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**List of Specifications**

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## PART 1 - GENERAL

### 1.1 References

- .1 Latest version of National Building Code of Canada (NBC) including all amendments up to tender closing date.

### 1.2 Description of Work

- .1 Work includes repositioning and repairs of existing wooden boardwalk and installing earth anchors in Shirley's Bay, construction of a new composite plastic boardwalk in Shirley's Bay, full removal and replacement of existing boardwalk sections at two working areas for over a total length of 70m supported on timber sleepers in Stony Swamp and full removal and replacement of existing boardwalk (5m) in Carlsbad. Work also includes mobilization/ demobilization, traffic protection and environmental mitigation measures, the removal and off-site disposal of existing boardwalks to demolish, and site reinstatement to original site conditions and cleanup at all affected locations by construction. Construction Period shall be between contract award and December 31<sup>st</sup>, 2013.

### 1.3 Codes

- .1 Perform work in accordance with latest version of National Building Code of Canada (NBC) and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Meet or exceed requirements of:
  - .1 contract documents,
  - .2 specified standards, codes and referenced documents.

### 1.4 Documents Required

- .1 Maintain at job site, one copy each of following:
  - .1 Contract drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed shop drawings if required.
  - .5 Change orders.
  - .6 Other modifications to Contract.
  - .7 Copy of approved work schedule.
  - .8 Instructions for the supply and installation provided by Suppliers

### 1.5 Work Schedule

- .1 Provide within 5 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by Contract documents.

- .2 Construction works shall be done from 7h30 to 17h30.
- .3 Provide in form acceptable to Engineer, within 5 working days after Contract award, a detailed schedule showing activities and dates for:
  - .1 lists of materials and samples
  - .2 delivery of equipment and materials
  - .3 completion date related to completion date stipulated in contract.
- .4 Interim reviews of work progress based on work schedule will be conducted as decided by Engineer and schedule updated by Contractor in conjunction with and to approval of Engineer.

#### 1.6 Contractor's Use of Site

- .1 Work areas will be closed during construction, but pathways leading to work areas will remain open to public during construction.
- .2 Use of site: as specified in contract documents and as per Engineer's instructions. The NCC will designate and stake out a stockpile and staging area near the sites if required. The contractor is not to use the parking lot for this purpose. Stockpile area must be fenced and secured from public access. Small amounts of material for immediate use may be stockpiled within the footprint of the existing boardwalk. Contractor is to keep the access roads to the parking lot open at all times. Contractor to install proper signage to indicate to pedestrians closure of trail at work areas.
- .3 Contractor's vehicles and equipment will remain on designated trail and staging areas; no incursion onto naturalized areas is permitted. Main access to work areas by NCC Parkings. Access road to sites will be identified on site by NCC representative. Access road can mostly accommodate light truck and trailer and other small motorized equipment (e.g. ATVs, Bob-Cat loader, Gator) for hauling equipment and materials to working areas. No other vehicles are allowed on the pathways.
- .4 Contractor shall be responsible for all damages, dirt, oil, etc., on trail elements, and shall remove them.
- .5 A fence shall be installed during non-working hours to isolate the working area for public safety.
- .6 Contractor to do snowplowing in all access routes to pathways

and into pathways to get to construction site at his cost, if required.

- 1.7 Project Meetings
- .1 Hold project meetings at times and locations approved by Engineer.
  - .2 Provide 48 hour notice to participants of date and time of meetings.
  - .3 Record minutes of meetings, and distribute to participants within 7 days of meeting.

- 1.8 Setting Out of Work
- .1 Assume full responsibilities for and execute complete layout of work to locations, lines and elevations indicated.
  - .2 Provide devices needed for lay out, construction, and demolition work.

- 1.9 Written Warranties
- .1 Sleepers, wood beams and decks against medium splitting for two (2) years.

- 1.10 Additional Drawings
- .1 Engineer may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

- 1.11 Interpretation of "Engineer"
- .1 Designation "Engineer" in Sections is to be replaced by "NCC Representative".

