Design, Construction and Retrofit Strategies

			2023-2024		2024-2025 2025-2026				2026-27		2027-2028	2023/24-2027/28				
Lighting	Quantity of Time that Measure will be in place (years)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Saving (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)	Energy Payback Period	% related to Electricity	% related to Natural Gas	
High Efficiency Lighting Systems (D5020, D502001, D502003,	30	105,000	44 671	\$ 174,167	74,098	62,500	26,590	\$ 52,083	22,158	\$ 52,083	22,158	665.993	15	100	0	
D502004)	30	25,000	10.636	\$ 22 100	9.402	26,000	11.061	\$ 23,636	10.056	6 22,024	9,374		15	100		
Outdoor Lighting (D502004) Occupancy Sensors (D5021, D5022)	10	25,000		\$ 6,500	4,148	5 000		\$ 25,036 \$ 5.000	3,191	\$ 22,034 \$ 5.000	3,191		10	100	0	
Other (Describe)		-	-	\$ -	4,140	-	5,151	\$ -	-	S -		40,714	0	100	100	
				*						*						
			2023-2024		2024-2025		2025-2026		2026-27		2027-2028	2023/24-2027/28				
H.V.A.C.	Quantity of Time that Measure will be in place (years)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)	Energy Payback Period	% related to Electricity	% related to Natural Gas	
Efficient Boilers (near condensing) (D3020, D302001, D302002)	30	-	· ·	\$ -	- 9	-	The second secon	\$ -		s -			15	5		
High-efficiency Boilers (condensing) (D3020, D302001, D302002)	15	-		\$ 50,000	92,229	50,000	92,229	\$ 25,000	46,114	\$ 25,000	46,114	783,946	12	5	95	
High-efficiency Boiler Burners (D3020)	10	-	•	\$ -	- 9	-	•	\$ -	•	\$ -	•		5	5	95	
Geothermal (D302099)	25	-		\$ -		-		\$ -		s -	•		35	100	0	
Heat Recovery/Enthalpy Wheels (D3090)	20	25,000	33,181	s -		-		\$ -	•	\$ -		165,907	12	20	80	
Economizers (D306002)	15	-		5 -				\$ -		\$ -			7.5	50	50	
Energy Efficient HVAC systems (D3050,D3040)	35	1,100,000	149,654	\$ 496,250	67,514	421,813	57,387	\$ 347,375	47,260	\$ 322,563	43,884		75	50	50	
Energy Efficient Rooftop Units (D302098)	25	445,000	100,903	\$ 300,775	68,200	326,313	73,991	\$ 227,000	51,472	\$ 212,813	48,255		45	50 15	50	
High Efficiency Domestic Hot Water (D2020) Efficient Chillers and Controls (D3030, D303011, D303012)	10 25	-	•	-	•	•		-	•	-			100	15	85	
High-efficiency Motors (D304007, D303011)	25	-	· .	-	- 3	•	· ·	-	•	-			100	100	0	
VFD (D302056)	10	-	•	-	•	-		-	•	-			12	75	0	
Demand Ventilation (D3040)	10	-	· .	-	· .	-		-	· .	-	·		- 12	50	50	
Entrance Heater Controls (D302099)	20	-		\$ - \$				s -		s -			5	50	50	
Destratification Fans (D3090)	10	-		\$ -	-	-		S -		\$ -			7	100	0	
Other Hydronic Radiant Ceiling Panels	15	275,000	199,888	\$ 80,000	58,149	50,000	36,343	\$ 66,500	48,336	\$ -		1,437,737	35	0	100	
			2023-2024		2024-2025		2025-2026		2026-27		2027-2028	2023/24-2027/28				
Controls	Quantity of Time that Measure will be in place	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)	Energy Payback Period	% related to Electricity	% related to Natural Gas	
Building Automation Systems - New (D3060)	15	50,000	25,509	\$ 25,000	12,755	15,625	7,972	\$ 17,857	9,110	\$ 25,000	12,755	233,455	20	50		
Building Automation Systems - Upgrade (D3060)	15	105,000	53,569	\$ 145,000	73,977	30,000	15,306	\$ 10,000	5,102	\$ 10,000	5,102	624,975	20	50		
Real-time energy data for operators to identify and diagnose building issues	10	-		-		-		s -		s -			3	50		
Voltage Harmonizers (D501001)	15	-		s -	- 9			\$ -	and the second s	s -			7	100		
Other (Describe)				s -				s -					0		100	
				2024-2025			2025-2026		2026-27		2027-2028					
			2023-2024		2024-2025		2025-2026		2020-27		2027-2028	2023/24-2027/28				
