



saving you energy

DETAILED ENERGY AUDIT REPORT for 10 BUILDINGS



Thompson Rivers University – Kamloops Campus
Project No. 2010098
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TABLE OF CONTENTS

1.	EXECUTIVE SUMMARY	1
2.	BACKGROUND AND METHODOLOGY.....	3
2.1	Contact Information.....	3
2.2	Objectives	3
2.3	Energy Audit and Analysis Methodology.....	3
3.	BUILDING AND SYSTEM DESCRIPTION.....	5
3.1	General Building Description	5
3.2	Building Occupancy and Use.....	5
3.3	Location Data and Documentation	6
3.4	Lighting Systems Description.....	6
3.5	Luminaire Description	8
3.6	Description of Other Electrical Systems.....	18
3.7	Mechanical Systems Description.....	20
3.8	Domestic Water	38
4.	ENERGY PERFORMANCE.....	39
4.1	Utility Rates	39
4.2	Energy Use and Cost Summary	40
4.3	Greenhouse Gas Emissions Summary	41
4.4	Energy Analysis.....	42
4.5	Comparison to Other Facilities (Benchmarking).....	46
4.6	Building Energy End Use	47
5.	RECOMMENDED ENERGY CONSERVATION MEASURES.....	48
5.1	ECM 1: Lighting Retrofit	49
5.2	ECM 2: Lighting Controls	54
5.3	ECM 3: Vending Machine Usage Control.....	55
5.4	ECM 4: Appliance Timers for Corridor Televisions	56
5.5	ECM 5: Power Factor Correction	57
5.6	ECM 6: Holiday Scheduling.....	57
5.7	ECM 7: Optimum Start Morning Warm-up and Cool down for Ventilation Systems	59
5.8	ECM 8: Summer Scheduling	60
5.9	ECM 9: VAV Zone Isolation.....	62
5.10	ECM 10: DCV for Classrooms and Offices Served by WS Heat Pumps	65
5.11	ECM 11: Demand Controlled Ventilation for Clock Tower Theatre	65
5.12	ECM 12: Align Clock Tower DDC Weekly Schedules with Typical Occupancy.....	66
5.13	ECM 13: Trades Welding Booth Fan Operation	66
5.14	ECM 14: Wood Shop Dust Collector Occupancy Controlled Shutdown	68
5.15	ECM 15: Standby Mode and DCV for Gym Ventilation Systems	69
5.16	ECM 16: Heat Pump Loop Pump Shutdown.....	69
5.17	ECM 17: Old Main Unoccupied Exhaust Fan Shutdown	70
5.18	ECM 18: Install Flue Dampers on CAC Heating Plant	70
6.	OTHER SAVING OPPORTUNITIES.....	71
6.1	Halogen Lamp Replacement.....	71
6.2	Exterior HID to LED Lighting Replacement Luminaires.....	72
6.3	Replace Neon Tube Lighting with LED Accent Lighting	73
6.4	Trades and Technology Overhead Door Alarm.....	73
6.5	Curtail Unoccupied Heating	73

7.	CAPITAL UPGRADE PROJECTS.....	74
7.1	Paracube Louvres Replacement.....	74
7.2	PCB Disposal.....	75
7.3	Improve Trades and Technology Corridor Lighting.....	76
7.4	Code Violation Correction.....	76
8.	BEHAVIOURAL AND OPERATIONAL CHANGE	77
8.1	Communication and Awareness Program.....	77
8.2	Enable Power Saving Features of Computers and Monitors	77
8.3	Operating Procedures.....	77
9.	IMPLEMENTATION AND MONITORING	78
9.1	Implementation of Retrofit	78
9.2	Monitoring of Results	79

LIST OF TABLES

Table 1:	Summary of Recommended Energy Conservation Measures (ECMs).....	2
Table 2:	Summary of Potential BC Hydro Incentives	3
Table 3:	Buildings Audited	5
Table 4:	Library Operating Hours.....	6
Table 5:	Lighting Technology Breakdown per Building.....	7
Table 6:	Animal Health Technology Lighting Description	8
Table 7:	Arts and Education Lighting Description.....	8
Table 8:	Campus Activity Centre Lighting Description.....	9
Table 9:	Clock Tower Lighting Description	10
Table 10:	Gymnasium Lighting Description	10
Table 11:	International Building Lighting Description.....	11
Table 12:	Library Lighting Description.....	11
Table 13:	Old Main Lighting Description.....	12
Table 14:	Science Lighting Description	13
Table 15:	Trades and Technology Lighting Description	13
Table 16:	Most Commonly Used Exterior Lighting Systems.....	14
Table 17:	Onsite Light Level Measurement	15
Table 18:	Elevator Motor Sizes.....	18
Table 19:	Vending Machines.....	19
Table 20:	Old Main Heating Boilers	20
Table 21:	Summary of Heating Water Distribution Pumps	21
Table 22:	Summary of Chilled Water and Distribution Pumps	22
Table 23:	Summary of Air Handling Units	23
Table 24:	Summary of A-Block Addition Rooftop Units	23
Table 25:	Summary of B and C Blocks Rooftop Units	24

Table 26: Summary of Heating Water Distribution Pumps	25
Table 27: Summary of WSHP.....	25
Table 28: Summary of Makeup Air Units	26
Table 29: Summary of TTC Air Handling Units	27
Table 30: Summary of Exhaust Fans	28
Table 31: Summary of Heating Water Distribution Pumps	29
Table 32: Summary of Independent Centre Addition Rooftop Units	30
Table 33: Summary of Supply Fans	30
Table 34: Summary of Exhaust Fans	31
Table 35: Summary of IB Air Handling Units	32
Table 36: Summary of WSHP.....	33
Table 37: Summary of Exhaust Fans	33
Table 38: Summary of Gym Rooftop Units.....	34
Table 39: Summary of Library Rooftop Units.....	35
Table 40: Summary of Exhaust Fans	35
Table 41: Summary of Heating Water Distribution Pumps	36
Table 42: Summary of Chilled Water and Distribution Pumps	36
Table 43: Summary of Heating Water Distribution Pumps	37
Table 44: Summary of Animal Health Technology Rooftop Units.....	37
Table 45: Summary of Exhaust Fans	38
Table 46: Rates used for Electricity Savings Estimates (Not including HST).....	39
Table 47: Rates used for Gas Savings Estimates (Not including HST)	39
Table 48: Energy Account Summaries for Three Years	40
Table 49: Base Period Summary	44
Table 50: Summary of Recommended ECMs	48
Table 51: Typical Lighting Retrofit Design.....	52
Table 52: Recommended Exterior Lighting Measures.....	53
Table 53: Systems Recommended for Holiday Scheduling.....	58
Table 54: Systems Recommended for Summer Scheduling.....	60
Table 55: Systems Recommended for VAV Zone Isolation - International Building.....	62
Table 56: Systems Recommended for VAV Zone Isolation Trades and Technology Building.....	63
Table 57: Systems Recommended for VAV Zone Isolation - Campus Activity Centre.....	64
Table 58: Systems Recommended for VAV Zone Isolation - Old Main Building B-Block.....	64
Table 59: Other Energy Measure Opportunities Summary	71
Table 60: Typical Halogen Lamp Replacement	71
Table 61: Summary of Capital Upgrade Projects.....	74

LIST OF FIGURES

Figure 1: AHT Operating Area	8
Figure 2: AHT Classroom.....	8
Figure 3: AHT Corridor.....	8
Figure 4: A&E Classroom.....	9
Figure 5: A&E Corridors.....	9
Figure 6: A&E Office.....	9
Figure 7: CAC Main Atrium.....	9
Figure 8: CAC Student Atrium	9
Figure 9: CAC Book Store	9
Figure 10: CT Lecture Hall.....	10
Figure 11: CT Concourse	10
Figure 12: CT Office	10
Figure 13: GYM Gymnasium	10
Figure 14: GYM Change Rooms	10
Figure 15: GYM Basement	10
Figure 16: IB Lecture Hall	11
Figure 17: IB Corridor	11
Figure 18: Atrium	11
Figure 19: LIB Bookstacks.....	11
Figure 20: LIB Offices	11
Figure 21: LIB Atrium	11
Figure 22: OM Classroom.....	12
Figure 23: OM Concourse.....	12
Figure 24: OM Office.....	12
Figure 25: SC Laboratories.....	13
Figure 26: SC Lecture Hall	13
Figure 27: SC Offices.....	13
Figure 28: TT Shops	13
Figure 29: TT Classrooms.....	13
Figure 30: TT Equipment Room	13
Figure 31: Perimeter Lighting	14
Figure 32: Walkway Lighting	14
Figure 33: Old Main North Perimeter	14
Figure 34: CAC Walkway	14
Figure 35: LED Exit Sign In TT	15
Figure 36: Burnt-Out Exit Signs in OM	15

Figure 37: Energy Use and Cost Breakdown by Energy Source 41
Figure 38: GHG Emissions by Energy Source 41
Figure 39: Monthly Electrical Energy Consumption 43
Figure 40: Monthly Gas Use and Heating Degree Days 43
Figure 41: Breakdown of Weather Sensitive and Non-Weather Sensitive Energy Use by Account 44
Figure 42: Gas CUSUM 1..... 45
Figure 43: Benchmarking Comparison..... 46
Figure 44: Electrical Energy End Use Breakdown 47
Figure 45: Gas Energy End Use Breakdown..... 47
Figure 46: Kamloops Annual Outdoor Air Temperature Profile..... 59
Figure 47: Arc Welding Booths 66
Figure 48: Welding Booth Exhaust Fans 66
Figure 49: Welding Booth Usage Distribution 67
Figure 50: Woodshop Exhaust Ducting 68
Figure 51: CAC Neon Lighting..... 73
Figure 52: Trades and Technology Corridor Lighting..... 76
Figure 53: Exposed Wiring 76

LIST OF APPENDICES AND GLOSSARY

APPENDIX A: CONTACT INFORMATION

APPENDIX B: BUILDING SYSTEMS INFORMATION

APPENDIX C: UTILITY RATES AND ENERGY HISTORIES

APPENDIX D: GREENHOUSE GAS REDUCTION ANALYSIS

APPENDIX E: LIGHTING ANALYSIS

APPENDIX F: ELECTRICAL ANALYSIS

APPENDIX G: MECHANICAL ANALYSIS

APPENDIX H: PROJECT SUMMARY

APPENDIX I: NO COST AND LOW COST ENERGY SAVING OPPORTUNITIES

GLOSSARY

1. EXECUTIVE SUMMARY

This report summarizes an energy analysis conducted by Prism Engineering Limited (Prism) for ten buildings at Thompson Rivers University (TRU), Kamloops Campus and describes the measures prescribed to save energy. The areas reviewed make up approximately 75% of the energy used on campus.

There is potential to reduce energy use by:

- retrofitting or relamping fluorescent lighting systems with energy saving lamps and high efficiency electronic ballasts and replacing metal halide lighting systems;
- improving lighting controls by adding occupancy sensors in classrooms, washrooms and hallways, adding daylight sensors in atriums and lobbies and reprogramming central lighting controls;
- installing automated controls or timers on vending machines and TVs installed in hallways that operate continuously;
- align equipment schedules with occupancy and use (including holiday, summer and zone scheduling), adding controls to building exhaust fans, and optimizing the welding booth fans operation;
- reducing fuel use by demand controlled ventilation and flue dampers on CAC heating plant.

Through the energy recommendations outlined in this report, the following saving levels may be achieved:

- electrical savings of 1,617,000 kWh or 11% per year of the entire campus consumption;
- fuel savings of approximately 3,136 GJ or 9% per year of the entire campus consumption.

These savings would reduce annual costs by approximately \$92,150 for electricity and \$55,615 for natural gas. The combined total annual savings are estimated at \$147,750 or nearly 10% of 2009 energy costs of the entire campus.

The budget costs for implementing the recommendations are approximately \$1,120,000. This cost includes engineering, implementation and project management, but does not include the cost of hazardous waste removal or seismic upgrading of equipment.

The financial performance of the project is summarized as follows:

- the simple payback for the project is 7.6 years;
- the equivalent before tax internal rate of return is 14.1 % based on a 20 year life and a 2.5 % escalation in rates;
- the net present value for the project is \$941,750 based on a 6 % discount rate and a 20 year life.

The financial performance would be improved through potential utility and government incentives.

A summary of the recommended energy savings opportunities is included in Table 1. Additional details, including the financial analysis, are included in **APPENDIX H**.

Table 1: Summary of Recommended Energy Conservation Measures (ECMs)

Section	Measure	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
5.1	ECM 1: Lighting Retrofit	693,564	\$46,656	-	-	\$46,659	\$661,000	14.2
5.2	ECM 2: Lighting Controls	122,292	\$4,941	-	-	\$4,941	\$65,500	13.3
5.3	ECM 3: Vending Machine Usage Control	45,033	\$1,819	-	-	\$1,819	\$10,000	5.5
5.4	ECM 4: Appliance Timers for Corridor Televisions	10,530	\$425	-	-	\$425	\$650	1.5
5.5	ECM 5: Power Factor Correction	0	\$8,191	-	-	\$8,191	\$36,800	4.5
5.6	ECM 6: Holiday Scheduling	198,380	\$8,015	768	\$6,960	\$14,975	\$31,000	2.1
5.7	ECM 7: Optimum Start Morning Warm-up and Cool down for Ventilation Systems	216,990	\$8,765	839	\$7,600	\$16,365	\$44,900	2.7
5.8	ECM 8: Summer Scheduling	67,345	\$2,720	0	\$0	\$2,720	\$6,500	2.4
5.9	ECM 9: VAV Zone Isolation	116,330	\$4,700	203	\$1,845	\$6,545	\$50,000	7.6
5.10	ECM 10: DCV for Classrooms and Offices Served by WS Heat Pumps	21,755	\$880	1,227	\$11,125	\$12,005	\$102,500	8.5
5.11	ECM 11: Demand Controlled Ventilation for Clock Tower Theatre	3,800	\$155	23	\$210	\$365	\$3,900	10.7
5.12	ECM 12: Align Clock Tower DDC Weekly Schedules with Typical Occupancy	3,295	\$135	140	\$1,265	\$1,400	\$8,700	6.2
5.13	ECM 13: Trades Welding Booth Fan Operation	36,120	\$1,460	851	\$7,710	\$9,170	\$40,200	4.4
5.14	ECM 14: Wood Shop Dust Collector Occupancy Controlled Shutdown	9,885	\$400	14	\$130	\$530	\$5,200	9.8
5.15	ECM 15: Standby Mode and DCV for Gym Ventilation Systems	30,050	\$1,215	330	2,985	\$4,200	\$12,900	3.1
5.16	ECM 16: Heat Pump Loop Pump Shutdown	33,815	\$1,365	0	\$0	\$1,365	\$8,300	6.1
5.17	ECM 17: Old Main Unoccupied Exhaust Fan Shutdown	7,910	\$320	365	\$3,300	\$3,620	\$27,100	7.5
5.18	ECM 18: Install Flue Dampers on CAC Heating Plant	0	\$0	1,377	\$12,480	\$12,480	\$8,000	0.6
	Total	1,617,095	\$92,160	6,135	\$55,613	\$147,775	\$1,123,150	7.6

By implementing the measures outlined in this report, TRU can also lessen its impact on the environment and reduce greenhouse gas (GHG) emissions. The anticipated reduction of GHG emissions into the atmosphere is 355.3 tonnes of equivalent CO₂ (eCO₂) per year, or 9 % of 2009 emissions.

In addition to the potential savings identified above, this report also contains savings opportunities in exterior lighting retrofits, curtailing unoccupied heating and installing an overhead door alarm in the trades building. These measures have longer payback periods which may exceed TRU's acceptable payback threshold.

Capital upgrade options for mechanical and electrical equipment are also identified that do not relate to energy savings.

The financial viability for lighting retrofits and lighting controls measures may be improved by excluding areas with low usage areas such as utility and storage rooms. Additionally, utility incentives can significantly lower project costs.

Incentives under the BC Hydro Power Smart Partners Program for TRU lighting and controls have been estimated and their impact on retrofit measures payback is shown in Table 2. These estimates are presented as guideline figures only and will need to be verified with BC Hydro prior to implementing of any measures. As the various BC Hydro programs are subject to change, net incentives may be different than the estimates presented here.

Table 2: Summary of Potential BC Hydro Incentives

Section	Measure	Budget Retrofit Costs (\$)	Estimated Incentives (\$)	Budget Retrofit Costs After Incentives (\$)	Revised Payback (yrs)
5.1	ECM 1: Lighting Retrofit	\$661,000	\$172,000	\$489,000	10.5
5.2	ECM 2: Lighting Controls	\$65,500	\$21,500	\$44,000	8.9
5.3	ECM 3: Vending Machine Usage Control	\$10,000	\$3,100	\$6,900	3.8

2. BACKGROUND AND METHODOLOGY

2.1 Contact Information

Client and consultant contacts pertinent to this project are located in **APPENDIX A**.

2.2 Objectives

This study was designed to meet the following objectives:

- to develop a working model of the equipment and energy related systems in the building, including building operation and use;
- to review and analyze the energy use history and obtain a breakdown by end use to be used as a baseline from which savings could be measured;
- to determine what can be done to reduce energy use and what options are available for system upgrades; and
- to provide a summary of cost effective upgrades and a financial analysis.

2.3 Energy Audit and Analysis Methodology

Site Visits and Interviews

Site visits were carried out from April to June, 2010. We met with the representatives of TRU, Lincoln Chua, James Gudjonson, Michael Burke and Tom O'Byrne to review the operation of the building. They provided invaluable information and were very helpful in the site review process - Their assistance is appreciated.

Energy Analysis Methodology

The energy analysis was carried out based on the following methodology:

- an audit of the building equipment was carried out including physical equipment counts, nameplate readings, and measurements to determine the equipment load in kilowatts (kW);
- the hours of operation were determined for all equipment from the system schedules, hardware settings, building operators' experience, and site observations. The hours and load information was combined to determine the consumption in kilowatt-hours (kWh) or gigajoules (GJ);
- the energy use calculated above was reconciled to the actual metered consumption;
- the impact of weather data was reviewed and models for the building's energy use were determined for heating and cooling.

End-Use Breakdown

The audited equipment loads and hours of operation were used to determine the breakdown of the total energy use.

Lighting Audit and Analysis

The lighting study includes an audit of the facilities' lighting systems and controls, an analysis of retrofit alternatives and a summary of recommendations. The audit includes a detailed review of the various sources of lighting installed. This information was obtained through a physical, on-site review of the lighting system on a room-by-room basis.

Electrical Equipment Audit and Analysis

The electrical systems audit includes a review of plug loads and power factor.

Mechanical Audit and Analysis

The mechanical study includes an audit of the facilities' heating, cooling and ventilation systems and controls, an analysis of retrofit alternatives and a summary of recommendations. This information was obtained through a physical, on-site inventory and review of the mechanical equipment and equipment data prepared by TRU.

Measure Selection Criteria

Each measure proposed for implementation on this project has been selected based on its viability, as measured against the following criteria:

- costs and savings within overall payback guidelines;
- appropriateness for tasks performed in the space;
- condition of existing systems;
- cost to retrofit the existing system compared to the cost of replacement;
- maintenance requirements;
- consistency of application (areas of similar function are consistent);
- overall impact on occupants and general acceptance of changes;
- equipment approval by facilities personnel.

We recommend that all mechanical retrofit equipment be permanently installed and anticipate the new equipment will last 10 years or more. The life expectancy of the existing systems being modified by the retrofit equipment is estimated to have at least 10 years of service life remaining unless otherwise indicated.

Cost Estimation Methodology

Costs are determined based on data from previous projects, and not theoretical pricing. For the lighting costs, we have a detailed database of lighting products and product combinations. It is our intent to provide accurate pricing; however, the pricing provided should be used as budgets only and not fixed prices. Pricing includes engineering, project management and contingency.

Savings Methodology

Savings estimates are based on engineering calculations and are not guaranteed.

Cost/Benefit Analysis

Retrofit alternatives were evaluated. Measures were selected to yield a positive net present value. Measures are evaluated on simple payback, return on investment and net present value. More details about the assumptions used for the measure savings and cost analysis are included below:

1. The costs included are based on installed costs. These costs include materials and labour. Costs do not include possible extra costs for painting, asbestos abatement, or costs for other unknown installation factors. Installed costs include mark-up for implementation fees. HST is not included in the installation costs.
2. Electrical utility costs are based on published BC Hydro rates presently in effect for the Rate Codes as shown on the Account History Record (AHR). Electrical saving estimates include consumption and demand savings. HST is not included in the savings.
3. Hours of operation are based on information provided by staff, information gathered on-site, and direct observation of operations. Where hours of operation are not fixed or are variable, effort has been made to use conservative estimates for hours of operation.
4. All lamp and ballast watts are based on published figures from manufacturer literature.
5. The saving calculations are estimates of savings potential and are not guaranteed. The impact of building changes, use changes, new equipment, additional computers and weather need to be considered when evaluating savings.

3. BUILDING AND SYSTEM DESCRIPTION

3.1 General Building Description

Thompson Rivers University main campus in Kamloops encompasses 26 buildings on one site, with a combined total area of 94,500 m².

Ten buildings were included in the energy audit, covering an area of 73,780 m². A summary of the buildings is presented in Table 3.

Table 3: Buildings Audited

Bldg Code	Building Name	Area (m ²)	Year built
OM	Old Main	21,000	1970
SC	Science	10,800	1980
TT	Trades & Technology	10,500	1997
CAC	Campus Activity Centre	7,200	1992
IB	International Building	6,500	2005
A&E	Arts and Education	6,100	1991
GYM	Gymnasium	3,800	1980
LIB	Library	3,500	1975
CT	Clock Tower	3,200	1990
AHT	Animal Health Technology	1,180	2002

3.2 Building Occupancy and Use

The majority of the buildings audited are used as instructional facilities; containing lecture halls, classrooms and laboratories, as well as offices for administrative and teaching staff. Two facilities are used mostly for non-instructional purposes; the Clock Tower building is used primarily for administration offices, while the Campus Activity Centre is a multipurpose facility containing the campus bookstore, large conference rooms that are rented out, plus retail and student recreational activity areas.

While there are regularly scheduled classroom and administration areas hours, these hours of occupancy are quite dynamic. Many classes are run in the evenings and outside groups rent space for continuing education programs and other uses. Student occupancy of common areas of various buildings is wide-ranging and can occur most any time that the buildings are accessible; based on comments, students can be found in the various buildings from 6:00 AM until after midnight.

Day classes and lectures are scheduled from 8:30 AM to 5:30 PM, while continuing education and evening classes take place from 5:30 PM to 9:00 PM. Workshops, seminars and other events, put on by both TRU and outside groups, can take place on any weekdays and on weekends; these sessions have varying start and finish times that typically fall between 8:00 AM and 9:00 PM. However, there are occasional outside group sessions that begin as early as 6:00 AM and there are rare sessions that end after midnight.

The Trades and Technology building is used for many evening classes. The workshops are typically used for long periods of time and at odd hours of the day by students for practice and work on study projects.

The Library operates year-round, with operating hours that vary by semester; as shown in Table 4. The Library is not occupied beyond operating hours.