END OF SECTION

## PART I – GENERAL

### 1.1 General

- .1 Work includes repositioning and repairs of existing wooden boardwalk and installing earth anchors in Shirley's Bay, construction of a new composite plastic boardwalk in Shirley's Bay, full removal and replacement of existing boardwalks sections at two working areas for over a total length of 70m supported on timber sleepers in Stony Swamp and full removal and replacement of existing boardwalk (5m) in Carlsbad. Work also includes mobilization/ demobilization, traffic protection and environmental mitigation measures, the removal and off-site disposal of existing boardwalks to demolish, and site reinstatement to original site conditions and clean-up at all affected locations by construction. Construction Period shall be between contract award and December 31<sup>st</sup>, 2013.
- .2 Payment at the lump sum contract price shall be full compensation for all labor, services, equipment, and materials to complete the work, for all pay items described in the following paragraphs and listed in the Form of Tender.

### 1.2 Pay Item 1 - Mobilization / demobilization, traffic control, site clean-up and site re-instatement

- .1 The work includes all site preparation and mobilization / demobilization. It includes the protection measures to protect public traffic (vehicular and pedestrian) including traffic signs, snowplowing of roadway and access trail from NCC parkings to construction work areas, all environmental protection and mitigation measures, site clean-up during and at the end of contract, as well as re-instatement of all sites to original condition, removal and transportation off-site of debris and demolition materials.
- .2 Work of this item is primarily described in Sections 01005, 01340, 01500, 01545, 01561, 01600, 01710 and 02070.
- .3 This item will be paid on a lump sum basis at the price included in the Schedule of Prices.
- .4 No measurement for payment will be made for this item.

### 1.3 Pay Item 2 - Shirley's Bay – Repositioning, repairs and anchoring of existing boardwalk

- .1 This item includes the following as shown in the specifications and on drawings. It includes at work area #1, approx. 10m long existing wooden boardwalk to be repositioned to be aligned with

trail (to be coordinated with NCC representative), replace all decking (41 – 2x6 boards, 1m in length), ramps (15 – 2x6 boards, 1m in length) and sleepers (8 – 2x6 boards, 1m in length) at each end and install 4 earth anchors. It includes also supply and erection of new wood elements, trimming, drilling, sawn/cut-out, shimming, adjustments and fastening, connections and screws. When work is complete, structure must be level, sturdy and securely anchored to the ground.

- .2 Work of this item is primarily described in Sections 01600 and 06100.
- .3 This item will be paid on a lump sum basis at the price included in the Form of Tender.
- .4 No measurement for payment will be made for this item.

#### 1.4 Pay Item 3 - Shirley's Bay – New plastic composite boardwalk

- .1 This item includes the following as shown in the specifications and on drawings. It includes at work area #2, construction of new 12.8m long by 1.52m wide boardwalk, entirely made out of Axion International plastic composite materials or approved equivalent (Refer to **GI15 Approval of Alternative Materials** in the Instructions To Tenderers for instructions on submitting substitution). Structure to be erected on single or doubled sleepers to accommodate natural terrain. Installation to be as per manufacturer instruction and recommendation. Exact location of new boardwalk to be coordinated with NCC representative. It includes also supply and erection of new plastic composite elements, trimming, drilling, sawn/cut-out, shimming, adjustments and fastening, connections and screws.
- .2 Work of this item is primarily described in Sections 01600 and 06200.
- .3 This item will be paid on a lump sum basis at the price included in the Form of Tender.
- .4 No measurement for payment will be made for this item.

#### 1.5 Pay Item 4 - Stony Swamp – Existing boardwalk (±10m) to be replaced

- .1 This item includes the following as shown in the specifications and on drawings. It includes at work area #3, 10m long existing boardwalk to be removed and 10m new wood boardwalk to be

built. New boardwalk shall be widened to 1.52m within the same corridor. It includes also supply and erection of decking, beams, sleepers, trimming, drilling, sawn/cut-out, shimming, adjustments and fastening, connections and screws.

- .2 Work of this item is primarily described in Sections 01600 and 06100.
- .3 This item will be paid on a lump sum basis at the price included in the Form of Tender.
- .4 No measurement for payment will be made for this item.

