

**Publics Works and Government  
Services Canada**

**Construction of a New Commercial Operations  
Building**

**Ground Border Post, Lacolle (Qc)**

**N° R.035717.001**

**FOR TENDER  
ADDENDUM # 2**

**Technical specifications  
Structural / Civil / Electrical**

March 31, 2014

O/Ref.: 247P042298-0300-GN-S-0004-02

**DESSAU**

**Publics Works and Government Services Canada**  
**Construction of a New Commercial Operations Building**  
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RECORD OF REVISIONS AND ISSUES		
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02	2014-03-31	Addendum # 2
01	2014-03-21	Addendum # 1
00	2014-02-07	For Tender <i>"This document shall not be used for construction"</i>
0B	2013-12-20	Execution SR 99 % <i>"This document shall not be used for tender and construction"</i>
0A	2013-10-07	Execution SR4 50 % <i>"This document shall not be used for tender and construction"</i>

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This addendum is an integral part documents of submission to which it refers, by completing them, modifying them or by eliminating certain elements.

**1. SPECIFICATIONS**

**1.1 STRUCTURAL**

The following sections of specifications are emitted with the present addendum:

<u>Sections</u>	<u>Emitted pages</u>
03 30 00, rev. 01	All
05 12 23, rev. 01	All

- Modifications are brought to sections 03 30 00 and 05 12 23.

**1.2 ELECTRICAL**

The following sections of specifications are emitted with the present addendum:

<u>Sections</u>	<u>Emitted pages</u>
26 27 26, rev. 01	All
26 29 10, new	All
27 51 16, new	All

- The paragraph 2.2 is added to the section 26 27 26.
- Modifications are brought to section 26 27 26.

## Addendum # 2

### 2. DRAWINGS

#### 2.1 STRUCTURAL

Sketches SC-06 and SC-07 are emitted with the present addendum:

<u>Drawings</u>	<u>Emitted Sketches</u>
S04, rev. 01	SC-C06
S12, rev. 01	SC-C07

➤ See extracts on sketches for the modifications.

#### 2.2 CIVIL

Drawings CE02 and CE05 revision 01 are emitted with the present addendum.

#### 2.3 ELECTRICAL

Sketches EL-CE01 to EL-CE07 are emitted with the present addendum:

<u>Drawings</u>	<u>Emitted Sketches</u>
E01, rev. 02	EL-CE-06
E03, rev. 01	EL-CE-07
E04, rev. 01	EL-CE-01
E06, rev. 01	EL-CE-02 et CE-03
E10, rev. 02	EL-CE04
E12, rev. 02	EL-CE05

➤ See extracts on sketches for the modifications.

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## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 This section specifies the requirements regarding the providing, placement, finishing, protection and curing of the cast-in-place concrete.

### **1.2 REFERENCES**

- .1 The following standards and publications are mentioned in this section of the specifications. They form an integral part of the specifications and their provisions apply, but are not limited by the other provisions of this section.
  - .2 American Society for Testing and Materials (ASTM)
    - .1 ASTM C109/C109M-02, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens).
    - .2 ASTM C260-01, Specification for Air-Entraining Admixtures for Concrete.
    - .3 ASTM C309-03, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
    - .4 ASTM C332-87 (1991), Specification for Lightweight Aggregates for Insulating Concrete.
    - .5 ASTM C494/C494M-04, Specification for Chemical Admixtures for Concrete.
    - .6 ASTM C827-95a, Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
    - .7 ASTM C939-97, Test Method for Flow of Grout for Preplaced-Aggregate Concrete.
    - .8 ASTM D412-92, Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
    - .9 ASTM D624-91, Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
    - .10 ASTM D1751-83 (1991), Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
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- .11 ASTM D1752-84 (1992), Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
  - .3 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
    - .2 CAN/CGSB-51.34-M86 Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
    - .3 CGSB 81-GP-1M-77, Flooring, Conductive and Spark Resistant.
  - .4 Canadian Standards Association (CSA)
    - .1 CAN/CSA-A3000-03, Cementitious Materials Compendium:
      - A3001-03  
Cementitious Materials for use in Concrete
      - A3004-03  
Test Methods and Standard Practices for Cementitious Materials
      - A3005-03  
Test Equipment and Materials for Cementitious Materials for use in Concrete and Masonry
    - .2 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction / Methods of Test and Standard Practices for Concrete.
    - .3 CSA-A23.3-04, Design of Concrete Structures.
    - .4 CSA-A23.5-03, Supplementary Cementing Materials.
  - .5 National Research Council Canada (NRC)
    - .1 National Building Code of Canada 2010, Volumes 1 and 2, as well as the user's guide – NBC 2010: Structural Commentaries (Part 4 of Division B)

### 1.3 SAMPLES

- .1 At least four (4) weeks before beginning the work, advise the Ministerial Representative regarding the proposed source of supply for the aggregates, and allow him to access the source for sampling purposes.
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## 1.4 CERTIFICATES

- .1 At least [4] week[s] prior to starting concrete work, provide the Ministerial Representative with copies of the manufacturer's trial reports, as well as a certificate issued by a qualified independent testing and inspection laboratory attesting that the materials listed hereinafter will comply with the specified requirements.
  - .1 Portland Cement
  - .2 Blended Hydraulic Cement
  - .3 Supplementary Cementing Materials
  - .4 Grout
  - .5 Admixtures
  - .6 Aggregates
  - .7 Water
  - .8 Waterstops
  - .9 Waterstop Joints
  - .10 Joint Filler
- .2 Provide the mix formulas for approval by the Ministerial Representative and a certificate attesting that the selected mix will produce concrete of the required quality, strength and performance, and that it complies with the requirements of the CSA-A23.1-00 standard.
- .3 Provide a certificate attesting that the batching plant, equipment and materials that will be used to produce the concrete comply with the requirements of the CSA-A23.1-00 standard.
- .4 The Ministerial Representative's acceptance of the cement mix or mixes shall in no way release the Contractor from his responsibility to provide concrete whose properties, in both its elastic and hardened states, meet the requirements of these specifications.
- .5 All documents shall be submitted in triplicate. A single (1) annotated copy shall be returned to the Contractor. The Contractor shall be responsible for making additional copies and distributing them.

## 1.5 QUALITY ASSURANCE

- .1 At least four (4) weeks prior to starting concrete work, submit proposed quality control methods for approval by the Ministerial Representative, regarding the following items:
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- .1 Hot weather concreting
- .2 Cold weather concreting
- .3 Curing
- .4 Finishes
- .5 Joints

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Cement: Type GU and/or Gub-SF Portland cement that complies with the CSA-A23.5-03 or the CSA-A5/A8/A362-03 standard. Only use one recognized brand of cement per type of concrete for the entire contract.
- .2 Fine aggregate: of normal density, complying with Article 4.2.3 of the CSA-A23.1 standard. The aggregate may be natural sand or manufactured sand containing at least 20% natural sand.
- .3 Coarse aggregate: of normal density, complying with Article 4.2.3 of the CSA-A23.1 standard. The particles shall be clean, durable and free from dust and harmful material and shall contain less than 10% flat or elongated particles. Loss shall be less than 12% after 5 cycles of the magnesium sulphate soundness test. The Los Angeles abrasion test loss shall be less than 50%. The aggregates shall not contain fine-grained limestone and crystalline limestone. The maximum aggregate size shall be 20 mm, unless otherwise indicated. Subject to the Ministerial Representative's approval, a 13 mm maximum aggregate size may be used in certain areas where concrete flow is restricted.
- .4 Mixing water: complies with Section 4.2.2 of the CSA-A23.1 standard.
- .5 Air-entraining admixture: complies with the ASTM C260 standard.
- .6 Chemical and pozzolanic mineral admixtures: comply respectively with the requirements of the ASTM C494/C494M and ASTM C1017/C1017M standards. The use of calcium chloride or admixtures that contain calcium chloride is not allowed. The Ministerial Representative must approve accelerators or retarders during hot and cold weather concrete work.
- .7 Non-shrink mortar for concrete repairs: pre-mixed Portland cement-based product containing a non-metal aggregate and a plasticizer, capable of achieving at least 35 MPa of compression strength at seven (7) days.
- .8 Superplasticizer: complies with requirements of the ASTM C494/C949M standard.

- .9 Fly Ash and Supplementary Cementing Materials: comply with the CSA-A23.5 standard.
- .10 Cementitious hydraulic slag: complies with the CAN/CSA-A362 standard.
- .11 Set retarders: comply with the ASTM C494/C494M water-based, low VOC content, solvent-free standard. The set retarder film shall never be exposed to humidity.

## 2.2 MIX DESIGN

- .1 Assume responsibility for the mix of each type of concrete required, while taking into account the requirements described in Section 2.1 of these specifications and the following criteria in compliance with possibility No. 1 presented in Table 5 of the CSA-A23.1 standard.

- .1 Types of concrete:



- a) Concrete for ~~exterior~~ **interior** walls, ~~mat~~, footings, pilasters, columns, ~~structural slabs~~, slabs on grade and ~~access ramps~~ **slabs on steel deck**



- tested compression strength: 30 MPa at 28 days, **unless otherwise indicated on the drawings**

- cement type: GUb-SF

- fly Ash added



- exposure category (Table No. 1, CSA-A23.1/A23.2) : ~~C-4~~ **N**

- maximum nominal size of coarse aggregate: 20 mm



- ~~air content: 5 to 8%~~



- maximum water/cement mass ratio: **0,55**

- desired on-site slump: 80 mm ( $\pm 30$  mm)

- normal density concrete

- b) Concrete for new pit

- tested compression strength: 30 MPa at 28 days, unless otherwise indicated on the drawings

- cement type: GU

- fly Ash added

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- exposure category (Table No. 1, CSA-A23.1/A23.2): N
  - maximum nominal size of coarse aggregate: 20 mm
  - maximum water/cement mass ratio: 0.55
  - desired on-site slump: 80 mm ( $\pm 30$  mm)
  - normal density concrete
-  c) Concrete for sidewalks, curbs, **exterior** slabs, **exterior access ramps** and exterior footings and enclosures
- tested compression strength: 35 MPa at 28 days
-  - cement type: **GUb-SF**
-  - fly Ash added
-  - exposure category (Table No. 1, CSA-A23.1/A23.2): ~~C-2~~ **C-1**
- maximum nominal size of coarse aggregate: 20 mm
  - air content: 5 to 8%
-  - maximum water/cement mass ratio: ~~0.45~~ **0,4**
- desired on-site slump: 80 mm ( $\pm 30$  mm)
  - normal density concrete
- d) Lean concrete blinding slab:
- minimum tested compression strength at 28 days: 15 Mpa
  - cement type : GU
  - fly Ash added
  - exposure category (Table No. 11, CSA-A23.1/A23.2): F-2
  - air content: 4 to 7%
  - maximum water/cement mass ratio: 0.55
  - desired on-site slump: 80 mm ( $\pm 20$  mm)
  - normal density concrete
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**e) Concrete for exterior walls:**

- **tested compression strength: 30 MPa at 28 days, unless otherwise indicated on the drawings**
- **cement type : GU**
- **exposure category (Table No. 11, CSA-A23.1/A23.2): F-2**
- **maximum nominal size of coarse aggregate: 20 mm**
- **air content: 4 to 7%**
- **maximum water/cement mass ratio: 0.5**
- **desired on-site slump: 80 mm (±20 mm)**
- **normal density concrete**

- .2 Obtain the Ministerial Representative approval for all admixtures used in concrete mixes (superplasticizers and required air-entrainers or other admixtures needed for any specific purpose, designated by the Contractor). The use of calcium chloride is prohibited.
- .3 Provide a sample of the admixture(s) used, at the Ministerial Representative request.
- .4 Follow the manufacturer's instructions when using admixtures.
- .5 The Contractor is responsible for ensuring the admixtures are compatible with one another and with the materials included in the mix.
- .6 Enter the type and quantity of the admixture(s) used on the concrete shipping slip.
- .7 The use of an admixture shall never reduce the soundness of the concrete or its ability to withstand freezing and thawing.

