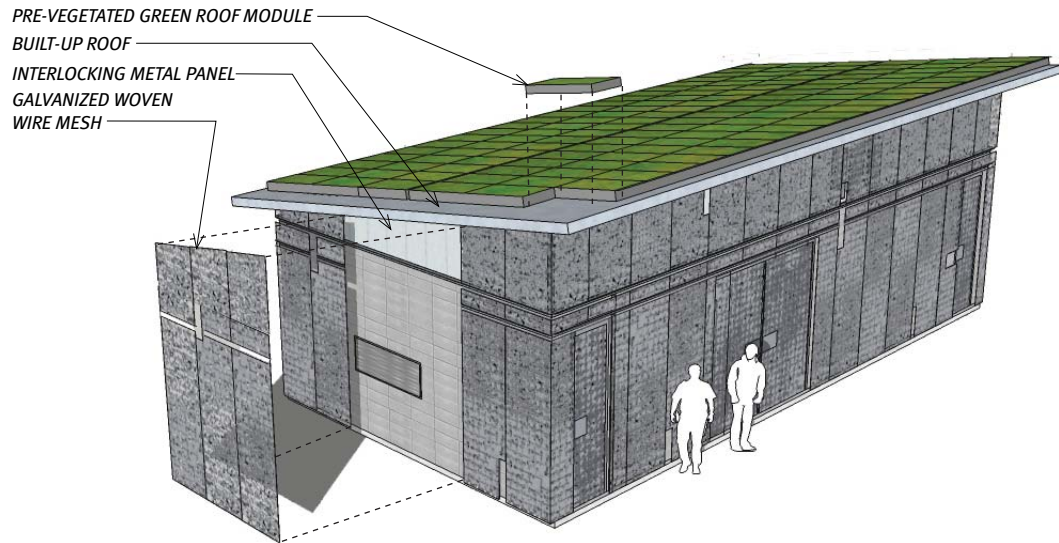
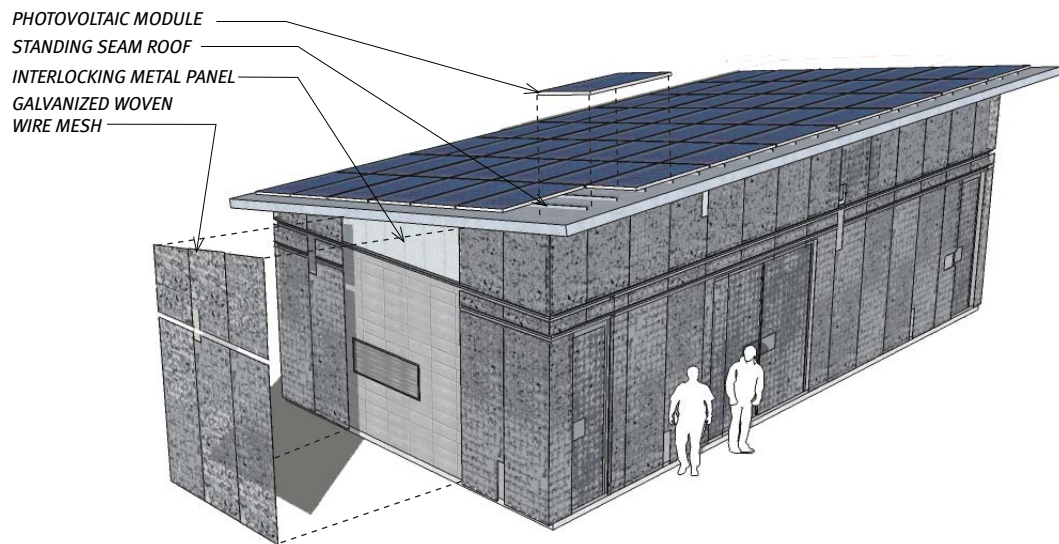


