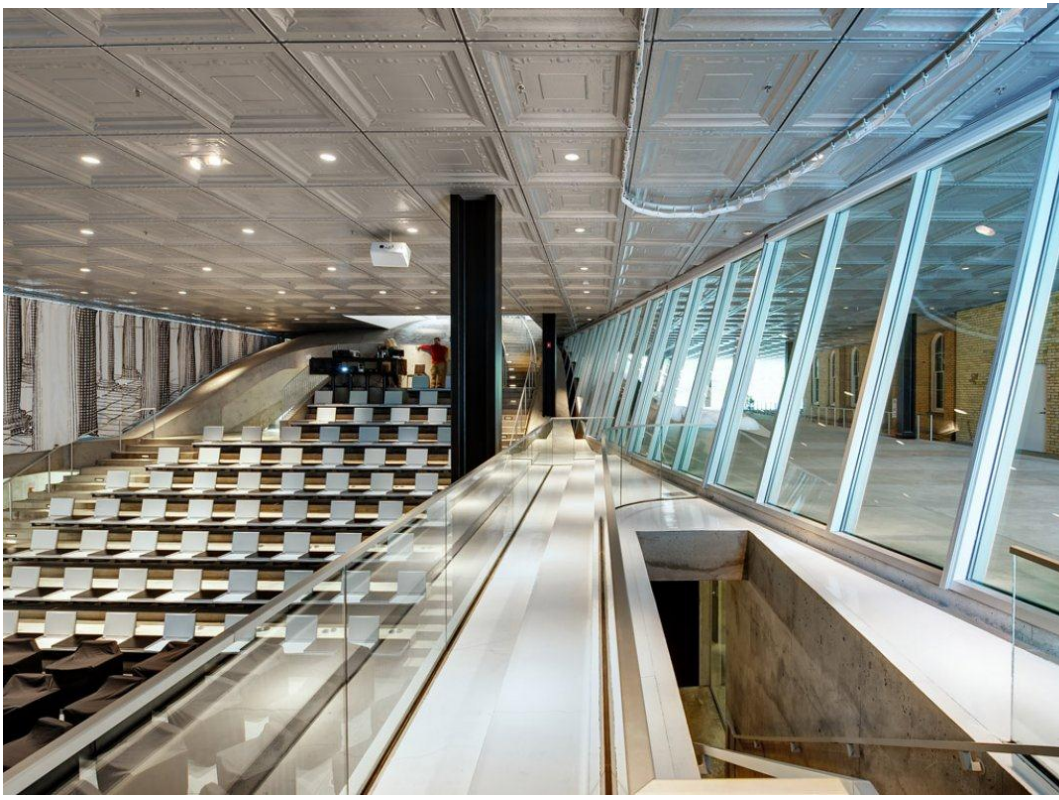
CORNELL UNIVERSITY

PROJECT MANAGER'S DESK GUIDE



2013 Edition

T A B L E O F C O N T E N T S

1 PROJECT TYPES & STAKEHOLDERS

1.1 Purpose

The purpose of this guide is to provide guidance and direction in managing planning, design and construction projects at Cornell. It serves as the prime document to disseminate project management policies and practices.

Additional Best Practices for Project Management can be found at the Project Managers Toolbox web site located at:

pm.fs.cornell.edu/toolbox/default.cfm, or through the FS website, resources/project managers.

The Project Management Toolbox is a repository of past presentations on specific topics related to managing projects at Cornell covering such topics as:

- *The bidding process,*
- *Municipal approvals,*
- *Construction Scheduling,*
- *Negotiation for PMs,*

The PM toolbox is an excellent source to obtain additional information for various topics, however individual presentations are not routinely updated and may contain information that has been super ceded by new policies. The guidebook will be regularly updated to provide project managers with the most current information necessary to properly execute projects. Periodic supplements can issued to update and expand specific sections between the release of a full document revision. Project managers are strongly encouraged to provide lessons learned that would benefit their colleagues in future projects.

This guide is not a substitute for formal training or experience in the management of capital projects and Cornell's project managers are encouraged to stay abreast of industry trends through industry literature like Engineering News Record or extended professional organizations such as the Construction Management Association of America. The content of the guide is focused on executing projects for Cornell University.

1.2 Defining Projects and Project Management

Projects requiring the coordination of multiple participants and resources are led by a *project manager.* By comparison, routine maintenance work handled by maintenance management or a maintenance agreement such as equipment adjustments, inspections, servicing that are handled as a service call are not classified as a project effort at Cornell

In this guide, a project is defined as those efforts that result in:

- *A physical change to structures(s) or the Campus (such as the addition of new buildings, interior renovation, systems upgrading and landscape projects).*
- *Planning studies.*

1.3 Project Types

There are many types of projects at Cornell University from new buildings, renovations, utility projects, state-funded projects, systems upgrading, roofing, planning studies and some that are difficult to classify. For this reason, project management centers specializing in particular areas of expertise have been established to provide the University with the highest service in executing projects and to build institutional knowledge. However all projects follow the same basic administrative approvals process.

This guide provides guidance for the full range of probable projects. Each section will highlight differences between small and large scale projects.

1.4 Five Project Management Centers

Capital Projects and Planning (CPP)

This group was established to manage major projects requiring broad campus and community approvals on the Endowed Campus. These projects generally are over $2 million dollar and usually take several years to execute. Major planning studies are usually managed out of this office. Depending on workload, Contract Colleges (see next group) may contract the services of a CPP Project Manager.

Contract College Facilities (CCF)

This group was established to manage state funded projects of varying size and complexity according to their special procurement

requirements. See section 1.5 below for more information on this basic project type.

Project Services Group

The Project Services Group offers a broad range of services from project conception to completion on projects typically under $2M. The projects managed in this section generally can be accomplished within a year.

Facilities Engineering

Projects that are more engineering-based or utilities-based typically under $5M are managed by the Facilities Engineering (FE) group.

Units

Units may have certified staff that can opt to "self-manage" a project under $500,000 that do not impact the architecture of the campus or related building systems. Unit managed projects over $500,000 must be discussed and coordinated with the Director of the Project Services Group within Facilities Management.

1.5 About State-Funded Projects

A state-funded project is a project that is funded in part or in whole by the State of New York through the State University of New York (SUNY) Capital Plan.

All state-funded projects are subject to state guidelines and procedures for procurement of architect/engineering consultant services and construction services. The approval by NYS Attorney General's Office and the Office of the State Comptroller (OSC) has historically been required for all contracts over a certain dollar threshold. State-funded projects may also include state requirements for purchasing furniture, fixtures and equipment that therefore require careful oversight and coordination with the University Budget Office and Supply Management Services. Cornell's Facilities Contract's office and CCF are now required to process fully all contracts, with the same back-up information that may be audited by these government entities. Projects managed by the state directly would administer their own design and construction contracts. There are certain contracts and cost limits that do not require outside approvals.

Due to recent developments within OSC, the PM should check with the CCF office to acquire the most recent policy for limits and any other new development. State funded projects at Cornell can be managed through a variety of means ranging from projects managed directly by the State to those delegated to Cornell for execution. There are four basic project types within the contract colleges project management office:

1. **State-funded SUCF-managed Projects**

   These are state-funded project that is managed by the State University Construction Fund.

2. **State-funded Cornell-Managed (Campus Let) Projects**

   These projects are state funded project but that is managed through Cornell's Contract Colleges Facilities through delegation. The project managers for these projects may be from CCF or other PM Centers

3. **State-funded Matching Program Projects**

   A state-funded –Matching Program project (referred to as "Campus Let") is a project that is partially funded by the State and partially funded by one of Cornell's Contract Colleges. Cornell funds 60% of design/planning, construction, construction change order, and equipment; the state funds 40% of the same costs.

4. **College-funded Project within a Contract College**

   A college-funded project is a project that is funded by a department within one of the Contract Colleges and does not involve state capital funds.

1.6 The Core Project Management Team

Projects engage many different participants and stakeholders. However, each project has key individuals that hold the highest level of responsibility for the project's success. In addition to the project manager, most major projects have at least two core supportive participants, the Construction Manager and Facilities Contracts.

Project Manager

The project manager is the one-point of overall project responsibility to meet the University's goals and objectives for a

project. The project manager plans the project then manages to that plan. The project manager regularly reports on project progress, issues, and risks to their respective Directors. The project manager is held accountable to meet the budget, schedule, scope and quality objectives for their projects. Any risk to the meeting of these objectives must be communicated to stakeholders with sufficient advance notification so the impacts of the situation are minimized.

The key tasks of project management for these projects are (but not limited to)

- *Conceive and propose to the sponsoring unit a recommended approach to the project delivery and options.*
- *Coordinate agreed-upon project planning, design, and construction efforts.*
- *Coordinate close out.*
- *Balance Stewardship with meeting the needs of the sponsoring unit.*

The PM will accomplish the above tasks by:

- *Being responsive to the sponsoring unit's needs.*
- *Providing sound process and execution practices.*
- *Facilitating sponsoring unit choice options.*
- *Utilizing cost control techniques when appropriate.*
- *Representing both University and sponsoring unit interests.*
- *Embracing systematic, inclusive and pro-active communications between sponsoring unit, stakeholders, occupants, etc, as appropriate to the project.*
- *Championing delivery strategies that are responsive and appropriate in a given project, always seeking reasonable economies in project cost and effort balanced with stewardship.*
- *Ensuring projects have a financial status transparency true to an open book culture and with the goal on minimizing unforeseen costs.*
- *Supporting and adhering to all University authorization and approval process,.*

- *Seeking best value while balancing the role of University Steward to ensure the University standards relevant to the project.*
- *Being knowledgeable of and adhere to current Cornell Design, Construction and Sustainability standards, as well as, all other standards relevant to a project.*
- *Assuring the project will not cause building systems to be less efficient.*

Construction Manager

On major projects, the construction manager provides the project manager with specialized expertise in construction issues during the design and construction phases due to their engagement with repeated construction projects on campus. The construction manager is typically brought into the project during mid-design to provide constructability knowledge to the design process, and to better continuity between design and construction. During construction, the construction manager engages directly with the construction contractor to resolve issues and to represent the University's interests in the execution of the construction contract. The construction manager has the authority to administer progress payments and negotiate construction change orders which are approved by the project Manager. In construction meetings, the construction manager usually is the University's primary representative but consults regularly with the project manager as a team member. The project manager together with the construction manager manage and maintain the project budget and routinely report to their common management on the project's progress and important issues.

Facilities Contracts Director

The Facilities Contracts director is the designated signatory to all design and construction contracts. The project manager and the construction manager are the technical representatives of the contracts director in the execution of contracts.

Ethics

Construction projects represent a significant investment of the University's resources. The project management core team is entrusted to manage these resources to obtain the highest value to the institution. More than any other project participants, the core team must exercise careful judgment in dealing with contractors

and consultants. As the most front line representatives of the University, the project and construction managers must demonstrate the highest ethical conduct. The University has formally codified its standard in Policy 4.6 which should be well understood by the core team. The core team must avoid any situation that will compromise, or will appear to compromise their objectivity and fairness in dealing with external contractors. The team member should discuss any situation that seems ambiguous regarding its appropriateness with their supervisor. In general, team members should take the most conservative approach in interpreting situations.

1.7 Facility Services Project Participants & Stakeholders

There are numerous departments and individuals within Cornell University who play a role in small projects and larger capital projects. The PM is responsible for being aware of these groups and including them as appropriate to the project. They include the following groups.

Capital Projects and Planning (CPP)

This group manages all major efforts that impact the overall physical campus from initial land use physical planning through project design and construction under the leadership of the Senior Director and University Architect. The division consists of four offices that work together to optimize the delivery of major projects and to ensure that they are properly integrated with the overall Campus Master Plan. They are:

Campus Planning Office/University Planner

The University Planner (UP) leads the Campus Planning Office (CPO), and is the steward for the Campus Master Plan and all planning matters. The UP brings the campus-wide planning context to bear upon the individual project and leads the site selection. The UP advises on the short and long-term planning impacts of siting decisions, both from the University's perspective as well as from the community's, and ensures that these decisions and subsequent site design and development are consistent with existing master plans. The UP also advises the municipal project approval process regarding land use and zoning, planning, environmental and transportation issues.

The University Landscape Architect and Senior Transportation Planner in the CPO guide the landscape and transportation planning aspects of individual projects over their duration, and are also the lead on landscape and transportation planning projects respectively.

The CPO manages an extensive database of campus information and maps.

Office of the University Architect

The University Architect (UA) leads the architect selection process and serves as steward for all architectural matters, including working with the University Planner in the site selection process. The UA makes presentations at Capital Funding and Priorities Committee (CFPC) and the Trustee's Building &Properties (B&P) for approval of project concept and design.

For CCF projects, the UA will lead the selection committee in collaboration with the Director of CCF. On SUCF Managed projects, the UA may partner with the Director of CCF to voice Cornell's opinion to the SUCF selection committee.

Project Management Office

The Project Management (PM) office is responsible for providing collaborative project management leadership for Cornell's medium and large capital projects for the Endowed Colleges and, in some instances, projects for Contract Colleges. Working closely with the University Architect's Office and Campus Planning Office, the PM office engages early in the development of a project. It provides a single point of contact for clients in development of project requirements, needs, budget and schedules.

Construction Management Office

The Construction Management Office includes construction managers and project coordinators who manage contractors and construction phase activities. Individuals in the Construction Management Office are frequently members of the project Core Team. The Director of Construction Management is also responsible for leading the contractor selection process. Core teams work with the Director to select pre-construction contractors, construction managers, general contractor bidders lists, and to develop construction delivery strategy.

Contract Colleges Facilities (CCF)

Contract Colleges Facilities, in partnership with many stakeholders, manages or oversees the management of all facilities efforts that impact the contract colleges. Under the leadership of the Senior Director of Facilities Services/Campus Manager, CCF manages the SUNY Capital Plan; manages planning, design, and construction efforts for maintenance and capital projects within the zone; manages NYS code compliance and permitting for state-owned facilities, and provides support for and reporting of space inventory of several state facilities. CCF is responsible for the following:

- *Capital Planning: Manage the SUNY Capital Plan.*
- *Project Management:*
- *Document required CU, State University Construction Fund (SUCF) and municipal approvals.*
- *Manage campus capital projects.*
- *Facilitate SUCF managed projects.*
- *Partner with Contract College Facility staff.*
- *Facilities Maintenance: Administer financial resources for the maintenance of SUNY-owned buildings, greenhouses, and grounds, on the Ithaca campus, Geneva, and throughout the state.*
- *May contract with Endowed Project Managers (in CPP, see above) to assist with projects and/or hire an outside construction manager at agency.*
- *Code Compliance*
- *Ensure compliance with the NYS Building Code.*
- *Issue permits - temporary certificates of occupancy as well as certificates of occupancy for all projects managed by Cornell in state owned facilities of the Contract Colleges. (Note: SUCF issues TCO's and CO's on projects that they manage directly.)*
- *Space Inventory: Support the Facilities Information Group by providing drafting and specialized space reporting for Contract Colleges Facilities.*

Facilities Administration and Finance

Facilities Administration and Finance is one of the groups that PMs must work closely together with on a day to day basis since it houses the contracts and project accounting functions that are so important to managing projects. The group houses the following areas:

Facilities Contracts

Most projects that involve hiring companies to provide labor for planning, design, construction and renovation work require execution of a contract as opposed to a purchase order that is used for procurement of supplies and/or materials. The Facilities Contracts (FC) Office writes the University's contracts.

The FC Office also administers the electronic Capital Project (ePAR) System.

The FC office also provides stewardship in ensuring the integrity of the bid process and bid documents for a project.

Project Accounting

The Finance Department houses Project Accounting, which maintains an internal Capital Project System to provide services relating to authorizations, commitments, project expenditures and budget tracking to monitor the financial status of Capital Projects. It utilizes an accounting system that tracks Project Authorization Requests (PAR) authorizations, budget allocations, and commitments/expenditures associated with capital projects.

Facilities Engineering

Facilities Engineering (FE) has a stewardship role to oversee engineered systems on the Cornell campus.

In addition to its stewardship role, FE provides project management services, engineering and architectural design, and facilities information support. The following departments are included within FE:

University Engineer

The University Engineer (UE) is the campus steward for engineered systems. The UE is responsible for selection of engineering consultants and is the keeper of the Cornell Design and Construction Standards. The UE Office works with designers to develop concepts for engineered systems and ensures that construction documents

comply with the Design and Construction Standards and other standards of quality.

Projects managed by any PM group shall submit their respective projects to the FE group for review at all design phases to ensure conformance to CU design standards.

Civil Section

The Civil Section offers a full range of professional engineering services in support of University wide construction and renovation projects. The Civil Section also coordinates many programs including Roof Asset Management, Pavement Asset Management, Underground Structures and Bridge Asset Management.

The Civil Section provides:

Engineering, design, project management, and construction management services for civil, structural, building envelope and landscape projects including:

- *Site designs*
- *Professional surveying services*
- *Grading and drainage*
- *Athletics fields*
- *Surface and structured parking facilities*
- *Pavement design*
- *Site utilities*
- *Building envelopes and moisture mitigation*
- *Building structural systems*
- *Masonry restoration*
- *Reinforced concrete condition surveys and repairs*
- *Bridges*
- *Campus beautification projects*
- *Facility condition audits, prioritized repair and deferred maintenance planning, and capital renewal programming.*

- *Utility locating services to support "call before you dig" or "Dig Safely New York".*

Electrical Section

The Electrical Section offers professional-level electrical design experience in support of University construction and renovation projects. The group administers the Design & Construction Standards and the Capital Project Design Document Review programs. The Electrical Section frequently partners with the endowed electrical utility enterprise that provides technical supervision over the medium voltage distribution system on campus.

Electrical engineering, design, code review, and project management services extend to:

- *Power distribution (normal, clean, UPS)*
- *Emergency power, generator installation and testing*
- *Telecommunications infrastructure*
- *Fire alarm and security*
- *Interior and architectural lighting*
- *Site and nightscape lighting*

This Section can assist with:

- *Project Scoping*
- *Troubleshooting Investigation*
- *Feasibility Study and Condition Assessment*
- *Maintenance Planning and Prioritization*
- *Program Development and Management of Campus-wide Testing*
- *Arc Flash Hazard Analysis and Short Circuit Study*
- *Lighting Modeling*

Mechanical Section

The Mechanical Section consists of a team of talented design engineers and project managers committed to providing innovative and cost effective solutions. The Mechanical Section's Team can investigate operating deficiencies in your existing system or design a new system to meet changing needs. Additionally, the Section can provide project management services, scoping activities with stakeholders' group and project authorization requests. The Mechanical Section is dedicated to managing the resources necessary to deliver projects in keeping with the University mission and customer expectations.

The Mechanical Section offers services in the following areas, including:

- *Heating, Ventilation & Air Conditioning (HVAC)*
- *Plumbing Systems*
- *Fire Protection Engineering*
- *Process Cooling and Specialized Piping Systems*
- *Process Exhaust and Dust Collection*
- *Building Controls*
- *Server Rooms*
- *Animal Holding Facilities*
- *Kitchen and Dining Facilities*
- *Office and Classroom Renovations*
- *Laboratories, Containment Facilities and Clean Rooms*
- *Greenhouses*
- *Office and Classroom Renovations*
- *Health Care Facilities*
- *Project Initiation and Feasibility*
- *Project Management Services*
- *Design/Build*
- *Energy Modeling*

- *Grant Application Assistance*

Architectural Services Section

The Architectural Services Section offers a full range of professional level architectural and interior design services in support of University wide construction and renovation projects. Services include initiation studies that assist customers with project scoping, feasibility studies and conceptual designs. Full service designs are offered either by our in-house staff or in conjunction with outside consultants.

Architectural Section has expertise in a wide range of projects including:

- *Project initiation studies*
- *Feasibility studies*
- *Space planning*
- *Interior design*
- *ADA accommodations*
- *Public spaces – kitchens, dining lobbies student lounges*
- *Laboratories and clean rooms*
- *Lecture rooms*
- *Code expertise*
- *Dormitory renovations*

Facilities Information Group (FIG)

The Facilities Information Group, a part of Facilities Engineering, provides a focal point for information about University facilities and management of several stewardship responsibilities.

- *Facilities Inventory: An appropriated function that maintains and provides building floor plans and custom reports, and tracks space used by the University. Data and floor plans from this group serves as primary support for cost allocations to academic units.*
- *Facilities Archiving Services: Manages the University archive of documents generated by construction and renovation*

projects. Provides information and images about existing buildings to project teams and archiving services during and at the end of construction.

- *Facilities Computer Aided Design (CAD) administration and support: Provides CAD standards for consultant and in-house CAD documents, coordination and quality control. Drafting application management and coordination of user training.*

Energy & Environmental Engineering

Energy and Environmental Engineering serves the University community with design solutions, project management, and regulatory guidance for projects ranging from hazardous site cleanups to renewable energy opportunities to energy infrastructure and green building consulting. Services are provided to match each project's needs, from full-service project design and management to consulting in support of researchers and project teams with more limited needs.

