

From: [Philip.Christensen](#)
To: [Lester.Balsillie](#); [Darren.Stahl](#)
Cc: [Jody.Fobe](#)
Subject: FW: TCCL OLD CROW 100% SOR R1 Cost Report
Date: August 21, 2020 9:35:47 AM
Attachments: [TCCL OLD CROW 10-PLEX & HWC with SCHEDULE OF RISK 100% SOR CLASS C COST ESTIMATE 2020.07.22 - R1.pdf](#)
[image002.png](#)

Here is the updated costing from the consultant. I was sure this was sent around but regardless.

In conversation with VGG regarding housing costs in the community, the figure ^{75(1)(a)(ii)} per unit was mentioned, based on their current elders facility. Keep in mind this is a ballpark and may not reflect current conditions.

I am waiting for a call back on the cost of ad-freeze piles vs thermopiles. There may be savings here but at what long term cost?

^{75(1)(a)(ii)}

Yukon



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From: Alan Nessick <Alan.Nessick@tccl.ca>
Sent: July 22, 2020 2:41 PM
To: Philip.Christensen <Philip.Christensen@gov.yk.ca>
Subject: TCCL OLD CROW 100% SOR R1 Cost Report

Phil, please find attached the revised cost report based on our conference call last week.

Any questions, please call.

Best regards,



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Quantity Surveyor's
100% Statement of Requirements
Class "C"
COST ESTIMATE with RISK ALLOWANCE R1
on July 22, 2020

**OLD CROW 10-PLEX HOUSING &
HEALTH & WELLNESS CENTRE**

Old Crow YT



Government of Yukon
Department of Highways & Public Works
113 Industrial Road
Whitehorse, Yukon Y1A 2T8



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1. INTRODUCTION

1.1 Background

The Government of Yukon, Highways and Public Works objective is to deliver the construction of a new 10-Plex housing unit and Health and Wellness Centre on Vuntut Gwich'in Government owned property as a response to the community needs requirements for healthcare and housing. The 10-plex will be a two-storey structure built with combustible wood construction methods above a specialized thermopile foundation. This project includes above grade exterior canopies and walkways to enable unit access from the exterior. The building envelope will be finished with fibre cement siding and asphalt shingle roofing and be designed in accordance with pressure equalized rain-screen design principles. The interior finishes and appliances will be to a durable and resilient residential standard. All units will be serviced by a common mechanical / electrical room including all necessary systems to fully support the units. The health and wellness centre is a single storey non-combustible steel framed structure with a mechanical mezzanine, also supported by a thermopile foundation. This building also includes canopies and walkways for building access. The building envelope will include a PERSIST designed exterior wall with fibre cement siding and a standing seam metal roof finish. Interior finishes will be of good quality, durable, and low maintenance typical for a healthcare facility. The mechanical and electrical systems will be designed to a healthcare standard with patient care design criteria, where required. The site development includes gravel access and parking as well as a storage garage. The site development includes two site structures including the parking garage as well as the addition of a 10-unit storage building.

Procurement strategy for this estimate is based on Design-Build. The costing is based on a 22-month construction schedule, ice road availability and a site camp for 6 to 10 workers. We have also assumed the utilization of some local skilled and semi-skilled labour.

Costs of the construction and schedule of risks are summarized as follows:

Activity		Estimated Cost In Current Dollars	Area (m ²)	Cost/m ²
1	10 - Plex Housing	75(1)(a)(ii)		
2	Health & Wellness Centre			
3	Sitework incl. Garage & Storage			
4	General Requirements & Design - Builder Fee			
PRE BID ESTIMATE				
5	Design Allowance			
6	Cash Allowances			
7	Construction CO Allowance			
TOTAL CONSTRUCTION COST				
8	Agreed Risk Register Allowance			
ADJUSTED TOTAL CONSTRUCTION COST				

1.2 Purpose

This report is intended to provide a practical analysis of construction costs for new remote multi-unit housing and a healthcare facility in Old Crow, Yukon. All scope/cost item exceptions are listed below in section 1.4 Exclusions.

1.3 Methodology

Where possible, elements have been assessed or measured, then priced at rates considered competitive for a project of this type. This report is developed using standardized methods and techniques. Formatting of the report in accordance with the following documents:

Canadian Institute of Quantity Surveyors. "Elemental Cost Analysis-Method of Measurement and Pricing" (Toronto ON, Canada: Canadian Institute of Quantity Surveyors, 1990).

Construction Specifications Institute. "UniFormat™: A Uniform Classification of Construction Systems and Assemblies" (Alexandria VA, USA: The Construction Specifications Institute, 2010 Edition).

Construction Specifications Institute. "MasterFormat 2010™" (Alexandria VA, USA: The Construction Specifications Institute, 2010 Edition).

Costing for the estimated areas of work is developed using the historical data of similar projects. Consideration is made to include for project complexity, geographic location, and current market pricing.

1.4 Exclusions

This analysis excludes the following:

- a. GST
- b. Owner's independent consultants (i.e. Quantity Surveyor, Commissioning, etc.)
- c. Project management costs & disbursements
- d. Design bridging consultants
- e. Independent testing (including air monitoring)
- f. Removal contaminated / organic soils
- g. Escalation beyond July 2020
- h. Furniture, Fixtures & Equipment (FF&E)
- i. IT & specialist equipment
- j. Landscaping & planting
- k. Off-sites including utilities, service upgrades, site development & access, levies, etc.
- l. Premium time working
- m. Decanting costs

2. DOCUMENTATION

This report has been prepared from documentation supplied by:

Bridging Design Consultant	Stantec Architecture Ltd.
Geotechnical	Tetra Tech

The basis for this estimate is the 100% submission of the Statement of Requirements Report including drawings and specifications dated May 26th, 2020 and received on June 2, 2020 with subsequent notes, comments, and updates received from the consultants. Additionally, this estimate is based on the email dated June 1, 2020 from Philip Christensen of the Government of Yukon for the agreed risk schedule. This revised cost report is a result of comments, adjustments and further discussions with the client team including a video conference meeting on July 16, 2020 based on our June 22, 2020 cost report submission.

3. COSTING

3.1 Cost Base:

The basic capital dollars are expressed in current **July 2020** dollars, that is, as if the project were tendered in **July 2020**.

COVID 19 has brought with it uncertainties regarding the global economy and specifically for construction project delay notices as a result of force majeure. The degree of impact to projects at the preconstruction stage is continually changing, however, the risk probability of delay or shutdown are factors that require increased consideration.

Historically, low interest rates would stimulate investment and capital ventures, however, we believe that in the near term, the current uncertain environment outweighs investment decisions, and therefore less projects will proceed to tender stage. We believe that as industry activity reduces, particularly as developers and Government defer or cancel projects, escalation and market impacts will decrease. Indicators are that as fewer projects are tendered, more will be at an increased value with lower cost.

We expect a trend in increased number of bidders, providing better investor "value" through competition. Contractors will reduce costs and take on slightly higher cost risks to secure projects and maintain work force. However, to mitigate the execution risks, pricing may reflect increased requirements for site health and safety, potentially longer durations, and allowances for project delays, shutdowns, etc. To cover these items and other anticipated risks a risk schedule was prepared, agreed to and included in Section 8 and 9. We have updated the risk schedule, previously submitted to reflect the updated construction costs based on the 100% scope of requirements documentation submitted.

3.2 Cost Predictability

Pricing by the PQS reflects probable construction costs obtainable in the location of the project as of the date of the report and is a determination of fair market value for the construction of this project and should not be taken as a prediction of low bid.

Typically, pricing assumes competitive bidding for every portion of the construction works including all subcontractors as well as the general contractor and assumes a minimum of three (3) bidders. If fewer bids are received, the bid results can be expected to be higher.

For an estimate / cost analysis at Conceptual Design (Class "C") the industry standard level of accuracy is between 15% and 20%.

3.3 Allowances / Contingencies:

As this project is currently at Schematic Design the following allowances have been included:

- a. Design Allowance / Contingency = 7.0 %
 - An allowance for design changes during the development of the design. The allowance is to cover unforeseen items during the design phase that do not change the project scope. The allowance, which is included in the primary stages, is ultimately absorbed into the design and quantified work as more detailed information becomes available and is therefore normally reduced to zero at tender stage.
- b. Location Allowance / Contingency
 - Location factors are applied to baseline unit costs, to allow for the higher costs of construction in locations that are further away from the main centers of operations, notably Whitehorse, Yukon. Initially, these factors are calculated by assessing the extra costs of supplying skilled labour and delivering materials from either the main city center to those remote locations, and incorporating the relative risks involved in doing business there.
- c. Escalation Allowance / Contingency = 0.0 %
 - No allowance to account for anticipated cost escalation from the time of this estimate to the midpoint of the anticipated construction schedule. The midpoint of the construction schedule is used to account for differential escalation over the total construction period. Rates used within the estimate backup represent constant dollars as the cost base. No allowance has been applied as a percentage to the estimate total.
- d. Construction Allowance / Contingency = 10.0 %
 - An allowance for changes to the contract price during construction. The allowance is to cover unforeseen items during the construction period which will result in change orders.

4. GROSS FLOOR AREA

Building areas and volumes are measured in accordance with the latest issue of "Elemental cost Analysis - Measurement of Buildings by Area and Volume", published by the Canadian Institute of Quantity Surveyors.

The current requirement is for gross floor area to be calculated to the outside face of the building skin.

Area / Floor Level	75% SOR	100% SOR
	Area (m ²)	Area (m ²)
10-Plex Housing	984	984
Main Floor	593	593
Second Floor	391	391
Health & Wellness Centre	1,005	1,070
Main Level	940	952
Mezzanine / Fan Room	65	118
Total Area	1,989	2,054

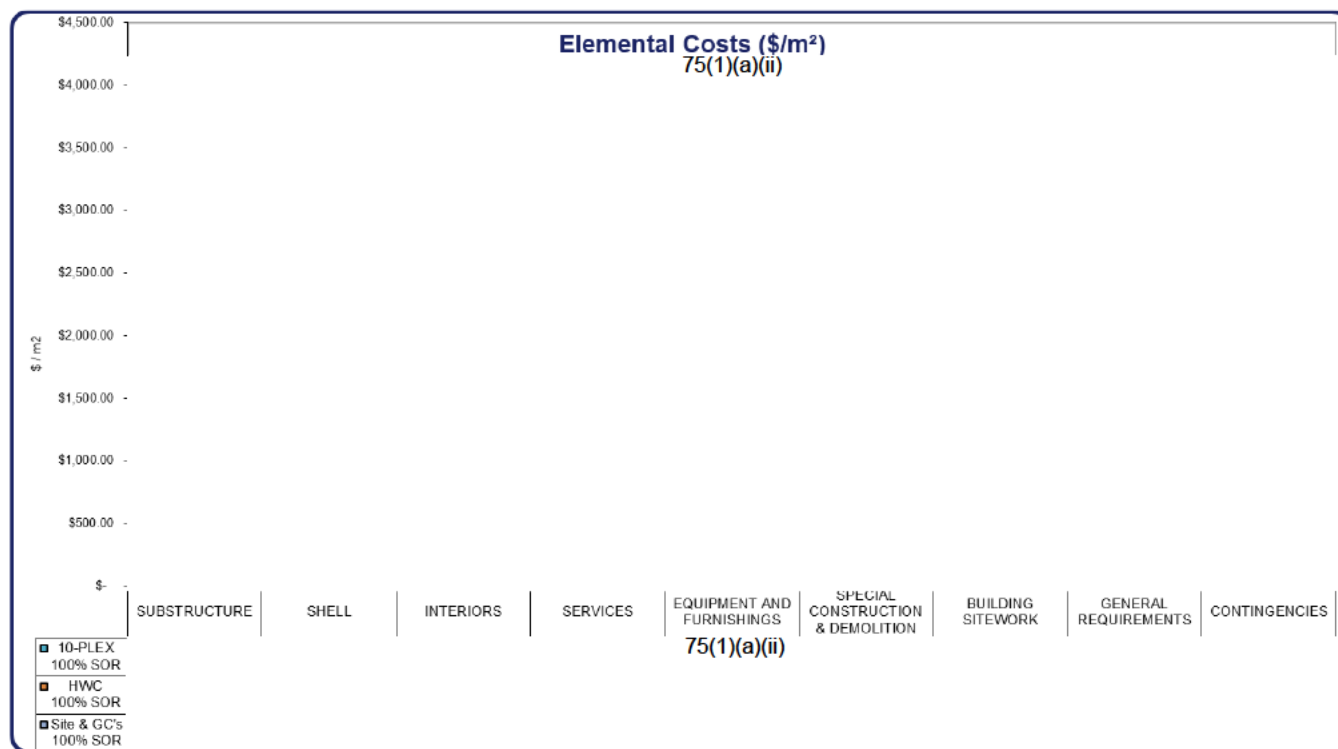
The current GFA has increased by 65m² since the 75% SOR submission. This area difference is related directly to the Health and Wellness Centre as outlined in our area summary above.

5. COSTING SUMMARIES

MAJOR ELEMENT \$/ELEMENT

ELEMENTAL SUMMARY OF COSTS \$	10-PLEX 100% SOR	HWC 100% SOR	Site & GC's 100% SOR
ELEMENT	TOTAL	TOTAL	TOTAL
A SUBSTRUCTURE	\$	75(1)(a)(ii)	
B SHELL	\$		
C INTERIORS	\$		
D SERVICES	\$		
E EQUIPMENT AND FURNISHINGS	\$		
F SPECIAL CONSTRUCTION			
G BUILDING SITEWORK			
Z GENERAL			
ALLOWANCES	\$		
TOTAL COST	\$		
AREA (m²)			
RATE PER GFA (m²)	\$		
RATE PER GFA (ft²)	\$		

MAJOR ELEMENT \$/GFA (m²)



6.0 UNIFORMAT ELEMENTAL COST SUMMARY

Uniformat Elemental Cost Summary

Project Old Crow - 10-Plex Housing
Design Bid Build Procurement
Location Old Crow, Yukon

GFA 984 m²
Date July 22, 2020
Report Status 100% SOR - Class "C" Cost Estimate

ELEMENT	Ratio to GFA	Elemental Costs		Elemental Amounts		Rate per GFA		% Total
		Quantity	Unit Rate	Sub-Total	Total 75(1)(a)(ii)	Sub-Total	Total	
A SUBSTRUCTURE								8.68
A10 Foundations								8.68
A1020 Special Foundations	0.60	593 m ²						
A20 Basement Construction								-
B SHELL								49.46
B10 Superstructure								15.84
B1010 Floor Construction	1.00	984 m ²						
B1020 Roof Construction	0.68	674 m ²						
B20 Exterior Enclosures								18.54
B2010 Exterior Walls	1.22	1,203 m ²						
B2020 Exterior Windows	0.12	121 m ²						
B2030 Exterior Doors	0.01	12 no.						
B30 Roofing								15.08
B3010 Roof Coverings	0.69	682 m ²						
B3030 Balconies and Projections	0.41	408 m ²						
C INTERIORS								14.36
C10 Interior Construction								9.24
C1010 Partitions	1.37	1,345 m ²						
C1020 Interior Doors	0.08	81 no.						
C1030 Fittings	1.00	984 m ²						
C20 Stairs								-
C30 Interior Finishes								5.12
C3010 Wall Finishes	3.30	3,246 m ²						
C3020 Floor Finishes	0.82	811 m ²						
C3030 Ceiling Finishes	0.82	811 m ²						
D SERVICES								23.32
D10 Conveying								-
D20 Plumbing								6.82
D2010 Plumbing Fixtures	1.00	984 m ²						
D2020 Domestic Water Distribution	1.00	984 m ²						
D2030 Sanitary Waste	1.00	984 m ²						
D2090 Other Plumbing Systems	1.00	984 m ²						
D30 Heating Ventilating and Air Conditioning (HVAC)								10.29
D3020 Heat Generation	1.00	984 m ²						
D3040 HVAC Distribution (Distribution Systems)	1.00	984 m ²						
D3050 Terminal and Packaged Units	1.00	984 m ²						
D3060 HVAC Instrumentation and Controls	1.00	984 m ²						
D3070 Testing, Adjusting, and Balancing	1.00	984 m ²						
D3090 Other Special HVAC Systems & Equipment	1.00	984 m ²						
D40 Fire Protection								0.04
D4010 Sprinklers	1.00	984 m ²						
D4030 Fire Protection Specialties	1.00	984 m ²						
D50 Electrical								6.17
D5010 Electrical Service and Distribution	1.00	984 m ²						
D5020 Lighting and Branch Wiring	1.00	984 m ²						
D5030 Communications and Security	1.00	984 m ²						
D5090 Other Electrical Systems	1.00	984 m ²						
E EQUIPMENT AND FURNISHINGS								4.18
E10 Equipment								1.39
E1010 Commercial Equipment (Appliances)	1.00	984 m ²						
E20 Furnishings								2.79
E2010 Fixed Furnishings	1.00	984 m ²						
E2020 Moveable Furnishings	-							
F SPECIAL CONSTRUCTION AND DEMOLITION								-
F10 Special Construction								-
F20 Selective Building Demolition								-
NET CONSTRUCTION COST								100.00

Uniformat Elemental Cost Summary

Project Old Crow - Health & Wellness Centre
Design Bid Build Procurement
Location Old Crow, Yukon

GFA 1,070 m²
Date July 22, 2020
Report Status 100% SOR - Class "C" Cost Estimate

ELEMENT	Ratio to GFA	Elemental Costs		Elemental Amounts		Rate per GFA		% Total
		Quantity	Unit Rate	Sub-Total	Total	Sub-Total	Total	
A SUBSTRUCTURE				75(1)(a)(ii)				4.93
A10 Foundations								4.93
A1020 Special Foundations	0.89							
A20 Basement Construction								-
B SHELL								36.17
B10 Superstructure								15.64
B1010 Floor Construction	1.00							
B1020 Roof Construction	0.90							
B20 Exterior Enclosures								9.84
B2010 Exterior Walls	0.99							
B2020 Exterior Windows	0.05							
B2030 Exterior Doors	0.01							
B30 Roofing								10.69
B3010 Roof Coverings	0.90							
B3030 Balconies and Projections	0.13							
C INTERIORS								13.42
C10 Interior Construction								8.82
C1010 Partitions	1.49							
C1020 Interior Doors	0.05							
C1030 Fittings	1.00							
C20 Stairs								-
C30 Interior Finishes								4.60
C3010 Wall Finishes	2.90							
C3020 Floor Finishes	0.90							
C3030 Ceiling Finishes	0.90							
D SERVICES								40.51
D10 Conveying								-
D20 Plumbing								6.73
D2010 Plumbing Fixtures	1.00							
D2020 Domestic Water Distribution	1.00							
D2030 Sanitary Waste	1.00							
D2040 Rain Water Drainage	1.00							
D2090 Other Plumbing Systems	1.00							
D30 Heating Ventilating and Air Conditioning (HVAC)								24.27
D3020 Heat Generation	1.00							
D3030 Refrigeration	1.00							
D3040 HVAC Distribution (Distribution Systems)	1.00							
D3050 Terminal and Packaged Units	1.00							
D3060 HVAC Instrumentation and Controls	1.00							
D3070 Testing, Adjusting, and Balancing	1.00							
D3090 Other Special HVAC Systems & Equipment	1.00							
D40 Fire Protection								0.03
D4010 Sprinklers	1.00							
D4030 Fire Protection Specialties	1.00							
D50 Electrical								9.47
D5010 Electrical Service and Distribution	1.00							
D5020 Lighting and Branch Wiring	1.00							
D5030 Communications and Security	1.00							
D5090 Other Electrical Systems	1.00							
E EQUIPMENT AND FURNISHINGS								4.98
E10 Equipment								1.93
E1010 Commercial Equipment	1.00							
E20 Furnishings								3.04
E2010 Fixed Furnishings	1.00							
E2020 Moveable Furnishings	-							
F SPECIAL CONSTRUCTION AND DEMOLITION								-
F10 Special Construction								-
F20 Selective Building Demolition								-
NET CONSTRUCTION COST								100.00

Uniformat Elemental Cost Summary

Project Old Crow - Site Development, General Requirements & Design-Builder Fee
Design Bid Build Procurement
Location Old Crow, Yukon

