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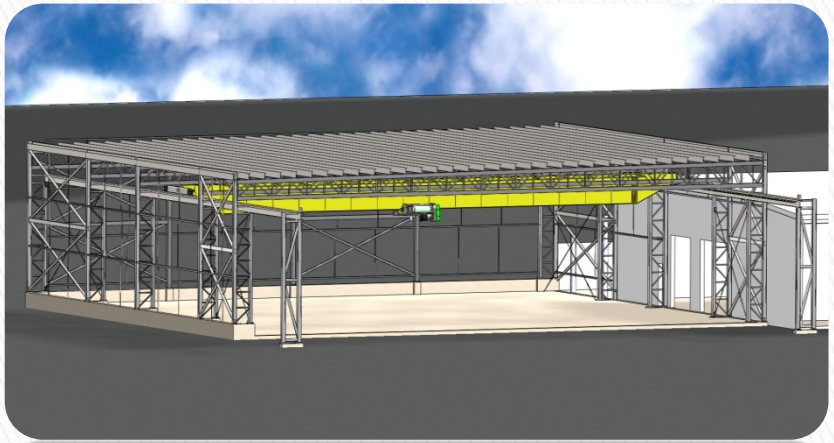

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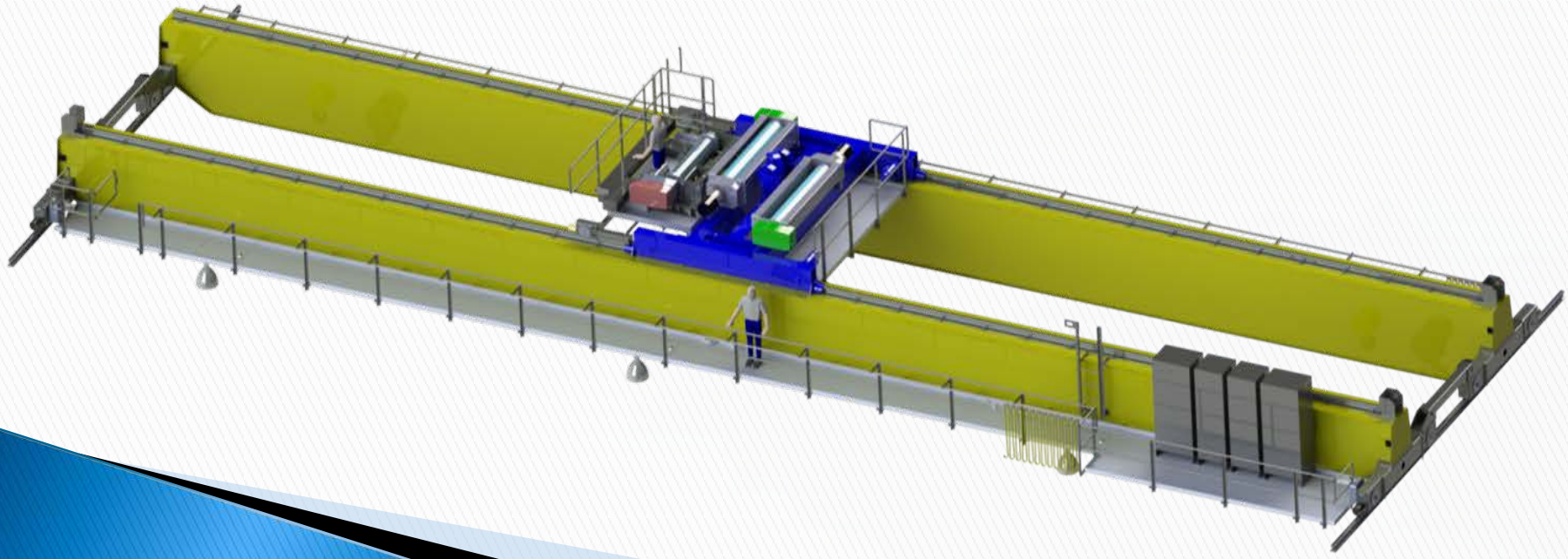
PRINCIPAL LIFTING EQUIPMENT PROJECTS



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Project *SNC Lavalin / Arcelor Mittal Mont Wright*

- TRDG 120T+60T, 69, 50
- TRDG 060T+15T, 76, 55
- TRDG 045T+45T, 75, 55
- TRDG 070T+15T, 92, 95
- TRDG 015T, 46, 86

- 9 motorized jibs (2 000 kg)
- 1 motorized jibs (10 000 kg)

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TRDG 120T+60T, 69, 50

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Project *SNC Lavalin / Arcelor Mittal Mont Wright*

TRDG 070T+15T, 92, 95

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Project *SNC Lavalin / Arcelor Mittal Mont Wright*

TRDG 045T+45T, 75, 55

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Project *SNC Lavalin / Arcelor Mittal Mont Wright*

10 000 kg capacity motorized jib

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Project *Acier Pacific*

TRDG 2X10T,105,30 & TRDG 2X10T,80,30

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Project *Acier Picard, Varennes*

11 Overhead cranes 2X5,000kg & 1 Overhead crane 2X7,500kg

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Project *Acier Picard, Varennes*

11 Overhead cranes 2X5,000kg & 1 Overhead crane 2X7,500kg

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Project *ABF*

Gantry 2MT capacity, variable span (9@15m)

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Project *ABF*

Gantry 2MT capacity, variable span (9@15m)

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Project *Acier Orford*

Gantry 2MT capacity, variable span (9@15m)

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Project *Osisko*

75 000 kg capacity overhead crane

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Project *XSTRATA Nickel*

Overhead cranes TRDG 20,06,06C (Stool down Trolley)

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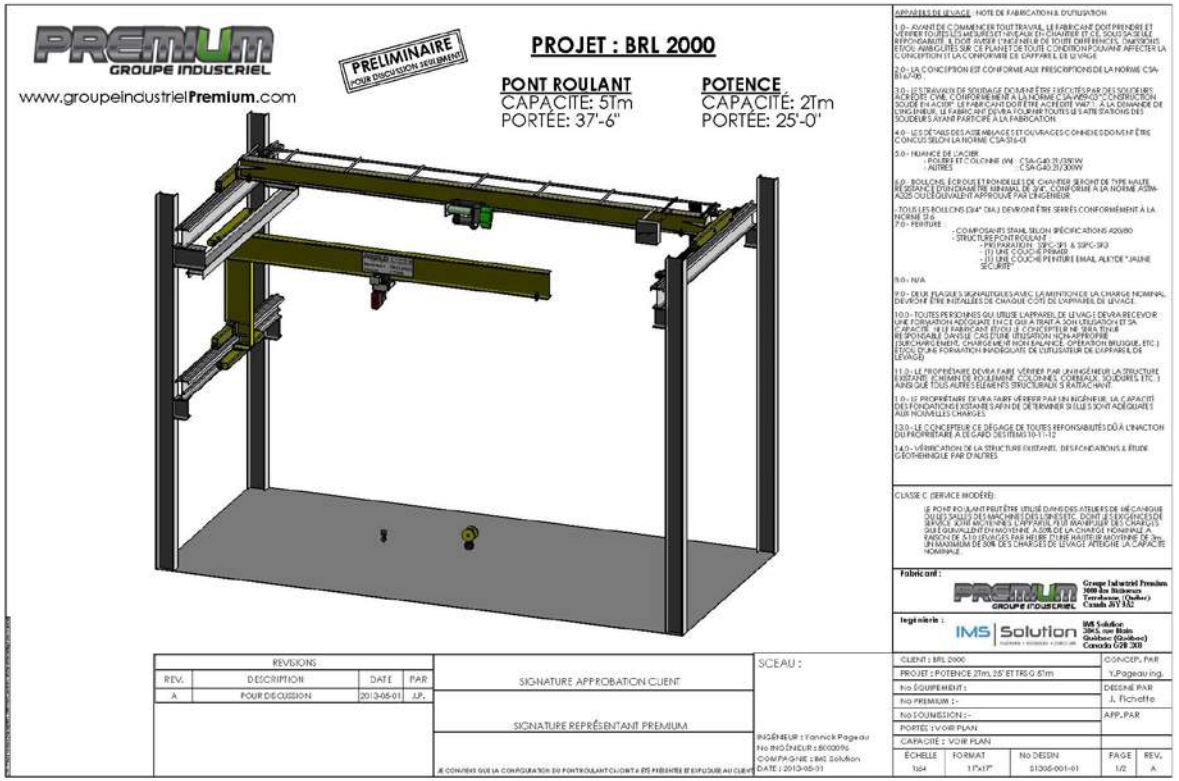
Project *BRL 2000*

2MT Wall cantiliver jib crane 25’ span & 5TM TRSG 37’-6’’ span



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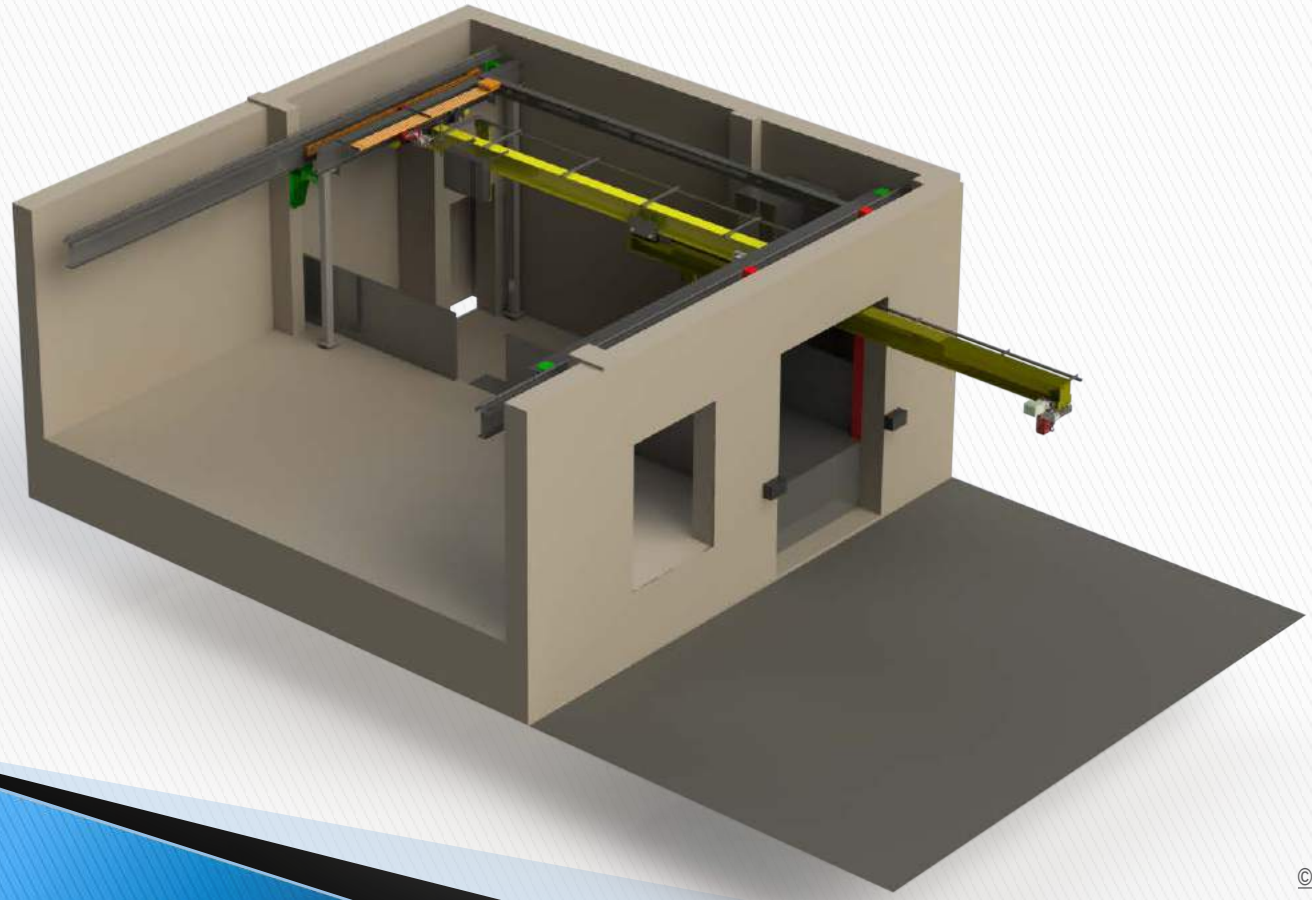
Project *Université Laval*

