

JOHN G. COOKE & ASSOCIATES LTD. CONSULTING ENGINEERS

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JCAL# 14016

North/Nord Stamp/Étampe

PROFESSIONAL ENGINEER M.-J. LOCKMAN (15-0017-2016) PROVINCE OF ONTARIO

KEY PLAN PLAN-REPÈRE

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| 05 | | |
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| 01 | ISSUED FOR PERMIT - 99% EMIS POUR PERMIS -99% | 15-10-15 |
| revision | | date |

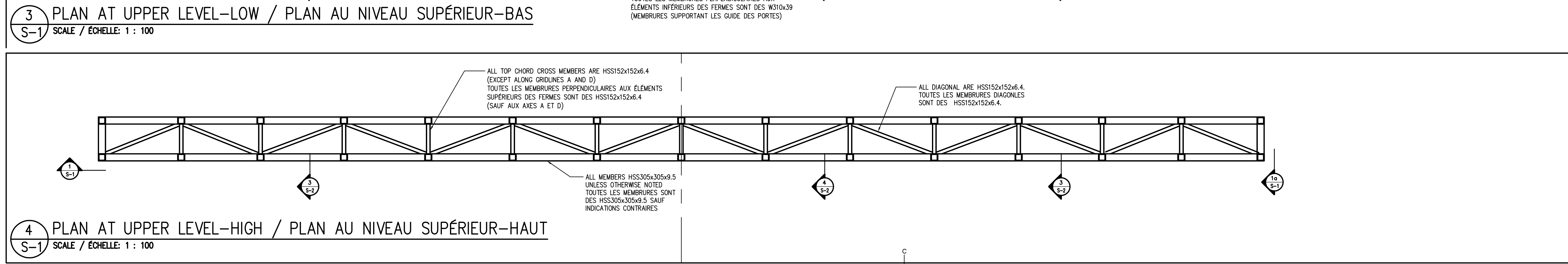
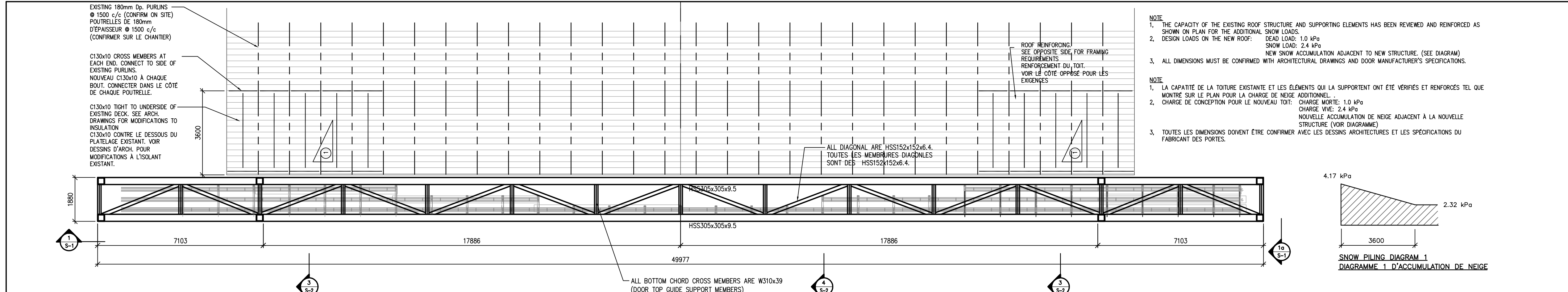
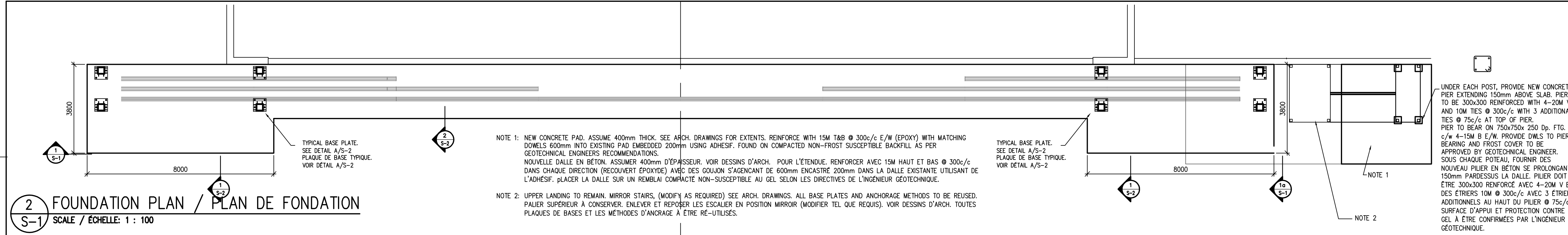
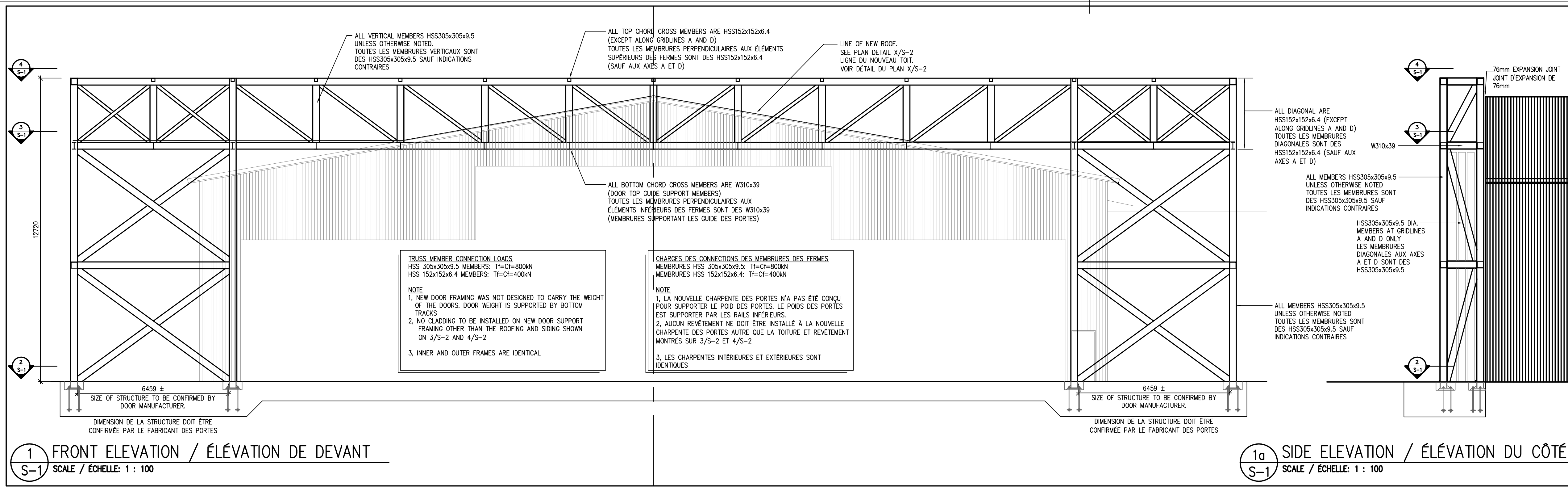
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| A | A detail no. no. du détail | A |
| B | B location drawing no. no. de localisation | BC |
| C | C drawing no. no. du dessin | |

