# TOOLKIT

## FOR BUILDING PROJECTS:

### FROM CONCEPT TO CONSTRUCTION



NORTHWEST TERRITORIES ASSOCIATION OF ARCHITECTS
Incorporated 2001

NWTAA

NORTHWEST TERRITORIES ASSOCIATION OF
ARCHITECTS



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# INTRODUCTION



## Intent of Toolkit

This document is a guide to carrying out building projects, from concept to construction. It will give an overview of the process of a building project, the roles of the different parties involved - including the owner, architect, and contractor - and how to get started.

## How do you get a building project built?

Getting a building project constructed is a difficult task, and even knowing where to start can be daunting. You may know the exact details of the project (such as budget, schedule, program, etc.) or you may simply know that there is a need for a certain facility in your community. Where do you start?

What you need is someone who is experienced in the construction industry and who can take the requirements of the building and coordinate consultants, contractors and other professionals to develop a design and build the project. The primary role of an **architect** on a project is to do just this; they will coordinate most aspects of the design on your behalf.



# STARTING A PROJECT

## 1 Identify the *project*

First you need to know what it is you want to build or renovate. Do you need a new facility such as a community centre, or do you need to renovate an existing building to provide social or commercial space for the community?

## 2 Know the *program* of the building

A program describes the space requirements (room adjacencies, furniture, security, etc.) for all of the rooms or spaces in a project. If you do not have a program for the project, you should retain an architect to develop one with you, based on discussions with the owner and/or the community.

## 3 Determine the budget & schedule

Determine how much money you have to spend on the project and identify any timing constraints. The architect will review the budget and schedule and advise accordingly.

## 4 Determine project delivery method

There are several project delivery methods to choose from. Review the options and determine which would be best suited for your project - see page 9.

## 5 Establish a project manager

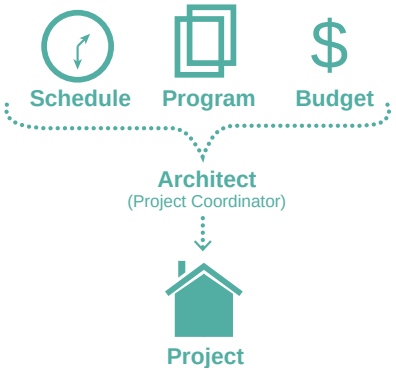
On small projects, the owner can likely manage the project themselves. For more complex projects, a trained project manager or building committee is required.

## 6 Retain a prime consultant (architect)

Retain an architect to coordinate the design of the project on your behalf. See “Role of an Architect”.

## 7 Assembling a team

The architect will assemble a project team (consultants), coordinate their work and be the point person for the project.

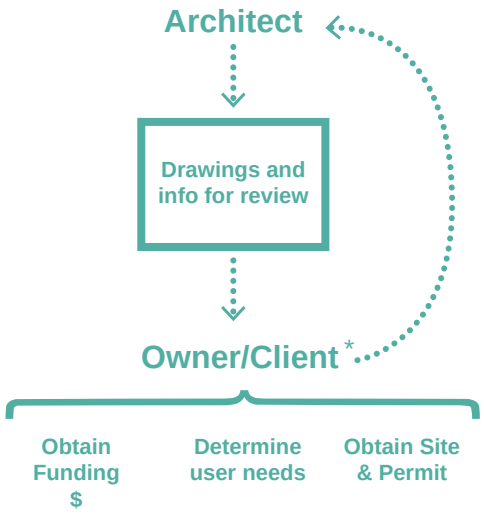








# ROLE OF A CLIENT & OWNER






*In this document, we assume the owner is the client; however, this is not always the case.

## Who is the client of a building?

The client is an individual or group of people who consider and/or initiate a building project. The client usually selects the prime consultant and pays the required fees.

## Who is the owner of a building?

The owner is an individual or group of people who own the land for which a project is being considered. The owner may or may not be the client and/or the planned final occupant of a building.

## Role of an Owner

In general, the owner's role in each phase of the project is to review the work and provide critical comments, and ultimately decide if the project can move on to the next phase.

