

# CLASS 3 ESTIMATE

STUDENT UNION BUILDING - SUSTAINABILITY ITEMS

UNIVERSITY OF VICTORIA, BC

December 2, 2020

**Prepared by  
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### A ESTIMATE BREAKDOWN

per: Advicas Group Consultants Inc.

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Choose an item.

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**Advicas Project No. 2020139**

## INTRODUCTION

This report sets out the estimate of capital construction cost at schematic design stage for the proposed Student Union Building - Sustainability Items in University of Victoria, BC.

### Project Description

The project comprises sustainability initiatives to improve energy conservation and reduce greenhouse gases and also improve thermal comfort.

Four options of window and door systems are explored:

- Option 1     Replace single pane windows and doors with insulated sealed units, and new passive solar shading device
- Option 2     As Option 1 plus replacing existing storefront with insulated sealed units, and triple glazing to skylights
- Option 3     Replace window, doors, storefronts, and skylights to curtain wall with triple glazed insulated glass units
- Option 4     As Option 3 but insulated sealed double glazing

### Gross Floor Area

The gross floor area<sup>1</sup> of the existing three storey building is 6,500 m<sup>2</sup>.

<sup>1</sup> measured to the outside face of exterior walls

## ESTIMATE COSTS

The estimate costs have been developed in current (December 2020) dollars only. The estimated capital construction cost of the options are as follows:

Architectural Sustainability Upgrade Option 1 - Window and Door Systems	\$908,800	\$139.82/m <sup>2</sup>
Architectural Sustainability Upgrade Option 2 - Window and Door Systems	\$1,326,600	\$204.09/m <sup>2</sup>
Architectural Sustainability Upgrade Option 3 - Window and Door Systems	\$2,076,200	\$319.42/m <sup>2</sup>
Architectural Sustainability Upgrade Option 4 - Window and Door Systems	\$1,679,300	\$258.35/m <sup>2</sup>
Mechanical Sustainability Upgrades	\$101,800	\$15.66/m <sup>2</sup>

A breakdown of the estimate for each of the above items is included in Appendix A.

### General Requirements and Fee

The General Requirements provide for all General Contractor's costs associated with the management and supervision of the construction work in accordance with the contract documents and construction schedule. Typical costs include site superintendent/foreman, site set up and demobilization, temporary office and storage, temporary equipment including crane, first aid facilities, bonding, and construction insurance.

The General Contractor's Fee includes office expenses, profit, and attendance on building sub trades; and profit on own forces work.

**Escalation**

**Escalation during Construction Period** – the estimate, as is typical, includes any cost increases incurred by the contractor/sub-contractor, and suppliers in conforming to contractor/supplier timelines dictated by the construction schedule. These increases are built into the respective detailed unit rate costs.

**Future Escalation** – this has been provided in the above Estimate Costs for cost escalation incurred between March 11, 2020 and the current date. Escalation beyond this point is not included and will be based on values given in Table 1 below.

**COVID-19 Premium** – we are all very much aware of the impact of the COVID-19 virus, and the mandated and recommended regulations introduced by the government to protect the health and safety of all in overcoming this challenge.

We have seen over the past four years a market trend reflecting an annual increase in market price levels in the order of 10% per annum. The advent of COVID-19 has had a major impact on the construction industry. While continuing as a deemed essential service, the new government regulations and guidelines, carried onto the construction site, has translated into the need to adapt the process of construction completion. This will, and has, attracted additional costs. New items introduced into the construction process have included:

- The requirement for limited sub trades/sub-trade personnel on the site at any one time to maintain/ensure social distancing. This has caused suspected inefficiencies in performance of the work, ultimately adding time to work completion. The overall construction completion schedule will lengthen, attracting an increase in the General Contractor’s overall supervision and management costs. The trades themselves, through managing inefficiencies, will incur additional cost.
- The limited sub trade personnel on site will cause all trades to revise their internal schedule to meet their obligations on all projects. We expect this will necessitate the need to build in flexibility on a trade’s attendance timeline on site, again lengthening the construction schedule, attracting additional supervision and management costs.
- The setup of wash station facilities on site to provide workers with the necessary facilities to wash hands, sterilize, etc.; employment of staff dedicated to providing ongoing cleaning and sterilization of site offices, equipment, etc. as necessitated throughout the construction.
- Screening of all personnel coming onto site each day.

