



**COURSE: BLDG6851 - PROJECT COST ESTIMATING**

**SEMESTER: FALL-2022**

**PARKHILL DEVELOPMENT BUILDING 2  
MILTON, ONTARIO – Bid Submission**

**FINAL TERM PROJECT**

**Instructor**

**Mark Sagaria, P.Eng., M.Eng., MFin, LL.M.**

**Submitted By**

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## 1.0 LETTER OF INTENT

December 7, 2022

To: Broccolini

Project: Parkhill Development Building 2 – Milton Ontario

Subject: Letter of Intent to Bid

Greetings!

We, **BVVD Builders Inc.**, would like to formally signify our intent to bid for the construction of **Parkhill Development Building 2** to Broccolini with this letter of intent. We offer a total bid price of \$5,783,304.00 for the industrial building with an estimated area of 7969.32 sqm located in Milton, Ontario. Our scope will include the following works:

- Concreting works
- Masonry works
- Steel framing and metal decking works
- Finishing works
- Thermal and moisture protection
- Equipment and specialty items installation

We believe that BVVD Inc. will bring unique value and capabilities to the project. Our company has proven its competency and integrity for the past decade as one of the leaders in building construction in Ontario. We specialize on industrial buildings and warehouses, among others. We have executed similar projects in the past years such as Etobicoke Warehouse Complex in 2015 and Sarnia Development Building Centre in 2018, just to name a few.

We are excited to meet with you to discuss your project. We look forward to doing business and build rapport between our companies.

Sincerely,

Elon Musk  
Managing Director  
BVVD Inc.

## 2.0 ROLES & RESPONSIBILITIES

Our team is composed of experienced and highly efficient staff to manage and execute the tasks required for the completion of Parkhill Development Building 2.

### **Bryan Jay Sanggalang (Structural Engineer)**

Engr. Sanggalang has 10 years of work experience in the engineering and construction industry. His main responsibilities are making quantity take-offs, calculations, and RSMeans pricing for structural steel items. He also assisted the team in summarizing the report and in some items in the concrete quantity take-offs.

### **Darshit Rudani (Civil Engineer)**

Engr. Rudani has 2 years of experience in construction, structural designing, and quantity estimation. His major responsibilities are making quantity take-offs, formwork quantity, reinforcement rebar quantity and RS Means pricing.

### **Vikas Vaghasiya (Civil Engineer)**

Engr. Vaghasiya has 1 years of working experience in civil engineering industry. He worked on tender documentation and quantity documentation. His major responsibilities include concrete quantity take-off, roofing quantity and RS Means pricing.

### **Wasiuddin Mohammed (Civil Engineer)**

Engr. Mohammed has 3 years of experience in the construction industry. His responsibilities include quantity take-off for elements such as footing, metal roof deck, and hardware. Moreover, he did a rate analysis by Rs-means and Broccolini price sheet.

### 3.0 MASTERFORMAT 2018 TOTAL COST BREAKDOWN

Table 1 – Total Cost Breakdown

Description	Quantity	Pricing Unit	Sub Cost	Total Cost
<b>03 00 00 Concrete</b>				<b>\$2,586,113.92</b>
<b>03 10 00 Concrete Forming and Accessories</b>				<b>\$54,199.08</b>
<b>03 11 00 Concrete Forming</b>				<b>\$54,199.08</b>
<b>03 11 13 Formwork</b>				<b>\$54,199.08</b>
Strip Footings	118.15	sfca	\$9.00	\$1,063.35
Piers	436.26	sfca	\$9.00	\$3,926.34
Foundation Walls Standard	5,467.71	sfca	\$9.00	\$49,209.39
<b>03 20 00 Concrete Reinforcing</b>				<b>\$56,856.96</b>
<b>03 21 00 Reinforcing Steel</b>				<b>\$56,856.96</b>
<b>03 21 00 Reinforcing Steel</b>				<b>\$56,856.96</b>
Reinforcing Steel 10M S/I	400.00	kg	\$2.88	\$1,152.00
Reinforcing Steel 15M S/I	12,610.00	kg	\$2.88	\$36,316.80
Reinforcing Steel 20M S/I	584.00	kg	\$2.88	\$1,681.92
Reinforcing Steel 25M S/I	6,148.00	kg	\$2.88	\$17,706.24
Reinforcing Steel 30M S/I	0.00	kg	\$0.00	\$0.00
Reinforcing Steel 35M S/I	0.00	kg	\$0.00	\$0.00
<b>03 30 00 Cast-in-Place Concrete</b>				<b>\$777,806.94</b>
<b>03 31 00 Structural Concrete</b>				<b>\$777,806.94</b>
<b>03 31 00 Concrete Supply</b>				<b>\$777,806.94</b>
25 MPA - Footing	3.70	m3	\$131.21	\$485.70
25 MPA - Foundation Walls	5.78	m3	\$142.68	\$824.24
25 MPA - Interior Augured Footings	129.46	m3	\$137.75	\$17,833.31
25 MPA - Slabs	1,235.30	m3	\$95.02	\$117,378.21
25 MPA with air - Perimeter Augured Footings	431.04	m3	\$137.75	\$59,375.31
25 MPA with air - Foundation Walls	71.64	m3	\$142.68	\$10,221.85
25 MPA with air - Trench Footing	138.02	m3	\$131.21	\$18,109.00
25 MPA with air - Piers	7.82	m3	\$141.35	\$1,105.63
Environmental Cost, Fuel Surcharge & Carbon Tax	2,022.76	m3	\$9.00	\$18,204.80
Steel Fibres 15kg/m3	18,529.56	kg	\$27.50	\$509,562.90

High Range Super Plasticizer (Required with Steel Fibres)	1,235.30	m3	\$20.00	\$24,706.00
<b>03 35 00 Concrete Finishing</b>				<b>\$146,618.44</b>
<b>03 35 00 Concrete Finishing</b>				<b>\$146,618.44</b>
Floor Hardener Traprock 60lbs/100sf	85,321.83	sf	\$0.75	\$63,991.37
Pour / Finish 6" Slab on Grade	85,321.83	sf	\$0.70	\$59,725.28
Sawcuts @ slab on grade	17,962.00	lf	\$0.80	\$14,369.60
Wet Cure Slab on Grade > film	85,321.83	sf	\$0.10	\$8,532.18
<b>03 40 00 Precast Concrete</b>				<b>\$1,550,632.50</b>
<b>03 45 00 Precast Architectural Concrete</b>				<b>\$1,550,632.50</b>
<b>03 45 13 Faced Architectural Precast Concrete</b>				<b>\$1,550,632.50</b>
Insulated Precast Concrete Panel System	34,458.50	sf	\$45.00	\$1,550,632.50
<b>04 00 00 Masonry</b>				<b>\$15,276.93</b>
<b>04 20 00 Unit Masonry</b>				<b>\$15,276.93</b>
<b>04 22 00 Concrete Unit Masonry</b>				<b>\$15,276.93</b>
<b>04 22 00 Masonry</b>				<b>\$15,276.93</b>
Fire-rated CMU Block 190mm - 2 hrs	1,081.17	sf	\$14.13	\$15,276.93
<b>05 00 00 Metals</b>				<b>\$1,115,572.12</b>
<b>05 10 00 Structural Metal Framing</b>				<b>\$886,645.90</b>
<b>05 12 00 Structural Steel Framing</b>				<b>\$886,645.90</b>
<b>05 12 00 Structural Steel</b>				<b>\$886,645.90</b>
Column HSS 254x254x10	15,912.20	kg	\$4.98	\$79,175.53
Column HSS 254x254x13	5,623.18	kg	\$3.84	\$21,573.96
Column HSS 305x305x10	51,026.03	kg	\$4.11	\$209,815.16
Continuous Angle L127x76x10	6,022.17	kg	\$7.87	\$47,394.47
Bracing Angles L76x76x6	1,498.98	kg	\$0.45	\$680.40
Girts HSS 203x203x6	4,878.95	kg	\$5.23	\$25,533.58
Girts HSS 203x203x10	2,639.95	kg	\$3.59	\$9,481.55
Girts HSS 203x203x13	1,143.43	kg	\$2.77	\$3,168.98
Girts W360x33	1,579.79	kg	\$3.43	\$5,418.83
X Bracing HSS 203x203x6	5,050.01	kg	\$5.23	\$26,428.78
X Bracing HSS 254x254x13	1,932.27	kg	\$4.89	\$9,442.59
Beam W200x27	3,623.76	kg	\$4.09	\$14,828.80
Beam W250x33	4,807.50	kg	\$3.43	\$16,490.15
Beam W360x33	4,522.50	kg	\$3.43	\$15,512.59
Beam W410x39	1,364.77	kg	\$3.08	\$4,210.08

