SECTION 00030

FACILITY PROGRAMMING/PREDESIGN

1.0 Emory University requires all potential projects to go through a formal Facility Programming Process before a project can be approved for design and construction. The Facility Programming Process may be performed internally by Facilities Management staff or by a programming consultant. The results of the Facility Programming Process will be used by Emory University to define and establish a final budget for the potential project being programmed. This information will also serve as the parameters of the design process and is the basis of the design intent document. This resultant design intent document is, to the owner, one of the most important documents produced in the whole construction process. This document is absolutely essential to the owner's commissioning program in that it states the occupant's expectations for the building. For the project to be successful, these expectations of performance must form the goals of the project team. Indeed, the goal of commissioning is to ensure that the actual performance of the building meets or exceeds the intent of the design team as well as the occupants' expectations for the building. The design intent document is followed by the basis of design, which explains how the design team selects certain systems and space arrangements to meet the needs of the occupants. The accuracy of the budget is critical to the success of the project; once approved there are no budget increases.

1.1 It is an Emory University requirement that the project design team shall provide, at the end of programming/predesign, this design intent document. This detailed description of the buildings performance attributes must be stated in terms familiar to the occupants as well as the entire design team and all construction entities. The design intent shall include at least the following:
A general description of the building type
The building occupancy code category
Applicable construction codes
Fire/life safety requirements
Climatic design conditions
Conditioned interior space design conditions
Relative adjacent spaces (and overall building) pressurization
Special building envelope requirements
Particular building needs, air purity, air volume, noise/light levels
Special environmental requirements
Special sub-systems, such as video, security, data, etc.
Basic HVAC system selection
Emergency systems and operation during utility outages
Operation and maintenance training and manual organization
Site and site infrastructure items necessary to support the above

The following is a narrative that establishes the guidelines and expectations of Emory University's Facility Programming Process. Emory University's Project Manager will give project specific direction on the Programming requirements which will be based on this description.

2.0 THE PROGRAMMING PROCESS

2.1 Programming is an effort to interpret the needs of the client (or owner) and to translate these needs into an acceptable (to the client) balance of space, quality and cost. It is a process that establishes a framework within which design should take place and should, in all cases, precede design and, where appropriate, can even precede the hiring of the design architect. Since a program's design intent document is a reliable and detailed depiction of an owner's needs and establishes many project "givens" on the front end, it can be a very useful document during the interview and selection of the design architect. There can be more than one "owner" or "client" for various scopes of work within a project whose needs must be addressed.

2.2 The programming effort generally attempts to identify and define project information into four categories:

Goals
Facts
Concepts
Needs

Briefly, definitions of these categories of information are as follows:

Goals: These state what the primary mission and intended purpose of the building are, as well as establishing its schedule and budget.

Facts: These are "fixed constraints on the project, whether site conditions, governing legislation, personnel projections, and other such presumed constants.

Concepts: Concepts are developed around functional relationships and define how work units interact within the total organization. There are functional, spatial, environmental and operation concepts to be determined.

Needs: This information describes what the client wants to achieve, sometimes expressed in spatial terms (150 sq. ft. per employee) or terms of cost ($275 per square foot).

2.3 All of this information is then translated into three basic criteria by which the building is to be designed: Quality, Space, Cost

A balance between these three, as determined according to the priorities of the client, is achieved by evaluating the benefits of space versus its cost and the desired quality of the facility. Cost must be

established during the programming phase so that subsequent design can be evaluated in terms of its "design to cost" success.

2.4 While compromises may be necessary (and often painful), the achievement of an acceptable balance between quality, size (space), and cost for the project demonstrates the ability to obtain a successful, affordable, and right-sized building even before design has begun.

3.0 PROGRAM SERVICE PROVIDERS

3.1 It is to the university's benefit, and that of its projects for which it seeks unqualified success in quality, size, and cost, to formally document the goals of its projects and establish a realistic project budget prior to committing itself and its selected architects to begin the design process.

3.2 To acquire a professionally prepared Facility Program document, Emory University uses three sources for this work:

3.2.1 Through in-house qualified staff (depending on time and resources available)
3.2.2 Services of a professional programming consultant
3.2.3 Through its selected design consultants which will also provide design services.

3.3 The design architects are currently providing these programming services but, in most all cases, these services have been undertaken subsequent to the University adoption of a "project budget."