PROPOSED DESIGN

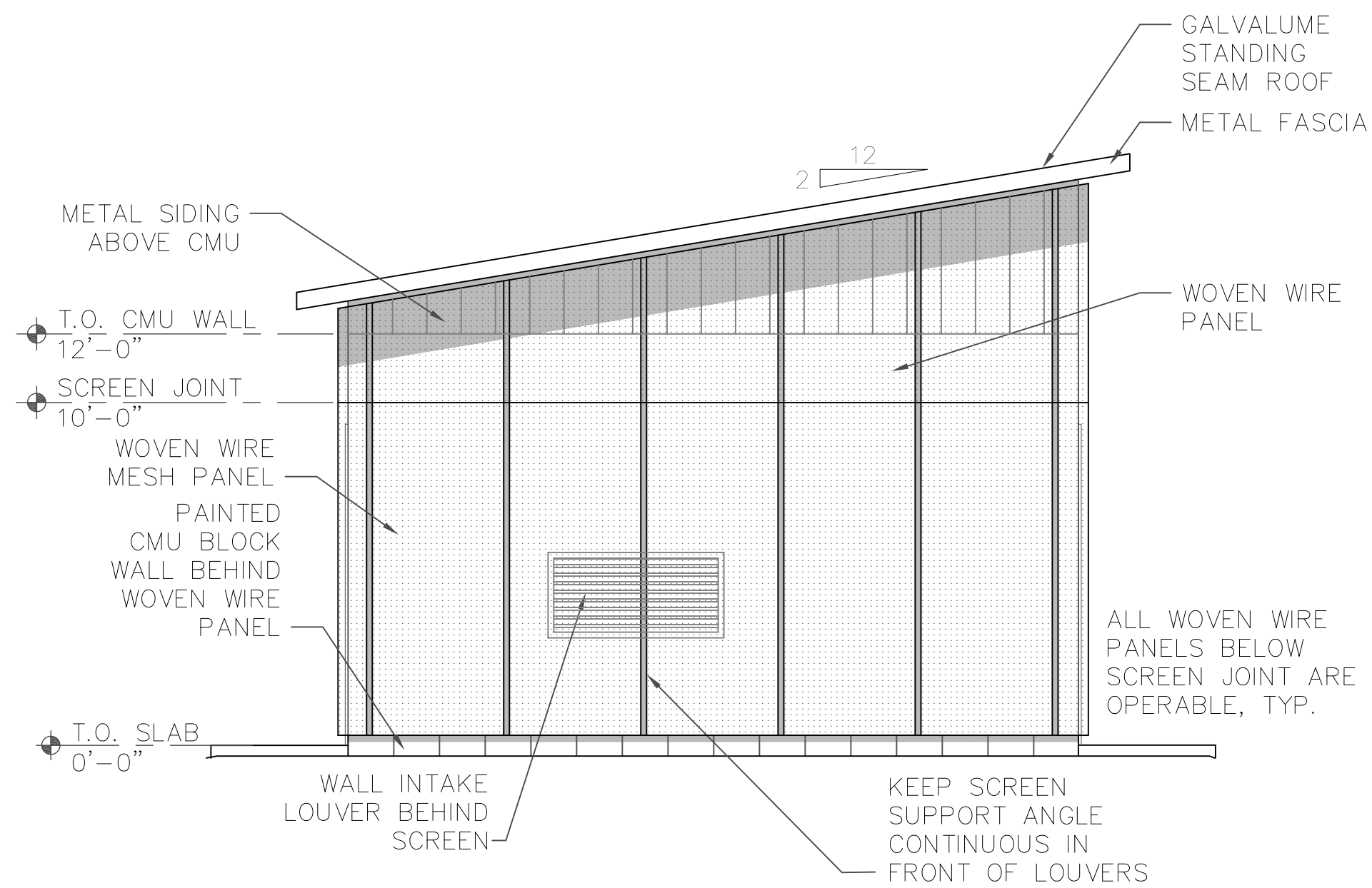


TPSS WITH MODULAR GREEN ROOF AND GALVANIZED WOVEN WIRE MESH

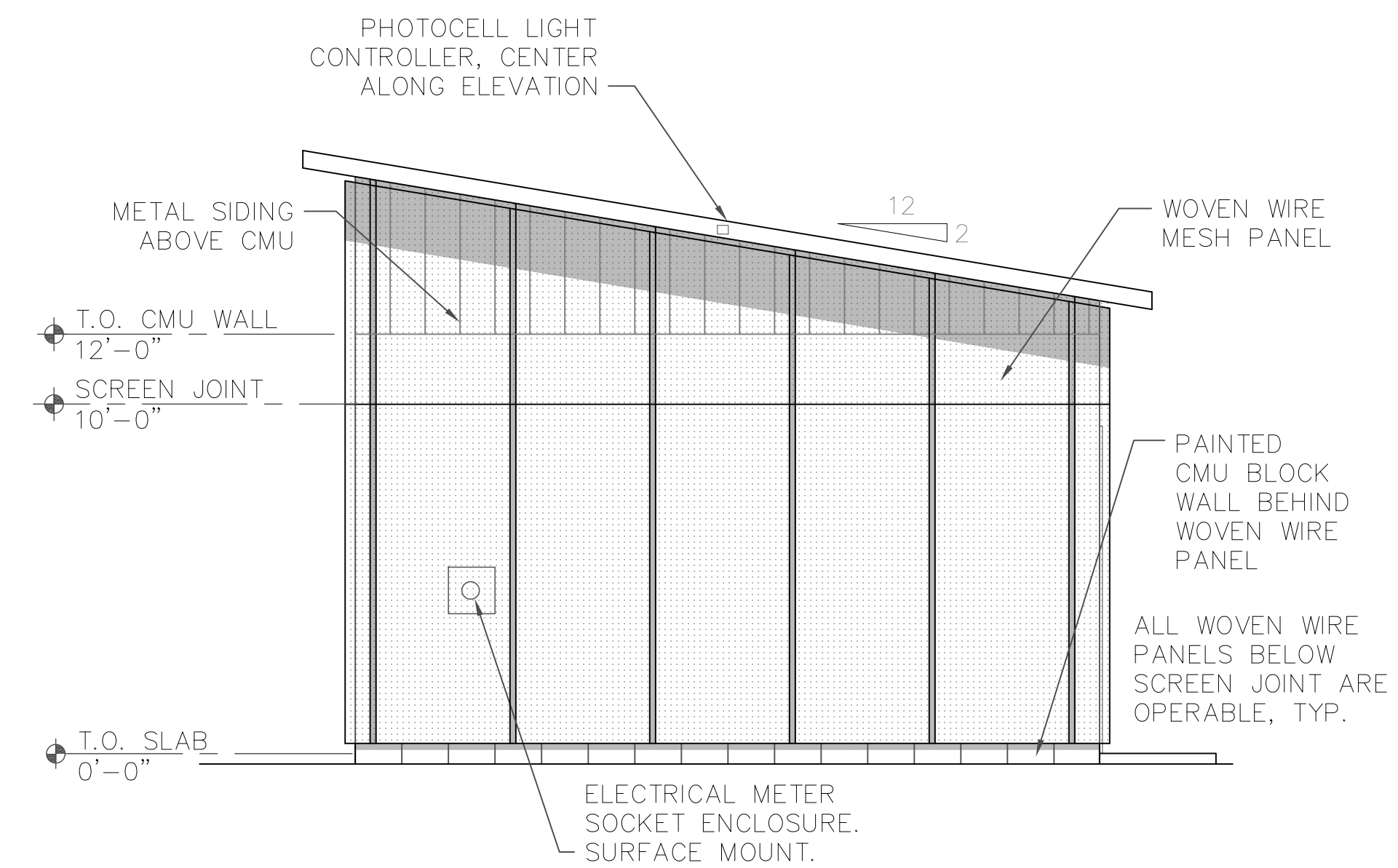


