CONSTRUCTION ADMINISTRATION AND INSPECTION TASK MANUAL

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PART B: TASKS

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 as per 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:

> 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 ensure a quality end product. This situation must be reported to the Contract Control Officer.

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.

GRADING AND DRAINAGE – TASK 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 1st to August 1st).
GD 1.3	Check that all clearing, close cutting and grubbing debris is removed and managed as per OPSS 180.
GD 1.4	Check that clearing, close cutting and grubbing is carried out to the limits given.

LEVEL OF INSPECTION – B1/E2

GRADING AND DRAINAGE – TASK GD 2

BOULDER CLEAN-UP

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

LEVEL OF INSPECTION – B1/E2

GRADING AND DRAINAGE – TASK 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	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, ensure proper documentation is kept to carry out a recalculation.**

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK GD 4

SWAMP TREATMENT

Task # **Activity**

GD 4.1 Floating the road.

(i) Check during construction that the integrity of the mat material is maintained.

(ii) Check that no rock fill 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.

(vi) Confirm each layer is built using an outside to inside sequence by keeping the outer one third portions of the layer a least 30 metres 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 as per Special Provisions (time, pore pressure dissipation levels, etc.)

(ix) Check that culverts are installed with specified articulation and or camber.

GD 4.2 M Excavation

(i) Survey and record the limits and depth of the excavation and compare them to the design limits.

(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.

(iv) Ensure, if using Truck Rental items for disposal of swamp excavation, that hours are for the time that the trucks are working, and verify the efficiency of operation to ensure that 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).

(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.

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

LEVEL OF INSPECTION – A2

GRADING AND DRAINAGE – TASK GD 5

EARTH CUT

Task #	Activity
GD 5.1 M	**Check suitability of cut material for use as fill in other locations. Consult with Contract Control Officer if anticipated volume of suitable earth material from individual cuts differs markedly from Contract estimate.**
GD 5.2	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 5.3 M	**Check that treatment of frost susceptible soil area is completed as specified in the contract documents. Check the Contractor's records to ensure that the disposition of material from each earth cut area is recorded.**
GD 5.4 M	**Boulders 1 cubic metre and greater in volume are measured and recorded for payment as rock excavation.**
GD 5.5	Check for proper crown and that adequate drainage is maintained.
GD 5.6	Check that the excavation is carried out to the required geometry and depth.
GD 5.7 M	**Verify and record that grading tolerances are correctly applied and all slopes conform to the acceptance envelope.**
GD 5.8	Check that longitudinal and transverse transition treatments (cut to fill, fill to fill) are constructed correctly.
GD 5.9	Check that soil sloughing is avoided and controlled during excavation procedure.
GD 5.10	Check that toe drains, slope drains and / or interceptor ditches are properly constructed.
GD 5.11	Check that erosion and sediment control schemes (i.e. gravel sheeting, rip rap, rock protection) are in place and functioning properly prior to earth excavation and that temporary or permanent erosion control measures are implemented following earth excavation, as required by the contract. Determine if additional erosion control measures or locations are required.

GD 5.12 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

GRADING AND DRAINAGE – TASK GD 6

EARTH EMBANKMENT

Task #	Activity
GD 6.1 M	**Check that erosion and sediment control schemes are in place and functioning. Determine if additional erosion control measure, or additional locations may be required.**
GD 6.2	Check that any organic or deleterious material is sub-excavated prior to embankment construction.
GD 6.3	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 ensure target density is obtained.**
GD 6.5	Inspect embankment construction to ensure 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 cross fall 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	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 as per Special Provisions.

LEVEL OF INSPECTION – D2

GRADING AND DRAINAGE – TASK GD 7

ROCK CUT

Task #	Activity
GD 7.1	Check to ensure 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 7.2 M	**Check that overburden is excavated from each transition treatment area prior to blasting.**
GD 7.3	Check that removal of overburden and earth is carried out sufficiently in advance to permit surveying of original rock cross-sections.
GD 7.4	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 7.5 M	**Survey for payment purposes all original and stripped rock cross-sections and ensure 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 or to the cross-section rolls. Ensure 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 7.6	Check that blasting design, blasting permit, and pre-construction survey have been submitted.
GD 7.7	Check qualifications of the Blasting Designer.
GD 7.8	Check that proper notifications are provided to the appropriate authorities.
GD 7.9	Check that all safety precautions are observed prior to blasting, including the sounding of audible warning device before and after blasting as required.

GD 7.10 Check that protective measures to control fugitive flyrock, as specified, are used around private properties and/or utility locations.

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 Check that extra depth shatter is verified and drilling depths recorded.

GD 7.15 Check that drilling pattern is as per 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 Control Officer. Ensure any special rockfall hazard designs have been properly implemented, as indicated in the contract documents.

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

GD 7.19 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 7.21M 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 ensure rock mass stabilization.

GD 7.23 Check that appropriate notification is conducted prior to blasting.

GD 7.24 Check that blasting monitoring equipment, procedure and recording is conducted as specified.

LEVEL OF INSPECTION – C2

GRADING AND DRAINAGE – TASK GD 8

ROCK EMBANKMENT

Task #	Activity
GD 8.1	Check that rock fill is built in accordance with SP206S03, unless otherwise specified in the contract documents.
GD 8.2	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 rock fill is not placed on frozen soil.
GD 8.4	If rock fill is used to displace soft underlying materials, the centre should be kept ahead of the sides or one 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	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	Record daily, the construction of Rock Fill (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 Rock fill placement is such that mud waves are displaced away from the embankment.

LEVEL OF INSPECTION – D2

GRADING AND DRAINAGE – TASK 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

GRADING AND DRAINAGE – TASK GD 10

FROST HEAVE TREATMENT

Task #	Activity
GD 10.1	Check that material supplied by the Contractor is sampled as required.
GD 10.2	Check that the polystyrene complies with environmental specifications.
GD 10.3 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 10.4	Check to ensure adequate drainage from treated area.
GD 10.5	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 10.6	Check that backfill materials comply with the specifications and are compacted to the target density.

LEVEL OF INSPECTION – B2

GRADING AND DRAINAGE – TASK GD 11

BASE AND SUBBASE

Task #	Activity
GD 11.1	Check that the Contractor has submitted QC test results prior to delivery of materials and that they meet the physical property and production requirements as specified in the contract documents.
GD 11.2	Check for any evidence of contamination from subgrade pumping into subbase and have the Contractor take appropriate corrective action.
GD 11.3	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 11.4 M	**Check that subbase and base materials comply as specified in the contract documents. Check that no Blast Furnace Slag material is being place in the base and sub base. Check Contractor's compaction density readings to see that all the work falls within the specified tolerances.**
GD 11.5 M	**Check that Contractor has obtained the required weigh scale certification in accordance with the contract documents.**
GD 11.6 M	**Verify and record horizontal and vertical grading tolerances prior to the placement of the next type of material or pavement.**
GD 11.7	Check that material control, distribution and weighing conform to the contract documents.

LEVEL OF INSPECTION – D2

GRADING AND DRAINAGE – TASK GD 12

RESTORING ROADWAY SURFACES

Task #	Activity
GD 12.1	Check that the restored roadway surface is compacted to the target density.
GD 12.2 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

GRADING AND DRAINAGE – TASK GD 13

GRADE AND COMPACTION

Task # **Activity**

Horizontal and Vertical Grading Tolerances

GD 13.1 M **A monitoring checking frequency of a minimum of 25% (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 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 Control Officer. 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.**

Compaction

GD 13.2 M **A testing frequency of a minimum of 25% (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 base. When one half 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 Control Officer.**

LEVEL OF INSPECTION – D2

GRADING AND DRAINAGE – TASK GD 14

BORROW PITS AND QUARRIES

Task #	Activity
GD 14.1	Check that the pit or quarry is worked to the approved line and grade and appropriate measurements are taken to support payment.
GD 14.2 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 14.3	Check that stripping material does not contaminate the borrow.
GD 14.4	Check that the operation of the pit or quarry is carried out in accordance with the Aggregate Sources List, site plan and permit / Letter of Approval. 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 Control Officer immediately.
GD 14.5 M	**Check that the rehabilitation of the pit or quarry, at the completion of the job, is in accordance with the site plan.**

LEVEL OF INSPECTION – C1

GRADING AND DRAINAGE – TASK GD 15

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

Task #	Activity
GD 15.1	Check that required stripping is carried out and all unsuitable material is removed from the pit or quarry face. Visually inspect for seams of unsuitable material in pit or quarry face during extraction.
GD 15.2	Check that the Contractor is working the pit or quarry in accordance with the Aggregate Sources List, in the area indicated on the site plan and to the depths indicated on the log of test holes where applicable.
GD 15.3	Check that the operation of the pit or quarry is carried out in accordance with the site plan and Aggregate / Wayside Permit / Letter of Approval. If the Contractor does not operate in accordance with the site plan standards and / or the operational requirements, notify the Contractor by Instruction Notice and notify the Contract Control Officer immediately.
GD 15.4 M	**Check that the rehabilitation of the pit or quarry, at the completion of the job, is in accordance with the site plan.**

LEVEL OF INSPECTION – C1

GRADING AND DRAINAGE – TASK GD 16

EQUIPMENT RENTAL

Task #	Activity
GD 16.1	Record that the equipment used meets the requirements specified in the contract documents (i.e. size, capacity, horsepower).
GD 16.2	Check the efficiency of operation to ensure productivity of rented equipment.
GD 16.3	Record and verify hours daily with the Contractor.
GD 16.4 M	**The CA shall issue one 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 – D2 =

GRADING AND DRAINAGE – TASK GD 17

DITCHING

Task #	Activity
GD 17.1 M	**Check that appropriate measures are taken to prevent erosion of ditches prior to the start of ditching. 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 17.2 M	**Check that ditch grading tolerances are correctly applied and all slopes conform to acceptance envelope.**
GD 17.3	Check that suitable material excavated from ditches is utilized in fill areas.
GD 17.4	Check that unsuitable material is managed as specified in the contract documents.
GD 17.5 M	**Check for positive drainage from field tiles.**

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK GD 18

SUBDRAINS

Task #	Activity
GD 18.1	Check specified size of pipe, including filter material.
GD 18.2	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 18.3	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 18.4	Check that couplings are suitable for and compatible with the class and type of pipe and installed correctly.
GD 18.5 M	**Check that granular materials comply with the specifications and are compacted to the target density.**
GD 18.6	If impervious clay cap is required, check that cap is properly built.
GD 18.7	Check that proper connection to manholes, catchbasins, and ditch inlets (grouting and grade) are made.
GD 18.8	Check that each outlet location is marked with an approved marker and is visible from the driving portion of the roadway.
GD 18.9	Check that outlet and collector pipers are not crushed during backfilling operations.
GD 18.10	Check that outlet and collector pipes are placed to required slope and grade to ensure gravity flow.
GD 18.11	Check that rodent grates are installed securely and quickly after subdrain installation.
GD 18.12	Check that the trenches are excavated to the width, grade and alignment specified in the Contract Documents.
GD 18.13	Check for trench stability during excavation.

GD 18.14 Check that pipe bedding and backfilling is conducted as specified.

GD 18.15 Check that inspection report is completed by the Contractor for the excavation, bedding and backfilling.

GD 18.16 Check that a non-woven geotextile is used to wrap the trench when 19 mm clear stone is specified as backfill.

GD 18.17 Check that video camera inspection is conducted as specified.

LEVEL OF INSPECTION – D2

GRADING AND DRAINAGE – TASK 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	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 19.3	Check to ensure that the dewatering and flow passage arrangements comply with restrictions / provisions specified in the contract.
GD 19.4	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 19.5	Check to ensure 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 M	**Confirm and record limits of excavation (width and depth) to ensure that 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 19.9	For crossings identified as watercourses in the contract documents, survey existing streambed elevation prior to construction to ensure that the new culvert depth is at or below the exiting streambed elevation (i.e. a

minimum 300mm depression unless otherwise specified in the contract documents) to create low flow channel.

GD 19.10 Check for signs of basal heave due to unbalanced hydrostatic head conditions.

GD 19.11 Check for working slabs / working pads.

GD 19.12 Check that any temporary protection scheme to facilitate the excavation and construction of the culvert is carried out.

LEVEL OF INSPECTION – C2

GRADING AND DRAINAGE – TASK GD 20

BEDDING AND BACKFILL FOR CULVERTS

Task #	Activity
GD 20.1	Check that erosion and sediment control schemes are in place and functioning prior to placement of bedding and backfill. Determine if additional erosion control measures, or additional locations may be required.
GD 20.2	Check that dewatering 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 20.3 M	**Check that the bedding and backfill materials are sampled as required, comply with the specifications, and are compacted to the target density. Check that the proper compacted lift thickness is as specified. (Elevation not to exceed existing streambed elevation.)**
GD 20.4	Check the bedding site for: transition from firm to soft material; high points; soft spots; stones or boulders under culvert; general foundation problems due to unstable soil conditions. Investigate pipe relocation to avoid cutting the organic mat when the embankment rides the swamp.
GD 20.5	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 20.6	If required, check that upstream end of the pipe is embedded in clay and properly compacted to prevent seepage.
GD 20.7	Check for proper camber.
GD 20.8	Check that the bedding and the backfill materials are placed in the dry, and as specified in the contract documents.
GD 20.9	Check that backfill is compacted under the haunches.
GD 20.10	Check that backfill is brought up evenly on both sides of the pipe at the same time.
GD 20.11	Check that compaction equipment does not impose excessive vibrations on structure.

GD 20.12 Check that specified depth of cover is placed before heavy equipment is allowed over culvert location.

GD 20.13 Check that strutting requirements are met when required.

GD 20.14 Check frost taper requirements are met and dimensions recorded.

GD 20.15 For crossings identified as watercourses in the contract documents, survey existing streambed elevation if not provided in the contract documents to ensure that the new culvert depth does not exceed the exiting streambed elevation (i.e. a minimum 300mm depression unless otherwise specified in the contract documents) to maintain low flow channel.

GD 20.16 Check excavation limits.

GD 20.17 Check that proper gaskets and couplers are used.

GD 20.18 Check that advanced dewatering is conducted as required to prevent soil sloughing, basal heave and boiling.

LEVEL OF INSPECTION – C2

GRADING AND DRAINAGE – TASK GD 21

SEWER IN TRENCH

Task #	Activity
GD 21.1	Check that erosion and sediment control schemes are in place and functioning prior to the start of trenching for sewer. Determine if additional erosion control measures, or additional locations may be required.
GD 21.2	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 21.3	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 21.4	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 21.5	Check that the founding soil is sound and undisturbed.
GD 21.6 M	**Check that alignment, grade and designed widths are adhered** to, as loading on pipe is partially dependent on trench widths.
GD 21.7	Check that specified bedding is used and constructed as per contract requirements.
GD 21.8	Check all pipes to ensure correct class and reject those that are damaged and cannot be repaired.
GD 21.9	During progress of work, check that pipes and connections are kept clean and free of foreign material.
GD 21.10	Check that all gaskets and joints are tight.
GD 21.11 M	**Check that backfill materials are as specified in the contract and the required compaction checks are made.**
GD 21.12	Check that oversize particles are removed.
GD 21.13	Where applicable, check that joints are lapped in direction of flow.

GD 21.14 Check that proper equipment is used for compaction until the specified depth of cover over the pipes is achieved.

GD 21.15 Check that backfill is placed evenly on both sides of the pipe.

GD 21.16 Record trench widths, type of bedding and type of backfill.

LEVEL OF INSPECTION – D2

GRADING AND DRAINAGE – TASK GD 22

SEWER TUNNEL / JACK AND BORE

Task #	Activity
GD 22.1	Check that erosion and sediment control schemes, and cofferdams are in place and functioning prior to the start of tunnelling. Determine if additional erosion control measures, or additional locations may be required.
GD 22.2	Check that sheetflow from stockpiles of excavated material is intercepted using silt fence, straw bale or sandbag barriers. Check that stockpiles are positioned away from waterbodies.
GD 22.3	Check that dewatering 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 22.4	Check that sufficient indicators are set up and maintained to detect and monitor any movements within and outside the tunnel.
GD 22.5	Check that techniques employed meet the specification.
GD 22.6	Check that alignment and grade are maintained.
GD 22.7	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 22.8	Check that permanent liners are supplied and installed.
GD 22.9	Check and verify the soil spoil.
GD 22.10	Check that grouting materials are properly supplied and placed.
GD 22.11	Report all ground movements, failures, seepage zones and changes in soil conditions to the Contract Control Officer.
GD 22.12	Check that appropriate dewatering is conducted to avoid soil cave-in and sloughing during the tunnelling.
GD 22.13	Check to verify any obstructions attributable to boulders and cobbles.

GD 22.14 Check that a preconstruction survey has been conducted.

GD 22.15 Check that excavation shafts and shoring systems are stable.

GD 22.16 Check that stamped working drawings are submitted.

GD 22.17 Check for Tunnel Portal Work Plan.

GD 22.18 Check for Primary Support plans, including materials, connection details and method of installation.

GD 22.19 Check for Tunnel Excavation Work Plan including sequence, dimensions, methods, provisions for controlling line and grade, ventilation and muck handling methods.

GD 22.20 Check Secondary Liner materials, installation.

GD 22.21 Check criteria for assessment of Roadway subsidence.

