

Housing the Library

Part II. The New Building

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THE architects were authorized to start their work by a contract signed on May 9, 1957. The initial work requested was in the form of a subcontract requiring a report to determine two main things: first, the functional and space requirements based on the tentative program and supplemental information to be furnished by the National Library of Medicine, and second, in relation to these requirements to evaluate and determine the practicality of the complete or partial use, if any, of the Advance Planning Report FY 1956, for the Armed Forces Medical Library, National Naval Medical Center, Bethesda. This Report included preliminary drawings of the building as proposed by the Navy's Bureau of Yards and Docks.

Mr. Metcalf had been the consultant to the Navy on these plans, and consequently the architects had the advantage of continuity of advice and suggestions in the new development. The determination of the functional and space requirements started, naturally, with a review of earlier work.

The Tentative Program of Requirements provided by NLM officials called for an area of 240,000 sq. ft. (a reduction from the 300,000 of the Navy plan), storage for 1,100,000 volumes, a staff of 250 people, and provision of 175 seats for the reading public. The chief characteristics of this new Library, as compared with the more usual one, were a relatively large staff of technical and clerical personnel, stacks closed to the public, specialization in the collection of medical material, and utilization of specialized technical equipment to an unusual degree, particularly in photography. Most of its service was by mail, and was world-wide in range. The number of readers present in the Library at any time would be relatively small; while these readers would make use of the public catalog, the Acquisition and Catalog Divisions would use it heavily and would have to be located near it.

The question of whether to use the Navy plans had to be resolved. Investigation showed that, while the program had been thoroughly studied, the plans were not far advanced and were based on a library building calling for 300,000 sq. ft. which was more than the space allowance permitted by the Bureau of the Budget. Also it had been designed for another site. The final decision was to start afresh.

Many sites had received consideration and the ultimate selection, from the architect's point of view, seemed most suitable. In the southeast corner of the grounds of the National Institutes of Health, across the avenue from the Naval Hospital, there was a golf course. Ten acres of this area on Wisconsin Avenue were made available for the Library. The possibility of locating the building on a knoll at the foot of which flowed a small stream gave the opportunity of providing a beautiful setting for the Library with open land all about. It would, of course, have to be related to the master plan in preparation for the general NIH site. As part of the NIH site, utilities were generally available. Good access from Wisconsin Avenue was possible.

The first step was to establish the size of the main floor, where the principal functions take place. In this case the minimum requirements, at first, seemed to be provision for administration (with the office of the Director), reference librarians, acquisition librarians and catalogers, the public catalog, the loan and reference desk, and the general reading room, all to be grouped about the public catalog, the heart of the Library. The result was a trial area of 55,000 sq. ft.

The first floor below grade, "A" level, was next in importance. Here it was found that the controlling factor would be the service entrance which had to be connected with grade level. Related to it would be the receiving, shipping, and general service areas. The remainder of this floor would be devoted to the photographic services, the film section, and binding. The only public area remaining to be taken care of was the History of Medicine Collection including the Art Section, both located below grade to provide protection.

The allowance of 125,000 sq. ft. for stacks and related functions together with the area of "A" floor made a total of 163,000 sq. ft. below the main floor. If each underground floor were 55,000 sq. ft., the area of the first floor considered correct for economic planning, it could be assumed there should be three basement levels. There remained 20,800 sq. ft. for a second floor above grade to accommodate the somewhat independently operated Index Division, the balance of the administration offices, and a cafeteria. It was obvious that the last would have to be only a partial or mezzanine floor.

With this as a framework numerous schemes were studied in the trial and error method in which architecture proceeds until finally one, numbered H-12, seemed to meet the requirements in the best overall way. There must have been a little uncertainty even then, as "I" series of plans was started.

The basic decisions of this last scheme can be seen in the final plans. The principal alteration was the relocation of the History of Medicine Division, which, being open to the public, was moved up to the main floor

so that all the public areas would be on one level, simplifying control, but sacrificing some of the intended protection of the rare books below-grade. Their stacks, being closed to the public anyway, could remain below. To accommodate this change, the Director's office was moved up to the mezzanine, thereby consolidating the administration areas.

Consideration turned now to some of the physical aspects of the project; with the three levels below grade, the question of drainage became important. No librarian likes to think of water in contact with his books. The amount of water modern fire engines can pump into such a vast basement is not inconsiderable, and even water mains may break. So it seemed desirable to aim for gravity drainage of the lowest area of books. Reliance on sump pumps would not do, for in time of catastrophe power to operate them would almost certainly be cut off. Therefore, the lowest level of books was established sufficiently above that of the brook to permit a gravity drainage line to run out to the valley, where the stream might be enclosed in a storm sewer at some future time.

As a general principle, our mechanical engineers, James Mongitore Associates, had already decided on vertical rather than horizontal distribution of air in order to reduce floor thickness, so we were able to estimate the height between floors and establish the level of the first floor. Planning on flat slab construction without projecting beams, the clear floor-to-ceiling height of 8 ft.-6 in. was agreed upon. This would put the first floor somewhat above the average outside grade. It was not forgotten there would be a vast amount of earth to be taken out of the excavation.