3.4 Fees for programming services are generally based on time and meeting requirements envisioned by the programmers and is generally provided in "lump sum" proposals. Comparatively speaking, costs for the programming service are expected to be about .5% (1/2 percent) of the construction cost for a project. Fees for pre-design portion are expected to be about .25% (1/4 percent of the planned construction cost.

3.5 There are professional "programming" consultants available who are trained to produce a formal Program document. Their services are provided without obligation or commitment to provide design services on the project as well. Their focus is, instead, on developing a reliable "picture" or "model" of the project for which others will be responsible for design and construction. Their expertise is in helping Emory University understand and "fix" its expectations at the earliest phase of project development.

4.0 PROGRAMMING EXPECTATIONS AND DELIVERABLES

4.1 The goal of a formal programming effort is to establish four basic criteria by which the building is to be designed: Quality, Space, Cost, Schedule

4.2 In order to establish these criteria with reliability and confidence, the programming consultant must quantify and evaluate a multitude of information about the project through a series of programming sessions with University representatives. The scope of a thorough program development will include

investigations and documentation of information across a wide spectrum of project elements. Among these are:

Institutional and project specific goals and objectives

FACTS	CONCEPTS	NEEDS	ANALYSIS
Budget and scope limitations	Menu of options	Realistic Budget	Budget summary
Site analysis	Site options	Address impacts	Identify all impacts
Programmatic needs/ Diagram	Stack and Block Plan	Adjacency matrix	Optimize relationships
Existing site use			Alternatives
Development constraints	Site Recommendation	Efficiency factors	Basic project/building scope & quality
Space categories			University Criteria
Schedule	Sequencing	Realistic Schedule	Constraints
Parking structures	Parking demands Parking concerns Parking budgets Parking recommendations	Support	Alternatives/Traffic Study
Master Plan Guidelines	Exterior Environment	Meet Guidelines	Precinct Study
Future Building Sites	Masterplan		Precinct Study
Site zone/precinct	Criteria/determinant		Alternatives
Open spaces	Walking Campus	Precinct needs	Precinct study

FACTS	CONCEPTS	NEEDS	ANALYSIS
Zoning restrictions of variances	Precinct Meet	zoning regs	Alternatives in lieu
Roadway network	Efficiency	Optimize	Traffic Study
Tree Ordinance	Tree Replacement Reforestation	Forest Preservation	Tree Identification
Environmental	Reduce impacts		Alternatives
Emergency access	Safety		Identify Access
Service access	Trash/Recycling Deliveries Service Vehicles		Identify Access
Security concerns		Program	Identify needs
LEED^{tm}/COE issues	LEED^{tm} Certification	Satisfy program needs	Best value/Lifecycle
Easements and utilities	Services	Meet all needs	Identify all extensions
Water		Satisfy program needs	Identify impacts
Sound Systems	Acoustical/Audio-Visual	Special performance spaces	
Storm Water	Detention/Retention	Reduce impacts	All watersheds
Sanitary	Services	Meet all needs	Identify all extensions
ADA Compliance	Criteria		
Room descriptions	“Typicals”	Classrooms & lecture halls	Criteria
	Generic	Laboratories	Benchmarks
Individual room design	“Typicals”	Offices	Criteria

FACTS	CONCEPTS	NEEDS	ANALYSIS
Individual room design		Lounges Food Amenities	
		Classroom	University Standards
Maintenance concerns	Engineering	Functional relationships	Deferred Maintenance issues
		Support Equipment schedule Interior finishes	
Elevators	Design guidelines		
Mechanical concerns	Mechanical		Design guidelines
Electrical concerns	Electrical Lighting		Design guidelines
Structural concerns	Codes		Site specific Seismic study
EMS Governing codes and Standards			
Energy conservation	LEED^{tm}/Design Standards		
Building occupancy			
Classification			
Fire Protection	Codes/County		FM Global
Fire Resistance	Codes/County		FM Global

4.3 At the conclusion of a formal programming effort, the product is a clear and concise description of the project, an accurate depiction of its intended scope expressed in net and gross square footages, an understanding of the intended quality (marble clad or accent pieces), and the projected cost and schedule to accomplish all that is contained in the program. Agreement on all of the above establishes specific design goals and expectations for its design architects as well as a baseline against which the designers success can be evaluated. Upon its adoption, the Program becomes the project anchor during the design and construction phases of the project.

4.4 The Facility Programming results will be issued to the project design team. If an area of the Facility Programming documentation appears to be insufficient for the design preparation the Architect must specifically address this area in writing to Emory's project Manager. The Architect shall not make assumptions to cover insufficient programming information. Any assumptions made, without written direction from Emory's Project manager, are subject to correction at the Architect's expense if the assumption conflicts with Emory's desired results.