#### 1.6 Pay Item 5 - Stony Swamp – Existing boardwalk ( $\pm 60$ m) to be replaced

- .1 This item includes the following as shown in the specifications and on drawings. It includes at work area #3, 60m long existing boardwalk to be removed and 60m new wood boardwalk to be built. New boardwalk shall be widened to 1.52m within the same corridor. It includes also supply and erection of decking, beams, sleepers, trimming, drilling, sawn/cut-out, shimming, adjustments and fastening, connections and screws.
- .2 Work of this item is primarily described in Sections 01600 and 06100.
- .3 This item will be paid on a lump sum basis at the price included in the Form of Tender.
- .4 No measurement for payment will be made for this item.

#### 1.7 Pay Item 6 – Carlsbad – Existing boardwalk ( $\pm 5$ m) to be replaced

- .1 This item includes the following as shown in the specifications and on drawings. It includes at work area #4, 5m long existing boardwalk to be removed and 5m new wood boardwalk to be built. New boardwalk shall be widened to 2.438m (8') within the same corridor. It includes also supply and erection of decking, beams, sleepers, trimming, drilling, sawn/cut-out, shimming, adjustments and fastening, connections and screws. Also includes the use of two (2) wood caissons made of 8x8 timber provided by the NCC but installed by the Contractor. The Contractor must transport these caissons to the site from the Woodroffe warehouse (1740 Woodroffe Ave., Ottawa, Ontario).

- .2 Work of this item is primarily described in Sections 01600 and 06100.
- .3 This item will be paid on a lump sum basis at the price included in the Form of Tender.
- .4 No measurement for payment will be made for this item.

END OF SECTION

### 1.1 General

- .1 This section specifies general requirements and procedures for contractor's submissions of product data and samples to Engineer for review.
- .2 Do not proceed with work until relevant submissions are reviewed by Engineer.
- .3 Present product data and samples in SI Metric units.
- .4 Where items or information are not produced in SI Metric units converted values are acceptable.
- .5 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submissions.
- .6 Notify Engineer, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer's review of submission, unless Engineer gives written acceptance of specific deviations.
- .8 Make any changes in submissions which Engineer may require consistent with Contract Documents and resubmit as directed by Engineer.
- .9 Notify Engineer, in writing, when resubmitting, any revisions other than those requested by Engineer.

### 1.2 Submission Requirements

- .1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow three (3) days for Engineers review of each submission.
- .3 Accompany submissions with transmittal letter, in duplicate, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.

- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.
- .4 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Performance characteristics.
    - .4 Standards.
    - .5 Relationship to adjacent work.
- .5 After Engineer's review, distribute copies.

### 1.3 Product Data

- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
- .2 Submit six (6) copies of product data.
- .3 Sheet size: 215 x 280 mm, maximum of 3 modules.
- .4 Delete information not applicable to project.
- .5 Supplement standard information to provide details applicable to project.
- .6 Cross-reference product data information to applicable portions of Contract Documents.

### 1.4 Samples

- .1 Samples: examples of materials, equipment, quality, finishes, workmanship.
- .2 Where colour, pattern or texture is criterion, submit full range of samples.

- .3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

### 1.5 Submission

- .1 Wood samples
- .2 All connectors (screws, etc)

END OF SECTION

## PART 1 – GENERAL

### 1.1 Access

- .1 Provide and maintain adequate access to project site.
- .2 If authorised to use existing roads and pathways for access to project site, maintain such roads and pathways for duration of Contract and make good any damage resulting from Contractors' use of roads or pathways.
- .3 Clean all areas daily where used by Contractor's equipment.

### 1.2 Sanitary Facilities

- .1 Contractor to provide and pay for on-site sanitary facilities in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

### 1.3 Power

- .1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances. No power facilities exist on site.

### 1.4 Water Supply

- .1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances. No water facilities exist on site.

### 1.6 Shoring

- .1 Get approval of shoring and scaffolding to erect structure including all temporary structures erected during construction.

