Composite Recycling Technology Center

Building Innovation Center

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Olympic Region Clean Air Agency

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Project Narrative for Wood Thermal Modification

The Composite Recycling Technology Center (CRTC) is a 501(c)3 not for profit organization in Port Angeles, WA that is engaged with activities that transform waste streams or underutilized materials into useful consumer goods. To date, the CRTC has re-purposed landfill destined carbon fiber from Boeing and other aerospace manufacturers into 23 market ready products. The applications of recycled carbon fiber have met needs in aquaculture marine cable (reducing plastics), medical orthotics, and sporting goods (pickleball nets and paddles). A new initiative of the CRTC is the Building Innovation Center (BIC), which is capturing utility from Western Coastal Hemlock, a tree not usually used for construction due to its lack of strength, by using a thermal modification process to add value to the lumber for applications in military bases and affordable housing.

The thermal modification process is the centerpiece of the BIC operation and involves the use of a Maspell Vacuum Thermal Modification kiln. Depending on specifications, the kiln will heat the wood at temperatures up to 420 degrees Fahrenheit, collapsing the cell walls and thereby altering the properties of the lumber. This process provides the wood with similar qualities to pressure treatment, but without the use of harmful chemicals. After the thermal modification process, the lumber is pressed into cross laminated timber (CLT) panels that form the basis for constructing the various end-use products. Equipment used for this stage includes planers, saws, a custom-built press, routers and other woodworking equipment.

The BIC is sourcing the hemlock from the nearby Makah Tribe, supporting their timber industry and has in fact assisted them with building a new sawmill, which will be the main source of the BIC’s hemlock supply. More species may be used in future applications as the business progresses. The CRTC was founded on repurposing waste streams and operating in ways that support environmental efforts alongside economic development. Part of this effort has been working toward net zero operations. About 30% of the facility’s energy usage is offset with solar arrays (with expansion of those systems planned) - all equipment is powered by electricity. Net zero efficiency is also a major consideration for the design of the ADU structures to be manufactured.

While CLT panels and thermally modified lumber are the main planned products, consideration is being given to usage of scrap wood, wood shavings and sawdust. Other products such as furniture and briquettes for heating homes may emerge as part of our effort to be landfill free. We have also partnered with a local farm to provide sawdust and wood scrap for their composting operation.

The BIC is an exciting project that will add up to 50 jobs to an economically distressed community while creating value for the nearby Makah Tribe. We are reducing pollutants in the industry through factory construction (75% less than site built), a local supply chain which we are working on upgrading to zero emission trucks, and a green manufacturing facility. We appreciate ORCAA’s input in helping us to keep our air emissions clean throughout our efforts to develop this new facility.