5.0 PREDESIGN GUIDELINES:

PURPOSE OF THE PREDESIGN STUDY AND EXPECTED OUTCOME:

5.1 The purpose of conducting a predesign study, prior to final project approval is to:
Reduce the majority of project uncertainty related to:

Scope,
Major project issues and impacts/funding milestones,
Addressing impacts to surrounding areas, infrastructure, and environment
Address Emory Masterplan Guidelines and Emory Design Standards
Coordination of project delivery method for construction,
Develop/confirm project schedule and,
Total Project Cost

5.2 Establish an appropriate total project budget for the complete implementation of the project; and document the above information into a single comprehensive report. This report is the first step in the creation of a design intent document which is intended to be carried forward and further developed in the subsequent design stages of the project

5.3 Incorporate a sustainable / green building approach using the U.S. Green Building Council's LEEDtm 2.0 (or current version at the time of design) project design criteria. Emory University has a goal of achieving a LEED tm Certified Rating where feasible; this program has been accepted as a guiding principle for the University.

5.4 To date, the University's experience is when approached as intended by the USGBC as integration of architecture and engineering and with an understanding of the University Design standards; LEED tm should have little or no cost impact on projects at the "Certified" level.

5.5 All of the predesign items have to be addressed at some point prior to construction, even if predesign does not exist as a separate activity. It is anticipated that the early determination of project requirements, constraints, options, analyses, decisions, and documentation that are an integral part of predesign will not only assist, but also actually expedite, a project to its timely and successful completion. Thus, the project more fully meets the needs of its users. In addition the report shall identify and address impacts to the University and other related constituencies.

6.0 CONTENT OF PROGRAM/PREDESIGN STUDY

6.1 Predesign should provide the following information in a manner, and at a level of detail, appropriate for a particular project's type, complexity, size, and site characteristics:

Summary of basis of project need and expected occupant use, and prior planning efforts supporting the project

Details related to the project scope

Documentation of user requirements (known existing and potential future)

Architectural/engineering program related to space, special systems, and equipment to meet those Requirements

Identification and evaluation of potential site(s) and analysis of existing conditions

Construction cost and total project cost estimates based on the project scope, site characteristics, and expected implementation schedule

Planned project management and administration process (including method of construction delivery)

Project implementation plans showing the project schedule and funding requirements to complete the project.

6.2 EXECUTIVE SUMMARY

The executive summary section presents essential and high-level information about the project. It summarizes material that is presented in the subsequent sections related to the purpose and function of the project, description of project type, size (e.g., gross square footage, number of floors, etc.), location, major project funding amounts and milestones, recommended project delivery method, and construction cost estimate and total project cost estimate.

The information contained in the executive summary should not require a technical background to understand. Significant unresolved or incomplete issues to be addressed in subsequent project activities should also be identified. The one page project implementation plan summary prepared and presented in

the Project Analysis section should also be included in the Executive Summary section. Generally, the executive summary should not be any longer than one or two pages in length and contain all the important information that a senior executive should need to be conversant with the project.

6.3 PROGRAM ANALYSIS

The programming activity defines the complete and specific needs of the user translated into facilities terms. The program will identify the requirements of all architectural spaces, equipment, and any special needs (i.e., security fencing, surveillance cameras, special ventilation requirements, etc.) which define the project and will be included in the eventual design of the facility. This includes defining a project's functional needs, interior and exterior functional requirements (including space sizes, contents, activities), and relationships. A project program serves not only as a basis for design and a source of information about a project, but is also the basis to develop the estimated construction cost.

The program analysis may be the most extensive and most important section of the predesign study. The requirements should not be unnecessarily restrictive in nature, but should clearly and directly express the existing and future potential needs of the Program. Consultants likely will be needed to conduct or assist in the program analysis. However, it is important that the user Program be heavily involved in the process by providing initial guidance and information and then actively involved in the review of the analysis. The Programming Executive Committee under the coordination of the FM project manager should make all final decisions.

The program describes the scope (what, and how much) and quality (the level of performance and amenity) to be accommodated. Scope, quality, and site conditions are key factors in establishing the project cost. Programming and costing should be seen as an iterative process that is both simultaneous and reciprocal and may involve trade-offs and alternatives to be developed and considered. Additional input will be provided under this process to the programmer

6.3.1 Architectural and Occupancy Requirements

Identify the basic elements and set up the structure and techniques to obtain necessary information from owners, managers, and users - any people with necessary knowledge or significant influence:

Owner

The program must reflect the owner's needs and aspirations, goals, organization, and procedures.