### 1.7 Removal of Temporary Facilities

- .1 Remove temporary facilities from site when directed by Engineer.
- .2 When project is closed down for a period of time keep temporary facilities operational until close down or removal is approved by Engineer.

END OF SECTION

## PART I – GENERAL

### 1.1 References

- .1 CSA S269.1-1975 Falsework for Construction Purposes.
- .2 CAN/CSA-S269.2-M87 Access Scaffolding for Construction Purposes.
- .3 FCC No. 301-1982 Standard for Construction Operations.

### 1.2 Construction

#### Safety Measures

- .1 Observe construction safety measures of latest version of National Building Code Part 8, or of Provincial Government, Workers'/Workmen's Compensation Board and municipal authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.
- .2 Comply with requirements of FCC No. 301, Construction Works, June 1982, issued by Fire Commissioner of Canada.

### 1.3 Overloading

- .1 Ensure no part of Work is subjected to loading that will endanger its safety or will cause permanent deformation.

### 1.4 Falsework

- .1 Design and construct falsework in accordance with CSA S269.1.

### 1.5 Scaffolding

- .1 Design and construct scaffolding in accordance with CSA S269.2

### 1.6 WHMIS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.
- .2 Deliver copies of WHMIS data sheets to Engineer on delivery of materials.

END OF SECTION

PART I - GENERAL

1.1 Fires

- .1 Fires and burning of rubbish on site not permitted.

1.2 Disposal of Wastes

- .1 Do not bury rubbish and waste materials on site unless approved by Engineer.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, marshes and storm or sanitary sewers.

1.3 Drainage

- .1 Do not pump water containing suspended materials into waterways, marshes, sewer or drainage systems.
- .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4 Site Clearing and Plant Protection

- .1 Protect trees and plants on site and adjacent properties where indicated by NCC representative. If trees are accidentally damaged or removed as a result of the works, the contractor will plant two trees for each tree damaged or removed (a 2:1 ratio). Contractor will monitor the success of all plantings and re-vegetation for two years and will undertake any remedial actions that may be required.
- .2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.
- .3 Protect roots of trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones. Reduce to a minimum the removal of vegetal soil and vegetation.

1.5 Pollution Control

- .1 Control emissions from equipment to local authorities emission requirements.
- .2 Prevent extraneous materials from contaminating air and water beyond application area, by providing temporary enclosures.

- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads, construction site and roads during construction.
- .4 To minimize the risk of spills, the contractor will be required to use construction machinery and equipment in good working order and to refuel at least 30 m away from wetland or watercourse.
- .5 Emergency Response Plan: In case of Soil and Water Contamination due to accidental spills or leaks from construction equipment, the contractor must prepare an Emergency Response Plan, have spill containment equipment on-site, comply with provincial and federal regulations, and notify the NCC's Environmental Services Section if a spill occurs (Telephone: 613-239-5353).

#### 1.6 Work Adjacent to Waterways

- .1 Do not operate construction equipment in waterways and marshes.
- .2 Do not use waterway beds and marshes for borrow material.
- .3 Do not dump excavated fill, waste material or debris in waterways and marshes.
- .4 Cutting and drilling of timber must be done outside the wetland area.

#### 1.7 Special Requirements

- .1 Work area #1 is considered a wet land, therefor no vehicles are to circulate on trail 10. The only vehicle allowed up to the boardwalk is a small ATV and trailer. All exposed tree roots on trail 10 are to be protected with mulch to avoid damages. During removal of existing timber, a tarp must be placed underneath the structure to collect falling debris.
- .2 Work area #4: During removal of existing boardwalk, a tarp must be placed underneath the structure to collect falling debris.
- .3 Special attention must be given to construction and clean up because of the sensitive nature of marsh environments, and the permanence of any scarring or damage to their surfaces.