We have seen a major reduction in projects out on the street requesting tender. From industry bulletins and media, we have noted projects ready for tender, but placed on hold until the market becomes more certain. Those projects that have been tendered have come in significantly under budget, although with a wide range of bids submitted by upwards of eight bidders. This indicates the uncertainty in the market at this time; a potential second COVID-19 wave; future investment in construction infrastructure.

Our viewpoint on movement in construction market price levels given the COVID-19 protocol, and assumptions on a future trend in projects released for tender, applied to the Construction Cost, is presented in the table below.

**Table 1 – BUDGET ADJUSTMENT – APPLIED FOR FUTURE ADJUSTMENT IN CONSTRUCTION COST**

	COVID-19 PREMIUM	CONSTRUCTION MARKET PRICE INCREASE	TOTAL ESCALATION ON CONSTRUCTION COST
2020 –Mar 11 <sup>th</sup> to Aug	+8%	-10%	-2.0%
2020 – beyond Aug	0%	0%	0%
2021	0%	+1.5%	+1.5%
2022	0%	+1.5%	+1.5%
2023	0%	+2.0%	+2.0%
2024	0%	+2.5%	+2.5%

*Note: Island average norm 3.5%, equated over the past thirty-five years of construction*

## Sustainability Initiatives

It is our understanding that this project is intended to have a level of sustainability to coincide with University of Victoria's environmental principles (e.g., energy efficiency, water consumption, site strategies). While the sustainable blueprint of the project is still to be outlined, our estimate includes allowances to cover systems and design elements which are associated with LEED® Gold targeted buildings.

The estimate does not include costs for registering and certifying the project with the Canadian Green Building Council as a LEED Gold Rated project (e.g., LEED registration/certification costs, LEED consultant fees, LEED submission documentation).

## BASIS OF THE ESTIMATE

We have assumed that the work will be tendered competitively in one contract.

In all cases the estimates are based upon our assessment of fair value for the work to be carried out. We define fair value as the amount a prudent contractor, considering all aspects of the project, would quote for the work. We expect our estimate to be in the middle of the bid range to ensure that funding for the work remains adequate for the duration of the project.

It should be noted that Advicas Group Consultants Inc. does not have control over the cost of labour, materials, or equipment, over the Contractor's methods of determining bid prices, or over competitive market conditions. We define competitive conditions in the project as attracting a minimum of three general contractors' bids with a minimum of two sub-trade tenders, and suppliers' tenders, within each of the sub-trade categories. Accordingly, Advicas Group Consultants Inc. cannot and does not warrant or represent that bids will not vary from the estimate.

The current construction market is extremely active, bringing with it a volatility in tender price levels. We have seen tenders exceeding budget where there has been a single general contractor bid, or suspected single sub-trade, or supplier bid. Whilst we endeavor to gauge the developing market conditions, it is not always possible to predict industry interest in this project, and the potential for a poor, uncompetitive, response.

## Contingency Reserves

Contingency is an allowance specifically identified within our elemental cost analysis to meet unforeseen circumstances and represents an assessment of the financial risk relating to this project. As detailed design information becomes available, this risk will diminish, and the contingency allowances will accordingly reduce.

Design contingency is introduced into the estimated cost at the earliest estimate stage and is a measurement of the amount and detail of the design information available. As the design develops and systems and material selections are fixed, the amount of the contingency allowance is reduced and is absorbed into the measured elements. On completion of contract documents, at tender stage, the allowance is normally reduced to zero.

Our determination of this risk level and the amount of the contingency allowance is the result of many years of cost planning, on over 4,000 construction projects, and of monitoring the increasing design information that occurs during the design phase. The design contingency is not a discretionary cost element.

A design contingency allowance has been included, calculated at 10% of the construction costs, to provide for unforeseen items arising during the design phase.

No allowance has been made for construction contingency. This typically provides for unforeseen items arising during the construction period – such as field conditions, coordination discrepancies – which will result in change orders and extra costs to the contract, other than changes in scope.

No allowance has been made for project contingency. This is a contingency, held by the Client, to be used at his discretion to fund specific Client driven changes to the project scope, conditions, etc.

## Taxes

GST is excluded from the estimate.

PST at 7% is included in the estimate.