The expertise and experience of staff from the Energy and Environmental Engineering section covers a wide range of technical areas. For project managers, the most important services this group provides are:

- *Local (CEQR) environment review*
- *State (SEQRA) environmental review*
- *Federal (NEPA) environmental review*
- *Local approval processes.*
- *LEED Support from peer review to submission.*
- *Facilitate LEED kick-off meetings on larger capital projects.*
- *Local approvals processes are carried out in partnership with the Campus Planning Office, Counsel's Office and the Office of Government and Community Relations.*

Facilities Management

Facilities Management supports the academic mission by maintaining the buildings and grounds of the University. Project

managers should consult with key members of Facilities Management in support of their projects.

Maintenance Planning

Maintenance Planning provides advice and review of construction documents regarding maintainability of building and site elements of a project.

They also provide advice to project managers regarding the forecasted operating and maintenance costs that must be identified and included in Section 9 of all PARs.

ADA Coordinator

The ADA coordinator is part of the Maintenance Planning team. Cornell is committed to fully complying with all aspects of the Americans with Disabilities Act and the New York State Building Code and to assure complete compliance, Facilities Services' ADA Coordinator can assist in the accessibility elements of all projects, large and small. It is important to include accessibility considerations in mind—even for those projects that do not appear to have access considerations, such as roofing projects, but will have construction impacts on path of travel surrounding the building or staging issues. Projects at all design phases should be submitted to the ADA Coordinator for a formal review.

Asbestos Project Coordinator

Facilities Project's asbestos project coordinator oversees a wide range of asbestos and LEAD services through testing, design and abatement firms that are under blanket agreement. The asbestos project coordinator will work with project managers to determine the project scope of work and what potentially asbestos-containing surfaces are being impacted. The services provided may include a materials survey or bulk sampling of structural materials for asbestos and lead.

The asbestos project coordinator can also estimate the cost and duration of the abatement phase of the project. His consultants will provide project specification for the contract that includes the scope of work and how the work should be conducted in compliance with Code Rule 56 and OSHA.

The asbestos project coordinator is responsible for hiring and supervision of all blanket contract abatement and monitoring labor within the asbestos program.

Facilities Projects

Project Services Group (PSG) part of Facilities projects, offers a broad range of services from project conception to completion of construction projects up to $2 million. Its flexible service model is designed to assist the campus community with project delivery at any stage of their project.

Project Management Services – Comprehensive project delivery services including management of the planning, design, and construction of projects from conception to completion. Project delivery and management are tailored to project requirement and size.

Construction Management Services – Manage the competitive procurement and delivery of construction services for project managers in other units and departments. The procurement method employed is project dependent and includes such options as less than 100K self-bid, lump sum, sole source, and GC services with multiple prime contracts.

Project Intake, Assessment, and Assignment - PSG assists the campus community with identifying options available to them relative to project assignment and delivery methods to ensure a successful project.

Building Care

Building Care can provide project managers with information on requirements for custodial closets that may be required when renovating or building new construction. Additionally, Building Care's custodial contracting enterprise facilitates construction project clean up and off campus buildings. This function is contained within project's maintenance zone.

Facilities Operations

Building Automation and Control Systems Integration

The Building Automation and Control Systems Integration group is tasked with ensuring the most efficient operation of the energy system components of buildings and the connection of their monitoring and control equipment to the University's Energy Management and Control System (EMCS). The BACSI standards are a part of the Cornell Design and Constructions Standards for design

professionals during the design phase of projects. The group also provides guidelines during construction and commissioning.

Transportation and Mail Services
Transportation and Mail Services (TMS) works with project teams to identify parking resources both for contractors and to support the finished project. They are responsible for the policy on transportation assessment for non-maintenance projects >and = $2M. This group works closely with the Senior Transportation Planner in the Campus Planning Office to advise on individual projects as well as campus wide transportation planning issues.

1.8 Energy and Sustainability Department

The Energy and Sustainability Department focuses on the reduction of Cornell's environmental footprint while providing reliable, economic energy and water to campus. The Department consists of the following areas:

Utilities

The **Utilities** group has two principle functions.

1) *They work with project teams to identify utility design and construction methods, especially connections to the various campus distribution networks.*

2) *They also provide advice and review of construction documents for compliance with design and construction standards.*

Energy Management

The Energy Management staff:

- *Assists with identifying and implementing conservation-focused measures in small and large capital projects to meet the university's needs with less energy use.*
- *Recommends metering and sub-metering for each project.*
- *Reviews all designs for compliance with Cornell's design and construction standards.*

Sustainability

The Sustainability Office monitors the Cornell Climate Action Plan, a university-wide commitment that impacts how projects are designed and constructed. Sustainability is addressed throughout the guide for all the phases of a project.

1.9 University Participants (Outside of Facilities Services)

Office of University Counsel

The Office of University Counsel represents Cornell's legal interests with regard to land use regulations and approvals affecting facilities and/or site improvements under state and local laws, including but not limited to environmental quality review laws, zoning, site plan approval, historic preservation laws, and Recreational River regulations.

All Projects requiring zoning or building code variances, rezoning, site development plan approval, environmental review, certificates of appropriateness or other review of historic buildings or districts and their environs, Recreational River permits, special permits, or bond financing by municipalities or other governmental agencies, should include a representative from the Counsel's Office as part of the approvals process team.

Project managers are encouraged to consult with the legal representative early in the planning for the approvals process to help identify potential issues, required approvals, time frames, and potential site control issues.

A representative from Counsel's Office is also able to interface with municipal attorneys during the approvals process in order to discuss and often reach accord over legal interpretations or other issues about which the municipal attorney will be advising a board.

The Counsel's Office also represents Cornell in the event of litigation over an approval or disapproval. Counsel's early involvement in a project approvals process may help avert litigation and in all events will help to shape the university's applications and supporting materials so that they present as sufficient a legal basis as possible upon which to prevail in the event of subsequent litigation.

Government and Community Relations

Government and Community Relations must be included in any major capital or when the project will impact or is of interest to Cornell's neighbors, elected and appointed officials or the wider community. Examples include projects at or near the edges of the main campus, ones that make a noticeable change in vehicular traffic flow on surrounding streets, or have other noticeable impacts on the community including environmental impacts and views to the campus.

Cornell Information Technology (CIT)

CIT may become involved with projects in three ways:

(1) They author construction standards and work with designers on design of IT systems including telecommunication rooms and raceway systems.

(2) They install and maintain telecommunication equipment and software across campus and/or manage installation of these systems by contractors.

(3) Finally, they have an Audio/Visual consulting group that helps project teams and consultants plan, specify, install and commission high tech A/V systems.

The State uses CIT for peer review of projects for both IT infrastructure and A/V design. CIT is hired by the PM typically using College support funds to provide review of design and minimal construction oversight/inspections. A PM may elect to hire CIT for design or infrastructure or A/V on smaller capital projects. The latter would require the use of College funds versus State funds.

President's Sustainable Campus Committee (PSCC)

The PSCC team incorporates the former Energy Standards for New Buildings work group and also addresses broader issues of construction and existing building O&M.

Cornell University Police

The Cornell Police should be consulted at the start of a project to access a project's potential security issues. Building sites, points of entries, sensitive programs and even internal layout can all have serious security implications that can be more easily addressed early in site selection and schematic design.

As the design develops, Cornell Police may participate in project discussions regarding building and security system design, access control, video surveillance, and intrusion alarms. In addition, they advise on the placement of Blue Light telephones, exterior safety lighting, and emergency interior phones. Cornell Police should be involved in any movement of large construction-related vehicles across campus roadways. The Cornell Police also conduct security assessments, upon request, for both campus facilities and exterior areas.

Risk Management

Risk Management makes decisions regarding required levels and types of insurance for consultants and contractors, and also analyzes the fiscal health of these companies.

Environmental Health and Safety

The Environmental Health and Safety department (EH&S) oversees the status of all Fire Protection Systems. The project manager should engage EH&S when

The proposed work will have a direct impact on any fire protection system

The proposed project changes the existing occupancy classification or changes the existing footprint of the space or building.

EH&S also provides guidance with Lab Safety, Occupational Health and Environmental Compliance concerns. It also offers liaison support with applicable Authority's Having Jurisdiction.

Supply Management Services

A part of the Division of Financial Affairs, Supply Management Services works collaboratively with the campus community to develop initiatives to leverage Cornell's buying power and cost containment opportunities. Individuals who purchase goods and services on behalf of the university are required to be familiar with University Policy 3.25, Procurement of Goods and Services as well as the Buying Manual, which provides the procedures that comply with the policy. See Supply Management Services web page for resources concerning procurement needs for a project.

Division of Planning and Budget (DPB)

The DPB works with units across the university to develop, report and implement the Ithaca campus' operating plan.

Operational planning is informed by institutional priorities, policies, and metrics related to the University's core mission activities. Serving as stewards of institutional resources, the DPB is responsible for:

- *Forecasting revenue and expense and providing analytical context for planning assumptions and budget policies.*

- *Coordinating the presentation and review of policy, procedure, and allocation issues impacting operations with senior management.*
- *Allocating resources, monitoring their use, and reporting on results against plan.*
- *Modeling the impact of program, policy, and process changes.*
- *Providing specialized budget services to meet New York State (NYS) and State University of New York (SUNY) requirements.*
- *The maintenance of schedules, process tools (including computerized budget systems and data marts), and training that supports the annual development of departmental and unit operating budgets.*

Capital Budget and Space Planning are two important offices with the DPB about which Project Manages should know.

Capital Budget

The Office of Capital Budget is responsible for coordination and review of the university capital and debt plan as part of the university's five year rolling plan for capital activity. PMs should be aware of how the Capital Planning Process works and how to determine whether a project is on the capital plan or not.

Space Planning

The Office of Space Planning is responsible for the coordination of central university allocation of existing and new space on the Ithaca campus. Particular involvement with space issues related to university administrative functions outside of the academic units, and the examination of space utilization across the campus.

The Office of Space Planning is dedicated to ensuring that University building space is well utilized and equitably provided. The office develops and maintains space standards for various types of occupancies. The office should be included in any discussion that involves changing existing space or adding new space to the campus and can be a resource to help guide the PM through these high level and political discussions. The office hosts the Space Use Advisory Committee which reviews all changes in the use of campus space and is effective in communicating the efficacy of the proposed space

use change to the project approval committees. Therefore, it is in the project's best interest to engage this office as soon as possible.

Space planning and management enhancements are identified as one of the nineteen action sets the University will implement to eliminate greenhouse gas emissions, as described in the University's Climate Action Plan (CAP) released in September 2009. The CAP takes a progressive approach to green development that extends the planning elements of the Campus Master Plan with recommended actions to reduce the rate of capital construction and space per person. Carbon abatement opportunities are linked to optimal use of built space.

1.10 Community Stakeholders

One of the more important responsibilities of the project manager is to ensure that all applicable municipal and governmental approvals are well integrated into the project. Project managers must research the appropriate approvals in consultation with University Counsel's Office and the Planning Office. Both communities have on-line resources that provide updated guidance on their approval processes.

City and County Stakeholders

The Cornell main campus is primarily located in either the City or Town of Ithaca. The line between both municipalities runs north south through the campus. The majority of the core campus falls within the City of Ithaca with areas roughly east of Fernow Hall falling within the Town of Ithaca. The approval procecess of both municipalities are very similar. Both have a seven member planning board that reviews all major projects meeting about once a month.

State funded contract college projects are not required to comply with local municipal requirements but may electively comply to maintain a positive relationship with the community. Since the University also has projects that must comply with local requirements, the relationship issue is important.

Endowed	Contract Colleges
Municipalities	
Cornell's main campus occupies the following ▪ Tompkins County ▪ City of Ithaca ▪ Town of Ithaca ▪ Village of Cayuga Heights ▪ Town of Dryden ▪ Town of Lansing Besides the main campus, there are other areas where Cornell property is located. The requirements for municipal approvals and permitting vary by municipality. The County does not have any zoning or environmental regulatory authority, but advises individual jurisdictions during their planning or project review.	For projects funded by the State University Construction Fund (SUCF) or performed in a state-owned building, some of the criteria are not subject to approval by the local municipality, but instead are reviewed and approved by the Code Enforcement Officer. For SUCF managed projects, the AHJ is from SUCF/Albany.) Courtesy presentations are often given, although SUCF and CCF Code Authority projects are exempt from municipal site plan review. Please review with CCF Director to determine if project requires municipal approvals. Typically they do not, but mixed funding sources or special circumstances may impact approvals required. This must occur prior to reaching outside Cornell University and SUCF for input.
Building Inspector and Fire Marshall	
The Building Inspector generally works with the project team and the Architect/Engineer during design of the project to prepare a strategy for code compliance. The Building Inspector may include the Fire Marshall to gain consensus on issues such as fire truck access to the project site, design of fire protection systems, and proposals for handling hazardous materials. Although Cornell's contractors generally apply for building permits and arrange for inspections themselves, most jobs require the Project Manager to facilitate discussions and resolution of code issues during construction and project close out phases.	**New York State Building Code and local code ordinances:** typically local codes and ordinances do not apply to State projects. Project Managers shall review the project with CCF to determine who shall provide inspections. This could involve CCF, SUCF, and EH&S. This must occur prior to reaching outside Cornell University and SUCF for input.
Community/Neighborhood Associations	
Cornell's campus is surrounded by many neighborhoods, each of which has an association of homeowners. Cornell's Office of Government and Community Relations normally arranges for meetings with these groups as appropriate to keep them informed of projects near their neighborhoods.	PM should review specifics of project with CCF Director to determine best course of action. This must occur prior to reaching outside Cornell University and SUCF for input.
Planning and Development Boards and Other Boards	
Cornell's main campus in Ithaca in Ithaca is primarily located in three municipalities (City of Ithaca, Town of Ithaca, and Village of Cayuga Heights) in Tompkins County. Each has a unique Environmental Quality Review and Site Plan Review and approval process, and the PM is responsible for ensuring the timely engagement of the various staff and planning board groups. In cases where the project needs to seek a variance, the Zoning Board of Appeals review also needs to be factored into the approvals process. Other boards may be included in the approvals process as deemed necessary by the municipal planning staff and planning boards.	PM should review specifics of project with CCF Director. Typically this does not apply to State Projects. This must occur prior to reaching outside Cornell University and SUCF for input.

State-funded Stakeholders

For state-funded projects there are many more "stakeholders" outside Cornell that may influence the project processes. Below are some of those stakeholders:

- *The State University Construction Fund (SUCF)*
- *The NYS Division of Budget*
- *Office of State Operations*
- *Office of the Attorney General*
- *Office of the State Comptroller*
- *Department of Environmental Conservation (DEC)*
- *State Historic Preservation Office (SHPO)*

1.11 Stewardship

The Cornell campus represents nearly 150 years of continual development. Project managers must balance the needs of the sponsoring unit with the stewardship of the overall campus.

Campus Planning and the Master Plan

The overall campus is greater than the sum of its constituent parts – buildings, landscapes and the infrastructure. While each of these is addressed through individual projects, each project contributes to the quality of the campus as a while. The Campus Planning Office and the Campus Master Plan (CMP) both address this holistic view. Stewardship is addressed through the effective and responsible use of campus land, facilities and infrastructure through the following means in the CMP:

- *A compact mixed-use campus, that integrates amenities and services into academic facilities;*
- *A campus environment that is pedestrian-oriented, universally accessible and maximizes connectivity;*
- *Accommodating service and loading functions in a centralized facility, and in a safe, unobtrusive manner where required on campus;*

- *Sustainably developed sites that retain and enhance their landscape as well as that of any immediately adjacent areas; and*
- *Active conservation and stewardship of campus open space and natural resources, especially the gorges but also major landscapes and streets.*

The Campus Master Plan takes the long-term view of campus growth and has principles and essential features to guide physical development. All projects including college, area and infrastructure plans need to be part of the CMP implementation. This includes not just the building, but all site development, landscape, transportation and utilities needs associated with the project. The implementation of the Campus Master Plan is embedded into the University's Climate Action Plan (see below). The Campus Planning Office assists individual projects with CMP compliance at the project level, understanding and including any CMP implications within the project.

Project Managers should be familiar with its contents, both Parts 1 and 2. In particular, the specific requirements of each building parcel. The University Planner should be consulted at the outset of a project regarding the CMP. Campus Master Plan implications have to be addressed in each PAR – PMs are advised to approach the University Planner to properly address this question.

Sustainability

Project Managers should be well versed in the sustainability initiatives overseen by the Energy and Sustainability Office. These include

- The Ten Campus Focus Teams (Buildings, Climate, Energy, Food, Land, People, Purchasing, Transportation, Waste and Water.)
- The Cornell Climate Action Plan

The above initiatives should be addressed as early as the Planning stage, as they impact the following:

- *Design choices*
- *Site selection*
- *Site development and design*

- *Landscape*
- *Transportation and circulation*
- *Building envelope including glazing, shading, roof and wall insulation values, HVAC and lighting systems, building automation and controls.*
- *Energy modeling and predicted energy usage*
- *Building materials*
- Construction practices
- Commissioning.

For Contract College projects, the state's Executive Order 111 requires commissioning on most projects regardless of LEED/Cornell initiatives. All Cornell projects require some form of commissioning up to and including full third party hands-on commissioning.

Energy Standards for New Construction Task Team

The Energy Standards for New Construction Task Team is responsible for the creation of energy performance and modeling design standards and tools that are used to direct project managers and Design Professionals as to how Capital Projects are to comply with the sustainability initiatives of Cornell University, most specifically, the Climate Action Plan. The members of this task team cross-departmental boundaries, consisting of staff from Facilities Services including the Office of the University Engineer and the Department of Energy and Sustainability. This task team should be consulted to develop project specific energy modeling guidance documentation and to establish Energy Utilization Intensity (EUI) targets for Capital Projects that significant renovate a building or create a new building.

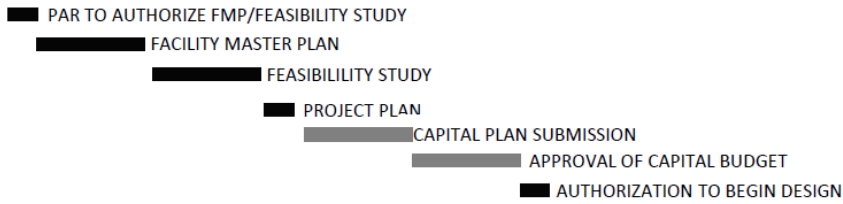
LEED Standards for Projects over $5 Million

Cornell's Board of Trustees voted to require all building projects that exceed $5 million to achieve Silver Leadership in Energy and Environmental Design LEED Standards. Project managers who are managing projects over $5 million will then have to be knowledgeable in these standards.

1.12 Other Important Standards

- Cornell Design and Construction Standards
- CIT AV Standards
- CIT Infrastructure Standards
- Cornell University Communication Standards
- Cornell University Electrical Standards
- Access Control Standards

2 PROJECT PLANNING & PREPARATION



2.1 Project Approval Request (PAR)

The Project Approval Request (PAR) is a form designed to seek University level approval on any project or study where planned project costs will be over $100,000. Project costs are defined as all costs related to the execution of a project that include planning, design, construction, contingencies and general support costs. It defines the primary attributes of a project such as scope, budget and schedule. It provides the project manager with the formal authorization to employ resources and spend University funding for a project as described in the PAR. If it appears that a project will be deviating from this authorization, the project manager must submit a revised PAR notifying the Administration of said changes. The most obvious changes would be a necessary and unavoidable cost escalation and changes in the project scope. The PAR template can be downloaded from the Cornell Facilities Services website at:

http://finance.fs.cornell.edu/contracts/par/parTemplate.cfm

The website also provides guidance on filling out the different sections of the form. This guidance is also summarized in the Appendix of this guide.

Most PAR level projects will require at least two administrative approvals during their development.

- *Request to Authorize the Start of Design (see section 3)*
- *Request to Authorize Construction (see section 4)*

PARS are approved by the University according to the project cost threshold.

