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SETON RECREATION FACILITY: A STEEL EFFORT FOR GREAT RESULTS

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Abstract: Located in Southeast Calgary (AB, CAN)) the brand-new *SETON RECREATION FACILITY) is* a multi-purpose building. There are both cultural and sporting amenities in it so everyone can benefit from this Calgary facility. The building includes: a competition pool, diving, waterpark, spectator viewing area, leisure pool, hot tubs/steam room, 2 multi-purpose ice rinks, 3 gymnasiums, fitness center, aerobic studios, 200m meters running/walking track, large and small rooms (for studios, classrooms and meeting spaces), full service library, youth center, art making, studio, gallery space, 250 seat theatre, childcare/child minding, food services and physiotherapy/medical clinic.

1 PROJECT OVERVIEW

As stated in the abstract, the building is located in Southeast Calgary (AB, CAN). Canam Group Inc. participated in this project as a subcontractor of a steel fabricator (Quirion Metal a Quebec based company member of CAMNOR GROUP). The steel fabricator was hired by Bird Construction (General Contractor) which had as a client the City of Calgary. We, Canam Group Inc., were awarded the fabrication of the open web steel joists as well as the supply of the steel deck for this building. The open web steel joists were fabricated in our Calgary plant as well as the steel deck.

The main challenges were the complexity of the building geometry, the size of the open web steel joists and the AESS fabrication criteria to be achieved. Majority of the joists were 36.4 meters long (approximately 120 ft) by 3 metres deep (approximately 10 ft) and needed an impeccable steel finish to respond to the architectural coating needs. The picture below illustrates the complexity of the building geometry:

Figure 1 : Landscape photo of SRF to show the complex geometry of the building (Photo taken by Maxime S. Harvey from Canam group)

Numerous 3D model exchanges between joist fabricator and the steel fabricator had been required in order to ensure there would be no interferences between open web steel joists and the main steel structure. Communication between all parties, internal as well as external, was crucial to keep the project on track. Teams from Western Canada, Eastern Canada and even Europe were involved in this project. The figure below summarizes the interactions between the involved parties and thus, shows why good communication was a key factor to the success of this project.