## Exclusions

The following items are excluded from the capital construction cost:

- Interior work except where noted
- Removal and relocation of loose furniture, fittings, and equipment from the construction zone prior to construction work commencing
- Relocation and reinstallation of loose furniture, fittings, and equipment upon completion of construction work
- Costs associated with temporary relocation, i.e., decanting and relocating staff from the construction zone
- Storage costs
- Site development
- Structural or seismic upgrade
- Separate prices
- Client Administration costs
- Clerk of Works
- Client Project Manager
- Offsite costs
- Material testing
- Premium costs associated with environmental contaminants
- Asbestos abatement
- Traffic study costs
- Survey fees
- Financing costs
- Legal fees
- Client Insurances costs
- Development cost charges
- Development permit fees
- Phasing of the work
- Out of hours working
- Consultants' fees and expenses
- Construction contingency
- Project contingency
- Escalation
- GST

## Documentation

The estimate is based on the following:

- Zeidler
  - SUB Sustainability Initiatives Report DRAFT 1 dated November 16, 2020
  - 11x17 drawings A101 to A111 Received November 23, 2020
  - Email on additional Option 4 Received November 25, 2020
  
- AME Group
  - UVic SUB Building Sustainability Initiatives Design Development Report dated November 6, 2020 Received November 17, 2020
  
- AES Engineering Ltd.
  - Electrical Feasibility Study For UVic SUB Sustainability Initiatives dated November 6, 2020 Received November 17, 2020
  
- Emails and telephone discussions with the design team during the preparation of the estimate

# APPENDIX A

## ESTIMATE BREAKDOWN



	QUANTITY	UNIT	RATE	COST
<b>Architectural Sustainability Upgrade Option 1 - Window and Door Systems</b>	<b>6,500</b>	<b>m<sup>2</sup></b>	<b>\$139.82</b>	<b>\$908,800</b>
<b>Phase 1 and Phase 2 Building Area</b>				
Replace single pane, non-thermally broken window, door and skylight assemblies with code complaint Insulated Glazing Units (IGU) systems				
Phase 1 Lower Floor windows including openers	119	m <sup>2</sup>	\$1,010.00	\$120,190
Phase 2 First Floor storefront	15	m <sup>2</sup>	\$855.00	\$12,825
Phase 1 - pitched skylight	12	m <sup>2</sup>	\$2,000.00	\$24,000
Phase 1 - transom strip windows	28	m <sup>2</sup>	\$865.00	\$24,220
Replace existing double glazing with dual pane IGU with COG = 0.24 or lower				
Phase 1 First Floor storefront glazing	7	m <sup>2</sup>	\$650.00	\$4,550
Phase 2 First Floor storefront glazing	32	m <sup>2</sup>	\$650.00	\$20,800
Existing single glazed door - Phase 1	1	lvs.	\$2,500.00	\$2,500
Existing single glazed door - Phase 2	2	lvs.	\$2,500.00	\$5,000
Replace all pressed steel door assemblies with code complaint Insulated Glazing Units (IGU with thermally broken steel or aluminum frames				
Phase 1 single door - D3	1	lvs.	\$2,000.00	\$2,000
Phase 2 single door - D3	1	lvs.	\$2,000.00	\$2,000
Phase 2 double doors - D4	4	prs.	\$3,000.00	\$12,000
Phase 2 triple doors - D5	1	set	\$5,000.00	\$5,000
Install thermal insulation on interior face of solid concrete window jambs to reduce thermal bridging				
Phase 1 windows	161	m	\$30.00	\$4,830
Phase 2 windows	17	m	\$30.00	\$510
Install vestibules at main entrances to reduce loss/gain of heat				
New full height single pane glazing aluminum storefront - Phase 2	14	m <sup>2</sup>	\$650.00	\$9,100
Premium over aluminum storefront for glazed single door - Phase 2	1	lvs.	\$1,350.00	\$1,350
Premium over aluminum storefront for glazed double doors - Phase 2	1	prs.	\$2,700.00	\$2,700
Premium over doors for automatic entry - Phase 2	1	no.	\$4,000.00	\$4,000
<b>Phase 3 Building Area</b>				
First Floor – storefront glazing systems. Retrofit all single pane glazing in doors with IGU's. On south and west elevation / in areas with high heat gain selectively retrofit existing storefront system with IGU's with COG = 0.24 or lower and with low(er)SHGC to help reduce heat gain from sunlight.				
Phase 3 single door glazing	4	lvs.	\$630.00	\$2,520
Phase 3 double doors glazing	8	prs.	\$1,260.00	\$10,080
Phase 3 south and west storefront glazing	388	m <sup>2</sup>	\$650.00	\$252,200
First Floor – storefront glazing systems. On south and west elevations install exterior passive shading devices. Utilize existing steel structures where available and if in sound condition.				
Phase 3	250	m <sup>2</sup>	\$300.00	\$75,000
First Floor – Install vestibules to reduce loss/gain of heat				
New full height single pane glazing aluminum storefront - Phase 3	61	m <sup>2</sup>	\$650.00	\$39,650
Premium over aluminum storefront for glazed single door - Phase 3	2	lvs.	\$1,350.00	\$2,700
Premium over aluminum storefront for glazed double doors - Phase 3	2	prs.	\$2,700.00	\$5,400
Premium over doors for automatic entry - Phase 3	2	no.	\$4,000.00	\$8,000
Z11 General Requirements		15.00%		\$97,969
Z12 Fee		10.00%		\$75,109
Z21 Design Contingency		10.00%		\$82,620
Z22 Escalation				Excluded
GST				Excluded