**2.3 CONCRETE CONTROL**

- .1 Concrete quality control performed in compliance with the CSA-A23.2 standard by a designated laboratory at the Ministerial Representative's expense.
- .2 Submit to the Ministerial Representative for approval, proposed formulas for batching the mixes for each class of concrete; specify the type and brand of all admixtures used.
- .3 Provide to the Ministerial Representative with samples of the fine and coarse aggregates that will be incorporated into the concrete blends and identify the quarry they come from.

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Unless otherwise directed in writing by the Ministerial Representative, also provide the laboratory with a document signed by a recognized petrographer certifying that none of the harmful alkali-aggregate and cement-aggregate reactions described in Appendix B of the CSA-A23.1/A23.2 standard are likely to occur in the concrete after it has been poured.

- .4 Notify the laboratory at least 24 hours before each concrete pour, whatever the volume involved.
  - .5 Cooperate with sampling and facilitate testing. Provide free access to the structures. Provide the required concrete at no cost. If applicable, protect and provide a storage area for the samples taken.
  - .6 The concrete's compression strength shall be checked during construction by taking 3 core samples per 75 m<sup>3</sup> poured or at least 3 core samples per pour. The Ministerial Representative may ask the laboratory to produce a fourth core sample and let it cure on the construction site as a control sample. A sample shall be crushed on the 7<sup>th</sup> day; the two other samples shall be crushed on the 28<sup>th</sup> day.
  - .7 The cylinders shall be numbered consecutively and the laboratory report shall indicate the exact location of the concrete they represent in the framework, as well as the number of the truck that delivered the concrete.
  - .8 The laboratory shall measure the concrete slump and air content every time it samples the concrete for strength tests and as often as necessary depending on the type of structure to be built.
  - .9 Provide a sheltered location on site where the concrete core samples can be stored at an ambient temperature ranging from a minimum of 10°C to a maximum of 25°C before they are shipped to the trial laboratory.
  - .10 If the core sample test results do not comply with Article 4.4.6.7 of the CSA A23.1 standard, the Ministerial Representative may require that Section 4.4.6.8 of the standard be applied.
  - .11 The Contractor is solely responsible for the all concrete work required to complete the structures as indicated on the drawings or stipulated in the Specifications. All work that does not meet the requirements of the Specifications, for any reason whatsoever (quality of materials, batching, placement, strength, impermeability, etc.), shall be modified in compliance with the Engineer's requirements, or it shall be completely demolished and rebuilt in compliance with the provisions of the Specifications and drawings, at the Contractor's expense.
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**PART 3 - PERFORMANCE****3.1 PREPARATION**

- .1 Ensure that the forms are erected and that they are clean and free of ice, snow and water, and that form reinforcement and hardware are installed in compliance with the requirements of Sections 03 10 00, 03 20 00 and 03 25 00 of the specifications.
  - .2 Before starting the work, obtain the Ministerial Representative's approval of the concrete placement methods, which shall comply with Section 7.2 of the CAN/CSA-A23.1-04/A23.2-04 standard.
  - .3 Obtain the Ministerial Representative's written authorization before performing the concrete work and notify him 24 hours before beginning the work. To notify the Ministerial Representative, the "Avis de bétonnage" form from Dessau must be used and duly completed by the Contractor.
  - .4 Pumping concrete is [forbidden] [shall only be permitted once the equipment and the mix are approved].
  - .5 Ensure that the reinforcement and embedded components are not moved while the concrete is being poured.
  - .6 Before performing the concrete work, obtain the Ministerial Representative's written authorization regarding the proposed method for protecting the concrete during the pour and the subsequent cure.
  - .7 No concrete shall be poured without the Ministerial Representative's written authorization.
  - .8 Authorization to pour concrete shall only be provided once the Ministerial Representative has completed his own inspection of the formwork and determined that the requirements of Article 3.1 appear to have been met.
  - .9 It is forbidden to pour concrete when it is raining or snowing, unless the Ministerial Representative provides the required authorization, being satisfied with the measures taken to shelter the concrete while it is being transported and placed.
  - .10 The Ministerial Representative's authorization to pour concrete when the outside temperature is below 5°C or above 25°C shall in no way release the Contractor from his full responsibility regarding the strength and soundness of the concrete to be poured.
  - .11 Keep a concrete placement log, which indicates the date and location of each placement, the concrete's characteristics, the truck numbers, the ambient temperature, samples taken and other relevant information.
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- .12 Immediately before placing the concrete, carefully clean and remove all waste and debris of any kind from the space the concrete will occupy.
  - .13 In areas where new concrete is bonded to an existing structure, drill holes in the existing concrete and install steel dowels made of high adherence steel rebar in it and thoroughly embed the dowels with non-shrink epoxy grout to anchor and maintain them in the positions indicated.
  - .14 No load shall be exerted on the new concrete components until the Ministerial Representative has provided the required authorization.

### **3.2 MANUFACTURE AND DELIVERY OF THE CONCRETE**

- .1 Provide ready-to-use concrete manufactured in a concrete plant, transported and discharged at the site in compliance with Section 5.2 of the CAN/CSA-A23.1/A23.2 standard, or provide concrete manufactured on site, in compliance with all the requirements of that same section. If the second alternative is chosen, submit the entire procedure to the Ministerial Representative for approval.
  - .2 The manufacturer of the ready-to-use concrete is solely responsible for batching the concrete, and he shall personally, at his expense, take all necessary measures to ensure the quality and uniformity of his product.
  - .3 Require that the concrete supplier provide a delivery slip for each load of concrete and provide the Ministerial Representative with a copy of these slips. The slips shall contain the following information: name and address of the supplier's company, truck number, Contractor's name, any Subcontractor's name, project name and location, class of concrete, cumulative quantity, start of discharge, end of discharge, maximum size of aggregate, slump and air-entrainment required, types of admixtures used, quantity and type of cement and quantity of water.
  - .4 The addition of water to the mix after the initial batching shall only be carried out in strict adherence with Article 5.2.4.3.2 of the CAN/CSA-A23.1/A23.2 standard, but the maximum quantity used shall be 6 l/m<sup>3</sup>. Submit all anticipated additions to the Ministerial Representative for approval and control. Indicate on the delivery slip the quantity of all water added at discharge.
  - .5 Plan the manufacture of the concrete and schedule the deliveries to the site so that each pour can be performed without any interruptions. Each batch of concrete shall be completely discharged into the forms within two (2) hours of beginning of batching.
  - .6 Never remix concrete or mortar that has started to set.
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- .7 The temperature of the concrete at discharge shall be within the range presented in Table 1 of the CAN/CSA-A23.1/A23.2 standard and shall be controlled according to Article 5.2.4.4 of the same standard. Use all protective measures required for this purpose.
  - .8 No aluminum component shall be used to batch, transport or place the concrete.

### 3.3 IMPLEMENTATION

- .1 Place the concrete in compliance with the requirements of the CAN/CSA-A23.1/A23.2 standard.
- .2 Carry out the consolidation of the concrete using models and sizes of mechanical vibrators approved by the Engineer.
- .3 Select an appropriate type and number of vibrators and use them in accordance with Section 7.2.5 of the CAN/CSA-A23.1/A23.2 standard.
- .4 Bind the fresh concrete with rock or hardened concrete in accordance with Section 19.2 of the CSA-A23.1/A23.2 standard.
- .5 Saturate hardened concrete surfaces with water immediately before pouring concrete on these surfaces.
- .6 Lay the concrete without interruption or in layers thick enough that each new layer will bind with the underlying layers before they have hardened enough to form cold joints.
- .7 If difficulties arise during pouring, change the concrete formula following the laboratory's directives and use the admixture(s) prescribed by the laboratory, and assume all expenses for this procedure.
- .8 Adding a superplasticizer to the concrete before it has been poured into the forms is mandatory when pouring walls (including retaining walls) and columns.

### 3.4 CONCRETE CURING

- .1 The concrete shall be cured according to the requirements of section 7.4 of the CSA-A23.1/A23.2 standard. Walls and slabs 500 mm thick or thicker are considered mass concrete.
  - .2 The use of curing compounds is prohibited.
  - .3 The concrete of walls and other vertical elements shall be cured using two layers of jute kept moist at all times.
  - .4 The concrete of slabs shall be cured using a cover kept moist at all times,
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- .5 Slabs and other unformed surfaces shall be kept moist for a period of at least 7 days.
  - .6 Walls, beams, columns and other formed surfaces shall undergo the following 7-day curing schedule:
    - .1 forms left in place: 3 days;
    - .2 moist curing after removal of the forms: 4 days.
  - .7 When the outside temperature exceeds 20°C for mass concrete or otherwise 27°C, keep the forms moist before pouring the concrete and throughout the entire time they remain in place.
  - .8 In cold weather, water curing ends 12 hours before the end of protection.
  - .9 Throughout the entire cure, the concrete shall never be under any load and shall be adequately protected against violent shocks, excessive vibration, weather and other disturbances.
  - .10 The provision, installation and maintenance of all falsework and devices required for the curing and protection of the concrete in hot or cold weather, as well powering the equipment, are part of the contract work, for which all costs are to be assumed.

### **3.5 CONCRETE PROTECTION**

- .1 In hot weather, the concrete shall be protected according to Article 7.4.2.4 of the CSA-A23.1/A23.2 standard.
  - .2 Concrete components containing silica fume shall be protected from drying according to Article 7.4.2.2 of the CSA-A23.1/A23.2 standard.
  - .3 Other concrete components shall be protected from dryout based on Appendix D of the CSA-A23.1/A23.2 standard.
  - .4 In cold weather, the concrete shall be protected according to Article 7.4.2.5 of the CSA-A23.1/A23.2 standard.
  - .5 Methods for protecting concrete in cold weather are detailed in Chapter 15.4.3.13 of the "Cahier des charges et devis généraux (CCDG)", 2003 edition. Payment methods described in this chapter of the CCDG shall not apply to this contract.
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### 3.6 FINISHING OF FORMED SURFACES

- .1 Clean and finish the formed surfaces in compliance with Section 7.7.3 of the CSA-A23.1/A23.2 standard. Visible surfaces in completed buildings require smooth formed surfaces in accordance with Article 7.7.3.6 of the CSA-A23.1/A23.2 standard. All other surfaces require a rough formed surface in accordance with Article 7.7.3.5 of the CSA A23.1/A23.2 standard.
- .2 Fill the holes left by the form ties in compliance with Section 03 10 00 of these specifications.

### 3.7 CONCRETE PREPARATION

- .1 Remove and replace all damaged or defective concrete with concrete that meets the specifications and requirements of the drawings.
- .2 After the forms have been removed, the Ministerial Representative shall examine all voids, honeycombs and other defects. If applicable, submit the methods for repairing the voids, honeycombs and other defects to the Ministerial Representative for approval. Do not repair any of the surfaces before having received the Ministerial Representative's authorization.
- .3 Wherever possible, repair formed surfaces as soon as possible after the forms have been removed.
- .4 Cover the concrete surfaces with a cement-latex slurry or an epoxy-based glue before performing concrete or mortar repairs.
- .5 The product used shall comply with Section 2.1.7 of this section.

### 3.8 CUTS, DRILL HOLES AND CUT-OUTS IN HARDENED CONCRETE

- .1 Components that have already been poured shall never be cut, drilled or cut-out for any reason whatsoever, unless the Ministerial Representative has authorized these procedures.
  - .2 Any cut, drill hole or cut-out in hardened concrete authorized by the Ministerial Representative shall be performed at the specific location, using the exact dimensions he has approved. Use rotary tools that prevent the concrete from shattering.
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### 3.9 TOLERANCES

- .1 If the tolerances specified in Article 6.4 of the CSA-A23.1/A23.2 standard have not been met during the construction of any component of a structure shown on the drawings, the Ministerial Representative may require that this component be demolished and rebuilt according to the tolerances of said article, at no additional expense to the Ministerial Representative.