Beam W410x46	337.49	kg	\$3.06	\$1,034.39
Beam W460x52	1,638.77	kg	\$3.08	\$5,054.43
Beam W460x60	508.82	kg	\$3.03	\$1,542.66
Beam W760x134	7,505.22	kg	\$3.11	\$23,358.44
Beam W840x176	37,251.93	kg	\$2.82	\$105,004.68
Beam W920x201	25,203.59	kg	\$2.81	\$70,921.15
Beam W920x238	4,274.94	kg	\$2.97	\$12,683.41
OWSJ 900mm	94,436.64	kg	\$1.67	\$158,068.19
ALLOWANCE - Base plates, gusset plates, connections, bolts, etc. (2% of total structural steel weight)	5,655.66	kg	\$3.51	\$19,823.09
<b>05 30 00 Metal Decking</b>				<b>\$228,926.22</b>
<b>05 31 00 Steel Decking</b>				<b>\$228,926.22</b>
<b>05 31 23 Steel Decking</b>				<b>\$228,926.22</b>
Metal Roof Deck @ Main Roof	91,119.47	sf	\$2.49	\$226,887.48
Metal Roof Deck @ Entrance Canopies	818.77	sf	\$2.49	\$2,038.74
<b>06 00 00 Wood, Plastics, and Composites</b>				<b>\$4,632.96</b>
<b>06 10 00 Rough Carpentry</b>				<b>\$4,632.96</b>
<b>06 11 00 Wood Framing</b>				<b>\$4,632.96</b>
<b>06 11 10 Blocking</b>				<b>\$4,632.96</b>
2' x 10' x 12' @ Parapet	1,272.79	lf	\$3.64	\$4,632.96
<b>07 00 00 Thermal and Moisture Protection</b>				<b>\$323,964.37</b>
<b>07 40 00 Roofing and Siding Panels</b>				<b>\$119,521.82</b>
<b>07 42 13 Metal Wall Panels</b>				<b>\$119,521.82</b>
<b>07 42 13.20 Aluminum Siding Panels</b>				<b>\$8,621.22</b>
Aluminum Composite Panel Alucobond System SL2000 - Color Red @ Canopy	694.14	sf	\$6.21	\$4,310.61
Aluminum Soffits Alucobond System SL2000 - Color Red @ Canopy	694.14	sf	\$6.21	\$4,310.61
<b>07 42 13.30 Steel Siding</b>				<b>\$110,900.60</b>
Insulated Metal Panels (Type W2) - Grey	5,282.72	sf	\$17.86	\$94,349.38
Insulated Metal Panels (Type W2) - White	926.72	sf	\$17.86	\$16,551.22

<b>07 50 00 Membrane Roofing</b>				\$198,984.79
<b>07 51 00 Built-Up Bituminous Roofing</b>				\$198,984.79
<b>07 51 13.20 Built-Up Roofing Systems</b>				\$198,984.79
Roof R1 (Bldg) - 4 ply built up roofing over R30 rigid insulation over vapor retarder - Note 301/A3.2	85,321.83	sf	\$2.31	\$197,093.43
Roof R2 (Canopy) - Single ply membrane flashing	818.77	sf	\$2.31	\$1,891.36
<b>07 65 00 Flexible Flashing</b>				\$5,457.77
<b>07 65 10 Sheet Metal Flashing</b>				\$5,457.77
<b>07 65 10 Sheet Metal Flashing</b>				\$5,457.77
Metal cap flashing w/ cont. metal starter strip @ IMP Parapet	509.12	sf	\$5.36	\$2,728.88
Metal cap flashing w/ cont. metal starter strip @ Parapet Precast	509.12	sf	\$5.36	\$2,728.88
<b>08 00 00 Openings</b>				\$1,064,245.46
<b>08 10 00 Doors and Frames</b>				\$5,487.57
<b>08 11 00 &amp; 08 13 00 Metal Doors and Frames</b>				\$5,487.57
<b>08 11 13 &amp; 08 13 13 Metal Doors and Frames</b>				\$5,487.57
Hollow Metal Door - 3-2 x 7-0	9	ea	\$404.92	\$3,644.28
Hollow Metal Frame - 3-2 x 7-0	9	ea	\$204.81	\$1,843.29
<b>08 30 00 Specialty Doors and Frames</b>				\$41,413.00
<b>08 33 00 Coiling Doors and Grilles</b>				\$41,413.00
<b>08 33 23 Sectional Overhead Coiling Doors</b>				\$41,413.00
Overhead Door 12 x 14' Type SD2	2	ea	\$4,550.18	\$9,100.36
Overhead Door 9 x 10' Type SD1	12	ea	\$2,692.72	\$32,312.64
<b>08 40 00 Entrances, Storefronts, and Curtain Walls</b>				\$509,645.82
<b>08 42 00 Entrances</b>				\$10,347.76
<b>08 42 26 All-Glass Entrances</b>				\$10,347.76
Aluminum Entrance Door (Double Door) w/ Tempered Glazing & Hardware	4	ea	\$2,586.94	\$10,347.76
<b>08 44 00 Curtain Wall and Glazed Assemblies</b>				\$499,298.06



<b>08 44 13 Glazed Aluminum Curtain Walls</b>				<b>\$499,298.06</b>
Alum Curtain Wall 1" Insulated Tempered Glass - Vision & Spandrel Panels	6,712.80	sf	\$74.38	\$499,298.06
<b>08 70 00 Hardware</b>				<b>\$8,401.00</b>
<b>08 71 00 Door Hardware</b>				<b>\$8,401.00</b>
<b>08 71 20 Hardware</b>				<b>\$8,401.00</b>
Hinges Per Door	27	ea	\$43.56	\$1,176.12
Door Stop W1276 CCS	9	ea	\$52.00	\$468.00
Threshold 200D	13	ea	\$66.43	\$863.59
Standard Door Closer - 8581 BF	9	ea	\$288.33	\$2,594.97
Door Shoe 216DV	9	ea	\$198.40	\$1,785.60
Door Seals S88	9	ea	\$34.32	\$308.88
Latch Guard LP2	9	ea	\$133.76	\$1,203.84
<b>09 00 00 Finishes</b>				<b>\$7,403.87</b>
<b>09 20 00 Plaster and Gypsum Board</b>				<b>\$5,390.68</b>
<b>09 21 00 Plaster and Gypsum Board Assemblies</b>				<b>\$5,390.68</b>
<b>09 21 16 Gypsum Board Assemblies</b>				<b>\$5,390.68</b>
Drywall Partition type P2 - 2hr separation	786.96	sf	\$6.85	\$5,390.68
<b>09 90 00 Painting and Coating</b>				<b>\$2,013.19</b>
<b>09 91 00 Painting</b>				<b>\$2,013.19</b>
<b>09 91 23 Interior Painting</b>				<b>\$2,013.19</b>
Paint Door & Frame 2 coats - Single door	9	ea	\$75.04	\$675.36
Drywall Paint 2 coats @ P2 wall type (both sides)	1,573.92	sf	\$0.85	\$1,337.83
<b>11 00 00 Equipment</b>				<b>\$121,932.00</b>
<b>11 10 00 Vehicle and Pedestrian Equipment</b>				<b>\$121,932.00</b>
<b>11 13 00 Loading Dock Equipment</b>				<b>\$121,932.00</b>
<b>11 13 19 Stationary Loading Dock Equipment</b>				<b>\$121,932.00</b>
Loading Dock Equipment - hydraulic	12.00	ea	\$10,161.00	\$121,932.00

<b><i>SUBTOTAL 1: DIRECT COSTS</i></b>	<b>\$5,117,209.62</b>
<b><i>General Conditions (4.5%)</i></b>	<b>\$230,274.43</b>
<b><i>SUBTOTAL 2</i></b>	<b>\$5,347,484.05</b>
<b><i>Construction Contingency (3%)</i></b>	<b>\$160,424.52</b>
<b><i>SUBTOTAL 3</i></b>	<b>\$5,507,908.57</b>
<b><i>Fee (5%)</i></b>	<b>\$275,395.43</b>
<b><i>GRAND TOTAL</i></b>	<b>\$5,783,304.00</b>

#### 4.0 TENDER ANALYSIS FOR CONCRETE SUPPLY

Project Name: Parkhill Development Building 2

Date: December 7, 2022

Table 2 – Concrete Tender Analysis

			SUBTRADE #1		SUBTRADE #2	
Items	Qty	Unit	Unit Rate	Total Cost	Unit Rate	Total Cost
25MPa Concrete in Footing	710.04	m3	\$107.00	\$75,974.28	\$112.00	\$79,524.48
25MPa Concrete in Foundation	77.42	m3	\$116.00	\$8,980.72	\$117.00	\$9,058.14
25MPa Concrete in SOG	1235.3	m3	\$127.00	\$156,883.10	\$122.00	\$150,706.60
Environmental Cost, Fuel Surcharge & Carbon Tax	2022.76	m3	\$8.65	\$17,496.87	\$9.00	\$18,204.84
Steel Fibres 15kg/m3	18529.56	kg	\$5.67	\$105,062.61	\$5.33	\$98,762.55
High Range Super Plasticizer (Required with Steel Fibres)	1235.3	m3	\$30.00	\$37,059.00	\$22.00	\$27,176.60
<b>TOTAL</b>				<b>\$401,456.58</b>		<b>\$383,433.21</b>

Based on the tender analysis, Subtrade #2 will have the lower cost. Therefore, we will select Subtrade #2. Unit rate for material cost by subtrade #2 will be used in this estimate. No mark-up will be applied.

#### 5.0 LIST OF ASSUMPTIONS

1. For 03 31 00 Concrete Supply – 25 MPa with Air Foundation Walls, since FGL varies from 211.53 to 211.58 around the building the average elevation of 211.56m was used.
2. Loose items such as angles for OWSJ connections, clip angles and back slopes angles are included in the allowance for connection quantities.