## Responsibilities of an Owner:

- Obtaining funding for the project
- Determining and defining user needs
- Obtaining a site and a building permit
- Being available to answer questions about the project and attend meetings
- Reviewing drawings and other information from the architect and making timely decisions
- Communicating any concerns, questions or ideas that may arise
- Awarding contracts and making payments
- Operating and maintaining the building after it is built



# ROLE OF AN ARCHITECT

## Why should you hire an architect?

An architect acts as the coordinator for the design of a building project and is generally hired as the prime consultant. An architect will help guide you through the design and construction process and help to control costs, in discussions with the client/owner.

## When is an architect required?

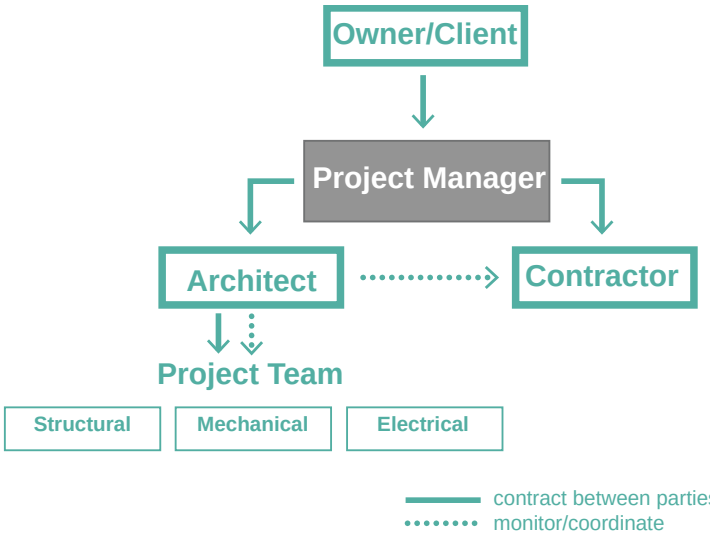
While an architect is not required to construct all types of buildings, it is highly recommended to retain one to help you carry out your project.

Buildings not requiring an architect must be 3 storeys or less in building height, have a gross building area (combined area of all floors) under 600m2 and be one of the following occupancies:

- residential
- business and personal services (offices)
- mercantile (stores)
- low & medium hazard industrial

## What services can a client expect from an architect?

- Coordinating the design team (engineers, specialists, etc.)
- Establishing goals with the client
- Ensuring the building meets codes and regulations
- Providing drawings, sketches and models for the client
- Assisting in the selection of a general contractor and overseeing construction.




Make sure you review the requirements of your building with a professional before proceeding without an architect.

## An architect can navigate codes and regulations on your behalf

- Proper site planning by the design team is required to meet building setbacks, parking requirements and special zoning conditions
- Architects make design submissions to 'Authorities Having Jurisdiction' such as the Office of the Fire Marshal or Local Building Inspectors, which are required by Territorial or Municipal legislation.
- Other regulatory bodies may need to be consulted including health, environmental, and utilities branches as well as electrical, propane, elevator and boiler inspectionbranches.



# SELECTING AN ARCHITECT



## How do you find the right architect for your project?

You should plan on interviewing 3-5 architects or design firms. Ask as many questions as you need to understand what they can offer. Remember that selecting an architect is a big decision; you will be working with them on the same project for 1, 2 or even 5 years depending on the size of the project.

Ask to see their project portfolio - especially projects which are similar to yours - and ask for references. Lastly, make sure to explain what you want and need for the project and what you can afford.