### 3.10 CONSTRUCTION JOINTS

- .1 Follow the indications of Section 7.3 of the CSA-A23.1/A23.2 standard for construction joints.
- .2 The Ministerial Representative shall approve the location of the construction joints that demarcate each concrete pour. If the Ministerial Representative deems it appropriate, he may require that these joints be brought closer together or relocated.
- .3 None of the construction joints already indicated on the drawings shall be moved or eliminated without prior authorization from the Ministerial Representative.
- .4 Immediately before resuming pouring against a construction joint or above it, clean and score the surface of the hardened concrete to eliminate all loose fragments and any trace of bleeding, moisten the surface and allow to dry to obtain saturated, dry surface conditions.
- .5 Install 80 mm thick shear keys on construction joints along the entire length/height of the component, of a width equal to one-third the thickness of the component. Slightly bevel the sides of the shear keys.
- .6 For vertical components (walls, strip footings) construction joints shall be a maximum of 20 m apart. For structural raft foundation and slabs install construction joints with maximum 20 m x 20 m spacing. Submit the location of the construction joints to the Engineer.
- .7 Allow a section to cure for a minimum of 7 days before pouring a new section next to it.

### 3.11 WATERSTOPS

- .1 Where indicated on the drawings, install waterstops to provide continuous watertightness. Do not bend or puncture the waterstops in order to avoid hindering their performance. Do not move the reinforcement when installing waterstops. Splice waterstops on site using equipment that complies with the manufacturer's requirements. Firmly secure the waterstops before the concrete is poured.
- .2 Joints butt-welded on site are only allowed between the points of intersection of the straight lengths. Weld the intersecting parts on site.

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### 3.12 WATER STOPS FOR COLD JOINTS

- .1 Where indicated on the drawings, install weather-stripping and waterstops for cold joints to provide continuous watertightness. Strictly follow manufacturer recommendations regarding the installation, handling and materials required for each type to be used. Submit for the Ministerial Representative's approval the installation method for each type used, in keeping with the manufacturer's recommendations.

### 3.13 CONCRETE TOPPING:

- .1 Pour the concrete toppings shown on the drawing in accordance with Section 7.6 of the CSA-A23.1/A23.2 standard.
  - .2 Clean the surface of the concrete to remove any demolished concrete and dirt and remove any dust. The concrete surface shall be clean and rough.
  - .3 Clean the existing reinforcement by grinding or use another method (no sand or water blasting is allowed).
  - .4 Replace, and if required, dowel the new reinforcement if the existing reinforcement is in bad condition.
  - .5 Prepare existing concrete surfaces in compliance with Article 7.6.4.1 of the CAN/CSA-A23.1/A23.2 standard to remove all bleeding, dirt, dust, debris, grease and other substances that may hamper the bond between the existing concrete and the new concrete. However, only methods c) and d) of Article 7.6.4.1 shall be accepted.
  - .6 Have the Ministerial Representative approve the prepared surfaces before applying the bonding agent.
  - .7 Apply the bonding agent immediately before placing the new concrete in accordance with Section 7.6.4.2, "Bonding" of the CSA A23.1/A23.2 standard and the following requirements:
    - .1 Keep the surface of the slab wet at all times before pouring the concrete topping.
    - .2 Moisten the surface according the bonding agent manufacturer's recommendations.
  - .8 Install a bonding agent composed of styrene-butadiene-based latex cement, according Section 7.6.4.2.2, Method b) "Latex added to grout" of the CSA-A23.1/A23.2 standard. The bonding method shall achieve tensile strength in adhering to the existing concrete slab in excess of 0.9 MPa at 28 days according to the CSA-A23.2-6B testing method.
  - .9 Pour and finish the surface of the topping in compliance with Article 3.6 of this section of the specifications.
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**3.14 ON-SITE QUALITY CONTROL**

- .1 A testing laboratory designated by the Ministerial Representative shall inspect and test the concrete and its constituents in accordance with the CSA-A23.1/A23.2 standard.
- .2 The owner shall assume all costs for the trials.
- .3 The Laboratory shall take additional core samples during cold weather concrete work. These core samples shall be cured on site, under the same conditions as the concrete pours they represent.
- .4 Non-destructive concrete trials shall be performed according to the methods described in the CSA-A23.1/A23.2 standard.
- .5 The inspection and trials performed by the Laboratory shall not replace or finalize the quality control performed by the Contractor, nor shall they release the Contractor from his contractual obligations in this respect.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 The Contractor shall provide all the materials, equipment and labour required to perform the detailing, joint design, manufacturing, fitting-up, factory painting, transportation and installation of the steel framework.
- .2 The Contractor shall also provide all parts to be embedded in concrete as well as the anchor bolts.

### **1.2 REFERENCES**

- .1 The following standards and publications are mentioned in this section of the specifications. When reference is made to them, they must be consulted:
    - .1 Canadian Standards Association (CSA)
      - .1 CAN/CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
      - .2 CAN/CSA-G164-M92 (C2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
      - .3 CAN/CSA-S16-01 CONSOLIDATION, Limit States Design of Steel Structures.
      - .4 CAN/CSA-S136-01 (C2007), North American Specification for the Design of Cold-Formed Steel Structural Members.and CAN/CSA-S136S1-04, Commentary on CSA Standard S136.
      - .5 CAN/CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.
      - .6 CAN/CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding.
      - .7 CAN/CSA W55.3-1965 (R2003), Certification of Companies for Resistance Welding of Steel and Aluminium.
      - .8 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
    - .2 American Society for Testing and Materials International, (ASTM)
      - .1 ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
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- .2 ASTM A193/A193M-09, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications .
  - .3 ASTM A307-00, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .4 ASTM A325-02, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - .5 ASTM A325M-00, Standard Specification for High-Strength Bolts for Structural Steel Joints [Metric].
  - .6 ASTM A490M-00, Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints [Metric].
  - .3 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.
  - .4 Canadian Institute of Steel Construction (CISC)/Canadian Paint and Coatings Association – CPCA (formerly the Canadian Paint Manufacturers Association - CPMA).
    - .1 CISC/CPMA 1-73A (1975), A Quick-drying One-coat Paint for Use on Structural Steel.
    - .2 CISC/CPMA 2-75 (1975), A Quick-drying Primer for Use on Structural Steel.
  - .5 Master Painters Institute
    - .1 MPI-INT 5.1-04, Structural Steel and Metal Fabrications.
    - .2 MPI-EXT 5.1-04, Structural Steel and Metal Fabrications.
  - .6 The Society for Protective Coatings (SSPC)
    - .1 SSPC-SP 3 (1995), Power Tool Cleaning.
  - .7 National Research Council Canada (NRC)
    - .1 National Building Code of Canada 2010 and Supplement
  - .2 Unless otherwise specified, perform structural steel work and welding work in compliance with the CAN/CSA-S16.
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- .3 The framework welding shall only be performed by a duly approved member of the Canadian Welding Bureau (CWB), in accordance with the requirements of the CAN/CSA W47.1 standard, Division 1 or Division 2.1. Check whether the subcontractor is a certified member of the CWB in the Division concerned, because the Ministerial Representative will reject any contractor that does not meet this requirement.

### 1.3 DESIGN CRITERIA

- .1 Structural and jointing details shall be designed in accordance with the requirements of the CAN/CSA-S16, CAN/CSA-S136 standards, so that they can withstand the indicated forces, moments and shear stresses, and accommodate anticipated thermal movements.
- .2 Factory connections shall be welded.
- .3 Unless otherwise indicated on the drawings, the types of bolted joints are as follows:

Components	Types of Connections
Beams, columns	Bearing type
Bracing	Slip critical connections
Trusses	Slip critical connections

- .4 Unless otherwise indicated on the drawings, the stresses to be used in the design of connections are as follows:

Components	Stresses
Beams, columns	The more stringent of two (2) criteria: <ul style="list-style-type: none"> <li>▪ Reaction of the uniform load producing the section's ultimate resisting moment</li> <li>▪ Or 50% of the beam's shear strength</li> </ul>
Columns	<ul style="list-style-type: none"> <li>▪ The section's ultimate compressive strength and shear strength</li> </ul>
Trusses	<ul style="list-style-type: none"> <li>▪ The section's ultimate tensile strength</li> </ul>

- .5 Additional stresses induced on components to be connected:
- .1 All joints shall be designed so that no additional stresses are induced on the components to be connected.

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- .2 The Ministerial Representative shall reject all details that create torque, bending moment or other stresses.
  - .3 The Ministerial Representative shall be the only one to decide whether the details submitted are accepted or rejected.
  - .4 All modifications relating to changes required by the Ministerial Representative shall be at the Contractor's expense.
  - .6 For non-standard joints, submit sketches and design notes bearing the seal and signature of a qualified Engineer recognized in the Province of Quebec, Canada.
  - .7 Use at least two bolts per bolted joint (including those where anchors are used).
  - .8 The depth of a beam joint shall never be less than 50% of the beam.

#### 1.4 SHOP DRAWINGS

- .1 Submit the shop drawings to the Ministerial Representative.
  - .2 Each shop drawing must bear the seal and signature of an Engineer who is a member in good standing of the Ordre des Ingénieurs du Québec.
  - .3 Clearly indicate on the shop drawings all forming and assembly details, including cuts, cut-outs, joints, drill holes, threaded anchors, bolts, shear connectors and welds. Use the symbols indicated in the CAN/CSA W59 Standard to represent welds.
  - .4 Submit to the Ministerial Representative the description of the work methods, the order in which the components are to be assembled, and the type of material intended for use. Even if this formality has been fulfilled and the document submitted, the Contractor remains solely responsible regarding the use of the methods, equipment, delivery mode and safety measures.
  - .5 Provide the Ministerial Representative with three (3) copies of each complete and detailed shop and erection drawings of the steel framework to be built. The drawings shall be provided in metric units (SI).
  - .6 The shop and erection drawings shall contain all the information mentioned in Articles 4.2 and 4.3 of the CAN/CSA-S16 Standard and bear the signature of the person who verified them before their submission to the Ministerial Representative.
  - .7 The project title as well as the names of the Owner, Architect, Engineer, Expert framework consultant and of the Contractor shall appear on each shop and erection drawing.
  - .8 The shop and erection drawings shall be sent soon enough to ensure that the Ministerial Representative has at least ten (10) working days to examine them.
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- .9 A copy of each drawing shall be returned to the Contractor who, if required, shall revise the annotated drawing(s) and resubmit it (them). If the Ministerial Representative determines that the revisions are too numerous or complex, he shall return the drawing(s) without annotating it (them). The Contractor shall be responsible for making any additional copies he requires.
- .10 The Contractor shall only manufacture the framework components after the Ministerial Representative has returned the shop and erection drawings.



### ~~1.5 ASSEMBLY VIDEO~~

- ~~.1 The steel framework Contractor, in conjunction with the manufacturer of the pre-stressed concrete components, shall make an assembly video that shows in details the components installation sequences.~~
- ~~.2 The sequences shall be ordered as to balance the various loads exerted on the main trusses to avoid any twisting.~~

### 1.6 VERIFICATION OF DIMENSIONS, MEASUREMENTS AND LEVELS

- .1 Before manufacturing the components of the framework, take and check all the dimensions, measurements and levels on site to compare them with the ones on the drawings or to complete the information shown on the drawings. Notify the Ministerial Representative of any errors on the construction site or of any incompatibility between the dimensions taken and the instructions provided on the drawings. Await the Ministerial Representative's instructions on how to correct the errors and/or make the required adjustments.
- .2 If connecting to an existing framework, check all the dimensions, measurements and levels of the existing framework before producing shop drawings of the new frame that will be connected to it. Adjust the dimensions of the parts to be built to the situation and submit the modifications to the Ministerial Representative.

### 1.7 QUALITY ASSURANCE

- .1 Submit 1 copies of shop trial reports [4] weeks prior to assembly of the structural steel work.
  - .1 The shop trial reports shall indicate the steel's chemical and physical properties, as well as other relevant details before it is used for this work,
  - .2 The trial reports shall be certified by qualified metallurgists authorized to work in the Province of Quebec, Canada.