TPSS WITH MONOCRYSTALLINE PHOTOVOLTAICS AND GALVANIZED WOVEN WIRE MESH

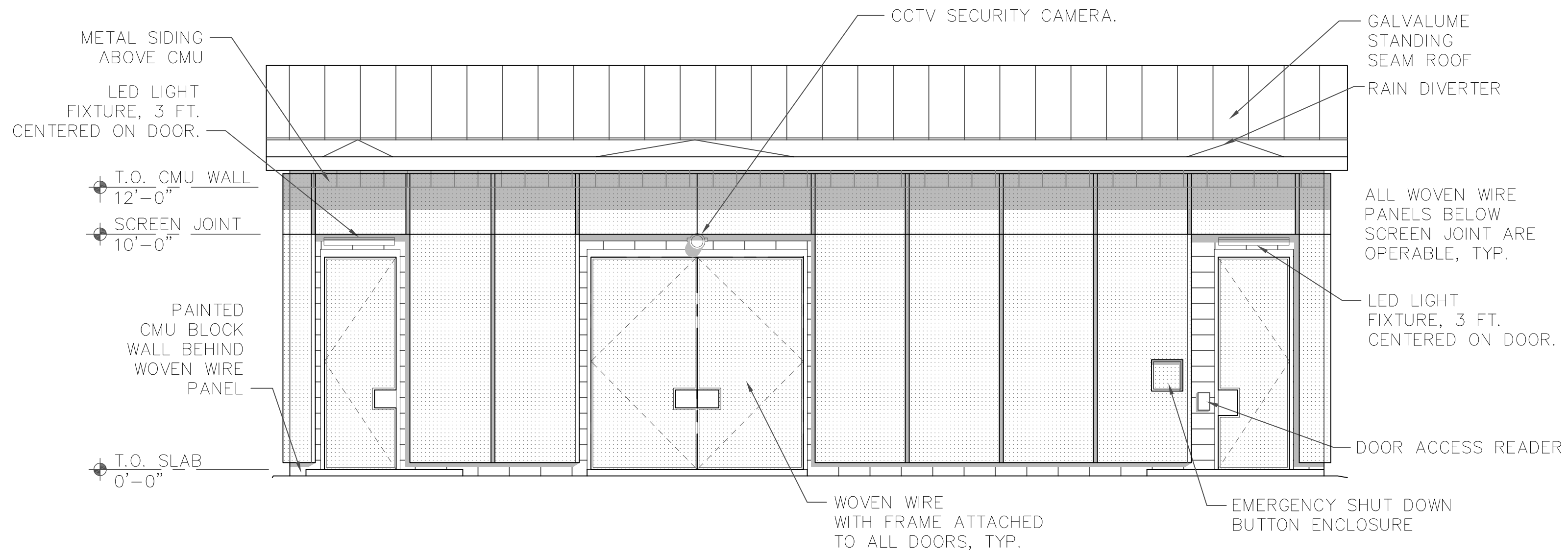
1