project HANGAR DOORS / PORTES DU HANGAR

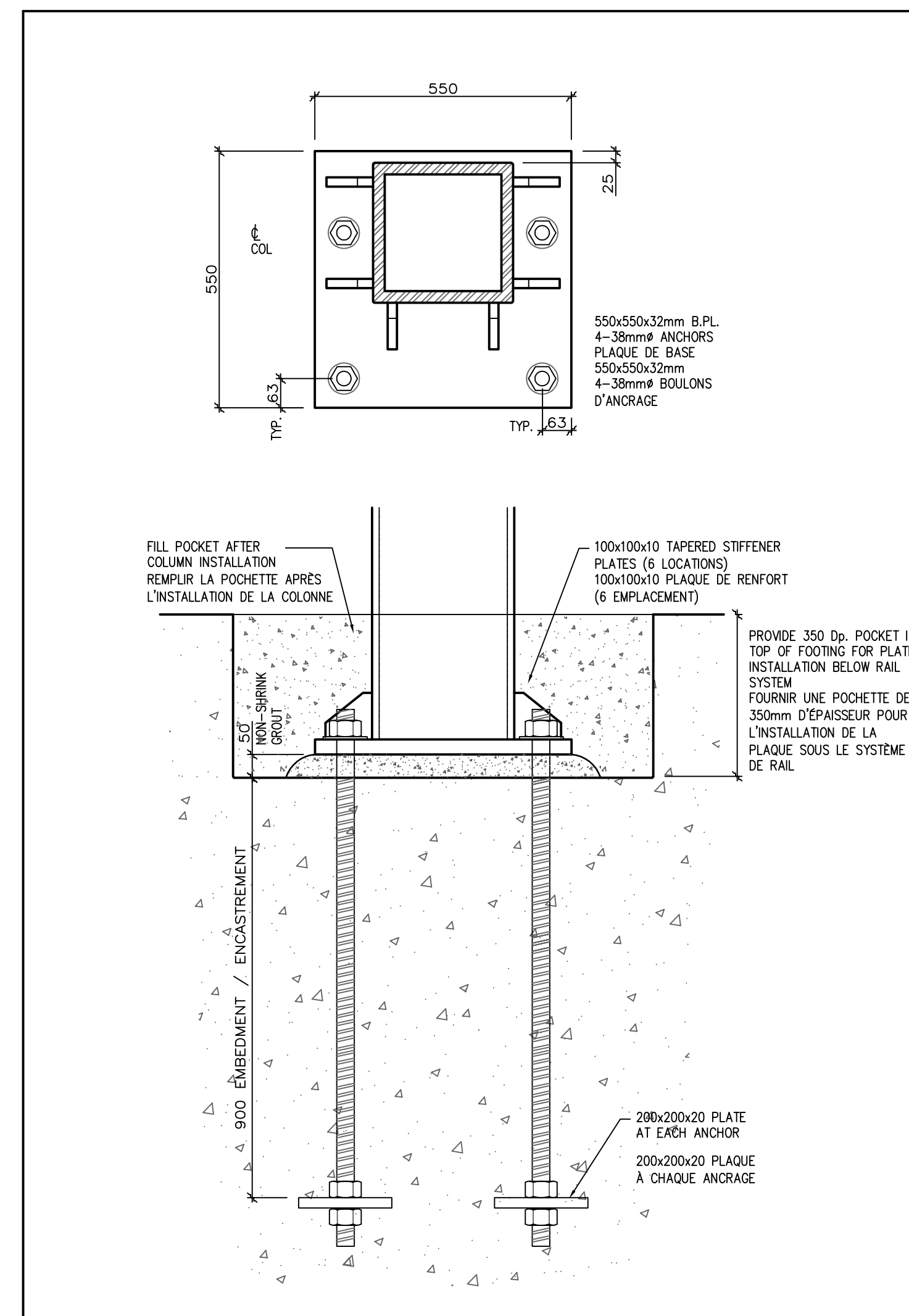
