

Backfill

Emergency Housing Cut to Length

When western Alaska's Kuskokwim River overflowed its banks in May 2011, sweeping away much of the remote Yupik village of Crooked Creek, state disaster-relief officials turned to the Fairbanks-based Cold Climate Housing Research Center for help. Nine

replacement homes were needed, on a tight budget and within an even tighter time window. Throughout the month of June, CCHRC president Jack Hébert and his staff collaborated with a truss manufacturer in the port city of Kenai to work out the details of an innovative framing system that combined roof, walls, and floor in a single whole-house truss.

In mid-July, the trusses and other required building materials were loaded on a barge for the 1,200-mile sea voyage around the Alaska peninsula to the north side of Bristol Bay. On their arrival a month later, barge and materials were met by a crew of mostly volunteer builders who swiftly began assembling four types of structures, from a 24-by-16-foot studio apartment to a 24-by-52-foot four-bedroom house.

The new homes share a simple, utilitarian appearance. Their interior walls and ceilings are paneled with AC plywood finished with flame-retardant paint, and exteriors are sided with prefinished steel roofing applied horizontally. But their energy performance is exceptional. A thick layer of closed-cell foam sprayed against the building envelope from the inside and an open-web truss design that virtually eliminates thermal bridging should make them remarkably warm and tight. And with the first snows of winter already falling when the crew wrapped up work in the middle of October, both qualities were quickly put to the test. — *Jon Vara*



Thanks to the one-size-fits-all truss design, homes of different sizes varied mostly in length and interior floor plan. The simple foundations consist of two parallel glulam beams fastened to pressure-treated timber cribbing on pads of native river gravel.



Blocking between trusses took the place of a conventional bottom plate; a $\frac{3}{8}$ -inch plywood skin beneath the bottom chords of the open-web floor assemblies served as backing for a thick layer of polyurethane spray foam. An open space between the upper surface of the foam and the subfloor above provided an unobstructed and frostproof plumbing chase.



All nine of the new homes, completed in the rapidly shortening days marking the approach of an Alaskan winter, feature air-lock entries and R-60 thermal envelopes.