GFA 2,054 m²
Date July 22, 2020
Report Status 100% SOR - Class "C" Cost Estimate

ELEMENT	Ratio to GFA	Elemental Costs		Elemental Amounts		Rate per GFA		% Total
		Quantity	Unit Rate	Sub-Total	Total	Sub-Total	Total	
F SPECIAL CONSTRUCTION AND DEMOLITION				75(1)(a)(ii)				
F10 Special Construction								
F1010 Special Structures (Garage & Storage)		0.09	192 no.					
G BUILDING SITEWORK								
G10 Site Preparation								
G1010 Site Clearing		2.50	5,128 m²					
G1030 Site Earthwork		2.50	5,128 m²					
G20 Site Improvements								
G2010 Roadways		-	-					
G2020 Parking Lots		1.62	3,337 m²					
G2030 Pedestrian Paving		0.03	55 m²					
G2040 Site Development		1.65	3,392 m²					
G2050 Landscaping		-	-					
G30 Site Civil / Mechanical Utilities								
G40 Site Electrical Utilities								
G4010 Electrical Distribu ion		1.00	2,054 m²					
G4020 Site Lighting		1.00	2,054 m²					
G50 Other Site Construction								
NET CONSTRUCTION COST								
Z GENERAL REQUIREMENTS & ALLOWANCES								
Z10 General Requirements								
Z1010 Supervision & Labour Expenses			22 mo					
Z1020 Temporary Conditions			22 mo					
Z1030 Permits, Insurance & Bonds								
Z20 Fee								
Z2010 Fee (Design-Builder)								
ESTIMATED CONSTRUCTION COST (Excluding Allowances)								
Z30 Allowances								
Z3010 Design Allowance								
Z3020 Cash Allowance								
ESTIMATED TENDER COST (Excluding Construction Allowance)								
Z3030 Construction Allowance								
ESTIMATED CONSTRUCTION COST (Excluding GST)								
GST (if applicable)		0.0%						
ESTIMATED CONSTRUCTION COST (Including GST)								