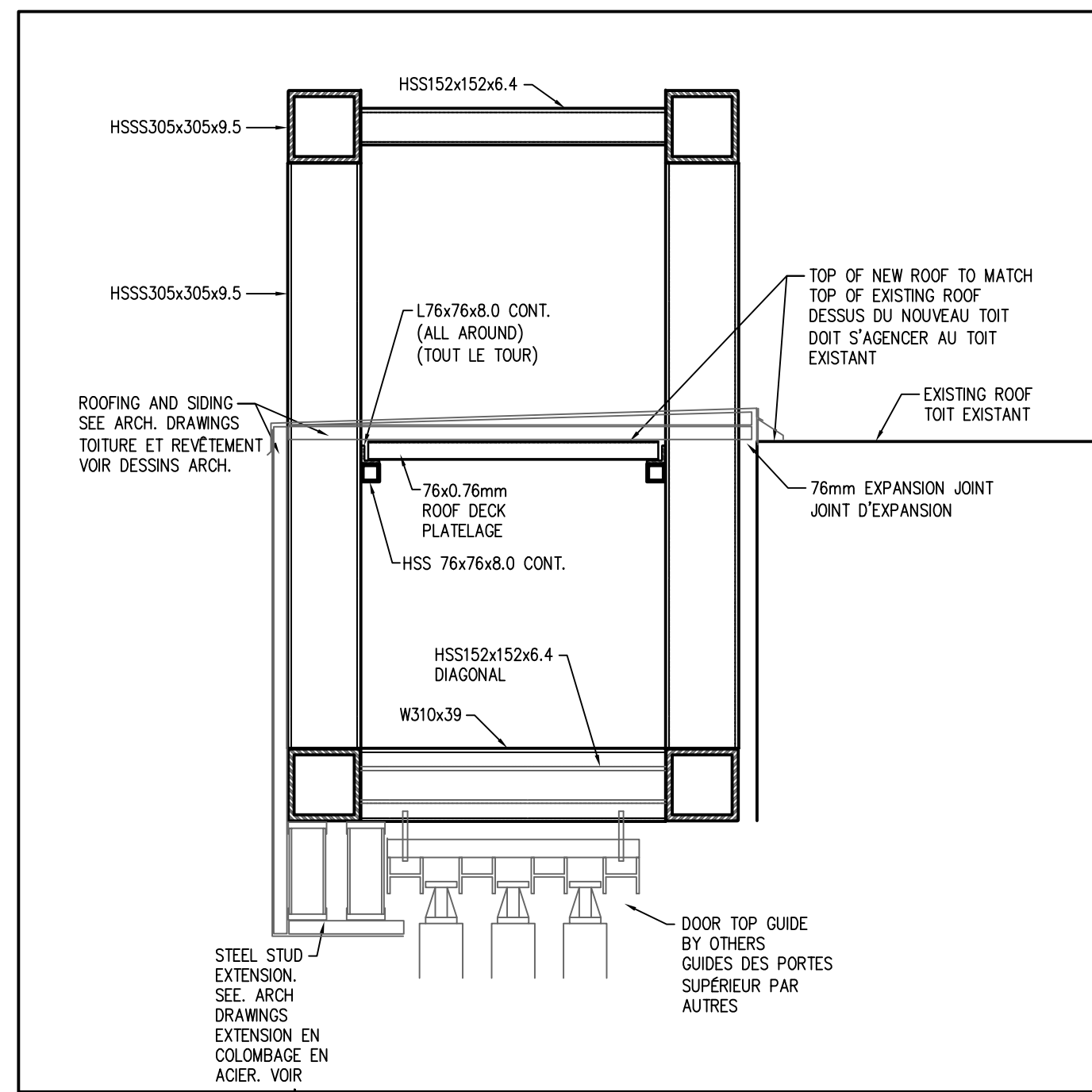
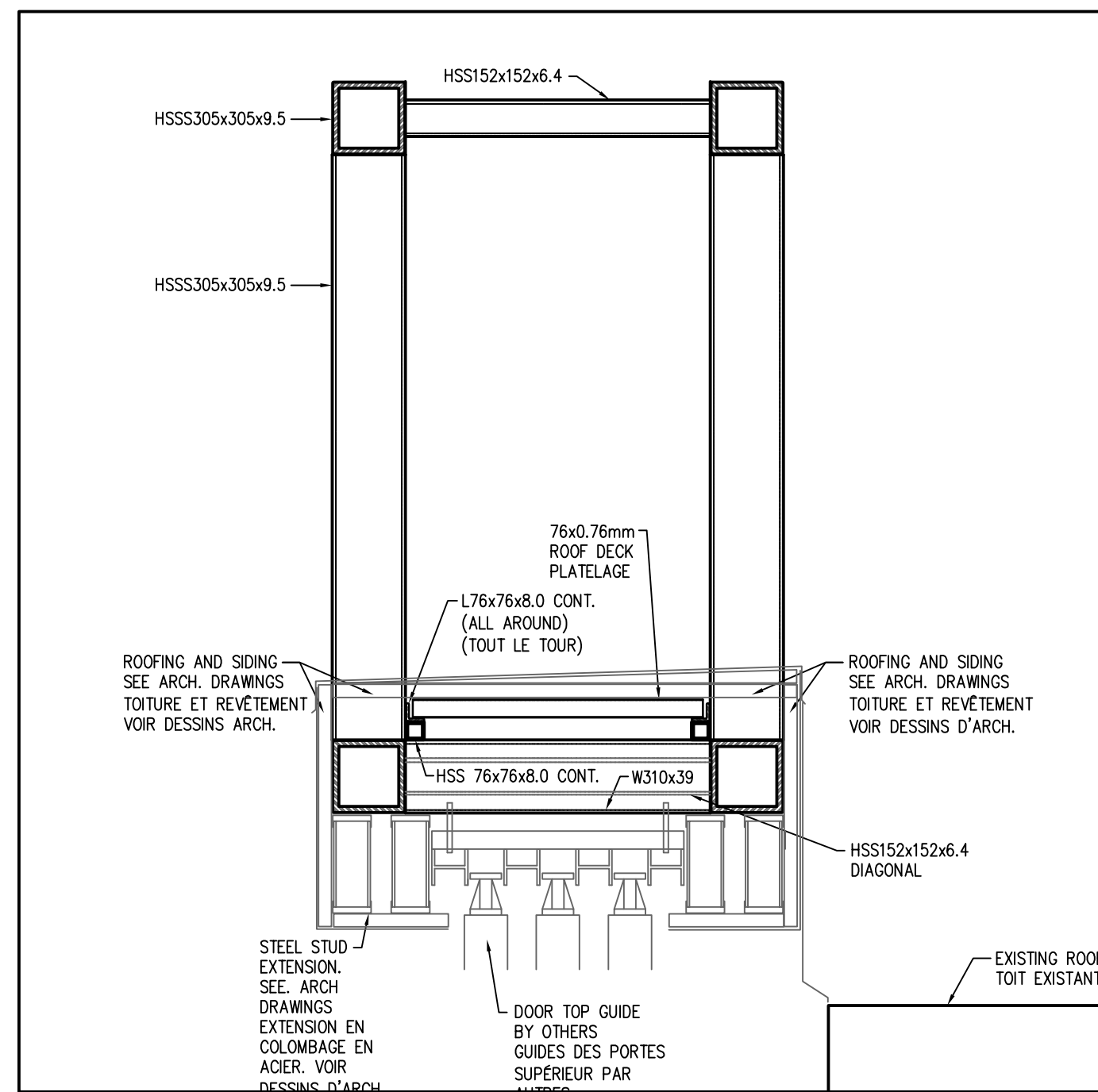
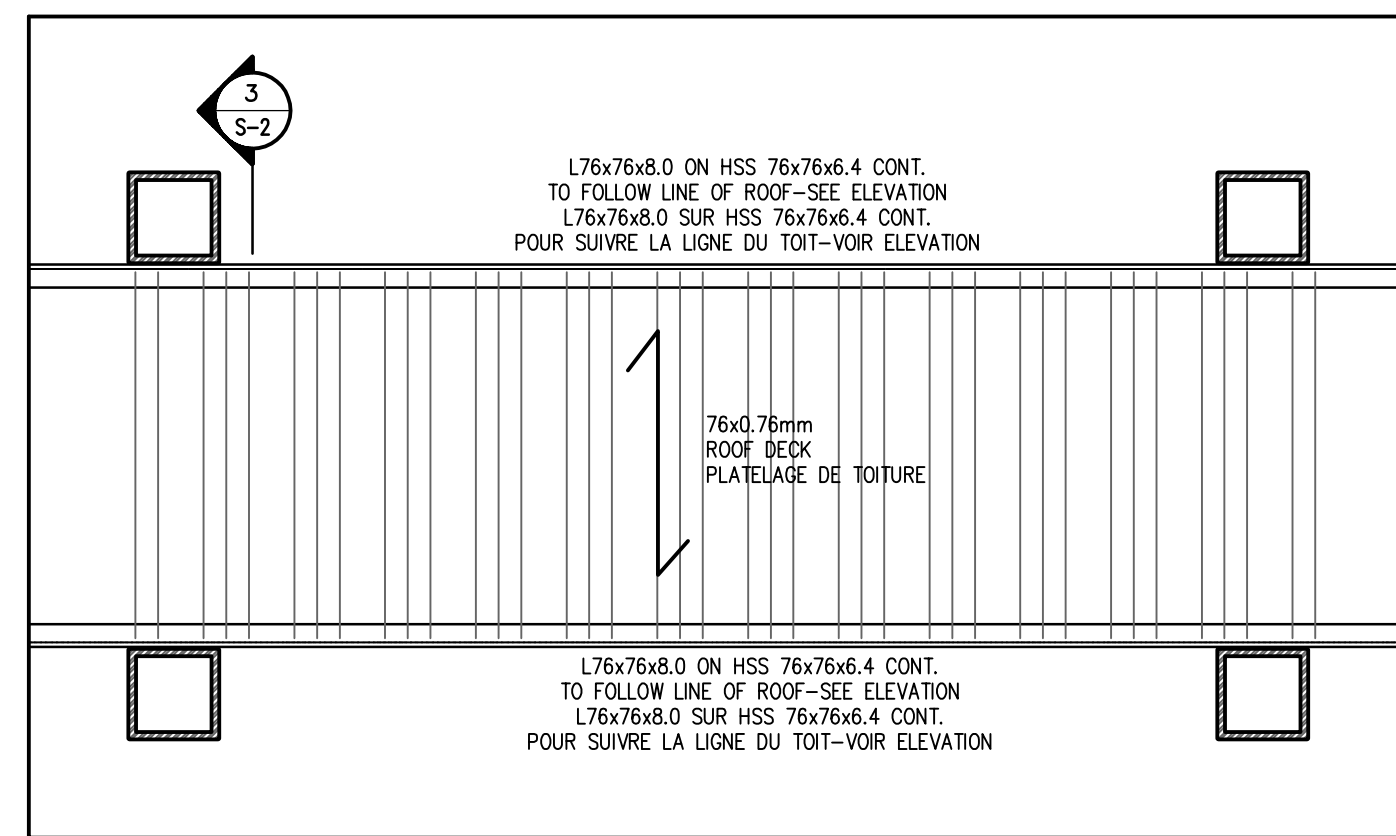