LEVEL OF INSPECTION – C2

GRADING AND DRAINAGE – TASK GD 23

WATERMAIN IN TRENCH

Task #	Activity
GD 23.1	Check that erosion and sediment control schemes are in place and functioning prior to the start of trenching. Determine if additional erosion control measures, or additional locations may be required.
GD 23.2	Check that dewatering 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 23.3	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 23.4	Check that excavations are free of water at all times.
GD 23.5 M	**Check that alignment and designed widths are adhered to as loading on pipe is partially dependent on trench widths.**
GD 23.6	Check that specified bedding is used and constructed as per contract requirements.
GD 23.7	Check that watermain is placed in trench to depth as specified in the contract for frost penetration.
GD 23.8	Check all pipes to ensure correct type and class.
GD 23.9	During progress of work check that pipes, connections and appurtenances are kept clean and free of foreign material.
GD 23.10	Check that all pipe ends are lubricated with material recommended by the pipe manufacturer prior to installation.
GD 23.11	Check that fabricated bends are used when changes in line or grade are required.
GD 23.12	Check that any connections, caps and bends are provided with thrust blocks and wedges.

GD 23.13 M Check that backfill materials are as specified in the contract documents and the required compaction checks are made.

GD 23.14 Check that backfill is brought up evenly on both sides of the pipe at the same time.

GD 23.15 Check that oversize particles are removed.

GD 23.16 Check that appropriate equipment is used for compaction until the specified depth of cover over the pipe is achieved.

GD 23.17 Observe all appropriate testing for approvals.

GD 23.18 Check that top of pipe elevations are recorded.

GD 23.19 Check that measurements of bends, ties, connections, etc. are recorded.

GD 23.20 Check that watermains are flushed and disinfected as specified.

GD 23.21 Check that the founding soil is sound and undisturbed.

LEVEL OF INSPECTION – C2

GRADING AND DRAINAGE – TASK GD 24

MANHOLES, CATCHBASINS, AND DITCH INLETS

Task #	Activity
GD 24.1	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.
GD 24.2	Check type, alignment, offset and grades of manholes, catchbasins and ditch inlets.
GD 24.3	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	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	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

GRADING AND DRAINAGE – TASK GD 25

GEOTEXTILE

Task #	Activity
GD 25.1	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.
GD 25.2	Check that material supplied by the Contractor is sampled as required and forwarded for testing.
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 days.
GD 25.8	Check that drop height for material placed onto it is less that 1 metre to ensure material is not damaged.
GD 25.9	Check that sufficient geotextile is placed on the ditch sides to ensure water does not erode 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

GRADING AND DRAINAGE – TASK GD 26

GRANULAR BLANKET

Task #	Activity
GD 26.1	Check that erosion and sediment control schemes are in place and functioning prior to start of excavation. Determine if additional erosion measures, or additional locations may be required.
GD 26.2	Check that granular materials comply with the specifications.
GD 26.3 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 26.4	Check that granular blanket is placed as excavation progresses and completion of the blanket coincides with completion of the cut.
GD 26.5	Check construction of interceptor ditches.
GD 26.6	Check the placement of any subdrains below the ditch line.
GD 26.7	Check that care is taken in placement to minimize segregation, especially if placed under water.
GD 26.8	Check thickness and evenness of placement to ensure a stable free draining slope material.

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK GD 27

RIP RAP

Task #	Activity
GD 27.1	Check that erosion and sediment control schemes are in place and functioning prior to the placement of rip rap. Determine if additional erosion measures, or additional locations may be required.
GD 27.2	Check that rip rap material is the specified quality and size.
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

GRADING AND DRAINAGE – TASK GD 28

GABIONS

Task #	Activity
GD 28.1	Check that erosion and sediment control schemes (and coffer dams if required) are in place and functioning prior to the installation of gabions. Determine if additional erosion control measures, or additional locations may be required.
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, ensure that work is isolated from the water as specified. Ensure that timing restrictions are adhered to, as specified.
GD 28.4	If working at a watercourse, 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, hoses, sediment bags, etc.) on site as required in the environmental submission.
GD 28.5	Confirm that any other relevant environmental constraints have been addressed.
GD 28.6	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 28.7	Check that bed is uniform, trimmed, not frozen and consolidated and check for the need of scour protection.
GD 28.8	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.

GD 28.14 Check that the founding soil is sound and undisturbed.

LEVEL OF INSPECTION – C1/E2

GRADING AND DRAINAGE – TASK GD 29

TOPSOIL

Task #	Activity
GD 29.1	Verify that original cross-sections have been taken on the topsoil stockpile prior to use and final cross-sections taken for payment.
GD 29.2	Check that topsoil stockpiles are positioned away from waterbodies.
GD 29.3	Check that erosion and sediment schemes are in place and functioning. Sheet flow from stockpiles should be intercepted using silt fence, straw bale or sandbag barriers. Determine if additional erosion control measures, or additional locations may be required.
GD 29.4	Check the quality of imported topsoil in accordance with the contract documents.
GD 29.5	Check that imported topsoil trucks are measured and tickets issued in accordance with the ministry requirements.
GD 29.6	Check that topsoil is not used for filling depressions or wasted.
GD 29.7 M	**Check that topsoil is spread uniformly to the depth specified.**

LEVEL OF INSPECTION – B1/E2

GRADING AND DRAINAGE – TASK GD 30

SODDING

Task #	Activity
GD 30.1	Check that erosion and sediment control schemes are in place and functioning prior to sodding. Determine if additional erosion control measures, or additional locations may be required.
GD 30.2 M	**Check that scarification and preparation of topsoil has been carried out.**
GD 30.3	Check application of fertilizer.
GD 30.4	Check sod before placement to ensure condition is as specified.
GD 30.5	Check placement of sod ensuring that the staking pattern is correct and that the sod edges are countersunk.
GD 30.6	Check the stake dimensions to ensure that they conform to specification requirements.
GD 30.7	Check that sod is applied within the appropriate period and in accordance with the applicable timing constraints as specified in the contract documents.
GD 30.8	Ensure that sodding operation is complete at temperatures or time of year allowed by specification or shown in the contract documents.
GD 30.9 W	**Check that the end result meets the provision of the warranty requirements. Follow the inspection intervals specified in the Special Provision.**

If Warranty is included only do items noted with "W"
If No Warranty is included do all items.

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK GD 31

SEEDING AND MULCHING

Task #	Activity
GD 31.1	Check that erosion and sediment control schemes are in place and functioning prior to seeding and mulching. Determine if additional erosion control measures, or additional locations may be required.
GD 31.2	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 31.3	Check that material supplied by the Contractor is sampled as required.
GD 31.4 W	**Check that material supplied by the Contractor bears a label indicating the specified information.**
GD 31.5	Check that hydraulic seeding/mulching equipment has the tank volume certification plate affixed in plain view.
GD 31.6 M	**Check specified preparation of soil prior to seeding and mulching.**
GD 31.7	Check that hydraulic seeder/mulcher is calibrated before commencement.
GD 31.8	Check that the designer's choice of seed type is used.
GD 31.9	Check that the designer's choice of ground cover is used.
GD 31.10 M	**Ensure the specified cover is applied as a separate operation immediately after the application of seed, fertilizer and water.**
GD 31.11	Check charging of seeder, recording amounts of seed, fertilizer and/or hydraulic mulch placed in tank.
GD 31.12	Check that asphalt tank on mulcher has been inspected for cleanliness and calibration.
GD 31.13	Check that mulch is applied within one hour of being charged into the hydraulic seeder/mulcher tank.
GD 31.14	Check specified rates and uniform application of seed fertilizer, hydraulic mulch, or straw mulch and asphalt adhesive.
GD 31.15	Ensure that seeding / mulching operation is completed at temperatures or time of year allowed by specification or shown in the contract documents.

GD 31.16 If erosion control blanket is used, check that it is applied and stapled according to manufacturers installation instructions.

GD 31.17 Check for growth of plant material, and / or erosion of seeded areas.

GD 31.18 W Check that the end result meets the provisions of the warranty requirements. Follow the inspection intervals specified in the Special Provision.

If Warranty is included only do items noted with "W"
If No Warranty is included do all items

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK GD 32

FENCE

Task #	Activity
GD 32.1 W	**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 ensure 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	Check that fence is placed in accordance with the requirements of the property agreements.
GD 32.6	Check that fence posts are the specified length.
GD 32.7	Check that all end, corner, anchor, line, straining and gate posts are properly installed with regard to depth, alignment, and spacing.
GD 32.8	Check all bracings are correctly installed.
GD 32.9	Check that loose material in the bottom of the posthole is tamped or removed prior to placing the posts.
GD 32.10	Check that all posts are vertical with the large end down and that the backfill is properly tamped.
GD 32.11	Check that steel wire for chain link fence fabric conforms to CAN2-138.1-M and has a uniform 50mm diamond pattern.
GD 32.12	Check that all fittings and accessories for chain link fences are galvanized.
GD 32.13	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 32.14 Check that all fences are maintained throughout the duration of the contract.

GD 32.15 Check that concrete footings are constructed properly with regards to forming and placement of concrete.

GD 32.16 Check that all abraded and damaged surfaces are repaired and coated with approved zinc pigmented paint.

GD 32.17 W Check that the results meet the provisions of the warranty requirements.

If Warranty is included only do items noted with "W"
If No Warranty is included do all items

LEVEL OF INSPECTION – E1

GRADING AND DRAINAGE – TASK GD 33

GUIDE RAIL

Task #	Activity
GD 33.1	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.
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 ensure 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.

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 is 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 that 250mm.

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

GRADING AND DRAINAGE – TASK GD 34

ECCENTRIC LOADER BARRIER AND EXTRUDERS

Task # **Activity**

GD 34.1 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.

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 Control Officer.

I. Check the preservative treated wood to ensure 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 3m wide and 30m long behind the end treatment that the ground is not steeper than 4:1 and is traversable (protrusions, rip rap, etc. size below 75mm are acceptable).

III. Check that the strut between foundation tubes at post one and two 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 as per the contract documents.

LEVEL OF INSPECTION – E1

GRADING AND DRAINAGE – TASK GD 35

TEMPORARY CONCRETE BARRIER (RELOCATION)

Task #	Activity
GD 35.1	Check for any defects in the barrier after installation.
GD 35.2	Check that the AI connector is always inserted in the channel end of adjacent unit.
GD 35.3 M	**Check that placement, end treatments and offsets are as specified in the contract documents.**
GD 35.4	During construction, periodically check for any misaligned or damaged barrier. Ensure that replacement or repair is carried out as required.
GD 35.5	Check that removal or relocation is carried out as specified in the contract documents.
GD 35.6 M	**Check that Certification of Temporary Precast Concrete Barrier Installations forms are received from the contractor as per the contract documents.**

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK GD 36

INERTIAL BARRIER MODULE

Task #	Activity
GD 36.1	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.
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

GRADING AND DRAINAGE – TASK GD 37

CRASH/CUSHION ATTENUATING TERMINAL BARRIER

Task # **Activity**

GD 37.1 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.

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 Control Officer.

I. Inspect the preservative treated wood to ensure 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 as per the contract documents.

LEVEL OF INSPECTION – E1

GRADING AND DRAINAGE – TASK GD 38

TREND END TREATMENT BARRIER

Task # **Activity**

GD 38.1 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.

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 Control Officer.

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 documents.

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 metres 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 75mm are acceptable).

GD 38.5 M Check that Certification of the Installation of Safety Item forms are received from the contractor as per the contract documents.

LEVEL OF INSPECTION – E1

GRADING AND DRAINAGE – TASK GD 39

GUIDE RAIL ENERGY ABSORBING TERMINAL BARRIER

Task # **Activity**

GD 39.1 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 Control Officer.

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 or more bays or a temporary system has six 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 as per the contract documents.

LEVEL OF INSPECTION – E1

GRADING AND DRAINAGE – TASK GD 40

CONNETICUT IMPACT ATTENUATION SYSTEM BARRIER

Task # **Activity**

GD 40.1 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.

GD 40.2 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 Control Officer.

I. Check that concrete pad and backwall are constructed as specified in the contract documents.

II. Check that granular pad constructed is a minimum 150mm 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 as per the contract documents.

LEVEL OF INSPECTION – E1

GRADING AND DRAINAGE – TASK GD 41

NOISE BARRIER

Task #	Activity
GD 41.1	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.
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 ensure 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	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 ensure 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 ensure specified torque.
GD 41.14	Check that all drainage requirements have been implemented.

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK GD 42

SURCHARGING

Task #	Activity
GD 42.1	Check that erosion and sediment control schemes are in place and functioning prior to the start of surcharging. Determine if additional erosion control measures, or additional locations may be required.
GD 42.2	Check that surcharge is built and removed to the requirements shown in the contract documents.
GD 42.3 M	**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

GRADING AND DRAINAGE – TASK GD 43

HAUL ROADS

Task #	Activity
GD 43.1 M	**Inspect haul road prior to construction use with Contract Control Officer, Contractor and local officials.**
GD 43.2	Ensure 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 ensure 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

GRADING AND DRAINAGE – TASK 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	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.

LEVEL OF INSPECTION – C2

GRADING AND DRAINAGE – TASK 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 meets the provisions of the maintenance and warranty requirements including winter protection of conifers. Follow the inspection interval specified in the NSSP.**

LEVEL OF INSPECTION – E2

GRADING AND DRAINAGE – TASK 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 sign's condition and take a picture.
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	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. 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 as per 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 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 Check that constructed unit is as per design requirements.

GD 46.13 Check that applicable submissions are received by contractor.

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK CS 1

CONCRETE PLACEMENT, CONSOLIDATION, FINISHING, AND CURING

Task #	Activity
CS 1.1	Obtain and review concrete mix design and supporting documentation.
CS 1.2	Check to ensure all materials are from approved lists and meet the requirements of the contract documents.
CS 1.3	Review details of “pre-placement” meeting regularly for compliance.
CS 1.4	Check that thermal coupler wire and/or copper tubing is installed correctly at locations decided by the Contract Administrator.
CS 1.5	Check transferring systems (concrete pumps, belts, runways, etc.).
CS 1.6	Obtain and review submissions for Cold & Hot Weather Concrete placement.
CS 1.7 M	**Ensure “Notification of Placement of Structural Concrete” form letter is issued and that the form is signed by Contractor.**
CS 1.8 M	**Ensure concrete delivery tickets are checked for correct class of concrete and batching time.**
CS 1.9	Check that placement operations are as specified in the contract documents.
CS 1.10	Check that all required quality control testing, quality assurance testing and sampling are carried out.
CS 1.11	Check that the technician performing the testing of plastic concrete is certified by A.C.I. or C.S.A.
CS 1.12	Check that test cylinders are handled, cured and transported as per C.S.A.
CS 1.13	Check that vibratory equipment is in good operating condition and meets specification requirements.
CS 1.14	Check for adequate consolidation and proper use of vibrators.

CS 1.15 Check that deck finishing equipment is as specified in the contract documents.

CS 1.16 Check that deck finisher dry run is conducted.

CS 1.17 Check that finishing of plastic concrete is as specified in the contract documents.

CS 1.18 Check that finished concrete is within tolerances specified in the contract documents.

CS 1.19 Check that specified curing is carried out.

CS 1.20 Check that hot and cold weather protection requirements are carried out as specified in the contract documents including monitoring concrete temperatures where applicable.

CS 1.21 M Carryout the covermeter survey.

LEVEL OF INSPECTION – B1 / E2 after initial set

CONCRETE AND STRUCTURES – TASK CS 2

HIGH PERFORMANCE CONCRETE

(This task list should be used in conjunction with CS 1)

Task #	Activity
CS 2.1	Obtain the Contractor's mix design submission and verify that it meets the requirements of the contract documents. In addition, for trial batch mix verify that the trial batch concrete meets the requirements of the Special Provision for air content, slump and temperature of the plastic concrete and compressive strength at 28 days, rapid chloride permeability at 28 days and air void system parameters. For all other mixes verify that the submission includes documentation demonstrating that the results meet the requirements for air void system, compressive strength and rapid chloride permeability.
CS 2.2	Review concrete mix design and verify that Type GUb 8 SF or GUb 22S/5SF cement is used and the content of blast furnace slag, fly ash or the mixture of slag and fly ash does not exceed 25%.
CS 2.3	Obtain documentation certifying that the superplasticizer conforms to ASTM C494 and C1017 and that no chlorides were added to the superplasticizer during its manufacture.
CS 2.4	Obtain the Contractor's Temperature Control Plan and verify that it meets the requirement of the Special Provision for the Temperature Control Plan, and Control of Temperature and Temperature Difference for High Performance Concrete.
CS 2.5	Review and approve or reject the Contractor's proposed location for trial batch.
CS 2.6	Witness trial batch mixing, sampling and testing to verify that it is carried out in accordance with the requirements of the Special Provision.
CS 2.7	Give or deny permission to incorporate concrete from trial batch into parts of structure that require concrete of specified strength lower than 50 MPa.
CS 2.8	Review and approve or reject the Contractor's proposed location for trial slab, when trial slab is required.
CS 2.9	Check the Contractor's ability to adequately place, finish and cure the concrete during the construction of the trial slab, and document the personnel, methods and equipment used in the construction of trial slab.

CS 2.10 Check that four (4) cores have been taken from the trial slab and verify if the consolidation is adequate by examining the slab and cores, then return one core to the Contractor for the analysis of air void system parameters.

CS 2.11 Give or deny permission to place high performance concrete in the structural deck within 24 hours of receiving the cores from the Contractor based on the Contractor's ability to adequately place, finish and cure the concrete and on verification that adequate consolidation was achieved.

CS 2.12 Obtain results from the Contractor for air void analysis on the core taken from the trial slab and forward the result to the Ministry.

CS 2.13 Check that the thermocouples for temperature and temperature difference control are installed as per the Contractor's plan.

