


Solutions for Assignment 1

- year 2012 assumed to be the date of publication unless stated
- building parameters were left as default unless prompted to change in question

1)

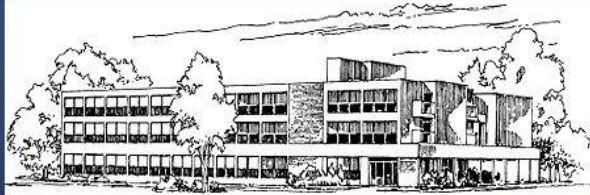
1 (a) College Dormitory- Reinforced concrete Frame

Building Parameters	
Model:	College, Dormitory, 2-3 Story with Face Brick with Concrete Block Back-up / R/Conc. Frame
Location:	NATIONAL AVERAGE
Stories (Ea.):	3
Story Height:	12
Floor Area:	65,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$182.05
Building Cost	\$11,833,500.00



College Dormitory- Steel Frame

Building Parameters	
Model:	College, Dormitory, 2-3 Story with Face Brick with Concrete Block Back-up / Steel Frame
Location:	NATIONAL AVERAGE
Stories (Ea.):	3
Story Height:	12
Floor Area:	65,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$193.67
Building Cost	\$12,588,500.00



1 (b) Fast food restaurant- Steel frame

Building Parameters	
Model:	Restaurant, Fast Food with Brick Veneer / Steel Frame
Location:	NATIONAL AVERAGE
Stories (Ea.):	1
Story Height:	10
Floor Area:	3,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$223.33
Building Cost	\$670,000.00



1(c) Parking Garage- Steel frame

Building Parameters	
Model:	Garage, Parking with Precast Concrete / Steel Frame
Location:	NATIONAL AVERAGE
Stories (Ea.):	5
Story Height:	10
Floor Area:	250,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$82.89
Building Cost	\$20,723,500.00



Parking Garage- Reinforced Concrete frame

Building Parameters	
Model:	Garage, Parking with Precast Concrete / R/Conc. Frame
Location:	NATIONAL AVERAGE
Stories (Ea.):	5
Story Height:	10
Floor Area:	250,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$64.83
Building Cost	\$16,207,000.00



2)

2(a) College Dormitory- Reinforced concrete Frame

National Average cost= C(NAC)=\$ 11,833,500

C (ottawa)= C(NAC)*[I(ottawa)/100]= \$ 11,833,500 (108.7/100)= \$12,863,015

C (vancouver)= C(NAC)*[I(vancouver)/100]= \$ 11,833,500 (110.9/100)= \$13,123,355

C (halifax)= C(NAC)*[I(halifax)/100]= \$ 11,833,500 (101.9/100)= \$12,058,340

College Dormitory- Steel Frame

National Average cost= C(NAC)=\$ 12,588,500

C (ottawa)= C(NAC)*[I(ottawa)/100]= \$ 12,588,500 (108.7/100)= \$13,683,700

C (vancouver)= C(NAC)*[I(vancouver)/100]= \$ 12,588,500 (110.9/100)= \$13,960,650

C (halifax)= C(NAC)*[I(halifax)/100]= \$ 12,588,500 (101.9/100)= \$12,827,685

2(b) Fast food restaurant- Steel frame

National Average cost= C(NAC)=\$ 670,000

C (ottawa)= C(NAC)*[I(ottawa)/100]= \$ 670,000 (108.7/100)= \$728,290

C (vancouver)= C(NAC)*[I(vancouver)/100]= \$ 670,000 (110.9/100)= \$743,030

C (halifax)= C(NAC)*[I(halifax)/100]= \$ 670,000 (101.9/100)= \$682,730

2(c) Parking Garage- Steel frame

National Average cost= C(NAC)=\$ 20,723,500

C (ottawa)= C(NAC)*[I(ottawa)/100]= \$ 20,723,500 (108.7/100)= \$22,526,445

C (vancouver)= C(NAC)*[I(vancouver)/100]= \$ 20,723,500 (110.9/100)= \$22,982,365

C (halifax)= C(NAC)*[I(halifax)/100]= \$ 20,723,500 (101.9/100)= \$21,117,250

Parking Garage- Reinforced Concrete frame

National Average cost= C(NAC)=\$ 16,207,000

C (ottawa)= C(NAC)*[I(ottawa)/100]= \$ 16,207,000 (108.7/100)= \$17,617,000

C (vancouver)= C(NAC)*[I(vancouver)/100]= \$ 16,207,000 (110.9/100)= \$17,973,565

C (halifax)= C(NAC)*[I(halifax)/100]= \$ 16,207,000 (101.9/100)= \$16,514,935

3)