3. For steel sections, standard weights were taken from CISC steel shapes database retrieved from <https://www.dlubal.com/>.
4. For reinforcing bar unit weight ( $\text{kg/m}^3$ ) is calculated using  $d^2/162$ .
5. Pricing for labor and equipment cost of augered footings are based on deep continuous footing, direct chute 03310570 – Placing Concrete.
6. Pricing for labor and equipment cost of 650mm & 850mm piers are based on columns, square or round, 900mm thk, pumped 03310570 – Placing Concrete.
7. Conversion for steel weight is  $1000 \text{ kg} = 1 \text{ metric ton}$ .
8. Quantities from the calculation that is in square meter are converted to square feet to match the master format breakdown.
9. RS Means pricing were adjusted to match the units in the Brocolinni breakdown (i.e. structural steels, membrane roofing)

## 6.0 SAMPLE CALCULATIONS OF QUANTITY TAKE-OFF

### 6.1 Augered Footing

#### Augered Footing- 25 MPA (Concrete supply)

Diameter = 2440mm, Height = 1400mm, No. of footing F1= 7

$$\text{Area of footing} = \pi \times (d/2)^2 = \pi \times (2.44/2)^2 = 4.68 \text{ m}^2$$

$$\text{The volume of concrete} = \text{Area} \times \text{Height} = 4.68 \text{ m}^2 \times 1.4\text{m} = 6.552 \text{ m}^3$$

Total quantity for 25 MPA – interior Augured footing F1

$$\text{Vol.F1} = \text{No. of Footing} \times \text{Volume} = 7 \times 6.552 \text{ m}^3 = 45.864 \text{ m}^3$$

$$\text{Total volume including Wastage } 10\% = 1.1 \times 45.864 = \mathbf{50.45 \text{ m}^3}$$

#### 25 MPA with air Piers (Concrete Supply).

Length = 800mm; width = 800mm; Height = 1050mm,

No of Pier1 = 8

$$\text{Total volume} = \text{No of piers} \times \text{Length} \times \text{width} \times \text{height} = 8 \times 0.8 \times 0.8 \times 1.05$$

$$\text{Total volume} = 5.376 \text{ m}^3$$

**Total volume including Wastage 3% =  $1.03 \times 5.376 \text{ m}^3 = 5.537 \text{ m}^3$**

Augured Footing- Reinforcement

25M vertical

Length of one rebar = 1.4m, # of bars = 18, Unit Weight =  $3.92 \text{ kg/m}^3$ , # of F1 footing = 12

Total weight =  $18 \times 1.4 \times 3.92 \times 12 = 1,185.45 \text{ kg}$

15M ties @ 300mm O/C

Length of one rebar =  $\pi d = 3.14 \times (2.44 - 2 \times 0.075) = 7.19 \text{ m}$

# Of bars =  $(1.4 / 0.3 + 1) = 6$ , Unit Weight =  $1.58 \text{ kg/m}^3$ , # of F1 footing = 12

Total weight =  $7.19 \times 6 \times 1.58 \times 12 = 817.93 \text{ kg}$

**6.2 Trench Footing**

Interior Wall Perimeter =  $5406 + 4166 + 6959 + 200 + 5406 + 5406 = 27543 \text{ mm}$

Less 5d (4+1 x d to include the middle wall) = 500 mm

$PCL_{\text{int.wall}} = 27543 \text{ mm} + 500 \text{ mm} = 28043 \text{ mm} / 1000 = 28.043 \text{ m}$

Width of footing = 600 mm; Thickness = 200

Total Volume =  $28.043 \text{ m} \times 0.2 \text{ m} \times 0.6 \text{ m} = 3.37 \text{ m}^3$

Total Volume + 10% wastage factor =  $3.70 \text{ m}^3$

**Reinforcement**

15M Bottom Bar

Length of one rebar = 388.212m, # of bars = 2, Unit Weight =  $1.58 \text{ kg/m}^3$

Total weight =  $388.212 \times 2 \times 1.58 = 1226.74 \text{ kg}$

**6.3 Foundation Wall**

Concrete Supply

Interior wall for Electrical and sprinkler room

$PCL_{\text{int.wall}} = 28.043 \text{ m}$

Width of wall = 200 mm; Height = 1000

Total Volume =  $28.043 \text{ m} \times 0.2 \text{ m} \times 1 \text{ m} = 5.61 \text{ m}^3$

Total Volume + 3% wastage factor =  $5.78 \text{ m}^3$

Formwork

West side wall

Interior wall length =  $131.244 - 2 \times 0.23 = 130.784 \text{ m}$

Formwork for west wall =  $131.244 \times 1.35 + 130.784 \times 1.3 = 353.737 \text{ m}^2 = 3,807.59 \text{ sf}$

North, East, South and West Recess wall

Interior wall length =  $257.408 - 3 \times 0.23 = 256.718 \text{ m}$

Formwork =  $257.408 \times 0.3 + 256.718 \times 0.3 = 154.23 \text{ m}^2 = 1,660.12 \text{ sf}$

Total Foundation wall formwork =  $3,807.59 + 1,660.12$

Total Foundation wall formwork =  $5,467.71 \text{ sf}$

### Reinforcement

Horizontal 15M cont. top,

Length of one rebar =  $257.408 \text{ m}$ , # of bars = 4, Unit Weight =  $1.58 \text{ kg/m}^3$

Total weight =  $257.408 \times 4 \times 1.58 = 1,626.81 \text{ kg}$

15M Dowel @ 400mm O/C typical section

Length of one rebar =  $0.75 \text{ m}$ , # of bars =  $(257.408/0.4 + 1) = 655$ , Unit Weight =  $1.58 \text{ kg/m}^3$

Total weight =  $0.75 \times 655 \times 1.58 = 776.175 \text{ kg}$

## 6.4 Strip Footing

### Concrete Supply

Interior wall for Electrical and sprinkler room

Width of footing =  $600 \text{ mm}$ ; Thickness =  $200 \text{ mm}$

Total Volume =  $28.043 \text{ m} \times 0.6 \text{ m} \times 0.2 \text{ m} = 3.37 \text{ m}^3$

Total Volume + 10% wastage factor =  $3.7 \text{ m}^3$

### Formwork

Outer Perimeter =  $[2 \times (5406+400) + 6959 + 4166 + (5 \times 200)] = 23,737 \text{ mm} = 23.737 \text{ m}$

Interior Perimeter =  $[4 \times (5406 - 200) + 4166 - 400 + 6959 - 400] = 31,149 \text{ mm} = 31.149 \text{ m}$

Formwork =  $31.149 \times 0.2 + 23.737 \times 0.2 = 10.9772 \text{ m}^2$

Formwork =  $118.15 \text{ sf}$

### Reinforcement

15M Bottom Bar

Length of one rebar =  $30.349 \text{ m}$ , # of bars = 2, Unit Weight =  $1.58 \text{ kg/m}^3$

Total weight =  $30.349 \times 2 \times 1.58 = 95.90 \text{ kg}$

## 6.5 Slab on Grade

Concrete supply – slab area is divided into no. of parts

Volume of concrete (1) = Area (1) x Depth = (131.244 x 30.271) x 0.15 = 595.93m<sup>3</sup>

Volume of concrete in square feet = (595.93 x 10.764 = 6414.50 cu. ft.

Similarly,

V2 = 725.91 m<sup>3</sup>, V3 = 4560.88 m<sup>3</sup> ,V4 = 370.62 m<sup>3</sup> ,V5 = 582.2 m<sup>3</sup> ,V6 = 251.92 m<sup>3</sup> ,

Total volume of slab = 6411.29 + 725.91 +4560.88 + 370.62 + 582.20 +251.92  
= 12902 cu. ft

Total volume of slab = 1199.24 cu. m

#### Placing of Finishing

Area (1) = Length x Breadth = 131.244 x 30.271 x 10.764 = 42741.157 sf

Similarly,

A2 = 725.91 sf, A3 = 4560.88 sf, A4 = 370.62 sf, A5 = 582.2 sf, A6 = 251.92 sf,

Total Area = 42741.91 +725.91 +4560.88 +370.62 +582.2 +251.92  
= 49233.44 sf

### 6.8 Structural Steel

Column HSS 254x254x10

Length = 11.143m

Weight of Column = 71.40 kg/m

No. of Columns = 20

Total weight of Column HSS 254x254x10 = 20 x 11.143m x 71.40kg/m = 15,912.20 kg

Beam W460x52

Mark	Section	Type	Col- Col Length	Col 1	Col 2	Length *	Qty	Length
4B2	Beam W460x52	Beam	7816	305	305	7511	1	7.51
4B7	Beam W460x52	Beam	8463	305	305	8158	1	8.16
4B6	Beam W460x52	Beam	8168	305	305	7863	1	7.86
4B5	Beam W460x52	Beam	8167	305	305	7862	1	7.86
Total Length								31.39

\*Length = Col-col length – (Col 1/2 + Col 2/2)

Total weight of Beam W460x52 = 31.39m x 52.2 kg/m = 1,638.56 kg

## 7.0 CONCLUSION

Parkhill Development project is an industrial building structure with a surface area of 7969.32 m<sup>2</sup> located in Milton, Ontario. The quantities were calculation based on the provided construction drawings and best practices in estimation. For the pricing of items, RS Means online database and the provided Broccolini price lists were utilized. Based on the provided quotes and supply prices, the tender analysis for the supply of concrete is completed. It is concluded that Subtrade #2 will be adapted for the concrete supply material cost since they are quoting the lower prices. The majority of the bid amount is allocated to concrete works and structural steel framing and metal decking works. Building openings and roller doors also added significant amount.

BVVD Builders Inc. are putting in a bid to build this facility as a general contractor. For the ensuing project, a lump-sum contract will be employed. A total project cost of \$5,783,304.00 was offered to the Client which includes direct costs, indirect charges, and markups. With the cost projection, the first phase of the of bid process was completed.

## 8.0 REFERENCES

Plotner, S.C., 2017. RS Means Building Construction Cost Data, 74th Annual Edition. RS Means.