7.0 DETAILED ELEMENTAL ESTIMATE

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
10PLEX										
	A						SUBSTRUCTURE		75(1)(a)(ii)	
		A10					Foundations			
			A1020				Special Foundations			
				A1020.0050			Piles			
					31-63-26.13	0050	Mobilization	1.00 ea		
					31-63-26.13	1097	Thermal Piles, 12m depth incl. manifold	42.00 ea		
	B						SHELL			
		B10					Superstructure			
			B1010				Floor Construction			
				B1010.0300			Main Floor Construction - Structural Steel Beams / Supports			
					05-12-23.75	0050	Structural steel, C Channel Shape,a992 steel,shop fab,incl shop primer,bolted connection	1,800.00 kgs		
					05-12-23.75	0100	Structural steel, W Shape,a992 steel,shop fab,incl shop primer,bolted connection	18,000.00 kg		
					05-12-23.45	0200	Miscellaneous angles / supports, shop fabricated	900.00 kg		
				B1010.1000			Main Floor Construction - Wood			
					06-16-23.10	0205	Subfloors, plywood, CDX, 20mm thick, pneumatic nailed	593.00 m2fl		
					06-11-10.18	3011	Framing, composite TJI wood joists, 300mm deep	593.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 200 mm thick, 5.3 m2.K/W	1,186.00 m2		
					06-16-36.10	0805	Sheathing, plywood on walls, CDX, 20mm thick, pneumatic nailed	593.00 m2		
					07-41-13.20	0925	Metal Liner Panel	593.00 m2		
				B1010.1000			Second Floor Construction - Wood			
					06-16-23.10	0205	Subfloors, plywood, CDX, 20mm thick, pneumatic nailed	391.00 m2fl		
					06-11-10.18	3011	Framing, composite TJI wood joists, 300mm deep	391.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 200 mm thick, 5.3 m2.K/W	782.00 m2		
			B1020				Roof Construction			
				B1020.0950			Wood Roof Construction - Lower Roof			
					06-16-36.10	0205	Sheathing, plywood on roof, CDX, 16mm thick T&G, pneumatic nailed	130.00 m2		
					06-11-10.18	3030	Framing, composite TJI wood joists, 406mm deep	130.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 200 mm thick, 5.3 m2.K/W	256.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	130.00 m2		
					06-16-36.10	0305	Sheathing, plywood on roof, CDX, 19mm thick, pneumatic nailed	130.00 m2		
					06-17-53.10	0800	Roof trusses, flat wood truss	130.00 m2fl		
				B1020.0950			Wood Roof Construction - Mechanical / Electrical Roof			
					06-16-36.10	0205	Sheathing, plywood on roof, CDX, 16mm thick T&G, pneumatic nailed	103.00 m2		
					06-11-10.18	3030	Framing, composite TJI wood joists, 406mm deep	103.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 200 mm thick, 5.3 m2.K/W	206.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	103.00 m2		
					06-16-36.10	0305	Sheathing, plywood on roof, CDX, 19mm thick, pneumatic nailed	103.00 m2		
					06-17-53.10	0800	Roof trusses, flat wood truss	103.00 m2fl		
				B1020.0950			Wood Roof Construction - High Roof			
					06-16-36.10	0205	Sheathing, plywood on roof, CDX, 16mm thick T&G, pneumatic nailed	441.00 m2		
					06-11-10.18	3030	Framing, composite TJI wood joists, 406mm deep	441.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 200 mm thick, 5.3 m2.K/W	882.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	441.00 m2		
					06-16-36.10	0305	Sheathing, plywood on roof, CDX, 19mm thick, pneumatic nailed	441.00 m2		
					06-17-53.10	0800	Roof trusses, flat wood truss	441.00 m2fl		
		B20					Exterior Enclosure			
			B2010				Exterior Walls			
				B2010.0125			Wood Stud / TJI Wall Construction w/ Fibre Cement Siding			
					07-46-46.10	0065	Fiber cement siding, lap siding, woodgrain texture, 8mm thick x 300mm wide, 264 mm exposure	772.00 m2		
					06-11-10.42	0600	Furring, wood, on walls, on wood, 25mm x 75mm	772.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	772.00 m2		
					07-22-16.10	0130	Insulation, wood fiberboard , 80mm thick, GUTEX MULTITHERM	772.00 m2		
					06-11-10.26	0209	Wood Framing, 241mm TJI-230 Studs @ 610mm OC	772.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 240 mm thick, 5.3 m2.K/W	772.00 m2		
					06-16-36.10	0705	Sheathing, plywood on walls, CDX, 16mm thick, pneumatic nailed w/ taped joints	772.00 m2		
					06-11-10.26	0207	Wood Framing, studs, std. & better lumber, 38 x 140mm	772.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	772.00 m2		
				B2010.0125			Wood Stud / TJI Wall Construction w/ Fibre Cement Panels			
					07-46-46.10	0080	Fiber cement siding, panel siding, grooved woodgrain texture, 8mm thick	214.00 m2		
					06-11-10.42	0600	Furring, wood, on walls, on wood, 25mm x 75mm	214.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	214.00 m2		
					07-22-16.10	0130	Insulation, wood fiberboard , 80mm thick, GUTEX MULTITHERM	214.00 m2		
					06-11-10.26	0209	Wood Framing, 241mm TJI-230 Studs @ 610mm OC	214.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 240 mm thick, 5.3 m2.K/W	214.00 m2		
					06-16-36.10	0705	Sheathing, plywood on walls, CDX, 16mm thick, pneumatic nailed w/ taped joints	214.00 m2		
					06-11-10.26	0207	Wood Framing, studs, std. & better lumber, 38 x 140mm	214.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	214.00 m2		
				B2010.0125			Wood Stud / TJI Wall Construction w/ Fibre Cement Panels both sides			
					07-46-46.10	0080	Fiber cement siding, panel siding, grooved woodgrain texture, 8mm thick	88.00 m2		
					06-11-10.42	0600	Furring, wood, on walls, on wood, 25mm x 75mm	88.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	88.00 m2		
					07-22-16.10	0130	Insulation, wood fiberboard , 80mm thick, GUTEX MULTITHERM	88.00 m2		
					06-11-10.26	0209	Wood Framing, 241mm TJI-230 Studs @ 610mm OC	88.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 240 mm thick, 5.3 m2.K/W	88.00 m2		
					06-16-36.10	0705	Sheathing, plywood on walls, CDX, 16mm thick, pneumatic nailed	88.00 m2		
					06-11-10.26	0207	Wood Framing, studs, std. & better lumber, 38 x 140mm	88.00 m2		
					06-16-36.10	0705	Sheathing, plywood on walls, CDX, 16mm thick, pneumatic nailed	88.00 m2		
					06-11-10.42	0600	Furring, wood, on walls, on wood, 25mm x 75mm	88.00 m2		
					07-46-46.10	0080	Fiber cement siding, panel siding, grooved woodgrain texture, 8mm thick	88.00 m2		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				B2010.0900			Soffits & Fascia		75(1)(a)(ii)	
					07-46-73.10	0100	Soffit, baked enamel on steel, 1.5mm or 1.2mm thick	96.00 m2		
					07-71-19.30	0300	Fascia, steel, galvanized & enameled, stock, long panels, excl. furring	33.00 m2		
			B2020				Exterior Windows			
				B2020.0200			Vinyl Windows			
					08-53-13.40	0400	Vinyl windows, triple glazed	121.00 ea		
			B2030				Exterior Doors			
				* unassigned *						
					09-91-13.70	0190	Paints & coatings, exterior doors, flush, both sides, roll & brush, primer + 2 coats, exterior latex, incl. frame & trim	12.00 ea		
				B2030.0050			Single H.M. Insulatd Dr./Frame/Hardware			
					08-13-13.13	1760	Doors, commercial, steel, insulated, full panel, 1.2 mm, 914 mm x 2134 mm x 44 mm thick	10.00 ea		
					08-12-13.25	0100	Door frames, steel channels with anchors and bar stops, 150 mm channel @ 12 kg/m, 915 mm x 2135 mm door, weighs 68 kg	10.00 ea		
					08-71-20.15	2250	Door hardware, single, exterior	10.00 door		
					08-71-25.10	2700	Weatherstripping, doors, metal frame, extruded sections, aluminum, for 900 mm x 2135 mm door	10.00 opng		
					08-71-25.10	3650	Weatherstripping, for thresholds, door sweep, flush mounted, aluminum	10.00 ea		
				B2030.0075			Double H.M. Insulatd Dr./Frame/Hardware			
					08-13-13.13	1760	Doors, commercial, steel, insulated, full panel, 1.2 mm, 914 mm x 2134 mm x 44 mm thick	2.00 ea		
					08-12-13.25	0200	Door frames, steel channels with anchors and bar stops, 200 mm channel @ 17 kg/m, 1830 mm x 2440 mm door, weighs 125 kg	1.00 ea		
					08-71-20.15	3100	Door hardware, double, exterior	1.00 pr		
					08-71-25.10	3100	Weatherstripping, doors, metal frame, extruded sections, aluminum, for 1830 mm x 2135 mm door	1.00 opng		
					08-71-25.10	3650	Weatherstripping, for thresholds, door sweep, flush mounted, aluminum	2.00 ea		
		B30					Roofing			
			B3010				Roof Coverings			
				* unassigned *						
					07-71-23.30	2800	Galvanized steel gutters, half round or box, stock, 150mm wide, 0.5mm thick	81.00 m		
					07-71-23.10	6100	Steel downspouts, galvanized, rectangular, plain, 75mm x 100mm, 0.4mm thick	78.00 m		
				B3010.0100			Asphalt Shingles			
					07-31-13.10	0505	Asphalt shingles, premium, laminated multi-layered shingles, class A, 13.50-17.75kg/m2, pneumatic nailed	682.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	682.00 m2		
					07-71-43.10	0500	Drip edge, galvanized, mill finish, 200mm wide	162.00 m		
			B3030				Balconies and Projections			
				A1020.0050			Piles			
					31-63-26.13	1097	Thermal Piles, 12m depth incl. manifold	30.00 ea		
				B3030.0100			Main Level Balcony			
					05-53-21.50	0632	Galvanized metal grating	140.00 m2		
					06-11-10.28	0350	Porch or deck framing, treated lumber	140.00 m2		
				B3030.0100			Second Level Access Balcony			
					05-53-21.50	0632	Galvanized metal grating	77.00 m2		
					06-11-10.28	0350	Porch or deck framing, balcony, treated lumber	77.00 m2		
				B3030.0100			Access Ramps			
					05-12-23.77	---	Access ramps, galvanized metal grating	30.00 m2		
				B3030.0200			Second Level Access Canopy			
					07-31-13.10	0355	Asphalt shingles, standard, laminated multi-layered shingles, class A, 11.50-13.50kg/m2, pneumatic nailed	161.00 m2		
					07-31-13.10	0825	Asphalt shingles, 13.8kg felt underlayment	161.00 m2		
					06-16-36.10	0205	Sheathing, plywood on roof, CDX, 16mm thick T&G, pneumatic nailed	161.00 m2		
					06-11-10.36	1340	Soffit and canopy framing, wood	161.00 m2		
					07-46-73.10	0100	Soffit, baked enamel on steel, 1.5mm or 1.2mm thick	161.00 m2		
					07-71-19.30	0300	Fascia, steel, galvanized & enameled, stock, long panels, excl. furring	12.00 m2		
					07-71-43.10	0500	Drip edge, galvanized, mill finish, 200mm wide	58.00 m		
					07-71-23.30	2800	Galvanized steel gutters, half round or box, stock, 150mm wide, 0.5mm thick	44.00 m		
					07-71-23.10	6100	Steel downspouts, galvanized, rectangular, plain, 75mm x 100mm, 0.4mm thick	18.00 m		
				C2010.0300			Metal Grate Stairs			
					05-51-13.50	1600	Stair landings, shop fabricated, steel, pre-erected, incl framing, metal fan forms, excl concrete for pan forms	15.00 m2		
					05-51-19.50	0100	Stair, shop fabricated, steel, 1200 mm W, incl pipe railing, stringers, grating treads w/ safety nosing, per riser	32.00 risr		
					05-51-19.50	0100	Stair, shop fabricated, steel, 1200 mm W, incl pipe railing, stringers, grating treads w/ safety nosing, per riser	32.00 risr		
					05-51-19.50	0100	Stair, shop fabricated, steel, 1200 mm W, incl pipe railing, stringers, grating treads w/ safety nosing, per riser	13.00 risr		
				C2010.0300			Handrails / Guardrails			
					05-73-23.50	0200	Railing, ornamental, aluminum, 1050 mm high, posts @ 1800 mm O.C., panelized, plain	181.00 m		
					05-52-13.50	0910	Railing, pipe, aluminum, wall rail, dark anodized finish, 31 mm dia, shop fabricated	26.00 m		
							INTERIORS			
							Interior Construction			
							Partitions			
				C1010			Double 38 x 140mm Wood Stud FR Partition			
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	346.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	346.00 m2		
					06-16-36.10	0605	Sheathing, plywood on walls, CDX, 15mm thick, pneumatic nailed	346.00 m2		
					07-21-16.20	1340	Blanket insulation, for walls or ceilings, mineral wool batts, 139 mm thick, 3.3 m2/K/W	346.00 m2		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				C1010.0600			Double 38 x 140mm Wood Stud FR Partition		75(1)(a)(ii)	
					06-11-10.26	0207	Pwstd,wst,std&bet lum, 38 x 140mm	346.00 m2		
					06-11-10.26	0207	Pwstd,wst,std&bet lum, 38 x 140mm	346.00 m2		
					07-21-16.20	1340	Blanket insulation, for walls or ceilings, mineral wool batts, 139 mm thick, 3.3 m2.K/W	346.00 m2		
					06-16-36.10	0605	Sheathing, plywood on walls, CDX, 15mm thick, pneumatic nailed	346.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	346.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	346.00 m2		
				C1010.0600			38 x 140mm Wood Stud Partition			
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	35.00 m2		
					06-11-10.26	0207	Pwstd,wst,std&bet lum, 38 x 140mm	35.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	35.00 m2		
				C1010.0600			38 x 89mm Wood Stud Partition			
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	889.00 m2		
					06-11-10.26	0206	Pwstd,wst,std&bet lum, 38 x 89mm	889.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	889.00 m2		
				C1010.0600			Wood Stud Partition w/ Metal Liner Panel			
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	75.00 m2		
					07-21-16.20	1340	Blanket insulation, for walls or ceilings, mineral wool batts, 139 mm thick, 3.3 m2.K/W	75.00 m2		
					06-11-10.26	0207	Pwstd,wst,std&bet lum, 38 x 140mm	75.00 m2		
					06-11-10.26	0209	Pwstd,wst,std&bet lum, 38 x 240mm	75.00 m2		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 240 mm thick, 5.3 m2.K/W	75.00 m2		
					06-16-36.10	0605	Sheathing, plywood on walls, CDX, 15mm thick, pneumatic nailed	75.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	75.00 m2		
				C1010.1500			Rough Carpentry and Firestopping			
					06-11-10.26	1401	Blocking and rough carpentry & finish carpentry	984.00 m2		
					07-84-13.10	0751	Firestopping	984.00 m2		
			C1020	* unassigned *			Interior Doors			
					09-01-23.35	0130	Paints & coatings, interior latex, doors, flush, both sides, roll & brush, primer + 1 coat, incl. frame & trim	81.00 ea		
				C1020.0010			Single HM Dr./Frame/Hardware			
					08-13-13.13	0640	Doors, commercial, steel, flush, full panel, hollow core, hollow metal, 0.9 mm, 914 mm x 2134 mm x 44 mm thick	1.00 ea		
					08-12-13.25	0100	Door frames, steel channels with anchors and bar stops, 150 mm channel@ 12 kg/m, 915 mm x 2135 mm door, weighs 68 kg	1.00 ea		
					08-71-20.15	2850	Door hardware, single, interior	1.00 door		
				C1020.0020			Double HM Dr./Frame/Hardware			
					08-13-13.13	0640	Doors, commercial, steel, flush, full panel, hollow core, hollow metal, 0.9 mm, 914 mm x 2134 mm x 44 mm thick	2.00 ea		
					08-12-13.25	0200	Door frames, steel channels with anchors and bar stops, 200 mm channel@ 17 kg/m, 1830 mm x 2440 mm door, weighs 125 kg	1.00 ea		
					08-71-20.15	3110	Door hardware, school, interior, excl. panic device	1.00 pr		
					09-01-23.35	0130	Paints & coatings, interior latex, doors, flush, both sides, roll & brush, primer + 1 coat, incl. frame & trim	2.00 ea		
				C1020.0100			Single Wood Doors			
					08-14-16.09	4040	Door, wood, exterior, flush, solid wood stave core birch, 914 mm x 2134 mm x 44 mm	46.00 ea		
					08-12-13.25	0100	Door frames, steel channels with anchors and bar stops, 150 mm channel@ 12 kg/m, 965 mm x 2135 mm door, weighs 68 kg	46.00 ea		
					08-71-20.15	2850	Door hardware, single, interior	46.00 door		
				C1020.0105			Double Wood Doors (Closet)			
					08-14-16.09	3320	Door, wood, architectural, flush, interior, M.D. overlay on hardboard, 35 mm, 800 mm x 2135 mm	32.00 ea		
					08-12-13.25	0110	Dr frm, stl chn wth anc and bar stop, 150 ch@ 12 kg/, 1100 x 2150 dr.	16.00 ea		
					08-71-20.15	2850	Door hardware, single, interior (closet)	16.00 pr		
			C1030				Fittings			
				C1030.0010			Washroom Accessories			
					10-28-13.13	0300	Toilet accessories, shower curtain rod, chrome, 32 mm diameter x 1524 mm	10.00 ea		
					10-28-13.13	3600	Toilet accessories, mirror, 914 mm x 610 mm, with 127 mm ss shelf & stainless steel 19 mm square frame	10.00 ea		
					10-28-13.13	7000	Toilet accessories, towel holder, hotel type, 2 guest size	10.00 ea		
					10-28-13.13	4400	Toilet accessories, robe hook, heavy duty, concealed mounting	10.00 ea		
					10-28-13.13	6100	Toilet accessories, toilet tissue dispenser, stainless steel, surface mounted, single roll	10.00 ea		
					10-28-13.13	0900	Toilet accessories, grab bars, straight, stainless steel, 610 mm long	3.00 ea		
					10-28-13.13	1950	Toilet accossr, grab bars, 120 degree angle, 610x 610	3.00 ea		
					10-28-13.13	2010	Commercial toilet accessories, grab bar, tub/shower/toilet, stainless steel, 2-wall, 900 x 600 mm, 32 mm dia	3.00 ea		
				C1030.0060			Signage			
					10-14-19.10	2800	Signs, letters, acrylic on high density foam, 305 mm high x 51 mm deep	11.00 ea		
		C30					Interior Finishes			
			C3010				Wall Finishes			
				C3010.0150			Wall Finishes			
					09-01-23.72	1240	Paints & coatings, walls & ceilings, interior, concrete, drywall or plaster, latex paint, 3 coats, smooth finish, roller	2,893.00 m2		
					09-30-13.10	5500	Ceramic tile, walls, interior, thin set, 150 mm x 108 mm	30.00 m2		
					09-06-56.20	0300	Wall coating, epoxy coatings, solvent based	323.00 m2		
			C3020				Floor Finishes			
				C3020.0200			Floor Finishes			
					09-05-16.10	8200	Resilient flooring, vinyl sheet goods, backed, plain pattern/colors, 3 mm thick	601.00 m2		
					09-05-16.10	8151	Resilient Flooring, vinyl sheet goods, non-slip	140.00 m2		
					09-05-19.19	7450	Resilient Flooring, static dissipative	70.00 m2		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				C3020.0200			Floor Finishes		75(1)(a)(ii)	
					09-05-13.13	1100	Wall base, rubber, straight or cove, standard colors, 100 mm high, 3 mm thick	649.00 m		
					09-05-13.13	1661	Integral cove base	263.00 m		
			C3030				Ceiling Finishes			
				C3030.0100			Drywall Ceilings - Main Level			
					06-11-10.12	6450	Wood framing, suspended ceiling	225.00 m2		
					09-29-10.30	3050	Gypsum wallboard, on ceilings, standard, taped & finished (level 4 finish), 16 mm thick	225.00 m2		
					09-29-10.30	3050	Gypsum wallboard, on ceilings, standard, taped & finished (level 4 finish), 16 mm thick	225.00 m2		
				C3030.0100			Drywall Ceilings w/ Acoustic Tile - Main Level			
					06-11-10.12	6450	Wood framing, suspended ceiling	193.00 m2		
					09-29-10.30	3050	Gypsum wallboard, on ceilings, standard, taped & finished (level 4 finish), 16 mm thick	193.00 m2		
					09-29-10.30	3050	Gypsum wallboard, on ceilings, standard, taped & finished (level 4 finish), 16 mm thick	193.00 m2		
					09-51-23.30	0810	Complete suspended ceilings,mineral fiber,lav-in board,800 x 1200 x 16 mm,24 t bar suspension,include std suspension system,excl 40mm carrier channels	193.00 m2		
				C3030.0100			Drywall Ceilings - Second Level			
					06-11-10.12	6450	Wood framing, suspended ceiling	181.00 m2		
					09-29-10.30	3050	Gypsum wallboard, on ceilings, standard, taped & finished (level 4 finish), 16 mm thick	181.00 m2		
				C3030.0100			Drywall Ceilings w/ Acoustic Tile - Second Level			
					06-11-10.12	6450	Wood framing, suspended ceiling	142.00 m2		
					09-29-10.30	3050	Gypsum wallboard, on ceilings, standard, taped & finished (level 4 finish), 16 mm thick	142.00 m2		
					09-51-23.30	0810	Complete suspended ceilings,mineral fiber,lav-in board,800 x 1200 x 16 mm,24 t bar suspension,include std suspension system,excl 40mm carrier channels	142.00 m2		
				C3030.0100			Exposed Ceilings			
					09-01-23.72	4101	Pnts&ctng,clng,high lvl,water rpln,2 coats,spray	70.00 m2		
	D						SERVICES			
		D20					Plumbing			
			D2010				Plumbing Fixtures			
				D2010.0050			Residential Water Closets			
					22-41-13.40	1100	Wcttyp,vtr chn,flr mnt,cls cpl,two pc,6 l fls,inc st,sup pip wth stop	7.00 ea		
					22-41-13.40	1000	HC,Wtr cls,tnk typ,vtr chn,flr mnt,one pc,6 l fls,inc st,sup pip wth stop	3.00 ea		
				D2010.0100			Lavatories			
					22-41-16.10	3020	Lvtry,vanity top,vitres china,white,md,single bowl,475 mm,inclds trim	10.00 ea		
					22-41-16.10	3580	Lavatory, vanity top, rough-in, supply, waste and vent	10.00 ea		
				D2010.0125			Sinks			
					22-41-16.30	5790	Sink, s/s, double	10.00 ea		
				D2010.0150			Showers			
					22-41-19.10	4000	Bath / Shower Combo - fixed shower head	7.00 ea		
					22-41-19.10	4000	Bath / Shower Combo - hand held shower head	3.00 ea		
				D2010.0200			Floor Drains			
					22-13-16.50	2801	Floor Drains	2.00 ea		
			D2020				Domestic Water Distribution			
				D2020.0010			Piping & Insulation			
					22-11-13.23	1200	Domestic Water hook-ups c/w suite manifolds	71.00 ea		
					22-07-19.10	6870	Insulation, pipe covering (price copper tube one size less than I.P.S.), fiberglass with all service jacket, 25 mm wall, 25 mm iron pipe size	1.00 ls		
					22-11-19.42	1010	Meter Tree and Backflows - 6"	1.00 ea		
					33-16-13.23	7000	FRP Water Tank - 5,400l (total of 10,800l)	2.00 ea		
			D2030				Sanitary Waste			
				D2030.0010			Sanitary Waste			
					22-13-16.30	21601	Sanitary / Vent hook-up	41.00 ea		
					33-36-13.19	0025	FRP Sectional Sewage Tank, 12,600l c/w pump out	1.00 ea		
			D2090				Other Plumbing Systems			
				D2090.0010			Other Plumbing Systems			
					22-34-30.13	2040	Domestic Water Heater	2.00 ea		
					22-41-39.10	4201	Mixing valve	10.00 ea		
					26-27-26.50	0117	Heat Trace	50.00 m		
				G3040.0100			Heating Distribution			
					23-13-23.26	0400	Above grade Fuel Oil Storage and delivery system c/w main & aux storage tanks and fuel oil transfer pumps	1.00 ea		
					23-13-23.26	0400	Dual pipereturn system c/w tank top connections & anti-siphon prevention	1.00 ea		
		D30					HVAC			
			D3020				Heat Generation			
				D3020.0010			Boilers			
					23-52-23.40	2280	Boiler, oil fired, flame retention burner, cast iron, steam, gross output, 879 kW, includes standard controls and insulated flush jacket, packaged	3.00 ea		
				D3020.0020			Expansion/Fill Tanks			
					23-21-20.46	3100	Expansion Tank	2.00 ea		
					23-21-20.46	3200	Domestic Water Storage Tank	2.00 ea		
				D3020.0030			Heat Exchangers			
					23-57-19.16	1100	Heat Exchanger	1.00 ea		
			D3040				HVAC Distribution			
				D3040.0010			Heating Piping & Insulation			
					22-11-13.44	0610	Pipe, steel, black, threaded includes coupling and clevis hanger assembly sized for covering, 3 m OC	300.00 m		
					22-07-19.10	7320	Insulation	300.00 m		
					22-11-13.48	1041	Valves	1.00 ls		
				D3040.0020			Pumps			
					23-22-23.10	0100	Primary Heating Pumps	3.00 ea		
					23-22-23.10	0150	Secondary Heating Pumps	2.00 ea		
					23-22-23.10	0250	Domestic hot water circulation Pumps	2.00 ea		
					23-21-23.13	1110	Lead /standby circulator system	1.00 ea		
					22-14-29.16	7570	Duplex variable speed water booster system c/w pressure tank	1.00 ea		
					22-14-29.16	7580	Duplex lift sump pump station - assumed 500 gallon (2)2.0HP grinder pumps	1.00 ea		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				D3040.0030			Ductwork		75(1)(a)(ii)	
					23-31-13.13	0570	Exhaust duct c/w hook ups to Rangehoods	500.00 kg		
				D3040.0040			Grilles & Diffusers			
					23-37-13.30	1001	Grilles & diffusers	1.00 ls		
					23-37-15.40	1150	Louvres	1.00 ls		
				D3040.0050			Fans			
					23-34-23.10	6385	General exhaust fans	10.00 ea		
			D3050				Terminal and Packaged Units			
				D3050.0020			Unit Heaters, Fan & Heating Coils			
					23-82-19.20	0100	Unit Heaters	3.00 ea		
					23-74-33.10	8005	Ventilation Energy Recovery (HRV) - recirc defrost, c/w pre-heat & re-heat coils	10.00 ea		
				D3050.0050			Radiant Panels			
					23-82-36.10	1400	Baseboard	100.00 m		
					23-82-36.10	1450	Primer convectors - crawlspace	75.00 m		
			D3060				HVAC Instrumentation and Controls			
				D3060.0100			Instrumentation & Controls			
					23-09-43.10	0210	Controls, points for HVAC	984.00 m2		
					23-05-05.15	0020	Critical building alarm auto dialler	984.00 m2		
			D3070				Testing, Adjusting, and Balancing			
				D3070.0100			Testing, Adjusting & Balancing			
					23-05-05.15	0025	Testing, Adjusting and Balancing	984.00 m2		
			D3090				Other Special HVAC Systems			
				D3090.0100			Other Special HVAC			
					23-21-20.46	3185	Water treatment	984.00 m2		
					23-21-20.46	3185	Pre-flush, prior to occupancy	984.00 m2		
					23-21-20.46	3181	Glycol	984.00 m2		
					23-21-20.46	3185	Building Commissioning	984.00 m2		
			D40				Fire Protection			
				D4030			Fire Protection Specialties			
				D4010.0010			Fire Protection			
					10-44-16.13	0120	Fire Extinguishers	12.00 ea		
			D50				Electrical			
				D5010			Electrical Service and Distribution			
				D5010.0100			Meter Centre			
					26-27-13.10	2190	Meter center, main circuit breaker, 1P 3W 120/240 V, 600 A	1.00 ea		
					26-27-13.10	0100	Meter socket, single position, 4 terminal, 100 A	11.00 ea		
					26-24-13.30	0402	SPD, surge protective device integral to main service	1.00 ea		
					26-09-13.30	0100	Smart metering, in panel, single phase, 120/208 volt, 100 amp	11.00 ea		
				D5010.0200			Panelboards			
					26-24-16.30	1750	Panelboards, 1 phase 3 wire, main circuit breaker, 120/240 V, 100 A, 32 circuits, NQOD, incl 20 A 1 pole plug-in breakers	10.00 ea		
					26-24-16.30	1800	Panelboards, 1 phase 3 wire, main circuit breaker, 120/240 V, 100 A, 60 circuits, NQOD, incl 20 A 1 pole plug-in breakers	1.00 ea		
				D5010.0700			Wire			
					26-05-19.55	0500	Non-metallic sheathed cable, copper with ground wire, 600 V, 3 conductor, #6, (Romex)	500.00 m		
				D5010.0900			Grounding			
					26-05-26.80	0100	Grounding rod, copper clad, 3 m long, 19 mm diameter	3.00 ea		
					26-05-26.80	0400	Ground wire, copper wire, bare stranded, #6	30.00 m		
					26-05-26.80	2000	Water pipe ground clamps, heavy duty, bronze, 13 mm to 25 mm diameter	1.00 ea		
					26-05-26.80	2100	Water pipe ground clamps, heavy duty, bronze, 32 mm to 51 mm diameter	1.00 ea		
			D5020				Lighting and Branch Wiring			
				D5020.0050			Wiring Devices			
					26-27-26.40	0100	Duplex receptacle, grounded, 120V, 15/20A	160.00 ea		
					26-27-26.40	0101	Duplex receptacle, grounded, 120V, 15/20A, GFCI	30.00 ea		
					26-27-26.40	0154	Duplex receptacle, grounded, 120 V, 15/20A, W.P	12.00 ea		
					26-27-26.40	0302	Receptacle, dryer, 30 A	10.00 ea		
					26-27-26.40	0303	Receptacle, washer, 15 A	10.00 ea		
					26-27-26.40	0304	Receptacle, range, 50 A	10.00 ea		
					26-27-26.30	0102	3 way switch, 15 A	40.00 ea		
					26-27-26.30	0101	Toggle switch, quiet type, single pole, 15 A	72.00 ea		
				D5020.0150			Interior Lighting LED			
					26-51-13.55	2001	Interior LED fixtures, industrial strip, chain hung or surface mounted, 4' / 1220mm long	10.00 ea		
					26-51-13.55	0101	Interior LED fixtures, downlight, recess mounted, 9 watt, 4" / 102 mm diameter	50.00 ea		
					26-51-13.55	0180	Interior LED fixtures, interior surface mounted	80.00 ea		
					26-51-13.55	2011	Interior LED fixtures, linear (vanity), surface wall mounted	10.00 ea		
				D5020.0300			Exterior LED Lighting			
					26-56-23.55	0100	Exterior LED fixture, wall mounted, indoor/outdoor, 12 watt, incl lamps	11.00 ea		
					26-56-23.55	0110	Exterior LED fixture, wall mounted, indoor/outdoor, 32 watt, incl lamps	8.00 ea		
				D5020.0600			Mechanical Equipment			
					26-27-26.50	0122	Rough in & hookup, Split A/C Condensing Unit 1P2W, 208V, 30A	1.00 ea		
					26-27-26.50	0250	Rough in & hookup, Fan Coil Unit, 120V, 15A	10.00 ea		
					26-27-26.50	0210	Rough in & hookup, Boiler, 120V, 15A	3.00 ea		
					26-27-26.50	0215	Rough in & hookup, Glycol Fill System, 120V, 15A	1.00 ea		
					26-27-26.50	0220	Rough in & hookup, HRV, 120V, 15A	10.00 ea		
					26-27-26.50	0225	Rough in & hookup, Range Hood, 120V, 15A / Frac HP	10.00 ea		
					26-27-26.50	0112	Rough in & hookup, dishwasher	10.00 ea		
					26-27-26.50	0260	Rough in & hookup, Cabinet Unit Heater, 120V, 15A / Frac HP	1.00 ea		
					26-27-26.50	0265	Rough in & hookup, Unit Heater, 120V, 15A / Frac HP	1.00 ea		
					26-27-26.50	0495	Rough in & hookup, Pumps	12.00 ea		
				D5020.0700			Wire			
					26-05-19.55	0250	Non-metallic sheathed cable, copper with ground wire, 600 V, 2 conductor, #12, (Romex)	4,500.00 m		
					26-05-19.55	0300	Non-metallic sheathed cable, copper with ground wire, 600 V, 3 conductor, #12, (Romex)	450.00 m		
					26-05-19.55	0350	Non-metallic sheathed cable, copper with ground wire, 600 V, 2 conductor, #10, (Romex)	150.00 m		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				D5020.0700			Wire		75(1)(a)(ii)	
					28-05-19.55	0400	Non-metallic sheathed cable, copper with ground wire, 600 V, 3 conductor, #10, (Romex)	450.00 m		
					28-05-19.55	0450	Non-metallic sheathed cable, copper with ground wire, 600 V, 3 conductor, #8, (Romex)	450.00 m		
					28-05-19.20	0150	Armored cable, copper, solid, 600 V, 2 conductor, #12, BX, exposed	150.00 m		
					28-05-19.20	0200	Armored cable, copper, solid, 600 V, 3 conductor, #12, BX, exposed	75.00 m		
			D5030				Communications and Security			
				D5030.0100			Fire Alarm System			
					28-31-23.50	7001	Detection Systems, smoke detectors, excl. wires & conduit	16.00 ea		
					28-31-23.50	7012	Detection Systems, fire alarm, CO detector excl. wires & conduit	10.00 ea		
				D5030.0800			Data / Telephone System			
					27-13-23.13	0403	T.V outlets - RG6	36.00 ea		
					27-13-23.13	0417	Data outlets - 2D Cat6	36.00 ea		
					27-13-23.13	0600	Data / Voice outlets - 1D Cat6	16.00 ea		
					27-13-23.13	0416	Wireless access points - 2D Cat6	10.00 ea		
					27-13-23.13	0435	Data racks - 2 post	1.00 ea		
					27-13-23.13	0408	Telephone BIX Terminations	1.00 ea		
					28-32-33.10	0300	Uninterruptible Power Source (UPS), 1.5 kW	1.00 ea		
					27-13-23.13	0050	Data Cable, Cat 6	4,500.00 m		
					27-41-19.10	1500	Cable, coaxial, RG6	1,500.00 m		
			D5090				Other Electrical Systems			
				D5090.0300			Emergency Lighting Systems			
					28-52-13.10	0700	Emergency lighting units, nickel cadmium battery operated, twin sealed beam light, 25 W, 6 V each	2.00 ea		
					28-52-13.10	1150	Emrgn light, remote head, dual head,	2.00 ea		
					28-52-13.10	1100	Emrgn light, remote head, dual head, WP	12.00 ea		
					28-53-13.10	0262	Exit lighting, LED w/ battery unit, vandal-resistant & WP, single face, ceiling or wall mount	4.00 ea		
					28-53-13.10	0240	Exit lighting, LED w/ battery unit, single face, ceiling or wall mount	1.00 ea		
E							EQUIPMENT AND FURNISHINGS			
	E10						Equipment			
		E1010					Commercial Equipment			
				* unassigned *						
					11-05-10.00	---	Allowance for Owner Supplied Equipment / Furniture handling & installation	1.00 ls		
				E1010.100			Residential Appliances			
					11-31-13.13	0020	Cooking range, residential appliances, free standing, 1 oven, 750 wide, min	10.00 ea		
					11-31-13.13	1250	Microwave ovens, residential appliances, minimum	10.00 ea		
					11-31-13.23	5750	Refrigerator, residential appliances, no frost, .40 to .45 m3, minimum	10.00 ea		
					11-31-13.23	2000	Deep freezer, residential appliances, .42 to .65 m3, minimum	10.00 ea		
					11-31-13.53	4150	Range hood, residential appliances, vented, min. 2 speed, 750 wide, minimum	10.00 ea		
					11-31-23.13	6650	Washing machine, residential appliances, automatic, minimum	10.00 ea		
					11-31-23.23	3200	Dryer, residential appliances, automatic, minimum	10.00 ea		
					11-31-13.33	2750	Dishwasher, residential appliances, built-in, 2 cycles, minimum	10.00 ea		
	E20						Furnishings			
		E2010					Fixed Furnishings			
				E2010.0200			Washroom Vanities / Medicine Cabinets			
					12-32-13.30	8050	Vanities, vanity bases, 2 door, 750mm h x 600mm d x 915mm w	10.00 ea		
					12-36-23.10	0750	Counter tops, custom plastic, 32 thick, with splash	10.00 m		
					10-28-16.20	1200	Medicine cabinets, hotel type, stainless steel, w/lower shelf, unlighted	10.00 ea		
				E2010.0950			Closet Shelving			
					12-32-13.10	1263	Closet shelf & coat rod	30.00 m		
					12-32-13.10	1263	Coathooks w/ shelving	20.00 m		
				E2010.0950			Pantry / Storage Shelving			
					12-32-13.15	0100	Open shelving	20.00 m		
				E2010.1000			Kitchen Cabinets			
					12-32-13.10	1201	Lower cabinets	40.00 m		
					12-32-13.10	4441	Upper cabinets	40.00 m		
					12-36-23.10	0750	Counter tops, custom plastic, 32 thick, with splash	40.00 m		
				E2010.2000			Window Treatment			
					12-24-13.10	0901	Shades, rollup, blackout, manual	115.00 m2		
GC										
	Z						GENERAL REQUIREMENTS AND ALLOWANCES			
		Z10					General Requirements			
			Z1010				Supervision and Labour Expenses			
				* unassigned *						
					01-31-13.20	---	Supervision & Labour	22.00 mnth		
			Z1030				Temporary Conditions			
				* unassigned *						
					01-54-33.60	---	Temporary Conditions / LOA	22.00 mnth		
					01-54-36.50	1600	Logistics - Mobilization of Goods & Materials to site (Ice Road)	1.00 ls		
					03-05-13.30	---	Concrete Mixing	1.00 ea		
					01-54-36.50	1600	Logistics - Mobilization of Goods & Materials to site (Air)	1.00 ls		
			Z1050				Permits, Insurance and Bonds			
				Z1050.0100			Permits			
					00-31-43.00	0010	Building Permit, 7.25/1000	23,000.00 k		
				Z1050.0200			Bonding			
					00-61-13.00	0005	Bid Bond, 2/1000	23,000.00 k		
					00-61-13.00	0010	Performance Bond, 6/1000	23,000.00 k		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				Z1050.0200			Bonding		75(1)(a)(ii)	
					00-61-13.00	0020	Labour & Material Bond, 3/1000	23,000.00 k		
				Z1050.0300			Insurance			
					00-73-16.00	0010	Insurance, Wrap-Up, 3/1000	23,000.00 k		
					00-73-16.00	0020	Insurance, Course of Construction, 4/1000	23,000.00 k		
		Z30					Allowances			
			Z3050				Cash Allowance			
				Z3050.100			Cash Allowance(s)			
					33-71-16.33	---	Power & Telecom Utility Hookups - CASH ALLOWANCE	1.00 LS		
				Z3050.100			Cash Allowance(s)			
					33-71-16.33	---	Power & Telecom Utility Hookups - CASH ALLOWANCE	1.00 LS		
HWC										
	A						SUBSTRUCTURE			
		A10					Foundations			
			A1020				Special Foundations			
				A1020.0050			Piles			
					31-63-26.13	0050	Mobilization	1.00 ea		
					31-63-26.13	1097	Thermal Piles, 12m depth incl. manifold	38.00 ea		
	B						SHELL			
		B10					Superstructure			
			B1010				Floor Construction			
				* unassigned *						
					03-35-29.60	---	Allowance for housekeeping pads	1.00 ls		
				B1020.0300			Structural Steel Insulated Composite Floor - Main Floor			
					05-12-23.75	0050	Structural steel, C Channel Shape, a992 steel, shop fab, incl shop primer, bolted connection	3,250.00 kg		
					05-12-23.75	0100	Structural steel, W Shape, a992 steel, shop fab, incl shop primer, bolted connection	27,500.00 kg		
					05-21-19.10	0440	OWSJ K series,	15.00 m tn		
					05-12-23.80	0600	Girts and bracing, Structural HSS	5,000.00 kg		
					05-31-13.50	5120	Metal floor decking, steel, non-cellular, composite, galvanized, 38 mm D, 18 gauge	952.00 m2		
					03-21-10.80	0400	Reinforcing, elevated slabs, #10 to #25	3.10 m tn		
					03-31-05.35	0200	Ready Mix Concrete, 25 Mpa, 3500 psi	77.00 m3		
					03-31-05.70	1400	Concrete placing to elevated slab, pumpd, incl vibrating	77.00 m3		
					03-35-29.30	0020	Concrete finishing, floors, monolithic, screed finish	952.00 m2		
					03-35-29.30	0250	Concrete finishing, floors, monolithic, machine trowel finish	952.00 m2		
					07-81-16.10	2050	Sprayed fireproofing, vermiculite cement, troweled or sprayed, 13mm thick	952.00 m2		
					05-12-23.40	0400	Angle framing, structural steel, 100 mm and larger, field fabricated, incl cutting & welding	1,950.00 kg		
					07-21-16.20	1380	Blanket insulation, for walls or ceilings, mineral wool batts, 200 mm thick, 5.3 m2.K/W	1,880.00 m2		
					06-29-10.30	9525	15.9mm thick glass fibre faced gypsum sheathing	952.00 m2		
					07-41-13.20	0925	Metal Liner Panel	952.00 m2		
				B1020.0300			Structural Steel Composite Floor - Mezzanine / Fan Room			
					05-12-23.17	0100	Columns, Structural HSS	1,850.00 kg		
					05-12-23.75	0100	Structural steel, W Shape, a992 steel, shop fab, incl shop primer, bolted connection	6,475.00 kg		
					05-31-13.50	5120	Metal floor decking, steel, non-cellular, composite, galvanized, 38 mm D, 18 gauge	118.00 m2		
					03-21-10.80	0400	Reinforcing, elevated slabs, #10 to #25	0.74 m tn		
					03-31-05.35	0200	Ready Mix Concrete, 25 Mpa, 3500 psi	18.50 m3		
					03-31-05.70	1400	Concrete placing to elevated slab, pumpd, incl vibrating	18.50 m3		
					03-35-29.30	0020	Concrete finishing, floors, monolithic, screed finish	118.00 m2		
					03-35-29.30	0250	Concrete finishing, floors, monolithic, machine trowel finish	118.00 m2		
					07-81-16.10	2050	Sprayed fireproofing, vermiculite cement, troweled or sprayed, 13mm thick	118.00 m2		
					05-12-23.40	0400	Angle framing, structural steel, 100 mm and larger, field fabricated, incl cutting & welding	925.00 kg		
			B1020				Roof Construction			
				* unassigned *						
					05-12-23.17	---	Miscellaneous Steel Supports	1.00 ls		
				B1020.0300			Structural Steel Composite Roof - Low Roof			
					05-12-23.17	0095	Structural steel, W Shape, a992 steel, shop fab, incl shop primer, bolted connection	21,500.00 kg		
					05-12-23.17	0100	Columns, Structural HSS	4,175.00 kg		
					05-12-23.17	0050	Structural Steel HSS, girts, bracing etc.	4,675.00 kg		
					05-21-19.10	0440	OWSJ K series, span to 10 to 15m, horizontal bridging, avg	5.00 m tn		
					05-31-23.50	2650	Metal roof decking, steel, open type B wide rib, galvanized, 465 to 4650 m2, 38 mm D, 20 gauge	875.00 m2		
					05-12-23.40	0400	Angle framing, structural steel, 100 mm and larger, field fabricated, incl cutting & welding	3,500.00 kg		
				B1020.0300			Structural Steel Composite Roof - Upper Roof			
					05-12-23.17	0100	Columns, Structural HSS	1,110.00 kg		
					05-12-23.40	0600	Channel framing, structural steel, 200 mm and larger, field fabricated, incl cutting & welding	370.00 kg		
					05-12-23.75	0100	Structural steel, W Shape, a992 steel, shop fab, incl shop primer, bolted connection	1,850.00 kg		
					05-21-19.10	0440	OWSJ K series	1.50 m tn		
					05-12-23.80	0600	Girts and bracing, Structural HSS	296.00 kg		
					05-31-23.50	2650	Metal roof decking, steel, open type B wide rib, galvanized, 465 to 4650 m2, 38 mm D, 20 gauge	118.00 m2		
					05-12-23.40	0400	Angle framing, structural steel, 100 mm and larger, field fabricated, incl cutting & welding	462.50 kg		
		B20					Exterior Enclosure			
			B2010				Exterior Walls			
				B2010.0125			Steel Stud Wall Construction w/ Fibre Cement Siding			
					07-46-46.10	0065	Fibre cement siding, lap siding, woodgrain texture, 8mm thick x 300mm wide, 264 mm exposure	701.00 m2		
					09-22-13.13	1200	Furring / Strapping, walls, on steel, galvanized fastened w/ long stainless screws	701.00 m2		
					07-21-14.10	0725	Wall insulation, semi-rigid mineral fibre 150 thick	701.00 m2		
					07-21-14.10	0725	Wall insulation, semi-rigid mineral fibre 150 thick	701.00 m2		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				B2010.0125			Steel Stud Wall Construction w/ Fibre Cement Siding		75(1)(a)(ii)	
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	701.00 m2		
					09-29-10.30	9525	15.9mm thick glass fibre faced gypsum sheathing on walls	701.00 m2		
					09-22-16.13	3240	Metal stud partition, non-load bearing, galvanized, 3660 mm H, 20 ga., 152 mm wide, 0.53 mm thick, 400 mm O.C., includes top & bottom track	701.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	701.00 m2		
				B2010.0125			Steel Stud Wall Construction w/ Metal Panel			
					07-42-13.30	1020	Steel siding, colored, corrugated or ribbed, on steel frame, 10 year finish, 0.90mm thick, incl. fasteners	363.00 m2		
					09-22-13.13	1200	Furring / Strapping, walls, on steel, galvanized fastened w/ long stainless screws	363.00 m2		
					07-21-14.10	0725	Wall insulation, semi-rigid mineral fibre 150 thick	363.00 m2		
					07-21-14.10	0725	Wall insulation, semi-rigid mineral fibre 150 thick	363.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	363.00 m2		
					09-29-10.30	9525	15.9mm thick glass fibre faced gypsum sheathing on walls	363.00 m2		
					09-22-16.13	3240	Metal stud partition, non-load bearing, galvanized, 3660 mm H, 20 ga., 152 mm wide, 0.53 mm thick, 400 mm O.C., includes top & bottom track	363.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	363.00 m2		
				B2020			Exterior Windows			
				B2020.0200			Vinyl Windows			
					08-53-13.40	0400	Vinyl windows, triple glazed	50.00 m2		
				B2030			Exterior Doors			
				* unassigned *						
					09-91-13.70	0190	Paints & coatings, exterior doors, flush, both sides, roll & brush, primer + 2 coats, exterior latex, incl. frame & trim	11.00 ea		
				B2030.0050			Single H.M. Insulatd Dr./Frame/Hardware			
					08-13-13.13	1760	Doors, commercial, steel, insulated, full panel, 1.2 mm, 914 mm x 2134 mm x 44 mm thick	5.00 ea		
					08-12-13.25	0100	Door frames, steel channels with anchors and bar stops, 150 mm channel @ 12 kg/m, 915 mm x 2135 mm door, weighs 68 kg	5.00 ea		
					08-71-20.15	2250	Door hardware, healthcare, single, exterior, incl. lever, panic device	5.00 door		
					08-71-25.10	2700	Weatherstripping, doors, metal frame, extruded sections, aluminum, for 900 mm x 2135 mm door	5.00 opng		
					08-71-25.10	3650	Weatherstripping, for thresholds, door sweep, flush mounted, aluminum	5.00 ea		
				B2030.0075			Double H.M. Insulatd Dr./Frame/Hardware			
					08-13-13.13	1760	Doors, commercial, steel, insulated, full panel, 1.2 mm, 914 mm x 2134 mm x 44 mm thick	6.00 ea		
					08-12-13.25	0200	Door frames, steel channels with anchors and bar stops, 200 mm channel @ 17 kg/m, 1830 mm x 2440 mm door, weighs 125 kg	3.00 ea		
					08-71-20.15	3100	Door hardware, double, exterior, incl. panic device	3.00 pr		
					08-71-25.10	3100	Weatherstripping, doors, metal frame, extruded sections, aluminum, for 1830 mm x 2135 mm door	3.00 opng		
					08-71-25.10	3650	Weatherstripping, for thresholds, door sweep, flush mounted, aluminum	6.00 ea		
				B30			Roofing			
				B3010			Roof Coverings			
				B3010.0050			SBS Roofing			
					07-52-13.10	0060	Modified bituminous membrane, base sheet, 6.8kg organic felt, spot mopped to deck	967.00 m2		
					07-52-13.10	2150	Modified bituminous membrane, smooth surface cap sheet, polyester reinforced, 4.3mm, torched	967.00 m2		
					07-52-13.10	2250	Modified bituminous membrane, smooth surface flashing, 4mm, torched	967.00 m2		
					07-22-16.10	0120	Roof deck insulation, fiberboard high density, 25mm thick, 0.44m2.K/W, fastening excluded	967.00 m2		
					07-21-14.10	0720	Roof deck insulation, semi-rigid mineral fibre 400 thick	967.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	967.00 m2		
					09-29-10.30	9525	15.9mm thick glass fibre faced gypsum sheathing	967.00 m2		
				B3030			Balconies and Projections			
				A1020.0050			Piles			
					31-63-26.13	1097	Thermal Piles, 12m depth incl. manifold	20.00 ea		
				B3030.0100			Exterior Entrance Canopy			
					05-12-23.77	---	Canopies, structural steel incl. finishes	6.00 m2		
				B3030.0100			Main Level Decks			
					05-53-21.50	0632	Decks / Balconies, structural steel framing w/ galvanized metal grating	57.00 m2		
				B3030.0100			Access Ramps			
					05-12-23.77	---	Access ramps, structural steel framing w/ galvanized metal grating	71.00 m2		
				C2010.0300			Metal Grate Stairs			
					05-51-13.50	1600	Stair landings, shop fabricated, steel, pre-erected, incl framing, metal fan forms, excl concrete for pan forms	6.00 m2		
					05-51-19.50	0100	Stair, shop fabricated, steel, 1600 mm W, incl pipe railing, stringers, grating treads w/ safety nosing, per riser	17.00 risr		
					05-51-19.50	0100	Stair, shop fabricated, steel, 1200 mm W, incl pipe railing, stringers, grating treads w/ safety nosing, per riser	35.00 risr		
					05-51-19.50	0100	Stair, shop fabricated, steel, 1200 mm W, incl pipe railing, stringers, grating treads w/ safety nosing, per riser	12.00 risr		
					05-51-19.50	0100	Stair, shop fabricated, steel, 1200 mm W, incl pipe railing, stringers, grating treads w/ safety nosing, per riser	9.00 risr		
				C2010.0300			Handrails / Guardrails			
					05-73-23.50	0200	Railing, ornamental, aluminum, 1050 mm high, posts @ 1800 mm O.C., panelized, plain	194.00 m		
							INTERIORS			
							Interior Construction			
				C1010			Partitions			
				C1010.0100			2-92mm Metal Stud Partition - Fire Rated			
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	568.00 m2		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				C1010.0100			2-92mm Metal Stud Partition - Fire Rated		75(1)(a)(ii)	
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	568.00 m2		
					08-16-36.10	0800	Sheathing, plywood on walls, CDX, 16mm thick	568.00 m2		
					07-21-16.20	1320	Blanket insulation, for walls or ceilings, mineral wool batts, 88 mm thick, 2.1 m2.K/W	568.00 m2		
					09-22-16.13	3200	Metal stud partition, non-load bearing, galvanized, 3660 mm H, 20 ga., 92 mm wide, 0.53 mm thick, 400 mm O.C., includes top & bottom track	568.00 m2		
					09-22-16.13	3200	Metal stud partition, non-load bearing, galvanized, 3660 mm H, 20 ga., 92 mm wide, 0.53 mm thick, 400 mm O.C., includes top & bottom track	568.00 m2		
					07-21-16.20	1320	Blanket insulation, for walls or ceilings, mineral wool batts, 88 mm thick, 2.1 m2.K/W	568.00 m2		
					08-16-36.10	0800	Sheathing, plywood on walls, CDX, 16mm thick	568.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	568.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	568.00 m2		
				C1010.0100			152 mm Metal Stud Partition			
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	945.00 m2		
					09-22-16.13	3140	Metal stud partition, non-load bearing, galvanized, 3660 mm H, 25 ga., 152 mm wide, 0.53 mm thick, 400 mm O.C., includes top & bottom track	945.00 m2		
					07-21-16.20	1340	Blanket insulation, for walls or ceilings, mineral wool batts, 139 mm thick, 3.3 m2.K/W	945.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	945.00 m2		
				C1010.1000			Interior Glazing w/Hollow Metal Frames			
					08-12-13.13	4002	Interior glazing w/ hollow metal frames	44.00 m2		
				C1010.1300			Security Grilles			
					08-11-74.10	0030	Security Grille	9.00 m		
					08-11-74.10	0020	Rolling Grille Supports, overhead framed	9.00 m		
				C1010.1500			Rough Carpentry and Firestopping			
					08-11-10.26	1401	Blocking and rough carpentry	1,070.00 m2		
					07-84-13.10	0751	Firestopping	1,070.00 m2		
				C1010.2000			Folding Partition			
					10-22-26.43	0700	Partitions,overhead track type,acoustical,53.7 kg/m2,76mm thick,min	14.00 m2		
			C1020	* unassigned			Interior Doors			
					09-91-23.35	0130	Paints & coatings, interior latex, doors, flush, both sides, roll & brush, primer + 1 coat, incl. frame & trim	55.00 ea		
				C1020.0005			Sliding Wood Dr./Frame/Hardware			
					08-32-19.15	0015	Triple Panel Doors, sliding, solid core wood w/ PS frame, 2743 x 2438 high	1.00 opng		
				C1020.0010			Single HM Dr./Frame/Hardware			
					08-13-13.13	0840	Doors, commercial, steel, flush, full panel, hollow core, hollow metal, 0.9 mm, 914 mm x 2134 mm x 44 mm thick	1.00 ea		
					08-12-13.25	0100	Door frames, steel channels with anchors and bar stops, 150 mm channel@ 12 kg/m, 915 mm x 2135 mm door, weighs 68 kg	1.00 ea		
					08-81-10.10	0800	Float glass, tempered, clear, 6 mm thick	1.00 m2		
					08-71-20.15	1500	Door hardware, healthcare, single	1.00 door		
				C1020.0100			Single Wood Doors			
					08-14-16.09	4040	Door, wood, interior, flush, solid wood stave core birch, 914 mm x 2134 mm x 44 mm	48.00 ea		
					08-12-13.25	0100	Door frames, steel channels with anchors and bar stops, 150 mm channel@ 12 kg/m, 915 mm x 2135 mm door, weighs 68 kg	48.00 ea		
					08-81-10.10	0800	Float glass, tempered, clear, 6 mm thick	15.00 m2		
					08-71-20.15	1500	Door hardware, healthcare, single	48.00 door		
				C1020.0105			Double Wood Doors			
					08-14-16.09	4000	Door, wood, interior, flush, wood door solid core birch, 600 mm x 2134 mm x 44 mm	8.00 ea		
					08-12-13.25	0110	Dr frm, stl chn wth anc and bar stp, 150 ch@ 12 kg/, 1200 x 2150 dr,	4.00 ea		
					08-71-20.15	3110	Door hardware, healthcare, double, interior	4.00 pr		
			C1030				Fittings			
				C1030.0010			Washroom Accessories			
					10-28-13.13	0400	Toilet accessories, diaper changing station, plastic, wall mounted, horizontal	4.00 ea		
					10-28-13.13	0900	Toilet accessories, grab bars, straight, stainless steel, 610 mm long	5.00 ea		
					10-28-13.13	2010	Commercial toilet accessories, grab bar, tub/shower/toilet, stainless steel, 2-wall, 900 x 600 mm, 32 mm dia	3.00 ea		
					10-28-13.13	1950	Toilet accssr,grab bars,120 degree angle,25 dia,610x 610	5.00 ea		
					10-28-13.13	1105	Toilet accessories, grab bars, straight, stainless steel, 1050 mm long	3.00 ea		
					10-28-13.13	1710	Toilet Accessories, grab bars, fold down vertical arm	6.00 ea		
					10-28-13.13	3600	Toilet accessories, mirror, 914 mm x 610 mm, with 127 mm ss shelf & stainless steel 19 mm square frame	8.00 ea		
					10-28-13.13	4201	Toilet Accessories, sanitary napkin disposal	8.00 ea		
					10-28-13.13	0610	Toilet accessories, dispenser units, towel dispenser & waste receptacle, 68.1 liter capacity	8.00 ea		
					10-28-13.13	6900	Toilet accessories, towel dispenser, plastic, touchless, battery operated	14.00 ea		
					10-28-13.13	4400	Toilet accessories, robe hook, heavy duty, concealed mounting	22.00 ea		
					10-21-16.10	2300	Toilet accessories, fold-down shower bench	3.00 ea		
					10-28-13.13	0200	Toilet accessories, curtain rod, stainless steel, 25 mm diameter x 1524 mm long	3.00 ea		
					10-28-13.13	4800	Toilet accessories, soap dispenser, chrome, surface mounted, liquid	20.00 ea		
					10-28-13.13	6200	Toilet accessories, toilet tissue dispenser, stainless steel, surface mounted, double roll	8.00 ea		
				C1030.0030			Privacy Curtains			
					10-21-23.16	0020	Hospital partitions, curtain track, box channel, ceiling mounted	63.00 m		
					10-21-23.16	0310	Hospital partitions, curtains, nylon mesh tops, fire resistant, polyester oxford cloth, 373gram per lineal meter, 2743 mm ceiling height	60.00 m		
					10-21-23.16	0700	Hospital partitions, curtains, nylon mesh tops, biohazard, designer oxford cloth, 2743 mm ceiling height	3.00 m		
				C1030.0050			Wall Protection			
					10-26-13.10	0200	Corner guards, stainless steel, 9.1 kg/m, 75 mm x 75 mm x 8 mm	30.00 m		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				C1030.0050			Wall Protection		75(1)(a)(ii)	
					10-26-13.20	1000	Corner protection, vinyl cover, aluminum retainer, surface mount, 76 mm x 76 mm	30.00 m		
					10-26-16.10	1200	Wallguard, bed bumper, vinyl acrylic, aluminum retainer, 533 mm long	6.00 ea		
					10-26-16.10	3010	Wallguard, handrail/bumper, vinyl cover, aluminum retainer, bracket mounted, flat rail, 140 mm	180.00 m		
				C1030.0060			Signage			
					10-14-19.10	2800	Signage Allowance	1.00 ls		
				C1030.0100			Other Fittings			
					10-11-23.10	2160	Bulletin board, prefabricated, aluminum frame, 6 mm cork, 1219 mm x 1219 mm	9.00 ea		
					10-11-13.13	5910	Whiteboards, wall hung, deluxe units, aluminum trim & chalktrough, 1219 mm x 1219 mm	12.00 ea		
					10-11-13.13	5920	Whiteboards, wall hung, deluxe units, aluminum trim & chalktrough, 1219 mm x 2438 mm	2.00 ea		
					10-57-13.10	1400	Utility hook strips, 6 hooks, 9.5 mm x 64 mm x 457 mm	3.00 ea		
					10-57-13.10	1500	Coat racks/wardrobes, utility hook strips, 12 hooks, 9.5 mm x 64 mm x 864 mm	2.00 ea		
					10-28-13.13	4100	Mop holder strip, stainless steel, 5 holders, 1219 mm long	2.00 ea		
					10-51-13.10	4000	Boot Rack, steel, baked enamel, 4-tier w/ folding shelves	3.00 ea		
					10-51-13.10	0510	Lockers, steel, baked enamel, two person, 450 mm x 450 mm x 1800 mm	6.00 ea		
	C30						Interior Finishes			
				C3010			Wall Finishes			
				* unassigned *						
					09-77-43.20	---	Allowance for Acoustic / Architectural Finishes	1.00 LS		
				C3010.0150			Wall Finishes			
					09-96-56.20	0300	Wall coating, epoxy coatings, solvent based	1,897.00 m2		
					09-91-23.72	1240	Paints & coatings, walls & ceilings, interior, concrete, drywall or plaster, latex paint, 3 coats, smooth finish, roller	475.00 m2		
					09-77-33.10	0161	Semi Rigid PVC wall covering	274.00 m2		
					09-77-33.10	0220	FRP wall covering 2.5mm	454.00 m2		
				C3020			Floor Finishes			
				C3020.0200			Floor Finishes			
					09-65-16.10	8200	Resilient flooring, vinyl sheet goods, backed, plain pattern/colors, 3 mm thick	571.00 m2		
					09-65-16.10	8151	Resilient Flooring, vinyl sheet goods, non-slip	123.00 m2		
					09-65-19.19	7450	Resilient Flooring, static dissipative	54.00 m2		
					12-48-13.13	2530	Entrance floor mats, roll-out	16.00 m2		
					09-65-13.13	1100	Wall base, rubber, straight or cove, standard colors, 100 mm high, 3 mm thick	654.00 m		
					09-65-13.13	1061	Integral cove base	300.00 m		
					03-35-29.30	1900	Concrete finishing, floor, sealer	133.00 m2		
					09-68-13.10	0210	Carpet tile, tufted nylon, cushion back, 737 gram, 450 mm x 450 mm	70.00 m2		
				C3030			Ceiling Finishes			
				* unassigned *						
					09-51-23.30	---	Allowance for Acoustic / Architectural Finishes	1.00 ls		
				C3030.0050			Acoustic Suspended Ceiling System			
					09-51-23.30	0810	Complete suspended ceilings, mineral fiber, lay-in board, 600 x 1200 x 16 mm, 24 t bar suspension, include std suspension system, excl 40mm carrier channels	530.00 m2		
					09-51-23.30	0700	Complete suspended ceilings, fiberglass ceiling board, plain faced, washable, 600 x 1200 x 19 mm, include std suspension system, excl 40mm carrier channels	113.00 m2		
				C3030.0100			Exposed Ceilings			
					09-91-23.72	4101	Pnts & ctnng, ctnng, high lvl, water rpln, 2 coats, spray	161.00 m2		
				C3030.0100			Gypsum Ceilings			
					09-29-10.10	0450	Complete gypsum ceiling, moisture resistant, level 4 finish incl. suspension system / framing	163.00 m2		
					09-91-23.72	1280	Paints & coatings, walls & ceilings, interior, concrete, drywall or plaster, latex paint, 3 coats, smooth finish, spray	163.00 m2		
					09-29-10.10	0225	Drywall Bulkheads	1.00 ls		
	D						SERVICES			
		D20					Plumbing			
				D2010			Plumbing Fixtures			
				D2010.0050			Water Closets			
					22-41-13.40	1100	Wcttyp, vtr chn, flr mnt, cls cpl, two pc, 6 l fls, inc st, sup pip wth stop	2.00 ea		
					22-41-13.40	1010	HC, Wtr cls, wall hung, vtr chn, flr mnt, one pc, 4.2 l fls, inc st, sup pip wth stop	6.00 ea		
				D2010.0100			Lavatories			
					22-41-16.10	3020	Lvtry, vanity top, vitres china, white, rnd, single bowl, 475 mm, inclds trim	8.00 ea		
					22-41-16.10	3580	Lavatory, vanity top, rough-in, supply, waste and vent	10.00 ea		
				D2010.0125			Sinks			
					22-41-16.30	4980	Sink, s/s, single	2.00 ea		
					22-42-16.40	8981	Mop Sink	3.00 ea		
					22-42-16.40	7000	medical hand wash sinks	4.00 ea		
					22-42-16.40	7100	Patient care sinks	4.00 ea		
				D2010.0150			Showers			
					22-41-19.10	4000	Bath / Shower Combo - hand held shower head	3.00 ea		
					22-41-16.30	4104	Eyewash (wall mounted gravity operated)	2.00 ea		
					22-41-16.30	4104	Eyewash (pulldown station)	1.00 ea		
					22-41-16.30	4104	Eyewash (piped system)	1.00 ea		
					22-41-23.20	2900	Shower, hand-held head	2.00 ea		
				D2010.0200			Floor Drains			
					22-13-16.50	2801	Floor Drains	14.00 ea		
				D2010.0225			Miscellaneous Plumbing			
					11-31-23.13	4500	Washer/dryer connection	1.00 ea		
					11-31-23.13	4600	Kitchen equipment hookups	10.00 ea		
					22-05-23.20	8790	reduced pressure backflow	10.00 ea		
					11-31-23.13	4501	Dishwasher hook up	2.00 ea		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				D2010.0225			Miscellaneous Plumbing		75(1)(a)(ii)	
					11-31-23.13	4601	Medical Gas - NIS - limited to portable gas canisters	0.00 ea		
					11-74-10.10	0400	Dental office equipment, air compressor and vacuum	1.00 ea		
					22-11-19.46	1080	Vacuum breaker, anti-siphon, brass, hot or cold water, 20 mm size	10.00 ea		
			D2020				Domestic Water Distribution			
				D2020.0010			Piping & Insulation			
					22-11-13.23	1200	Domestic Water hook-ups	62.00 ea		
					22-07-19.10	6870	Insulation, pipe covering (price copper tube one size less than I.P.S.), fiberglass with all service jacket, 25 mm wall, 25 mm iron pipe size	1.00 ls		
					22-11-19.42	1010	Meter Tree and Backflows - 6"	1.00 ea		
					33-16-13.23	7000	FRP Water Tank - 3,250l (total of 6,500l)	2.00 ea		
					33-16-13.23	7000	Alternate water supply - exterior piped service, c/w reduced pressure backflow preventer and exterior hose connection	1.00 ea		
			D2030				Sanitary Waste			
				D2030.0010			Sanitary Waste			
					22-13-16.30	21601	Sanitary / Vent hook-up	52.00 ea		
					33-36-13.19	0025	FRP Sectional Sewage Tank, 5,400l c/w pump out	1.00 ea		
			D2040				Rain Water Drainage			
				D2040.0010			Rain Water Drainage			
					22-13-16.20	2160	Rainwater leaders	6.00 ea		
			D2090				Other Plumbing Systems			
				D2090.0010			Other Plumbing Systems			
					22-34-30.13	2040	Domestic Water Heater	2.00 ea		
					22-41-39.10	4201	Mixing valve	5.00 ea		
					22-31-16.10	6100	Water softener, softener systems, 150,000 grains, 2.33 L/s continuous, 3.22 L/s peak	2.00 ea		
					22-11-23.10	3180	Recirculation Pump	2.00 ea		
				G3040.0100			Heating Distribution			
					23-13-23.26	0400	Above grade Fuel Oil Storage and delivery system c/w main & aux storage tanks and fuel oil transfer pumps	1.00 ea		
					23-13-23.26	0400	Dual pipereturn system c/w tank top connections & anti-siphon prevention	1.00 ea		
		D30					HVAC			
			D3020				Heat Generation			
				D3020.0010			Boilers			
					23-52-23.40	2280	Boiler, oil fired, flame retention burner, cast iron, steam, gross output, 879 kW, includes standard controls and insulated flush jacket, packaged	4.00 ea		
				D3020.0020			Expansion/Fill Tanks			
					23-21-20.46	3000	Glycol Expansion Tank	1.00 ea		
					23-21-20.46	3020	Heating Water Storage Tank	1.00 ea		
					23-21-20.46	3182	Glycol fill tank packages	1.00 ea		
					23-21-20.46	3200	Domestic Hot Water Expansion Tank	1.00 ea		
					23-21-20.46	3200	Domestic Water Storage Tank	3.00 ea		
					23-21-20.46	3180	DW Pressure Tanks	2.00 ea		
					23-21-20.46	3140	Boiler Fuel Oil Day tank	1.00 ea		
				D3020.0030			Heat Exchangers			
					23-57-19.16	1100	Heat Exchanger	1.00 ea		
			D3030				Refrigeration			
				D3030.0010			Refrigeration			
					23-82-19.10	0200	Split Air Conditioning Unit	2.00 ea		
					23-63-13.10	0380	Packaged air condensing units	2.00 ea		
			D3040				HVAC Distribution			
				D3040.0010			Heating Piping & Insulation			
					22-11-13.44	0610	Pipe, steel, black, threaded includes coupling and clevis hanger assembly sized for covering, 3 m OC	750.00 m		
					22-07-19.10	7320	Insulation	750.00 m		
					22-11-13.48	1041	Valves	1.00 ls		
				D3040.0020			Pumps			
					23-22-23.10	0100	Primary Heating Pumps	3.00 ea		
					23-22-23.10	0150	Secondary Heating Pumps	2.00 ea		
					23-22-23.10	0250	Domestic hot water circulation Pumps	2.00 ea		
					23-21-23.13	1110	Lead /standby circulator system	1.00 ea		
					22-14-29.16	7570	Duplex variable speed water booster system c/w pressure tank	1.00 ea		
					22-14-29.16	7580	Duplex lift sump pump station - assumed 500 gallon (2)2.0HP grinder pumps	1.00 ea		
					23-34-23.10	3020	Lead/standby circulator system	1.00 ls		
				D3040.0030			Ductwork			
					23-31-13.13	0570	Supply/return duct c/w cleaning (system 1)	1,600.00 kg		
					23-31-13.13	0570	Exhaust duct	1,200.00 kg		
					23-51-33.10	9041	Breeching / Combustion Air	1.00 ls		
					23-33-19.10	9000	Duct accessories, silencer, noise control for air flow duct, lined for healthcare, allowance	60.00 m3/s		
					23-33-53.10	3348	Insulation, ductwork	300.00 m2		
					23-31-13.13	0570	Supply/return duct c/w cleaning (system 2)	1,600.00 kg		
					23-31-13.13	0570	Smoke management system	1.00 ls		
					23-31-13.13	0570	Smudging	1.00 ls		
					23-31-13.13	0570	Mechanical ventilation c/w explosion & chemical resistant fans and piping	3.00 al		
				D3040.0040			Grilles & Diffusers			
					23-37-13.30	1001	Grilles & diffusers	1.00 ls		
					23-37-15.40	1150	Louvres	1.00 ls		
				D3040.0050			Fans			
					23-34-23.10	6385	General exhaust fans	3.00 ea		
					11-30-13.19	5000	EA/OA hoods	5.00 ea		
			D3050				Terminal and Packaged Units			
				D3050.0010			Roof Top & Make-up Air Units			
					23-74-33.10	1221	AHU - 900l/s	1.00 ea		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				D3050.0010			Roof Top & Make-up Air Units		75(1)(a)(ii)	
					23-74-33.10	2201	AHU - 3,100/s	1.00 ea		
					23-74-33.10	2202	ERV Unit for crawlspace	3.00 ea		
					23-84-13.10	0580	Humidifier	2.00 ea		
				D3050.0020			Unit Heaters, Fan & Heating Coils			
					23-82-19.20	0100	Unit Heaters	3.00 ea		
					23-74-33.10	8005	Ventilation Energy Recovery (HRV) - recirc defrost, c/w pre-heat & re-heat coils	1.00 ea		
				D3050.0050			Radiant Panels			
					23-82-36.10	1400	Radiant Panels	200.00 m		
					23-82-36.10	1450	Primeter convectors	150.00 m		
			D3060				HVAC Instrumentation and Controls			
				D3060.0100			Instrumentation & Controls			
					23-09-43.10	0210	Controls, points for HVAC	1,070.00 m2		
					23-05-05.15	0020	Critical building alarm auto dialler	1,070.00 m2		
			D3070				Testing, Adjusting, and Balancing			
				D3070.0100			Testing, Adjusting & Balancing			
					23-05-05.15	0025	Testing, Adjusting and Balancing	1,070.00 m2		
			D3090				Other Special HVAC Systems			
				D3090.0100			Other Special HVAC			
					23-21-20.46	3185	Water treatment	1,070.00 m2		
					23-21-20.46	3185	Pre-flush, prior to occupancy	1,070.00 m2		
					23-21-20.46	3181	Glycol	1,070.00 m2		
					22-11-13.14	1130	Emergency generator hookup	1.00 ls		
					23-21-20.46	3185	Building Commissioning	1,070.00 m2		
					23-21-20.46	3185	Staff Training	1,070.00 m2		
			D40				Fire Protection			
			D4030				Fire Protection Specialties			
				D4010.0010			Fire Protection			
					10-44-16.13	0120	Fire Extinguishers	15.00 ea		
			D50				Electrical			
			D5010				Electrical Service and Distribution			
				D5010.0100			Main Distribution			
					26-27-13.10	2300	Meter center, main circuit breaker, 3 P 4W 120/208 V, 400 A	1.00 ea		
					26-27-13.10	0400	Meter socket, transformer rated c/w test switch, 600V, 20A	1.00 ea		
					26-24-13.30	0402	SPD, surge protective device integral to main service	1.00 ea		
					26-05-33.05	1870	Rgd glv stl cnd, 50 dm, 4.6 m h, inc 2 trm, 2 elb & 11 beam clmp per 30.5 m	12.00 m		
					26-05-33.18	2350	Service Entrance Mast Kit / Supports, 50mm dia	2.00 ea		
					26-05-19.90	0400	Wire, copper, stranded, 600 V, 250 kcmil, type THW, in raceway	48.00 m		
					26-24-13.30	0203	Main distribution Panel, 400A, 3P, 4W	1.00 ea		
				D5010.0300			Secondary Distribution Panels			
					26-24-16.30	0600	Panelboards, 3 phase 4 wire, main lugs, 120/208 V, 100 A, 12 circuits, NQOD, incl 20 A 1 pole plug-in breakers	1.00 ea		
					26-24-16.30	1050	Panelboards, 3 phase 4 wire, main lugs, 120/208 V, 225 A, 60 circuits, NQOD, incl 20 A 1 pole plug-in breakers	8.00 ea		
				D5010.0300			Generator Distribution Panels			
					26-24-13.30	0202	Emergency distribution Panel, 200A, 3P, 4W	1.00 ea		
					26-32-13.13	3300	Automatic Transfer Switch, 200A 3P4W, 277/480V	1.00 ea		
				D5010.0400			Branch Panel / Circuit Metering			
					26-09-13.30	1120	Smart metering, in panel, three phase, 120/208 volt, 200 amp	10.00 ea		
					26-09-13.30	2000	Smart metering, in panel, data recorder, 8 meters	1.00 ea		
					26-09-13.30	3100	Smart metering, in panel, software package, premium	1.00 ea		
				D5010.0600			Equipment Rough-Ins			
					26-27-26.50	0200	Rough in & hookup, A/C Split Unit, 1P2W, 208V, 15A	1.00 ea		
					26-27-26.50	0122	Rough in & hookup, Split A/C Condensing Unit 1P2W, 208V, 30A	1.00 ea		
					26-27-26.50	0750	Rough in & hookup, Air Handling Unit (AHU)	2.00 ea		
					26-27-26.50	0211	Rough in & hookup, Boiler, 3P3W, 480V, 15A	2.00 ea		
					26-27-26.50	0205	Rough in & hookup, Domestic Water Heater, 120V, 15A	3.00 ea		
					26-27-26.50	0230	Rough in & hookup, Exhaust Fan, 120V, 15A / Frac HP	7.00 ea		
					26-27-26.50	0240	Rough in & hookup, Exhaust Fan, 3P3W, 208V / Frac HP	1.00 ea		
					26-27-26.50	0495	Rough in & hookup, Circulation Pump, 120V, Frac HP	2.00 ea		
					26-27-26.50	0505	Rough in & hookup, Pump, 3P3W, 480V, 2-4HP	4.00 ea		
					26-27-26.50	0265	Rough in & hookup, Unit Heater, 120V, 15A / Frac HP	12.00 ea		
				D5010.0700			Conduit & Wire			
					26-05-33.05	5000	Elc mtl tbn (m), 15 dm, 4.6 m hgh, inc 2 trm, 2 elb & 11 bm clmp per 30.5 m	100.00 m		
					26-05-33.05	5020	Elc mtl tbn (m), 20 dm, 4.6 m hgh, inc 2 trm, 2 elb & 11 bm clmp per 30.5 m	300.00 m		
					26-05-33.05	5040	Elc mtl tbn (m), 25 dm, 4.6 m hgh, inc 2 trm, 2 elb & 11 bm clmp per 30.5 m	150.00 m		
					26-05-33.05	5060	Elc mtl tbn (m), 32 dm, 4.6 m hgh, inc 2 trm, 2 elb & 11 bm clmp per 30.5 m	30.00 m		
					26-05-33.05	5100	Elc mtl tbn (m), 50 dm, 4.6 m hgh, inc 2 trm, 2 elb & 11 bm clmp per 30.5 m	150.00 m		
					26-05-19.90	0030	Wire, copper solid, 600 V, #12, type THW, in raceway	1,200.00 m		
					26-05-19.90	0040	Wire, copper solid, 600 V, #10, type THW, in raceway	600.00 m		
					26-05-19.90	0140	Wire, copper, stranded, 600 V, #8, type THW, in raceway	150.00 m		
					26-05-19.90	0180	Wire, copper, stranded, 600 V, #6, type THW, in raceway	300.00 m		
					26-05-19.90	0200	Wire, copper, stranded, 600 V, #3, type THW, in raceway	300.00 m		
					26-05-19.90	0350	Wire, copper, stranded, 600 V, 4/0, type THW, in raceway	900.00 m		
				D5010.0900			Grounding			
					26-05-26.80	0100	Grounding rod, copper clad, 3 m long, 19 mm diameter	3.00 ea		
					26-05-26.80	0400	Ground wire, copper wire, bare stranded, #6	30.00 m		
					26-05-26.80	2000	Water pipe ground clamps, heavy duty, bronze, 13 mm to 25 mm diameter	6.00 ea		
					26-05-26.80	2100	Water pipe ground clamps, heavy duty, bronze, 32 mm to 51 mm diameter	3.00 ea		
			D5020				Lighting and Branch Wiring			
				D5020.0050			Wiring Devices			
					26-27-26.20	2480	Duplex receptacle, grounded, 120 V, 15/20 A	95.00 ea		
					26-27-26.20	0606	Duplex receptacle, grounded, 120V, 15/20A, GFCI	16.00 ea		