Table 4: Library Operating Hours

	Weekdays	Weekend
September - April	8:00 AM – 12:00 PM	9:00 AM – 12:00 PM
May-August	8:00 AM – 5:00 PM	Closed

In many buildings, exact hours of occupancy and hours of operation for equipment use (lighting, plug loads and etc.) were difficult to determine. For example, when outside groups rent space in the Gymnasium or the Campus Activity Centre, they do not always use the facilities consistently from month-to-month or for the same periods of time and number of events year-to-year. Sporadic access by students, staff and other occupants to the different facilities impacts both building hours of occupancy and equipment operating; these times are not easily tracked and anticipated.

As a result, energy use estimates are based on the information provided and adjusted based on our experience with such dynamic occupancy and usages. It is anticipated that energy use and resulting savings may be understated due to the various ‘unknowns’ affecting equipment use and energy consumption.

Cleaning in most buildings is generally performed daily from 8:00 PM to 4:00 AM, on weekdays. Security guards patrol the campus daily 24 hours a day, 7 days a week.

3.3 Location Data and Documentation

Thompson Rivers University campus is located at 900 McGill Road in Kamloops, BC.

Floor plans of the buildings audited are included in **APPENDIX B**.

3.4 Lighting Systems Description

Lighting System Overview

As with any educational or institutional complex, where facilities are of differing age, the buildings at TRU use various and diverse styles of lighting systems. The systems in use are affected by the vision of the architects who designed the buildings, the lighting “trends” that were in vogue through the decades, or the general purchasing habits of the university over these periods.

Indoor lighting throughout the campus is predominately provided by fluorescent luminaires which are supplemented by incandescent and compact fluorescent light sources. High Intensity Discharge (HID) luminaires are used to illuminate exterior locations and high ceiling interior areas such as the Library’s atrium, the Trades building workshops and the Gymnasium.

Fluorescent luminaires in buildings constructed since 2000 and in facilities that were converted during previous energy saving upgrades, utilize T8 technology lamps. Predominantly, these lamps are an 800 series, 4100 Kelvin colour temperature type lamp; although some 700 series lamps, which produce lower quality and less light than 800 series lamps, were observed onsite. Where T12 systems are still in use, most lamps are a 34 watt energy saving, “Cool White” type.

A mixture of standard efficiency and energy saving electromagnetic ballasts are used to power T12 fluorescent lamps. Most T8 fluorescent lamps are powered by standard efficiency instant start electronic ballasts; although some are powered by energy saving electromagnetic and rapid start electronic ballasts.

The Campus Activity Centre is the only facility that utilizes neon tube lighting. These systems are used for a colour accent in the high ceiling atria and for bookstore signage.

Overall, there are approximately 11,500 luminaires of various types throughout the audited buildings. See Table 5 for a breakdown of lighting technology used in each building and the predominate lighting operating voltage.

Table 5: Lighting Technology Breakdown per Building

Building	Lighting Technology Utilized (%)			Predominate Lighting Voltage
	T8	T12	Others	
Animal Health Technology	90%	0%	10%	120 V
Arts and Education	25%	55%	20%	347 V
Campus Activity Centre	10%	20%	70%	120 V
Clock Tower	35%	40%	25%	277 V
Gymnasium	15%	55%	30%	120 V
International Building	60%	<1%	40%	347 V
Library	70%	20%	10%	277 V
Old Main	70%	~1%	30%	277 V
Science	65%	10%	25%	277 V
Trades & Technology	70%	5%	25%	347 V

A list of existing lighting systems for each area in the buildings is located in **APPENDIX E**.

General Luminaire Conditions

Luminaire conditions vary throughout the buildings on campus; the majority of systems appear to be in serviceable condition and still have usable life.

Lighting Maintenance

The building electrical systems are maintained in-house and by electrical contractors on an on-call basis. Lamps and ballasts are replaced on a spot replacement basis with T8 technology upon failure.

Luminaires were observed to have accumulated dirt, bugs and dust, which have resulted in reduced light levels. Many units also exhibit signs of paint finish and lensing deterioration further reducing illumination. Some luminaires in the welding shop of the Trades and Technology building show signs of deterioration due to the corrosive environment resulting from off-gassing emitted during welding activities and other work.

3.4.1 Previous Energy Saving Lighting Retrofits

Based on the age of the older buildings, lighting systems were originally equipped with T12 fluorescent technology.

Over time, some lighting systems have been retrofitted with T8 lamps and ballasts. Some buildings appear to have been subject to a building-wide / comprehensive retrofit, while other buildings appear to have had lighting systems modified piecemeal, as systems fail, or during renovations.

Lighting systems in newer buildings such as the Animal Health Technology and the International Building utilize T8 technology almost exclusively. The systems appear to be original and to have not undergone significant changes.

3.5 Luminaire Description

Lighting systems exist in many differing configurations including recessed, surface mounted and suspended luminaires. Although luminaire types may be similar within a building, the type of lamps and ballasts used, lamp quantity and lensing may be different.

Table 6 to Table 14 detail the most commonly used lighting systems in the various task or usage areas of the campus facilities:

Table 6: Animal Health Technology Lighting Description

Building: Animal Health Technology	
Room Types	Luminaire Types
Corridors	2' x 4' recessed, lensed or deep cell parabolic louvered luminaires with 2 – 32w T8 lamps
	1' x 4' recessed, deep cell parabolic louvered luminaires with 2 – 32w T8 lamps
Laboratories, Animal Rooms & Operating Areas	1' x 4' recessed, lensed luminaires with 2 – 32w T8 lamps
	2' x 4' recessed, lensed or deep cell parabolic louvered luminaires with 2 or 3 – 32w T8 lamps
Classroom	Recessed downlights with 1-32w compact fluorescent lamp
	2' x 4' recessed deep cell parabolic louvered luminaires with 3 – 32w T8 lamps
Individual Offices	2' x 4' recessed deep cell parabolic louvered luminaires with 3 – 32w T8 lamps



Figure 1: AHT Operating Area



Figure 2: AHT Classroom



Figure 3: AHT Corridor

Table 7: Arts and Education Lighting Description

Building: Arts and Education	
Room Types	Luminaire Types
Corridors	2' x 2' recessed, lensed luminaires with 2 – 32w T8 U-bend, or 2 – 34w T12 U-bend lamps
Classrooms	2' x 4' recessed, lensed luminaires with 2 or 3 - 34w T12 lamps
	1' x 4' recessed, lensed luminaires with 2 - 34w T12 or 2 – 32w T8 lamps
General and Individual Offices	2' x 4' recessed, lensed or deep cell parabolic louvered luminaires with 3 - 34w T12 lamps
Washrooms	1' x 4' surface mounted or recessed, lensed luminaires with 2 - 34w T12 lamps
Lobbies and Lounge Areas	8" diameter, recessed downlights with 2 – 13w compact fluorescent lamps
Utility Areas	4' surface mounted striplight luminaires with 1 or 2 – 34w T12 lamps



Figure 4: A&E Classroom



Figure 5: A&E Corridors



Figure 6: A&E Office

Table 8: Campus Activity Centre Lighting Description

Building: Campus Activity Centre	
Room Types	Luminaire Types
Corridors , Washrooms and Vestibules	Recessed downlights with 2-13w or 1-32w compact fluorescent lamps
Restaurants	Recessed downlights with 2-13w or 1-32w compact fluorescent lamps
	Recessed downlights with 1-60w or 100w incandescent lamp
	Trackhead with 1-60w MR16 halogen lamp
Offices	2'x4' recessed, lensed or deep cell parabolic louvered luminaires with 2 or 3 - 34w T12 or 32w T8 lamps
	1'x4' recessed, lensed or deep cell parabolic louvered luminaires with 2 - 34w T12 or 32w T8 lamps
Main Atrium	Wall mounted floodlight luminaires with 1-400w and 1-100w metal halide lamps
Student Study Area Atrium	Suspended "lowbay" luminaires with 1-250w metal halide lamp
	Suspended cylinders with 1-32w compact fluorescent lamp
Book Store	2' x 4' recessed, deep cell parabolic luminaires with 3 - 32w T8 lamps
	Trackhead with 1-50w MR16 halogen lamp
	Recessed downlight with 1-75w PAR38 halogen lamp



Figure 7: CAC Main Atrium



Figure 8: CAC Student Atrium

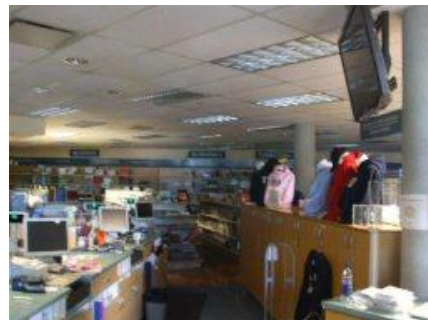


Figure 9: CAC Book Store

Table 9: Clock Tower Lighting Description

Building: Clock Tower	
Room Types	Luminaire Types
Concourse, Lobbies & Main Stairwell	Suspended cylinder lights with 2- 26w compact fluorescent lamp
	2'x2' recessed, deep cell parabolic louvered luminaires with 2 – 32w U-Bend lamps
General Offices	2' x 4' recessed, lensed or deep cell parabolic louvered luminaires with 2 or 3 - 32w T8 or 34w T12 lamps
Individual Offices	2' x 4' recessed, lensed or deep cell parabolic louvered luminaires with 2, 3 or 4- 32w T8 or 34w T12 lamps
Lecture Hall	1' x 4' surface mounted, lensed luminaires with 2 - 34w T12 lamps (50% utilize dimming)



Figure 10: CT Lecture Hall



Figure 11: CT Concourse



Figure 12: CT Office

Table 10: Gymnasium Lighting Description

Building: Gymnasium	
Room Types	Luminaire Types
Gymnasium	16" diameter "highbay" HID luminaires with 1-400w metal halide lamp above Gym Floor
	16" diameter "highbay" HID luminaires with 1-250w high pressure sodium lamp above bleacher area
Change Rooms	1' x 4' surface mounted, wraparound lensed luminaires with 2 – 34w T12 lamps
	1' x 4' surface mounted, vapour proof luminaires with 2 – 32w T8 lamps
Basement Weight Room	2' x 4' recessed, lensed luminaires with 2 - 34w T12 lamps
Individual Offices	2' x 4' recessed, lensed luminaires with 2 - 34w T12 lamps
	1' x 4' recessed, lensed luminaires with 2 - 34w T12 lamps



Figure 13: GYM Gymnasium



Figure 14: GYM Change Rooms



Figure 15: GYM Basement

Table 11: International Building Lighting Description

Building: International Building	
Room Types	Luminaire Types
Corridors & Stairwells	2' x 2' recessed, deep cell parabolic luminaires with 2 - 38w long compact fluorescent lamps
	1' x 4' recessed, lensed luminaires with 2 - 32w T8 lamps
Lecture Halls/Classrooms	4', 8' and 12' suspended linear fluorescent luminaires with 2, 4 or 6 - 32w T8 lamps
General Offices	2' x 4' recessed, deep cell parabolic louvered luminaires with 2 or 3 - 32w T8 lamps
Individual Offices	1' x 4' recessed, lensed luminaires with 2 - 32w T8 lamps
	2' x 4' recessed, lensed luminaires with 2 - 32w T8 lamps
Atrium	Surface mounted HID luminaires with 1-250w metal halide lamp



Figure 16: IB Lecture Hall



Figure 17: IB Corridor



Figure 18: Atrium

Table 12: Library Lighting Description

Building: Library	
Room Types	Luminaire Types
Library	2' x 4' recessed, lensed luminaires with 3 or 4 - 32w T8 lamps
	2' x 2' recessed, lensed luminaires with 2 - 32w T8 U-Bend or 2 - 34w U-bend lamps
General & Individual Offices	2' x 4' recessed, lensed or paracube louvered luminaires with 4 - 32w T8 or 34w T12 lamps
Atrium	Suspended HID "lowbay" luminaires with 1-250w metal halide lamp



Figure 19: LIB Bookstacks



Figure 20: LIB Offices



Figure 21: LIB Atrium

Table 13: Old Main Lighting Description

Building: Old Main	
Room Types	Luminaire Types
Corridors & Walkways	2' x 2' recessed, lensed luminaires, with 2 - 32w T8 U-Bend lamps
	Surface mounted wall sconces with 2- 13w compact fluorescent lamps
	6" diameter, recessed downlights with 2 – 13w compact fluorescent lamps
Stairwells	4' surface mounted, wraparound lensed luminaires with 2 – 32w T8 lamps
Computer Labs	2' x 4' recessed deep cell parabolic luminaires with 3 – 32w T8 lamps
Classrooms	2' x 4' recessed deep cell parabolic luminaires with 2 or 3 – 32w T8 lamps
	2' recessed wall wash luminaires with 1- 38w long compact fluorescent lamp
General Offices	2' x 4' recessed deep cell parabolic louvered luminaires with 2 or 3 – 32w T8 lamps
Individual Offices	2' x 4' recessed deep cell parabolic louvered luminaires with 2 or 3 – 32w T8 lamps
	1' x 4' recessed deep cell parabolic louvered luminaires with 2 – 32w T8 lamps
Concourse	16" diameter "highbay" HID luminaires with fluted glass dome and 1-175 w metal halide lamp (Lower Concourse)
	16" diameter "highbay" HID luminaires with fluted glass dome and 1-100 w metal halide lamp (Upper Concourse)



Figure 22: OM Classroom



Figure 23: OM Concourse

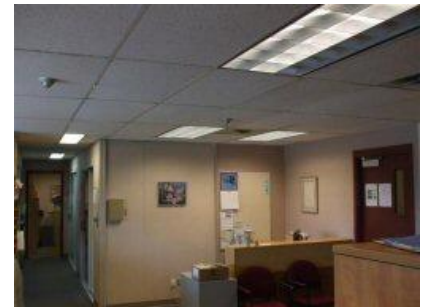


Figure 24: OM Office

Table 14: Science Lighting Description

Building: Science	
Room Types	Luminaire Types
Corridors & Stairwells	2' x 2' recessed, lensed luminaires with 2 - 32w U-Bend T8 lamps
	6" diameter, recessed downlights with 2 - 13w or 2- 26w compact fluorescent lamps
Classrooms, Lecture Halls & Laboratories	2' x 4' recessed, deep cell parabolic louvered luminaires with 2 or 3 - 32w T8 lamps
	12" diameter recessed downlights with 1-150w PS (Pear Shaped) incandescent lamp
General & Individual Offices	2' x 4' recessed, deep cell parabolic louvered luminaires with 2 or 3 - 32w T8 lamps
Washrooms	1' x 4' surface mounted, lensed, box luminaires with 2 - 32w T8 lamps
	1' x 4' recessed mounted, lensed, luminaires with 2 - 32w T8 lamps



Figure 25: SC Laboratories



Figure 26: SC Lecture Hall



Figure 27: SC Offices

Table 15: Trades and Technology Lighting Description

Building: Trades and Technology	
Room Types	Luminaire Types
Shops, Equipment & Storage	16" diameter "highbay" HID luminaires with fluted glass dome and 1-400w metal halide lamp
	4' suspended mounted industrial luminaires with 2 - 32w T8 lamps
Laboratories & Classrooms	4', 8' and 12' suspended indirect/direct linear fluorescent luminaires with 2, 4 or 6 - 32w T8 lamps
Offices	2' x 4' recessed, lensed or deep cell louvered luminaires with 3 or 4 - 32w T8 lamps
Corridors	4' surface mounted wallwash fluorescent luminaires with 1-32w T8 lamp



Figure 28: TT Shops



Figure 29: TT Classrooms



Figure 30: TT Equipment Room

Exterior

Exterior lighting is provided primarily by a mixture of compact fluorescent and HID luminaires as well as incandescent light sources to a lesser extent.

Table 16 detail the most commonly used lighting systems in the various exterior areas of the campus facilities.

Table 16: Most Commonly Used Exterior Lighting Systems

Areas	Luminaire Types
Most Building Perimeters	Surface mounted wallpack luminaire with 1-50 or 70w high pressure sodium lamp (Figure 31)
Campus Activity Centre Perimeter and Walkways	Surface mounted wallpack luminaire with 1-100 or 175w metal halide lamp
	Surface mounted floodlight luminaire with 1- 400w metal halide lamp
	Steplights with 1-32w compact fluorescent lamp
Clock Tower Perimeter	Surface mounted wallpack luminaire with 1- 50w metal halide lamp
Gymnasium Perimeter	Surface mounted wallpack luminaire with 1-50w metal halide lamp
	Surface mounted vandalproof wallpack with 1-9w compact fluorescent lamp
International Building Main Entrance	8” diameter recessed downlight luminaires with 1-175w metal halide lamp
Old Main North Perimeter	Wall mounted shoebox luminaires with 1 – 100w mercury vapour lamp
	Surface mounted wallpack luminaire with 1- 100w metal halide lamp
Building Perimeter Walkways	Pole mounted half sphere dome post top luminaire with 1- 100w high pressure sodium Lamp (Figure 32)



Figure 31: Perimeter Lighting



Figure 32: Walkway Lighting



Figure 33: Old Main North Perimeter



Figure 34: CAC Walkway

Exit Signs

Exit signage is provided by single and double-faced rectangular exit signs. With the exception of a few units, all exit signs utilize LED lamps which are considered the most energy efficient lamps for this application (Figure 35). Some signs throughout the campus have burnt-out lamps (Figure 36).



Figure 35: LED Exit Sign In TT



Figure 36: Burnt-Out Exit Signs in OM

3.5.1 Light Level Measurements

Overall, lighting levels throughout the buildings vary from being slightly lower to slightly higher than acceptable for the tasks performed. Lighting level ranges differ from building to building; dependent upon lighting system in use, luminaire condition and lighting layout or ‘pattern’.

Comments from occupants provided insight into the various occupants’ preferences and perceived lighting requirements. Dependant upon the lighting system in place and task performed, occupants considered lighting levels inadequate to excessive for the tasks performed.

Critical seeing areas have been reviewed for comfort of the visual environment and adequacy of illumination to meet occupant needs for light levels.

Areas of inadequate lighting or where illumination levels are below recommended levels include the main gym floor in the Gymnasium building, various corridors and offices in the Arts & Education and Old Main buildings.

Light levels were measured at the task plane or 30" above the floor for interior areas and are summarized in Table 17.

Table 17: Onsite Light Level Measurement

Building	Room Type	Measured Light Levels Ranges in FC	Target Levels in FC	IES Recommended Levels in FC
Animal Health Technology	Classroom	58	50	50-75-100
	Office	55-65-65	35 – 50	20-30-50
	Laboratory	34-50-72	50	50
Arts and Education	Classroom	18-44-63	50	50-75-100
	Office Hallway	11-17-25	18 – 20	10-15-20
	Corridors	7-14-17	18 – 20	10-15-20
	Individual Office	17-30-53	35 – 50	20-30-50
	General Office	24-45-51	35 – 50	20-30-50
Campus Activity Centre	Book Store	80-88-95	35 – 50	20-30-50
	Atrium - Student Study Area	15	15	10-15-20
	Student Study Rooms	50-72-140	35 – 50	20-30-50

Building	Room Type	Measured Light Levels Ranges in FC	Target Levels in FC	IES Recommended Levels in FC
Clock Tower	Lecture Theatre	56-60-60	50	50-75-100
	General Office	29-59-95	35 – 50	20-30-50
	Individual Office	15-47-86	35 – 50	20-30-50
Gymnasium	Gym Floor	30-32-34	50	50-75
	Change Rooms	18-22-28	15-20	10-15-20
	Individual Offices	17-47-60	35 – 50	20-30-50
International Building	Lecture Halls	32-50-70	50	50-75-100
	Individual Offices	20-29-47	35 – 50	20-30-50
	General Office	62-63-63	35 – 50	20-30-50
	Corridors	6-17-30	18 – 20	10-15-20
Library	Library	13-50-65	35 – 50	20-30-50
	Individual Offices	18-35-50	35 – 50	20-30-50
	General Offices	30	35 – 50	20-30-50
Old Main	Computer Labs	28-35-65	20-30	20-30-50
	General Offices	28-46-63	35 – 50	20-30-50
	Individual Offices	18-36-65	35 – 50	20-30-50
	Corridors	7-18-33	18 – 20	10-15-20
	Classrooms/Lecture Halls	15-44-68	50	50-75-100
Science	Classroom	19-55-85	50	50-75-100
	Laboratory	34-50-80	50	50
	Individual Offices	20-35-95	35 – 50	20-30-50
	General Offices	50-58-65	35 – 50	20-30-50
Trades and Technology	Shops	12-42-56	50	50-75-100
	Classrooms	40-67-78	50	50-75-100
	General Office	37-52-64	35 – 50	20-30-50
	Individual Offices	24-54-80	35 – 50	20-30-50

The Illuminating Engineering Society recommends various levels of lighting for varying tasks performed within building spaces, as measured in footcandles or Lux (metric equivalent). Some IES recommended light levels are shown as a range. The range depicts the low-middle-high illumination levels for a specific task classification. Depending on the difficulty of the task and the age of the occupant, appropriate light levels are selected as the recommended level.

As the tasks performed throughout the facilities are typically performed by younger individuals and have a moderate critical seeing task, the tasks can adequately be performed with lighting levels in the lower to midpoint illumination levels.

In most applications, the recommended lighting levels for an office area or reading area is 50 footcandles. This illumination level can be provided by an overhead lighting system supplying either the full 50 footcandles of luminance or an ambient level of 35 footcandles supplemented by task lighting to increase illumination for reading printed materials. Areas where workers intensively use computers can operate more comfortably at lower ambient illumination levels (35 footcandles).

The recommended lighting levels for corridors, stairwells and other common use areas are 10 to 20 footcandles.

The recommendations made in this report will maintain existing or alter the lighting levels to better match the required lighting levels.

3.5.2 Lighting Controls and Operating Hours

The majority of interior lighting is manually switched on and off by building occupants.

The interior lighting in Animal Health, Clock Tower and Gymnasium is predominately controlled by line voltage switches. Most rooms in the other buildings utilize low voltage switches for lighting control (auxiliary areas such as electrical closets utilize line voltage switches) which are connected to GE, Douglas or Leviton relay panels. The low voltage systems appear to have the ability to be, but are currently not, interfaced with a building automation system. The addition of a relay scanner with timer function or interface module would allow this lighting to be automatically swept off lighting at preset times by either a building automation system or lighting system programmed module.

Many classrooms in Old Main, Arts & Education, Science & Health Science and International Building are controlled by sensors that automatically switch off lighting when no occupancy is detected for several minutes. The Science & Health Science building has occupancy sensor controls installed in the corridors and laboratories; however, the majority of sensors in the laboratories have been disconnected as there was increased potential for chemical spills, equipment damage and occupant injury if the lighting were to automatically switch off unexpectedly.

Corridor lighting in the Trades and Technology building is controlled by a GE central timer system. The system is currently programmed to automatically switch lighting "On" at 3:30 AM and 6:30 AM and "Off" at 11:30 PM. Override switches located in the main electrical room allow cleaners to manually switch lighting on and off.

A Douglas system controls corridor lighting in the International building. The system is programmed to switch lighting "On" at 6:00 AM and "Off" at midnight and again at 1:15 AM, everyday except Sunday.

For the exterior lighting, a series of photocells operate the outdoor incandescent, compact fluorescent and HID lighting. This system controls the lighting to operate an average of 12 hours per day (fluctuating during the year due to changes in hours of daylight), year round.

Estimated operating hours for lighting in classrooms, lecture halls and seminar rooms are based on a review of class schedules for 2009 summer, 2010 winter and spring semesters provided by TRU. Due to changes in class schedules and staff vacations, lighting use will differ from year to year.