CS 2.14 Check that the personnel, methods and equipment to be used to place deck concrete are the same as used in trial slab, where trial slab was required.

CS 2.15 Check that the concrete temperature is between 10°C and 25°C, the slump is less than 230 mm and the air content is within 1.5% of the target value provided in the mix design, immediately prior to placing concrete.

CS 2.16 Check that the concrete does not segregate during placement and consolidation.

CS 2.17 Check for lumps in the concrete. Reject concrete containing lumps and when another trial batch is required by the Special Provision, attend the trial batch testing to verify that the Contractor identified and addressed cause(s) of the problem and eliminated the lumps. Give or deny approval for placement to proceed based on the new trial batch testing.

CS 2.18 Check structure decks, approach slabs, curbs and sidewalks, to ensure that fog mist is applied continuously from the time concrete is deposited in the deck until it is covered with burlap.

CS 2.19 Check that burlap is prevented from freezing during cold weather.

CS 2.20 Obtain the Contractor's datalogger temperature records and a records of any action taken by the Contractor, daily, to verify that the Contractor takes action when necessary to ensure that the temperature of the concrete and the temperature difference within the concrete is controlled within the specified limits.

CS 2.21 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 2.22 Obtain from the Contractor a complete temperature record including graphical plot at the end of the temperature-monitoring period.

CS 2.23 Obtain results of the Contractor's crack inspection and the Contractor's Plan for remedial action and verify that the Plan addresses all areas of deficiency.

CS 2.24 Accept or deny acceptance of the Contractor's proposed limits of repair/replacement.

CS 2.25 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 2.26 Check that the moulds used for making test cylinders conform to the requirement of the Special Provision.

CS 2.27 Determine if additional compressive strength cylinders shall be cast for information purposes.

CS 2.28 Determine random locations for coring specimens for testing of air void system and rapid chloride permeability.

CS 2.29 Obtain air void system results from the Contractor within 21 days of concrete placement.

CS 2.30 Obtain rapid chloride permeability results within 37 days of concrete placement.

CS 2.31 Obtain the Contractor's written statement of intent to invoke AVS referee testing, if applicable, within three weeks of concrete placement and at the time of submission of the original test results.

CS 2.32 Invoke referee testing by the Owner when conditions specified in the Special Provision are met. Identify AVS samples for re-testing. Contact the QA Section and the Concrete Section for assistance with the criteria and identification of samples for re-testing.

CS 2.33 Advise the Contractor of the Owner's desire to invoke referee testing.

CS 2.34 Obtain the Contractor's AVS samples within 5 days of the referee test being invoked by either the Contractor or the Owner and forward to the referee testing laboratory.

CS 2.35 Provide the Contractor with the names of referee testing laboratory and operator.

CS 2.36 Notify the Owner and the Contractor of the date of the referee testing at least one business day in advance to allow the Contractor and Owner to witness the testing.

CS 2.37 Obtain referee test results from the referee laboratory and verify that re-polishing is documented if the referee laboratory carried it out.

CS 2.38 Obtain the referee test cores from the referee laboratory and retain them until the contract's Final Acceptance.

CS 2.39 Accept components with formed and unformed surfaces based on verification that the cracks in the completed work were treated as required by the Special Provision.

CS 2.40 Determine the quantity of concrete in lots using the dimensions in the Contract Documents, for the purpose of calculating bonus or penalty for air void system, or penalty for rapid chloride permeability.

LEVEL OF INSPECTION – A1

CONCRETE AND STRUCTURES – TASK CS 3

TREMIE CONCRETE

Task #	Activity
CS 3.1	Obtain and review submission “Tremie Placement Plan”.
CS 3.2	Check that erosion and sediment control schemes are in place and functioning prior to placement of Tremie concrete.
CS 3.3	Check that unwatering is not carried out prior to when it is specified in the contract documents.
CS 3.4	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, hoses, filter bags, etc.) on site as required in the environmental submission.
CS 3.5	Check that placement operations are as specified.
CS 3.6	Check that concrete placement, consolidation, finishing and curing operations are in accordance with CS 1.
CS 3.7	Check elevation at which the placement is terminated.
CS 3.8 M	**Check proper removals, cleaning and soundness of top surface prior to placing additional concrete.**
CS 3.9	Ensure that formed enclosure meets water tightness specified in the Contractor’s submission, when placement is required next to a watercourse.

LEVEL OF INSPECTION – A1

CONCRETE AND STRUCTURES – TASK CS 4

CURB AND GUTTER

Task #	Activity
CS 4.1	Check that proper type of curb is constructed.
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 placement, consolidation, finishing and curing operations are in accordance with CS 1.
CS 4.6	If extrusion method is being used, check that the proper percentage of air is being maintained behind slip former.
CS 4.7	Check for proper drop curb at entrances and at Traffic Signal locations.

LEVEL OF INSPECTION – B1/E2

CONCRETE AND STRUCTURES – TASK CS 5

CONCRETE SIDEWALK

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 placement, consolidation finishing and curing operations are in accordance with CS 1.
CS 5.4	Check that a chase is installed on structures where a chase is specified in the contract documents.

LEVEL OF INSPECTION – B1/E2

CONCRETE AND STRUCTURES – TASK CS 6

CONCRETE BARRIER WALLS

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 concrete placement, consolidation and finishing operations are in accordance with CS 1.
(iv) Check that specified curing requirements are carried out.
(v) Check for surface tolerances and cracking.
(vi) Check that railing mounts / anchorages are correctly installed (Location, elevation, flushness, and anchor bolt protrusion is adequate for tube rails)
(vii) Check that the inside face of formwork is clean and in good order, to produce a smooth cast face.
(viii) Check that the barrier wall forms are adequately restrained to prevent uplift.

CS 6.3 Extruded Method (Not allowed on bridge decks)

(i) Check for correct alignment, grade and granular base preparation.
(ii) Check that concrete placement, consolidation and finishing operations are in accordance with CS 1.
(iii) Check that specified percentage of air is being maintained.
(iv) Check that construction joints, isolation joints and contraction joints are constructed as per the Contract requirements.
(v) Check that specified curing requirements are met.
(vi) Check for surface tolerances and cracking.
(vii) 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 are 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

CONCRETE AND STRUCTURES – TASK CS 7

CONCRETE BASE AND PAVEMENT

Task #	Activity
CS 7.1	Obtain a plan detailing curing and protection when concrete is placed in cold weather conditions. Ensure plan includes method by which in-place minimum concrete temperatures are maintained.
CS 7.2	Obtain Contractor's submission and verify that the concrete mix design along with the supporting documentation meets the requirements of the Contract requirements.
CS 7.3	Check that all the delivered material is supplied from the approved list and is properly stored, sampled and tested.
CS 7.4	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 7.5	Check for proper alignment, grade and base preparation.
CS 7.6	Check that the dowel bars are entirely coated with bond breaker prior to installing them.
CS 7.7	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 are visibly marked on the side of the concrete for joint cutting.
CS 7.8	Check the temperature of the existing surface to receive the concrete, to ensure it is not above 35ºC or below 5ºC. Check the air temperature to ensure it is not below 0ºC or above 32ºC prior to or during the concrete placing operation.
CS 7.9	Load transfer devices should be checked following paving operations to ensure that they have not been moved.
CS 7.10	Check that concrete placement, consolidation, finishing and curing operations are in accordance with CS 1 and the contract requirements.

CS 7.11 Check that the specified trial run of the paving equipment is made. After the first day's production, check cut-out to ensure 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 7.12 When fixed form pavers are used, check that hand held vibrators are used properly to supplement consolidation.

CS 7.13 Check that specified finishing and texturing procedures are adhered to. Check the width, centres and depth of grooves to ensure they meet the Contract requirements.

CS 7.14 Check that timing of form removal is as specified and any honeycombed areas are properly repaired.

CS 7.15 Check that the joints are the correct type and are cut at the proper location.

CS 7.16 Check that the initial sawcut is made to the depth specified in the contract documents. Ensure this initial sawcut is done within the constraints specified in the contract documents, without damaging the concrete surface.

CS 7.17 Inspect hardened concrete surface for cracks outside of the joints and to ensure it is within surface tolerance.

CS 7.18 M Check that traffic is not permitted on the concrete pavement/base until the concrete has attained a compressive strength of 20 MPa.

CS 7.19 Check that Quality Assurance cores are obtained and delivered to the designated laboratory.

CS 7.20 Calculate the Percent Within Limits for the criteria of strength and thickness.

CS 7.21 Ensure the profile measuring device (PMD) meets the contract requirements and that it has been correlated with the Owner's PMD.

CS 7.22 Ensure that the measuring of the concrete surface for roughness is carried out as per the contract documents in the presence of the Contract Administrator.

CS 7.23 M Check profile traces and ensure scallops are ground prior to sealing joints, where specified.

CS 7.24 Calculate the Percent Within Limits for the criteria of surface roughness.

CS 7.25 Check that the contract has an effluent containment system in place.

CS 7.26 Check that reservoir cuts are made to specified widths and depths.

CS 7.27 Check that the reservoir cuts are immediately flushed with water to remove slurry as per the contract requirements.

CS 7.28 Check that all the joint faces are abrasive blast cleaned according to OPSS 929 immediately prior to joint sealing and are blown clean and dry.

CS 7.29 Check that reservoir cuts are sealed according to the contract requirements.

LEVEL OF INSPECTION – A1 / A2

CONCRETE AND STRUCTURES – TASK CS 8

CONCRETE BASE AND PAVEMENT – FULL DEPTH REPAIR

Task #	Activity
CS 8.1	Obtain Contractor's submission and verify that the concrete mix design meets the requirements of the special provision for air void system in the hardened concrete and minimum specified 28 day compressive strength.
CS 8.2	Obtain documentation certifying that the superplasticizer meets the special provision requirements.
CS 8.3	Obtain the Contractor's linear shrinkage test results within 28 days after the time the mix design submission and forward a copy to the Quality Assurance Section and a copy to the Concrete Section.
CS 8.4	Check that all supporting test data is not more than 12 months old from the date the concrete mix design was submitted.
CS 8.5	Obtain the Contractors details of the method of concrete removal at least two weeks prior to start of any work and ensure it is according to the special provision.
CS 8.6	Check that removal limits shown in the contract drawings are appropriate to existing field conditions.
CS 8.7	Check that the saw cuts are full depth.
CS 8.8	Check Contractor is using proper equipment to remove the concrete slabs.
CS 8.9	Check that the concrete removal operation does not damage the subbase or adjacent concrete surfaces. If the subbase is disturbed, ensure disturbed material is removed.
CS 8.10	Check that the dowels, tie bars and load transfer devices are placed as specified in the contract documents.
CS 8.11	Ensure gang drills are used to drill holes for dowel bars.
CS 8.12	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 8.13 Check concrete placement, consolidation, finishing and curing procedures are in accordance with CS 1 unless otherwise specified elsewhere in the contract documents.

CS 8.14 Check that the concrete is sampled and tested in accordance with the special provision.

CS 8.15 Check the work for any of the defects listed in the special provision.

CS 8.16 Calculate the Percent Within Limit for the 28-day compressive strength.

CS 8.17 Check that the contract has an effluent containment system in place.

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

CONCRETE AND STRUCTURES – TASK CS 9

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

(This task list is in addition to CS 8 and should be used in conjunction to 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, including: - Calibration chart indicating compressive strength vs. temperature. - Calibration chart indicating temperature vs. time. - Ambient air temperature during trial. - Cover letter signed and sealed by P. Eng detailing curing method, test method and development of calibration chart.
CS 9.2	Review and approve or reject 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 as per 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 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

CONCRETE & STRUCTURES - TASK CS 10

CONCRETE BASE AND PAVEMENT – PARTIAL DEPTH REPAIR

Task #	Activity
CS 10.1	Obtain Contractor's submission and verify that the concrete mix design meets the requirements of the special provision for air void system in the hardened concrete and minimum specified 28 day compressive strength.
CS 10.2	Obtain documentation certifying that the superplasticizer meets the special provision.
CS 10.3	Obtain the Contractor's linear shrinkage test results within 28 days after the time the mix design submission and forward a copy to the Quality Assurance Section and a copy to the Concrete Section.
CS 10.4	Check that all supporting test data is not more than 12 months old from the date the concrete mix design was submitted.
CS 10.5	Obtain the Contractors details of the method of concrete removal at least two weeks prior to start of any work and ensure it is according to the special provision.
CS 10.6	If the Contractor submits a proposal to use a proprietary product instead of concrete, check if material is on the Ministry's approval list and that the dimension of the repair area(s) are less than 300 mm.
CS 10.7	Delineate the limits of the areas to be repaired.
CS 10.8	Check that the perimeter of the repair area is sawcut vertically to a depth of 50 mm.
CS 10.9	Check that concrete removal is being done correctly and as specified in the Contract.
CS 10.10	Check that preparation work, prior to placing concrete is carried out according to the Contract documents. (ie. Abrasive blast cleaning, pre-wetting and application of bonding agent)
CS 10.11	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 10.12 Check concrete placement, consolidation, finishing and curing procedures are in accordance with CS 1, unless otherwise specified elsewhere in the Contract.

CS 10.13 Check the work for any of the defects listed in the special provision.

CS 10.14 Calculate the Percent Within Limit for the 28-day compressive strength.

LEVEL OF INSPECTION – A1

CONCRETE AND STRUCTURES – TASK 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	Check that all old waterproofing membrane are completely removed from the concrete surface without any damage to the existing surface of the deck.
CS 11.2	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 11.3	Check that all repairs and remedial work to the concrete deck have been completed.
CS 11.4	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 – D2

CONCRETE AND STRUCTURES – TASK CS 12

STRUCTURE REHABILITATION – CONCRETE REMOVALS

Task #	Activity
CS 12.1	Obtain from the Contractor an identification of equipment and manufacturer's published specification for concrete removals.
CS 12.2	Obtain **Working Drawings** for "Concrete Removal – Structural Component" and "Concrete Removal – Complete Deck" at least one 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 12.3 M	**Obtain a Certificate of Conformance upon completion of the designated concrete removal for each structural component and / or the complete deck as per requirements of the contract documents.**
CS 12.4	Obtain notification from the Contractor, 24 hours prior to, the commencement of the scarifying operation.
CS 12.5	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 12.6	Notify the Quality Assurance Section and the Regional Structural Section as soon as the Contractor submits notification to commence with the concrete surveys.
CS 12.7	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 12.8	Carry out, as per the contract requirement, the following concrete removal surveys as part of determining and demarcating the actual location and extent of removals: • Visual and Delamination Survey – Identify areas of scaling, honeycombing and delaminated concrete. • 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 12.9 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 12.10 Determine full depth localized removal areas in the deck by performing the following:

- Complete the concrete removal surveys on both the top surface of the deck and the soffit.
- Superimpose both the concrete removal surveys on the original bridge deck condition survey.

CS 12.11 Determining areas of removal on structures where the existing concrete overlay will not be completely removed by performing the following:

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

CS 12.12 Superimpose all concrete removal surveys on original bridge deck condition surveys. Clearly identify all delaminations and actively corroding areas in different colours.

CS 12.13 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 12.14 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 12.15 Provide the Contractor with written permission to proceed with the concrete removals.

CS 12.16 Demarcate all areas of exposed reinforcing steel prior to scarifying operation. For scarifying greater than 10 mm, demarcate areas of low cover.

CS 12.17 Check weight of equipment does not exceed the limit specified.

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 Check that concrete removal is being done correctly and as specified in the contract documents. (ie. Hammer size and strokes, size and weight of equipment, location and depth of removals, staging of removal and strength of adjacent new concrete)

CS 12.21 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 12.22 Notify the Quality Assurance Section and Regional Structural Section if the concrete is delaminated beyond 25 mm of the 1st layer of reinforcing steel; or if the Contractor has removed concrete more than the specified depth.

CS 12.23 Check existing reinforcing steel, post-tensioned cables, adjacent concrete, hardware and components to remain in place are not damaged during concrete removal. Check to ensure existing concrete to remain in place has not been contaminated.

CS 12.24 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 12.25 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 48 hours.

CS 12.26 For full depth removal with full depth sawcut construction joint, ensure the sawcut surfaces are roughened.

CS 12.27 Measure concrete removal areas to determine quantities.

CS 12.28 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.

CS 12.29 Check that environmental protection enclosures or containment systems are in place and functioning.

LEVEL OF INSPECTION – A1

CONCRETE AND STRUCTURES – TASK 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 Significant Area.

LEVEL OF INSPECTION - D2

CONCRETE AND STRUCTURES – TASK CS 14

STRUCTURE REHABILITATION – NORMAL CONCRETE OVERLAY

Task #	Activity
CS 14.1	Obtain Contractor's submission at least one week prior to production of the concrete and verify that the concrete mix design meets the requirements of the Special Provision for air void system in the hardened concrete and minimum specified 28 day compressive strength.
CS 14.2	Obtain documentation certifying that the superplasticizer meets the following: Conforms to ASTM C 494 and C017 requirements No chlorides were added during the manufacturer of the superplasticizer
CS 14.3	Obtain the Contractor's linear shrinkage test results within 28 days after the time of mix design submission and forward to the Ministry.
CS 14.4	Check that all supporting test data is not more than 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	Check that the Contractor's trial run has been completed before each placing operation to ensure that the minimum thickness of the overlay can be achieved.
CS 14.7	Check that the Contractor has submitted a Certificate of Trial Run, verifying that a trial run has been completed before proceeding with the placement of the overlay in accordance with the contract requirements.
CS 14.8	Check that the Contractor has verified that the screed rails and finishing machine have been set to ensure that the thickness of the overlay meets the requirements of the contract documents before proceeding with the placement of the overlay.
CS 14.9	Check that all full depth patches have been repaired prior to placing the overlay, unless otherwise specified in the contract documents.
CS 14.10	Check that concrete for all partial depth removal areas in the deck are placed at the same time as the overlay.