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				D5020.0050			Wiring Devices		75(1)(a)(ii)	
					26-27-26.20	2803	Duplex receptacle, grounded, 120V, 15/20A, Hospital Grade	16.00 ea		
					26-27-26.20	2565	Duplex receptacle, grounded, 120 V, 15/20A, w/ 2 USB	6.00 ea		
					26-27-26.20	2463	Fourplex receptacle, grounded, 120 V, 15/20A	25.00 ea		
					26-27-26.20	2461	Duplex receptacle, grounded, 120 V, 15/20 A, W.P	6.00 ea		
					26-27-26.20	2461	Duplex receptacle, grounded, 120 V, 20 A, W.P on roof	2.00 ea		
					26-27-26.20	2466	Fourplex receptacle, grounded, 120 V, 15/20A, floor mounted pedestal w/ data provision	2.00 ea		
					26-27-26.20	0807	Duplex receptacle, grounded, 120V, 15/20 A, Hospital Grade GFCI	6.00 ea		
					26-27-26.20	2803	Special single receptacles, Twist-lock, servers	4.00 ea		
				D5020.0050			Lighting Controls			
					26-27-26.20	0200	Toggle switch, quiet type, single pole, 15 A	12.00 ea		
					26-27-26.20	0600	3 way switch, 15 A	4.00 ea		
					26-27-26.20	0601	Occupancy sensor, wall switch	12.00 ea		
					26-27-26.20	0602	Occupancy sensors, ceiling mtd.	24.00 ea		
					26-27-26.20	1650	Dimmer switch, LED, 0-10V	6.00 ea		
					26-27-26.20	0804	Time control switch	1.00 ea		
					26-09-23.10	0350	Lighting devices, photoelectric control	1.00 ea		
				D5020.0150			Interior Lighting LED			
					26-51-13.55	1020	Interior LED fixtures, architectural troffer, recess mounted, 600mm x 600mm	40.00 ea		
					26-51-13.55	1000	Interior LED fixtures, troffer, recess mounted, 600mm x 600mm	132.00 ea		
					26-51-13.55	3020	Interior LED fixtures, linear, vanity	8.00 ea		
					26-51-13.55	2020	Interior LED fixtures, strip, surface mounted or suspended, 1200mm	12.00 ea		
					26-51-13.55	0100	Interior LED fixtures, recessed downlight 4"	24.00 ea		
					26-51-13.55	3020	Interior LED fixtures, linear, direct/ indirect (2440mm)	6.00 ea		
					26-51-13.55	0180	Interior LED fixtures, occupied light	8.00 ea		
					26-51-13.55	0180	Interior LED fixtures, decorative pendant	3.00 ea		
				D5020.0300			Exterior LED Lighting			
					26-56-23.55	0100	Exterior LED fixture, wall mounted, indoor/outdoor, 12 watt, incl lamps	4.00 ea		
					26-56-23.55	0110	Exterior LED fixture, wall mounted, indoor/outdoor, 32 watt, incl lamps	8.00 ea		
				D5020.0400			Conduit & Wiring			
					26-05-19.90	0030	Wire, copper solid, 600 V, #12, type THW, in raceway	4,800.00 m		
					26-05-19.90	0040	Wire, copper solid, 600 V, #10, type THW, in raceway	1,200.00 m		
					26-05-19.90	0140	Wire, copper, stranded, 600 V, #8, type THW, in raceway	300.00 m		
					26-05-19.90	0160	Wire, copper, stranded, 600 V, #6, type THW, in raceway	150.00 m		
					26-05-19.20	0200	Armored cable, copper, solid, 600 V, 3 conductor, #12, BX, exposed	300.00 m		
					26-05-19.20	0150	Armored cable, copper, solid, 600 V, 2 conductor, #12, BX, exposed	900.00 m		
					26-05-33.05	5000	Elc mtl tbn (m),15 dm,4.6 m hgh,inc 2 tm,2 elb&11 bm clmp per 30.5 m	600.00 m		
					26-05-33.05	5020	Elc mtl tbn (m),20 dm,4.6 m hgh,inc 2 tm,2 elb&11 bm clmp per 30.5 m	1,200.00 m		
					26-05-33.05	5040	Elc mtl tbn (m),25 dm,4.6 m hgh,inc 2 tm,2 elb&11 bm clmp per 30.5 m	300.00 m		
			D5030				Communications and Security			
				D5030.0100			Fire Alarm System			
					28-31-23.50	4000	Detection system, fire alarm control panel, 12 zone, excluding wires & conduits	1.00 ea		
					28-31-23.50	4800	Detection system, signal bell for fire alarm, manual station, excluding wires & conduits	6.00 ea		
					28-31-23.50	5600	Detection system, strobe & horn, excluding wires & conduits	28.00 ea		
					28-31-23.50	8000	Detection system, door holder, electro-magnetic, excluding wires & conduits	4.00 ea		
					28-31-23.50	6200	Detection system, electric strike lock, combination holder and closer, excluding wires & conduits	8.00 ea		
					28-31-46.50	5400	Detection system, smoke detector, duct type, excl. wires & conduit	2.00 ea		
					28-31-23.50	7001	Detection Systems, smoke detectors, excl. wires & conduit	6.00 ea		
					28-31-46.50	5200	Detection system, heat detector, smoke detector, ceiling type, excl. wires & conduit	2.00 ea		
					28-31-23.50	7003	Detection Systems, fire alarm testing and documentation	1.00 ea		
					28-31-23.50	7004	Detection Systems, fire alarm system verification	1.00 ea		
					28-31-23.50	7015	Detection Systems, isolation modules, excl. wires & conduit	6.00 ea		
					28-31-23.50	5601	Detection Systems, fire alarm, End-Of-Line resistor	4.00 ea		
					28-31-23.50	7005	Detection Systems, control modules, excl. wires & conduit	6.00 ea		
					26-05-19.55	0150	Non-metallic sheathed cable, copper with ground wire, 600 V, 2 conductor, #14, (Romex)	450.00 m		
					26-05-23.10	0030	Control cable, copper, THHN wire with PVC jacket, 600 V, 3 wires, #14	450.00 m		
				D5030.0500			Clock System			
					27-53-13.50	1600	Clock system	1,070.00 m2		
				D5030.0700			Security System			
					28-16-16.50	2200	Security / Access Control	1,070.00 m2		
				D5030.0800			Data / Telephone System			
					27-13-23.13	0403	T.V outlets - RG6	12.00 ea		
					27-13-23.13	0417	Data outlets - 2D Cat6	48.00 ea		
					27-13-23.13	0600	Data / Voice outlets - 1D Cat6	24.00 ea		
					27-13-23.13	0416	Wireless access points - 2D Cat6	10.00 ea		
					27-13-23.13	0430	Data racks - 4 post	1.00 ea		
					27-13-23.13	0408	Telephone BIX Terminations	1.00 ea		
					26-32-33.10	0300	Uninterruptible Power Source (UPS), 1.5 kW	1.00 ea		
					27-13-23.13	0050	Data Cable, Cat 6	6,000.00 m		
					27-41-19.10	1500	Cable, coaxial, RG6	900.00 m		
				D5030.0900			Panic / HELP system			
					27-52-23.10	1602	Panic / Help system incl. panic buttons & siren / strobes	1,070.00 m2		
			D5090				Other Electrical Systems			
				D5090.0100			Generator Systems			
					26-32-13.13	2300	Generator set, diesel, 3 phase 4 wire, 277/480 V, 100 kW, incl battery, charger, muffler, & day tank, excl conduit, wiring, & concrete	1.00 ea		
				D5090.0300			Emergency Lighting Systems			
					26-52-13.10	0700	Emergency lighting units, nickel cadmium battery operated, twin sealed beam light, 25 W, 6 V each	4.00 ea		
					26-52-13.10	1150	Emrgn light, remote head, dual head,	20.00 ea		
					26-53-13.10	0280	Exit lighting, LED w/ battery unit, singl / double face, ceiling or wall mount	14.00 ea		
				D5090.0500			Cable Tray / Raceway System			