3.6 Description of Other Electrical Systems

3.6.1 Vertical Transportation Services

The motor size and type of each elevator was reviewed for the purpose of energy reconciliation (see section 4.6). No energy saving measures recommendations are contained in this report for the upgrading of controls and motors, due to the high costs involved with retrofitting or replacing elevator motors and controllers.

Table 18 details the quantity of elevators and the elevator motor sizes in the buildings audited. All elevators are powered by hydraulic pump motors.

Table 18: Elevator Motor Sizes

Building	Elevator Motor Size	Elevator Quantity
Animal Health Technology	-	0
Arts and Education	25 HP	1
Campus Activity Centre	25 HP	1
Clock Tower	22 HP	1
Gymnasium	20 HP	1
International Building	65/75 HP	1
Library	15 HP	1
Old Main	25 HP	2
Science and Health Science	20 HP	1
Trades and Technology	20 HP	1

3.6.2 Plug Loads

A plug load audit was conducted of computers, office equipment, and some convenience equipment (i.e. coffee machines, etc). These loads are summarized in **APPENDIX B**.

The audit does not include every plug load in the buildings; for example, cell phone chargers were not audited.

Computers

There are approximately 1,800 computers located throughout the buildings.

Computer operation is variable; some systems were observed to be on 24 hours per day, both monitor and CPU, other systems had only the CPU operating 24 hours per day, while the monitor was turned off. Many staff computers were found to be turned off at the end of the day while the computers in computer labs and other student areas were often left on (with the monitor turned off).

Approximately 5% of the computers still utilize CRT monitors, which draw significantly more energy than comparable sized LCD types.

Vending Machines

There are a total of 42 non-perishable (i.e. pop machines), 14 snack, 4 coffee and one ice cream vending machines in the buildings audited (see Table 19). The vending machines are of various sizes and capacity. The machines operate continuously, with the exception of those in the Arts & Education and Science & Health Science Building which are equipped with Vending Misers that switch off the machines during periods of low occupancy.

The non-perishable vending machine systems have an internal compressor and lighting that can consume between an estimated 2,800 - 3,200 kWh annually for standard machines that are several years old. Newer, more energy efficient vending systems have been introduced to the market; these systems use between an estimated 1,700 - 2,200 kWh annually, many are programmable for energy saving operation.

Snack dispensing machines use less energy, as they have no compressor or chiller capacity. The energy usage of these machines is dependant upon the size of the machine and the number of lamps used for illumination of the signage panel and the interior. It is estimated that a standard size machine can utilize 700 to 900 kWh annually.

Table 19: Vending Machines

Building	Beverage	Snack	Coffee	Ice Cream
Animal Health Technology	-	-	-	-
Arts and Education	3	1	1	-
Campus Activity Centre	6	2	-	-
Clock Tower	1	1	-	-
Gymnasium	1	-	-	-
International Building	3	2	-	-
Library	1	1	-	-
Old Main	14	4	1	1
Science and Health Science	4	1	1	-
Trades and Technology	9	2	1	-
Total	42	14	4	1

3.6.3 Electrical Distribution Power Factor

Power Factor penalties are charged by BC Hydro when the power factor drops below 90%.

A review of the Account History Record shows that the overall campus power factor levels ranged from 88-93% through 2008 and 2009. During this period, TRU incurred surcharges totalling \$5,158 and \$8,191 in power factor penalties for 2008 and 2009 respectively.

Additionally; this issue has been an ongoing cost, where TRU has incurred penalties of approximately \$5,000 per year for several years prior to 2008.

Power factor levels appear to be lowest during the summer from the months of May to August. This suggests an increased use of air-conditioning and cooling equipment (low power factor) and a decrease in lighting (high power factor) usage.

The total combined usage of resistive and inductive loads determines the overall power factor at the electrical service. Examples of resistive loads (100% power factor) include incandescent lighting and electric heaters while inductive loads (<100% power factor) include motors, transformers and fluorescent lighting systems. Fluorescent and discharge lighting systems typically have integral correction that significantly increases their power factor levels (typically to 95%). An increased use in resistive and high power factor lighting loads increases overall power factor levels.

3.7 Mechanical Systems Description

3.7.1 General Overview

A photo log of the major mechanical systems is included in **APPENDIX B**.

A detailed list of relevant (energy using) mechanical equipment and operating hours is included in **APPENDIX G**.

The following sections provide an overview of these systems by building and a description of their operation.

3.7.2 Old Main Building

Boilers

Three separate heating plants serve the building, each system consist of two boilers, as listed below:

- B-1 and B-2 located in the A-Block penthouse mechanical room, 4th floor;
- B-1 and B-2 located in the C-Block boiler room on the second floor off the mezzanine level;
- B-3 and B-4 are on the B- Block first floor, North End.

All boilers are DDC controlled. A summary of the boilers is presented in Table 20.

Table 20: Old Main Heating Boilers

Tag	Location	Main Service	Make/Model	Rated Input (mBH)	Firing Type
B-1	A-Block	A-Block Perimeter Radiation, terminal reheat and AHU-7 heating coil.	Thermal Solutions/ Evolution EVH-1000	1,000	Modulating
B-2	A-Block	A-Block Perimeter Radiation, terminal reheat and AHU-7 heating coil.	Thermal Solutions/ Evolution EVH-1500	1,500	Modulating
B-1	C-Block	C-Block Perimeter Radiation, forced flow heaters	Teledyne Laars/HH IN 10 11K 1CC	1,010	Two-Stage
B-2	C-Block	C-Block Perimeter Radiation, forced flow heaters	Teledyne Laars/HH IN 10 11K 1CC	1,010	Two-Stage
B-3	B-Block	B-Block Perimeter Radiation, terminal reheat and heating coils for AHU-3 & AHU-4	Thermal Solutions/ Evolution EVH-1000	1,000	Modulating
B-4	B-Block	B-Block Perimeter Radiation, terminal reheat and heating coils for AHU-3 & AHU-4	Thermal Solutions/ Evolution EVH-1000	1,000	Modulating

Hot Water Distribution

Heating in rooms is provided with perimeter hot water wall fin radiation units that are controlled by two-way control valves with pneumatic actuators.

A-block first and second floors air handling units are equipped with constant volume terminal reheat coils. Second floor of B-block terminal reheat coils are constant volume and the rest are VAV reheat. During the site visit a VAV box retrofit was in progress for the first floor of A-Block and all B-Block.

Hot water forced flow heaters are installed in the building's entrances. Mechanical rooms are equipped with hot water unit heaters.

A-Block boilers B-1 and B-2 use boiler pumps BP1 and BP2 for primary heating loop circulation through the boilers. Heating coil for air handling unit AHU-7 is equipped with a 3-way valve and a coil circulation pump. Two pumps arranged in parallel (P6A & P6B) supply the terminal reheat coils in A-block. A secondary loop, controlled by a 3-way valve serves the A-block radiation loop; this secondary loop uses recirculation pumps P5A and P5B, configured in parallel. Pump P-19 serves the A-block third floor VAV reheat boxes.

B-Block Boilers B-3 and B-4 use boiler pumps BP3 and BP4 for primary heating loop circulation through the boilers. Heating coils in air handling units AHU-3 and AHU-4 are equipped with 3-way valves and coil circulation pumps. Two secondary loops (one per floor) serve the perimeter radiation system for the first and second floors. Both loops are controlled by 3-way valves. Recirculation to the loops is provided by pumps P-10 and P-54.

The C-block heating plant piping configuration is primary-only; there is no secondary loop or 3-way valve.

A summary of the main heating distribution pumps is included in Table 21.

Table 21: Summary of Heating Water Distribution Pumps

Tag	Description	Hp
BP1	A-block heating plant boiler pump	½
BP2	A-block heating plant boiler pump	½
P5A	A-block perimeter radiation	3
P5B	A-block perimeter radiation	3
P6A	A-block reheat coils	1 ½
P6B	A-block reheat coils	1 ½
AHU7P	Air handling AHU-7 heating coil	¼
BP3	B-block htg plant boiler pump	½
BP4	B-block htg plant boiler pump	½
P-9	B-block terminal reheat	1 ½
P-1	C-Block perimeter radiation	3
P-2	C-Block perimeter radiation	3

Chilled Water System

Blocks A and B are cooled by a chilled water plant located in the A-block mechanical penthouse. The plant consists of a 250-ton Trane Centravac chiller model PCV-2H and a Baltimore Air Coil model VTL-198-N cooling tower. The chiller has been retrofitted with R123 refrigerant and is interfaced with the DDC system. There is a short term plan to replace the existing chiller plant.

Chilled Water Pumps and Water Distribution

Chilled water from the chiller is pumped by a primary chilled water pump, P2, to the cooling coils serving A-block (AH-1, AH-2 and AHU-7). Two secondary pumps, arranged in parallel, circulate the chilled water to the B-block mechanical rooms through the cooling coils of the air handling units AHU-3 AHU-4.

A summary of the pumps is presented in Table 22.

Table 22: Summary of Chilled Water and Distribution Pumps

Tag	Description	Hp
P-1	Condenser Water Pump	15
P-2	Primary Chilled Water	10
P-3	Cooling coil AH-1 A-Block	3
P-4	Cooling coil AH-2 A-Block	3
P-7	Cooling coil AHU-3 B-Block	½
P-8	Cooling Coil AHU-4 B-Block	¾
P-11	CHW Booster pump, B-Block	3

Air Handling Units

The ventilation system for A-Block comprises the following:

- two air handling units (AH-1 and AH-2);
- a common return fan F-1; and
- a wheel-type heat recovery system equipped with two power exhaust fans (F4 & F5) and two outdoor air fans (F2 & F3) that supply to the air handling units mixing sections.

Electric motors for units AH-1 and AH-2 are equipped with Variable Speed Drives (VSD); but the system operates as constant volume, terminal reheat. The third floor is served by a separate unit, tagged AHU-7.

B-block is served by air handling units AHU-3 and AHU-4. The second floor is equipped with Variable Air Volume (VAV) boxes and terminal reheats, whereas the first floor is a constant volume, terminal reheat system.

All air handling units are DDC controlled. A summary of the units is provided in Table 23.

Table 23: Summary of Air Handling Units

Tag	Service	HP	CFM	Flow Control	Heating Coil	Cooling Coil
AH-1	A-Block first floor	30	24,950	None	No	Yes
AH-2	A-Block second floor	40	27,900	None	No	Yes
AHU-3	B-Block South	25	12,200	VSD	Yes	Yes
AHU-4	B-Block North	25	14,300	VSD	Yes	Yes
AHU-7	A-Block third floor	3	3,700	None	Yes	Yes

Rooftop Air Conditioning Units

Additional heating, ventilation and air conditioning (HVAC) is provided by rooftop units as follows:

- three units serving the theatre area on C-block;
- one unit serving the computer lab;
- eight units serving the workshops on B and C blocks;
- four units serving the addition to block A, Eastside ; and
- one unit serving the B-block addition (print shop).

The units comprise a mixing section, gas fired furnaces, direct expansion (DX) cooling coils and integral condensers.

The unit serving the main theatre area (RTU-1) is equipped with a return fan (RF-1). The unit serving the rehearsal areas (RTU-3) is equipped with terminal bypass boxes and hot water reheat coils.

All units are in the DDC system. A summary of the units is provided in Table 24 and Table 25.

Table 24: Summary of A-Block Addition Rooftop Units

Tag	Service Area	Make/ Model	Fan HP	Cooling Capacity (Ton)	Heating Stages	Cooling Stages
RTU-1	Second floor, East	Lennox/ LGC042S2	2	3 ½	2	1
RTU-2	Second floor, West	Lennox/ LGC036S2	2	3	1	1
RTU-3	First floor, East	Lennox/ LGC042S2	2	3 ½	2	1
RTU-4	First floor, West	Lennox/ LGC036S2	2	3	1	1

Table 25: Summary of B and C Blocks Rooftop Units

Tag	Service Area	Make/ Model	Fan HP	Cooling Capacity (Ton)	Heating Stages	Cooling Stages
RTU-1	Theatre	Lennox/ YCC048F4H	10	24	Modulating	4
RTU-2	Rehearsal/storage	Lennox/ LGA042SS	1 ½	3 ½	1	2
RTU-3	Makeup room	Lennox/ LGA088HH	3	7	Modulating	2
AHU-2	Computer lab	Trane/ YCD075C4HA	40	60	Modulating	4
RTU-1	Print shop	Lennox/ LGA102S2	3	8	2	2
ACU-1	Drawing room	Trane/ YCC048F4H	¾	4	1	1
ACU-2	Painting room	Trane/ YCC060F4M	¾	5	1	1
ACU-3	Ceramics room	Trane/ YCC060F4M	¾	5	1	1
ACU-4	Print shop	Trane/ YCD075C4HA	1	6 ¼	1	1
ACU-5	Print making	Trane/ YCC036F4H	1/3	3	1	1
ACU-6	Art Gallery	Trane/ YCC048F4H	¾	4	1	1
ACU-7	Darkrooms	Trane/ YCC036F4H	1	3	1	1
ACU-8	Video studio	Trane/ YCC024F1L	¼	2	1	1

Exhaust

General exhaust on block-A is provided by two 2 hp exhaust fans (F-3 and F-4). Washrooms exhaust is provided by two exhaust fans, located on the roof, operating continuously. Exhaust for the C-block shops area is provided by 38 exhaust fans locally controlled by manual switches or time-clocks. A summary of the exhaust fans serving the building is included in **APPENDIX G**.

Compressed air systems

Pneumatic control systems are supplied with compressed air from one 7 ½ hp Quincy Compressor reciprocating air compressors installed in the B-block South mechanical room.

3.7.3 Science Building

Boilers

The West loop is served by two Smith Cooper 1,200 mBH atmospheric Boilers. The boilers are connected in parallel; water is circulated through the boilers by a ¾ hp boiler pump. East loop has a Bryan model CL-180-W-FDG forced flow boiler (B-1) rated at 1,800 mBH maximum input. Water is circulated through B-1 by a ¾ hp boiler pump. Both heating plants are connected for backup.

Hot Water Distribution

The heating plant serves the heat pump loops through a heat exchanger controlled by a two-way valve. Perimeter radiation is achieved by hot water convectors, all without control valves. Make-up air units SF101 and SF102 heating coils are supplied from the secondary loop. A summary of the heating distribution pumps is included in Table 26.

Table 26: Summary of Heating Water Distribution Pumps

Tag	Description	Hp
P-102	Boiler loop circulator	1
P-103	East hot water heating loop	3/4
P-104	West hot water heating loop	3/4
P-105	SF-101 heating coil	1/3
P-106	SF-102 heating coil	1/3

Heat Pump Loop

The main source of heating and cooling for the Building is via a series of water source heat pump units connected by two independent water loops of piping, one serving the East wing and one for the West, through which water is continuously circulated.

Heat is rejected into the water loops when units are in cooling mode and is taken out of the loops when units are heating the space they serve. To keep the water loop temperature within a specified range, the loops are equipped with evaporative fluid coolers (one per loop) for heat rejection and two gas-fired boilers for heat addition.

Heat Pump Loop Water Distribution

Two pumps, P-1 and P-101, serving the East and West water loops respectively, circulate water in the heat pump loops. The 7 ½ hp pumps operate continuously.

Fluid Coolers

Two fluid coolers, one per loop, located on the roof provide heat rejection for the heat pump loops. The fluid coolers B.A.C. model F1743-L, are equipped with two fan motors rated at 15 and 5 hp in a main/pony fashion and a 1 hp spray pump.

Heat Pump Units

There are 32 McQuay water source heat pumps (WSHP) installed in the building's mechanical closets that provide heating, cooling and air circulation. The units are controlled by DDC. A summary of the units is presented in Table 27.

Table 27: Summary of WSHP

Size	Quantity	Cooling Capacity (TON)
12	2	1
19	2	1 3/4
24	4	2
30	4	2 1/2
36	6	3
42	4	3 1/2
48	3	4
60	7	5

Make-Up Air Units

Three make-up air units provide ventilation for the areas served by the heat pumps. Additional make up air is provided to the areas with fume hoods by units SF-103 and MAU-1. SF-103 is a constant volume unit equipped with a recirculation damper to allow for variable flow system that is controlled to maintain a constant static pressure. Unit MAU-1(also called SF-104) is equipped with a VFD. The VAV boxes supplying the space are controlled in accordance with the number of fume hoods in operation. All units are in DDC, a summary is presented in Table 28.

Table 28: Summary of Makeup Air Units

Tag	Service	HP	CFM	Flow Control	Heating Coil	Cooling
AH-1	Base building	N/A	N/A	None	Yes	No
SF-101	East wing addition	5	3,700	None	Yes	No
SF-102	West wing addition	5	6,600	VSD	Yes	No
SF-103	VAV	10	8,900	VSD	Yes	No
MAU-1	Second floor VAV	7 ½	7,100	VSD	Gas fired Burner	DX

Exhaust

General and washroom exhaust is provided by two DDC controlled exhaust fans.

Twenty two roof exhaust fans serve the fume hoods installed on the laboratories. All fume hoods are locally controlled by manual switches and the status is DDC monitored. A detailed list of the exhaust fans serving the building is included in **APPENDIX G**.

Compressed air systems

Two Ingersoll Rand air compressors located in the basement mechanical room provide compressed air for the labs.

3.7.4 Trades and Technology Centre

Boilers

The heating plant consists of six (B1 to B6) 3,560 mBH Burnham atmospheric hydronic boilers arranged in parallel. The boilers are equipped with electronic ignition. The firing sequence of the boilers is DDC controlled. Each boiler has a dedicated $\frac{1}{7}$ hp boiler circulation pump that is operated in conjunction with the boiler.

Hot Water Distribution

The piping configuration is primary-only; there is no secondary loop or 3-way valve. Heating water circulation is achieved by two 5 hp circulation pumps (P-1 & P-2) arranged in parallel that operate in lead/lag fashion.

Heating in rooms is provided by DDC controlled hot water reheat coils. The entrances and lobbies have hot water forced flow heaters controlled by local thermostats. The boiler room and mechanical rooms are equipped with hot water unit heaters controlled by local thermostats.

Unit heaters

A total of seven Reznor model SCB125 unit heaters are installed in the workshops, one in the automotive, three in carpentry, one in electrical, two in tech transfer and one in the tool room. The units are enabled by the DDC system and controlled by local thermostats.

Infrared Heaters

There are 15 Gordon Ray HB model BH-60-20 and BH-80-30 gas fired infrared heaters in the automotive shop. All heaters are enabled by the DDC system and controlled by local thermostats.

Cooling Systems

The building is cooled by a 240 Ton, air-cooled Trane chiller located outside the building, West of the welding shop. The chiller is interfaced with the DDC system.

Chilled water from the chiller is pumped to the mechanical room where the air handling units are located. The chilled water pump, P-3A, is a Bell & Gossett series 80 with a 10 hp motor, software interlocked with the chiller through the DDC system.

Ventilation Systems

Air Handling Units

Classroom areas, common areas and offices are served by three air handling units (AHU-1 to AHU-3). All units are equipped with cooling coils, indirect gas fired burners and mixing section. The supply fans speed is controlled by a VSD. Units supply VAV boxes with reheat coils.

The telecommunications room has a dedicated air handling unit (FC-1) with a cooling coil and a mixing section.

The welding shop has a makeup air unit with direct gas fired heating. The two-speed fan is controlled by DDC.

A summary of the units is provided in Table 29.

Table 29: Summary of TTC Air Handling Units

Tag	Service	HP	CFM	Flow Control	Heating Stages	Cooling Coil
AHU-1	Classrooms, storage	25	19,000	VSD	Modulating	Yes
AHU-2	Second floor South	40	26,800	VSD	Modulating	Yes
AHU-3	First and second floors East end	20	13,000	VSD	Modulating	Yes
FC-1	Computer room	3	3,800	None	Modulating	Yes
MAU-1	Welding shop	15	20,000	2-Speed	2 Stage	No

Transfer Fans

The workshops are supplied with conditioned air from the central corridor by 19 transfer fans. Transfer fans 7 to 16 are DDC controlled. A summary is presented in **APPENDIX G**.

Exhaust

Exhaust from washrooms is provided by three fans, located on the roof. Exhaust from the shops is provided by 26 exhaust fans, controlled by local switches and monitored in DDC.

A dust collector system is installed in the carpentry shop, consisting of a dust collector (DC-1) controlled by a manual switch.

A summary of the exhaust fans serving the building is included in Table 31.

Table 30: Summary of Exhaust Fans

Tag	Description/Service Area	Hp	l/s
EF-1	Washrooms EF	¾	1,640
EF-2	Washroom 288C EF	Fracc.	55
EF-3	Washroom EF	¼	220
EF-4,5&6	Stairwell EF	¼	1,130
EF-7	Comm Veh shop EF	5	2,270
EF-8	Automotive shop EF	5	1,700
EF-9	Automotive shop EF	2	950
EF-10	Marine engine shop EF	2	685
EF-11	Commercial transpot shop EF	2	1,130
EF-12	Heavy duty Mecs shop EF	1.5	850
EF-13to16, 25,27to31	shops gral EF	1	3,000
EF-17,18	Welding booth exhaust	5	1,980
EF-19 to 22	Welding booth exhaust	3	1,415
EF-23	EF welding shop	1 ½	3,800
EF-24	Welding booth exhaust	2	2,270
EF-26	Elevator machine room	Fracc.	212
EF-32	EF Computer room	1/3	1,000
EF-33	Welding booth exhaust	5	2,360

Compressed Air Systems

Two 35 hp Gardner Denver air compressors located in the compressor room provide compressed air for the building.

3.7.5 Campus Activity Centre

Boilers

The heating plant consists of four (B1 to B4) 1,160 mBH Weil-McLain LGB-12-W atmospheric hydronic boilers. The rated efficiency of the boilers is 80%.

Hot Water Distribution

Boiler pumps P-1 and P-2 provide primary heating loop circulation through the boilers. Hot water circulation for the secondary loops is achieved as follows:

- loop serving hot water heating loop, serving reheat coils, radiant panels and fan coil heating coils, using circulation pumps P-8/9. Loop temperature is controlled by DDC via a 3-way valve;
- loop serving the hot water/glycol heat exchanger. Hot water temperature in the heat exchanger is controlled by DDC through a 3-way valve; and
- glycol heating loop feeding AHU-1 heating coil using pumps P3/P4.

A summary of the heating distribution pumps is included in Table 31.

Table 31: Summary of Heating Water Distribution Pumps

Tag	Description	Hp
P1	Boiler primary loop	3
P2	Boiler primary loop	3
P3	Glycol loop	3
P4	Glycol loop	3
P8	Secondary heating loop	3
P9	Secondary heating loop	3

Unit Heater (Hot Water)

The mechanical room and crawl space, where the condenser water sumps are located, are heated by hot water unit heaters with line voltage thermostats.

Forced-flow Heaters

The hallways/entrances have a total of 9 hot water forced-flow heaters with built-in thermostats.

Cooling Systems

The building is cooled by a chilled water plant located in the mechanical room. The plant consists of a 180-ton Multistack chiller, a chilled water pump, a condenser water pump and a cooling tower.

