

## Appendix B

### WORK EXPERIENCE - CATEGORIES, DESCRIPTIONS AND REQUIRED ACTIVITIES

Candidates must acquire 5580 hours of experience in specific categories to satisfy the OAAAS program requirements. Review the detailed list of experience categories and required hours for each.

#### Category A: Design and Construction Documents

##### 1. Programming

Programming is the process of setting forth in writing the owner's requirements for a given project. Steps in this process include: establishing goals, considering a budget, collecting, organizing and analyzing data, identifying and developing concepts, and determining general needs. The Client-Architect agreements presume that the owner will furnish the program and that any involvement of the architect in writing the program will be a service not covered in the traditional agreement for Design and Contract Administration. However, many owners employ the architect to assist them in preparing a functional program. The project may also be affected by the mortgage lender; public officials involved in health, welfare and safety; future tenants, and, increasingly, the people who will work in the built environment. Their input at the programming stage could be essential to maintain an orderly design process.

##### Required OAAAS Candidate Activities include the following:

- Participate in conferences with clients regarding programming, periodic reviews and formal presentations and assist in preparing minutes or reports for future reference.
- Assist with presentations at zoning and variance hearings, and at meetings with the owners and consultants of these projects.
- Assist in preparing the summary and evaluation of data and requirements obtained from all sources. Research current literature pertaining to architectural programming.

##### 2. Site and Environmental Analysis

Site analysis includes land planning, urban design and environmental evaluation. Land planning and urban design are concerned with relationships to surrounding areas and involve consideration of the physical, economic and social impact of proposed land use on the environment, ecology, traffic and population patterns. Governmental agencies frequently require documentation on the results that construction will have on surrounding lands (i.e. environmental impact studies). Decisions relating to site analysis must involve the selection, organization and evaluation of pertinent data that will lead to a resolution of the owner's program while conforming to legal requirements.

##### Required OAAAS Candidate Activities include the following:

- Assist in analyzing several sites to assess the feasibility of their use for a proposed project.
- Help analyze the feasibility of using a specific site for a project.
- Assist in the analysis of specific land use and location for a project.
- Assist in the formulation of the most appropriate land use strategy to achieve a desired environmental impact.
- Research site restrictions such as zoning, easements, utilities, etc.
- Participate in public hearings about land use issues and prepare reports for future reference.

### **3. Schematic Design**

From the owner-approved program, the architect develops alternative solutions to satisfy technical and aesthetic requirements. Preferred schemes are presented until the owner and architect can agree on one.

#### **Required OAAAS Candidate Activities include the following:**

- Participate in the development and preparation of preliminary design concepts to determine the spatial relationships that best satisfy the owner's program.
- Participate in the development and coordination of program requirements with consultants.
- Assist in the preparation of presentation drawings and models.
- Assist in the analysis and selection of engineering systems.
- Participate in design review and approval meetings with clients, user groups, etc.

### **4. Engineering Systems Coordination**

The architect is usually responsible for the selection, design and coordination of all building systems, including the engineering systems. The emphasis of this training requirement is to develop an understanding of the integration of the engineered systems normally designed by consultants and provided by product suppliers under the direct supervision and control of the architect. These traditionally have included structural, mechanical and electrical subsystems as well as newer technical innovations and special requirements, such as security, telecommunications and computer applications. Architects must know how engineering systems work, including system benefits and limitations, availability, initial and operating costs, and the space requirements necessary to provide the basis for system design, selection and integration. This knowledge also provides the vital communication links necessary for appropriate interaction with engineering consultants and product suppliers.

#### **Required OAAAS Candidate Activities include the following:**

- Become familiar with construction methods and performance of different engineering systems.
- Understand safety requirements and the selection process for engineering systems.
- Assist in research, analysis and selection of engineering systems during the schematic design and development phases.
- Help coordinate engineering systems documents provided by consultants into the construction documents produced by the architect.
- Review consultants' drawings for conceptual understanding of systems, space requirements and possible conflicts or interference of structure, ductwork, plumbing lines, electrical fixtures, etc.
- Assist in checking shop drawings, evaluating samples and maintaining records.
- Visit job site and observe installation and integration of engineering systems, construction details and space requirements.
- Attend systems start up, operation and maintenance meetings required for acceptance and use by the owner.
- Obtain and study manufacturers' literature for engineering systems and components.
- Become familiar with relevant codes and regulatory standards applicable to various engineering systems.
- Check maintenance manuals and warranties submitted by contractors for conformance with contract documents.