1MT Telescopic overhead crane



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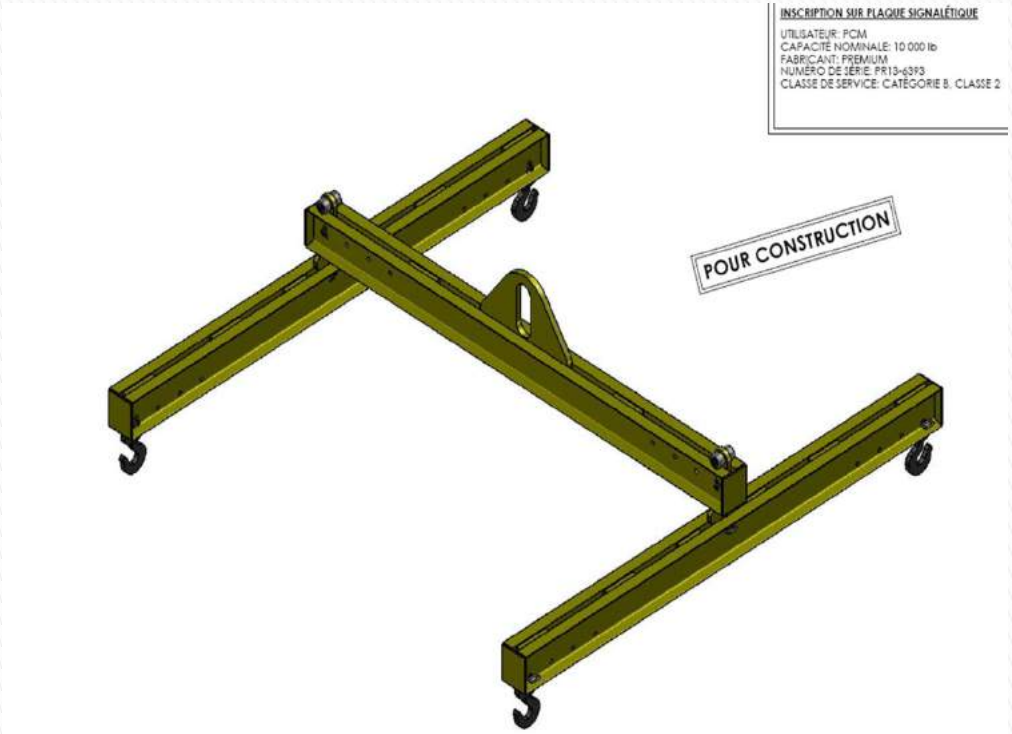
Project *4 adaptable hooks*

10 000 lb capacity spreader beam



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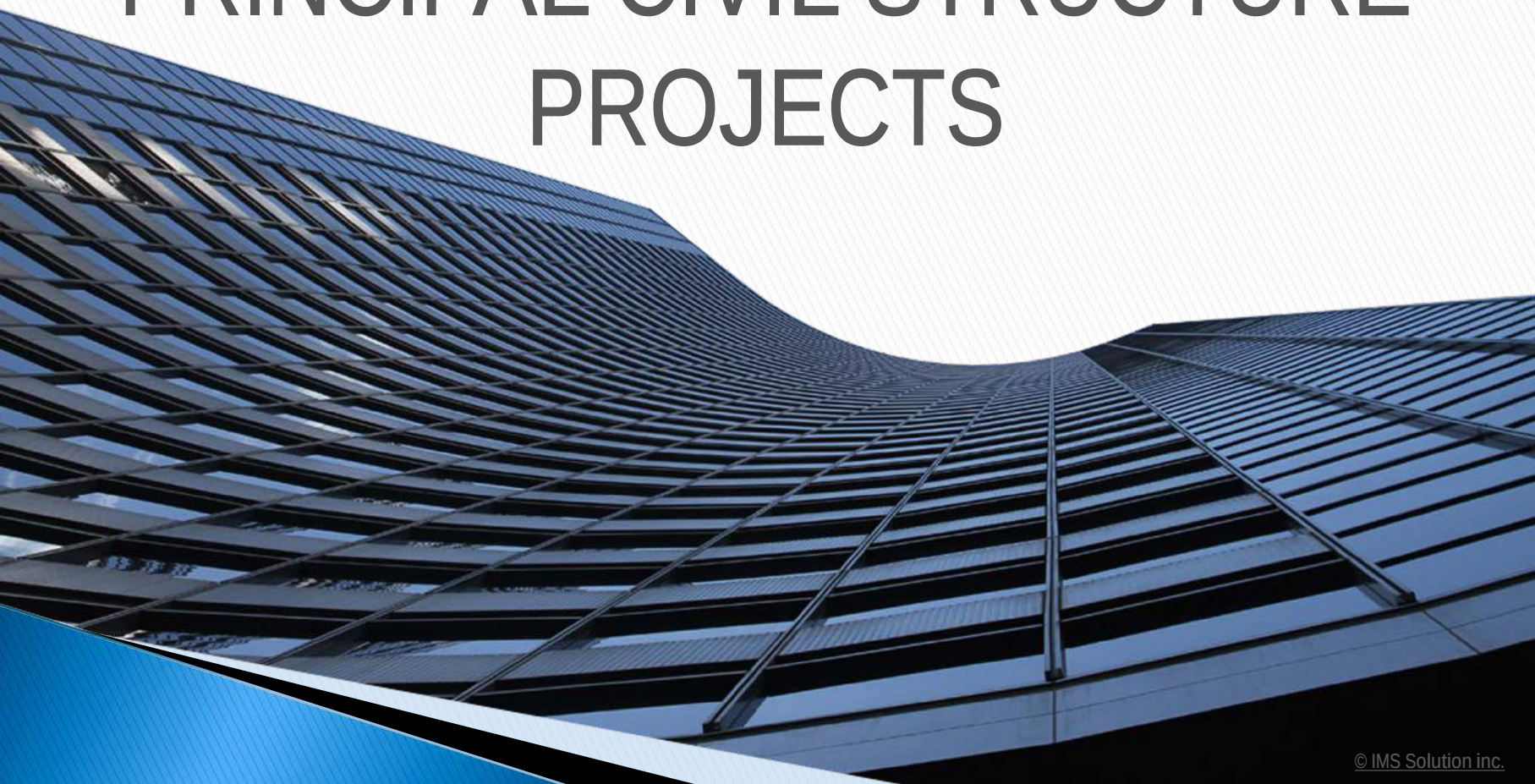
PRINCIPAL CIVIL STRUCTURE PROJECTS



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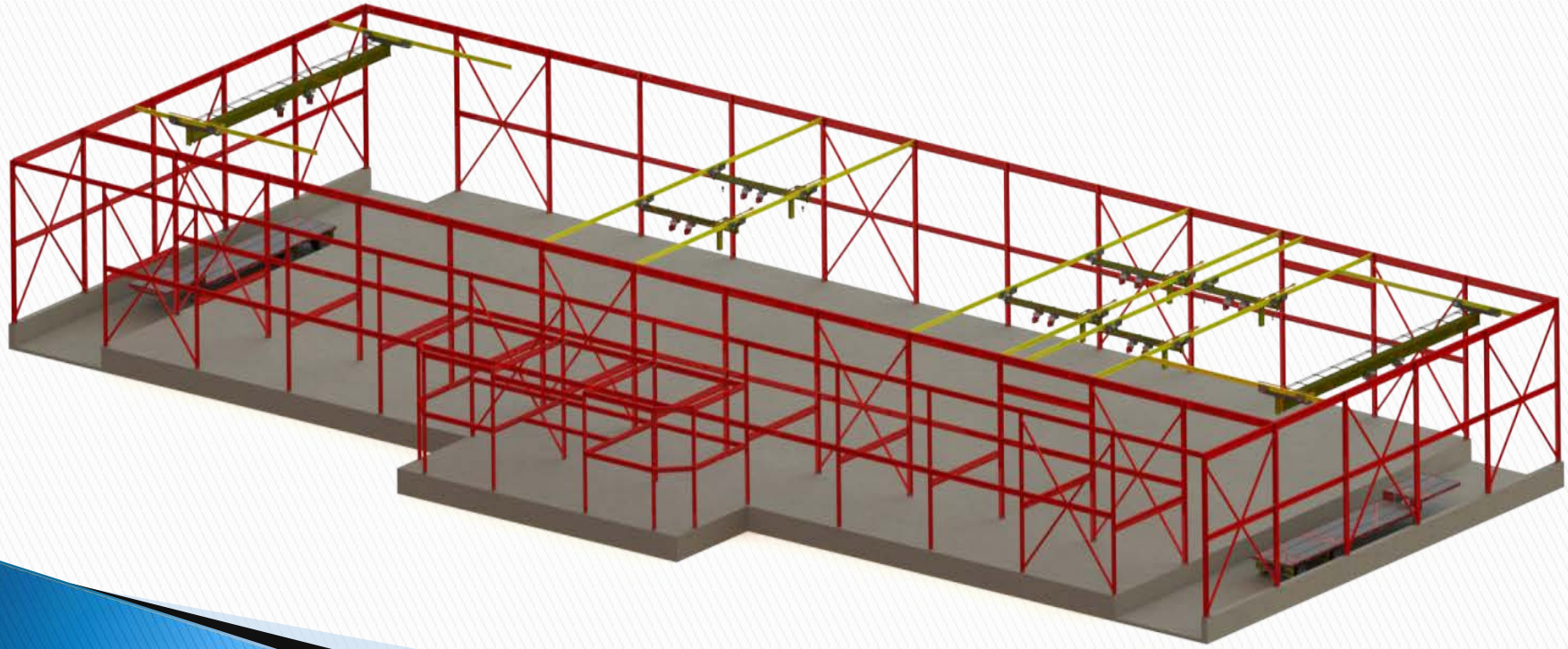
Project *Peinture GS*

Structural design of a new factory building 260’-0’’x100’-0’’
8 x URSG 2 x 6.3 MT capacity



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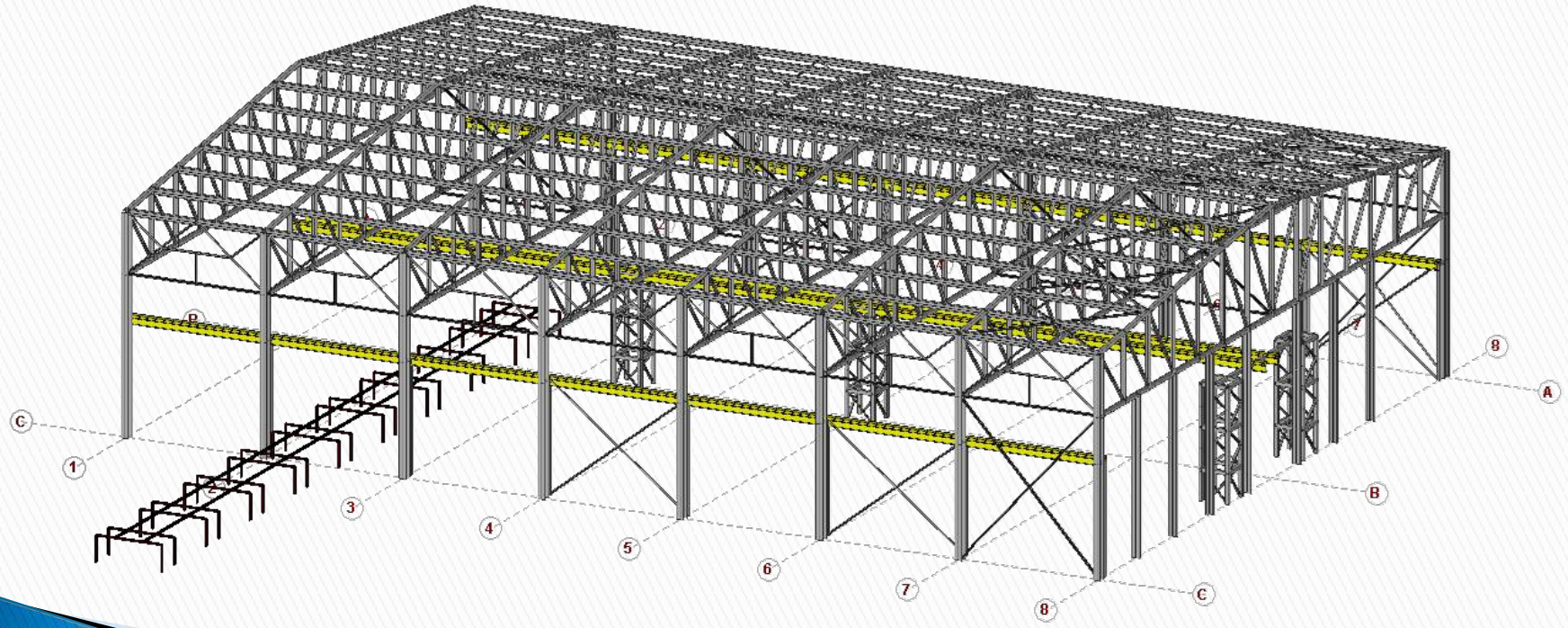
Project *Béton Brunet*