2.2 Project Budgeting

Developing a project's budget is one of the key responsibilities of the project manager. Under funding will adversely impact the possibility for success in later design and construction phases. Conversely, over funding is negatively viewed by the Administration as an irresponsible potential use of the University's resources. Cost benchmarks are utilized to determine the construction cost of a proposed project. In addition to the hard construction costs, project managers must plan for soft costs necessary to execute the project. At a minimum, the following costs must be provided in the formulation of the *Total Project Costs:*

Budget Item	Description	Typical Allowance
Construction	The targeted cost of the initial construction contract	Per benchmark or consultant estimate based on project type
Planning & Design	Cost of planning & design consultants	Depending on project size and complexity between 10 and 15% of construction cost
Project Management	Project manager, construction manager and support staff costs	Based on a forecast of staffing for the duration of the projects
Project Support	Special fees, permits, printing and other sundry costs	About 1.5% of construction cost
Furniture Fixtures & Equipment	FF&E not attached to the building.	Depending on the unit's specific requirements, about 2.5% of construction cost
Transportation Fee	Project's contribution to the overall campus parking and transportation budget.	Normally 1.5% of construction cost on projects over $1.5M
Contingency	Project contingency	Typically 10% of the overall project cost depending on project specifics
Operations & Maintenance	Cost to operate the improvement over the life cycle	Based on input from Facilities Management

2.3 Project Approval Committees

There are four separate approval thresholds based on project cost. Projects under $250,000 can be approved by the Vice-President of Facilities Services. If the project is on the approved capital plan, the Vice-President of Facilities Services can approve projects up to

$500,000. The *Capital Planning Group (CPG)* approves all projects between $500,000 and $5,000,000. Projects over $250,000 not on the approved capital plan must also be approved by the CPG. The Capital Funding Priorities Committee (CFPC) which is attended by the President and Provost approves projects$5,000,000 to $10,000,000. And finally, any project over $10M must be approved by the Trustees. Additionally, the Trustees must approve all site selections and project designs that impact the visual quality of the campus as recommended by the University Architect. Each subordinate committee must approve a project before it is presented to the next approving committee. With the exception of the Trustees, the committees meet roughly once a month. Project managers should know the meeting calendars as they relate to the necessary approvals for their project and the resulting impact on schedule.

SUMMARY OF PROJECT APPROVAL AUTHORITIES

THRESHOLDS	
VP for Finance and CFO or Provost – Signature Only	
	< $250K
	> $250K - $500K and listed in the Capital Plan – Requires Signature PAR ONLY
Capital Planning Group (CPG)	
	> $250K and not listed in the Capital Plan
	> $500K
Capital Funding and Priorities Committee (CF&PC)	
	> $250K and not listed in the Capital Plan
	> $5M and anything that needs to go to B&P
Building and Properties Committee (B&P)	
	> $10M
	< $10M if the project lies within the "core campus" and will significantly change the outward appearance of a building or an area

2.4 Integrated Planning and Stewardship

Project managers must balance the goals of the sponsoring unit's requests for a project with University guidelines designed to make optimal use of limited University resources, including money and

space. These guidelines protect the quality of the construction, address long-term future University goals, and are responsive to the impact of such projects on the environment. In this role, the PM is a steward for the University. They act as stewards with respect to the Campus Master Plan, Space Management, University Construction Standards, and Sustainability Initiatives.

In terms of financial stewardship, the overall goal of a PM, particularly during the planning phase of projects, is to align academic planning and financial planning with capital planning. The place where this alignment occurs is in the reporting and approval process with the Capital Planning Group (CPG) and Space Use Advisory Committee (SUAC). The intention of these early discussions is to achieve Integrated Planning.

2.5 Capital Project Spending Guidelines

Project managers should be well-versed in the Capital Project Spending Guidelines. These guidelines form the basis for all project development actions and their required approval by the Administration. Summarized, they outline a four step project initiation/execution process:

Units can spend their own funds to formulate a project plan that describes all significant attributes of a project such as scope, budget, schedule, and site. Depending on the funding amount, this action would need a PAR approved by CPG. The project plan is the basis of the project to be included in the University's Capital Plan. Projects in the Capital Plan must also have an approved funding plan covering all project, operations and maintenance costs.

Projects can begin design if they are in the Capital Plan after approval by the University by the appropriate authorization committee. The project can proceed until the end of Schematic Design if full funding has not been obtained in writing. The Schematic Design can be used to fund raise the remaining required funding.

The Design can be completed and construction can proceed only if 75% of the required funding is acquired ("Cash in Hand") and the remaining 25% is collected within five years.

2.6 The Capital Budget Planning Process and Calendar

A basic understanding of the University's capital planning and project approval process is necessary to effectively guide the project development process. Every summer, the University's Division of Planning and Budget issues an annual "planning call" to all units for projects to be included in the five year capital plan. The five year plan lists all projects over $250,000 by planned fiscal year. Projects under $250,000 are sometimes bundled within a larger program allowance. This plan is submitted to the Trustees the following Spring for approval. The first year of the Capital Plan constitutes the approved *Capital Budget*. These are the projects that are intended for execution in the next fiscal year. The standard for inclusion in the Capital Budget differs from a project in the Capital Plan in outlying fiscal years. Most major projects included in the Capital Budget have well defined scopes, budget, schedules and funding strategies usually developed by a Feasibility Study using the units funding.

2.7 Planning Process Overview

One of the most common and important questions asked by the Administration and the Trustees concerns the necessity of a project and the assurance that cost-effective alternatives have been carefully examined in the formulation of the project. This usually requires that existing facilities are thoroughly reviewed for their suitability to meet the change in programmatic requirements.

On major projects the most comprehensive approach to address these questions is called a Facilities Master Plan. The Facilities Master Plan is a pre-capital planning effort that helps units better understand and communicate their long, intermediate and short

range facility requirements. This tool is recommended to best answer any concern regarding the necessity of a major project.

2.8 Facility Master Plan

Facility Master Plans begin with a review of a units' approved strategic plan that forms the baseline for future programmatic change. A change in facility requirements should be clearly supported by a unit's goal and objectives that are translated to space needs. For example, an increase in offices and/or classrooms should be supported by a well-documented and approved strategic plan that calls for an increase in faculty and/or students.

These space modifications of both quantity and type are then compared against the existing buildings to develop potential modifications to accommodate the changes in program. This effort must include an analysis of current space utilization and its compliance with current Cornell space standards. Facility Master Plans consists of the following sections:

- *College Profile and Strategic Vision*
- *Assessment of Space Needs Based on Strategic Vision*
- *Facilities Condition Assessments*
- *Alternatives to accommodate the programmatic changes*
- *Recommended Alternative.*

The Recommended Alternatives will normally consist of a series of phased projects that will incrementally achieve a unit's long range programmatic requirements over multiple fiscal years. The recommended alternative will address temporary surge space and other logistics necessary to realize the overall plan. The value of the Facility Master Plan is to provide the University with a full understanding of how future projects work together to work towards a strategic goal. These individual projects could be included in the University's Capital Plan for future development.

A facility master plan can also be used to establish a phased approach to multi-year infrastructure, utility, landscape or any facilities program that is multi-phased over several fiscal years.

The results of the Facility Master Plan can be used in liu of a feasibility study if the supporting documentation of an individual

project is sufficient to address the issues required by the project plan to include the project in the University's annual capital budget.

2.9 Feasibility Study

Individual projects as supported by a Facility Master Plan or other means of justification often require additional definition and/or refinement prior to seeking University approval or seeking authorization to begin design. The feasibility study better establishes a budget and schedule. In the case of a major renovation project, it can focus on construction phasing, research affected adjacent building materials, systems and assemblies, review surge space options and other project particulars that will facilitate a more predictable design process.

New construction will likely require a site selection which is led by the University Planner and is an action that is approved by the Trustees. In new construction, a recommended site must be part of the feasibility study so that all costs related to the site are included in the overall project budget. The feasibility study for a new construction project should result in the following:

- *Project Budget*
- *Project Schedule*
- *Recommended Site (in the case of new construction)*
- *Site Development Guidelines (in the case of new construction)*
- *Surge Space Strategy (in the case of renovation projects)*

The feasibility findings are reported to the Administration by means of a Project Plan. If approved, the project is included in annual Capital Budget that is submitted to the Trustees for approval. Approval of the Capital Budget (providing the project is accepted as part of the budget) allows the unit to begin fund raising if required. Once the appropriate funds have been raised per the Capital Plan Spending Guidelines then the project can be submitted to the approving committees for Design Start Authorization.

Summary of Major Project Planning Actions

Facility Master Plan	Establishes and describes a unit's multi-year program of facility modifications based on a detailed review of overall programmatic objectives vs. existing buildings. Output can be multiple projects over several fiscal years.
Feasibility Study reported as a "*Project Plan*" to the Administration.	Establishes the budget, schedule, program and site for a proposed project. Approval allows unit to identify funds necessary to support eventual design and construction.
Authorization to Design	Once sufficient funds have been identified per the Spending Guidelines and the project is on the current capital plan it can be submitted to begin the design process.

Site Selection

One of the more sensitive project actions in the development of a new construction project is the selection of a proposed site. Sites are selected as part of the feasibility study process for any new construction project since the preferred site always implies significant collateral enabling projects such as utility relocations, parking impacts, potential relocation of existing land-uses and the possible need for surge space. The project must fully address these potentially costly impacts as part of the proposition of a fully vetted project that would be represented in the project plan. Since sites are University assets, they are approved by the Trustees Buildings and Properties Committee. In the past, the selection of a site was often a singular Trustee approval, but since the goal of the project plan is to present all expected costs and impacts, the site must be made part of that proposition.

The site selection process is led by the University Planner who will include representatives of various potentially affected stakeholders and will work with various technical representatives to fully integrate utilities, civil, and municipal impacts into the site evaluation process. The evaluation of sites is also conducted within the context of the approved University Campus Master Plan that identifies potential parcels and their developmental capacities as well as overall campus landscape initiatives that must be addressed.

Site Development Guidelines

As part of the site selection process, the University Planner develops a set of Site Development Guidelines based on the requirements of

the University Campus Master Plan and on-going initiates to coordinate the campus into a cohesive whole such as transportation, landscape and water management issues. The guidelines also record the findings of necessary enabling projects developed during the site selection process to ensure that all attendant project costs are well addressed in the proposition of the project to the Trustees. The goal of the guidelines is not be restrictive, but to ensure that necessary coordination actions are identified for the architect to address in design.

Renovation Projects

Renovation projects should be explored as much as possible to minimize exposure to risk during design and construction. At a minimum such critical issues as surge, staging, building access, impacts to existing systems, historic, work area separation and other sensitive issues dealing with renovation projects must be fully explored to best represent the best knowledge available as part of the project's proposition. If possible, exploration of hidden conditions should be undertaken as part of the feasibility study process.

2.10 The Role of the PM

The responsibilities of the PM during this phase is to facilitate and assist the executive level decision making process. The PM should define scope, budget and schedule and gain agreement of these with sponsoring unit and all stakeholders.

Much of what the PM does during these early discussions involves summarizing and refining all the complex variables so that executives can make informed decisions about which direction to take with respect to a project.

The process at this early stage is very fluid; it tends to iterative and non-linear. The sponsoring unit may be trying to gauge support for projects and understand funding opportunities. Project managers need to have a flexible mind set, as things change rapidly during these initial discussions. It requires flexibility, adaptability, time management skills, and creative problem-solving, many of the competencies listed in Cornell's Staff Skills for Success.

After the planning phase, the process becomes more linear and predictable. However, maintaining the perspective of *Integrated*

Planning will continue throughout all phases in terms of ensuring that the Integrated Planning standards addressed initially are maintained throughout the execution of a project.

2.11 The Project Plan

Project plans are formal notifications to the Administration of a unit's intention to pursue a major action affecting facilities and/or the overall campus prior to spending significant funding. Examples of actions described by project plans are multi-year programmatic installations such as energy retrofits, utility projects, landscape development and planning studies with a potential major facility impact. The multi-year building program of a unit should be presented to the Trustees in the form of a Project Plan. While there is no immediate requisition of funding, the Project Plan seeks programmatic approval to pursue a series of related project actions.

Another important use of Project Plans is to initiate major capital projects by seeking inclusion into the Capital Budget. Project plans for major capital projects must fully define the project's scope, budget, need, schedule and other project specifics. This supporting information is usually developed through a Feasibility Study. If a unit has sufficient funding to begin design as outlined in the Spending Guidelines, the Project Plan can include a request to authorize the start of design.

2.12 Project Budget and Accounting

Once a PAR is issued, Facilities Administration and Finance will work with the Division of Financial Affairs (DFS) to establish a capital project account. A notice to the project manager advising them of the project account and ID numbers is issued and a meeting, as needed, is held to discuss budget line items to be entered into the Capital Project System. The project manager can obtain regular cost reports from the Facilities Administration and Finance.

Project Filling System

A standardized project filing system is vital to ensure that vital project information is being collected and maintained. It facilitates the continuation of a project should another project manager be assigned to the project and greatly simplifies the retrieval of critical information to reconstruct a project's history. At the beginning of a project, a meeting must be held with Facilities Contracts and the Facilities Information Group to review planned major document

types and their anticipated receiving dates. Facilities Contracts will be providing a checklist of vital documents that must be obtained and filed at the start of design and construction. Project managers will be held accountable for maintaining complete and well maintained project files organized according to the following structure:

Project managers should anticipate that files will be reviewed by their supervisor at the mid-point and the end of both design and construction as a basis for their performance evaluation.

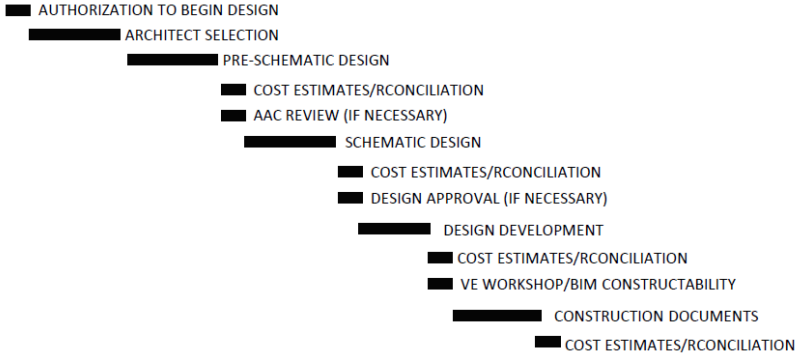
See the Appendix for an outline of the standardized filing system.

2.13 Minor Projects Under $250,000

Projects under $250,000 are not identified in the capital plan as a line item and in most cases are bundled in a large budget allowance. If the project is over $100,000 it will need a PAR for approval that is approved by the Vice-President of Facilities Services. Generally, these projects do not require the planning preparation necessary for major projects.

3 Project Design

3.1 Overview of the Design Phase



3.2 Authorization to Begin Design PAR

In many ways, the Authorization to Begin Design formally initiates the project. The start of design signifies a significant commitment and expenditure of funds to execute the proposed project. It also usually implies that an even greater commitment will follow in the authorization to begin construction.

3.3 A Note on SUCF-Managed Projects

The role of the Cornell project manager is different for a SUCF-managed project. In a SUCF-managed project, a PM from the state is assigned to the project, and the state holds the contracts for the project. The state-assigned PM will manage the consultants on this project.

A PM from Cornell will be assigned to this project as well. His or her role will be to ensure Cornell is following the directives of the state PM and the contracts. The Cornell PM will have the same responsibilities outlined in this guide in terms of project management but because Cornell does not hold the contracts, the level and scope of decision making during the project are different. The Cornell PM will not, for example, select the consultants or negotiate costs or scope changes, but the Cornell PM will be involved in the discussions around these issues.

During the A/E selection, Cornell has a seat on the selection committee and one vote.

The Cornell PM will be instrumental in setting up and coordinating meetings with key Cornell stakeholders and the state PM and ensuring that the project moves ahead.

The Cornell PM will internally review documents.

The project does not become Cornell's until the Certificate of Occupancy is issued.

3.4 Select a Design Consultant

The process of procuring design consultants applies to all endowed and Campus-Let Projects. It is vital that the PM consult with the University Architect on the selection process that includes the appointment of evaluation committee members, establishment of evaluation criteria, approval of the RFP and the identification of acceptable firms for competition. (The variances for Campus Let projects will be noted throughout this phase and all other phases.)

One of the most important decisions in the execution of a project is the selection of the architect/engineering team. This is especially true in projects that visually impact the overall campus. While Cornell design professionals provide guidance during the design process, the best projects are produced by designers that lead the design discussion by their interpretive abilities. The goal of the University Architect is to facilitate the achievement of Design Excellence by talented designers, rather than to shepherd the design process by continual critique. The technical quality of the design is highly leveraged through the subsequent construction process. High quality construction documents represent significant savings in construction. And high quality functional and aesthetic design translates into a much better investment for the University.

On projects that are more technical in nature, the emphasis should be on a proven track record on success in the project type. On smaller projects with minimal impact to the University, the two-step evaluation process can be combined where four to six firms are invited to submit materials and could be interviewed, depending on the project. In still smaller projects, it would be acceptable to simply contract with a local firm. The project manager must consult with the University Architect to develop an appropriate

selection process. The below process outlines the basic steps for a major project:

Step One: Solicitation of Qualifications

On major endowed projects, the University Architect will develop a list of architects to submit their written qualifications relevant to the project being considered. In this first phase, the emphasis will be on demonstrated design ability by both the team and the proposed lead designer on dealing with projects of similar complexity to the subject project. Their managerial capability will also be reviewed and their proposed project manager will be part of the evaluation. The goal of this first phase is to identify the four to six firms that should be invited for an interview and to compose their project team.

State projects require that all projects be publicly advertised, however, the University Architect will inform specific firms that should submit their qualifications for consideration.

Step Two: Interviews and Technical Review

In step two, the firms are invited to interview with the evaluation committee. In addition to the evaluation factors comprising stage one, additional factors are employed to evaluate the full teams' technical capacity. The University Architect and University Engineer will discuss the most appropriate strategy to evaluate the engineering capabilities. In some cases, the University Engineer will identify several firms that Cornell has had successful experiences for the Architect to consider. The committee will rank the firms and recommend that negotiations begin with the top ranked firm. If an agreement cannot be reached, then Cornell will negotiate with the second ranked firm. The negotiations begin with Cornell issuing a Request for Proposal based on a well-defined scope of services and contract conditions.

The A/E Evaluation Committee

The composition of the evaluation committee is vital to the success of the selection. There should be a balance between the sponsoring unit's representative, the core project team and committee members with a comprehensive understanding of Architecture and Planning. The committee size must be limited to no more than six members, so that the deliberations resemble a conversation. The University Architect will establish the evaluation committee for both step one and two. Step two will normally be expanded to

include the project manager and the University Engineer to properly evaluate the technical and managerial qualities of the proposed teams.

On SUCF managed projects, the evaluation committee is determined by SUCF with Cornell having one representative.

Design Services Request for Proposal (RFP)

The Request for Proposal (RFP) provides sufficient information so that the design consultant can provide a price for the desired services. It must contain the full A/E contract that outlines all the services, schedule and contract conditions. Standard A/E *Scope of Services* are maintained by the contracts office. On major projects, the University Architect should be consulted to align expectations regarding project execution. The request for proposal must require that the A/E provide a detailed breakout showing the number of hours by each proposed professional by each phase. This information will be the basis of the negotiation.

All University requirements must be addressed in the scope of services such as:

Energy Standards for Labs and Buildings.
The PM should include energy targets provided by the University Engineer for the building as part of the proposal in the Architect/Engineer Agreement. The PM should make sure he or she addresses these standards in the information provided to the Design Consultants, as they may impact building materials, construction practices and commissioning. The PM is also responsible to ensure that the consultant provide energy models at each design phase as described in the CU Design and Construction Standards.

Green Buildings Initiative.
New construction and major renovation projects over $5M total project cost will be required to attain LEED certification at a minimum of Silver level, and that these projects achieve a minimum 30% energy savings compared to the baseline established by ASHRAE 90.1, the national standard for energy efficient buildings.

Cornell Design and Construction Standards

The CU Design and construction standards must be followed on all major projects. The standards are available on the web at: http://cds.fs.cornell.edu/default.cfm

List of Approved Consultants

On minor projects, the PM can consult with the Contracts office to obtain a list of approved consultants. On larger projects the consultant selection process will be led by the University Architect or the University Engineer as appropriate.

Campus-Let Steps

For campus let projects, a Statement of Qualifications (SOQ) and Letter of Interest (LOI) begin the design procurement process.

Additionally, there are advertising requirements for this type of project. The PM must advertise for state-funded projects. The PM should contact the CCF office for information regarding advertising. The PM should build in additional time for placement of ads in the local newspaper. The PM must also advertise in the New York State Contract Reporter.

The PM may use a list of design consultants and review recommendations to send out Request for Qualifications to other Architects and Engineers (A/E) after the RFP is public and has been advertised. In state projects, the project team will rank consultants. If selecting an alternate, they PM must select the next consultant in that ranked sequence.

Select Consultant

Once the RFPs (LOIs and SOQs for Campus Let projects) are received and reviewed, the project team will decide on the consultant for the specific design phase of the project.

3.5 Negotiating A/E Contracts

There are several commonly accepted means to negotiate an A/E contract. The most defensible is the detailed negotiation based on hours of effort. Summarized, it divides the design effort into phases which provides the number of weeks and a basis to discuss the size, expertise and salary rates of the proposed team. It is commonly acceptable that there is more high-cost principle effort in the earlier phases of design as the more conceptual ideas are being generated.

