testing and placement the SCC is free of segregation.

CS 54.13 Check that moist curing is carried out for the specified curing period.

CS 54.14 Check that sampling for quality assurance testing is carried out as per the contract requirements.

CS 54.15 Check that one cylinder per sublot is cast and sent to MTO for a visual segregation evaluation according to the contract requirements.

LEVEL OF INSPECTION – A1

CS 55 CRACK REPAIR BY PRESSURE INJECTION, CONCRETE

Task # Activity

CS 55.1 M **Check that the Crack Repair Work Plan has been received and administered as per the contract requirements. Verify that field copies are stamped with "Permission to Construct" prior to commencing the operation.**

CS 55.2 Check that the materials to be used are listed or meet the contract requirements for active or passive cracks in accordance with the contract specifications.

CS 55.3 Check that all equipment is fitted with pressure gauges and that the gauges are certified by an organization certified by the Standards Council of Canada and capable of measuring the pressure within the specified tolerance.

CS 55.4 Check that the pump(s) are capable of delivering an operating pressure at least twice the required effective pressure. Check that the injection hoses and ports have a rated working pressure that is equal or greater than the maximum pump operating pressure.

CS 55.5 Check that the installation of all accessories is in accordance with the manufacturer's recommendations and the submitted work plan.

CS 55.6 M **Check that the concrete temperature is a minimum of 5^{o}C or greater.**

CS 55.7 Identify and record the cracks requiring repair according to the contract documents.

CS 55.8 Check that the location and spacing of the injection ports are such that the ports intersect the crack mid-depth and are not spaced further apart than the depth of the crack or 200mm.

LEVEL OF INSPECTION – A2

CS 56 CRACK REPAIR BY ROUT AND SEAL, CONCRETE

Task #	Activity
CS 56.1	Obtain 4 copies of the crack repair work plan from the Contractor at least 3 weeks prior to the commencement of crack repair. Verify that the work plan includes all the information required by the contract documents and is signed and sealed by an Engineer.
CS 56.2	Return 2 copies of each submission to the Contractor stamped with the wording that allows: (i) Permission to construct (ii) Permission to construct as noted or (iii) Showing only required changes
CS 56.3	Check that the materials to be used meet the contract requirements for hot-poured or cold-applied joint sealing compound.
CS 56.4	Check that hot-poured rubberized joint sealing compound is only used in horizontal applications. Check that cold-applied joint sealing compound is only used on vertical surfaces or horizontal surfaces that are not to be waterproofed.
CS 56.5	Check that the concrete temperature is a minimum of $5^{O}C$.
CS 56.6	Identify the cracks requiring repair according to the contract documents.
CS 56.7	Witness the Contractor number and physically mark and measure the extent of the cracks prior to the commencement of the work.
CS 56.8	Check that the routed chase has a depth to width ratio of 1H:1V and that the width of the chase is in accordance with the contract documents. Check that the crack is located within the middle third of the chase.
CS 56.9	Check that the chase is abrasive blast cleaned within 36 hours prior to application of the joint sealing compound.
CS 56.10	Check that the chase is blasted with compressed air immediately prior to the application of the bond breaker in the bottom of the chase.
CS 56.11	Check that the finished elevation of the joint sealing compound relative to the adjacent concrete is in accordance with the contract documents.
CS 56.12	When the repair operation is complete, inspect the work for defects.

CS 56.13 Measure the total length of acceptable injected cracks for calculation of payment.

LEVEL OF INSPECTION – B1/C2

BIT 1 GRANULAR SEALING

Task #	Activity
BIT 1.1 M	**Check that areas to be sealed are shaped and dampened before sealing.**
BIT 1.2 M	**Check that the list of all sealer products that the Contractor intends to use has been submitted prior to the commencement of the contract and verify that all of the delivered sealer material is being supplied either from a source listed on the appropriate DSM or otherwise meets the requirements for granular sealing materials specified in the Contract Documents.**
BIT 1.3 M	**Check the environmental constraints before applying sealer, that the granular material to be sealed is not frozen, the air temperature is a minimum of 5°C and rising, precipitation is not imminent, and that the sealer application meets all other requirements specified in the Contract Documents.**
BIT 1.4 M	**Check that material supplied by the Contractor is sampled as required and that the samples that are taken are delivered to the appropriate lab and tested within the timelines required for the type of product supplied and that the results from the testing and meet the requirements specified in the Contract Documents.**
BIT 1.5 M	**Check for the proper rate and method of application specified in the Contract Documents, that the wind does not cause drifting of the sealer off of the designated areas in the contract and that the granular material is uniformly coated.**

LEVEL OF INSPECTION – D2

BIT 2 RECLAIMING ASPHALT PAVEMENT

Task # **Activity**

BIT 2.1 M **Check that reclaiming is carried out full width to essentially the same station before shutdown each day and properly ramped.**

BIT 2.2 Check that there is no contamination with granular shoulder and granular base material when RAP is to be used in RHM.

BIT 2.3 Partial Pavement Removal

(i) Check for correct crossfall, depth and surface texture during milling;
(ii) Record reclaimed asphalt removal rate (kg/m²);
(iii) Check that the milled surface is broomed and inspected, and that areas of asphalt rich dust are removed.

BIT 2.4 Full Depth Removal

(i) Check that granular is restored to specified requirements following pavement removal;
(ii) Check and record depths of removal.

LEVEL OF INSPECTION – B1/D2

BIT 3 HOT MIX PAVING FOR CONTRACTS BY TONNES

Task #	Activity
BIT 3.1	Check proper joint construction including location of longitudinal joints, preparation, tack coating and compaction.
BIT 3.2	Check that paving is carried out full width to approximately the same station, with ramping as specified in the contract prior to shutdown each day, including edge ramping.
BIT 3.3	Check the condition of substrata (compaction, etc.) ahead of paving operation. Confirm surface to be paved is unfrozen, clean, dry and free of standing water.
BIT 3.4	Check sequence of paving operations including, but not limited to, paving intersections, tapers, ramps, bridge decks and all staging plans.
BIT 3.5 M	**Check placement of hot mix including alignment, crossfall, surface tolerance, width, smoothness, depth of asphalt mat using the area covered and applicable BRD for the mix (kg/m²) or other applicable contract related field checks (such as for the m² payment method).**
BIT 3.6 M	**Check that the distribution rates of premium surface courses are revised to account for the mass multiplier factors.**
BIT 3.7	Check that air temperature at the surface of the road is above the minimum specified in the contract to permit paving.
BIT 3.8	Check and record the temperature of mix delivered to the site. For bridge deck paving, check that the waterproofing system is set and that the temperature of the mix delivered to the site does not fall below the minimum temperature recommended by the PGAC supplier.
BIT 3.9 M	**Visually inspect mix placed for dragging, segregation and other visual defects prior to covering with another lift and/or stage changes. Check the temperature of the mat prior to covering with another lift or opening to traffic.**
BIT 3.10	Check paving in echelon operation to determine that the specified distance between pavers is maintained.
BIT 3.11 M	**Check and witness that all required samples are taken at correct (random) locations and tonnages.**

BIT 3.12 Check that equipment does not impact/damage areas beyond shoulder.

BIT 3.13 M Check for proper reinstatement of sample locations (loose mix and cores) on a daily basis.

LEVEL OF INSPECTION – A2

BIT 4 HOT MIX PAVING FOR METRE SQUARE (m2) CONTRACTS

Task #	Activity
BIT 4.1	Check proper joint construction including location of longitudinal joints, preparation, tack coating and compaction.
BIT 4.2	Check that paving is carried out full width to approximately the same station, with ramping as specified in the contract prior to shutdown each day, including edge ramping.
BIT 4.3	Check the condition of substrata (compaction, etc.) ahead of paving operation. Confirm surface to be paved is unfrozen, clean, dry and free of standing water.
BIT 4.4	Check sequence of paving operations including, but not limited to, paving intersections, tapers, ramps, bridge decks and all staging plans.
BIT 4.5 M	**Measure the width of the section to be paved. Determine the random sample locations for the sublot(s) to be placed (for example, please see the Field Guideline for Hot Mix Paving and Bridge Deck Waterproofing). Do not tell the Contractor in advance the sampling locations; wait until the paver is close (approximately 100 m) before informing them of the location for loose mix samples. Location of compaction samples are to be provided after the sublot has been paved. Location of thickness cores are to be provided after the final lift in a sublot has been paved.**
BIT 4.6 M	**Check placement of hot mix including alignment, crossfall, surface tolerance, width, smoothness, or other applicable contract related field checks (such as for the m² payment method).**
BIT 4.7	Check that air temperature at the surface of the road is above the minimum specified in the contract to permit paving.
BIT 4.8	Check and record the temperature of mix delivered to the site. For bridge deck paving, check that the waterproofing system is set and that the temperature of the mix delivered to the site does not fall below the minimum temperature recommended by the PGAC supplier.
BIT 4.9 M	**Visually inspect mix placed for dragging, segregation and other visual defects prior to covering with another lift and/or stage changes. Check the temperature of the mat prior to covering with another lift or opening to traffic.**

BIT 4.10 Check paving in echelon operation to determine that the specified distance between pavers is maintained.

BIT 4.11 M Check and witness that all required samples are taken at correct (random) locations.

BIT 4.12 Check that thickness cores include all lifts of measurement by square metre hot mix placed in the sublot, plus an underlying lift if one exists.

BIT 4.13 M Check and record the width of each lift placed after paving is complete.

BIT 4.14 Check that equipment does not impact/damage areas beyond shoulder.

BIT 4.15 M Check for proper reinstatement of sample locations (loose mix and cores) on a daily basis.

LEVEL OF INSPECTION – A2

BIT 5 CUT AND FILL GROOVES

Task #	Activity
BIT 5.1 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
BIT 5.2 M	**Check that material supplied by the Contractor is sampled and tested as specified in the contract.**
BIT 5.3 M	**Check that existing pavement joints are marked to determine that the new groove is located precisely over the existing joints.**
BIT 5.4	Check that the grooves are cleaned and dried immediately prior to pouring the joint sealing compound.
BIT 5.5	Check that grooves are cut and filled as soon as possible after paving, as specified in the Contract Documents.

LEVEL OF INSPECTION – B1/D2

BIT 6 ROUTING AND SEALING CRACKS

Task # Activity

WITH WARRANTY

BIT 6.1 W Document non-compliance with contract requirements.

WITHOUT WARRANY

BIT 6.2 M Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.

BIT 6.3 M Check that all required samples are taken and delivered and batch numbers are recorded as specified in the Contract Documents.

BIT 6.4 M Check that all cracks as specified in the Contract Documents are routed to the specified width and depth and that the rout is centered on the crack.

BIT 6.5 M Check that all routed and unrouted cracks are blown clean and dry using hot compressed air lance before sealing commences.

BIT 6.6 Check that dust and debris from exposed Work, and from routing and sealing operations, does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not entering a watercourse or Environmentally Sensitive Area.

BIT 6.7 Check that sealing material is heated within the manufacturers recommended range and is being continuously agitated.

BIT 6.8 M Check that sealing material is applied immediately after cleaning and drying.

BIT 6.9 Check that cracks are filled with sealant as specified in the Contract Documents and that no spillage occurs.

BIT 6.10 Check that debris, including excess sealing material, is removed from routed area and adjacent pavement.

BIT 6.11M Inspect the work for deficiencies according to the Contract Documents and measure the total length of sealed cracks with deficiencies.

BIT 6.12M **Measure the total length of sealed cracks without deficiencies according to the Contract Documents for calculation of payment.**

BIT 6.13 M **Check that sealed cracks are dusted with a suitable bond breaker before opening to traffic as specified in the Contract Documents.**

LEVEL OF INSPECTION – C1/E2 with warranty
– B1/C2 without warranty

BIT 7 TACK COAT

Task #	Activity
BIT 7.1 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**
BIT 7.2 M	**Check that pavement surface or protection board is dry and clean before applying tack coat.**
BIT 7.3 M	**Check that proper rate of application and coverage is used.**
BIT 7.4 M	**Check that tack coat application is visually uniform.**
BIT 7.5 M	**Check that tack coat has cured to the desired level before placing hot mix asphalt.**
BIT 7.6 M	**Check that traffic is not allowed on the tack coated area before paving.**
BIT 7.7 M	**Check that all required samples are taken and delivered in a condition suitable for testing, and within 2 business Days of sampling as specified in the Contract Documents.**
BIT 7.8 M	**Check that all test results are received and payment adjustments are calculated and applied as specified in the Contract Documents.**

LEVEL OF INSPECTION – B1/D2

BIT 8 PAVEMENT MARKING

Task # **Activity**

BIT 8.1 M **Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract. Check that the material supplied by the Contractor is sampled and tested as specified in the Contract Documents.**

BIT 8.2 Check that air temperature, pavement temperature and surface condition requirements are met.

BIT 8.3 Check that the locations of the markings applied are as specified in the Contract Documents.

BIT 8.4 Check that the surface is dry and free of loose and/or foreign material.

BIT 8.5 Temporary and Permanent Tape

(i) Check for correct spacing and application;
(ii) Check that only butt splices are used;
(iii) Check that specified tamping has been carried out;
(iv) Check that material is stored as specified.

BIT 8.6 M **Pavement Marking**

(i) **Check that zone painting is completed on any temporary driving surface prior to opening to traffic;**
(ii) **Check zone painting has a well-defined edge, free from waviness, uniformly dimensioned and shaded with no splatter or overspray;**
(iii) **Check for correct material application temperature;**
(iv) **Check that glass beads are applied uniformly prior to the paint drying;**
(v) **Check that the pavement markings and materials are applied as specified in the Contract Documents;**
(vi) **Check that the glass beads are applied as specified in the Contract Documents;**
(vii) **Conduct a bond/adhesion test on durable marking materials (for thermoplastic and field reacted polymeric:**
(viii) **A monitoring frequency of a minimum of 25%, but not limited to, is required to be performed and recorded to determine that the Contractor has properly applied sight distance requirements as specified.**

LEVEL OF INSPECTION – B1/D2

BIT 9 SURFACE TREATMENT

Task # **Activity**

WITH WARRANTY

BIT 9.1 W **Document non-compliance with the contract requirements.**

WITHOUT WARRANTY

BIT 9.2 Check the condition of the grade for compaction, profile, potholes, grade failure repair and brooming, etc.