Users

In some projects, the owner is not the project's ultimate user. In these situations, it is important that the Programmer understands that the needs and aspirations of the owner and users may be quite different and that both must be recognized in the design. In case of conflict, the owner shall be the final authority.

External Requirements and Standards:

Identify planning and zoning ordinances, building codes, and other regulations that affect facility requirements.

At the same time, planning and design standards (such as benchmark floor area requirements for auditorium seating, viewing standards for projected media, and utility requirements for laboratories) will establish certain program requirements.

Emory University has a commitment to using LEED as a guiding principal in the development of projects. Each project shall address this commitment via a LEED certification plan (or LEED criteria application plan for projects that fall outside of the LEED process).

6.3.2 Programmer's Experience

The programmer's experience with the facility type, the owner type, or situation faced by the owner can be invaluable in identifying and presenting options that lie beyond the owner's familiarity. Experienced Programmers understand that interactive guidance to owners is central to effective programming and will provide this guidance and benchmark examples during the process.

Prepare a space requirement information outline - Organize the material into small parts related to user interests and to the ways in which the designer will proceed, and then key all information to the outline. (Room/space data sheet-/document the needed information for determining floor space and associated requirements).

Interview the essential decision-makers. Organize the material into small parts related to the owner's interests and to the ways in which the designer will proceed, and then key all information to the outline.

6.3.4 Document and evaluate:

Have occupants and decision-makers evaluate the present spaces.

Start with the user's present building (if one exists); document how much space is used by each employee/entity, what works well and what does not. Provide guidance and benchmarking of best practices and examples of similar spaces

Identify existing equipment and furniture types and the likely degree they may be relocated to the new facility.

Have occupants and decision-makers participate in identifying areas and features to retain or change.

Explain the amount of contact with the general public and any special requirements for parking, public transportation, etc.

Space and use requirements; include projected growth and flexibility to expand.

Functional requirements / Common Uses / Shared spaces of each Program.
Group like type spaces.
Spatial relationships between spaces.
People: Number and functional responsibility of personnel.
Utilize existing applicable Program / industry space standards and guidelines to prepare a detailed list of each space:

Space title and function
Size of space based on position / job title
Efficiency determination: gross vs. net square footage ratio
Project sequencing constraints and requirements
Codes/Regulations
Building and life safety
Accessibility

6.3.5 Total Gross Space Program

The total area of a building [that area enclosed within the exterior walls] is a combination of the assignable (net) and non-assignable areas of the facility and is generally known as the ”gross area”. For predesign purposes, the gross area may be calculated by multiplying the assignable net area (as defined by Emory University FIMS standards) by a “grossing” factor to account for non-assignable spaces that must be accommodated in the building envelope. The selection and application of this factor is both an art and a science and is extremely important in arriving at a relatively accurate overall facility size and its estimated construction cost.

Typically, the programmer should work with the Campus Planning project manager to develop an initial grossing factor that is intended to cover required constructed space such as walls, columns, mechanical chases, electrical and communications risers, air handler rooms, vestibules, corridors, main restrooms, stairs, elevator shafts and equipment rooms, custodial closets, electrical and communications closets, and main mechanical and electrical rooms that are not part of the net assignable space program. Due to the nature of the Emory “look and feel”, the attic space created under a pitched roof must be addressed in this calculation.

When a facility is programmed in this manner, then it is recommended that the appropriate grossing factor be validated to ensure that these needs can fit within the total target square gross footage (if provided). It is necessary to validate assumptions by treating many of the above spaces (such as atriums, interaction and special spaces that integrate with corridors), as net areas to generate the gross area. Assumptions on efficiency must also be validated against the Masterplan footprint assumptions, criteria that can affect Gross Area.

Spaces above and as identified in Section 01830 Operations and Maintenance: Space and Technical Guidelines) as net areas should be developed through an interview process coordinated through the development of the user program and with FM Operations and Maintenance and other University representatives. Programming each space by creating individual Room/Space Data Sheets [or common

Room/Space Data Sheets. By programming in this comprehensive fashion, it is appropriate to use adjust the final grossing multiplier since uncertainty has been reduced.

The selection of the appropriate grossing factor should also consider the overall intended spaciousness/amenity of the facility and the intensity of staff, client, and visitor volumes and peak circulation requirements. Also, since single floor buildings have no need for stairways and elevators, lower range grossing factors may be more appropriate.