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- .2 Also provide an affidavit from the manufacturer of the structural steel work certifying that the products, equipment and materials used for this work comply with the relevant standards that apply to the required or indicated products, equipments and materials.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Use materials free of dirt, rust, scale, pinholes, leafing or any other defect. No used materials shall be accepted.
- .2 General structural steel: in compliance with the CAN/CSA-G40.20/G40.21 Standard of grade 350W
- .3 CAN/CSA-S16 Standards, of grade 350W, class H, as indicated on the drawings.
- .4 High-strength bolts, nuts and washers: in compliance with the ASTM A325M or A490M Standard.
- .5 Anchor bolts:
- .1 Lower strength: in compliance with the CAN/CSA G40.21 Standard, grade 300W and the ASTM A307 Standard, grade A.
- .2 High-strength: in compliance with the ASTM-A-449 standard with a minimum yield strength of 500 MPa.
- .6 Welding materials: in compliance with the CAN/CSA W59 Standard and the CAN/CSA W48 series Standards and approved by the Canadian Welding Bureau.
- .7 Shear connectors (if required on the drawings): in compliance with the CAN/CSA W59 Standard, Clause 5.5.6 and its Appendix H.
- .8 Non-shrink grout: non-metallic pre-mixed Portland cement-based product, of a consistence appropriate for pouring and capable of achieving at least 50 MPa compression strength at 28 days, subject to the Ministerial Representative's approval.
- .9 Paint:
- .1 1-73A CISC/CPMA: "Quick-drying one-coat paint for use on structural steel", grey colour.
- .2 2-75 CISC/CPMA: "Quick-drying primer for use on structural steel", grey colour.
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- .10 Mechanical anchor bolts (when specified on the drawings): as manufactured by Hilti Canada Ltd. or an equivalent approved by the Ministerial Representative. The type required, the diameter and total length are specified on the drawings.
- .11 Hot dip galvanizing: apply a minimum 600 g/m<sup>2</sup> coat of zinc on the indicated areas, in compliance with the CAN/CSA-G164 Standard.
- .12 Retouch paint on galvanized steel: compliant with CAN/CGSB-1.181 with metallic zinc content greater than 87% (% by weight of the non volatile coating such as "ZRC cold galvanized compound" of ZRC Worldwide). Coatings in aerosol form are prohibited. The dry film of the coating must contain 95% metallic zinc.

## 2.2 FACTORY PAINTING

- .1 Structural steel components shall be cleaned, prepared and coated with a layer of primer at the workshop in compliance with the CAN/CSA-S16 Standard, with the exception of components to be embedded in concrete.
- .2 The components shall be cleaned and freed of millscale, rust, oil, dust and all other foreign material. The surfaces shall be prepared according to the SSPC-SP 3 method.
- .3 In cases where frame components are not visible in the finished building (structural steel components covered by other construction materials), at the shop, apply on the structural steel a quick-drying one-coat paint for use on structural steel, in compliance with the 1-73A CISC/CPMA Standard. Follow the requirements of this standard regarding the methods to be used, atmospheric conditions to maintain and temperatures to respect when applying the paint.
- .4 In cases where frame components are visible in the finished building (exposed structural steel components later covered with one or two coats of finish paint on site, such as a gymnasium), at the shop, apply on the structural steel a quick-drying primer for use on structural steel, which complies with the 2-75 CISC/CPMA Standard. Follow the requirements of this standard regarding the methods to be used, atmospheric conditions to maintain and temperatures to respect when applying the paint.
- .5 Paint on nuts, bolts, straight edges and angles shall be removed before it is dry.

## PART 3 - PERFORMANCE

### 3.1 FORMING

- .1 Form the steel components in compliance with the CAN/CSA-S16 Standard and according to the shop drawings submitted.

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- .2 Structural members formed of welded sections shall be rejected if they are not shown as such on the shop drawings.
  - .3 The use of members whose quality and/or dimensions differ from those shown is strictly forbidden without the Ministerial Representative's written permission.
  - .4 Drill or punch the bolt holes. All burning or cutting with a torch is forbidden.
  - .5 The manufacturing and assembly tolerances are respectively those described in Sections 28.9 and 30.7 of the CAN/CSA-S16 Standard.
  - .6 If required, reinforce the openings to maintain the design strength.
  - .7 Where indicated on the drawings, continuously seal all steel members with a continuous weld bead and grind the welds.
  - .8 Reinforce the girder web with stiffening plates at each girder-column intersection and at each concentrated load location.
  - .9 Grind visible welds where required.
  - .10 Provide the qualified trades persons with the templates and the parts to be embedded in the concrete or masonry.
  - .11 Once the assembly is completed, touch-up the rivets, on-site welds, and bolts as well as burned or scratched surfaces.
  - .12 Apply a zinc primer on galvanized surfaces in areas burned as a result of on-site welding work.
  - .13 The welding companies shall be certified under the terms of Division 1 of these specifications or Article 2.1 of the CAN/CSA W47.1 Standard regarding fusion welding of steel structures, and/or the CAN/CSA W55.3 Standard regarding resistance welding of structural members.

### **3.2 MARKING**

- .1 Mark the materials in compliance with the CAN/CSA-G40.21 Standard. Do not use die-stamping. When the steel part must not be painted, stamp the mark in locations that will not be visible after assembly.
  - .2 Joint markings: at the factory, mark load-bearing assemblies, assembly joints and adjustment joints.
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### 3.3 ASSEMBLY

- .1 The proposed technique, as well as the equipment used to erect the frame are subject to the Ministerial Representative's approval. However, this approval shall in no way release the Contractor from his full responsibility regarding the choice of technique and the handling of the equipment that will enable him to perform his work quickly and in complete safety.
  - .2 Assemble the steel components in compliance with the CAN/CSA-S16 Standard and according to the shop drawings.
  - .3 Assemble the metal structures ensuring that they are square, plumb, aligned, accurately adjusted, and have tight joints and intersections.
  - .4 Where indicated on the drawings, continuously seal all steel members with a continuous weld bead and grind the welds.
  - .5 Obtain the Ministerial Representative's written authorization before cutting or modifying structural steel members on site.
  - .6 Once the assembly is completed, touch up the bolts, rivets, welds, and surfaces where the factory-applied galvanization is degraded.
  - .7 Deliver, handle and store all steel on site to avoid any damage. Damaged members and joints shall be rejected.
  - .8 Take measures so as not to overload on-site structures which are already completed or under construction, beyond the allowable loads indicated on the drawings for these structures.
  - .9 Where required on the drawings, weld shear connectors to the load-bearing components of the frame, using steel decking if required, following the manufacturer's instructions.
  - .10 Notify the Ministerial Representative as soon as possible regarding any defects detected in the assembly of factory-built components and abide by his decision regarding the corrections to be made.
  - .11 Straighten slightly deformed components before assembling them on site and replace those that are damaged to the point where the Ministerial Representative raises doubts regarding their effectiveness.
  - .12 It is strictly forbidden to perform joint welds on site unless they are indicated on the shop drawings or the Ministerial Representative has approved them beforehand.
  - .13 It is strictly forbidden to drill, cut or modify in any way a component of the frame on site without having obtained the Ministerial Representative's written authorization beforehand.
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- .14 Structural elements made of galvanized steel can not be cut, drilled or modified in any way whatsoever on the worksite. If changes on the structural elements of galvanized steel are made on the worksite, they must be returned to the workshop to be galvanized once more.

### 3.4 ON-SITE QUALITY CONTROL

- .1 The Ministerial Representative shall have access to the shop at all times to inspect the manufacturing and assembly work performed there.
- .2 The Ministerial Representative may require that analytical trials, estimates and calculations be performed. Replace all work or materials found to be defective, at no expense and without any unnecessary project delays.
- .3 At the Ministerial Representative's request, provide a factory certificate attesting that the quality of the steel meets the requirements of the contract documents.
- .4 At Ministerial Representative's request, provide him with certified copies of the steel factory inspection reports concerning the chemical and physical properties of the steels used.
- .5 A testing laboratory approved by the Ministerial Representative shall inspect and test materials and craftsmanship.
- .6 The Ministerial Representative may require that the Laboratory assess certain welds he considers important through visual inspection, or by performing penetrating liquid, magnetic particle, x-ray or ultrasound examinations. Cooperate fully on the performance of these tests and if required make the necessary repairs following these inspections.
- .7 The parts of welds that have been repaired shall be fully re-inspected following the same method used to perform the first inspection.
- .8 The Laboratory shall check the shear connectors using the following method: after welding, the Contractor shall remove the ceramic ring around each connector and the Laboratory shall visually inspect the weld bead. Beads extending less than 360 degrees shall undergo more thorough inspection. These types of connectors shall be tested using a hammer to bend the connector 15 degrees from vertical toward the nearest side of the embedded plate or structural component. Welds that bend without breaking are acceptable. Bent connectors shall not break when straightened after the test. In addition, the Laboratory shall use the same method to conduct random testing on one percent of connectors where the weld bead is visually acceptable. The Contractor shall replace defective connectors at his expense.
- .9 The Ministerial Representative may ask the Contractor to check whether the columns are plumb, in his presence. The Contractor shall provide the equipment required to perform this audit.
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- .10 The Ministerial Representative may ask the Contractor to check the bolted joints, in his presence. High-strength joint shall comply with the CAN/CSA-S16 Standard, clauses 23.7 and/or 23.8.
- .11 The inspection and verification to ensure the framework is aligned, plumb and level shall comply with the CAN/CSA-S16 Standard, clause 29.7.

### **3.5 JOINTS**

- .1 Unless otherwise indicated on the drawings, all factory-built joints shall be welded. If friction joints are specified, high-strength bolts shall be used.
- .2 High-strength bolts shall be used on all friction joints performed on site, in accordance with Section 23 of the CSA-S16-01 standard.

### **3.6 TEMPORARY BRACING**

- .1 Assembly the steel framework, ensuring it is aligned and plumb to specified tolerances. Use temporary bracing for the assembly where necessary to offset any load to which the frame may be subjected, including wind, snow, equipment and its use.  
  
Leave these braces in place without disturbing them as long as they are required for safety, and until final installation of permanent braces.
- .2 The Contractor shall be responsible for any negligence in adequately anticipating the stresses exerted during assembly of the framework.
- .3 Do not perform permanent bolting, welding or riveting as long as the braced framework has not been properly aligned.
- .4 The Contractor is entirely responsible for the temporary stability of the steel frame.

### **3.7 GROUT APPLICATION**

- .1 Where indicated on the drawings, after the framework has been erected and aligned, completely fill the space under column base plates or other supports with the specified non-shrink grout, following the manufacturer's written instructions.
- .2 Install the grout and wait until it has achieved 75% of its specified strength before pouring the concrete slabs on steel decking.

### **3.8 ON-SITE PAINTING**

- .1 Unless otherwise indicated, use a primer that complies with the SSPC-SP 3 Standard to touch up all damaged surfaces and surfaces that were not factory painted. Apply the paint in compliance with the requirements of the CAN/CGSB 85.10 Standard.

### **3.9 RETOUCH FOR GALVANIZED STEEL**

- .1 After the approval of the Ministerial Representative, the surfaces of the galvanized structural elements which have been damaged, scratched during transportation, handling or installation must be touched up with zinc enriched paint on the surfaces in question.
- .2 The structural elements of galvanized steel which have been scratched or damaged on a cumulative surface greater than 10 cm<sup>2</sup> must be removed and returned the workshop to be galvanized again and then reinstalled afterwards.

### **3.10 SUBSTITUTION**

- .1 Do not change the dimension and size of the members shown on the drawings without the Ministerial Representative's written authorization. Substitution of members with units stronger than those specified may be accepted at no additional cost.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Works Results - Electrical.