Chilled water from the chiller is pumped by circulating pump P-2 to AHU-1 cooling coils CC-1 to CC-4. P-2 is a Bell & Gosset series 1510-4AC with a 3 hp electric motor. Condenser water is circulated by a 5 hp Bell & Gosset pump (P-1)

A Marley Primus dry sump cooling tower is located outside the building, on grade level, on the North side. Two sumps, located in the crawl space, are used for storage of the condenser water.

Air Handling Units

Air handling unit AHU-1, located in the ground floor mechanical room, provides ventilation to the original building. AHU-1 supplies a VAV system with terminal reheat; fan speed is controlled by VSDs. AHU-1 comprises two 40 hp supply fans in parallel with a rated capacity of 15,350 l/s and two 15 hp return fans in parallel. AHU-1 is equipped with a glycol heating coil and a chilled water cooling coil.

The centre court is also served by air handling unit FC-1, located in the rotunda crawl space. FC-1 is equipped with a 5 hp supply fan motor and a heating coil. Both units are DDC controlled.

Rooftop Air Conditioning Units

HVAC to the Independent Centre is provided by four Lennox rooftop units. The units comprise a mixing section, gas fired furnaces, DX cooling coils and integral condensers.

Units RTU-1 and RTU-2 are equipped with terminal bypass boxes and electric reheat coils.

All units are interfaced to the DDC system. A summary of the units is provided in Table 32.

Table 32: Summary of Independent Centre Addition Rooftop Units

Tag	Service Area	Model	Fan HP	Cooling Capacity (Ton)	Heating Stages	Cooling Stages
RTU-1	Main floor offices	LGA072	3	6	2	1
RTU-2	Second floor offices and club room	LGA120	5	10 ½	2	2
RTU-3	Multi-purpose room West	LGA360	10	30	Mod	3
RTU-4	Multi-purpose room East	LGA360	10	30	Mod	3

Mechanical Rooms Ventilation

Five supply fans are installed in the building to provide ventilation and free cooling to the building's service and mechanical rooms. The units are controlled by line voltage thermostats. A summary is presented in Table 33.

Table 33: Summary of Supply Fans

Tag	Description/Service Area	Hp	l/s
SF-2	Electrical room	½	1,050
SF-3	Telephone room	0.4	260
SF-4	Elevator machine room	¼	260
SF-5	Combustion air	½	850
SF-6	Mechanical room	¾	1,440

Exhaust

Washroom exhaust fans EF-3 and EF-4 are DDC controlled, exhaust from the pub, including the kitchen hood and dishwasher exhaust are controlled by a local manual switches. A summary of the exhaust fans serving the building is included in Table 34.

Table 34: Summary of Exhaust Fans

Tag	Description/Service Area	Hp	CFM
EF-01	Photocopy	0.40	230
EF-02	2nd floor WR North	¼	440
EF-03	Main floor WR	0.40	275
EF-04	2nd floor WR	⅓	800
EF-05	Grant hall storage	¼	320
EF-06	Pub	1	2,000
EF-07	3rd floor WR	¼	330
EF-08	Atrium	¾	800
EF-09	Kitchen WR	0.16	145
EF-10	Kitchen storage	0.30	185
EF-11	Pot wash area	¼	250
EF-12	Dishwasher	¼	560
EF-13	Baking hood	1.5	1,120
EF-14	Hot prod. Hood	5	3,190
EF-15	EF short order	3	2,000
EF-16	EF janitor storage	0.40	230
EF-01	IC addition EF lower photocopy	0.10	120
EF-02	IC addition EF lower meeting	0.10	120
EF-03	IC addition EF Main floor WR	⅓	780
EF-04	IC addition EF meeting room #1	¼	120
EF-05	IC addition EF club room	¼	120
EF-06	IC addition EF meeting room #2	¼	120
EF-07	IC addition EF meeting room #3	¼	120
EF-08	IC addition EF electrical room	0.10	120

3.7.6 International Building

Boilers

The heating plant consists of two (B1 and B2) 1,500 mBH forced flow Thermal Solutions boilers. The boilers have a rated efficiency of 88% (steady state). Each boiler has a dedicated ¾ hp boiler circulation pump (BP1 & BP2).

Hot Water Distribution

The piping configuration is primary-only; there is no secondary loop or 3-way valve. Hot water circulation is achieved by two (P-1 & P-2) 7 ½ hp Bell & Gosset pumps piped in parallel. The pumps are equipped with VFDs.

All the air handling units serving the building are equipped with heating coils controlled by 3-way valves. The heating loop also serves terminal reheat coils and forced flow heaters controlled by two-way valves. A three zone radiant floor system is installed in the foyer; circulation is achieved by a ⅓ pump (P-5).

Cooling Systems

The building is cooled by an air cooled chiller located outside the building, on the South wing. The chiller is a 130-TON Trane model RTAC155, rated at 1.23 kW/TON.

Chilled water from the chiller is circulated by two (P-3 & P-4) 10 hp pumps, arranged in parallel. Both pumps are equipped with VFDs. Chilled water is pumped through a chilled water piping system to the mechanical rooms in each of the buildings where the air handling units are located.

The computer and language laboratories, located in the second floor, are equipped with dedicated split cooling systems. The outdoor units are two McQuay model ALC 40 condensing units, mounted on the roof. The indoor units are ACSON model ALC 40 installed one in the language lab and one in the computer lab. The units are rated at 3 ½ each cooling capacity and are locally controlled.

Ventilation Systems

Air Handling Units

Ventilation is provided by three air handling units. All units are equipped with a mixing section, heating and cooling coils and VFDs. Units AHU-1 and AHU-2 supply to a VAV system with terminal reheat. Some VAV boxes are fan powered. All units are interfaced with the DDC System. A summary of the units is provided in Table 35.

Table 35: Summary of IB Air Handling Units

Tag	Location	Service	HP Supply/Return	CFM
AHU-1	3 rd floor North mechanical room	Building North zone	30/10	21,000
AHU-2	3 rd floor South mechanical room	Building South zone	30/10	20,00
AHU-3	Mechanical room 132	Foyer	10/None	7,000

Exhaust

Exhaust from washrooms, mechanical, janitorial, photocopy and other rooms is provided by 17 ceiling mounted fractional exhaust fans. General exhaust for the foyer is provided by a 1 ½ hp exhaust fan (EF-401) with a rated capacity of 7,200 CFM.

3.7.7 Arts and Education Building

Heat Pump Loop

The main source of heating and cooling for the Building is via a series of water source heat pump units connected by two independent water loops of piping, one serving the East wing and one for the West, through which water is continuously circulated.

To keep the water loop temperature within a specified range, the loops are equipped with evaporative fluid coolers (one per loop) for heat rejection and two gas-fired boilers for heat addition.

Boilers

The Building is served by two Brian Steam model CL120-W-FDG forced draft boilers rated at 1,200 mBH. The boilers are rated at 80% efficiency at full fire (steady state). The boilers are piped in parallel; water is circulated through the boilers using two 2 hp Taco pumps model 1638 (P-2 & P-102).

Heat Pump Loop Water Distribution

Two pumps, P-1 and P-101 serving East and West water loops respectively circulate water in the heat pump loops. The pumps are both Taco model VL3008, rated at 7 ½ hp each. The pumps operate continuously.

Fluid Coolers

Two fluid coolers, one per loop, located on the roof provide heat rejection for the heat pump loops. The fluid coolers are Evapco model F1-742-K, equipped with two fan motors rated at 10 and 3 hp in a main/pony fashion and a 1 hp spray pump.

Heat Pump Units

There are 63 water source heat pumps (WSHP) installed in the Building's ceiling space and mechanical closets that provide heating, cooling and air circulation. The units are controlled by DDC. A summary of the units is presented in Table 36.

Table 36: Summary of WSHP

Make	Model	Quantity	CFM	Capacity (TON)	
				Cooling	Heating
Water Furnace	VS015	3	530	1 ¼	1 ½
Water Furnace	VS019	5	650	1 ¾	2
Water Furnace	VS024	9	800	2	2 ½
Water Furnace	VS030	8	1,000	2 ½	3 ¼
Water Furnace	VS036	13	1,250	3	3 ½
Water Furnace	VS042	1	1,500	3 ½	4 ½
Water Furnace	VS048	7	1,700	4	4 ¾
Water Furnace	VS060	17	2,000	5 ¼	6 ¼

Make-up Air Unit

An Engineered Air model LM-15C makeup air unit provides ventilation for the Building. The unit is located in the penthouse mechanical room and is equipped with a 7 ½ hp fan motor and two heating coils each with a three-way valve and a ½ circulator pump. The makeup air unit is DDC controlled.

Exhaust

Washroom exhaust fans EF-1 and EF-101 and EF-6 are DDC controlled; the rest are locally controlled. A summary of the exhaust fans serving the building is included in Table 37.

Table 37: Summary of Exhaust Fans

Tag	Description/Service Area	Hp	l/s
EF-1	East washroom	2	2,831
EF-2	Elevator mach room	3/5	236
EF-3	Student lounge	1/8	425
EF-4	Staff lounge	1/8	425
EF-5	ECED	1/8	378
EF-6	Anthropology	3/5	274
EF-101	East wing WR Exhaust	5	3,575
EF-102	Electrical room	½	520

3.7.8 Gymnasium

Heating, Ventilation and Air Conditioning Systems

HVAC is provided by rooftop units (RTU). The units comprise a mixing section, gas fired furnaces, DX cooling coils and integral condensers.

Air Handling Units

The Building is served by four rooftop units. Units AH-1 to AH-3 are located on the East wing roof, unit AH-4 is located on a concrete slab, West of the recreational room at the second floor level.

All RTUs are equipped with indirect fired gas burners; firing of the burners is controlled by the DDC system.

All RTUs are in DDC. Unit AH-2 is equipped with a CO₂ sensor on the return, unit AH-3 is a multi-zone system with hot and cold deck and 5 mixing DDC controlled zone dampers.

A summary of the units is presented in Table 38

Table 38: Summary of Gym Rooftop Units

Tag	Service Area	Rated HP	CFM	Heating Stages	Cooling Capacity (ton)	Cooling Stages
AH-1	Main gym area South	25	22,000	Modulating	60	4
AH-2	Main gym area North	15	12,900	N/A	N/A	2
AH-3	Recreational room	7 ½	5,000	Modulating	15	2
AH-4	Change rooms, washrooms and offices	5	5,900	2	15	2

Exhaust

Exhaust from the washrooms/change rooms is provided by a 1 hp exhaust fan (EF-1) rated at 7,800 CFM. EF-1 is DDC controlled.

3.7.9 Library Building

Rooftop Air Conditioning Units

HVAC to the library is provided by four Trane rooftop units. The units comprise a mixing section, gas fired furnaces, DX cooling coils, integral condensers and power exhaust.

Units RTU-1 and RTU-2 are equipped with terminal bypass boxes and electric reheat coils.

All units are in the DDC system. A summary of the units is provided in Table 39.

Table 39: Summary of Library Rooftop Units

Tag	Service Area	Model	Fan HP	Cooling Capacity (Ton)	Heating Stages	Cooling Stages
RTU-1	Main floor offices	LGA072	3	6	2	1
RTU-2	Second floor offices and club room	LGA120	5	10 ½	2	2
RTU-3	Multi-purpose room West	LGA360	10	30	2	3
RTU-4	Multi-purpose room East	LGA360	10	30	2	3

Exhaust

All rooftop units are equipped with power exhaust fans. Six exhaust fans provide exhaust to washrooms, offices and the vestibule. All Exhaust fans are in DDC. During the site visit it was noted the building is under negative pressure. A further investigation is recommended to correct this issue.

A summary of the exhaust fans serving the building is included in Table 40.

Table 40: Summary of Exhaust Fans

Tag	Description/Service Area	Hp	CFM
EF-3	Handicapped washroom	Fracc	86
EF-4	Main washroom	1/6	747
EF-5	Staff washroom	Fracc	122
EF-6	Vestibule	1/4	1,560
EF-7	Lounge	1/6	225
EF-8	Elevator Mechanical room	1/6	225

3.7.10 Clock Tower Building

Boilers

The heating plant consists of two (B1 and B2) 1,000 mBH Thermal Solutions model EVA1000BN1 forced flow boilers. The boilers are rated at 88% efficiency at full fire (steady state). The boilers are piped in parallel; water is circulated through the boilers using two ¾ hp Grundfos pumps (P-1 & P-2).

Hot Water Distribution

Boiler pumps P-1 and P-2 provide primary heating loop circulation through the boilers. Hot water circulation into the secondary loops is achieved as follows:

- loop serving first and second floors perimeter radiant ceiling panels. Loop temperature is controlled by DDC through a 3-way valve, water circulation is provided by P-5;
- loop serving third and fourth floors perimeter radiant ceiling panels. Loop temperature is controlled by DDC through a 3-way valve, water circulation is provided by P-3; and
- heating coils serving AHUs F-1 and F-2 heating coils. Coil temperatures are controlled by DDC through a 3-way valve, water circulation is provided by P-9 and P-11 respectively.

A summary of the heating distribution pumps is included in Table 41.

Table 41: Summary of Heating Water Distribution Pumps

Tag	Description	Hp
P-1	Boiler pump	¾
P-2	Boiler pump	¾
P-3	Heating pump 3 rd & 4 th floors	¾
P-4	Heating pump standby	¾
P-5	Heating pump 1 st & 2 nd floors	¾
P-9	F-1 heating coil	Fracc.
P-11	F-2 heating coil	¼

Cooling Systems

The office tower is cooled by an air cooled chiller located on the tower's roof. The chiller is a 55 Ton McQuay reciprocating chiller. The chiller is rated at 1.12 kW/ton and is DDC interfaced.

Chilled Water Pumps and Water Distribution

Chilled water from the chiller is pumped by two pumps (P-6 & P-7) in parallel to cooling coils in the air handling units. Each air handling unit is equipped with a cooling coil pump. A summary of the pumps is presented in Table 42.

Table 42: Summary of Chilled Water and Distribution Pumps

Tag	Description	Hp
P-6	Chilled water pump	1
P-7	Chilled water pump	1
P-8	F-1 cooling coil	Fracc.
P-10	F-2 cooling coil	¼

Air Handling Units

Two air handling units (F-1 and F-2) provide ventilation to the building. F-1 serves the third and fourth floors. F-2 serves first and second floors. Both units are equipped with a 10 hp motor with VFD.

Lecture Theatre Rooftop Unit

HVAC to the lecture theatre is provided by a Lennox model GCS11 rooftop unit. The unit is equipped with a 5 hp motor; a two-stage indirect gas fired heating section, and DX cooling. The unit is interfaced with the DDC.

Exhaust

General exhaust for the building and the lecture theatre (EF-1 & EF-2 respectively) interlocked with the AHUs. The rest of the exhaust fans are controlled by local switches.

Compressed air systems

Pneumatic control systems are supplied with compressed air one Quincy model QHPR5 reciprocating air compressors installed in the fourth floor boiler room.

3.7.11 Animal Health Technology Building

Boilers

Heating for the building is provided by a Burnham model 809B hydronic heating boiler rated at 528 mBH input. The rated efficiency of the boiler (steady state) is 80%.

Hot Water Distribution

Water circulation on the primary loop is achieved through two pumps (P-2 and P-3) arranged in parallel. Water flow to the secondary loop is controlled by a 3-way valve, interfaced with DDC, and distributed to a slab heating system, forced flow heaters located at the entrances, perimeter radiation, a unit heater in the mechanical room and coils on the supply air ductwork.

A summary of the Heating water pumps is provided in Table 43.

Table 43: Summary of Heating Water Distribution Pumps

Tag	Description	Hp
P-2	Primary heating loop	3/4
P-3	Primary heating loop	3/4
P-4	Secondary heating loop	3/4
P-5	Secondary heating loop	3/4
P-7	Indoor slab heating	1/4

Rooftop Air Conditioning Units

HVAC to the building is provided by six Lennox rooftop units and two Engineered Air makeup air units. The rooftop units comprise a mixing section, gas fired furnaces, DX cooling coils and integral condensers. Makeup air unit RTU-3 is equipped with mechanical cooling.

The perimeter zones of the areas served by the Lennox units are equipped with hot water reheat coils.

All units are in the DDC system. The economizers are controlled locally on each rooftop unit. A summary of the units is provided in Table 45.

Table 44: Summary of Animal Health Technology Rooftop Units

Tag	Service Area	Make	Model	Fan HP	Cooling Capacity (Ton)	Heating Stages	Cooling Stages
RTU-1	East perimeter zones	Lennox	LGA072	2	6	2	1
RTU-2	North interior zone	Lennox	LGA072	2	6	2	1
RTU-3	Room 119	Eng. Air	FWA-72	2	4	1	2
RTU-4	Multi-use Room #1	Lennox	LGA036	2	3	1	1
RTU-5	Multi-use Room #2	Lennox	LGA048	1 ½	4	2	1
RTU-6	South interior zone	Lennox	LGA060	2	5	2	1
RTU-7	South perimeter zone	Lennox	LGA048	1 ½	4	2	1
RTU-8	Kennels area	Eng. Air	DJ-40-O	1	N/A	2	None

Ventilation Systems

Exhaust

Three ceiling fans (EF-10 to EF-12), eight roof mounted exhaust fans and one fractional kitchen hood (EF-4) remove heat, odours and fumes from the building. A summary of the exhaust fans serving the building is included in Table 45.

Table 45: Summary of Exhaust Fans

Tag	Service Area	Hp	CFM
EF1	Isolation area	1/4	200
EF-2	Surgery	1/2	1,400
EF-3	Developing	1/4	200
EF-4	Fume hood	Fracc.	N/A
EF-5	Multi use #1	¼	600
EF-6	Washrooms, Janitor & Storage	¼	480
EF-7	Chemical storage	1/4	300
EF-8	Animal areas	3/4	3,700
EF-9	Hood	1/4	300
EF-10	Washroom	1/5	300
EF-11	Shower	Fracc.	100
EF-12	Washroom	Fracc.	100

3.7.12 Mechanical Maintenance

The building mechanical systems are maintained in house and by outside contractors.

3.7.13 Central Building Controls

Building Management/Automation System (BAS)

The mechanical systems in the campus are controlled from a BAS controlled with Direct Digital Control (DDC). Nine of the buildings included in the audit are included in a system manufactured by SIEMENS. The system is Insight version 3.6.0 and consists of 24 control panels installed in the mechanical rooms and sub-panels (TEC) controlling VAV boxes, heat pumps and other unitary equipment. Remote access is available only through remote desktop connection.

The library has a Johnson Controls Metasys system, accessible via web browser.

The building automation systems are maintained, on a call-in basis. They do not have a long-term maintenance contract.

3.8 Domestic Water

3.8.1 Domestic Cold Water

Domestic water is distributed throughout the building with available city water pressure.

3.8.2 Domestic Hot Water

Domestic hot water for the campus is generated on each by building by gas fired domestic hot water tanks (DHWT), with the exception of the TTC and IBC buildings that have ceiling mounted electric DHWTs.

4. ENERGY PERFORMANCE

4.1 Utility Rates

Electricity is provided by BC Hydro through one account at rate 1211.

Natural gas is provided by Terasen Gas through one account at rate 25 – Transportation, High volume with demand charge.

Energy cost reduction for the analysis was calculated based on the marginal rate for the accounts. The marginal rate is the rate that applies to the last unit of energy used, not a blended average. In addition, the average carbon tax over a three-year period (\$25 per tonne or \$1.25 per GJ) and the cost of carbon offsets (\$25 per tonne or 1.25 per GJ) was added to the fuel rate.

Electrical and fuel histories in addition to copies of the rate structures applicable to this site are included in **APPENDIX C**.

The marginal rates used for the savings calculations are summarized in Table 46 and Table 47.

Table 46: Rates used for Electricity Savings Estimates (Not including HST)

Utility	Vendor	Rate	In effect	Marginal Electricity (\$/kWh)	Marginal Demand (\$/kW)
Electricity	BC Hydro	1211	April 2010	\$0.0404	\$7.99

Table 47: Rates used for Gas Savings Estimates (Not including HST)

Utility	Source	Rate	In effect	(\$/GJ)
Natural Gas	Terasen Gas	5	July 1, 2010	6.563
Carbon Tax	BC Government		2010-2012 average	\$1.25
Carbon Offset	BC Government		June 2011	\$1.25
Total				\$9.063

4.2 Energy Use and Cost Summary

Prism's Utility Management and Analysis (PUMA) database was used for the analysis. Note that HST is not included in any cost calculations or billed amounts. Natural gas cost was calculated using Terasen Gas rate 5.

Power factor correction charges are not included in electrical costs.

Energy usage for three years is presented in Table 48.

Table 48: Energy Account Summaries for Three Years

		2007	2008	2009
Electricity	Use (kWh)	15,104,400	15,283,230	15,367,200
	Cost (\$)	\$768,311	\$805,817	\$852,349
	BEPI (kWh/ft ² /yr)	14.4	14.6	14.6
	BECI (\$/ft ² /yr)	\$0.73	\$0.77	\$0.81
Gas	Use (GJ)	69,384	71,706	68,832
	Use (ekWh) ¹	19,273,190	19,918,310	19,120,110
	Cost (\$)	\$652,108	\$692,330	\$559,001
	BEPI (ekWh/ft ² /yr)	18.4	19.0	18.2
	BECI (\$/ft ² /yr)	\$0.62	\$0.66	\$0.53
Total	Total Use (ekWh)	34,377,600	35,201,540	34,487,310
	Total Cost (\$)	\$1,420,419	\$1,498,148	\$1,411,350
	BEPI (ekWh/ft ² /yr)	32.8	33.6	32.9
	BECI (\$/ft ² /yr)	\$1.35	\$1.43	\$1.35

The energy intensity was based on an area of 1,048,964 ft².

Power factor penalties are charged by BC Hydro when the power factor drops below 90%. Power factor has ranged from 88% to 93% over the most recent 24-month period. Over this period, TRU incurred more than \$13,000 in surcharges for poor power factor.

The following observations were made based on our analysis of the historical energy usage:

- electricity use was consistent during the period studied;
- small changes (less than 5%) in gas usage occurred during the three-year period. However, similar variations in HHD were observed over the same period;
- overall, energy consumption did not change significantly during the period studied.

The figures below show the energy use and cost breakdowns by energy source.

¹ ekWh = equivalent kWh (used for gas)

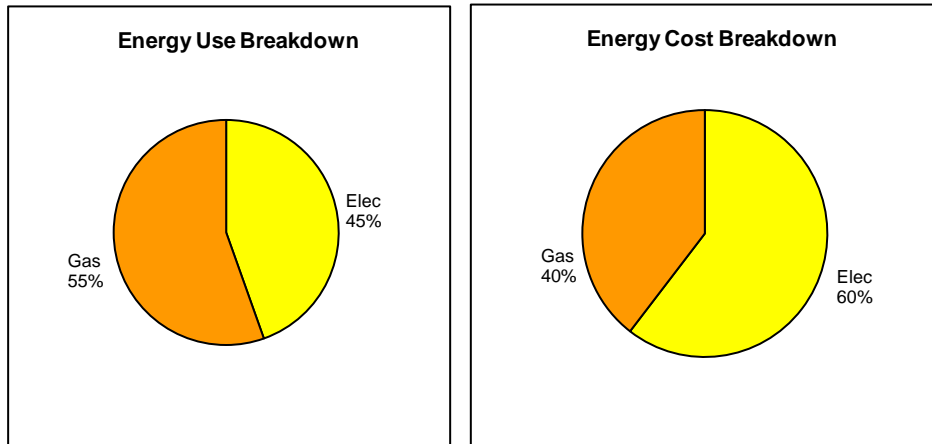


Figure 37: Energy Use and Cost Breakdown by Energy Source

4.3 Greenhouse Gas Emissions Summary

In calculating reductions in greenhouse gas emissions, both direct reductions (resulting from reduced fuel use) and indirect reductions (resulting from reduced electricity use) are included. The source of indirect emissions factor (resulting from electrical energy consumption) is BC Hydro¹. Direct emissions factor has been drawn from the Environment Canada publication, Canada Greenhouse Gas Inventory, 1997 Emissions and Removals Trends², unless otherwise specified.

