

BEST BUILDING PRACTICES GUIDELINE

PURPOSE

The purpose of this document is:

- To define guidelines for the methods of designing and constructing University buildings based on leading practices.
- To ensure appropriate reviews/approvals are obtained from all stake-holders.
- To clarify roles in the design and construction process.
- To ensure construction projects are managed to allow for a goal of successful completion.

These practices apply to all land, parking lots, buildings and building improvements owned, purchased or leased.

SCOPE

Research-related buildings and building improvements may be subject to additional guidelines established by the Office of Research Services in relation to Research funding agencies. If this is the case, Research and the funding agency's rules and regulations may take precedence over the University policies.

PROJECT MANAGEMENT

1. Project Management services and project oversight for all construction projects will be provided by Facilities Management unless delegated in advance to a department or unit stakeholder in writing by the Associate Vice-President, Facilities Management.
2. All projects will be managed by either: an in-house Facilities Management Project Manager/employee, a contract employee, or an external project management company. In-house staff resources may be supplemented by contract employees if warranted for the duration of the project.
3. The Project Manager acts in the best interest of the University to provide project leadership and is responsible for the delivery of projects including construction, renovation, renewal and other development projects from inception through to completion of construction/occupancy and project close-out.
4. Utilizing in-house project management resources is preferred due to their experience and familiarity with University culture, procedures and expectations.

5. External project managers require oversight which will be provided by a designated individual(s) from Facilities Management.
6. An oversight committee may be established for large major capital projects. This will be determined in the early stages of project planning in consultation with project stakeholders and senior administration. If required, the oversight committee will be comprised of project stakeholders including representation from senior administration, Financial Services and Facilities Management. The Project Manager will provide administrative support to the committee.

PROJECT PLANNING

7. Planning activities for a Major Capital project will only commence upon the direction of the Vice-President Finance and Administration.
8. Research grant applications that will require changes to existing space and/or the construction of new buildings or additions should align with the University's strategic objectives, conform to the Campus Plan and any other relevant physical planning documents, and be supported by cost estimates developed under the supervision of a Facilities Management Project Manager.
9. Facilities Management, Campus Planning and Design Services (CPDC) develops, updates and manages the University's Long Term Capital Plan (LTCP). The LTCP is a five-year rolling plan of all projects valued at \$10,000 or more. Projects are deemed either Minor Projects if they have a value of less than \$1,000,000, or Major Projects if they have a value of \$1,000,000 or more. All Minor and Major projects being planned by any administrative or academic unit of the University are to be listed on the LTCP.
10. At the inception of project planning activities, the "scope of work", (i.e. what type and quantity of space is required, the expected users and occupants, and when the space is required) needs to be defined.
11. A preliminary "order of magnitude" total project budget should be developed as early as possible to assist in determining if a project is financially feasible. The preliminary budget will include all anticipated hard and soft costs, with costs escalated to the estimated construction date. A professional Cost Estimator can be consulted on probable construction costs.
12. Where new buildings or significant changes to existing facilities are proposed, a Feasibility Study should be prepared. The intent of the Feasibility Study is to develop an accurate indication of the project scope, cost and time requirements. The Feasibility Study will be prepared by appropriate architectural/engineering consultants under the direction of the Project Manager with input from project stakeholders. As a minimum the Feasibility Study will typically include the development of an outline Statement of Requirements (SOR) including rooms and space requirements; siting opportunities, analysis and recommendation; utility servicing strategies and options; schematic floor plans and site plan; estimated construction cost (with escalation); estimated annual operating costs; and other analysis and recommendations as may be required. Depending

on the scale and scope of the project the Feasibility Study may require other specialist investigations such as a land survey, a geotechnical/geological report, traffic study, etc.

