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Iain Macdonald, Director
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A.A. Red Emmerson Advanced Wood Products Laboratory
3205 SW Washington Way
Corvallis, OR 97331

Dear Iain,

I am pleased to provide you with a preliminary design report for the siting of a proposed fire testing facility on the campus of Oregon State University (OSU).

C.1. Description of project components

The proposed fire testing facility will require the construction of a new, one story, approximately 1,050 square-foot building on a 1,500 square foot slab, designed to meet current state structural codes to accommodate the furnace and associated equipment. The building will likely be of concrete block construction on concrete footings and slab and will include a restroom and service plumbing, fire sprinklers and alarms, HVAC and service electrical. The building will also contain appropriate exhaust for the furnace and other safety systems. The portion of the slab not occupied by the building itself (approx. 450 square feet) will be used to place the chimney/stack and dust collector/baghouse equipment.

Appropriate land use codes for building setbacks and building materiality as determined by design guidelines shall be followed. Per OSU building development requirements, the building will be required to follow current OSU Construction Standards (https://fa.oregonstate.edu/cpd-standards), which require the building to be fully accessible, must include accessible toilet facilities, and appropriate space within the building to accommodate staff overseeing use of the facility. The proposed facility must include a drive lane to accommodate materials delivery to the facility which must meet current campus standards for width, turning radius, material depth to accommodate proposed truck delivery, and signage.

C.2. EDA Investment Project Description

The project components in this engineering report are consistent with the EDA investment priorities relevant to this application, as described in Section 3 (Proposed Solution) of the project narrative. The key elements from the narrative are reiterated below:

> "Research and testing activities at OFTF will directly address Oregon's goal of reducing future wildfire risks by informing best-practices for landowners, forest managers and public stewards of the land. Simultaneously, they will enable researchers at OSU and private-sector partners to produce data on fire safety of mass timber buildings that is

vital for expansion of the industry. This data will be used by: developers, architects and structural engineers to validate design assumptions and obtain permits for mass timber building designs; mass timber manufacturers to assist with product development efforts and technical sales, and; by code officials to evaluate building code changes.
Fire safety testing is vital for the permitting and delivery of the modular affordable housing that is at the core of our Coalition's cluster strategy. Higher demand for mass timber will increase employment in sawmills and mass timber manufacturing facilities, supporting recovery and revitalization of rural timber-dependent communities that saw employment in Oregon's wood products industry fall from over 80,000 in 1980 to 29,000 by 2016. The use of mass timber in place of more energy-intensive materials such as reinforced concrete will reduce carbon emissions in our buildings and support environmentally-sustainable development."

C.3. Drawings

A site location map and proposed plan of the fire testing facility are shown below.

Figure 1: OFTF Proposed Site (red) and Alternative Site (blue)

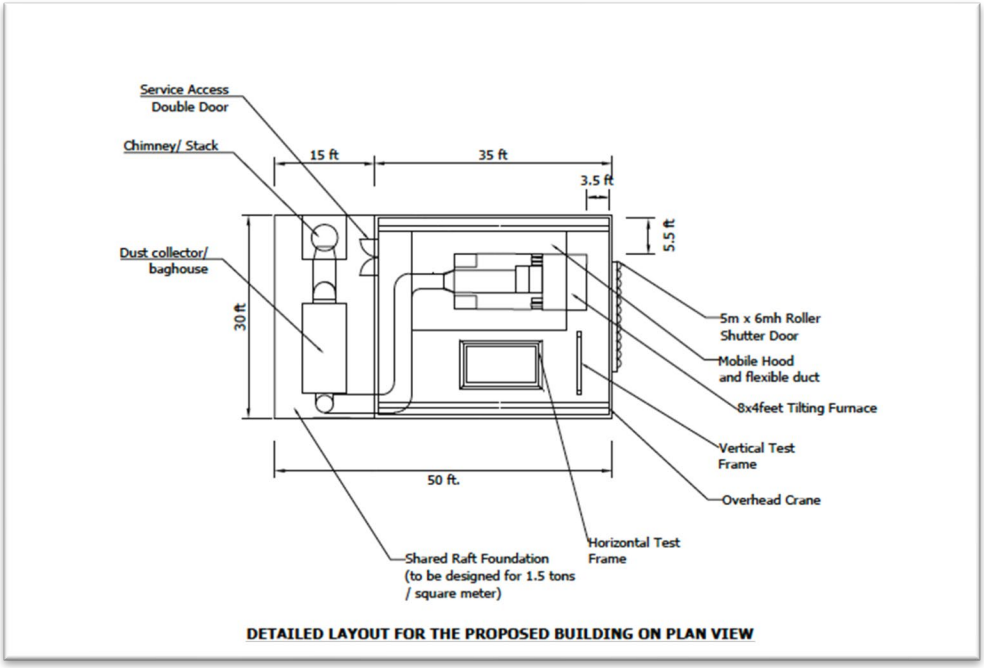

Figure 2: OFTF Building: Plan View

C.4. Constructability Analysis:

Two sites have been identified, both directly adjacent to the A.A. "Red" Emmerson Advanced Wood Products Laboratory. The first site (shown in red in Figure 1, above) directly north of the lab building, is currently developed as a parking lot. The project would need to pay for replacement parking elsewhere on campus, but the site itself has already been established with underground utilities, drive up access, electrical service and overall site preparation. The second site to the west of the lab building (shown in blue in Figure 1 above) is on a greenfield site with no existing site upgrades. However, the proximity to the lab building will make improvements to this site straightforward. Street improvements have already been completed as part of the lab building, and truck access to the lab building will be adequate for the fire testing lab, as the roadway leading from 35th Street to the Emmerson Lab has been designed for truck deliveries of up to 65 feet in length.

C.5. Proposed Construction

OSU will likely use Design Bid Build (DBB) as the plans will be relatively simple and development of the plans with the builder will not be required.

C.6. Construction Cost Estimate

Based on a 1,500 gsf footprint and an enclosed building of 1,050 gsf, we have used the cost per square foot for the recently constructed A.A. Red Emmerson Advanced Wood Products Lab with appropriate escalation. Included in this cost is materials and labor, contingency, escalation, contractor fees and general conditions, insurance and bonds.

Included as part of the total project cost beyond the construction costs are design fees, survey, commissioning, inspections, owner contingency, permits, and site improvements. Assumed for site improvements are either the cost of developing the greenfield site *or* replacing existing parking.

C.7. Real Property Acquisition

The proposed site for this project falls within the OSU Corvallis Campus and does not require a real property acquisition, nor are there any foreseen required easements.

C.8. Anticipated Permits

Construction at OSU's Corvallis campus requires a City of Corvallis construction permit, which is obtained through a plan review to ensure code compliance. The City of Corvallis also requires a separate PIPC permit (Public Improvements by Private Contracts). The facility will require inspection of the structure, fire suppression systems and dust collection/air filtration systems by the Corvallis Fire Department.

C.9. Estimated Project Schedule

i. Design period: 5 months

ii. Plans and Specifications: 2 months

iii. Permit period: 2 months

iv. ROW period: not foreseen

v. Bidding and contracting period: concurrent with permitting: 2 months

vi. Contingency period for material, equipment or other delays: 3 months

vii. Construction period: 9 months

C.10. Overall project budget breakdown

1. Administrative and legal expenses - $128,150

- Includes project management fees, coordination required with facilities services, and other administrative functions to support the construction of the building. Amount is calculated based on 5% of the total of the expense items which will be included in the construction contract, namely: Relocation ($360,000), Site Work ($240,000), Construction ($1,000,000) and Equipment ($963,000).

2. Land, structures, rights-of-way, appraisals, etc.- $6,000
    - Fees for filing potential right of way agreements with public utilities.

3. Relocation expenses and payments - $360,000
    - Relocation of 30 parking spaces at $12,000 per space

4. Architectural and engineering fees -TBD
    - Includes architectural and engineering design fees.

5. Other architectural and engineering fees - $58,000
    - Includes site survey, geotechnical reports and special material inspections.

6. Project inspection fees - $28,000
    - Includes permit and inspection fees from the AHJ.

7. Site work - $140,000
    - Includes the cost of underground utilities, access road and site preparation. (Relocation of parking spaces on existing site is budgeted under Item 3).

8. Demolition and removal - $0
    - No demolition and removal required.

9. Construction - $1,000,000
    - This line item includes materials & labor, general requirements, contractor contingency, escalation, contractor fee, general conditions, insurance and bonds.

10. Equipment - $963,000

This fixed equipment total for the fire testing chamber total is made up of the following elements:

Hydraulic Tilting Type Fire Resistance Test Furnace of Internal Chamber Size: 2.44m x 1.22m x 1.22m deep ($ 438,200)

Design and construction of one customized fume hood and associated casework to capture smoke and dust/particulates above the Tilting Type Fire Resistance Test Furnace ($ 25,000)

Main flue gas ducting from Furnace to Air Pollution Control Device (Baghouse) ($50,000)

Baghouse for Dust Collection, Induced Draft Fan ($400,000)

Interconnecting duct work and Stack, 9 m tall ($50,000)

11. Miscellaneous - $25,000
    - Keying, Fire Extinguishers, Signage