	QUANTITY	UNIT	RATE	COST
<b>Architectural Sustainability Upgrade Option 2 - Window and Door Systems</b>	<b>6,500</b>	<b>m<sup>2</sup></b>	<b>\$204.09</b>	<b>\$1,326,600</b>
<b>Phase 1 and Phase 2 Building Area</b>				
As Option 1	1	item	\$257,575.00	\$257,575
<b>Phase 3 Building Area</b>				
First Floor storefront glazing systems - window, door and skylight frame systems to remain. Replace all glazing with dual pane IGU with COG = 0.24 or lower. On the south elevation the new IGU's to have a much lower SHGC to help reduce heat transfer from the exterior sunlight.				
Phase 3 single door glazing	4	lvs.	\$630.00	\$2,520
Phase 3 double doors glazing	8	prs.	\$1,260.00	\$10,080
Phase 3 south and west storefront glazing	388	m <sup>2</sup>	\$650.00	\$252,200
First Floor clerestory glazing system - frame systems to remain. Replace all glazing with dual pane IGU with COG = 0.24 or lower. On the south elevation the new IGU's to have a much lower SHGC to help reduce heat transfer from the exterior sunlight.				
Phase 3 windows including openers	15	m <sup>2</sup>	\$1,255.00	\$18,825
Phase 3 clerestorey windows	119	m <sup>2</sup>	\$865.00	\$102,935
Phase 3 clerestorey gable windows with arched top	21	m <sup>2</sup>	\$1,300.00	\$27,300
Skylights (if Kawneer 2000 Series) retrofit with adapter allowing 44mm triple glazed infill / install triple pan glazing and				
Phase 3 - sloped skylight glazing	72	m <sup>2</sup>	\$2,100.00	\$151,200
First Floor – storefront glazing systems. On south and west elevations install exterior passive shading devices. Utilize existing steel structures where available and if in sound condition.				
Phase 3	250	m <sup>2</sup>	\$300.00	\$75,000
First Floor – Install vestibules to reduce loss/gain of heat.				
New full height single pane glazing aluminum storefront - Phase 3	61	m <sup>2</sup>	\$650.00	\$39,650
Premium over aluminum storefront for glazed single door - Phase 3	2	lvs.	\$1,350.00	\$2,700
Premium over aluminum storefront for glazed double doors - Phase 3	2	prs.	\$2,700.00	\$5,400
Premium over doors for automatic entry - Phase 3	2	no.	\$4,000.00	\$8,000
Z11 General Requirements		15.00%		\$143,008
Z12 Fee		10.00%		\$109,639
Z21 Design Contingency		10.00%		\$120,603
Z22 Escalation				Excluded
GST				Excluded

