

STRUCTURAL WORK

- 1. GENERAL
1.1 PROVIDE ALL MATERIAL AND LABOUR REQUIRED FOR THE COMPLETION OF THE WORK. BREAKDOWN OF WORK BY TRADE IS FOR GUIDANCE ONLY AND IS NOT NECESSARILY COMPLETE.
1.2 COORDINATE ALL WORK SHOWN ON THE STRUCTURAL DRAWINGS WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, ALL OTHER DISCIPLINES AND EXISTING CONDITIONS (EXISTING CONDITIONS ARE ASSUMED). REPORT ANY INCONSISTENCIES TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK.
1.3 DO NOT SCALE THESE DRAWINGS.
1.4 SEE ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS.
2. CODES AND STANDARDS
2.1 COMPLY WITH THE REQUIREMENTS OF THE 2006 ONTARIO BUILDING CODE IN FORCE AND THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
3. SUBMITTALS
3.1 SUBMIT FOR REVIEW BEFORE START OF WORK, 4 COPIES OF SHOP DRAWINGS FOR:
- CONCRETE REINFORCING (INCLUDING PLACING DIAGRAMS AND BAR LISTS)
- STRUCTURAL STEEL
- TEMPORARY SHORING
3.2 SUBMIT CONCRETE MIX DESIGNS BEFORE START OF WORK.
3.3 SHOP DRAWINGS FOR: STRUCTURAL STEEL AND TEMPORARY SHORING SHALL TO BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN ONTARIO.
3.4 REVIEW OF SHOP DRAWINGS IS ONLY FOR GENERAL CONFORMITY WITH STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS. COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS. NOR DO THEY AUTHORIZE ANY CHANGES TO THE CONTRACT. REVIEW OF A SPECIFIC ITEM SHALL NOT INCLUDE REVIEW OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. THE CONTRACTOR'S RESPONSIBILITIES INCLUDE ALL QUANTITIES, DETAIL DIMENSIONS, FIELD MEASUREMENTS, FABRICATION PROCESS, MEANS, METHODS, SEQUENCES AND PROCEDURES OF CONSTRUCTION. COORDINATION OF WORK WITH ALL TRADES AND PERFORMING ALL WORK IS A SAFE AND SATISFACTORY MANNER. THE REVIEW OF SHOP DRAWINGS DOES NOT IMPLY ANY CHANGE IN ANY OTHER CONSULTANTS' OR PROFESSIONALS' RESPONSIBILITIES RELATED TO DESIGN OF SPECIFIC ITEMS AS OUTLINED BY THE SPECIFICATIONS (SUCH AS STRUCTURAL STEEL CONNECTIONS, STEEL JOISTS, PRECAST ELEMENTS, ETC.).
3.5 AFTER REVIEW, ERECTION DIAGRAMS WILL BE RETURNED TO THE CONTRACTOR STAMPED TO SHOW ONE OF THE FOLLOWING:
NOT REVIEWED - SHOWS WORK WHICH IS NOT WITHIN THE SCOPE OF STRUCTURAL CONSULTING
REVIEWED - REVIEWED WITH NO COMMENTS.
NOTED - REVIEWED WITH COMMENTS NOTED ON DRAWING. SUBMIT TWO FINAL RECORD PRINTS AS SOON AS CORRECTIONS ARE MADE.
RESUBMIT - REVIEWED WITH COMMENTS NOTED ON DRAWING. CORRECT AND RESUBMIT FOR REVIEW.
CONFORM TO THE REQUIREMENTS OF EACH AUTHORITY THAT HAS REVIEWED THE DRAWINGS.
3.6 ALLOW A MINIMUM OF 5 WORKING DAYS FOR REVIEW OF EACH SUBMISSION OF SHOP DRAWINGS IN THE STRUCTURAL ENGINEER'S OFFICE. ALLOW MORE TIME WHEN LARGE QUANTITIES OF SHOP DRAWINGS ARE SUBMITTED. SUBMIT IN GENERAL CONFORMITY WITH THE SEQUENCE OF CONSTRUCTION INTENDED. COORDINATE WITH THE CONSULTANT. SHOP DRAWINGS RECEIVED AFTER NOON WILL BE DATE-STAMPED AS RECEIVED THE FOLLOWING WORKING DAY.
3.7 PROVIDE FINAL RECORD DRAWINGS AFTER ALL CORRECTIONS ARE MADE.

FOUNDATIONS

- 4.1 FOUNDATION DESIGN IS BASED UPON A GEOTECHNICAL REPORT PREPARED FOR THE PROJECT BY PETO MACCALLUM LTD., REPORT NO. 15BF035, DATED SEPTEMBER, 2015.
4.2 SET FOUNDATIONS ON UNDISTURBED SOIL, CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 150 kPa AT ULS AND 100 kPa AT SLS.
4.3 PRIOR TO PLACING FOOTINGS, BEARING CAPACITY OF EACH FOOTING MUST BE CONFIRMED IN WRITTEN REPORTS BY A GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR. GEOTECHNICAL ENGINEER TO CARRY LIABILITY INSURANCE TO MINIMUM REQUIRED BY PEO. SUBMIT EACH REPORT IMMEDIATELY TO CONSULTANT.
4.4 PROTECT FOOTINGS, WALLS, SLABS ON GRADE AND ADJACENT SOIL AGAINST FREEZING AND FROST ACTION AT ALL TIMES DURING CONSTRUCTION.
4.5 THE LINE OF SLOPE BETWEEN ADJACENT EXCAVATIONS FOR FOOTINGS OR TRENCHES SHALL NOT EXCEED A RISE OF 7 IN A RUN OF 10.
4.6 BACKFILL SIMULTANEOUSLY ON BOTH SIDES OF OTHER WALLS BELOW GRADE.
4.7 DO NOT PLACE CONCRETE IN WATER OR ON FROZEN SOIL.

CONCRETE

- 5.1 CONFORM TO CSA A23.1 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION".
5.2 INTERIOR APPLICATIONS:
- CLASS OF EXPOSURE: N
- CEMENT: TYPE GU
- MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 25MPA
- MAXIMUM WATER/CEMENTING MATERIAL RATIO: 0.45
- NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE: 20MM
- SLUMP AT TIME AND POINT OF DISCHARGE: 50MM TO 110MM
5.3 FOUNDATIONS:
- CLASS OF EXPOSURE: F-2
- CEMENT: TYPE GU
- MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 25 MPa
- MAXIMUM WATER/CEMENTING MATERIAL RATIO: 0.55
- NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE: 20MM.
- SLUMP AT TIME AND POINT OF DISCHARGE: 50MM TO 110MM.
- AIR CONTENT: 5 TO 7%
5.4 EXTERIOR APPLICATIONS:
- CLASS OF EXPOSURE: C-1
- CEMENT: TYPE GU
- MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 35 MPa
- MAXIMUM WATER/CEMENTING MATERIAL RATIO: 0.40
- NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE: 20MM.
- SLUMP AT TIME AND POINT OF DISCHARGE: 50MM TO 110MM.
- AIR CONTENT: 5 TO 8%
5.5 DRILLED CONCRETE ANCHORS (DCA) TO BE HLTI KWIK BOLTS OR EQUIVALENT. LOCATE REBAR AND OTHER EMBEDMENTS IN CONCRETE FIRST AND ADJUST LOCATIONS OF ANCHORS AS INSTRUCTED BY ENGINEER IF THERE IS A CONFLICT. DO NOT CUT REBAR
5.6 USE NEW EXTERIOR PLYWOOD CONFORMING TO CAN/CSA O121 FOR FORMWORK, EXCEPT FOR ROUGH CONCRETE IN AN UNEXPOSED LOCATION, SUCH AS FOUNDATIONS WHERE USED MATERIAL IS ACCEPTABLE. USE INTERNAL FORM TIES OF ADJUSTABLE METAL DESIGNED TO ACT AS SPREADERS, AND, WHICH WHEN REMOVED, WILL LEAVE NO METAL CLOSER THAN 25 MM (1") TO CONCRETE SURFACE.
5.7 REINFORCEMENT: USE NEW DEFORMED BAR REINFORCEMENT CONFORMING TO CAN/CSA C30.18 GRADE 400R OR 400W.
5.8 EPOXY-COATED BARS SHALL CONFORM TO ASTM D3963.
5.9 ACCESSORIES, BAR SUPPORTS, AND TIES TO CONFORM TO RISC MANUAL OF STANDARD PRACTICE. PROVIDE EPOXY-COATED CHAIR-BARS AND BOLSTERS AND PLASTIC-COATED TIE WIRES FOR EPOXY-COATED REINFORCING.
5.10 WHERE CONCRETE IS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, THE MINIMUM CONCRETE COVER TO REINFORCING BARS CLOSEST TO THE CONCRETE SURFACE SHALL BE 75 MM.
5.11 FOR CLASS N CONCRETE, THE MINIMUM CONCRETE COVER TO REINFORCING BARS CLOSEST TO THE CONCRETE SURFACE SHALL BE 30 mm FOR BEAMS AND COLUMNS, AND 20 mm FOR SLABS AND WALLS. FOR CLASS F-1 AND F-2 CONCRETE, THE MINIMUM COVER SHALL BE 40 MM.
5.12 FOR CLASS C-1 CONCRETE, THE MINIMUM COVER SHALL BE 60 MM.

- 5.13 INCREASE COVER WHERE REQUIRED TO MAINTAIN MINIMUM RATIO OF COVER TO NOMINAL BAR DIAMETER OF 1 FOR CLASS N, 1.5 FOR CLASSES FA AND F2, AND 2 FOR CLASSES C1 AND C3.
5.14 HEAT CONCRETE AND DELIVER AT A TEMPERATURE BETWEEN +15°C AND +27°C, WHENEVER OUTDOOR TEMPERATURE IS LESS THAN +5°C.
5.15 CONVEY CONCRETE FROM TRUCK TO FINAL LOCATION BY METHODS WHICH WILL PREVENT SEPARATION OR LOSS OF MATERIAL. MAXIMUM FREE FALL 1.5M (5'-0"). CONSOLIDATE CONCRETE WITH ELECTRICAL VIBRATORS.
5.16 POWER STEEL TROWEL FINISH EXPOSED FLOORS AND FLOORS WHICH RECEIVE RESILIENT FLOORING OR CARPET. WOOD FLOAT AND BROOM FINISH EXTERIOR SLABS. FLOAT FINISH OTHER SLABS.
5.17 CURE CONCRETE SURFACES NOT IN CONTACT WITH FORMS BY THE APPLICATION OF A CURING-SEALING COMPOUND CONFORMING TO ASTM C309-97, IMMEDIATELY AFTER DISAPPEARANCE OF SURFACE WATER SHEEN.
5.18 COLD WEATHER: PROTECT CONCRETE ACCORDING TO CSA-A23.1.
5.19 ARCHITECTURAL CONCRETE: EXPOSED EXTERIOR CONCRETE SHALL MATCH APPEARANCE OF NEARBY EXISTING EXPOSED ARCHITECTURAL CONCRETE.
5.20 PREMIXED GROUT: MINIMUM STRENGTH 40 MPA AT 28 DAYS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
5.21 ENSURE THAT SLEEVES AND OPENINGS DO NOT IMPAIR THE REQUIRED STRENGTH OF THE MEMBER, AND UNLESS SHOWN ON THE STRUCTURAL DRAWINGS, ARE ACCEPTED BY THE CONSULTANT FOR SIZE, LOCATION, AND REINFORCEMENT BEFORE CONCRETE IS CAST. NO TRADE SHALL CUT HOLES THROUGH EXISTING CONCRETE UNLESS ACCEPTABLE TO THE CONSULTANT.