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				D5090.0500			Cable Tray / Raceway System		75(1)(a)(ii)	
					28-05-36.10	0200	Cable tray, ladder type, galvanized steel, 102 mm deep, 102 mm rung spacing, 305 mm wide, to 4.6 m elevation, incl fittings & supports	120.00 m		
	E						EQUIPMENT AND FURNISHINGS			
		E10					Equipment			
			E1010				Commercial Equipment			
				* unassigned						
				*						
					11-05-10.00	---	Allowance for Owner Supplied Equipment / Furniture handling & installation	1.00 ls		
				E1010.100			Staff Room Appliances			
					11-31-13.13	0020	Cooking range, residential appliances, free standing, 1 oven, 750 wide, min	1.00 ea		
					11-31-13.13	1250	Microwave ovens, residential appliances, minimum	1.00 ea		
					11-31-13.23	5750	Refrigerator, residential appliances, no frost, .40 to .45 m3, minimum	1.00 ea		
					11-31-13.23	2000	Deep freezer, residential appliances, .42 to .65 m3, minimum	1.00 ea		
					11-31-13.53	4150	Range hood, residential appliances, vented, min. 2 speed, 750 wide, minimum	1.00 ea		
					11-31-23.13	8850	Washing machine, residential appliances, automatic, minimum	1.00 ea		
					11-31-23.23	3200	Dryer, residential appliances, automatic, minimum	1.00 ea		
					11-31-13.33	2750	Dishwasher, residential appliances, built-in, 2 cycles, minimum	1.00 ea		
					11-31-13.23	5500	Refrigerator, residential appliances, no frost, .28 to .34 m3, minimum	1.00 ea		
		E20					Furnishings			
			E2010				Fixed Furnishings			
				E2010.0200			Healthcare Millwork			
					12-32-13.10	---	Allowance for Millwork & Countertops	1,070.00 m2		
				E2010.2000			Window Treatment			
					12-24-13.10	0901	Shades, rollup, manual	50.00 m2		
Site										
	F						SPECIAL CONSTRUCTION AND DEMOLITION			
		F10					Special Construction			
			F1010				Special Structures			
				* unassigned						
				*						
					28-27-26.40	---	Garage Electrical wiring & lighting	60.00 m2		
				A1030.0100			Compacted Gravel Base (Garage & Storage)			
					31-22-16.10	1100	Fine grading, fine grade for gravel base	192.00 m2		
					31-23-23.17	0800	Fill, gravel fill, compacted, under floor slabs, 1,000 mm deep	192.00 m2		
				B2010.0125			Wood Stud Wall Construction w/ Metal Cladding (Garage & Storage)			
					07-42-13.30	1020	Steel siding, colored, corrugated or ribbed, on steel frame, 10 year finish, 0.90mm thick, incl. fasteners	305.00 m2		
					08-11-10.42	0800	Furring, wood, on walls, on wood, 25mm x 75mm	305.00 m2		
					07-21-14.10	0710	Wall insulation, semi-rigid mineral fibre 100 thick	305.00 m2		
					07-26-10.10	0350	Mod bit, Thermofusible Grade, Air/Vapour Membrane 2.5mm	305.00 m2		
					08-16-36.10	0705	Sheathing, plywood on walls, CDX, 16mm thick, pneumatic nailed	305.00 m2		
					08-11-10.26	0207	Pwstd, wst, std&bet lum, 38 x 140mm	305.00 m2		
					07-21-16.20	1340	Blanket insulation, for walls or ceilings, mineral wool batts, 139 mm thick, 3.3 m2.K/W	305.00 m2		
					08-16-36.10	0705	Sheathing, plywood on walls, CDX, 16mm thick, pneumatic nailed	305.00 m2		
				B2020.0200			Vinyl Windows (Garage)			
					08-53-13.40	0400	Vinyl windows, double glazed	3.00 m2		
				B2030.0050			Single H.M. Insulatd Dr./Frame/Hardware (Garage & Storage)			
					08-13-13.13	1760	Doors, commercial, steel, insulated, full panel, 1.2 mm, 914 mm x 2134 mm x 44 mm thick	11.00 ea		
					08-12-13.25	0100	Door frames, steel channels with anchors and bar stops, 150 mm channel @ 12 kg/m, 915 mm x 2135 mm door, weighs 88 kg	11.00 ea		
					08-71-20.15	2250	Door hardware, single, exterior	11.00 door		
					08-71-25.10	2700	Weatherstripping, doors, metal frame, extruded sections, aluminum, for 900 mm x 2135 mm door	11.00 opng		
					08-71-25.10	3850	Weatherstripping, for thresholds, door sweep, flush mounted, aluminum	11.00 ea		
					09-01-13.70	0190	Paints & coatings, exterior doors, flush, both sides, roll & brush, primer + 2 coats, exterior latex, incl. frame & trim	11.00 ea		
				B2030.0150			Overhead Sectional Door (Garage)			
					08-36-13.20	0320	Doors, residential, garage, overhead, sectional	1.00 ea		
				B3030.0200			Roof Construction & Finishes (Garage & Storage)			
					07-31-13.10	0355	Asphalt shingles, standard, laminated multi-layered shingles, class A, 11.50-13.50kg/m2, pneumatic nailed	268.00 m2		
					07-31-13.10	0825	Asphalt shingles, 13.6kg felt underlayment	268.00 m2		
					08-16-36.10	0205	Sheathing, plywood on roof, CDX, 16mm thick T&G, pneumatic nailed	268.00 m2		
					08-17-53.10	0800	Roof joists, 140mm	268.00 m2fl		
					07-21-16.20	1340	Blanket insulation, for walls or ceilings, mineral wool batts, 139 mm thick, 3.3 m2.K/W	268.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	268.00 m2		
					07-46-73.10	0100	Soffit, baked enamel on steel, 1.5mm or 1.2mm thick	68.00 m2		
					07-71-19.30	0300	Fascia, steel, galvanized & enameled, stock, long panels, excl. furring	22.00 m2		
					07-71-43.10	0500	Drip edge, galvanized, mill finish, 200mm wide	112.00 m		
					07-71-23.30	2800	Galvanized steel gutters, half round or box, stock, 150mm wide, 0.5mm thick	52.00 m		
					07-71-23.10	0400	Aluminum downspouts, enameled, 75mm x 100mm, .6mm thick	18.00 m		
				C1010.0600			38 x 89mm Wood Stud Partition (Storage)			
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	118.00 m2		
					08-11-10.26	0208	Pwstd, wst, std&bet lum, 38 x 89mm	118.00 m2		
					09-29-10.30	2150	Gypsum wallboard, on walls, fire resistant, taped & finished (level 4 finish), 16 mm thick	118.00 m2		
	G						BUILDING SITEWORK			
		G10					Site Preparation			
			G1010				Site Clearing			