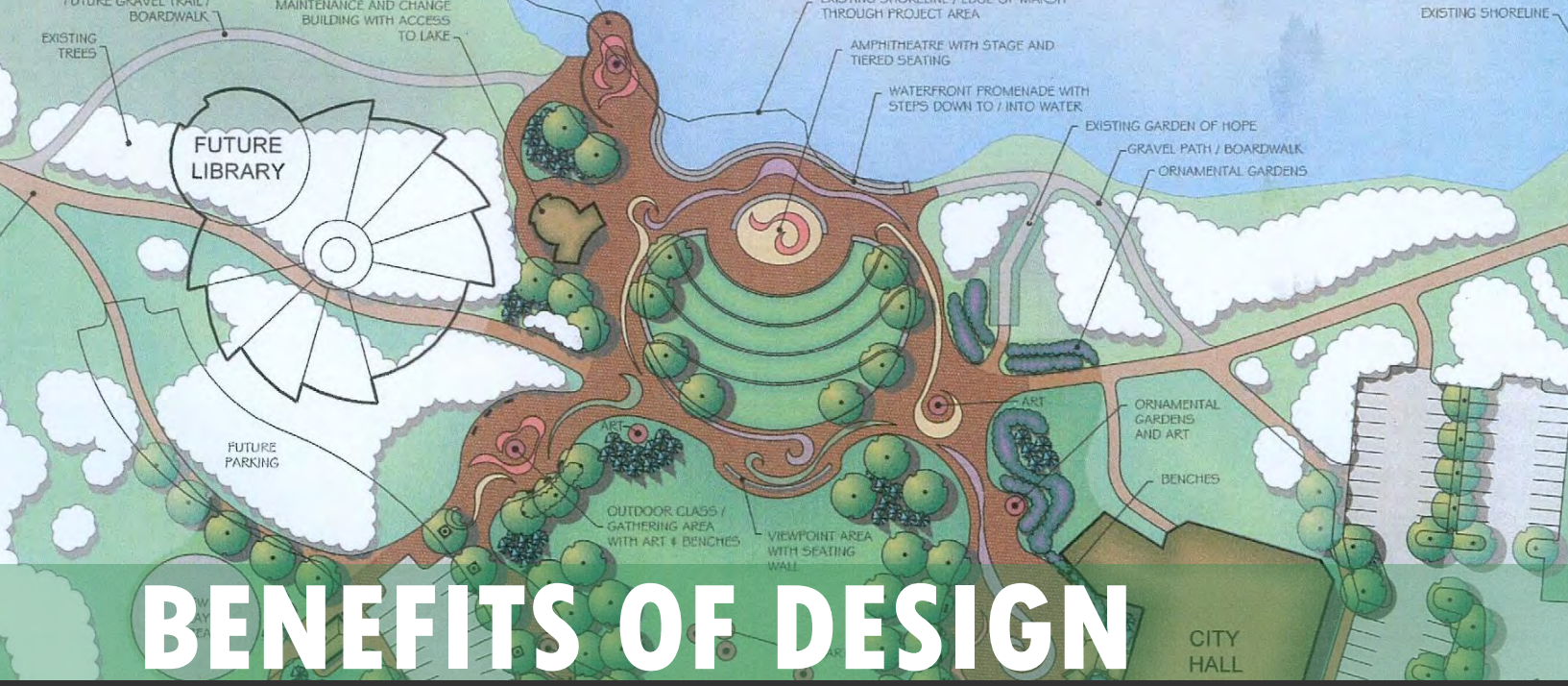


## Where can you find a list of architects/ design firms?

Architects must be licensed with the NWT Association of Architects in order to practice architecture and provide serves to clients in the Northwest Territories. You can find a list of architecture firms with firm permits in the Northwest Territories on the NWTAA website in the Members Directory:

http://www.nwtaa.ca/

A list of registered members can be found on the same page.



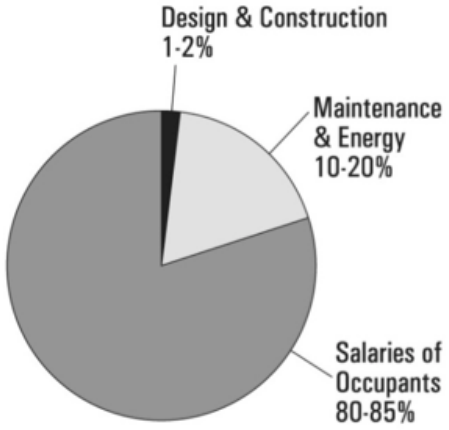

# BENEFITS OF DESIGN

## Good design saves you money

The cost to design a project is only 1-2% of the total cost of the building. In contrast, building operation and maintenance (energy, heating, electricity, etc.) is 10 times the cost of the design. Good design will incorporate energy saving techniques which will save you a significant amount of money down the road.

Architectural design also considers the interior environment. Consideration of views and natural light create a more pleasant environment, as well as increase productivity of users.

Consideration of landscaping, building form and siting (position on the site), and exterior siding and screening can also decrease the risk of vandalism, saving in repair and maintenance costs.




Cost of construction and owning a building over the lifespan of a building

## Good design incorporates your needs

Whether it's a new building or a renovation, an architect will consider and incorporate the specific needs of users and the community as a whole in the design of a building project.





