FACILITIES PLANNING news

A TRADELINE PUBLICATION • 115 ORINDA WAY • ORINDA • CALIFORNIA • 94563 • VOL. 11, NO. 11 • NOVEMBER REPRINT 1992

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New Diabetes Research Institute at University of Miami School of Medicine

Multidisciplinary Approach to a Diabetes Cure

The new Diabetes Research Institute (DRI) at the University of Miami School of Medicine takes a unique approach to the quest for a cure to diabetes. The 90,000-sf building accommodates basic scientists, clinical researchers, primary and tertiary care physicians and outpatients all under one roof.

Clinical activities are housed in a three-story wing that includes patient exam rooms, an education center and administrative offices. The six-story research wing contains labs and support spaces.

...biochemists, immunologists and microbiologists will work in laboratories just a few floors above the medical center where patients receive treatment.

Miami's 90,000-sf Diabetes Research Institute, scheduled to open in January 1993, accommodates basic scientists, clinical researchers, physicians and outpatients all under one roof. (Photo courtesy of the Diabetes Research Institute.)

When the DRI opens in January 1993, biochemists, immunologists and microbiologists will work in laboratories just a few floors above the medical center where patients receive treatment. Clinical researchers can observe patients and conduct studies under controlled conditions. At the same time, patients and their families will have convenient access to all related healthcare professionals, from specialists like ophthalmologists and nephrologists to dieticians and exercise physiologists.

With this multidisciplinary strategy, which unites researchers investigating several aspects of diabetes in one location, planners hope to accelerate progress in the treatment, reversal and prevention of the illness that afflicts one out of every 20 Americans.

"The concept is that an aggregate of brain power focused on the same idea will produce more far-reaching results than individual scientists working in individual labs," says Daniel Mintz, M.D., the DRI's scientific director and guiding force behind the new building.

At the same time, the presence of patients will serve as a constant reminder of the institute's mission.

"The emphasis on the patient unites the energies...of scientists... into a cooperative effort in which they will not compete with each other but supplement each other's ideas and learn from each other," says Dr. Mintz.

The DRI design also offers promise as a model approach to the treatment and cure for other diseases.

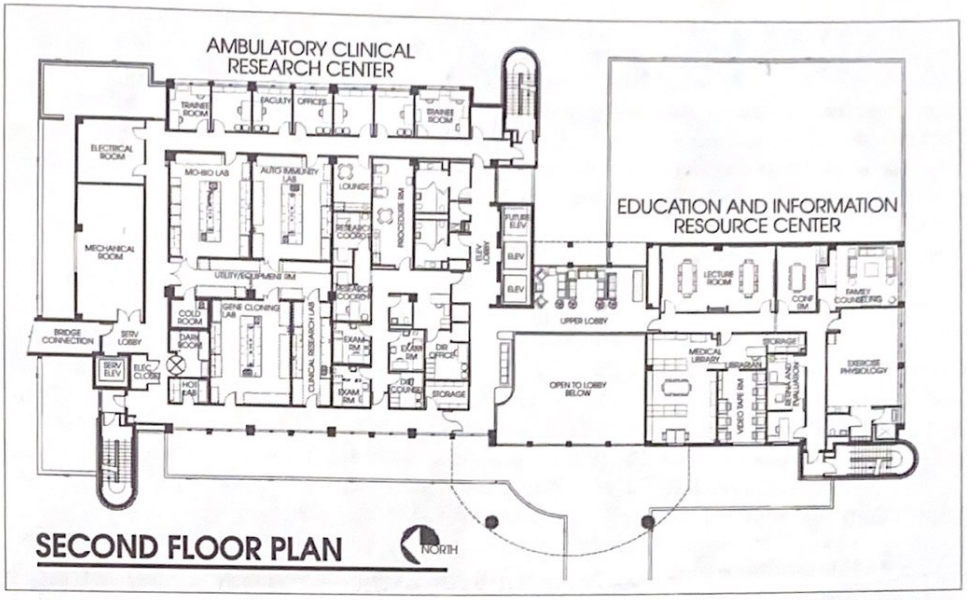
"If we can make an attack on issues related to disease prevention and reversal, and be innovative about how care is delivered for such a demanding illness, then we will be making a major step," says Mintz.