### **5. Building Cost Analysis**

An important responsibility of the architect is to evaluate the probable project construction cost. Accurate estimates are crucial to the client. They influence decisions involving basic design, selection of building products and systems and construction scheduling. Long-term maintenance, as well as tax impact of material and system selection (value engineering), are additional factors that bear on development of the project. For their own preliminary analysis, most architects use computations based on area and/or volume. Estimates of cost provided later in the design process are frequently made on the basis of labour and material requirements (quantity surveys), a method that requires a more specialized knowledge of construction costs.

**Required OAAAS Candidate Activities include the following:**

- Calculate the area and volume of a project.
- Make a simplified quantity takeoff of selected materials and prepare comparative cost analyses.
- Assist in the preparation of cost estimates of each stage of a project.
- Review various references and texts utilized in cost estimating.
- Assist in the preparation of cost analyses for current projects, using a variety of indices.
- Conduct a survey of current costs per square foot of various types of projects, using local cost data

**6. Code Research**

Building inspectors as well as officials in zoning, environmental and other agencies relating to the health, welfare and safety of the public, oversee the enforcement of federal, provincial and local regulations related to building construction. The codes promulgated by these various agencies have a direct bearing on the total design process and thorough knowledge of all requirements is essential to the satisfactory completion of any project.

**Required OAAAS Candidate Activities include the following:**

- Assist in searching and documenting codes, regulations, etc. for one or more specific projects.
- Study procedures necessary to obtain relief or variances from particular requirements as they relate to a project.
- Calculate certain variables (i.e. numbers and size of exits, stair dimension, public toilet rooms, and ramps) in satisfaction of code requirements.
- Determine a project's allowable land coverage as well as maximum areas in compliance with zoning and any other related ordinances.

**7. Design Development**

Based on the client-approved schematic design, the architect fixes and details, for the client's further approval, the size and character of the entire project, including selection of material and engineering systems.

**Required OAAAS Candidate Activities include the following:**

- Participate in the preparation of detailed design development drawings from schematic design documents.
- Assist in developing various schedules and outline specifications for materials, finishes, fixed equipment, fixtures, construction time and construction cost.
- Help coordinate engineering systems proposed for the project.
- Participate in design review and approval meetings with clients, user groups, etc.

**8. Construction Documents**

The working drawings phase of construction documents preparation constitutes the major activity on a project in an architect's office. These drawings describe in graphic form all of the essentials of the work to be done: location, size, arrangement and details of the project. Since the successful and timely execution of these documents can be equated closely with an office's financial success, architects constantly search for more efficient ways to produce construction documents. Regardless of the method of preparation, it is extremely important that the documents be accurate, consistent, complete and understandable. This requires thorough quality control including constant review and cross-checking of all documents. In addition, effective coordination of consultants' drawings is essential to avoid conflicts between the various trades during construction.

**Required OAAAS Candidate Activities include the following:**

- Work in the preparation of detail drawings, developing technical skills in drafting accuracy, completeness and clarity.
- Assist in the coordination of all documents produced by the architect and the consultants.
- Develop knowledge of professional responsibilities and liabilities arising from the issuance of construction documents.
- Participate in the mechanics of assembling the finished construction documents.
- Assist the job captain (or equivalent) in routine administrative/control tasks.

## **9. Specifications and Materials Research**

Well-grounded knowledge of specification-writing principles and procedures is essential to the preparation of sound, enforceable specifications. Unless these skills are properly developed, expert knowledge of materials, contracts and construction procedures cannot be communicated successfully. A fundamental principle of specification writing requires the architect to understand the relationship between drawings and specifications, and to be able to communicate in a logical, orderly sequence, the requirements of the construction process. Many factors must be considered in the selection and evaluation of material or products to be used in a project: appropriateness, durability, aesthetic quality, initial cost, maintenance, etc. To avoid future problems, it is extremely important that the architect recognize the function of each item to be specified. The architect must carefully assess new materials as well as new or unusual applications of familiar items, regardless of manufacturer representations; to be certain no hidden deficiencies exist that might create problems for the owner and expose the architect to liability.

### **Required OAAAS Candidate Activities include the following:**

- Review construction specifications' organization, purpose and format, and assist in writing specifications. Review and analyze bidding forms, insurance and bonding requirements, liens, supplementary and special conditions.
- Research and evaluate data for products to be specified, including information regarding availability, cost, code acceptability and manufacturers' reliability. Attend sales presentations in connection with this research.
- Research industry standards and guidelines for specific classes of products (e.g. curtain walls, aluminum windows) as they affect various manufacturers' items being considered for acceptability on a project. Research construction techniques and systems and understand workmanship standards such as poured-in-place concrete, masonry construction, etc.
- Evaluate the potential for using master specifications in a project specification, including procedures needed to adapt individual sections for this use.