RS Means from Gordian. Canadian Construction Cost Data. RS Means (Version 66FTV1). Retrieved from <https://www.rsmeansonline.com/>

## 9.0 APPENDIX

### Detailed Calculation of Quantities

#### Steel Quantities and RSmeans Pricing conversion

Section Size	Length (m)	Unit Weight (kg/m)	Total Weight (kg)	RSmeans Description	RSmeans Code	Qty	Unit	Material Cost	Labor Cost	Equip Cost	New Material Cost	New Labor Cost	New Equipment Cost
Column HSS 254x254x10	222.86	71.4	15912.20	Struct tubing 250x250	051223.13	60	ea	1225	55.5	34	4.64	0.21	0.13
Column HSS 254x254x13	60.73	92.6	5623.18	Struct tubing 250x250	051223.13	16	ea	1225	55.5	34	3.58	0.16	0.10
Column HSS 305x305x10	590.58	86.4	51026.03	Struct tubing 250x250	051223.13	160	ea	1225	55.5	34	3.83	0.17	0.11
Continuous Angle L 127x76x10	415.32	14.5	6022.17	Angle framing, 100 or larger		6022.17	kg	1.43	5.9	0.54	1.43	5.90	0.54
Bracing Angles L 76x76x6	205.34	7.3	1498.98	Angle framing less than 100		1498.98	kg	1.5	9.85	0.91	0.06	0.36	0.03
Girls HSS 203x203x6	126.73	38.5	4878.95	Struct tubing 200x200	051223.13	34	ea	660	53	32.5	4.63	0.37	0.23
Girls HSS 203x203x10	47.06	56.1	2639.95	Struct tubing 200x200	051223.13	13	ea	660	53	32.5	3.18	0.26	0.16
Girls HSS 203x203x13	15.73	72.7	1143.43	Struct tubing 200x200	051223.13	4	ea	660	53	32.5	2.45	0.20	0.12
Girls W360x33	48.02	32.9	1579.79	W 250 x 33	051223.75	48.02	m	89.5	14.5	8.85	2.72	0.44	0.27
X Bracing HSS 203x203x6	131.17	38.5	5050.01	Struct tubing 200x200	051223.13	35	ea	660	53	32.5	4.63	0.37	0.23
X Bracing HSS 254x254x13	26.58	72.7	1932.27	Struct tubing 250x250	051223.13	7	ea	1225	55.5	34	4.55	0.21	0.13
Beam W200x27	136.23	26.6	3623.76	W 300 x 31	051223.75	136.23	m	85.5	14.5	8.85	3.21	0.55	0.33
Beam W250x33	146.12	32.9	4807.50	W 250 x 33	051223.75	146.12	m	89.5	14.5	8.85	2.72	0.44	0.27
Beam W360x33	137.46	32.9	4522.50	W 250 x 33	051223.75	137.46	m	89.5	14.5	8.85	2.72	0.44	0.27
Beam W410x39	35.08	38.9	1364.77	W 410 x 39	051223.75	35.08	m	106	8.7	5.3	2.72	0.22	0.14
Beam W410x46	7.31	46.2	337.49	W 410 x 46	051223.75	7.31	m	126	9.7	5.9	2.73	0.21	0.13
Beam W460x52	31.39	52.2	1638.77	W 460 x 52	051223.75	31.39	m	142	13.1	5.9	2.72	0.25	0.11
Beam W460x60	8.52	59.7	508.82	W 460 x 60	051223.75	8.52	m	162	13.1	5.9	2.71	0.22	0.10
Beam W760x134	56.26	133.4	7505.22	W 760 x 147	051223.75	56.26	m	400	10.45	4.73	3.00	0.08	0.04
Beam W840x176	211.90	175.8	37251.93	W 840 x 176	051223.75	211.90	m	480	10.7	4.84	2.73	0.06	0.03
Beam W920x201	125.39	201	25203.59	W 920 x 201	051223.75	125.39	m	550	10.75	4.85	2.74	0.05	0.02
Beam W920x238	17.97	237.9	4274.94	W 920 x 253	051223.75	17.97	m	690	10.9	4.93	2.90	0.05	0.02
OW/SJ 900mm	3604.45	26.2	94436.64	30K12	0512119.12	11822.6019	lf	11	1.6	0.77	1.38	0.20	0.10



**STRUCTURAL STEEL FRAMING**

Mark	Section	Type	T.O.S.	Column 1	Column 2	Length	Qty	Length	Dwg No.
4C8	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C10	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C11	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C16	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C19	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C17	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C9	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C12	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C13	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C18	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C14	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C12	Column HSS 254x254x13	Column	10820			11143	1	11.14	S1
2C9	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C7	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C13	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C16	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C5	Column HSS 254x254x13	Column	10820			11143	1	11.14	S1
2C10	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C14	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C11	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
2C15	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C19	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C8	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C10	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C17	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C16	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C17	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C9	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C11	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C18	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C12	Column HSS 254x254x13	Column	10820			11143	1	11.14	S1
1C6	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C13	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C14	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C7	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
1C15	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C7	Column HSS 254x254x13	Column	10820			11143	1	11.14	S1
3C11	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C10	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C9	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C8	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C2	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C4	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C5	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C3	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C6	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C3	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C6	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C3	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C6	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C4	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1

3M1	Bracing Angles L76x76x6	Beam	2761.959			2762	4	11.05	S1
3M2	Bracing Angles L76x76x6	Beam	2761.959			2762	4	11.05	S1
4M8	Bracing Angles L76x76x6	Beam	2873.682			2873.7	4	11.49	S1
4M16	Bracing Angles L76x76x6	Beam	2873.682			2873.7	4	11.49	S1
1B27	Girts W360x33	Beam	5316	305	305	5011	1	5.01	S2
1B29	Girts W360x33	Beam	6640	305	305	6335	1	6.34	S2
1B30	Girts W360x33	Beam	6640	305	305	6335	1	6.34	S2
1B28	Girts W360x33	Beam	5316	305	305	5011	1	5.01	S2
1B26	Beam W360x33	Beam	1900			1900	1	1.90	S1
1B25	Beam W360x33	Beam	1900			1900	1	1.90	S1
1B32	Beam W360x33	Beam	9192			9192	1	9.19	S1
1B31	Beam W360x33	Beam	9192			9192	1	9.19	S1
MC1	Beam W360x33	Beam	1900	305		1747.5	3	5.24	S1
1B24	Beam W200x27	Beam	1900			1900	12	22.80	S1
PM2	Bracing Angles L76x76x6	Beam	18592			18592	1	18.59	S1
4B25	Girts W360x33	Beam	5364	305	305	5059	1	5.06	S2
4B26	Girts W360x33	Beam	4723	305	305	4418	1	4.42	S2
4B28	Beam W360x33	Beam	9175	305	305	8870	1	8.87	S1
4B31	Beam W360x33	Beam	1900	305	305	1595	1	1.60	S1
4B30	Beam W200x27	Beam	1900	305	305	1595	5	7.98	S1
MC1	Beam W360x33	Beam	1900	305		1747.5	4	6.99	S1
4B24	Beam W200x27	Beam	1900			1900	7	13.30	S1
4B32	Girts W360x33	Beam	8643	305	305	8338	1	8.34	S2
4B29	Girts W360x33	Beam	7816	305	305	7511	1	7.51	S2
4B33	Beam W360x33	Beam	12280			12280	1	12.28	S1
4B27	Beam W360x33	Beam	1900			1900	1	1.90	S1
PM2	Bracing Angles L76x76x6	Beam	17655			17655	1	17.66	S1
3RF1	Bracing Angles L76x76x6	Joist	2032			2032	2	4.06	S1
4RF1	Bracing Angles L76x76x6	Joist	2032			2032	4	8.13	S1
4RF2	Bracing Angles L76x76x6	Joist	1905			1905	2	3.81	S1
4RF3	Bracing Angles L76x76x6	Joist	1905			1905	2	3.81	S1
OWSJ	OWSJ 900mm	OSWJ	16459			16459	84	1382.56	S1
OWSJ	OWSJ 900mm	OSWJ	16459	305	254	16040	1	16.04	S1
OWSJ	OWSJ 900mm	OSWJ	16459	254	254	16078	6	96.47	S1
OWSJ	OWSJ 900mm	OSWJ	16459	305		16230	4	64.92	S1
OWSJ	OWSJ 900mm	OSWJ	15231	305		15002	2	30.00	S1
OWSJ	OWSJ 900mm	OSWJ	15231	254	305	14812	1	14.81	S1
OWSJ	OWSJ 900mm	OSWJ	15231		305	15002	1	15.00	S1
OWSJ	OWSJ 900mm	OSWJ	15231	254		15041	1	15.04	S1
OWSJ	OWSJ 900mm	OSWJ	15231			15231	20	304.62	S1
OWSJ	OWSJ 900mm	OSWJ	16459	254	254	16078	6	96.47	S1
OWSJ	OWSJ 900mm	OSWJ	16459	254	254	16078	5	80.39	S1
OWSJ	OWSJ 900mm	OSWJ	16459			16459	56	921.70	S1
OWSJ	OWSJ 900mm	OSWJ	16459			16459	10	164.59	S1
OWSJ	OWSJ 900mm	OSWJ	16459			16459	9	148.13	S1
OWSJ	OWSJ 900mm	OSWJ	15142			15142	1	15.14	S1
OWSJ	OWSJ 900mm	OSWJ	13711		254	13521	1	13.52	S1
OWSJ	OWSJ 900mm	OSWJ	1279.5	254		1089	1	1.09	S1
OWSJ	OWSJ 900mm	OSWJ	10848.3			10848	1	10.85	S1
OWSJ	OWSJ 900mm	OSWJ	9417			9417	1	9.42	S1
OWSJ	OWSJ 900mm	OSWJ	7986			7986	1	7.99	S1
OWSJ	OWSJ 900mm	OSWJ	15857			15857	1	15.86	S1
OWSJ	OWSJ 900mm	OSWJ	14426			14426	1	14.43	S1
OWSJ	OWSJ 900mm	OSWJ	12995			12995	1	13.00	S1
OWSJ	OWSJ 900mm	OSWJ	11564			11564	1	11.56	S1