Interaction Areas

A central atrium lobby serves as a common entrance point for all building users, encouraging interaction among the different groups. Balconies off the second and third floors of the six-story research wing overlook the atrium. Here scientists can meet for informal conversation. Soft seating and wall-mounted writing boards encourage them to linger and share ideas, while the view of patients in the lobby

serves as a strong visual reminder of the building's mission.

"The idea of the research wing overlooking the clinic's atrium waiting room gives a sense of purpose," says Michael Vascellaro, AIA, design architect with project architects Flad & Associates of Gainesville, Fla. "DRI scientists are not isolated. We designed the elevator and vertical circulation path through the atrium to allow this visual contact with patients."



For flexibility, research labs at the DRI are based on a 28′ x 11′ module, typically grouped in pairs to make a four-person lab with a center island bench and counter space along the wall. Because diabetes patients frequently experience side-effects or complications, the DRI clinic offers access to a wide variety of healthcare professionals. (Floorplan courtesy of the Diabetes Research Institute.)

One-Stop Clinic

The potential side-effects of diabetes include blindness, high-risk pregnancy, heart disease, kidney failure and amputation due to gangrene. Because of this wide-ranging impact, modern diabetes management typically involves several medical specialties and a strong program of patient education.

The DRI clinic is set up to provide diagnosis and treatment for all related medical problems, thus eliminating the need to send patients elsewhere for ancillary services.

The first floor, known as the Eleanor and Joseph Kosow Diagnostic Treatment Center, houses nine 110-sf generic exam rooms equipped with a sink, work desk, seating for a family member and an exam table surrounded by a closeable curtain. Floors are vinyl tile.

Four larger diagnostic and procedure rooms, between 150 to 160 sf each, are dedicated to hematology, cardiovascular, orthopedic and non-invasive procedures.

To eliminate the need for complex wayfinding systems, arriving patients are greeted by a receptionist and escorted to their destination in the clinic. An outdoor courtyard behind the lobby provides a place for children to play while waiting for medical attention or family counseling.

The Kosow Center also includes faculty offices, support areas for records and billing, and special rooms for psychological and nutrition counseling for patients and their families.

Education Center

Treatment of diabetes usually requires patients to make significant changes in their daily activities and behavior in order to achieve optimal control of abnormal blood glucose levels and other metabolic variables.

For that reason the DRI devotes approximately 3,500 gsf to the Education and Information Resource Center on the second floor of the clinic wing. Along with a medical library, the area includes rooms for video tape viewing, family counseling, conferences and exercise physiology (where state-of-the-art exercise equipment is used to monitor blood pressure and blood glucose during graded levels of exercise). A 500-sf lecture room accommodates up to 40 people; a folding partition divides it into two rooms for smaller groups.

In order to get to the education center, patients take an elevator from the research side of institute. This provides easy access to the DRI's Ambulatory Clinical Research Center, another patient area located right outside the elevators on the second floor. A lobby-like bridge over the atrium leads to the education center in the clinic wing.

Lab Flexibility

On-going developments in diabetes research and current recruiting efforts make future adaptability an important criterion for DRI lab planners. Two key flexibility features are a central utility corridor and a modular layout that repeats from floor to floor.

Labs are located in a block approximately 80 feet wide by 66 feet deep surrounded by a fire-rated pedestrian corridor. A 10-foot-wide utility corridor, open to the underfloor above, bisects the area and distributes all services through an overhead scheme into the labs.