A 10% allowance for Managing Principle effort is routinely accepted by many owners. The negotiation can be outlined as follows:

Number of weeks x project team = number of hours x rate x overhead/profit = fee

Another approach which should be used to check the reasonableness of the above calculation is based on the number of potential drawings. A rough rule of thumb is that is takes 80hours/sheet to produce detailed engineering drawings and 40hours/sheet for architectural drawings.

And finally, Cornell has historically awarded design contracts between 10% and 18% of the cost of construction. The complexity of the project has direct bearing on the fee rate. The University Architect's office should be consulted on major A/E negotiations for advice.

These three negotiation benchmarks should be used as a basis to determine the reasonableness of the cost proposal.

It is also important that the negotiated cost not be front loaded. This not only compromises Cornell's position regarding payment for insufficient progress, but weakens the A/E's incentive towards the end of a project when a significant part of the overall effort is necessary to provide a quality design. In general, the following industry standard should be followed:

Pre-Schematic/ Schematic Design	30%
Design Development	60%
Construction Documents	100%

See A/E cost estimate form in the appendix as an example structuring an effort based cost proposal, analysis and negotiation.

3.6 Complete a Contractual Request Form

After a consultant or contractor has been selected for a project, and prior to start of design work, the terms and conditions surrounding the execution of the work must be documented in a Contractual Agreement.

Cornell's Facilities Contracts (FC) maintains Cornell's contractual instruments and develops all Contractual Agreements between the University and its consultants and contractors. The project manager is responsible for working with Facilities Contracts on modification of the contract instrument to meet the specific requirements of the project. In fact, PMs should contact Facilities Contracts before any documents are signed. FC will assist the PM in the development of the contracts.

The PM will now submit a Contractual Request Form to Facilities Contracts in order to generate a contract for the selected design consultant. The form can be obtained from the Facility Services Finance website.

Facilities Contracts will review the proposal to make sure that it is consistent with the stipulations within the proposed contract.

3.7 Preconstruction Services

In addition to the architect/engineering team, Cornell may employ a consultant or a contractor to perform preconstruction services on all projects over $5M in construction costs. These services include independent cost estimating at each major phase of design, conducting value engineering workshops, constructability reviews of the design documents and provide construction expertise during design to facilitate planning. The extent of these services is dependent on the complexity and nature of the project. For example, construction planning could be much more critical in the design of a major renovation project within an occupied building than a major new construction project. The following thresholds establish the minimum general range of preconstruction services on projects:

Over $5M

- *Independent cost estimate at each major A/E submission*
- *Value Engineering Workshop at DD and 50% CD*
- *Constructability Review at DD and 50% CD*
- *Market research on the regional availability of critical major assemblies such as curtain walls and specialty items.*
- *Construction logistics planning*

Between $2 and 5M

Cost Estimate prior to bidding to confirm budget

Value Engineering Workshop at appropriate design phase

Under $2M

Services as determined by the project manager's direct supervisor in consultation with the Director of Construction Management.

On projects over $5M where the pre-construction services will be conducted by the contractor, the competitive selection process is guided by Section 4 of this handbook describing the contractor selection process. On projects over $5M where the contractor will be selected after the completion of design, pre-construction services will be selected on the basis of qualifications relevant to the Pre-construction effort as outlined in the project's procurement plan described in section 4 of this document that is approved by the Senior Director having responsibility for the project.

3.8 Design Management

Design management consists of several interrelated efforts. As the Universities representative, the project manager tracks progress, manages progress payments, checks quality of contracted services, and coordinates the many Cornell stakeholders to achieve the goals of the project. As a general design management principle, stakeholders must be made informed of the expectations of each design phase and their responsibility to make binding judgments at the appropriate time. Decisions made in earlier design phases are often very costly to change in later stages of design.

The project Manager should carefully read the scope of services to ensure that the agreed upon services are being provided at each major design submittal.

Key Tasks

- *Oversee Schedule during each of the design phases.*
- *Schedule and facilitate meetings between design consultant and sponsoring unit/stakeholders.*
- *Oversee Budget during each of the design phases.*
- *Stewardship.*

- *Risk Management.*
- *Pre-construction Services*

3.9 Design Review

The University Architect should be kept apprised of all design decisions affecting the impact on the building's expression such as overall massing, exterior material detailing, architecture of major interior public spaces and landscaping. These issues are especially important early in the design process. On major projects affecting the campus, the University Architect invites a panel of peers to review the design called the Architectural Advisory Committee near the end of Pre-Schematics and Schematic Design. Project managers should schedule these meetings with the University Architect at least a month in advance.

3.10 Building Information Modeling (BIM)

On building projects over $20M, projects must be modeled in 3D using any of the commonly used BIM design software packages. Use of attribute loaded components is encouraged to facilities energy performance analysis and real time cost estimated provided it is not an additional service. At a minimum, the modeling of the structural and major mechanical assemblies is required to test for potential collisions that can result in costly coordination errors in the design.

3.11 Design Cost Control

Design consultants must provide cost estimates at each major design submittal to ensure that their work product is within the established project budget.

Cost Estimating Formats and Levels

As the design evolves and becomes more defined, the cost estimates must also reflect the increase in accuracy. Industry accepted standards such as *Uniformat,* or *Masterformat* are scalable according to the stage of design. Cornell's policy is to have an independent cost estimate for each design submittal on major projects. Therefore, it is vital to ensure that both the architect's and the independent estimator use the same formatting system and the same level of detail, so that the two estimates can be compared, discussed and reconciled.

Design Contingency

A design contingency is normally applied to each design submittal cost estimate to cover the design elements not yet fully defined. The following table outlines the normal ranges for this design contingency according to design stage:

Design Contingency Table

Schematic Design	7-10%
Design Development	5-7%
50% Construction Documents	2-5%
Construction Documents	0%

Cost Reconciliation Workshop

At the conclusion of each design stage, a cost workshop is held where both the architect's and independent cost estimators review their estimates and attempt to reconcile their differences. This reconciliation is achieved by checking quantities and/or verifying cost assumptions by contacting potential suppliers.

Market Survey

The A/E must perform a market survey of major building assemblies and local market issues affecting the cost of construction for projects over $5,000,000. This effort is a critical cost control measure to ensure that all relevant cost factors have been identified and addressed. This is especially important when complex building elements and assemblies are being used in the Ithaca area for the first time. As applicable, the following issues must be addressed:

- *Availability and shipping origin of major materials*
- *Capability of local fabricators, precast yards, plants, etc,*
- *Availability and capability of local labor,*
- *Special erection and hoisting equipment,*
- *Transportation to the work site issues,*
- *Anticipated capacity of local contractors during bidding period,*
- *Site accessibility,*

The market survey report will describe the source of information for each addressed issue.

Design work product must not advance to the next level until the scope and budget are fully reconciled without approval from the project manager's director.

3.12 Pre-Schematic Phase

Practically all projects have at least several potential general solutions. The purpose of the pre-schematic phase is to explore three possible general solutions to the design problem with sufficient detail to evaluate their cost and performance. In almost all cases, there is a scheme that is clearly the most cost-effective approach and an approach that is more ambitious in its objectives. These two approaches should be explored so that the most cost-effective scheme forms a comparative cost baseline, while the upper range scheme reveals project possibilities. Each pre-schematic scheme will be cost estimated and their energy performance will be modeled. In some cases, the pre-schematic solutions will be reviewed by the *Architectural Advisory Committee* to examine the schemes and provide insight into which scheme, or hybridization of schemes should be pursued in the next Schematic phase. Even in modest projects, the approach of examining alternatives early in the design process is critical in developing an accountable approach to design.

3.13 Schematic Design (SD) Phase

The purpose of the Schematic Design phase is to develop the preferred pre-schematic into a design that will be presented to the Trustees for design approval in the case of major new external projects. In major projects, it must clearly communicate siting decisions, materiality, massing, and other particulars necessary to provide a clear understanding of the design. The project must be within the established budget before proceeding to the next design phase. Projects exceeding their budget will not be brought before the Trustees for Design Approval since the presentation would not represent an executable design.

Review and Approve SD

The SD documents should reflect the space program and/or explain any deviations from it.

The 100% SD documents should include but are not limited to:

- *Site plan, including connection to central Utilities if required.*

- *Typical floor plans for each level.*
- *All typical elevations.*
- *An outline specification.*
- *Other characteristics in comparison to the program.*
- *A preliminary cost estimate. (May require an independent additional estimate.) (See budget below.)*
- *Renderings, models or other drawings that adequately present the concept including sustainable design narrative which is required during this phase for all capital projects.*
- *A cost/value analysis might be applicable at this point.*

The PM should then obtain the sponsoring unit's and relevant stakeholder approvals (including design review by FS Engineering and Facilities Management, if applicable). Submittal requirements for each design phase are described in Schedule G of the standard Cornell A/E contract.

Quality Control, Commissioning, Stewardship

During Schematic design the project manager should develop a Commissioning strategy. Depending on the project scope, a third party commissioning agent should be brought in at this time.

Review for ADA Access Compliance. Keep an accurate review of partners consulted on access review, and maintain ongoing conversations with architects and Cornell University staff on access elements.

Form municipals approvals team which will identify local, state and federal approvals needed and strategies to obtain them. Be aware of the municipal calendar.

Value Engineering Focus

Value engineering during Schematic Design is generally focused on the general efficiencies of the building mass and spaces. Such issues as the ratio of occupiable to gross area, building volume efficiencies, vertical transportation requirements, site access, and other large scale costing issues are usually considered in this phase.

Design Approval

On major projects impacting the appearance of the campus, the University Architect presents the design to the Administration and the Trustees for approval. Projects presented for approval must be within the established budget. Project managers should work with the University Architect to schedule and prepare for the presentations.

Building Security Committee

On major projects, the project manager must consult with Cornell Police and Risk Management to develop a security strategy for the project's design that begins with an assessment of risks, threat and vulnerability at the start of the project and continues through the end of design. Workshops with the building users, Cornell Police, Risk Management and the architect at the start of each design phase will ensure that the design addresses potentially costly issues effectively. The American Institute of Architects pamphlet, "Building Security Through Design" should be used to provide a general framework for discussion.

Architectural Advisory Committee

On some complex projects the University Architect may elect to have the Schematic Design reviewed by the Architectural Advisory Committee prior to the Trustees presentation for Design Approval.

Municipal Approvals

Project managers must plan for these reviews and submit the appropriate filing applications. The key milestones for reviewing a major project for both the City and the Town are as follows:

Informal consultation with city staff

The review process for all projects that will be reviewed by the municipality should begin with an informal discussion with the planning department to reveal any potential issues regarding a project and to coordinate the overall review process very early in the design process.

Sketch Plan Review

Sketch plan review is an opportunity to present the early conceptual designs of a project to the assembled planning board to prepare for the Preliminary Site Plan Review.

Preliminary Site Plan Review

A presentation to the full planning board that is usually based on early Schematic Design addressing,

- *Parking,*
- *Means of Access,*
- *Lighting,*
- *Location and Dimensions of Buildings,*
- *Adjacent Land Uses,*
- *Architectural Features,*

The board will approve the presented design through a formal resolution that usually includes conditions.

Final Site Plan Review

This is the final presentation that addresses all the conditions required by the Planning Board on the Preliminary Site Plan Review submittal. Final approval is the desired outcome with minor additional conditions. It is important to understand that any substantial changes from the approved Final Site Plan can trigger a need for re-submission. A building permit cannot be issued with outstanding site plan review issues. Minor changes can be approved by staff.

Ithaca Landmarks Preservation Review (ILPC)

Prior to municipal site plan approval, the Ithaca Landmarks Preservation Review Committee must approve of all designs on historic properties and all projects located in East Hill, the Arts Quad and Cornell Heights Historic Districts.

3.14 Design Development

The purpose of the Design Development phase is to further develop the Schematic Design so that building systems are developed to verify assumptions regarding their performance and cost. In earlier design phases, cost estimates are usually based on a rough area calculation based on the estimators past experience. In Design Development, all the building systems are developed so that cost can be based on actual quantities on many assemblies. The energy model can be more precise as the building envelope is better defined. Design development provides Cornell engineers and other design professionals a better understanding of approaches taken and their resulting cost and performance. In most projects, Design

Development is the last opportunity for significant adjustment of building systems before beginning the intense documentation required of contract documents. For this reason, the most meaningful and robust discussions on value-engineering and constructability are held during this phase of design. Also during Design Development, a preliminary schedule can be developed that could suggest that early release packages such as excavation, foundations, and/or structural steel should be considered to expedite construction.

Space Planning

During this phase most of the programming, space planning and fit-out decisions must be concluded. Project managers should review this submittal with the user group to ensure they understand the design.

Finish Boards

During design development, the architect must present finish boards showing materials being proposed for all common and assigned areas. Interior renderings of major public areas are vital to properly communicate the design.

Building Information Modeling (BIM)

On projects utilizing Building Information Modeling (BIM), a 3D model of the structural system and major MEP systems will be used to identify and correct potential clashes.

Review and Approval DD

In the design development phase, the scope of work previously approved in the Schematic Design Phase is further developed. The primary purpose is to define and describe all important aspects of the project so all that remains after the completion of this phase is the creation of construction contract documents.

The Design development documents should reflect the space program and/or explain any deviations from it.

The PM should receive 100% Design Development documents from the Design Consultant that include all documents from SD, documentation defined in the contract's Schedule G modified as required to meet the project requirements, as well as the following, if applicable to the project:

- *Fully developed floor plans, interior and exterior elevations, reflected ceiling plans, wall and building sections, and key details.*
- *Basic mechanical, electrical, plumbing and fire protection systems are accurately defined, if not fully drawn.*

During this phase, the PM should:

- *Continue to coordinate with stakeholders such as Engineering, Energy and Sustainability, Contracts, Cornell Police, CIT, Maintenance Management, EH&S, etc. See Internal Stakeholders.*
- *Ensure document review by key stakeholders, including the Energy and Sustainability Office (energy management, utilities) and the Energy & Environment Group.*
- *Continue to validate project schedule, including definition of long-lead items, if applicable.*
- *Validate and reconcile project budget with DD estimate. This may require an additional independent estimate.*
- *Review and get approvals for DD package from Core Team and Stakeholders (including design review by Facilities Engineering or Facilities Management and sponsoring unit agent).*
- *Obtain sign-off on plans.*
- *Begin a dialogue with Facilities Contracts and the consultant regarding front end documentation such as General Conditions and General Requirements for the bid package.*

Design Development Cost Control

Cost Estimates

Perform a DD estimate at the end of the Design Development Phase along with an optional parallel estimate from an independent, professional cost-estimating firm as deemed necessary by the project manager. This estimate should have a consistent format with schedule of values in the budget template to facilitate direct comparisons between the estimators. See the budget template format in "Develop a Budget" in the Planning Phase. Differences between the two independent estimators are reconciled on a line item basis by discussing unit costs, quantities and consulting with

outside cost sources to arrive at a common understanding of costs. If the project is over budget, savings must be identified to reduce costs. This is called "*cost cutting*" and not *value engineering.* It is usually prudent to identify scope items that can bid as alternates to ensure that an award can be made in the case of high bids. It is vital to communicate the proposed reductions to project stakeholders prior to instructing the architect to incorporate these strategies into the contract documents.

Value Engineering Workshop

Conduct a Value Engineering Workshop that includes the architect, pre-construction consultant, representatives from Facilities Engineering, the building user and operators to generate, review, and incorporate modifications to the design that can result in lower construction and/or maintenance costs on project components, systems and assemblies. Value Engineering differs from "cost cutting" in that it could examine higher first cost equipment on the basis of overall operational savings. The workshop begins with the DD submittal being sent to the preconstruction consultant for review about two weeks prior to the session. Ideas for value improvements are discussed in the workshop. The resources should be present to calculate construction and operational savings. Modifications to the design will be incorporated by the architect in the next stage of design. While significant findings can be discovered in Schematic Design and Construction Documents, the most opportune design phase for detailed value engineering is typically the Design Development stage of design.

Risk Management

In terms of risk management during a project, the PM is responsible for assessing the financial risk at this stage of the project. If the risk is high, Cornell can require a bond from the contractor, which will add to the cost of the project. See Risk Management for the Bid Phase of a project.

Schedule

Validate project schedule including identification of long-lead items.

Begin dialogue and agreements regarding front ends General Conditions and General Requirements for the bid package with the Facilities Contracts office and the consultant.

Building Address, Room Numbers and Keying

The PM must engage the Facilities Information Group (FIG) for assignment of facility code (new buildings), emergency response street address, and for room numbering (all new buildings and renovations that move partition walls).

3.15 Quality, Control and Commissioning

At this phase, the PM should ensure that quality control/commissioning strategies have been developed with the Architect. The PM Toolbox training Quality Control, Inspections and Commissioning provides detailed information on the resources required and how the PM can best accomplish this task, including procurement of testing services, licenses and permits, General Conditions and General Requirements.

3.16 Construction Documents

The creation of the construction documents is the final stage of the design process, which finalizes the drawings and specifications for all components and systems of the project, resulting in construction contract documents used to solicit bids for the work and construct the project.

The deliverables at this stage are 100% of the Construction Contract Documents. This set of documents fully describes the project and will be the basis for soliciting bids from the selected contractors. This documentation is defined in the contract's Schedule G modified as required to meet the project requirements. Internal review of the documents by University stakeholders is normally done at 50% and 95% completion for content and final comments.

The design must not change during this phase. Alternates to the base bid design must be finalized and agreed to by the Core Project Team. Alternates are often developed during the Construction Documents (CD) phase to estimate the costs of specific scope elements or to identify scope that can be deleted from the project in the event that the bids exceed the budget. Separating items provides a clear means for cost benefit analysis of options that would enlarge or shrink the building program, according to the available project budget.

A final CD cost estimate is prepared at the end of this design phase. A contractor selected to perform pre-construction services will review the construction documents to validate the final cost estimate and to help avoid potential bid cost over runs. Perform final budget reconciliation just prior to bid. The PM should ensure that the selected alternates allow a construction contract to be issued.

Construction Documents Estimate.

The PM prepares a final Construction Document cost estimate at the end of this design phase. A contractor may be selected to perform pre-construction services; he or she will review the construction documents to validate the final cost estimate and to help avoid potential bid cost over runs. The PM should perform final budget reconciliation just prior to bid. The PM should also ensure that the selected alternates will allow a construction contract to be issued. (If the PM is contracting another consultant, see above for how to procure a design consultant.)

Operating and Maintenance Costs

One of the key issues at this point is to identify the range of the costs, and which department(s) will be responsible for assuming them. The analysis should include a discussion on energy use and life cycle costs.

See Maintenance Management for assistance on other potential costs.

Address energy use and life cycle costs.

Prepare for Construction Procurement

Prepare bid document package, noting any special project requirements such as accelerated schedule or working on off shifts .

Value Engineering Workshop

Conduct a Value Engineering (VE) Workshop that includes the architect, pre-construction consultant, representatives from Facilities Engineering, the building user and operators to generate, review, and incorporate modifications to the design that can result in lower construction and/or maintenance costs on project components, systems and assemblies. Value Engineering differs from “cost cutting” in that it could examine higher first cost equipment on the basis of overall operational savings. The workshop begins with the DD submittal being sent to the

preconstruction consultant for review about two weeks prior to the session. Ideas for value improvements are discussed in the workshop. The resources should be present to calculate construction and operational savings. Modifications to the design will be incorporated by the architect in the next stage of design. While significant findings can be discovered in Schematic Design and Construction Documents, the most opportune design phase for detailed value engineering is typically the Design Development stage of design. It is important that any VE idea be approved by the most affected stakeholder prior to acceptance.

Bid Package

The output of this phase is the construction design documents that will be used to bid the construction phase of the project.

The PM should make sure that all key stakeholders impacted by this project have reviewed and approved the bid package. This includes services offered by Facilities Engineering and Energy Management to ensure that all controls for the project, when relevant, meet current construction standards. There is a fee for these services, which a PM should include as part of the cost of the project. Contact FE for information on these services.

Project managers should consult with Facilities Contracts at least two months in advance of the completion of contract documents to plan and coordinate the construction procurement process.

The approved construction documents are provided to Facilities Contracts as follows:

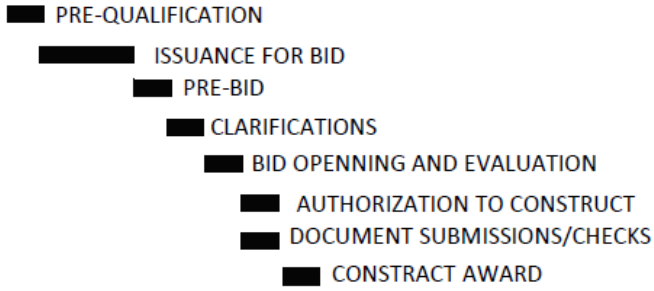
- *Front-end (.doc)*
- *Technical specifications (.pdf)*
- *Drawings (.pdf)*
- *Drawings (one set, stamped)*
- *Specifications (1 single sided set)*

3.17 Minor Projects Under $2M

Minor projects under $2M may not require all the services of a multi-phase design approach, municipal approvals, and/or design approvals. Project managers for these projects should discuss the planned delivery approaches with the director responsible for the

project. In many cases these projects can be designed by an A/E delivering a few informal submittals requiring minimal reviews and approvals.