BIT 9.3 M **Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.**

BIT 9.4 Check that quality and aggregate gradation tests have been done in accordance with the current MTO test method.

BIT 9.5 M **Check the adequacy of the following:**

(i) **Binder and aggregate distribution and application**
(ii) **Width of application**
(iii) **Emulsion temperature**
(iv) **Air temperature**
(v) **Centreline and transverse joints**
(vi) **Rolling operation**
(vii) **Brooming off of excess aggregates**

BIT 9.6 Check that material is confined to the area specified in the Contract Documents.

BIT 9.7M **Check that all required samples are taken and delivered in a condition suitable for testing, and within 5 Business Days of sampling as specified in the Contract Documents.**

BIT 9.8 M **Check that all test results are received and payment adjustments are calculated and applied as specified in the Contract Documents.**

LEVEL OF INSPECTION – D1/E2 – With warranty
– B1/C2– Without warranty

BIT 10 HOT–IN–PLACE RECYCLING (HIR)

Task # Activity

BIT 10.1 M Check that the mix design and material submissions meet the requirements as specified in the Contract Documents.

BIT 10.2 Check the sequence of HIR operations. Confirm all through lane HIR mix is completed prior to paving side roads, speed change lanes, and other paved areas.

BIT 10.3 M Measure the width of the section to be HIR processed. Determine the random sample locations for the sublot(s) to be placed. Do not tell the Contractor in advance the sampling locations; wait until the HIR train is close (approximately 100 m) before informing them of the location for loose mix samples. Locations of compaction and thickness core samples are to be provided after the sublot has been compacted.

BIT 10.4 Check the condition of the existing pavement ahead of the HIR operation. Confirm the existing pavement is prepared as specified in the Contract Documents.

BIT 10.5 Check that traffic is restricted as specified in the Contract Documents.

BIT 10.6 Check the following:

(i) Check that HIR processing is carried out across the complete lane width, including shoulders if applicable.
(ii) Check that joints are constructed as specified in the Contract Documents, including location of longitudinal joints, preparation, and compaction.
(iii) Check that there is no open flame heating the pavement.
(iv) Check that there is no burning or scorching of the pavement occurring.
(v) Check that the smoke emission level does not endanger traffic or worker safety.
(vi) Check that equipment does not impact/damage adjacent pavement or appurtenances.
(vii) Check for broken stones and white aggregate (shows proof of insufficient heating).
(viii) Check that the hot milled material, rejuvenating agent, and beneficiating HMA (if used), has been mixed properly and contains no oversized particles.
(ix) Check that the HIR mix temperature meets the requirements as specified in the Contract Documents.

(x) Check that the underlying pavement temperature meets the minimum requirements when paving as specified in the Contract Documents.

(xi) Visually inspect the mat for segregation, flushing, and other visual defects as specified in the Contract Documents.

BIT 10.7 M Check and witness that all required samples are taken correctly and at the instructed locations. Record the location.

BIT 10.8 Check that thickness cores include the whole HIR lift placed, plus an underlying lift if one exists.

BIT 10.9 M Check for proper reinstatement of sample locations (plates and cores) on a daily basis.

BIT 10.10 M Check placement of HIR mix including alignment, crossfall, surface tolerance, smoothness, or other applicable contract related field checks.

BIT 10.11 M Check and record the width of the HIR mix placed after the HIR operation is complete.

LEVEL OF INSPECTION – A2

BIT 11 COLD IN–PLACE RECYCLING (CIR) or COLD IN-PLACE RECYCLING WITH EXPANDED ASPHALT MIX (CIREAM)

Task # Activity

BIT 11.1 M Check that the mix design meets the requirements as specified in the Contract Documents.

BIT 11.2 M Verify that the recycling train works properly including:

(i) **The cutting drum is capable of reclaiming a full lane width.**
(ii) **The spray bar and nozzles provide a uniform application of emulsion/expanded asphalt and are not clogged.**
(iii) **The opening size of the screen deck meets the specification and is in good working condition.**
(iv) **All oversize material is routed through the crushers and re-screened.**
(v) **The mixing unit is properly calibrated and is capable of accurately dispensing the required quantity of additives (water, emulsion/expanded asphalt, etc.)**
(vi) **The weighing scale for the aggregate feed system is calibrated to the manufacturer's tolerance.**
(vii) **The flexible hose used to convey emulsion/asphalt binder from the tanker to the pugmill is secured, clean and not contaminated.**
(viii) **The paver has adequate horsepower and adequate hopper size.**
(ix) **The automatic grade and cross-slope controls are functioning properly.**

BIT 11.3 Check that the pavement surface is prepared as specified in the contract documents.

(i) The pre-milling width, depth and extent follow the Contract Documents.
(ii) All loose milled materials are removed from the milled surfaces.
(iii) All crack sealants are removed and disposed of.
(iv) Any appurtenances have been adjusted, protected or removed as in urban areas.

BIT 11.4 Check that CIR/CIREAM shall not be placed after September 1st; otherwise, a written approval shall be issued to the contractor.

BIT 11.5 Check that the ambient temperature meets the requirements as specified in the Contract Documents.

BIT 11.6M Check that a trial section is accepted or waived according to the specification.

BIT 11.7 Check the compaction including:

(i) Check that a control strip is established to determine the target density for compaction at the start of production.
(ii) Check that a suitable location has been selected for the control strip.
(iii) Check that the type of compaction equipment to be used is suited to the material to be compacted and the degree of compaction required.
(iv) Check that samples from the control strip are sent to the laboratory to verify its moisture content and are within the allowable tolerance as specified in the Contract Documents.
(v) Make sure that the same nuclear gauge is being used in the control strip and the subsequent sublot testing for compaction.
(vi) Check that a new control strip is established when a new gauge is used for the lot testing, or a different mix design is applied, or the exiting pavement material significantly changes, or after every 100,000 m2 of mix production has been completed.

BIT 11.8 Check that the pavement is reclaimed to the depth and width as specified in the Contract Documents.

BIT 11.9 Check that the CIR/CIREAM material has been mixed properly, contains no oversize particles and that the processed material is uniform and coherent.

BIT 11.10 Monitor and record materials including any corrective aggregate or active filler incorporated in the mix.

BIT 11.11 M Check that materials (reclaimed materials, emulsion/asphalt binder, active fillers if required) are sampled and tested as specified in the Contract Documents.

BIT 11.12 M Check that the finished surface has a uniform texture, is free of surface defects according to SP-027 manual and meets the grade and crossfall requirements as specified in the contract documents.

BIT 10.13 M Check that the pavement is ready to opening for traffic as specified in the contract documents.

BIT 11.14 M Check that CIR/CIREAM mat meets the testing requirements as specified in the contract documents prior to placing the wearing surface.

BIT 11.15 Check that the wearing surface is placed within the time restriction specified in the Contract Documents.

Bit 11.16 Check that all operation constraints are compiled as specified in the Contract Documents.

LEVEL OF INSPECTION – A2

BIT 12 IN–PLACE FULL DEPTH RECLAMATION OF BITUMINOUS: PAVEMENT AND UNDERLYING GRANULAR

Task #	Activity
BIT 12.1 M	**Check that the in–place materials are processed to the depths, widths and gradation as specified in the Contract Documents.**
BIT 12.2	Check that the composition of the blended material is as specified in the Contract Documents.
BIT 12.3	Check that oversized material has been removed or reprocessed as specified in the Contract Documents.
BIT 12.4 M	**Check that operational constraints are carried out as specified in the Contract Documents.**
BIT 12.5 M	**Check that surface shaping and compaction is as specified in the Contract Documents.**

LEVEL OF INSPECTION – B2/D2

BIT 13 SURFACE SMOOTHNESS MEASUREMENTS USING AN INERTIAL PROFILER

Task # Activity

BIT 13.1 M Prepare a sublot sketch that identifies all of the sublots which must be measured and those sublots which are exempted along with stations. Check that the sublots are consecutively numbered, that no two sublots have the same sublot number and that the proposed reference lines and offsets are indicated on the sketch. Provide the sketch to the Contractor for review at the pre-pave meeting. Receive and review any proposed sublot exemptions as requested by the Contractor prior to the start of surface course paving and provide a response to the Contractor.

BIT 13.2 Submit a request to the Owner to provide an inertial profiler for QA/Referee acceptance testing or to re-measure a repaired sublot. Such request is to be prepared within one (1) Business Day after the Contract Administrator receives the Contractor's written notice indicating that the Contractor has clearly marked out the sublots and removed any debris from the pavement. The Contract Administrator shall coordinate supply of an approved high speed profiler and qualified (profiler operator) to complete smoothness measurements. Verify that the profiler operator is accompanied by at least one (1) helper.

BIT 13.3 Obtain from the profiler operator a copy of the correlation certificate. Record the make and serial number of the inertial profiler.

BIT 13.4 Prior to the commencement of any surface smoothness measurements each day, observe while the profiler operator is doing the "block test", the "bounce test", and the distance calibration. All such checks will be done in accordance with the instructions of the manufacturer of the inertial profiler or LS-296. Provide a copy of the sublot sketch to the profiler operator and identify the sublots that are intended for measurement that day including respective stations and exempted sublots. Confirm the reference line(s) and offsets that the profiler should use.

BIT 13.5 When the profiler operator is conducting the measurements check that the measurements are being done in accordance with the requirements specified in the Contract Documents. In the event the profiler operator deems that the results for one (1) or more sublots within a particular run are invalid, review operator's reasoning and decide on whether or not to allow the profiler to repeat that run. Keep a record of the discussions.

BIT 13.6 Make sure that the profiler operator has provided one (1) electronic copy of the raw data files including GPS data files on CD using proper file names and format stated in LS-296 including a list of “lead-ins” and “lead-outs” for each file.

BIT 13.7 Make sure that, within four (4) Business Days after each set of measurements, the profiler operator has provided all the electronic processed files, the Microsoft Excel spreadsheet file(s) containing all IRI measurements and the locations and values of all localized roughness in both wheel paths, for each run of each sublot. All test results shall be accompanied by a transmittal letter to the Contract Administrator, under the signature of the profiler firm’s Project Manager for this assignment, verifying the limits measured and indicating that the data analysis have been verified and the submitted results are in compliance with the requirements of LS-296 and the current version of the smoothness specification.

BIT 13.8 M Within five (5) Business Days after each set of measurements, provide to the Bituminous Section (bituminous@ontario.ca), the Regional Quality Assurance Section, and the Contractor, by email or one (1) CD the following:

(i) **All of the unfiltered and processed data files that are generated by the Inertial Profiler in ppf or erd format that can be read by ®ProVAL including the GPS files;**
(ii) **An electronic copy of the ®ProVAL reports showing all applicable IRI and the locations and magnitudes of all localized roughness determinations for each profile run that was carried out;**
(iii) **A hard copy or electronic summary of the longitudinal reference lines and offsets as well as the “lead-in” and “lead-out” distances that were used for each profile run;**
(iv) **Microsoft Excel spreadsheet file(s) containing all IRI measurements, the resulted payment factors, and the locations and values of all localized roughness in both wheel paths, for each run of each sublot, in accordance with LS-296. This information shall be reported on the Microsoft Excel form provided by MTO;**
(v) **Areas of special conditions, such as superelevations or curves, any additional information such as joints or major intersections, and any areas that are being measured but will be exempt from surface smoothness-related price reductions/repairs.**
(vi) **Include the transmittal letter that was supplied by the inertial profiler firm.**

BIT 13.9 Arrange to have any repaired sublots re-measured by a QA inertial profiler, obtain the data, calculate the pay factors, fill out the Excel spreadsheets, and submit the files to the Bituminous Section, Regional Quality Assurance Section, and the Contractor.

BIT 13.10 Calculate pay factors and determine the overall price adjustment for the surface course.

BIT 13.11 Produce a written report containing a summary of the QA/Referee data with reasons for any areas which were exempt from measurements and/or penalties, a summary and all decisions regarding rejectable sublots and localized roughness and a summary of the surface tolerance measurements which were carried out in areas that were either not measured by PMD or were measured by PMD but were exempt from penalties.

LEVEL OF INSPECTION – C2

BIT 14 EXPANDED ASPHALT STABILIZATION

Task # Activity

BIT 14.1 M Check that the mix design meets the requirements as specified in the Contract Documents.

BIT 14.2 M Verify that the recycling train works properly including:

(i) **The cutting drum is capable of reclaiming a full lane width.**
(ii) **The spray bar and nozzles provide a uniform application of expanded asphalt and are not clogged.**
(iii) **The opening size of the screen deck meets the specification and is in good working condition.**
(iv) **All oversize material is routed through the crushers and re-screened.**
(v) **The mixing unit is properly calibrated and is capable of accurately dispensing the required quantity of additives (water, expanded asphalt, etc.)**
(vi) **The weighing scale for the aggregate feed system is calibrated to the manufacturer's tolerance.**
(vii) **The flexible hose used to convey asphalt binder from the tanker to the pugmill is secured, clean and not contaminated.**
(viii) **The paver has adequate horsepower and adequate hopper size.**
(ix) **The automatic grade and cross-slope controls are functioning properly.**

BIT 14.3 M Check that a trial section is accepted or waived as specified in the Contract Documents.

BIT 14.4 Monitor and record materials including any corrective aggregate or active filler incorporated in the mix.