# PROJECT DELIVERY METHODS

| Method | Description | Advantages | Disadvantages |
|---|---|---|---|
| **Design-Bid-Build (Stipulated Price Contract)** | - Most traditional method<br>- Owner engages architect to prepare design, drawings & specs<br>- Owner hires a contractor by competitive bidding<br>- Linear sequence | - widespread use and familiarity<br>- resolution of program requirements and design prior to construction<br>- known price before const. begins | - separation of design and const. restricts communication<br>- contracts (esp. public) awarded to low bidder (may not be qualified) |
| **Construction Management** | - Owner engages architect to provide design and const. docs<br>- Owner hires CM to oversee schedule, costs, const. method, bidding/negotiation, coord. of const. activities<br>- More commonly used on large complex projects | - const. advise during design<br>- “fast tracking” construction possible<br>- careful monitoring of costs and schedule | - complex relationships / communication<br>- owner is “constructor” (responsible for const. safety)<br>- const. begins before total costs are known |
| **Design-Build** | - Owner contracts directly with a single entity that is resp. for both design and const.<br>- Owner may engage an “advocate” architect for initial advice and prep. | - streamlined process can increase efficiency<br>- team approach | - There is less opportunity for changing or modifying the design than with typical design-bid-build approach |
| **Public Private Partnership (P3)** | - Partnership b/t public and private sectors - relies on alternate sources of financing and revenue to cover all or part of capital costs<br>- generally for infrastructure and larger scale public projects, or gov’t “bundles” small projects of similar type together | - efficiencies and expertise of private sector for public projects<br>- alternate financing<br>- reduce life cycle costs<br>- reduced time and const. schedule | - transfers certain financial risk to private sector – can be more expensive<br>- “best value” not always achieved<br>- building users have less control |

## Choosing a project delivery method

A project delivery method describes the way the owner, architect, engineers and builder work together to take a building from a concept to a built project. The project delivery method selected will determine contractual and reporting relationships between all parties. The specifics of the role of each party (architect, contractor and owner) varies to different degrees depending on the delivery method selected.

The project delivery method you choose can also potentially affect the quality, cost and schedule. Determine what your priorities are and consider which approach would best achieve your goals.

Be sure to weigh the positives and the negatives of each approach before moving forward.

**Refer to the chart on the left,** keeping in mind that these are simply a few common project delivery methods and that others exist.



# UNDERSTANDING FEES

## Cost of a Project

The cost of a building project depends on a number of concerns, from the location of and type of building to the type of project delivery (see Construction Phase on page 13).

Only a small percentage of lifecycle cost (cost of a building over its lifetime) is attributed to the cost of design and construction, while a large portion is due to operation and maintenance costs.

### $ Project Cost = Site + Capital + Consultant Fees + Other Costs

- Site: purchasing land and site preparation
- Other: legal, cost estimates, site survey, geotech., etc.

### $ Lifecycle Cost = Capital + Operating Costs

- Capital Cost: cost of constructing building
- Operating Costs: heating, lighting, energy, etc.
- Maintenance Costs: repairs and renewals

## Before you look at Fees

Ask yourself what you are looking for in your project. Consider **Quality, Budget** and **Schedule**. Which of these aspects are most important to you for your project? Ensure that the architect is aware of the constraints and goals that the client/owner and/or the building users have for the project.

## Determining Architectural Fees

Each project is unique, and building sites (location of projects) vary drastically in the Northwest Territories and Nunavut. The architect's fee for each project will also vary. The client and architect must agree upon project requirements, and then negotiate a fee.

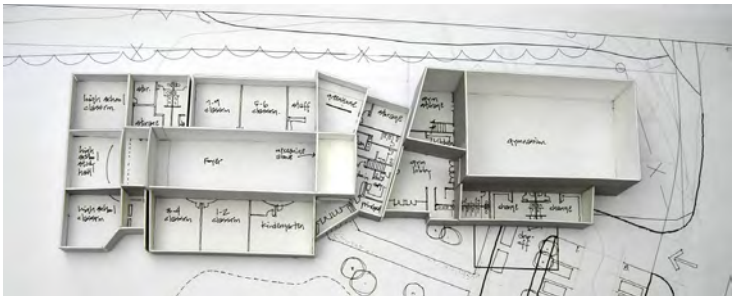
**Ways to Determine Architectural Fee**

| Method (fee) | Description | Advantages | Disadvantages |
|---|---|---|---|
| Lump Sum/Fixed | Fixed amount agreed upon with architect at the beginning of the project | - Price will not change<br>- Less financial risk to owner | - Potentially higher fees for consultants and contractor to account for risk factor |
| Time Basis | Fees based on hourly or daily rate | - Useful when services are difficult to determine in advance<br>- Good for small projects and studies | - Not appropriate for most projects (would result in high fees) |
| Percentage-based | Fee as percentage of construction cost | - Allows for flexibility in project<br>- Can allow for more community and client input | - Price can change |