CS 14.11 Check that overlay is not placed adjacent to any new concrete less than 48 hours old. If the ambient air temperature falls below 10° C within the first 48 hours after placement of concrete, the 48hour time requirement is extended to 96 hours.

CS 14.12 Check the temperature of the air and existing concrete surface to receive the overlay, to ensure it meets contract requirements prior to and during concrete operations

CS 14.13 If the air temperature drops below 5ºC during curing, ensure cold weather protection is provided according to the specifications.

CS 14.14 Check equipment and runways for the concrete transporting equipment to ensure they are not supported by reinforcing steel.

CS 14.15 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 14.16 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 14.17 Check that concrete surface and reinforcing steel have been abrasive blast cleaned according to **CS 43.**

CS 14.18 Check that removal of all dust and loose material is carried out by oil-free compressed air.

CS 14.19 Check that the prepared surface is maintained in a wet condition for six hours prior to placing concrete.

CS 14.20 Check that excess water is removed by oil-free compressed air immediately prior to application of bonding agent.

CS 14.21 Check that areas of reinforcing steel and prepared concrete surface are protected from oil leaks and dropping grout or concrete from placing equipment.

CS 14.22 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 14.23 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 30 minutes after mixing, is discarded.

CS 14.24 Check that concrete placement, consolidation, finishing and curing procedures are in accordance with **CS1** unless specified otherwise in the contract documents.

CS 14.25 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 14.26 Check that the burlap is prevented from freezing during cold weather.

CS 14.27 Obtain temperature-monitoring data to ensure concrete temperature does not fall below 10ºC within 7 days following concrete placement.

CS 14.28 Check that the construction joints are placed as specified in the contract documents.

CS 14.29 Define the lots and determine core locations for air void system and tensile bond strength test.

QUALITY ASSURANCE

CS 14.30 Check that the tensile bond strength testing is carried out as per the contract requirements.

CS 14.31 Check that the core holes have been filled according to the contract requirements.

CS 14.32 Obtain and review tensile bond strength within 4 business days of testing and forward the results to the Ministry.

CS 14.33 Check overlay for any areas of debonding, honeycombed areas or cracks.

CS 14.34 Obtain and verify Contractor's crack inspection report and review Contractor's crack treatment proposal if applicable.

CS 14.35 Check that permission to waterproof is not issued until cracks are treated (if applicable) and the deck is air dried for three days.

CS 14.36 Obtain and review Contractor's air void system test results within 3 weeks of concrete placement and forward the results to the Ministry.

LEVEL OF INSPECTION – A1

CONCRETE AND STRUCTURES – TASK CS 15

STRUCTURE REHABILITATION – CATHODIC PROTECTION – ANODE MESH SYSTEM AND CONCRETE OVERLAY

Task #	Activity
CS 15.1	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	Ensure one copy of all required submissions is forwarded to Bridge Office.
CS 15.4	Check that all patch repair has been completed in accordance with contract document before any wiring, reference cells and anode mesh is placed.
CS 15.5	Check that the top surface of all patched areas has been scarified or roughened in accordance with contract document before anode mesh is placed.
CS 15.6	Check that all saw cuts for wiring and reference cells installation are within the specified tolerance for depth, width and locations, and are properly filled with specified material afterwards without any voids.
CS 15.7	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 15.8	Check the surface preparation, concrete placement, finishing and curing of the overlay are in accordance with **CS 14**.
CS 15.9	Check that all electrical equipment, including CP cabinets, junction boxes, etc. is properly located as specified in the contract documents.
CS 15.10	Check that the acceptance testing is performed in accordance with the contract documents; review the acceptance testing report.

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK CS 16

STRUCTURE REHABILITATION – SILICA FUME CONCRETE OVERLAY

(This task list should be used in conjunction With CS 1 and CS 14)

Task #	Activity
CS 16.1	In addition to the submissions outlined in **CS 14**, verify that the concrete mix and materials meet the requirements of the Special Provision for rapid chloride permeability at 28 days.
CS 16.2	Check that the trial run procedures are in accordance with **CS14** 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 concrete placement, consolidation, finishing and curing operations are in accordance with **CS 1** and **CS 14**.
CS 16.4	Check that fog mist is applied continuously from the time of screeding until concrete is covered with burlap.
CS 16.5	Define the lots and determine core locations for air void system, tensile bond strength and rapid chloride permeability test.
CS 16.6	Check that Quality Assurance operations are in accordance with **CS 14.**
CS 16.7	Obtain and review rapid chloride permeability results within 4 business days of testing and forward the results to the Ministry.
CS 16.8	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 – A1

CONCRETE AND STRUCTURES – TASK CS 17

STRUCTURE REHABILITATION - LATEX-MODIFIED CONCRETE OVERLAY

Task #	Activity
CS 17.1	Check that all the delivered material is being supplied from the approved list and stored properly.
CS 17.2	Check that material supplied by the Contractor is sampled and tested as specified in the contract documents.
CS 17.3	Check that fine and coarse aggregate (enough for each stage) are stockpiled at the site three weeks prior to placing concrete. Sample as per 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 17.4 M	**Check that concrete mix design is available prior to the material discharge test on the mixing unit.**
CS 17.5	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 17.6 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 17.7	Check that the trial run procedures are in accordance with **CS 14**.
CS 17.8	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

CONCRETE AND STRUCTURES – TASK CS 18

STRUCTURE REHABILITATION – CONCRETE PATCHES

Task #	Activity
CS 18.1	Obtain Contractor's submission at least one week prior to production of the concrete and verify that the concrete mix design meets the requirements of the Special Provision for air void system in the hardened concrete and minimum specified 28 day compressive strength.
CS 18.2	Obtain documentation certifying that the superplasticizer meets the following: Conforms to ASTM C 494 and C 1017 requirements: No chlorides were added during the manufacturer of the superplasticizer.
CS 18.3	Obtain the Contractor's linear shrinkage test results within 28 days after the time of the mix design submission and forward to the Ministry.
CS 18.4	Check that all supporting test data is not more than 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 week prior to commencement of the work. Ensure that 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, to ensure it meets contract requirements prior to and during concrete operation.
CS 18.8	Check equipment and runways, vehicles for the concrete transporting/transferring equipment to ensure they are not supported by reinforcing steel.
CS 18.9	Check removal of all dust and loose material is carried out by oil-free compressed air.
CS 18.10	Check that the concrete surface and reinforcing steel have been abrasive blast cleaned according to **CS 43**.

CS 18.11 Check that the prepared surface is maintained in a wet condition for six 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 concrete placement, consolidation, finishing and curing procedures in accordance with **CS 1 and CS 14** unless specified otherwise elsewhere in the contract.

CS 18.14 Check that thermocouple wires have been installed in the concrete for cold weather protection as specified in the Special Provision.

CS 18.15 Review Contractor's temperature records daily for cold weather protection (if applicable).

CS 18.16 Check that prior to seasonal shut down, all patches are completed in all areas of concrete removal.

CS 18.17 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 18.18 Define the lots and determine core locations for air void system and tensile bond strength test.

CS 18.19 Check that the tensile bond strength testing is carried out as per the contract requirement.

CS 18.20 Check that the core holes have been filled according to the contract requirement.

CS 18.21 Obtain and review tensile bond strength within four (4) business days of testing and forward the results to the Ministry.

CS 18.22 Check patches for any areas of debonding, honeycombed areas or cracks.

CS 18.23 Obtain and verify Contractor's crack inspection report, review Contractor's crack treatment proposal if applicable.

CS 18.24 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 18.25 Obtain and review Contractor's air void system test results within three (3) weeks of concrete placement and forward the results to the Ministry.

LEVEL OF INSPECTION – A1
– B2 During placement

CONCRETE AND STRUCTURES – TASK CS 19

STRUCTURE REHABILITATION – CONCRETE REFACING

(This task list should be used in conjunction with CS 1 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 CAN/CSA G 164.
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.
CS 19.5	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 19.6	Check that the wire fabric is kept clean of any contamination.
CS 19.7	Check that submissions, concrete placement, finishing, curing, and quality assurance procedures are in accordance with **CS 1** and **CS 18** unless specified otherwise elsewhere in the contract documents.
CS 19.8	Check that the surface of the existing concrete is roughened according to the contract requirements.
CS 19.9	Check that burlap and water is applied immediately to the top of all exposed concrete surfaces, within 2 to 4 m from the finishing operation.
CS 19.10	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 19.11	Check that the forms are removed within 16 to 24 hours of concrete placement and that the concrete is cured as specified in the Special Provision.

CS 19.12 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.

CS 19.13 Check that environmental protection enclosures or containment systems are in place and functioning.

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK 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 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 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	Check that the nozzle operator is certified.
CS 20.8	Obtain and check the curing submission which includes equipment and procedures to be used one 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 ensure shelf life has not expired.
CS 20.12	Check that the following items meet specified requirements: (i) Shotcrete mixing equipment;

(ii) Removal of concrete, abrasive blasting, placement of steel wire fabric and protection of adjacent surfaces;
(iii) Pre-wetting of repair areas;
(iv) Mix proportions of material delivered to site;
(v) Application of shotcrete;
(vi) 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.

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK CS 21

STRUCTURE EXCAVATION

Task #	Activity
CS 21.1	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.
CS 21.2	Check that advanced unwatering is conducted as required to prevent soil sloughing, basal heave and boiling.
CS 21.3	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, an that the system is not causing sedimentation of the watercourse downstream of the work site.
CS 21.4	Confirm that any other relevant environmental constraints have been addressed.
CS 21.5 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 21.6	Check the geometry of temporary slopes to facilitate excavation.
CS 21.7	Check that all footing excavations conform to size, shape, line, elevations and grades as specified in the contract documents.
CS 21.8	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 21.9	Record the depth, length, width, type of material used, and how it was placed, when the contractor uses a working slab.
CS 21.10	Check that any adjacent utility / structure is not affected or undermined by the footing excavation.

CS 21.11 Check that the founding soil is protected and preserved.

CS 21.12 Check that the excavation is rendered stable during footing excavation and construction.

CS 21.13 Check that preconstruction survey of property and structures that may be affected by the work is submitted.

CS 21.14 Check that protection schemes are constructed as per working drawings.

CS 21.15 Check that excavation for frost tapers are carried out according to specifications.

CS 21.16 Check that any staged construction (excavation, backfilling sequence restrictions) is conducted.

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK 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	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 nor 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 22.13M	**Check that the Certificate of Conformance is supplied and reviewed as per 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.

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK 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	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.
CS 23.6	Check that the Contractor is monitoring as specified in the contract documents.
CS 23.7	Monitor pump inlet to ensure pump is not submerged in mud and is properly screened to prevent fish ingestion.
CS 23.8	Check that discharge is being managed as per contract requirements.
CS 23.9	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 23.10	Check that the Contractor's unwatering scheme is not causing loss of materials under adjacent founding elements or backfill.
CS 23.11	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 23.12	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**

LEVEL OF INSPECTION – B1/E2

CONCRETE AND STRUCTURES – TASK CS 24

PILING

Task #	Activity
CS 24.1 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 24.2	Check that erosion and sediment control schemes are in place and functioning prior to the start of pile driving. Determine if additional erosion control measures are in place and functioning around them.
CS 24.3 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 24.4	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 24.5	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 24.6	Check that pile driving equipment conforms to specified requirements. Monitor hammer performance.
CS 24.7	Check that the end treatments are correctly applied (i.e. shoes, Oslo Points, Bearing Points, collars, etc.).
CS 24.8	Check that pile installation sequence is as per submission, and that layout of piles conforms to contract requirements.
CS 24.9	Check that vertical and batter alignment of pile meets specified requirements.
CS 24.10	Verify that piles are not overdriven and hence damaged during installation.
CS 24.11	Check that welder is certified. Check that welding of splicing conforms to specified requirements, and that pile splices are carried out properly.
CS 24.12	Check that pile set and refusal criteria are satisfied. Check that actual tip elevation corresponds to design founding stratum.

CS 24.13 Check that the piles are cut off as specified.

CS 24.14 Check that retapping / redriving requirements are being satisfied.

CS 24.15 Check the contractor's pile driving records.

CS 24.16 Check that concrete placement, consolidation, finishing and curing operations are in accordance with CS 1.

CS 24.17 Check that noise control restrictions have been complied with.

CS 24.18 Check that the piles are installed to the specified tolerances.

CS 24.19 For piles driven to refusal, check that the appropriate Dynamic Formula is used in accordance with the contract documents..

CS 24.20 Check that piles are not driven adjacent to fresh concrete as specified in the Pile Driving Restrictions and Requirements in the Piling Special Provision.

LEVEL OF INSPECTION – A1 when driving

CONCRETE AND STRUCTURES – TASK CS 25

CAISSON FOUNDATIONS

Task #	Activity
CS 25.1	Check type, length and condition of caisson liners.
CS 25.2	Check that welder is certified.
CS 25.3	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 the contractor's cleaned out material containment location. Ensure 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 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 25.11	Check that concrete placement, consolidation, finishing and curing operations are performed in accordance with **CS 1**.
CS 25.12	Check that slurry properties are being tested and verified as per contract requirements.
CS 25.13	Check that reinforcement steel is being properly placed as per contract requirements.

CS 25.14 Check that vertical and batter alignment of caisson are as specified in the contract documents.

CS 25.15 Check that rock socketted caissons are installed to the appropriate depth, tip elevation and geometry.

CS 25.16 Check that any temporary slurry does not negatively impact shaft resistance design requirements. Temporary slurry needs to be adequately flushed.

LEVEL OF INSPECTION – B2

CONCRETE AND STRUCTURES – TASK CS 26

STRUCTURE BACKFILLING

Task #	Activity
CS 26.1	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 Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 26.3	Check that the area to be backfilled conforms to the contract documents.
CS 26.4 M	**Check that the structure excavation limits are verified and recorded prior to commencement of backfilling operations.**
CS 26.5 M	**Check that the concrete has reached the required percentage of the design strength prior to backfilling.**
CS 26.6	Check that subdrains are placed as specified in the contract documents.
CS 26.7	Check that proper procedures are used for weep holes and perforated pipe installation.
CS 26.8	Check that backfill is placed as specified in the contract documents, and that all backfill materials are free of waste.
CS 26.9	Check that appropriate compaction procedure and sequence is used, and that appropriate compaction equipment is used in restricted areas.
CS 26.10	Check that appropriate compaction testing is being conducted

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK CS 27

FORMWORK

Task #	Activity
CS 27.1 M	**Check that the Certificate of Conformance is supplied and reviewed as per the requirements of the contract documents.**
CS 27.2	Check all material, including hardware, for condition, quality, adjustment and fit.
CS 27.3	Check that dimensions of forms are as specified in the contract documents.
CS 27.4	Check that form release oil is applied to the forms before the installation of reinforcing steel.
CS 27.5	Check forms (several times) for alignment and possible deformation, during concrete placement.

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK CS 28

FALSEWORK

Task #	Activity
CS 28.1 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 28.2 M	**Check that stamped falsework drawings are on site. Check installed falsework against stamped working drawings prior to pour. (Specifically ensure member sizes and spacing, mudsill locations and associated member sizes, longitudinal and transverse bracing, max extension on screw heads of towers, type and location of hangers and location of screed rails).**
CS 28.3	Check that the founding soil is prepared.
CS 28.4	Check that any foundation bearing pad is properly placed and compacted.
CS 28.5	Monitor falsework (several times) during concrete placement operation for deflection and settlement.
CS 28.6 M	**Check that the required concrete strength has been reached prior to removing falsework.**

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK CS 29

INSTALLATION OF BEARINGS

Task #	Activity
CS 29.1 M	**Check that the Certificate of Conformance and the Adjustment of Bearing drawings are supplied and reviewed as per 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 ensure 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.

LEVEL OF INSPECTION – D2

CONCRETE AND STRUCTURES – TASK CS 30

CONCRETE AND STRUCTURAL STEEL BEAM ERECTION

Task #	Activity
CS 30.1 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 30.2	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 30.3	Check that the stamped erection drawings are on site.
CS 30.4	Check that beams have not been damaged and are set to the specified alignment and seated properly.
CS 30.5	Collect steel mill certificates (coupon tags) and store on file in site office.

LEVEL OF INSPECTION – D2

CONCRETE AND STRUCTURES – TASK CS 31

REINFORCING STEEL PLACEMENT

Task #	Activity
CS 31.1	Examine reinforcing steel schedule and drawings.
CS 31.2	Check for proper site storage and handling.
CS 31.3	Check mill certificates to ensure that the steel is supplied from a designated source.
CS 31.4	Check that the correct value of imported steel has been declared in the "Statement of Imported Content" form.
CS 31.5	Obtain a sample of stainless steel rebar as per the contract documents.
CS 31.6 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 31.7	Check that the correct grade and size of steel has been placed in accordance with the contract documents.