2B17	Beam W360x33	Beam	8025	305	305	7720	1	7.72	S1
2B18	Beam W360x33	Beam	6116	305	305	5811	1	5.81	S1
2B16	Beam W360x33	Beam	6074	305	254	5794.5	1	5.79	S1
2B11	Beam W250x33	Beam	8724	254	305	8444.5	1	8.44	S1
2B15	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
2B13	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
2B12	Beam W200x27	Beam	5922	305	305	5617	1	5.62	S1
2B14	Beam W200x27	Beam	5922	305	305	5617	1	5.62	S1
1B7	Beam W760x134	Beam	5163	305	305	4858	1	4.86	S1
1B6	Beam W200x27	Beam	3955	305	305	3650	1	3.65	S1
1B9	Beam W200x27	Beam	5316	305	305	5011	1	5.01	S1
1B11	Beam W200x27	Beam	6640	305	305	6335	1	6.34	S1
1B11	Beam W200x27	Beam	6640	305	305	6335	1	6.34	S1
1B9	Beam W200x27	Beam	5316	305	305	5011	1	5.01	S1
1B6	Beam W200x27	Beam	3955	305	305	3650	1	3.65	S1
1B10	Beam W760x134	Beam	5163	305	305	4858	1	4.86	S1
1B4	Beam W200x27	Beam	2655	305	254	2375.5	1	2.38	S1
1B3	Beam W410x39	Beam	7688	254	305	7408.5	1	7.41	S1
1B4	Beam W410x46	Beam	7610	305	305	7305	1	7.31	S1
1B5	Beam W250x33	Beam	6832	305	305	6527	1	6.53	S1
1B1	Beam W360x33	Beam	6836	305	305	6531	1	6.53	S1
1B2	Beam W360x33	Beam	6837	305	305	6532	1	6.53	S1
3B16	Beam W410x39	Beam	6896	305	254	6616.5	1	6.62	S1
3B3	Beam W360x33	Beam	5666	254	305	5386.5	1	5.39	S1
3B4	Beam W360x33	Beam	5866	305	305	5561	1	5.56	S1
3B2	Beam W360x33	Beam	6096	305	305	5791	1	5.79	S1
3B5	Beam W360x33	Beam	6096	305	305	5791	1	5.79	S1
3B1	Beam W360x33	Beam	6096	305	305	5791	1	5.79	S1
3B8	Beam W840x176	Beam	15488	305		15336	1	15.34	S1
3B6	Beam W840x176	Beam	15488	305		15336	1	15.34	S1
3B7	Beam W840x176	Beam	15488	305		15336	1	15.34	S1
3B6	Beam W840x176	Beam	15488	305		15336	1	15.34	S1
4B12	Beam W840x176	Beam	15488	305		15336	1	15.34	S1
4B10	Beam W840x176	Beam	15488	305		15336	1	15.34	S1
4B11	Beam W840x176	Beam	15488	305		15336	1	15.34	S1
3B10	Beam W920x201	Beam	18040		254	17913	1	17.91	S1
3B9	Beam W920x201	Beam	18040		254	17913	1	17.91	S1
3B11	Beam W920x201	Beam	18040		254	17913	1	17.91	S1
3B9	Beam W920x201	Beam	18040		254	17913	1	17.91	S1
4B14	Beam W920x201	Beam	18040		254	17913	1	17.91	S1
4B13	Beam W920x201	Beam	18040		254	17913	1	17.91	S1
4B15	Beam W920x201	Beam	18040		254	17913	1	17.91	S1
1B17	Beam W920x238	Beam	18249	254	305	17970	1	17.97	S1
1B15	Beam W840x176	Beam	18040	254		17913	1	17.91	S1
1B18	Beam W840x176	Beam	18040	254		17913	1	17.91	S1
1B16	Beam W840x176	Beam	18040	254		17913	1	17.91	S1
2B5	Beam W840x176	Beam	18040	254		17913	1	17.91	S1
2B6	Beam W840x176	Beam	18040	254		17913	1	17.91	S1
2B4	Beam W840x176	Beam	15240	254	254	14986	1	14.99	S1
1B14	Beam W760x134	Beam	9431			9431	1	9.43	S1
1B12	Beam W760x134	Beam	9431		305	9278.5	1	9.28	S1
1B13	Beam W760x134	Beam	9431		305	9278.5	1	9.28	S1
2B3	Beam W760x134	Beam	9431		305	9278.5	1	9.28	S1
2B2	Beam W760x134	Beam	9431		305	9278.5	1	9.28	S1
2B1	Beam W410x39	Beam	5819		305	5666.5	1	5.67	S1



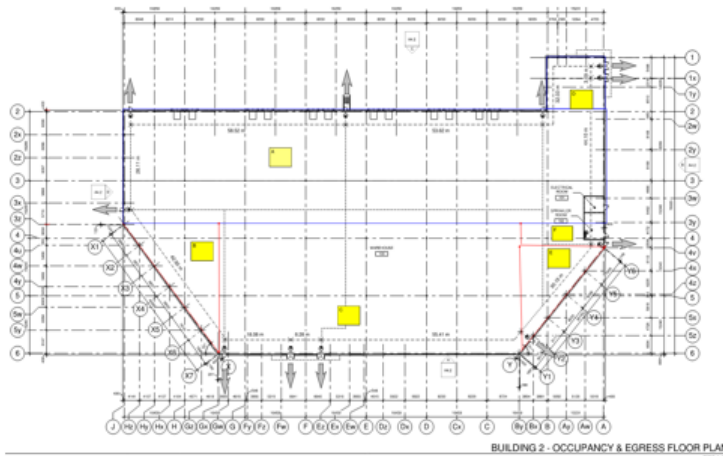
4C3	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C4	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C5	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C6	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C7	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
4C15	Column HSS 305x305x10	Column	10820			11143	1	11.14	S1
3C1	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
3C12	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
3C1	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
3C12	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
4C2	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
4C1	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
4C2	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
1C5	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
1C4	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
1C3	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
1C4	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
2C8	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
2C3	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
2C4	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
1C2	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
1C1	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
1C20	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
2C2	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
2C1	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
2C6	Column HSS 254x254x10	Column	10820			11143	1	11.14	S1
3B14	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
3B15	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
3B12	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
3B13	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
3B12	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
3B13	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
3B12	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
3B13	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
4B20	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
4B21	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
4B20	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
4B21	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
4B23	Beam W250x33	Beam	8230	305	305	7925	1	7.93	S1
4B22	Beam W250x33	Beam	8229	305	305	7924	1	7.92	S1
4B8	Beam W460x60	Beam	8828	305	305	8523	1	8.52	S1
4B3	Beam W360x33	Beam	5498	305	305	5193	1	5.19	S1
4B18	Beam W200x27	Beam	2763	305	305	2458	1	2.46	S1
4B16	Beam W200x27	Beam	2381	305	305	2076	1	2.08	S1
4B17	Beam W200x27	Beam	5364	305	305	5059	1	5.06	S1
4B19	Beam W200x27	Beam	4723	305	305	4418	1	4.42	S1
4B2	Beam W460x52	Beam	7816	305	305	7511	1	7.51	S1
4B7	Beam W460x52	Beam	8463	305	305	8158	1	8.16	S1
4B6	Beam W460x52	Beam	8168	305	305	7863	1	7.86	S1
4B5	Beam W460x52	Beam	8167	305	305	7862	1	7.86	S1
4B1	Beam W250x33	Beam	4666	305	305	4361	1	4.36	S1
4B4	Beam W360x33	Beam	6402	305	305	6097	1	6.10	S1
4B9	Beam W360x33	Beam	6681	305	254	6401.5	1	6.40	S1
2B20	Beam W410x39	Beam	7910	254	305	7630.5	1	7.63	S1
2B19	Beam W410x39	Beam	8067	305	305	7762	1	7.76	S1