## **10. Document Checking and Coordination**

Close coordination between drawings and specifications is required when preparing construction documents. The work of each consultant must be reviewed regularly and checked against the architectural drawings as well as the drawings of other consultants to eliminate conflicts. Before final release for construction purposes, the drawings must be checked and cross-checked for accuracy and compatibility.

### **Required OAAAS Candidate Activities include the following:**

- Assist in cross-checking products and materials called for in the specifications for consistency with corresponding terminology and descriptions on the working drawings.
- Check drawings prepared by others for accuracy of dimensions, notes, abbreviations and indications.
- Assist in developing a schedule of lead time required for proper coordination with other disciplines.
- Check consultants' drawings with architectural drawings and other consultants' drawings for possible conflicts and interference of plumbing lines, ductwork, electrical fixtures, etc.
- Assist in the final project review for compliance with applicable codes, regulations, etc.

## **Category B: Construction Administration**

### **11. Bidding and Contract Negotiations**

The architect assists in establishing and administering bidding procedures, issuing addenda, evaluating proposed substitutions, reviewing the qualifications of bidders, analyzing bids or negotiated proposals and making recommendations for the selection of the contractor(s). The construction contract and related documents are the formal instruments that bind the major parties together in the construction phase. They detail the desired product and the services to be provided in its construction, as well as the consideration to be paid for the product and the services.

**Required OAAAS Candidate Activities include the following:**

- Carefully review the bidding/award stages of previous projects. Develop an understanding of problems encountered and how they were resolved.
- Assist in the pre-qualification of bidders.
- Assist in the receipt, analysis and evaluation of bids, including any alternative, separate or unit prices.
- Learn what information and submittals are required prior to issuance of notice to proceed.
- Assist in evaluating equal product considerations in preparing addenda.
- Meet with contractors and material suppliers to better understand problems they encounter with bid packages and construction contract documents.
- Assist in the process of receipt and evaluation of bids.
- Assist in the preparation and negotiation of construction contracts and become familiar with the conditions of the contract for construction in order to identify the roles of the architect, contractor, owner, bonding company and insurer in the administration of the construction phase.

**12. Construction Phase – Office**

During the construction phase there are many related tasks that do not directly involve field observations: processing contractors' applications for payment, preparing change orders, checking shop drawings and samples, adjudicating disputes, etc. The architect's handling of these matters will usually have a direct impact on the smooth functioning of the work in the field. For example, prompt processing of the contractor's application for payment, including review of any substantiating data that may be required by the contract documents, helps the contractor maintain an even flow of funds. Items such as shop drawings, samples and test reports submitted for the architect's review must be acted upon promptly to expedite the construction process. Changes in the work that may affect the time of construction or modify the cost are accomplished by change orders. Interpretations necessary for the proper execution of work must be promptly given in writing even when no change order is required.

**Required OAAAS Candidate Activities include the following:**

- Assist in processing applications for payment and preparing certificates for payment.
- Assist in checking shop drawings, evaluating samples submitted and maintaining records.
- Assist in evaluating requests for changes interpreting documents and preparing change orders.
- Participate in resolution of disputes and interpretation of conflicts relating to the contract documents.
- Participate in the assembly of evidence and preparation of testimony to be used before an arbitration panel or in court.
- Become familiar with the legal responsibilities of owners, contractors and architects.
- Participate in the preparation of record documents at project completion.

**13. Construction Phase – Site**

In administering the construction contract, the architect's function is to determine if the contractor's work generally conforms to the requirements of the contract documents. To evaluate the quality of material and workmanship, the architect must be thoroughly familiar with all of the provisions of the construction contract. Periodic reports on the stage of completion of scheduled activities are collected and compared to the overall project schedule at job site meetings. These meetings facilitate communication between the contract parties and produce a detailed progress record. The architect must determine through observation the date of substantial completion and receive all data, warranties and releases required by the contract documents prior to final inspection and final payment.

In addition to these construction-related responsibilities, the architect interprets contract documents when disagreements occur and makes findings in regard to the dispute impartially, even when the owner is involved. Dissatisfaction with the architect's decision can lead to arbitration or litigation.