STRUCTURAL STEEL

- 6.1 CONFORM TO CAN/CSA S16 "LIMIT STATES DESIGN OF STEEL STRUCTURES".
6.2 FABRICATOR SHALL BE CERTIFIED BY CANADIAN WELDING BUREAU UNDER REQUIREMENTS OF CSA W47.1, DIVISION 1 GR 2.
6.3 PROTECT COMBUSTIBLE MATERIALS AND FINISHES DURING WELDING OPERATIONS.
6.4 MATERIALS:
- WIDE FLANGE SECTIONS: CAN/CSA G40.21, GRADE 350W
- CHANNEL, ANGLES AND PLATES: CAN/CSA G40.21, GRADE 300W
- HOLLOW STRUCTURAL SECTIONS: ASTM A500, GRADE C (345 MPA FOR SQUARE / RECTANGULAR AND 317 MPA FOR ROUND), OR CAN/CSA G40.21, GR. 350W, CLASS C. WHEN GALVANIZING IS REQUIRED HSS MEMBERS SHALL BE CLASS H ONLY OR STRESS RELIEF PRIOR TO GALVANIZING.
- HIGH STRENGTH BOLTS: ASTM A325M
- ANCHOR BOLTS: CAN/CSA G40.21, GRADE 300W
- FABRICATION: CAN/CSA S16
- WELDING: CSA W59
- PRIMER PAINT: CISC/CPMA 2.75
- ZINC RICH PRIMER: CGSB 1 GP 171M
- GALVANIZING: CAN/CSA G164
- DRILLED ANCHORS: SEE DRAWINGS
- HEADED STUDS: ASTM A108, GRADES 1010 THROUGH 1020, FY = 345 MPA (50 KSI), LENGTHS OF STUDS GIVEN ON DRAWINGS ARE THE LENGTHS AFTER WELDING.
6.5 ALL STRUCTURAL STEEL CONNECTIONS MUST BE DESIGNED BY A PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR TO CONFORM TO CAN/CSA S16 01. USE HEADER ANGLES AND HIGH STRENGTH BOLTS. Design beam connections for AN END REACTION DUE TO THE UNIFORMLY DISTRIBUTED LOAD CAPACITY OF THE MEMBER UNLESS A GREATER REACTION IS NOTED ON THE DRAWINGS.
6.6 DO NOT SPlice SECTIONS WITHOUT THE PRIOR ACCEPTANCE OF THE CONSULTANT AND THE SUBMISSION OF PERTINENT SHOP DRAWINGS. ACCEPTED SPLICES WILL BE REQUIRED TO DEVELOP THE SECTION. EACH SPLICE SHALL BE GIVEN A NON DESTRUCTIVE TEST BY AN INDEPENDENT INSPECTION COMPANY ACCEPTABLE TO THE CONSULTANT. TESTING SHALL BE AT THE CONTRACTOR'S EXPENSE. EVALUATE RESULTS IN ACCORDANCE WITH CSA W59 AND REPORT TO THE CONSULTANT.
6.7 APPLY PRIMER PAINT TO ALL STEELWORK, EXCEPT WHERE ZINC RICH PAINT IS CALLED FOR ON THE DRAWINGS. TOUCH UP PAINT AFTER ERECTION. SURFACES RECEIVING ZINC RICH PAINT SHALL FIRST RECEIVE COMMERCIAL BLAST CLEANING.
6.8 ALL STEEL LOCATED OUTSIDE THE VAPOUR BARRIER TO BE HOT DIPPED GALVANIZED TO CAN/CSA G164. FOR ALL OTHER STEEL, CLEAN STEEL TO SSPC SP1 AND APPLY ONE COAT OF SHOP PAINT CISC/CPMA 1-73a.
6.9 WELD OR BOLT TOGETHER MULTIPLE ANGLE LINTELS. PROVIDE A MINIMUM OF 150MM BEARING.
6.10 PROVIDE ALL ERECTION BRACING REQUIRED TO KEEP THE STRUCTURE STABLE AND IN ALIGNMENT DURING CONSTRUCTION.

ARCHITECTURALLY EXPOSED STRUCTURAL STEEL

- 7.1 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL CONSISTS OF CANOPY BEAM AND COLUMN.
7.2 AS-FABRICATED STRAIGHTNESS TOLERANCES FOR MEMBERS TO BE ONE-HALF OF THE STANDARD CAMBER AND SWEEP TOLERANCES.
7.3 MAKE ALL COPIES, MITRES AND CUTS IN SURFACES THAT ARE EXPOSED TO VIEW WITH UNIFORM GAP OF 3 MM IF SHOWN AS OPEN JOINTS OR IN REASONABLE CONTACT IF SHOWN WITHOUT GAPS.
7.4 REMOVE ALL IMPERFECTIONS WHICH ARE UNSIGHTLY. REMOVE MILL AND SHOP MARKS INCLUDING MANUFACTURER'S IDENTIFICATION MARKS. REMOVE ALL TEMPORARY ATTACHMENTS AND GRIND SMOOTH. FILL TEMPORARY HOLES WITH WELD METAL AND GRIND SMOOTH AND FLUSH.
7.5 PROVIDE CONTINUOUS WELDING AT EXPOSED JOINTS WITHOUT GAPS OR FILL BETWEEN DISCONTINUOUS WELDS WITH AN EPOXY RESIN FILLER, ACCEPTABLE TO THE CONSULTANT, FINISHED TO THE SAME PROFILE AS THE ADJACENT WELD. JOINTS SHALL BE WEATHER TIGHT AND SUITABLE FOR PAINTING.
7.6 EXPOSED WELDS SHALL BE SMOOTH. GRIND FLUSH ALL GROOVE AND PLUG WELDS.
7.7 CONCEAL CONNECTION BOLTS WHERE POSSIBLE. ORIENTATE BOLTS IN EXPOSED BOLTED CONNECTIONS SO THAT BOLT HEADS ARE ALL ON THE MORE VISUALLY IMPORTANT SIDE OF THE CONNECTION.
7.8 ORIENT SEAMS IN HOLLOW STRUCTURAL SECTIONS AWAY FROM THE MORE VISUALLY IMPORTANT SIDES OF THE MEMBERS.
7.9 ERECTION TOLERANCES SHALL BE ONE-HALF THOSE NORMALLY PERMITTED. DESIGN CONNECTIONS TO NON-EXPOSED STEEL TO ALLOW FOR ADJUSTMENT DURING ERECTION.

STEEL DECK

- 8.1 DECK: ASTM A653/A653M, GRADE 230, WIPED COATING ZF75
8.2 ZINC RICH PAINT: CGSB 1 GP 171M
8.3 DESIGN AND FABRICATE TO CSA S136 01. DESIGN LOADS ARE GIVEN ON THE DRAWINGS. LIMIT LIVE LOAD DEFLECTION TO 1/360TH OF SPAN.
8.4 COMPOSITE DECK SHALL HAVE EMBOSSEMENTS, WHICH ENSURE COMPOSITE ACTION OF STEEL AND CONCRETE. SUBMIT SUBSTANTIATING DATA IF REQUESTED.
8.5 MAKE DECK SECTIONS CONTINUOUS OVER 3 SPANS. PROVIDE INTER LOCKING SIDE LAP CONNECTIONS AT 600 MM (24") CENTRES MAXIMUM. WELD DECK TO SUPPORTS TO ALL BEARING POINTS WITH 20 MM (3/4") DIAMETER FUSION WELDS IN ALTERNATE FLUTES. DO NOT DAMAGE SUPPORTING MEMBERS.
8.6 CUT OPENINGS REQUIRED THROUGH DECK BY OTHER TRADES. REINFORCE OPENINGS 150 MM TO 300 MM (6" TO 12") WIDE WITH 51x51x4.8 (2"x2"x 3/16") ANGLE, TACK WELD UNDER FLUTES AT EACH END OF OPENING, FRAME OTHER OPENINGS.
8.7 PROVIDE ALL REQUIRED EDGE STIFFENERS, CLOSURES, REINFORCEMENT STEEL PLATES AND FLASHING.
8.8 PROVIDE REQUIRED FLASHING.
8.9 AFTER ERECTION TOUCH UP PAINT WITH ZINC RICH PAINT WHEREVER PROTECTIVE COATING HAS BEEN DAMAGED.

INSPECTION AND TESTING

- 9.1 THE CONTRACTOR MUST PROVIDE INSPECTION REPORTS FOR STRUCTURAL STEEL, MASONRY STRENGTH TESTS AND TEST REPORTS FOR CONCRETE. ALL REPORTS MUST BE PREPARED BY AN INDEPENDENT INSPECTION AND TESTING AGENCY.
9.2 MAKE ONE STANDARD TEST FOR EACH 50 CUBIC METRES OF CONCRETE BUT NOT LESS THAN ONE TEST FOR CONCRETE PLACED EACH DAY. PROVIDE A GROUP OF THREE CONCRETE CYLINDERS FOR EACH STANDARD CONCRETE TEST. BREAK ONE CYLINDER AT 7 DAYS.
9.3 AT LEAST 6 MORTAR CUBES ARE TO BE TESTED FOR EACH 500 SQUARE METRES OF WALL, OR PORTION THEREOF. AT LEAST 2 CYLINDER TESTS SHALL BE MADE FOR EACH 20 CUBIC METRES OF GROUT OR LESS. TEST METHODS AND RESULTS SHALL CONFORM TO CSA A179.

CONSTRUCTION REVIEW

- 10.1 NOTIFY THE CONSULTANT 48H PRIOR TO CONCRETE POURS, BACKFILLING, AND COVERING UP THE STRUCTURE WITH FINISHES.

TEMPORARY BRACING AND SHORING

- 11.1 MAKE ADEQUATE PROVISIONS FOR ALL LOADS ACTING ON THE STRUCTURE DURING ERECTION. PROVIDE TEMPORARY SHORING AND BRACING TO KEEP THE STRUCTURE PLUMB AND IN TRUE ALIGNMENT DURING CONSTRUCTION. MEMBERS SHOWN ON THE PLANS ARE THOSE REQUIRED FOR THE COMPLETED STRUCTURE AND MAY NOT BE SUFFICIENT DURING CONSTRUCTION.
11.2 TEMPORARY BRACING AND SHORING ARE THE RESPONSIBILITY OF THE CONTRACTOR. ALL SHORING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR. PREPARE SHORING DRAWINGS SIGNED AND SEALED BY THE ENGINEER.

REJECTED WORK

- 12.1 DO NOT DELIVER TO THE SITE MATERIALS, WHICH ARE KNOWN NOT TO MEET THE REQUIREMENTS OF THE SPECIFICATIONS. IF REJECTED AFTER DELIVERY, REMOVE IMMEDIATELY FROM SITE.

DESIGN LOADS

- 1. THE VALUES FOR CLIMATIC DATA USED IN THE DETERMINATION OF DESIGN LOADS HAVE BEEN OBTAINED FROM THE 2010 NBC FOR THE SPECIFIC LOCATION OF BORDEN, ON (NEAR EGBERT, ON).
2. SELF WEIGHT (SWT) IS DUE TO THE WEIGHT OF THE STRUCTURE ITSELF. IT VARIES WITH THE STRUCTURAL SYSTEM, AND INCLUDES CONCRETE TOPPING ON STEEL DECK.
3. SUPERIMPOSED DEAD LOADS (SDL) ARE NON-STRUCTURAL DEAD LOADS DUE TO NON-STRUCTURAL TOPPING, FINISHES, PARTITIONS, ROOFING MATERIALS, SUSPENDED EQUIPMENT, PAVERS, SOIL, ETC.
4. DEAD LOAD (DL) IS THE SELF WEIGHT OF THE STRUCTURE PLUS THE SUPERIMPOSED DEAD LOAD.
5. GRAVITY LOADS ARE SHOWN ON PLANS. LIVE LOAD REDUCTION HAS NOT BEEN USED.
6. NET FACTORED UPLIFT LOADS ON ROOFS ARE SHOWN ON PLANS.
7. UNLESS OTHERWISE NOTED, DESIGN LOADS SHOWN ARE SPECIFIED (UNFACTORED) LOADS. TO BE USED FOR ULS DESIGN.
8. FOR POINT LOADS, IF ONLY ONE LOAD IS GIVEN, CONSIDER IT LIVE LOAD.
9. SNOW
Ss = 2.2 kPa Sr = 0.4 kPa Is (ULS) = 1.0 Is (SLS) = 0.9
MINIMUM UNFACTORED SNOW LOAD = 2.5 kPa x Is
24 HOUR RAINFALL = 103 mm
10. LATERAL LOADS IN THIS STRUCTURE ARE RESISTED BY COLD FORMED STEEL FLAT STRAP BRACING DESIGNED BY OTHERS, AND ARE DETERMINED BASED ON THE WIND AND SEISMIC DATA BELOW.
11. WIND
q50 = 0.36 kPa Iw (ULS) = 1.0 Iw (SLS) = 0.75
BUILDING IS: LOW RISE
TERRAIN TYPE: OPEN
Dwg. DWL
Ce = 0.96
INTERNAL PRESSURE CATEGORY: 2
FACTORED BASE SHEARS & OVERTURNING MOMENTS:
V(NS) = 30 kN M(NS) = 100 kN.m
V(W) = 65 kN M(W) = 750 kN.m
13. SEISMIC
Ss(0.2) = 0.140 PGA = 0.045 IeFaSa(0.2) = 0.182
Ss(0.5) = 0.100 Rsd = 1.2
Sa(1.0) = 0.063 Rro = 1.3 SITE CLASSIFICATION = D
Sa(2.0) = 0.020 Ie = 1.0
SEISMIC FORCE RESISTING SYSTEM (SFRS): DIAGONAL STRAP CONCENTRICALLY BRACED COLD FORMED STEEL WALLS (CONVENTIONAL CONSTRUCTION) BY OTHERS
Fa = 1.3 Fv = 1.4