- .4 All construction activities in the marsh will take place within the area to be ultimately covered by the boardwalk including transport of material, assembly, clean-up, etc.
- .5 All timber or plastic composite materials must be cut and pre-drilled at least 30m away from any permanent or seasonal water body and that all debris is collected and disposed offsite.
- .6 Provide, if required, sediment and erosion control measures to prevent the transport and entry of sediments into the wetland and dispose offsite any excess soils from the minor excavations to be undertaken.
- .7 Replace any adjacent tree 10 cm dbh and greater accidentally damaged or removed during the works with species and at a ratio to be determined by the NCC Representative, and reinstate the site to the satisfaction of the latter as required.
- .8 All construction debris will be removed off site, none is to be burned or buried on site.
- .9 All tools and equipment should be refilled at a reasonable distance away from the pond and marsh; all vehicles will be refueled off site completely. Any spills of petroleum products will be reported to site inspector and clean-up carried out immediately by contractor under instructions of NCC.
- .10 Digging / excavation – There should be minimal excavation required to dismantle the existing boardwalk structures. Some minor leveling by hand may be needed during installation of the new structures. At no time should motorized equipment be allowed onto the pond and marsh floor.
- .11 Contractor is required to salvage the nails, bolts and wooden components of the boardwalks to be removed and consider recycling them.
- .12 The NCC Representative and the Contractor will conduct a site visit to determine the extent of reinstatement required. The contractor will be required to reinstate the areas used for the staging of machinery and construction materials to its original condition or better. If required, reseeded of affected areas must be done with approved NCC grass seed mix. The timing for reseeded will depend on the season in which the works are

completed. If required, spring seeding undertaken prior to May 15 increases reinstatement success.

- .13 To prevent potential damage to the Milksnake (*Lampropertis triangulum*), a species listed under the SARA, conduct a visual survey while accessing the worksite and conducting the works. If a Milksnake is seen on or near the worksite, do not disturb it and report the sighting to the NCC. The NCC will report the sighting to Environment Canada.

### 1.8 Construction Methodology

- .1 Contractor shall use construction methodology approved by Minister of Environment of Ontario and National Capital Commission.

END OF SECTION

## PART 1 - GENERAL

### 1.1 General

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 5 days of written request by Engineer, submit following information for materials and equipment proposed for supply:
  - .1 name and address of manufacturer,
  - .2 trade name, model and catalogue number,
  - .3 performance, descriptive and test data,
  - .4 manufacturer's installation or application instructions,
  - .5 evidence of arrangements to procure.
- .3 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.

### 1.2 Manufacturers Instructions

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify Engineer in writing of any conflict between these specifications and manufacturers instructions. Engineer will designate which document is to be followed.

### 1.3 Delivery and Storage

- .1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.
- .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
- .3 Store material and equipment in accordance with suppliers instructions.

### 1.4 Contractor's Options for Selection of Materials for Tendering

- .1 Materials specified by referenced standard, select any material that meets or exceeds the specified standard.

- .2 Materials specified by naming one or more materials, select any material named. For this specification, the expression "acceptable material" designates a complete product in good shape as per description given by manufacturer`s name, catalogue number, trademark or any combination of these elements.
- .3 When materials are specified by a Standard, Prescriptive or Performance specifications, upon request of the Engineer, obtain from manufacturer an independent testing laboratory reporting, showing that the material or equipment meets or exceeds the specified requirements.

#### 1.5 Substitution

- .1 No substitutions will be permitted without prior written approval of Engineer. Refer to **GI15 Approval of Alternative Materials** in the Instructions To Tenderers for instructions on submitting substitution.
- .2 Should proposed substitution be accepted, an addendum will be issued to all bidders.

#### 1.6 Conformance

- .1 When material or equipment is specified by standard or performance specifications, upon request of Engineer, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

END OF SECTION

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## PART I – GENERAL

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### 1.1 Reference

- .1 Government of Canada
  - .1 NBC Part 8
  - .2 Canada Labour Code, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
  - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990
- .3 Province of Quebec
  - .1 An Act Respecting Occupational Health and Safety, R.S.Q. 1997
  - .2 Safety Code for the Construction Industry 1997
- .4 Canadian Standards Association (CSA)
  - .1 CSA S350-M1980, Code of Practice for Safety in Demolition of Structures

