

## *Analysis and Drawings Shed Light on Trusses*

by Robert Foley

*Historic American Roof Trusses* by Jan Lewandoski *et al.* (Becket, Massachusetts: Timber Framers' Guild, 2006) softcover, 92 pages, ISBN 0-9706643-4-6, \$30. Illustrated with photos and line drawings.

**H**istoric American Roof Trusses is a compilation of articles that were originally written for *Timber Framing*, the Timber Framers' Guild's journal. That being said, this book takes those articles and adds an introduction by David C. Fischetti, a chapter on the history and evolution of roof trusses, and an invaluable glossary, which makes this readable volume a compendium of roof truss design, function, and analysis. The drawings, truly exquisite in simplicity of line, take the reader of this complex subject to a level of understanding not as easily reached through words alone.

The roof truss traditionally was used to span the walls of a building to create an "open room"—a space

unencumbered by posts or other types of supports. In eighteenth- and early-nineteenth-century America, the construction technique was found most often in churches and meeting houses.

Lewandoski talks about the origins of the truss during the classical antiquity period, in the Mediterranean and the spread throughout Europe and England in the Middle Ages. Roof trusses began to be used in America during the late-seventeenth century and gained popularity during the eighteenth and early-nineteenth centuries. The sources of theory, plans, and execution came first to America by way of English builder's guides by Moxon, Langley, Pain, and others. Asher Benjamin's architectural guides, published at the turn of the eighteenth century and into the nineteenth, made the information available to a wider number of American builders and framers.

Jan Lewandoski takes the reader through each major type of truss – king post, queen post, and scissor, and composites of the various styles (Figure 1). The

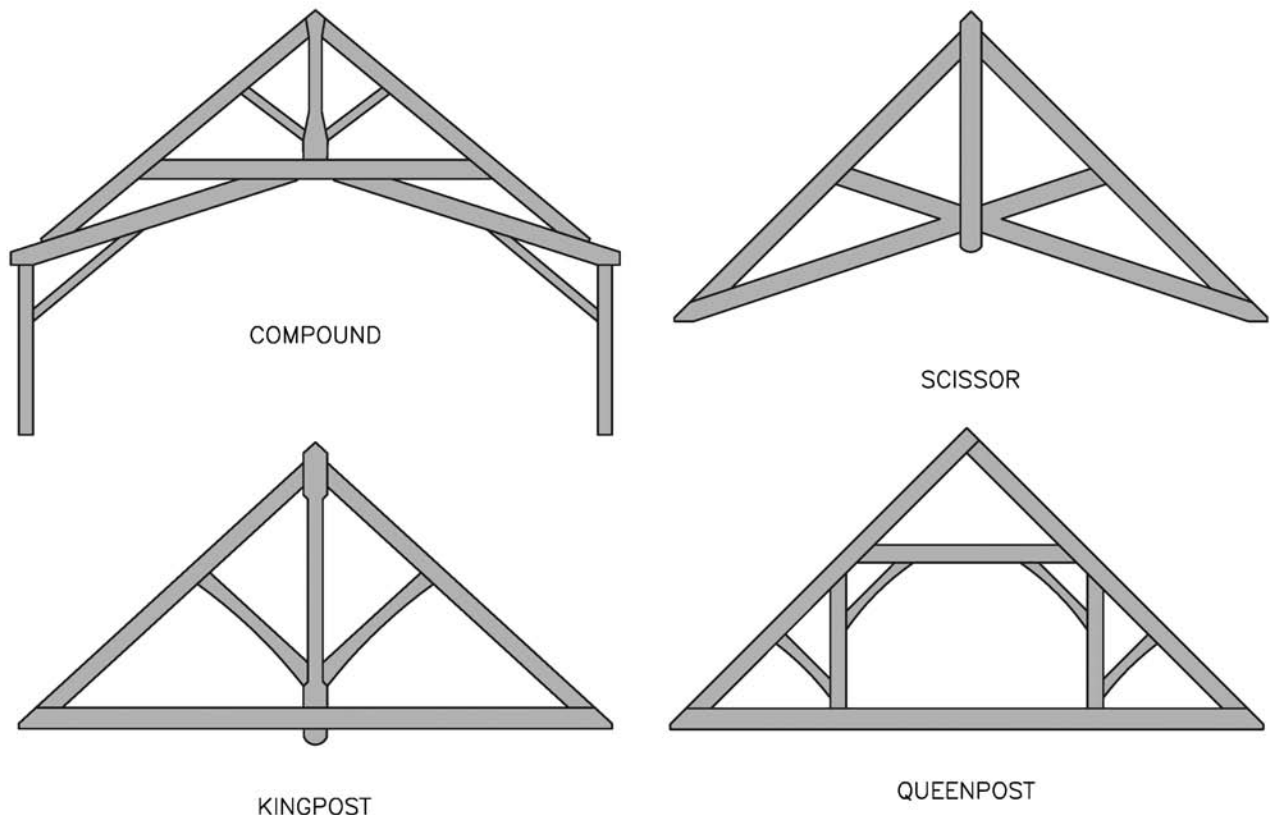


Figure 1. These (Figure 1-1 in the book) are the basic truss models. They evolved from these simple forms to accommodate special situations and the practices of the vernacular builders and framers.