Refer to **APPENDIX D** for a summary of the emissions factors used and a summary of the calculated emissions for TRU.

The chart below shows the contribution of each energy source to the greenhouse gas emissions.

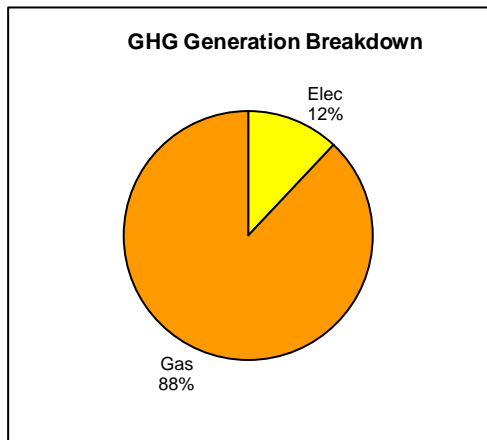


Figure 38: GHG Emissions by Energy Source

¹ <http://www.bchydro.com/info/reports/reports52594.html>

² Canada Greenhouse Gas Inventory, 1997 Emissions and Removals Trends (Draft Report). By F. Neitzert, K. Olsen and P. Collas. Pollution Data Branch, air Pollution Prevention Directorate, Environment Canada, 1999.

4.4 Energy Analysis

The energy analysis is a review and analysis of the energy use profiles of the facility. This analysis:

- (a) establishes a baseline of energy use from which savings may be measured and
- (b) acts as a guide to investigating certain building systems and operations exhibiting energy saving potential.

Utility bills only record total consumption for a particular billing period. The energy consumption can vary due to weather, production processes, operational changes, seasonal shut downs etc. It is important to understand the factors affecting energy use in the building, prior to recommending changes. In addition, the analysis may highlight anomalies or inconsistencies that may lead to energy saving opportunities.

4.4.1 Base Period Analysis

Energy use can be considered to consist of a base load plus a weather dependent load. The latter is dependent on the facilities Weather Factor and the external environmental conditions.

The first step in the analysis was to develop a statistical model, using regression analysis, of the base year representing the billing period use for each meter.

The daily weather information for Kamloops, as recorded by Environment Canada, was used to analyze the impact of weather conditions on energy use. Consumption and demand information was taken from actual utility bills.

The number of degree days in a billing period is the sum of the difference between the meter's balance point temperature and the mean daily outdoor temperature noted each day.

For each meter, statistical methods were used to test for the best straight-line relationship between the number of degree days and the actual use per billing period in the base year. For each meter the adjusted base year mathematical model is of the form:

$$\text{Use} = \text{Base load} + (\text{Weather factor} \times \text{Degree days})$$

The regression correlation coefficient, R^2 , is a measure of the degree in which two variables are linearly related. A value of one is a perfect fit.

Analysis of each model revealed the base load and weather factor. The base load was found to be the portion of the load that was always present regardless of the number of degree days in the billing period. The weather factor was found to be the rate at which the usage increased with an increase in the number of degree-days in the billing period.

The following figures show the energy consumption by reading period graphically; where accounts were determined to be weather sensitive, the heating or cooling degree days (HDDs or CDDs) are included on the graph.

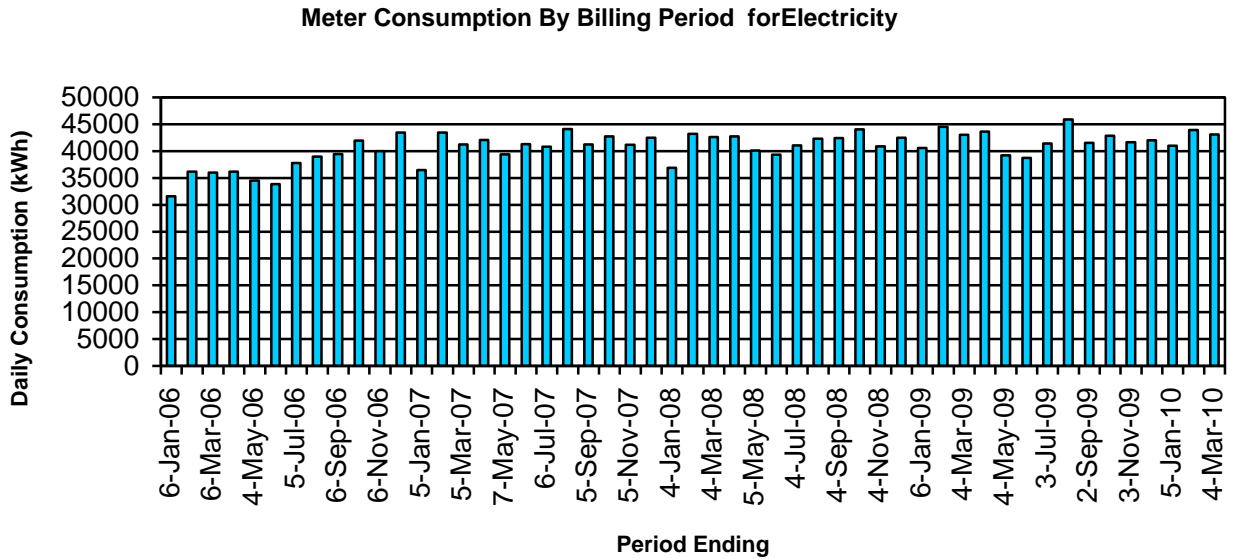


Figure 39: Monthly Electrical Energy Consumption

Figure 39 shows the electrical consumption was not found to be correlated with weather. Although the consumption shows some peaks during the summer months, usage seems to depend mainly on the school calendar occupancy.

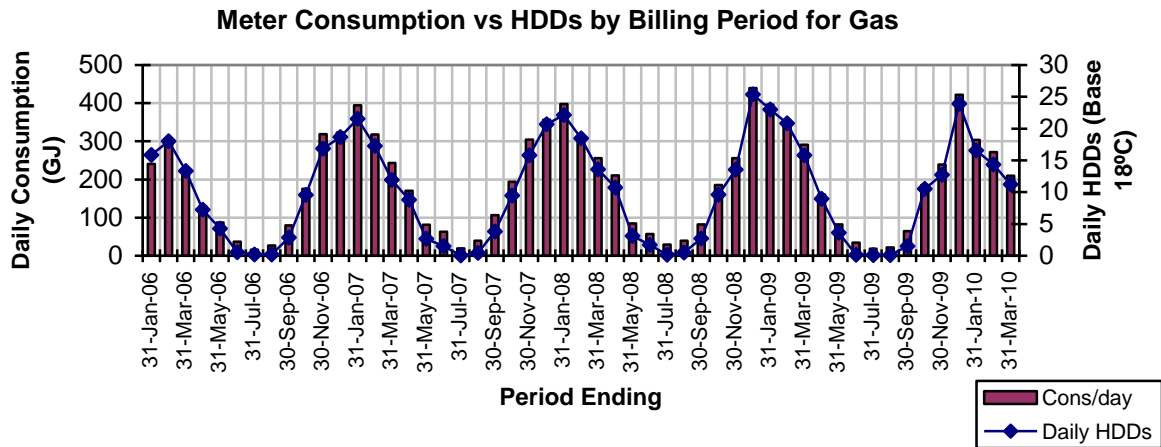


Figure 40: Monthly Gas Use and Heating Degree Days

Figure 40 shows the gas consumption varies with HDDs.

4.4.2 Base Period Selection

The base periods were selected by account to be as near as possible to calendar year 2009 to reflect the current operation practices. Table 49 shows the actual account base periods. The base period regression analysis for each account is included in **APPENDIX C**.

Table 49: Base Period Summary

Type	Base Start	Base End	Weather Sensitivity
Electric	12/5/2008	12/3/2009	None
Gas	1/1/2009	12/31/2009	Heating

Figure 41 graphically shows the breakdown of weather sensitive (WS) and non-weather sensitive (base) loads by meter expressed as a percentage of the overall energy use. The base load could include heating and/or cooling loads that are not weather sensitive such as domestic hot water, server room cooling, terminal reheats, refrigeration etc.

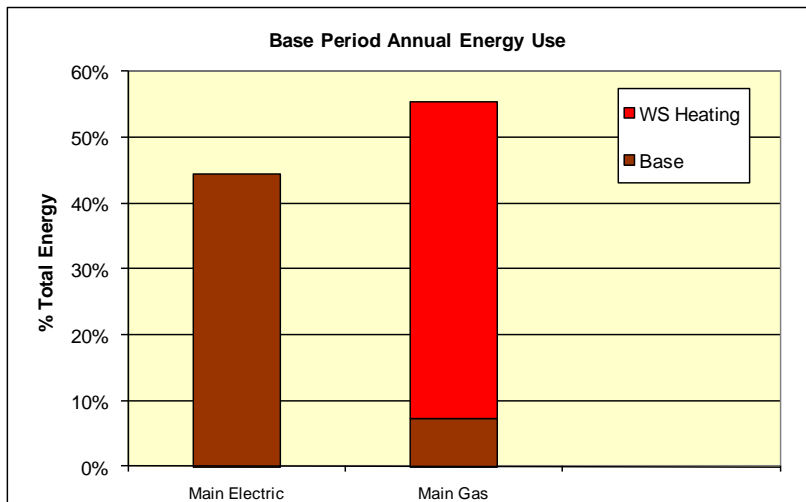


Figure 41: Breakdown of Weather Sensitive and Non-Weather Sensitive Energy Use by Account

4.4.3 Weather Corrected Energy Use Analysis

Varying weather conditions have a very significant impact on energy use. During the audit process, it is important to determine whether historical changes in energy use can be attributed to weather conditions, or whether operational changes or previous retrofits are responsible for the changes.

A review of the historical energy use for each meter was carried out using a technique referred to as CUSUM (cumulative sum). CUSUM is an analysis technique employed to understand and quantify changes in energy usage. The CUSUM analysis begins by the selection of a reference time period, referred to as the base period. A regression analysis of the base period energy usage is used to normalize for the impact of weather on energy use. Energy use during times outside the base period are then compared to base period usage. The flatter the resulting CUSUM line over the base period the better the regression model is for predicting the base period energy use.

When there have been changes in energy use, the CUSUM will deviate from the horizontal and slope upward over periods of reduced energy usage and downward over periods of increased usage. The steeper the slope, either upward or downward, the greater the deviation in energy use from that in the base period.

Successive periods of relatively constant slope denote time periods over which weather normalized energy use was consistent, indicating consistency in equipment performance and operational practices.

The intersections of successive periods with different slopes mark times at which a change in energy use occurred.

Where the CUSUM analysis is significant to the audit process, the figure is included below. The rectangle on the figure indicates the base period.

The CUSUM charts are also included in **APPENDIX C**.

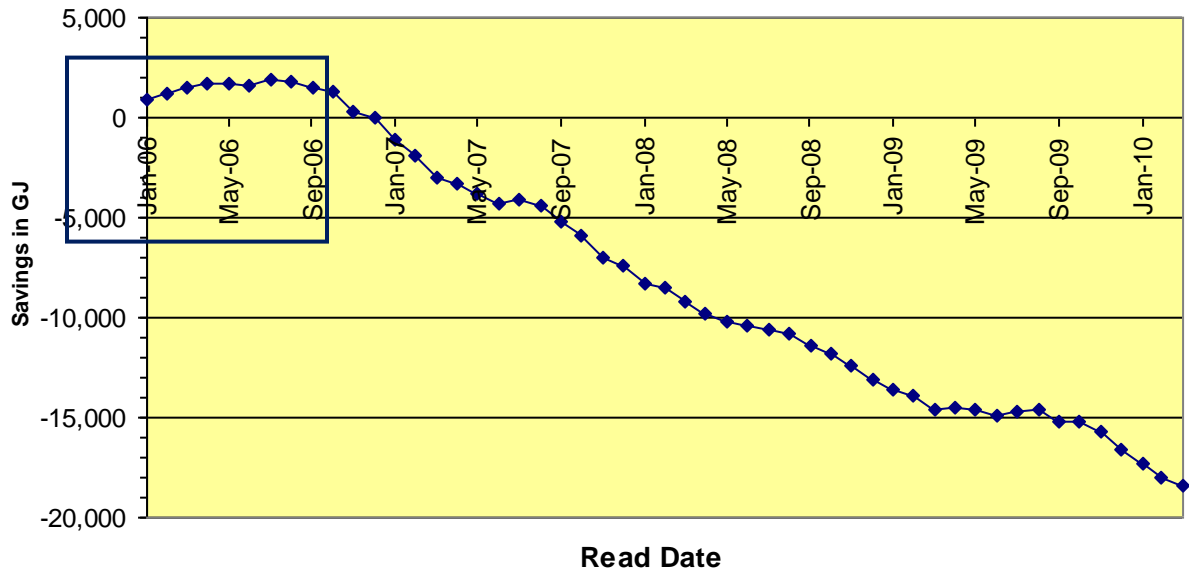


Figure 42: Gas CUSUM 1

The following observations are made based on Figure 42.

- the downward slope or increase in energy use, starting January 2007, indicates a change in energy use;
- a 16,500 GJ increase occurred from the beginning of 2007 to the end of 2009. This increase represents around 5,500 GJ per year during the analyzed period or almost 8% of 2009 consumption;
- the steep slope during the colder months and the flattening out in the summer indicates the change in energy use is weather related.

Based on a review of historical construction on the campus, we believe the change in energy use is primarily related to the addition of new buildings on the campus, including the Open Learning, Warehouse and Residence in 2007.

4.5 Comparison to Other Facilities (Benchmarking)

An energy analysis was carried out including a comparison of the energy use intensities of similar facilities studied by Prism Engineering. This analysis served as an indicator of the potential energy savings opportunity during the audit process.

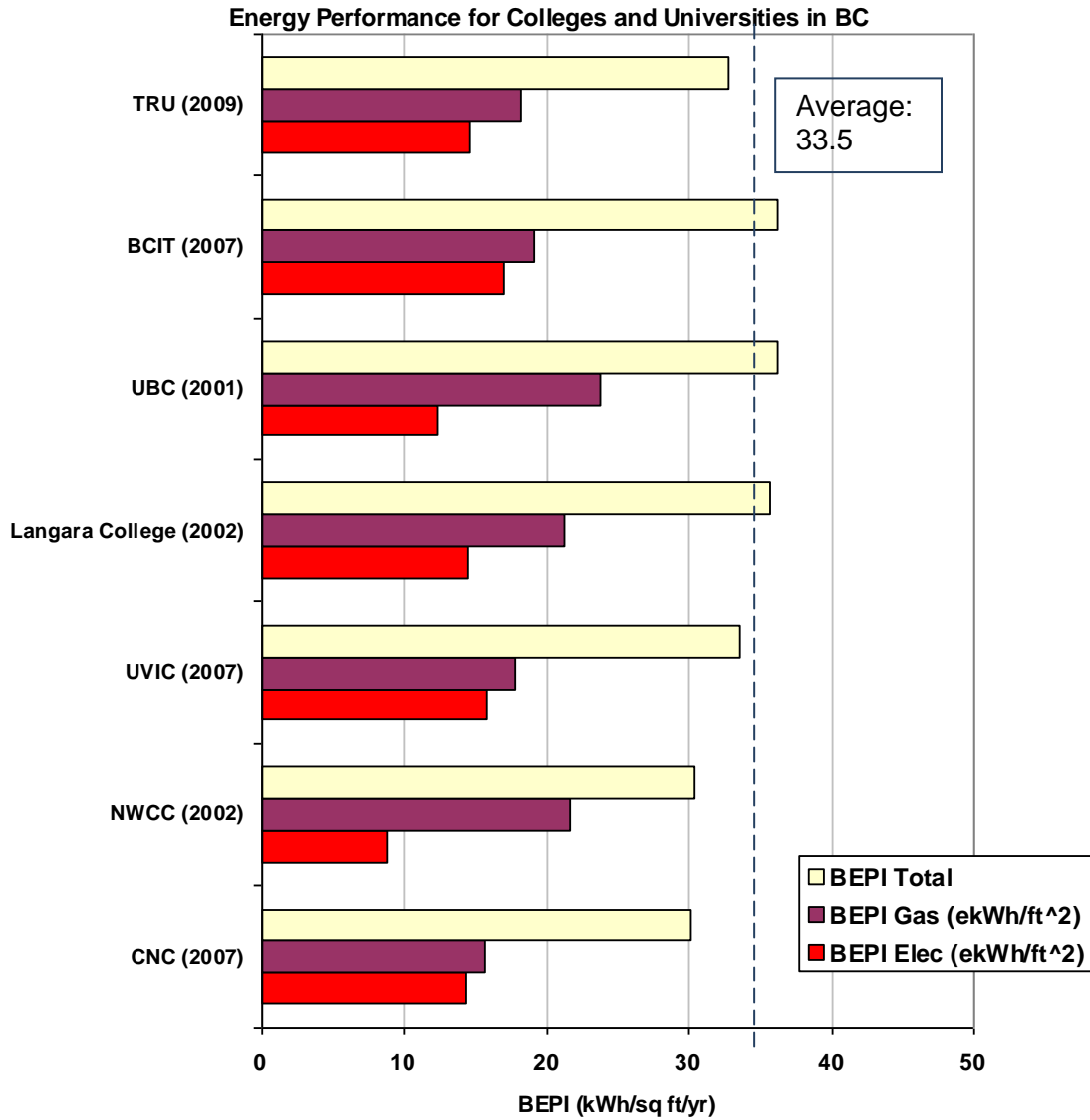


Figure 43: Benchmarking Comparison

TRU is slightly below the 33.5 sample with a total BEPI of 32.9 ekW/ft²/yr.

4.6 Building Energy End Use

The campus energy end use breakdowns are illustrated in Table 44 and Table 45.

Consumption from submeters for some buildings was provided by TRU. The information was analyzed and some of the results did not appear to represent the building’s energy consumption. A visual inspection during the site visit of the electric meters did not find any installation issues. In some cases the gas sub meters were installed upstream of the PRVs. We recommend commissioning of sub meters by a qualified technician including verification of PRV settings constant with meter calibration and building requirements.

Based on the highly questionable submeter data, the sub meter data was not used for reconciliation. As the buildings included on the audit represent 75% of the total campus area, the energy consumption for the building studied was assumed as 75% of the total.

As shown, the highest electrical energy use (approximately 23% of overall annual use) is for the fans systems. The second largest is lighting, followed by cooling (at 18% and 11% respectively). The unaccounted section includes kitchen and cafeteria refrigeration systems, miscellaneous equipment used the shops and laboratories, lap top computers, etc.

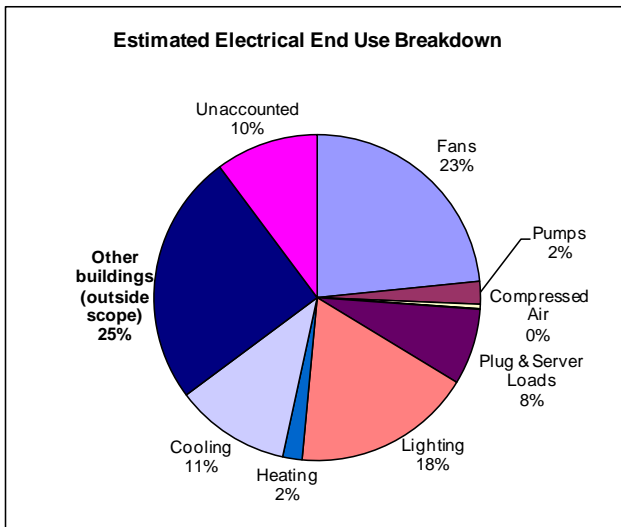


Figure 44: Electrical Energy End Use Breakdown

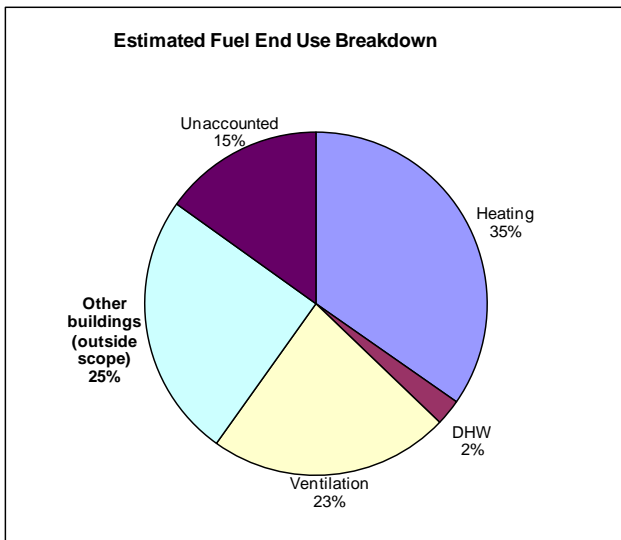


Figure 45: Gas Energy End Use Breakdown

5. RECOMMENDED ENERGY CONSERVATION MEASURES

A summary of the recommended energy conservation measures (ECMs) and budget costs are included in Table 50.

Table 50: Summary of Recommended ECMs

Section	Measure	Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
5.1	ECM 1: Lighting Retrofit	194.4	693,564	\$46,656	-	-	\$46,659	\$661,000	14.2
5.2	ECM 2: Lighting Controls	-	122,292	\$4,941	-	-	\$4,941	\$65,500	13.3
5.3	ECM 3: Vending Machine Usage Control	-	45,033	\$1,819	-	-	\$1,819	\$10,000	5.5
5.4	ECM 4: Appliance Timers for Corridor Televisions	-	10,530	\$425	-	-	\$425	\$650	1.5
5.5	ECM 5: Power Factor Correction	-	0	\$8,191	-	-	\$8,191	\$36,800	4.5
5.6	ECM 6: Holiday Scheduling	-	198,380	\$8,015	768	\$6,960	\$14,975	\$31,000	2.1
5.7	ECM 7: Optimum Start Morning Warm-up and Cool down for Ventilation Systems	-	216,990	\$8,765	839	\$7,600	\$16,365	\$44,900	2.7
5.8	ECM 8: Summer Scheduling	-	67,345	\$2,720	0	\$0	\$2,720	\$6,500	2.4
5.9	ECM 9: VAV Zone Isolation	-	116,330	\$4,700	203	\$1,845	\$6,545	\$50,000	7.6
5.10	ECM 10: DCV for Classrooms and Offices Served by WS Heat Pumps	-	21,755	\$880	1,227	\$11,125	\$12,005	\$102,500	8.5
5.11	ECM 11: Demand Controlled Ventilation for Clock Tower Theatre	-	3,800	\$155	23	\$210	\$365	\$3,900	10.7
5.12	ECM 12: Align Clock Tower DDC Weekly Schedules with Typical Occupancy	-	3,295	\$135	140	\$1,265	\$1,400	\$8,700	6.2
5.13	ECM 13: Trades Welding Booth Fan Operation	-	36,120	\$1,460	851	\$7,710	\$9,170	\$40,200	4.4
5.14	ECM 14: Wood Shop Dust Collector Occupancy Controlled Shutdown	-	9,885	\$400	14	\$130	\$530	\$5,200	9.8
5.15	ECM 15: Standby Mode and DCV for Gym Ventilation Systems	-	30,050	\$1,215	330	2,985	\$4,200	\$12,900	3.1
5.16	ECM 16: Heat Pump Loop Pump Shutdown	-	33,815	\$1,365	0	\$0	\$1,365	\$8,300	6.1
5.17	ECM 17: Old Main Unoccupied Exhaust Fan Shutdown	-	7,910	\$320	365	\$3,300	\$3,620	\$27,100	7.5
5.18	ECM 18: Install Flue Dampers on CAC Heating Plant	-	0	\$0	1,377	\$12,480	\$12,480	\$8,000	0.6
	Total	194.4	1,617,095	\$92,160	6,135	\$55,613	\$147,775	\$1,123,150	7.6
	2009 Data for entire Campus		15,367,200	\$852,349	68,832	\$559,001	\$1,411,350		
	% Savings		11%	9%	11%	10%	10%		

The following sections discuss the details of the ECMs. A more detailed energy savings summary is included in **APPENDIX H**.