BIT 14.5 Check that the pavement is reclaimed to the depth and width as specified in the Contract Documents.

BIT 14.6 M Check that the materials (reclaimed materials, asphalt binder, active fillers if required) are sampled and tested as specified in the Contract Documents.

BIT 14.7 Check and record thickness measurements at the frequencies specified in the Contract Documents.

BIT 14.8 Check that the material has been mixed properly, contains no oversize particles, and that the processed material is uniform and coherent.

BIT 14.9 Check that the finished surface has a uniform texture, is free of surface defects, and meets the profile and cross-section as specified in the Contract Documents.

BIT 14.10 M Check that the material meets the testing requirements as specified in the Contract Documents prior to placing the wearing surface.

BIT 14.11 M Check that the reclaiming and/or stabilizing is completed across the full width of pavement prior to the closing down of operations each day.

BIT 14.12 M Check the vertical clearance of all lanes at the underpass from top of asphalt to the bottom of bridge deck.

BIT 14.13 M Check and record applied rate of expanded asphalt to determine that the design rate is met at the end of each day's operation.

BIT 14.14 Check that all operation constraints are completed as specified in the Contract Documents.

LEVEL OF INSPECTION – A1

BIT 15 OPEN GRADED DRAINAGE LAYER

Task #	Activity
BIT 15.1 M	**Check that material submissions meet the requirements specified in the Contract Documents. Check that equipment to be used meets the requirements specified in the Contract Documents.**
BIT 15.2	Check that environmental conditions are met as specified in the Contract Documents.
BIT 15.3 M	**Check that the drainage system is operational prior to placing the Open Graded Drainage Layer (OGDL).**
BIT 15.4 M	**Check that the material is sampled and tested as specified in the Contract Documents.**
BIT 15.5	Check that that Portland Cement treated OGDL is cured as specified in the Contract Documents.
BIT 15.6	Check that traffic is restricted as specified in the Contract Documents.
BIT 15.7	Check that the wearing course is placed over the OGDL within the time restrictions specified in the Contract Documents.

LEVEL OF INSPECTION – B1/C2

BIT 16 FULL DEPTH ASPHALT CRACK REPAIR

Task #	Activity
BIT 16.1	Check that cracks, as specified in the Contract Documents, are removed to the specified width and depth and are centered on the crack.
BIT 16.2 M	**Check the condition of the underlying granular material to verify that it is shaped to the proper crossfall, compacted, unfrozen, cleaned of all loose, broken and foreign materials, dry and free of standing water.**
BIT 16.3	Check that hot mix placed meets the requirements of the Contract Documents.
BIT 16.4 M	**Check for proper construction including tack coating of all vertical faces, placement of hot mix and compaction. Confirm that the lift thickness of mix placed does not exceed the maximum allowable lift thickness as stated in the Contract Documents.**
BIT 16.5	Check that the ambient temperature at the surface of the road is above the minimum specified in the contract to permit paving.
BIT 16.6	Check and record the temperature of the mix delivered to the site.
BIT 16.7 M	**Check and witness that all samples required in the Contract Documents, are taken at correct (random) locations and tonnages. Confirm proper reinstatement of sample locations (loose mix and cores) on a daily basis.**
BIT 16.8	Check that equipment does not damage areas beyond the shoulder.
BIT 16.9	Check that debris, including excess material, is removed from the repair area and adjacent pavement.

LEVEL OF INSPECTION – A2

BIT 17 MICROSURFACING

Task #	Activity
BIT 17.1M	**Check that the mix design meets the requirements as specified in the Contract Documents.**
BIT 17.2	Check mixing, proportioning, and spreading equipment.
BIT 17.3	Check sequence of placement operation including, but not limited to, paving intersections, tapers, ramps, bridge decks, and all staging plans.
BIT 17.4 M	**Check for proper surface preparation including removal of durable pavement markings, removal of sealant where applicable, and tack coat where applicable.**
BIT 17.5	Check that current and forecast weather conditions meet the specified requirements.
BIT 17.6 M	**Check that an acceptable trial section is completed as specified in the Contract Document.**
BIT 17.7 M	**Check and note placement including alignment, longitudinal joint location, appearance, width, joint overlap, and other applicable contract related field checks.**
BIT 17.8	Check for dragging, lumped / balled / unmixed aggregate, segregation, and other defects.
BIT 17.9 M	**Check that the specified surface condition, surface appearance, and surface tolerance requirements are met.**
BIT 17.10	Check for loose, flying particles from microsurfacing opened to traffic.
BIT 17.11 M	**Check and witness that all required samples are taken at correct locations and times as specified in the Contract Documents.**
BIT 17.12	Check and record the placement width of each day’s placement.

LEVEL OF INSPECTION – B1/D2

BIT 18 SLURRY SEAL

Task #	Activity
BIT 18.1 M	**Check that the mix design meets the requirements as specified in the Contract Documents.**
BIT 18.2	Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract. Check that material supplied by the Contractor is sampled and tested as specified in the Contract Documents. Check that the materials meet the requirements specified in Contract Documents.
BIT 18.3	Check that the power brooms, mixing and spreading equipment, and proportioning devices meet the requirements specified in Contract Documents.
BIT 18.4	Check sequence of placement operation including, but not limited to, paving intersections, tapers, ramps, bridge decks, and all staging plans.
BIT 18.5 M	**Check that an acceptable trial area is completed as specified in the Contract Document.**
BIT 18.6	Check that current and forecast weather conditions meet the specified requirements. Check that the slurry seal application occurs within specified time frame.
BIT 18.7	Check for proper surface preparation as specified in the Contract Documents.
BIT 18.8 M	**Check and note placement including application rate, alignment, longitudinal joint location, appearance, width, joint overlap, clean up, repairs, and other applicable Contract related field checks.**
BIT 18.9	Check and witness that all required samples are taken at correct locations and times as specified in the Contract Documents.
BIT 18.10	Check and record the placement quantity for payment.

LEVEL OF INSPECTION – B1/D2

BIT 19 HOT MIX RESURFACING WITH 3 OR 5 YEAR WARRANTY

Task # **Activity**

BIT 19.1 Check sequence of paving operations including, but not limited to, paving intersections, tapers, ramps, bridge decks, and all staging plans.

BIT 19.2 Check and witness that all required samples are taken at correct (random) locations.

BIT 19.3 M Intermittently conduct visual inspection of HMA aggregate material for contamination, including clay balls, clay coated particles or foreign material. Confirm that prohibited material is not being used in the HMA aggregate.

BIT 19.4 M Check and note placement and condition of hot mix including alignment, longitudinal joint location, crossfall, surface tolerance, surface appearance, segregation, width, smoothness, and other applicable contract related field checks.

BIT 19.5 Record the following, and other information related to equipment, labour, and production rate:

(i) The Contractor's equipment inventory,
(ii) Contractor's hours of work,
(iii) Description of the work progress,
(iv) Labour or equipment hours worked or not worked.

BIT 19.6 Record air and hot mix temperature, condition of surface being paved, use of tack coat, joint construction practices, compaction sequence, any observed longitudinal streaks or discontinuities.

BIT 19.7 Check paving is completed to the same station each day and/or temporary ramping is properly constructed.

BIT 19.8 M Provide core sample locations for lift thickness measurement after each thickness sublot is placed.

BIT 19.9 Check that thickness cores include all lifts of hot mix placed in the sublot, plus an underlying lift if one exists. Check for proper reinstatement of core sample locations on a daily basis.

BIT 19.10 Check that granular shoulders are completed according to the specifications.

BIT 19.11 Check that NAD83 coordinates for the performance measurement segments are completed.

LEVEL OF INSPECTION – B1/D2

BIT 20 FLEXIBLE PAVEMENT CONSTRUCTION WITH 7 YEAR WARRANTY

Task # **Activity**

BIT 20.1 Check that removals are completed to the same station each day and/or temporary ramping is properly constructed.

BIT 20.2 M Inspect work designed by the Owner and included in the Flexible Pavement Structure item, for example shoulder, poor performing, and frost heave excavations and backfill, according to the normal CAITM inspections tasks for such work.

BIT 20.3 Record the following, and other information related to equipment, labour, and production rate:

(i) The Contractor's equipment inventory,
(ii) Contractor's hours of work,
(iii) Description of the work progress,
(iv) Labour or equipment hours worked or not worked.

BIT 20.3 Check and witness the taking of all aggregate quality assurance samples for testing.

BIT 20.4 M Check that all pavement materials, and the widths and depths of these materials, are according to the Pavement Design Report or amended report, and the Contract Documents. Non-conformances shall be reported to the Contractor by Instruction Notice.

BIT 20.5 Verify and record horizontal and vertical grading tolerances prior to the placement of the next type of material or pavement.

BIT 20.6 Check the submission of grade checks prior to placement of subsequent materials. Complete quality assurance grade checks where incorrect grade is suspected.

BIT 20.7 M Intermittently conduct visual inspection of aggregate material, including for HMA, for contamination, including clay balls, clay coated particles or foreign material. Confirm that prohibited material is not being used in aggregate.

BIT 20.8 There is no requirement for a Pre-Pave Meeting for Flexible Pavement Construction item work.

BIT 20.9 M **Check and note placement and condition of hot mix including alignment, longitudinal joint location, crossfall, surface tolerance, surface appearance, width, smoothness, and other applicable contract related field checks.**

BIT 20.10 During paving, record air and hot mix temperature, condition of surface being paved, use of tack coat, joint construction practices, compaction sequence, any observed longitudinal streaks or discontinuities.

BIT 20.11 Check paving is completed to the same station each day and/or temporary ramping is properly constructed.

BIT 20.12 M **Complete quality assurance grade checks on the final asphalt surface at intersections, areas with overhead clearances, curbs, catchbasins, areas of vertical grade revision, and areas where incorrect grade is suspected.**

BIT 20.13 Check that granular shoulder ramping and completion of granular shoulder is completed and according to time limits. Inspect and test the granular shouldering according to the requirements for Granular A or M.

BIT 20.14 Check that surface smoothness measurements are completed.

BIT 20.15 Check that excess materials are properly managed and/or placed at specified locations.

BIT 20.16 Check that NAD83 coordinates for the performance measurement segments are completed and submitted.

LEVEL OF INSPECTION – C2

BIT 21 PERFORMANCE GRADED ASPHALT CEMENT

Task # **Activity**

BIT 21.1 Review and follow Field Guide for the Acceptance of Hot Mix Asphalt and Bridge Deck Waterproofing for sampling practices.

BIT 21.2 M Confirm that the Contractor has submitted the purchase price of the PGAC for each grade prior to paving.

BIT 21.3 Prior to commencing any asphalt cement sampling, be aware of and follow all safety requirements required at the asphalt plants.

BIT 21.4 Determine the frequency of sampling. For details, refer to the Contract Documents and the Field Guide for the Acceptance of Hot Mix Asphalt and Bridge Deck Waterproofing.

BIT 21.5 Receive the Bill of Lading, certificate of analysis, and the documentation identifying the storage tank.

BIT 21.6 Witness samples being taken. Accompany the plant representative to the respective tank and record, both in diary and on sample, the tank identifier and location of the spigot from which the sample is being taken. Confirm and record, in the inspector's diary, which tank is feeding the mix at the plant control centre. Take possession of sample as soon as taken. Refer to the CAITM Part A Section "Sampling and Material Testing".

BIT 21.7 Conduct random plant visits in addition to sampling visits (BIT 21.6) for an asphalt plant with more than one tank. Confirm and record, in the inspector's diary, which tank is feeding the mix at the plant control centre.

Level of Inspection – For BIT 21.6: 100% for samples being taken.
– For BIT 21.7: On a random basis, for 50% of the days of asphalt production.

E/ATMS 1 ELECTRICAL AND ATMS CHAMBERS

Task #	Activity
E/ATMS 1.1 M	**Check all delivered material to verify that it is in accordance with the Contract Documents. Record all non-conformance items and provide recommendations.**
E/ATMS 1.2	Check that the type, alignment, offset, station, elevation relative to final grade, and depth of maintenance holes and hand holes conforms to the contract requirements.
E/ATMS 1.3 M	**Check that the number of concrete adjustment units conforms to contract requirements.**
E/ATMS 1.4	Check that the correct number of sleeves and openings are installed. Check for correct positioning, alignment and installation of: ladder rungs, pulling irons, duct sleeves, drainage pipe, and frames and covers.
E/ATMS 1.5 M	**Check that drainage installation has been completed as specified in the Contract Documents.**
E/ATMS 1.6 M	**Check that the backfill materials are as specified in the Contract Documents and are compacted to the target density.**
E/ATMS 1.7	Check that rigid ducts entering maintenance holes are installed with standard end bells placed flush with the face of the inside wall of the unit.
E/ATMS 1.8	Check that ATMS communications ducts entering chambers are installed such that they extend 150 mm beyond the face of the inside wall of the unit.
E/ATMS 1.9 M	**Check that frames and covers are connected to the system ground.**
E/ATMS 1.10 M	**Check that frames and covers are free of debris and that drain openings are clear.**
E/ATMS 1.11 M	**Obtain GPS readings for chambers.**