OWSJ	OWSJ 900mm	OSWJ	10133			10133	1	10.13	\$1
OWSJ	OWSJ 900mm	OSWJ	8701			8701	1	8.70	\$1
OWSJ	OWSJ 900mm	OSWJ	14163			14163	1	14.16	\$1
OWSJ	OWSJ 900mm	OSWJ	12599			12599	1	12.60	\$1
OWSJ	OWSJ 900mm	OSWJ	11035			11035	1	11.04	\$1
OWSJ	OWSJ 900mm	OSWJ	9470			9470	1	9.47	\$1
OWSJ	OWSJ 900mm	OSWJ	7906			7906	1	7.91	\$1
OWSJ	OWSJ 900mm	OSWJ	16545		305	16316	1	16.32	\$1
OWSJ	OWSJ 900mm	OSWJ	14981			14981	1	14.98	\$1
OWSJ	OWSJ 900mm	OSWJ	13416			13416	1	13.42	\$1
OWSJ	OWSJ 900mm	OSWJ	11852			11852	1	11.85	\$1
OWSJ	OWSJ 900mm	OSWJ	10288			10288	1	10.29	\$1
1HG2	Girts HSS 203x203x6	Girts	5163	305	305	4858	4	19.43	\$2
1HG1	Girts HSS 203x203x6	Girts	3955	305	305	3650	4	14.60	\$2
1HG4	Girts HSS 203x203x6	Girts	5361	305	305	5056	4	20.22	\$2
1HG3	Girts HSS 203x203x6	Girts	6640	305	305	6335	4	25.34	\$2
2D4	X Bracing HSS 203x203x6	V Bracing	8021.109	305	305	7716.1	1	7.72	\$2
2D5	X Bracing HSS 203x203x6	V Bracing	8021.109	305	305	7716.1	1	7.72	\$2
2D6	X Bracing HSS 203x203x6	V Bracing	8021.109	305	305	7716.1	1	7.72	\$2
2D1	X Bracing HSS 203x203x6	V Bracing	8021.109	305	305	7716.1	1	7.72	\$2
2D3	X Bracing HSS 203x203x6	V Bracing	9848.909	305	305	9543.9	1	9.54	\$2
2D8	X Bracing HSS 203x203x6	V Bracing	9848.909	305	305	9543.9	1	9.54	\$2
2D7	X Bracing HSS 203x203x6	V Bracing	9848.073	305	305	9543.1	1	9.54	\$2
2D2	X Bracing HSS 203x203x6	V Bracing	9848.073	305	305	9543.1	1	9.54	\$2
4HG7	Girts HSS 203x203x6	Girts	4723	305	305	4418	2	8.84	\$2
4HG10	Girts HSS 203x203x6	Girts	5364	305	305	5059	2	10.12	\$2
4HG8	Girts HSS 203x203x6	Girts	2381	305	305	2076	2	4.15	\$2
4H69	Girts HSS 203x203x6	Girts	2763	305	305	2458	2	4.92	\$2
4D2	X Bracing HSS 254x254x13	V Bracing	13594.31	305	305	13289	1	13.29	\$2
3D9	X Bracing HSS 254x254x13	V Bracing	13594.31	305	305	13289	1	13.29	\$2
4HG1	Girts HSS 203x203x6	Girts	4666	305	305	4361	2	8.72	\$2
4HG3	Girts HSS 203x203x10	Girts	8166	305	305	7861	2	15.72	\$2
4HG4	Girts HSS 203x203x13	Girts	8169	305	305	7864	2	15.73	\$2
4HG2	Girts HSS 203x203x10	Girts	8462	305	305	8157	2	16.31	\$2
4HG5	Girts HSS 203x203x10	Girts	7816	305	305	7511	2	15.02	\$2
4D3	Column HSS 254x254x13	V Bracing	8381.748	305	305	8076.7	1	8.08	\$1
4D1	Column HSS 254x254x13	V Bracing	8381.748	305	305	8076.7	1	8.08	\$1
4HG6	Girts HSS 203x203x6	Girts	5498	305	305	5193	2	10.39	\$2
3D8	X Bracing HSS 203x203x6	V Bracing	8150.418	305	305	7845.4	1	7.85	\$2
3D4	X Bracing HSS 203x203x6	V Bracing	8150.418	305	305	7845.4	1	7.85	\$2
3D1	X Bracing HSS 203x203x6	V Bracing	8150.418	305	305	7845.4	1	7.85	\$2
3D7	X Bracing HSS 203x203x6	V Bracing	8150.418	305	305	7845.4	1	7.85	\$2
3D6	X Bracing HSS 203x203x6	V Bracing	7979.853	305	305	7674.9	1	7.67	\$2
3D2	X Bracing HSS 203x203x6	V Bracing	7979.853	305	305	7674.9	1	7.67	\$2
3D3	X Bracing HSS 203x203x6	V Bracing	7979.118	305	254	7699.6	1	7.70	\$2
3D5	X Bracing HSS 203x203x6	V Bracing	7979.118	305	254	7699.6	1	7.70	\$2
2B9	Beam W200x27	Joist	6342			6342	1	6.34	\$1
2B7	Beam W200x27	Joist	4778			4778	1	4.78	\$1
2B8	Beam W200x27	Joist	3214			3214	1	3.21	\$1
2B10	Beam W200x27	Joist	1650			1650	1	1.65	\$1
1B19	Beam W200x27	Joist	6654			6654	1	6.65	\$1
1B20	Beam W200x27	Joist	5123			5123	1	5.12	\$1
1B21	Beam W200x27	Joist	3692			3692	1	3.69	\$1
1B22	Beam W200x27	Joist	2261			2261	1	2.26	\$1
1B23	Beam W200x27	Joist	830			830	1	0.83	\$1

1M15	Bracing Angles L76x76x6	H Bracing	2694.077	305		2541.6	5	12.71	\$1
1M5	Bracing Angles L76x76x6	H Bracing	2694.077	305		2541.6	6	15.25	\$1
1M3	Bracing Angles L76x76x6	H Bracing	1982.254	305		1829.8	1	1.83	\$1
1M14	Bracing Angles L76x76x6	H Bracing	2745.821	305		2593.3	1	2.59	\$1
1M12	Bracing Angles L76x76x6	H Bracing	1982.254	305		1829.8	1	1.83	\$1
2M6	Bracing Angles L76x76x6	H Bracing	2694.077	305		2541.6	3	7.62	\$1
2M9	Bracing Angles L76x76x6	H Bracing	2694.077	305		2541.6	3	7.62	\$1
2M1	Bracing Angles L76x76x6	H Bracing	1905			1905	1	1.91	\$1
2M7	Bracing Angles L76x76x6	H Bracing	2129.855	305		1977.4	1	1.98	\$1
2M4	Bracing Angles L76x76x6	H Bracing	2129.855	305		1977.4	1	1.98	\$1
2M2	Bracing Angles L76x76x6	H Bracing	1905			1905	1	1.91	\$1
2M10	Bracing Angles L76x76x6	H Bracing	2438.341	305		2285.8	1	2.29	\$1
2M6	Bracing Angles L76x76x6	H Bracing	1943.12	305		1790.6	1	1.79	\$1
2M1	Bracing Angles L76x76x6	H Bracing	1905			1905	1	1.91	\$1
2M8	Bracing Angles L76x76x6	H Bracing	2129.855	305		1977.4	1	1.98	\$1
2M3	Bracing Angles L76x76x6	H Bracing	2129.855	305		1977.4	1	1.98	\$1
4M2	Bracing Angles L76x76x6	H Bracing	1905			1905	1	1.91	\$1
4M13	Bracing Angles L76x76x6	H Bracing	1998.46	305		1846	1	1.85	\$1
4M10	Bracing Angles L76x76x6	H Bracing	2306.865	305		2154.4	1	2.15	\$1
4M2	Bracing Angles L76x76x6	H Bracing	1905			1905	1	1.91	\$1
4M11	Bracing Angles L76x76x6	H Bracing	2451.504	305		2299	1	2.30	\$1
4M7	Bracing Angles L76x76x6	H Bracing	1939.09	305		1786.6	1	1.79	\$1
4M2	Bracing Angles L76x76x6	H Bracing	1905			1905	1	1.91	\$1
4M4	Bracing Angles L76x76x6	H Bracing	2129.855	305		1977.4	1	1.98	\$1
4M6	Bracing Angles L76x76x6	H Bracing	2129.855	305		1977.4	1	1.98	\$1
4M1	Bracing Angles L76x76x6	H Bracing	1766			1766	1	1.77	\$1
4M9	Bracing Angles L76x76x6	H Bracing	1850.259	305		1697.8	1	1.70	\$1
4M5	Bracing Angles L76x76x6	H Bracing	2143.024	305		1990.5	1	1.99	\$1
4M15	Bracing Angles L76x76x6	H Bracing	2592.253	305		2439.8	1	2.44	\$1
4M12	Bracing Angles L76x76x6	H Bracing	2185.676	305		2033.2	1	2.03	\$1
4M3	Bracing Angles L76x76x6	H Bracing	2185.676	305		2033.2	1	2.03	\$1
4M14	Bracing Angles L76x76x6	H Bracing	2592.253	305		2439.8	1	2.44	\$1
4M15	Bracing Angles L76x76x6	H Bracing	2592.253	305		2439.8	1	2.44	\$1
4M17	Bracing Angles L76x76x6	H Bracing	2592.253	305		2439.8	1	2.44	\$1
PM1	Continuous Angle L127x76x10	Cont. Angl	415322			415322	1	415.32	\$1



### 03 31 00 Concrete Supply



#### 25 MPA - Slabs

Total area is divided into parts

	No	Length	Width	Height	cu. M
A	1	30.271	131.244	0.15	595.93
B	0.5	34.538	26.048	0.15	67.473
C	1	34.538	81.83	0.15	423.94
D	1	14.326	16.031	0.15	34.449
E	0.5	23.366	30.88	0.15	54.116
F	1	23.366	6.681	0.15	23.416
					1199.3
				wastage factor 3%	1235.3

#### 25 MPA with air - Foundation Walls

Mark	Section Type	Qty	PCL	Width	T.O.S.	F.G.L.	Slab Thk	Total Height	Total Volume	Dwg. No.
	Section 1	1	302182	230	211.58	211.56	152	0.32	22.24	Section 1 S3.0
	Section 2	1	18850	230	211.58	211.56	152	0.168	0.73	Section 2 S3.0
	Section 4	12	2160	230	211.58	210.38	152	0.842	5.02	Section 4 S3.0, Section 5 A8.4
	Dock West Wall	12	2620	375			150	0.67	7.90	Section 4 S3.0, Section 5 & 7 A8.4
	Dock North and South Wall	24	2234	230	211.58		150	0.664	8.19	Section 4 S3.0, Section 5 & 7 A8.4
	Section 5	1	80607	230	211.58	210.38	152	1.5	27.81	Section 5 S3.0
LESS										
	PIER1	8	800	230				1.05	1.55	
	PIER2	5	650	230				1.05	0.78	
Total									69.56	
Total Volume of Concrete + 3% for waste factor									71.64	

**25 MPA - Foundation Walls**

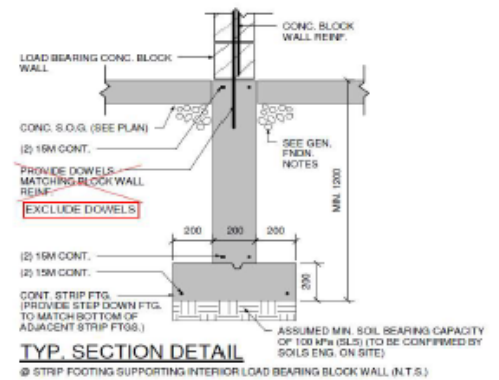
Exterior			Interior		
Mark	Grid	Ext. Wall Length	Mark	Grid	Int. Wall Length
North Wall	Along Grid A	50898	Sprinkler/Elect		
South Wall	Along Grid J	30405	East Wall		5406
East Wall	Along Grid 6	82767	South Wall		11325
West Wall	Along Grid 1 & 2	131244	West Wall		5406
North-East Wall	Along Grid Y	36525	Partition		5406
South-East Wall	Along Grid X	43032			
Recess	Along Grid A & B	28928			
Total Length		403799	Total Length		27543
Less	=400x4	1600	Add	=100x5	500
PCL		402199	PCL		28043

**25 MPA - Footing**

Mark	Qty	PCL	Width	Thickness	Total Volume	Dwg. No.
Cont. Strip Ftg	1	28043	600	200	3.37	51.0
Total Volume of Concrete + 10% for waste factor					3.70	