Complete structure certification after adding 2xTRSG 10MT & TRSG 20MT



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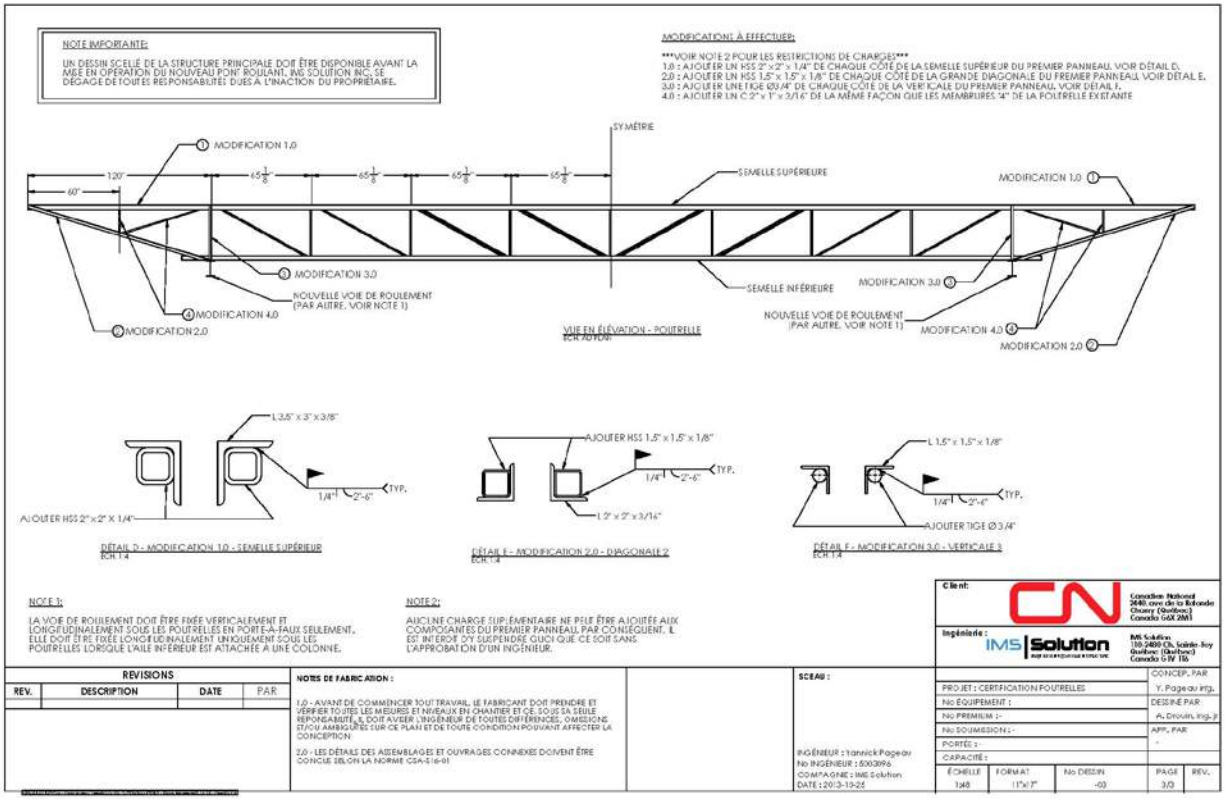
Project *Canadien National*

Structure reinforcement



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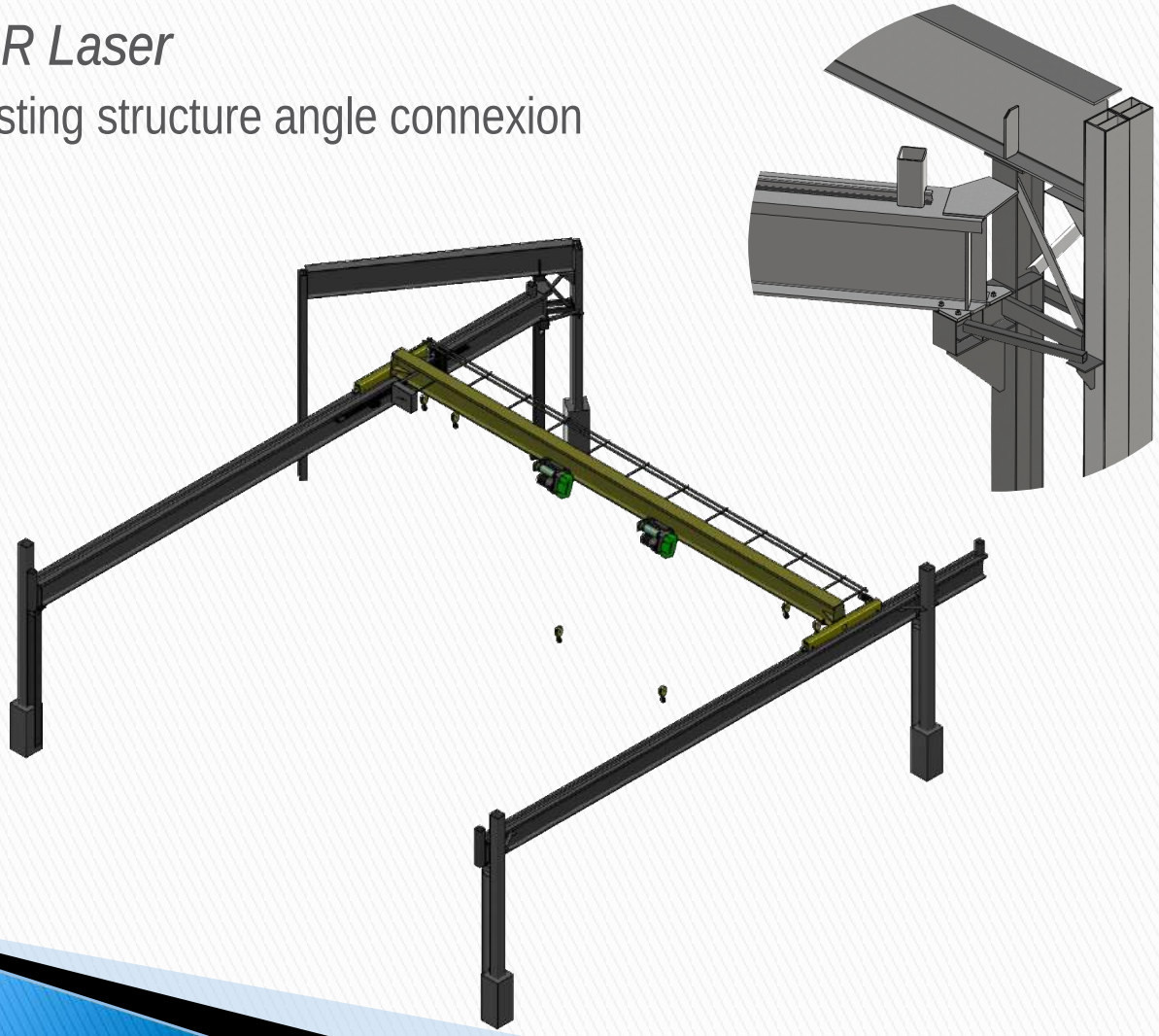
Project *CBR Laser*

Existing structure angle connexion



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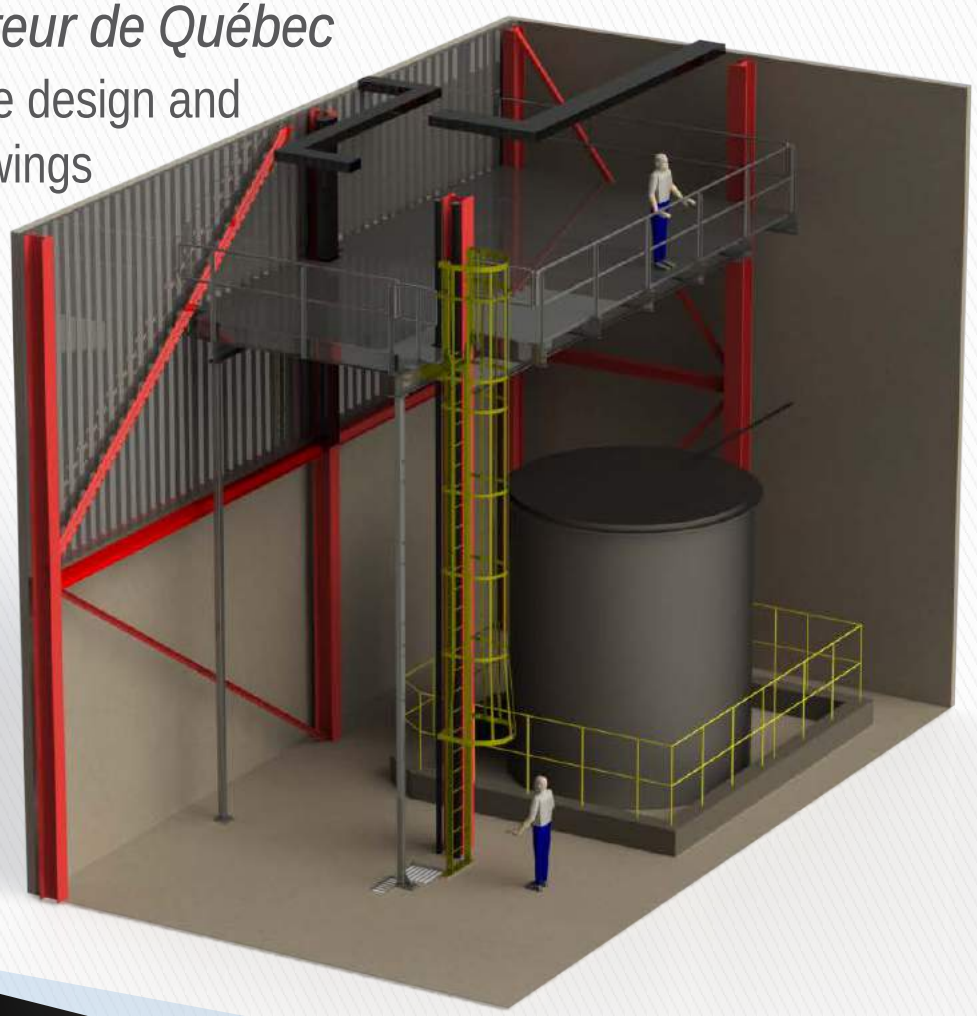
Project *Incinérateur de Québec*

Mezzanine design and Shop drawings



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Project *Silos structure*

4x150MT Silos

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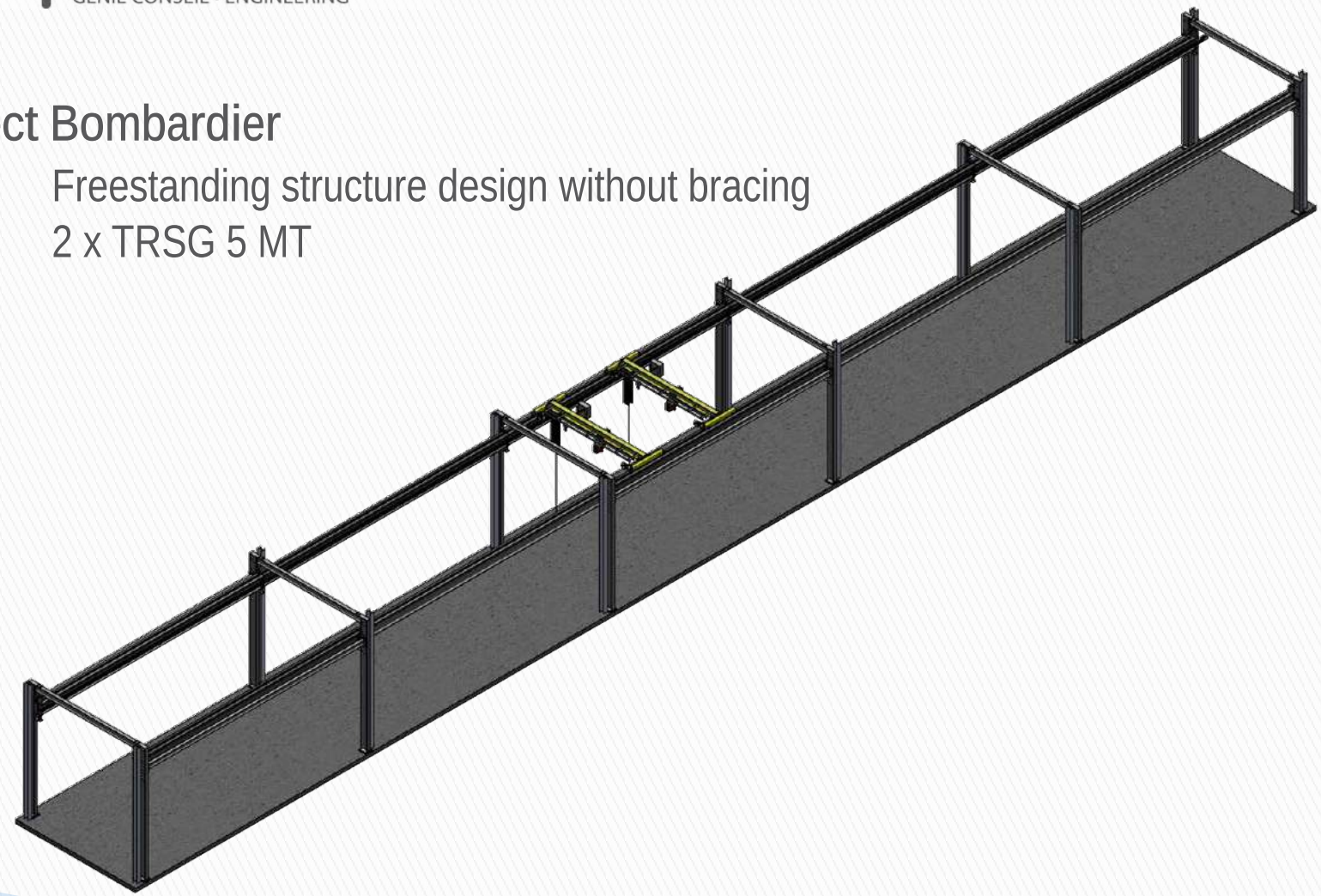
Project Bombardier