- DESIGN SPECTRAL RESPONSE ACCELERATION VALUES
S(0.2) = 0.182
S(0.5) = 0.140
S(1.0) = 0.088
S(2.0) = 0.028
S(4.0) = 0.014
FUNDAMENTAL PERIOD DATA
EMPIRICAL FORMULA (OBC CLAUSE 4.1.8.1(3))Tn = 0.17 sec
DESIGN PERIOD
Ta(NS) = 0.17 sec
Ta(W) = 0.17 sec
DESIGN SPECTRAL RESPONSE ACCELERATION AT FUNDAMENTAL PERIOD
S(Ta)NS = 0.182
M(NS) = 1.0J(NS) = 1.0
S(Ta)EW = 0.182
M(W) = 1.0
J(W) = 1.0
IRREGULARITY REVIEW: (OBC CLAUSE 4.1.8.6)
1. VERTICAL STIFFNESS: NO
2. WEIGHT: NO
3. VERTICAL GEOMETRIC: NO
4. IN-PLANE DISCONTINUITY: NO
5. OUT-OF-PLANE: NO
6. WEAK STOREY: NO
7. TORSIONAL: NO
B(NS) = 1.7 max
B(W) = 1.7 max
DIAGONAL STRAP CONCENTRICALLY BRACED COLD FORMED STEEL WALLS (CONVENTIONAL CONSTRUCTION) BY OTHERS TO BE DESIGNED SUCH THAT THE MAXIMUM SEISMIC DISPLACEMENT AT ONE CORNER OF THE BUILDING DOES NOT EXCEED 1.7 AVERAGE SEISMIC DISPLACEMENT IN ANY DIRECTION, TYP.
8. NON-ORTHOGONAL: NO
CONCLUSION: BUILDING IS: REGULAR
DYNAMIC ANALYSIS: NOT REQUIRED

- EQUIVALENT STATIC FORCE PROCEDURE:
BASE SHEARS
NS DIRECTIONS
VMIN = S(2.0) Mv le W/(Rd Ro) = 0.018 W
VMAX = (2/3) S(0.2) le W/(Ra Ro) = 0.078 W
EW DIRECTIONS
VMIN = S(2.0) Mv le W/(Rd Ro) = 0.018 W
VMAX = (2/3) S(0.2) le W/(Rd Ro) = 0.078 W
DESIGN BASE SHEARS & OVERTURNING MOMENTS
V(NS) = 0.078 W = 0.078 x 350 = 30 kN
M(NS) = M x J = 155 x 1 = 155 kN.m
V(W) = 0.078 W = 0.078 x 350 = 30 kN
M(W) = M x J = 155 x 1 = 155 kN.m

DRAWING LEGEND AND ABBREVIATIONS

UNLESS OTHERWISE NOTED, DESIGN LOADS SHOWN ARE SPECIFIED (UNFACTORED) LOADS. TO BE USED FOR ULS DESIGN. FOR POINT LOADS, IF ONLY ONE LOAD IS GIVEN, CONSIDER IT LIVE LOAD. FOR WIND AND SNOW LOADS TO BE USED FOR SLS DESIGN, REFER TO MATERIAL AND DESIGN DATA NOTES.

Table with columns for symbol, description, and symbol, description. Includes items like ANCHOR BOLT, ARCHITECTURALLY EXPOSED STRUCTURAL STEEL, FACTORED AXIAL LOAD IN kN, etc.

STRUCTURAL DRAWING LIST

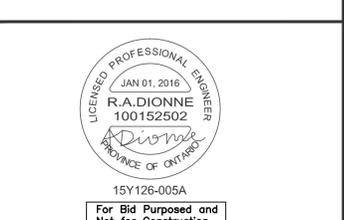
Table with columns DWG NO and DRAWING TITLE. Includes entries for S100 GENERAL NOTES, S200 PLANS AND TYPICAL DETAILS, S300 SECTIONS, S400 ELEVATIONS.

DRAWINGS FOR FOUNDATIONS/SLAB ON GRADE ONLY. SUPERSTRUCTURE DESIGN, SUPPLY AND ERECTION BY LIGHT GAUGE METAL SUBCONTRACTOR. SUPERSTRUCTURE FRAMING SHOWN IN THESE DRAWINGS SCHEMATIC ONLY. SEE OTHER CONSULTANTS DRAWINGS FOR ADDITIONAL REQUIREMENTS. CHANGE IN SECTION DIMENSION REQUIRE CONSULTANTS APPROVAL



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Revision table with columns: revision, description, date. Includes entries for 04 Issued for Tender (2016 01 29), 03 99% Progress Set (2016 01 11), 02 66% Progress Set (2015 10 30), 01 33% Progress Set (2015 10 09).

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

Detail callout table with columns A, B, C and descriptions: Detail No., drawing no. - where detail required, drawing no. - where detailed.

project title: EGBERT Ontario

6248 8TH LINE, LOL 1N0 NEW HYDROGEN GENERATION (HOGEN) AND BALLOON LAUNCHING BUILDING

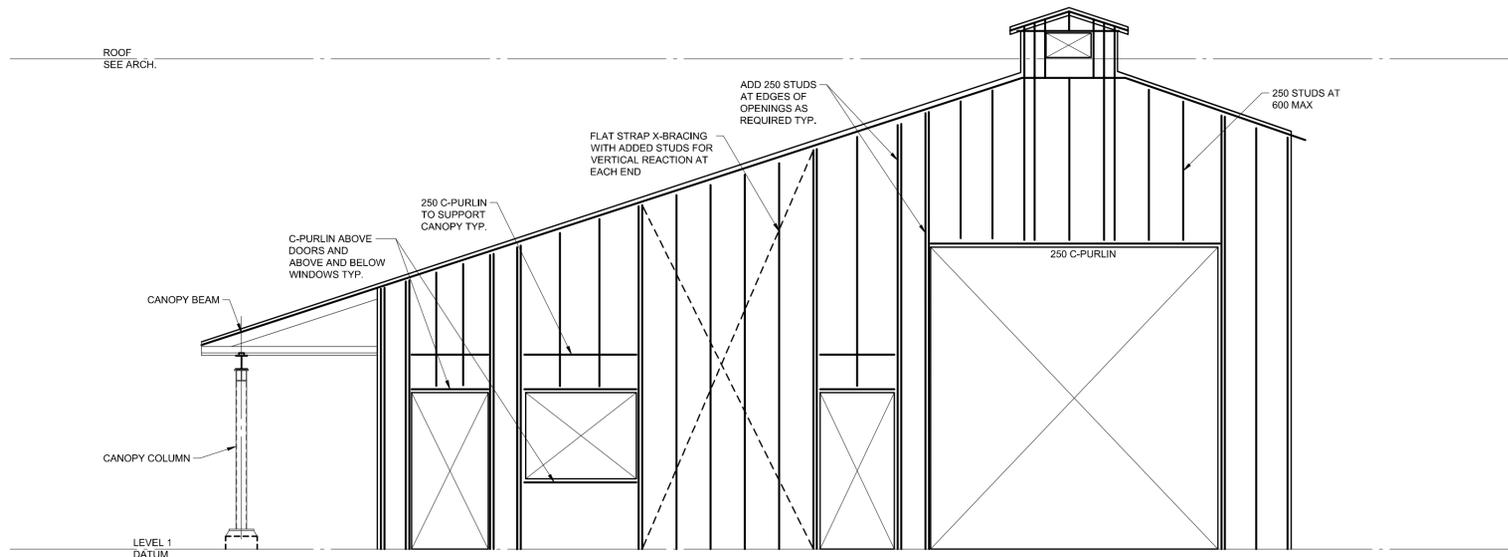
drawing title: GENERAL NOTES

Approval table with columns: role, name. Includes entries for drawn by SKC, designed by DXC, approved by JXS, bid offre, project manager.

project date: 2016-01-11

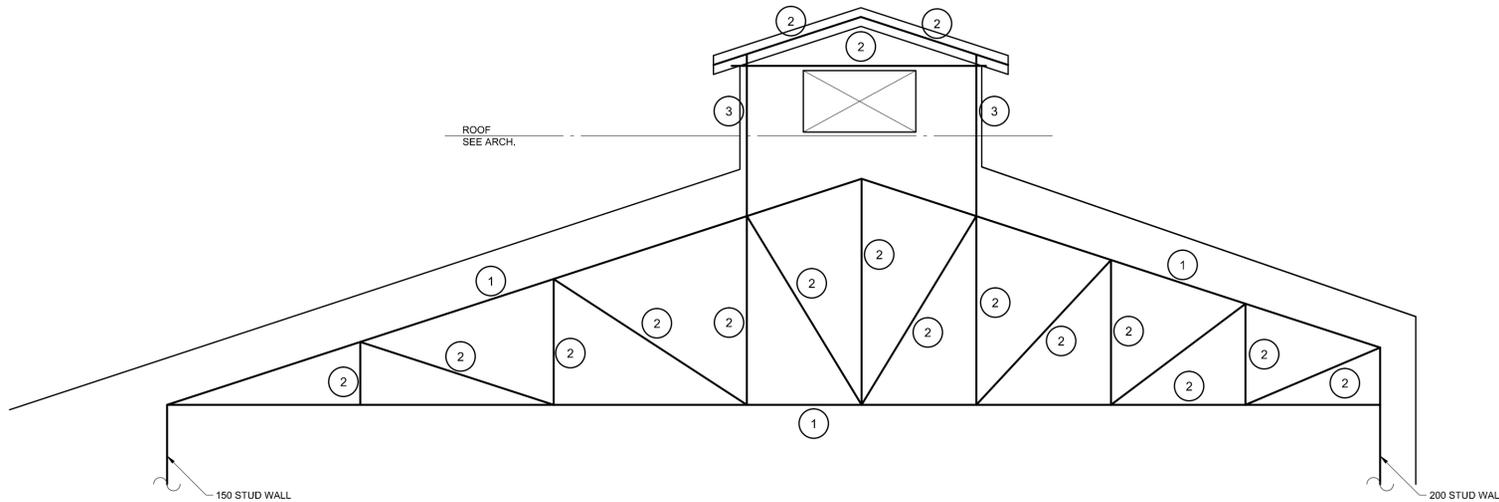
project no.: R.071909.001

drawing no.: S100



E1
S400

SCALE 1:50



EL-T1
S400

SCALE 1:20

NOTES:

- ① DENOTES 250 DEEP C-PURLIN
- ② DENOTES 150 DEEP C-PURLIN
- ③ DENOTES 150 STEEL STUD



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04	Issued for Tender	2016 01 29
03	99% Progress Set	2016 01 11
02	66% Progress Set	2015 10 30
01	33% Progress Set	2015 10 09
revision		date

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A	Detail No.
B	drawing no. - where detail required
C	drawing no. - where detailed

project title / titre du projet: **EGBERT Ontario**
6248 8TH LINE, L0L 1N0
NEW HYDROGEN GENERATION (HOGEN) AND BALLOON LAUNCHING BUILDING

drawing title / titre du dessin: **ELEVATIONS**

drawn by / dessiné par: **SKC**

designed by / conçu par: **DXC**

approved by / approuvé par: **JXS**

bid offer / offre: project manager / administrateur de projets

project date / date du projet: **2016-01-11**

project no. / no. du projet: **R.071909.001**

drawing no. / dessiné no.: **S400**

DRAWINGS FOR FOUNDATIONS/SLAB ON GRADE ONLY. SUPERSTRUCTURE DESIGN, SUPPLY AND ERECTION BY LIGHT GAUGE METAL SUBCONTRACTOR. SUPERSTRUCTURE FRAMING SHOWN IN THESE DRAWINGS SCHEMATIC ONLY. SEE OTHER CONSULTANTS DRAWINGS FOR ADDITIONAL REQUIREMENTS. CHANGE IN SECTION DIMENSION REQUIRE CONSULTANTS APPROVAL