5.1 ECM 1: Lighting Retrofit

Measure	Demand Savings (kW)	Electrical Savings (kWh)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
Base Retrofit	189.9	678,802	\$45,628	\$657,550	14.4
Screw-in CF Retrofit	4.5	14,762	\$1,028	\$3,450	3.4
Total Measure	194.4	693,564	\$46,656	\$661,000	14.2*

*Payback period after utility incentives is expected to be 10.5 years.

Fluorescent Lighting Technology Improvement and Retrofit

The fluorescent luminaires represent approximately 70% of the buildings' lighting energy demand and 60% of the lighting consumption. The greatest energy savings with regards to the lighting systems can be achieved by reducing the energy consumed by the fluorescent luminaires.

The existing fluorescent lighting systems currently present three main measures for reducing energy usage:

- retrofit remaining T12 luminaires with more efficient T8 lamp and electronic ballast technology;
- relamp T8 luminaires with 28 watt energy saving T8 lamps provided the ambient temperature is higher than 16°C and the existing ballast is an electronic instant start type; and
- delamp or remove redundant luminaires in overlit areas.

New development in both fluorescent lamps and ballasts are continuously emerging in the marketplace. These include energy saving T8 lamps and high efficiency electronic ballasts – both of which can be directly retrofitted into the existing fluorescent lighting systems.

Newer lamp technologies have added benefits of producing more light output per lamp over T12 lamps and have reduced light output degradation. Additionally, the higher colour rendering index of these lamps improves the quality of illumination and visual comfort for occupants. Reducing the quantity of lamps per luminaire in some locations is feasible without having a significant impact on the light level. As T8 fluorescent lighting continues to evolve, manufacturers are now offering energy saving T8 lamps. For standard four-foot lamps, there are now 30 watt, 28 watt and 25 watt lamps available.

Energy saving lamps are designed to operate only on instant start or programmed rapid start electronic ballasts. Based on observations on site, a majority of existing luminaires that use T8 lamps are equipped with instant start ballasts that will properly start up the lamps.

To reduce energy use and to renew lighting systems while maintaining consistency in lamp type, we recommend relamping fluorescent luminaires with 28 watt energy saving T8 lamps and retrofitting all electromagnetic T8 and T12 ballasts, as well as any T8 rapid start electronic ballasts with new high efficiency electronic instant start ballasts. For the luminaires that currently utilize instant start electronic ballasts (standard efficiency), the incremental savings do not justify the costs of upgrading to high efficiency ballasts. However, we recommend that high efficiency ballasts be used to replace the standard efficiency instant start electronic ballasts upon failure.

It is recommended that regular group relamping and maintenance cleaning of lenses and louvers be conducted in order to provide optimal light levels. We suggest group relamping and cleaning of lenses and louvers every several years or at 80% of rated lamp life (typical T8 fluorescent lamp is rated for 20,000 hours) to reduce dust accumulation and maintenance costs.

Lamp manufacturers do not recommend the use of energy saving lamps in exterior and other cold locations as they will not produce full light output and start up properly when subjected to low temperatures (below 16°C) and high air flow areas. Fluorescent luminaires in these areas should be retrofitted with 32 watt T8 lamps and ballasts that are rated for cold temperature operation.

Replacing Incandescent Lamps:

Incandescent lamps are considered inefficient and require frequent replacement because of short lamp life. Newer lighting technology such as compact fluorescent lamps can provide similar light output while drawing a fraction of the power as their incandescent counterparts.

We recommend replacing the 60 watt and 100 watt A19 watt incandescent lamps utilized in offices, washrooms, storage areas and utility rooms with 13 watt and 23 watt compact fluorescent screw-in lamps, where possible. This action can potentially provide significant energy savings at a low cost where the lighting is used for a few hours per day.

In areas where luminaires are controlled by dimmer switches it is not recommended to use compact fluorescent lamps. Dimmable ballasts can be installed in these luminaires but, due to the ballasts high costs and the lamps inability to operate at low dimmer settings they are not cost effective as a retrofit.

Replacing incandescent lamps with compact fluorescent in freezers and open luminaires in exterior locations is also not recommended as they may not start up properly or produce full light output in cold environments. Screw-in compact fluorescent lamps should not be used in unventilated, enclosed luminaires as their built-in ballasts tend to overheat and fail prematurely.

HID to Fluorescent Lighting Replacement

The high intensity discharge luminaires in the gymnasium, print shop, and workshops in the Gymnasium, Old Main, and Trades & Technology building are equipped with 400 watt metal halide lamps. These lamps have a high lamp lumen depreciation factor causing the light output to degrade by as much as 50% within 3 years of operation. This results in the need for frequent relamping in order to maintain light levels, which increases maintenance costs.

Because metal halide systems require several minutes to reach full light output when turned on, the lighting occupant may leave this lighting on, resulting in lighting energy being expended during unoccupied periods. This lighting is turned off after by custodial staff have cleaned the area in the evening; resulting in significant wasted energy.

Replacing the existing metal halide system with a fluorescent system has a number of advantages:

- lower energy consumption;
- better lumen maintenance over the lamp lifetime, resulting in higher maintained light levels and reducing the need for relamping;
- higher colouring index (CRI), which improves the occupants ability to distinguish differences in colour;
- quieter ballast operation;
- no change in colour of light output over lamp life;
- relatively uniform lighting is maintained even when lamps begin to burn out;
- no start up delay.

The proposed lighting upgrade is to replace the existing HID luminaires with 6 lamp fluorescent industrial or highbay luminaires and revise the lighting layout; this will increase light levels and better meet the requirements of tasks being performed. Each new luminaire would operate on six 32 watt T8 fluorescent lamps and two high efficiency, high ballast factor, electronic ballasts (one operating 4 lamps and one operating 2 lamps). The wiring to the luminaires can be re-configured to allow occupants the option of selecting lighting levels by switching on two, four or all six lamps in the luminaires. This provides greater flexibility as the light levels can be adjusted to suit varying illumination requirements or to save energy at times when the rooms are not in use but still require some illumination (for security, cleaning).

HID to Induction Lighting Replacement

A number of HID luminaires are mounted in high and difficult to access locations throughout the buildings including the Old Main, Library, Campus Activity Centre and International Building Atria/Foyers. These luminaires are costly to maintain, much like the luminaires described in the section above. The use of fluorescent systems in these atria, however, is unsuitable as they do not suit the spaces aesthetically.

The induction lamp is a relatively newer technology light source that offers long life and good energy efficiency. Induction lamps share some similarities with fluorescent technology, however, the major differences are that induction lamps operate without a cathode (the limiting component in fluorescent lamp life) and are powered by external magnetic fields created by a high frequency generator instead of an electrical current supplied by a ballast.

Based on manufacturers' literature, induction lamps have an expected life of 100,000 hours which is significantly greater than that of a typical metal halide lamp (~20,000 hours). The use of this long life technology will reduce the number of lamp replacements overtime, resulting in significant maintenance cost savings where expensive lift or scaffolding equipment is required. Their advantages over metal halide technology also include higher colour rendering, better colour consistency and "instant-on" capability. A lower wattage induction lamp can be used in place of the existing metal halide lamps to reduce electrical demand and consumption while producing consistent light output, over several years of operation.

In order to reduce energy use and maintenance costs we recommend retrofitting the luminaires with induction lamps of various wattages depending on the location. Due to the high cost of this lighting technology, it is not recommended to install induction lighting in low ceiling areas and accessible locations where maintenance costs are lower. Moreover, due to the limited selection in induction lamp wattage, some higher wattage HID luminaires cannot be retrofitted without significantly reducing light levels.

Exit Lights

A few existing exit signs in the buildings audited utilize incandescent lamps, which are not energy efficient and suffer from short lamp life. The recommendation is to replace the existing exit lights with signs that utilize more efficient LED (Light Emitting Diodes) technology. In addition to the energy savings, LED bars (lamps) have a rated life of approximately 25 years, significantly reducing necessary lamp replacements.

Summary

The following table outlines typical or most common retrofit types proposed for installation at Thompson Rivers University. As lighting systems in the various buildings and rooms of similar type vary somewhat, the proposed retrofits listed are not applicable to all rooms with the same lighting system type. Refer to **APPENDIX E** for the room-by-room details of the proposed changes.

Table 51: Typical Lighting Retrofit Design

Luminaire Types	Special Conditions	Proposed Retrofit
2' x 2' recessed, lensed or louvered luminaires	U-Bend Lamps are costly to replace	Replace with recessed 2' x 4' luminaire with 2 F28T8/800 series lamps, and electronic ballast (space permitting). Revise lighting layout where applicable.
	and/or Low light levels	Retrofit with 2 F17T8/800 series lamps, white reflector and high ballast factor electronic ballast where there is sufficient space in ceiling grid.
1' x 4' surface mounted, lensed luminaires with wraparound lenses		Retrofit with 2 F28T8/800 series lamps, and electronic ballast.
2' x 4' recessed, lensed or louvered luminaires	3 lamp luminaires with bi-level switching	Retrofit with 3 F28T8/800 series lamps, and either a 1 lamp and 2 lamp electronic ballast or a 3 lamp ballast.
	3 lamp luminaires	Retrofit with 2 F28T8/800 series lamps, electronic ballast and white reflector.
	2 lamp luminaires	Retrofit with 2 F28T8/800 series lamps, and electronic ballast.
2' x 4' recessed lensed luminaires	4 lamp luminaires with high lighting levels	Retrofit the existing luminaire with 2 F28T8/800 series lamps, new tracks and new electronic Low or Normal Ballast Factor ballast; utilizing shared, multi-lamp ballasts where possible.
	4 lamp luminaires where high lighting levels are critical	Retrofit the existing luminaire with 4 F28T8/800 series lamps, new lampholders and new electronic ballast.
1' x 4' recessed lensed luminaires	2 lamp luminaires	Retrofit the existing luminaire with 2 F28T8/800 series lamps, and new electronic Low or Normal Ballast Factor ballast.
4', 8' and 12' suspended, indirect lighting system luminaires	Trades and Technology building: luminaires are mounted to close to the ceilings, resulting in poor light distribution	Relamp the existing luminaire with 2 or 4 or 6 F28T8/800 series lamps. Lower luminaire suspension height by 2' if ceiling height is greater than 9'.
4' industrial or striplight luminaires		Retrofit the existing luminaire with 2 F28T8/800 series lamps, and new electronic Low or Normal Ballast Factor ballast; utilizing shared, multi-lamp ballasts where possible.
Recessed downlight, keyless lampholder or wall sconce	Incandescent 60watt or 100 watt A19 Lamp with no dimmer switch.	Relamp with 13 watt or 23 watt compact fluorescent screw-in lamp.
HID Highbay Luminaire	High maintenance costs	Replace with new fluorescent high bay luminaire or retrofit with induction technology depending on location application.

In addition to the retrofit actions listed in the above table note the following:

- luminaires will be relamped instead of retrofitted where electronic instant ballasts are already installed;
- all new ballasts will be high efficiency, instant start, electronic ballasts;
- new lampholders will be installed where luminaires are retrofitted from T12 to T8 technology.

Low Use Luminaires:

Retrofitting luminaires in areas of low usage (such as utility rooms, storage rooms) will result in longer payback periods than common use areas. However, these retrofits will save energy, reduce the different types of lamp stocked as well as reduce maintenance expenses. In addition, these retrofits will provide a renewal of the lighting system in these areas improving the lighting levels and quality.

Exterior

Table 52 outlines typical or most common retrofits proposed for the exterior spaces. Refer to **APPENDIX E** for area-by-area details of the proposed changes.

Table 52: Recommended Exterior Lighting Measures

Area	Luminaire Type and Conditions (if applicable)	Proposed Retrofit
Campus Activity Centre – Westside Perimeter	HID floodlight luminaires with 1-400 watt metal halide lamps	Retrofit existing with 1 – 320w Pulse Start Metal Halide lamp and ballast.
Campus Activity Centre – Accent Lighting	Trackheads with 1-90w inc Par38 H flood lamps	Relamp with 1 - 60w PAR38 IR lamp.
Trades and Technology Outdoor Workshops	4’ industrial fluorescent luminaires with 2-32 watt T8 lamps and electromagnetic ballasts	Retrofit existing with new electronic instant start ballasts rated for cold temperature operation and new 32 watt lamps.

The majority of exterior lighting is provided by wallpack and pole mounted luminaires with relatively low wattage (less than 100 watt) metal halide and high pressure sodium lamps which are considered efficacious (high light output per input watt) light sources and well suited for cold outdoor temperatures. As a result, the selection of energy efficient upgrades is more limited for the exterior lighting. See section 6.2 for energy saving opportunities for replacing these luminaires with LED technology.

5.2 ECM 2: Lighting Controls

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
-	122,292	\$4,941	-	-	\$4,941	\$65,500	13.3*

*Payback period after utility incentives is expected to be 8.9 years.

Lighting Controls

Integrating automated controls into a lighting system can result in reduced energy consumption, and increase maintenance savings by extending in-service life of lamps and ballasts. Several options were considered for the lighting systems on this campus. These include occupancy sensors, daylight sensors and timer systems.

Occupancy sensors are effective measures in reducing a lighting system's hours of operation by ensuring that lights are on only when the spaces are occupied. The sensors automatically turn off lights when an area is not in use, and can be set to turn on lights when an occupant is sensed.

Daylight sensors are also recommended in areas where incoming ambient daylight is sufficient to illuminate the space. The sensors are programmed to automatically switch off lighting systems when sufficient amounts of daylight are present.

Actions to improve the lighting controls in specific areas include:

- installing occupancy sensors in corridors¹, computer labs, classrooms, washrooms and other areas with long lighting operating hours and sustained periods of no occupancy²;
- installing automated light level sensing controls in stairwells and areas with large windows, foyers, atria or skylight areas to reduce lighting operation during times where ambient lighting sufficiently meets the light needs;
- integrate Trades & Technology outdoor workshop lighting with building's central lighting control system to automatically turn off lighting during the evening .

We do not recommend installing occupancy sensors in laboratories, workshops and utility rooms as this could potentially be hazardous to occupants and workers should the sensor fail to detect occupancy and switch off lighting unexpectedly. Rooms with low quantities of luminaires or where lighting appears adequately controlled by occupants are not included in this measure as the amount of energy savings is not cost justified.

Recommission Centralized Lighting Controls

The Trades & Technology building lighting controller is programmed to switch "On" corridor lighting at 3:30 AM and "Off" at 11:30 PM. The cleaning staff work from 8:00 PM until 4:00 AM every weekday and override the lighting when it automatically shuts off in the evening. Essentially, the corridor lighting likely remains on for 24 hours a day during weekdays and 20 hours a day during weekends.

¹ Corridor lighting layout may need to be revised to ensure that there are sufficient luminaires to provide night lighting if the occupancy sensors malfunction or fail to detect occupancy

² The sensors should be configured so that the lighting is switched off if no occupancy is detected for 15 minutes. A shorter time-out period could cause the lights to switch 'On' 'Off' too frequently which would result in a decrease in lamp life.

We recommend reprogramming the control system so that lighting on and off times coincide more closely with hours of use in the building. Energy savings can be achieved if the cleaners are scheduled to begin their daily cleaning starting from late afternoon or earlier in the evening so that lighting can be switched off earlier. Moreover, cleaning costs might also be reduced if evening shift cleaning rates are lower than overnight shift rates.

Energy savings are based on the assumption that the cleaning schedule can be changed and that the lighting is switched off from 10:00 PM to 6:00 AM, daily. Implementation costs have not been included as it is assumed the in-house maintenance staff can reprogram the system.

5.3 ECM 3: Vending Machine Usage Control

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
-	45,033	\$1,819	-	-	\$1,819	\$10,000	5.5*

*Payback period after utility incentives is expected to be 3.8 years.

A product, called the Vending Miser, has been designed for vending machine control that reduces energy consumption without compromising the vended product. The product uses a passive infrared sensor to power down the machine during unoccupied periods and automatically re-powers the vending machine when the area is reoccupied. The time-out period is automatically adjusted according to the space use. In addition, the product monitors the internal temperature when the machine is off and will restart the machine at appropriate intervals independent of occupancy to ensure that the product remains cold. Vending misers, however, should not be installed in machines that store perishable drinks, such as milk.

As with any occupancy sensor type product, the energy savings will be affected by the frequency at which occupants trigger the sensor. Therefore, a majority of the savings will be on evenings and weekends when there are fewer occupants. On average, we estimate a 30% reduction in vending machine (non-perishable) energy consumption for the buildings' audited.

Costs included in this report are based on installation by an outside contractor. As the installation of these units is straightforward, the work could be done by campus maintenance staff, resulting in a lower installed cost.

The fluorescent lights within the snack vending machines operate continuously and accounts for the majority of energy used in these machines. For additional energy savings (not including in analysis due to low savings), the vending misers installed in the beverage machines could be also be used to switch off the snack machines through the use of additional slave packs if the two machines are adjacent or close together.

5.4 ECM 4: Appliance Timers for Corridor Televisions

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
-	10,530	\$425	-	-	\$425	\$650	1.5

Television sets that display advertisements and university information have been installed in some of the buildings' corridors and lobbies. These TVs are operated 24 hours a day, 7 days a week and cannot be readily switched "off" without the use of a ladder or remote controls.

Indoor (7 day) appliance timers could be installed to switch off the TVs during evenings and weekends to reduce energy use. Energy savings are dependent on the schedules set for each day and the input power of the TVs. The energy savings listed in the table above were estimated based on the following:

- a total of 15 television sets were counted in the audited buildings;
- TVs having a rated input power of 200 watt each;
- TVs are switched off from 10:00 PM to 6:00 AM daily.

Budget costs do not include for installation by an outside contractor or engineering fees. Since the installation of these units is straightforward, the work could be done by campus maintenance staff, resulting in a lower installed cost.

Although not included in our analysis, appliance timers could also be installed on other electronics such as the video arcade machines in the Old Main and Campus Activity Centre. These machines often use volatile memory for recording player score information which will reset when switched off.

5.5 ECM 5: Power Factor Correction

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
-	-	\$8,191	-	-	\$8,191	\$36,800	4.5

The overall power factor levels at the campus' main electrical service drops below 90% during the summer months, resulting in electrical surcharges.

An electrical system's power factor can be improved by installing power factor correction capacitors. These capacitors are typically applied at the facilities' main electrical service or on specific pieces of equipment such as air-conditioning loads that have been identified as a major cause of the poor power factor.

Applying capacitors to the electrical system will cancel out the reactive power caused by the inductive loads, thereby, improving the power factor. To prevent system instability, or over voltage fluctuations, these capacitors are usually installed as part of a power factor correction unit. The unit measures the power factor and applies the required amount of correction (kVAR) by switching on and off individual capacitors.

The power factor level will fluctuate depending on changes in loads and equipment usage. If the decision is to implement this measure, further investigation (including electrical submetering) into the specific causes of the low power factor should be conducted after implementation of the selected ECMs included in this report.

Currently, we expect that the Trades and Technology building would be a major contributor to the low power factor due to the large amount of motors and process equipment located there.

Cost savings are based on the average power factor surcharges for 2009.

5.6 ECM 6: Holiday Scheduling

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	198,380	\$8,015	768	\$6,960	\$14,975	\$31,000	2.1

Currently all buildings with DDC operate to normal DDC weekday schedules on statutory holidays. It is proposed that the DDC be programmed to operate building systems in unoccupied mode on holidays.

According to operations personnel, buildings are locked on statutory holidays but access remains available to occupants through Campus Security. Override pushbuttons would be provided allowing occupants to revert systems operation to occupied mode for a timed interval. It should be noted that spaces served would be at unoccupied space temperature limits upon occupancy under some conditions.

The air handling systems listed in Table 53 have been identified for application of holiday scheduling.

Table 53: Systems Recommended for Holiday Scheduling

Building	System	Description	Building	System	Description
OM	AHU-1	A Block 1st floor	CAC	AHU-1	Main building AHU
OM	AHU-2	A Block 2nd floor	CAC	RTU-1	Addition main floor offices
OM	AHU-2	C-Block Computer lab	CAC	RTU-2	Addition 2nd floor & offices
OM	ACU-1	C-Block Drawing room Ref. Comp.	CAC	RTU-3	Addition multipurpose room
OM	ACU-2	C-Block ACU-2 Painting room	CAC	RTU-4	Addition multipurpose room
OM	ACU-3	C-Block ACU-3 ceramics room	IB	AHU-1	Building north wing
OM	ACU-4	C-Block ACU-3 ceramics room	IB	AHU-2	Building south wing
OM	ACU-5	C-Block ACU-5 store/workrooms	IB	AHU-3	Foyer
OM	ACU-6	C-Block Art Gallery	A&E	SF-1	Building make up air unit
OM	ACU-7	C-Block Darkrooms	A&E	HP	Heat pumps
OM	ACU-8	C-Block video studio	GYM	AH-1	Gym - south
OM	RTU-1	A-Block additions	GYM	AH-2	Gym - north
OM	RTU-2	A-Block additions	GYM	AH-3	Change rooms/offices
OM	RTU-3	A-Block additions	GYM	AH-4	Rec centre
OM	RTU-4	A-Block additions	LIB	RTU-1	Upper level South
OM	RTU-1	C-Block additions	LIB	RTU-2	Lower level South
OM	RTU-1	C-block theatre	LIB	RTU-3	Upper level North
OM	RTU-2	C-block theatre	LIB	RTU-4	Lower level North
OM	RTU-3	C-block theatre	CT	F-1	Third and fourth floors
OM	AHU-7	A Block third floor	CT	F-2	First and second floors
OM	AHU-3	B Block South	CT	RTU-1	Lecture theatre supply fan
OM	AHU-4	B Block North	AHT	RTU-1	East perimeter zones
SC	SF-101	East wing MAU	AHT	RTU-2	North interior zone
SC	SF-102	West wing MAU	AHT	RTU-3	Room 119
SC	SF-103	West wing MAU	AHT	RTU-4	Multi-use Room #1
SC	HP	Heat pumps	AHT	RTU-5	Multi-use Room #2
TTC	AHU-1	Level 1 South	AHT	RTU-6	South interior zone
TTC	AHU-2	Level 2 South	AHT	RTU-7	South perimeter zone
TTC	AHU-3	Levels 1 and 2 East			
TTC	FC-1	Networking room			
TTC	RTU-15	RTU-15			

Measure savings have been based on:

- ventilation savings based on Kamloops 2009 weather data and 16°C thermal balance temperature;
- Fan savings based on measured amps as recorded in balancing reports where available, or alternatively, motor size and 80% load factor;
- 20% fan run time to maintain minimum/maximum unoccupied space temperature, where necessary and;
- a 10% reduction in electrical and ventilation savings for occupant overrides.