Certain buildings may combine more than one function or primary type of assignable space so that the use of several grossing multipliers for each subtotal of similar net spaces may yield a more accurate gross building prediction than by simply applying a single factor.

6.3.6 Relationship Matrices

To assist the future project designer in achieving functional layouts, it is desirable to record preliminary information about the ideal arrangement among the programmed spaces. Based upon information gathered from future facility users and their current representatives, desired proximity relationships should be converted into an affinity matrix capable of indicating at a glance whether spaces should be adjacent, close, neutrally-placed or remote from one another

6.3.7 Special Performance Requirements

All special requirements that will define this entire project or specific spaces or functions should be identified. These include Emory Masterplan Guidelines and Emory Design Standards, and might include electronic, voice, data, audio visual, communications or other similar provisions as well as zoning, environmental issues, symbolic or special aesthetic goals, etc. Specific acoustical or sound separation requirements should be defined, as well as any unusual lighting requirements. Symbolic or aesthetic goals are to be documented, with particular attention being paid to contextual settings or surrounding buildings with which the project is to be compatible. Architectural style, use of materials and detailing are important considerations during design, and they must be addressed during Predesign through precinct studies and specific building studies with the Emory University Campus Architect and be incorporated in the construction cost estimate.

Any issues, which relate to historical districts or landmark building status (in the case of a renovation) should be documented, along with the restrictions that will be placed on the project and the processes and/or programs involved in securing approvals for the project.

System compatibility issues should be investigated and documented. These issues include a situation in which a project will require the involvement of a specific provider or vendor to insure compatibility of a system. Examples might include, but are not limited to, the use of a specific fire alarm system or HVAC control system to tie in with a system already in use on that campus or in a building.

With respect to the engineering systems of the planned facility, the operational intent of each system is to be defined as fully as possible. Issues such as division of HVAC systems and zoning, controls, exhaust,

filtration, ventilation criteria, emergency power requirements, etc., are to be identified and documented with respect to applicable regulations or guidelines as well as the users' requirements.

Examples of special requirements that should be considered include the following:
Emory NetCom (Data/CATV/Telecommunications) Requirements
Electrical and mechanical systems
Energy supply
Special HVAC
Environmental Needs
Ensure adequacy of existing power distribution center where applicable
Ensure adequacy of existing heating/cooling plant where applicable
Emergency power system justification and requirements
· Storage requirements:
Under/Above Ground Storage Tanks (UST/AST)
Hazardous material handling/storage
Lab Safety
Lab storage
AAALAC requirements
General purpose storage
Special storage
Hospital waste storage
Bio-hazardous waste
Radioactive waste
General waste
Chemical Storage
Ventilation requirements

6.3.8 Security Requirements

Identify user groups with specific security needs
Identify the public interaction within the space
Identify departments / Program with no public interaction
Identify need for card key access
Alarm systems
Fencing requirements

6.3.9 Operational Requirements

Vehicle fueling stations including alternative fueled vehicles
Food service operations
Shipping/Receiving functions (loading dock access, etc.)
Waste and refuse removal (space for dumpsters, etc.)
Recycling program (room, local centers, loading access)

6.3.10 Codes/Regulations

List all codes and regulations that may have an effect on this project
Building Codes - State and Local
Environmental
Other

6.3.11 Risk Management:
FM (Factory Mutual) Global Standards

6.3.12 Future Growth

Identify design measures and features that allow for future growth and change
Identify elements subject to probable change, both in the short and long term
Assess probabilities of change and indicate where expansion, contraction, or alteration should be provided in design.
Note technology and space needs that may change (e.g., mechanical and electrical systems, labs, computers)
Identify if energy and utility systems will allow for efficient building or campus expansion

6.3.13 Loose Equipment and Furniture

Loose equipment and furniture are items needed for the eventual use of the facility at its initial occupancy, but are not generally included as part of the main construction contract. Common examples are personal computers, copiers, desks, chairs, and file cabinets. Fixed equipment and fixtures items are normally part of the construction documents and include such items as carpets, blinds, voice and data communications infrastructure, built-in cabinets, and built-in laboratory or shop equipment.

If the item or equipment requires the services of a technician or some other trade for its installation, or is actually physically attached it probably belongs in the construction contract.