**25 MPA - Foundation Walls**

Mark	Qty	PCL	Width	Thickness	Total Volume	Dwg. No.
Fdn Wall	1	28043	200	1000	5.6086	51.0
Total Volume of Concrete + 3% for waste factor					5.78	


**25 MPA with air - Trench Footing**

Mark	Qty	PCL	Width	Thickness	Total Volume	Dwg. No.
900x500 Grade Beam	1	402199	500	900	180.99	51.0
LESS						
F1	5	2440	500	900	5.49	
F1(a)	2	2440	500	900	2.20	
F1(B)	2	2440	500	900	2.20	
F2	7	2130	500	900	6.71	
F3	3	2440	500	900	3.29	
F3(a)	5	2440	500	900	5.49	
F4	20	2130	500	900	19.17	
F5	7	1830	500	900	5.76	
F6	4	1675	500	900	3.02	
F7	2	2440	500	900	2.20	
F8	0	0	500	900	0.00	
Total Volume					125.47	
Total Volume of Concrete + 10% for waste factor					138.02	



**25 MPA - Interior Augured Footings**

	Footing Dimension (mm)			NOS	Total Vol. (m3)	Drawing No.
MARK	Diameter	Area(mm2)	Depth			
F1	2440	4673576	1400	7	45.80	53.1
F2	2130	3561466.5	1400	7	34.90	53.1
F3	2440	4673576	1400	5	32.72	53.1
F4	2130	3561466.5	1200	1	4.27	53.1
Total Volume					117.69	
Total Volume of Concrete + 10% for waste factor					129.46	

**25 MPA with air - Perimeter Augured Footings**

	Footing Dimension (mm)			NOS	Total Vol. (m3)	Drawing No.
MARK	Diameter	Area(mm2)	Depth			
F1	2440	4673576	1400	5	32.72	53.1
F1(a)	2440	4673576	2000	2	18.69	52.2
F1(B)	2440	4673576	3700	2	34.58	52.2
F2	2130	3561466.5	1400	7	34.90	53.1
F3	2440	4673576	1400	3	19.63	53.1
F3(a)	2440	4673576	2500	5	58.42	52.2
F4	2130	3561466.5	1200	20	85.48	53.1
F5	1830	2628886.5	1200	7	22.08	53.1
F6	1675	2202415.625	1200	4	10.57	53.1
F7	2440	4673576	8000	2	74.78	53.1
F8	0	0	1900	0	0.00	53.1
Total Volume					391.85	
Total Volume of Concrete + 10% for waste factor					431.04	

**25 MPA with air - Piers**

	Pier Dimensions (mm)			Qty	Total Vol. (m3)	Drawing No.
	L	W	H			
PEDESTAL						
PIER1	800	800	1050	8	5.38	53.1
PIER2	650	650	1050	5	2.22	53.1
					7.59	
Total Volume of Concrete + 3% for waste factor					7.82	

Steel fiber	
Slab quantity	1235.30
Steel fiber(kg) = 15 * slab quantity	18529.56

High Range Super Plasticizer (Required with Steel Fibres)		
High range super plasticizer	1,235.30	Liter

03 35 00 Concrete Finishing
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Floor Hardener Traprock 60lbs/100sf				
	No	Length	Width	sq m
A	1	30.051	130.804	3930.79
B	0.5	34.138	25.828	440.86
C	1	34.538	81.83	2826.24
D	1	14.326	15.591	223.36
E	0.5	23.146	30.66	354.83
F	1	23.146	6.681	154.64
Total in meter sqare				7930.72
Total in sq ft.				85321.83

Pour / Finish 6" Slab on Grade				
	No	Length	Width	sq m
A	1	30.051	130.804	3930.79
B	0.5	34.138	25.828	440.86
C	1	34.538	81.83	2826.24
D	1	14.326	15.591	223.36
E	0.5	23.146	30.66	354.83
F	1	23.146	6.681	154.64
Total in meter sqare				7930.72
Total in sq ft.				85321.83

Sawcuts @ slab on grade		
Remark	10'-0" o/c U.N.O. OR APPROVED.	
Note :-	Here the sawcuts are provided at 10' maximum distance	
Note :- Here the total length and width of building is divided into number of parts by keeping minimum distance between two consecuting grids 10' as per the remark.		
Total length of grid in West-East direction (feet)		427.8432
Total length of grid in North-South direction (feet)		209.92
Number of grids with minimum 10' distance in North-South direction = (Total length of grid in West-East direction (m))/10'		42.78432
Number of West-East direction = (Total length of grid in North-South direction (m))/10'		20.992
Total length of sawcuts in West-East direction (m)		8981.284454
Total length of sawcuts in North-South direction (m)		8981.284454
Total Sawcut in linear feet		17962.56891

Wet Cure Slab on Grade > film				
	No	Length	Width	sq m
A	1	30.051	130.804	3930.79
B	0.5	34.138	25.828	440.86
C	1	34.538	81.83	2826.24
D	1	14.326	15.591	223.36
E	0.5	23.146	30.66	354.83
F	1	23.146	6.681	154.64
				7930.72
Total in square feet				85321.83

04 22 00 Masonry

Fire-rated CMU Block 190mm - 2 hrs			
Number	Length	height	Total
1	11.315	3.65	41.29975
3	5.406	3.65	59.1957
Total in meter square			100.49545
Total in sq ft.			1081.170249

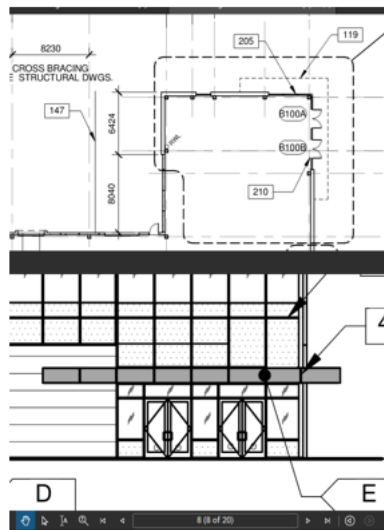
06 11 10 Blocking

2' x 10' x 12' @ Parapet			
Name	No	Length	sq m
South wall	1	30.404	30.404
South -East (Inclined wall)	1	43.258	43.258
East wall	1	82.219	82.219
North - East	1	36.874	36.874
North Wall	1	50.364	50.364
west wall	1	15.231	15.231
west wall (2)	1	14.864	14.864
west wall (3)	1	114.831	114.83
Total in meter			388.05
Total in ft.			1272.8

### 07 42 13.20 Aluminum Siding Panels

#### Aluminum Composite Panel Alucobond System SL2000 - Color Red @ Canopy

	Length	Width	Area (Sq. m)
Part A	9.369	1.45	13.58505
	10.88	1.6	17.408
Total in meter square			30.99305
Total in sq. ft			333.4356291
Part B	18.6	0.609	11.3274
Total in sq. ft			121.8647002
Part C	18.5	1.2	22.2
Total in sq. ft			238.83648
Grand Total			694.1368093

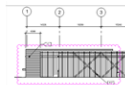
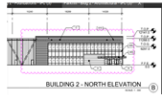
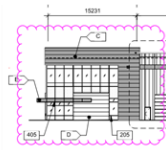


#### Aluminum Soffits Alucobond System SL2000 - Color Red @ Canopy

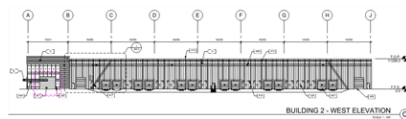
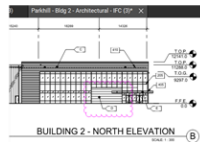
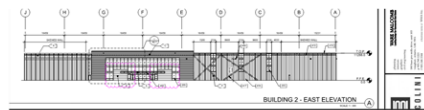
	Length	Width	Area (Sq. m)
Part A	9.369	1.45	13.58505
	10.88	1.6	17.408
Total in sq. meter			30.99305
Total in sq. ft			333.4356291
Part B	18.6	0.609	11.3274
			121.8647002
Part C	18.5	1.2	22.2
Total in sq. ft			238.83648
Grand Total			694.1368093

### 07 42 13.30 Steel Siding

Insulated Metal Panels (Type W2) - Grey			
West part	length	height	Area
	15.231	2.844	43.316964
	2.763	9.297	25.687611
		Total	69.004575
North part	length	height	Area
	37.281	2.844	106.027164
	4.666	9.297	43.379802
		Total	149.406966
South part	length	height	Area
	6.388	9.297	59.389236
		Total	59.389236
East part	length	height	Area
	44.803	2.844	127.419732
	9.23	9.297	85.81131
		Total	213.231042
Grand total in sq. m			491.031819
Grand total in sq. ft			5282.716722



Insulated Metal Panels (Type W2) - Grey			
East Part	length	height	Area
2	5.315	4.5	23.9175
Total in meter square			23.9175
North part	length	height	Area
1	8.463	4.5	38.0835
Total in meter square			38.0835
West part	length	height	Area
1	5.364	4.5	24.138
Total in meter square			24.138
Total in meter square			86.139
Total in square feet			926.7178176



### 07 51 13.20 Built-Up Roofing Systems

Roof R1 (Bldg) - 4 ply built up roofing over R30 rigid insulation over vapor retarder - Note 301/A3.2

	No	Length	Width	sq m
A	1	30.051	130.804	3930.79
B	0.5	34.138	25.828	440.86
C	1	34.538	81.83	2826.24
D	1	14.326	15.591	223.36
E	0.5	23.146	30.66	354.83
F	1	23.146	6.681	154.64
				7930.72
				85321.83

08 44 13 Glazed Aluminum Curtain Walls

Alum Curtain Wall 1" Insulated Tempered Glass - Vision & Spandrel Panels				
North Eleveation	Length	Height	Area	
	32.615	9.297	303.221655	
Total in meter sqare			3262.179853	
Deduction	Length	height	Number	Area
Door 1	8.463	4.5	1	38.08
Door 2	2	2.5	2	10.00
Total in meter sqare				48.08
Total in sqare feet				517.30
Area afte deduction				2744.88