Savings due to a reduction in building heat loss/gain have not been included.

Measure costs include for 30 override pushbuttons.

5.7 ECM 7: Optimum Start Morning Warm-up and Cool down for Ventilation Systems

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	216,990	\$8,765	839	\$7,600	\$16,635	\$44,900	2.7

Fans start-up times are established based the time required to restore the building space temperature to occupied condition after a period of overnight temperature setback or setup. Start-up times are dictated by periods of extreme outdoor air temperatures.

As shown in the Figure 46, the outdoor air temperature seldom falls or rises to levels that dictate the long warm-up times needed to restore building space temperature during extreme temperature conditions. On many days, the ventilation system start-up times can be delayed until quite close to building occupancy times.

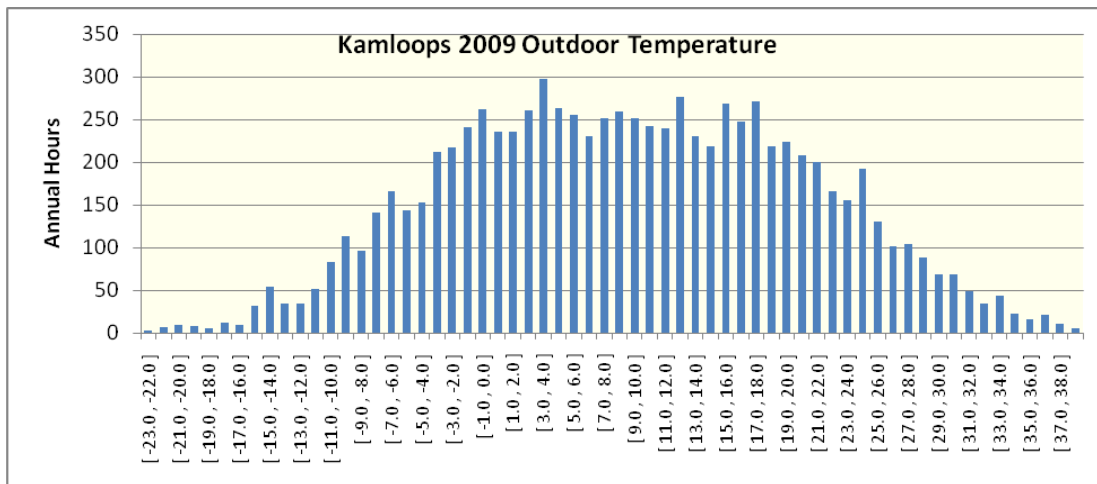


Figure 46: Kamloops Annual Outdoor Air Temperature Profile

It is proposed that the DDC system be modified to include optimum start heating and cooling. This allows system start-up times to vary with prevailing outdoor and space temperatures as required to attain desired space temperature at building occupancy. The algorithm used should include provision for self-tuning based on recent performance as well as earlier start times when systems have been off for more than one day.

During the optimum start period all air handling units would operate with full recirculation unless economizer cooling is appropriate and DDC interfaced exhaust fans would remain off. DDC weekly schedules would be modified to closely align with morning occupancy.

Measure savings have been based on:

- ventilation savings based on Kamloops 2009 weather data and 16°C thermal balance temperature;
- fan savings based on measured amps as recorded in balancing reports where available, or alternatively, motor size and 80% load factor;
- existing warm up times are appropriate for outdoor air temperatures at design condition; and
- warm up time decreasing linearly with increasing outdoor temperatures to 15 minutes prior to occupancy at thermal balance temperature.

5.8 ECM 8: Summer Scheduling

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	67,345	\$2,720	0	\$0	\$2,720	\$6,500	2.4

Fan systems operate to the same weekly schedules during the summer as they do during the spring and fall terms. Space usage during the summer is substantially reduced. It is proposed that a summer schedules be created and applied to each system listed in Table 54.

Override pushbuttons, provided in the Holiday scheduling measure, would be installed to allow building occupants to put systems into operation for a preset time, typically 4 hours.

Table 54: Systems Recommended for Summer Scheduling

Bldg	System	Service Area	Proposed Summer Schedule			
			Weekdays		Saturday and Sunday	
			Start Time	Stop Time	Start Time	Stop Time
OM	AHU-2	A Block 2nd floor	8:00 AM	4:30 PM	8:00 AM	4:30 PM
OM	F-1	Return fan for AHU-1 and AHU-2	8:00 AM	11:00 PM	8:00 AM	11:00 PM
OM	F-4	Gral Exhaust A- block South	8:00 AM	11:00 PM	8:00 AM	11:00 PM
OM	F-5	Gral Exhaust A- block North	8:00 AM	11:00 PM	8:00 AM	11:00 PM
OM	AHU-3	B Block	8:00 AM	11:00 PM	8:00 AM	11:00 PM
OM	AHU-4	B Block	8:00 AM	11:00 PM	8:00 AM	11:00 PM
OM	AHU-7	A-block 3rd floor	8:00 AM	4:00 PM	-	-
OM	AHU-2	C-Block Computer room	8:00 AM	11:00 PM	-	-
OM	ACU-1	C-Block ACU-1 drawing room	8:00 AM	5:00 PM	-	-
OM	ACU-2	C-Block ACU-2 Painting room	8:00 AM	5:00 PM	-	-
OM	ACU-3	C-Block ACU-3 ceramics room	8:00 AM	5:00 PM	-	-
OM	ACU-4	C-Block ACU-4 print shop	8:00 AM	5:00 PM	-	-
OM	ACU-5	C-Block ACU-5 store/workrooms	8:00 AM	5:00 PM	-	-
OM	ACU-6	C-Block Art Gallery	8:00 AM	5:00 PM	-	-
OM	ACU-7	C-Block Darkrooms	8:00 AM	5:00 PM	-	-
OM	ACU-8	C-Block video studio	8:00 AM	5:00 PM	-	-
OM	RTU-1	A-block addition	8:00 AM	4:00 PM	8:00 AM	4:00 PM
OM	RTU-2	A-block addition	8:00 AM	4:00 PM	8:00 AM	4:00 PM
OM	RTU-3	A-block addition	8:00 AM	4:00 PM	8:00 AM	4:00 PM
OM	RTU-4	A-block addition	8:00 AM	4:00 PM	8:00 AM	4:00 PM
OM	RTU-1	C-Block Addition	8:00 AM	4:00 PM		

OM	RTU-1	C-block theatre	8:00 AM	6:00 PM	8:00 AM	6:00 PM
OM	RTU-1	C-block theatre return fan	8:00 AM	6:00 PM	8:00 AM	6:00 PM
OM	RTU-2	C-block theatre	8:00 AM	6:00 PM	8:00 AM	6:00 PM
OM	RTU-3	C-block theatre	8:00 AM	6:00 PM	8:00 AM	6:00 PM
SC	SF-101	East wing MAU	8:30 AM	5:00 PM	-	-
SC	SF-102	West wing MAU	8:30 AM	5:00 PM	-	-
SC	SF-103	West wing MAU	8:30 AM	5:00 PM	-	-
SC	HP	Heat pumps	8:30 AM	5:00 PM	-	-
TTC	AHU-3	Levels 1 and 2 East supply fan	8:00 AM	5:00 PM	-	-
TTC	FC-1	Telecommunications	8:00 AM	9:00 PM	8:00 AM	9:00 PM
TTC	RTU-15	Supply fan	8:00 AM	5:00 PM	12:00 AM	12:00 AM
CAC	RTU-1	Addition main floor offices	8:00 AM	4:00 PM	8:00 AM	4:00 PM
IBC	SF-1	for AHU-1	8:00 AM	11:59 PM	8:00 AM	11:59 PM
IBC	SF-2	for AHU-2	8:00 AM	11:59 PM	8:00 AM	11:59 PM
IBC	AHU-3	for AHU-3	8:00 AM	11:59 PM	8:00 AM	11:59 PM
A&E	SF-1	Building make up air unit	8:00 AM	8:00 PM	8:00 AM	4:00 PM
A&E	Heat Pumps	Heat pump Geography	8:00 AM	11:57 PM	8:00 AM	11:57 PM
GYM	AH-1	for Gym - south	8:00 AM	4:00 PM	8:00 AM	4:00 PM
GYM	AH-2	for Gym - north	8:00 AM	4:00 PM	8:00 AM	4:00 PM
GYM	AH-3	change rooms/offices	8:00 AM	4:00 PM	8:00 AM	4:00 PM
GYM	AH-4	Rec Centre	8:00 AM	4:00 PM	8:00 AM	4:00 PM
LIB	RTU-1	Upper level South	8:00 AM	5:00 PM	-	-
LIB	RTU-2	Lower level South	8:00 AM	5:00 PM	-	-
LIB	RTU-3	Upper level North	8:00 AM	5:00 PM	-	-
LIB	RTU-4	Lower level North	8:00 AM	5:00 PM	-	-
LIB	EF-7	Lounge	8:00 AM	5:00 PM	-	-
CT	F-1	Third and fourth floors	8:00 AM	7:00 PM	-	-
CT	F-2	First and second floors	8:00 AM	7:00 PM	-	-
CT	RTU-1	Lecture theatre	8:00 AM	7:00 PM	-	-
AHT	RTU-1	East perimeter zones	8:00 AM	4:00 PM	-	-
AHT	RTU-2	North interior zone	8:00 AM	4:00 PM	-	-
AHT	RTU-3	Room 119	8:00 AM	4:00 PM	-	-
AHT	RTU-4	Multi-use Room #1	8:00 AM	4:00 PM	-	-
AHT	RTU-5	Multi-use Room #2	8:00 AM	4:00 PM	-	-
AHT	RTU-6	South interior zone	8:00 AM	4:00 PM	-	-

Measure savings have been based on:

- ventilation savings based on Kamloops 2009 weather data and 16°C thermal balance temperature;
- 20% fan run time to maintain minimum/maximum unoccupied space temperature, where necessary; and
- summer semester of 11 weeks.

5.9 ECM 9: VAV Zone Isolation

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	116,330	\$4,700	203	\$1,845	\$6,545	\$50,000	7.6

Currently all weekly scheduling is applied at a building or system level. Some of the zones served by air handling systems are generally not in use during evenings and weekends but the systems must operate to serve potentially occupied classrooms and occasional office usage.

In some cases, for example administration offices, bookstore and retail shops in CAC building, the occupancy periods are fixed. In others, the occupancy periods are unpredictable.

Where zones are served by DDC interfaced VAV boxes, various retrofits are proposed:

- **Type A:** weekly scheduling would be applied at the zone level where reduced occupancy periods are known. When the fan systems are operating, the VAV boxes serving known unoccupied areas would be closed subject to maintaining unoccupied space temperatures;
- **Type B:** some zones, for example offices, would be assigned to a weekly schedule aligned with typical occupancy hours and equipped with occupant overrides. When the fan systems are operating, the VAV boxes serving unoccupied areas would be closed subject to maintaining unoccupied space temperatures. Occupant overrides would restore occupied temperatures and ventilation rates for a fixed time interval;
- **Type C:** zones identified as having reduced but unpredictable occupancy would be equipped with occupancy sensors. When the fan systems are operating, the VAV boxes serving unoccupied areas would be closed subject to maintaining standby space temperatures. Standby space temperature during periods of potential occupancy would be maintained within the range of 19 to 24C. A periodic flush would be provided.

The zones identified for zone level scheduling are shown in Table 55 to Table 58.

Table 55: Systems Recommended for VAV Zone Isolation - International Building

Area	AHU	Zone Type
VAV 107 40 CASE ROOM	AHU-1	C
VAV 108 50/60 CASE ROOM	AHU-1	C
VAV 109 50/60 CASE ROOM	AHU-1	C
VAV 110 50/50 CASE ROOM	AHU-1	C
VAV 212 PASSIVE LOUNGE	AHU-1	C
VAV 213 BREAK OUT	AHU-1	C
VAV 214 STAFF	AHU-1	B
VAV 216 STAFF	AHU-1	B
VAV 217 COMPUTER LAB	AHU-1	B
VAV 218 STAFF	AHU-1	B
VAV 219 CIMPUPER LAB	AHU-1	B
VAV 220 STAFF	AHU-1	B
VAV 310 MULTIPURPOSE	AHU-1	D
VAV 311 MULTIPURPOSE	AHU-1	D
VAV 312 MULTIPURPOSE	AHU-1	D
VAV 314 OFFICES	AHU-1	A

Area	AHU	Zone Type
VAV 315 OFFICE	AHU-1	A
VAV 316 OFFICES	AHU-1	A
VAV 318 OFFICES	AHU-1	A
VAV 319 OFFICES	AHU-1	A
VAV 320 OPERATIONS CTR	AHU-1	A
VAV 322 OFFICES	AHU-1	A
VAV 201 STAFF	AHU-2	B
VAV 202 STAFF	AHU-2	B
VAV 203 STAFF	AHU-2	B
VAV 204 PASSIVE LOUNGE	AHU-2	C
VAV 205 BREAK OUT	AHU-2	C
VAV 206 LANGUAGE LAB	AHU-2	C
VAV 207 LANGUAGE LAB 207	AHU-2	C
VAV 208 STAFF	AHU-2	B
VAV 209 STAFF	AHU-2	B
VAV 210 STAFF	AHU-2	B
VAV 301 OFFICES	AHU-2	A
VAV 303 OFFICE	AHU-2	A
VAV 304 OFFICE-WAITING	AHU-2	C
VAV 305 OFFICES	AHU-2	A
VAV 306 CLASSROOM	AHU-2	C
VAV 307 OFFICES	AHU-2	A
VAV 308 OFFICES	AHU-2	A
VAV 309 OFFICE	AHU-2	A
VAV 401 WORK ROOMS	AHU-2	A
VAV-101 CLASSROOM	AHU-2	B
VAV-102 CLASSROOM	AHU-2	B
VAV-103 100 CASE ROOM	AHU-2	C
VAV-104 40 CASE ROOM	AHU-2	C
VAV-105 100 CASE ROOM	AHU-2	C

Table 56: Systems Recommended for VAV Zone Isolation Trades and Technology Building

Area	AHU	Zone Type
R 105 CLASSROOM	AHU-1	C
R 107 CLASSROOM	AHU-1	C
R 109 CLASSROOM	AHU-1	C
R 111 CLASSROOM	AHU-1	C
R 113 CLASSROOM	AHU-1	C
R 115 CLASSROOM	AHU-1	C
R 119 CLASSROOM	AHU-1	C
R 129 CLASSROOM	AHU-1	C
R 133 CLASSROOM	AHU-1	C

Area	AHU	Zone Type
R 135 CLASSROOM	AHU-1	C
R 137 CLASSROOM	AHU-1	C
R 139 CLASSROOM	AHU-1	C
R 141 CLASSROOM	AHU-1	C
R 149 CLASSROOM	AHU-1	C
R 153-173 OFFICES	AHU-1	A

Table 57: Systems Recommended for VAV Zone Isolation - Campus Activity Centre

Area	AHU	Zone Type
BOOKSTORE	AHU-1	A
ROOM 130	AHU-1	B
R 151, 152, 156-158 OFFICES	AHU-1	A
R-150-153-155 RETAIL	AHU-1	A
PUB	AHU-1	B
KITCHEN AREAS	AHU-1	B
FOOD COURT	AHU-1	C
GRAND HALL	AHU-1	D
CURA OFFICES	AHU-1	A

Table 58: Systems Recommended for VAV Zone Isolation - Old Main Building B-Block

Area	AHU	Zone Type
VAV-36, 38 PRINT MAKING	AHU-3	B
VAV-35 OFFICES 1523	AHU-3	A
VAV 37 STORAGE 1522	AHU-3	A
VAV-40 DESIGN STUDIO 1501	AHU-3	B
VAV-43 CICAC 1487	AHU-3	A
VAV-41 MEDIA SERVICES 1496-94	AHU-3	A
VAV-42 OFFICES 1482-86	AHU-3	A
VAV 46 CLASSROOM 1472	AHU-3	C
VAV-48 OFFICES 1462-1466	AHU-3	A
VAV-47 OFFICES 1455-1479 NORTH	AHU-3	A
VAV-50 OFFICE 1438	AHU-4	A
VAV-52 ADMIN OFFICE 1412	AHU-4	A
VAV-51 OFFICES 1417, 1421	AHU-4	A
VAV-53 LAB JOURNALISM 1411	AHU-4	B
VAV-55, 59 OFFICES 1251-1277	AHU-4	A
VAV-60 CLASSROOM 1219	AHU-4	C
VAV-62 CLASSROOM 1201	AHU-4	C
VAV-61 OFFICES 1222-1242	AHU-4	A
VAV-63 PRINTSHOP 1206	AHU-4	A

Measure savings have been based on:

- classrooms occupied 50% of the time during unscheduled usage periods (Type C);
- offices occupied 10% of the time during unscheduled occupancy periods (Type B) and;
- a 30% derating in savings for unoccupied/standby space temperature control.

5.10 ECM 10: DCV for Classrooms and Offices Served by WS Heat Pumps

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	21,755	\$880	1,227	\$11,125	\$12,005	\$102,500	8.5

Classrooms and offices in the Science and A&E buildings are served by heat pumps located in corridor service closets. Each closet contains about four heat pumps and is equipped with an outdoor ventilation supply from the make-up air system.

It is proposed that in each closet a modulating damper/actuator be installed on the make-up unit supply and a carbon dioxide (CO₂) transmitter be mounted in the closet. The transmitter and damper would be interfaced to one of the existing heat pump DDC controllers. The damper would be controlled, subject to a minimum damper position, to maintain a maximum supply air CO₂ concentration level. The supply air CO₂ concentration setpoint would be set to a level that would provide sufficient outdoor air when classrooms are fully occupied. Providing free cooling was not appropriate, when classrooms are not in use, the damper would modulate towards closure reducing the ventilation loads and make-up unit fan speed.

Measure savings have been based on:

- existing DDC weekly schedules as modified for holiday scheduling;
- areas occupied for approximately 30 hrs/week; and
- approximately 50% savings in make-up unit fan electrical energy and ventilation heating.

5.11 ECM 11: Demand Controlled Ventilation for Clock Tower Theatre

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	3,800	\$155	23	\$210	\$635	\$3,900	10.7

Air handling unit RTU-1 serves the 212-seat theatre located in the Clock Tower. Room allocation data indicates that for 2009 theatre usage was limited to about 56% of the 3720 hours of fan system operation.

It is proposed that space occupancy sensors and a carbon dioxide transmitter be installed to reduce both the air handling unit operating hours and ventilation loads. During weekly scheduled operating periods, the air-handling unit supply fan would be cycled as required to maintain somewhat higher or lower theatre temperatures when the theatre is unoccupied. When in operation, the outdoor air ventilation rate would be adjusted in accordance with the number of theatre occupants.

Measure savings have been based on:

- no fan or ventilation savings during scheduled occupancy periods;
- 2009 theatre usage;
- 20% fan system run time during unoccupied periods to maintain standby space temperatures; and
- a minimum outdoor ventilation rate of 5% fan system capacity.

5.12 ECM 12: Align Clock Tower DDC Weekly Schedules with Typical Occupancy

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	3,295	\$135	140	\$1,265	\$1,400	\$8,700	6.2

Offices in the Clock Tower are served by two air handling units (F1 & F2). The system operates on weekdays from 6:00 AM to 10:00 PM. Office hours are from 8:00 AM to 5:00 PM.

It is proposed that the weekly schedules be aligned with typical occupancy hours and occupancy override pushbuttons be installed to provide for after hours operation.

Measure savings are based on:

- retrofit schedule from 8:00 AM to 6:00 PM;
- Kamloops 2009 hourly weather data; and
- two days per week of extended operation to current shutdown time.

5.13 ECM 13: Trades Welding Booth Fan Operation

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	36,120	\$1,460	851	\$7,710	\$9,170	\$40,200	4.4

The two-speed 15 HP welding shop make-up unit (MAU-1) supplies 23,000 CFM of outdoor air which is exhausted by eight welding booth exhaust fans (EF-17 to EF-22, EF-24 & EF-33).



Figure 47: Arc Welding Booths



Figure 48: Welding Booth Exhaust Fans

Each exhaust fan serves four or five welding booths. The make up unit fan speed is controlled based on the number of exhaust fans in operation. As all exhaust fans are currently manually started in the morning and shut down at the end of each day by the instructor, the make-up unit operates at full speed for about 14 ½ hours each day.

It is proposed that each of the electrical circuits serving the arc welders in the welding booths be equipped with current sensors. When welding is detected by the current sensor, the associated exhaust fan would start and continue to operate for several minutes after completion of the welding operation. The speed of the make-up unit fan would be reset based on the number of active welding booth exhaust fans.

Measure savings has been based on a daily welding exhaust fan usage distribution shown in Figure 49.

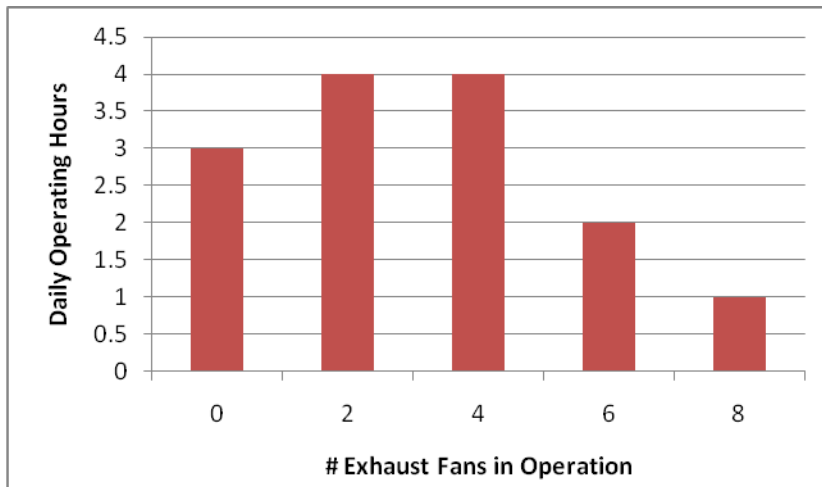


Figure 49: Welding Booth Usage Distribution

The welding instructor was in support of this measure and recognized that the energy savings is dependent on assignment of welding booths based on minimizing exhaust fan usage.

Measures costs include:

- supply and installation of a DDC panel interfaced to 36 current sensors; and
- DDC program code, graphics screen and documentation.

5.14 ECM 14: Wood Shop Dust Collector Occupancy Controlled Shutdown

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	9,885	\$400	14	\$130	\$530	\$5,200	9.8

The 30 HP wood shop dust collector system extracts wood dust from numerous stationary and workbench mounted tools. The 9000 CFM extraction system was operative at the time of the site visits although the shop was unoccupied.