	QUANTITY	UNIT	RATE	COST
<b>Architectural Sustainability Upgrade Option 3 - Window and Door Systems</b>	<b>6,500</b>	<b>m<sup>2</sup></b>	<b>\$319.42</b>	<b>\$2,076,200</b>
<b>Phase 1, Phase 2 and Phase 3 Building Areas</b>				
Replace all window, door and skylight assemblies with high performance assemblies with U = 1.8 W/m2K or lower. Example combinations for Phase 2 area:				
1620UT 2" curtain wall with standard aluminum pressure plate, warm edge spacer bars (U = 1.65 W/m2K)				
1620UT 2" curtain wall with fiberglass pressure plate, warm edge spacer bars				
1620UT with triple glazed insulated glass units (U < 1.65 W/m2K)				
Phase 1 Lower Floor windows including openers	119	m <sup>2</sup>	\$1,460.00	\$173,740
Phase 2 First Floor curtain wall	15	m <sup>2</sup>	\$1,600.00	\$24,000
Phase 1 - pitched skylight	12	m <sup>2</sup>	\$2,400.00	\$28,800
Phase 1 - transom strip windows	28	m <sup>2</sup>	\$1,315.00	\$36,820
Phase 1 First Floor curtain wall	7	m <sup>2</sup>	\$1,600.00	\$11,200
Phase 2 First Floor curtain wall	32	m <sup>2</sup>	\$1,600.00	\$51,200
Premium over curtain wall for single glazed door - Phase 1	1	lvs.	\$1,770.00	\$1,770
Premium over curtain wall for single glazed door - Phase 2	2	lvs.	\$1,770.00	\$3,540
Phase 3 south and west curtain wall	388	m <sup>2</sup>	\$1,600.00	\$620,800
Premium over curtain wall for glazed single door - Phase 3	4	lvs.	\$1,770.00	\$7,080
Premium over curtain wall for glazed double doors - Phase 3	8	prs.	\$3,600.00	\$28,800
Premium over doors for automatic entry - Phase 3	1	no.	\$4,000.00	\$4,000
Phase 3 windows including openers	15	m <sup>2</sup>	\$1,705.00	\$25,575
Phase 3 clerestorey windows	119	m <sup>2</sup>	\$1,315.00	\$156,485
Phase 3 clerestorey gable windows with arched top	21	m <sup>2</sup>	\$1,730.00	\$36,330
Phase 3 - sloped skylight glazing	72	m <sup>2</sup>	\$2,100.00	\$151,200
First Floor – storefront glazing systems. On south and west elevations install exterior passive shading devices. Utilize existing steel structures where available and if in sound condition.				
Phase 3	250	m <sup>2</sup>	\$300.00	\$75,000
First Floor – Install vestibules to reduce loss/gain of heat.				
New full height single pane glazing aluminum storefront - Phase 3	61	m <sup>2</sup>	\$650.00	\$39,650
Premium over aluminum storefront for glazed single door - Phase 3	2	lvs.	\$1,350.00	\$2,700
Premium over aluminum storefront for glazed double doors - Phase 3	2	prs.	\$2,700.00	\$5,400
Premium over doors for automatic entry - Phase 3	2	no.	\$4,000.00	\$8,000
Z11 General Requirements		15.00%		\$223,814
Z12 Fee		10.00%		\$171,590
Z21 Design Contingency		10.00%		\$188,749
Z22 Escalation				Excluded
GST				Excluded