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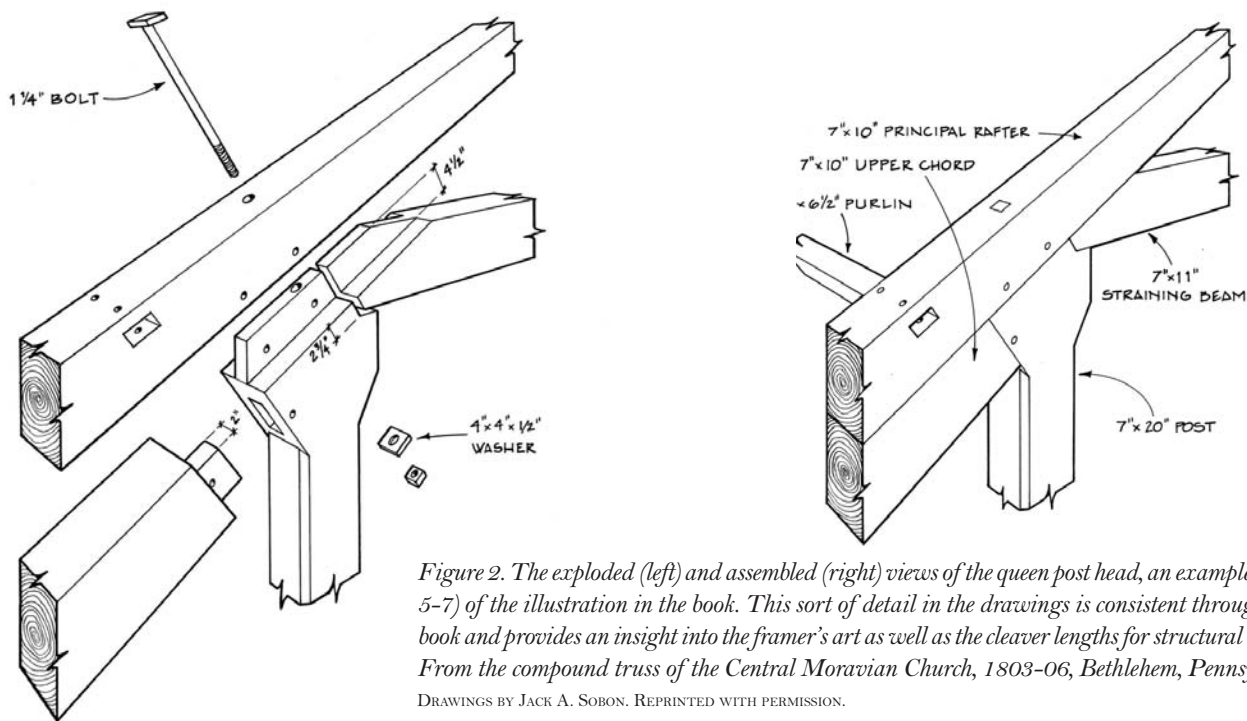


Figure 2. The exploded (left) and assembled (right) views of the queen post head, an example (Figure 5-7) of the illustration in the book. This sort of detail in the drawings is consistent throughout the book and provides an insight into the framer's art as well as the cleaver lengths for structural integrity. From the compound truss of the Central Moravian Church, 1803-06, Bethlehem, Pennsylvania.

DRAWINGS BY JACK A. SOBON. REPRINTED WITH PERMISSION.

transition from solely timber to timber augmented with iron is discussed as well. The chapters are devoted to specific types of truss designs and follow a format that examines in considerable detail four to six existing structures of each truss type with words, photos, and excellent, clear drawings, the latter done by Jack A. Sobon, one of the “*et al.*” in the title (Figure 2).

Ed Levin follows the explanatory with an analysis section that addresses the forces at play on trusses—bending stress, compression, and tension. He used computer models to explain and show graphically how the trusses are working, and in rare cases, faults in design. Drawings of the truss forms under discussion have a color coding that plainly shows areas of bending and the compression and tension elements of each examined truss.

The buildings chosen for examination are predominantly New England churches, with several from other areas of the northeast. All have an exterior photograph which provides context for the structural photos and drawings. All of these aspects, taken together, give a clear understanding of the truss—even for those without engineering degrees.

The glossary is a wealth of information that gives new meaning to some familiar words, relish, squint juggling and exposes more than a few arcane words one rarely hears such as joggle, schnaff or voussoir. The seven-page glossary makes for interesting reading on its own.

I have spent some time exploring the oft forgotten attic spaces of eighteenth- and early-nineteenth-century churches and the occasional meeting house—staring at, studying, and running a hand over the timbers and the joints the framers fashioned. I have never completely understood just what I was looking at and what was at work in the roof truss systems I gazed upon—not fully or comfortably. Perhaps I was, in part, confused by, as Lewandoski puts it, the accumulation of decades of “stuff” that confuses the mind—the repairs, the insulation hanging in lumps, the wires criss-crossing space and the oddments cast to the attic rather than the dump. This says nothing to the fears whirling through the mind with regard to putting a foot wrong in this dark and often floor-less land, bringing lath and plaster crashing into the “open room” or worse yet the vision of following ones foot.

Is it better to read this book and then explore the truss or explore and then read? Being in the latter group I have no choice; I will continue to explore and will do so with a much enlightened view for having read and studied *Historic American Roof Trusses*. I will never view the exterior of an old church and see shingles—I will be imagining a roof trussing system and wonder of it, king, queen or scissors?

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*Robert Foley is the preservation coordinator for the Newport Restoration Foundation and has been involved in the preservation and restoration of Newport eighteenth-century buildings since 1964.*