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### 1.2 Submittals

- .1 Health and Safety Plan
  - .1 Submit site-specific plan before contract award.
  - .2 Engineer will review Plan and provide comments to Contractor within seven (7) days after receipt of plan.
  - .3 Revise Plan as appropriate and resubmit to Engineer within seven (7) days after receipt of comments from Engineer.
  - .4 Submit two (2) copies of Contractor health and safety inspection reports at least once every two (2) weeks.
  - .5 Engineer's review of Plan or inspection reports does not provide an approval and does not diminish Contractor responsibility for health and safety.
- .2 Submit immediately upon receipt or completion:
  - .1 construction safety checklists,
  - .2 reports or directions issued by health and safety inspectors,
  - .3 incident and accident reports,
  - .4 Material Safety Data Sheets (MSDS), and
  - .5 health and safety training records including names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.
- .3 Certification of medical surveillance for site personnel
  - .1 Where prescribed by legislation, regulation or safety program, submit Certification within seven (7) days after date of Notice to Proceed and prior to site mobilization.
  - .2 Update and submit Certification as personnel are sent to site.

- .4 On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.

### 1.3 General requirements

- .1 In general: none.
- .2 Health and Safety Plan
  - .1 Perform site-specific hazard assessment.
  - .2 Attend health and safety pre-construction meeting.
  - .3 Develop and submit written site-specific Plan based on hazard assessment prior to contract award.
  - .4 Include in Plan safety and health risk or hazard analysis for site tasks and operations.
  - .5 Plan must address project specifications.
  - .6 File required health and safety notices with Provincial authorities prior to commencement of Work.
  - .7 Continue to implement, maintain, and enforce Plan until final demobilization from site.
- .3 Responsibility
  - 1 Be responsible for safety of persons and property on site and for protection of persons off site and environment to extent that they may be affected by conduct of Work.
  - 2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .4 Compliance requirements
  - 1 Applicable legislation, regulations
    - .1 NBC Part 8, WHMIS, FC 301, FC 302
    - .2 Canada Labour Code, Canada Occupational Safety and Health Regulations
    - .3 For work in Ontario: Ontario Health and Safety Act
    - .4 For work in Québec: Occupational Health and Safety Act, Industrial and Commercial Establishments Regulation, R.R.Q.
    - .5 Specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.
  - .2 Document postings and availability
    - .1 Comply with provincial general posting requirements and other safety-related postings as the Engineer may direct.
    - .2 Maintain one copy of each applicable health and safety standard at job site.

- 5 Designated substances, volatile compounds, unforeseen hazards
  - .1 Notify Engineer 48 hours in advance of work in occupied areas involving designated substances (under applicable provincial legislation), hazardous substances (Canada Labour Code Part II Section 10), and before works or using volatile compounds.
  - .2 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work immediately and advise Engineer verbally and in writing.

#### 1.4 Health and safety coordinator

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator must:
  - .1 have minimum two (2) years' site-related working experience specific to activities associated with the work.
  - .2 have basic working knowledge of specified occupational safety and health regulations,
  - .3 be responsible for completing health and safety training session and ensuring that personnel not successfully completing the required training are not permitted to enter site to perform Work,
  - .4 be responsible for implementing, enforcing daily and monitoring site-specific Health and Safety Plan, and
  - .5 be on site during execution of Work.

#### 1.5 Construction safety Checklist

- .1 Obtain Construction Safety checklist from Engineer.
- .2 Review and implement applicable health and safety checklists provided by Engineer in collaboration with Engineer.

#### 1.6 Correction of non-compliance

- .1 Immediately address health and safety non-compliance issues identified by Engineer.
- .2 Provide Engineer with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Engineer may stop Work if non-compliance of health and safety regulations is not corrected.

1.7 Blasting and power activated  
Fasteners

- .1 Blasting
  - .1 Blasting or other use of explosives is not permitted only after receipt of written instruction by Engineer.
  - .2 Blasting operations: to CSA S350.
- .2 Power-activated fasteners
  - .1 Use power actuated devices only after receipt written permission from Engineer.