Loose equipment and furniture can be delivered and installed ready for use without major effort or simple connection to utility stations or scribing to the walls. Summation of information on loose equipment and furniture from the room data sheets provides the primary portion of determining the total need. Additional miscellaneous equipment and furniture should be added for those spaces and functions not specifically addressed by room data sheets.

The process to determine loose equipment and furniture involves grouping major and significant cost items onto a summary sheet, estimating quantities, determining reasonable unit costs, and estimating the total cost in coordination with Emory University Campus Planning Interiors. Any cost for loose equipment and furniture, though not included in the construction cost, must be estimated and included as a line item in the total project cost. If the Program or Programming Consultant believes that a significant consultant effort related to loose equipment inventories, layouts, etc., will be required during the design phase, then appropriate estimates to generate budgets should be provided to cover this additional cost.

In coordination with Emory University Campus Planning Interiors, document loose equipment, furniture needs and costs from recently completed projects of similar type, size, and configuration, and use the cost per space or station to develop the total loose equipment and furniture cost allocation, with specific lists of items and quantities to be developed during design.
Emory University Campus Planning Interiors will provide benchmark “typical” furnishings for reference.

If it is planned to relocate existing equipment, it is important to realize the time that predesign, design, and construction will take. It is possible that existing equipment may be obsolete prior to occupying the new facility. It is also important to note that there is a cost in both time and dollars in the relocation of existing equipment. Other than the obvious expense of simply moving the equipment, there is the question of how existing staff will be affected while the equipment is unavailable and being moved.

6.3.14 Fixed Equipment and Fixtures

Fixed equipment, such as walk-in freezers, ovens, special laboratory equipment, security equipment, etc., must be included in the project as a part of the construction cost. Such equipment is installed at the time of original construction and usually requires some special connection or utility. If these needs are not addressed in this stage, the Program may be faced with the requirement to eliminate or defer some other part of the project in order to provide a complete, functional facility.

6.3.15 Exterior Space Program and Requirements

Important aspects of new construction projects at Emory University are requirements outside of the exterior of the building. These may include parking spaces, access and circulation roads, sidewalks, entrance plazas, lighting, fencing, landscaping, and signage and all utility extensions needed to support the project. Specific exterior items should be identified and quantified in this section of the report, and also included as part of the construction cost estimate as appropriate. There are other Emory University representatives that must be consulted to develop these items.
The determination of the extents of the project is a joint effort coordinated by the Emory Project Manager, between the programmer, users, owner’s representative, the Campus Architect, and other University Leadership.

6.3.16 Deferred Maintenance Issues:
In order to define the scope of work comprehensively, review the FM master list of deferred maintenance items, with FM Operations and Maintenance and others within FM. Coordinate and incorporate the appropriate Deferred Maintenance items into the scope of the work. Provide a summary and breakdown of the specific items and a narrative to describe why these items are appropriate to be included in the project." Coordinate the project estimate format to allow these items to be considered separately from the user program items.

6.4 SITE ANALYSIS

The proposed site is analyzed through a series of investigations to understand the opportunities and constraints that may be imposed upon a project and its design. Studies are conducted to evaluate existing conditions. These studies may include, but are not limited to, geo-technical reports, land surveys, and utility surveys. This section should identify the site-specific location and identify factors such as zoning, accessibility, transportation, environmental limitations, regulatory factors, etc. that are important considerations to the project.

The site analysis requires a program and a site. The program and site are analyzed to determine their compatibility.

The Predesign report should clearly present how the site analysis findings impact, and are incorporated, into the project's scope and cost estimate. For example, if the site analysis determines the need for a storm water detention/retention pond or structure, the site plan should show the potential location and the construction cost estimate should include its cost.

The determination of the site suitability for the program requires an analysis of the following site-specific needs:
Existing Conditions and Suitability
Evaluation of site as applicable and appropriate:
Topography
Land use, verification of property ownership, control
Economic Value
Physical Issues

Site history to the extent of previous uses of the site will be addressed by Emory University's Phase 1 Evaluation

Categorize existing conditions
Use existing information to determine risk of construction on site
Geo-technical/Soils

Categorize soils in area

Provide input and address information provided from limited soil borings and soils investigation by Emory University that may be necessary to analyze conditions present in area where the proposed project would be physically located.
Make preliminary determination of bearing capacity of soil

Review adjacent watersheds and outfalls, surface, storm water, or groundwater characteristics and ability for the adjacent waters to receive the new development.