	QUANTITY	UNIT	RATE	COST
<b>Architectural Sustainability Upgrade Option 4 - Window and Door Systems</b>	<b>6,500</b>	<b>m<sup>2</sup></b>	<b>\$258.35</b>	<b>\$1,679,300</b>
<b>Phase 1, Phase 2 and Phase 3 Building Areas</b>				
Replace all window, door and skylight assemblies with new code compliant double glazed thermally broken curtain wall system				
Phase 1 Lower Floor windows including openers	119	m <sup>2</sup>	\$1,210.00	\$143,990
Phase 2 First Floor curtain wall	15	m <sup>2</sup>	\$1,200.00	\$18,000
Phase 1 - pitched skylight	12	m <sup>2</sup>	\$1,800.00	\$21,600
Phase 1 - transom strip windows	28	m <sup>2</sup>	\$1,115.00	\$31,220
Phase 1 First Floor curtain wall	7	m <sup>2</sup>	\$1,200.00	\$8,400
Phase 2 First Floor curtain wall	32	m <sup>2</sup>	\$1,200.00	\$38,400
Premium over curtain wall for single glazed door - Phase 1	1	lvs.	\$1,650.00	\$1,650
Premium over curtain wall for single glazed door - Phase 2	2	lvs.	\$1,650.00	\$3,300
Phase 3 south and west curtain wall	388	m <sup>2</sup>	\$1,200.00	\$465,600
Premium over curtain wall for glazed single door - Phase 3	4	lvs.	\$1,650.00	\$6,600
Premium over curtain wall for glazed double doors - Phase 3	8	prs.	\$3,300.00	\$26,400
Premium over doors for automatic entry - Phase 3	1	no.	\$4,000.00	\$4,000
Phase 3 windows including openers	15	m <sup>2</sup>	\$1,455.00	\$21,825
Phase 3 clerestory windows	119	m <sup>2</sup>	\$1,115.00	\$132,685
Phase 3 clerestory gable windows with arched top	21	m <sup>2</sup>	\$1,550.00	\$32,550
Phase 3 - sloped skylight glazing	72	m <sup>2</sup>	\$1,665.00	\$119,880
First Floor – storefront glazing systems. On south and west elevations install exterior passive shading devices. Utilize existing steel structures where available and if in sound condition.				
Phase 3	250	m <sup>2</sup>	\$300.00	\$75,000
First Floor – Install vestibules to reduce loss/gain of heat.				
New full height single pane glazing aluminum storefront - Phase 3	61	m <sup>2</sup>	\$650.00	\$39,650
Premium over aluminum storefront for glazed single door - Phase 3	2	lvs.	\$1,350.00	\$2,700
Premium over aluminum storefront for glazed double doors - Phase 3	2	prs.	\$2,700.00	\$5,400
Premium over doors for automatic entry - Phase 3	2	no.	\$4,000.00	\$8,000
Z11 General Requirements		15.00%		\$181,028
Z12 Fee		10.00%		\$138,788
Z21 Design Contingency		10.00%		\$152,667
Z22 Escalation				Excluded
GST				Excluded

	QUANTITY	UNIT	RATE	COST
<b>Mechanical Sustainability Upgrades</b>	<b>6,500</b>	<b>m<sup>2</sup></b>	<b>\$15.66</b>	<b>\$101,800</b>
<b>AHU-1 Conversion to Heat Pump</b>				
Demolition:				
Remove existing cooling only system	1	sum	\$1,250.00	\$1,250
New Work:				
Heat pump unit	1	sum	\$14,500.00	\$14,500
Valves and piping between the coil and heat pump unit	1	sum	\$5,000.00	\$5,000
DDC	1	sum	\$10,000.00	\$10,000
Upgrade existing heating coil	1	sum	\$14,300.00	\$14,300
<b>AHU-7 Heat Recovery for DCW Preheat</b>				
Demolition:				
Remove existing 120 gallon hot water tanks	2	no.	\$200.00	\$400
New Work:				
Hybrid electric water heater and tie into existing DCW line	1	no.	\$6,650.00	\$6,650
Circulation pump	1	no.	\$2,500.00	\$2,500
<b>Electrical for mechanical upgrades</b>				
Demolition:				
Minor work in local area panel	1	sum	\$490.00	\$490
Disconnect and remove power feed for AHU-1, DWH x 2	1	no.	\$750.00	\$750
New Work:				
Minor work in local area panel	1	sum	\$750.00	\$750
New panel & installation - Conduit & Wire	1	sum	\$3,650.00	\$3,650
Mechanical Connections:				
CC & HP, HWT x 3				
Connections	4	no.	\$190.00	\$760
Disconnect & fuses	1	no.	\$2,000.00	\$2,000
Feeder/Conduit:				
2#10 inc gnd 27mm EMT	80	m	\$53.90	\$4,312
Allowance for terminations, splicing etc.	1	sum	\$646.80	\$647
Allowance for corners, couplings etc.	1	sum	\$646.80	\$647
General Conditions:				
Testing and commissioning of above systems	1	sum	\$2,100.90	\$2,101
General conditions for Electrical Contractor - demobilization - permits/working drawings	1	sum	\$2,416.05	\$2,416
Z11 General Requirements		15.00%		\$10,968
Z12 Fee		10.00%		\$8,409
Z21 Design Contingency		10.00%		\$9,250
Z22 Escalation				Excluded
GST				Excluded