1.8 Work stoppage

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Health and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Engineer may also stop Work for health and safety considerations.

PART 2 – PRODUCTS

NOT APPLICABLE

PART 3 – IMPLEMENTATION

NOT APPLICABLE

END OF SECTION

PART I - GENERAL1.1 General

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti- pollution laws.
- .2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

1.2 Materials

- .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 Cleaning During Construction

- .1 Provide on-site containers for collection of waste materials, and debris.
- .2 Dispose of waste materials, and debris off site.
- .3 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .4 Before impregnating, remove grease, dust dirt, stains, labels, fingerprints, and other foreign materials on all concrete and granite curbs, borders and pavers on a daily basis.

1.4 Final Cleaning

- .1 Remove grease, dust dirt, stains, labels, fingerprints, and other foreign materials, from interior and exterior finished surfaces.
- .2 Broom clean paved surfaces; rake clean other surfaces of grounds.
- .3 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

END OF SECTION

PART 1 - GENERAL

1.1 Storage and  
Protection

- .1 Protect existing items designated to remain and items designated or salvage. In event of damage to such items, immediately replace or make repairs to approval of Engineer and at no cost to the Commission.

1.2 Measurement  
Procedures

- .1 No separate measurement will be made for the removals.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.1 Preparation

- .1 Inspect site with Engineer and verify extent and location of items designated for removal, disposal, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

3.2 Sequences of  
Operation

- .1 Work Area #3 Removal
  - .1 Remove boardwalk farthest away from NCC Parking P10.
  - .2 Rebuild new boardwalk behind removal in order to use existing boardwalk for motorized equipment.
  - .3 Finish with boardwalk closest to NCC Parking P10.
  - .4 Do not disturb items designated to remain in place.
- .2 Disposal of Material
  - .1 Dispose of materials off-site.

3.3 Restoration

- .1 Restore areas and existing works outside areas of demolition to conditions that existed prior to commencement of work or to match condition of adjacent, undisturbed areas as directed by the Engineer.

3.4 Cleanup

- .1 Upon completion of work, remove debris, trim surfaces and leave work site clean.

END OF SECTION

## **1 General**

### **1.1 REFERENCES**

- .1 CSA B111-1974 Wire Nails, spikes and Staples.
- .2 CAN/CSA-G164-M92 Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN3-O86-M84 Engineering Design in Wood.
- .4 CSA O112 Series-M1977 CSA Standards for Wood Adhesives.
- .5 CAN/CSA-O141-91 Softwood Lumber.
- .6 CSA O151-M1978 Canadian Softwood Plywood.
- .7 CAN3-O437.0/O437.1-M85 Waferboard and Strandboard/Test Method for Waferboard and Strandboard.
- .8 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber [1991].

### **1.2 QUALITY ASSURANCE**

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: by grade mark in accordance with applicable CSA standards.

## **2 Products**

### **2.1 LUMBER MATERIAL**

- .1 Lumber: unless specified otherwise, species as below, S4S, moisture content 19% or less in accordance with following standards:
  - .1 CAN/CSA-O141;
  - .2 NLGA Standard Grading Rules for Canadian Lumber;
  - .3 Decking: Eastern white Cedar No.1, dry, unbleached and untreated, undressed;
  - .4 Sleepers and Beams: Eastern Hemlock No.1, unbleached and untreated, undressed.
- .2 Glued end-jointed (finger-jointed) lumber is not acceptable.

- .3 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  - .1 Board sizes: "Standard" or better grade.
  - .2 Dimension sizes: "Standard" light framing or better grade.

## **2.2 ACCESSORIES**

- .1 General purpose adhesive: to CSA O112 Series.
- .2 Spiral nails - galvanized: to CSA B111..
- .3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, [explosive actuated fastening devices], recommended for purpose by manufacturer.
- .4 Joist hangers: minimum 1 mm thick sheet steel, galvanized ZF001 coating designation.

## **2.3 FINISHES**

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work.

