



## MEMORANDUM

To:	Dan Marchisella, Mayor	Doc Ref:	Doc. 820612-0073(1.0)
From:	Michael Paul, P.Eng., PMP, LEED AP, PMI-RMP	Date:	November 23, 2017
Project:	City of Elliot Lake - Multi-Use Complex		
Subject:	Memo – Pre Engineered vs. Conventional Steel Frame Construction		

Dear Mr. Marchisella,

Please see the below opinion based on our experience in terms of proceeding with pre-engineered or conventional construction for the new Multi Use Complex in Elliott Lake.

Conventional construction involves on site construction/coordination for all aspects of the build, involving more design, coordination and in turn more room for errors. Pre Engineered build involve pre-fabricated steel elements made off site in a controlled environment and delivered to site ready to be placed and connected with minimal coordination and adjustments. Both options essentially require the same building materials however they have different processes as well as their own pros and cons. See below for a more in depth review of the two options.

### **Pre Engineered Construction (Steel Frame Construction)**

Pre Engineered builds can minimize or eliminate the involvement of an Architect and/or Engineer, as they can easy and quickly select a pre-engineered structure which has already been designed by the fabricators. These buildings drive the design by setting the building shape and size right away. This would help set the foundation, interiors and exterior materials to suit the selected pre-engineered building due to the standardized steel sections and connections, simplifying erection and accelerating construction completion. With this streamlined approach, the build would be more efficient and deliver a more controlled building, as well as reducing errors and related costs. Overall this option would speed up project timelines and creates less waste (material and labour costs), although the designer would not have as much flexibility as conventional construction. Pre-engineered builds are ideal for commercial and industrial construction projects such as gas stations, box stores, offices and recreational facilities.

### **Conventional Construction (Steel Frame Construction)**

Convention construction approaches construction in a step by step method, which includes multiple trades and coordination requirements. For example, the excavation and foundation are construction before the framing from the design documents, and then the steel fabrication would involve site measurements, shop drawing reviews and fabrication of the steel components to meet the design intent. The Architect/Engineer design done from scratch will standardize sections as much as possible however the building size and shape is less set and can inadvertently create "one off" connections and structural members that will lead to more time and costs required to complete the work. The timelines to design, measure, approve and fabricate alone will create a significant delay for other trades to coordinate their work, and in turn slow down the ordering of materials and construction of their respective tasks. This type of construction is ideal for complex designs. Complex designs come with higher costs, more coordination (i.e. more potential for errors) and longer completion timelines.



**Summary of Pre Engineered vs. Conventional Steel Frame Construction**

<b>Pre Engineered</b>	<b>Conventional</b>
<b>Pro(s)</b>	<b>Pro(s)</b>
Less Quality Control required	Complex/Creative Designs, more flexibility
Less Cost (Labour)	
Shorter Construction Timelines (easier to fabricate and deliver/construct)	
Pre Engineered Selection drives the other design elements	
<b>Con(s)</b>	<b>Con(s)</b>
Simple Designs, not as flexible.	Coordination Mistakes (More QC required)
	More Costs (Labour)
	Longer Construction Timeline (longer deliveries and construction)
	Complex/Creative Designs come with more complex detailing and construction methods

In summary, a pre-engineered building would be ideal for the multi-use complex, and a more conventional approach could be used for the lobby or other areas of the facility to add its own aesthetic appeal for the City of Elliott Lake and its future multi use complex users.

Regards,

Michael Paul, P.Eng., PMP, LEED AP, PMI-RMP

Principal

[michael.paul@colliersprojectleaders.com](mailto:michael.paul@colliersprojectleaders.com)