Location	U1	U2	U3	Assembly	Phase	Item	Description	Takeoff Quantity	Grand Total Price	Grand Total Amount
				G1010.0150			Site Clearing		75(1)(a)(ii)	
					31-14-13.23	1460	Site Clearing, remove shrubs, etc.	5,128.00 m2		
			G1030				Site Earthwork			
				* unassigned *						
					31-22-13.20	0280	Rough grading sites, open, allowance	5,128.00 m2		
		G20					Site Improvements			
			G2020				Parking Lots			
				G2020.0010			Gravel Access / Driveway			
					31-22-16.10	0012	Fine grading, finish grading, small area, to be paved with grader	3,337.00 m2		
					32-11-23.23	0100	Base course drainage layers, aggregate base course for roadways and large paved areas, stone base, compacted, 20 mm stone base, to 150 mm deep	3,337.00 m2		
					32-11-23.23	0050	Base course drainage layers, aggregate base course for roadways and large paved areas, compacted, 75 mm deep, crushed 20 mm stone base	3,337.00 m2		
					32-17-13.19	1000	Precast concrete parking bumpers, wheel stops, precast concrete, 150 mm x 250 mm x 1800 mm, includes 2 dowels per each	12.00 ea		
					10-14-53.20	0900	Signs, stock signs, reflectorized, 450 mm x 600 mm, excludes posts	8.00 ea		
					10-14-53.20	1500	Signs, 3 m, add to above for steel posts, galvanized, upright, bolted	8.00 ea		
			G2040				Site Development			
				G2040.0200			Site Furnishings			
					12-93-23.20	0020	Allowance for garbage / recycling	3.00 ea		
		G40					Site Electrical Utilities			
			G4010				Electrical Distribution			
				G4010.0010			Electrical Distribution (U/G Service for 10 Plex)			
					33-71-19.15	1070	Electro undrgr ducts and manhls,pvc,condt with cplng,100 dm,schedl 40,instll direct burial slab duct bank,exclds excvtn,backfill and cast place concrete	80.00 m		
					33-71-19.15	1070	Electro undrgr ducts and manhls,pvc,condt with cplng,100 dm,schedl 40,instll direct burial slab duct bank,exclds excvtn,backfill and cast place concrete	80.00 m		
					26-05-19.90	0450	Wire, copper, stranded, 600 V, 350 kcmil, type THW, in raceway	240.00 m		
					26-05-19.90	0450	Wire, copper, stranded, 600 V, 350 kcmil, type THW, in raceway	240.00 m		
				G4010.0010			Electrical Distribution (U/G Service to Garage from HWC)			
					33-71-19.15	1030	Electro undrgr ducts and manhls,pvc,condt with cplng,25 dm,schedl 40,instll direct burial slab duct bank,exclds excavtn,backfill and cast place concrete	45.00 m		
					26-05-19.90	0180	Wire, copper, stranded, 600 V, #6, type THW, in raceway	180.00 m		
				G4010.0010			Site Electrical			
					33-71-19.15	1016	Car Receptacles, block heater, 120V controlled	6.00 ea		

8.0 SUMMARY SCHEDULE OF RISKS

RISK #	SELECTED RISK	Potential Cost Impact Over Cost Base	Comments
DESIGN & APPORVALS			
1	Scope Increase	\$ 75(1)(a)(ii)	Low risk - impact removed
2	Approval Delays	\$	Increase to impact
	Sub-total	\$	
PROCUREMENT			
3	Thermo Piles	\$	Low risk - impact lowered
4	Lack of Competition	\$	Agree with impact
5	Lack of Competition Sub-trades/ Supplies	\$	Agree with impact
6	International Trade Agreement	\$	Agree with impact
7	Money Market Variations	\$	Agree with impact
8	Healthcare Innovations	\$	Low risk - impact removed
9	No Bid Submissions	\$	Agree with impact
10	Tender Submission Upgrading	\$	Agree with impact
	Sub-total	\$	
CONSTRUCTION			
11	Pandemic	\$	Increase to impact
12	Extreme Cold Weather	\$	Low risk - impact lowered
13	Mild Weather Conditions	\$	
14	Staff Changes	\$	Low risk - impact removed
15	Delays in Deliveries	\$	Increase to impact
16	Increase Change Orders Contingency	\$	
17	Construction Delay Claims	\$	Increase to impact
18	Local Labour Content	\$	Low risk - impact removed
19	Vandalism	\$	Low risk - impact removed
20	Bankruptcy of Design/Builder	\$	Increase to impact
	Sub-total	\$	

Total Potential Cost Impact **\$ 75(1)(a)(ii)**

Note: The above items are a summarised version of the Detailed Schedule of Risks

9.0 DETAILED SCHEDULE OF RISKS

RISK #	SELECTED RISK	DESCRIPTION	ANALYSIS / TO ASSESS RISK	Impact Probability	Capital Cost Base (\$)	Optimistic Cost Saving Over Cost Base	Worst Cost over Cost Base	Potential Cost Impact Over Cost Base	Mitigation Control Recommendations and Comments
DESIGN & APPORVALS									
1	Scope Increase	Overall Business case/ Value Engineering Studies/ Partnering -May identify items of design to be added- scope creep	Specialist workshops industry savings and/or increase of scope	Medium	75(1)(a)(ii)				Allowance for savings 1% of total budget cost. Allowance for increases of 2.5% of total project costs. Low risk; therefore, exclude from 100% SOR Class "C" Estimate.
2	Approval Delays	Delay date (waiting for approvals, delay, etc.) timely review	Government procedures may delay approval process	Low					Allowance of 0.5% on overall budget. Agreed to increase worst case senario based on initial analysis.
PROCUREMENT									
3	Thermo Piles	Sole Source Supply	Lack of competition; superior product; shallow depth	Extremely High					Allow alternate product in procurement process Pre-Bid piles and carry cash allowance. Low risk; therefore, reduce worst case from initial analysis.
4	Lack of Competition	No interest for true competitive bidding from design builders	High demand for specialist as economy is impacted after he pandemic slowdown	Medium					Allowance of 2.5% on overall budget. Agreed with initial analysis.
5	Lack of Competition Sub-trades/ Supplies	No interest for true competitive bidding from sub-trades or suppliers (mechanical, electrical, drywall, etc.)	High Demand for subtrades, suppliers as economy is impacted after the pandemic slowdown	Medium					Allowance of 2.5% on overall project budget. Agreed with initial analysis.
6	International Trade Agreement	Tariffs/ Free Trade Agreements	Existing agreement modified due to political changes	Medium					Allowance of 0.75% on overall project budget. Agreed with initial analysis.
7	Money Market Variations	Fluctuations in Canadian dollar (material, supply price variation - import/ export (e.g. steel, wood))	Fluctuations in supply prices due to currency changes particular to the US dollar	Medium					Allowance of 0.75% on overall project budget Try to pass some on all of risk to Design Builders. Agreed wi h initial analysis.
8	Healthcare Innovations	Medical Innovations/Recommendations (e.g. legislated upgrades for handicap., bariatric, flu pandemic, patient records C.I.T)	Heal hcare Industry upgrades, changes of standards, etc.	Low					Allowance for 0.85% of total project cost. Low risk; herefore, exclude from 100% SOR Class "C" Estimate.
9	No Bid Submissions	Lack of overall interest due to high volume of tenders at time of bidding (governments Provincial/Territorial/Federal s imulate economy)	Too much work being tendered as economy is impacted due to pandemic slowdown	Medium					7.0% premium on overall price. Negotiate with local or other teams for alternative form of procurement; Construction Management, Design Bid Build, Cost Plus or delay tender until more favorable. Agreed with initial analysis.

DETAILED
SCHEDULE OF RISKS

RISK #	SELECTED RISK	DESCRIPTION	ANALYSIS / TO ASSESS RISK	Impact Probability	Capital Cost Base (\$)	Optimistic Cost Saving Over Cost Base	Worst Cost over Cost Base	Potential Cost Impact Over Cost Base	Mitigation Control Recommendations and Comments
10	Tender Submission Upgrading	Design/Builder submission due to Client/Stakeholder increased expectations	Joint stakeholders consider upgrades necessary	Medium	75(1)(a)(ii)				Allowance of 1% on overall budget. Agreed with initial analysis.
CONSTRUCTION									
11	Pandemic	Changes to working conditions due to Covid-19	Changes required by Government to improve health and sanitation condition to site working conditions	Extremely High					Allowance of 7% pf supervision, labour, temporary conditions, general requirements. Agreed to increase worst case senario based on initial analysis.
12	Extreme Cold Weather	Variable weather conditions - excessive cold weather for site in remote north	Location of building site Arctic conditions; too cold to work on open site	High					Extreme cold will close site for works or additional weather protection required. Allowance of 1.5% over total project cost. Low risk; therefore, reduce worst case from initial analysis.
13	Mild Weather Conditions	Variable Weather Conditions - excessive warm weather - Ice Road failures, erosion of storm water management, etc.	Location of in extreme north	High					Repair costs to ice road, site services, fly into site materials at premium cost, whilst ice road required. Agreed with initial analysis.
14	Staff Changes	Changes of personnel during construction period due to remoteness of location	Key personnel difficult you retain due to isolation of project	High					Incentives to Design Build team to avoid unnecessary changes, delays. Try to pass risk to Design Builder. Low risk; therefore, exclude from 75% SOR Class "D" Estimate.
15	Delays in Deliveries	Logistics- moving of goods, availability of materials etc.	Materials suppliers unable to supply detail due to remoteness of site, economy, etc.	High					Various factors may occur to economy, owner change orders, etc. Try to pass some of risk to Design Builder. Agreed to increase worst case senario based on initial analysis.
16	Increase Change Orders Contingency	Stakeholders/Owners change orders - variations to Design/Build existing construction contract medical innovations	Joint stakeholders consider changes necessary	Medium					Additional change order allowance required. Agreed to increase worst case senario based on initial analysis.