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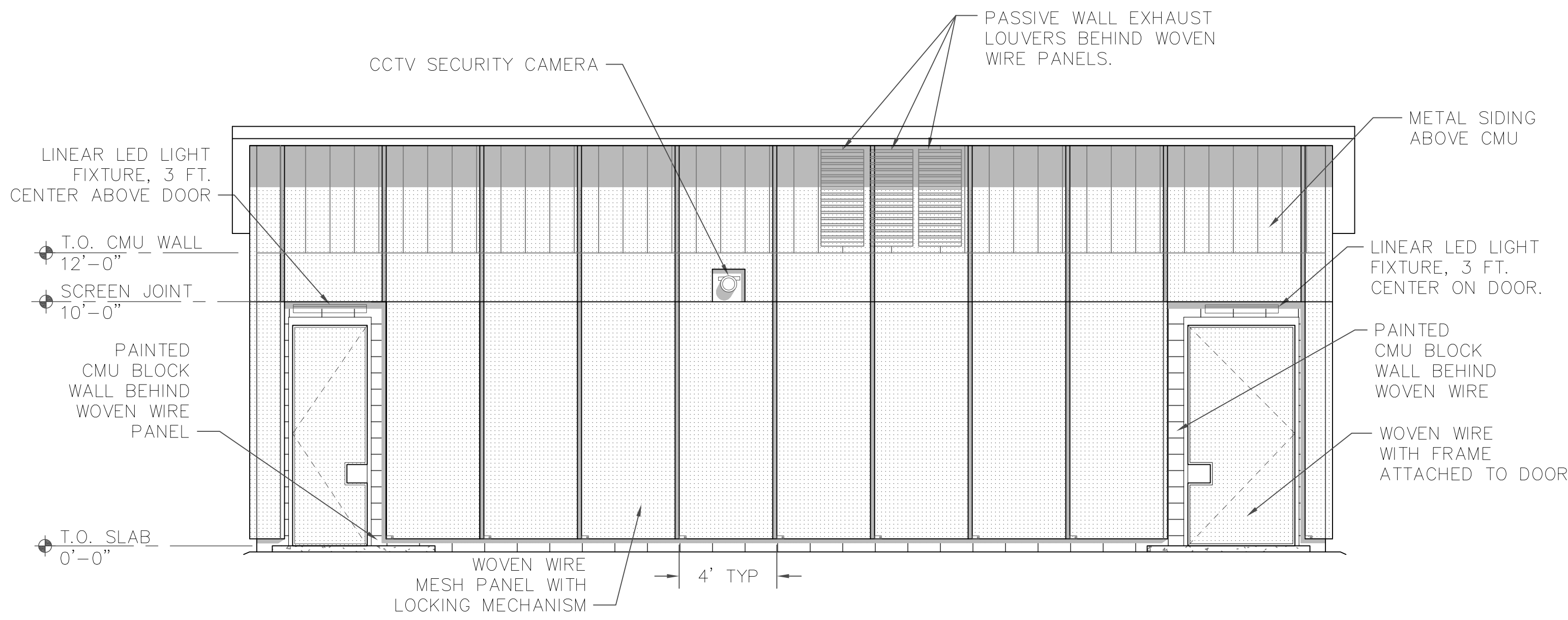
TPSS SIDE 1 ELEVATION 3
SCALE: 1/4" = 1'-0" A15ME-300