Freestanding structure design without bracing

2 x TRSG 5 MT



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Project *Lexitar (Alberta)*

Building extension design

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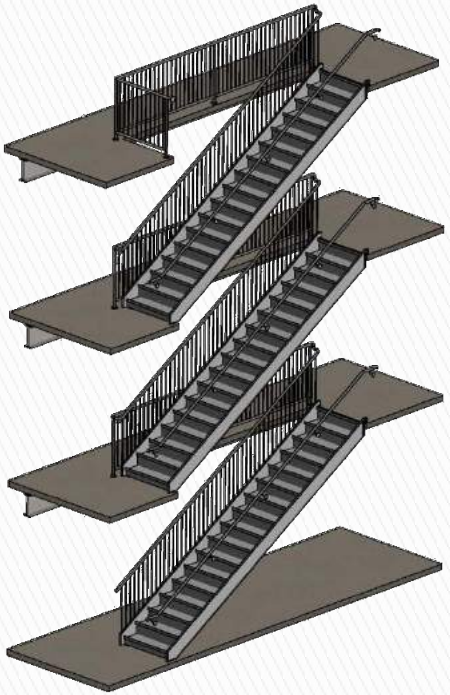
PRINCIPAL MECHANICAL AND STRUCTURE SHOP DRAWINGS PROJECTS



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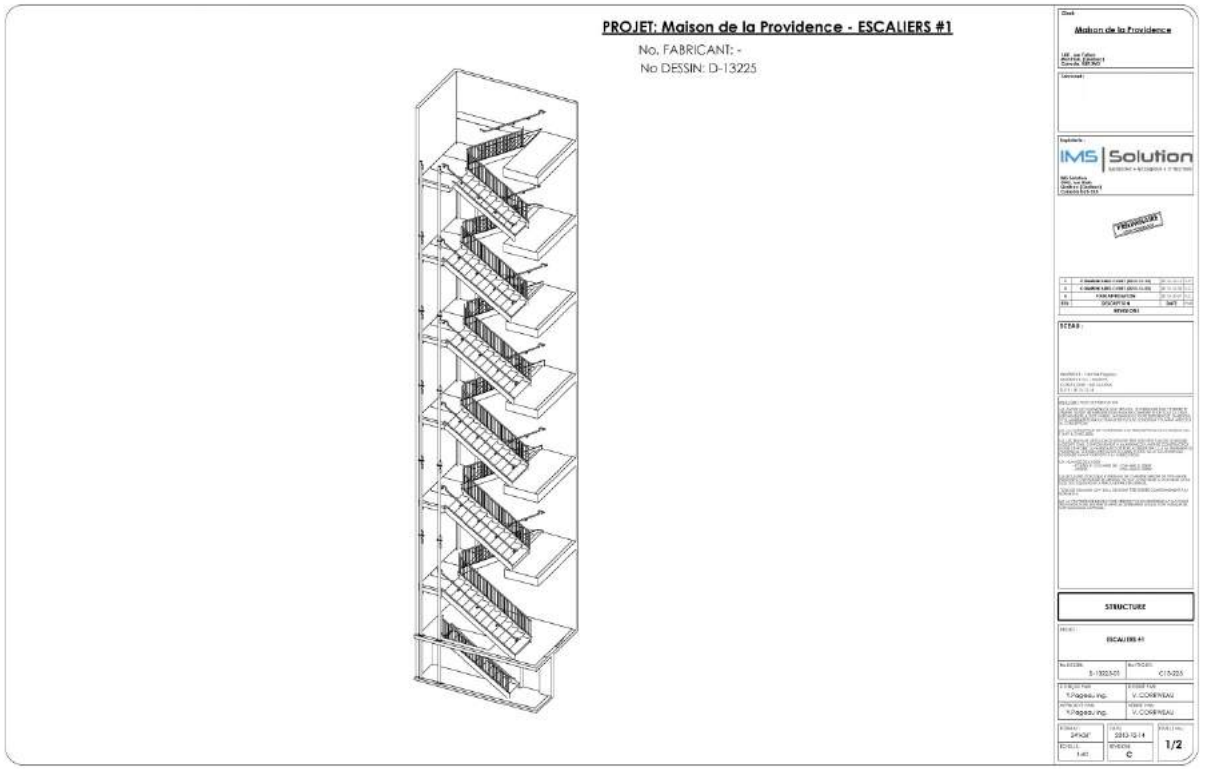
Project *Staircase*

7-floor staircase Shop Drawings



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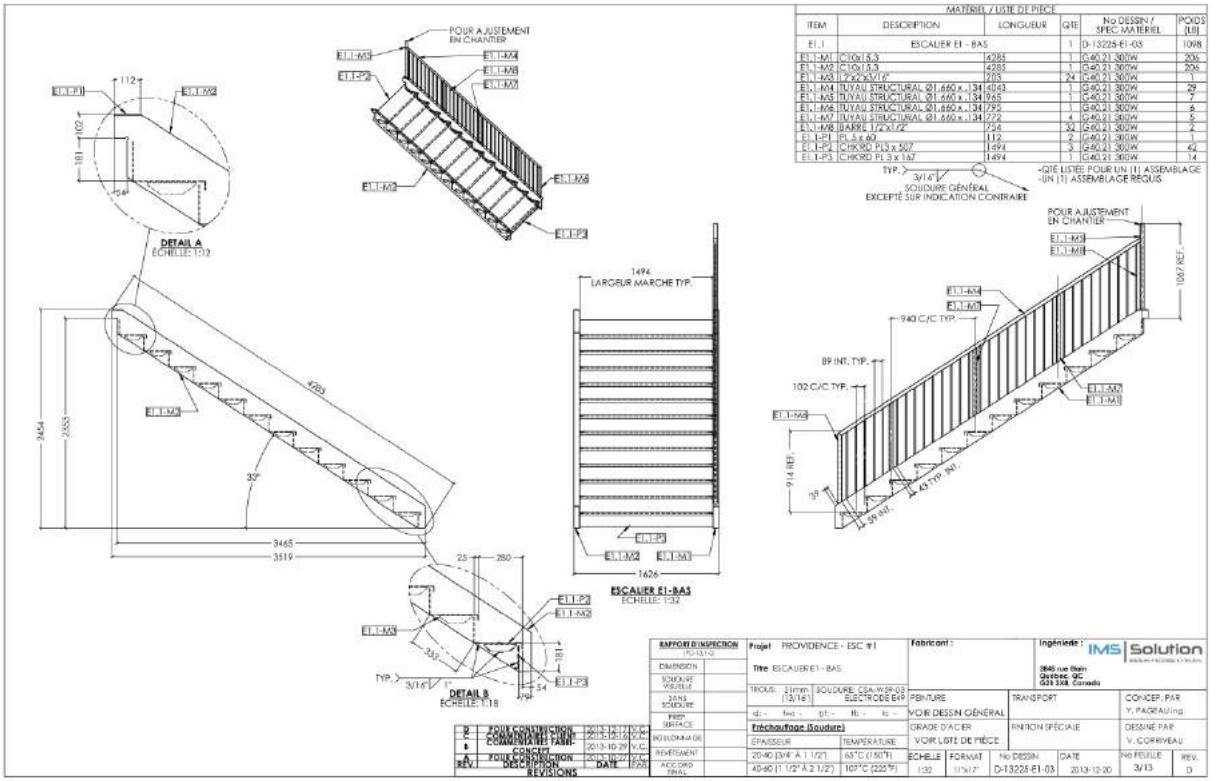
Project *Staircase*

7-floor staircase Shop Drawings



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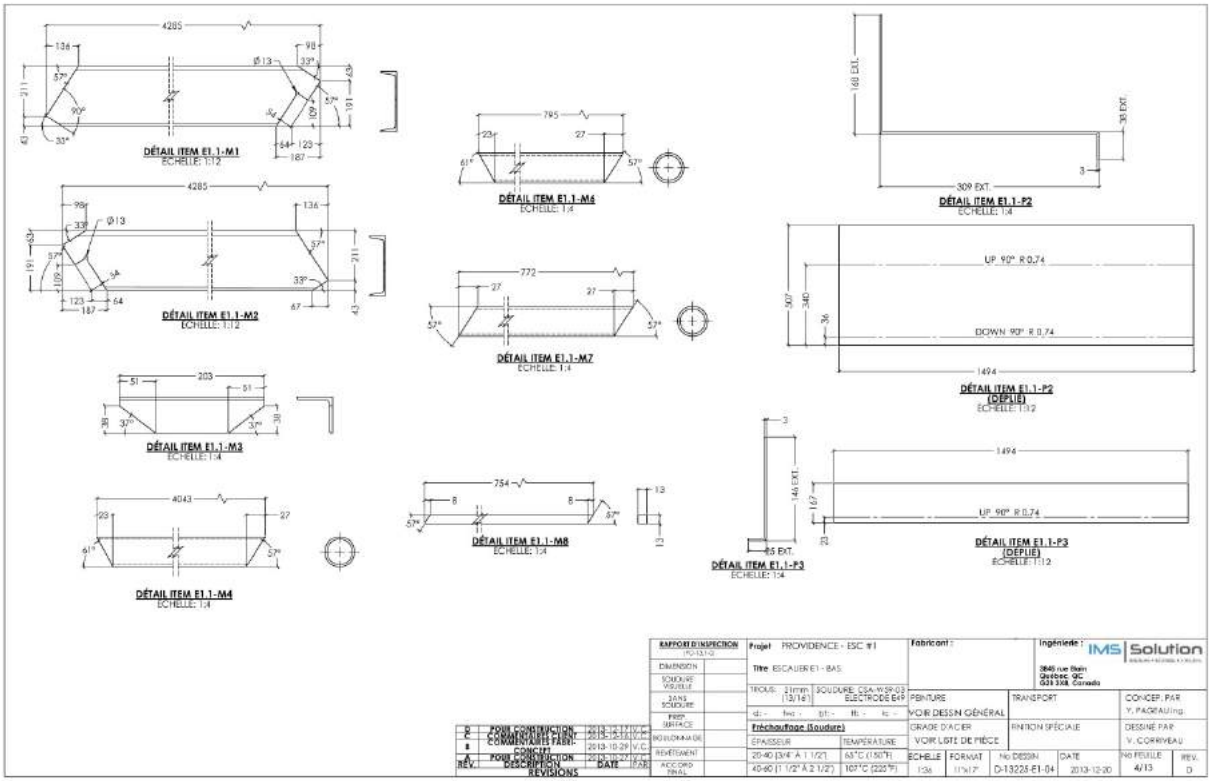
Project *Staircase*