LEVEL OF INSPECTION – C1/D2

E/ATMS 2 UNDERGROUND DUCTS

Task #	Activity
E/ATMS 2.1 M	**Check all delivered material to verify that it is in accordance with the Contract Documents. Record all non-conformance items and provide recommendations.**
E/ATMS 2.2 M	**Check that excavation for the duct and/or duct bank conforms to the specified dimensions and is suitable for duct placement.**
E/ATMS 2.3	Check that the depth of ducts conforms to contract requirements.
E/ATMS 2.4 M	**Check that wobble joints are installed as specified in the Contract Documents, and are appropriately supported and backfilled.**
E/ATMS 2.5	Check that the correct size, type, colour and number of ducts are being installed.
E/ATMS 2.6 M	**Check that backfill materials are as specified in the Contract Documents and are compacted to the target density.**
E/ATMS 2.7	Check that surface mounted duct has been installed in accordance with the manufacturer's recommendations and the contract drawings.
E/ATMS 2.8 M	**Where Electrical Non-Metallic Tubing (ENT) is used: check that it has been installed in accordance with the manufacturer's recommendations, and is appropriately grounded.**
E/ATMS 2.9	Check that marker tape and cable bricks have been installed as specified in the Contract Documents.
E/ATMS 2.10 M	**Check that ducts are free of debris.**
E/ATMS 2.11 M	**Check that all unused ducts are plugged with plastic plugs and have fish line installed.**
E/ATMS 2.12 M	**Check that ducts for underpass luminaires consist of non-metallic liquid tight conduit and connectors.**

LEVEL OF INSPECTION – A1 for communication ducts, C1/D2 for all other ducts

E/ATMS 3 NON-INTRUSIVE TRAFFIC SENSOR INSTALLATION

Task #	Activity
E/ATMS 3.1 M	**Check all the delivered material to verify that it is being supplied from the approved material selection approval (MSA) that was submitted by Contractor at the commencement of the contract.**
E/ATMS 3.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation Work.**
E/ATMS 3.3	Check that the Contractor has accurately mounted the unit(s) according to manufacturer's installation guidelines for parameters including the mounting height, tilt angle, etc. Check that the mounting pole location is as specified in the contract.
E/ATMS 3.4	Check that each traffic sensor unit is aimed properly relative to the travel lanes based on whether it is configured for side-fire or forward-looking mode. Verify with the Contractor that each detection footprint is contained within one (1) lane.
E/ATMS 3.5	Check that sensor communications and power cables are continuous between the surge suppressor units and the cabinet and connected correctly at the sensor unit, surge suppressors and to controller unit inside the cabinet. Verify grounding of the surge suppression and cable.
E/ATMS 3.6	Check that the external power supplies, grounding and RF equipment are connected in accordance with contract requirements and manufacturer installation guidelines.
E/ATMS 3.7	Check that the sensor unit is properly calibrated at the site by using the manufacturer's configuration and calibration software. Confirm that the appropriate data communication is received at the controller and the Traffic Operations Centre (where applicable).
E/ATMS 3.8 M	**Check if additional calibration table is required later in the contract to reflect lane configuration shifts dictated by staging. Note approximate schedule.**
E/ATMS 3.9 M	**Check that all sensor equipment has passed Proof of Performance (POP).**

LEVEL OF INSPECTION – C1/D2

E 4 POLE FOUNDATIONS AND POLE ERECTION

Task #	Activity
E 4.1 M	**Check all delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
E 4.2	Check that the Contractor augers holes to the specified dimensions for poles and footings.
E 4.3 M	**Check that the foundations are constructed according to the Contract Documents.**
E 4.4	Visually check all poles for dents, cracks, scratches, paint chipping, and any other obvious imperfections.
E 4.5	Check that the Contractor properly stores, erects and supports the poles in accordance with the manufacturer's recommendations and the contract constraints.
E 4.6	Check that the pole orientation and handhole orientation are as specified in the Contract Documents.
E 4.7 M	**Check that the orientation and elevation of each and every frangible base is as specified in the Contract Documents. Perform 100% inspection of frangible bases.**
E 4.8 M	**Check that pole foundations and poles are installed to the correct elevation, station, offset, and vertically aligned, as specified in the Contract Documents.**
E 4.9 M	**Check that the local grading around the pole foundations is completed as specified in the Contract Documents.**
E 4.10 M	**Check that the distance between the pole bases and the pole footings are according to the Contract Documents.**
E 4.11 M	**Check that all formwork is removed.**
E 4.12 M	**Obtain GPS readings for all lighting poles.**

LEVEL OF INSPECTION – C1/D2

E 5 GROUNDING

Task #	Activity
E 5.1 M	**Check all delivered material to verify that it is in accordance with the Contract Documents. Record all non-conformance items and provide recommendations.**
E 5.2	Check that insulation ground wire is of correct colour and type, as specified in the Contract Documents.
E 5.3 M	**Check that the specified ground electrodes are used and that the type, quantity, dimensions, and locations of ground electrodes are according to the Contract Documents.**
E 5.4 M	**Check that all ground connectors are Canadian Standards Association (CSA) approved, and are of the size and type specified in the Contract Documents.**
E 5.5 M	**Check that all inaccessible ground connections are installed as specified in the Contract Documents.**
E 5.6 M	**Verify that the Contractor conducts the resistance to ground tests.**
E 5.7 M	**Verify that the Contractor ensures that the grounding system complies with the requirements of the Electrical Safety Authority (ESA) and is in conformance with the Contract Documents.**
E 5.8 M	**Verify and record the testing and measurement of the grounding grid at each power supply location is completed in accordance with the Contract Documents.**
E 5.9 M	**Check that the traffic signal grounding system is in conformance with the Contract Documents.**
E 5.10 M	**Check that all metal components throughout the contract are grounded according to the Ontario Electrical Safety Code.**
E 5.11	Check that the system ground is continuous throughout.

LEVEL OF INSPECTION – D2

E 6 CABLE INSTALLATION

Task #	Activity
E 6.1 M	**Check all delivered material to verify that it is in accordance with the Contract Documents. Record all non-conformance items and provide recommendations.**
E 6.2 M	**Check that the size, type and colour of cables are as specified in the Contract Documents.**
E 6.3 M	**Check that all communication cable on-reel tests have been completed successfully, immediately following delivery and prior to any communication cable installation Work.**
E 6.4 M	**Check that the Contractor pulls cables through the ducts without exceeding the maximum pulling tension recommended by the manufacturer and without underground splices. Check that sufficient cable lubricant is used during the pulling operation.**
E 6.5	Where direct buried cable is installed, check that marker tape and cable bricks are installed as specified in the Contract Documents.
E 6.6 M	**For Low Voltage Systems and Extra Low Voltage Systems, check that the Contractor performs continuity and resistance to ground tests, as specified in the Contract Documents.**
E 6.7	Check that all splices and terminations conform as specified in the Contract Documents.
E 6.8 M	**Check that all continuity and attenuation tests on all connectorized links are as specified in the Contract Documents.**
E 6.9 M	**For High Voltage Systems, check that the Contractor performs all testing required by the local authorities and all tests specified in the Contract Documents.**
E 6.10	Check that all ducts terminating in traffic signal control cabinets, power supply cabinets, and/or distribution assemblies with wiring installed are sealed.
E 6.11	Check that all unused ducts are plugged with plastic plugs and have fishwire installed.

E 6.12 M Check that coils and slack cable is provided as specified in the Contract Documents.

LEVEL OF INSPECTION – C1/C2

E 7 LUMINAIRES

Task #	Activity
E 7.1M	**Verify that the Working Drawing submission is in accordance with the Contract Documents.**
E 7.2	Check that the Proof of Performance and Installation of the luminaires is completed in accordance with Contract Documents
E 7.3 M	**Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract is as per Working Drawing submission, and meets the luminaire "burn-in" period for acceptance as specified in the Contract Documents.**
E 7.4	Check that the luminaires delivered have the correct lamp, socket position, photometrics, ballast, and that they are dated.
E 7.5 M	**Check that luminaires are installed and aligned correctly.**
E 7.6 M	**Check that luminaire shields, refractors, and reflectors are installed and aligned correctly.**
E 7.7 M	**Check that all luminaires and associated hardware and materials are visually checked for cracks, dents and other damage.**
E 7.8 M	**Once all of the luminaires have been installed, perform an aerial inspection on a minimum of 10% of the conventional (non-high mast) luminaires.**
E 7.9 M	**Verify by visual inspection that all luminaires operate properly when the system is energized.**
E 7.10	Check that fuses are of the correct amperage and type.

LEVEL OF INSPECTION – D2

E 8 POWER SUPPLY EQUIPMENT

Task #	Activity
E 8.1 M	**Check all delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
E 8.2 M	**Check that the Contractor has obtained the Electrical Safety Authority (ESA) label of approval prior to installation of the power supply.**
E 8.3	Check the equipment for obvious defects or damage.
E 8.4	Check that the equipment is as specified, paying special attention to the ratings for voltage and amperage.
E 8.5 M	**Check that the specified grounding is completed.**
E 8.6	Where applicable, check that the power supply is mounted at the correct height, using the specified brackets.
E 8.7 M	**Check that the Contractor has tested the cables and the grounding system in accordance with the contract specifications.**
E 8.8 M	**Check that the photoelectric controllers are installed and oriented correctly.**
E 8.9 M	**Check that the component layout conforms to the approved shop drawings.**
E 8.10 M	**Check that the Contractor has obtained a connection authorization from the Electrical Safety Authority (ESA) prior to energization.**
E 8.11 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the contract.**
E 8.12 M	**Obtain GPS readings for power supply cabinets and distribution assemblies.**
E 8.13 M	**Check that Arc Flash warning labels are installed according to the Contract Documents.**

LEVEL OF INSPECTION – E2

E 9 TRAFFIC SIGNAL EQUIPMENT

Task #	Activity
E 9.1	Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.
E 9.2 M	**Receive manufacturer's certificate for pre-installation testing of equipment.**
E 9.3 M	**Check that the PH-M-125 (legal approval form) is received prior to signal equipment (both permanent and temporary) being activated.**
E 9.4	Check that the signal heads and brackets are the correct size and type.
E 9.5	Check that the lamps or the LED modules are the correct wattage and are installed correctly.
E 9.6	Check the orientation and mounting heights of traffic signal and pedestrian signal heads.
E 9.7	Check that test results for loops conform to the contract requirements.
E 9.8	Check that all traffic signal actuation devices operate properly.
E 9.9 M	**Check that all accessible pedestrian signal pushbutton poles are located according to the Contract Documents and the Accessibility for Ontarians with Disabilities Act (AODA).**
E 9.10 M	**Check that all accessible pedestrian signals and actuation devices operate according to the Contract Documents and the AODA.**
E 9.11 M	**Once all of the signal displays have been installed, perform an aerial inspection on a minimum of two (2) non-pedestrian signal heads per intersection.**
E 9.12 M	**Check that the Contractor has tested all traffic signal control equipment, demonstrated that it is fully operational and that it conforms to the requirements as specified in the Contract Documents.**
E 9.13 M	**Check that traffic signal operation conforms to the timing plan and operational parameters set by the regional traffic section.**

E 9.14 M **For Portable Temporary Traffic Signals receive a copy of the standard timing sheet, with a copy of the Generic Signal Timing Sheet attached from the Contractor. Forward timing sheets to the regional traffic section.**

E 9.15 M **Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the contract.**

LEVEL OF INSPECTION – E2

E 10 TRAFFIC ACTUATION AND DETECTION EQUIPMENT

Task #	Activity
E 10.1 M	**Check all delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
E 10.2 M	**Check that the equipment has passed pre-installation testing prior to any installation Work.**
E 10.3	Check that sealant is the approved type and rated for the temperature at which time the installation is taking place.
E 10.4	Check that loop layout and installation are in conformance with the Contract Documents. Check that the loops are installed with the size, winding direction, number of turns and type of cable specified.
E 10.5 M	**Check that the Contractor has accurately laid out the loops. The position (centred within the lane), dimensions and spacing to upstream or downstream loops are critical. Check that the Contractor applies special treatment (neoprene tubing) to sawcut slots that cross pavement irregularities and that the corners have been rounded as detailed in the Contract Documents.**
E 10.6	Check that the loop cable end at the splice point which progresses clockwise is clearly identified, such as being marked with multiple bands of electrical vinyl tape which also indicate the loop number (loop number four (4) requires four (4) bands of tape, etc.).
E 10.7	Check that the sawcut slot depth is as required and has been cleaned and thoroughly dried as specified in the Contract Documents.
E 10.8	Check that the black conductor of the extra low voltage cable is consistently connected to the clockwise winding of the loop lead cable.
E 10.9	Check backing rods are the correct length, diameter and are spaced as required in the Contract Documents.
E 10.10	For Traffic Counting Stations, check that post, accessories (reflector/chain, etc.) and handhole sizes, type and orientation is as specified in the Contract Documents.

E 10.11 Check that the metallic shield of extra-low voltage cables are cut off cleanly and left unconnected in the resin loop splice.

E 10.12 M Verify all loop splices and determine that they are encased in a resin splice with the splices positioned to obtain a minimum coverage of 6 mm of resin around each splice.

E 10.13 Check that initially, the sensitivity switches of amplifiers are set to Level 4. Fine-tuning of the sensitivity switches will be adjusted during the physical car counting process.

E 10.14 Check that the High (FH) Low (FL) frequency switches of amplifiers alternate on each channel.

E 10.15 M Check that the Contractor tests the loop with a "megger" and with an inductance meter and submits the measured values for verification.

E 10.16 M Verify that the loop is operating as specified in the Contract Documents.

E 10.17 M Check that the Certificate of Conformance (if required) is supplied and reviewed in accordance with the time requirements of the contract.