Utilities Systems Availability, Compatibly and Existing Capacities

Water
Sewer
Stormwater
Gas
Electricity
Telephone
Cable
Other

Environmentally Sensitive Conditions

Forest and existing tree canopy
Steep Slopes
Unstable soils
Flood plains
Water supplies and resources
Wetlands
Protected Species and Critical Habitats
Other

Hazardous Materials – Incorporate input from Emory EHSO regarding:

Underground or surface storage of hazardous materials such as:
Asbestos-containing materials (ACM's)
Lead paint
Toxic waste
Underground Storage Tanks (UST)
Emory maintains information on environmental contaminants issues governed by EPA and Georgia EPD

Site Survey

For the predesign process the present land survey should be less than 5 years old, (further project development will require a more current survey). Emory University will obtain survey information.

Regulatory Factors

Zoning Codes

Review with the county/city the zoning classification
Identify any inconsistencies with current zoning

Building Codes and Requirements

Fire Department Access and Fire Lanes-DeKalb county criteria, input, and refinement; coordination with the overall fire access network of the campus; Fire service, fire hydrants and system coordination; flow testing and capacity assessment

Any local codes or special code needs

Design review
Land use permits
Other

Adverse cost impacts
Any delays that may be imposed in the design or construction phase

Evaluation of Site to Meet Requirements

The evaluation of the site to ensure compatibility with all elements of the project and program to include the following issues as appropriate and applicable to the project. Develop information and criteria to determine what is needed to mitigate impacts of the project that might adversely affect the quality of the environment.

The site coverage of the building, parking and other impervious areas
Suitability of soil to support proposed building
Impact to forested areas (Emory Forest Policy)
Configuration of the building
Degree of earthwork and grading required for the project
Vehicle access, parking, circulation, and delivery-determined through consultation with Emory Parking Office representatives and be set by zoning ordinances or other local regulations

Circulation and Open Space Requirements

Space for pedestrian and vehicular circulation
May depend on site configuration, land value, and Emory Masterplan design objectives

Special Constraints and Requirements

Utility easements
Set backs
Rights-of-way
Need for retention/detention ponds
Parks and recreation areas
Flood plain areas
Fire Lane Network
Environmental

Historical/Archeological
Ecological/Research preserves
Other

Access Issues
Site Accessibility
Impact of project on traffic flows/public streets/infrastructure
Traffic/parking study
Identify required improvements
Identify rights-of-way or additional land that may be needed to provide access to the site

Utilities

Identify type, capacity, and tie-in requirements for all utilities
Water
Gas
Telephone
Electricity
Cable
Sewer
Other

6.5 PROJECT COST ESTIMATE/TOTAL PROJECT BUDGET

One of the key informational items developed during predesign is a project cost that includes all direct and associated costs for all activities and phases, including design, construction, loose equipment, and start-up [building commissioning], move-in, and contingencies.

It is recommended that a cost engineer or a professional consulting firm prepares the construction cost estimate and that they work closely with Programming Committee and Emory Project Manager in developing the total project cost estimate. The construction cost estimate must pull together the program requirements, site conditions, and reasonable project/facility design assumptions to develop the estimate. Although the potential cost magnitude of the project must be kept in mind throughout the Predesign phase, the detailed construction cost estimate should be prepared in an iterative process, as all portions of the study are completed and coordinated, and should take into consideration all of the scope elements and site conditions of the proposed project. The FM Project Manager is responsible for the Total Project Budget.

6.5.1 Design Assumptions and Narrative Specifications:

Building configuration, methods, materials and systems vary from one building and type of construction to another. Building assumptions, such as architectural treatments, building systems/components, and any special accommodations (i.e., security, parking, environmental constraints, etc.) not previously identified should be defined and documented in this section. The objective is not to "lock-in" a particular design

configuration, but to understand and document the assumptions and associated cost impacts that are used for the basis of the construction cost estimate. This section should describe the assumptions used in preparing the cost for each item in the category, defend more expensive choices and discuss any trade-offs that were considered (i.e., sloped vs. flat floor, or standing seam vs. built-up roof, etc.). Brief narrative specifications should be presented by CSI UniFormat category.

A concise summary of key cost estimate design assumptions and features should also be prepared to assist in confirmation that basic program requirements are met and to highlight the various structural, architectural, mechanical, electrical, and site features used in the construction cost estimate

6.5.2 Construction Cost Estimate:

This section should describe the approach used to establish costs for the project. At a minimum, project descriptions and cost estimates should utilize Levels 1 and 2 of CSI UniFormat. The construction cost estimate combines cost estimates from the individual elements in each of the of the 12 system categories of the CSI UniFormat Classification system. The estimate format should be reviewed with the Emory Project Manager in advance.