ENVIRONMENTAL

13. Environmental legislation may be reviewed at the outset of the project to determine the University's environmental responsibilities related to the planned project. This is particularly important for any proposed developments off the main campus or on sites with previous uses where an Environmental Risk Assessment may be required.
14. Prior to occupancy, Ministry of Environment approvals may be required for the operational activities of the facility, including for the release contaminants (pollutants) into the air, onto land, or into water, or for the storage, transportation, or disposal of waste.

BUDGETING/FINANCIAL

15. The Project Manager will develop and maintain the Total Project Budget which describes the financial resources required to undertake all stages of the project and includes: consultant fees, construction costs, permits, internal charges, furniture and equipment, ITS costs, building signage, legal fees, one-time start-up costs, contingencies and other miscellaneous items.
16. The Total Project Budget should include a Construction Contingency and a Project Contingency.
17. The Construction Contingency is to be used for unforeseen items or conditions that arise during the course of construction and require a change to the base construction contract value. Use of this contingency for owner initiated changes is to be minimized and avoided where possible. Expenditures against this contingency allowance are authorized through the construction contract change order process. For budgeting purposes the Construction Contingency should be based on a percentage of the base construction budget. Each project should be assessed individually and an appropriate contingency amount determined based on the project specifics. Recommended amounts are:
 - a. Design-Bid-Build, new construction - 8%.
 - b. Construction Management, new construction - 10%.
 - c. Construction Management, fast-tracked with high degree of cost risk - 12%
 - d. Design-Bid-Build or Construction Management, renovation - 12%
 - e. Design-Build, contingency for owner initiated changes - 3%
 - f. Smaller projects or projects where there is a high degree of probability that unknown conditions will be encountered require a higher contingency allowance which should be determined based on the project conditions and previous similar experience.
18. The Project Contingency is to be used only when the remainder of the project budget is not sufficient to properly complete the project. Expenditures against this contingency

allowance are authorized by senior administration. For budget purposes, the Project Contingency should be based on a percentage of the Total Project Budget:

- a. Low risk project - 2%
 - b. Medium risk project - 3%
 - c. High risk project - over 3%
19. If a project will result in reallocation and renovation of existing space due to occupants moving into a new facility than an estimate of the cost of the post-project moves/renovations shall be developed early in the process and separately listed on the Total Project Budget spreadsheet.
20. An estimate of the annual operating cost of the building shall be developed including: utilities, maintenance and operations, custodial, Campus Security, ITS, insurance, an allocation for deferred maintenance based on a cost/square foot and any other relevant costs. Recommended amounts for deferred maintenance are:
- a. Low - under \$1/sq.ft.
 - b. Medium - \$1 to \$4/sq.ft.
 - c. High - \$4 or higher

PROJECT DESIGN

21. Consultant retention is to be undertaken in accordance with the Brock University "Purchasing Policy".
22. The design process typically includes the following stages: schematic design, design development, and construction document preparation. A design committee will be established which shall include representation from the following:
- a. Occupant stakeholders consisting of representative from the various groups planned to occupy the new facility.
 - b. Operations stakeholders consisting of representatives from administrative units with operational responsibilities such as Facilities Management, ITS, Campus Security, Health, Safety and Wellness, etc.
23. The design committee will participate in regular meetings with the Project Manager and the architect/engineers during the the schematic design and design development stages. Less frequent meetings with stakeholders will be held during the construction document preparation stage.
24. Stakeholder groups will provide written approval (sign-off) of the design at the end of each stage.
25. The design of all new facilities and renovations should take into consideration or incorporate the following:
- a. Campus planning strategies: adherence to the Campus Plan and other planning documents as well as any specific planning studies done for the particular project.