LEVEL OF INSPECTION – C1/C2

E 11 HIGH MAST LIGHTING

Task #	Activity
E 11.1	Check all the delivered material to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.
E 11.2 M	**Check that the supply erection drawings and procedures have been received prior to the commencement of the assembly of any high mast poles.**
E 11.3 M	**Check that the high mast equipment training certificates for the Contractor's employees have been received prior to the commencement of construction of any high mast poles.**
E 11.4 M	**Check that the shop drawings (poles, anchorage assemblies and raising/lowering equipment) have been received prior to the commencement of any high mast poles.**
E 11.5 M	**Check that the distance from the top of the high mast pole footing to the bottom of the bottom levelling nuts is according to the Contract Documents.**
E 11.6	Inspect the high mast lighting luminaires in accordance with Task **E 7.**
E 11.7 M	**Check that all high mast lighting equipment and materials are in place and are visually checked for cracks, dents and other damage.**
E 11.8 M	**Check that the Contractor has tested all high mast lighting equipment, particularly the raising and lowering equipment, demonstrated that it is fully operational, and that it conforms to the requirements as specified in the Contract Documents.**
E 11.9 M	**Check that the certificate of conformance has been received, and any required documentation concerning the galvanizing and paint coating of the high mast lighting equipment.**
E 11.10	Check that the fuses are of the correct amperage and type.
E 11.11 M	**Check that shielding is correctly in place and providing required light transmission cut off prior to the burn-in test.**

LEVEL OF INSPECTION – F2

E 12 SIGNAL ACTIVATION (TEMPORARY AND PERMANEMT INSTALLATION)

Task #	Activity
E 12.1 M	**Check the Contractor has an approved signed copy of the applicable PHM 125 documents.**
E 12.2	Check offset from E/P or back of curb to front face of pole base is in accordance with contract related documents.
E 12.3	Check grading requirements are in accordance with MTO related documents.
E 12.4	Check that pedestrian push buttons are accessible and approaches are level.
E 12.5	Check that pole bases (if adjusted during the construction) that the arm lengths are in accordance with contract requirements.
E 12.6	Primary Heads must be positioned in the centre of the through lane.
E 12.7	Check if heads are obstructed by any site objects. If any concerns contact the designer for recommendation.
E 12.8	Check appropriate signage has been installed and is per contract related documents.
E 12.9	Check that Pre-Marking of the Stop Bars, Crosswalks and dropped curbs are in the correct locations (in accordance with PHM 125 and MTO standards).
E 12.10	For temporary installations – Check site specific conditions at the time of installation math PHM 125 drawing.
E 12.11	For temporary installations – Check TCB is placed in accordance with the PHM 125 and that it meets MTO standards.
E 12.12 M	**Check that the mandatory pre-activation meeting is held in advance of signal activation (if applicable) and all required personnel have been invited.**
E 12.13	Check if the pedestrian push buttons are being activated one at a time to determine that they are functioning properly.

E 12.14 M Confirm the phases and turning movements to determine adequate time is being allotted to each phase as intended.

DAY OF ACTIVATION

E 12.15 Check that all applicable people are present (which includes Police, Traffic Section representative, Prime Contractor representative, Electrical Co-ordinator, Contract Services Administrator and CA Electrical Inspector)

E 12.16 Check if the corners of the loops are marked with non-permanent paint on top lift of pavement if cut into the binder.

E 12.17 M Police must control traffic through the intersection until signals are activated, including during the flash out of the signals,

E 12.18 Check if the pavement markings are being installed in accordance with contract requirements.

E 12.19 Check if pedestrian push buttons are being activated one at a time to determine that they are functioning properly.

E 12.20 M Confirm the phases and turning movements to determine adequate time is being allotted to each phase as intended (this should be at the pre-activation meeting).

E 12.21 M Record any requests for changes to timing and/or any other adjustment made (this should be at the pre-activation meeting).

LEVEL OF INSPECTION – A2/A1

ATMS 13 ATMS ELECTRICAL CABLE INSTALLATION

Task #	Activity
ATMS 13.1 M	**Check all delivered material to verify that it is being supplied from the appropriate DSM, or the approved Material Selection Approval (MSA) list that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 13.2 M	**Check that the size, type and colour of cables are as specified in the Contract Documents.**
ATMS 13.3 M	**Check that the Contractor pulls cables through the ducts without exceeding the maximum pulling tension recommended by the manufacturer. Also verify that no underground splices are used. Check that cable lubricant is used at appropriate locations and in sufficient quantity during the pulling operation.**
ATMS 13.4 M	**For Low Voltage Systems and Extra Low Voltage Systems, check that the Contractor performs continuity and resistance to ground tests, as specified in the Contract Documents.**
ATMS 13.5	Check that all splices and terminations conform as specified in the Contract Documents.
ATMS 13.6	Check that all ducts terminating in ATMS cabinets, and/or power supply cabinets with wiring installed are sealed.
ATMS 13.7	Check that all unused ducts are plugged with plastic plugs and have fish wire installed.
ATMS 13.8 M	**Check that coils and slack cable is provided as specified in the Contract Documents, and are appropriately labelled and organized.**

LEVEL OF INSPECTION – C1/C2

ATMS 14 GROUNDING

Task #	Activity
ATMS 14.1 M	**Check all delivered material to verify that it is in accordance with the Contract Documents. Record all non-conformance items and provide recommendations.**
ATMS 14.2	Check that insulated ground wire is of correct colour and type, as specified in the Contract Documents.
ATMS 14.3 M	**Check that the specified ground electrodes are used and that the type, quantity, dimensions, and locations of ground electrodes are according to the Contract Documents.**
ATMS 14.4 M	**Check that all ground connectors are Canadian Standards Association (CSA) approved, and are of the size and type specified in the Contract Documents.**
ATMS 14.5 M	**Check that all inaccessible ground connections are properly installed as specified in the Contract Documents.**
ATMS 14.6 M	**Check that the Contractor conducts the resistance to ground tests. Check that the Contractor determines that the grounding system complies with the requirements of the Electrical Safety Authority (ESA) and is in conformance with the Contract Documents.**
ATMS 14.7 M	**Take note of any electrodes installed in a non-standard manner, where additional electrodes were required, and where they were located.**
ATMS 14.8	Check that all metal components throughout the contract are grounded according to the Ontario Electrical Safety Code.
ATMS 14.9	Check that the system ground is continuous throughout.
ATMS 14.10 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the contract.**

LEVEL OF INSPECTION – D2

ATMS 15 POWER SUPPLY EQUIPMENT

Task #	Activity
ATMS 15.1 M	**Check all delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) list that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 15.2 M	**Check that the Contractor has obtained the Electrical Safety Authority (ESA) label of approval prior to installation of the power supply.**
ATMS 15.3	Check the equipment for obvious defects or damage.
ATMS 15.4	Check that the equipment is as specified, paying special attention to the ratings for voltage and amperage, and that the appropriate circuit breakers have been fitted per contract requirements.
ATMS 15.5 M	**Check that the specified grounding and/or bonding is completed.**
ATMS 15.6 M	**Where applicable, check that the power supply is mounted at the correct height, using the specified brackets.**
ATMS 15.7 M	**Check that the Contractor has tested the cables and the grounding system in accordance with the contract specifications.**
ATMS 15.8 M	**Check that the Certificate of Conformance is supplied and reviewed in accordance with the time requirements of the contract.**
ATMS 15.9	Verify local grading has been appropriately addressed for pad mounted power supply plant.
ATMS 15.10 M	**Obtain GPS readings for ATMS power supply equipment.**

LEVEL OF INSPECTION – E2

ATMS 16 CLOSED CIRCUIT TELEVISION (CCTV) POLES AND MAINTENANCE SITES

Task #	Activity
ATMS 16.1 M	**Check all delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) list that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 16.2	Check that the Contractor excavates holes to the specified dimensions for poles and foundations.
ATMS 16.3 M	**Check that the foundations are constructed according to the Contract Documents.**
ATMS 16.4	Visually check all poles for dents, cracks, scratches, and any other obvious imperfections.
ATMS 16.5	Check that the Contractor properly stores, erects and supports the poles in accordance with the manufacturer's recommendations and the contract constraints.
ATMS 16.6	Check that the pole orientation and hand hole orientation are as specified in the Contract Documents.
ATMS 16.7 M	**Check that pole foundations and poles are installed to the correct elevation, station, offset, and vertically aligned, as specified in the Contract Documents.**
ATMS 16.8 M	**Check that the local grading around the pole foundations is completed as specified in the Contract Documents.**
ATMS 16.9 M	**For locations fitted with dedicated camera maintenance sites, check that the guard rail or road side barrier opening and any transition treatment for vehicles is as per the contract requirements.**
ATMS 16.10 M	**For locations fitted with dedicated camera maintenance sites, check that the installation of the subdrain is as specified in the Contract Documents when the maintenance site is being developed.**
ATMS 16.11 M	**Check that the Contractor compacts any dedicated camera maintenance site fill material to the target density.**

ATMS 16.12 M Obtain GPS readings for camera poles.

LEVEL OF INSPECTION – C1/D2

ATMS 17 COMMUNICATION CABLE INSTALLATION

Task #	Activity
ATMS 17.1 M	**Check all delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) list that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 17.2 M	**Check that the size, type and colour of cables are as specified in the Contract Documents.**
ATMS 17.3 M	**Check that all communication cable on-reel tests have been completed successfully, immediately following delivery and prior to any communication cable installation Work. Verify that appropriate reels are delivered to site in good condition.**
ATMS 17.4	Check that generous amounts of cable lubricant is applied during the installation at appropriate intervals along the pulling path, and that the pulling lubricant is homogeneous and not deteriorated prior to use.
ATMS 17.5 M	**Check that communication cable is installed according to all the constraints of the contract and manufacturers recommendations. Verify the appropriately rated break off fitting is used for the pull, and that logging equipment is working properly and recording pulling tension data.**
ATMS 17.6 M	**Check that all continuity and attenuation tests on all connectorized links in accordance with the Proof of Performance (POP) and the Contract Documents are performed successfully.**
ATMS 17.7	Check that all unused ducts are plugged with plastic plugs and have fish line installed. Check that used communication ducts are plugged with duct sealing compound.
ATMS 17.8 M	**Check that coils and slack cable in maintenance chambers are provided and appropriately arranged as specified in the Contract Documents (typically at bridge crossings, and upstream and downstream of communication pedestals).**
ATMS 17.9 M	**Check that all cables are labelled according to the contract.**

LEVEL OF INSPECTION – C1/D2

ATMS 18 DATA TRANSMISSION EQUIPMENT INSTALLATION

Task #	Activity
ATMS 18.1 M	**Check all the delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 18.2 M	**Check that all required information related to node addresses net masks, and other configurable parameters are obtained from the Owners representatives and are configured into the Ethernet or other data Transmission equipment in advance of placing the equipment into PIT testing.**
ATMS 18.3 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation Work.**
ATMS 18.4	Check that the field and Traffic Operations Centre (TOC) equipment is installed and secured in the appropriate cabinets' designated reserved space in accordance with the contract drawings.
ATMS 18.5	Check that all cables are neatly trained together within the cabinet when routed along the same path and supported along the rails of the equipment rack and that no minimum bending radii have been exceeded.
ATMS 18.6	Check that this equipment is plugged into the outlets of the cabinet Power Distribution Assembly (PDA), or any fitted UPS supported power outlets, as the contract specifications may nominate to power this equipment.
ATMS 18.7	Check that the proper data interface cable is installed to match the type of controller and communication equipment and if appropriate, it is correctly terminated.
ATMS 18.8 M	**Check that all data interface equipment has successfully passed Proof of Performance (POP) testing prior to commencing System Testing, (or optionally, when specified, Data System Line-up Acceptance Testing (DSLAT) testing). Where DSLAT testing is specified it shall be completed successfully before moving on to System Integration Testing.**

ATMS 18.9 M **Check that the data communications documentation being supplied meets the contract requirements and firmware versions supplied.**

ATMS 18.10 Check that the new data transmission equipment configuration is correctly entered into the network management software at the TOC.

LEVEL OF INSPECTION – C1/D2

ATMS 19 VIDEO TRANSMISSION/DISPLAY EQUIPMENT INSTALLATION

Task #	Activity
ATMS 19.1 M	**Check all the delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 19.2 M	**Check that all required information related to any pertinent device addresses, net masks, and other configurable parameters are obtained from the Owners representatives and are configured into the transmission equipment and the TOC head end systems in advance of placing the equipment into PIT testing.**
ATMS 19.3 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation Work.**
ATMS 19.4	Check that the field and Traffic Operations Centre (TOC) equipment is installed and secured in the appropriate cabinets' designated reserved space in accordance with the contract drawings.
ATMS 19.5	Check that all cables are neatly trained together within the cabinet when routed along the same path and supported along the rails of the equipment rack and that no maximum bending radii have been exceeded.
ATMS 19.6	Check that this equipment is plugged into the outlets of the cabinet Power Distribution Assembly (PDA), or any fitted UPS supported power outlets, as the contract specifications may nominate to power this equipment.
ATMS 19.7 M	**Check that all video transmission/display equipment has successfully passed Proof of Performance (POP) testing prior to commencing System Testing, (or optionally, when specified, Video System Line-up Acceptance Testing (VSLAT) testing). Where VSLAT testing is specified it shall be completed successfully before moving on to System Integration Testing.**

LEVEL OF INSPECTION – C1/C2

ATMS 20 CAMERA EQUIPMENT INSTALLATION

Task #	Activity
ATMS 20.1 M	**Check all the delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) that was submitted by the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 20.2 M	**For digital cameras with integral encoders, check that all require information related to any pertinent device addresses, net masks, and other configurable parameters are obtained from the Owners representatives and are configured into the transmission equipment and the TOC head end systems in advance of placing the equipment into PIT testing.**
ATMS 20.3 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation Work.**
ATMS 20.4	Check that the pole top and any equipment mounted nearby is independently grounded according to the contract drawings.
ATMS 20.5	For Power over Ethernet (PoE) powered equipment verify that the installation conforms to the manufacturers recommendations for the cable involved including any lowering cable slack lengths required for the installation.
ATMS 20.6	Check that the field equipment is installed and secured in the cabinets' designated reserved space in accordance with the contract drawings.
ATMS 20.7	Check that all cables are neatly trained together within the cabinet when routed along the same path and supported along the rails of the equipment rack and that no maximum bending radii have been exceeded.
ATMS 20.8	Check that the camera equipment is plugged into the outlets of the cabinet Power Distribution Assembly (PDA), or any fitted UPS supported power outlets, as the contract specifications may nominate to power this equipment.
ATMS 20.9	Check that the camera image pan/tilt blanking masks are appropriately configured with the assistance and guidance of TOC staff.