STRUCTURAL WORK

- GENERAL**
 - PROVIDE ALL MATERIAL AND LABOUR REQUIRED FOR THE COMPLETION OF THE WORK. BREAKDOWN OF WORK BY TRADE IS FOR GUIDANCE ONLY AND IS NOT NECESSARILY COMPLETE.
 - COORDINATE ALL WORK SHOWN ON THE STRUCTURAL DRAWINGS WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, ALL OTHER DISCIPLINES AND EXISTING CONDITIONS (EXISTING CONDITIONS ARE ASSUMED). REPORT ANY INCONSISTENCIES TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK.
 - DO NOT SCALE THESE DRAWINGS.
 - SEE ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS.
- CODES AND STANDARDS**
 - COMPLY WITH THE REQUIREMENTS OF THE 2006 ONTARIO BUILDING CODE IN FORCE AND THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
- SUBMITTALS**
 - SUBMIT FOR REVIEW BEFORE START OF WORK, 4 COPIES OF SHOP DRAWINGS FOR:
 - CONCRETE REINFORCING (INCLUDING PLACING DIAGRAMS AND BAR LISTS)
 - STRUCTURAL STEEL
 - TEMPORARY SHORING
 - SUBMIT CONCRETE MIX DESIGNS BEFORE START OF WORK.
 - SHOP DRAWINGS FOR STRUCTURAL STEEL AND TEMPORARY SHORING SHALL TO BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN ONTARIO.
 - REVIEW OF SHOP DRAWINGS IS ONLY FOR GENERAL CONFORMITY WITH STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS. COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS, NOR DO THEY AUTHORIZE ANY CHANGES TO THE CONTRACT. REVIEW OF A SPECIFIC ITEM SHALL NOT INCLUDE REVIEW OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. THE CONTRACTOR'S RESPONSIBILITIES INCLUDE ALL QUANTITIES, DETAIL DIMENSIONS, FIELD MEASUREMENTS, FABRICATION PROCESS, MEANS, METHODS, SEQUENCES AND PROCEDURES OF CONSTRUCTION, COORDINATION WITH ALL TRADES AND PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER. THE REVIEW OF SHOP DRAWINGS DOES NOT IMPLY ANY CHANGE IN ANY OTHER CONSULTANTS' OR PROFESSIONALS' RESPONSIBILITIES RELATED TO DESIGN OF SPECIFIC ITEMS AS OUTLINED BY THE SPECIFICATIONS (SUCH AS STRUCTURAL STEEL CONNECTIONS, STEEL JOISTS, PRECAST ELEMENTS, ETC.).
 - AFTER REVIEW, ERECTION DIAGRAMS WILL BE RETURNED TO THE CONTRACTOR STAMPED TO SHOW ONE OF THE FOLLOWING:
 - NOT REVIEWED** - SHOWS WORK WHICH IS NOT WITHIN THE SCOPE OF STRUCTURAL CONSULTING
 - REVIEWED** - REVIEWED WITH NO COMMENTS.
 - NOTED** - REVIEWED WITH COMMENTS NOTED ON DRAWING. SUBMIT TWO FINAL RECORD PRINTS AS SOON AS CORRECTIONS ARE MADE.
 - RESUBMIT** - REVIEWED WITH COMMENTS NOTED ON DRAWING. CORRECT AND RESUBMIT FOR REVIEW.
 CONFORM TO THE REQUIREMENTS OF EACH AUTHORITY THAT HAS REVIEWED THE DRAWINGS.
 - ALLOW A MINIMUM OF 5 WORKING DAYS FOR REVIEW OF EACH SUBMISSION OF SHOP DRAWINGS IN THE STRUCTURAL ENGINEER'S OFFICE. ALLOW MORE TIME WHEN LARGE QUANTITIES OF SHOP DRAWINGS ARE SUBMITTED. SUBMIT IN GENERAL CONFORMITY WITH THE SEQUENCE OF CONSTRUCTION INTENDED. COORDINATE WITH THE CONSULTANT. SHOP DRAWINGS RECEIVED AFTER NOON WILL BE DATE-STAMPED AS RECEIVED THE FOLLOWING WORKING DAY.
 - PROVIDE FINAL RECORD DRAWINGS AFTER ALL CORRECTIONS ARE MADE.
- FOUNDATIONS**
 - FOUNDATION DESIGN IS BASED UPON A GEOTECHNICAL REPORT PREPARED FOR THE PROJECT BY PETO MACCALLUM LTD., REPORT NO. 15BF035, DATED SEPTEMBER, 2015.
 - SET FOUNDATIONS ON UNDISTURBED SOIL CAPABLE OF SUPPORTING AN ALLOWABLE BEARING PRESSURE OF 150 kPa AT ULS AND 100 kPa AT SLS.
 - PRIOR TO PLACING FOOTINGS, BEARING CAPACITY OF EACH FOOTING MUST BE CONFIRMED IN WRITTEN REPORTS BY A GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR. GEOTECHNICAL ENGINEER TO CARRY LIABILITY INSURANCE TO MINIMUM REQUIRED BY PEO. SUBMIT EACH REPORT IMMEDIATELY TO CONSULTANT.
 - PROTECT FOOTINGS, WALLS, SLABS ON GRADE AND ADJACENT SOIL AGAINST FREEZING AND FROST ACTION AT ALL TIMES DURING CONSTRUCTION.
 - THE LINE OF SLOPE BETWEEN ADJACENT EXCAVATIONS FOR FOOTINGS OR TRENCHES SHALL NOT EXCEED A RISE OF 7 IN A RUN OF 10.
 - DO NOT BACKFILL AGAINST WALLS RETAINING EARTH UNTIL ELEMENTS PROVIDING LATERAL SUPPORT, INCLUDING SLAB ON GRADE, ARE COMPLETED. BACKFILL SIMULTANEOUSLY ON BOTH SIDES OF OTHER WALLS BELOW GRADE.
 - DO NOT PLACE CONCRETE IN WATER OR ON FROZEN SOIL.
- CONCRETE**
 - CONFORM TO CSA A23.1 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION".
 - FOUNDATIONS:
 - CLASS OF EXPOSURE: F-2
 - CEMENT: TYPE GU
 - MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 25 MPA
 - MAXIMUM WATER/CEMENTING MATERIAL RATIO: 0.55
 - NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE: 20MM.
 - SLUMP AT TIME AND POINT OF DISCHARGE: 50MM TO 110MM.
 - AIR CONTENT: 5 TO 7%
 - DRILLED CONCRETE ANCHORS (DCA) TO BE HILTI KWIK BOLTS OR EQUIVALENT. LOCATE REBAR AND OTHER EMBEDMENTS IN CONCRETE FIRST AND ADJUST LOCATIONS OF ANCHORS AS INSTRUCTED BY ENGINEER IF THERE IS A CONFLICT. DO NOT CUT REBAR
 - USE NEW EXTERIOR PLYWOOD CONFORMING TO CAN/CSA O121 FOR FORMWORK, EXCEPT FOR ROUGH CONCRETE IN AN UNEXPOSED LOCATION, SUCH AS FOUNDATIONS WHERE USED MATERIAL IS ACCEPTABLE. USE INTERNAL FORM TIES OF ADJUSTABLE METAL DESIGNED TO ACT AS SPREADERS, AND, WHICH WHEN REMOVED, WILL LEAVE NO METAL CLOSER THAN 25 MM (1") TO CONCRETE SURFACE.
 - REINFORCEMENT: USE NEW DEFORMED BAR REINFORCEMENT CONFORMING TO CAN/CSA G30.18 GRADE 400R OR 400W.
 - EPOXY-COATED BARS SHALL CONFORM TO ASTM D3963.
 - ACCESSORIES, BAR SUPPORTS, AND TIES TO CONFORM TO RISC MANUAL OF STANDARD PRACTICE. PROVIDE EPOXY-COATED CHAIR-BARS AND BOLSTERS AND PLASTIC-COATED TIE WIRES FOR EPOXY-COATED REINFORCING.
 - WHERE CONCRETE IS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, THE MINIMUM CONCRETE COVER TO REINFORCING BARS CLOSEST TO THE CONCRETE SURFACE SHALL BE 75 MM.
 - FOR CLASS N CONCRETE, THE MINIMUM CONCRETE COVER TO REINFORCING BARS CLOSEST TO THE CONCRETE SURFACE SHALL BE 30 mm FOR BEAMS AND COLUMNS, AND 20 MM FOR SLABS AND WALLS. FOR CLASS F-1 AND F-2 CONCRETE, THE MINIMUM COVER SHALL BE 40 MM.
 - INCREASE COVER WHERE REQUIRED TO MAINTAIN MINIMUM RATIO OF COVER TO NOMINAL BAR DIAMETER OF 1. FOR CLASS N, 1.5 FOR CLASSES FA AND F2, AND 2 FOR CLASSES C1 AND C3.
 - HEAT CONCRETE AND DELIVER AT A TEMPERATURE BETWEEN +15°C AND +27°C, WHENEVER OUTDOOR TEMPERATURE IS LESS THAN +5°C.
 - CONVEY CONCRETE FROM TRUCK TO FINAL LOCATION BY METHODS WHICH WILL PREVENT SEPARATION OR LOSS OF MATERIAL. MAXIMUM FREE FALL 1.5M (5'-0"). CONSOLIDATE CONCRETE WITH ELECTRICAL VIBRATORS.
 - CURE CONCRETE SURFACES NOT IN CONTACT WITH FORMS BY THE APPLICATION OF A CURING-SEALING COMPOUND CONFORMING TO ASTM C309-97, IMMEDIATELY AFTER DISAPPEARANCE OF SURFACE WATER SHEEN.

- 5.17 COLD WEATHER: PROTECT CONCRETE ACCORDING TO CSA-A23.1.
- 5.18 PREMIXED GROUT: MINIMUM STRENGTH 40 MPa AT 28 DAYS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
- INSPECTION AND TESTING**
 - THE CONTRACTOR MUST PROVIDE INSPECTION REPORTS FOR MASONRY STRENGTH TESTS AND TEST REPORTS FOR CONCRETE. ALL REPORTS MUST BE PREPARED BY AN INDEPENDENT INSPECTION AND TESTING AGENCY.
 - MAKE ONE STANDARD TEST FOR EACH 50 CUBIC METRES OF CONCRETE BUT NOT LESS THAN ONE TEST FOR CONCRETE PLACED EACH DAY. PROVIDE A GROUP OF THREE CONCRETE CYLINDERS FOR EACH STANDARD CONCRETE TEST. BREAK ONE CYLINDER AT 7 DAYS.
 - AT LEAST 6 MORTAR CUBES ARE TO BE TESTED FOR EACH 500 SQUARE METRES OF WALL, OR PORTION THEREOF. AT LEAST 2 CYLINDER TESTS SHALL BE MADE FOR EACH 20 CUBIC METRES OF GROUT OR LESS. TEST METHODS AND RESULTS SHALL CONFORM TO CSA A179.
- CONSTRUCTION REVIEW**
 - NOTIFY THE CONSULTANT 48H PRIOR TO CONCRETE POURS, BACKFILLING, AND COVERING UP THE STRUCTURE WITH FINISHES.
- REJECTED WORK**
 - DO NOT DELIVER TO THE SITE MATERIALS, WHICH ARE KNOWN NOT TO MEET THE REQUIREMENTS OF THE SPECIFICATIONS. IF REJECTED AFTER DELIVERY, REMOVE IMMEDIATELY FROM SITE.