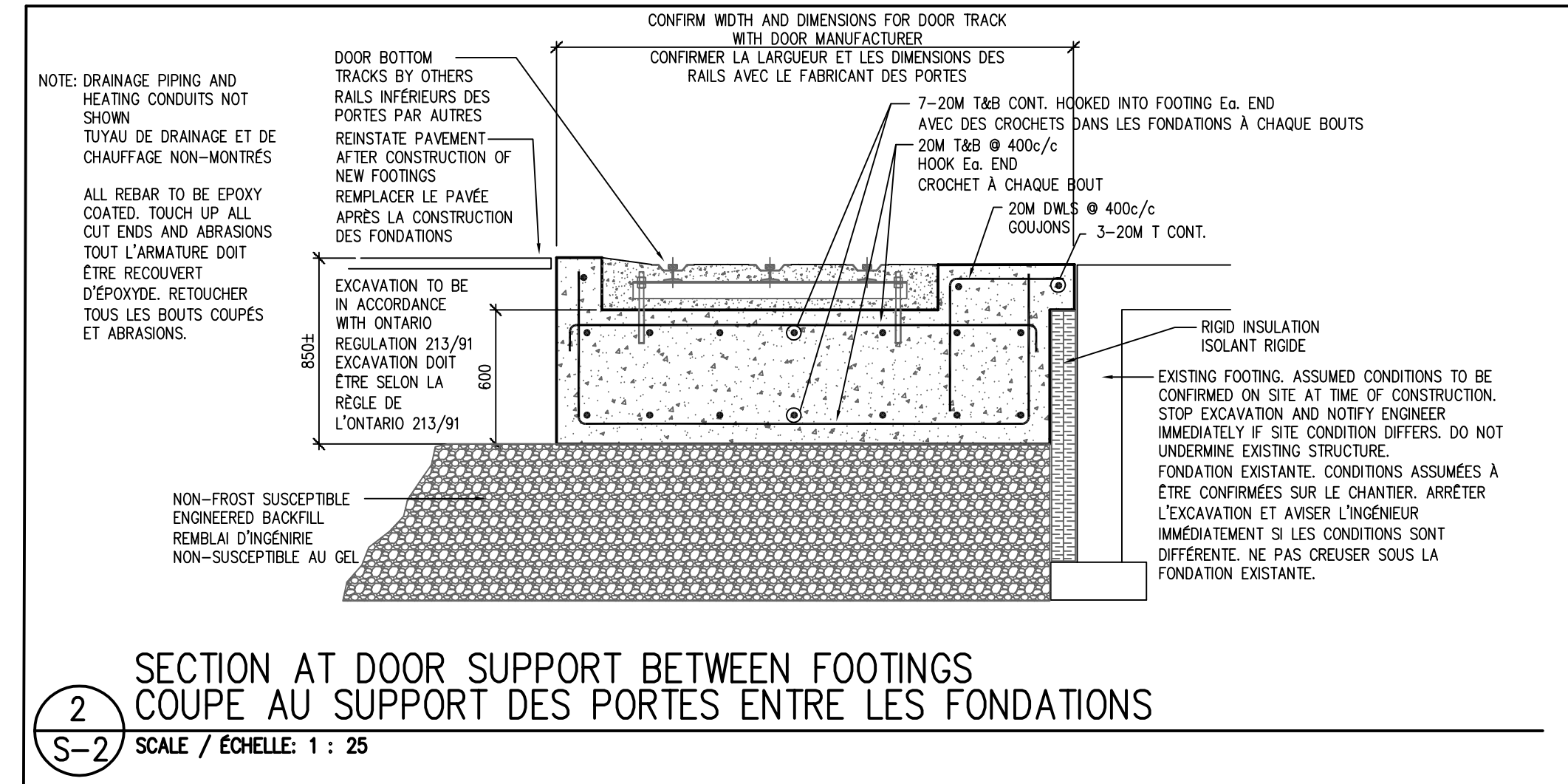
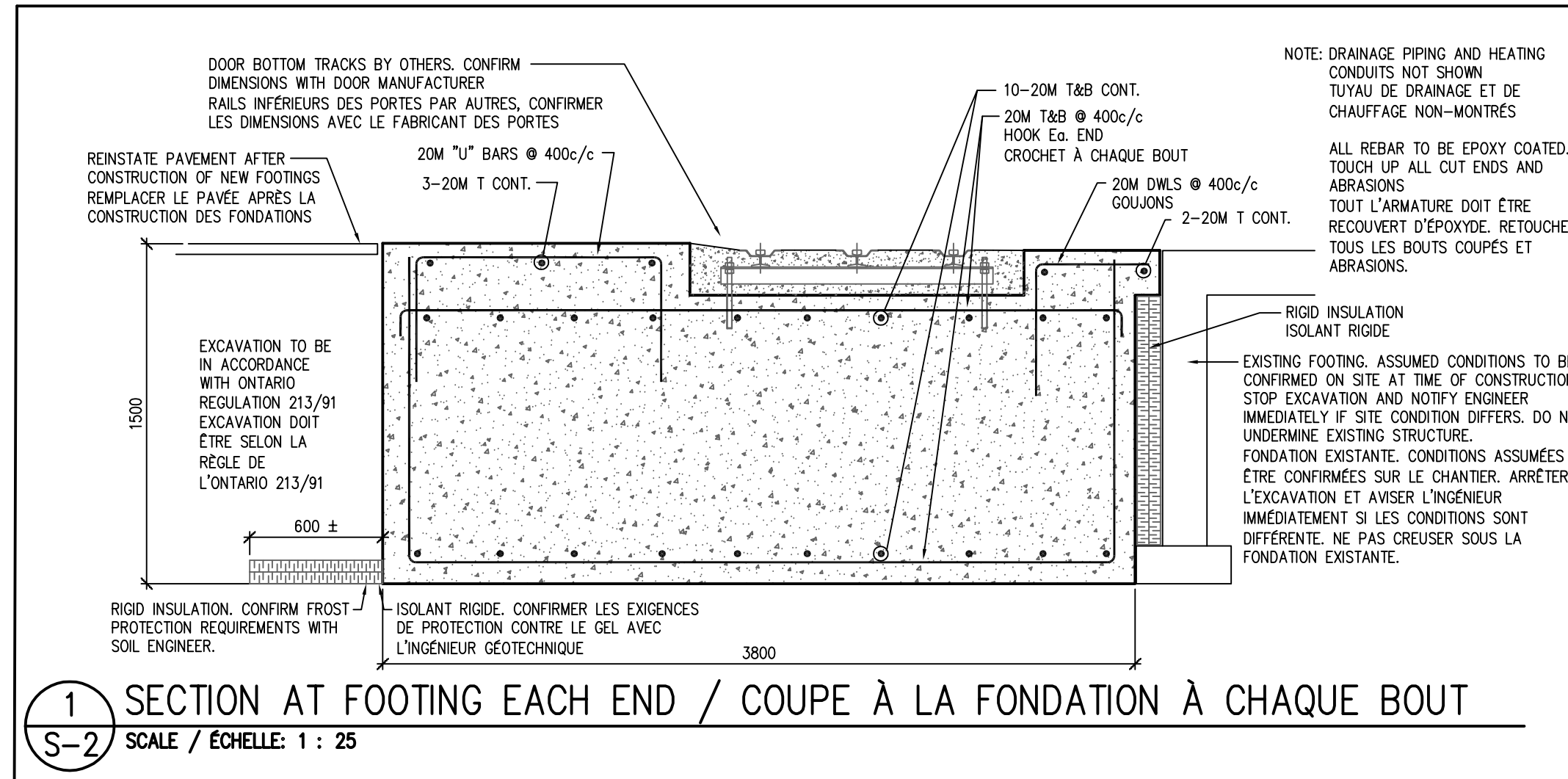
ONTARIO