All assumptions used to develop the individual cost for each element should be explained, (i.e., system "L"-Site Work, element "121" Site Preparation: describe the element along with the number of units and the cost per unit, then the total for the element; or for system "K"- equipment, element "111"-Fixed Equipment: list all equipment that will be included in construction documents along with the number of units and the cost per unit, then the total for each item followed by a total for the element).

Each system of the CSI UniFormat specification (A-Foundations, B-Substructure, and C-Superstructure, through L-Site Work) should be compiled in a separate grouping to eliminate confusion. A standard format should be followed which is consistent with the narrative of assumptions, and includes a list of the elements, description of each element, number of units, cost per unit, subtotal, with a total for the system/element at the end of the list.

After all the individual systems are estimated, the next step is to determine the complete construction cost estimate. Because Predesign space and specification assumptions may be revised during actual design, the use of a “design contingency” may be appropriate, generally at a rate not to exceed 12% to 15% of the total cost (The FM project manager will provide direction). Also, it is necessary to include an escalation factor, not to exceed 5% per year, to escalate the construction estimate from current year dollars to the expected construction bid date per the project’s schedule. Both of these items should be documented on the Construction Cost Estimate. Review assumptions and recommendations with the Emory Project Manager in advance.

6.5.3 Total Project Cost:

Although the construction cost estimate is vital, it is only a portion of the complete cost of the project, known as the total project cost. The total project cost is developed by the Emory FM project manager and with interaction with the programmer. This information should be presented on a separate page, with

supporting back-up material and narrative as appropriate, which totals all aspects and activities of the project in an orderly manner to obtain the complete project. It is recommended that a cost engineer or consulting firm assist with the preparation of the total project cost estimate, and in appropriate distribution of costs by the project's phases. The total project cost estimate pulls together the construction cost with architectural and engineering fees, special consultants, land acquisition, and loose equipment, and other directly related project activities and costs to develop the total project cost estimate. It is critical to coordinate the project estimate format to allow the University to consider deferred maintenance items separately from the user program items.

6.6 OPERATIONS AND MAINTENANCE IMPACTS

The Operations and Maintenance Impacts section defines the potential project impact on the annual operating budget for the University. Items such as changes in staffing levels anticipated expenses for salaries; operations, maintenance, and utilities should be presented in this section in coordination with FM input. These estimates should be amounts that are anticipated over present levels of funding for operations and maintenance and staffing. Particular attention should be paid as to whether the maintenance and operational services are expected to be performed by FM or by the Program. Potential revenue sources and amounts should also be discussed in this section. All revenue sources (parking decks, dormitories, student centers, cafeterias, etc.) should be listed individually and totaled to show the offset of operational expenses. An outside consultant or FM might prepare this section with input from the Program.

6.7 PROJECT DRAWINGS / DIAGRAMS

The Project Drawings / Diagrams section may contain conceptual (pre-design) drawings of the proposed project in enough detail to foster an understanding of the project and show the general location of the project on the site. Site diagrams illustrating site layouts such as site survey, site location, utility location, topography, fire lanes, watersheds, forest and vegetation etc., should also be included in the report. Identify the extent of site development graphically. Show special impacts such as trees, parking, or buildings lost to construction, with assessment of loss, Typical room layouts may be desirable to show how expected occupancy, furniture, and equipment may be accommodated, but detailed floor plans of the entire facility are not recommended in Predesign studies due to the limited project development at this stage. Photographs of the proposed site and surrounding area should be included with special attention paid to adjacent structures and any unique existing conditions (i.e., rock outcroppings, creeks, etc.).

Diagrams of spatial needs of the project requirements including building footprint, massing (location of Facilities/objects in immediate area to project), parking, access, circulation and open spaces, landscaped areas, noting special constraints and requirements, should be included.
Functional / bubble diagrams consisting of generalized spaces representing program elements organized in realistic relationships and scaled to show relative size are also useful.

6.8 APPENDIX

The report should have an Appendix to include a reference list of the codes, standards, guidelines, prior studies, etc., which were used in performing the predesign study. It should also include copies of any supplemental information such as Program space, functional, and performance planning or programming standards and guidelines that were used in the predesign study that will also be relevant for use during design; these are the basis of the Design Intent Document.

Scope or cost information from recently completed Program projects of similar type, size, and configuration that are used for the predesign study should be adequately documented in the Appendix to support its transferability to this project.