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK CS 32

PRESTRESSING 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 as per the time requirements of the contract documents.**

LEVEL OF INSPECTION – B2

CONCRETE AND STRUCTURES – TASK CS 33

STRESSING OPERATION

Task #	Activity
CS 33.1	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 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 as per the time requirements of the contract documents.**

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK CS 34

GROUTING OF POST-TENSIONING DUCTS

Task #	Activity
CS 34.1	Check that ducts are blown out with water and oil free air.
CS 34.2	Check that all vent tubes are free from blockage.
CS 34.3	Check that each grout mix component is from an approved source.
CS 34.4	Check that the concrete temperature of the deck is as specified in the contract documents.
CS 34.5	Check the mixer and pump. Check that pressure gauge at pump or intake, water measures, and timer are accurate.
CS 34.6 M	**Prior to the grouting operations, check that the test batch has been mixed and that the quality of the grout meets the specified requirements.**
CS 34.7	Check that the grout is being tested and meets the specified requirements.
CS 34.8	Check that grout cubes are taken for testing and delivered as required to the specified testing facility.
CS 34.9	Check that grouting operation is continuous and hoses are topped-up prior to tying off as specified in the contract documents.
CS 34.10 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract documents.**
CS 34.11	Check Contractor's placing schedule such that placement of sidewalks, curbs, median curbs, etc., is done after the grouting of post tension grout tubes.

LEVEL OF INSPECTION – A1

CONCRETE AND STRUCTURES – TASK CS 35

BRIDGE DECK WATERPROOFING

Task #	Activity
CS 35.1 M	**Check that the deck meets requirement for surface tolerance and surface finish.**
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 temperature are 5°C or higher.**
CS 35.5	Check that contractor performing the waterproofing is approved.
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.**
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	Ensure that the Contractor takes adequate protective measures to mask concrete and prevent over-spray of tack coat materials onto adjacent concrete surfaces (curb face, barrier wall, abutments, columns, etc.) to prevent waterproofing material from entering a watercourse.
CS 35.9	Check that all delivered materials are approved.
CS 35.10	Check that tack coat is cured completely and free of any surface moisture and dirt before waterproofing membrane is applied.
CS 35.11	Check that temperature of waterproofing membrane at time of placing is as specified.
CS 35.12	Check for correct placement of membrane reinforcement over joints.
CS 35.13	Check for correct placing of protection boards.

CS 35.14 Check proper lapping of waterproofing at construction joint and staging boundaries.

CS 35.15 Upon completion of each lot, measure and record membrane thickness following the procedure in the “Field Guide for the Acceptance of Hot Mix and Bridge Deck Waterproofing”.

CS 35.16 M Compute payment adjustment factor and have the Contractor sign form PH-CC-129 A prior to paving.

CS 35.17 Check that all test results have been received and price adjustments calculated and applied as appropriate.

CS 35.18 Check that asphalt drainage tubes are open.

CS 35.19 Check tack coating of protection boards just prior to paving.

LEVEL OF INSPECTION – B2

CONCRETE AND STRUCTURES – TASK CS 36

CATHODIC PROTECTION – COKE MIX PRODUCTION AND PAVING

Task #	Activity
CS 36.1	Check that all the delivered material is supplied from the approved list and is stored properly.
CS 36.2	Check that material supplied by the Contractor is sampled and tested as required.
CS 36.3 M	**Check that an approved mix design has been established.**
CS 36.4	Check the coke breeze for gradation and moisture content of less than one percent by mass.
CS 36.5	Check that the resistivity test carried out on the electrically conductive mix meets the specified requirements.
CS 36.6	Check the Contractor has carried out the specified resistivity testing on a trial batch of the mix and the material from the trial batch is not incorporated in the work.
CS 36.7 M	**Check that the concrete surface is not tack coated and is dry and free of debris. Also check that adhesive tape is removed from anodes and voltage probes and the anode top surfaces are cleaned with a wire brush.**
CS 36.8	Check that the electrically conductive mix is not placed within 150mm of any metal appurtenances such as deck drains, expansion joints, etc. Check that this space is filled with a hot mix containing a non-conductive aggregate.

LEVEL OF INSPECTION – C2
– A2 – During paving operation

CONCRETE AND STRUCTURES – TASK CS 37

INSTALLATION OF EXPANSION JOINTS

Task #	Activity
CS 37.1	Check that no damage occurs during handling.
CS 37.2	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 37.3	Check that material supplied by the Contractor is sampled as required.
CS 37.4	Check for proper storage of the joints.
CS 37.5	Check that field splices in steel components are located and welded as per shop drawings and are performed by a certified welder.
CS 37.6	Check that the dimensions of the block-out to receive the joint assembly are in accordance with the contract drawings and standard drawings.
CS 37.7	Check that the block-out area to receive the joint is abrasive blast cleaned, without damaging the epoxy coated steel.
CS 37.8	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 37.9 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 37.10 M	**Check that the Certificate of Conformance is supplied and reviewed for each task and as per the time requirements of the contract documents.**
CS 37.11	Check that concrete placement, consolidation, finishing and curing operations are in accordance with CS 1.
CS 37.12	Check that clamping angles or channels are removed as specified in the contract documents.
Cs 37.13	Check that holes left from removal of clamping angles or channels are cleaned and grouted with approved epoxy.

CS 37.14 Check for concrete blockages in the expansion joint opening.

CS 37.15 Check that seal is properly installed with no damage, wrinkles or splices.

CS 37.16 Check that sliding plates on sidewalk, curbs and median have been installed properly with regards to the direction of traffic.

CS 37.17 Check that formwork including styrofoam has been removed below expansion joint assembly between deck and ballast wall.

CS 37.18 Check for cracks in the concrete adjacent to the expansion joint.

CS 37.19 M Ensure 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 37.20 Ensure end dam concrete has been cured for a minimum of 7 days and has reached 25 MPa prior to epoxy injection.

CS 37.21 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 37.22 M Sound the steel armour for voids. If voids are detected, ensure proper procedures are taken to fill the voids.

CS 37.23 Check that a water test has been carried out.

CS 37.24 Check that all waste material (Styrofoam) is disposed of as per the contract documents.

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK 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.**
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 as per plan.
CS 38.5	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

CONCRETE AND STRUCTURES – TASK 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 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. Ensure a copy of all test results and manifests are provided to the MTO Environmental Planner – Waste Management.
CS 39.6 M	**Check that surface preparation is carried out as specified in the contract 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 dewpoint 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 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**

except that acceptance of multiple coats will be based on the cumulative minimum 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 Form PH-CC-782 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. Ensure repairs are as specified in the contract documents.

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

LEVEL OF INSPECTION – A1

CONCRETE AND STRUCTURES – TASK CS 40

STEEL PARAPET RAILING

Task #	Activity
CS 40.1	Check type, size, length and condition of materials (including protective coatings) delivered to the site.
CS 40.2	Check that all the delivered material is being supplied from the approved list and is properly stored.
CS 40.3	Check that installation is as specified in the contract documents.
CS 40.4	Check the condition of completed posts and rails. Check that damaged areas are properly repaired.
CS 40.5 M	**Check that the Certificate of Conformance is supplied and reviewed for each task and as per the time requirements of the contract documents.**

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK CS 41

OVERHEAD SIGN PLACEMENT

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 Certificate of Conformance is supplied and reviewed as per the time requirements of 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	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	Check that the correct value of imported steel has been declared on the “Statement of Imported Content” form.
CS 41.6	Check overhead sign structure to ensure that installation is in accordance with the contract drawings and shop drawings.
CS 41.7	Check that correct sign message is mounted on the support.
CS 41.8	Check to ensure 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 3 diameters.
CS 41.12	Check the top of footing for surface finish and levelness.

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK CS 42

RETAINED SOIL SYSTEMS

Task #	Activity
CS 42.1 M	**Check that the Certificates of Conformance are supplied and reviewed in a timely manner to correspond with the intervals that meet the specified contract requirements.**
CS 42.2	Check that all submissions bear the seal and signature of the Design Engineer and the Design Check Engineer.
CS 42.3	Check that the Contractor has selected a RSS designated as A (Accepted) or DE (Demonstration) on the DSM List that meets the specified contract requirements.
CS 42.4	Check that the Contractor has a copy of the stamped working drawings on site at all times.
CS 42.5	Check that the working drawings include at least the following: • All design, fabrication and construction drawings and specifications for the RSS • Details of all excavation, unwatering, drainage and backfilling required to construct the RSS, including type and source of associated backfill • Details at joints and connections to other structures where shown in the Contract Drawings • Details of all protection systems • Statement of bearing resistance required by the RSS foundation, and the bearing resistance provided in accordance with the CHBDC • Statement of satisfactory internal and external stability • All design, fabrication and construction drawings and specifications for traffic barriers and base, and finishing caps, where applicable • Details of how all relevant Operational Constraints and Environmental Constraints, as specified elsewhere in the contract, will be adhered to • A copy of the Approved Product Drawings covering material and construction details.
CS 42.6	Forward one set of the stamped working drawings to the Pavement and Foundation Section, Ministry of Transportation, Downsview, for information purposes
CS 42.7	Check that all loose, softened, deleterious material at the founding elevation of the RSS is removed.

CS 42.8 Check that the contractor is following the foundation preparation as per the manufacturers recommendations specified, working drawings and contract documents.

CS 42.9 Check that the backfill type is as indicated on the working drawings and that the contractor is placing the backfill as per the manufacturers recommendations, working drawings and contract documents.

CS 42.10 Check alignment such as stations, lines and grades, cross-sections, verify levelling pad elevation and other constraints as specified in the Contract Drawings.

CS 42.11 Check for Out-of-Tolerance Geometry, Performance and Aesthetics Conditions / Deficiencies as per 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 contract.

CS 42.12 Check that Warranty requirements are satisfied.

LEVEL OF INSPECTION – A1/A2

CONCRETE AND STRUCTURES – TASK 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	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	Ensure the subsequent concrete is placed within the time limit specified in the contract documents.
CS 43.5	Verify contract document requirement for removal of epoxy coating from existing epoxy coated reinforcing steel.
CS 43.6	Ensure all new epoxy coated reinforcing steel in the vicinity of the abrasive blast cleaning is protected.

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK CS 44

LIGHTWEIGHT FILL MATERIALS

Task #	Activity
	SLAG
CS 44.1 M	**Check that the Contractor has submitted Certificates 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.**
CS 44.2	Check that the contractor has submitted the Certificates of Conformance for the material properties prior to placement.
CS 44.3	Check that the contractor submits Quality Control Test Results.
CS 44.4	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 44.5	Check that the trial area is properly constructed.
CS 44.6	Check that the insitu unit weight requirements and overcrushing restrictions are satisfied during the trial and also during construction.
CS 44.7	Check that the contractor's compaction equipment and procedure satisfies the requirements of the specification.
CS 44.8	Check that the Quality Assurance component of the Special Provision is enforced.
	Expanded Poly Styrene
CS 44.9	Check that the shop drawings are reviewed, signed and sealed by the Quality Verification Engineer prior to commencement of work.
CS 44.10	Check that a final Certificate of Conformance signed and sealed by the Quality Verification Engineer is submitted.
CS 44.11	Check that the materials satisfy the requirements of the Special Provisions.

CS 44.12 Check that foundation excavation and preparation is conducted to remove any loosened or deleterious materials.

CS 44.13 Check that the levelling pad is properly placed and compacted.

CS 44.14 Check that the EPS are properly installed.

CS 44.15 Check that the EPS blocks are properly covered with polyethylene.

CS 44.16 Check that the concrete slab is properly constructed on top of the EPS blocks.

CS 44.17 Check that side slope material is placed without damage to the blocks.

CS 44.18 Check that the Quality Assurance component of the Special Provision is enforced.

LEVEL OF INSPECTION – C2

CONCRETE AND STRUCTURES – TASK CS 45

PRECAST CONCRETE CULVERTS

Task #	Activity
CS 45.1	Check the manufacturer is on the Ministry's approved list. .
CS 45.2	Review contract related documents.
CS 45.3 M	**Check that applicable contract required submissions are received and reviewed prior to fabrication.**
CS 45.4	Check maximum concrete strength specified on contract drawings is provided on submitted shop drawings.
CS 45.5 M	**Check that applicable certificate of conformance of the fabrication of the units are received and reviewed prior to shipment from the fabrication facility. (If applicable per contract requirements, otherwise go to task 45.6 M)**.
CS 45.6 M	**Check dimensions of units as arriving on site until consistency of units is confirmed checking every third unit from there on prior to any installation operations. Reject any units that do not meet the dimension tolerances outlined in contract documents.**
CS 45.7	Check that all environmental and dewatering schemes are in place and working in an acceptable manner.
CS 45.8	Check the condition, limits and elevation etc., of subgrade has been approved prior to and placement of granular base material.
CS 45.9	Check granular base limits, material meets contract requirements. .
CS 45.10	Confirm bedding materials, elevations and levelness.
CS 45.11	Check that apron walls are aligned properly and applicable grout is installed as per contract requirements
CS 45.12	Check the installation of the units are as per contract document requirements (shop drawings and manufacturer's recommendations).
CS 45.13 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 45.14 Check gasket or seals have been installed as per the contract requirements.

CS 45.15 Confirm streambed substrate.

CS 45.16 M Check that structure excavation limits have been verified and recorded prior to backfilling operations.

CS 45.17 Check that are external joint requirements, recesses, lifting lugs and holes are filled as per contract related requirements prior to backfilling.

CS 45.18 Check that the backfilling operation and material etc., meet contract related requirements. (see applicable backfilling inspection task)

CS 45.19 Check that applicable post tensioning is per contract requirements (see applicable post tension inspection task).

CS 45.20 M Check that all applicable Certificate of Conformance's including installation are submitted and reviewed. (as per applicable contract requirements).

LEVEL OF INSPECTION – C2 during placement of the units

– C1 during non-placement operations

CONCRETE AND STRUCTURES – TASK CS 46

DOWELS IN CONCRETE

Task #	Activity
CS 46.1	Review contract documents.
CS 46.2	Check that related material being used is on the Ministry's approved designated sources list.
CS 46.3	**Check concrete in the vicinity of the dowel location is sound and free of cracks.**
CS 46.4	**Check the hole drilled is correct size, depth and free of all dust, debris and water prior to placing the applicable bonding material.**
CS 46.5	Check that all applicable manufacture's recommendations and written instructions are adhered to.
CS 46.6	Check that dowels are maintained in the proper position during the setting period.
CS 46.7	CA to carry out or observe as specified the applicable pull testing per contract requirements.
CS 46.8	Verify / record the results of the pull test.

LEVEL OF INSPECTION – A2

CONCRETE AND STRUCTURES – TASK CS 47

STEEL BREAKAWAY SIGN PLACEMENT

Task #	Activity
CS 47.1 M	**Check that support is laid out at the correct station and offset. The offset is measured relative to the edge of pavement, which is the nearest pavement lane edge line.**
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	Check that support parts are supplied by a designated source. Verify that all support parts are new.
CS 47.4	Check to ensure that support is constructed according to contract drawings, Sign Support Manual and relevant Special Provisions. Pay particular attention to the footings.
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	Check that constructed unit is as per design.
CS 47.9	Check that applicable submissions are received.

LEVEL OF INSPECTION – E2

CONCRETE AND STRUCTURES – TASK CS 48

TIMBER BREAKAWAY SIGN PLACEMENT

Task #	Activity
CS 48.1	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	Check to ensure to ensure that support is constructed according to contract drawings, Sign Support Manual and relevant Special Provisions. 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	Check that constructed unit is as per design.
CS 48.7	Check that applicable submissions are received.

LEVEL OF INSPECTION – E2

BITUMINOUS – TASK BIT 1

GRANULAR SEALING

Task #	Activity
BIT 1.1	Check that areas to be sealed are shaped and dampened before sealing.
BIT 1.2	Check that granular is not frozen, air temperature is above minimum, wind does not cause drifting off designated area in contract and precipitation is not imminent.
BIT 1.3	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 1.4	Check that material supplied by the Contractor is sampled and tested as required.
BIT 1.5	Check environmental constraints before applying sealant.
BIT 1.6	Check for proper rate and method of application and uniform coating.

LEVEL OF INSPECTION – D2

BITUMINOUS – TASK BIT 2

RECLAIMING ASPHALT PAVEMENT

Task #	Activity
BIT 2.1	Check that random samples of Reclaimed Asphalt Pavement (RAP) to be used in Recycled Hot Mix (RHM) have been taken after processing.
BIT 2.2 M	**Check that reclaiming is carried out full width to essentially the same station before shutdown each day and properly ramped.**
BIT 2.3	Check that there is no contamination with granular shoulder and granular base material when RAP is to be used in RHM.
BIT 2.4	Partial Pavement Removal
	(i) Check for correct crossfall, depth and surface texture during milling;
	(ii) Record reclaimed asphalt removal rate (kg/m^2);
	(iii) Check that the milled surface is broomed and inspected, and that areas of asphalt rich dust are removed.
BIT 2.5	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

BITUMINOUS – TASK BIT 3

HOT MIX PAVING

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 essentially 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	Check placement of hot mix including alignment, crossfall, surface tolerance, width, smoothness, depth of asphalt mat and distribution (kg/m^2) or other applicable contract related field checks (such as for the m^2 payment method). Check that the distribution rates of premium surface courses are revised to account for the mass multiplier factors.
BIT 3.6	Check that air temperature at the surface of the road is above the minimum specified in the contract to permit paving.
BIT 3.7	Check that temperature of mix delivered to the site does not exceed the maximum discharge temperature allowed.
BIT 3.8	Visually inspect mix placed for dragging, segregation and other visual defects prior to covering with another lift and / or stage changes.
BIT 3.9	Check paving in echelon operation to ensure specified distance between pavers is maintained.
BIT 3.10 M	**Check and witness that all required samples are taken at correct (random) locations and tonnages.**
BIT 3.11	Check that equipment does not impact or damage areas beyond the shoulder.
BIT 3.12 M	**Check for proper reinstatement of sample locations (plates and cores) on a daily basis.**

LEVEL OF INSPECTION – A2

BITUMINOUS – TASK BIT 4

CUT AND FILL GROOVES

Task #	Activity
BIT 4.1	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.
BIT 4.2	Check that material supplied by the Contractor is sampled and tested as specified in the contract.
BIT 4.3	Check that existing pavement joints are marked to ensure that the new groove is located precisely over the existing joints.
BIT 4.4	Check that the grooves are cleaned and dried immediately, a maximum of two minutes prior to pouring the joint sealing compound.
BIT 4.5	Check that grooves are cut and filled as soon as possible after paving, as specified in the contract documents.

