Message

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Sent: 8/17/2012 1:30:11 PM
To: Marta Proctor [/O=TOC/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=Mproctor]; Dave McNalty [/O=TOC/OU=First Administrative Group/cn=Recipients/cn=dmcnalty]
Subject: pre eng vs membrane comparison

Marta / Dave, below is some additional points that I will have in the main body. I'm still waiting on the costing, when I receive it I will send everything together.

Pre Engineered Structure vs Membrane Structure Comparison

Energy Use / Thermal Performance

The normal insulation value for a Pre Engineered Structure with a sandwich panel is R-19 for roofs and R-12 for walls. However greater R values can be achieved with insulated panels and roofs. By increasing the thickness and providing more insulation, values as high as R30 are achievable. Membrane Structures by their nature have no inherent thermal resistant R value, however by creating a cavity higher R values can be obtained. With a 6" cavity and thermoplastic or similar insulation R30 is achievable.

Actual energy usage can be calculated based upon a developed envelope design and usage assumptions. At this point of time there is insufficient detail available do accurate modeling. For both systems with equivalent amount of insulation applied in a continuous fashion with no framing breaks, the performance would be expected to be the same. Cladding a Pre-Engineered Structure with a continuous insulation layer protecting the structure from the outside temperature is achievable. While the avoidance of thermal breaks is not possible with a Membrane Structure as the aluminum frame that supports an interior and exterior membrane encapsulating the insulation has direct contact with both the inside and outside resulting in thermal bridging. For this reason the performance of a Pre Engineered Structure with an equivalent amount of insulation to that of a Membrane structure would be expected to be superior.

Enclosure Durability

Insulated metal panels typical for a Pre Engineered building system come with a variety of finishes and coating systems. Modern coating systems for panels include coatings which are durable contain synthetic resins, ceramic and other inorganic pigments. They have a chemical bond which provides resistance to ultraviolet radiation resulting in good color retention and resistance to chemical degradation. Still even as coatings have improved, it is expected that at some point repainting may be required. The expected life span of panel coatings is dependent upon the environment but warrantied for 20 years. On a Pre Engineered Structure typically the roofing is TPO or PVC, and is warrantied for 20 years.

Membrane Structures have an integral roof and wall system, with an aluminum reinforced layer at the bottom of the envelope. As the main part of the enclosure is a membrane, it is expected that it's life expectancy before replacement would be in the range of 20 years as with PVC roofing. The product often comes with pro- rated guarantees for approximately that time.

Mechanical and Electrical Systems

It is not expected that there would be any difference between mechanical systems including dehumidifiers, the ice plant and air handling units. Electrically and lighting systems would also be similar, as lighting is always directed at work and playing surfaces and indirect bounce lighting is not normally used as it is less efficient.

Constructability

The project development time for both systems would be similar, as the time for design, approvals, site services, plumbing, ice plant installation, rink and other slab construction, electrical, block work and finishes are the same for both systems. As for the erection time of a super structure, it is expected that there would be no difference, leaving only a small advantage to a Membrane Structure in the enclosure of the superstructure.

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