### **1.2 REFERENCES**

- .1 CSA International
  - .1 CSA C22.2 No.42-10, General Use Receptacles, Attachment Plugs and Similar Devices.
  - .2 CAN/CSA C22.2 No.42.1-00(R2009), Cover Plates for Flush-Mounted Wiring Devices (Bi-national standard, with UL 514D).
  - .3 CSA C22.2 No.55-M1986(R2008), Special Use Switches.
  - .4 CSA C22.2 No.111-10, General-Use Snap Switches (Bi-national standard, with UL 20).

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for wiring devices and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:

### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for wiring devices] for incorporation into operation and maintenance manual.

### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
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- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wiring devices from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **PART 2 - PRODUCTS**

### **2.1 SWITCHES**

- .1 20 A, 347 V, three-way switches, "Specification Grade".
- .2 Manually-operated general purpose AC switches with following features:
  - .1 Terminal holes approved for No. 10 AWG wire.
  - .2 Silver alloy contacts.
  - .3 Urea or melamine moulding for parts subject to carbon tracking.
  - .4 Suitable for back and side wiring.
  - .5 Color: white for normal circuits, red for emergency circuits.
- .3 Toggle operated fully rated for tungsten filament and fluorescent lamps, and up to 120% of rated capacity of motor loads.
- .4 Switches of one manufacturer throughout project.
- .5 Acceptable products:

	<b>Pass &amp; Seymour</b>	<b>Hubbell</b>	<b>Leviton</b>
347 V - 20 A - 1 P	372010-I	HBL-18221-I	18201-I
347 V - 20 A - 3 P	372030-I	HBL-18223-I	18203-I
347 V - 20 A - 4 P	372040-I	HBL-18224-I	18204-I

- .1 Replacement materials or products: approved by addendum according to Instructions to bidders.



## 2.2 SWITCHES WITH INTEGRATED PRESENCE DETECTOR

- .1 **Manual switch, single pole, 15 A - 347 V, including a presence detector, dual technology: passive infrared and ultrasonic.**
- .2 **Lens: vandal resistant.**
- .3 **Programmable such as:**
  - .1 **The user must press the switch to turn on the light ("Manual ON");**
  - .2 **A 30 minutes delay without presence detection with one or other technology, before the lights ("Auto OFF").**
  - .3 **Colour: white.**
- .4 **Acceptable product:**
  - .1 **Model DW-100-347 W of Watt Stopper (Legrand);**
  - .2 **Model AD347W1 of Hubbell;**
  - .3 **Model OSSMT-MD of Leviton;**
  - .4 **Replacement materials or products: approved by addendum according to Instructions to bidders.**

## 2.3 RECEPTACLES

- .1 Duplex receptacles, "Specification Grade"/"Hospital Grade" type, CSA type 5-15 R, 125 V, 15 A, U ground, to: CSA C22.2 No.42 with following features:
  - .1 Urea moulded housing, unless indicated otherwise.
  - .2 Suitable for No. 10 AWG for back and side wiring.
  - .3 Break-off links for use as split receptacles.
  - .4 Eight back wired entrances, four side wiring screws.
  - .5 Triple wipe contacts and rivetted grounding contacts.
  - .6 Color: white for normal circuits, red for emergency circuits, and orange for receptacles with isolated ground.
- .2 Single receptacles, "Specification Grade" type, CSA type 5-15 R, 125 V, 15 A, U ground with following features:

- .1 Urea moulded housing.
- .2 Suitable for No. 10 AWG for back and side wiring.
- .3 Four back wired entrances, 2 side wiring screws.
- .4 Color: white for normal circuits, red for emergency circuits, and orange for receptacles with isolated ground.
- .3 Other receptacles with ampacity and voltage as indicated.
- .4 Receptacles of one manufacturer throughout project.
- .5 Receptacles for maintenance shall be designed for 15 A and 20 A plugs, and shall be of 5-20R configuration.
- .6 Acceptable products:

	<b>Pass &amp; Seymour</b>	<b>Hubbell</b>	<b>Leviton</b>
15 A - 125 V (5-15R)	5262-I	HBL-5262-I	5262-I

- .1 Replacement materials or products: approved by addendum according to Instructions to bidders

**2.4 SPECIAL WIRING DEVICES**

- .1 Special wiring devices:
  - .1 Clock hanger outlets, 15 A, 125 V, 3 wire, grounding type, suitable for No. 10 AWG for installation in flush outlet box.

**2.5 COVER PLATES**

- .1 Cover plates for wiring devices to: CSA C22.2 No.42.1.
- .2 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.
- .3 Stainless steel, vertically brushed, 1 mm thick cover plates for wiring devices mounted in flush-mounted outlet box.
- .4 Aluminum cast cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.
- .5 Weatherproof double lift spring-loaded cast aluminum cover plates, complete with gaskets for duplex receptacles as indicated.
- .6 Weatherproof spring-loaded cast aluminum cover plates complete with gaskets for single receptacles or switches.

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## 2.6 SOURCE QUALITY CONTROL

- .1 Cover plates from one manufacturer throughout project.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wiring devices installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Departmental Representative unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

### 3.2 INSTALLATION

- .1 Switches:
    - .1 Install single throw switches with handle in "UP" position when switch closed.
    - .2 Install switches in gang type outlet box when more than one switch is required in one location.
    - .3 Mount toggle switches at height in accordance with Section 26 05 00 - Common Work Results - Electrical.
  - .2 Receptacles:
    - .1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.
    - .2 Mount receptacles at height in accordance with Section 26 05 00 - Common Work Results - Electrical.
    - .3 Where split receptacle has one portion switched, mount vertically and switch upper portion.
  - .3 Cover plates:
    - .1 Install suitable common cover plates where wiring devices are grouped.
-

- 
- .2 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.
  - .4 Identification:
    - .1 On each cover plate, identify receptacles and switches with a self-adhesive plastic label ("Brother P-Touch") size 1 indicating the number of the panelboard and circuit. Label media shall be transparent mat with white lettering on black background for normal network and white lettering on a red background for emergency network.
  - .5 Perform tests in accordance with current standards and provide a test report.
  - .6 All outlets installed in less than 1 500 mm of a washbasin, sink or tub shall be protected at the panelboard by a differential circuit breaker or they shall of the differential type (GFCI).
  - .7 It is forbidden to install outlets back to back against the wall. Leave a minimum horizontal clearance of 150 mm between the boxes.

### 3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.
- .3 Repair damage to adjacent materials caused by wiring device installation.

**END OF SECTION**

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## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Works Results - Electrical.

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA C22.2 n° 60947-4-1: Electromechanical contactors and motor-starters.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
    - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
    - .2 Provide shop drawings for each type of starter to indicate:
      - .1 Mounting method and dimensions.
      - .2 Starter size and type.
      - .3 Layout and components.
      - .4 Enclosure types.
      - .5 Wiring diagram.
      - .6 Interconnection diagrams.

## 1.4 CLOSEOUT SUBMITTALS

- .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit operation and maintenance data for each type and style of motorstarter for incorporation into maintenance manual.
- .3 Extra Materials:
  - .1 Provide listed spare parts for each different size and type of starter.
    - .1 3 contacts, stationary.
    - .2 3 contacts, movable.
    - .3 1 contacts, auxiliary.
    - .4 1 control transformers.
    - .5 1 operating coil.
    - .6 2 fuses.
    - .7 10% indicating lamp bulbs used.

## 1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

## **PART 2 - PRODUCTS**

### 2.1 MATERIALS

- .1 Starters: to CSA 22.2 n° 60947-4-1, with AC4 utilization category.
  - .2 Reduced power starters are not acceptable.
  - .3 Obtain motor running amp from nameplate in order to adjust overload current.
-

## 2.2 FULL VOLTAGE MAGNETIC STARTERS

- .1 Combination magnetic starters of size, type, rating and enclosure type as indicated with components as follows:
  - .1 Contactor solenoid operated, rapid action type.
  - .2 Motor overload protective device in each phase, manually reset from outside enclosure.
  - .3 Terminals for power and control circuits.
  - .4 Wiring and schematic diagram inside starter enclosure in visible location.
  - .5 Identify each wire and terminal for external connections, within starter, with permanent number marking identical to diagram.
- .2 Combination type starters to include fused or non-fused disconnect switch as indicated, with operating lever on outside of enclosure, and provision for:
  - .1 Locking in "OFF" position with up to 3 padlocks.
  - .2 Independent locking of enclosure door.
  - .3 Provision for preventing switching to "ON" position while enclosure door open.
- .3 Accessories:
  - .1 Selector switches: three positions "MAN-STOP-AUTO", heavy duty.
  - .2 Indicating lights: LED, red color indicating presence of power, green indicating running.
  - .3 1-N/O and 1-N/C spare auxiliary contacts unless otherwise indicated.

## 2.3 CONTROL TRANSFORMER

- .1 Single phase, dry type, control transformer with primary voltage as indicated and 120 V secondary, complete with secondary fuse, installed in with starter as indicated.
- .2 Size control transformer for control circuit load plus 20% spare capacity.

## 2.4 FINISHES

- .1 Apply finishes to enclosure in accordance with Section 26 05 00 - Common Work Results for Electrical.

## **2.5 EQUIPMENT IDENTIFICATION**

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Designation label size 1.

## **2.6 ACCEPTABLE PRODUCTS**

- .1 Freedom series from Eaton (Cutler-Hammer);
- .2 8538 series from Schneider Electric (Square D);
- .3 Sirius series from Siemens;
- .4 Replacement materials or products: approved by addendum according to Instructions to bidders.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- .1 Install starters and control devices in accordance with manufacturer's instructions.
- .2 Install and wire starters and controls as indicated.
- .3 Ensure correct fuses installed.
- .4 Confirm motor nameplate and adjust overload device to suit.

### **3.2 FIELD QUALITY CONTROL**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical and manufacturer's instructions.
- .2 Operate switches and contactors to verify correct functioning.
- .3 Perform starting and stopping sequences of contactors and relays.
- .4 Check that sequence controls, interlocking with other separate related starters, equipment, control devices, operate as indicated.

**END OF SECTION**

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**PART 1 - GENERAL****1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Works Results - Electrical.

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA C22.2 n° 1, Audio, video and similar electronic equipment.
- .2 Industry Canada - Terminal Attachment Program
  - .1 CS-03-2010, Telecommunication Apparatus Compliance Specification, Issue 8.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for public address and mass notification systems and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
  - .2 Indicate on drawings:
    - .1 Riser diagram, block diagram of complete public address system.
    - .2 Public address system design criteria.

**1.4 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
  - .2 Operation and Maintenance Data: submit operation and maintenance data for public address and mass notification systems for incorporation into manual.
-

- .3 Include in manual:
  - .1 Operation instructions.
  - .2 Description of system operation.
  - .3 Description of each subsystem operation.
  - .4 List showing each piece of equipment in system or subsystem by its original manufacturer name and model number.
  - .5 Part list showing parts used in equipment by identification numbers that are standard to electronics industry.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect public address systems from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **PART 2 - PRODUCTS**

### **2.1 SYSTEM DESCRIPTION AND COMPONENTS**

- .1 Equipment cabinet including but not limited to:
  - .1 Amplifier with a power of 25% greater than the power required, to be used for general call and notification.
  - .2 Amplifier to be integrated into the console:
    - .1 Input: 110/123 V, 50-60 Hz;
    - .2 Output: line 10, 25, 45, 60, 70 V;

- .3 Power output: provide detailed capacity calculation of the amplifier as a function of number of device (speaker etc.);
- .4 Input impedance: low;
- .5 Signal: - 80 dB;
- .6 Frequency Range: less than one dB from 20 to 20,000 Hz;
- .3 CD player;
- .4 Auxiliary I-Pod and MP3 jack;
- .5 EC- PMT monitor panel;
- .6 Internal clock;
- .7 Ethernet port for remote programming of schedules;
- .8 Alphanumeric programming of rooms or zones;
- .9 Distribution of 5 programs simultaneously;
- .10 Calls in queue.
- .2 Master station:
  - .1 Compact master station with a large screen 8 line backlit with 6 buttons.
  - .2 Mic/speaker block with mute feature.
  - .3 Composition without lifting the handset.
  - .4 Control the volume of the ringer and the handset.
  - .5 Telephone handset, allowing two-way communication with telephone system. A 1.5 meter cable with plug connector connects the station to the system.