7-floor staircase Shop Drawings



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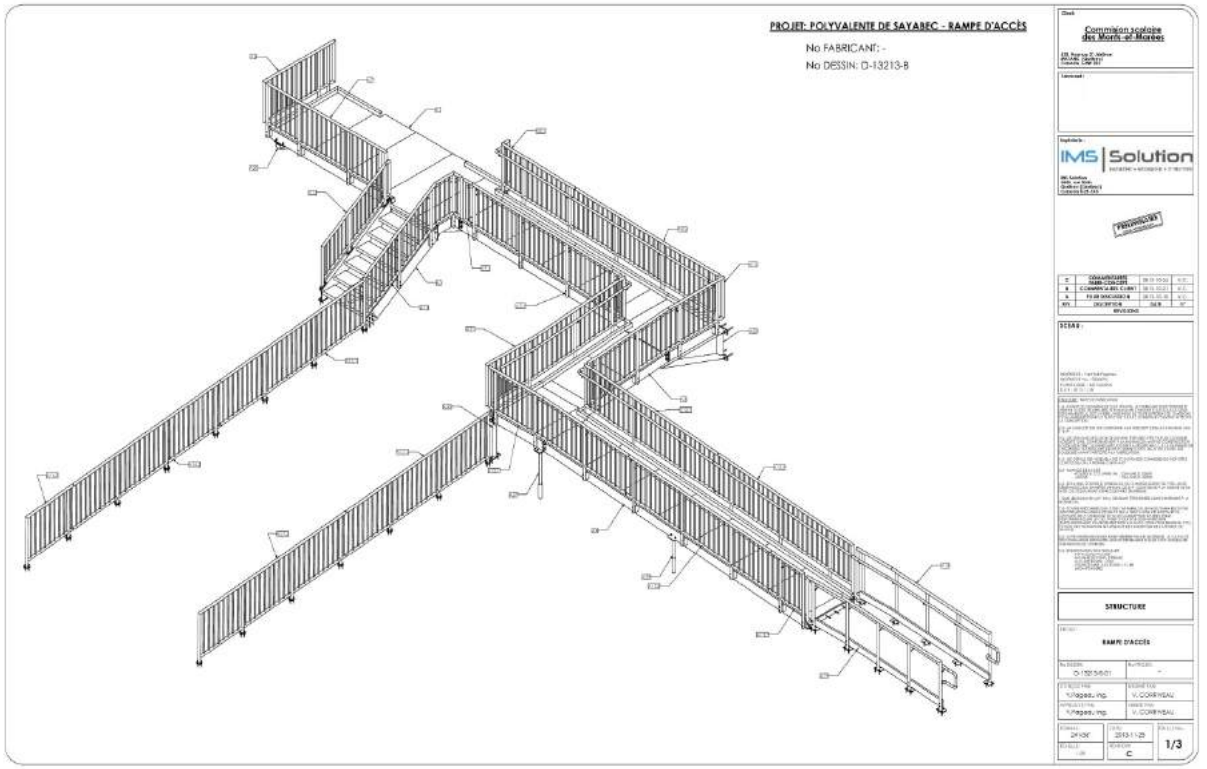
Project *Polyvalente de Sayabec*

Access ramp Shop Drawings



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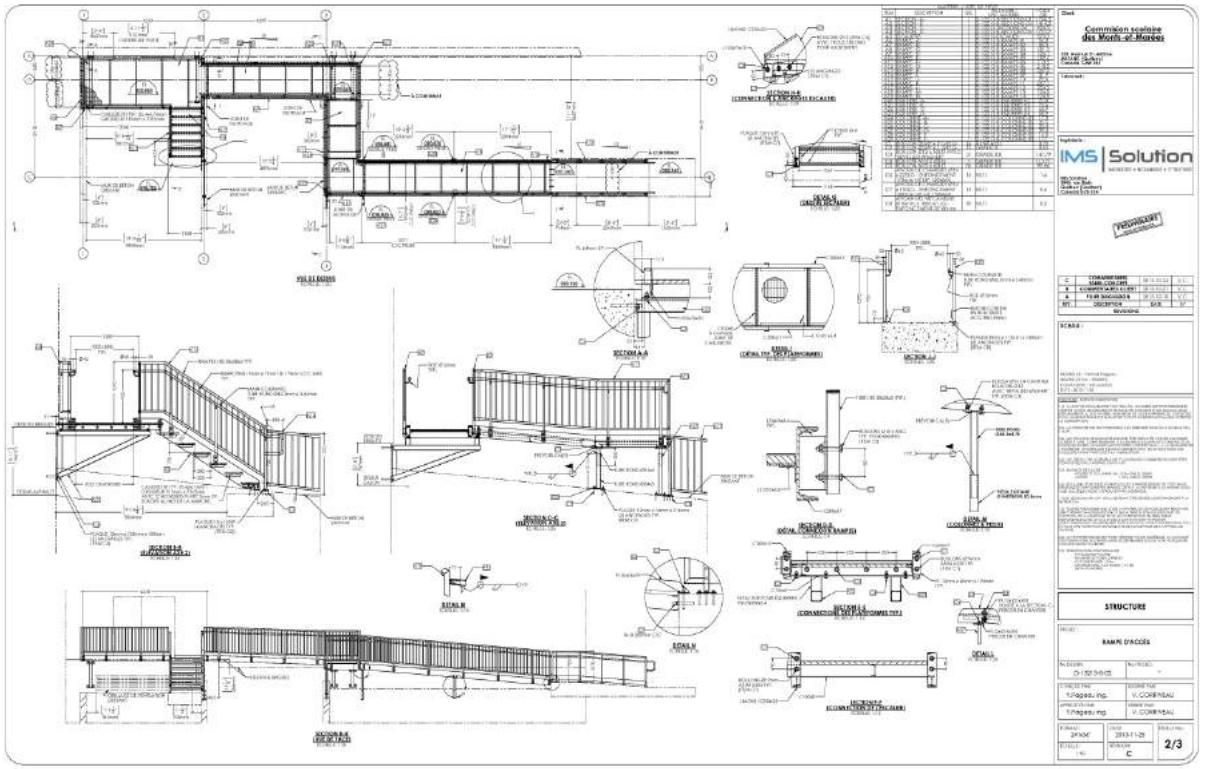
Project *Polyvalente de Sayabec*

Access ramp Shop Drawings



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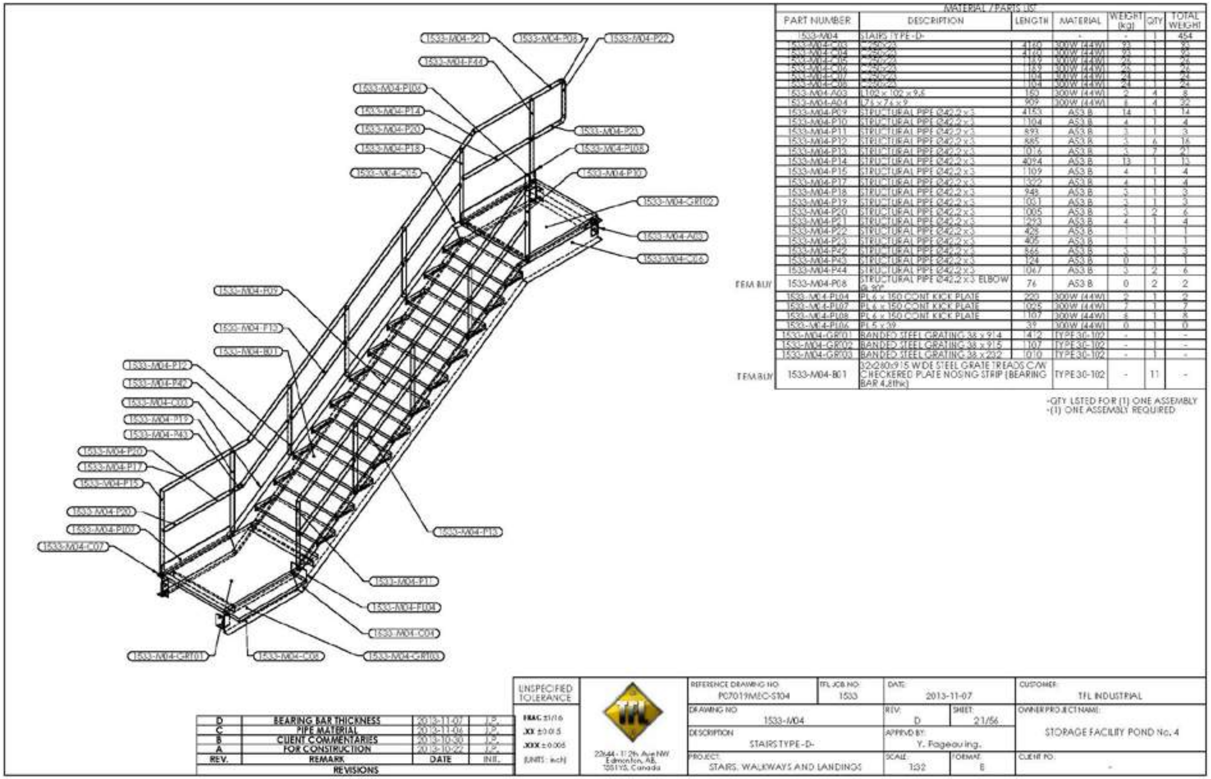
Project *TFL Industrial*

Pump access stairs Shop Drawings



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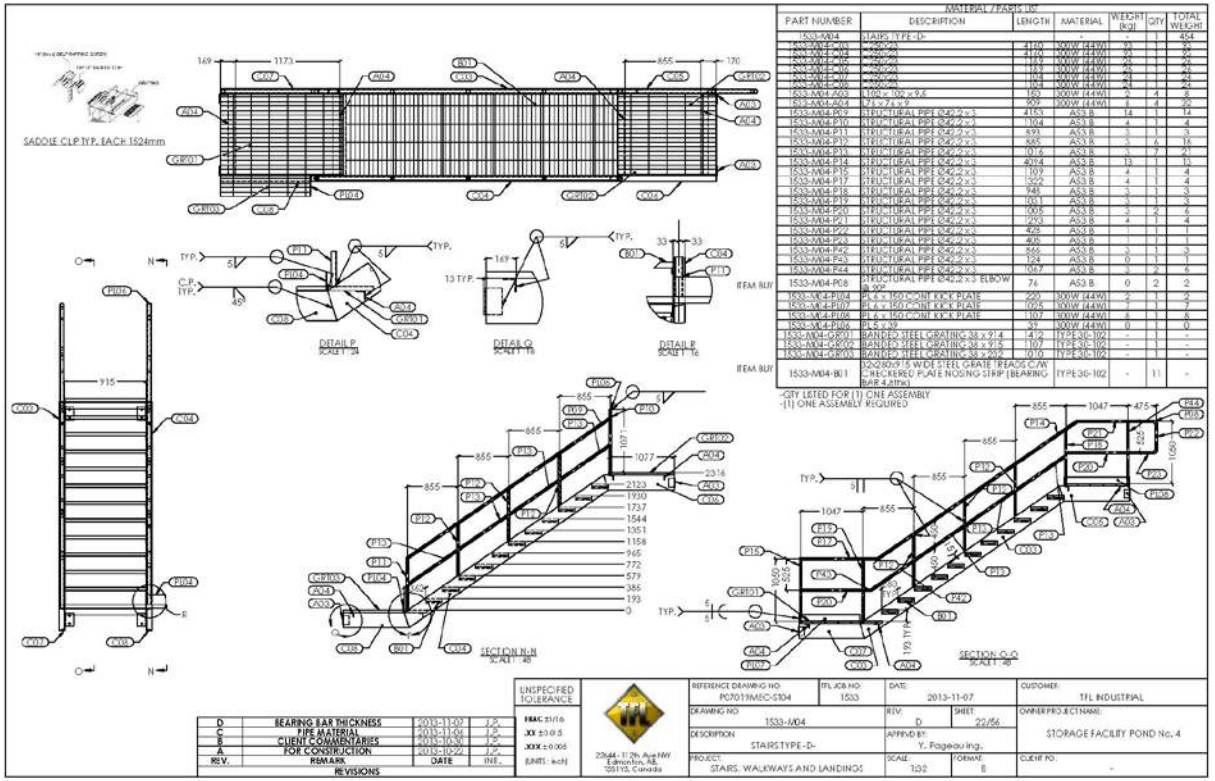
Project *TFL Industrial*

Pump access stairs Shop Drawings



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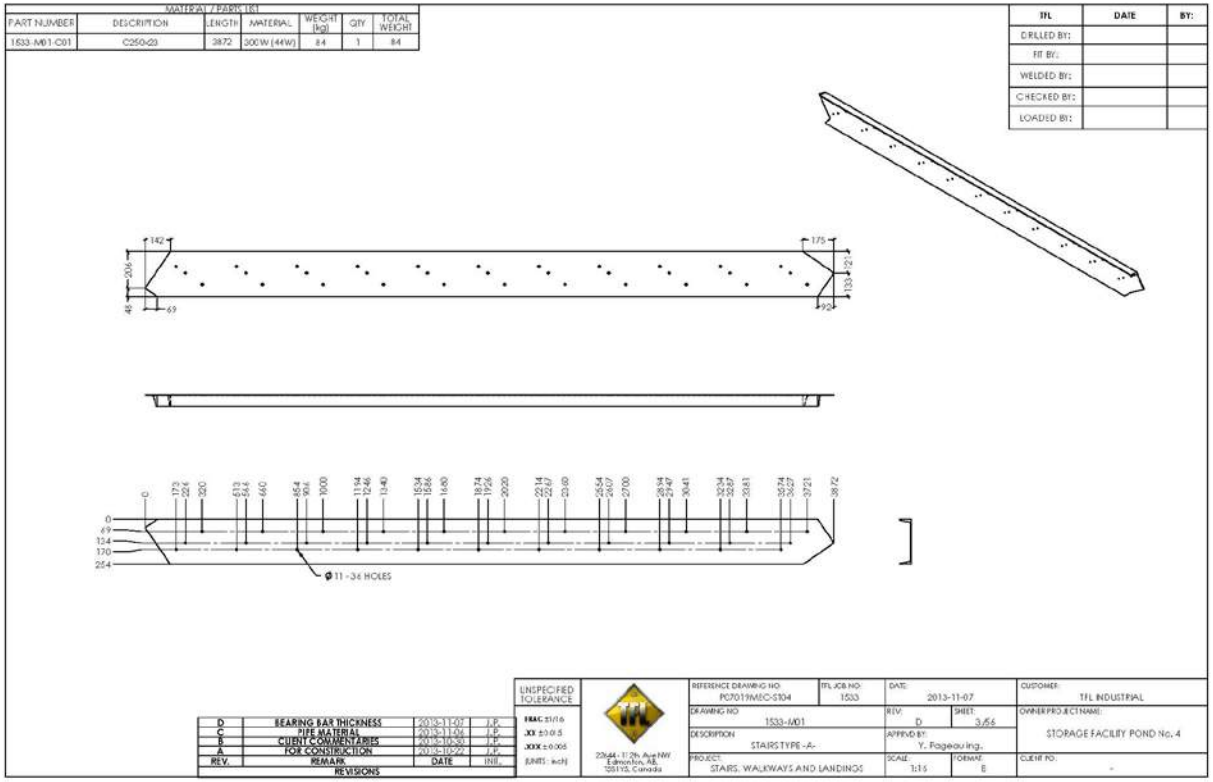
Project *TFL Industrial*