Adjustment for Time:

3(a) 3 Storey Dormitory, 65000ft², face bricked with concrete block backup, reinforced concrete framing

ANS: (1970)

Cost per Square Foot = \$182.05/ft²

Total Cost = \$11,833,500

$$\text{Present Value} = \text{Known Value} * (1 + i)^n$$

$$\text{Present Value} = \$11,833,500 * (1 + 0.03)^{1970-2012}$$

$$\text{Present Value} = \$3,419,398.98/\text{ft}^2$$

ANS: (1990)

$$\text{Present Value} = \text{Known Value} * (1 + i)^n$$

$$\text{Present Value} = \$11,833,500 * (1 + 0.03)^{1990-2012}$$

$$\text{Present Value} = \$6,175,814.91/\text{ft}^2$$

ANS: (2010)

$$\text{Present Value} = \text{Known Value} * (1 + i)^n$$

$$\text{Present Value} = \$11,833,500 * (1 + 0.03)^{2010-2012}$$

$$\text{Present Value} = \$11,154,208.69/\text{ft}^2$$

3(b) Fast Food Restaurant, 3000ft², steel framing

ANS: (1970)

Cost per Square Foot = \$233.33/ft²

Total Cost = \$670,000

$$\text{Present Value} = \text{Known Value} * (1 + i)^n$$

$$\text{Present Value} = \$670,000 * (1 + 0.03)^{1970-2012}$$

$$\text{Present Value} = \$193,602.68/\text{ft}^2$$

ANS: (1990)

$$\text{Present Value} = \text{Known Value} * (1 + i)^n$$

$$\text{Present Value} = \$670,000 * (1 + 0.03)^{1990-2012}$$

$$\text{Present Value} = \$349,667.98/\text{ft}^2$$

ANS: (2010)

$$\begin{aligned} \text{Present Value} &= \text{Known Value} * (1 + i)^n \\ \text{Present Value} &= \$670,000 * (1 + 0.03)^{2010-2012} \\ \text{Present Value} &= \$631,539.26/\text{ft}^2 \end{aligned}$$

3(c) Multi-Level Parking Garage, 250000ft², steel framing

ANS: (1970)

Cost per Square Foot = \$82.89/ft²

Total Cost = \$20,723,500

$$\begin{aligned} \text{Present Value} &= \text{Known Value} * (1 + i)^n \\ \text{Present Value} &= \$20,723,500 * (1 + 0.03)^{1970-2012} \\ \text{Present Value} &= \$5,988,246.48/\text{ft}^2 \end{aligned}$$

ANS: (1990)

$$\begin{aligned} \text{Present Value} &= \text{Known Value} * (1 + i)^n \\ \text{Present Value} &= \$20,723,500 * (1 + 0.03)^{1990-2012} \\ \text{Present Value} &= \$10,815,439.24/\text{ft}^2 \end{aligned}$$

ANS: (2010)

$$\begin{aligned} \text{Present Value} &= \text{Known Value} * (1 + i)^n \\ \text{Present Value} &= \$20,723,500 * (1 + 0.03)^{2010-2012} \\ \text{Present Value} &= \$19,533,886.32/\text{ft}^2 \end{aligned}$$

4)

4(a) all estimations for this question are done based on 3rd quarter 2012 in RS-Means

Building Parameters

Model:	College, Dormitory, 2-3 Story with Precast Concrete Panels / Steel Frame
Location:	MONTREAL, PQ
Stories (Ea.):	3
Story Height:	13
Floor Area:	65,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$221.00
Building Cost	\$14,365,000.00



$$F=P (1+3\%)^3= \$14,365,000.00 * (1+3\%)^3= \$15,697,023.355$$

4(b)

Building Parameters

Model:	Restaurant, Fast Food with Wood Siding / Wood Frame
Location:	TORONTO, ON
Stories (Ea.):	1
Story Height:	9
Floor Area:	4,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$215.75
Building Cost	\$863,000.00



$$F=P (1+3\%) = \$863,000.00 * (1+3\%) = \$888,890$$

4(c)

Building Parameters

Model:	Garage, Parking with Face Brick with Concrete Block Back-up / Steel Frame
Location:	CHARLOTTETOWN, PE
Stories (Ea.):	3
Story Height:	10
Floor Area:	250,000
Basement:	No
Additive Cost:	\$0.00
Cost per S.F.:	\$70.44
Building Cost	\$17,609,500.00



$$F=P (1+3\%)^1 = \$17,609,500.00 * (1+3\%) = \$ 181,377,85$$