- b. AODA Accessibility: design to Brock University's Facility Accessibility Design Standards (FADS).
 - c. Eliminate any existing barriers to accessibility identified in the Brock University Accessibility Audit.
 - d. All relevant Brock University Design Standards
 - e. Deferred maintenance: in renovation work incorporate the renewal of any items identified in building condition or deferred maintenance audits.
 - f. Leadership in Energy and Environmental Design (LEED): design to a minimum of LEED Silver.
 - g. Energy efficiency: design highly efficient buildings that conserve energy by incorporating advanced and proven building systems and equipment. Investigate opportunities for incorporating alternative energy sources.
26. For major capital projects, estimates of construction cost prepared by a professional Cost Consultant are to be completed at the end of the following stages:
- a. 100% Schematic Design - Class "C" estimate
 - b. 100% Design Development - Class "B" estimate
 - c. 50% Contract Documents - Class "B" estimate
 - d. 100% Contract Documents - Class "A" estimate
27. For major capital projects, as a risk management measure, a second independent cost estimate should be prepared by a Cost Consultant contracted directly to the University at each of the above-noted stages, or for less complex major capital projects at the following stages as a minimum:
- a. 100% Design Development - Class "B" estimate
 - b. 100% Contract Documents - Class "A" estimate
28. Sufficient time shall be allowed in the project schedule to prepare and review the estimates. Should the estimate be higher than the approved funding, the design shall be modified to conform to the budget in consultation with the project stakeholders. Consideration shall be given to increasing the project budget only after other cost savings options have been exhausted and only as directed by senior administration.

PROCUREMENT, TENDER AND AWARD

29. All project procurement activities are to follow the Brock University purchasing Policy and the Province of Ontario's Broader Public Sector Procurement Directive.
30. Project delivery options can be considered and evaluated at the inception of the project and a procurement strategy tailored to the unique aspects of the project developed.
31. The University has been successful utilizing the traditional "Design-Bid-Build" method of construction procurement. While this method is preferred, other methods may be used if warranted or required in the specific project circumstances.
- a. The "Design-Bid-Build" (DBB) strategy requires a fully completed design, and a completed set of construction documents and specifications which are tendered to

- general contractors. A stipulated sum contract is entered into with the lowest compliant bidder. The advantage of design-bid-build is that the base bid is known prior to commencing construction. The total price at completion has the potential to exceed the budget due to unknown conditions encountered or changes required due to document coordination if these costs are greater than the Construction Contingency allowance.
- b. The “Construction Management” (CM) strategy is generally employed when the project has a very tight deadline or other complexities. Typically construction management also includes fast-tracking of the construction which includes sequential tendering of the individual trade contracts’ and starting construction prior to completion of the consultant’s design. Advantages of construction management include the ability to start construction quickly and flexibility in making changes during construction. As construction is usually started prior to completion of the construction documents, there is a higher degree of cost risk and the total cost at completion is less certain than in a Design-Bid-Build approach. To avoid being deemed the Constructor under Ontario’s Occupational Health and Safety Act, all sub-contracts must be held by the Construction Manager directly.
 - c. The “Design-Build” (DB) approach requires the University to prepare a comprehensive design brief describing all the project requirements including space requirements, general design parameters, required materials and methods, operating requirements, warranties and contracted maintenance required, schedule, site and utility information, etc. The design brief is appended to a Request for Proposal issued to pre-qualified design-Build teams who submit proposals to design and build the project on behalf of the University for a stipulated sum. Any University initiated changes prior to or during construction will increase the cost of the project.
 - d. In the “Design-Build-Finance-Maintain” (DBFM) approach, a contract is entered into with a consortium usually consisting of a contractor, design consultants, a lending authority and a facility maintenance company for the design, construction, financing and maintenance of a facility for long term period.
32. Contractors should be prequalified wherever possible by conducting a Request for Pre-Qualification (RFPO) process. Pre-qualification submissions are requested from contractors which are then reviewed and scored by a stakeholder committee prior to the tender. A short list of typically 6 to 8 prequalified contractors with proven experience and expertise suitable for the project is then developed. It is good practice to prequalify general contractors, construction managers, mechanical and electrical sub-contractors and well as any other sub-contractors that would have a high degree of impact on project success.
 33. Contractors for major capital projects should employ at least one site superintendent with a Gold Seal Certification from the Construction Institute of Canada.
 34. The tender and award process is to be undertaken in accordance with the Brock University “Purchasing Policy” .