DETAILED
SCHEDULE OF RISKS

RISK #	SELECTED RISK	DESCRIPTION	ANALYSIS / TO ASSESS RISK	Impact Probability	Capital Cost Base (\$)	Optimistic Cost Saving Over Cost Base	Worst Cost over Cost Base	Potential Cost Impact Over Cost Base	Mitigation Control Recommendations and Comments
17	Construction Delay Claims	Design Builder delay claims against owners/Stakeholders	Design Builder considers Owner/Stakeholder have not complied with contract	Low	75(1)(a)(ii)				7% allowance for supervision, labour, temporary conditions, etc. Agreed to increase worst case senario based on initial analysis.
18	Local Labour Content	Decision to improve public relations with local communi ies - local labour content requirements may lack skills, extra supervision etc. Delays in schedule, poor workmanship , etc.	Design builder consider local content to project incurred financial losses	Low					Allowance of 1% of total project costs. Low risk; therefore, exclude from 100% SOR Class "C" Estimate.
19	Vandalism	Safety/security risks- during construction, trespassing, theft, noise, etc.)	Exterior involvement into site not covered by normal insurance rights	Low					Small allowance to cover unforeseen items not covered by regular insurance policies. Low risk; therefore, exclude from 100% SOR Class "C" Estimate.
20	Bankruptcy of Design/Builder	Liquidation / Insolvency	Declaration of bankruptcy by trustee in bankruptcy	Low					Cost to cover miscellaneous expenses to trustee in bankruptcy, delays, bonding company, legal, etc. Agreed to increase worst case senario based on initial analysis.
Note: The above items are determined following a selection of risks (potentially from the 'Risk Identification Checklist' and a high-level analysis of Schedules 1, 2, and 3.									

From: [Jennifer.Macgillivray](#)
To: [Karen.Chan](#); [Colin.McDowell](#)
Cc: [Natasha.Phillips](#); [Ben.Hancock](#); [Nick.Rodger](#); [Peter.Blum](#); [Darren.Stahl](#)
Subject: FW: Tetra Tech Document on Thermopiles for Old Crow - Stamped
Date: January 6, 2021 9:50:40 AM
Attachments: [Memo to YG - Information on Standard Adfreeze Piles and Thermopiles for Old Crow IFU.pdf](#)
[Old Crow HWC - 10-Plex Foundation Info Note \(4\).docx](#)
[Thermopile Foundations .pdf](#)
[image001.png](#)
[image002.png](#)

FYI, this is to support the Ministerial conversation this morning in Old Crow.

Jenn



Jennifer Macgillivray, NCIDQ, PMP, MBA
 Assistant Deputy Minister
 Highways and Public Works | Property Management Division
 C 867-334-1000 | [Yukon.ca](#)

From: Priyank.Thatte <Priyank.Thatte@gov.yk.ca>
Sent: January 5, 2021 3:18 PM
To: Paul.McConnell <Paul.McConnell@gov.yk.ca>; Krysten.Johnson <Krysten.Johnson@gov.yk.ca>
Cc: Jennifer.Macgillivray <Jennifer.Macgillivray@gov.yk.ca>
Subject: Tetra Tech Document on Thermopiles for Old Crow - Stamped

Hello Paul,

Please see attached a technical memo from Tetrattech. It has the same messages we had in our internal briefing note but presented in a more technical format.

I've attached yesterday's internal messaging note for your background as well since it contains responses to some sentiments we've heard.

A third pdf with installation examples also attached.

Let me know if you have follow up questions.

/Priyank



Priyank Thatté
 Director, Strategic Initiatives
 Highways and Public Works | C: 867-334-7378
[Strategic Initiatives Branch](#) | [Dempster Fibre Project](#) | [Green Infrastructure Program](#)



TECHNICAL MEMO

ISSUED FOR USE

To:	Peter Blum, Sr. Building Program Manager	Date:	January 5, 2021
c:		Memo No.:	001
From:	Richard Trimble, P.Eng.	File:	704-ENG.WARC-Old Crow
Subject:	Additional Information on Standard Adfreeze Piles and Thermopiles for Use in Old Crow, YT		

1.0 BACKGROUND

Standard adfreeze steel pipe piles have been used for foundation construction in Old Crow since 1989 (Chief Zzeh Gittlet School). Most recently, adfreeze piles have been used for the Co-op Store (design by others) and for both the new Community Centre and the Elder's Complex (design by Tetra Tech). The locally available drill rig (Watson 1100, Tracked Carrier Mounted) operated by Porcupine Enterprises has been used to install the adfreeze piles for the Community Centre and Elder's Complex – these piles were installed and backfilled in boreholes up to 350 mm in diameter and 14 m in depth.

2.0 DESIGN CONSIDERATIONS

The design of adfreeze piles is based on the adfreeze bond between the pile backfill (sand/water slurry) and the permafrost. The strength of this bond is dependant on the permafrost temperature. Global warming models of air temperature are used to predict changes in the permafrost temperature that would occur during the design life of the structure.

Existing permafrost conditions (ground ice content) are also an important consideration with respect to the selection of foundation type. In general, the permafrost in Old Crow may contain ground ice up to 30% by volume, and specific sites may contain much more ground ice.

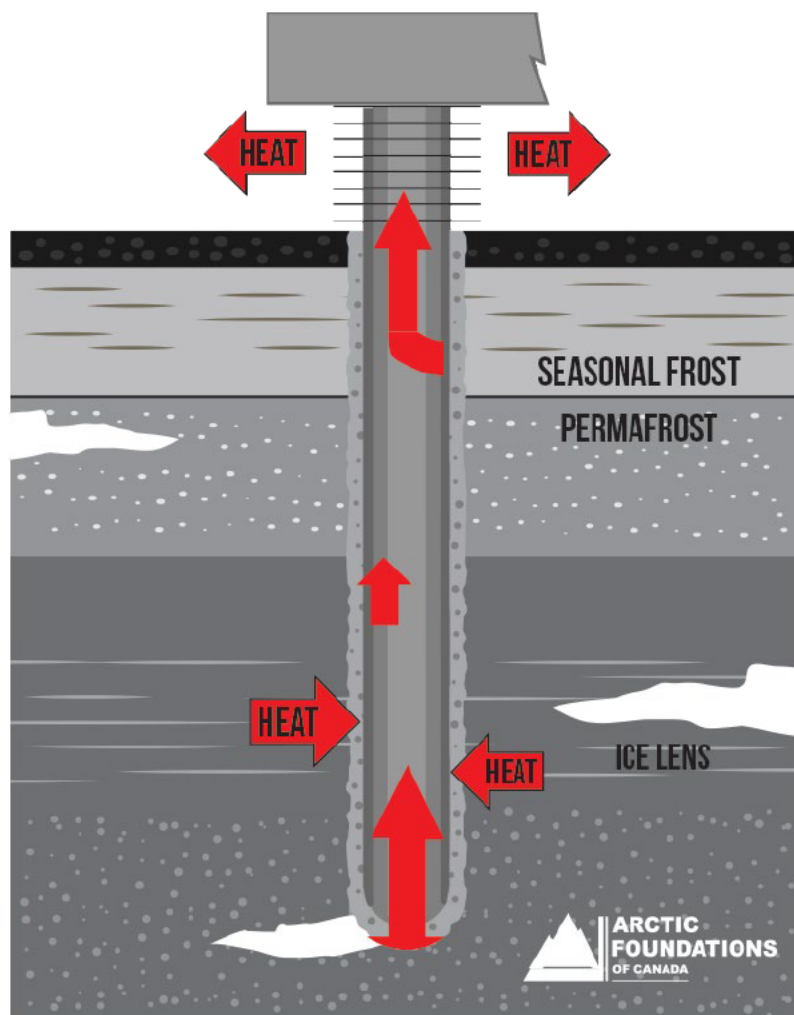
The proposed Health Centre site is within an area of anomalous high ground ice content. During the site investigation drilling program, a one metre thick layer of 75% ice was encountered within the top four metres below the surface organics. This is not the "normal" permafrost encountered within the community and necessitated greater care in the selection of a foundation system.

A design life of 60 years was also specified, and our calculations showed that the permafrost may not be cold enough in 60 years to support building loads on standard adfreeze piles, so thermopiles were recommended.

3.0 THERMOPILE INFORMATION

Thermopiles are adfreeze piles that incorporate thermosyphon technology to keep the permafrost frozen and chilled at a suitable temperature to generate the required adfreeze bond to resist foundation loads.

The attached brochure from Arctic Foundations of Canada (the only supplier in Canada at present) show that thermopiles are a sealed steel pipe pile with the addition of passive heat extraction. During winter months when the air temperature is lower than the ground temperature, they provide passive heat extraction to maintain and cool the existing permafrost throughout the rest of the year.



This is an environmentally friendly closed system, using pressurized carbon dioxide (CO_2) and does not inject anything into the ground.

Once installed, the thermopiles would be fully commissioned and tested to immediately confirm their integrity. CO_2 is contained in the seamless, sealed steel pipe at a pressure much lower than that contained in a typical fire extinguisher. The system works by natural convection - heat extracted from the ground in winter evaporates the liquid CO_2 at the bottom of the pipe. The evaporated CO_2 gas rises and is cooled when it reaches the top of the pipe, transferring heat to the cold winter air through radiating fins. The gas condenses back to liquid which flows back down the pipe to repeat the cycle.

No CO₂ is released to atmosphere or to the ground. The CO₂ is expected to remain for the life of the system and is at a concentration that is considered environmentally benign. This type of system has proven to be very reliable. The chances of a valve failure are considered to be very low, however, if something hits a valve causing a leak, the amount of gas released to atmosphere would be equivalent to several fire extinguishers and would quickly disperse. A steel cap will be installed to protect the top of the pile and valve assembly.

Arctic Foundations of Canada routinely ships CO₂ across the north, including by air. There are no moving parts and virtually no maintenance is required other than annual monitoring and review of temperature records.

4.0 THERMOPILE INSTALLATION

The equipment in Old Crow is a Watson 1100 drill rig mounted on a tracked carrier. The manufacturer's brochure is attached to this memorandum. As previously noted, the piles installed to date have been in boreholes up to 350 mm in diameter and up to 14 m deep.

The thermopiles, as currently designed, may require a borehole up to 500 mm diameter and no deeper than about 12 m. This is within the operational range of the equipment according to the brochure. It is recognized that promotional information from suppliers is based on ideal conditions, but Porcupine Enterprises has also indicated in an email that:

The drill is capable of drilling a 1200 mm x 50 m hole but that is in normal ground conditions. Given the ground is completely in permafrost state, I would only feel comfortable in drilling a hole no bigger than 500 – 600 mm without causing extreme stress to the machine.

The final design (length, diameter) of the thermopiles is dependant upon the building loads, but all efforts will be made to design the piles so they can be installed with the equipment currently in Old Crow.

The thermopiles themselves would be constructed in Winnipeg by Arctic Foundations of Canada Ltd. and shipped to Old Crow via Hercules aircraft or on a winter road, if available. Arctic Foundations personnel would supervise the installation and ensure that all piles were operational.

5.0 FOUNDATION PERFORMANCE MONITORING

Ground temperature (thermistors) cables would be installed vertically next to several piles to verify their operation. Other sensors to be installed would include air temperature under the building. These would all be attached to dataloggers to record the temperatures daily.

It is good practice to check the operation of the thermopiles using an infra-red (IR) camera once a year, usually in early winter (November). Photographs would be taken of all the thermopiles to verify that they were operational. The photo below shows a typical IR image of operating radiators from another project.



This information would be reviewed, along with the recorded ground temperatures from the datalogger, to verify that the thermopiles are extracting heat from the ground and operating as designed.

Local personnel from Old Crow can be trained and provided with the necessary equipment to take the photographs and forward the temperature data to the engineers for review.

6.0 MAINTENANCE REQUIREMENTS

If the data review shows that some maintenance is required, crews from Arctic Foundations can fly to the site and re-pressurize any thermopiles. It should be noted that the loss of pressure in one of these piles is a very rare event (less than 1%) and if pressure is lost, the pile will still perform as a standard adfreeze pile until maintenance is completed.

Finally, thermosyphon technology has been used in Canada for at least 40 years, and thermopiles have been used throughout Alaska for at least 20 years. The only application of thermopiles in Canada at present is the RCMP building in Inuvik, that was constructed in 2016 and has been performing well. Another thermopile installation is occurring in Inuvik in early 2021.

7.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

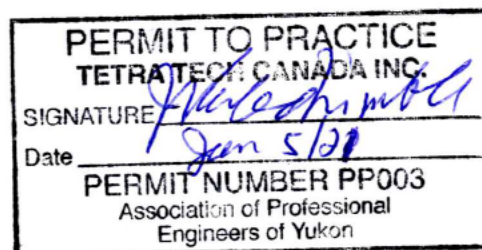
Respectfully submitted,
Tetra Tech Canada Inc.



J. Richard Trimble, P.Eng., FEC
Principal Consultant, Arctic Group
Engineering Practice
Direct Line: 867-668-9216+
Richard.Trimble@tetratech.com

Attachments:

1. Arctic Foundations Brochure
2. Watson Model 1100 Drill Rig Brochure

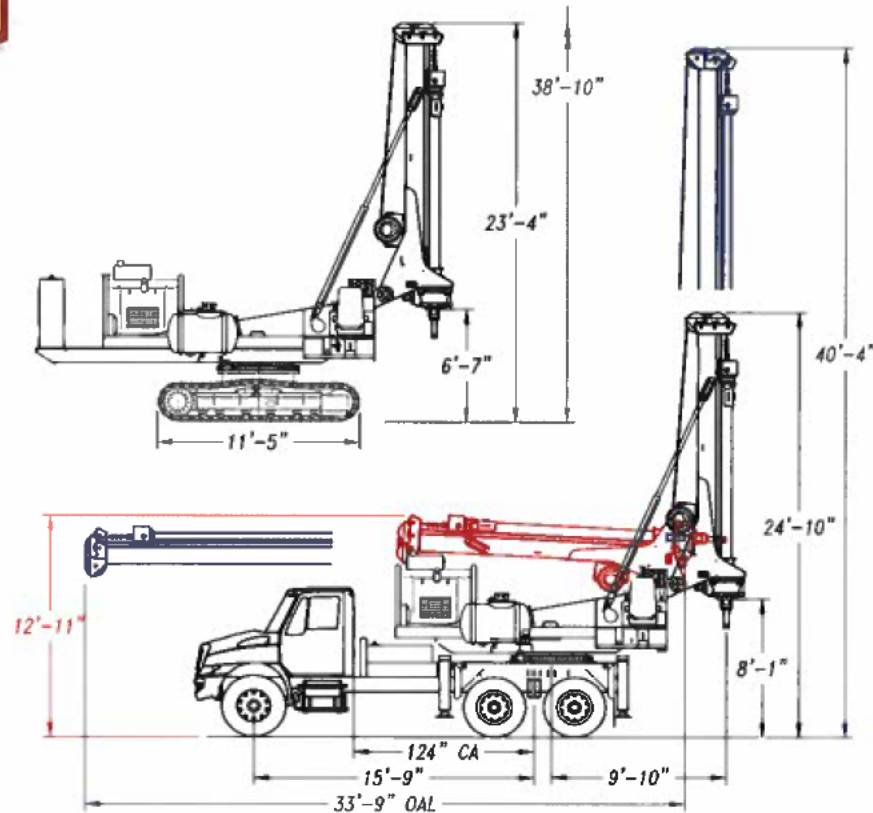




4015 South Freeway
Fort Worth, Texas 76110
Fax 817-927-8716
sales@watsonusa.com

100% WATSON OWNED

MODEL 1100⁰⁰⁴²



*Porcupine Enterprises
in
Old Crow
CM 1100*

PERFORMANCE

POWER	140 hp
	104 kW
TORQUE	45,000 ft-lb
	61 kNm
SPIN OFF	230 rpm
KELLY WINCH	18,000 lbs
With FREEFALL	80 kN
SERVICE WINCH	4,500 lbs
	20 kN
CROWD FORCE	21,700 lbs
	97 kN

CONFIGURATION

TRUCK BASE	6X4 Class 7
TRUCK WEIGHT	45,000 lbs
	20,411 kgs
CRAWLER WEIGHT	33,000 lbs
	14,968 kgs
DRILLING DEPTH	96 ft
(4-ELEMENT)	29 M
CROWD STROKE	25 ft
	7.6 m
SIDE TILT	7° left/right

DEFINING FEATURES

- Telescoping dry kellys** achieve deeper depths without leaks or repacking
- 6x4 or 6x6 Conventional truck** mount provides easy mobilization without permitting
- Dedicated engine** improves fuel economy and relieves truck of wear and tear
- Torque Converter** delivers responsiveness unmatched by any hydraulic rig
- Full Top Crowd** drills straighter holes faster and simplifies bar locking
- Single layer, grooved Kelly winch** drum for max linepull and longer rope life
- Controlled freefall**, 2 speed Kelly winch for faster cycle times than any other drill
- Time tested** with 18 years of proven productivity in the toughest conditions
- Customizable Designs** direct from the factory can provide the advantage you need

STANDARD OPTIONS

- Three mast heights from 24'10" to 40'4"**
- Can be mounted to a wide range of Trucks and CAT tracks**
- Upgrades include service winches, outriggers, lighting, cab and tanks**
- Hydraulic Rotary version and round locking bars available**

Thermo-Helical Pile Foundations



Background of Thermo-Helical Piles

Originally developed by Arctic Foundations Inc. in Anchorage Alaska. Thermosyphon technology has been used as a foundation solution since the early 1960's. Canadian use of the technology and solutions began in the early 1980's through Arctic Foundations of Canada Inc. Since that time Thermosyphons have been used in hundreds of installations across the Canadian Arctic.

Thermopiles and Thermo-Helical Piles are specific applications of thermosyphon technology. These specially designed piles incorporate a sealed and capped piping design which houses liquid Carbon Dioxide (CO₂) refrigerant to significantly lower the adjacent ground temperature and greatly increase the loading capability over traditional adfreeze piles. By lowering the ground temperature throughout the pile, this design also ensures long foundation life in the face of increasing climate change.

The use of CO₂ as a refrigerant is by far the most environmentally friendly option and in the concentrations found in our technology is considered environmentally benign. Once charged, the piles remain operational for the life of the system. There are no moving parts and no maintenance requirements for the foundation. A yearly inspection of the piles is recommended and can easily be completed by local personnel. A step-by-step process for inspection will be provided by Arctic Foundations of Canada upon completion of the foundation installation.

All Thermosyphons (including Thermopiles) are designed, constructed, and installed in strict accordance with the current CSA S500 *Thermosyphon Foundations for Building in Permafrost Regions* Standard. Arctic Foundations of Canada continues to be involved in the ongoing updating and development, ensuring that our products meet and exceed this recently developed national standard. Our modern day system designs are developed in partnership with recognized Canadian and international engineering experts in this specific design field.

Installation Examples

Thermopiles have been extensively used in Alaska and are rapidly becoming a foundation solution in the Canadian Arctic to allow for long term foundations in an increasingly warm climate. Below are examples of Thermo-Helical Pile Foundations.

Inuvik RCMP Building – Inuvik NT

Completed in 2015, this foundation comprised of 128 Thermo-Helical Piles designed to overcome the challenging geotechnical site conditions as well as meet the planned 50yr design life of the structure.



Nullagivik Hotel – Kotzebue, AK

Foundation comprised of 213 Thermopiles



Manilaq Health Centre – Kotzebue, AK

Thermopile foundation completed for new hospital complex.



Yukon – Kuskokwim Recreational Aquatic Health and Safety Centre – Bethel, AK

Recent Recreational centre completed on a Thermopile foundation. (photo credit to Ken Graham Photography) Work completed by Arctic Foundations Inc.



Information Note

Old Crow Health and Wellness Centre and 10-plex – Pile Foundation

Highways and
Public Works

This note provides background information on the recommended Thermopile type foundation.

Issue:

- The geotechnical analysis for this project provided a recommended Thermopile foundation type. ^{74(1)(a)}

Key Points and Thermopile foundation summary description:

1. Thermopiles follow CSA standards and are in use elsewhere in the Canadian Arctic and in particular in Alaska where there are thousands of piles installed:

- Thermopiles are a steel pipe pile system, (ad-freeze system) with the addition of refrigeration loops. These loops keep the ground cool through the condensing of carbon dioxide gas in the loops driven by the temperature difference between the air and the ground. When the ground temperature is warmer than the air temperature, (in winter) they extract heat from the ground, when the ground temperature is cooler than the air temperature (summer) they lie dormant.
- This system is recommended because the geotechnical site investigation for this site shows an ice rich site which will be subject to degradation quickly through warming and subsequent conduction, the refrigeration loops will assist in the perseveration of the permafrost under the building maximizing the building lifespan.
- Thermosyphon systems used for projects in other communities in the Yukon and across the north are also refrigeration systems although the approach is quite different, a matt system is used for example and the foundations are shallow, they are not appropriate for this site.
- Thermopiles were installed for the Inuvik RCMP facility in 2015/16 and are performing well. Thermopiles are being installed for the new International Airports in Iqaluit and Rankin Inlet and have been used for many years in numerous locations in Alaska, failure is extremely rare at (1-2% likelihood); if a refrigeration loop fails the pile will still maintain strength as an ad-freeze pile.

Information Note

Old Crow Health and Wellness Centre and 10-plex – Pile Foundation

Highways and
Public Works

- As with all pile installations, ad-freeze or otherwise the temperature of the ground around the piles will be checked on a regular basis to ensure the ground temperature is as expected and planned for during design.