LEVEL OF INSPECTION – B1/D2

BITUMINOUS – TASK BIT 5

ROUTING AND SEALING CRACKS

Task #	Activity
	WITH WARRANTY
BIT 5.1	Document non-compliance with contract requirements.
	WITHOUT WARRANY
BIT 5.2	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.
BIT 5.3	Check that the material supplied by the Contractor is sampled and tested as required and batch numbers are recorded as specified in the contract documents.
BIT 5.4	Check that 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 5.5	Check that all routed and unrouted cracks are blown clean and dry using hot compressed air lance before sealing commences.
BIT 5.6	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 5.7	Check that sealing material is applied immediately after cleaning and drying.
BIT 5.8	Check that sealing material is heated within the manufacturers recommended range and is being continuously agitated.
BIT 5.9	Check that cracks are filled with sealant as specified in the contract documents and that no spillage occurs.
BIT 5.10	Check that debris, including excess sealing material, is removed from routed area and adjacent pavement.

BIT 5.11 Check that completed cracks are dusted with a suitable bond breaker before exposing to traffic.

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

BITUMINOUS – TASK BIT 6

TACK COAT

Task #	Activity
BIT 6.1	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.
BIT 6.2	Check that existing pavement is dry and clean before applying tack coat.
BIT 6.3	Check that proper rate of application and coverage is used.
BIT 6.4 M	**Check that tack coat has cured to the desired level before placing hot mix pavement.**
BIT 6.5 M	**Check that traffic is not allowed on the tack coated area before paving.**
BIT 6.6	Check that all required samples are taken and delivered as specified in the contract documents.

LEVEL OF INSPECTION – B1/D2

BITUMINOUS – TASK BIT 7

PAVEMENT MARKING

Task #	Activity
BIT 7.1	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.
BIT 7.2	Check that the material supplied by the Contractor is sampled and tested as specified in the contract documents.
BIT 7.3	Check that air temperature, pavement temperature and surface condition requirements are met.
BIT 7.4	Check that the locations of the markings applied are as specified in the contract documents.
BIT 7.5	Check that the surface is dry and free of loose and/or foreign material.
BIT 7.6	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.
BI 7.7 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 ensure the**

contractor has properly applied sight distance requirements as specified.

LEVEL OF INSPECTION – B1/D2

BITUMINOUS – TASK BIT 8

SURFACE TREATMENT

Task #	Activity
BIT 8.1	If a Contractor warranty is in place, document non-compliance with the contract requirements.
	If no warranty, the following applies:
BIT 8.2	Check the condition of the grade for compaction, profile, potholes, grade failure repair and brooming, etc.
BIT 8.3	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 8.4	Check that material supplied by the Contractor is sampled and tested as specified in the contract documents.
BIT 8.5	Check that quality and aggregate gradation tests have been done in accordance with the current Ministry test method.
BIT 8.6	Check the adequacy of the following: 1) Binder and aggregate distribution and application 2) Width of application 3) Emulsion temperature 4) Air temperature 5) Centreline and transverse joints 6) Rolling operation 7) Brooming off of excess aggregates
BIT 8.7	Check that material is confined to the area specified in the contract documents.
BIT 8.8	Check that all test results are received and price adjustments are calculated and applied as applicable.

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

BITUMINOUS – TASK BIT 9

HOT–IN–PLACE RECYCLING (HIR)

Task #	Activity
BIT 9.1	Check that the Mix Design and material submissions meet the requirements as specified in the contract documents.
BIT 9.2	Check that the material supplied by the Contractor is sampled and tested as specified in the contract documents.
BIT 9.3	Check the pavement is prepared as specified in the contract documents.
BIT 9.4	Check that HIR scarification depth tests are carried out and are acceptable as specified in the contract documents.
BIT 9.5	(i) Check that there is no direct flame in contact with the pavement; (ii) Check that there is no charring of the pavement occurring; (iii) Check that the fine aggregate added is dry and uniform; (iv) Check that there is no excess smoke; (v) Check that the mix temperature meets the requirements as specified in the contract documents; (vi) Visually inspect the mat appearance for uniform mixing, no segregation flushing or lumps; (vii) Check that longitudinal and transverse joints are constructed as specified in the contract documents; (viii) Check the ring test to determine depth of HIR. (ix) Check for white aggregate (broken stones) produced by scarification. (Shows proof of insufficient heating which results in cold milling.)
BIT 9.6	Check that HIR is sampled and tested as specified in the contract documents.
BIT 9.7	Check smoke emission level to ensure traffic safety.

LEVEL OF INSPECTION – A2

BITUMINOUS – TASK BIT 10

COLD–IN–PLACE RECYCLING (CIR)

Task #	Activity
BIT 10.1	Check that the Mix Design and material submissions meet the requirements specified in the contract documents.
BIT 10.2	Check that all the delivered material is supplied from the approved list submitted by the Contractor at the commencement of the contract.
BIT 10.3	Check that pavement is prepared as specified in the contract documents.
BIT 10.4	Check that the ambient temperature meets the requirements as specified in the contract documents.
BIT 10.5	Check that the pavement is reclaimed as specified in the contract documents.
BIT 10.6	Check that the CIR material has been mixed properly, contains no oversize particles and that the processed material is not slumping.
BIT 10.7	Check that compaction is carried out as specified in the contract documents.
BIT 10.8	Check that CIR material is sampled and tested as specified in the contract documents.
BIT 10.9 M	**Check that traffic is restricted as specified in the contract documents.**
BIT 10.10 M	**Check that CIR pavement meets requirements as specified in the contract prior to placement of the wearing surface.**
BIT 10.11	Check that the wearing surface is placed within the time restriction specified in the contract documents.

LEVEL OF INSPECTION – B1/D2

BITUMINOUS – TASK BIT 11

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

Task #	Activity
BIT 11.1	Check that the in–place materials are processed to the depths, widths and gradation as specified in the contract documents.
BIT 11.2	Check that the composition of the blended material is as specified in the contract documents.
BIT 11.3	Check that oversized material has been removed or reprocessed as specified in the contract documents.
BIT 11.4 M	**Check that operational constraints are carried out as specified in the contract documents.**
BIT 11.5 M	**Check that surface shaping and compaction is as specified in the contract documents.**

LEVEL OF INSPECTION – B1/D2

BITUMINOUS – TASK BIT 12

SURFACE SMOOTHNESS MEASUREMENTS

Task #	Activity
BIT 12.1	Review the Contractor's sketch of sub-lots at the Pre-Pave meeting to ensure that all of the sub-lots which must be measured and those which are to be measured but not subject to price-reductions and/or repairs are shown, that the sub-lots are consecutively numbered, that no two sub-lots have the same sub-lot number and that the proposed reference lines and offsets are indicated.
BIT 12.2	Check that the PMD Operator or the Contractor's QCT has been approved by the Ministry by asking to see the Ministry's approval card, then record the Manufacturer and serial number of the PMD that the Contractor is using and check with the applicable Regional Quality Assurance Section (or the Bituminous Section) whether that particular PMD has been approved for use on MTO contracts.
BIT 12.3	Prior to the commencement of any surface smoothness measurements each day, check that the tire pressure and the height calibration of the measuring (i.e. "bicycle") wheel are within allowable limits, that the PMD is tracking properly and then discuss with the Contractor which sub-lots the Contractor intends to measure that day, agree to and record the reference line(s) and offsets that the Contractor intends to use.
BIT 12.4	When the Contractor is carrying out any surface smoothness measurements which are required under the terms of the contract (including surface courses, binders, existing surfaces, etc.) check, at least once each hour, that the PMD is always taking measurements in the direction of traffic, that any particular sub-lot and wheel path is only being measured once and that all other requirements stated in SP 103F31 and the Field Guide for the Acceptance of Hot Mix and Bridge Deck Waterproofing are being adhered to (e.g. the operator is following well-defined stating markings and offsets, the PMD is tracking properly, etc.) and sign the profile record with the date and time at the point when the visit was made.
BIT 12.5	Check that one unbroken, continuous profile trace representing all of the sub-lots and any other pavement surfaces measured that day has been received before the PMD leaves the site for the day and that all of the various mix types, lane numbers and direction and wheel paths are all clearly indicated on the trace with all the appropriate headings and input parameters (blanking band, bump height/width, etc.).

BIT 12.6 Check that all relevant profile traces, summary sheets and electronic files from all areas which are to be measured have been received on time and in their proper format in accordance with the requirements of SP 103F31 and the Field Guide for the Acceptance of Hot Mix and Bridge Deck Waterproofing and that an electronic copy of all initial measurements taken in every area measured (including all measured areas which are exempt from penalties) during any construction season, is sent to both the appropriate Regional Quality Assurance Section and MTO's Bituminous Section no longer than one month after the last smoothness measurement is taken during that same construction season.

BIT 12.7 Check that all of the profile indices from the traces for each wheel path match those given in the summary sheet and that the locations and amplitudes of all scallops shown on the profile traces have been accurately recorded on the summary sheets.

BIT 12.8 Hire a California profilograph company and/or approved operator to provide audit testing of at least 10% of the sub-lots that were measured by the Contractor using exactly the same reference lines and offsets that the Contractor used after discussion with the appropriate Regional Quality Assurance Section and using the guidelines laid out in the Field Guide for the Acceptance of Hot Mix and Bridge Deck Waterproofing.

BIT 12.9 Check that all repairs of rejectable sub-lots and scallops and the re-decisioning of all repaired areas have been completed prior to the end of the contract or current construction season, whichever occurs first, as long as temperature conditions permit it.

BIT 12.10 Determine the overall price adjustment for the surface course.

BIT 12.11 Produce a written report containing a summary of the QC data with reasons for any areas which were exempt from measurements and/or penalties, a summary of the side-by-side QC versus QA data, a summary and all decisions regarding rejectable sub-lots and scallops and a summary of the 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

BITUMINOUS – TASK BIT 13

EXPANDED ASPHALT STABILIZATION

Task #	Activity
BIT 13.1	Check that the Mix Design and material submissions meet the requirements as specified in the contract documents.
BIT 13.2	Check that all the delivered material is supplied from the approved list that was submitted by the contractor at the commencement of the contract.
BIT 13.3	Check that oversize material has been removed or reprocessed as specified in the contract documents.
BIT 13.4	Ensure that an acceptable trial section is completed as specified in the contract documents.
BIT 13.5	Monitor and record materials including any corrective aggregate incorporated in the mix.
BIT 13.6	Check that the system of nozzles provides a uniform application of expanded asphalt.
BIT 13.7	Check that the material is sampled and tested as specified in the contract documents.
BIT 13.8	Check and record thickness measurements at the frequencies specified in the contract documents.
BIT 13.9	Check that compaction is in accordance with the requirements of the contract.
BIT 13.10	Check that the finished surface has a uniform texture, is free of surface dust defects and meets the profile and cross-section specified in the contract documents.
BIT 13.11 M	**Check that the material meets the requirements (dry, wet and tensile strength ratio, thickness, compaction, surface tolerance) specified in the contract documents prior to placing the wearing surface.**
BIT 13.12 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 13.13 M Check all vertical clearances from top of asphalt to the bottom of beam at the edge of all lanes.

BIT 13.14 M Check and record applied rate of expanded asphalt to ensure design rate is met at the end of each day's operation.

LEVEL OF INSPECTION – B1/D2

BITUMINOUS – TASK BIT 14

OPEN GRADED DRAINAGE LAYER

Task #	Activity
BIT 14.1	Check that material submissions meet the requirements specified in the contract documents.
BIT 14.2	Check that equipment to be used meets the requirements specified in the contract documents.
BIT 14.3	Ensure that environmental conditions are met as specified in the contract documents.
BIT 14.4 M	**Check that the drainage system is operational prior to placing the OGDL.**
BIT 14.5 M	**Check that an acceptable trial section is completed as specified in the contract documents.**
BIT 14.6	Check that the material is sampled and tested as specified in the contract documents.
BIT 14.7	Check that that Portland cement treated OGDL is cured as specified in the contract documents.
BIT 14.8	Check that traffic is restricted as specified in the contract documents.
BIT 14.9	Check that the wearing course is placed over the OGDL within the time restrictions specified in the contract documents.

LEVEL OF INSPECTION – B1/C2

ELECTRICAL – TASK E 1

ELECTRICAL CHAMBERS

Task #	Activity
E 1.1	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 1.2	Check that the type, alignment, offset, station, elevation relative to final grade, and depth of maintenance holes and hand holes conforms to contract requirements.
E 1.3 M	**Check that the number of concrete adjustment units conforms to contract requirements.**
E 1.4	Check that the correct number of sleeves and openings are installed. Ensure correct positioning and installation of ladder rungs, pulling irons, duct sleeves, drainage pipe and frames and covers
E 1.5	Check that drainage installation has been completed as specified in the contract documents.
E 1.6 M	**Check that backfill materials are as specified in the contract and are compacted to the target density.**
E 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 1.8 M	**Check that frames and covers of electrical chambers are connected to the system ground.**
E 1.9 M	**Check that frames and covers of electrical chambers are free of debris and that drain openings are clear.**

LEVEL OF INSPECTION – E2

ELECTRICAL – TASK E 2

UNDERGROUND DUCTS

Task #	Activity
E 2.1	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 2.2	Check that excavation for the duct and/or duct bank conforms to the specified dimensions.
E 2.3	Check that the depth of ducts conforms to contract requirements.
E 2.4 M	**Check that wobble joints are installed as specified in the contract.**
E 2.5	Check that the correct size and number of ducts are being installed.
E 2.6 M	**Check that backfill materials are as specified in the contract documents and are compacted to the target density.**
E 2.7	Check that surface mounted duct has been installed in accordance with the manufacturer's recommendations.
E 2.8 M	**Where Electrical Non-Metallic Tubing (ENT) is used; check that it has been installed in accordance with the manufacturer's recommendations.**
E 2.9	Check that marker tape and cable bricks have been installed as specified in the contract documents.
E 2.10 M	**Check that ducts are free of debris.**
E 2.11	Check that all unused ducts have a fishwire installed, and are plugged.
E 2.12 M	**Check that ducts for underpass luminaires consist of non-metallic liquid tight conduit and connectors.**

LEVEL OF INSPECTION – C1 / D2

ELECTRICAL – TASK E 3

POLE FOUNDATIONS AND POLE ERECTION

Task #	Activity
E 3.1	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 3.2	Check that the Contractor augers the holes to the specified dimensions for footings.
E 3.3	Visually check all poles for dents, cracks, scratches, paint chipping, and any other obvious imperfections.
E 3.4	Check that the Contractor properly stores, erects and supports the poles in accordance with the manufacturer's recommendations.
E 3.5	Check that pole orientation and handhole orientation are as specified in the contract documents.
E 3.6M	**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 3.7 M	**Check that pole foundations and poles are installed to the correct elevation, station and offset, as specified in the contract documents.**
E 3.8 M	**Check that the local grading around the pole foundations is completed as specified in the contract documents.**
E 3.9 M	**Check that the distance between the pole bases and the pole footing is according to the contract documents.**
E 3.10 M	**Check that all formwork is removed.**

LEVEL OF INSPECTION – C1 / D2

ELECTRICAL – TASK E 4

GROUNDING

Task #	Activity
E 4.1	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 4.2	Check that insulated ground wire is of correct colour and type, as specified in the contract documents.
E 4.3	Check that the specified ground electrodes are used and that the dimensions are correct.
E 4.4	Check that all ground connectors are CSA approved, and are of the size and type as specified in the contract documents.
E 4.5 M	**Check that all inaccessible ground connections are installed as specified in the contract documents.**
E 4.6 M	**Check that the Contractor conducts the resistance to ground tests. Check that the Contractor ensures that the grounding system complies with the requirements of the Electrical Safety Authority.**
E 4.7 M	**Check that all metal components throughout the contract are grounded.**
E 4.8 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract.**

LEVEL OF INSPECTION – D2

ELECTRICAL – TASK E 5

CABLE INSTALLATION

Task #	Activity
E 5.1	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 5.2 M	**Check that the size, type and colour of cable are as specified in the contract documents.**
E 5.3 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 5.4	Check that the Contractor pulls the cables through the ducts without exceeding the maximum pulling tension recommended by the manufacturer and without underground splices. Check that a cable lubricant is used during the pulling operation.
E 5.5	Where direct buried cable is installed, check that marker tape and cable bricks are installed as specified in the contract documents.
E 5.6	Check that all splices and terminations conform as specified in the contract documents.
E 5.7 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 5.8 M	**Check that all continuity and attenuation tests on all connectorized links are as specified in the contract documents.**
E 5.9 M	**For High Voltage Systems, check that the Contractor performs all testing required by the local authorities and all tests identified as specified in the contract documents.**
E 5.10	Check that all ducts terminating in traffic signal control cabinets, distribution assemblies with wiring installed are sealed.
E 5.11	Check that coils and slack cable is provided as specified in the contract documents.

