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# **Special Collections**

*Flyer*

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## **PREFABRICATION**

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In response to reports from Florence Nightingale, who had led a contingent of nurses to the battlefields of the Crimean War, as well as from others, on the deplorable state of sanitary and medical conditions there, the British government set out to provide adequate hospital facilities for its soldiers as quickly as possible.

The hospital, whose construction plans are documented in a significant recent acquisition in Special Collections, was remarkable for the speed with which it was designed, built, shipped to Turkey and erected.

On February 16th, 1855, the War Office invited Isambard Kingdom Brunel, one of Britain's leading civil engineers, to design a temporary, prefabricated hospital. Within six days, he placed an initial contract for the supply of buildings for a 1,000 bed hospital. Such speed almost certainly indicates that he had already discussed the project at some length with government officials.

Little was completely new in Brunel's design. Standardized, prefabricated buildings had begun to emerge in the 1830s and the principles of sanitary hospitals had been well expounded by Nightingale and others.

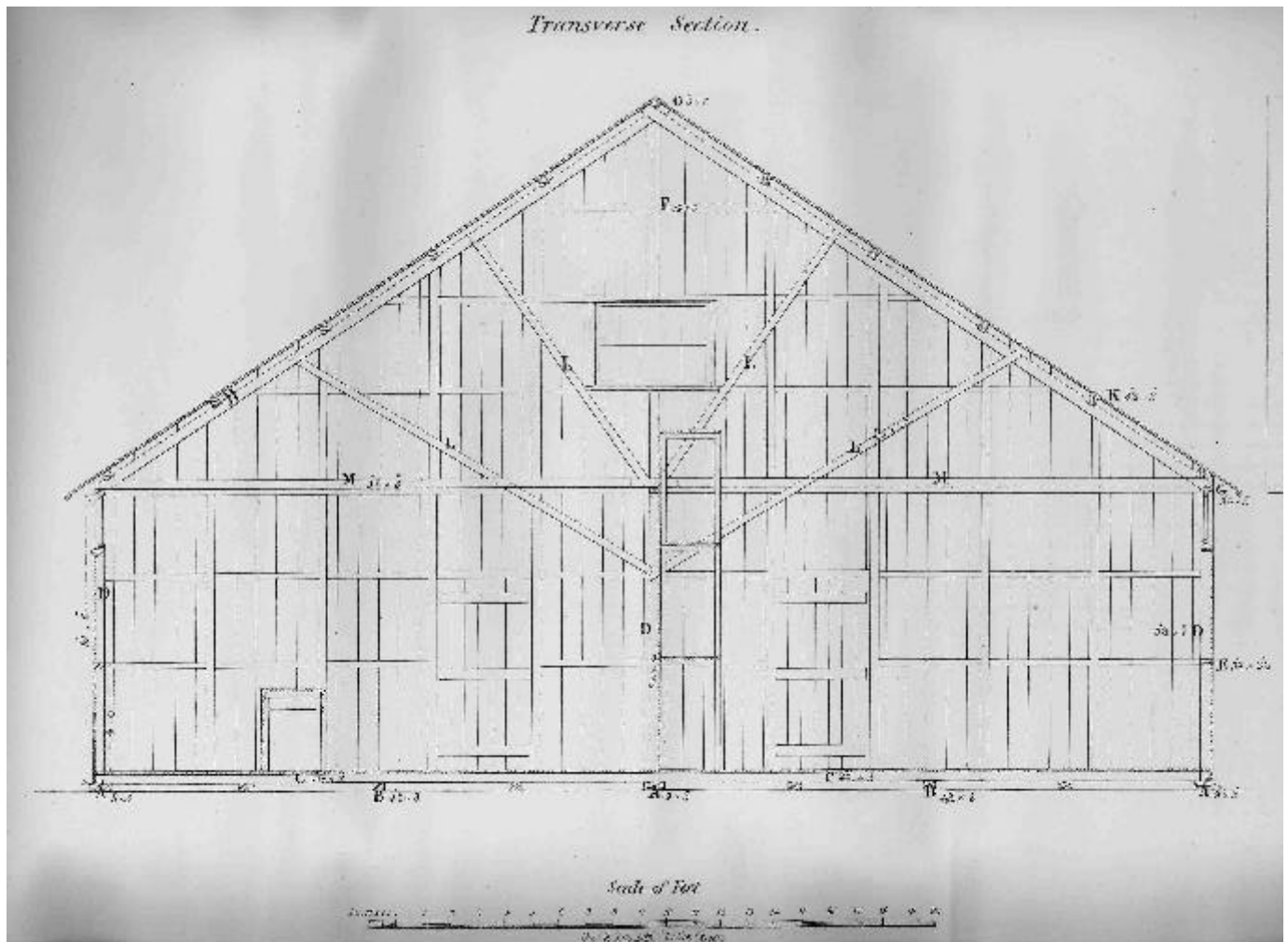
What Brunel did was to take the best of the existing ideas and produce a combination that was startling, prac-