4 Construction Procurement



4.1 Overview of Tasks during the Construction Procurement Phase

The project manager's primary goal for the construction procurement phase of the project is to procure the construction work required by the project. The PM should procure the work by using an effective process that considers

Funding source and project cost which may require a public bid and acceptance of lowest responsive and responsible bidder.

To achieve the above the PM will do the following:

- *Coordinate review process and bid document finalization*
- *Provide Facilities Contracts with CD of all bidding documents*
- *General Conditions and other supplementary instructions in word (.doc) format*
- *Technical Specifications (.pdf)*
- *Drawings (.pdf)*
- *Other documents (.pdf)*
- *Specifications – 1 single sided printed set*
- *Drawings – 1 set of stamped drawings*
- *Conduct Pre-Bid Meeting*
- *Coordination of RFI Process & Addendum Preparation*

4.2 Role of Facilities Contracts

The PM should work closely with the Facilities Contracts Office if contracts are required; FC Contracts role in this process includes:

- *Integrity of Bid Process*
- *Instructions to Bidders*
- *Bid Form*
- *General Conditions*
- *General Requirement*
- *Bid Schedule*
- *Printing/Portal Coordination*
- *Attendance at Pre-Bid Meeting*
- *Issuance of Addendum*
- *Conduct Bid Open Meeting*

In terms of working with Facilities Contract, the PM is responsible for the following:

- *If applicable, identify and select appropriate prospective contractors based on project specifics such as nature of project, scope, schedule and past performance. Work with Facilities Contracts to determine approved contractors and best bidding process for this project. (This is NOT applicable on Contract College projects.)*
- *Ensure the Designer/Architect has developed the technical specifications and General Requirements for the project.*
- *Ensure Facilities Contracts has created the General Conditions. Facilities Contracts will also create the Bid Form and determine the pre-bid deadline dates, as well as the meeting dates.*
- *Initiate bidding effort using appropriate mechanisms. See Pricing a Construction Project below.*
- *Request issuance of contract for selected contractor.*
- *See below for more information. The contract form is the Contractual Request Form Construction*

- *Negotiate when appropriate. Evaluate reasonableness of cost using validation tools such as third party independent estimate, designer's opinion of probable cost, preliminary estimates in the RFP, etc. (This is NOT applicable on public bid projects.)*
- *Evaluate routinely contractor proposals and bid submissions, with Facilities Contracts when appropriate, for likelihood of success indicators including*
- *De-scoping to ensure comprehensive packages and understandings*
- *Evaluation of the contractor's proposed staffing and delivery plans*
- *Contractor commitment to this and other projects.*

4.3 Role of Construction Management

This office includes construction managers and project coordinators who manage contractors and construction phase activities. Individuals in the Construction Management Office are frequently members of the project Core Team. The Director of Construction Management is also responsible for leading the contractor selection process. Core teams work with the Director to select pre-construction contractors, construction managers, general contractor bidders lists, and to develop construction delivery strategy.

4.4 Procurement Strategy/Plan

No later than at the end of Design Development, the core team consisting of the project manager, construction manager, and the Facilities Contracts must develop a detailed procurement plan for the project that addresses a planned contracting type, the survey of available contractors, evaluation criteria, evaluation team, bonding requirements and other particulars for planning the acquisition process and to seek any necessary approvals on all projects over $2M. On projects over $2M, this procurement plan must be approved by the respective Senior Director responsible for the project. On projects under $2M, the procurement strategy must be reviewed by the project manager's supervisor and facilities contracts. On projects over $20M, the procurement plan must be approved by the Vice-President of Facilities Services.

4.5 Contracting Types

Cornell employs four basic construction contracting types based on the complexities and particulars of each project. The type of contracting should be defined in the Design Development phase of design.

Lump-Sum

This is the most basic construction procurement method that obtains competitive bids on the completed construction documents. It is often used on simple projects, although it is commonly used on very large scale projects. It is the only acceptable type of contracting for state projects. A variation on the Lump-Sum contracting method is Lump-Sum Qualifications based selection. The contracting method is identical, but the selection process weighs price against qualifications.

Guaranteed Maximum Cost (GMC) Contracts or CM at Risk

This popular method of contracting usually selects the contractor before the design is completed. The contractor is selected by a competitive process based on a GMC often based on the Design Development design package and their qualifications. This method facilitates incorporating the construction expertise of the builder into the design process for value engineering and constructability reviews. It also allows for early release packages to expedite construction. Facilities Contracts can provide additional information regarding contract clauses for this contracting method.

Job Order Contracting (JOC)

This contracting method is based on pre-negotiated unit costs with contracting service. It is best used for simple single trade work with a clearly definable scope.

Time and Material Contracting

This contracting method is utilized when the scope of a project cannot be fully defined before work must begin. It is usually reserved for emergency situations, or when the extent of work is not well understood. This type of contracting exposes the University to open ended costs and must be used only when necessary.

4.6 Selecting a Contractor

It is vital that Cornell projects obtain the best possible value given the relatively high level of investment that most construction contracts represent to the University. Fairness, openness and transparency of the construction procurement process stimulates greater interest by more regional contractors and assures stakeholders that the project funds are being spent effectively. While past experience with contractors, and specific team members is a valuable tool in accessing a potential contractor's performance, it must not lead to a limited pool of contractors that are given unfair preference over other regional competitors. Moreover, the evaluation of such experience must be well supported by a methodical selection process that could be subject to future audit and external review. On major projects over $5M, a two-step selection process should be employed. The project manager, the construction manager, and Facility Contracts together develop a procurement strategy based on the complexities and requirements of the project.

Step One: Pre-qualification

As a general principal, all regional contractors meeting Cornell's union labor, financial and technical requirements must be given the opportunity to provide a competitive bid or offer on all major construction projects. The Contracts office can provide the necessary union and financial requirements to the project team. Technical requirements must be clearly and reasonably relevant to the proposed project. For example, on a $50M laboratory project, it would be reasonable to set a minimal threshold of past experience with projects of similar complexity and magnitude in the region. The goal is not to be restrictive, but to maximize competition among qualified contractors. The goal of the team should be to have a pool of at least 5 contractors.

Step Two: Qualification based selection or Low-Bid

If the project team believes that all pre-qualified bidders could succeed, then the best alternative is to award to the lowest bidder. The bids are opened publically under this approach.

An alternative to lump-sum low-bid method of award, is a qualifications based selection. This process establishes a set of clearly defined weighted evaluation criteria that is used to determine which contractor is offering the best value to the University that incorporates cost and the technical strength of the

project team. Meaningful and effective evaluation criteria should be limited from four to six factors. Beyond that number, it is difficult for evaluation teams to summarize and communicate their reasons for selection. It is important to understand that the numerical scoring is a tool to reach consensus and should be used to support a clear and concise narrative supporting the selection which is signed by all evaluation committee members.

Typical weighted evaluation criteria include the following:

- *Experience of the contractor with projects of similar complexity,*
- *Experience of the project manager/Superintendent and/or other key team members with projects of similar complexity,*
- *Impact of other currently on-going major work on the contractor*
- *Project Management Plan or Approach (schedule, innovation, etc)*
- *Cost (at least 50% of the evaluation)*

The cost of each proposal is withheld from the technical evaluation team to ensure that their review is focused exclusively on the technical merits of the proposal. After each firm is ranked, cost is introduced into the evaluation so that it can be weighed against the technical scores to ensure that the University obtains the best value.

Cost must be at least 50% of the overall technical/cost evaluation. One commonly acceptable method of using this requirement is to structure the evaluation process so that as costs are more similar, then technical scoring is weighted more heavily. Conversely, as technical scores are more similar, then cost is weighted more heavily. This method addresses the situation where a cluster of cost proposals are very tight, yet the best value could be the highest cost in a very tight spread of bids.

The evaluation team should include a member of the sponsoring unit, the architect, contracts, the project manager and the construction manager. The evaluation criteria and evaluation team must be approved through the procurement strategy plan by the Senior Director responsible for the project.

The evaluation committee documents their findings by an evaluation report that describes the ranking of the firms without reference to cost. After the evaluation of qualifications, cost is

introduced and the committee makes a recommendation that weighs cost and technical scoring to the approving authority.

For projects over $5M, the approving authority is the Senior Director responsible for the project. For projects over $20M, the approving authority is the Vice-President of Facilities Services.

Since the basis of award is a composite of technical criteria and cost, cost proposals (bids) are not opened publically in this type of proposal evaluation.

4.7 Bid Phase Schedule

The bid phase consists of four basic steps that must be coordinated with Facilities Contracts Office.

Construction Procurement Coordination Meeting

The initial meeting with the contracts office is to develop a procurement strategy to maximize competition. All contractors within the region with the capability to successfully deliver the project and meeting Cornell's contracting requirements should be considered for invitation. The contracts office will provide the specific requirements regarding union labor and bonding capacity. Additionally, language regarding reasonable pre-qualification should be developed in the initial meeting. Commonly accepted pre-qualification standards related to corporate and individual experience with project of similar complexity and positive references can be utilized to ensure that competition is promoted among equivalent respondents.

In qualifications based selection, the core team must develop evaluation criteria to weigh against the price proposal and define the evaluation team.

Preliminary Document Review & Assembly

The core team assembles the bidding documents that include the architect's construction documents, instructions to the bidders, a bid form, general conditions and general requirements. The assembled bidding documents are sent to the printers.

Issue for Bid

All bidders are notified of the bidding opportunity and informed of instructions to acquire bidding documents.

For Campus Let projects, projects out for bid must advertise 3 weeks prior to bid deadline in two places: the local paper and the New York State Contract Reporter . Add a few days for local paper advertising as it takes a few days to appear after an ad has been placed.

For Campus Let Projects, construction managers who are bidding on a project submit a Statement of Qualifications. Click Statement of Qualifications for a copy of this form.

Posting to the Portal

(See http://finance.fs.cornell.edu/contracts/pob/projects.cfm)

Clarifications

It is Cornell's best interest that all bidders fully understand the contract documents and provide opportunities to clarify any potential misunderstanding. All projects over $5M should follow the following process to ensure that all potential bidders understand the contract requirements unless waived by the Senior Director of the particular project office.

Pre-bid meeting	Typically 1 week after release of bid documents to bidders. This meeting is hosted by the Director of Facilities Contracts and is attended by the project manager, Construction Manager and the A/E to review the project and the overall bidding process.
RFI Period	Up to 2 weeks for all bidders to submit questions and request for clarification to the Director of Facilities Contract. No direct responses shall be given to any bidder. All questions shall be answered as a general addendum to all bidders in writing.
Final Addendum.	The final addendum must be released no later than 1 week prior to bid. Complex addendums may require more time to ensure that bidders have adequate time to respond.

4.8 Bonding Requirements

Contracting for construction of University facilities frequently requires the use of vendors, installers, and contractors with whom the institution has had no previous experience or with whom there has been previous financial difficulty. To protect the University, the following procedures are required.

All construction contractors bidding for work at the University must be financially capable of completing awarded work. Facilities Administration & Finance personnel will check and insure financial

soundness through any legitimate means which do not violate the rights of the prospective contractor. Typically a Z-Score (predictor of bankruptcy formula) is derived from the Contractor's financial information (audit statement, review statements and/or income tax returns). If additional information is need, a Dunn & Bradstreet report or other similar reporting may be obtained. Bonds may be required of some firms and not others on the same or different projects.

Since bonds typically cost 1.5-2.0% of the contract cost, it may be in the University's best interest to waive a bond for financially stable, highly reliable contractors who have demonstrated excellent performance records. This determination is made by the Senior Director of Administration and Finance. The decision is documented in the project procurement plan.

4.9 Bids Exceed Construction Budget: De-Scoping

The de-scoping effort is led by the construction manager with detailed discussions with the project manager, Facilities Contracts, and the sponsoring unit's representative as needed.

The primary goal of de-scoping is to ensure that the apparent low bidder has addressed all the contract requirements fully. A commonly accepted technique is to compare the low bid against all the other bidders to identify significant differences on a line item basis. The bidder can be questioned to ensure that the cost category fully addresses the contract requirements.

4.10 Bid Analysis and Review

Sufficient Competition

The market survey conducted during design should have revealed any potential problem regarding having an adequate bid pool. Additionally, activity surrounding the pre-bid meeting as well as the clarification process would normally indicate the interest in a particular project. However, in the event that less than three contractors place bids on a major project, the project manager, the construction manager and the Director of Facilities Contracts will review the bids to ensure that adequate competition was obtained. Additionally, several of the major contractors that had expressed an interest in bidding should be contacted to learn why they decided not to pursue the project. In the case of less than three bidders, the construction manager will explain the suspected cause of the

situation and document their judgment that the resulting pricing represents a good value to the institution in the procurement plan.

Bid Irregularities

Bids must be reviewed by the core team to determine their responsiveness to the project requirements. Bids with major exceptions or significant substitutions compromise the competitive nature of bidding since not all proposers are offering the same scope work for the offered price. In some cases, major exceptions can provide justification to exclude the bid from competition.

The bid forms for all the bidders should be compared against each other and the last A/E design estimate as a basis for determining the best probable distribution of costs by major building system. A bidder who's allocation of costs seems oddly different than the average distribution could reflect a misunderstanding of the project requirements.

Disqualifying a bidder is a serious action that nullifies a very significant effort by a contractor. However, the University's best interest is to contract with contractors that respect the bidding process and fully understand the project. In some cases, perceived irregularities can be discussed with the contractor to ensure that they fully understand all aspects of the project through the de-scoping process. In other cases, the core team can conclude that the bidder was non-responsive to the project requirements and recommend that the bid be excluded from competition. In these cases, the construction manager prepares a notice to the Senior Director for Finance and documents the decision in the procurement plan as part of the project record.

4.11 Awarding the Project to a Bidder

On a Lump Sum project, award is made on the basis of low base bid or project specific criteria. Once this selection has been made, alternate pricing is then taken into consideration.

State-funded projects are awarded on the basis of base bid plus alternates in sequential order.

Prior to award, the Core Team considers and makes decisions with respect to the incorporation of all acceptable VA/VE suggestions made by the selected contractor, if applicable. A contract is then awarded by Facilities Contracts.

4.12 Signatory Authorities

All contracts including change orders must be signed by the University's authorized signatory. Facilities Contracts is authorized to sign on be-half of the University for projects under $100,000. Between $100,000 and $500,000, contracts must be signed by the Vice-President of Facilities Services. Any contract over $500,000 must be signed by the Vice-President of Financial Affairs and University Controller.

5 CONSTRUCTION PHASE

5.1 Overview of the Construction Phase

Once the contractor for construction has been identified and approved, the PM now moves into the construction phase. The PM's goal during this phase is to provide effective construction administration.

The primary objective is to build the specified project within the agreed-upon schedule and budget and with a high level of quality.

5.2 Authorization to Construct (PAR)

The construction phase is formally initiated by the approval for the authorization to construct by the appropriate approving entity. Finalized pricing on the contract through the bid process is required prior to presenting the PAR to the approving committee.

5.3 General Conditions and General Requirements

Prior to award, the project and construction managers must read the General Conditions and General Requirements very carefully to ensure that all stated contract requirements will be fully addressed.

The general conditions are organized into fifteen articles:

Article 01: Interpretation of Contract Documents

Article 02: Contractor Obligations and Responsibilities

Article 03: Inspection and Certification

Article 04: Changes in Work

Article 05: Time of Completion

Article 06: Termination

Article 07: Disputes

Article 08: Subcontracts

Article 09: Coordination and Cooperation

Article 10: Protection of Rights, Persons and Property

Article 11: Use or Occupancy prior to Acceptance by Owner

Article 12: Payment

Article 13: Tax Exemption

Article 14: Guarantee

Article 15: Standard Provisions

Article 16: Accountings, Inspection and Audit

Article 17: Royalties and Patents

Article 18: Confidentiality and Use of Owner's Name

Each of the above clauses outline the terms of the contract and must be well understood by both the project and construction manager. Additionally, there are other requirements contained in the individual specification sections regarding submittals, execution and other performance requirements.

5.4 Pre-construction and Site Mobilization

Contract Executed

Prior to a contractor mobilizing on site, a contract must be fully executed and all contractual requirements for insurance, bonding, etc., as specified in the contract must be in place. Once all necessary documents are received, Facilities Contracts issues a "Notice to Proceed".

It rare instances when a project delay represents a major impact to the University, it may be necessary for Facilities Contract to issue a "*letter of intent*" to begin a limited portion of work prior to attaining all necessary project approvals. This work must not exceed $25,000 and be limited to non-site related work such as shop drawings, submittals, subcontractor de-scoping meetings, establishment of the project team, schedule development, and/or the preparation of the schedule of values. This work must be funded by an approved PAR. Therefore, project managers may need to consider that their design and bidding PAR include a $25,000 construction line to cover this potential situation.

Any work beyond $25,000 but below $500,000 must obtain a *"Letter of Authorization*" signed by the VP of Facilities Services and it limited to situations that delay would expose the University to unacceptable risks or costs.

Pre-construction Meeting

The project manager is responsible for conducting a pre-construction meeting per the terms of the Agreement. Prior to and during the early phase of construction, a Core Team member will establish with the contractor the appropriate:

- *administrative procedures such as RFIs and submittal process*
- *progress meeting schedules*
- *progress update requirements*
- *schedule controls*
- *methods to expedite the required approvals of certain documents provided by the design consultants*
- *discuss major submissions and inspections*
- *Utilities shut downs, road way closures should be addressed (road closure submission forms must be submitted):*

Permits must be obtained by the contractor, and coordination of building trades and site logistics must be determined and agreed to by the Core Team.

Communication and Coordination

The project manager should implement effective processes of communication between the Core Team, design consultant and contractor.

Part of ensuring good communication is effective meeting management. Additionally, you may use the Template for Meeting Minutes during Construction Phase.

The Construction Manager must expedite coordination of trades and site logistics, as well.

The PM should ensure that contractor communicates clearly with the Construction Manager, when relevant, especially on items that pose a risk to either the budget or schedule.

5.5 Quality Control, Inspections & Commissioning Strategy

As part of the project start-up, a series of detailed coordination meetings must be held to plan for quality assurance and control of

the project and its major systems. These meetings must include the architect, lead design engineers, commissioning agent, testing labs, suppliers, and other representatives responsible for ensuring that the project is being built according to the contract documents. Each specification section outlines specific quality assurance and execution requirements such as mock-ups and inspections that must be jointly reviewed by both owner and contractor at the start of the project and in planning for the actual execution of work.

This coordination must be part of the normal owner's meeting so that third party review can be coordinated when necessary with a least a two-week advance notice.

It is important that the PM ensures compliance with

- *Documents and contract agreements*
- *ADA--Review for ADA access compliance. Project managers should keep an accurate review of partners consulted on access review, as well as have conversations with architects and Cornell University staff on access elements.*
- *Life Safety*
- *OFPC*
- *New York State Dormitory Authority*
- *Governmental permits, codes, and regulatory requirements*
- *For City of Ithaca code compliance (building permits), click here.*
- *University polices and requirements, especially Facilities Contracts. See*
- *Contact Environmental Health and Safety (EHS):*
- *OSHA: The PM is responsible for ensuring that all OSHA compliance and related issues are resolved. EHS can assist.*
- *Keep an accurate review of partners consulted on access review.*
- *Ensure conversations with architects and Cornell University staff on access elements.*
- CIT: Keep CIT infrastructure and/or A/V design – build representatives involved with interdependencies of the base construction and planned technology.

Facilities Inventory Issues: If there are changes in the design that impact the floor plan, Facilities Inventory needs to be notified to re-assign official room numbers. It could be costly to correct errors after design documents have been published.

5.6 Construction Documentation

Cornell project and construction managers should approach their projects with a cooperative attitude to facilitate the contractor's success. However, it is vital that Cornell have access to full and complete records documenting the process of construction. The documentation process begins with the contractor's project manager or superintendent daily job log that records the number and type of workmen on site as well as major work accomplished and other relevant factors such as weather or disruptions. This job log should be reviewed by the Cornell construction manager at least on a weekly basis to ensure that an accurate and full account is being kept that is agreed upon by both builder and owner. A weekly summary of the daily job log supported by site photographs and video of major work accomplished or special conditions should be filed with the construction manager.

The construction manager will obtain a list of all the subcontractors from the General Contractor. This list is submitted to Facilities Contracts to facilitate the release of lien process at the end of the construction project.

5.7 Construction Scheduling

The contractually required resource loaded schedule is vital to properly manage progress payments and to agree upon to the schedule impact of contract changes or unforeseen conditions. Cornell's general conditions allow the owner to withhold payment if a schedule meeting the general condition requirements is not met under Article 12. The schedule is due within 2 weeks of the contract award date. The critical path must be clearly shown which normally includes major submittals, since they usually must be approved prior to fabrication which could delay the delivery of key assemblies and impact the overall project.