LEVEL OF INSPECTION – C2

ELECTRICAL – TASK E 6

LUMINAIRES

Task #	Activity
E 6.1	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 6.2	Check that the luminaires delivered have the correct lamp, socket position, photometrics, ballast, and that they are dated.
E 6.3 M	**Check that luminaires are installed and aligned correctly.**
E 6.4 M	**Check that luminaire shields, refractors, and reflectors are installed and aligned correctly.**
E 6.5 M	**Check that all luminaires and associated hardware and materials are in place and are visually checked for cracks, dents and other damage.**
E 6.6 M	**Once all of the luminaires have been installed, perform an aerial inspection on a minimum of 5 percent of the conventional (non-high mast) luminaires.**
E 6.7 M	**Check that all luminaires operate properly when the system is energized.**
E 6.8 M	**Check that the luminaire "burn-in" period meets requirements as specified in the contract documents.**
E 6.9	Check that fuses are of the correct amperage and type.

LEVEL OF INSPECTION – E2

ELECTRICAL – TASK E 7

POWER SUPPLY EQUIPMENT

Task #	Activity
E 7.1	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 7.2 M	**Check that the Contractor has obtained the Electrical Safety Authority label of approval prior to installation of the power supply.**
E 7.3	Check the equipment for obvious defects or damage.
E 7.4	Check that the equipment is as specified, paying special attention to the rating for volts and amps.
E 7.5 M	**Check that the specified grounding is completed.**
E 7.6	Where applicable, check that the power supply is mounted at the correct height, using the specified brackets.
E 7.7 M	**Check that the Contractor has tested the cables and the grounding system in accordance with contract specifications.**
E 7.8 M	**Check that the photoelectric controllers are installed and orientated correctly.**
E 7.9 M	**Check that the component layout conforms to the approved shop drawings.**
E 7.10 M	**Check that the Contractor has obtained a connection authorization from the Electrical Safety Authority prior to energization.**
E 7.11 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract.**

LEVEL OF INSPECTION – F2

ELECTRICAL – TASK E 8

TRAFFIC SIGNAL EQUIPMENT

Task #	Activity
E 8.1	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 8.2 M	**Receive manufacturer's certificate for pre-installation testing of equipment.**
E 8.3 M	**Check that the PH-M-125 (legal approval form) is received prior to signal equipment (both permanent and temporary) being activated.**
E 8.4	Check that the signal heads and brackets are the correct size and type.
E 8.5	Check that the lamps or the LED modules are the correct wattage and are installed correctly.
E 8.6	Check the orientation and mounting heights of traffic signal heads.
E 8.7	Check that test results for loops conform to the contract requirements.
E 8.8	Check that all actuation devices operate properly.
E 8.9 M	**Once all of the signal displays have been installed, perform an aerial inspection on a minimum of 5 percent of the traffic signal displays.**
E 8.10 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 8.11 M	**Check that traffic signal operation conforms to the timing plan and operational parameters set by the Regional Traffic Section.**
E 8.12 M	**Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract.**

LEVEL OF INSPECTION – E2

ELECTRICAL – TASK E 9

TRAFFIC ACTUATION AND DETECTION EQUIPMENT

Task #	Activity
E 9.1	Check all the delivered material (cabinet, controller, modem, sealant, etc.) to verify that it is being supplied from the approved list that was submitted by the Contractor at the commencement of the contract.
E 9.2M	**Receive manufacturer's certificate for pre-installation testing of equipment.**
E 9.3	Check that sealant is the approved type and rated for the temperature at which time the installation is taking place.
E 9.4	Check that loop layout and installation are in conformance with the contract documents.
E 9.5	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 9.6	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 9.7	Check that the saw cut slot depth is as required and has been cleaned with pressurized water and dried by means of compressed forced air and / or a heat lance.
E 9.8	Check that the black conductor of the extra low voltage cable is consistently connected to the clockwise winding of the loop lead cable.
E 9.9	Ensure that detector wires are encapsulated in neoprene tubing where detector wires are crossing pavement irregularities such as pavement cracks.
E 9.10 M	Check to ensure backing rods are the correct length, diameter and are spaced as required in the contract documents.

E 9.11 Check that the type, alignment, offset, station, elevation relative to final grade, and depth of hand holes conforms to contract requirements.

E 9.12 Check that frames and covers of electrical chambers are free of debris.

E 9.13 Check that backfill materials are as specified in the contract documents and are compacted to the target density.

E 9.14 Check that post, accessories (reflector / chain etc.) and handhole sizes, type and orientation is as specified in the contract documents.

E 9.15 Check that the metallic shield of extra-low voltage cables are cut off cleanly and left unconnected in the resin loop splice.

E 9.16 Verify all loop splices and ensure that they are encased in a resin splice with the splices positioned to obtain a minimum coverage of 6mm of resin around each splice.

E 9.17 Check that initially, the sensitivity switches or amplifiers are set to Level 4. Fine-tuning of the sensitivity switches will be adjusted during the physical car counting process.

E 9.18 Check that the High (FH) Low (FL) frequency switches of amplifiers alternate on each channel.

E 9.19 Check that the Contractor tests the loop with a “megger” and with an inductance meter and submits the measured values for verification.

E 9.20M Verify that the loop is operating as specified in the contract documents.

E 9.21 M Check that the Certificate of Conformance is supplied and reviewed as per the time requirements of the contract.

LEVEL OF INSPECTION – C2

ELECTRICAL – TASK E10

HIGH MAST LIGHTING

Task #	Activity
E 10.1	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 10.2 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 10.3 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 10.4 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 10.5 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 10.6	Inspect the high mast lighting luminaires in accordance with Task **E6**
E 10.7 M	**Check that all high mast lighting equipment and materials are in place and are visually checked for cracks, dents and other damage.**
E 10.8 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 10.9 M	**Check that the certificate of compliance has been received.**
E 10.10	Check that the fuses are of the correct amperage and type.
E 10.11 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

ATMS – TASK ATMS 1

ATMS CHAMBERS

Task #	Activity
ATMS 1.1 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 1.2	Check type, alignment, offset and grade of ATMS chambers and junction boxes.
ATMS 1.3	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.
ATMS 1.4	Check that drainage installation has been completed as specified in the contract documents.
ATMS 1.5 M	**Check that backfill materials are as specified in the contract documents and are compacted to the target density.**
ATMS 1.6	Check that communication ducts entering ATMS chambers are installed such that they extend 150mm beyond the face of the inside wall of the unit.
ATMS 1.7	Check that flexible ducts entering ATMS chambers are installed with standard end bells placed flush with the face of the inside wall of the unit.
ATMS 1.8 M	**Check that frames and covers of ATMS chambers are connected to the system ground.**

LEVEL OF INSPECTION – C1/E2

ATMS – TASK ATMS 2

ATMS CONDUITS

Task #	Activity
ATMS 2.1 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 2.2 M	**Check that wobble joints are installed as specified in the contract documents.**
ATMS 2.3	Check that excavation for the duct and/or duct bank conforms to the specified dimensions.
ATMS 2.4	Check that the correct size, type and number of ducts are being installed.
ATMS 2.5 M	**Check that backfill materials are as specified in the contract documents and are compacted to the target density.**
ATMS 2.6	Check that surface mounted duct has been installed in accordance with the manufacturer's recommendations and contract drawings.
ATMS 2.7	Check that marker tape and cable bricks have been installed as specified in the contract documents.
ATMS 2.8 M	**Check that ducts are free of debris.**
ATMS 2.9 M	**Check that all unused ducts are plugged with plastic plugs and have fishwire installed.**

LEVEL OF INSPECTION – A1

ATMS – TASK ATMS 3

ATMS ELECTRICAL CABLE INSTALLATION

Task #	Activity
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 the Contractor at the commencement of the contract. Record all non-conformance items and provide recommendations.**
ATMS 3.2	Check that size, type and colour of cable is as specified in the contract documents.
ATMS 3.3	Check that the Contractor pulls the cables through the ducts without exceeding the maximum pulling tension recommended by the manufacturer. Ensure that a cable lubricant is used during the pulling operation.
ATMS 3.4	Check that all splices and terminations conform as specified in the contract documents.
ATMS 3.5 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 3.6	Check that all ducts terminating in ATMS cabinets or power supply cabinets with wiring installed are sealed.
ATMS 3.7 M	**Check that coils and slack cable is provided as specified in the contract documents.**

LEVEL OF INSPECTION – C1/C2

ATMS – TASK ATMS 4

GROUNDING

Task #	Activity
ATMS 4.1 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 4.2	Check that insulated ground wire is of the correct colour and type, as specified in the contract documents.
ATMS 4.3	Check that the specified ground electrodes are used and that the dimensions are correct.
ATMS 4.4 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 4.5 M	**Check that all inaccessible ground connections are installed as specified in the contract documents.**
ATMS 4.6 M	**Check that the Contractor conducts the resistance to ground tests as specified in the contract documents.**
ATMS 4.7	Check that all metal components throughout the contract are grounded.
ATMS 4.8	Check that the system ground is continuous throughout.

LEVEL OF INSPECTION – A1

ATMS – TASK ATMS 5

POWER SUPPLY EQUIPMENT

Task #	Activity
ATMS 5.1 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 5.2 M	**Check that the Contractor has obtained the Electrical Safety Association (ESA) label of approval prior to installation of the power supply.**
ATMS 5.3	Check the equipment for obvious defects or damage.
ATMS 5.4	Check that the equipment is as specified, paying special attention to the rating for volts, amps, and wattage.
ATMS 5.5	Check that the power supply is mounted at the correct height, using the specified brackets.
ATMS 5.6	Check that the specified grounding is completed.
ATMS 5.7 M	**Check that the Contractor has tested the cables and the grounding system in accordance with the contract specifications.**

LEVEL OF INSPECTION – E2

ATMS – TASK ATMS 6

CLOSED CIRCUIT TELEVISION (CCTV) POLES AND MAINTENANCE SITES

Task #	Activity
ATMS 6.1 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 6.2	Check that the Contractor augers the holes to the specified dimensions.
ATMS 6.3	Visually check all poles for dents, cracks, scratches and any other obvious imperfections.
ATMS 6.4	Check that the Contractor properly stores, erects and supports the poles in accordance with the manufacturer's recommendations and contract constraints.
ATMS 6.5	Check that pole orientation is as specified in the contract documents.
ATMS 6.6	Check that poles are installed to the correct elevation, station, offset, and vertically aligned, as specified in the contract documents.
ATMS 6.7	Check that the opening for the maintenance site is not less than 5.0m and has the proper taper back to the edge of pavement.
ATMS 6.8 M	**Check the installation of the subdrain as specified in the contract documents.**
ATMS 6.9 M	**Check that the Contractor compacts the fill materials of the maintenance site to the target density.**

LEVEL OF INSPECTION – C1/E2

ATMS – TASK ATMS 7

COMMUNICATION CABLE INSTALLATION

Task #	Activity
ATMS 7.1 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 7.2 M	**Check that all on-reel tests have been completed successfully, immediately following delivery and prior to any communication cable installation work.**
ATMS 7.3	Check that a generous amount of cable lubricant is applied during the installation.
ATMS 7.4	Check that the communication cable is installed according to all the constraints of the contract and that none of the dynamic characteristics of the cable are exceeded to prevent damage.
ATMS 7.5 M	**Check that all slack in maintenance chambers as identified in the contract documents is provided (typically at bridge crossings, and upstream and downstream of communication pedestals).**
ATMS 7.6	Check that all unused communication ducts have a fishwire installed and are capped with plastic plugs. Check that used communication ducts are plugged with duct sealing compound.
ATMS 7.7 M	**Check that all continuity and attenuation tests on all connectorized links as per the Proof of Performance (POP) and contract documents are performed successfully.**
ATMS 7.8 M	**Check that all cables are labelled according to the contract.**

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 8

DATA TRANSMISSION EQUIPMENT INSTALLATION

Task #	Activity
ATMS 8.1 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 8.2 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation work.**
ATMS 8.3	Check that the field and traffic operations centre (TOC) equipment is installed and secured in the cabinets' designated reserved space as per the contract drawings.
ATMS 8.4	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 8.5	Check that the equipment is connected to the proper power distribution assembly (PDA) receptacle reserved for the communication equipment.
ATMS 8.6	Check that the proper data terminal equipment/data communications equipment (DTE/DCE) to DTE/DCE data interface cable is installed to match the type of controller equipment.
ATMS 8.7 M	**Check that all data interface equipment has successfully passed Proof of Performance (POP) testing prior to commencing data system line-up acceptance testing (DSLAT) testing and that DSLAT testing is completed successfully.**
ATMS 8.8 M	**Check that the data communications documentation being supplied meets the contract requirements.**

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 9

VIDEO TRANSMISSION / DISPLAY EQUIPMENT INSTALLATION

Task #	Activity
ATMS 9.1 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 9.2 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation work.**
ATMS 9.3	Check that the field and traffic operations centre (TOC) equipment is installed and secured in the cabinets' designated reserved space as per the Contract Drawings.
ATMS 9.4	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 9.5	Check that the equipment is connected to the proper power distribution assembly (PDA) receptacle reserved for the video transmission / display equipment.
ATMS 9.6 M	**Check that all video transmission / display equipment has successfully passed Proof of Performance (POP) testing prior to commencing video system line-up acceptance testing (VSLAT) testing and that VSLAT testing is completed successfully.**

LEVEL OF INSPECTION – C1/C2

ATMS – TASK ATMS 10

CAMERA EQUIPMENT INSTALLATION

Task #	Activity
ATMS 10.1 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 10.2 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation work.**
ATMS 10.3	Check that the entire pole top is grounded according to the contract drawings.
ATMS 10.4	Check that the field equipment is installed and secured in the cabinets' designated reserved space as per the contract drawings.
ATMS 10.5	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 10.6	Check that the equipment is connected to the proper power distribution assembly (PDA) receptacle reserved for the camera equipment.
ATMS 10.7	Check that the pan/tilt range stops are field adjusted with the assistance and guidance of advanced traffic management systems (ATMS).
ATMS 10.8 M	**Check that all camera equipment has successfully passed Proof of Performance (POP) testing.**

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 11

VEHICLE DETECTION EQUIPMENT INSTALLATION

Task #	Activity
ATMS 11.1 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 11.2 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation work.**
ATMS 11.3 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 to sawcut slots that cross pavement irregularities and that the corners have been rounded as detailed in the contract documents.**
ATMS 11.4	Check that the sawcut slot is the required depth, and has been cleaned with pressurized water and dried by means of compressed forces air.
ATMS 11.5	Check that the loops are installed with the size, winding direction, number of turns and type of cable specified.
ATMS 11.6	Check that the loop cable end at the splice point which progresses clockwise is 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.).
ATMS 11.7	Check that the Contractor tests the loop with a “Megger” and with an inductance meter and submits the measured values for verification.
ATMS 11.8	Check that the black conductor of the extra low voltage cable is consistently connected to the clockwise winding of the loop lead cable.
ATMS 11.9	Check that the metallic shield of extra-low voltage cables are cut off leanly and left unconnected in the resin loop splice.

ATMS 11.10 M **Verify all loop splices and ensure that they are encased in a resin splice with the splices positioned to obtain a minimum coverage of 6mm of resin around each splice.**

ATMS 11.11 Check that the operating mode of all connected detector amplifiers is set to presence (PR) mode.

ATMS 11.12 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 11.13 Check that the High (FH) Low (FL) frequency switches of amplifiers alternate on each channel.

ATMS 11.14 Check that each detector station is identified with a nameplate on the inside wall of the splice point.

ATMS 11.15 Check that the loop location is accurately marked with a cut cross on each curb.

ATMS 11.16 M **Check that all vehicle detection station (VDS) equipment has successfully passed Proof of Performance (POP) testing.**

LEVEL OF INSPECTION – C1/C2

ATMS – TASK ATMS 12

CABINET AND CONTROLLER INSTALLATION

Task #	Activity
ATMS 12.1 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 12.2 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation work.**
ATMS 12.3	Check that all concrete cabinet pads are installed to the correct elevation, station and offset, as specified in the contract documents.
ATMS 12.4	Check that all conduits for the concrete cabinet pads are installed to the proper dimensions.
ATMS 12.5	Check that all conduits into the cabinets are identified as to their purpose.
ATMS 12.6	Check that all unused conduits into a cabinet have a fishwire installed and are plugged with plastic plugs, used conduits should be sealed.
ATMS 12.7	Check that the cabinet is installed with the door orientation specified in the Contract Drawings.
ATMS 12.8	Check that the proper 12 character laminated phenolic identification nameplate is installed on the cabinet so as to be visible when approaching along the highway.
ATMS 12.9	Check that the cabinet ground bus is connected to the system ground at the power supply ground termination.
ATMS 12.10	Check that the loop input wires (extra low voltage cables) are labelled and terminated at the I/J file according to the contract drawings.
ATMS 12.11	Check the controller is plugged into the proper outlet of the cabinet power distribution assembly (PDA).

ATMS 12.12 Check the controller is left with the power switch in the “on” position.

ATMS 12.13 M Check that all controller and cabinet equipment has successfully passed Proof of Performance (POP) testing.