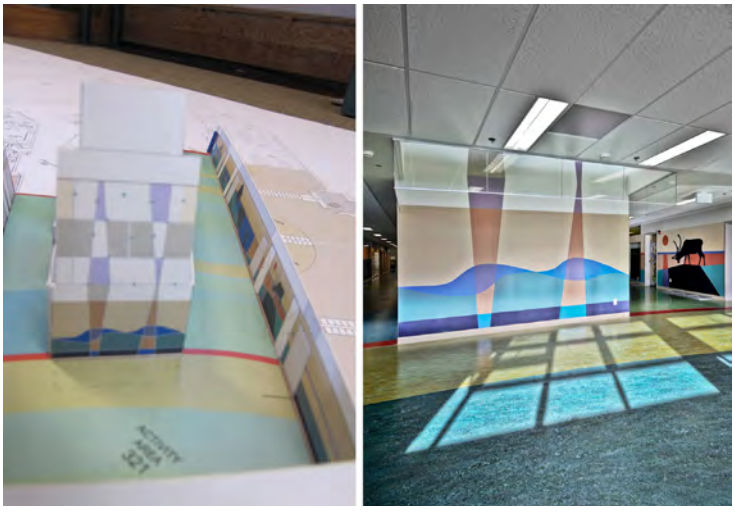
Refer to RAIC Guide to Determining Appropriate Fees for the Services of an Architect




# PROCESS OF A PROJECT



Schematic design model of school shown above



Schematic design model → to realized project

## Project Phases

There are several stages to a project, from design to construction to occupancy. The next four pages will explain and guide you through these stages.

### 1 Pre-Design:

- Project Definition (programming, etc.)
- Site Acquisition
- Assemble Project Team

### 2 Design:

- Schematic Design
- Design Development
- Construction Documents

### 3 Construction:

- Tender (Bidding and Negotiation)
- Construction Administration

### 4 Post-Construction:

- Warranty Period
- Tenant Occupancy

# PRE-DESIGN PHASE



Before the architect can start what are called "Basic Services," the project requirements have to be determined, a site identified and its characteristics defined. The owner, or client, is responsible for all information regarding the land on which the building is to be constructed.



## Shared responsibilities of the architect and client/owner:

### Project Definition:

- The owner is responsible for preparing an outline, or functional program, that determines the detailed space requirements for each room/space (furniture, equipment, security requirements, etc.). The architect can prepare this on behalf of the client as an additional service.
- The architect may conduct an initial feasibility study. This indicates if the building project can be built and under which constraints (estimating an approximate cost and identifying challenges)
- The architect can help the owner obtain legal and topographical surveys.



## A Client's Responsibilities:

### Site Acquisition:

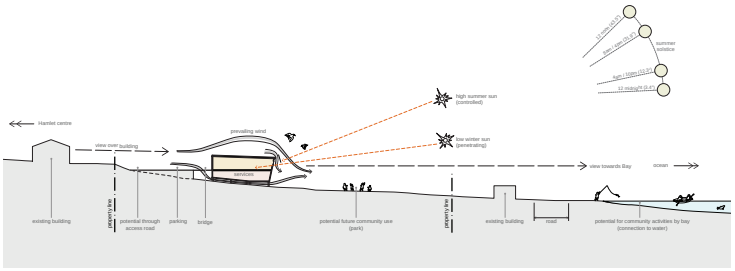
- With the help of a lawyer, a project site must be purchased and secured.
- A geotechnical engineer should be hired to study soil conditions.
- Legal and topographical site surveys are required as well as records of existing buildings on the site.
- Determine if environmental assesment is required.