Pump access stairs Shop Drawings



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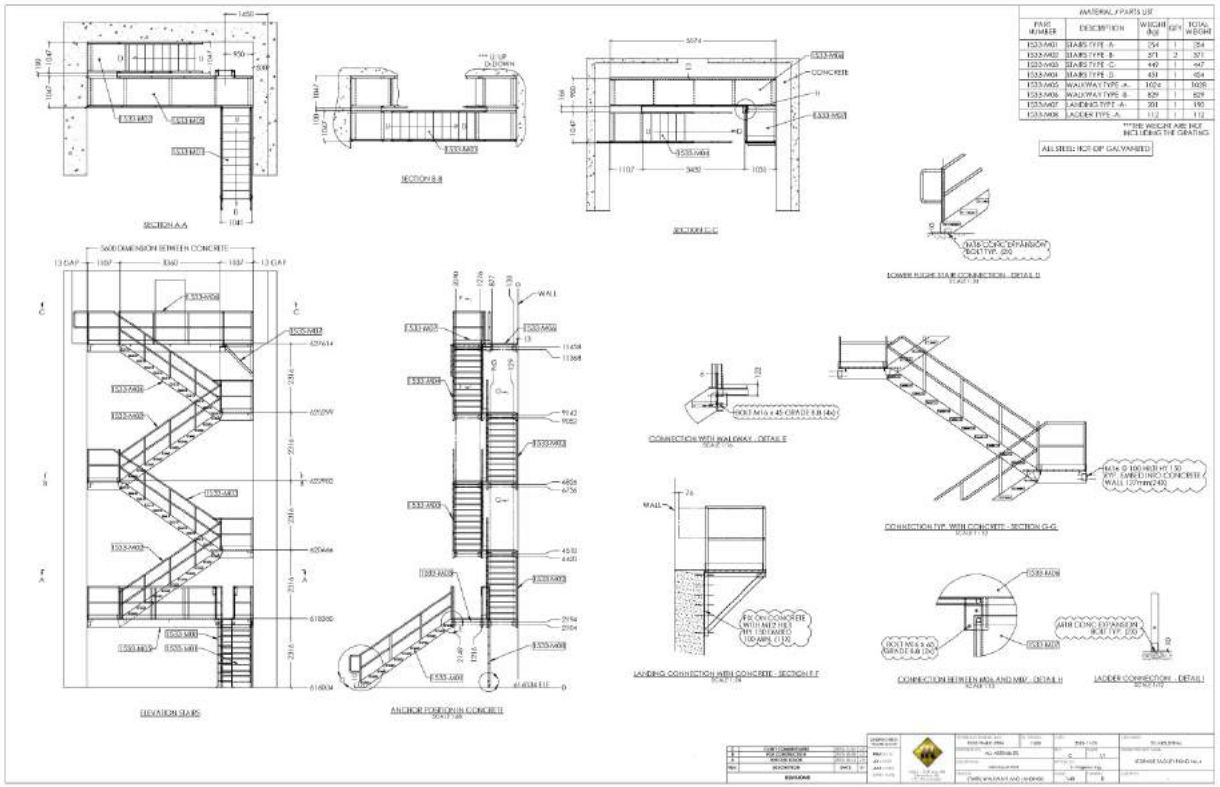
Project *TFL Industrial*

Pump access stairs Installation Drawings



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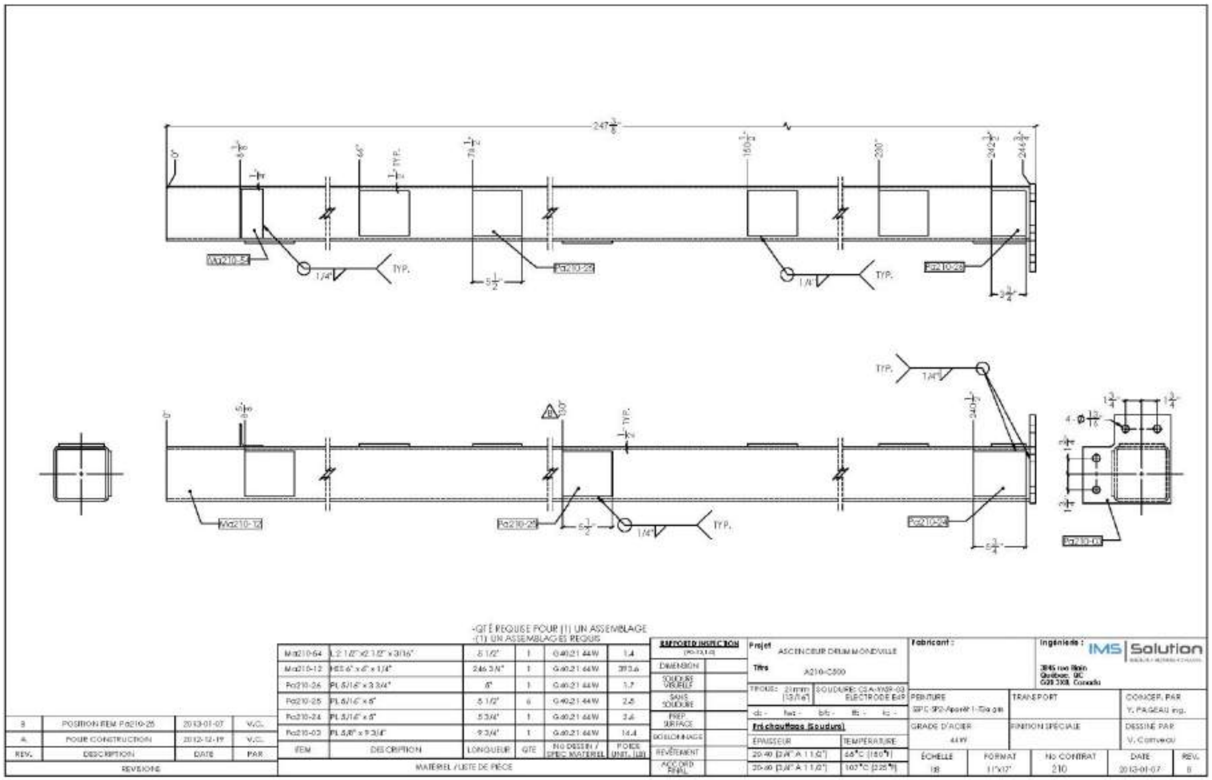
Project *Soucy Belgen*

Elevator Shop drawings structure



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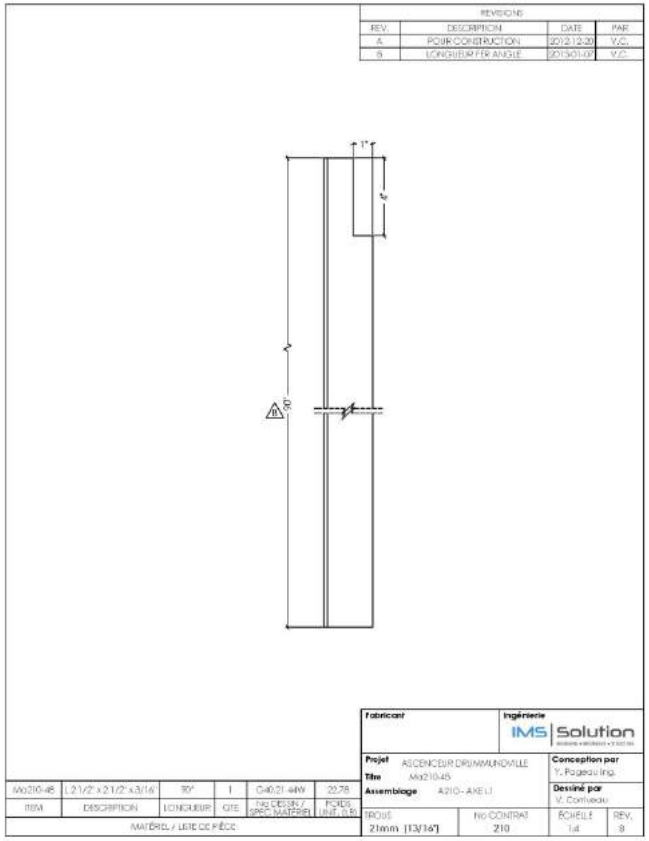
Project *Soucy Belgen*

Elevator Shop drawings structure



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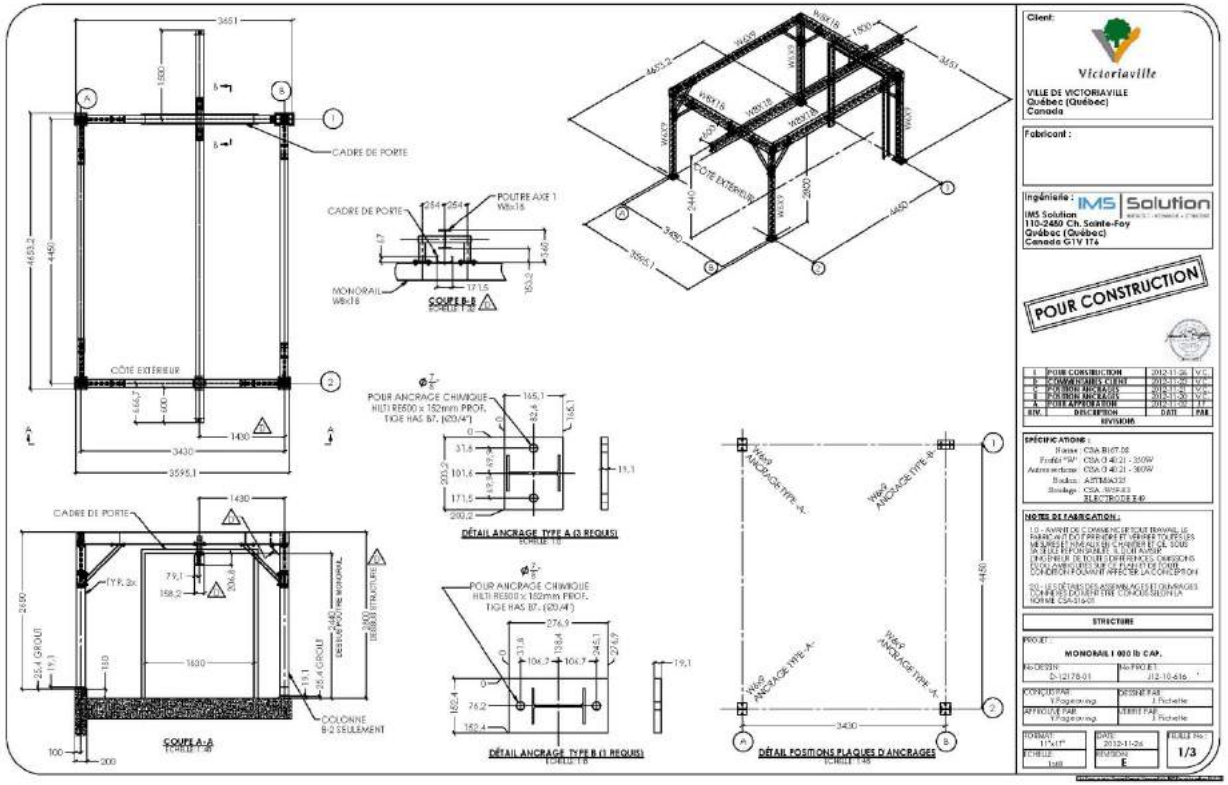
Project *Ville de Victoriaville*