The natural reaction would be to sell the earth for fill on some other project, but we thought we had a better use. Having tentatively located the Library on the highest part of the land, a sort of knoll, the excavated material could be placed around the sides, in effect extending the knoll, and balancing out the amount of excavation required. With two-thirds of the building below grade, we had been concerned that the amount remaining above ground might not seem as significant or imposing as one would expect for an institution of this character. Distribution of this excavated material in terraces would enhance the appearance of the building; it would help to give the library a special individual character in an area already dominated by high buildings.

While the site provided was relatively generous in size, the necessity of keeping to the high ground pushed the building back, but this provided a good setting, as the Library would be seen from Wisconsin Avenue across the fields of the old golf links. In adjusting the site plans to the overall plans of the National Institutes of Health, it was agreed that an open strip along the main boundaries of the NIH would be retained for

their future projects for which plans are already under way. The ideal disposition of the building, of course, was tempered by the necessity of providing adequate parking spaces and making an allowance for future expansion. It was decided to make this allowance at the rear of the building so that, as a significant public building, its established impression from the front would be preserved. This expansion area, in the present plan, is covered by a parking area to bring the cars as near to the building as practical for the time being.

Throughout this period of plan development the architect always had the direct participation of Frank B. Rogers, the Director of the Library, together with the continuous help of his Special Assistant for the project, at first R. W. Severance, then Ray W. Grim, the Library's Executive Officer. The Public Buildings Service of the General Services Administration was ably represented by C. J. Biegalski until his untimely death, when he was followed by J. Victor Keyes.

Before starting the plans in detail, a module had to be determined which would be a guide to accommodating in the most practical way the vast number of bookstacks. From the structural point of view, the nearer the typical bay is to a square the better, and the conclusion was reached that a bay approximately 21 feet square would meet the various requirements in the best way. The actual size settled upon was 21 ft. by 21 ft. 1 in. to allow some tolerance in setting the bookstacks (3 ft. units, on 4 ft. 2 $\frac{3}{8}$ in. centers). The modular system was also extended to the ventilation scheme so that every bay would have supply and exhaust available. The building had also assumed a simple rectangular shape, so that as it expanded it would more nearly approach the area efficiency of a square. For flexibility in usage, fire safety, and protection, the use of a series of flat concrete slab floors was decided on rather than multiple tier stacks.

Detailed consideration of the exterior now began to take place. As an unusual initial requirement, characteristic of the age we live in, particular consideration had to be given to bomb blast effect where it might influence structural design. (It happened that our structural engineers, Severud, Elstad and Kruger, were one of the Government's principal consultants on this particular subject.) The first step in this direction was the proposal to locate the stacks below ground, inherited from the Navy plans.

It was realized that resistance to bombing by structures built on the principle of an old fashioned fort is no longer possible. The effects of a direct hit, of course, were not being considered, but the stupendous pressures raised by bombs falling anywhere near were matters of concern. The provision of an excavation for the storage of the books would not serve the purpose by itself. The roof of any reasonably possible floor would be punched in, as would any typical walls above grade. The

new basic principle now being followed is to endeavor to equalize the pressures on both sides of any floor or wall. In case of floors at grade or below, this is done by providing a dry moat around the building back of an embankment. Into this can be opened ventilating louvres for the required area so that the pressure of an explosion could be let in under the floor in time to equalize the pressure from above.

For the same reason vertical slots were initially planned for each section of wall, again to equalize external pressures. These slots are in effect a set-back portion of the wall provided with an opening in either direction. This opening is glazed at right angles to the wall so that if glass were broken it would fly along the wall rather than inwards over the working areas. It is, in effect, a bay window in reverse, with solid panels in the part parallel to the outside wall. With the large floor areas established and arranged to keep the people who work in the Library in as close proximity to the central catalog as possible, rather than to let them spread out in radiating wings, the working areas extend back far from the exterior wall and therefore cannot depend on natural light. Furthermore, it is perfectly practical to be entirely dependent on artificial light and ventilation, even though some people like to have an opportunity to look out once in a while, and it is convenient, when it is time to go home, to know whether it is raining outside. Various designs in arrangement of openings were considered, but it was finally concluded that the tall vertical slots were architecturally the most interesting and carried out the most effective design for the building.

For protection from bomb blast damage, the vast area of the floors would also require a pressure-relief opening near the center. This was the beginning of the idea of some form of clerestory roof near the middle of the building to cover such an opening. While a few studies were made with a flat roof, nearly all showed some form of dome structure over this area. As things developed it was further realized that the roof and well would emphasize the heart of the Library—the card catalog area—used by staff and public alike. To give added impact on entering the Library a source of light coming through the mezzanine with a dome above seemed to us attractive. Domes of various shapes were considered, although today these domes would be considered an expensive way to roof a large area. In Mexico, however, an architect named Felix Candela had successfully roofed large areas with thin concrete shells in the form of hyperbolic-paraboloids. This method has the advantage that the form work can be constructed entirely of straight pieces of lumber despite the unusual shape resulting. In addition, the new shape in itself is a great source of strength because the concrete can be very thin, saving weight, hence coming to be known as a shell. Its use would give a dome in which

the form work would not be unduly expensive; in fact, a saving was possible.