Building Envelope Q	Quantity of Time that Measure will be in place	Estimated Cost of Implementation	2023-2024 Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	2024-2025 Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	2025-2026 Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	2023/24-2024/28 Estimated Total Accumulated Energy Savings (ekWh)	Energy Payback Period	% related to Electricity	% related to Natural Gas	
Building Envelope Glazing (B302006, B2020, B3021)			Estimated Annual Energy Savings from all projects		Estimated Annual Energy Savings from all projects		Estimated Annual Energy Savings from all projects		Estimated Annual Energy Savings from all projects		Estimated Annual Energy Savings from all projects	Estimated Total Accumulated Energy Savings	Energy Payback Period 80			
Glazing (B302006, B2020, B3021)	be in place		Estimated Annual Energy Savings from all projects (ekWh)	Implementation	Estimated Annual Energy Savings from all projects (ekWh)		Estimated Annual Energy Savings from all projects (ekWh)	Implementation	Estimated Annual Energy Savings from all projects (ekWh)		Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)	Period	Electricity		
Glazing (B302006, B2020, B3021) Increased Wall Insulation (B2010)	be in place 30 50	Implementation 6 - 6 60,000	Estimated Annual Energy Savings from all projects (ekWh) - 23.891	Implementation -	Estimated Annual Energy Savings from all projects (ekWh) - 41,145	Implementation - 93,000	Estimated Annual Energy Savings from all projects (ekWh) - 37,030	Implementation \$ -	Estimated Annual Energy Savings from all projects	Implementation \$ - \$ 51,667	Estimated Annual Energy Savings from all projects (ekWh) - 20,572	Estimated Total Accumulated Energy Savings (ekWh) - 465,070	Period 80	Electricity 20 20	Gas 80	
Glazing (B302006, B2020, B3021)	be in place	Implementation	Estimated Annual Energy Savings from all projects (ekWh) - 23.891	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 41.145 9,158	Implementation -	Estimated Annual Energy Savings from all projects (ekWh) - 37,030 15,927	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 24,687 15,927	Implementation	Estimated Annual Energy Savings from all projects (ekWh) - 20.572 15.927	Estimated Total Accumulated Energy Savings (ekWh) 465,070 164,049	Period 80 40	Electricity 20	Gas 80 80	
Stazing (B302006, B2020, B3021) Increased Wall Insulation (B2010) New Roof (B3010, B3020)	50 22 :	Implementation - 60,000 8 80,000	Estimated Annual Energy Savings from all projects (ekWhi) 23,891 6,371 23,891	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 41,145 9,158 40,772	Implementation - 93,000 200,000	Estimated Annual Energy Savings from all projects (exWh) 37,030 15,927 49,772	Implementation \$ -	Estimated Annual Energy Savings from all projects (ekWh)	Implementation \$ - \$ 51,667 \$ 200,000	Estimated Annual Energy Savings from all projects (ek.Wh) 20.572 15.927 38.500	Estimated Total Accumulated Energy Savings (ekWh) - 465.070 164.049 583.992	80 40 200	20 20 20 20	Gas 80 80 80	
Glazing (B302006, B2020, B3021) Increased Wall Insulation (B2010) New Roof (B3010, B3020) New Windows (B2020)	be in place 30 50 22 32	Implementation 6 60,000 8 80,000 120,000	Estimated Annual Energy Savings from all projects (ekWhi) 23,891 6,371 23,891	Implementation	Estimated Annual Energy Savings from all projects (ekWh) 41.145 9,158	Implementation 93,000 200,000 250,000	Estimated Annual Energy Savings from all projects (exWh) 37,030 15,927 49,772	Implementation	Estimated Annual Energy Savings from all projects (exWh) 24,687 15,927 39,918	Implementation S	Estimated Annual Energy Savings from all projects (ekWh) - 20.572 15.927	Estimated Total Accumulated Energy Savings (ekWh) - 465,070 164,049 5583,992 207,052	80 40 200 80	20 20 20 20 20	80 80 80 80 80	