Monorail Shop Drawings



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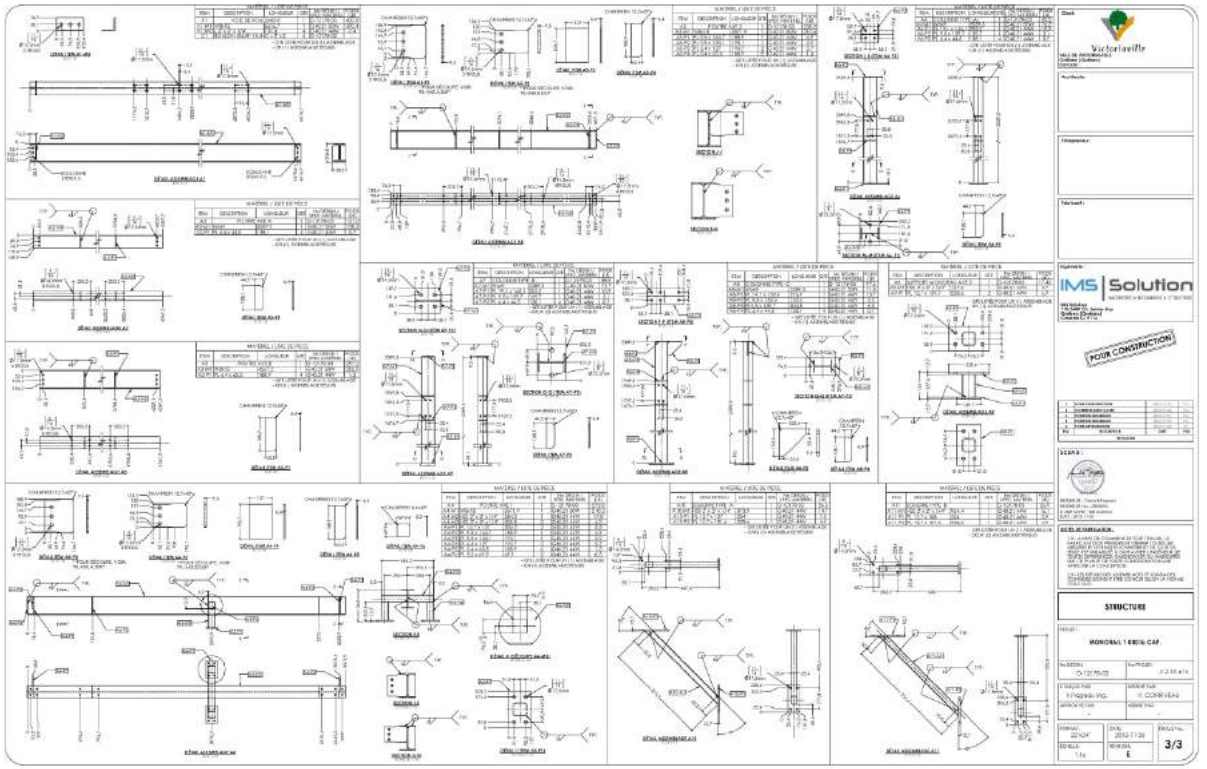
Project *Ville de Victoriaville*

Monorail Shop Drawings



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PRINCIPAL PROJECT MANAGEMENT PROJECTS

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Project *AD Prevost*

Design and Shop Drawings of a URDG 1TM structure

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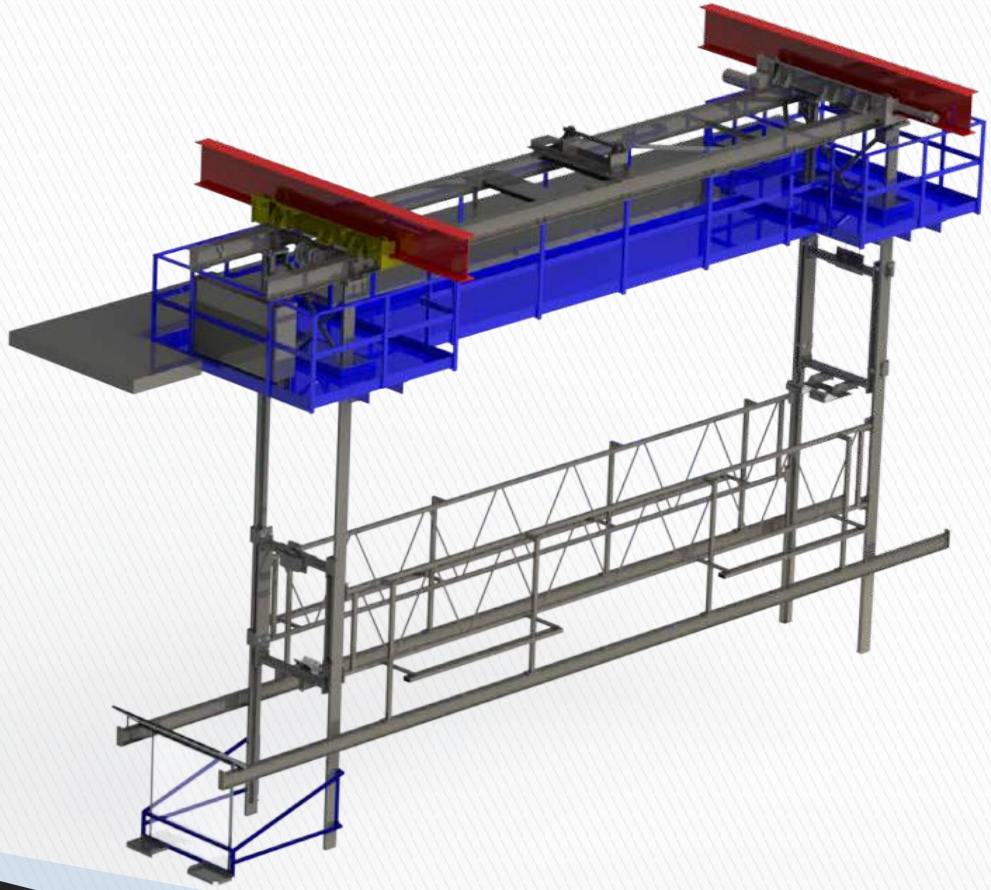
Project *AD Prevost*

Design and Shop Drawings of a URDG 1TM structure



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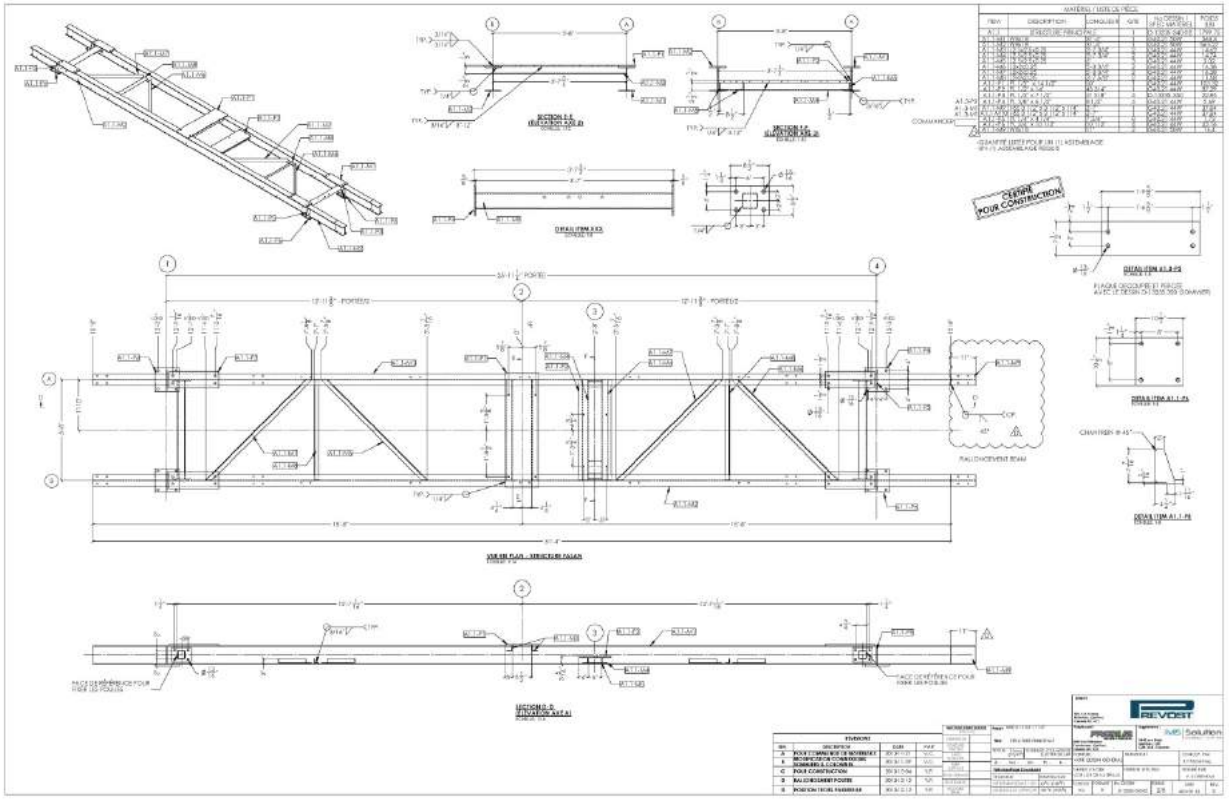
Project *AD Prevost*

Design and Shop Drawings of a URDG 1TM structure



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PRINCIPAL MECHANICAL STRUCTURE PROJECTS

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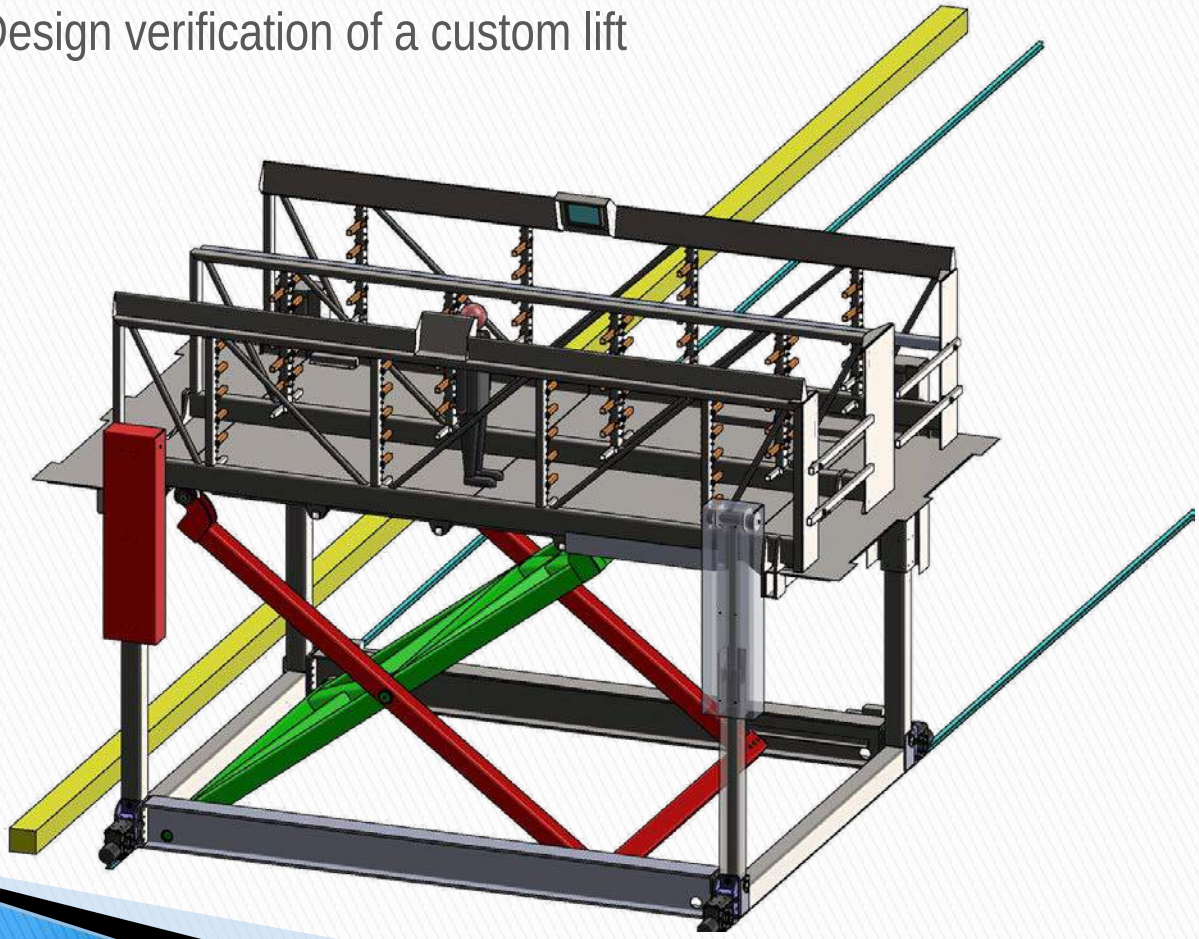
Project *Acier Victoria*