ELEVATIONS AND PLANS / ÉLÉVATIONS ET PLANS

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|---------------------|-------------------------------|---------------|
| designed | M.L. | conçu |
| date | 08-03-2012 | |
| drawn | J.B. | dessiné |
| date | 08-03-2012 | |
| reviewed | | révisé |
| date | | |
| approved | | approuvé |
| date | | |
| tender | ANNA CHOW | soumission |
| PWC Project Manager | Administrateur de projets TPC | |
| project no. | PTS3447 | no. du projet |
| scale | Scale AS NOTED | échelle |
| drawing no. | S-1 OF 3 | no. du dessin |

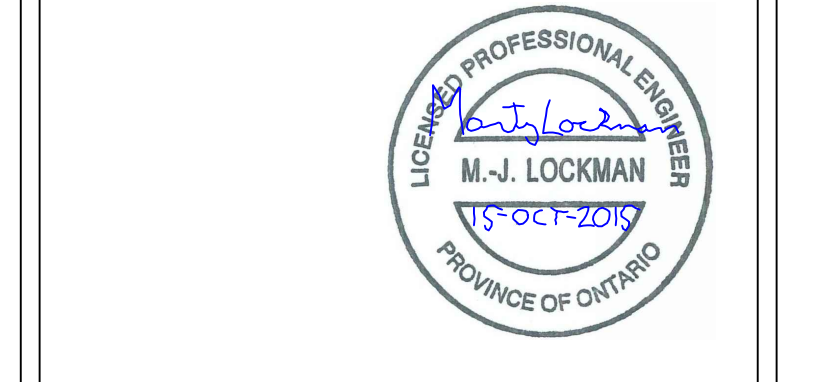
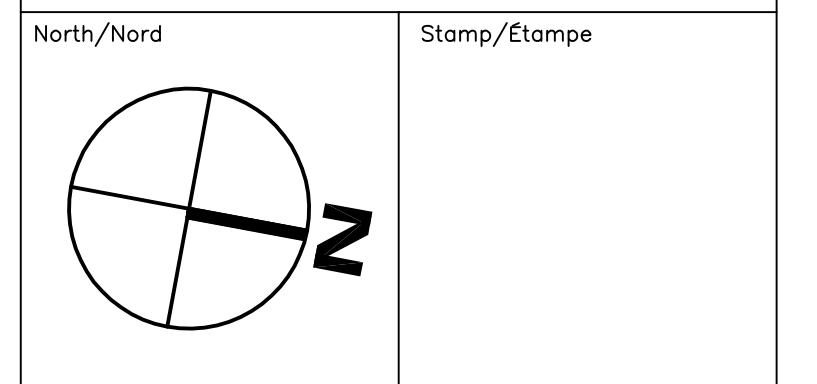


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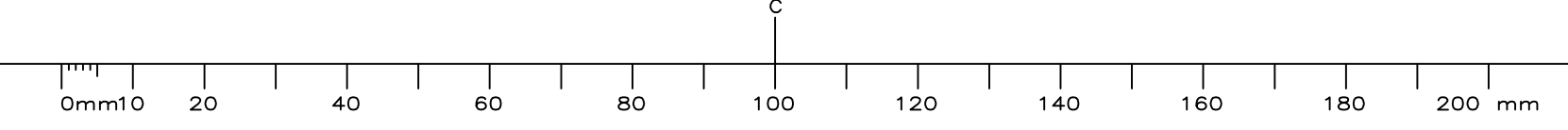
project HANGAR DOORS / PORTES DU HANGAR
project

drawing SECTIONS AND DETAILS / COUPES ET DÉTAILS
dessin

designed M.L. / conçu
date 08-03-2012
drawn J.B. / dessiné
date 08-03-2012
reviewed / révisé
date
approved / approuvé
date

tender ANNA CHOW / soumission
PWC Project Manager / Administrateur de projets TPC
project no. PTS3447 / no. du projet
scale Scale AS NOTED / echelle
drawing no. S-2 OF 3 / no. du dessin