Standard lab services include compressed air (15 psi air), lab gas (natural gas), high purity water and reverse osmosis deionized water, with individual

APPROXIMATE AREA BREAKDOWN

Approximate Net Area	53,340 nsf
Administration	3,500 nsf
Central Services	3,600 nsf
Childcare	3,400 nsf
Clinic	7,200 nsf
Clinical Research	1,600 nsf
Foundation Offices	4,100 nsf
Lobby	2,000 nsf
Patient Education	4,000 nsf
Research Labs	16,700 nsf
Research Offices	5,000 nsf
Shell Space	2,240 nsf
Approximate Gross Area	88,357 gsf
Gross Area with Exterior Covered Spaces	90,548 sf

water polishers provided by the owner (University of Miami School of Medicine) at the point of use. Specialty gases are piped from cylinders in the utility corridor as needed. The piping runs from the corridor up through the lab ceiling and down to the benchtop through umbilicals. This distribution path gives DRI the flexibility to install the appropriate type of piping necessary for the specific gas (for example, hydrogen would be supplied through stainless steel pipe) required by the researchers.

"If an investigator in an individual lab needs something not already part of the lab, all we have to do is drop a line without major reconstruction," explains Mintz. "The utility corridor is planned for the year 2000. We were very careful in trying to predict the direction of future research so we have the energy and mechanical supply to meet the needs of new instrumentation."

A 10-foot-wide utility corridor, open to the underfloor above, bisects the area and distributes all services through an overhead scheme into the labs.

The standard lab module, 28′ x 11′, can yield several different configurations. Units are often grouped in pairs to make a four-person lab with a center island bench and counter space along the wall. Some single module labs are L-shaped, borrowing space from the unit next door. Because of their access to the corridor, perimeter modules can be subdivided into smaller special-purpose areas to house equipment or dark or cold rooms.

"Any lab module can be fitted for any future use," says Vascellaro. "The most generic floor is the fifth, where we have six identical 22′ x 28′ labs."

"When an application is given to a generic lab, we go in and assign appropriate storage, equipment and in some cases finishes," says Hilda Cadenas, design and construction project manager for the DRI.

Customized Islet Labs

The DRI's flexibility features enabled planners to create the fourth floor islet lab complex without departing from the building's modular layout. (Islets are the insulin-producing cells found in the pancreas. Mintz has done research transplanting islet cells into diabetes patients to reverse the disease.)

Islet research requires adjacent support space and a more sterile environment than that found in most labs. Planners joined three double modules to make the 1,848-sf lab complex, using the center module to house the dressing room, scrub area and glasswashing facilities.

Other features that help minimize contamination from bacteria are seamless epoxy resin surfaces on floors and cabinets and epoxy resin paint on walls, Cadenas says. The core also contains a lounge to encourage personnel to remain within the sanitary complex instead of going elsewhere for breaks.

Lab Block, Office Block

All scientist offices are located in a block across the hall from the labs in the same perimeter area on every research floor. Vascellaro says the location was chosen not so much for construction economy but for user access and flexibility.

Future expansion plans include the addition of a 122 to 124-seat auditorium...

"It didn't seem very convenient to separate the offices into a different wing, yet we wanted to allow flexibility for the labs to grow within each other," says Vascellaro. "If one research project expands and needs more space, we can go to the lab next door without having to be concerned with moving offices," he says.

HVAC

Heating is not necessary in the temperate Miami climate. Cooling for the DRI comes from three 250-ton centrifugal chillers mounted in a mechanical penthouse on the roof. Cadenas says the three chillers provide 100% redundancy since the entire building load is 500 tons.

All scientist offices are located in a block across the hall from the labs in the same perimeter area on every research floor.

"If one chiller fails, we will always have another as back up," Cadenas says.