## 2.2 SOUND REPRODUCERS

- .1 Speakers:
  - .1 Speakers with a diameter of 200 mm with permanent magnet 10 ounces, power of 10 W, a coil of 25 mm diameter and a frequency response of 50 12 000 Hz, sound board , 10 mm thick , terminal strip , mounted on a perforated metal mesh, painted white. To be attached to a mounting box 20 gauge steel recessed or surface acoustic materials with 12 mm thickness.

- .2 The speakers should be provided with multiple matching transformer impedance. Output 70 V, 0.5 W, 1 , 2 and 4 W.
  - .3 The speakers should be grouped by areas.
  - .4 Products : Luvicon , Equinox series with recessed housing.
- .2 Horns:
- .1 Made of ABS , with a dimension of 160 mm by 225 mm, weatherproof with adjustable mounting bracket. Power 32/16 W 70/25 V.
    - .1 Dispersion angle: 90° x 120°;
    - .2 Frequency response: 450 to 8 000 Hz;
    - .3 Impedance: 8 ohms.

### **2.3 ACCEPTABLE PRODUCTS**

- .1 Equinox of Luvicom;
- .2 TrueCom of Nad Communication;
- .3 AIPHONE;
- .4 Replacement materials or products: approved by addendum according to Instructions to bidders.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- .1 Install equipment in accordance with manufacturer's instructions, and as indicated.

### **3.2 FIELD QUALITY CONTROL**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Conduct intelligibility test.

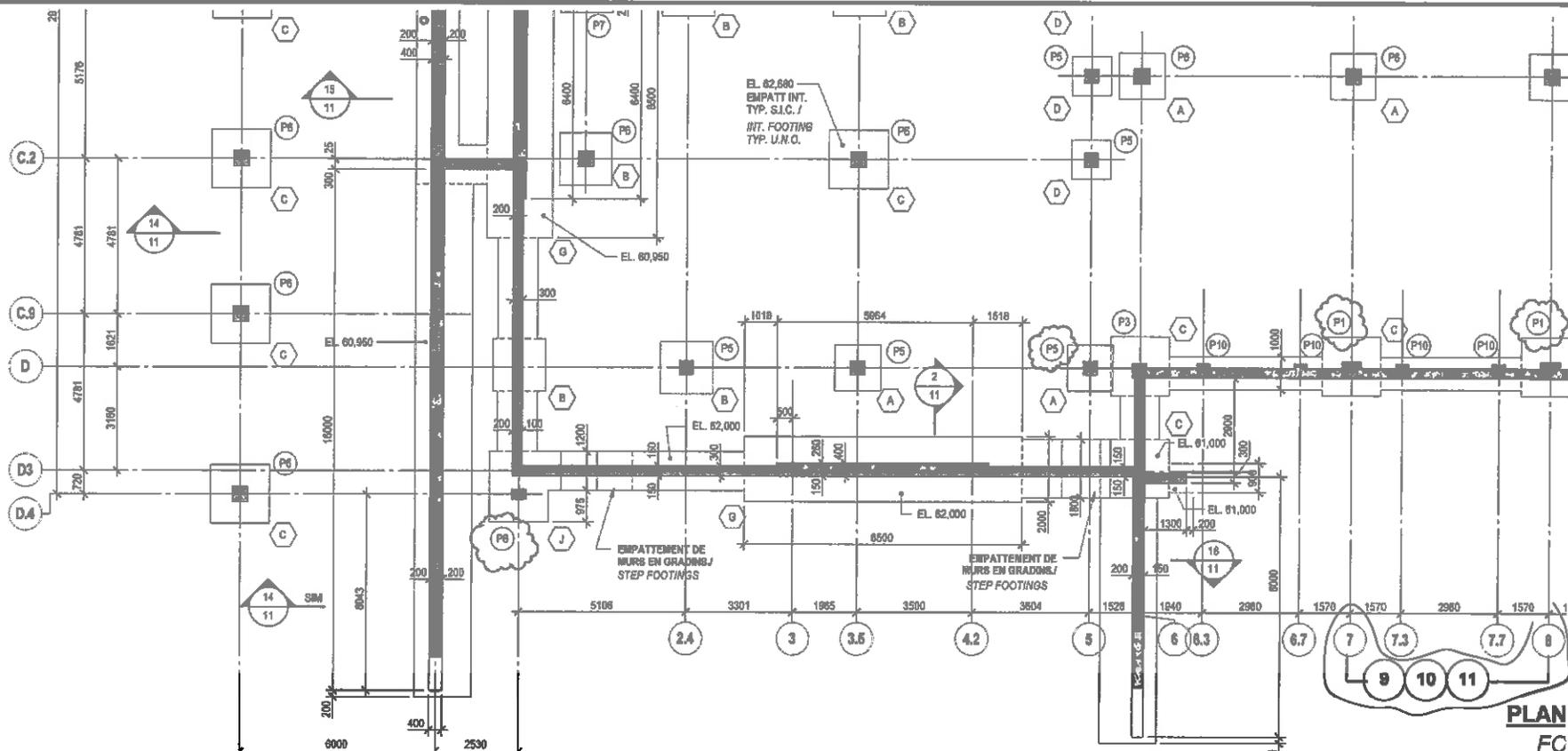
### **3.3 CLOSEOUT ACTIVITIES**

- .1 Manufacturer's factory service engineer to instruct:
  - .1 Maintenance personnel in maintenance of system.
  - .2 Operating personnel in use of system.

**END OF SECTION**

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**PLAN**  
FC

**NOTES GÉNÉRALES**  
**GENERAL NOTES**

DALLE STRUCTURALE EXTÉRIEUR : 35 MPa  
EXTERIOR SLAB ON GRADE : 35MPA



PILASTRE TYPE -P1- AUX AXES D/7, D/8, D/9, D/10 ET D/11 /  
PILASTRE TYPE -P1- AT AXES D/7, D/8, D/9, D/10 ET D/11 /

Projet / Project

**LA COLLE**

Rue 15, St-Denis de Beaulieu, Québec

Titre / Title

**ADDENDA No2 /  
ADDENDUM No. 2**

Dessau inc.

1884, rue de Bayou (Rue), Bureau 300  
Montréal (Québec) H2Z 1S8  
Téléphone: 514.282.1212  
Télécopieur: 514.796.8799

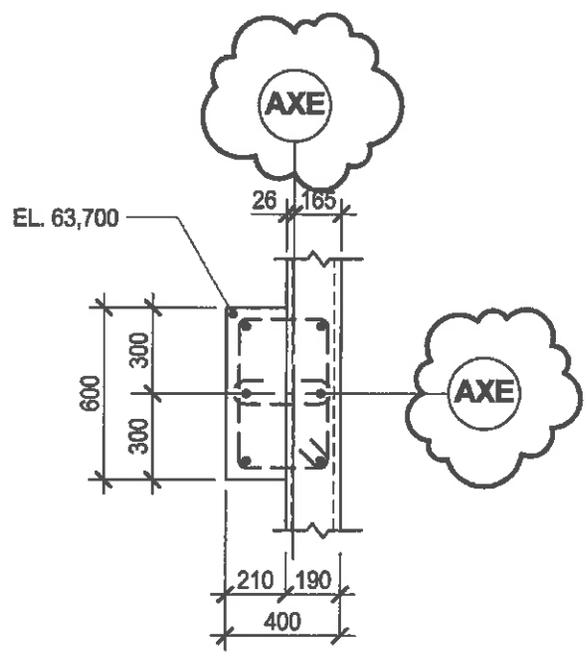
**DESSAU**

Projet / Design <b>G. Abi-Saad</b>	Discipline <b>STRUCTURE</b>	Chargé de projet / Project Manager <b>Muhammad Haddad</b>
Dessiné / Drawn by <b>Silva A. Akar</b>	Statut / Status <b>INDIQUÉE</b>	Échelle / Scale <b>S04</b>
Vérifié / Verified <b>G. Abi-Saad</b>	Date <b>2014-03-31</b>	Révisé / Rev. <b>1</b>

Service / Srv. code <b>247</b>	Projet / Project <b>P-0042298</b>	Op. <b>201</b>	Dise. <b>SC</b>	Type <b>D</b>	N° Dessin / No. Drawing <b>C06</b>	Rév. <b>0</b>
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CE DOCUMENT D'INGÉNÉRIE EST LA PROPRIÉTÉ DE DESSAU ET EST PROTÉGÉ PAR LA LOI. IL EST DESTINÉ EXCLUSIVEMENT AUX FINS QUI Y SONT MENTIONNÉES. TOUTE REPRODUCTION OU ADAPTATION, PARTIELLE OU TOTALE, EN EST STRICTEMENT PROHIBÉE SANS AVOIR PRÉALABLEMENT OBTENU L'AUTORISATION ÉCRITE DE DESSAU.

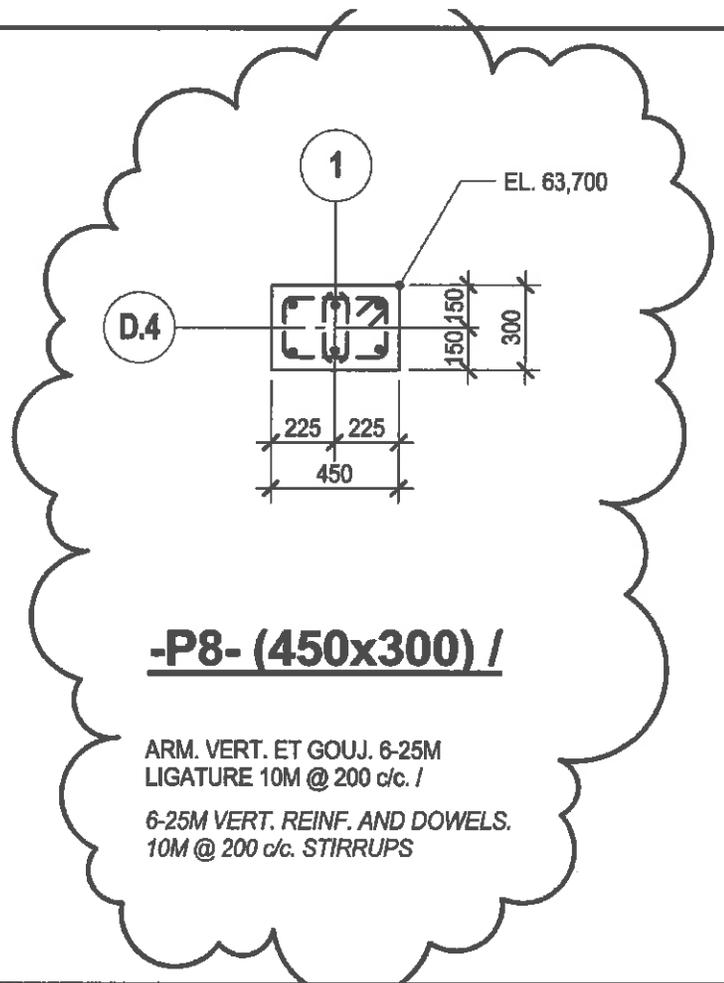
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**-P1- (400x600)**

ARM. VERT. ET GOUJ. 6-25M  
LIGATURE 10M @ 200 c/c. /

6-25M VERT. REINF. AND DOWELS.  
10M @ 250 c/c. STIRRUPS



**-P8- (450x300) /**

ARM. VERT. ET GOUJ. 6-25M  
LIGATURE 10M @ 200 c/c. /

6-25M VERT. REINF. AND DOWELS.  
10M @ 200 c/c. STIRRUPS



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Projet / Project	<b>LA COLLE</b>
Site / Title	Route 15, St-Basile de Jacquié, Québec
	<b>ADDENDA No2 / ADDENDUM No. 2</b>