Scale AS NOTED

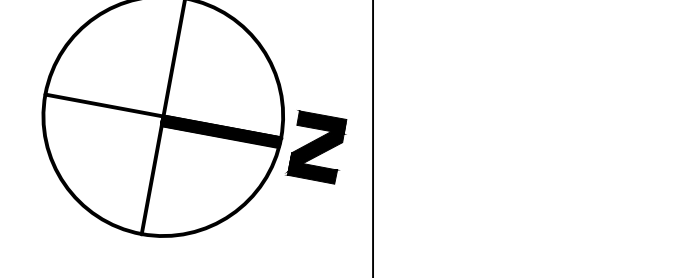


A. GENERAL NOTES

- 1. General
1.1. Check all dimensions on Structural Drawings with the Architectural Drawings. Report any inconsistencies before proceeding with the work. DO NOT scale these drawings.
1.2. All dimensions unless otherwise noted are in millimeters.
1.3. Independent Inspection and Testing: The Departmental Representative will appoint an independent inspection and testing agency. The cost of inspection shall be paid by the Departmental Representative. Work will be inspected as directed by the Departmental Representative to determine conformance to the drawings and specifications.
1.4. These drawings show the completed structure. The contractor is responsible for safety on the job site, and design, installation, and supervision of all temporary bracing, excavation shoring and supports.
1.5. The use of these drawings shall be strictly limited to the instructions in the revision block. Building from these drawings shall proceed only when 'ISSUED FOR CONSTRUCTION'.
1.6. The scope of the work depends on the site conditions. Notify the Departmental Representative where on-site conditions may require modifications to the contract documents.
1.7. Before all excavation, the contractor must verify the existence of Public Utility services and their elevations. The contractor is responsible for diverting or relocating of conduits, water, sewer or power lines which interfere with the execution of the works and obtaining the authorization of the proper organization.
1.8. Design and Construction to be in accordance with the Ontario Building Code 2012.
2. Excavation Shoring
2.1. Excavation shoring shall be based on the criteria recommended in the soils report and shall be to the approval of the municipality or any other governing authority. Where required, shoring contractor to obtain all necessary approvals for installation of tieback anchors outside the indicated property line. Establish the location and extent of underground utility lines where interference with excavation/shoring operations is possible.
2.2. Contractor to submit shop drawings showing details of design and method of installation and construction of temporary earth retaining systems and underpinning, including tiebacks and raker system. All drawings to be stamped by a Professional Engineer registered in the Province of Ontario.
2.3. Monitor at regular intervals, not exceeding 2 weeks, deformation of shoring against existing buildings, and submit reports to the departmental representative.
3. Foundations
3.1. Carry all footings down to undisturbed strata or specified engineered backfill capable of safely supporting the design bearing pressures noted, but not less than 1500mm below exterior finished grades. Provide insulation under and beyond footings in accordance with Geotechnical Engineer recommendations.
3.2. Bearing pressures to be verified in writing in the field by a Geotechnical Engineer registered in the Province of Ontario prior to placing concrete.
3.3. Protect footings, walls, slabs on grade and adjacent soil against freezing and frost action at all times during construction.
3.4. The line of slope between adjacent excavations for footings or trenches or along stepped footings shall not exceed a rise of 1 in a run of 1.0. Maximum step approximately 600mm.
3.5. Center footings and piers under centroid of columns unless otherwise noted.
3.6. Do not backfill against walls retaining earth until elements providing lateral support are completed. Place backfill simultaneously on both sides of other walls below grade.
4. Cast-in-Place Concrete
4.1. All concrete formwork and reinforcing steel work must be done in accordance with CSA A23.1-09 and A23.2-09.
4.2. Horizontal construction joints in concrete walls are not permitted except where shown on these drawings. Leave chases and pockets in walls for seating of slabs and beams.
4.3. Bars marked continuous shall be developed by Class B tension lap where spliced.
4.4. The minimum clear concrete cover for steel reinforcement, unless noted on drawings, shall conform to Clause 6.6.6., and Table 17 of CSA-A23.1-09/A23.2-09.
4.5. The contractor shall notify the Departmental Representative, not less than 24 hours before placing concrete, when the reinforcing steel and formwork are ready for inspection. Do not close forms until the reinforcement has been reviewed. The contractor must give notice to the Testing Laboratory to ensure the presence of their representative for each concrete pour.
4.6. Read reinforcing steel size as if M post script were included.
4.7. Submit 5 white prints of bar lists and placing diagrams to Departmental Representative to review prior to fabrication of reinforcing steel. Draw diagrams to a scale of not less than 1:50. Review of shop drawings is a precaution against oversight or error. It is not a detailed check and shall not be construed as relieving the Contractor of responsibility for making the work accurate and in conformity with the Contract Documents. Maintain a set of reviewed drawings on site.
4.8. Independent Inspection and Testing: The Departmental Representative will appoint an independent inspection and testing agency to undertake concrete strength tests. The cost of testing shall be paid by the Departmental Representative. Laboratory curing and testing of samples will be carried out in accordance with CSA A23.1-09/CSA A23.2-09 except that strength tests, including air entrainment and slump tests, will be required for each 50 m³, but not less than one test, for each class of concrete placed each day. Provide a group of three cylinders for each standard strength test. One specimen will be tested at 7 days and two at 28 days. Provide one additional field cured cylinder for testing at 7 days when concrete is placed under cold weather conditions. Results will be on the form conforming to CSA A23.2-09, Annex B, stating the location of concrete to which tests relate and with comments on abnormal results and conditions, and will be reported to the Departmental Representative with copies to the Structural Engineer, the Contractor and the Municipal Authorities.
5. Structural Steel
5.1. Structural Steel Shapes (are shown in the metric designation).
5.2. Erect steel in accordance with CSA S16-G-09 and CSA-S16-G-07.
5.3. Square out or full length weld all columns at baseplates and at top where beaming under continuous beams. Provide 6mm thick cap plates at all open ends of HSS members.
5.4. Provide 10mm plate stiffeners each side of beam where continuous over supports and on one side of beam at all bearing conditions, unless noted otherwise.
5.5. Do not splice material without the written approval of the Departmental Representative. Where granted 100% X-ray inspection will be mandatory and paid for by the contractor.
5.6. Touch up welds, connections and abrasions with paint matching the shop paint system.