TPSS SIDE 2 ELEVATION 4
SCALE: 1/4" = 1'-0" A15ME-300



TPSS BACK ELEVATION 1
SCALE: 1/4" = 1'-0" A15ME-300



TPSS FRONT ELEVATION 2
SCALE: 1/4" = 1'-0" A15ME-300

NO.	DATE	BY	CHK.	APPD.	REVISIONS

JYG	DESIGNED	01/27/12	DATE
JGG	DRAWN	01/27/12	DATE
	CHECKED		DATE
	APPROVED		DATE

		PORTLAND MILWAUKIE LIGHT RAIL	
Hennebery Eddy Architects Inc.		CAPITAL PROJECTS AND FACILITIES DIVISION 710 N.E. HOLLADAY STREET PORTLAND, OREGON 97232	
SUBMITTED: DB	DATE: 3/2/12	APPROVED:	DATE:
SCALE: 1/4" = 1'-0"		DRAWING NO.: A15ME-300	CONTRACT NO.:
SHEET NO.:		EAST SEGMENT ARCHITECTURAL TYPICAL SUBSTATION BUILDING	

GREEN ROOFS

Green roof systems have several benefits including habitat creation, visual relief, improved air quality, protecting roofs from UV degradation, and reduced cooling loads through shading and evapotranspiration. They also create an iconic green building statement. We examined several green roof technologies.

Our research concluded that the installation of a modular green roof system over a standing seam roof has some inherent issues and that it is not the best solution for a green roof over metal structure. When we began, the concept of a modular pre-vegetated panel green roof system over a standing seam roof was appealing because it could not only be installed on new buildings but also retrofitted onto existing buildings by the use of a clip system mounted onto the standing seams. However, we have not found any examples of this method being used. Deploying the system on this project would be an “experimental” application.

Other issues include:

- Air pockets under the panel system could have a desiccating effect on plant life during freezing weather, potentially causing die off.
- If gaps between seams under vegetated panels were infilled with insulation, insulation may trap water and minerals from soil drainage, which may have detrimental effects on the metal roof over time.
- The pre-vegetated modular system would require either a substantial metal frame clipped to the standing seam roof so that the panels could be walked on for maintenance, or that panels be spaced apart to create a walking path.
- Additional structural engineering would be required to address the load added by the substantial frame and the potential for wind uplift.

There are too many unknowns about this system for us to recommend it for the Portland-Milwaukie line. However, there are a number of successful green roof applications over metal roofs that are not standing seam. A built-up system can be applied directly to a substrate while a waterproof membrane protects the substrate from any green roof run-off. It is also a less expensive and more lightweight solution than the green roof over standing seam metal roof alternative. Within the built-up green roof type, there are two possible systems, pre-vegetated panels and pre-vegetated mats. We recommend the pre-vegetated panel system. This system is easy to maintain, install and replace if plants die or become diseased. With pre-vegetated mats, the matting would need to be cut out and replaced with new matting that would then take root into the existing soil over time. Since pre-vegetated panels are fully rooted in their soil, there is less concern about the vegetation potentially not taking root in the soil over time. Another convenience with the pre-vegetated panels is easy access to the irrigation system since the irrigation laterals are placed between panels rather than buried in soil.

Since prolonged hot dry weather stresses extensive green roof systems by drying out plants and potentially killing them, an irrigation system is proposed for green roof plantings. Irrigating green roofs will keep the plants in good health and prevent them from going dormant, optimizing both plant appearance and the cooling effect of the green roof system. The irrigation system at each green roof will be connected to the station irrigation system at that location, and all irrigation components will be compatible with that system. The proposed sprayheads, Rainbird 1804 SAM PRS, are the most adaptable to a



Modular Green Roof Tray System from GreenFeathers