5.8 Monitor Contractor's Compliance

Continue to monitor Contractor's compliance with contractual submissions. Many different Cornell stakeholders can play a role in

monitoring compliance. The Cornell shops, structural engineers, designers, project team, EH&S, clients, the commissioning agent, Maintenance Management, are examples of groups who can provide input into compliance of the contractor.

The PM should ensure that the Construction management point of contact information plan as described in the General Conditions and General Requirements, includes a site-specific Safety Plan, Affirmative Action requirements for the general contractor.

The PM should work with the Energy and Sustainability Office to provide metering for construction and verify that the metering design is adequate for final services. The PM should ensure that the Energy and Sustainability Office verifies that all metering is in place and functional before building services are energized.

5.9 Validate, track and monitor cost change orders

Cost change proposals are negotiated procurements that can represent a significant increase in the contract costs. Construction Managers must be reasonable, but aggressive in determining the validity of a claimed cost change proposal and in negotiating its costs. The Architect must be notified on the potential classification of a change order as an error and omission and be given 5 work days to dispute the classification in writing. Documentation of the change order must at a minimum explain the cause for the cost change that includes the citation of the contract document that most closely covers the change versus the condition that must be remedied. Any potential cost change proposal over $100,000 must first obtain written approval from the project manager's Senior Director prior to issuance of the request for proposal, or beginning negotiations on a Change Order Request.

The construction manager and project manager must strive to negotiate cost change proposals before allowing any work to proceed. In the case that time-critical work must proceed prior to negotiation due to an unacceptable potential impact to the University, the construction manager can proceed on a time and material basis until a cost change proposal can be negotiated. Such authorization is limited to $10,000.

Document the cause of each cost change proposal (e.g., field conditions, design errors and omissions, owner initiated program change). Keep an accurate, current Change Order log and insure Change Order costs are added to/deducted from the Master Project

Budget Model. See Change Order Process in the Appendix. Also see the following templates and forms at the Facilities Contract site by clicking here.

Change Order Classification

The project manager is responsible for determining use of contingency in the E&O and Unforeseen Conditions categories.

Errors and Omissions

The construction process will reveal many instances where the construction documents do not adequately address a site condition, or when the contract documents are clearly in error. Construction case law has established a concept called, "Standard of Care" that defines the acceptable cost of change orders attributable to errors and omissions depending on the complexity of the building project. Normally, it is reasonable to expect 2 to 3% of the cost of construction be spent on errors and omissions. Beyond that threshold, the A/E should be notified that Cornell intends to seek compensation for possible professional negligence after consultation with legal counsel. The professional standard of care would normally be established though expert testimony that would consider the complexity of the project, the compensation and services of the A/E and other affecting conditions.

Unforeseen Conditions

Unforeseen conditions occur when the architect or contractor had no way of anticipating a job site condition that affects the project. For example, in a renovation project the contractor may discover a structural problem in the building when a wall is opened up. Another example is the contractor doing an excavation and encountering a utility line that was not on the construction documents and not on the Owner's utility maps. In each case, no one is responsible for not having addressed the condition in the construction documents and Cornell must pay to fix the problem.

Project teams frequently encounter circumstances at the conclusion of a project, when the building is newly occupied and problems arise as a result of the dissatisfaction of certain occupants or stakeholders. For example, the occupant of an office might want an extra data outlet, or a piece of mechanical equipment may prove to be unreliable, even though it was purchased and installed according to the contract documents. The project manager is responsible for

post-construction contingency use when it falls into the E&O and Unforeseen Conditions categories.

Scope/Program Change

Scope or program changes occur when Cornell makes a change to the scope of the project after the work has been bid and awarded. It is important to note that discretionary changes to the project after construction has begun are strongly discouraged.

All potential change orders with a potential cost over $15,000 and classified as owner initiated program changes, or changes to scope must be approved by the project manager's Senior Director and the Vice-President of Facilities services prior to negotiation. Additionally, the Vice-President of Facilities Services must be notified of aggregate spending on owner initiated scope changes over $100,000 on any construction contract.

Time Impact

Negotiating the time impact is often as important as negotiating the cost of change orders. This is one reason why the baseline schedule requirement is so important. The change order request will describe the nature of the change, the cost and the time impact. The construction manager must work to reveal potential re-sequencing of the schedule to recover the time impact if possible. Overtime claims are valid only if there is no possible time recovery by adjusting the schedule.

Manage Scope Creep

Minimize or eliminate the occurrence of scope creep. Contingency funds are not to be used for discretionary design changes or scope items not specifically defined in the original agreements. The project manager and Construction Manager develop an expedited means to review/approve submittals, and monitor it carefully.

5.10 Construction Contract Claims

Cornell University enjoys a special status in the construction contracting community as the major builder in the area which incentivizes contractors to maintain a good and lasting relationship with the institution. However, construction managers should be aware that contractors can seek significant additional compensation due to unforeseen disruptive project conditions. Most of these claims are based in the loss of normally expected productivity due to the owner's actions. Therefore, careful administration of the

contractually required critical path schedule is a vital part of the construction administration process. Owner representatives are sometimes surprised to find that a contractor that struggled with the schedule requirement will produce the most detailed and elaborate reconstruction of history in preparation for a claim. It is important to understand that these types of claims are usually presented near the end of the project. Defense against unwarranted claims can only be accomplished by the owner's ability to reconstruct the project's history. Again, this reinforces the need for thorough record keeping and an ongoing discussion on the schedule.

Industry wide, the most exercised cause for claims have been:

Delay and Disruption

This claim is a general claim to recover direct and overhead costs due to changes to the contract, or unforeseen conditions that extended the length of the contract period due to the owner's impact.

Cumulative Impact

This claim is based on the unforeseen aggregation of excessive multiple change orders and unresolved project issues. While there is a contract change order clause in the contract, and there should be a discussion on the schedule impact of said changes, this claim type is based on the concept that the number of changes was well beyond the expected levels and the "cumulative impact" delayed the overall project beyond the individual changes.

Ripple Effect

Ripple effect claims are based on the concept that a significant change impacted other related work disrupting the planned and optimum sequence.

Defective Contract Documents

Defective contract documents claims stems from the concept that the number of change orders and request for information demonstrate that the contract documents were inadequate and seriously impacted the contractor's ability to prosecute the work.

5.11 Payments to Contractors

Cornell's General Conditions establish the requirements for contractor invoicing. The Construction Manager and the project manager must enforce these requirements fully as one of their most important responsibilities in the management of the contract. The payments are based on the "schedule of values" and the current project schedule that itemize the entire construction contract by building systems and is submitted and agreed to prior to contract award. Once a month, the CM, PM, Architect and Contractor review the work versus the schedule of values to determine the amount of payment for that period. Based on this assessment, the contractor will submit a written application for payment along with an affidavit certifying the truth and accuracy of the request, and that all bills for labor and material have been paid. Upon prior written approval of the Owner, the cost for materials stored off site may be made conditioned upon submission of bill of sale, insurance certificates, notice of bonded warehousing and appropriate "Stored Materials Invoicing Form by the contractor. The Architect will also review the payment application and advise Cornell on its accuracy. A 10% retainer is maintained by Cornell on all progress payments.

5.12 Timely Responses to Contractors

Make sure there is always a timely response to all requests by the Contractor. Adopt an effective system to manage and document this flow of information.

5.13 Acquisition of Required Permits

The local Authority Having Jurisdiction determines the necessity for a building permit. (AHJ) When required, a contractor must obtain a building permit from the appropriate AHJ.

Project managers need to know when permits are required in order to ensure the contractors are fulfilling their responsibilities. The following aspects of a project typically trigger the need to acquire building permits for the project:

- *The construction materially affects structural features*
- *The project costs greater than $10,000*
- *The project affects fire safety features, such as sprinkler systems, fire alarm detection systems, exits*
- *The project requires the installation or extensions or electrical systems*

- *The project requires installation of solid fuel burning heating appliance*
- *The project requires "change in use" or "conversion"*

In terms of state building Permits, Contract Colleges Facilities has code and building permit jurisdiction for all projects in state owned buildings regardless of funding source. Contact the CCF's AHJ with questions regarding state building permit thresholds and procedures. The PM for Contract College or State Funded projects shall ALWAYS review project with CCF AHJ prior to ever discussing the project with a local municipality (zoning, building permit, historic review, or storm water permits, etc.)

If a PM is unsure if a permit is required, the PM should talk to the AHJ or his or her immediate supervisor whichever is relevant.

5.14 Construction Audits

On Guaranteed Maximum Cost (GMC) contracts, general condition costs are audited at two occasions. The first audit is conducted when the project is about 20% complete. The first audit reviews billed wage and overhead rates and report compared against the contract requirements. The purpose of this first audit is to report on discrepancies so that they can be corrected for the balance of the contract and avoid the discovery of overpayment at the end of the project when cost recovery is much more difficult. The second audit occurs near the end of the project to review the same wage and overhead rates for overpayment and cost recovery.

5.15 Contractor Evaluation

At a minimum, all contractors on all projects will be evaluated twice during a project. The first evaluation should be conducted at about 30% construction completion. This review should be intended to provide the contractor with Cornell's perspective on their performance at a time that they can still improve their standing for the remaining period of the project. The project manager must report the findings of the evaluation to the Sr. Director of the responsible FS project management group so that any serious issues can be discussed with the contractor's upper management. A final evaluation is conducted at the end of the project which is filed with contracts and is used in the evaluation of the contractor for future projects.

FS Contracts maintains the most current contractor evaluation forms.

5.16 Risk Management

Insurance Claims

The PM should be aware of the following claims, and should be prepared to address them should they arise:

- *Workers Compensation*
- *Liability*
- *Property*

Workers Compensation

Person Injured	Relationship	Claims Process
Cornell Endowed employee	All Contracts	Cornell Medical Leave Administration-EH&S link
Cornell State employee	All Contracts	Covered by state insurance fund
Contractor's employee	Normal contract	Contractor's insurance
	OCIP	OCIP claims process-OCIP Administrator

Liability

Relationship	Person Responsible for Injury	Claims Process
Normal contract	Cornell Employee	Cornell Insurance—report to Risk Management
	Contractor	Contractor reports to his carrier
	Contractor employee is injured and sues Cornell	May tender back to Contractor—Over-action Claim
OCIP	All	Report to OCIP administrator

Property

Property Owner	Coverage	Claims
Cornell	Builders risk	Requires an understanding of who is carrying builders risk, Cornell or contractor
Contract College	Builders risk	SUCF process
Contractor	Contractor's property insurance	Contractor's claim process

5.17 Contractor Forms and Templates (Endowed)

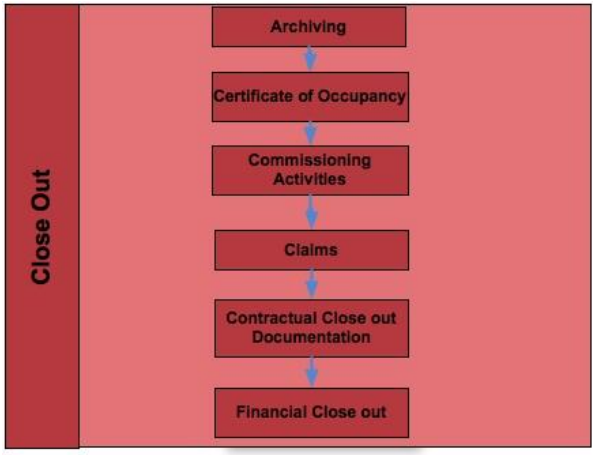
The forms below may be used throughout this phase (and potentially other phases) of construction and are obtained from the FS Contracts office.

- *Affirmative Action*
- *Affirmative Action Plan*
- *Summary of Subcontractor Bid Activity with M/WBE Firms*
- *Minority Utilization Report*
- *Monthly Workforce Report*
- *Monthly Workforce Report (SAMPLE)*
- *Change Orders*
- *Change Order Request Contractor performing the work*
- *Change Order Request Summary*
- *Change Order Request Summary GMC*
- *Contractor Waste Material Disposal Plan*
- *Hazardous Blanket Contractor Waste Material Disposal Plan*
- *General*
- *Labor Rate Breakdown*
- *GMC Fee Calculation Worksheet*
- *Invoice Audit*
- *Cash Flow Projection Template*
- *Final Release*
- *Waiver of Lien (Grounds Blanket Agreements)*

- *Waiver of Lien (Blanket Agreement)*
- *Guarantee*
- *Stored Materials*
- *W-9 for New Vendors*

6 Close Out

6.1 Overview of Tasks during the Close out Phase



This phase facilitates the occupancy and turnover of the completed and commissioned project to the Primary Sponsoring unit.

Deliverables: Delivery of the completed project to the occupants.

6.2 Archiving

Before occupancy, initiate the process of obtaining measured drawings through Facilities Inventory within the Facilities Information Group (FIG).

Sort project materials for dispensation to one of these:

- *University Archives*
- *Facilities Document Records Center*
- *CIT Infrastructure and AV Engineering*

The project manager should meet with FIG and Facility Contracts to ensure that all documents are properly archived.

6.3 Certificate of Occupancy

The certificate of occupancy process is managed by the general contractor; however the Cornell construction manager can greatly

facilitate this process. Several weeks prior to the planned final inspection, the building inspector should be invited to the site to conduct a preliminary review of the work. All necessary certificates such as EH&S pre-occupancy inspection, sprinkler and fire-alarm test, electrical and plumbing inspections, elevator inspections, and others must be obtained prior to the final inspection.

6.4 Commissioning Activities

Complete commissioning activities, including generation of final building commissioning report and owner training in building operations by the design consultant, contractor and commissioning agent. See recommended check list below. These activities include but are not limited to:

- *Fume Hood / Emergency showers and eyewash / Safety Inspections*
- *Fire alarm testing*
- *Review of HVAC systems*
- *Review of all electrical systems and controls*
- *Review of any special equipment requirements*
- *Inspection of energy requirements standards*
- *Reviews and turnover of warranties on all major equipment and building assemblies.*

6.5 Claims

The project manager must work to resolve any claims as expeditiously and fairly as possible. To achieve resolution, the PM should work with the University's Counsel's office. Complex claims may require the assistance of a consultant for developing the owner's position.

6.6 Notification to Capital Planning Group (CPG) of Outstanding Issues

No later than three months after obtaining the certificate of occupancy, the project manager must report on any outstanding project issues such as potential claims, warranty work, or the need to retain an expert to resolve a major defect to the Capital Planning

Group. These costs must be presented along with a planned timeline for resolution. The goal of this action is to notify the Administration of all potential costs necessary to fully close the project.

6.7 Contractual Close out Documentation

Obtain contractual close out documentation and make final payment to the Contractor as required by Article 12 of the General Conditions of the contract that includes a satisfactory Release of Lien (Exhibit "C") by the Contractor and each subcontractor. The Article also provides for the consent of surety for final payment. Final payment means that the project is complete which triggers the warrantee period. There should be no open items on the project.

6.8 Financial Close out

Financial close out of project promptly after completion of all work and payment of all project related expenses.

The project manager will send via email the Project Report requesting that the project account be closed. In this request, the PM will address the following:

Identify open RFS's/Job Orders, Tickets and/or open commitments. The project manager is responsible to contact appropriate individual to request closure via email.

- *Shops Orders closed by Shops Administration.*
- *EH&S Orders closed by EH&S Administration.*
- *MM Orders closed by Maintenance Management Administration.*
- *CCP Orders closed by Capital Projects.*
- *Tickets closed by Customer Service.*
- *NOTE: RFS's/Job Orders must be closed by the issuing department.*
- *Review any Purchase Orders to make sure they are final billed and closed. Work with Facilities Contracts to resolve any issues or open commitments.*
- *Review all Contracts to make sure they have final billed. Work with Facilities Contracts to clear any outstanding commitments*.

6.9 Checklist for Close out

Close Out Check List

Documentation

- ☐ Record Drawings
- ☐ Manuals
  - ☐ Balance Report
  - ☐ Equipment, material
- ☐ Retainage/Final Billing
- ☐ Letter of Substantial Completion
- ☐ Letter of Final Acceptance
- ☐ Certificate of Occupancy
- ☐ City, State Inspection
- ☐ Guarantees/Warranties
- ☐ Record Retention
  - ☐ Meeting notes, inspection reports, photos
- ☐ Release of Liens
- ☐ Permits
- ☐ Test Results
  - ☐ Geotechnical, Smoke, Compaction
- ☐ Final Project Status Report
- ☐ Space Inventory
- ☐ Submittals

Commissioning

- ☐ Air Balance Reports
  - ☐ Balancing Dampers in Specs&Documents
- ☐ Water Balance Reports
  - ☐ Wet System Valves
- ☐ Controls Contractor—Collaborative
  - ☐ Sequence of Operations
- ☐ Fire Alarm Collaboration
  - ☐ City of Ithaca
  - ☐ EH&S
  - ☐ Contractor
  - ☐ Controls System
- ☐ Certification
  - ☐ Components
  - ☐ Communication to Barton System
- ☐ Fire Protection System
  - ☐ Flow Tests
  - ☐ Factory Mutual
  - ☐ EH&S
  - ☐ Authority Having Jurisdiction
- ☐ Electrical Testing
  - ☐ Dedicated Circuits
  - ☐ Emergency Generator
  - ☐ Transformer Testing
  - ☐ Lightning Protection
- ☐ Equipment Start-up Testing
  - ☐ Manufacturers, Training
  - ☐ Variable Frequency Drives
  - ☐ Leak Testing
  - ☐ Pressure Testing
- ☐ Punch List
- ☐ A/V System-General Performance
- ☐ Operating Manuals
- ☐ Doors Hardware, Roofs
- ☐ Off-gassing
- ☐ Mechanical Shop Inventory
- ☐ Walkthroughs and Training
  - ☐ Maintenance Management
  - ☐ Building Manager
  - ☐ Shops

Building Department

- ☐ Inspection
  - Plumbing (water, sewer)
  - ☐ Electrical
  - ☐ Fire (EH&S)
  - ☐ Building Inspection
  - ☐ Planning Board, when applicable
  - ☐ Health Department (food service)
  - ☐ Fire Department
  - ☐ Sprinkler Test
- ☐ Certificate of Occupancy
- ☐ Fee for Inspection
- ☐ File Documents
  - ☐ Building Permit
  - ☐ Temporary Certificate of Occupancy (TCO)
  - ☐ Certificate of Occupancy (CO)
  - ☐ Receipt for Fees
  - ☐ Meeting notes, inspection reports, photos
- ☐ EH&S Pre-Occupancy Inspection
- ☐ Other Permits
  - ☐ Army Corps of Engineers
  - ☐ DEC
  - ☐ SHPO
- ☐ Parking & Handicap Signage
- ☐ Reconcile Building Permit Fee

Contractual Close-Out issues

- ☐ Release of Lien
- ☐ Warrantees and Guarantees
- ☐ Record Drawings/Record Documents
- Final Payment
- Operating & Maintenance Manuals
- Claims Resolutions
- All Fiscal Obligations Met
  - ☐ Shared Savings
  - ☐ Milestones
  - ☐ Allowances Reconciliation
- ☐ Closeout of Open Item Log
- ☐ Completion of Punch List
- ☐ Change Order for Retention Reduction
- ☐ Certificate of Occupancy
- ☐ Letter of Substantial Completions
- ☐ Change Order for Contract Limit Lines
- ☐ Consent of Surety for Retainage Reduction

Fiscal

- ☐ Close Tickets and Job Orders
- ☐ Verify Subs are paid (final release)
- ☐ Review Invoices & Retainage
  - ☐ Final Payment
- ☐ TCO fee
- ☐ Capital Project budget Reconciliation
  - ☐ Final Budget Status Report
- ☐ Contingency Dispersed PAR
  - ☐ Finds Transfer
- ☐ Customer Follow-Up

6.10 Potential Obstacles to Closing out a Project

Obstacles to closing out a project could include:

- *Open RFS or Purchase Order against a project.*
- *Legal action or claim (see Risk Management)*
- *Lack of final paperwork from the contractor. (For example, .e., record drawings/as-builts, required O&M manuals & warranties.)*
- *Open contract or commitment.*
- *Warranty or Open Items.*
- *The close out phase lasts through the end of contract warranty periods.*

6.11 Warranty Work and Latent Defects

Part of the commissioning process is the turnover of a full list of equipment, their warranties and contract information to Facilities Management. Until this list is compiled and forwarded to Facilities Management, the project team will be the point of contract for all warranty issues. Facilities Management or the building occupants will probably be the first to discover any building problems after the completion of major construction activity. The Facilities Management representative will log any necessary warranty work or defect into Maximo, the University's maintenance information system. Upon receipt of this service request, the maintenance zone shop will notify the contractor and/or the system's manufacturer to resolve the issue. Logging the work item into Maximo tracks the issue and provides the opportunity to identify recurring problems. Some issues may be not easily resolvable by the Facilities Management representative due to their complexity, or the reluctance of the contractor to address the matter. In this case, the project team is notified and will work to resolve the matter.