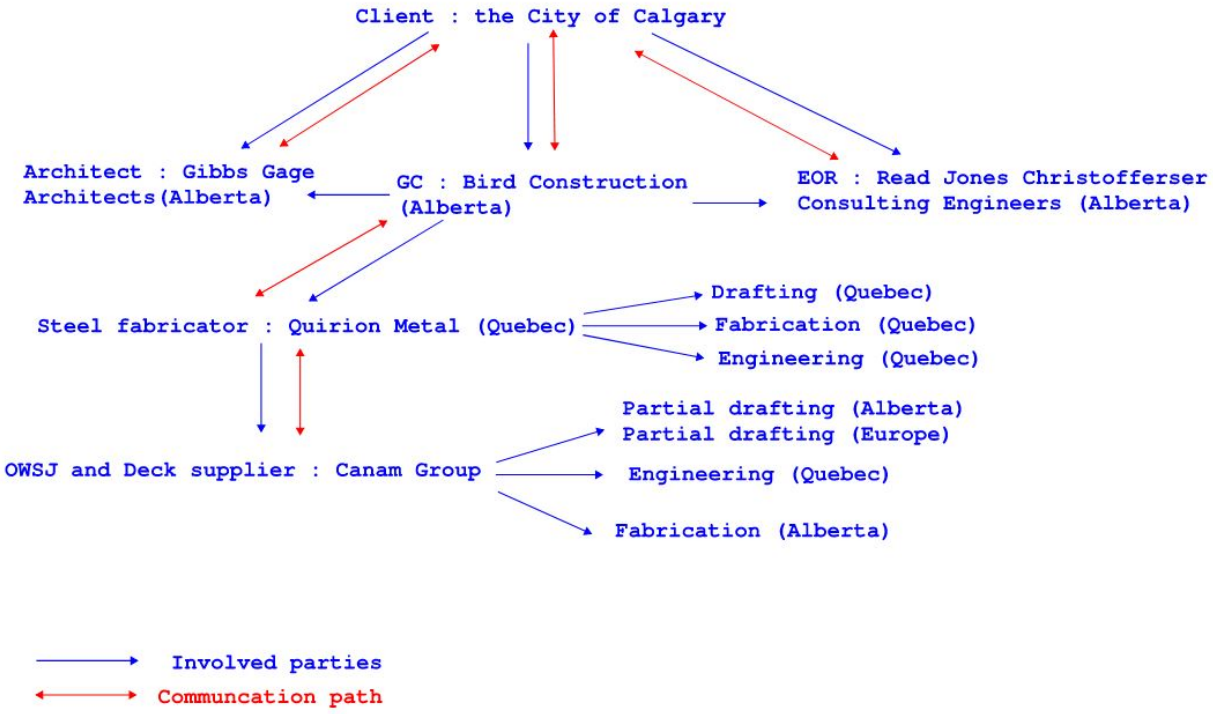

Figure 2: Involved parties in structural steel

2 INNOVATION

It was known from the beginning that a project of this magnitude would require some innovations in every aspect to supply a flawless product to our client. There were challenges in all the steps, from engineering to freight. This section will highlight some of these challenges in every field that was involved in this project. The first step was engineering, the whole process relies on the engineering design of these joists; drafting

needed member sizes to modelize and to draw the project, the plant needed the drawings to fabricate and so on. For engineering, one of the major challenges was due to the homemade joist design software, it could not fully manage the design of the joists because of the curved bottom chord.

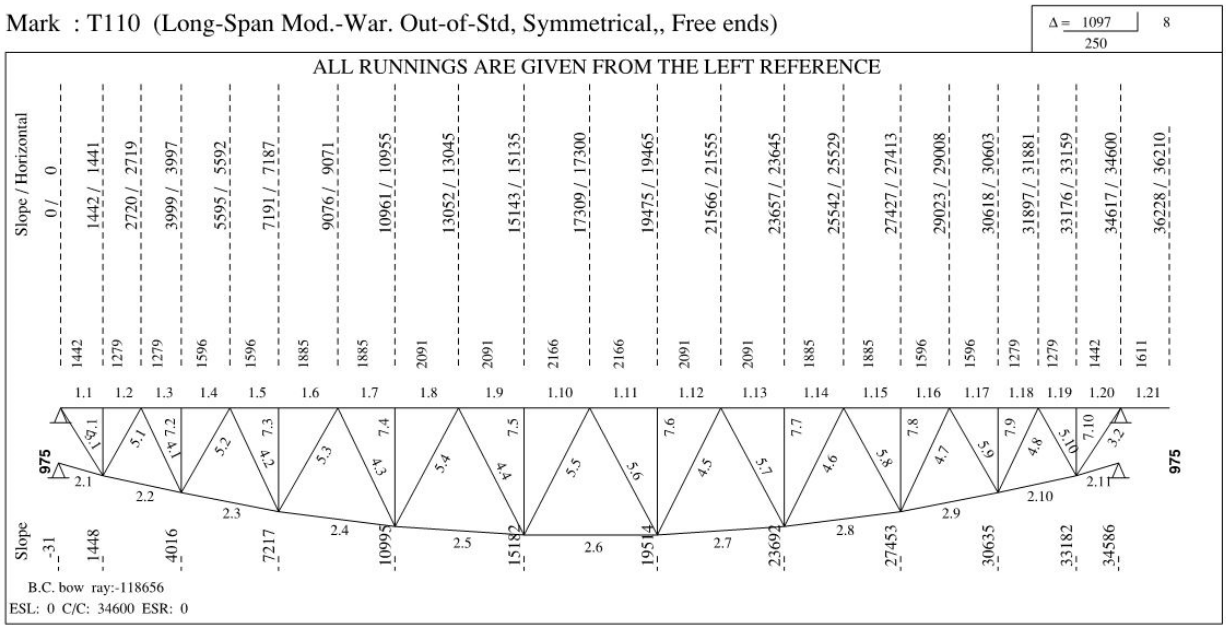

Figure 3 : Special joist geometry

Joists had to be modelized in 3D structural analysis software to ensure that structural criteria were met. Thresholds obtained from the 3D analysis were then inputted into the homemade software in order to speed up the design.