The result is somewhat like a starched handkerchief supported at the four corners and raised in between. The gable so formed permits windows to be placed giving the clerestory through which light comes down through the opening in the mezzanine to the catalog below.

The unusual shape that resulted, of course, gave some misgivings to many people, but as time went on it came to be accepted and finally liked by practically everyone; it gives a special character to this building. The final estimates indicated it would not have the adverse affect on the budget that some were afraid of at first.

These considerations had an important bearing in establishing the original architectural design and were retained in the final design, although it was eventually decided that the additional funds necessary to provide the embankment, moat, and under-floor louvres should not be spent.

The Library is fortunate in having a limestone rather than a brick exterior, possible, economically, because most of the building is below ground where a facing is not required. Because the uniformity of this particular stone makes it monotonous in large areas, the slabs of stone are arranged to give a pattern or texture to the wall with narrow border stones between the large pieces, recessed in such a way as to emphasize shadow lines.

Above the main story the building is set back radically to the mezzanine floor forming a square at the center of the building. This square is surmounted by the dome, or shell structure, on four piers.

The front entrance is emphasized by a panel of polished green granite, a full story high, bearing the name of the Library. The panel is made up of six large stones, believed to be the largest ever taken from the quarry located in Ogunquit, Maine.

Coming into the building the visitor arrives in a front hall or lobby where on the marble wall to the right will be incised portraits, by the sculptor Paul Jennewein, of three men significant in the history of the Library: Billings, Fletcher, and Garrison. The catalog is straight ahead for the users of the Library, and a stair to the right leads to the administrative area. Nearest the front door and to the right, is the entrance to the History of Medicine Division. This room will have specially designed furniture and will be finished in butternut wood, with grided cases around the walls so that the books may be seen as well as benefit by the air conditioning. Special provisions are made for exhibition in this area, and in addition to open tables there are special studies provided for visiting scholars. An area opposite the desk is provided with glazed-in cases where items of special interest, such as incunabula, may be kept on view.

In the public catalog area a very large circular fixture supplements the normal lighting to give a higher intensity of light at the catalog drawers. Above, the face of the mezzanine balcony will be finished in a mosaic design by Frans Wildenhain.

Through the catalog area to the left is the public reading room.

Upstairs the floor of the mezzanine section is somewhat recessed below the main roof to save cubage as well as to improve the exterior appearance; there are only high windows above the wall spaces around the rooms to let in natural light. This permits cases to be set against the wall. While persons working at this level do not have the pleasure of looking down on the grounds outside, they do have the interesting opportunity to look over the balcony down at the catalog below or to the dome. The Board Room, practically an all-purpose room, is also located on this floor.

As for the outside of the building, a special effort has been made in the landscape design. Bethesda is a neighborhood which has high standards of landscape development, particularly characterized by the variety of its flowering shrubs and trees. With a building of almost classical severity, having large areas of plain walls and the extensive base of terraced slopes, the proper use of the plant material is important. To enhance the setting, flowering crab apple trees are spaced around three sides of the building; these low trees have been intentionally selected to carry out the horizontal feeling. Not only will their flowers be pleasing in the spring, but in winter the pattern of their branches will also provide interest.

Evergreen materials, separated by a splash stop of pebbles, are used against the base of the building to strengthen it in its setting the year round. Additional trees and flowering shrubs are provided in a way to enhance this aspect as seen from a distance. Particular effort has been made to select those that come into blossom successively in the spring so that the flowering is not all over in one brief period but there is a continuity of bloom over an extensive period of time. Some of the other plants that are used are the sweetbay magnolia, forsythia, and Korean azalea. Shadblow and other varieties of azaleas are provided along the roads to continue the blossoming effect. Mountain silverbell trees will blossom against a background of hemlock. A row of Japanese dogwood runs along the north side of the staff parking area. The selections have been made not only for effect, but also for operating economy; trees, such as yews and holly that will not require clipping, and periwinkle, juniper, and roses that serve as ground cover, reduce the cost of maintenance.

A few statistics might be the best way to summarize the story of the National Library of Medicine:

Gross area of building at ground level: 53,287 sq. ft.

Number of levels: 5; 3 below grade.

Floor to ceiling heights: C 8'-6"; B 8'-6"; A 9'-0"; First Floor 14'-0"; Mezzanine 9'-8".

Modular column spacing: 21'-0" x 21'-1".

Total number of square feet: 231,855.

Total number of cubic feet: 3,187,476.

Stack capacity: 1,061,150 (according to "cubook" formula).

Catalog drawers: 4,550.

Number of staff: 250.

Lighting: Generally fluorescent.

Air conditioning provided.