East Eleveation	Length	Height	Area	
Area 1	32.918	9.297	306.038646	
Total in sqare feet			3292.486169	
	Length	Height	Area	
Area 2	2.134	9.297	19.839798	
			213.4444828	
Total in sqare feet			3505.930652	
Deduction	Length	height	Number	Area
Door 1	4.315	4.5	2	38.835
Door 2	2	2.5	2	10
Total in meter sqare				48.835
Total in sqare feet				525.386464
Area afte deduction				2980.54
West Eleveation				
	Length	Height	Area	
Area 1	12.468	9.297	115.914996	
			1247.059893	
Deduction	Length	height	Number	Area
Door 1	5.364	4.5	1	24.138
Total in meter square				24.138
Total in square feet				259.6862592
Area afte deduction				987.37
Grand total				6712.80

09 21 16 Gypsum Board Assemblies
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Drywall Partition type P2 - 2hr separation			
Assume	The thickness of 2hr separation partition wall is 150 mm		
Number	length	height	Area
2	2.3	7.17	32.982
2	2.801	7.17	40.16634
		Total	73.14834
Total in square feet			786.9591011

09 91 23 Interior Painting
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Paint Door & Frame 2 coats - Single door	
Number of paint door and frame 2 coats -single door	9

Drywall Paint 2 coats @ P2 wall type (both sides)			
Assumption	The P2 wall thickness 150 mm		
Outer side wall area			
Number	Length	Height	Area
2	2.3	7.17	32.982
2	3.101	7.17	44.46834
Total in square meter			77.45034
Total in square feet			833.2417379
Internal side wall area			
Number	Length	Height	Area
2	2	7.17	28.68
2	2.801	7.17	40.16634
Total in square meter			68.84634
Total in square feet			740.6764643
Grand total			1573.918202



### 03 11 00 Concrete Forming

Code	Description	Unit	# Of Element	Length	Width	Depth	Quantity
03 11 13	<b>Formwork</b>						
1	<b>Strip Footing</b>						
	Outer Perimeter [2 x (5406+400) + 6959 + 4166 + (5 x 200)]/1000 = 23.737m	sf	1	23.737		0.2	51.02
	Interior Perimeter = [4 x (5406 - 200) + 4166 - 400 + 6959 - 400] / 1000 = 31.149m	sf	1	31.149		0.2	66.95
							<b>118.15</b>
2	<b>Piers</b>						
	P1	sf	8	3.2		1.05	289.33
	P2	sf	5	2.6		1.05	146.92
							<b>436.26</b>
3	<b>Foundation Wall Standard</b>						
	West Elevation-Interior Perimeter	sf	1	130.784		1.35	1,900.40
	West Elevation-Outer Perimeter	sf	1	131.244		1.35	1,907.04
	North, South and East Elevation-Interior Perimeter	sf	1	256.718		0.3	829
	North, South and East Elevation-Outer Perimeter	sf	1	257.408		0.3	831.18
							<b>5467.71</b>

### 03 21 00 Reinforcing Steel

Sr	Description	Bar	# Of elements	# Of rebar	Length of one bar(m)	Unit weight (kg/m <sup>3</sup> )	Total (kg)
<b>1</b>	<b>Strip Footing</b>						
	Bottom Bars	15M	1	2	30.349	1.58	95.90
<b>2</b>	<b>Trench Footing</b>						
	Bottom Bars	15M	1	2	388.212	1.58	1226.75
<b>3</b>	<b>Pier 1</b>						
	Vertical	25M	8	8	1.05	3.92	263.42
	Ties @ 300mm O/C	10M	8	5	2.88	0.788	90.78
	Ties @ 300mm O/C	10M	8	5	0.72	0.788	22.69
	Ties @ 300mm O/C	10M	8	5	0.72	0.788	22.69
<b>4</b>	<b>Pier 2</b>						
	Vertical	20M	5	8	1.05	2.35	98.70
	Ties @ 300mm O/C	10M	5	5	4.56	0.788	89.83
<b>5</b>	<b>Foundation Wall</b>						
	<b>Reinforcement @ section 1</b>						
	15M Horizontal	15M	1	4	257.408	1.58	1626.82
	15M Dowel @ 400mm O/C	15M	1	655	0.75	1.58	776.18
	<b>Reinforcement @ section 4</b>						
	10M Dowel @ 400mm O/C	10M	2	6	3.048	0.788	28.82
	10M Conti. (10% extra for lap)	10M	1	1	131.244	0.788	113.76
	10M Bottom Dowel @ 400mm O/C	10M	1	7	1.8	0.788	9.93
	10M Bottom Dowel @ 400mm O/C	10M	1	6	2.2	0.788	10.40
	<b>Reinforcement @ section 5</b>						
	15M Horizontal	15M	1	7	131.244	1.58	1451.56
	15M Dowel @ 300mm O/C	15M	1	439	1.524	1.58	1057.08
	15M Vertical @ 300mm O/C	15M	1	439	1.46	1.58	1012.69

<b>6</b>	<b>Augur Footing</b>						
	<b>F1 (Depth = 1.4m)</b>						
	Vertical Bar	25M	12	18	1.4	3.92	1185.41
	Ties @ 300mm O/C	15M	12	6	7.19	1.58	817.93
	<b>F1(a) (Depth = 2.0m)</b>						
	Vertical Bar	25M	2	18	2	3.92	282.24
	Ties @ 300mm O/C	15M	2	8	7.19	1.58	181.76
	<b>F1(b) (Depth = 3.7m)</b>						
	Vertical Bar	25M	2	18	3.7	3.92	522.14
	Ties @ 300mm O/C	15M	2	14	7.19	1.58	318.09
	<b>F2 (Depth = 1.4m)</b>						
	Vertical Bar	25M	14	14	1.4	3.92	1075.65
	Ties @ 300mm O/C	15M	14	6	6.21	1.58	824.19
	<b>F3 (Depth = 1.4m)</b>						
	Vertical Bar	25M	8	16	1.4	3.92	702.46
	Ties @ 300mm O/C	15M	8	6	7.19	1.58	545.29
	<b>F3(a) (Depth = 2.5m)</b>						
	Vertical Bar	25M	5	16	2.5	3.92	784.00
	Ties @ 300mm O/C	15M	5	10	7.19	1.58	568.01
	<b>F4 (Depth = 1.2m)</b>						
	Vertical Bar	25M	21	12	1.2	3.92	1185.41
	Ties @ 300mm O/C	15M	21	5	6.21	1.58	1030.24
	<b>F5 (Depth = 1.2m)</b>						
	Vertical Bar	20M	7	16	1.2	2.35	315.84
	Ties @ 300mm O/C	15M	7	5	5.27	1.58	291.43
	<b>F6 (Depth = 1.2m)</b>						
	Vertical Bar	20M	4	15	1.2	2.35	169.20
	Ties @ 300mm O/C	15M	4	5	4.78	1.58	151.05
	<b>F7 (Depth = 8m)</b>						
	Vertical Bar	25M	2	18	8	3.92	1128.96
	Ties @ 300mm O/C	15M	2	28	7.19	1.58	636.17

<b>7</b>	<b>Exterior Column Supporting Vert. Braces</b>						
	Vertical Bar	25M	1	8	2.1	3.92	65.86
	Ties @ 300mm O/C	10M	1	6	2.4	0.788	11.35
						<b>Total</b>	<b>Kg</b>
						<b>10M</b>	400
						<b>15M</b>	12,610
						<b>20M</b>	584
						<b>25M</b>	6,418.00

### 03 45 13 Faced Architectural Precast Concrete

03 45 13	Faced Architectural Precast Concrete	Unit	# Of Element	Length	Width	Depth	Quantity
	Insulated Precast Concrete Panel System	sf	1	283.602		11.288	<b>34458.5</b>

### 05 31 23 – steel Decking

#### Metal Roof Decking

Description of item	Units	No's	Length	Bredth	Depth	Quantity	Comments	Drawing no
Steel Decking			Area					
Metal Roof Deck @ Main Roof	SF	1	91119.47			91119.47		S2
Metal Roof Deck @ Entrance Canopies	SF	1	818.77			818.77		S2

### 08 11 13 & 08 13 13 -Openings

#### Metal doors and Frames

Description of item	Units	No's	Length	Bredth	Depth	Quantity	Comments	Drawing no
Metal Doors and Frames								
Hallow Metal Door - 3-2 x 7-0	ea	9				9		A7.1
Hallow Metal Frame - 3-2 x 7-0	ea	9				9		A7.1

### 08 33 23 – Sectional overhead coiling Doors

Description of item	Units	No's	Length	Bredth	Depth	Quantity	Comments	Drawing no
Sectional overhead coiling								
Overhead Door 12x 14' Type SD2	ea	2				2		A7.1
Overhead Door 9x 10' Type SD1	ea	12				12		A7.1

### 08 42 26 -All - glass Entrances

Description of item	Units	No's	Length	Bredth	Depth	Quantity	Comments	Drawing no
All-Glass Entrances								
Aluminium Entrance Door (Double door) w/ Tem Glazing & Harware	ea	4				4		A7.1

**08 70 00 –Hardware**

Description of item	Units	No's	Length	Bredth	Depth	Quantity	Comments	Drawing no
Hardware								
Hinges per door	ea	9x3				27	1-1/2 pair per door ( since door B4 height is 85")	A7.1
Door stop W1276 CCS	ea	9				9		A7.2
Thershold 2000	ea	13				13		A7.2
Standard door Closer-8581 BF	ea	9				9		A7.2
Door Shoe 216 Dv	ea	9				9		A7.2
Door seal S88	ea	9				9		A7.2
Latch guard LP2	ea	9				9		A7.2