5.7. Design connections to conform to CSA-S16-G-09 and the CISC Handbook of Steel Construction for a service capacity in kN equal to the beam depth in mm multiplied by 0.5, unless a greater reaction is noted on the drawings. Design all splices and connections of tension or compression members for their full capacity. Arrange and pay for nondestructive testing of all unspecified splices in columns, beams and connections. All connections and details shall be designed by a suitable qualified Registered Professional Engineer licensed to practice in the Province of Ontario, whose stamp and signature shall be on the shop drawings.
5.8. Submit 5 white prints of erection diagrams and shop fabrication details for review prior to fabrication. Review of shop drawings is a precaution against oversight or error. It is not a detailed check and shall not be construed as relieving the Contractor of responsibility for making the work accurate and in conformity with the Contract Documents. Maintain a set of reviewed drawings on site.
5.9. Independent Inspection and Testing: The Departmental Representative will appoint an independent inspection and testing agency, certified by the Canadian Welding Bureau to CSA W178.1-08. The cost of inspection shall be paid by the Departmental Representative. Work will be inspected in the shop and when erected to determine conformance to the drawings and specifications.
5.10. Provide mill tests, or other acceptable proof confirming that W-sections, and HSS sections are 350 W grade steel, prior to installation.
6. Steel Deck
6.1. Steel deck is designed to provide diaphragm action to resist lateral loads.
6.2. Weld steel deck to supports at all bearing points with 20mm diameter fusion welds in alternate flutes. Stagger welds along flanges of supporting members. Place one weld in each flute where side lap is made. Make end laps over supports not less than 50mm. Connect male and female laps by welding or mechanically interlocking at not more than 600mm centers unless noted otherwise on plans. Paint welds with zinc rich paint. Weld deck to perimeter angles with 20mm diameter fusion welds at 600mm on center unless noted otherwise on plans, where angles are parallel to the valleys in the deck. Decking nails are acceptable as a substitute for fusion welds.
6.3. Deck units to be continuous over three spans unless noted.
6.4. Provide angles to support edges of deck and provide closure strips as required for unsupported flute edges as detailed. Where deck flute is cut so that it does not bear on structural steel supports, provide additional steel deck edge support framing welded to main steel framing.
B. MATERIAL AND DESIGN DATA
1. All loads shown on drawings are unfactored service loads in kN and kPa unless otherwise noted.
2. Footing design bearing pressure: 100 kPa SLS and 150 kPa ULS. As per geotechnical investigation report dated September 26, 2012 by Paterson Group. Allowable soil bearing pressure and frost protection requirements shall be confirmed by a Soils Engineer prior to footing construction.
3. Concrete compressive strength at 28 days:
Location Strength (MPa) Coarse aggregate (mm) Slump (mm) Air Content (%) W/C Ratio
Footings/Fondations 25 20 20-50 4-7 0.55
4. Reinforcing steel: to CANCSA G30.1 B-M92, Grade 400. Wire fabric reinforcement: to ASTM A185-07
5. Structural steel: to CSA G40.20/G40.21-04 Welding: to CSA W59-03(R2008).
a) Rolled shapes and plates: Grade 300W, Grade 350W
b) Hollow structural sections: Grade 350W - Class C
c) Welding electrodes: E70XX (E480XX) A325 (A325M)
d) Fasteners: A325 (A325M) Grade 262W
e) Anchor bolts: Grade 262W
6. Roof deck: to C59B1-10M-08 Mechanical Deck Anchors: Decking nails.
7. Design Loads:
a) Gravity as shown on plans.
b) Ground snow load: 2.32 kPa
c) Wind Pressure: Le q.Ce.Cp.Cp = 1.35 kPa
d) Soil site class for seismic design: Class E, as per geotechnical investigation report dated September 6, 2010 by Fondex
e) The project has been designed to resist forces due to wind and earthquake as specified in the Ontario Building Code 2012.
C. CODES AND STANDARDS
1. Conform to requirements of the Ontario Building Code 2012 and The Occupational Health and Safety Act and Regulations for Construction Projects. (latest Edition)
2. Concrete Materials and Design: to CSA-A23.1-09 and CANCSA-A23.3-04 Respectively.
3. Falsework for Construction Purposes: to CSA S269.1-1975.
4. Concrete Formwork: to CANCSA S269.3 M92
5. Concrete Testing: to CANCSA-A23.2-09.
6. Concrete Construction: to CANCSA-A23.1-09.
7. Structural Steel Design, Fabrication and Erection: to CANCSA-S16-G-09.
8. Welding: to CSA Standards W59-03(R2008), CANCSA-S16-G-09, and W47.1-09.
9. Primer Paint: to CANCGSB-1.40-97.
10. Steel Deck: to CSA Standards CSA-S16-G-07, C59B1 10M-08 (Steel Roof Deck).
SEISMIC ASSESSMENT OF BUILDING MODIFICATIONS: MINOR ADDITIONS
1. Description of Work: New door structure constructed independently from existing structure, separated by an expansion joint. New door structure designed to resist forces due to earthquake as specified in the Ontario Building Code 2012.
Existing Building/Renovation/Addition Age: □ ≤ 5 Years ■ > 5 Years
Mass of Addition Plus any Previous Addition = N/A
Area of Addition Plus any Previous Addition = N/A
Mass of Original Building = N/A
Gross Area of Original Building = N/A
2. Analysis
a. Addition Mass ≥ 10% Original: □ Yes □ No ■ N/A
b.a. Addition Area ≥ 10% of Original (To a Max of 500 m²) or > 500 m²: □ Yes □ No ■ N/A
b.b. Addition Area ≥ 200 m² and Addition Mass > 10% of Original: □ Yes □ No ■ N/A
b.c. Addition Area ≥ 500 m² and Addition Mass > 2% of Original: □ Yes □ No ■ N/A
c. Addition Meets Requirements Noted Above (All Checks are No): □ Yes □ No
d. Existing Building is in Good Condition: □ Yes □ No
3. Confirmation
□ Building > 5 Years
The structural engineer confirms that in our professional opinion, the addition, alteration, and/or repair to the existing structure does not increase the seismic risk to the public and building occupants, that the structural adequacy of the existing building system is not adversely affected, and it complies with section 1.1.2.7. (Div.A) of the OBC 2012. The structural engineer also confirms that the new construction and its connections to the existing building system comply with Part 4 of OBC 2012.
□ Building < 5 Years
The structural engineer confirms that in our professional opinion, the addition, alteration, and/or repair to the existing structure does not increase the seismic risk to the public and building occupants, that the structural adequacy of the existing building system is not adversely affected, and it complies with section 1.1.2.7. (Div.A) of the OBC 2012. The structural engineer also confirms that the new construction and its connections to the existing building system comply with Part 4 of OBC 2012.
A. NOTES GÉNÉRALES
1. Généralités
1.1. Vérifier toutes les dimensions présentées sur les dessins de structure, en les comparant à celles des dessins d'architectures et aux conditions sur le chantier. Signaler toutes contradictions par écrit et ceci avant la mise en oeuvre des travaux. NE PAS mesurer directement sur les dessins.
