Planning Goals & Objectives

Clinical Center
NIH Design Policy and Guidelines

It is the intent of the NIH to provide state-of-art biomedical research and patient care. To accomplish this objective, the design efforts in the facility should take a futuristic approach toward achieving the goals of each customer.

These guidelines refer specifically to the renovations of the existing CCC. Within that building's framework, there will often be very little flexibility in the proposed location of the renovation project's major circulation elements. For specific requirements, turn to section D. Design Criteria.

Strategic goals and objectives include:

- Establishing a framework of circulation, functional zones, and expansion zones to support the development of current projects and accommodate future expansion. This circulation framework helps to separate the staff, patient, and visitor travel, and material movement

- Optimizing efficient operation without compromising research or patient care. Planning should encourage appropriate sharing of resources between Institutes

- Optimizing flexible and adaptable spaces which are largely dependent upon the building's physical infrastructure, including the structural, mechanical, and electrical systems

- Developing flexible and adaptable facilities capable of accommodating changing research programs and patient care needs without disruption to adjacent activities

- Providing the closest possible adjacency between clinical research beds and research laboratories within the developmental framework

At the very heart of the NIH mission is the close relationship between clinical care and medical research. Facilities designed to support this relationship will best meet the needs of the NIH.

B.1 Quality of Life

In a health care facility, the quality of life is an essential element to the comfort and well-being of patients, staff, and visitors. The quality of life directly impacts the healing process. It also can provide and promote an environment for advanced research.

B.1.1 Scale of Space

Use of human-scale spaces will help to alleviate some of the patients' anxiety and occasional loneliness during hospital visits. Scales that are more residential and human help patients feel more at home and comfortable in a large institutional facility.

B.1.2 Clarity of Circulation/Ease of Wayfinding

Clarity of circulation and ease of wayfinding is one of the most critical factors in the design and development of health care facilities. Patients are often anxious and sometimes disoriented during visits and procedures. Clarity in circulation can do much to reduce their anxiety and enhance their quality of life. Clarity of circulation can also enhance staff efficiency, reduce the cost of material handling, and allow for critical response time to patients needs. Also, a clear circulation system will set the direction for future expansions and growth.

B.1.3 Noninstitutional Appearances

A more residential character in health care facilities has been found to reduce patient anxiety and enhance the recovery process. This can be achieved through color and material selection and through the scale of spaces. Care must be taken to select furnishings and items which can withstand institutional usage.

B.1.4 Colors and Materials

Colors which are appropriate to moods desired in health care facilities are to be used. Calming and relaxing colors may be used in treatment, procedure, and patient areas. Public spaces and high-activity areas may use more exciting colors. Working closely with the NIH will be required to determine the intent for various room functions.

The use of materials with texture and color is desirable in areas where patient comfort is critical. Through material selection the scale and perception of space can be modified. The materials used can also enhance desired moods in a space. Refer to Section E - Room Data Sheets for generic finishes, required for certain room types.

B.1.5 Acoustic Levels

Sound source and transmission should be considered an integral part of the design and construction. This section describes basic acoustical criteria to be considered during early design phases of a project. The design should employ details and techniques which will preclude acoustical deficiencies and respond to the critical concern for patient privacy, confidentiality, and comfort.

Some of the sound transmission problems which are to be considered for elimination or minimized through proper design techniques are as follows:

- Sound transmission through suspended ceiling systems and down through the ceilings of adjacent spaces, through cracks between the tops of partitions and the bottom of continuous, suspended ceiling systems, and through fabric-covered accordion doors

- Sound leakage around heads, jambs, and sills of connecting doors

- Sound production by noisy items of equipment in special purpose rooms transmitted through walls and ceilings into adjoining spaces, such as a toilet room with wall-hung

fixtures adjacent to a conference room

- Sound transmission through short ventilation ducts with registers in different rooms through poorly designed or installed, recessed light fixtures in the ceiling, through electrical outlet boxes or other penetrations located opposite each other on a party wall, through the joint between walls and floors, and through door grilles

Basic acoustical objectives include controlling the level and character of background sound within a space (ambient noise level), reducing the sound transmitted between spaces, either by initial planning or with construction elements (sound isolation), and controlling the level of noise and vibration produced by the operation of the building mechanical systems (noise control). The ambient noise level in a space and the sound isolation of the enclosure together define the degree of speech privacy obtained in that space. If either one of these acoustical characteristics is downgraded, the other one must be increased to maintain the same level of privacy.