DESIGN LOADS

- THE VALUES FOR CLIMATIC DATA USED IN THE DETERMINATION OF DESIGN LOADS HAVE BEEN OBTAINED FROM THE 2010 NBC FOR THE SPECIFIC LOCATION OF BORDEN, ON (NEAR EGBERT, ON).
- SELF WEIGHT (SWT) IS DUE TO THE WEIGHT OF THE STRUCTURE ITSELF. IT VARIES WITH THE STRUCTURAL SYSTEM, AND INCLUDES CONCRETE TOPPING ON STEEL DECK.
- SUPERIMPOSED DEAD LOADS (SDL) ARE NON-STRUCTURAL DEAD LOADS DUE TO NON-STRUCTURAL TOPPING, FINISHES, PARTITIONS, ROOFING MATERIALS, SUSPENDED EQUIPMENT, PAVERS, SOIL, ETC.
- DEAD LOAD (DL) IS THE SELF WEIGHT OF THE STRUCTURE PLUS THE SUPERIMPOSED DEAD LOAD.
- GRAVITY LOADS ARE SHOWN ON PLANS. LIVE LOAD REDUCTION HAS NOT BEEN USED.
- NET FACTORED UPLIFT LOADS ON ROOFS ARE SHOWN ON PLANS.
- UNLESS OTHERWISE NOTED, DESIGN LOADS SHOWN ARE SPECIFIED (UNFACTORED) LOADS, TO BE USED FOR ULS DESIGN.
- FOR POINT LOADS, IF ONLY ONE LOAD IS GIVEN, CONSIDER IT LIVE LOAD.
- SNOW**
 - Ss = 2.2 kPa Sr = 0.4 kPa Is (ULS) = 1.0 Is (SLS) = 0.9
 - MINIMUM UNFACTORED SNOW LOAD = 2.5 kPa x Is
- RAIN**
 - 24 HOUR RAINFALL = 103 mm
- LATERAL LOADS IN THIS STRUCTURE ARE RESISTED BY COLD FORMED STEEL FLAT STRAP BRACING DESIGNED BY OTHERS, AND ARE DETERMINED BASED ON THE WIND AND SEISMIC DATA BELOW.
- WIND**
 - q50 = 0.36 kPa Iw (ULS) = 1.0 Iw (SLS) = 0.75
 - BUILDING IS: LOW RISE
 - TERRAIN TYPE: OPEN
 - Ce = 0.96
 - INTERNAL PRESSURE CATEGORY: 2
 - FACTORED BASE SHEARS & OVERTURNING MOMENTS:
 - V(N)S = 10 kN
 - M(N)S = 20 kN.m
 - V(E)W = 25 kN
 - M(E)W = 50 kN.m
- SEISMIC**
 - Sa(0.2) = 0.140 PGA = 0.045 IeFaSa(0.2) = 0.182
 - Sa(0.5) = 0.100 Rd = 1.2
 - Sa(1.0) = 0.063 Ro = 1.3 SITE CLASSIFICATION = D
 - Sa(2.0) = 0.020 Ie = 1.0
 - SEISMIC FORCE RESISTING SYSTEM (SFRS): DIAGONAL STRAP CONCENTRICALLY BRACED COLD FORMED STEEL WALLS (CONVENTIONAL CONSTRUCTION) BY OTHERS
 - Fa = 1.3
 - Fv = 1.4
 - DESIGN SPECTRAL RESPONSE ACCELERATION VALUES**
 - S(0.2) = 0.182
 - S(0.5) = 0.140
 - S(1.0) = 0.088
 - S(2.0) = 0.028
 - S(4.0) = 0.014
- FUNDAMENTAL PERIOD DATA**
 - EMPIRICAL FORMULA (OBC CLAUSE 4.1.8.11(3))Ta = 0.17 sec**
 - DESIGN PERIOD**
 - Ta(NS) = 0.17 sec
 - Ta(EW) = 0.17 sec
 - DESIGN SPECTRAL RESPONSE ACCELERATION AT FUNDAMENTAL PERIOD**
 - S(Ta)NS = 0.182
 - M(NS) = 1.0J(NS) = 1.0
 - S(Ta)EW = 0.182
 - M(EW) = 1.0
 - J(EW) = 1.0
- IRREGULARITY REVIEW (OBC CLAUSE 4.1.8.6)**
 - NA
- EQUIVALENT STATIC FORCE PROCEDURE:**
 - BASE SHEARS**
 - NS DIRECTIONS**
 - VMIN = S(2.0) Mv Ie W/(Rd Ro) = 0.018 W
 - VMAX = (2/3) S(0.2) Ie W/(Rd Ro) = 0.078 W
 - EW DIRECTIONS**
 - VMIN = S(2.0) Mv Ie W/(Rd Ro) = 0.018 W
 - VMAX = (2/3) S(0.2) Ie W/(Rd Ro) = 0.078 W
 - DESIGN BASE SHEARS & OVERTURNING MOMENTS**
 - V(NS) = 0.078 W = 0.078 x 70 = 5.5 kN
 - M(NS) = M x J = 9.2 x 1 = 9.2 kN.m
 - V(EW) = 0.078 W = 0.078 x 70 = 5.5 kN
 - M(EW) = M x J = 9.2 x 1 = 9.2 kN.m

DRAWING ABBREVIATIONS

UNLESS OTHERWISE NOTED, DESIGN LOADS SHOWN ARE SPECIFIED (UNFACTORED) LOADS, TO BE USED FOR ULS DESIGN. FOR POINT LOADS, IF ONLY ONE LOAD IS GIVEN, CONSIDER IT LIVE LOAD. FOR WIND AND SNOW LOADS TO BE USED FOR SLS DESIGN, REFER TO MATERIAL AND DESIGN DATA NOTES.

ABC	ALBERTA BUILDING CODE	LE	LEFT END
A-RD	ANCHOR ROD	LG	LONG
AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	UL	UPPER LEVEL BM/JOIST
AI	FACTORED AXIAL LOAD IN kN	LL	LOWER LEVEL BM/JOIST
	(+ INDICATES TENSION, -INDICATES COMPRESSION)	LLH	LIVE LOAD IN kN/m²
	ALTERNATE ARCHITECTURAL	LLV	LONG LEG HORIZONTAL
ALT	ALTERNATE ARCHITECTURAL	LSV	LONG LEG VERTICAL
ARCH	ARCHITECTURAL	LSH	LONG SIDE HORIZONTAL
		LP	LOW POINT
B, BOT	BOTTOM	MAX	MAXIMUM
BOP	BOTTOM OF FOOTING	MECH	MECHANICAL
BCBC	BRITISH COLUMBIA BUILDING CODE	MF	FACTORED MOMENT IN kN.m
BCP	BORED CONCRETE PILE	MM	MINIMUM
BEW	BOTTOM EACH WAY	MJ	MOVEMENT JOINT
BL	BOTTOM LOWER LAYER	MPa	MEGAPASCAL
BM	BEAM	MTI	FACTORED TORSION IN kN.m
BP	BASE PLATE		
BRP	BEARING PLATE		
BST	BASEMENT		
BUL	BOTTOM UPPER LAYER		
BUP	BOTTOM OF UNDERPINNING		
CA	COLUMN ABOVE ONLY (NO COLUMN BELOW)	NBC	NATIONAL BUILDING CODE
CAM	CAMBER	NF	NEAR FACE
CANT	CANTILEVER	NTS	NOT IN CONTRACT
CB	COLUMN BELOW	NTS	NOT TO SCALE
C/C	CENTRE TO CENTRE	OBC	ONTARIO BUILDING CODE
CEL	CENTRE OF ELEVATION FOR PILES	P	POINT LOAD IN kN, POST
CF	CONCRETE FIREPROOFED CONSTRUCTION JOINT	PL	FACTORED POINT LOAD IN kN
CL	CENTRELINE	PL	PLATE
CJ	STEEL DECK CORE NOMINAL THICKNESS	PSF	POUNDS PER SQUARE FOOT
COMP	COMPOSITE	PSI	POUNDS PER SQUARE INCH
COL	COLUMN	PT	POST TENSION
CONC	CONCRETE	RA	ROOF ANCHOR
CONT	CONTINUOUS CONNECTION PLATE	RD	ROOF DRAIN
CP	SEE GENERAL NOTES	REIN	REINFORCEMENT
CWS		RF	RIGHT END
CLS		RI	FACTORED VERTICAL REACTION IN kN
CSS		RH	FACTORED HORIZONTAL REACTION IN kN
		RTU	ROOF TOP UNIT
DCA	DRILLED CONCRETE ANCHOR		
DET	DETAIL		
D-FIR-L	DOUGLAS FIR-LARCH		
DIA Ø	DIAMETER		
DM	DEAD LOAD IN kN/m²		
DMA	DRILLED MASONRY ANCHOR		
DN	DOWN		
DO	DITTO	SEC	SECTION
DP	DEEP DRAWING	SIM	SIMILAR
DWG	DRAWING	SJ	STEEL JOIST
DWL	DOWEL	SLS	SERVICEABILITY LIMIT STATE
EA	EACH	SOG	SLAB-ON-GRADE
EAC	EPOXY COATED REINFORCEMENT	SPF	SPRUCE PINE FIR
EE	EACH END	STR	STRIP
EF	EACH FACE	STIFF	STIFFENER
EL	ELECTRICAL		
EL, EXP JT	EXPANSION JOINT	TB	TRANSFER BEAM
ELEV	ELEVATOR	T	TOP
EMBED	EMBEDMENT	TEW	TOP EACH WAY
EQ	EQUAL	THK	THICK
EW	EACH WAY EXISTING	TJ	TIE JOIST
EX, EXIST	EXISTING	TLL	TOP LOWER LAYER
		TOP	TOP OF FOOTING
FD	FLOOR DRAIN	TPC	TOP OF PILE CAP
FF	FAR FACE	TS	TENSION SPLICE
FIN	FINISHED	TUL	TOP UPPER LAYER
FMC	FULL MOMENT CONNECTION	TYP	TYPICAL
FTG	FOOTING	ULS	ULTIMATE LIMIT STATE
fc	COMPRESSIVE STRENGTH OF CONC	UN	UNDERSIDE
fy	YIELD STRENGTH IN MPa	UNT	UNLESS NOTED UPTURNED
GLV	GALVANIZE		
GB	GRADE BEAM	VB	VERTICAL BRACING
GL	GRIDLINE	VEF	VERTICAL EACH FACE
		VI	FACTORED SHEAR IN kN
h	TOTAL THICKNESS	VIC	VERTICAL IN CENTRE
H, HOR	HORIZONTAL - HANGER	V, VERT, VERTS	VERTICAL, VERTICALS
HG	HOT DIPPED GALVANIZED	VVC	VERTICALLY SLOTTED CONNECTION
HEF	HORIZONTAL EACH FACE	VXB	VERTICAL 'X' BRACING
HH	HOOK EACH END		
HC	HORIZONTAL IN CENTRE	WC	WIND COLUMN
HK	HOOK	WWA	WINDOW WASHING ANCHORS
HP	HIGH POINT	WWF	WELDED WIRE FABRIC
IBA	INTEGRITY BARS ADDED	ZRP	ZINC RICH PAINT
IBI	INTEGRITY BARS INTERIOR		
IBE	INTEGRITY BARS EXTERIOR		
JG	JOIST GIRDER		
KN	KILONEWTON		
KN/m²	KILONEWTON PER METRE SQUARED		
kPa	KILO PASCAL		
LB	POUND, POUNDS		
ld	TENSION DEVELOPMENT LENGTH OF REBAR		
ldc	COMPRESSION DEVELOPMENT LENGTH OF REBAR		
L	SINGLE ANGLE		



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03	Issued for Tender	2016 01 29
02	99% Progress Set	2016 01 11
01	50% Progress Set	2015 10 09
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

	A	Detail No.
	B	No. du détail
	C	drawing no. - where detail required dessin no. - où détail exigé

project title
titre du projet
EGBERT Ontario
6248 8TH LINE, LOL 1N0
NEW OPERATIONS TRAILER FOR HYDROGEN GENERATION (HOGEN) AND BALLOON LAUNCHING HOGEN

drawing title
titre du dessin
GENERAL NOTES

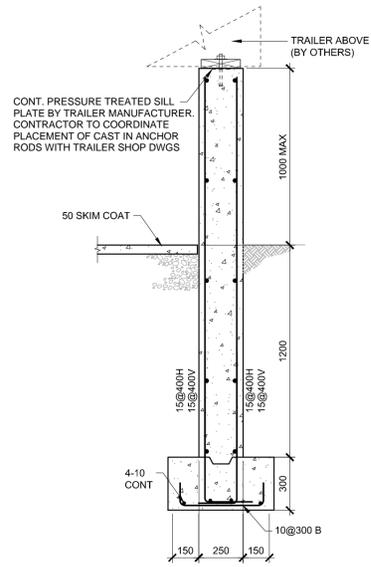
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approved by approuvé par	JXS
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DWG NO	DRAWING TITLE
S100-OP	GENERAL NOTES
S200-OP	PLAN, TYPICAL DETAILS AND SECTIONS

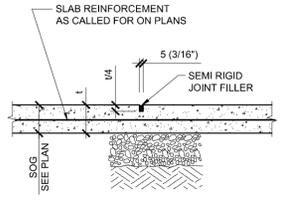
TRAILER DRAWINGS FOR SLAB ON GRADE AND MASONRY SUPPORT ONLY. SUPERSTRUCTURE DESIGN, SUPPLY AND ERECTION BY TRAILER MANUFACTURER.