### Assembling Project Team:

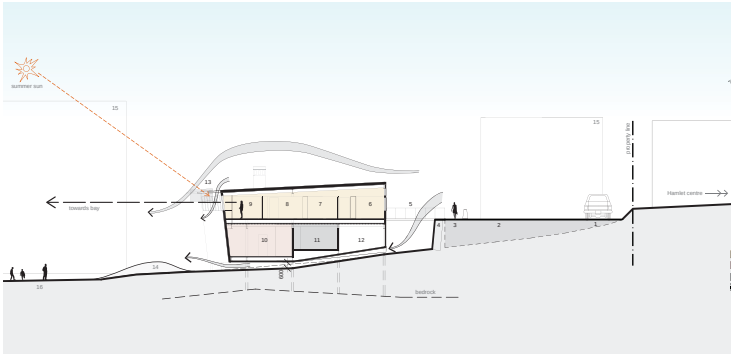
For larger buildings, a project manager or owner's representative should be identified from among the team. This person will be tasked with hiring and signing a contract with an architect and engineering team.

# DESIGN PHASE

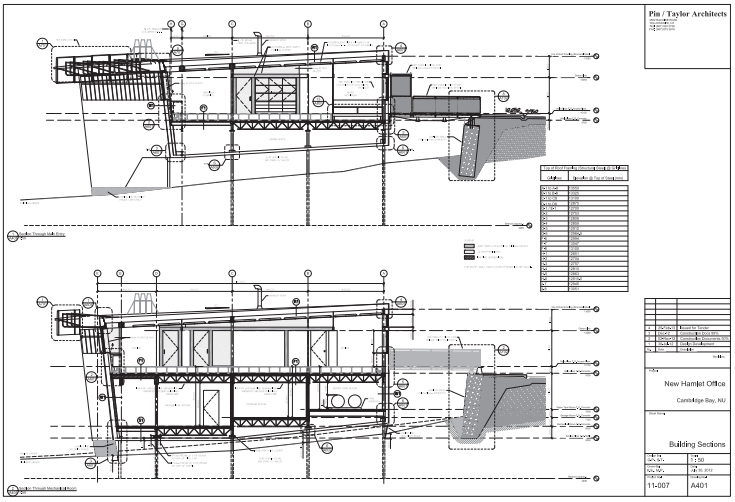
## Example of drawing developed from Schematic Design to Construction Documents



Schematic Design - Site Section through building



Design Development - Building Section



Construction Documents - Building Sections

In the design phase, the architect and consultant team take the information gathered in the pre-design phase and incorporate it into a cohesive building design. Various alternative schematic designs - “sketches” or big-picture designs of the project - are often developed and presented to the client. The chosen design is then developed in greater detail in “Design Development.”

Once the drawings have been approved in design development, the consultant team gets to work on developing construction or tender documents - these are highly developed drawings and specifications which are used by the contractor. See Construction Phase for more information.

## What to expect from the architect (Deliverables):

**Schematic Design:**

Site analysis, basic building massing and preliminary mechanical and electrical concepts

**Design Development:**

Documents showing architectural and structural design elements as well as preliminary mechanical and electrical items/concepts.

**Construction Documents:**

Documents showing all design elements including structural, mechanical and electrical drawings.

## A Client’s Responsibilities:

**Pre-design:**

Provide general information about the project and what is required - priorities, budgets, functional program, legal and topographic surveys and geotechnical information - and obtain a site.

**Schematic Design:**

Review concepts and design options, discuss with architect and select design.

**Design Development:**

Review detailed design information and provide approval to move forward.



# CONSTRUCTION PHASE



The client issues the Construction or Tender Documents, which include drawings and specifications, during the tender period for contractors to review and base their bids on (estimates for the cost of construction). Once the tender closes and all bids have been received, the client (potentially with the help of the architect) chooses the winner - often the lowest bidder. The architect will then coordinate with the winning contractor to construct the project.

This process may vary depending on the type of project (for example, design-bid-build projects vs. design-build). The architect will help the client with the tender process.

## What to expect from the architect & contractor (Deliverables):

**Tender:**

- Architect provides construction and tender documents including drawings & specifications.
- Contractor provides a budget and cost estimate for the project. The architect will clarify any questions from the contractor.

**Construction:**

The architect will review shop drawings, assess compliance of construction with design, review progress payments and respond to questions from the contractor.