ATMS 20.10 M **Check that all camera equipment has successfully passed Proof of Performance (POP) testing.**

ATMS 20.11 M **Obtain GPS readings for ATMS camera equipment.**

LEVEL OF INSPECTION – C1/D2

ATMS 21 VEHICLE DETECTION EQUIPMENT INSTALLATION

Task #	Activity
ATMS 21.1 M	**Check all delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) list that was submitted by the Contractor at the commencement of the contract.** **Record all non-conformance items and provide recommendations.**
ATMS 21.2 M	**Check that the equipment has passed pre-installation testing prior to any installation Work.**
ATMS 21.3	Check that sealant is the approved type and rated for the temperature at which time the installation is taking place.
ATMS 21.4	Check that loop installations are in conformance with the Contract Documents. Check that the loops are installed with the size, winding direction, number of turns and type of cable specified.
ATMS 21.5 M	**Check that the Contractor has accurately laid out the loops. The position (centred within the lane), dimensions and spacing to upstream or downstream loops are critical. Check that the Contractor applies special treatment (neoprene tubing) to sawcut slots that cross pavement irregularities and that the corners have been rounded as detailed in the Contract Documents.**
ATMS 21.6	Check that the sawcut slot depth is as required and has been cleaned and thoroughly dried as specified in the Contract Documents.
ATMS 21.7	Check that the black conductor of the extra low voltage cable is consistently connected to the clockwise winding of the loop lead cable.
ATMS 21.8	Check backing rods are the correct length, diameter and are spaced as required in the Contract Documents.
ATMS 21.9	Check that the metallic shield of extra-low voltage cables are cut off cleanly and left unconnected in the resin loop splice.
ATMS 21.10 M	**Verify all loop splices and determine that they are encased in a resin with the splices positioned to obtain a minimum coverage of 6 mm of resin around each splice, or that other approved splice enclosures are properly used.**

ATMS 21.11 Check that each detector station is identified with a nameplate on the inside wall of the splice point.

ATMS 21.12 Check that the loop location is accurately marked with a cut cross on each curb.

ATMS 21.13 Check that the operating mode of all connected detector amplifiers is set to Presence (PR) mode.

ATMS 21.14 Check that initially, the sensitivity switches of amplifiers are set to Level 4. Fine-tuning of the sensitivity switches will be adjusted during the physical car counting process.

ATMS 21.15 Check that the High (FH) Low (FL) frequency switches of amplifiers alternate on each channel.

ATMS 21.16 M Check that the Contractor tests the loop with a "megger" and with an inductance meter and submits the measured values for verification.

ATMS 21.17 M Verify that the loop is operating as specified in the Contract Documents.

ATMS 21.18 M Check that the Certificate of Conformance (if required) is supplied and reviewed in accordance with the time requirements of the contract.

ATMS 21.19 M Check that all Vehicle Detection Station (VDS) equipment has successfully passed Proof of Performance (POP) testing.

ATMS 21.20 M Obtain GPS readings for VDS loop station.

LEVEL OF INSPECTION – C1/C2

ATMS 22 CABINET AND CONTROLLER INSTALLATION

Task #	Activity
ATMS 22.1 M	**Check all the delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) that was submitted by the Contractor at the commencement of the contract.** **Record all non-conformance items and provide recommendations.**
ATMS 22.2 M	**For controllers and any IP connected cabinet options (UPS, etc.) check that all required information related to any pertinent device addresses, net masks, and other configurable parameters are obtained from the Owners representatives and are configured into the equipment and the TOC head end systems in advance of placing the equipment into PIT testing.**
ATMS 22.3 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation Work.**
ATMS 22.4	Check that all concrete cabinet pad footings are installed to the correct elevation, station and offset, as specified in the Contract Documents.
ATMS 22.5	Check that all conduits for the concrete cabinet pads are installed to the proper quantity, entry alignment, and dimensional sizes. Verify the appropriate nominated spares are provided as part of the conduit entry count in advance of pouring the cabinet top slab.
ATMS 22.6	Check that all conduits into the cabinets are identified as to their purpose.
ATMS 22.7	Check that all unused conduits into a cabinet have a fish line installed and are plugged with plastic plugs, used conduits should be sealed.
ATMS 22.8	Check that the cabinet is installed with the door orientation specified in the contract drawings.
ATMS 22.9	Check that the proper twelve (12) character laminated phenolic identification nameplate is installed on the cabinet so as to be visible when approaching along the highway.
ATMS 22.10	Check that the cabinet ground bus is connected to the system ground at the power supply ground termination.

ATMS 22.11 Check that the loop input wires (extra low voltage cables) are labelled, appropriately dressed off, and terminated at the I/J file according to the contract drawings.

ATMS 22.12 Check the controller and other cabinet equipment are plugged into the proper outlets of the cabinet Power Distribution Assembly (PDA), or any fitted UPS supported power outlets, per contract requirements.

ATMS 22.13 Check the controller is left with the power switch in the “on” position.

ATMS 22.14 M Check that all controller and cabinet equipment has successfully passed Proof of Performance (POP) testing.

ATMS 22.15 M Obtain GPS readings for cabinet.

LEVEL OF INSPECTION – C1/E2

ATMS 23 VARIABLE MESSAGE SIGN (VMS) INSTALLATION

Task #	Activity
ATMS 23.1 M	**Check all the delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) that was submitted by Contractor at the commencement of the contract.** **Record all non-conformance items and provide recommendations.**
ATMS 23.2 M	**Check that the layout survey work undertaken by the Contractor, and that if any discrepancy is found between field conditions and the design data the matter is forwarded to the designer for clarification, in advance of footing excavation or steel placement commencing.**
ATMS 23.3 M	**For controllers and any IP connected options (UPS, etc.) check that all require information related to any pertinent device addresses, net masks, and other configurable parameters are obtained from the Owners representatives and are configured into the equipment and the TOC head end systems in advance of placing the equipment into PIT testing.**
ATMS 23.4 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation Work.**
ATMS 23.5	Check that the structural support truss is grounded according to the contract drawings.
ATMS 23.6	Check that the field equipment is installed and secured in the cabinets' designated reserved space in accordance with the contract drawings.
ATMS 23.7	Check that all cables are neatly trained together within the cabinet when routed along the same path and supported along the rails of the equipment rack and that no minimum bending radii have been exceeded.
ATMS 23.8	Check that the Contractor has all tools tied off while working on the structure and that all Operation Constraints for traffic control from the Contract Documents have been followed.
ATMS 23.9	Check that all support clamps are secured prior to removing the crane support.

ATMS 23.10 Check that all attachment bolts and/or nuts are tightened to the recommended manufacturer's torque, and if nominated in the design, that field side anti climb shields are fitted as part of the initial sign installation.

ATMS 23.11 M Check that all VMS equipment has passed the Proof of Performance (POP).

ATMS 23.12 M Obtain GPS readings for Variable Message Signs

LEVEL OF INSPECTION – C1/D2

ATMS 24 SYSTEM INTEGRATION TEST (SIT) VERIFICATION

Task #	Activity
ATMS 24.1 M	**Check that all equipment installed in the contract has successfully completed its Pre-Installation Test (PIT) and/or Proof of Performance (POP) testing prior to commencing with SIT.**
ATMS 24.2 M	**Check that the SIT plan being utilized has been reviewed and this plan is the approved version. Check that the approved SIT test procedures are followed.**
ATMS 24.3 M	**Check that the Contractor tests in the following chronological order:** (i) **Successfully complete all predecessor equipment and subsystem tests required in the Contract Documents;** (ii) **Make careful notes of the existing configurations and backup configuration files to allow new work to be backed out of gracefully if testing reveals problems to existing or new systems with new plant being added.** (iii) **Test each subsystem independently on the communication subsystem;** (iv) **Test each subsystem independently through the communications subsystem with the head end control device in the traffic operations centre (TOC);** (v) **Add subsystems one at a time and monitor the head end performance at the TOC; and** (vi) **Fail safe testing of all subsystems one at a time and monitor the lead end performance at the TOC.**
ATMS 24.4 M	**Check that all tests are successfully completed and all results (PIT, POP and Stage 1 of SIT) are submitted for verification.**
ATMS 24.5 M	**Check that a notification to start the Stage 2 burn-in test is submitted five (5) business days in advance, before the commencement of the test.**
ATMS 24.6 M	**Check daily that the Event and Error Logs of the Compass System during the fourteen (14) day burn-in test are error free and to notify the Contractor promptly if there are any errors.**

LEVEL OF INSPECTION – A1/A2

ATMS 25 PORTABLE VARIABLE MESSAGE SIGN (PVMS) INSTALLATION FIXED SUPPORT

Task #	Activity
ATMS 25.1 M	**Check all the delivered material to verify that it is being supplied from either Designated Sources Materials (DSM) vendors or the Approved Material Selection (MSA) documentation that was submitted by the Contractor at the commencement of the contract.**
ATMS 25.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation Work.**
ATMS 25.3	Check that the PVMS support structure is grounded according to the contract drawings.
ATMS 25.4	Check that the PVMS is positioned and secured on/to the support structure in accordance with the contract drawings.
ATMS 25.5	Check that the PVMS is positioned with the angle recommended within the contract drawings, and verify message legibility with drive by confirmation viewings to confirm the suitability of the aim point.
ATMS 25.6	Check that all attachment bolts and/or nuts are tightened to the recommended manufacturer's torque.
ATMS 25.7	Check the installation of the PVMS controller cabinet including: mounting on the structure, locking mechanism, that equipment inside is securely mounted, that all cables linking them are appropriately and securely connected, including any supplied materials modem, and that all functions test correctly.
ATMS 25.8	Check the mounting and position of the solar panel and battery pack, if applicable.
ATMS 25.9	Check power supply connection to sign, if applicable, and note if it is installed in an appropriately robust manner if no details are provided in the contract documents. Record all non-conformance items and provide recommendations.
ATMS 25.10	Check communications link (e.g. telephone, fibre, etc.) to the sign, if applicable and note if it is installed in an appropriately robust manner if no

details are provided in the contract documents. Record all non-conformance items and provide recommendations.

ATMS 25.11 M **If applicable, check that the communication mode has been set for remote control (e.g. cellular communication). Alternately check that the controller address is set appropriately if it is on a fixed communication link. Test to determine that there is proper control from a COMPASS Traffic Operations Centre or Radio Room, and that the head end software is appropriately configured to best utilize the display capabilities of the installed sign.**

ATMS 25.12 M **Check that all PVMS equipment has passed Proof of Performance (POP).**

ATMS 25.13 M **Obtain GPS readings for Portable Variable Message Sign.**

LEVEL OF INSPECTION – C1/D2

ATMS 26 PORTABLE VARIABLE MESSAGE SIGN (PVMS) INSTALLATION PORTABLE (TRAILER MOUNTED)

Task #	Activity
ATMS 26.1 M	**Check all the delivered material to verify that it is being supplied from either a Designated Sources Materials vendor or the Approved Material Selection (MSA) that was submitted by the Contractor at the commencement of the contract.**
ATMS 26.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation Work.**
ATMS 26.3	Pre site delivery checks: that a non-skid finish is in place on trailer fenders, that there is no material corrosion present on the battery terminals, that the batteries measure as being fully charged, and that they will hold a charge in the yard in the days prior to delivering the sign to site.
ATMS 26.4	Check that communication link to signs with wireless installations have had their wireless connection activated prior to the sign site deployment.
ATMS 26.5	Check that the PVMS trailer is stabilized and levelled.
ATMS 26.6	Check that that the PVMS trailer assembly includes wheel locks to maintain security of the PVMS, or other security measures as specified in the contract documents.
ATMS 26.7	Check that the PVMS sign display is accurately aligned towards traffic and verify message legibility with drive by confirmation viewings to confirm the suitability of the aim point.
ATMS 26.8	Check that the PVMS is locked into secure position to prevent rotation and lowering of the sign while in display mode.
ATMS 26.9	Check that the solar panel is locked into the appropriate seasonal tilt and true south rotation positions on the top of the sign case by using the independent locking mechanisms.
ATMS 26.10	Check that all attachment bolts and/or nuts have not vibrated loose or snapped, and are tightened to the recommended manufacturer’s torque.

ATMS 26.11 Check the installation state of the PVMS controller cabinet including: mounting to the sign support, locking mechanism, that equipment inside is securely mounted, that all cables linking them are appropriately and securely connected, including any supplied materials modem, and that all functions test correctly.

ATMS 26.12 Check battery pack is secured and connected.

ATMS 26.13 M Check that the controller has been set to allow remote control operations (e.g. cellular communication). Test to determine that there is proper remote control from a COMPASS Traffic Operations Centre or Radio Room, and that the head end software is appropriately configured to best utilize the display capabilities of the installed sign.

ATMS 26.14 M Check that all PVMS equipment has passed Proof of Performance (POP).

ATMS 26.15 M Obtain GPS readings for PVMS for initial installation and each relocation required in the contract. The GPS coordinates and sign face orientation shall be provided to COMPASS Operations by email within two (2) hours of the PVMS initial installation, and every relocation.

ATMS 26.16 M For PVMS used for traffic management during the construction contract, provide PVMS operation data in the traffic signage diary. The record shall include PVMS display content, status of operation, location and direction of the PVMS face. Provide the message content to COMPASS Operations daily.