15Y126-005A
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F1
S200-OP
SCALE 1:20



TYPICAL SAWCUT CONTROL JOINT IN SLAB ON GRADE

T3201
OCT 10

TENSION DEVELOPMENT LENGTH FOR BAR GRADE 500 MPa, l_d IN mm (in")

BLACK BARS
- FOR EPOXY BARS MULTIPLY VALUES IN TABLE BY 1.5 EXCEPT THAT A MULTIPLIER OF 1.2 CAN BE USED WHEN CLEAR COVER IS MORE THAN 3x BAR DIAMETER AND CLEAR SPACING BETWEEN BARS IS MORE THAN 6x BAR DIAMETER.
- FOR SEMI LOW DENSITY CONCRETE MULTIPLY VALUES IN TABLE BY 1.2
- FOR BUNDLED BARS, MULTIPLY VALUES IN TABLE BY 10% FOR A TWO BAR BUNDLE, 20% FOR A THREE BAR BUNDLE AND 33% FOR A FOUR BAR BUNDLE
- *TOP* MEANS THAT THERE IS MORE THAN 300mm (12") OF CONCRETE BELOW, AND LESS THAN 300mm (12") OF CONCRETE ABOVE THE HORIZONTAL BAR WITHIN THE INDIVIDUAL CONCRETE POUR.
- ALL VERTICAL BARS ARE CONSIDERED "BOTTOM"

BAR SIZE	f _c = 25		f _c = 30		f _c = 35		f _c = 40		f _c = 50	
	BOTTOM	TOP								
10	360 (14")	470 (19")	330 (13")	430 (17")	310 (12")	400 (16")	300 (12")	370 (15")	300 (12")	340 (13")
15	540 (21")	710 (28")	500 (20")	650 (26")	460 (18")	600 (24")	430 (17")	560 (22")	390 (15")	500 (20")
20	720 (28")	940 (37")	660 (26")	860 (34")	610 (24")	800 (31")	570 (22")	740 (29")	510 (20")	670 (26")
25	1130 (44")	1470 (58")	1030 (41")	1340 (53")	960 (38")	1240 (49")	890 (35")	1160 (46")	800 (31")	1040 (41")
30	1350 (53")	1760 (69")	1240 (49")	1610 (63")	1150 (45")	1490 (59")	1070 (42")	1390 (55")	960 (38")	1250 (49")
35	1580 (62")	2050 (81")	1440 (57")	1870 (74")	1340 (53")	1740 (69")	1250 (49")	1620 (64")	1120 (44")	1450 (57")

CLASS B TENSION LAP SPLICES LENGTH FOR BAR GRADE 500 MPa IN mm (in")

BLACK BARS
- FOR EPOXY BARS MULTIPLY VALUES IN TABLE BY 1.5 EXCEPT THAT A MULTIPLIER OF 1.2 CAN BE USED WHEN CLEAR COVER IS MORE THAN 3x BAR DIAMETER AND CLEAR SPACING BETWEEN BARS IS MORE THAN 6x BAR DIAMETER
- FOR SEMI LOW DENSITY CONCRETE MULTIPLY VALUES IN TABLE BY 1.2
- FOR BUNDLED BARS, MULTIPLY VALUES IN TABLE BY 10% FOR A TWO BAR BUNDLE, 20% FOR A THREE BAR BUNDLE AND 33% FOR A FOUR BAR BUNDLE
- *TOP* MEANS THAT THERE IS MORE THAN 300mm (12") OF CONCRETE BELOW, AND LESS THAN 300mm (12") OF CONCRETE ABOVE THE HORIZONTAL BAR WITHIN THE INDIVIDUAL CONCRETE POUR.
- ALL VERTICAL BARS ARE CONSIDERED "BOTTOM"

BAR SIZE	f _c = 25		f _c = 30		f _c = 35		f _c = 40		f _c = 50	
	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP
10	470 (19")	610 (24")	430 (17")	560 (22")	400 (16")	520 (20")	370 (15")	490 (19")	340 (13")	440 (17")
15	710 (28")	920 (36")	650 (26")	840 (33")	600 (24")	780 (31")	560 (22")	730 (29")	500 (20")	650 (26")
20	940 (37")	1220 (48")	860 (34")	1120 (44")	800 (31")	1030 (41")	740 (29")	970 (38")	670 (26")	870 (34")
25	1470 (58")	1910 (75")	1340 (53")	1740 (69")	1240 (49")	1610 (63")	1160 (46")	1510 (59")	1040 (41")	1350 (53")
30	1760 (69")	2290 (90")	1610 (63")	2090 (82")	1490 (59")	1930 (76")	1390 (55")	1810 (71")	1250 (49")	1620 (64")
35	2050 (81")	2670 (105")	1870 (74")	2430 (96")	1740 (69")	2250 (89")	1620 (64")	2110 (83")	1450 (57")	1890 (74")

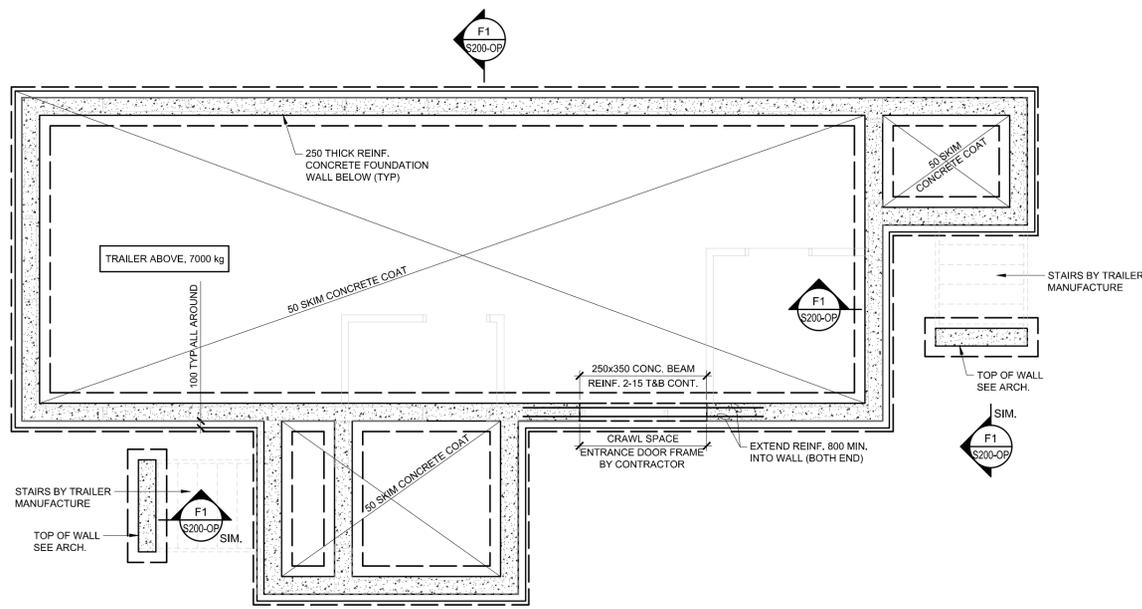
MINIMUM TENSION EMBEDMENT LENGTH WITH STANDARD END HOOKS FOR BAR GRADE 500 MPa IN mm (in")

BLACK BARS
- FOR EPOXY BARS MULTIPLY VALUES IN TABLE BY 1.2
- FOR SEMI LOW DENSITY CONCRETE MULTIPLY VALUES IN TABLE BY 1.2

BAR SIZE	f _c = 25		f _c = 30		f _c = 35		f _c = 40		f _c = 50	
	BOTTOM	TOP								
10	180 (7")	160 (6")	160 (6")	150 (6")	150 (6")	150 (6")	150 (6")	150 (6")	150 (6")	150 (6")
15	270 (11")	240 (9")	240 (9")	230 (9")	210 (8")	210 (8")	210 (8")	210 (8")	190 (7")	190 (7")
20	350 (14")	320 (13")	320 (13")	300 (12")	280 (11")	280 (11")	280 (11")	280 (11")	250 (10")	250 (10")
25	440 (17")	400 (16")	400 (16")	370 (15")	350 (14")	350 (14")	350 (14")	350 (14")	310 (12")	310 (12")
30	530 (21")	480 (19")	480 (19")	450 (18")	420 (17")	420 (17")	420 (17")	420 (17")	380 (15")	380 (15")
35	620 (24")	560 (22")	560 (22")	520 (20")	490 (19")	490 (19")	490 (19")	490 (19")	440 (17")	440 (17")

TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICES - BAR GRADE 500 MPa
IF VALUE NOT PROVIDED IN TABLE FOR ANY CONCRETE STRENGTH BETWEEN 25 TO 50, VALUES ARE TO BE INTERPOLATED FROM NEAREST VALUES PROVIDED.

T3505
DEC 12



OPERATIONS TRAILER FOUNDATION AND LEVEL 1 PLAN NOTES

- SEE GENERAL REQUIREMENTS AND TYPICAL DETAILS ON DRAWING S100.
- LEVEL 1 DATUM ELEVATION IS 0.0 (GEODETIC EL. _____).
- UNLESS OTHERWISE NOTED ON PLAN, DESIGN LOADS ARE:
 - LIVE LOAD = 2.4 kN/m²
 - SNOW LOAD ABOVE TRAILER = 2.5 kN/m²
 - DEAD LOAD OF TRAILER SHOWN ON PLAN.
- TOP OF SLAB IS 0 FROM DATUM ELEVATION EXCEPT WHERE NOTED *xx* ON PLAN.
- REFER TO GENERAL NOTES FOR FOUNDATION BEARING CAPACITY.

TRAILER DRAWINGS FOR SLAB ON GRADE AND MASONRY SUPPORT ONLY. SUPERSTRUCTURE DESIGN, SUPPLY AND ERECTION BY TRAILER MANUFACTURER.