<b>DESSAU</b>		Dessau inc.	
1880, rue de Ste-Juste, bureau 200 Montréal (Québec) H3C 1K2 Téléphone: 514.521.8888 Télécopieur: 514.798.8798			
Projet / Design G. Abi-Saad	Discipline <b>STRUCTURE</b>	Chargé de projet / Project Manager Khalil Haddad	
Dessiné / Drawn by Elias A. Altar	Revisé / Revised Date 2014-03-31	Échelle / Scale <b>S12</b>	Rev. <b>1</b>
Vérifié / Verified G. Abi-Saad			
Rev. n° / Rev. No.	Projet / Project <b>247 P-0042298</b>	Qté / Qty <b>201</b>	Disc. / Disc. <b>SC</b>
	Type <b>D</b>	MP Dessau <b>C07</b>	Edu. <b>0</b>





LISTE DES LUMINAIRES / LIST OF FIXTURES

TYPE	MANUFACTURIER / MANUFACTURER	NUMÉRO DE CATALOGUE / CATALOGUE NUMBER	TENSION (VOLTS)	PUISSANCE (WATTS)	LAMPE / LAMP	MONTAGE / MOUNTING	TEMPÉRATURE / TEMPERATURE	REMARQUES / REMARKS	NOTES
A	CFI	FK0CSDW864	347	380W	6x78HO	SUSPENDU / SUSPENDED	4100°K	610x120	1, 2, 3, 8 ET 9
A2	CFI	FHANW4W4534TH4	347	250W	4x78HO	SUSPENDU / SUSPENDED	4100°K	610x120	1, 2, 3, 8 ET 9
A3	CFI	FHANW4W4534TH4	347	250W	4x78	SURFACE	4100°K	610x120	1, 2 ET 6
B	CFI	88248	347	80W	2x78	SUSPENDU / SUSPENDED	3600°K	REGLLETTE AVEC GRILLAGE	1, 2, 8 ET 11
B2	CFI	88248	347	80W	2x78	SURFACE	3600°K	REGLLETTE AVEC GRILLAGE	1, 2 ET 8
C	KEENIE	LP16-T	120	40W	DEL	SURFACE	4000°K	CIA TRANSFORMATEUR ABAISSEUR 347/120V	10
D	HUBBELL	DOK-16-LJ-8K-FI-C861R-1R5-FC-DSDL40	120	24W	DEL	SURFACE	8000K	FICHE 16A-120V	-
E	CFI	LPTT	120	7W	DEL	SURFACE	4100°K	CIA TRANSFORMATEUR ABAISSEUR 347/120V	10
F	CFI	CSW248-347SV8	347	80W	2x78	SURFACE	-	ESCALIER	1, 2 ET 6
G	CFI	RVX1C00US232-W	120	60W	2x78	SURFACE	3600°K	ANTI-VANDAL, 1220mm	1, 2, 5 ET 6
G2	CFI	RVX1C00US217-W	120	40W	2x78	SURFACE	3600°K	ANTI-VANDAL, 810mm	1, 2, 5 ET 6
H	CFI	A2W8-347HVB	347	80W	2x78	ENCASTRÉ / RECESSED	3600°K	610x120	1, 2 ET 6
H2	CFI	A2W8-347HVB-R02X4	347	80W	2x78	ENCASTRÉ / RECESSED	3600°K	610x120 PLAFOND PLACOLAÎRE	1, 2 ET 6
H8	CFI	A2W8-347HVB	347	80W	2x78	ENCASTRÉ / RECESSED	3600°K	305x120	1, 2 ET 6
J	COOPER	LD80A-30-DE710-ES0406-4-40-ALSQ1-LH-847	120	45W	DEL	ENCASTRÉ / RECESSED	4000°K	CIA TRANSFORMATEUR ABAISSEUR, 347/120V	10
J2	COOPER	LD80A-4-DE10-ES0406-4-40-ALSQ1-LH-847	120	20W	DEL	ENCASTRÉ / RECESSED	4000°K	CIA TRANSFORMATEUR ABAISSEUR, 347/120V	10
N	CALCULITE	CXAL-10NH-CAMAL-10DL3KCCCL	120	20W	DEL	ENCASTRÉ / RECESSED	3500°K	CIA TRANSFORMATEUR ABAISSEUR, 347/120V	2 ET 10
N2	CALCULITE	CS8BL18N1-C88BL18DL3KCCCL	120	40W	DEL	ENCASTRÉ / RECESSED	3600°K	CIA TRANSFORMATEUR ABAISSEUR, 347/120V	2 ET 10
P	CFI	VTS 248	347	80W	2x78	SURFACE	3600°K	ÉTANCHE À L'EAU	1, 2 ET 6
Q	REBELLE	2400-TL-40-120-LV-SM	120	7W	DEL	ENCASTRÉ / RECESSED	4000°K	CIA TRANSFORMATEUR ABAISSEUR, 347/120V	7 ET 10
R	CFI	TCU22M-347-HI	347	30W	1x78	SURFACE	3600°K	SOUS ARMOIRE	1, 2 ET 6

NOTES / NOTES:

- CIA BALLAST ÉLECTRONIQUE INTÉGRÉ À DÉMARRAGE PROGRAMMÉ / CW INTEGRATED ELECTRONIC BALLAST, PROGRAM START
- CIA CONNECTEUR DE SECTIONNEMENT POWERPLUS 450-102 DE IDEAL INDUSTRIES. / CW DISCONNECT CONNECTOR POWERPLUS 450-102 FROM IDEAL INDUSTRIES
- HÀ LE HAUT À 680mm / Hk: 680mm / Hk: 2170mm
- HÀ LE HAUT À 350mm / Hk: 350mm / Hk: 5170mm
- CIA PILE D'URGENCE 120 VAC, MODÈLE 850-CAN BOONIE DE PHILIPS. / CW EMERGENCY BALLAST 120VAC, MODÈLE 850-CAN BOONIE FROM PHILIPS
- FURNIR ET INSTALLER DES LAMPES ET DES BALLAST DU MÊME MANUFACTURIER. / SUPPLY AND INSTALL LAMPS AND BALLAST FROM THE SAME MANUFACTURER.
- Hk: 350mm / Hk: 350mm / Hk: 5170mm
- Hk: 370mm / Hk: 370mm / Hk: 5170mm
- PROFILER D'ACIER AU BAS DES POUTRELLES AVEC TIGE DE SUSPENSION, BAS DE LA POUTRELLE ± 750mm DU PLANCHER. / CHANNEL BELOW THE BEAM WITH SUSPENSION ROD, ± 750mm BETWEEN THE BEAM AND THE FLOOR.
- DOWNSTEP TRANSFORMER 347/120V, SUPPLIED BY FIXTURE MANUFACTURER.
- MONTAGE AVEC CHAÎNE DE SUSPENSION / CW SUSPENDED FIXTURE.



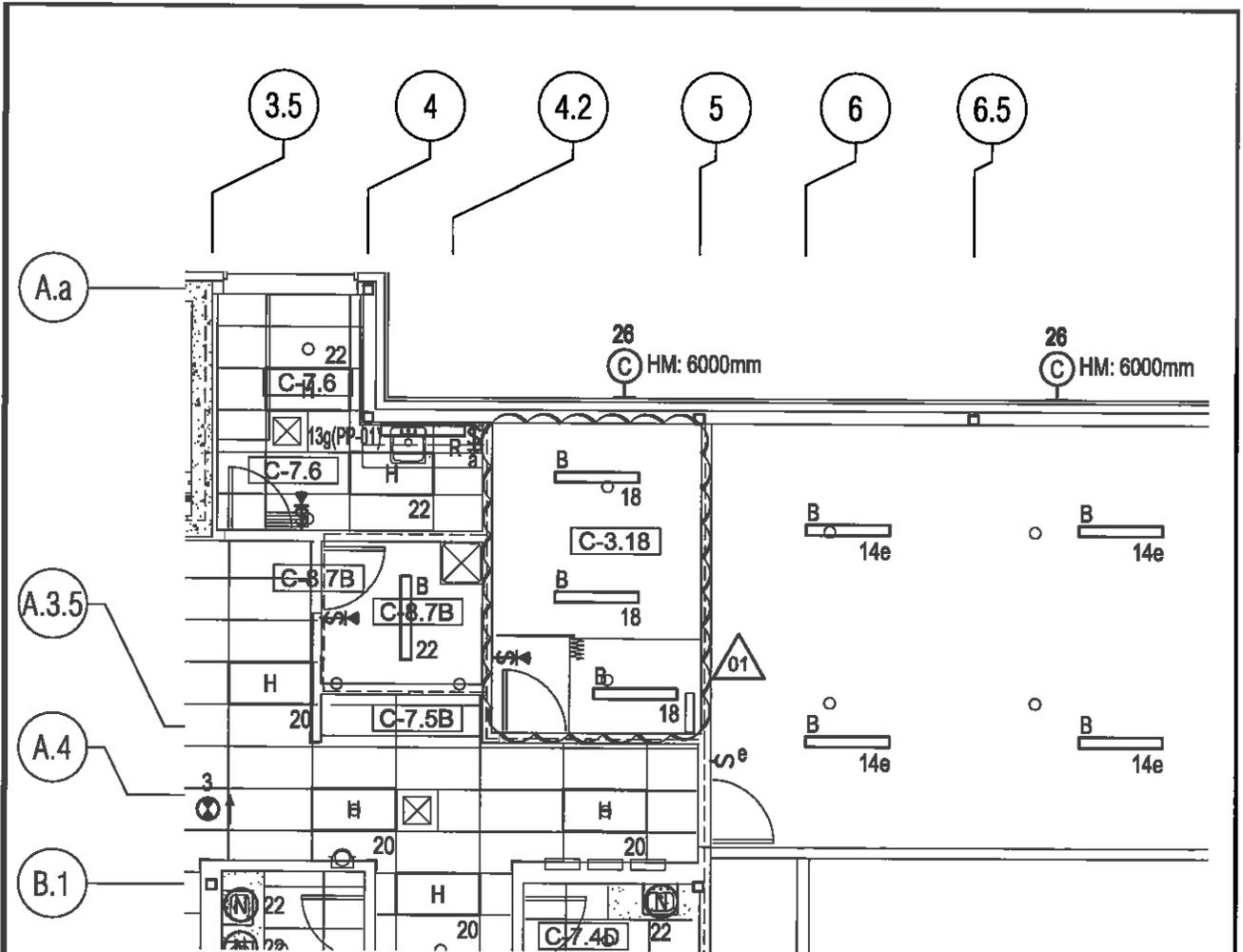
ADDENDA No 2 / CE-06



<p>Travaux publics et Services gouvernementaux Canada Direction générale des biens immobiliers Région du Québec</p>	<p>Public Works and Government Services Canada Real Property branch Quebec region</p>	<p>Projet/Project <b>POSTE FRONTALIER DE ST-BERNARD DE LACOLLE</b></p>	<p>Titre du dessin/Drawing title: <b>LÉGENDE, LISTE DES PLANS ET TABLEAU DES LUMINAIRES</b></p>
		<p>conçu par/designed by: Vincent Robichaud</p>	<p>date: 2014-03-31</p>
<p>Agence des services frontaliers Canada</p>	<p>Canada Border Services Agency</p>	<p>dessiné par/drawn by: Vincent Robichaud</p>	<p>no. de projet/project no. R.035717.001</p>
		<p>révisions: </p>	<p>date: 2014-03-31</p>
		<p>échelle/scale: AUCUNE</p>	<p>nom du fichier/file name R_035717_001-E01-LE-SYM-N.dwg</p>
			<p>E01/14</p>