LEVEL OF INSPECTION – C1/D2

ATMS 27 DOME CAMERA INSTALLATION

Task #	Activity
ATMS 27.1 M	**Check all the delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) that was submitted by the Contractor at the commencement of the contract.**
ATMS 27.2 M	**For digital cameras with integral encoders, check that all require information related to any pertinent device addresses, net masks, and other configurable parameters are obtained from MTO ATMS staff and are configured into the transmission equipment and the TOC head end systems in advance of placing the equipment into PIT testing.**
ATMS 27.3 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation Work.**
ATMS 27.4	Check that the pole top and any equipment mounted nearby is independently grounded according to the contract drawings.
ATMS 27.5	For Power over Ethernet (PoE) powered equipment verify that the installation conforms to the manufacturers recommendations for the cable involved including any lowering cable slack lengths required for the installation. Check that the wiring between the camera and cabinet has been installed continuous with no intermediate splices.
ATMS 27.6	Check that cable strain relief is provided for the power and communication cables.
ATMS 27.7	Check that all cables are neatly trained together within the cabinet when routed along the same path and supported along the rails of the equipment rack and that no minimum bending radii have been exceeded.
ATMS 27.8	Check that the camera mount arm bracket is oriented and the home position of the camera on the arm is oriented such that the camera pole does not obstruct the desired camera field review.
ATMS 27.9	Check by visual inspection of the image at TOC, or roadside cabinet, that the stainless steel straps for the camera arm are sufficiently tightened and that the dome is free of dirt.

ATMS 27.10 Check that the camera image pan/tilt blanking masks are appropriately configured with the assistance and guidance of TOC staff.

ATMS 27.11 Check that the camera equipment is plugged into the outlets of the cabinet Power Distribution Assembly (PDA), or any fitted UPS supported power outlets, as the contract specifications may nominate to power camera equipment

ATMS 27.12 M Check that all Dome Camera equipment has passed Proof of Performance (POP).

ATMS 27.13 M Obtain GPS readings for dome camera.

LEVEL OF INSPECTION – C1/D2

ATMS 28 CAMERA RAISING AND LOWERING DEVICE INSTALLATION

Task #	Activity
ATMS 28.1 M	**Check all the delivered material to verify that it is being supplied from the approved material selection approval (MSA) that was submitted by Contractor at the commencement of the contract.**
ATMS 28.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation Work.**
ATMS 28.3	Check that camera pole is free from external damage from transportation to the site.
ATMS 28.4	Check that camera pole is placed in accordance with contract specifications and that underground ducts connect properly to the pole, and for internally fitted lowering systems, the pole top aperture is appropriately oriented.
ATMS 28.5	Verify that pole is installed plumb.
ATMS 28.6	Check that the straps for the pole mounted fitter with pulley housing and mounting bracket are tightened securely.
ATMS 28.7	For externally fitted lowering systems, check that the camera arm is positioned in accordance with contract specifications, and installed at the height specified in the contract specifications.
ATMS 28.8	Check that power and communications cables and suspension cable have sufficient length to allow lowering of the camera to ground level, in accordance with manufacturers recommendations.
ATMS 28.9	Check that there are no splices in the camera power and communication cables between the cabinet and the pole top, unless the contract documents indicate otherwise.
ATMS 28.10	Check that the winch is rust free, appropriately lubricated, and installed securely.
ATMS 28.11 M	**Check to see the raising/lowering device can be operated using both (a) an electrically-powered and (b) hand-operated device, and that**

the hand powered device, if designed to be stowed in the pole, is located there.

ATMS 28.12 M **Check that the length of the fitted raising and lowering cable and control cable is such that they can be utilized to have the camera housing reach the ground and also correctly latch and unlatch from the pole top lowering arm assembly.**

ATMS 28.13 M **Check that all Camera Raising and Lowering Device equipment has passed Proof of Performance (POP).**

ATMS 28.14 M **Obtain GPS readings for Camera Raising and Lowering Device.**

LEVEL OF INSPECTION – C1/D2

ATMS 29 WIRELESS COMMUNICATION SYSTEM INSTALLATION

Task #	Activity
ATMS 29.1 M	**Check all the delivered material to verify that it is being supplied from the approved Material Selection Approval (MSA) that was submitted by the Contractor at the commencement of the contract.**
ATMS 29.2 M	**Check that the equipment passed Pre-Installation Testing (PIT) as required prior to any installation Work.**
ATMS 29.3	Check that the field equipment is installed and secured on the structure (e.g. antennae mounted on poles/towers) in accordance with the contract drawings, at the recommended mounting height, orientation, and spacing from any adjacent RF radiators.
ATMS 29.4	Check that all cables are supplied if appropriate, trimmed to optimize RF power transfer, and are splice free from cabinet to pole top.
ATMS 29.5	Check that all cable connectors are correctly installed and are securely seated and weather proofed, as may be required.
ATMS 29.6	Check that all cables are neatly trained together within the cabinet when routed along the same path and supported along the rails of the equipment rack and that no minimum bending radii have been exceeded. Make sure no cables are excessively pinched.
ATMS 29.7	Check that the wireless equipment is plugged into the outlets of the cabinet Power Distribution Assembly (PDA), or any fitted UPS supported power outlets, as the contract specifications may nominate to power this equipment. Further check that any recommended Radio Frequency Interference suppressing chokes supplied have been installed.
ATMS 29.8 M	**Check that transceiver antennae are properly aligned towards each other with regards to aim and orientation per contract requirements. Verify with the Contractor that the antenna link has been optimized and verify that all mandated testing results are recorded.**
ATMS 29.9 M	**Check that all wireless communication links equipment has passed Proof of Performance (POP).**
ATMS 29.10 M	**Obtain GPS reading for any dedicated poles or cabinets associated with the wireless communications system.**

LEVEL OF INSPECTION – C1/C2

TRAFFIC CONTROL

TC 1 GENERAL

Task #	Activity
TC 1.1 M	**Check that Contractor has submitted an applicable site specific Workers Protection Plan and Traffic Control Plan.**
TC 1.2	Review the Approved Signing Requirements with the Contractor.
TC 1.3	Record Contractor's contact person(s) responsible for traffic control and the Traffic Control Signing diary.
TC 1.4	Check that the construction zone designation is in place before speed limit signs are changed or the construction zone begins/ends signs are installed.
TC 1.5	Check that layout of signs is in accordance with Ontario Traffic Manual Book 7 Temporary Conditions or as modified by the Regional Traffic Office.
TC 1.6 M	**Check that Contractor's initial sign placements (by station, offset and height above pavement) and all revisions are clearly documented in the Traffic Control Signing diary.**
TC 1.7	Check that all signs and traffic control devices are properly maintained, and in good working order, (i.e. flashers, etc.), and that temporary traffic signals are working properly with no long delays.
TC 1.8	Check that signs and traffic control devices are retro-reflective, clean, legible and in good working order.
TC 1.9	Check for the removal of temporary signs when they are no longer required.
TC 1.10 M	**Check that (on a regular basis) the Contractor records each stage change or sign change in the Traffic Control Signing diary.**
TC 1.11 M	**If an accident occurs check that the Contractor has documented all traffic control devices, signing, time of inspection and any other pertinent information including measurements, photos and police accident reports.**
TC 1.12 M	**Check that all lane closure protocol is adhered to in accordance with the requirements of the Contract Documents.**
TC 1.13 M	**The Contract Administrator shall complete the Traffic Restrictions at Structures Report form and submit to the CSA, OSCLIS Custodian and**

alternate, 5 days prior to any traffic restriction being implemented. The form shall detail any horizontal and/or vertical restrictions that will be in place during construction as well as the anticipated duration of the restriction. If there are any changes to the restrictions (i.e. modifications or staging changes), the CA will update the OSCLIS form and email 5 days prior to the changes taking place.

TC 1.14 M **The CA shall <u>confirm the actual clearance dimensions, in metres to 2 decimal places, within 24hrs of implementation of the restriction or any changes to the implementation</u>.**

TC 1.15 M **As soon as the temporary restriction/s are removed, the CA shall complete and email an OSCLIS form with the date that the restriction/s were removed and the pre-construction or new construction clearances were reinstated.**

LEVEL OF INSPECTION – A1

NOTE: This task shall be performed by all staff on the contract on an "ongoing" basis. It shall be performed at the initial installation of the traffic stage and every change throughout the life of the contract.

ENV 1 USE OF WASTE PRODUCTS/MATERIALS IN THE WORK

Task #	Activity
ENV 1.1 M	Check that waste product dust suppressants meet the material and construction requirements of the Contract Documents, e.g. MOECC approved dust suppressant.
ENV 1.2 M	Check that any use/placement of reclaimed/excess concrete, asphalt pavement, etc. as aggregate, embankment material, slope flattening material, engineered fill within the ROW or other fill is in compliance with the material and construction requirements of the Contract Documents.
ENV 1.3 M	Check that standard forms regarding use of blast furnace slag in the Work are submitted three (3) weeks prior to any use of the material.
ENV 1.4 M	Check that any use/placement of blast furnace slag as aggregate, embankment material, slope flattening material or fill is in compliance with the material and construction requirements of the Contract Documents.

LEVEL OF INSPECTION – C1

ENV 2 MANAGEMENT AND DISPOSAL OF EXCESS MATERIALS

Task # Activity

ENV 2.1 M Check that sampling, testing, storage, documentation/manifesting, transportation and disposal of excess materials that is hazardous waste is conducted in accordance with the Contract Documents. A copy of all test results and waste manifests are provided to the Environmental Planner.

ENV 2.2 M Check that standard forms regarding the management of excess material are submitted prior to management of excess material off site.

ENV 2.3 M Check that areas are pre-cleared prior to excess material placement and contour graded and seeded and mulched after placement.

ENV 2.4 Record the locations of management areas and sources of excess material being managed.

ENV 2.5 M Check compliance with conditions on management of disposed fill and materials stockpiled inside the ROW, on MTO property and on third (3rd) party properties covered with letters of agreement.

LEVEL OF INSPECTION – C1

ENV 3 WORK IN, ADJACENT TO, AND OVER WATERBODIES

Task #	Activity
ENV 3.1	Check that sediment and other deleterious substances are prevented from reaching waterbodies.
ENV 3.2	Check that entry of equipment and construction materials to waterbodies and undertaking of any Work is limited to that specified in the Contract Documents and environmental provisions and as may be authorized through environmental permits/approvals.
ENV 3.3	Check that Work specified in the waterbodies and on waterbody banks is in compliance with that specified in the Contract Documents and environmental provisions and as may be authorized through environmental permits/approvals.
ENV 3.4	Check that temporary flow control systems, temporary waterbody crossings, cofferdams and turbidity curtains are installed, maintained and removed in compliance with the Contract Documents.
ENV 3.5	Check that disturbance/damage to waterbody beds, banks and bank vegetation is limited to that specified in the Contract Documents and environmental provisions, and as may be authorized through environmental permits/approvals.
ENV 3.6	Check for compliance with the time constraints specified in the Contract Documents relative to Work in and adjacent to waterbodies.
ENV 3.7	Check that re-grading and restoration measures are undertaken as specified in the Contract Documents and that the erosion/sedimentation control schemes are in place and functioning. Determine if additional erosion control measures or additional locations may be required.

LEVEL OF INSPECTION – C1

– A1 During critical operations (i.e. in-water Work, beginning and ending of dewatering and unwatering operations) except where the Contract Documents require the Contractor to hire a Fisheries Contracts Specialist to oversee the Work or where the Owner has required a Fisheries Contracts Specialist to be part of the CA team.

ENV 4 WORK IN AND ADJACENT TO AREAS OF TREES NOT DESIGNATED FOR REMOVAL

Task #	Activity
ENV 4.1	Check that sediment and other deleterious material are prevented from reaching areas of trees not designated for removal.
ENV 4.2	Check that the specified limits of grading are not exceeded in and adjacent to areas of trees not designated for removal, and that damage/removal of trees is limited to that specified in the Contract Documents and environmental documentation.
ENV 4.3	Check that entry of equipment, construction materials and excess materials to areas of trees not designated for removal is limited to that specified in the Contract Documents and environmental documentation.
ENV 4.4	Check that tree barrier protection is in place prior to commencement of construction activities.
ENV 4.5	Check for proper placement and maintenance of barrier for tree protection.
ENV 4.6	Check for any damage to trees, and have them repaired/replaced as specified in the Contract Documents.

LEVEL OF INSPECTION – C1

ENV 5 CONTROL OF DUST/EARTH/MUD/AGGREGATE/DEBRIS FROM THE WORK

As required by clauses GC 7.07.03 and 7.08.07 of the MTO General Conditions of Contract.

Task #	Activity
ENV 5.1	Check that dust from exposed Work, and from construction operations such as grading, concrete cutting/grinding, abrasive blast cleaning of concrete and steel, and road sweeping, etc. does not cause a nuisance to pedestrian and vehicular traffic within the ROW, adjacent residential/commercial/institutional properties, and is not entering a watercourse or Environmentally Sensitive Area. Check that earth, mud, aggregate and other debris are not tracked onto the roadway by construction vehicles.

LEVEL OF INSPECTION – A1

NOTE: This task shall be performed by all staff on the contract on an “ongoing” basis.