03	Issued for Tender	2016 01 29
02	99% Progress Set	2016 01 11
01	50% Progress Set	2015 10 09
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

A	Detail No.	
B	drawing no. - where detail required	
C	drawing no. - where detailed	

project title
titre du projet
EGBERT Ontario
6248 8TH LINE, L0L 1N0
NEW OPERATIONS TRAILER FOR HYDROGEN GENERATION (HOGEN) AND BALLOON LAUNCHING (HOGEN)

drawing title
titre du dessin
PLAN
TYPICAL DETAILS AND SECTIONS

drawn by
dessiné par **SKC**

designed by
conçu par **DXC**

approved by
approuvé par **JXS**

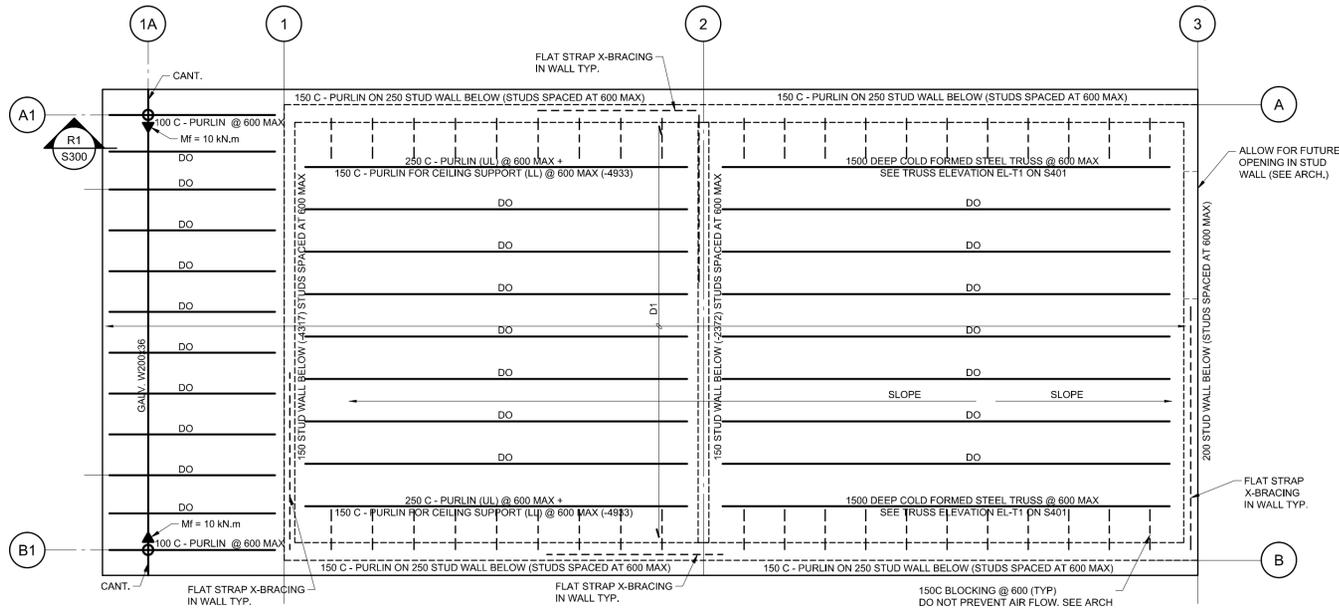
bid
offre project manager
administrateur de projets

project date
date du projet **2016-01-11**

project no.
no. du projet **R.071909.001**

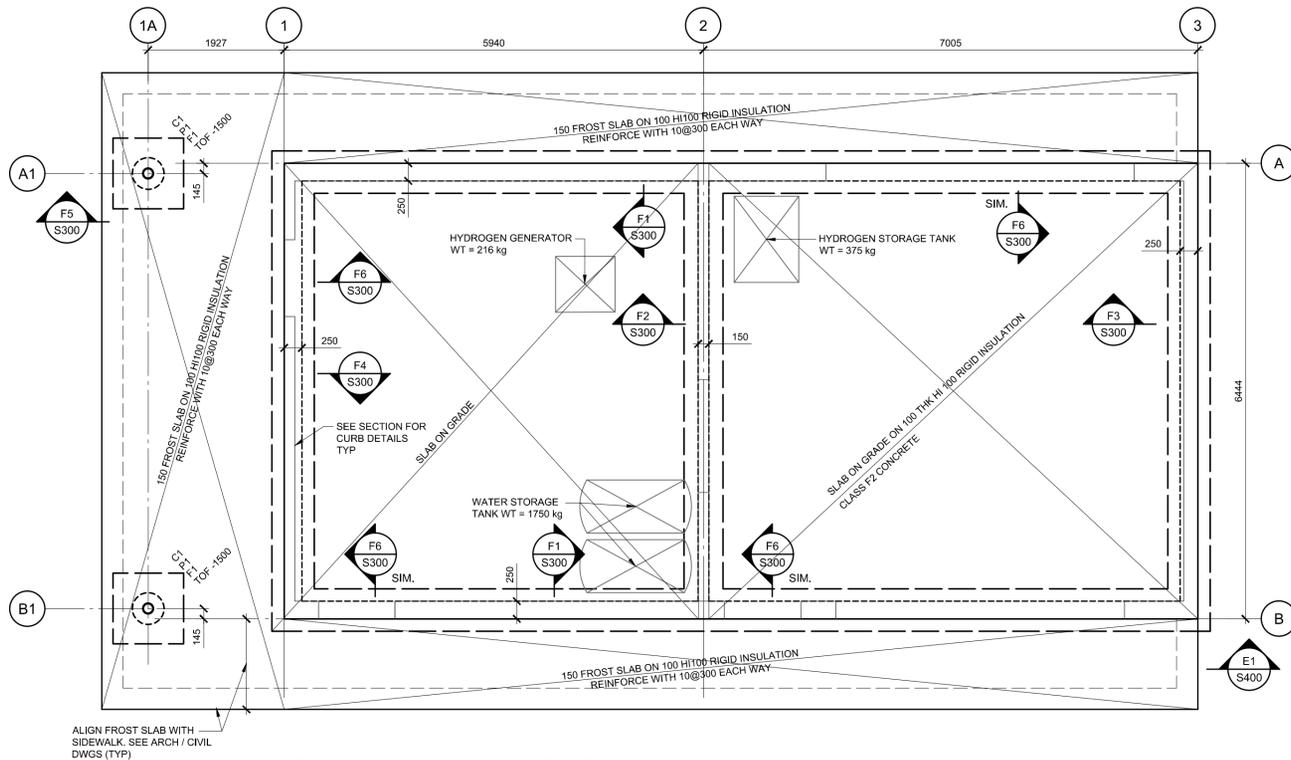
drawing no.
dessiné no. **S200-OP**





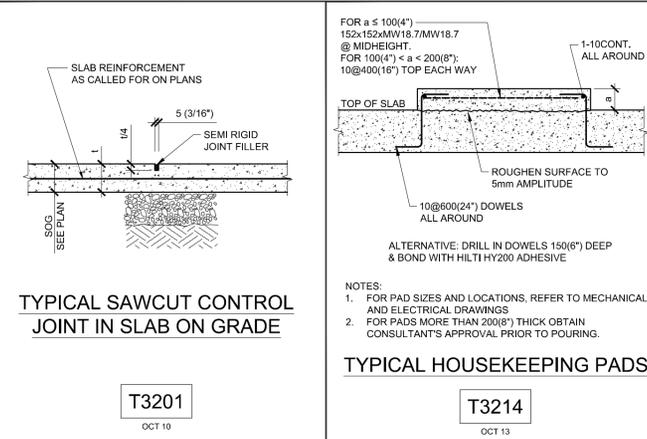
ROOF PLAN NOTES

- SEE GENERAL REQUIREMENTS AND TYPICAL DETAILS ON DRAWING S100.
- ROOF DATUM ELEVATION AT ROOF PEAK IS +8200
- UNLESS OTHERWISE NOTED ON PLAN, DESIGN LOADS ARE:
 - LIVE LOAD (SNOW) = 2.6 kN/m² MINIMUM
 - SUPERIMPOSED DEAD LOAD = 0.75 kN/m²
 - SWT = 0.5 kN/m²
- DESIGN STEEL DECK AND COLD FORMED STEEL JOISTS AND BRIDGING FOR MINIMUM NET FACTORED UPLIFT OF 1.7 kN/m² DUE TO WIND. INCREASE AT ROOF EDGES AND CORNERS IN ACCORDANCE WITH THE USER'S GUIDE TO NBC - STRUCTURAL COMMENTARIES. DESIGN ROOF DIAPHRAGM FOR A MINIMUM FACTORED SHEAR OF 5kN/m
- FOR OVERALL BUILDING WIND DESIGN, REFER TO NOTES ON DRAWING S100.
- FOR OVERALL SEISMIC DESIGN, REFER TO NOTES ON DRAWING S100.
- UNLESS OTHERWISE NOTED ON PLANS OR DETAILS, THE FOLLOWING DATA APPLIES:
 - UNDERSIDE OF ROOF DECK SLOPES. DISTANCE TO UNDERSIDE OF STEEL DECK FROM DATUM ELEVATION IS AS NOTED 2X ON PLAN.
 - D1* ON PLAN DENOTES 38 THICK PLYWOOD DECKING
 - ALL MEMBERS TO BE COLD FORMED STEEL, DESIGNED BY OTHERS TYPICAL.
 - DESIGN BOTTOM CHORD OF COLD FORMED STEEL TRUSSES / CEILING SUPPORT BEAMS FOR DL = 0.25 kPa + 1 kN HANGING LOAD LOCATED AT ANY POINT ALONG THE SPAN OF THE MEMBER. SEE ARCH FOR SUPPORT OF OVERHEAD DOOR AND ADDITIONAL REQUIREMENTS.



FOUNDATION AND LEVEL 1 PLAN NOTES

- SEE GENERAL REQUIREMENTS AND TYPICAL DETAILS ON DRAWING S100.
- LEVEL 1 DATUM ELEVATION IS 0.0 (ASSUMED GEODETIC EL. 247.5).
- UNLESS OTHERWISE NOTED ON PLAN, DESIGN LOADS ARE:
 - LIVE LOAD = 4.8 kN/m²
 - SUPERIMPOSED DEAD LOAD = 1.5 kN/m²
 - PARTITION LOAD IS INCLUDED IN THE SDL
- TOP OF SLAB IS 0 FROM DATUM ELEVATION EXCEPT WHERE NOTED 2X ON PLAN. REFER TO ARCHITECTURAL DRAWINGS FOR SLOPES FOR DRAINAGE
- PROVIDE 150 THICK CONCRETE SLAB-ON-GRADE REINF WITH 10@300EW @ 50 CLEAR COVER TO TOP OF SLAB.
- UNLESS OTHERWISE NOTED, SET TOPS OF COLUMN AND WALL FOOTINGS (TOF) AT -1200 BELOW FLOOR DATUM
- REFER TO GENERAL NOTES FOR FOUNDATION BEARING CAPACITY.
- *C1* ON PLAN DENOTES GALV HSS 152 DIA x 6.4 Af + 40 kN. SEE F5/S300 FOR BASE PLATE AND ANCHORAGE.
- *P1* ON PLAN DENOTES 450 DIAMETER CONCRETE PIER REINFORCED WITH 4-20V + 10@300 TIES. EXPOSED CONCRETE ABOVE GROUND FLOOR. USE FORM LINER FOR SMOOTH FINISH.
- *F1* ON PLAN DENOTES 1000x1000x300 CONCRETE SPREAD FOOTING REINFORCED WITH 4-15 BEW (HH)
- SEE MECH / ARCH FOR HOUSE KEEPING PAD REQUIREMENTS UNDER MECHANICAL EQUIPMENT



TENSION DEVELOPMENT LENGTH FOR BAR GRADE 500 MPa, ld IN mm (in")

-BLACK BARS
-FOR EPOXY BARS MULTIPLY VALUES IN TABLE BY 1.5 EXCEPT THAT A MULTIPLIER OF 1.2 CAN BE USED WHEN CLEAR COVER IS MORE THAN 3x BAR DIAMETER AND CLEAR SPACING BETWEEN BARS IS MORE THAN 6x BAR DIAMETER.
-FOR SEMI LOW DENSITY CONCRETE MULTIPLY VALUES IN TABLE BY 1.2
-FOR BUNDLED BARS, MULTIPLY VALUES IN TABLE BY 10% FOR A TWO BAR BUNDLE, 20% FOR A THREE BAR BUNDLE AND 33% FOR A FOUR BAR BUNDLE
-*TOP* MEANS THAT THERE IS MORE THAN 300mm (12") OF CONCRETE BELOW, AND LESS THAN 300mm (12") OF CONCRETE ABOVE THE HORIZONTAL BAR WITHIN THE INDIVIDUAL CONCRETE POUR.
-ALL VERTICAL BARS ARE CONSIDERED "BOTTOM"

BAR SIZE	fc = 25		fc = 30		fc = 35		fc = 40		fc = 50	
	BOTTOM	TOP								
10	360 (14")	470 (19")	330 (13")	430 (17")	310 (12")	400 (16")	300 (12")	370 (15")	300 (12")	340 (13")
15	540 (21")	710 (28")	500 (20")	650 (26")	460 (18")	600 (24")	430 (17")	560 (22")	390 (15")	500 (20")
20	720 (28")	940 (37")	660 (26")	860 (34")	610 (24")	800 (31")	570 (22")	740 (29")	510 (20")	670 (26")
25	1130 (44")	1470 (58")	1030 (41")	1340 (53")	960 (38")	1240 (49")	890 (35")	1160 (46")	800 (31")	1040 (41")
30	1350 (53")	1760 (69")	1240 (49")	1610 (63")	1150 (45")	1490 (59")	1070 (42")	1390 (55")	960 (38")	1250 (49")
35	1580 (62")	2050 (81")	1440 (57")	1870 (74")	1340 (53")	1740 (69")	1250 (49")	1620 (64")	1120 (44")	1450 (57")

CLASS B TENSION LAP SPLICES LENGTH FOR BAR GRADE 500 MPa IN mm (in")