tical and successful. His notes and sketch books reveal that he was concerned not just with the general layout, but efficient ventilation and sanitation, right down to the detail of how the sinks might empty.

He recommended the engineer John Brunton to the War Office, who was sent at the end of March to prospect for the site. Eventually, he found a suitable place on the coast two miles from the village of Renkioi, and on May 3rd, 1855, Dr Edmund Parkes, a civilian doctor appointed Medical Superintendent of the new hospital, visited the site and agreed with Brunton's choice.

The first consignment of prefabricated buildings arrived on May 7th. By July 12th the hospital was ready to receive 300 patients, by August 11th, 500, and by December 4th the full 1,000. However, possibly because it was a civil hospital outside military control and the army procrastinated, patients did not begin to arrive until October 2nd.

As building technology historian and Lehigh professor of architecture Tom F. Peters explains, this set of structures ranks next to its contemporary, the Crystal Palace, in importance in the history of building technology.



The hospital for 2200 beds was to be prefabricated and transported by sea to the site, and Brunel chose wood as his material both for its insulating qualities and because it was lighter than iron. His design was guided by the principle "That the aggregate of the building should consist of such parts as might be conveniently be united with one whole under great variations of conditions of the form and nature of the site." Like Fox in the far better known Crystal Palace, Brunel chose a modular system. However, his module, although only single-storied, was more complex than the simple structural bay of the exhibition building. It was a self-contained, completely installed pavilion with its own insulation, heating and cooling apparatus, and sanitary installations. The standardized ward units of 26 beds each were aligned along a spine, an open corridor that was later enclosed. Additional modules could be added or replaced with variant units at any time without disturbing the functioning of the whole. The modules were so designed that they could accommodate differences in site level. The difficulty was to decide between economy of unit construction and the limits of site adaptability. Roofing had been a problem in both the Crystal Palace and its successor exhibition buildings, and it was here too. Brunel proposed a prefabricated tin sheathing similar in type to the one designed for the Kensington Art Museum that year. It did not provide enough protection against rain, however, and a more elaborate system was suggested for future buildings of the type. Although the units were not reused for military purposes or for housing the poor as originally planned, but were dismantled and sold piecemeal, especially the machinery being recycled to other uses, the complexity of the module and the incremental site organization for erection were unique in the history of temporary construction.

Lehigh's document is one of the tenders for the prefabrication of the wooden modules. It is unknown how many of these there were, but this one comes from the Brunel family archives in England. No other copies are recorded in libraries, but it is to be presumed that anywhere from three to ten such tenders once existed. Lehigh's purchase of this document enhances the research value of one of the world's premier collections of material on the history of civil and structural engineering and construction.

The document consists of 15 lithographed plans, about 14" x 44", and 22 pages of specifications. — P.A.M

Special Collections materials are available for research and consultation without restriction. For further information contact Philip A. Metzger, Curator of Special Collections, or Ilhan Citak, Special Collections Assistant. Reading room

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Total of Class D. Stone	3,200	0	0
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Total of Class E. Stone	3,800	0	0
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Price for Plaster, Mortar, Foundation, etc. to the top of the wall	ditto	0	0
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*Philip A. Metzger*