In some cases, it may not be readily apparent if the issue is the result of a design or construction error. In these situations, when there is no clear means to solve the problem, the project manager must be notified to develop a response to both the A/E and the contractor as soon as possible. Latent defects that were not evident at close-out must be handled expeditiously by the project manager

since the statute of limitations in the State of New York limits the designer's liability to 3 years and the builder to 6 years after the conclusion of construction. Cornell's counsel office must be notified as soon as any significant latent defect is discovered by the project manager. Often, it may not be obvious as to which construction participant is responsible for the defect. A careful review of inspection reports during the installation of the defective assemblies, the construction documents, submittals, and other relevant documents is the first step in formulating an owner's position on the issue. The owner must notify both the designer and builder as soon as possible of the defects and encourage resolution between the two participants. If this is not possible, and a fair resolution cannot be reached, then an independent expert could be required to provide an impartial position on resolving the matter. The project must provide funding for the potential resolution of post-construction completion issues.

Since time is of the essence in the resolution of latent defects and warranty service, the project manager will establish a schedule of events leading to resolution that is approved by their immediate supervisor and communicated to Facilities Management.

6.12 Post-Occupancy Inspection

90 days prior to the end of the construction contract's guarantee period, the project manager, construction manager and the architect will inspect the entire project to document any defects that may have arisen since the acceptance of the project. This inspection will also include a discussion with the building operations team as well as the primary building users' representative. The purpose of this inspection is to document and resolve construction defects prior to the expiration of the warranty period. Additionally, to provide the University with lessons learned that can improve our design and construction standards.

The project manager will submit a report to the findings of the inspection to Sr. Director of Capital Projects and Planning with a recommendation of resolution of any outstanding defects or project issues. This report is also the basis to fully close out the financial account for the project.

On-line Resources

Project Manager's Toolbox	pm.fs.cornell.edu/toolbox/default.cfm, or through the FS website, resources/project managers.
PAR Template	http://finance.fs.cornell.edu/contracts/par/parTemplate.cfm
Roadway closure form	http://www.fs.cornell.edu/docs/RoadwayClosureForm.pdf
FS Contracts Forms & templates	http://finance.fs.cornell.edu/contracts/forms/forms.cfm
Utility shut-down form	http://www.fs.cornell.edu/fs/GTD/fs_requestshutdown.cfm

Project Manager/Construction Manager Responsibility Matrix

**Note all contract actions are approved by the Contracts Office.*

	PM	CM	PC
Manage change orders to agree upon the scope, cost, and schedule impact of changed conditions. Prepares independent CU cost estimates. Present rational/justification for approval to the PM.		X	
Approve Change Orders presented by the CM	X		
Coordinates and directs, as authorized by the contract, Contractors during construction, acts as a single voice for CU to the contractor. PM is the backup voice. Day-to-day communication is between contractor and CM.		X	
Work directly with User Groups on scope items and project development issues. CM and PM negotiate the magnitude of scope items the CM can and can't commit to during construction (scope creep). PM and CM to negotiate the level of cost change issues, either additive or deductive, that need PM approval before the fact.	X		
Communicates with and coordinates day-to-day issues with the customer contact person, e.g. moves, information exchange, parking, traffic, EHS, police, fire department/alarm testing, crane schedules, inspections, COs and TCOs, etc.		X	X
Reviews schedule for constructability. Monitors progress against the schedule and keeps PM informed of deviations. Recommends actions to get back on schedule if needed. Maintains schedule.		X	X
Reviews schedule evaluation and recommendations from CM. Advises CM as to correctness of schedule and evaluation and to jointly develop actions for schedule compliance corrections.	X	X	X
Monitor output of Contractors; feedback, site productivity, etc	X	X	X
Coordinate efforts of EH&S (Job Site Safety). Work with EHS to review the Safety Plan, enforces Safety Plan. Schedules mock OSHA inspection with EHS.		X	X
Coordinates the construction efforts of CIT		X	
Coordinates the construction efforts of Cornell Line Crew (cabling and hookups)		X	
Oversee purchasing (ex: buying furniture) for owner supplied equipment identified in the PAR as an F&CS responsibility.	X	X	S
Coordinate arrival of CU purchased equipment. Arrange for storage and transport to the site as required and requested by the PM. Responsible for inspection prior to turnover to contractor. Responsible for installation contract if needed.		X	X

Tracking construction costs, telecommunications costs, site work and other costs that need to be tracked on an as needed basis against budget costs		X	X
Responsible for controlling the use of contingency funds	X	X	X
Issue tickets to the shops and monitor progress. Track ticket costs and keep PM informed. Highlight deviations from budget estimates.		X	X
Supervise the coordination of administrative activities related to the project (i.e. accounts payable, job cost, status reports). CM to track reports as requested by PM.	X	X	X
Develop contracts and subcontracts as needed	X	X	X
Supervise payments for project services, ensure that expenses are monitored against project budgets.	X		
Supervise and inspect field conditions and progress of work against project schedule; coordinate and/or act as liaison among participants to resolve problems or conflicts. Work with PDC Shops in providing quality inspections	X	X	X
Run the "owners" weekly job meetings. Write the minutes. PM and CM work together to develop the format of the meetings.		X	X
Prepare space programs, building standards and other project criteria to guide the work of outside A/E consultants.	X	S	S
Interview and advise on the selection of A/E consultants for major design projects.	X	S	S
Negotiate service agreements with outside A/E consultants. Prepare contracts.	X	S	S
Manage and direct the activities of A/E consultants. Review contract compliance and authorize payments.	X	S	S
Monitor quality of workmanship and materials with the assistance and support of the Design Consultant and associated PDC Shops to maintain high standards. Coordinate and schedule Shops inspections.	S	X	S
Create the CM and PC budget line dollar amount.	X	X	X
Responsible for the project construction documents review/written response process.	X	X	X
Empowered to give field direction changes to the contractor	S	X	S
Ensures frequent contact between the CM and the Contract Officer. Computer status reports by CM and Superintendent.	X	X	
Establish criteria and measure Team performance	X	X	X
Responsible for the monthly/trustee report	X	S	S
Review and approve progress payments	X	S	S
Authorized to release retainage	S	S	
Provides feedback on contractors/AE performance	X	X	X
Speaks to the news media	X	X	S
Coordinate parking issues, such as coordinating contractor permits and how does PDC arrange for laydown areas, etc.	X	X	S
Recommend a scope or time increase during construction	X	X	
Authority to make no cost/no time field related changes? PM & CM to discuss & negotiate	X	X	

PROJECT FILING STRUCTURE

1.0 Administration

- 1.1 Project Directory
- 1.2 PAR's
- 1.3 CFPC/Administration
- 1.4 B&P/Trustees
- 1.5 New York State Administration
- 1.6 Pictures & Presentations

2.0 Contracts

- 2.1 Design Contracts
  - 2.1.1 Amendments
- 2.2 Construction Contracts
  - 2.2.1 Change Orders
- 2.3 Testing Labs Contracts
- 2.4 Commissioning Contracts
- 2.5 Other Contracts

3.0 Project Budget & Financing

- 3.1 Project Budget
- 3.2 CPS Project Manager's Report
- 3.3 RFS Project Leaders Report
- 3.4 Design Payments
- 3.5 Construction Payments (can be subdivided for multiple contractors)
- 3.6 Cash Flow Projections
- 3.7 New York State Coding
- 3.8 Construction Estimates (is the same as the design estimates?)
- 3.9 Job Numbers/RFS/Tickets
- 3.10 Miscellaneous Bills/CIT
- 3.11 Purchase Orders
- 3.12 Other Payments

4.0 Project Schedule

- 4.1 Project Schedule
- 4.2 Construction Schedule

5.0 Regulations/Guidelines

- 5.1 Cornell
- 5.2 Local Municipalities

5.3 New York State

5.4 Contract Colleges Facilities Code Enforcement

5.5 Federal

5.6 ADA

6.0 Planning & Design Phase

6.1 AE Selection

6.2 Existing Conditions

6.2.1 Site Information

6.2.2 Haz-mat Survey

6.3 Space Inventory/Program

6.4 Feasibility Study

6.5 Schematic

6.6 Design Development

6.7 Construction Documents

6.8 Design Commissioning

6.9 LEED

7.0 Bid Phase

7.1 Request for Proposal

7.2 Bidders

7.3 Bid Documents

7.4 Addendum

7.5 Bids

7.6 Post Bid Bulletins

7.7 Contractor Descope

7.8 Value Engineering/Cost Reductions

7.9 Selection Documentation

8.0 Construction Phase

8.1 Job Drawings

8.2 Meeting Minutes

8.3 Safety

8.4 Schedule

8.5 Submittals (breakout by CSI section)

8.6 RFI/Request for Information

8.7 ASI/Architect's Supplemental Information

8.8 Proposal Requests

8.9 Pending Change Orders/Field Orders

8.10 Field Directives
8.11 Quality Assurance/Quality Control
8.9.1 Laboratory Test Reports
8.9.2 Inspection Reports
8.9.3 A/E Site Reports
8.9.4 EH&S Safety Inspections
8.9.5 Shop Inspections
8.9.6 CM Agency
8.12 Accident Reports
8.13 Commissioning
8.14 Punch List
8.15 Close-Out Documents

9.0 Special Subjects

9.1 Furnishings, Fixtures & Equipment
9.2 Hazardous Materials
9.2.1 Asbestos
9.2.2 Lead
9.2.3 Other
9.3 Biosafety
9.4 Security

10.0 Warranty Period

11.0 Post Warranty Issues

PAGE OF PAGES

ARCHITECT-ENGINEER COST ESTIMATE

CITY | STATE

BUILDING | PROJECT NO.

DESIGN STAGE | COMPLETION IN WEEKS

COST OF PRICING DATA REFERENCE

A. DIRECT SALARY COSTS

SPECIAL TIES	JOB TITLES	MAN-HOURS	RATES $	AMOUNTS $	TOTALS
PROJECT MANAGEMENT AND COORDINATION					
ARCHITECTURAL					
No. of Dwgs. ( )					
STRUCTURAL					
No. of Dwgs. ( )					
MECHANICAL					
No. of Dwgs. ( )					
ELECTRICAL					
No. of Dwgs. ( )					
SPECIFICATIONS					
No. of Pages ( )					
ESTIMATES					
OTHER					
TOTAL DRAWINGS	TOTAL MAN-HOURS		TOTAL SALARIES A		

B. CONSULTANTS *(Attach estimate)* — AMOUNTS $

1
2
3
4

TOTAL CONSULTANTS B

C. OTHER DIRECT COSTS *(Attach estimate as necessary)* — AMOUNTS $

1
2
3
4

TOTAL OTHER DIRECT COSTS C

D. OVERHEAD POOLS

TITLES	RATES %	BASES $	ITEMS
1			
2			

ARCHITECT-ENGINEER FIRM NAME AND ADDRESS

E	TOTAL COST TO ARCHITECT-ENGINEER	
F	PROFIT % OF E	
G	TOTAL COST TO GOVERNMENT	

PREPARED BY *(Signature and Title)* | DATE | APPROVED BY *(Signature and Title)* | DATE

GENERAL SERVICES ADMINISTRATION — GSA FORM 2630 (2-71)

Cornell University
Facilities Services

CONTRACTUAL REQUEST FORM
CONSTRUCTION

Type: ☐ New Request ☐ Change Order to Existing **Contract No.** _____

Vendor Name: _____

Project Title: _____

NEW CONTRACT	**Contract Value**	**Completion Date**
Construction	_____	_____
Alternates, if applicable	_____	
TOTAL	$ 0.00	
Accepted Alternates:	_____	
Rejected Alternates:	_____	
Reserved Alternates:	_____	

CHANGE ORDERS	**Contract Value**	**Revised Completion Date**
Amount	_____	_____

Project Manager: _____ _____
Name *Net ID*

Financial Manager: _____ _____
Name *Net ID*

Director: _____ _____
Name *Net ID*

Funding Information:		
CHOOSE ONE:	PAR ID (if applicable)	_____
	Direct Bill Account No.	_____
OR	Job No.	_____
	Maximo Work Order No.	_____

EMAIL THIS FORM AND ALL ATTACHMENTS TO:
Facilities Contracts

Cornell University
Facilities Services

CONTRACTUAL REQUEST FORM
DESIGN SERVICES

Type: ☐ New Request ☐ Amendment to Existing **Contract No.** _____

Vendor Name: _____

Project Title: _____

DESIGN (SINGLE PHASE)	Contract Value		Completion Date
Basic Services			
Reimbursable Expenses			

DESIGN (FULL SERVICE)	Contract Value		Completion Date
Pre-Schematic			
Schematic			
Design Development			
Construction Documents			
Bid			
Construction		Start	
		Completion	
TOTAL	$0.00		
Reimbursable Expenses			

Established Construction Budget _____

Project Manager: _____ (*Name*) _____ (*Net ID*)

Financial Manager: _____ (*Name*) _____ (*Net ID*)

Director: _____ (*Name*) _____ (*Net ID*)

Funding Information:

PAR ID (if applicable) _____

Direct Bill Account No. _____

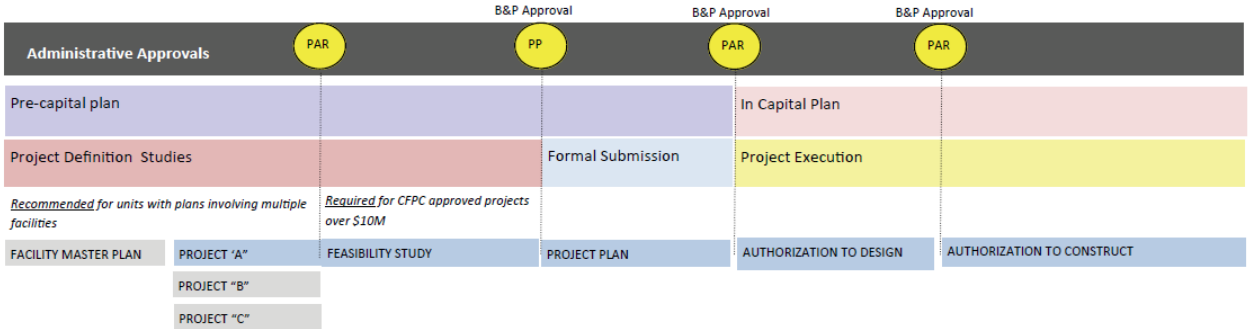
OR

Job No. _____

Maximo Work Order No. _____

EMAIL THIS FORM AND ALL ATTACHMENTS TO:

Facilities Contracts



A unit conducts a Facility Master Plan that assesses future space needs against existing facilities and defines future projects to meet evolving needs in a coordinated strategy over several fiscal years.

This effort is recommended for major projects that require an analysis of multiple buildings and/or other resources to better understand and communicate the need for a project that is part of a larger series of related projects.

The findings of a facility master plan can serve as a specific project's feasibility study if it fully defines a project as required by the project plan.

An individual project is further defined by the unit for inclusion into the capital plan. At a minimum, the feasibility study must address:

- *Program*
- *Budget*
- *Need*
- *Site (if new construction)*
- *Surge (if required)*
- *Funding sources*
- *Schedule*
- *Enabling projects*
- *O&M costs*

Can be performed by in-house or contracted professionals.

The project plan summarizes the findings of the feasibility study as a formal reporting action to CPG, CFPC and B&P (as applicable).

Approval of the project plan supports public discussion of the project to fund raise (if required) and provides authority to select an architect.

Increase in project scope and budget will require another project plan submission. Other project specifics such as O&M costs, schedule, etc. can be finalized at Schematic Design Approval.

The action is a project plan and not a PAR since it is a no cost action.

If the unit has sufficient funding, the unit may seek Authority to begin design.

Design may progress until the end of Schematic Design until the funding requirements for construction are acquired.

B&P will approve schematic design on projects visually impacting the campus

At least 75% of gifts must be in hand with the majority of remaining gifts scheduled to be collected within 5 years of construction start. Funds not in hand must be "backstopped" with funds identified and committed.

Approval Authorities

$500,000	CPG*		
$5,000,000	CPG	CFPC	
$10,000,000	CPG	CFPC	B&P

**In the approved Annual Capital Budget, $250,000 for projects not in the annual budget*

Overall Project Development Process for projects over $5,000,000

PROJECT APPROVAL REQUESTS (PAR)

STEP-BY-STEP GUIDE

Deadlines

Project managers should consult the "Facilities Projects Approval Calendar" for submission deadlines for PARs. This is a color coded calendar that details deadlines that must be met in order to bring a PAR forward to the Capital Projects Group (CPG) and/or Capital Funding and Priorities Committee (CFPC).

All PARs must be submitted by the stated deadline each month in order for the project to be considered for committee approval. "Submitted" shall be defined as having a status of "In Development" within the EPAR system by 3PM on the stated date and be inclusive of all required information. Request for partially developed PARs should not be made for input.

Please plan ahead and allow sufficient time for input to meet the deadlines as posted on the website. Should the rare need for an extension arise, please send an e-mail message requesting this extension to the Office of the Vice President for Facilities Services e-mail address (ovpfs@cornell.edu) briefly describing the situation and the justification for the exception. Exceptions to this rule will only be accepted if approved by me in writing with a copy to his assistant, Pamela Lockwood (pml64@cornell.edu). Requests for an exception to the deadline must be submitted by the PAR submission deadline.

Having a firm deadline for these submissions will better facilitate the creation of agendas, preparation of materials, and allow the due consideration of projects for these meetings. For reference, these deadlines are listed on the color calendar found on the FS Website. http://www.fs.cornell.edu/fs/ir/fs_info.cfm

Helpful Hints

1. Tell the whole project story with the PAR, especially the phases that have happened and the ones that are anticipated to happen.

2. Be succinct in your presentation. If additional lengthy explanation of an element of the PAR is needed, please include it as an attachment.

3. For the purposes of the PAR please differentiate between the words "approve" and "authorize."

4. One authorizes money/effort that has not yet been spent; one approves things that have alreadybeen done.

5. Include maps/spreadsheets as a .PDF attachment when it's valuable; if you include maps reference them somewhere in the PAR.

6. Do not delete entire sections. Simply type "N/A" next to the title.

7. Do not right-justify the text portions of a PAR.

8. Place a single space between bullets.

9. Have line height of 12 throughout including the header, after the cover page.

10. Use Times New Roman font consistently throughout the document.

11. When completing embedded tables **DO NOT** double click on the area. Right click on the table and select "Worksheet Object", "Open". The table will automatically open in a new excel worksheet that can be completed without affecting the template. Information should only be entered in the white cells, not the shaded cells. Please note that the tables have been populated with formulas to assure accurate addition. Use care not to edit these formatted cells. Once you have completed the information you may close the window by clicking the X. Individual tables may be saved to your hard drive for future reference.

12. An excel "workbook" with each table as a sheet has been developed to aid in drafting the needed information for your PAR. http://finance.fs.cornell.edu/contracts/par/parPrepTips.cfm

13. Check header titles to be consistent with the PAR content.

14. Make sure front-page numbers are the same as subsequent page numbers.

15. Remove any unnecessary page breaks from the PAR template when you're done writing the PAR.

16. Spell-check the document.

PAR Identification

PROJECT APPROVAL REQUEST (PAR)
PROJECT MASTER RECORD #
PAR ID #
FACILITY CODE #

1. The Project Master Record number is auto-generated by the EPAR system. This number will remain with the project for all approval requests.

2. The PAR ID number is how the number of PARs associated with a particular project will be tracked. This number should be formatted as #01, #02, #03, etc. as updated PARs are prepared. The Project Manager selects the appropriate number based on previous PAR submission.

3. The Facility Code number is meant to capture all facility codes for buildings and/or areas associated with a project. Facility code accuracy is essential to support certain financial activities. If a building or other facility does not yet have a facility code (e.g., for projects starting design), the customer will need to work with the Facilities Inventory Group to assign a facility code. A listing can be found at:
http://www.fs.cornell.edu/fs/fs_facilFind.cfm

Project Team

The **Project Team Members** are responsible for executing tasks and producing deliverables as outlined in the Project Plan and directed by the Project Manager, at whatever level of effort or participation has been defined for them. The Project Team section should be populated as needed. Delete those that do not apply to your particular project. Project Team members will receive notifications and copies of the completed PAR and approval letter.

The following is a guide to aid in understanding who each of the following might be:

Project Manager: The Project Manager is the person responsible for ensuring that the Project Team completes the project.

College/Unit/Department: The College, Unit or Department comprise the business units that identified the need for the product or service the project will develop. Customers can be at all levels of an organization.

Facilities Management: The individual representative within the organization that has knowledge or has provided input (O&M cost data, maintenance, etc.) into particulars of a specific project.