-BLACK BARS
-FOR EPOXY BARS MULTIPLY VALUES IN TABLE BY 1.5 EXCEPT THAT A MULTIPLIER OF 1.2 CAN BE USED WHEN CLEAR COVER IS MORE THAN 3x BAR DIAMETER AND CLEAR SPACING BETWEEN BARS IS MORE THAN 6x BAR DIAMETER
-FOR SEMI LOW DENSITY CONCRETE MULTIPLY VALUES IN TABLE BY 1.2
-FOR BUNDLED BARS, MULTIPLY VALUES IN TABLE BY 10% FOR A TWO BAR BUNDLE, 20% FOR A THREE BAR BUNDLE AND 33% FOR A FOUR BAR BUNDLE
-*TOP* MEANS THAT THERE IS MORE THAN 300mm (12") OF CONCRETE BELOW, AND LESS THAN 300mm (12") OF CONCRETE ABOVE THE HORIZONTAL BAR WITHIN THE INDIVIDUAL CONCRETE POUR.
-ALL VERTICAL BARS ARE CONSIDERED "BOTTOM"

BAR SIZE	fc = 25		fc = 30		fc = 35		fc = 40		fc = 50	
	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM	TOP
10	470 (19")	610 (24")	430 (17")	560 (22")	400 (16")	520 (20")	370 (15")	490 (19")	340 (13")	440 (17")
15	710 (28")	920 (36")	650 (26")	840 (33")	600 (24")	780 (31")	560 (22")	730 (29")	500 (20")	650 (26")
20	940 (37")	1220 (48")	860 (34")	1120 (44")	800 (31")	1030 (41")	740 (29")	970 (38")	670 (26")	870 (34")
25	1470 (58")	1910 (75")	1340 (53")	1740 (69")	1240 (49")	1610 (63")	1160 (46")	1510 (59")	1040 (41")	1350 (53")
30	1760 (69")	2290 (90")	1610 (63")	2080 (82")	1490 (59")	1930 (76")	1390 (55")	1810 (71")	1250 (49")	1620 (64")
35	2050 (81")	2670 (105")	1870 (74")	2430 (96")	1740 (69")	2250 (89")	1620 (64")	2110 (83")	1450 (57")	1890 (74")

MINIMUM TENSION EMBEDMENT LENGTH WITH STANDARD END HOOKS FOR BAR GRADE 500 MPa IN mm (in")

-BLACK BARS
-FOR EPOXY BARS MULTIPLY VALUES IN TABLE BY 1.2
-FOR SEMI LOW DENSITY CONCRETE MULTIPLY VALUES IN TABLE BY 1.2

BAR SIZE	fc = 25		fc = 30		fc = 35		fc = 40		fc = 50	
	BOTTOM	TOP								
10	180 (7")	160 (6")	150 (6")	150 (6")	150 (6")	150 (6")	150 (6")	150 (6")	150 (6")	150 (6")
15	270 (11")	240 (9")	230 (9")	230 (9")	210 (8")	210 (8")	190 (7")	190 (7")	190 (7")	190 (7")
20	350 (14")	320 (13")	300 (12")	300 (12")	280 (11")	280 (11")	250 (10")	250 (10")	250 (10")	250 (10")
25	440 (17")	400 (16")	370 (15")	370 (15")	350 (14")	350 (14")	310 (12")	310 (12")	310 (12")	310 (12")
30	530 (21")	480 (19")	450 (18")	450 (18")	420 (17")	420 (17")	380 (15")	380 (15")	380 (15")	380 (15")
35	620 (24")	560 (22")	520 (20")	520 (20")	490 (19")	490 (19")	440 (17")	440 (17")	440 (17")	440 (17")

TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICES - BAR GRADE 500 MPa T3505 DEC 12

DRAWINGS FOR FOUNDATIONS/SLAB ON GRADE ONLY. SUPERSTRUCTURE DESIGN, SUPPLY AND ERECTION BY LIGHT GAUGE METAL SUBCONTRACTOR. SUPERSTRUCTURE FRAMING SHOWN IN THESE DRAWINGS SCHEMATIC ONLY. SEE OTHER CONSULTANTS DRAWINGS FOR ADDITIONAL REQUIREMENTS. CHANGE IN SECTION DIMENSION REQUIRE CONSULTANTS APPROVAL



15Y126-005A
For Bid Purposed and Not for Construction

revision	description	date
04	Issued for Tender	2016 01 29
03	99% Progress Set	2016 01 11
02	66% Progress Set	2015 10 30
01	33% Progress Set	2015 10 09

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

Detail No.	where detail required
A	drawing no. - ou détail exigé
B	drawing no. - ou détail exigé
C	drawing no. - ou détail exigé

project title
titre du projet
EGBERT Ontario

6248 8TH LINE, L0L 1N0
NEW HYDROGEN GENERATION (HOGEN) AND BALLOON LAUNCHING BUILDING

drawing title
titre du dessin
PLANS AND TYPICAL DETAILS

drawn by
dessiné par **SKC**

designed by
conçu par **DXC**

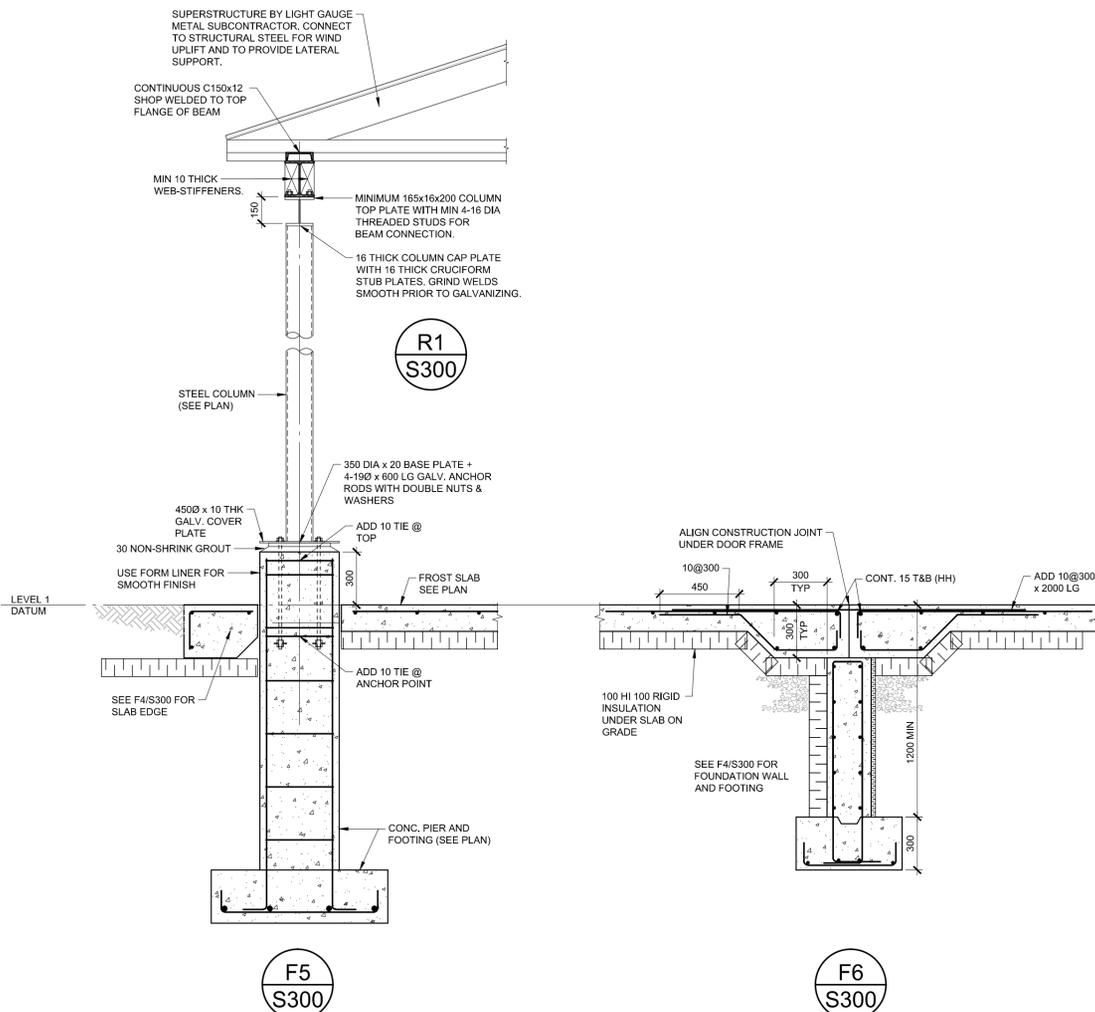
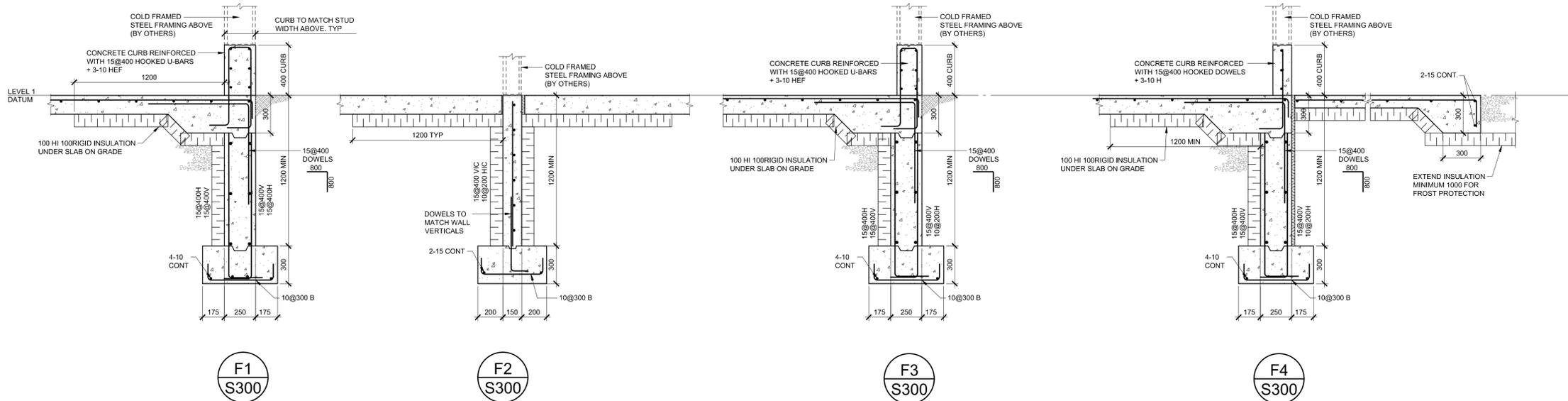
approved by
approuvé par **JXS**

bid offer
offre

project date
date du projet **2016-01-11**

project no.
no. du projet **R.071909.001**

drawing no.
dessiné no. **S200**



15Y126-005A
 For Bid Purposed and Not for Construction

04	Issued for Tender	2016 01 29
03	99% Progress Set	2016 01 11
02	66% Progress Set	2015 10 30
01	33% Progress Set	2015 10 09
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

A B C	A	Detail No.
	B	drawing no. - where detail required dessin no. - où détail exigé
	C	drawing no. - where detailed dessin no. - où détaillé

project title / titre du projet: **EGBERT Ontario**
 6248 8TH LINE, L0L 1N0
 NEW HYDROGEN GENERATION (HOGEN) AND BALLOON LAUNCHING BUILDING

drawing title / titre du dessin: **SECTIONS**

drawn by / dessiné par	SKC
designed by / conçu par	DXC
approved by / approuvé par	JXS
bid / offre
project manager / administrateur de projets

project date / date du projet: **2016-01-11**

project no. / no. du projet: **R.071909.001**

drawing no. / dessiné no.: **S300**

DRAWINGS FOR FOUNDATIONS/SLAB ON GRADE ONLY. SUPERSTRUCTURE DESIGN, SUPPLY AND ERECTION BY LIGHT GAUGE METAL SUBCONTRACTOR. SUPERSTRUCTURE FRAMING SHOWN IN THESE DRAWINGS SCHEMATIC ONLY. SEE OTHER CONSULTANTS DRAWINGS FOR ADDITIONAL REQUIREMENTS. CHANGE IN SECTION DIMENSION REQUIRE CONSULTANTS APPROVAL