1.2. Sauf indication contraire, toutes les dimensions sont présentées en millimètres.
1.3. Agences indépendantes d'inspection et d'essai: Le représentant du ministre aura aux services d'une agence indépendante d'inspection et d'essai, certifiée par le bureau canadien de la soudure selon la norme CSA W178-08. Le coût de ces essais sera absorbé par le propriétaire. Les travaux seront inspectés dans l'atelier et lors du montage pour s'assurer que les travaux sont conformes aux dessins et devis.
1.4. Ces dessins présentent les travaux d'ossature à l'état complété et terminé. L'entrepreneur doit assurer toutes les responsabilités de sécurité au chantier, ainsi que les responsabilités de conception, de montage et de surveillance de toutes les entretoises provisoires, étalements des excavations et supports requis ou nécessaires.
1.5. L'utilisation des présents dessins devra strictement se limiter aux instructions formulées dans le cartouche des révisions. Les travaux de construction à partir de ces dessins ne devront être exécutés que quand les dessins seront "PRÉSENTÉS AUX FINS DE CONSTRUCTION".
1.6. L'entrepreneur doit tenir compte que les travaux dépendent des conditions du chantier. Avoir le représentant du ministre des conditions de chantier qui peuvent nécessiter des modifications aux documents de contrat.
1.7. Avant toute excavation, l'entrepreneur doit vérifier l'existence de services utilitaires publics et leurs élévations. L'entrepreneur est responsable pour dévier ou déplacer les conduits ou lignes qui interfèrent avec exécution des travaux et d'obtenir les autorisations appropriées.
1.8. La conception et la construction doivent être conformes au Code du Bâtiment de l'Ontario 2012.
B. MATÉRIEL ET PARAMÈTRE DE CONCEPTION
1. Toutes les charges montrées sont des charges de service non-pondérées en kN et kPa, sauf indications contraires.
2. Pression admissible pour la conception des fondations: 100 kPa SLS et 150 kPa ULS. Selon le rapport d'investigation géotechnique daté le 26 septembre 2012 par Paterson Group. La pression du sol admissible et les exigences de protection contre le gel doivent être confirmées par un ingénieur géotechnicien avant la construction des fondations.
3. Résistance du béton à 28 jours:
Emplacement Résistance (MPa) Gros granulats (mm) Affaissement (mm) Teneur en air (%) Ratio eau-ciment
Semelles et Fondations 25 20 20-50 4-7 0.55
4. Acier d'armature: selon CANCSA G30.1 B-M92, Nuance 400. Renforcement en treillis soudé: selon ASTM A185-07
5. Acier structural: selon CSA G40.20/G40.21-04 Soudure: selon CSA W59-03(R2008).
a) Plaques et formes roulées: Nuance 300W, Nuance 350W
b) Sections HSS: Nuance 350W - Class C
c) Électrodes de soudure: E70XX (E480XX)
d) Boulons: A325 (A325M)
e) Boulons d'ancrage: Nuance 262W
6. Plâtrage en acier: selon C59B1-10M-08 Ancrage mécanique pour plâtrage: Clous à plâtrage.
7. Charges de conception:
a) Charges de gravité tel que montrées sur les plans.
b) Charge de neige: 2.32 kPa
c) Pression du vent: Le.q.Ce.Cp.Cp = 1.35 kPa
d) Classe du sol pour les charges de conception sismiques: Class E, selon le rapport d'investigation géotechnique daté le 6 septembre 2010 par Fondex
e) Ce projet a été conçu pour résister aux charges dues à vents et tremblements de terre tel que spécifié dans le code du bâtiment de l'Ontario 2012.
C. CODES ET NORMES
1. Se conformer aux exigences du code du bâtiment de l'Ontario 2012 et du Occupational Health and Safety Act and Regulations for Construction Projects. (édition la plus récente)
2. Matériau et conception du béton: selon CSA-A23.1-09 et CANCSA-A23.3-04 Respectivement.
3. Étalement temporaire pour construction: et CSA S269.1-1975.
4. Coffrage pour béton: selon CANCSA S269.3 M92
5. Essais du béton: selon CANCSA-A23.2-09.
6. Construction en acier: selon CANCSA-A23.1-09.
7. Conception, fabrication et montage de l'acier structural: selon CANCSA-S16-G-09.
8. Soudure: selon les normes CSA W59-03(R2008), CANCSA-S16-G-09, et W47.1-09.
9. Peinture couche primaire: selon CANCGSB-1.40-97.
10. Plâtrage en acier: selon la norme CSA CSA-S16-G-07 et C59B1 10M-08 (plâtrage de toiture en acier).
ÉVALUATION SEISMIQUE POUR LES MODIFICATIONS DU BÂTIMENT: ADDITIONS MINEURES
1. Description des travaux: Nouvelle structure de porte construite indépendamment de la structure existante, séparée par un joint d'expansion. La nouvelle structure de porte est conçue pour résister aux charges dues à vents et tremblements de terre tel que spécifié dans le code du bâtiment de l'Ontario 2012.
Âge du bâtiment existant/Renovation/Addition: □ ≤ 5 Ans ■ > 5 Ans
Masse de l'addition plus les additions précédentes = N/A
Surface de l'addition plus les additions précédentes = N/A
Masse du bâtiment original = N/A
Surface brute du bâtiment original = N/A
2. Analyses
a. Masse de l'addition ≥ 10% Original: □ Oui □ Non ■ N/A
b. Surface de l'addition ≥ 10% Original (Max de 500 m²) ou > 500 m²: □ Oui □ Non ■ N/A
b.b. Surface de l'addition ≥ 200 m² et masse de l'addition > 10% Original: □ Oui □ Non ■ N/A
b.c. Surface de l'addition ≥ 500 m² et masse de l'addition > 2% Original: □ Oui □ Non ■ N/A
c. L'addition rencontre des exigences notées ci-haut (Toutes les cases sont des Non): □ Yes □ No
d. Le bâtiment existant est en bon condition: □ Oui □ Non
3. Confirmation
□ Bâtiment > 5 Ans
L'ingénieur en structure confirme que dans son opinion professionnelle que l'addition, la modification, et/ou les réparations au bâtiment existant n'augmentent pas les risques sismiques aux publics et aux occupants du bâtiment, que la résistance de la structure n'est pas affectée négativement et est selon la section 1.1.2.7. (Div.A) du code du bâtiment de l'Ontario 2012. L'ingénieur en structure confirme également que la nouvelle construction des ces connecteurs au bâtiment sont selon la partie 4 du code du bâtiment de l'Ontario 2012.
□ Bâtiment < 5 Ans
L'ingénieur en structure confirme que dans son opinion professionnelle que l'addition, la modification, et/ou les réparations au bâtiment existant n'augmentent pas les risques sismiques aux publics et aux occupants du bâtiment, que la résistance de la structure n'est pas affectée négativement et est selon la section 1.1.2.7. (Div.A) du code du bâtiment de l'Ontario 2012. L'ingénieur en structure confirme également que la nouvelle construction des ces connecteurs au bâtiment sont selon la partie 4 du code du bâtiment de l'Ontario 2012.

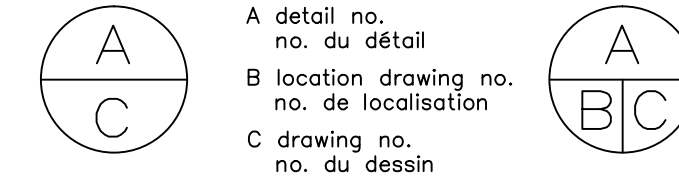


North/Nord Stamp/Étampe



KEY PLAN PLAN-REPÈRE

Revision table with columns for revision number, date, and status. Row 01: ISSUED FOR PERMIT - 99%, 15-10-15.



HANGAR DOORS PORTES DU HANGAR

ONTARIO

GENERAL REQUIREMENTS EXIGENCES GÉNÉRALES

Project information table with fields for designed, date, drawn, date, reviewed, date, approved, date, tender, project no., scale, drawing no. Values include ANNA CHOW, M.L., J.B., PTS3447, Scale AS NOTED, S-3 OF 3.

Scale AS NOTED