From the drafting side, the complex geometry of the building could not allow the joist coordination with the structural steel with simple 2D drawings. It all had to be done in the structural steel 3D model. This method ended up to be really beneficial for the project and saved a lot of time since nearly no interferences have been reported.

And then, come the fabrication which was not spared from challenges at all. Due to limited space of the plant, every step of the manufacturing process had to be planned out in detail to ensure that all was done efficiently from assembly to finishing. They also had to put a special attention to the fabrication order to make sure that they fabricated them according to erection order. This way, the joists were shipped to site and directly lifted by the crane from the trailer to the receiving steel. Considering the size of the joists, each lift less was a great time and money saving for the erection. They quickly realised the steel finish was the most time consuming step of the fabrication process. At the time, they feared that if they were not able to accelerate the finish process they would not meet the delivery dates. Once again, they rolled up their sleeves to find a solution and ended up buying more efficient tools. Although it was not the greatest innovation on earth, this simple solution solved the problem they had. The simplest solutions are the best. It was cheap and fast and this is what we needed. Another challenge of this project was the steel deck. Covering a surface with steel deck sheets might seem simple but here it was nothing simple. The roof of this building has 3 way slopes thus it was barely possible to fabricate supports to ensure that the deck bears properly on joist top chords. The steel fabricator came up with a smart solution. They used an epoxy product with a good balance of consistency, to make sure it does not leak, and strength to offer a proper bearing surface for the steel deck. The figure below clearly illustrates what is described above.

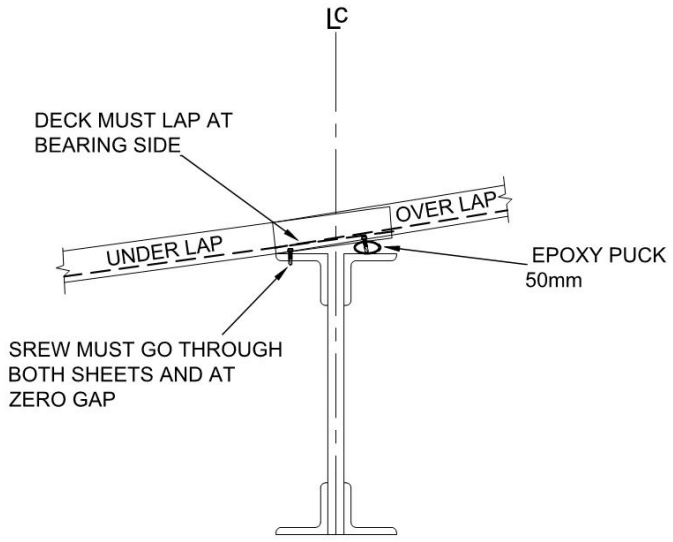

Figure 4 : Epoxy bearing product detail, Excerpt from CANAM Erection Drawing DE100A

Everyone was sceptical but it finally came up as a great solution due to the great flexibility offered by the epoxy product.

3 LESSONS LEARNED

A lot had been learned from this project. Starting with making sure that everyone in the company well understands the scope of a project. It created discrepancies in project expectation between sales, management and production team. When you are not aligned with expectations, it makes collaboration more difficult and it can affect the quality of the product you will deliver. On another note, we realized that AESS criteria had a significant impact on the amount of work that had to be done at each stage of the production process. Here are some examples: Engineering has to chose material that is suitable to AESS criteria, drafting must pay particular attention to details and the shop has a tremendous amount of additional work to do (grinding, continuous welding, …). Thus, every decision you make in your trade has an impact on the following trade amount of work. From the beginning, AESS criteria must be clarified as of where it is REALLY required and what is it REALLY required. This exercise made beforehand, could result in a lot of money saving for the client because you just do what you NEED to do WHERE it is required to. The most important lesson learned from this project would be to trust the teams you work with and maintain a good relationship with them. When you start a project with this attitude, it pushes everyone in the same direction and great things can be accomplished. At the end of the day, no matter what you had gotten through during the construction process of the project the only thing people will remember is the great product that had been delivered and that will serve Calgary population for the years to come.