LEVEL OF INSPECTION – C1/E2

ATMS – TASK ATMS 13

CHANGEABLE MESSAGE SIGN (CMS) INSTALLATION

Task #	Activity
ATMS 13.1 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 13.2 M	**Check that the equipment has passed Pre–Installation Testing (PIT) as required prior to any installation work.**
ATMS 13.3	Check that the structural support truss is grounded according to the contract drawings.
ATMS 13.4	Check that the field equipment is installed and secured in the cabinets' designated reserved space as per the contract drawings.
ATMS 13.5	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 13.6	Check that the CMS is positioned on the truss as per the contract drawings.
ATMS 13.7	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 13.8	Check that all support clamps are secured prior to removing the crane support.
ATMS 13.9	Check that the CMS is installed with the tile angle recommended within the contract documents.
ATMS 13.10	Check that all access doors are anchored and/or secured properly.
ATMS 13.11	Check that all attachment bolts and/or nuts are tightened to the recommended manufacturer's torque.

ATMS 13.12 M Check that all CMS equipment has passed Proof of Performance (POP).

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 14

SYSTEM INTEGRATION TEST (SIT) VERIFICATION

Task #	Activity
ATMS 14.1 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 14.2 M	**Check that the Contractor tests in the following chronological order:** ▪ **Complete all equipment and subsystem tests required in the contract documents;** ▪ **Test each subsystem independently on the communication subsystem;** ▪ **Test each subsystem independently through the communications subsystem with the head end control device in the traffic operations centre (TOC);** ▪ **Add subsystems one at a time and monitor the head end performance at the TOC;** ▪ **Fail safe testing of all subsystems one at a time and monitor the lead end performance at the TOC**
ATMS 14.3 M	**Check that the Contractor follows the approved SIT test procedures.**
ATMS 14.4 M	**Check that all tests are successfully completed and all results (PIT, POP and Stage 1 of SIT) are submitted for verification.**
ATMS 14.5 M	**Check that a notification to start the 14 day burn-in test is submitted 5 business days in advance, before the commencement of the test.**
ATMS 14.6 M	**Check daily that the Event and Error Logs of the Compass System during the 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 – TASK ATMS 15

PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) INSTALLATION

Fixed Support

Task #	Activity
ATMS 15.1 M	**Check all the delivered material to verify that it is being supplied from the approved material selection (MSA) that was submitted by the Contractor at the commencement of the contract.**
ATMS 15.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation work.**
ATMS 15.3	Check that the PCMS support structure is grounded according to the contract drawings.
ATMS 15.4	Check that the PCMS is positioned on the support structure as per the contract drawings.
ATMS 15.5	Check that the PCMS is positioned with the angle recommended within the contract drawings.
ATMS 15.6	Check that all attachment bolts and / or nuts are tightened to the recommended manufacturer's torque.
ATMS 15.7	Check installation PCMS controller cabinet including mounting on the structure, locking mechanism and that equipment inside is securely mounted.
ATMS 15.8	Check the mounting and position of the solar panel and battery pack, if applicable.
ATMS 15.9	Check power supply connection to sign, if applicable.
ATMS 15.10	Check communications link (e.g. telephone, fibre, etc.) to the sign, if applicable.
ATMS 15.11M	**Check that the communication mode has been set for remote control (e.g. cellular communication), if applicable. Test to ensure there is proper control from a COMPASS Traffic Operations Centre or Radio Room.**

ATMS 15.12 M **Check that all PCMS equipment has passed Proof of Performance (POP).**

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 16

PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) INSTALLATION

Portable (Trailer Mounted)

Task #	Activity
ATMS 16.1 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 16.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation work.**
ATMS 16.3	Check that the PCMS trailer is stabilized and levelled.
ATMS 16.4	Check that that the PCMS trailer assembly includes wheel locks to maintain security of the PCMS.
ATMS 16.5	Check that the PCMS sign display is accurately aligned towards traffic.
ATMS 16.6	Check that the PCMS is locked into secure position to prevent rotation and lowering of the sign while in display mode.
ATMS 16.7	Check that the solar panel tray is locked into the appropriate position on the top of the sign case by using the independent locking mechanism.
ATMS 16.8	Check that the solar panel tray is installed facing a true South.
ATMS 16.9	Check that all attachment bolts and / or nuts are tightened to the recommended manufacturer’s torque.
ATMS 16.10	Check that the PCMS controller cabinet and equipment inside is securely mounted.
ATMS 16.11	Check battery pack is secured and connected.
ATMS 16.12	Check that communication link to the sign has been activated.
ATMS 16.13	Check for presence of non-skid finish on fenders.

ATMS 16.14 M **Check that all PCMS equipment has passed Proof of Performance (POP).**

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 17

NON - INTRUSIVE TRAFFIC SENSOR INSTALLATION

Task #	Activity
ATMS 17.1 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 17.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation work.**
ATMS 17.3	Check that the Contractor has accurately mounted the unit according to manufacturer's installation guidelines for parameters including the mounting height, set-back position (side-fire configuration0, tilt angle, etc.
ATMS 17.4	Check that a traffic sensor unit is aimed properly to the travel lanes based on whether it is configured for side-fire or forward-looking mode. Ensure that each detection footprint is contained within one lane.
ATMS 17.5	Check that sensor communications and power cables are connected correctly at the unit and to ATC unit inside the cabinet.
ATMS 17.6	Check that the sensor unit is properly calibrated at the site by using manufacturer PC software.
ATMS 17.7 M	**Check if additional calibration table is required later in the contract to reflect lane configuration dictated by staging. Note approximate schedule.**
ATMS 17.8 M	**Check that all sensor equipment has passed Proof of Performance (POP).**

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 18

DOME CAMERA 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 Contractor at the commencement of the contract.**
ATMS 18.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation work.**
ATMS 18.3	Check that the pole top is grounded according to the contract drawings.
ATMS 18.4	Check that the wiring between the camera and cabinet has been installed continuous with no intermediate splices.
ATMS 18.5	Check that cable strain relief is provided for the power and communication cables.
ATMS 18.6	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 maximum bending radii have been exceeded.
ATMS 18.7	Check that the camera pole does not obstruct the desired camera field review.
ATMS 18.8	Check blanking preset, if applicable.
ATMS 18.9	Check that equipment is connected to the proper power distribution assembly (PDA) receptacle reserved for the camera equipment
ATMS 18.10	Check by visual inspection of the image at TOC that the stainless steel straps for the camera arm are sufficiently tightened and that the dome is free of dirt.
ATMS 18.11	**Check that all Dome Camera equipment has passed Proof of Performance (POP).**

LEVEL OF INSPECTION – C1/D2

ATMS – TASK ATMS 19

CAMERA RAISING AND LOWERING DEVICE 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 Contractor at the commencement of the contract.**
ATMS 19.2 M	**Check that the equipment has passed Pre-Installation Testing (PIT) as required prior to any installation work.**
ATMS 19.3	Check that CCTV pole is free from external damage from transportation to the site.
ATMS 19.4	Check that CCTV pole is placed as per contract specifications and that underground ducts connect properly to the pole.
ATMS 19.5	Verify that pole is installed plumb.
ATMS 19.6	Check that the straps for the pole mounted fitter with pulley housing and mounting bracket are tightened securely.
ATMS 19.7	Check that the arm is positioned as per contract specifications.
ATMS 19.8	Check that the arm is installed at the height specified in contract specifications.
ATMS 19.9	Check that power and communication cables are continuous from cabinet to the camera.
ATMS 19.10	Check that power and communications cables and suspension cable have sufficient length to allow lowering of the camera to ground level.
ATMS 19.11	Check that the winch is rust free and installed securely.
ATMS 19.12 M	**Check to see the raising/lowering device can be operated using both (a) an electrically-powered and (b) hand-operated device.**
ATMS 19.13 M	**Check that all Camera Raising and Lowering Device equipment has passed Proof of Performance (POP).**

LEVEL OF INSPECTION – C1 / D2

ATMS – TASK ATMS 20

WIRELESS COMMUNICATION SYSTEM 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 Contractor at the commencement of the contract.**
ATMS 20.2 M	**Check that the equipment passed Pre-Installation Testing (PIT) as required prior to any installation work.**
ATMS 20.3	Check that the field equipment is installed and secured on the structure (e.g. transmitter and receiver poles / towers) as per the contract drawings.
ATMS 20.4	Check that all cables are supplied continuous with no intermediate splices from cabinet to pole top.
ATMS 20.5	Check that cable connectors match equipment and are securely installed on the cables.
ATMS 20.6	Check that 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 20.7	Check that equipment is connected to the proper power distribution assembly (PDA) receptacle reserved for the communication equipment.
ATMS 20.8	Check that transmit and receive antennas are properly aligned towards each other.
ATMS 20.9 M	**Check that all wireless communication links equipment has passed Proof of Performance (POP).**

LEVEL OF INSPECTION – C1 / C2

TRAFFIC CONTROL – TASK TC 1

GENERAL

Task #	Activity
TC 1.1	Review the Approved Signing Requirements with the Contractor.
TC 1.2	Record Contractor's contact person(s) responsible for traffic control and the Traffic Control Signing diary.
TC 1.3	Ensure that the construction zone designation is in place before speed limit signs are changed or the construction zone begins / ends signs are installed.
TC 1.4	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 1.5	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 1.6	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 1.7	Check that signs and traffic control devices are retro-reflective, clean, legible and in good working order.
TC 1.8	Check for the removal of temporary signs when they are no longer required.
TC 1.9	Check that (on a regular basis) the contractor records each stage change or sign change in the Traffic Control Signing diary.
TC 1.10	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 1.11	Check that all lane closure protocol is adhered to as per the requirements of the contract documents.

TC 1.12 The CA is to drive through the site on a regular basis (once per week and after every time that we work on the travelled lanes) and document observations.

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.

ENVIRONMENTAL – TASK ENV 1

GENERAL ENVIRONMENTAL COMPLIANCE

Task #	Activity
ENV 1.1	Check compliance with design and construction commitments contained in the contract documents and the Summary of Environmental Concerns and Commitments table, including any commitments to contact affected parties prior to construction.
ENV 1.2	Check that work does not cause environmental impacts.
ENV 1.3	Check compliance with environmental requirements, prohibitions and conditions of federal and provincial legislation, particularly with respect to environmental impacts that are caused by the work.
ENV 1.4	Check compliance with environmental permits/approvals.
ENV 1.5	Check that all environmental permits/approvals are obtained (i.e. noise by-law exemptions, wayside pit permits, archaeological investigations and clearances / sign-off by Ministry of Culture prior to land capping or land disturbing activities such as stockpiling or material production in areas outside of the existing ROW / contract limits, authorization under the Fisheries Act, Navigable Waters Protection Act permit, Species at Risk Act, etc.
ENV 1.6	Confirm that all environmental protection systems and environmental constraints have been addressed and are monitored.

LEVEL OF INSPECTION – C1 until the Contractor demonstrates satisfactory performance of operations
– D1 after the Contractor demonstrates satisfactory performance of operations

ENVIRONMENTAL – TASK ENV 2

USE OF WASTE PRODUCTS / MATERIALS IN THE WORK

Task #	Activity
ENV 2.1 M	**Check that waste product dust suppressants meet the material and construction requirements of the contract documents, e.g. MOE approved dust suppressant.**
ENV 2.2 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 2.3 M	**Check that standard forms regarding use of blast furnace slag in the work are submitted 3 weeks prior to any use of the material.**
ENV 2.4 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

ENVIRONMENTAL – TASK ENV 3

MANAGEMENT AND DISPOSAL OF EXCESS MATERIALS

Task #	Activity
ENV 3.1 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. Ensure a copy of all test results and waste manifests are provided to the MTO Environmental Planner – Waste Management.**
ENV 3.2 M	**Check that standard forms regarding the management of excess material are submitted prior to management of excess material off site.**
ENV 3.3 M	**Check that areas are pre-cleared prior to excess material placement and contour graded and seeded and mulched after placement.**
ENV 3.4	Record the locations of management areas and sources of excess material being managed.
ENV 3.5 M	**Check compliance with conditions on management of disposed fill and materials stockpiled inside the R.O.W., on Ministry property and on third party properties covered with letters of agreement.**

LEVEL OF INSPECTION – C1

ENVIRONMENTAL – TASK ENV 4

WORK IN, ADJACENT TO, AND OVER WATERBODIES

Task #	Activity
ENV 4.1	Check that sediment and other deleterious material are prevented from reaching watercourses, and other water bodies.
ENV 4.2	Check that entry of equipment and construction materials to watercourses and waterbodies, and undertaking of any work, is limited to that specified in the contract documents and environmental documentation, and as may be authorized through environmental permits/approvals.
ENV 4.3	Check that work specified in the watercourses/waterbodies and their banks is in compliance with that specified in the contract documents and environmental documentation, and as may be authorized through environmental permits/approvals.
ENV 4.4	Check that temporary water passage systems, temporary waterbody crossings, cofferdams and turbidity curtains are installed, maintained and removed in compliance with contract requirements.
ENV 4.5	Check that disturbance/damage to watercourse/waterbody beds, banks and bank vegetation is limited to that specified in the contract documents and environmental documentation, and as may be authorized through environmental permits/approvals.
ENV 4.6	Check for compliance with the time constraints specified in the contract documents relative to work in and adjacent to watercourses.
ENV 4.7	Check weather forecast prior to understanding critical operations (depending on the watercourse, type and duration of work, etc.)
ENV 4.8	Check that re-grading and restoration measures are undertaken as specified in the contract documents 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.

ENVIRONMENTAL – TASK ENV 5

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

Task #	Activity
ENV 5.1	Check that sediment and other deleterious material are prevented from reaching areas of trees not designated for removal.
ENV 5.2	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 5.3	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 5.4	Check that tree barrier protection is in place prior to commencement of construction activities.
ENV 5.5	Check for proper placement and maintenance of barrier for tree protection.
ENV 5.6	Check for any damage to trees, and have them repaired / replaced as specified in the contract documents.

LEVEL OF INSPECTION – C1

ENVIRONMENTAL – TASK ENV 6

CONTROL OF DUST FROM THE WORK

Task #	Activity
ENV 6.1	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 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 – A1

NOTE: This task shall be performed by all staff on the contract on an “ongoing” basis.

ENVIRONMENTAL – TASK ENV 7

TEMPORARY EROSION AND SEDIMENTATION CONTROL

Task #	Activity
ENV 7.1 M	**Check that sediment barriers, flow checks, sediment traps, 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 7.2	Check that construction of temporary erosion and sedimentation control measures complies with contract requirements.
ENV 7.3	Check that temporary erosion and sedimentation control measures are maintained and replaced as specified in the contract documents. Check that contingency supplies where specified in the contract, such as straw bale flow checks, erosion control blanket, stakes, rock and silt fence are on site for the purposes of maintenance or repair of erosion and sediment control measures.
ENV 7.4	Check that accumulated sediment is cleaned out from temporary erosion and sedimentation control measures as specified in the contract documents, and that temporary erosion and sedimentation control measures are checked for effective working condition prior to forecasted major storm events, and subsequent to storm events.
ENV 7.5	Check that sediment discharges to watercourses and other sensitive areas are removed in consultation with environmental staff.
ENV 7.6	Check that temporary erosion and sedimentation control measures are removed as specified in the contract documents, and in a manner that prevents sediment escape.
ENV 7.7	Check for compliance with time constraints on the maximum period between removal of original vegetative surface cover and placement of final specified surface cover. Check that such compliance also provides for compliance with the cut-off dates for seed and cover specified in the contract documents.
ENV 7.8	Check that the Contractor installs any additional erosion and sedimentation control measures that are necessary solely because of preferred construction means, methods, techniques, sequences and procedures selected by the Contractor.

ENV 7.9 Check that the Contractor installs any additional erosion and sedimentation control measures that were not anticipated during design, but are required because of site conditions.

LEVEL OF INSPECTION – C1 during installation
– C1 prior to forecasted major storm events
– C1 following significant storm events

- **E1 for routine maintenance, unless maintenance / repairs are required upon inspection and after significant storm events**

ENVIRONMENTAL – TASK ENV 8

INCIDENT MANAGEMENT

(As required by clause GC7.13.03 of the MTO General Conditions of Contract)

Task #	Activity
ENV 8.1	**Check that any spill, discharge, emission, release or escape of a material, pollutant, containment, 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.**
ENV 8.2	Check that the Contractor undertakes immediate notification of the spill / environmental incident to the proper authorities (SP199F34).
ENV 8.3	If the Contractor is unable or unwilling to make the required notifications, or there is any doubt that they have been made, the CA shall make the immediate notifications on behalf of the Contractor.
ENV 8.4	Check that the Contractor undertakes cleanup and restoration of the environment to pre-spill / environmental incident conditions.
ENV 8.5	Check that the Contractor completes the Incident Notification Form (PH-CC-818) within 48 hours of the incident.

LEVEL OF INSPECTION - A1 Upon notification by the Contractor of an incident as required by MTO GC 7.13.03, or upon direct discovery by the CA

WEIGHED MATERIALS – TASK WM 1

VERIFICATION OF THE PLACEMENT OF WEIGHED MATERIALS

Task #	Activity
WM 1.1	Witness the dumping of the material and ensure that each load is completely dumped.
WM 1.2	Collect one original and two copies of the weigh ticket from the truck operator at the dumping point. Ensure that the material is placed in the area designated for that type of material.
WM 1.3	Ensure that the type of material delivered is the same as the type of material indicated on the weigh ticket.
WM 1.4	Visually inspect each load of material and report any obvious defects or deficiencies.
WM 1.5	Ensure that the weigh ticket is completely filled out.
WM 1.6	Write the word “Cancelled” on weigh 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 weigh ticket (i.e. station and use of the material).
WM 1.8	Sign the original and the two copies of the weigh ticket.

LEVEL OF INSPECTION – A1 / A2