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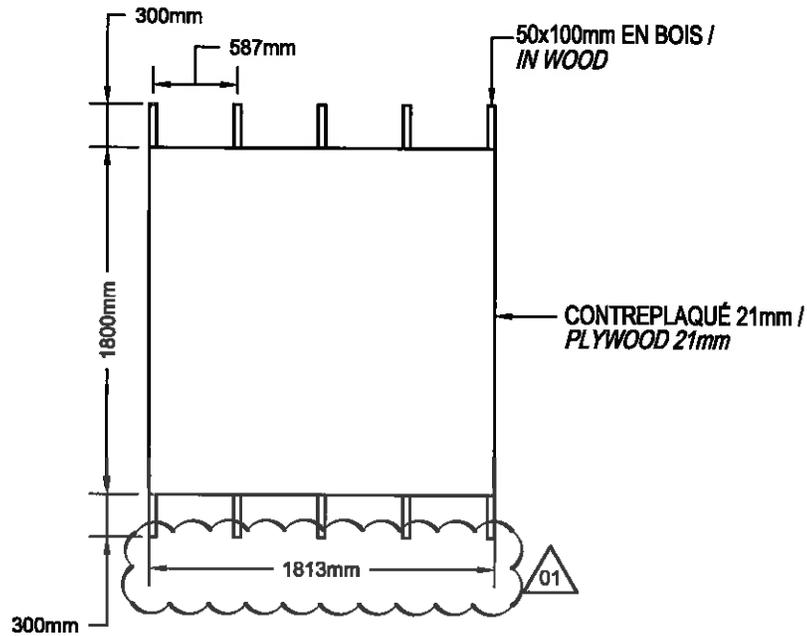


ADDENDA No 2 / CE-01



<p>Travaux publics et Services gouvernementaux Canada Direction générale des biens Immobiliers Région du Québec</p>	<p>Public Works and Government Services Canada Real Property branch Quebec region</p>	<p>Projet/Project <b>POSTE FRONTALIER DE ST-BERNARD DE LACOLLE</b></p>		<p>Titre du dessin/Drawing title: <b>ÉCLAIRAGE 2e ÉTAGE</b></p>	
		<p>conçu par/designed by: Vincent Robichaud</p>		<p>date: 2014-03-28</p>	
<p>Agence des services frontaliers Canada</p>	<p>Canada Border Services Agency</p>	<p>dessiné par/drawn by: Vincent Robichaud</p>		<p>no. de projet/project no.: R.035717.001</p>	
		<p>révisions: </p>		<p>échelle/scale: 1 : 100</p>	
				<p>date: 2014-03-28</p>	
				<p>date:</p>	

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**MUR POUR TÉLÉPHONE**  
**WALL FOR TELEPHONE**



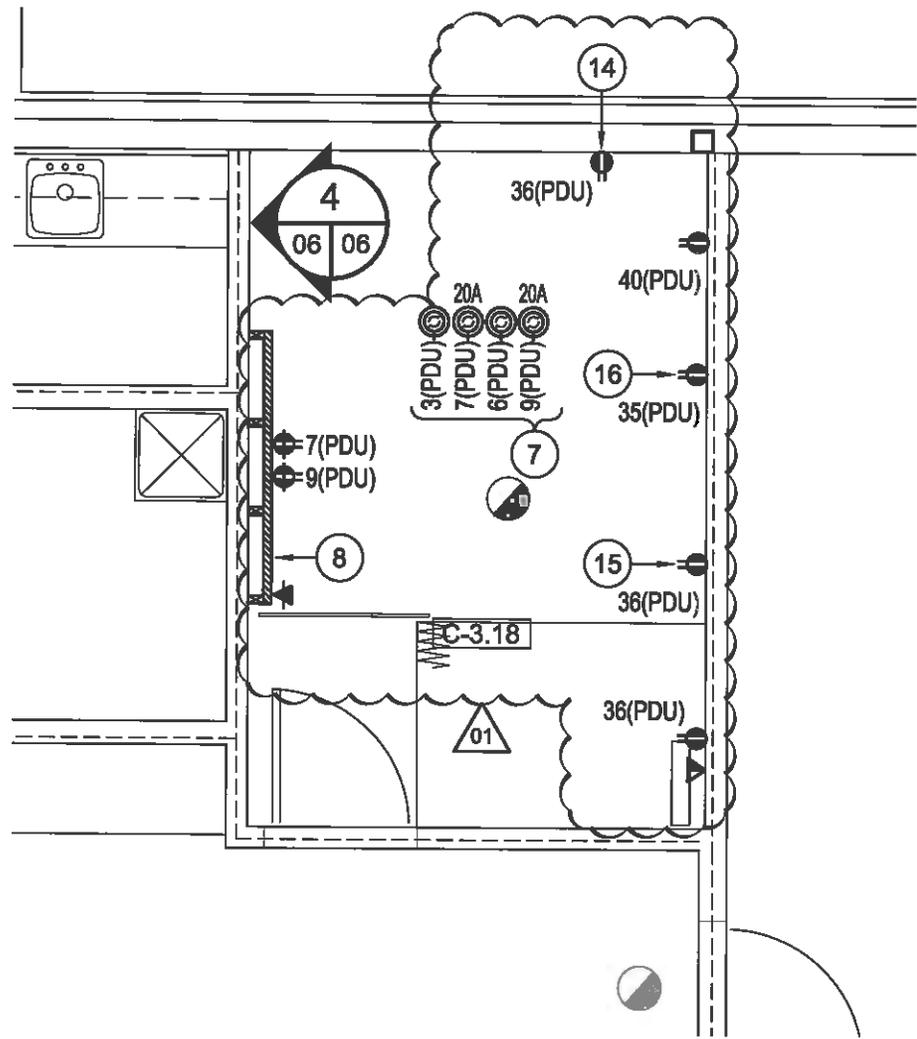
ADDENDA No 2 / CE-03



Travaux publics et Services gouvernementaux Canada Direction générale des biens immobiliers Région du Québec	Public Works and Government Services Canada Real Property branch Québec region 	2014-03-31 Projet/Project <b>POSTE FRONTALIER DE ST-BERNARD DE LACOLLE</b>		Titre du dessin/Drawing title: <b>SERVICES 2e ÉTAGE</b>	
		conçu par/designed by: Vincent Robichaud	date: 	approuvé par/approved by: Khalil Haddad, Ing.	date: 2014-03-28
Agence des services frontaliers Canada	Canada Border Services Agency	dessiné par/drawn by: Vincent Robichaud	date: 	no. de projet/project no. R.035717.001	date: 
		révisions: 	échelle/scale: 1 : 50	nom du fichier/file name R_035717_001-E06-DS-PRS-N.dwg	

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A.3.5  
A.4



**LOCAL C-3.1**  
**ROOM C-3.1**

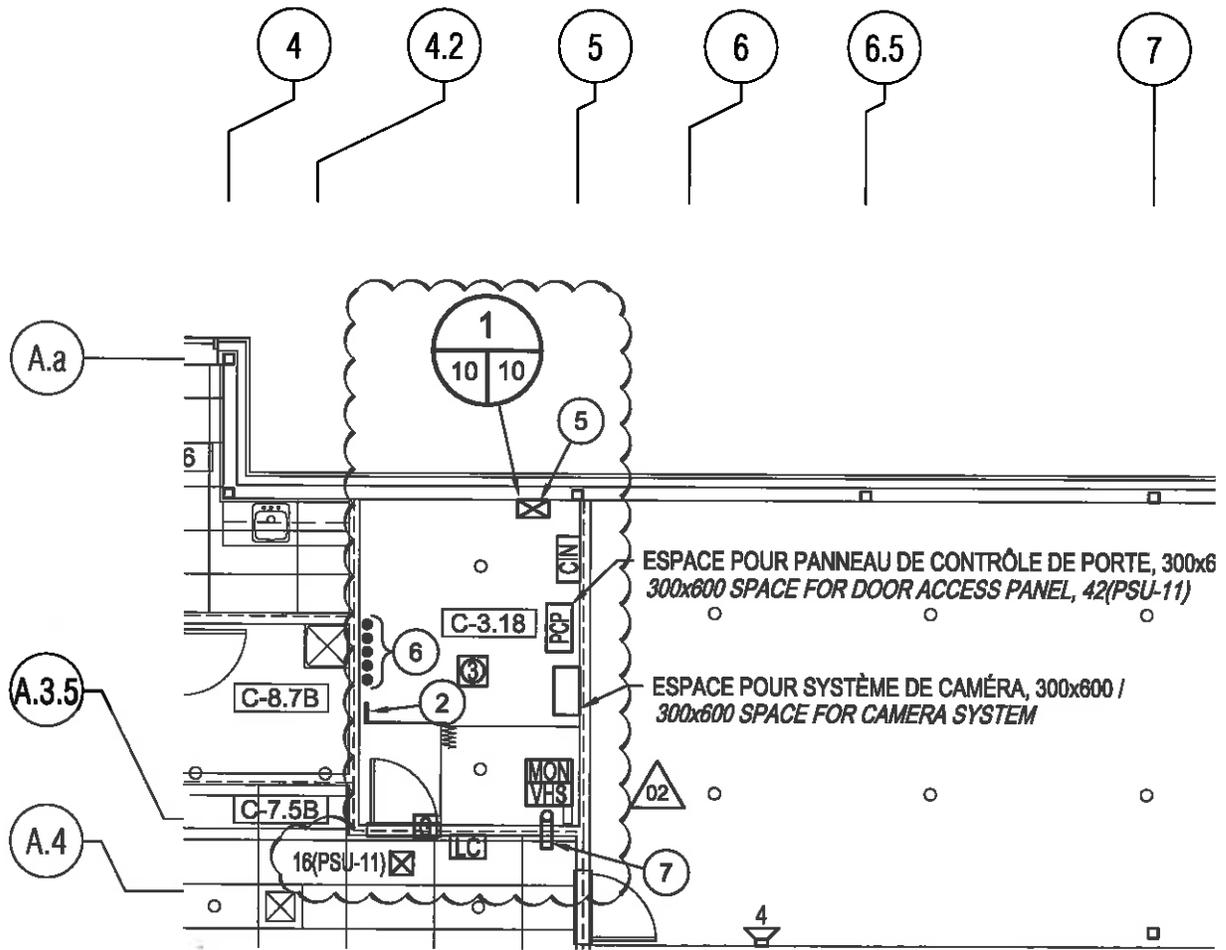


ADDENDA No 2 / CE-02



<p>Travaux publics et Services gouvernementaux Canada Direction générale des biens immobiliers Région du Québec</p>	<p>Public Works and Government Services Canada Real Property branch Quebec region</p> <p><b>Canada</b></p>	<p>Projet/Project <b>POSTE FRONTALIER DE ST-BERNARD DE LACOLLE</b></p>		<p>Titre du dessin/Drawing title: <b>SERVICES 2e ÉTAGE</b></p>	
		<p>conçu par/designed by: Vincent Robichaud</p>	<p>date:</p>	<p>approuvé par/approved by: Khalil Haddad, Ing.</p>	<p>date: 2014-03-28</p>
<p>Agence des services frontaliers Canada</p>	<p>Canada Border Services Agency</p>	<p>dessiné par/drawn by: Vincent Robichaud</p>	<p>date:</p>	<p>no. de projet/project no. R.035717.001</p>	<p>date:</p>
		<p>révisions: 01</p>	<p>échelle/scale: 1:50</p>	<p>nom du fichier/file name R_035717_001-E06-DS-PRS-N.dwg</p>	<p>E06/14</p>

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ADDENDA No 2 / CE-04



Travaux publics et Services gouvernementaux Canada Direction générale des biens Immobiliers Région du Québec	Public Works and Government Services Canada Real Property branch Québec region 	Projet/Project <b>POSTE FRONTALIER DE ST-BERNARD DE LACOLLE</b>		Titre du dessin/Drawing title: <b>SERVICES AUXILIAIRES 2e ÉTAGE ET SOUS-SOL</b>	
		conçu par/designed by: Vincent Robichaud	date:	approuvé par/approved by: Khalil Haddad, Ing.	date: 2014-03-28
Agence des services frontaliers Canada	Canada Border Services Agency	dessiné par/drawn by: Vincent Robichaud	date:	no. de projet/project no. R.035717.001	date:
		révisions: 	échelle/scale: 1:100	nom du fichier/file name R_035717_001-E10-SS-SAA-N.dwg	E10/14