Design verification of a custom lift



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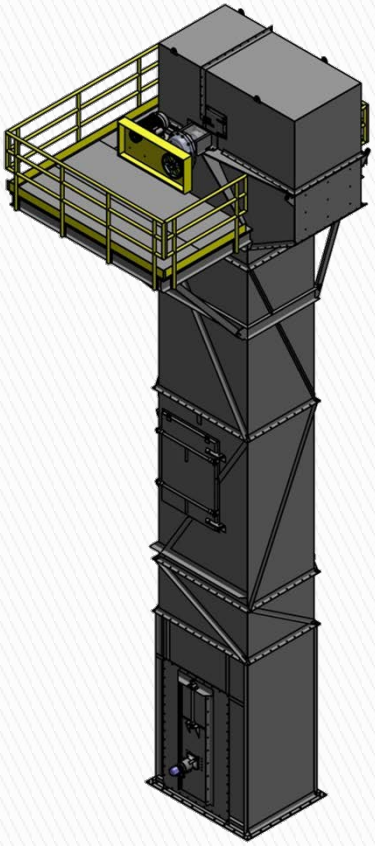
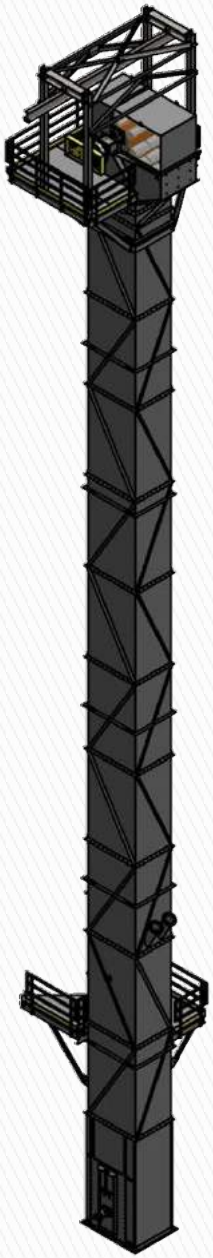
Project *JMS*

Design verification of 2 Bucket elevators



43’-0”



129’-0”

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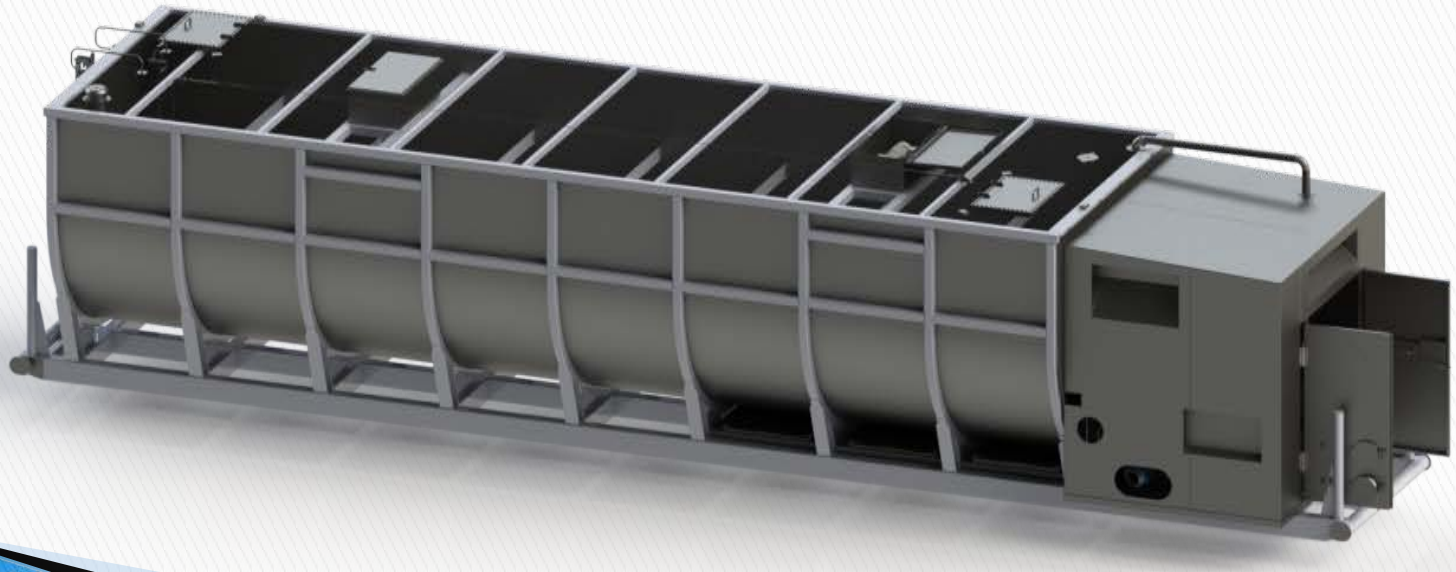

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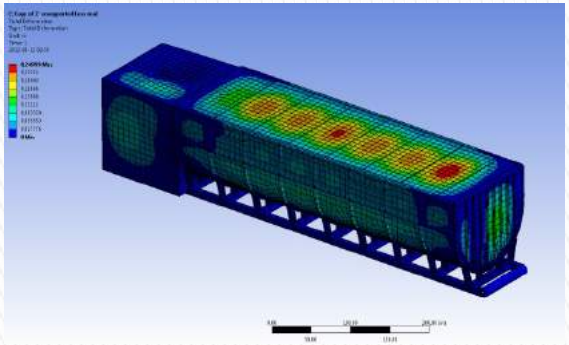
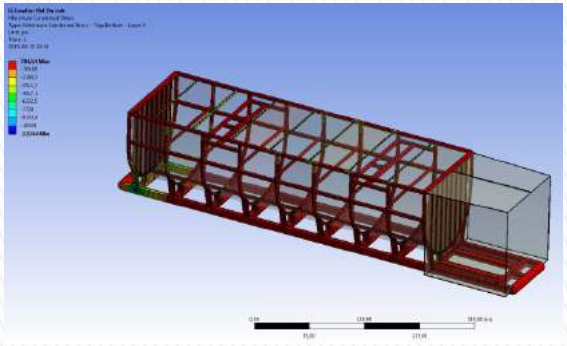
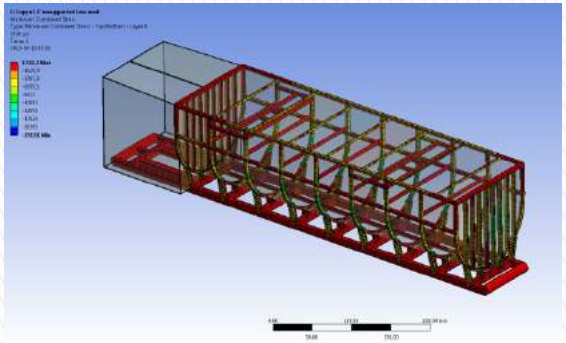
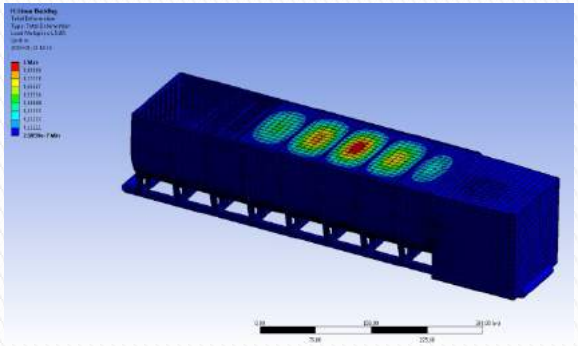
Project *STRAD*

Vessel tank drop test certification









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Project *NRG*

Skid lifting test certification

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(FEA) DEPARTEMENT
FINITE ELEMENT ANALYSIS

3. RESULTS

3.1 – SCENARIO 1, LIFTING CONDITION (EMPTY VESSEL)

Figure 1: *LIFTING CONDITION - Equivalent stress*

The maximum deformation observed is -17.5mm.

This analysis demonstrated a safety factor over 4 for the equivalent stress and 1.1 for the deformation.

The maximum capacity of each lifting lug is 5 300kg.

3.2 – SCENARIO 2, VESSEL FULL OF WATER CONDITION (NO LIFTING)

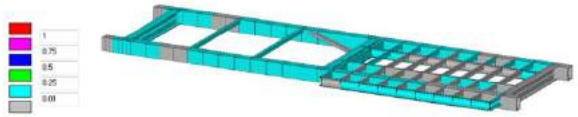

Figure 2: *VESSEL FULL OF WATER - Equivalent Stress*

The maximum deformation observed is -2mm.

This analysis demonstrated a safety factor over 4 for the equivalent stress and 4.5 for the deformation.

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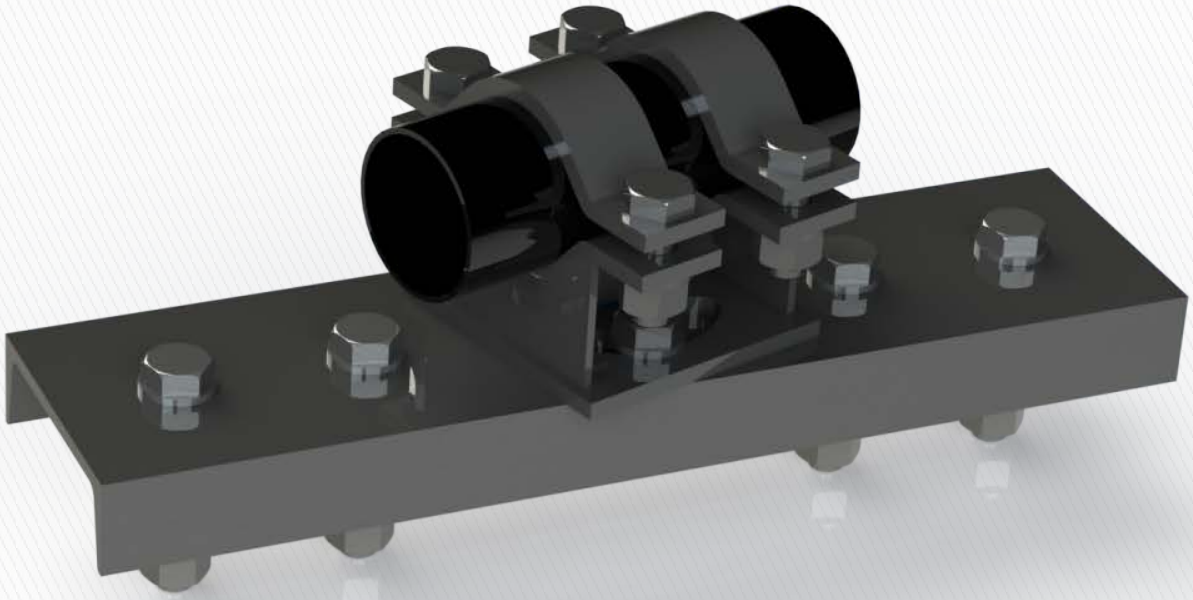
Project *LSC Industrial*

Power line support clamp stress design



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PRINCIPAL SAFE DESIGN OF MACHINERY PROJECTS

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Project *Sonaca*

10 spreader beams capacity certification

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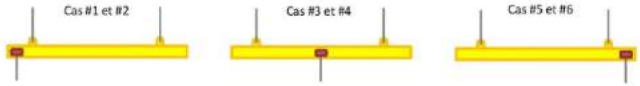
DÉPARTEMENT (FEA)
ANALYSE PAR ÉLÉMENT FINI

Tableau 1 – Résultats de l'analyse 1 et 2

Palonnier	Profilé	Cas #1 (Kg)	Cas #2[1] (Kg)	Cas #3 (Kg)	Cas #4[1] (Kg)	Cas #5 (Kg)	Cas #6[1] (Kg)	Résistance Attaches (Kg)
BP 02	W 10X20	180	450	440	650	-	-	3 600
BP 03	W 10X22	290	1 800	620	920	-	-	3 400
BP 04	W 10X26	230	500	550	1 500	260	750	3 600
BP 05	W 12X26	-	-	530	1 000	250	5 000	3 600
BP 07	W 12X26	240	1 700	520	1 200	280	7 000	3 600
BP 08	S 8X23	260	1 000	590	870	240	900	5 400
BP 09	W 12X26	235	700	560	1 900	330	5 000	3 600
BP 17	W 10X26	280	2 000	610	1 800	310	4 000	3 600
BP 18	W 10X26	235	750	560	1 900	-	-	3 400
BP 19	W 8X21	170	500	500	1 000	280	800	3 600

[1] *Résultats avec l'analyse II*



4. CONCLUSION

Selon les calculs de vérifications effectués, les palonniers peuvent soulever une charge équivalente à celle indiqué dans le tableau 1 et ce tout en respectant l'emplacement du chargement.

Finalement, nous recommandons que des plaques signalétiques soient installées sur les palonniers, tant sur la partie en portée simple comme ceux en porte-à-faux, afin d'aviser les opérateurs de la tolérance de l'équipement en fonction de l'emplacement des chariots. Un exemple de ces plaques se trouve en annexe.

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Project *Extrudex*

2 x 2,5MT spreader beam design

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