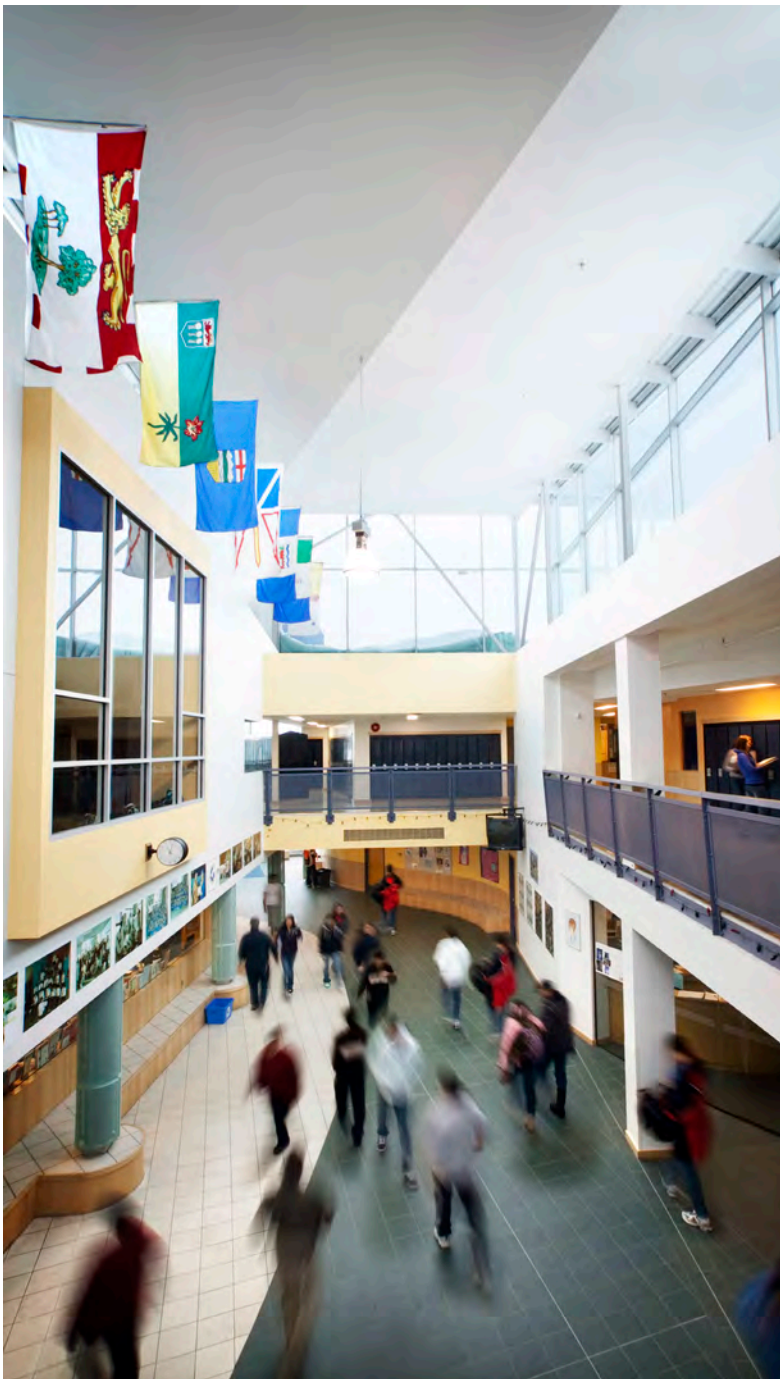
## A Client's Responsibilities:

**Tender:**

The client must issue tender documents for access by building contractors. This can be done through a government website, newspapers, etc.

**Construction:**

At this stage, an owner is typically responsible for reviewing the presented information and providing feedback and/or approval of the information, as well as coordinating with necessary regulatory organizations to obtain permits.



# POST CONSTRUCTION

Once a project is considered completed, a final review with the contractor is made to identify, confirm and correct and deficiencies (anything that does not comply with the drawings and specifications). This is followed by a 10-month *warranty review period*.

## What to Expect from the architect (Deliverables):

**Warranty review period:**

- Preparation of 'Record' drawings and specifications - these reflect any changes made to the project during construction.
- Field review and written report of deficiencies.

**Tenant Occupancy**

Before the owner and/or occupants can use the building, the building systems and operational equipment/components must be inspected to make sure they are fully functional. This procedure of checks and inspections is called Commissioning. This is generally done by the engineering consultants and architect.

## A Client's Responsibilities:

**Warranty Period:**

An owner is typically responsible for reviewing the presented information and providing feedback and/or approval of the information.

**Tenant Occupancy:**

The owner is also responsible for the operation and maintenance of the building once construction has been completed.



# FOR MORE INFO

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