## **3 Execution**

### **3.1 INSTALLATION**

- .1 Comply with requirements of most recent version of NBC Part 9 supplemented by following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 Select exposed framing for appearance. Install lumber materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .6 Install furring and blocking as required to space-out and support elements of bridge deck and railings.

- .7 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

### **3.2 ERECTION**

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

**END OF SECTION**

**1 General**

**1.1 REFERENCES**

- .1 Plastic composite materials by Axion International (or approved equivalent).
- .2 Contact information:

Dave Crane  
 Executive Vice President  
 Building Products  
[dcrane@axih.com](mailto:dcrane@axih.com)  
 908-542-0888 x 128 Office  
 908-673-3128 direct  
 267-401-0392 mobile  
 908-542-0999 fax

Axion International Inc.  
 180 South Street, Suite 104  
 New Providence, NJ 07974  
[www.axih.com](http://www.axih.com)

**2 Products**

**2.1 PLASTIC COMPOSITE MATERIAL**

- .1 Sleepers, joists and decking to be by Axion International or approved equivalent. Following properties must be met for Sleepers and joists:

MECHANICAL PROPERTIES					
Test / Standard	Property	Value			
<b>Specific Gravity</b> ASTM D6111	Specific Gravity	0.85 – 0.90			
	Density	53 – 56 lb/ft <sup>3</sup> (849-897 kg/m <sup>3</sup> )			
<b>Compression</b> AREMA Chapter 30 ASTM D6108	Compressive Strength (parallel to grain)	3,000 psi (20.6 MPa) min.			
	Compressive Strength (perpendicular to Grain)	1,200 psi (8.3 MPa) min.			
	Permanent Deformation Under Load (30,000 lb. / 13,608 kg)	0.013 in (0.33cm)			
<b>Flexural</b> AREMA Chapter 30 ASTM D6109	Ultimate Load	19,164 lbs (857 kN)			
	Modulus of Elasticity (flexure)	200,000 psi (2,165 MPa) min.			
	Shear Strength (calculated)	1,500 psi (10.3 MPa)			
	Modulus of Rupture (bending)	3,000 psi (27.3 MPa) min.			
	Plate Compression (MOE)	25,600 psi (176.5 MPa)			
<b>Thermal Expansion</b> ASTM D696		<b>Increase Length from 78° F – 160° F (25.6° C – 71.1° C)</b>	<b>Decrease Length from 160° F – 0° F (71.1° C – -17.8° C)</b>	<b>Increase Length from 0° F – 78° F (-17.8° C – 25.6° C)</b>	<b>Coefficient of Thermal Expansion</b>
	Average	0.2019 in (0.5128 cm)	-0.3503 in (-0.8897 cm)	0.1661 in (0.4219 cm)	
<b>Slip Resistance</b> ASTM F609	<b>Average Coefficient of Friction (Dry Condition)</b>		<b>Average Coefficient of Friction (Wet Condition)</b>		
	0.60		0.62		

- .2 Sleepers, joists and decking to be by Axion International or approved equivalent. Following properties must be met for Decking:

Property		Value
<b>Mechanical</b>	Modulus of Elasticity, Ambient	400,000 psi
	Modulus of Rupture, Ambient	4,100 psi
<b>Physical</b>	Specific Gravity	0.67 to 0.89 g/cc
	Water Absorption	0.2%
	Abrasion Resistance	10 mg
<b>Miscellaneous</b>	Coefficient of Friction (slip), Dry	0.72
	Coefficient of Friction (slip), Wet	0.71

**2.2 ACCESSORIES**

- .1 Screws shall be stainless, galvanized or epoxy coated with 1/16” pilot holes pre-drilled prior to placement (as per manufacturers recommendations)
- .2 The use of high performance blades and drill bits are required to cut and drill the composite material (as per manufacturers instructions).

**3 Execution**

**3.1 INSTALLATION**

- .1 Comply with requirements of most recent version of NBC Part 9 supplemented by following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 Select exposed framing for appearance. Install plastic composite materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .6 Install plastic composite material as per manufacturers instructions and recommendations.

### **3.2 ERECTION**

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

**END OF SECTION**