35. Industry standard construction contracts produced by the Canadian Construction Documents Committee will be used as the basis for most construction contracts entered into by the University.
36. After award of the construction contract, the signing of the contract is to proceed expeditiously.
37. Recommended bonding:
 - a. Bid bonds should be required of bidders for all tendered contracts with an estimated value in excess of \$100,000. Other acceptable security, such as a certified cheque or letter of credit, may be permitted for contracts with a pre-tender estimate of less than \$1,000,000.
 - b. Performance bonds should be provided by contractors for all contracts valued over \$500,000. Generally the bond shall be 50% performance and 50% labour and materials.
 - c. A Consent of Surety (letter from the Surety Company) indicating that the Contractor will obtain the required final bonding will be required to be submitted by all bidders.
38. Insurance:
 - a. Contractor and consultant insurance requirements are determined by the University's Human Resources, Health, Safety and Wellness Department.

CONSTRUCTION

39. For all major capital projects, a Project Mediator may be appointed by the parties after award of the contract in accordance with the contractual provisions.
40. Construction Change Management:
 - a. The change management process including responsibilities and timelines is to be documented and included in the tender documents. The change process is to be reviewed with the contractor and consultants at the first construction meeting.
 - b. The Project Manager will be the lead individual responsible for management of the change process and will monitor the contractor's, consultant's and the University's change resolution responsibilities to ensure that changes are being resolved in a timely manner over the course of construction.
 - c. Disputed items that can't be resolved through negotiation are to proceed to mediation promptly.
41. Contractor's quotations for work associated with changes and the subsequent signed Change Orders are to include both the cost of the change and schedule impact (time), if applicable. The Change Order will include all contractor costs associated with the change including material, labour, mark-up and any applicable general conditions.

42. For major capital projects, the Project Manager is to provide updates on the status of Construction Contingency expenditures including a forecast of expenditures at completion to senior administration and project stakeholders on a monthly basis.
43. Utilizing a commercial service to photographically document the construction process on a regular schedule, including documenting the locations of services, pipes, etc. buried or enclosed within walls is recommended for major capital projects or where otherwise warranted. In addition to providing a visual record of buried services, it can be used to review quality concerns, deficiencies, and in the event legal issues arise pertaining to schedule or scope of work.
44. When contractor activities will have an impact on the operations of the campus such as disruptions due to noise, dust, deliveries, etc., the Project Manager will facilitate communications between the contractor and the relevant University departments, and provide notification and communication to the affected Brock community.

HEALTH AND SAFETY

45. To avoid being deemed the Constructor under Ontario's Occupational Health and Safety Act, any contractors and suppliers/installers contracted directly by the University are only to perform work on the construction site after certification of Substantial Performance of the work and where their work does not overlap in time and space with other contractors. All construction sub-contracts will be held by a General Contractor or Construction Manager directly.
46. In accordance with the Ontario Occupational Health and Safety Act, the contractor is responsible for health and safety on the construction site.
47. Contractors are to be provided with a copy of the Brock University "Occupational Health and Safety Policy" which applies to all members of the University community, including, but not limited to students, employees, volunteers, commercial tenants, contractors, and visitors to campus.
48. Contractors are to be provided with a copy of the Brock University "Respectful, Work and Learning Environment Policy".
49. Contractors shall be encouraged to obtain a Certificate of Recognition (COR) from the Infrastructure Health and Safety Association (IHSA). A COR is recommended for all contractors submitting bids for major capital projects with an estimated value over \$1,000,000.

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Approved by:	Vice-President, Finance & Administration
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Related documents:	Purchasing Policy Delegation of Authority Policy Conflict of Interest Policy Occupational Health and Safety Policy Respectful, Work and Learning Environment Policy Shaping Our Future - A Guide to the Planning, Design, and Architecture of the Natural & Built Environments Facilities Management Operating Procedure - Construction Document Set-Up and Document Submission Requirements