For noise reduction coefficient (NRC) and sound transmission class (STC) requirements for specific rooms, refer to the American Institute of Architects (AIA) *Guidelines for Construction and Equipment of Hospital and Medical Facilities.*

B.1.6 Graphics/Signage

Graphics and signage will help employees and visitors find their way through the building. Directional graphics/signage should be functional and in harmony with the architecture of the building.

All interior signage shall comply with NIH guidelines as defined in the NIH *Interior Signage System Users Manual* and in conformance with the Building Services Art and Signage Program. Signage should be easy to read; have clear text; be consistent, concise, and well-coordinated; and get people where they need to go with little confusion. The room-numbering and room-naming system for the identification of all spaces for new projects is determined by the NIH Division of Space and Facility Management (DSFM), Space Planning Branch. The Architect/Engineer shall

submit a signage plan to the DSFM Design Development for it's review and approval as part of the (35%) Submission.

B.1.7 Artwork

Artwork may be considered for shared use, common support, and some circulation spaces. Artwork is not part of a projects construction budget and is to be selected and purchased by the user Institute.

B.1.8 Other Amenities

The CCC is equipped with amenities such as cafeterias, lounges, bank machines, credit unions, shower and locker facilities, and child care facilities.

B.1.9 Infrastructure Support

The appropriate use of mechanical, electrical, and plumbing systems can do much to enhance the quality of care in the facility. Obviously, code-required support must be provided to the extent allowed by the existing facility. However, careful evaluation with the NIH to design lighting, heating, ventilation, and air conditioning (HVAC) systems, medical gases, and power requirements can extend beyond code requirements to further enhance patient comfort and care. This can also enhance the staff's life and productivity. Design should maximize the efficiency of preventive maintenance and of cleaning/repair/supply delivery/ waste-removal operations in order to help minimize the intrusions by service organizations into clinical or public areas.

B.2 Functional Criteria

B.2.1 Smoke Zones

Smoke zones must be coordinated with the Fire Safety Section and meet applicable NFPA requirements. The design module must support hospital, research, and vivarium functions.

B.2.2 Floor-to-Floor Height

The existing CCC typically has 3,700 mm floor-to-floor heights.

B.2.3 Handicapped Accessibility

It is the intent of the NIH to provide freedom of movement for all visitors to the facility wherever possible. The NIH will construct their facilities to comply with the latest requirements of the Uniform Federal Accessibility Standards (UFAS).

B.2.4 Circulation Design

The original portion of the CCC is composed of wings which radiate from elevator towers. The corridors are typically flanked by columns, and the corridor route is reinforced by elevator, stairway, and shaft locations. The location of the corridors, fire stairs, and mechanical shafts and the size and location of elevator lobbies are all unlikely to be a consideration in renovation projects of the existing building.

The major east-west spine of the building has two parallel corridors:

The "N" Corridor runs the full length of the upper floors. In the central part of the building, single-loaded corridors border the PCUs and serves office spaces on the north side. At the east and west ends of the building, it is typically a double-loaded corridor serving research labs.

The "S" Corridor extends the middle two quarters of the building, and is typically a double-loaded corridor serving the PCUs.

Three major north-south corridors help define the original CCC building:

The "B" Corridor is approximately at the one-quater point of the "N" Corridor. It is a double-loaded corridors which serves a combination of research labs and PCU spaces.

The "D" Corridor is approximately at the three-quater point of the "N" Corridor. It is a double-loaded corridor which serves a combination of research labs and PCU spaces.

The "A" Corridor is at the east end of the "N" Corridor, on seven of the lower levels of the building. It is a double-loaded corridor serving research labs, offices, and service functions.

Other corridors serve additions to the original CCC building. These corridors may be zones of corridors, including multiple parallel corridors with the same letter designation. Examples include:

The "C" Corridor, which serves the ACRF addition

The "L" Corridor, which serves the library addition

In many instances, elevator cores are located at or near the intersection of the major corridors.

Rooms are accessed through doors which are numbered to reflect the corridor designation onto which the doors open. Door numbering typically refers to the 3,650 mm module of the building, thus, individual numbers might be skipped if doors are spaced 7,300 mm or 10,950 mm apart.