ENV 6 TEMPORARY EROSION AND SEDIMENT CONTROL

As required by OPSS 805 and Applicable Operational Constraint or Item-Specific Non-Standard Special Provisions

Task #	Activity
ENV 6.1 M	**Check that sediment barriers, grade breaks, flow checks, sediment traps, slope drains, diversion ditches, filter bags, turbidity curtains and cofferdams are installed where and when they are specified in the Contract Documents, or as specified in the Contractor's proposals, or are adjusted when installed, according to site conditions and staging activities.**
ENV 6.2	Check that training requirements are being met and that trained personnel are on-site as specified in the Contract Documents.
ENV 6.3	Check that temporary erosion and sediment control measures are installed, maintained and repaired as specified in the Contract Documents.
ENV 6.4	Check that supplies are on site for the purposes of maintenance, repair and adaptive management of erosion and sediment control measures and areas as specified in the Contract Documents.
ENV 6.5	Check that accumulated sediment is cleaned out of temporary sediment control measures and managed as specified in the Contract Documents.
ENV 6.6	Check that temporary erosion and sediment control measures are in effective working condition prior to forecasted rain events, and subsequent to rain events.
ENV 6.7	Check that the Contractor is monitoring all installed temporary erosion and sediment control measures for effectiveness and keeping required records as specified in the Contract Documents.
ENV 6.8	Check that the Contractor responds immediately to sediment discharges to watercourses and other sensitive receptors in accordance with the Contractor's Environmental Incident Management Plan under GC 7.13.02 of the MTO General Conditions of Contract.
ENV 6.9	Check that temporary erosion and sediment control measures are removed and disposed of as specified in the Contract Documents in a manner that prevents sediment escape.
ENV 6.10	Check for compliance with timing constraints on the maximum period between removal of original vegetative surface cover and placement of final specified

surface cover and with the cut-off dates for seed and cover as specified in the Contract Documents.

ENV 6.11 Check that the Contractor installs any additional temporary erosion and sediment control measures that are necessary solely because of preferred construction means, methods, techniques, sequences and procedures selected by the Contractor.

ENV 6.12 Check that the Contractor installs any additional temporary erosion and sediment control measures that were not anticipated during design, but are required because of site conditions or staging activities.

LEVEL OF INSPECTION – A1 During critical operations (i.e. in-water Work, beginning and ending of dewatering and unwatering operations)
– C1 During installation
– C1 Prior to forecasted rain events
– C1 Following rain events
– E1 For routine maintenance, unless maintenance/repairs are required upon inspection and after rain events

ENV 7 ENVIRONMENTAL INCIDENT MANAGEMENT

As required by clause GC7.13.02 of the MTO General Conditions of Contract

Task #	Activity
ENV 7.1 M	**Check that any spill, discharge, emission, release or escape of a material, pollutant, contaminant, deleterious substance or dangerous good as a result of an incident under the control of the Contractor or as a result of the Contractor's operations, is immediately contained according to the Contractor's Environmental Incident Management Plan.**
ENV7.2	Check that the Contractor undertakes immediate notification of the spill/environmental incident to the proper authorities according to the Contractor's Environmental Incident Management Plan.
ENV 7.3	Check that the Contractor undertakes cleanup and restoration of the environment to pre-spill/environmental incident conditions according to the Contractor's Environmental Incident Management Plan.
ENV 7.4 M	**If the Contractor is unable or unwilling to take the appropriate actions to contain the spill, make the appropriate notifications, clean up the spill and restore the environment or if there is any doubt whether notifications have been made the CA shall make the immediate notifications on behalf of the Contractor and take any other action necessary to protect the environment until such time as the Contractor is able or willing to provide the required response.**
ENV 7.5	Check that the Contractor completes the Incident Notification Form (PH-CC-818) within forty-eight (48) hours of the incident.

LEVEL OF INSPECTION – A1 Upon notification to the CA by the Contractor of an incident as required by MTO GC 7.13.02, or upon direct discovery by the CA

ENV 8 PROTECTION OF WATERBODIES AND WATERBODY BANKS

As required by OPSS 182, and as applicable SP101F23

Task #	Activity
ENV 8.1	Check that copies of all permits and licences obtained from regulatory agencies are submitted upon receipt and that any permits required to be kept on site are available for inspection as specified in the contract documents.
ENV 8.2	Check that timing of in-water work complies with timing windows specified in the contract documents.
ENV 8.3	Obtain the names of the Fisheries Contracts Specialist and Fisheries Assessment Specialist to be retained by the contractor, if applicable, and verify they are registered in the appropriate Specialty on RAQS.
ENV 8.4	Check that a Licence to Collect Fish for Scientific Purposes has been obtained from the Ontario Ministry of Natural Resources and Forestry (MNRF) prior to any in-water works where a Fisheries Contracts Specialist is not required to be retained by the contractor.
ENV 8.5	Check that safe fish passage is maintained at all times during the work unless otherwise specified in the contract documents or approved under a change proposal. If fish become stranded by the work check that they are rescued in accordance with the Licence to Collect Fish for Scientific Purposes and that all persons conducting electrofishing for this purpose possess a valid Ontario Electrofishing Certification.
ENV 8.6	Check that any water intakes or outlet pipes in fish bearing waters have been fitted with screens to prevent entrainment or impingement of fish and that the measures used comply with the DFO Fisheries and Oceans Freshwater Intake End-of-Pipe Fish Screen Guideline.
ENV 8.7	Check that the presence of aquatic Species at Risk and/or any mortality of aquatic Species at Risk that occur during fish rescue are reported to MNRF and DFO as specified in the contract documents.
ENV 8.8	Check that the Fisheries Contracts Specialist is on-site to inspect and confirm proper installation, functioning and decommissioning (as appropriate) of all temporary and permanent mitigation measures, and as applicable, offsetting measures required by Fisheries Act Authorization, as specified in the contract documents.
ENV 8.9	Check that the Fisheries Contracts Specialist completes all services, oversight and documentation requirements specified in the contract documents, as applicable.

ENV 8.10 Check for compliance with all general construction requirements and operational constraints as well as any additional measures to avoid harm to fish specified in the contract documents, as applicable.

LEVEL OF INSPECTION – C1

ENV 9 PROTECTION OF SPECIES AT RISK

As required by Operational Constraints and Item Applicable Item Specific Special Provisions

Task #	Activity
ENV 9.1	Check that the Contractor is aware of all Species at Risk that are known to be present within or adjacent to the contract limits as specified in the contract documents.
ENV 9.2	Check that the Contractor abides by any prohibitions against entry into Environmentally Sensitive Areas specified in SSP199F12 applicable to Species at Risk.
ENV 9.3	Check that the Contractor has a copy of any authorizations (e.g. permits, registrations) under the Endangered Species Act (ESA), 2007 on-site that apply to the Work, as required and specified in SSP199F31 if provided in the Contract Attachments or at the Pre-start Meeting.
ENV 9.4	Check that the Contractor is aware that the CA must be notified if the Contractor encounters Species at Risk that were not known to be present and therefore have not been identified in the contract documents in accordance with SSP100S14 that amends GC 3.07 Delays.
ENV 9.5	Follow direction in CAITM Part A upon notification by the Contractor that Species at Risk not known and identified in the contract documents have been encountered in accordance with SSP100S14.
ENV 9.6	Check that the Contractor provides protection of Species at Risk as specified in the contract documents including installation of exclusion measures and habitat features and compliance with all timing constraints, and monitoring, handling and notification requirements.
ENV 9.7	Check that the Contractor completes and submits to the CA all MNRF Natural Heritage Information Centre Species at Risk Observation Reporting Forms as specified in the contract documents.

LEVEL OF INSPECTION – C1
– B1/A2, during installation of exclusion measures and habitat features

ENV 10 PROTECTION OF MIGRATORY BIRDS

As currently required by Operational Constraint and Item Specific Non-Standard Special Provisions

Task #	Activity
ENV 10.1	Check that the Contractor has removed all non-active bird nests from structures prior to the nesting period for migratory birds as specified in the contract documents, before commencing any Work on the structures.
ENV 10.2	Check that the Contractor installs and maintains bird nesting preventative measures on structures after removal of non-active nests as specified in the contract documents and monitors structures to verify that the nesting preventative measures are working as intended.
ENV 10.3	Check that the Contractor is aware that the CA must be notified if the Contractor encounters active bird nests (nests with young and/or eggs) during the Work. Follow direction in CAITM Part A upon notification by the Contractor that active bird nests have been found during construction.
ENV 10.4	Check that the Contractor abides by all timing constraints for the Work to protect nesting migratory birds and their young and eggs from disturbance as specified in the contract documents.

LEVEL OF INSPECTION – C1

ENV 11 WILDLIFE MITIGATION MEASURES

As currently required by Operational Constraint and Item Specific Non-Standard Special Provisions

Task #	Activity
ENV 11.1	Check that the Contractor completes proper layout and staking of the limits and locations of all permanent wildlife exclusion fencing and escape ramps and/or gates, as applicable, to be installed for large and small animals as specified in the contract documents.
ENV 11.2	Check that all debris, trees, stumps, brush and logs have been removed and ground undulations have been corrected along the fenceline to obtain a smooth and uniform gradient prior to fence installation.
ENV 11.3	Check that trenches excavated to embed fencing and aprons that outfall to a waterbody are protected against soil erosion and sedimentation of the waterbody.
ENV 11.4	Check that the Contractor installs all permanent wildlife exclusion fencing with the fence fabric placed on the proper side of the posts (highway-side or wildlife side), as specified in the Contract Documents.
ENN 11.5	Check that fence ends are tied into embankments, escape ramps and/or gates or associated wildlife passages, as applicable, leaving no gaps greater than 15 cm to prevent animals getting through the fencing.
ENV 11.6	Check that fence tops are angled as specified to keep animals from climbing over the fence and that the bottom of the fence or attached apron is embedded into the surrounding earth or rock to prevent animals from climbing under the fence.
ENV 11.7	Check that all escape ramps and/or gates are installed leaving no gaps greater than 15 cm between the exclusion fencing and the escape ramps and gates. Check that gates are tensioned to allow proper functioning.
ENV 11.8	Check that all new habitat features and wildlife passages under and over the road are installed as specified in the contract documents including retrofits to existing habitat areas and structures (i.e. bridges and culverts) such as the addition of substrate material or dry-land ledges.

LEVEL OF INSPECTION – B1/A2

ENV 12 WATER TAKING

As required by the Ontario Water Resources Act, O. Reg. 387/04 Water Taking and Transfer and the Ontario Environmental Protection Act, O. Reg. 63/16 Registrations under Part II.2 of the Act – Water Taking and in relation to SSP100S59 and OPSS.PROV 517

Task # **Activity**

Active (with pumping) In-stream Diversions:

ENV 12.1 Check that the Contractor meets the following regulatory requirements:

(i) The water taken from the waterbody is returned directly to the same waterbody;
(ii) There is no visible petroleum hydrocarbon film or sheen present in the returned water;
(iii) Measures are implemented to control the rate of water taking and the flow rate of the returned water such that water quantity and quality are not affected upstream or downstream of the work area;
(iv) Erosion and sediment control measures are installed, used, maintained, removed and disposed along with accumulated sediment according to the Contract Documents and manufacturers' instructions; and
(v) No pumps are refuelled within 30 m of the waterbody.

Water Taking for Road Construction Purposes and Construction Site Dewatering

ENV 12.2 Check that the Contractor has provided confirmation of registration in MOECC's Environmental Activity Sector Registry (EASR), copies of final Permits to Take Water and any required Director's Orders exempting water taking activities from registration obtained from MOECC, as applicable, prior to commencing water taking activities.

ENV 12.3 Check that the Contractor meets the following regulatory requirements, as applicable:

(i) Any reports, plans or monitoring programs required to be prepared by a Qualified Professional to support registration in the EASR are on-site and are provided to MOECC upon request;
(ii) Any measures identified in the reports, plans and monitoring programs to be taken in specified circumstances are implemented as required;

(iii) Written notice has been provided to municipalities and conservation authorities within whose jurisdiction the water taking is located including the Contractor's name and the dates and locations of the water taking;
(iv) The flow rate of any permanent stream from which water is being taken is measured each day as specified in the reports prepared to support registration or using an alternate methodology as provided by the Contractor's Qualified Professional, and that the instantaneous rate of water taking from the stream does not exceed 5 per cent of the stream flow rate at the point of the water taking;
(v) A daily log is maintained that includes the waterbody names and locations (using UTM co-ordinates), the average rate of water taking in litres/second, the flow rate if water is being taken from a stream measured according to reports supporting registration in EASR or an alternate methodology as provided by the Contractor's Qualified Professional, and the total volume of water taken in litres;
(vi) Erosion and sediment control measures are installed, used, maintained, removed and disposed along with accumulated sediment according to the Contract Documents and manufacturers' instructions;
(vii) The refuelling of any equipment used in the water taking activity does not occur within 30 m of the waterbody;
(viii) Spill clean-up and containment equipment is available on-site during water taking;
(ix) There is no visible petroleum hydrocarbon film or sheen present in the water when water is discharged from the construction site;
(x) When water is discharged to a location within 30 metres of a waterbody, turbidity of the discharge does not exceed 8 Nephelometric Turbidity Units (NTU) above the background levels of the nearest waterbody;
(xi) If a method of discharge from a construction site includes a location that is within 30m of a waterbody, the MOECC District Office is notified prior to the first discharge; and
(xii) Any complaints received during water taking that relate to the natural environment are reported to the MOECC Spills Action Centre at 1-800-268-6060; the date, time, circumstances of the complaint and measures taken are recorded; and a copy of any written complaints is retained.

LEVEL OF INSPECTION – C1/A2

WEIGHED MATERIALS

WM 1 VERIFICATION OF THE PLACEMENT OF WEIGHED MATERIALS

Task #	Activity
WM 1.1 M	**Witness the dumping of the material and view that each load is completely dumped.**
WM 1.2 M	**Collect one (1) original and two (2) copies of the weight ticket from the truck operator at the dumping point. Check that the material is placed in the area designated for that type of material.**
WM 1.3	Check that the type of material delivered is the same as the type of material indicated on the weight ticket.
WM 1.4	Visually inspect each load of material and report any obvious defects or deficiencies.
WM 1.5	Check that the weight ticket is completely filled out.
WM 1.6	Write the word “Cancelled” on weight tickets for loads of material rejected or not received on the job. Record the reason on the ticket and sign it.
WM 1.7	Fill in the line “placed” on the weight ticket (i.e. station and use of the material).
WM 1.8	Sign the original and the two (2) copies of the weight ticket.

LEVEL OF INSPECTION – A1/A2