Campus Manager: The Campus Manager is responsible for coordinating and advocating for all facilities needs and planning of the units and colleges within that zone. A listing of the four Campus Managers can be found at:
https://www.fs.cornell.edu:8444/fs/zone_mgmt/assignments/default.cfm

Zone Facilities Manager: The Zone Facilities Managers role is to insure Cornell's facilities functions are provided in ways that optimize accountability, cost control and quality of service. A listing of Zone Facilities Managers can be found at:
https://www.fs.cornell.edu:8444/fs/zone_mgmt/assignments/default.cfm
EH&S: The individual representative within the organization that has knowledge or has provided input into particulars of a specific project.

Energy & Sustainability: The individual representative within the organization that has knowledge
or has provided input (Utilities, Sustainability, etc.) into particulars of a specific project.

Facilities Contracts: Typically the Manager of Facilities Contracts.

Unit Facilities Director: The Unit Facilities Director is an identified individual within a College/Unit to provide input on behalf of their organization. A listing of Unit Facilities Directors can be found at:
https://www.fs.cornell.edu:8444/fs/zone_mgmt/assignments/default.cfm

Opening Paragraph

This PAR requests authorization for $_____ to _____. Previous PARs in the amount of $_____ were approved in [month/year]. This PAR brings the total project budget to date to $_____. The total project cost is estimated to be $_____. This project is / is not included in the approved Capital Plan for FY__ (project name if different) with a total project budgetof $_____. **OR** This project is not required to be in the Capital Plan as it falls below the threshold.

1. The opening paragraph is intended to provide the reader with a concise description of the request. It is not intended to be a dissertation of the project.
2. "This PAR requests authorization for" should include the amount of the request and a brief explanation as to what the funds are for (i.e. - $100,000 to provide design services).
3. Any previous authorizations should be noted including the amount authorized and the date of the last authorization.
4. The aggregate amount of all PARs including this request should then be noted.
5. The current FY Capital Plan should then be addressed. The statements should be direct. Additional information, variances, etc. should be addressed in Section 3, not here. This project is not in the Capital Plan as it falls below the threshold.
6. This project is included in the Capital Plan for FYXX titled "Title" with a total project budget of $$.
7. This project is not included in the Capital Plan for FYXX. Keep in mind that while individual Colleges or Units may have their own capital plan documents, there is only one approved Capital Plan for the University. For reference, an excel version of this plan can be found at http://finance.fs.cornell.edu/contracts/par/parPrepTips.cfm For more information visit the Capital Planning web site:

   http://www.dpb.cornell.edu/FP_3_A_Capital_Planning.htm

Section 1 - Sponsoring Entity
INSERT the name of the sponsoring entity after the heading.

Section 2 - Purpose and Need

Purpose and Need: The purpose of this project is to_____. This is needed because _____.

INSERT into this section the purpose and need for the project so as to give the reader an understanding of what the project is meant to accomplish and why you feel it is important to the College/Unit.

Section 3 - Capital Plan Variance

If this request is an addition to or different from the university's approved Capital Plan (i.e. – not included in plan; expenditures differ from those listed, etc.), explain and/or justify: the variance to the Capital Plan. Explanations/justification should include:

1. Explanation as to the reason the project was not included in the Capital Plan.
2. Justification for why it should be approved as a change or addition to the Capital Plan.
3. Explanation as to the critical nature of the project. Think about how you might defend your position to the President?
4. Explanation and justification as to why the project should not wait until the next capital plan cycle. It should be noted that if the amount approved in the Capital Plan is less than the amount currently requested in the PAR (i.e. – creates a variance to the capital plan), the justification should also include an explanation of where the additional monies are to be funded from. If the new request exceeds a committee threshold, the PAR must go to the committee for approval.

Section 4 - Scope of Work

Scope of Work: The scope of work for this PAR includes the following:
INSERT into this section the scope of the services/work to be performed under the requested authorization.

Section 5 - Major Alternatives Considered

Describe in bullet format "major alternatives" that were considered in the conceptualization of the project. If "do nothing" was an alternative, please provide clear rationale as to why it was not feasible.

Section 6 - Proposed Project Schedule

Use regular font for proposed phases/dates included in this request for authorization; use italicized font for anticipated future phases/dates that are not part of this request for authorization. Please use three letter abbreviations for the month and a two- digit year. (example – Jun 11). Please make sure dates are right justified. Delete those phases that do not apply to your project.

Section 7 - Project Budget

1. Similar to the description on Page 1, provide the amount of the authorization request and a brief description of project in the first sentence of this section.

2. "To Date Budget" in this table must equal the "Project Funding (To Date Budget)" in Section 8. Explain any variances between the construction budget and the original proposed construction budget.

3. Do not deviate from the categories listed. The PAR will not be accepted with incomplete or incorrect entries.

IMPORTANT NOTE: If the project is required go to the Buildings & Properties Committee (B&P) and the Project Budget and/or Project Schedule change, the Project Manager must notify Pamela Lockwood, pml64@cornell.edu so that the Agenda can be updated.

For assistance in determining and identifying maintenance components, the preparer should consult with Jim Gibbs, jg20@cornell.edu.

All new construction, addition and renovation projects on the Cornell Ithaca Main Campus with a total project budget of $2,000,000 and higher, will be assessed a charge of 1.5% of total project costs.

This 1.5% infrastructure charge (hereafter referred to as the Transportation Assessment) ensures that construction projects will finance their fair share of needed transportation infrastructure improvements across the Ithaca Main Campus and other transportation related initiatives for the benefit of the entire Cornell community. The Transportation Assessment will apply and be implemented as follows:

1. All endowed and contract colleges new construction, addition and renovation projects will be charged 1.5% of all project costs1, including the total costs of subsequent phases referenced in the final PAR. The Transportation Assessment will not be applied on the Transportation Assessment line in the project budget.

2. *The Transportation Assessment is based on the total project cost, including contingency, as identified in the construction PAR, and will be assessed whether the contingency is expended or not. There is no final reconciliation at the end of the project or a subsequent adjustment of the Transportation Assessment.*

3. Project specific improvements, such as building service areas and connecting roadways, will be the responsibility of the individual project and not funded from the Transportation Assessment.

4. For a project that has both maintenance and construction components, the fee will be applied as though the entire project is a construction project if the percentage of construction exceeds 50% of the total project cost. If the percentage of construction is less than 50% of the total project cost, the Transportation Assessment will be applied only to the construction component. Maintenance only projects are not subject to the Transportation Assessment.

5. Facilities Contracts will be responsible for reviewing all PARs to ensure the Transportation Assessment is included prior to their entering the ePAR system. In special circumstances, CF&PC may elect to waive the Transportation Assessment or the cost of replacing parking, or some portion thereof.

6. This policy shall apply to all projects located on the Ithaca Main Campus of Cornell University. The Ithaca Main Campus is defined as those areas contained within the precincts as defined in the 2008 Cornell University Campus Master Plan.

Funds for replacing parking lost as a result of construction will also be part of the construction budget at current replacement costs ($8,000/space as of the date of this document). This amount may be adjusted periodically, as needed, to reflect the most current costs for replacing parking.

FACILITIES CAPITAL PROJECT & CONTRACTS ASSESSMENT. A Facilities Capital Project & Contracts assessment that should be included in all PAR documents. This assessment should be carried within the "**Project Support**" line of the budget.

Below is the table for calculating this fee:

Project Levels	Project Amount				% times 75% of PAR Budget
No Fees	Projects Under	$ 500,000			
Tier 1	Projects NOT IN CAPITAL PLAN*	$ 250,000	-	$ 500,000	0.75%
Tier 2	Projects Between	$ 500,001	-	$ 2,000,000	0.63%
Tier 3	Projects Between	$ 2,000,001	-	$ 5,000,000	0.50%
Tier 4	Projects Between	$ 5,000,001	-	$ 10,000,000	0.38%
Tier 5	Projects Over	$ 10,000,000			0.25%

* Excludes Deferred Projects and "Emergency" Projects

Section 8 - Project Funding

Provide a brief narrative of the funding source(s) for the project. If backstop funding may be required, please provide the name of the account and the account number. Project Manager's should consult the College/Unit/Department Financial Representative for assistance in obtaining this information. The named "College/Unit/Department Representative" on the signature page should have intimate knowledge of the information stated here.

The information reflected in the project funding spreadsheet has been requested as a means to enable the University to track stated sources and uses of funds to actual expenditures. There are two elements being tracked within this spreadsheet. The first is the **Project Funding (To Date Budget)** and the second is the **Funding of Estimated Project Expenditures (Estimated Total Budget)**. Questions regarding this section may be addressed to Tom Cole (tec2@cornell.edu). A sample completed

spreadsheet is available on the Project Approval Request web page (http://finance.fs.cornell.edu/contracts/par/parPrepTips.cfm).

College/Unit/Department Finance managers should provide current and previous funding information to the PAR preparer. It should be noted that the "Description" is the name of the account. Account numbers must be provided for all funding sources.

"**Total Project Funding (To Date Budget)**" in Section 8 must equal "**Total To Date Budget**" in Section 7. It should be noted that "**Funding of Estimated Project Expenditures (Estimated Total Budget)**" needs to match and add up to what has been previously stated in the opening paragraph of the PAR. Please do not round figures.

Where multiple funding units are listed, the "Contact person for funding issues/questions" should represent the Unit with the largest contribution. It shall be their responsibility to verify funding sources, accounts and contributions with the other units prior to approval of Section 8. Under "Contact person to authorize transfer of funds", list all unit individuals including name, netID and phone number. Where multiple accounts under a single source of funds are needed, please contact Facilities Contracts for assistance in unlocking cells and expanding the table.

College/Unit/Department Finance managers will receive an email advising them that their review and approval is required for Section 8 of the PAR document prior to routing to endorsers. Finance Managers need to verify that ALL information in this Section 8 is correct.

Enter from the drop down menu the appropriate organization code based on the unit occupying the building in order to capitalize the asset in the proper college.

Keep spreadsheet as formatted. Do not delete or "hide" unused columns and/or rows.

Section 9 - Maintenance and Operating Costs

Changes in Operating and Maintenance Costs							
	Custodial	**Utilities**	**Planned Maintenance**	**Routine & Preventive Maintenance**	**Grounds**	**Safety and Compliance**	**Total**
Endowed	$0	$0	$0	$0	$0	$0	$0
Department	$0	$0	$0	$0	$0	$0	$0
Contract Colleges	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

This section is required to be completed for all PARs that will result in projects that will change O&M costs. Keep spreadsheet as formatted. Do not delete or "hide" unused columns and/or rows.

For PARs without change in O&M costs, please indicate "Not Applicable to this PAR" above the table and delete the language below the table. **Do not delete the table.** Design PARs need not complete the table, but the narrative must include an outline of the O&M impact and the funding mechanism.

Please provide the rationale for determining the entries you have made even if you expect there will be no change in maintenance and operating costs. The key issue is to identify the range of the cost, and which department(s) will be responsible for assuming these costs. For projects with multiple phases, a more detailed analysis of projected costs is expected and must be shown. The analysis should include a discussion on energy use and life cycle costs. The estimates of these costs should be refined in each phase of the project as new information about the specific nature of the project is determined. Please feel free to contact Facilities Management (254-2996) which includes Maintenance Management, Building Care and Grounds, Energy & Sustainability (255-6648), Environmental Health & Safety (255-8200) and Risk Management (254-1575) for assistance in completing this section).

A discussion of maintenance and operating costs might include the following: *Maintenance and Operating costs will increase as a result of this project. Using previous models, we can anticipate that over the course of time we would spend about 1.5% of the construction cost per year for the planned maintenance, about $_____K. These costs would be less in the early years after construction, but more as major systems age and need replacement.*

Discussion must hit on the consideration of ECI (Energy Conservation Initiative). Other O&M costs that need to be considered are the utilities, preventive and routine maintenance and custodial costs.

We often see these in the range of $___/GSF/Year for facilities of this type, so we might anticipate these costs to be about $__K/year. Based upon comparable campus facilities, costs for Safety and Compliance have been calculated at $___/GSF/year. Therefore, the total to maintain and operate this facility is expected to be in the range $__K to $__K per year.

Section 10 - Space Usage
Project Managers are requested to contact Mary-Lynn Cummings (cummings@cornell.edu) if they have questions about how to complete this section.

Space Planning Resources are available at:
http://www.dpb.cornell.edu/IP_SP_Resources.htm

If your project does not impact space usage, insert "N/A" after 10. Space Usage **AND** delete Items A through D. (i.e. - 10. Space Usage: N/A)

10. Space Usage: (Please limit responses to 1-3 sentences and only answer the questions that apply.)

A. Does the activity described in this PAR follow from a Facilities Master Plan, Space Needs Study, or other planning study? If so, describe briefly.

B. If the proposed project is a renovation of existing space that changes space (room size,quality, and/or room type), please describe:

1. *Spaces impacted: List the spaces impacted, including all applicable facility codes and room numbers.*

2. *The nature of the changes: In 1-2 sentences, describe functional changes to the space (e.g., offices converted into wet labs, wet labs converted into offices, etc.)*

3. *The unit(s) (by name and KFS org code) responsible for the impacted space.*

C. If the proposed project includes construction of new space, please provide:

1. Net & gross square footage of new construction:

2. Room type composition: In 1-2 sentences, e.g., mix of wet labs and offices, new mechanical area, etc.

NOTE: Answer **BOTH** sections above **IF** the project is a mix of renovations & new construction.

D. For any project that impacts space (either B, C or both B and C above), please describe:

Use 1- 3 sentences to answer each of the following

1. Alternative strategies explored: Address the program need, including the feasibility of re-use of existing space with minimal renovation.

2. Swing space requirements generated: Describe any swing space requirements generated by the project, and how these needs will be met.

3. Campus movement impacts: Describe impacts, both during the project and as a result of the project. Consider whether people would move around the campus differently or be in new/different places because of a project and whether the project will change the physical movement of people or vehicles around campus, e.g., the project builds an addition that blocks a major sidewalk (permanent impact) or the project blocks a sidewalk, driveway, etc. during the life of a project (temporary impact).

Section 11 - Campus Master Plan
Please describe how this project relates to the Campus Master Plan, if there are any elements that conflict with the master plan, or any other implications or issues in this regard. Questions regarding the Campus Master Plan and how it relates to your project should be addressed to Mina Amundsen, mina.amundsen@cornell.edu or 254-8226.

Section 12 - ADA Considerations
This section of the PAR is important for noting impacts of projects that will have some American with Disabilities Act (ADA) elements of them included---i.e. lab renovations, restroom renovations or anything that has ADA accessibility requirements associated with the project. Writers should explain how they are including accessibility compliance as part of their project, stakeholders who are involved, etc. ALSO—for projects that accessibility is not primarily impacted, i.e. roofing projects, this section should be filled out describing how path of travel issues are handled such as sidewalk closures, interior path of travel routing changes or other construction issues that may impact accessibility.
If there are any questions as to whether there are ADA considerations for the project or construction impacts that should be considered for this section of the PAR, please contact Andrea Haenlin-Mott, ADA Coordinator for Facilities Service, ah45@cornell.edu or 255-5150.

Section 13 - Mode of Accomplishment
This section should outline "how" you intend to accomplish your project. Only address those areas that you are currently seeking authorization for (i.e. – if study phase you do not need to address construction mode)
How will design be accomplished? By whom? Who will manage the design?

How will construction be accomplished? Competitive bid, CM, GMC?

Who will provide the contract administration?

Who will handle asbestos removal? Etc.

If you propose to Single Source any procurement, it is recommended that you review this methodology with your Director prior to submitting. It is also recommended that you state who you are single sourcing to and the rationale for your decision.

Section 14 - Municipal, State and Federal
Please describe what Municipal, State and/or Federal jurisdictions may have authority over this project.
Questions regarding this section and how it relates to your project should be addressed to Mina Amundsen, mina.amundsen@cornell.edu. This section should include a paragraph similar to the following examples:

This project falls within the municipal jurisdiction of _____. *(City, Town, Village, County)*

This project will require the following municipal, state, or federal building, site or environmental approvals: *These might include items such as historic, wetlands, SEQR, site plan review, zoning variances, stream withdrawal permits, fill permits, and others.*

This is a Type II action under the New York State Environmental Quality Review Act with no adverse environmental impact. No additional action is required.

OR

This project is/is not subject to the State Environmental Quality Review (SEQR) process because_____. We intend to *(include one of the following statements.)*.
…submit a short Environmental Assessment Form.

…submit a long Environmental Assessment Form.

…seek a negative declaration for an EIS.

…seek a positive declaration for an EIS.

The most significant building, site, or environmental approval issues are expected to be _____.

Section 15 - Potential Issues
What are the unknowns? What could go wrong? What could happen that would put the university at risk? Please include a bullet format list and provide details.

Section 16 - Signatures
Submitted by: Signatures are decided on a PAR by PAR basis.

The **Project Manager** and the **College/Unit/Department Representative** should be shown as submitting the project. If your particular College/Unit/Department has protocol for approvals, please include as appropriate.

College/Unit/Department Financial Representative is the individual in the unit who is responsible for funding. This individual should have intimate knowledge of the information provided in Section 8 of the PAR.

Endorsed by: Signatures are decided on a PAR by PAR basis.

Provost, "W. Kent Fuchs, Provost", signature is required on a very limited number of PARs.

University Planner is required on PARs seeking site selection and site development guidelines.

University Architect is required for any project seeking design approval or those that affect the aesthetic appearance of the campus.

University Engineer is required on those PARs requiring civil, mechanical, and electrical engineering.

Facilities Management Senior Director is required on FM supported projects; when there will be $ from Maintenance Management; or there will be any change in the maintenance costs as a result of the project.

Energy and Sustainability is required when there will be $ from Energy Management or Utilities or there will be any change in the utilities costs as a result of the project.

Contract Colleges Facilities is required for projects involving Contract Colleges Facilities.

Unit Dean or Vice President is required on every PAR.

Alumni Affairs and Development is required when gift funds are involved in the project funding.

Ronald Seeber is required for all projects with SUCF/SUNY Capital funding.

Facilities Services, **Planning and Budget** and **Vice President's Office** are required on **ALL PARs**.

Committee Signatures for Sections 17, 18 and 19 are all required if the project:

1. Lies within the "core campus" and will significantly change the outward appearance of a building or an area

2. Is over $10M

Refer to the following thresholds when determining committee approvals that may be needed for your project.

THRESHOLDS	
VP for Finance and CFO or Provost – Signature Only	
	< $250K > $250K - $500K and listed in the Capital Plan – Requires Signature PAR ONLY
Capital Planning Group (CPG)	
	> $250K and not listed in the Capital Plan > $500K
Capital Funding and Priorities Committee (CF&PC)	
	> $250K and not listed in the Capital Plan > $5M and anything that needs to go to B&P
Building and Properties Committee (B&P)	
	> $10M < $10M if the project lies within the "core campus" and will significantly change the outward appearance of a building or an area

Final Considerations
PARs should be submitted electronically to the appropriate inputter as listed below. After the PAR has been reviewed and accepted, the PAR will be entered into the "ePAR" system. The submitter will be notified via email that the ePAR has begun circulating for signature.

Wendy Hackett, wjh6@cornell.edu , 255-0120, for Real Estate, Facilities Operations,Facilities Projects and all non-Facilities Service Units/Departments.

Wendy Franzese, wkf4@cornell.edu , 254-2996, for Facilities Management

Kim Frost, klk44@cornell.edu , 255-2348, for Facilities Engineering

Vickie Davis, vjd1@cornell.edu , 255-0279 for Energy & Sustainability

Jessie Dimick, ljd7@cornell.edu , 255-6658 for Capital Projects & Planning

Donna Sutliff, des17@cornell.edu , 255-7784 for Contract Colleges Facilities

PAR Inputters shall transmit via email a copy of the submitted PAR as a "Word.doc" document attachment to Wendy Hackett (wjh6@cornell.edu) with a copy to Nancy Phelps (nap2@cornell.edu) in the Facilities Contracts Office.

Once the ePAR has been fully endorsed and, if required, CPG, CF&PC and/or B&P approvals have been obtained, a project approval letter will be issued on behalf of the Vice President for Facilities Services. Approval letters are generally issued within two (2) days of the final approval. All submitters and endorsers will receive a copy of the project approval letter with a copy of the approved PAR as well as any comments adding during approval and supporting date and time stamped signatures.

PAR inputters do not routinely monitor the progress of an ePAR once it begins routing. PAR submitters (i.e. – Project Managers) are encouraged to monitor the progress of their PAR through the electronic approval process to assure its timely flow.

Once a PAR reaches the level of the Vice President for Facilities Services, Project Managers should contact Wendy Hackett (wjh6@cornell.edu) if they have concern regarding the progress of the PAR document. Project Manager's should not email or contact senior administrators regarding their PARs. The ePAR system automatically generates reminder emails, after 3 days, to signers up to the level of the Vice President for Facilities Services

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