2. Local economic benefits are important to us, contractors in Old Crow can do this work:

- The conceptual design shows an estimated pile diameter of 300 mm and depth of 10 m, requiring a bore-hole diameter of 450 mm. These figures are subject to change during the final design stage, for example, the pile diameter could be reduced to 200 mm with a slight depth increase and borehole diameter of 350 mm.
- Porcupine Enterprises noted that the existing drill rig located in Old Crow is capable of drilling holes in permafrost up to 500 – 600 mm in diameter, to depths up to 15 metres. The recommended design should align with the capacity of the rig used previously to install the typical “slotted” Ad-freeze piles in Old Crow. There is no difference in drilling and pile installation methodology for thermopiles vs ad freeze piles.
- The ad-freeze piles used for the Community Centre and Elders’ Complex projects were engineered to have a 30-year design life. These piles were installed using the existing drill rig and are 200 mm in diameter to depths of about 15 m.

3. This solution provides maximum protection from permafrost degradation:

- “Ad-freeze” systems depend on the bond between the steel pipe and surrounding frozen ground. The colder the pipe and ground, the stronger the bond. Thermopiles will slow the natural permafrost degradation and help to ensure maintenance of the bond strength thereby reducing the chances of building movement causing damage.
- Neither ad-freeze nor Thermopile systems will “fail” catastrophically, rather due to climate change, the permafrost will gradually degrade and settlement will occur. After 30 years, with ad-freeze (non-Thermopile) piles, building settlement can be expected at an increased rate, requiring more maintenance to repair damage and adjust building levels, with Thermopiles there will be less settlement thereby extending the building life.

4. This is an environmentally friendly solution, and does not inject anything into the ground.

- Thermopiles are fully commissioned and tested to confirm their integrity, if there is any issue they can be fixed before they are loaded.
- CO₂ is contained in the seamless, sealed, refrigeration loops at a pressure a fraction of that contained in a typical fire extinguisher. The gas in the loops circulates by passive

Information Note

Old Crow Health and Wellness Centre and 10-plex – Pile Foundation

Highways and
Public Works

convection. Heat from the ground is carried by the gas to the top of the loops, it is then is transferred to the cold winter air through radiating fins. The gas condenses to liquid which flows back down the pipe.

- No CO₂ is released to atmosphere or to the ground. The CO₂ will remain for the life of the system and is at a concentration that is considered environmentally benign.
- This type of system has proven to be very reliable. The chances of a valve failure are considered to be 1-2%, however, if something hits a valve (located at the top of the pile under the building) causing a leak, the amount of gas released to atmosphere would be minimal in any case and quickly disperse.
- The manufacturer of these piles routinely ships CO₂ across the north, including by air.

From: [Jennifer.Macgillivray](#)
To: [Colin.McDowell](#); [Karen.Chan](#)
Cc: [Ben.Hancock](#); [Peter.Blum](#); [Natasha.Phillips](#); [Darren.Stahl](#)
Subject: Foundation Decision & schedule
Date: January 6, 2021 1:32:52 PM
Attachments: [image001.png](#)

Hi Team,

Just an update, 74(1)(a)

The tender will be extended until the 28th of January due to requests from bidders.

We are still on schedule and will continue to be if:

74(1)(a), 75(1)(a)(ii)

Jenn



Jennifer Macgillivray, NCIDQ, PMP, MBA
Assistant Deputy Minister
Highways and Public Works | Property Management Division
C 867-334-1000 | [Yukon.ca](#)

From: [Darren.Stahl](#)
To: [Colin.McDowell](#)
Subject: RE: Old Crow Update
Date: April 9, 2021 9:34:00 AM
Attachments: [image001.png](#)

There is no actual construction slated for this FY, only site prep. The foundation thermopiles are not going to be installed the winter of 2021 which will allow for a late winter early spring construction start.

Darren

From: Colin.McDowell
Sent: April 9, 2021 9:27 AM
To: Darren.Stahl <Darren.Stahl@yukon.ca>
Subject: RE: Old Crow Update

Thanks Darren – one more thing. We say actual construction (presumably of the 10 plex) is scheduled to start in Spring 2022 – is that correct? I had thought (perhaps incorrectly) that the 10 plex was going up first (starting this year) and the health centre would follow in 2022. Can you confirm the order and timing of construction?

Thanks



Colin McDowell
Vice President | Operations
Yukon Housing Corporation
T 867-334-4231 | F 867-393-6274 | [Yukon.ca](#)

From: Darren.Stahl
Sent: April 9, 2021 9:16 AM
To: Colin.McDowell <Colin.McDowell@yukon.ca>
Subject: RE: Old Crow Update

Great catch!!

Sorry about that.
See below

Ketza/TSL formed a partnership and retained DGBK Architects from Vancouver . DGBK has included local firm, Northern Front Studios as part of the design team.

Wildstone Construction Group partnered with local design firm KZA

From: Colin.McDowell
Sent: April 9, 2021 9:10 AM
To: Darren.Stahl <Darren.Stahl@yukon.ca>
Subject: RE: Old Crow Update

Thanks – Just a quick question; I thought we discussed KZA having been partnered with Wildstone, not Ketza???



Colin McDowell
Vice President | Operations
Yukon Housing Corporation
T 867-334-4231 | F 867-393-6274 | Yukon.ca

From: Darren.Stahl
Sent: April 9, 2021 8:58 AM
To: Colin.McDowell <Colin.McDowell@yukon.ca>
Subject: FW: Old Crow Update

Colin

The following is a short update on the Old Crow project as requested.

If you would like this more in-depth please let me know.

Darren

Yukon Housing Corporations Old Crow 10 plex community housing project has now been awarded. The 10 plex is a joint project with Health and Social Services Health and Wellness Center. This combined project will be project managing by HPW on behalf of YHC and H&SS. The design build RFP tender closed on Feb. 26, 2021 which had two compliant bids. Wildstone Construction partnering with DGBK Architects from Vancouver and Ketza/TSL partnering with local design firm KZA were the two compliant bids. Following RFP evaluations and price envelopes, a contract was awarded to Ketza/TSL for \$44.88M. We will learn in the coming days what portion of the value is directly attributed to the 10 plex. The budget for the 10 plex will be held and managed by HPW. Construction schedule for this fiscal year includes some of the following components;

- Contractor is working on securing gravel for pad structure and site.
- Working with ATCO for power infrastructure requirements.
- Working on foundation design

- Preparing a shipping plan for foundation thermopiles
- Coordinating contractors and equipment for thermopile installation in winter of 2021/2022

Actual construction is scheduled to begin in the spring on 2022 with substantial completion in December of the same year.

Throughout the design and construction of the project, YHC staff will be working closely with HPW as support and to ensure YHC's requirements are met in the design of the project as well as throughout the construction of the new 10 plex.

Once the final design has been completed we will share the plans for further information.

Access.Analyst

From: Peter.Blum
Sent: May 27, 2021 9:50 AM
To: Natasha.Phillips; Darren.Stahl
Cc: Nick.Rodger
Subject: Old Crow HWC - 10-Plex Monthly Progress Update
Attachments: Old Crow HWC - 10-Plex Project Update 2021.05 (003).pdf

Natasha/Darren;

Here is the two page monthly update that we are providing for our Minister. It has the same format and content as our other major project updates for consistency.

Please review and let me know if you have any questions, comments or suggestions. I believe Priyank will share it with the Steering Committee for discussion at the next meeting (June 2nd).

Thanks,
Peter B.

**Peter Blum, PMP**

Senior Building Program Manager
Department of Highways and Public Works | Major Infrastructure Division
C 867-336-0314 | Yukon.ca



Old Crow Health and Wellness Centre and 10-Plex Housing Unit Monthly Progress Update

May 26, 2021

Current Situation Highlights

- Design-Build contract awarded to KetzaTSL Construction Ltd.
- 50% Design Development package was received and review comments returned, including coordination with the VGG, HSS, YHC and the Design-Build team. 75% submission is due in late June – early July.
- Final project schedule is under development and will include preliminary cash-flow projections for annual budget adjustment.

Budget

- Total Approved Budget - **\$52 million**
- Estimated Spending in Current Fiscal Year (21/22) - 75(1)(a)(ii)

*Note that these numbers are an estimate and will be dependent on the progress of the work and consultants/contractors billing and are expected to be adjusted as the work progresses.

Recent & Upcoming Schedule Highlights (2 Month Look Ahead)

Project Activities	Est. Completion
Revised Implementation Phase Approval Granted	March 3, 2021 (complete)
Design-Build Contract Award	March 11, 2021 (complete)
50% Design Development Review	May 17, 2021 (complete)
VGFN Chief and Council Update and Community Open House	May 20, 2021 (complete)
75% Design Development Submission due	June 2021 (ongoing)
Begin Site Preparation	June – August 2021
Thermopile Foundation Installation	Fall/Winter 2021-22

Notes: This timeline is a general estimate. There are complex interdependencies and one item may influence another in unexpected ways. This breakdown does not take into account changing the scope of the project or slower than expected approvals. Finally, stakeholder engagement is important and to ensure fulsome involvement and feedback the schedule may be affected.

Current Risks

Risk Item	Description & Management Strategy	Level of Risk		
		H	M	L
		74(1)(a)		
Design-Build start-up and VGFN/VGG engagement issues	<ul style="list-style-type: none">- On-going communications will be critical to coordinate with VGFN/VGG, the D-B team, HSS and YHC- Establishing communications protocol, and engagement plan – expectation management- Confirming all party understanding of project scope, schedule and delivery method- Establishing working relationships, including follow through regarding community opportunities for business, training and employment, etc.			
On-going COVID constraints and impacts	<ul style="list-style-type: none">- Establish means and timing of necessary in-person or virtual meetings and community/site visits- Confirm contractual provisions including Design-Builder’s schedule of values submission, 4-month initial period and further monitoring/reporting requirements			
Gravel availability in Old Crow	Ketza TSL is coordinating with VGG, Porcupine Entrprises and the Old Cow Development Corp. to confirm quantities and sources of material			

Upcoming Public Meetings & Messaging (2 Month Look Ahead)

- Monthly project updates for Vuntut Gwitchin Government
- Chief and Council update presentation – August 2021
- Potential Old Crow community meeting (e.g., Design-Builder “job fair” and general information presentation – August 2021)

Access.Analyst

From: Peter.Blum
Sent: June 23, 2021 3:14 PM
To: Priyank.Thatte; Karen.Chan; Colin.McDowell; Amy.Riske; Dale.Cheeseman; Nick.Rodger; Darren.Stahl; Linda.Steinbach; Genibeth.Genito
Subject: 20210614_NR_Old Crow HWC_construction begins (003)
Attachments: 20210614_NR_Old Crow HWC_construction begins (003).docx

All;

Attached is a draft news release about the start of site development in Old Crow planned for about mid-July. It has been through HPW, HSS and YHC Communications. We are working on including a couple of exterior perspective images. The draft has not yet been forwarded to VGFN/VGG – pending Steering Committee review/comments.

The message box and Q&S section will be updated separately as things progress.

Please let me know if you have questions or comments and whether the draft version can be forwarded to VGFN/VGG. We will then ask if Chief Tizaya-Tamm wants to add a quote. Ketza TSL are also being asked if they have a quote.

Thanks,
Peter B.



Peter Blum, PMP

Senior Building Program Manager

Department of Highways and Public Works | Major Infrastructure Division

C 867-336-0314 | Yukon.ca



FOR RELEASE
Month date, 2021

Construction started on Health and Wellness Centre and 10-Plex housing unit in Old Crow

Construction work is underway on the Health and Wellness Centre and 10-Plex housing complex in Old Crow.

The first phase of construction is site preparation. This includes clearing and grubbing the site, and putting in a gravel pad. Later this year, Thermopiles – for the foundation – will be shipped by air to the community, to be drilled and installed over the winter. Work on the building structure itself will start next spring.

Planning for these facilities has been underway for several years. ~~Continuous-e~~Engagement with the Vuntut Gwitchin First Nation included negotiation of a long-term land lease agreement to build and operate the two significant facilities on Settlement Land.

~~which is the first such agreement in Yukon.~~

The 10-Plex will be completed in late 2022 and the Health and Wellness Centre will be completed by late 2023.

Quotes

This government is committed to making investments across Yukon to build healthy, vibrant communities. This project will replace Old Crow's aging health centre, increase the number of affordable housing units and create jobs in the community. I look forward to seeing the engineering feats to come on this ambitious and logistically complicated project, including shipping of materials and equipment on a winter road.

– Minister of Highways and Public Works Nils Clarke

Include a quote here from a third party. Follow the [table of precedence](#) for Yukon in the Government of Yukon Style Guide which states the order in which officials are referred to and quoted.

– Third Party executive director John Smith

Quick facts

- The design-build contract for the project was awarded to Ketza TSL Construction in March 2021 for \$44.8 million.

Commented [P1]: Will check with Aboriginal Relations on this.

Commented [D2]: HPW-comms will check with YHC, HSS, VGG, Ketza about providing a quote.

Commented [P3]: Possibly Chief Tizya-Tramm for VGFN or the VGG Executive Director
Not sure if someone or who would be identified by Ketza TSL.

- A number of steel Thermopiles are drilled into the ground to carry a building's structural load while also extracting heat during cold winter months. This helps to keep the soil frozen, minimizing impacts to permafrost and providing structural integrity where typical concrete or similar horizontal footings are not feasible.
- The Health and Wellness Centre is the first to be designed and constructed based on a generic functional program developed by the departments of Health and Social Services and Highways and Public Works for smaller Yukon communities. It will provide healthcare services including homecare, mental health, social services, dental care, telehealth and emergency care.

Contact

Renee Francoeur
Cabinet Communications
867-334-9194
renee.francoeur@yukon.ca

Diana Dryburgh-Moraal
Communications, Highways and Public Works
867-332-3568
diana.dryburgh-moraal@yukon.ca

News release #21-xxx

Article teaser

We are breaking ground and starting pre-construction work on two new facilities in Old Crow.

Tweet

Construction work is underway on the Health and Wellness Centre and 10-Plex housing complex in Old Crow. First up is site preparation: that means clearing the ground and laying gravel in preparation for the Thermopile foundation to be installed over the winter.

Facebook

Construction work is underway on the Health and Wellness Centre and 10-Plex housing complex in Old Crow. First up is site preparation: that means clearing the ground and laying gravel in preparation for the Thermopile foundation to be installed over the winter.

Message box

Subject: Old Crow Health and Wellness Centre and 10-Plex

Lead department: HPW

Spokesperson: HPW: Peter Blum, Nick Rodger or Priyank Thatte
Housing/Health specific questions to be redirected to YHC/HSS

- The Government of Yukon is working to improve and modernize the services available in Old Crow through the construction of new, efficient facilities that meet community needs.
- Ketza TSL Construction Ltd. was awarded this contract in March 2021 and has now started construction on the Health and Wellness Centre and 10-Plex.
- Construction on the 10-Plex is expected to be complete by late 2022 and the Health and Wellness Centre is expected to be complete by late 2023.
- [The 10-plex in Old Crow is going to be a mixed use building. This means that it will be available to house different client groups from the community, including seniors, families and individuals – whether they are staff or rent-geared-to-income tenants. The housing project will also help support the recruitment and retention of qualified government staff in the community.](#)
- We are pleased to work with our partners on this ambitious and logistically-challenging project.

Questions and answers

Q. What is a Thermopile and how does it work?

A. A Thermopile foundation system is a series of individual hollow steel sealed tubes filled with carbon-dioxide gas, which extend from about 15

metres below to 2 metres above the ground level. Steel fins are fixed to the portion above ground. When the air is colder than the ground during winter months, heat is extracted from the soil and radiated to the air, similar to how a refrigerator works. This is a passive system having no moving parts, and using no energy.

Q. Who will live in the 10-plex?

A. Yukon Housing Corporation will work in partnership with the community of Old Crow to determine the best use of the units and ensure we use the asset to meet the highest community priorities. The Yukon Housing Corporation will be responsible for managing the 10-Plex. This will include allocation of units for nurses, ~~and other~~ staff and visiting professionals, and amongst other housing needs. ~~The 10-Plex will include a single two-bedroom unit allocated to the VGFN for its exclusive use.~~

Q. What size are the units?

A. The 10-unit community housing building will have:

- 5 - 2 bedroom units (1 Barrier Free)
- 4 - 1 bedroom units (1 Barrier Free)
- 1 - 2 bedroom unit set aside for VGFN - Barrier Free

Q. Will families (children) be allowed in these units?

A. Yes, families with children can be allocated a two-bedroom unit. YHC follows the National Occupancy Standards which would mean a couple or single parent with two same gender children (family of 3-4) or a couple or single parent with one child (family of 2-3) could be allocated a two-bedroom unit.

Q. Will YHC allocate more units for employee housing?

A. ~~YHC understands from the department of Health and Social Services that more employee housing will be needed to meet the staffing needs at the new Health Centre.~~ Yukon Housing Corporation will work in partnership with the community of Old Crow to determine the best use

[of the units and ensure we use the asset to meet the highest community priorities.](#)

Q. Why was a Land Lease Agreement needed and why couldn't the new building be in the same location as the existing one?

A. There is a lack of Government of Yukon land available in the community of the size needed for this project. The existing Health Centre needs to remain operational until completion of the new project.

Q. What will happen to the old Nurses Residence and Health Centre?

A. The existing facility will be assessed as a separate future project to determine options for its use or **decommissioning**.

Commented [P4]: PMD RCAP are reviewing options for assessment and potential future use/demolition.
74(1)(a)

Q. Will there be an ambulance station?

A. Ambulance Emergency Medical Services are provided by the department of Community **Services**. The generic functional program includes an "add-on module" for communities with highway access and larger areas and populations. Since Old Crow is a "fly-in" community, ambulance services are currently not included in this project.

Commented [P5]: Need to check with CS on messaging for EMS.

Prepared by : Diana Dryburgh-Moraal, HPW manager comms

Reviewed/approved by: Peter Blum – HPW – Sr. Building Program Manager

Access.Analyst

From: Peter.Blum
Sent: July 14, 2021 11:54 AM
To: Priyank.Thatte; Karen.Chan; Colin.McDowell; Amy.Riske; Darren.Stahl; Nick.Rodger; Linda.Steinbach; Genibeth.Genito
Cc: Dale.Cheeseman
Subject: RE: Old Crow HWC - 10Plex Steering Committee
Attachments: 20210614_NR_Old Crow HWC_construction begins_DM approved.docx

All;
As discussed this morning, here is the latest version of the news release. It was just confirmed that it has been approved by Cab Comms and is scheduled to be issued at 9a.m. this Friday.
Thanks,
Peter B.

**Peter Blum, PMP**

Senior Building Program Manager
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C 867-336-0314 | Peter.Blum@Yukon.ca



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Planning for these facilities has been underway for several years. Engagement with the Vuntut Gwitchin First Nation included negotiation of a long-term land lease agreement to build and operate the two facilities on Settlement Land.

The 10-Plex will be completed in late 2022 and the Health and Wellness Centre will be completed by late 2023.

Quotes

This government is committed to making investments across Yukon to build healthy, vibrant communities. This project will replace Old Crow's aging health centre, increase the number of affordable housing units and create jobs in the community. I look forward to seeing the engineering feats to come on this ambitious and logistically complicated project.

– Minister of Highways and Public Works Nils Clarke

The Government of Yukon is pleased to be moving forward with the Vuntut Gwitchin First Nation on the Old Crow Health and Wellness Centre and 10-Plex Housing unit project. The co-location of health and wellness related services in the new Health and Wellness Centre is an important step forward and supports the recommendations of the *Putting People First* Report by providing for more holistic, whole-person care by integrated, interdisciplinary teams.

– Minister of Health and Social Services Tracy-Anne McPhee

The Old Crow 10-Plex is a significant investment in housing in the Old Crow community. Designed as a mixed-use building, this project will enable us to respond to changing housing needs in the community. Supporting the vision and objectives of the Housing Action Plan and Aging in Place Action Plan, this project demonstrates collaboration between different levels of government to address community needs in the Yukon. This project will also boost Yukon's economy and generate construction jobs. We are

excited to see families and individuals get access to safe, affordable homes and improve their quality of life.

– **Minister responsible for the Yukon Housing Corporation Ranj Pillai**

These long-awaited buildings will have a significant impact on our community's health and wellness and our current housing shortage. The first phase of construction is an exciting milestone for our Government and our people. We are eagerly anticipating the overdue replacement of our health centre, built in the 1970s. The new centre will facilitate a collaborative approach to health and social needs, while the 10-unit housing complex will help provide other housing that will change lives in Old Crow.

– **Vuntut Gwitchin Government Chief Dana Tizya-Tramm**

This project means more than bricks and mortar to Ketza TSL Construction Ltd; the healthy development of our communities is so vital. A Health and Wellness Centre & 10-Plex in Old Crow will not only benefit families now, but future generations and we are grateful to be part of the team for this impactful investment in the community

– **Ketza TSL Construction Ltd. General Manager Eric Brohman**

Quick facts

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Contact

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News release #21-xxx

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- We are pleased to work with our partners on this ambitious and logistically-challenging project.

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