**Required OAAAS Candidate Activities include the following:**

- Visit the job site and participate in general review of the work in place and material stored, and prepare field reports of such routine reviews.
- Review and analyze construction time schedules. Understand the various network methods (e.g. critical path method) potentially available to the contractor. Compare work performed and the anticipated schedule.
- By reviewing contract documents and participating in professional development programs, develop an awareness of the contractual obligations related to the general review during construction.
- Attend periodic job-site construction meetings and assist in recording and documenting all actions taken and agreed to at such meetings.
- Participate in the substantial performance review and assist in the deficiency list verification.
- Participate in the final acceptance review with the owner and other involved parties.

**Category C: Management****14. Project Management**

The economic and professional health of a firm depends on an orderly, trackable method of project execution. A clearly defined project work plan, the key to the efficient management of project tasks, requires participation and input from team members, consultants, client representatives and other key decision-makers (financial experts, developers, lawyers and contractors). The project manager defines consensus goals, and coordinates tasks and scheduling. Team building depends on clear goals and good communication, with particular attention to decisions that influence the work of multiple team members.

A project file initiated and maintained by the project manager is the comprehensive record to the project's life and a useful resource for future endeavours. The work plan must be congruent with all project-related contractual agreements (which are normally maintained in the project file). Scheduled quality control reviews are identified in the work plan; the project manager may request interim reviews in advance of established submittal dates. It is the project manager's responsibility to measure actual schedule/budget progress against the work plan 'yardstick', assess all discrepancies and take the corrective action necessary to maintain project control. The project manager also maintains design quality during bidding, contract negotiation and construction phases through administration of the project file, oversees the firm's construction representative and monitors scheduled on-site quality reviews. Finally, the project manager closes out project records and agreements and sets up future post-occupancy evaluation procedures.

**Required OAAAS Candidate Activities include the following:**

- Review the firm's project management manual or all relevant forms, checklists and other practice aids if a manual does not exist.
- Understand the procedure for assignment of project management responsibilities and the project manager's role in the acquisition process.
- Participate in the development of a project work plan including identifying goals, client requirements, responsibilities, a first-cut schedule and the project record.
- Review a work plan against all project-related contractual agreements.
- Become familiar with team management including role assignments, team communication methods and frequency and maintaining the project file.
- Review design documentation standards and understand expected levels of documentation at each phase of the project.
- Attend quality reviews at project development milestones identified in the work plan.
- Assist in preparing project status assessments including schedule and scope variances and actions required to maintain project budget control.
- Review the project management file for close-out activities such as contractual fulfillments, final fee for services, invoicing and modifications (e.g. change orders).
- Attend post-occupancy evaluation trips to completed project sites.

## **15. Office Management**

Although architecture is a creative profession, current techniques of practice require that the architect's office operate in a similar manner to other commercial enterprises. Steady income must be generated and expenses carefully budgeted and monitored so that economic stability can be maintained. Accurate records must be kept for tax purposes and for use in future work. Established office requirements and regulations are essential to maintaining a smooth operation; office practice manuals are a typical tool for dissemination of this information. Profitable use of office personnel requires budgeting time and adhering to schedules. The architect's relationship to the client is established by contractual agreement. A contract establishes the duties and obligations of the parties. In order for a contract to be enforceable, there must be mutual agreement between competent parties, an acceptable monetary consideration, and it must be for lawful purpose and accomplishable within an estimated time frame. Effective public relations play an essential role in the creation of the architect's image. This is important in bringing new clients and work into the office as well as in attracting superior people for the professional staff. The architect must participate in marketing activities if the practice is to succeed. On the other hand, the architect's marketing activities (unlike those of merchants, manufacturers and others in commerce) are subject to certain professional constraints. The architect must learn marketing techniques that are effective while remaining within legitimate rules of professional conduct.

### **Required OAAAS Candidate Activities include the following:**

- Review the process of internal accounting and cost control systems for operation of the firm.
- Participate in allocation of time to all elements involved in a total project from preliminary design through construction.
- Review professional service contracts for their structure, content, determination of responsibility and enforcement procedures.
- Review the compensation structure as related to types of services rendered by the firm.
- Review current contractual relationships with consultants.
- Research legal obligations, limitations and liabilities of professional service contracts.
- Review the firm's professional liability insurance policy and develop an awareness of potential practices and procedures that are not covered by the policy.
- Assist in developing programs to publicize the firm's professional services and its expertise.
- Participate in the firm's program for securing commissions for professional services through assisting in market research, prospect list preparation and information-gathering activities.
- Assist in developing firm brochures and advertising as elements of promotion.
- Assist or accompany principals or marketing staff carrying out business development.
- Participate in presentation to prospective clients and formal selection interviews.
- Participate in the firm's internal budgeting (profit planning) process.