Keys		
colour: yellow		= Default value
colour: blue		= Calculated Value
	\$0.1567	= cost of 1 ekWh electricity
S	0.0393	= cost of 1 ekWh natural gas
	0.0955	m3 = 1 ekWh (as per NRCan
	0.0000	conversion table)
	\$0.4116	= cost of 1 m3 of natural gas

Operations and Maintenance Strategies	und Maintenance Strategies											_			
			2023-2024		2024-2025	2025-2026			2026-27	2027-2028		2023/24-2027/28			
Policy and Planning	Quantity of Time that Measure will be in place (years)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)	Energy Payback Period	i % related to Electricity	% related to Natural Gas
New School Design/Construction Guidelines and Specifications	5	\$ 5,000	10,204	\$ 5,000	10,204	-	· · · · · · · · · · · · · · · · · · ·	\$ -		-		91,833	5	50	50
Day and Night Temperature Guidelines for all Schools	10	s -		s -		\$ -		\$ -		-			5	20	80
Nighttime Blackout of Sites - Interior	10	s -	and the second s	s -	and the second s	\$ -	and the second s	s -	and the second s	\$ -	and the second s		7	100	
Nighttime Blackout of Sites - Exterior	10	s -		\$ -	•	\$ -		\$ -		\$ -			7	100	•
Procures Only Energy Star Certified Appliances	5	s -		s -		s -		s -		s -			5	100	•
Demand Ventilation (servicing) (D3020,D3030, D3040)	3	s -	· · · · · · · · · · · · · · · · · · ·	\$ -	•	\$ -	The second secon	\$ -	•	\$ -			5	50	50
HVAC Optimization (coil cleaning, re-calibration of equipment) (D3020)	3	\$ 7,500	15,306	s -		\$ 7,500	15,306	s -	•	\$ 7,500	15,306	137,750	5	50	50
Commissioning (retro and re)	10	\$ 5,000	5,102	\$ 5,000	5,102	\$ 5,000	5,102	\$ 5,000	5,102	\$ 5,000	5,102	76,528	10	50	50
Other (Describe)		s -		s -		\$ -		\$ -	· · · · · · · · · · · · · · · · · · ·	\$ -			0		100
			2023-2024		2024-2025		2025-2026		2026-27		2027-2028	2023/24-2027/28			
Energy Audits	Quantity of Time that Measure will be in place	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)	Energy Payback Period	% related to Electricity	% related to Natural Gas
Walk Through Audit	5	s -		\$ -		\$ -		s -		\$ -	The second secon		1000	50	50
Engineering Audit Other (Describe)	5	s -	The second secon	s -		\$ -	The second secon	s -		\$ -	and the second s		1000	50	50
Other (Describe)		s -		\$ -	•	s -		-	•	s -		•	0		100
			2023-2024		2024-2025		2025-2026		2026-27		2027-2028	2023/24-2027/28	1		
	İ														
Operations and Maintenance Strategies Total	Quantity of Time that Measure will be in place	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh	Estimated Total Accumulated Energy Savings (ekWh)			

Occupant Behaviour Strategies

		2023-2024			9-2020 2024-2025		2025-2026	2026-27		2027-2028		2023/24-2027/28			
Training and Education	Quantity of Time that Measure will be in place (years)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)	Energy Payback Period	% related to Electricity	% related to Natural Gas
Building Operator Training	3	\$ -		\$ -		\$ -		\$ -		\$ -		-	3	60	40
Energy Benchmarking Program	5	\$ -		\$ -		\$ -		\$ -		\$ -			1000	50	50
Building Automation Training (site specific)	3	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2	20	285,723	1	50	50
Ongoing Training and Awareness Programs for Energy Conservation	5	\$ -		\$ -		\$ -		\$ -		\$ -			10	90	10
Detailed Information on Building Operational Costs	1	\$ -		\$ -		\$ -		\$ -		\$ -			1000	50	50
Detailed Information on Energy Consumption (e.g. via the Utility Consumption Database or other database)	1	\$ -		s -		\$ -		s -		\$ -			1000	50	50
Participate in Environmental Programs, such as EcoSchools, Earthcare	1	\$ -		\$ -		\$ -	-	\$ -		\$ -			5	90	10
Other Tools (Define)		\$ -		\$ -		\$ -		\$ -		\$ -			0		100
Occupant Behaviour Strategies Total		\$ 2,000	20,407	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2	20	285,723			

Keys	
\$0.1567	= cost of 1 ekWh electricity
\$0.0393	= cost of 1 ekWh natural gas
0.0955	m³ = 1 ekWh
\$0.4116	= cost of 1 m³ of natural gas

Conservation Goal

	FY 2018	
Total Building Area (includes portables) (m²)	190,692	Enter from UCD use square meters
Total Building Area (includes portables) (ft²)	2,052,536	Enter from UCD - use square feet
Energy Consumption for the board (ekWh)	39,077,428	Enter from UCD

1 ft² = 0.0929 m²

	•	2023-2024	2024-2025		2025-2026			2026-27		2023/24-2027/28	
	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Cost of Implementation	Estimated Annual Energy Savings from all projects (ekWh)	Estimated Total Accumulated Energy Savings (ekWh)
Appendix B: Design, Construction and Retrofit Strategies Total	\$ 2,472,500	705,613	\$ 1,780,125	565,325	\$ 1,542,250	431,577	\$ 1,248,452	328,010	\$ 1,121,492	268,611	8,008,729
Appendix C: Operations and Maintenance Strategies Total	\$ 17,500	30,611	\$ 10,000	15,306	\$ 12,500	20,407	\$ 5,000	5,102	\$ 12,500	20,407	306,110
Appendix D: Occupant Behaviour Strategies Total	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2,000	20,407	\$ 2	20	285,723
TOTAL	\$ 2,492,000	756,632	\$ 1,792,125	601,038	\$ 1,556,750	472,392	\$ 1,255,452	353,519	\$ 1,133,994	289,038	8,600,563
Percentage reduction		1.94		1.54		1.21		0.90		0.74	6.3
Conservation Goal (ekWh/m²)		3.97		3.15		2.48		1.85		1.52	12.9
Conservation Goal (ekWh/ft²)		0.37		0.29		0.23		0.17		0.14	1.2
	Note		Note		Note		Note		Note		
	Check the total in cell B15 to confirm validity of estimated amount to be spent during that year		Check the total in cell D15 to confirm validity of estimated amount to be spent during that year		Check the total in cell F15 to confirm validity of estimated amount to be spent during that year		Check the total in cell H15 to confirm validity of estimated amount to be spent during that year		Check the total in cell J15 to confirm validity of estimated amount to be spent during that year		