B.2.5 Accommodation of Medical Equipment

Medical equipment design shall meet the functional, aesthetic, flexibility, and maintenance needs of each user. There are two categories of equipment: major or built-in medical equipment, and user-supplied medical equipment. Major equipment must be integrated with the planning of architectural, structural, mechanical, and electrical systems. Requirements are determined by codes, equipment-operating parameters (determined by the

manufacturer), installation, operation, maintenance, standards of medical practice, and user preferences. While spaces are planned to accommodate the equipment that will be used initially, there is no doubt that equipment will become obsolete and be replaced. Building systems such as mechanical, electrical, structural, and architectural, individual room and department layouts should exhibit a concern for flexibility and be able to accommodate change with the least possible disruption.

The planning, design, and installation of new or unique medical technology, such as linear accelerators, positron emission tomography (PET), and lithotripsy, require special consultants. MRI systems require extreme care to assure that the magnet is sufficiently isolated from ferromagnetic and radio frequency influences of the impacted environment and that the surrounding environment is isolated from the effects of the magnetic field. Therefore, the selection of the proper location for the magnet is extremely important and shall be addressed in the earliest stages of the planning and design of the MRI system. Project-specific guidance should be obtained from the manufacturer and/or equipment consultants.

B.3 Flexibility and Adaptability

The medical and research facility shall be highly flexible and economical to construct, operate, maintain, and modify over the life of the facility. Hospitals have great propensity for change because of innovations, new requirements, research protocol, staff transfer, or policy alterations.

Open plans, where feasible, allow easy departmental change. Expansion of expensive existing departments can often be coupled with relocation of lower cost functions. Placing departments on outside walls with adjacent site space available for expansion also adds future flexibility. Adequate access to general circulation is needed for each department to facilitate visitor, patient, staff, and material traffic. Designs should avoid floor plans that encircle a department with permanent corridors, stairs, mechanical rooms, or other building elements that are difficult to relocate.

Spaces should be designed in such a way that they can be easily reallocated from one service to another.

Electrical, mechanical, plumbing, and other support systems should be designed in such a manner as to permit modifications in support of medical functional changes with the least first cost and least disruption to the overall operations. Another measure of flexibility is the ability to expand or extend mechanical, steam, and power systems to all areas as requirements change.

Functional elements should be grouped in accordance with the following objectives. (Where difficulties arise in the mutual accommodation of all of the following objectives, the objective stated in the first paragraph below shall be given priority.)

- Combine elements on the basis of functional adjacency requirements to facilitate better functional flow and reduced operating and staff costs

- Combine elements with similar electrical, mechanical, and structural requirements to facilitate savings in construction costs

- Consistent with proper functional adjacency planning, locate "soft" functional areas (areas having minimal plumbing, special finishes, special mechanical features, and special power demands) between "hard" functional areas (areas having appreciable plumbing, special finishes, special mechanical features, and special power demands) to permit in-place future growth of the hard-functional areas by relocation of the less costly soft-functional areas.

B.4 Planning Module

The existing CCC building is designed on a 3,700 mm module. Exterior windows, the pipe stacks, and medical gas stacks are all 3,700 mm on center and will have a major impact on the layout of any hospital functions. The location of the 2,400 mm wide hospital corridor is reinforced by the column structure and elevator/shaft locations and thus would be extremely difficult to relocate.

B.5 Zoning and Circulation

The most important operational requirement has to do with the movement of patients, staff, visitors, and materials, in descending order of importance. Patients need to move easily and expeditiously from PCUs to diagnostic services. Easy movement is necessary between surgery and critical care beds and intermediate or longer-term PCUs. At the same time, movement of research investigators between selected laboratories and PCUs is also very important, since the investigators are responsible for both patient care and research activities. Access by these physicians to PCUs is vital to providing high-quality patient care. Other relationships have more to do with the frequency of movement and the impact which it may have on both economy of operation and convenience to staff.

Because the Institutes focus their attention on specific body systems, D & T services specific to those systems have generally been developed by the respective Institutes. A number of diagnostic services are useful in either diagnosing patients on protocols of a variety of Institutes or in following their progress. Eye and neurological examinations fall into this category. In other cases, patients who are the responsibility of one of the Institutes may develop an unrelated illness. In this case, the general policy has been to provide the needed treatment, if it can be done at an acceptable quality level, or to arrange for it from another provider. Both of these underlying reasons account for a portion of the service volume provided by the Institute diagnostic services.

The following Section C Space Descriptions, outlines the NIH methods of operation for the layout of the various PCUs, clinics, D & T, administration, public and educational, and support services.