The system delivers 100% fresh air to the labs and recirculated air to the clinic area; it provides 15 air changes per hour in occupied mode and six air changes per hour for unoccupied mode. Air in the labs enters through ceiling-mounted 99.9% HEPA filters and is exhausted through the bypass fume hoods and exhaust grills also mounted in the ceiling. Vascellaro says the initial plans called for each double lab to accommodate two fume hoods, while in actuality only one has been installed. When needed, exhaust for the second unit can be hooked up through the ceiling grill.

Expansion Space

Upon occupancy the DRI will accommodate a building population ranging from 200 to 250 faculty, staff, technicians and support personnel. Expansion space is available by outfitting the shell area on the sixth floor as either offices or labs.

Future expansion plans include the addition of a 122 to 124-seat auditorium on a site at the back of the clinic. If more space is needed in the clinic wing, the second and third floors could be built out over the roof of the larger ground floor treatment center.

Construction costs for the DRI total approximately $16.3 million, or $155 per sf based on 86,000 sf, with an additional $35 per sf for fees, furnishings and equipment.

The institute is built on land leased from the Dade County Public Health Trust to the University of Miami at a nominal yearly rate. Much of the DRI funding has come from donations, including $13 million pledged by the AFL-CIO's Building and Construction Trades Department. Construction is by McHugh Construction based in Chicago. ■

FACILITIES PLANNING news

Facilities Planning News (ISSN 1045-7089) is published monthly for $170/yr. by Tradeline, Inc., 115 Orinda Way, Orinda, CA 94563.

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Annual subscription rate (12 issues): $170/yr. (U.S. dollars), includes Canada and Mexico. Foreign rate: $200/yr. (U.S. dollars).

For subscription information address correspondence to:

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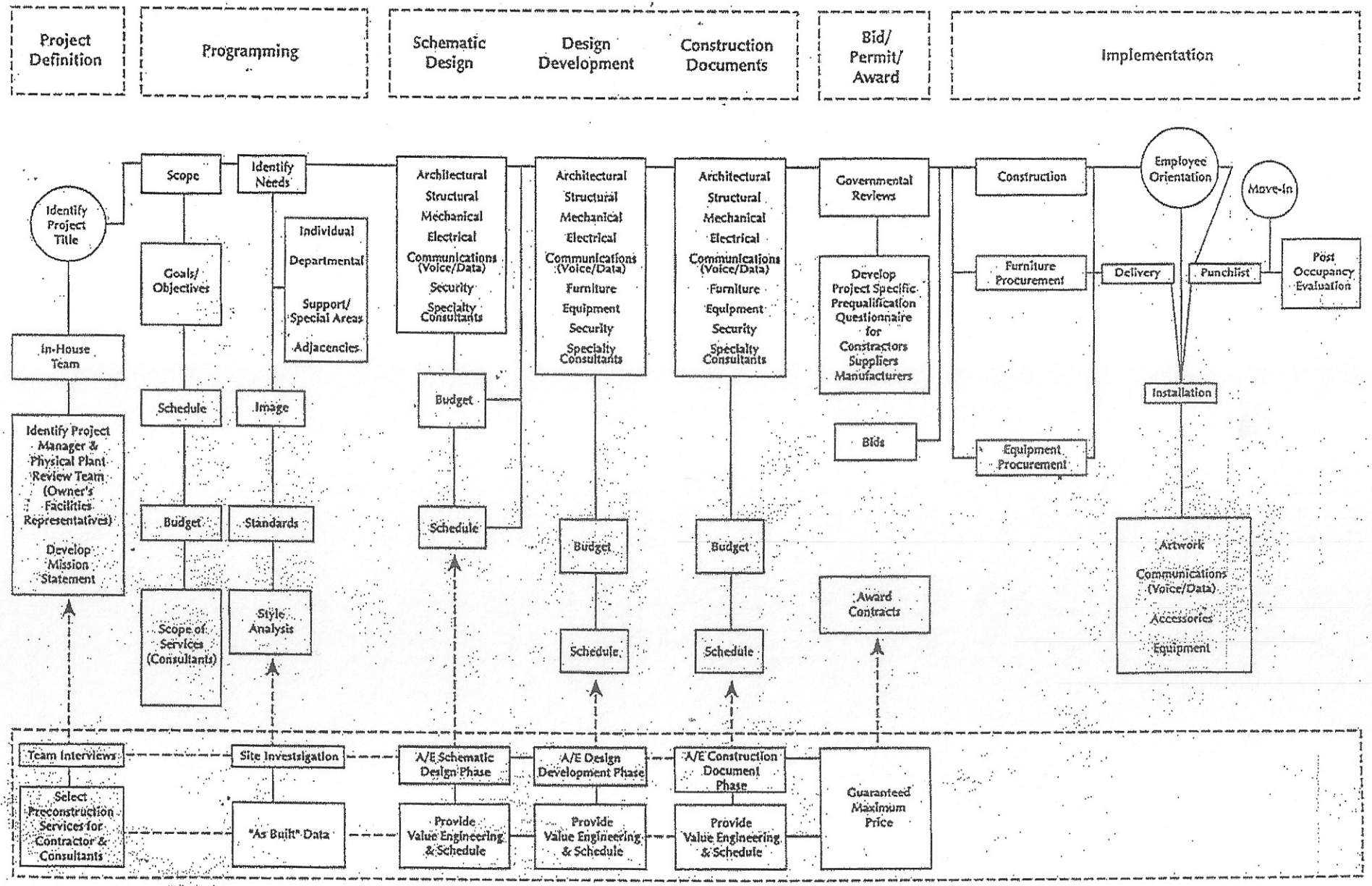
Project Delivery System
An Integrated Facilities Management Process*



*See Attachments (Exhibit "A" & "B")

Exhibit "A"
Valuable Features of a Facility Management Project Delivery System

(Refer to Project Delivery System flow diagram)

- A guaranteed maximum price for the work is provided during three phases of the design process: 1) completion of the schematic design, 2) design development and 3) 100 percent construction documents to assure that the project team remains focused on the project budget and parameters. Traditionally, redesign has occurred when an owner has relied on unrealistic estimates and undefined scope of probable cost.

- Under the Facilities Management Project Delivery System (FM PDS), value engineering and life-cycle analysis are an integrated part of the process assuring equipment and finishes are not stripped away or downgraded in an attempt to the save the project budget.

- The FM project manager maintains direct control over the budget during construction. The FM'S project manager is the contract administrator and is responsible for all commercial provisions of the contract at the onset of the project.

- The representative A/E and contractors' requests for payments, as well as the negotiations of value of contracted work, a role traditionally carried out by the architect, are the responsibilities of the FM project manager who is responsible to the owner. In this way, the architect remains focused and responsible for all of the technical aspects and coordination of the project.

- The processing of all related project requisitions and request for change orders will follow a standard process which includes all appropriate reviews and approvals which need to be signed off by all team members, inclusive of an independent cost consultant. Payments will be executed in accordance with standard accounting principles and sound business practices.

- Real-time computerized project development cost sheets and schedules are reviewed by the project team at critical milestones and established at the onset of the project.

- Utilization of the project specific requirements for contractor and supplier prequalification questionnaire and force ranking to assure quality of bidders.

- Dun and Bradstreet reviews of all consultants, contractors, key suppliers and vendors which are being considered for the project to assure financial stability.

- Standardized computerized project manuals for construction including government related clauses for administration in accordance with Davis-Bacon wage provisions with minority participation requirements and meeting federal reporting requirements.

- The owner/contractor agreement provides for clear definition of profit and overhead with a 15% maximum allowance for change order work, and no damage for delay language. The owner/contractor agreement also calls for manpower and equipment loaded critical path method (CPM) schedule as a contract document prior to the commencement of work. Further the contractor is required to verify the correctness of the schedule on a monthly basis and to update for any time related change. Budgets will be updated at the same time schedules are reviewed in accordaqnce with the revised schedule.