Figure 50: Woodshop Exhaust Ducting

It is proposed that DDC interfaced occupancy sensors be installed and the exhaust system be automatically shut down during periods when the shop is not in active use.

Measure savings have been based on:

- existing system operates for 2200 hrs/year;
- shop is in active use for an average of 6 hours per day;
- 40% run time due to sporadic occupancy detection when shop is not in active use;
- 15% of exhaust air is infiltration; and
- Kamloops 2009 weather data.

5.15 ECM 15: Standby Mode and DCV for Gym Ventilation Systems

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	30,050	\$1,215	330	\$2,985	\$4,200	\$12,900	3.1

The gymnasium is served by two air handling systems (AH-1 & AH-2), that provide heating, ventilation and air conditioning. The units collectively supply a minimum outdoor ventilation rate of about 7,000 CFM which is suitable for occupancy of 460 persons.

During moderate outdoor air conditions one or both fan systems can be shut down when the space is unoccupied during weekly scheduled occupancy periods. Furthermore, during periods of limited occupancy the outdoor air ventilation rate can be curtailed based on prevailing carbon dioxide concentration level.

It is proposed that the gym be equipped with occupancy sensors and carbon dioxide transmitters on the system return ducts. During unoccupied periods the fan systems would operate intermittently as required to maintain standby space temperature. During occupied periods the outdoor ventilation rate would be controlled to maintain a CO₂ concentration upper limit of 900 ppm.

A minimum ventilation rate would be maintained during system operation and a flush would be provided in the event that the system has not operated for a period of 2 hours. Fans would have a minimum run time of 30 minutes to prevent excessive cycling.

Measure savings have been based on:

- existing operating schedules (daily 8:00 AM to 10:30 PM) adjusted for proposed summer scheduling;
- gym occupancy for 65 hours each week;
- a minimum ventilation rate of 5% combined fan system capacity; and
- fan system run times reduced by approximately 60% during unoccupied periods.

5.16 ECM 16: Heat Pump Loop Pump Shutdown

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	33,815	\$1,365	0	\$0	\$1,365	\$8,300	6.1

Both the Science and A&E buildings are equipped with two heat pump loops to provide heating and cooling to classrooms, labs and offices. The four 7.5 HP loop circulating pumps currently operate continuously. All heat pumps are interfaced to the DDC system.

During mild outdoor temperature conditions the potential exists for shutting down of the heat pump loop pumps during unoccupied periods provided all spaces are within an acceptable unoccupied temperature range. As well, during more severe outdoor conditions the heat pump loop pumps can be shutdown each day at the end of the occupancy period until rooms reach the unoccupied temperature limits.

When any heat pump is required to operate to maintain unoccupied space temperatures, the loop pump would be started prior to enabling the heat pump compressor. The loop pump would then operate throughout the remainder of the unoccupied period.

- operation hours of 8:00 AM to 10:00 PM Monday to Friday;
- one hour per day of extended operation due to overrides; and
- Kamloops 2009 hourly weather data.

5.17 ECM 17: Old Main Unoccupied Exhaust Fan Shutdown

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	7,910	\$320	364	\$3,300	\$3,620	\$27,100	7.5

Numerous exhaust fans in the Old Main building were noted to be operating during unoccupied periods. Most of these exhaust fans are occupant controlled by line voltage switches. A few are equipped with run down timers that were not functional at the time of the site reviews.

The exhaust air from these fans during unoccupied periods is made up by infiltration air that is heated to unoccupied space temperature. The cost of the avoidable operation is predominately for heating of ventilation air.

It is proposed that 26 exhaust fans be interfaced to the DDC system and enabled/disabled based on weekly schedules. During unoccupied periods the fans would be shut down and during occupied periods the fans would be enabled to operate based on local switch settings.

Measure savings have been based on:

- daily fan shut down from 10:00 PM to 6:00 AM;
- fans currently operate 25% of the time during unoccupied periods;
- exhaust air flow rates of 80% capacity;
- heating of ventilation air to 16°C; and
- Kamloops 2009 weather data.

5.18 ECM 18: Install Flue Dampers on CAC Heating Plant

Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
0	0	\$0	1,377	\$12,480	\$12,480	\$8,000	0.6

Each of the four 1430 MBH atmospheric boilers serving the Campus Activity Centre are equipped with flue dampers to reduce standby losses when the boilers are not firing. Standby losses can be particularly high for this heating plant as heating water is continuously pumped through all boilers whenever the heating plant is in operation. At the time of the audit the operators on all four flue dampers had been removed and dampers locked in the fully open position. As well, wiring to the flue dampers was removed indicating intent not to restore the flue dampers to working order. Operations personnel indicated that replacement damper operators are no longer available.

It is proposed that new flue dampers be installed on each of the four boilers subject to confirmation that replacement operators are not available.

Measure savings have been based on:

- Kamloops 2009 weather data;
- at Kamloops heating design outdoor air temperature (-25°C) three boilers operating at full fire are required;
- existing 20°C heating plant warm weather shutdown;
- proper boiler staging; and
- a resulting 18.5% increase in the heating plant AFUE.

6. OTHER SAVING OPPORTUNITIES

There are technically feasible initiatives that can be implemented to achieve even further energy reductions beyond the measures presented. This section contains measures that were identified which resulted in lengthy paybacks or for which paybacks were not quantified. A summary is presented in Table 59.

Table 59: Other Energy Measure Opportunities Summary

Section	Measure	Demand Savings (kW)	Electrical Savings (kWh)	Fuel Savings (GJ)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
6.1	Halogen Lamp Replacement	28	42,364	-	\$4,375	\$15,000	3.4
6.2	Exterior HID to LED Lighting Replacement Luminaires	10	43,537	-	\$2,708	\$85,000	31.4
6.3	Replace Neon Tube Lighting with LED Accent Lighting	2	13,803	-	\$711	\$14,000	19.7
6.4	Trades and Technology Overhead Door Alarm						
6.5	Curtail Unoccupied Heating						

6.1 Halogen Lamp Replacement

In locations where halogen incandescent lamps, are either required for the quality of light they produce (where compact fluorescent lamps are not suitable), or in locations where dimmer switches are installed, an equivalent lower wattage IR (Infrared) halogen lamp could be used as a replacement. These lamps consume less energy, produce nearly identical light output and have an extended life over standard halogen lamps.

We do not recommend replacement of the existing lamps as part of an energy saving project, since the new lamps will likely burn-out before their payback period. However, we recommend that the halogen IR lamps be used to replace the standard halogen lamps upon failure.

The following table outlines the typical IR replacement lamps proposed. As lighting systems in vary, the proposed retrofits listed are not applicable in all locations.

Table 60: Typical Halogen Lamp Replacement

Existing Lamp	Recommended Replacement Lamp
35 watt MR16	20 watt IR MR16
50 watt MR16	35 watt IR MR16
100w Inc A19	40w PAR20 IR 120V (recessed downlights only)
65w Inc BR30	40w PAR30 IR 120V
150w Inc PS25	90 watt IR PAR38
90w Inc PAR38 H Flood	60w PAR38 IR

6.2 Exterior HID to LED Lighting Replacement Luminaires

Wall Mounted Luminaires

It is possible to replace the existing low wattage, 50, 70, 100 and 150 watt metal halide, mercury vapour, high pressure sodium wallpacks, and other building mounted lighting with new luminaires using LED technology light sources.

Many existing luminaires are not a cut-off or full cut-off type luminaire. This results in light output being emitted above 90 degrees from NADIR; this stray light does not reach any illumination task, it is merely lost to the skies and contributes to skyglow. The energy used to produce this lost light output is lost energy. This means that using a lower wattage and lower lumen output source, housed in a cut-off style luminaire could produce the same or even higher task illuminance values compared to existing systems. In this application, LED lighting could produce acceptable light levels, with viable energy savings.

LED technology has been slowly progressing through various development stages and problems. The evolution of these products has begun to move beyond issues related to reliability, light output, product operational life, and other factors that have kept this light source being viable in many applications. Up to the last couple of years, successful applications of this light source have been limited to mostly product branding applications or highlighting and not general illumination. If the decision is to proceed with this measure, we suggest performing a mock up installation prior to implementation to evaluate products from various manufacturers and determine the most effective system.

Cost savings for this measure do not include maintenance savings or utility incentive rebates; which will lower overall costs and paybacks. Implementation costs are based on a one-for-one replacement of each exterior luminaire. Additional quantities of luminaires may need to be installed to ensure adequate lighting levels.

Pole Mounted Luminaires

It is not yet recommended to replace high wattage, pole mounted parking lot and area lighting systems mounted higher than 15' with LED light sources. A higher wattage LED system would be required to match the light output of the existing HID systems, which would result in greater energy use.

Some lower wattage pole mounted luminaires, however, could be replaced with LED technology for energy and maintenance savings.

See **APPENDIX E** for savings and cost analysis for LED lighting.

6.3 Replace Neon Tube Lighting with LED Accent Lighting

Typically, neon lighting systems have an average rated life of 12-15 years. The neon accent lighting in the CAC atrium is approximately 18 years old and has reached its end of life. (Figure 51). During the audit, it was observed that there were burnt-out sections of tubing and signs of deterioration and delamination.

Replacing the failed transformers and burnt-out sections of neon tubing in the high ceiling space is estimated to cost \$1,000 a year. Replacement costs are expected to increase as the neon system becomes outdated and unavailable.

Replacing existing system with LED accent lighting can provide some energy savings while significantly reducing maintenance costs. The installation of a new LED system is not cost justified in term of energy savings alone (~20 year payback period); however, the expected annual maintenance savings is expected to reduce the payback period to approximately 8 years.

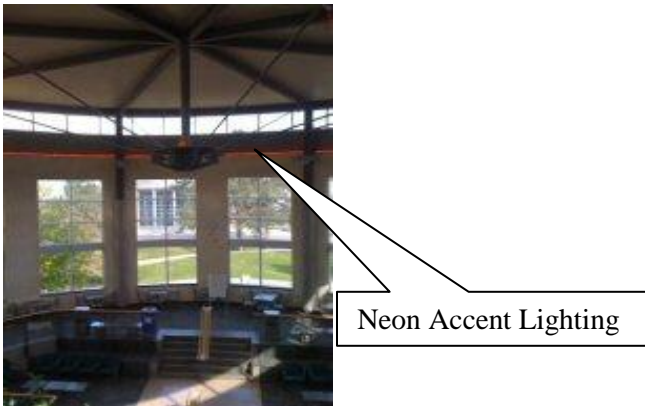


Figure 51: CAC Neon Lighting

6.4 Trades and Technology Overhead Door Alarm

An overhead door is located at the west end of the shop corridor. According to building occupants, students frequently leave this door open. This results in infiltration of outdoor air into the corridor, excessive heating by the corridor overhead mounted force flow units and discomfort for building occupants.

It is proposed that a door switch, strobe light and audible alarm be interfaced to the DDC system. When the door is left open under outdoor temperature conditions that necessitate additional heating loads, the strobe light would be energized subject to a reasonable delay. Should the door remains open for a further time interval, the audible alarm would be energized.

Door open periods and resulting infiltration cannot be quantified with any level of certainty. Consequently, measure savings have not been quantified. We are of the opinion that this retrofit will result in significant ventilation heating savings; implementation is highly recommended.

6.5 Curtail Unoccupied Heating

The heating boilers, primary circulators and secondary pumps in most buildings are enabled based on warm weather shutdown temperatures. During unoccupied periods, when building temperature is allowed to fall to unoccupied space temperature, there is no requirement for heating plant operation when outdoor air temperatures are above about 14°C. As well, when outdoor air temperatures are above freezing the heating plants can be disabled provided building setback temperature is maintained.

Fuel savings will be realized due to a reduction in heating plant standby and distribution losses. As well, unintentional heating resulting from passing heating valves will be avoided when pumps are off. Additional heating pump shutdown periods will result in electrical savings.

7. CAPITAL UPGRADE PROJECTS

The measures listed in this section are recommended as improvements to the building and are not cost justified based on energy savings.

In some cases, the energy use will increase because of the energy requirements of the capital recommendations. For example, increasing the amount of illumination in an area that has inadequate lighting will increase energy use. Furthermore, adding ventilation to areas without will increase both electrical and gas use.

The measures are summarized in Table 61.

Table 61: Summary of Capital Upgrade Projects

Section	Capital Measure	Demand Savings (kW)	Electrical Savings (kWh)	Fuel Savings (GJ)	Total Cost Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback (yrs)
7.1	Paracube Louvres Replacement	-	-	-	-	\$1,400	-
7.2	PCB Disposal	-	-	-	-	\$1,000	-
7.3	Improve Trades and Technology Corridor Lighting	-1.6	-13,549	-	-\$701	\$9,400	-
7.4	Code Violation Correction	-	-	-	-	-	-

7.1 Paracube Louvres Replacement

Some recessed fluorescent luminaires use ½” x ½” acrylic paracube louvers which were designed to reduce glare on older technology CRT computer monitors and thereby eliminate distracting reflections. While louvers are generally a good approach to glare control, these small-cell paracube louvers are extremely inefficient, blocking 40-60% of the light produced by the luminaire, as well as reducing the spread of light. This results in reduced light levels reaching the work surface and lowers the perceived level of brightness in a room.

The flat prismatic lenses used in the majority of recessed fluorescent luminaires are designed to spread light and provide even illumination on the work surface. Although prismatic lenses produce more glare, most computers on campus use LCD monitors which are not reflective. We suggest replacing the paracube louvers with prismatic lenses as they are far more efficient at transmitting light. This upgrade will increase lighting levels and offset any reduced light output of the energy saving fluorescent lamps. Alternatively, larger cell louvers (¾” x ¾” or 1” x 1”) could be used to maintain the style of the louvre while controlling glare and improving light levels.

The replacement of paracube louvers with prismatic lenses has not been included as part of the lighting systems upgrade. The estimated costs for replacement of louvers is included in the Capital Project Summary, based on the quantities observed on site.

7.2 PCB Disposal

Ballasts containing PCBs are an environmental hazard and must be disposed of in accordance with governmental regulations. As a part of the lighting systems upgrade, any PCB containing ballasts found at the site will need to be properly contained and disposed through the use of a registered environmental waste disposal firm.

Use of PCBs in lighting systems ballasts was regulated and discontinued after 1978 for fluorescent systems and after 1979 for High Intensity Discharge (HID) systems.

During the audit of the lighting in the facility, ballasts were reviewed to confirm if ballasts identifiable as containing PCBs were in use in the facility. Unless a facility was constructed after 1978, there is a potential that the facility could have ballasts in place that contain PCBs, whether these ballasts were identified during the audit review or not.

During our review, we observed that some of the fluorescent luminaries in the Old Main and Gymnasium buildings appear to utilize ballasts that are PCB contaminated. Although no PCB contaminated ballasts were seen in the Library building, there is a possibility that a few of the ballasts could still contain PCBs due to the year of construction of the building.

Based on an assigned percentage of ballasts that may contain PCBs, a cost estimate for disposal was determined and is included in the Capital Project Summary.

Contractors performing a lighting upgrade should be instructed to identify all potential PCB contaminated ballasts.

Regulatory changes to hazardous materials destruction will require that all PCB ballasts be not only removed from lighting systems, but be removed from sites and destroyed before 2014. As of 2009, onsite storage of such materials will only be allowed for six months. As a result, disposal costs are expected to rise due to the increased amounts of these materials that are sent to facilities for destruction. We recommend removing these materials sooner than later, to avoid any future regulatory issues and to have these materials disposed of at lower per unit costs that can be anticipated in the future.

7.3 Improve Trades and Technology Corridor Lighting

Trades and Technology Corridor Lighting

The wall-mounted luminaires (Figure 52) in the corridors of the Trades and Technology building do not appear to meet the BC Building Code. Section 3.1.13.4 of the code indicates that in the event of a fire, the lens/diffuser of a luminaire needs to be able to shrivel and fall to the floor when exposed to heat before coming in contact with flames. Although the lenses would shrivel, it appears unlikely that would fall due to the metal louvers in place.



Figure 52: Trades and Technology Corridor Lighting

The existing luminaires are also inefficient and have poor light distribution resulting in the corridors appearing dark as the walls and ceiling are not illuminated.

In order to rectify the issue while improving light levels, we recommend replacing these existing luminaires with new surface mounted luminaires that have an up and down distribution. The new luminaires should each be equipped with instant start electronic ballasts and 2-28 watt T8 lamps to match the remainder of the building.

7.4 Code Violation Correction

Exposed Wiring in Arts & Education Building

At the time of audit it was observed that there is wiring in room 9358 of the Arts & Education building as shown in Figure 53, which does not meet the electrical code as the conductors are exposed and not capped off. This constitutes a fire or shock hazard if the wiring becomes energized.

We recommend investigating whether the wiring is connected to a power source and ensuring that the exposed wiring is properly tagged and made electrically safe. Costs have not been included as it is assumed that an onsite electrician can correct this deficiency.



Figure 53: Exposed Wiring

8. BEHAVIOURAL AND OPERATIONAL CHANGE

This section provides information on areas where behavioural change can impact reductions to the energy use. Although the savings potential has not been determined, TRU should consider which aspects can be integrated into their operation. A list of low cost and no cost measures has been included in **APPENDIX I** and further details are provided in this section.

8.1 Communication and Awareness Program

Ongoing energy management should be part of a building communication program. For example, staff should be encouraged to shut off lights, computer monitors and copiers when not in use and to shut off computers at the end of the day. Education on the costs of running plug load equipment and the environmental benefits of reducing energy use may encourage participation.

Training operating staff, cleaners and security on the costs and benefits of energy management can provide another means of improving energy performance. Staff should be challenged and rewarded for actions that help improve the building performance.

In addition, increasing awareness among all building users of the link between energy use and the environment may help encourage better use of energy.

8.2 Enable Power Saving Features of Computers and Monitors

Computer monitors use energy even when a screen saver is in place. During the day, many monitors were observed as being on with no user present. Overnight, this number was reduced to an undetermined percentage of the computers in the facility. The following software settings can typically be set up on a computer to reduce its energy consumption:

- set screensavers to turn on after being idle for 14 minutes. Choose screensavers that avoid bright pictures or heavy colour use;
- shut down monitor after being idle for 20 minutes;
- turn off the hard drives after the computer has been idle for one hour.

These settings should be confirmed with users and PC support staff.

8.3 Operating Procedures

Improvements to operating procedures can also result in energy savings opportunities. The following are areas of potential improvement:

- training – increased knowledge of engineering staff on programming DDC system operation will help to optimize system performance;
- improved monitoring systems – improve monitoring of utilities by using computer software that will normalize for billing period, weather, occupancy, etc. It is critical that the software be capable of normalizing for these variables so that you can properly compare one month to the next. Problems with utility demands or consumptions can be caught and corrected within a month.
- consideration should be given to adding DDC points for measurement of building electrical load. This would allow for evaluation of peak electrical and unoccupied loads which may, in turn, lead to load reduction opportunities.

9. IMPLEMENTATION AND MONITORING

9.1 Implementation of Retrofit

The next phase of the project is the implementation of the energy management measures. This would include design, specification, tender, and commissioning of the project.

The following steps outline our recommended approach:

Designs and Specifications

Prism will provide detailed designs and specifications for the purchase and installation of equipment for the project. At the same time, test areas can be set up to demonstrate the suitability of certain retrofit measures.

Separate specifications will be provided for the lighting and mechanical measures. The tender packages will include product specifications and installation standards. The specifications will also include general terms and conditions addressing issues such as contractor liability, contractor insurance requirements and proper disposal of obsolete equipment.

We will meet with your assigned representative to review the designs and specification and to address your specific needs. Prism's familiarity with the building and recommended measures will ensure that all measures are implemented according to the intent of the study.

Lighting Drawing Preparation

Prior to the implementation of the project, drawings will be produced to assist in the installation of new lighting, repositioning of lighting or removal of excess lighting. These drawings will be provided on an as required basis.

Tender and Contract Preparation

Contractor(s) invited to submit pricing will be selected based on their ability to perform the work taking into account TRU's preferences. The tender will include a site meeting between Prism and the invited contractors to thoroughly review the specification documents and scope of work. Proposed equipment will be pre-approved by Prism Engineering prior to acceptance.

Tender Review and Recommendation

The bid review will include an evaluation of all tenders submitted by the invited contractors, including compliance, price, installation schedule and contractor experience. As we are not affiliated with any products, suppliers, or contractors, our recommendations will be based on the merits of the tenders alone.

Installation Overview

We will review shop drawings submitted by contractors and will conduct field reviews to ensure the installation complies with the specifications. We will assist in resolving any issues that might occur during the course of the installation. Emphasis will be placed on maintaining a clean site and not interfering with occupants' use of the building during the project.

Review and Testing

We will provide a final review of the equipment installed as part of the project to ensure compliance with the specification requirements.

Project Management

Prism will work with TRU's project management team. We will meet with you to report on the project as required and will make recommendations on contractor payment at various stages of the project.

9.2 Monitoring of Results

Monitoring can identify excessive energy use which, in turn, can lead to improved operating practices. The cost of utility monitoring can usually be justified by the energy savings derived from the operational changes made. Monitoring can identify excessive energy use that can lead to actions to improve operating practices. TRU spends over \$1,400,000 per year on energy. If monitoring could save an estimated 2% of the energy costs, this is equivalent to \$28,000 annually. Monitoring reports also provide feedback to the staff that will encourage the ongoing conservation effort.

Utility monitoring and targeting will benefit TRU by:

- providing easy to read summaries of electricity and fuel consumption and costs compared to previous periods;
- identifying energy performance for both individual accounts and consolidated for all accounts;
- benchmarking performance between sites (where applicable);
- calculating energy and cost savings achieved from prior retrofits or initiatives adjusted for the impact of weather;
- identifying locations with high energy use that require investigation;
- identifying trends in use that show changes at a location that impact on energy use;
- evaluating environmental impact of increased/reduced utility use;
- identifying irregularities or errors in utility billings;
- comparing energy use against a set target performance;
- providing summary reporting for budgeting and management reporting.

Prism's Utility Management and Analysis (PUMA) program can be utilized to meet your energy reporting needs. Reports can be generated for individual locations or any desired grouping of locations. Reports can also show total energy use and cost, use per unit area, cost comparisons, as well as environmental impact related to changes in energy use.

APPENDIX A: CONTACT INFORMATION

CLIENT CONTACT	Thompson Rivers University
Address	900 McGill Road, Kamloops BC V2C 5N3
Website	www.tru.ca
Building Type	College
Contact Name	James Gudjonson
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Email	jugdjonson@tru.ca
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Telephone	(604) 298-4858
Fax	(604) 298-8143
Website	www.prismengineering.com
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Title	President
Direct Line	(604) 205 5500
Cell	(604) 209 3257
Email	robert@prismengineering.com
Contact Name	Ken Holdren, P. Eng
Title	Associate, Energy Team Leader
Direct Line	(604) 205-5508
Cell	(604) 992-4858
Email	ken@prismengineering.com
Contact Name	Lawrence Jay BAsC, EIT
Title	Electrical Engineer
Direct Line	(604) 298-4858 ext 519
Email	lawrence@prismengineering.com
Contact Name	Juan C. Mani
Title	Energy Management Technologist
Direct Line	(604) 298-4858
Email	juan@prismengineering.com

APPENDIX B: BUILDING SYSTEMS INFORMATION

1. Floor Plans
2. Mechanical Systems Photo Log
3. Plug Loads Summary



Animal Health Technology

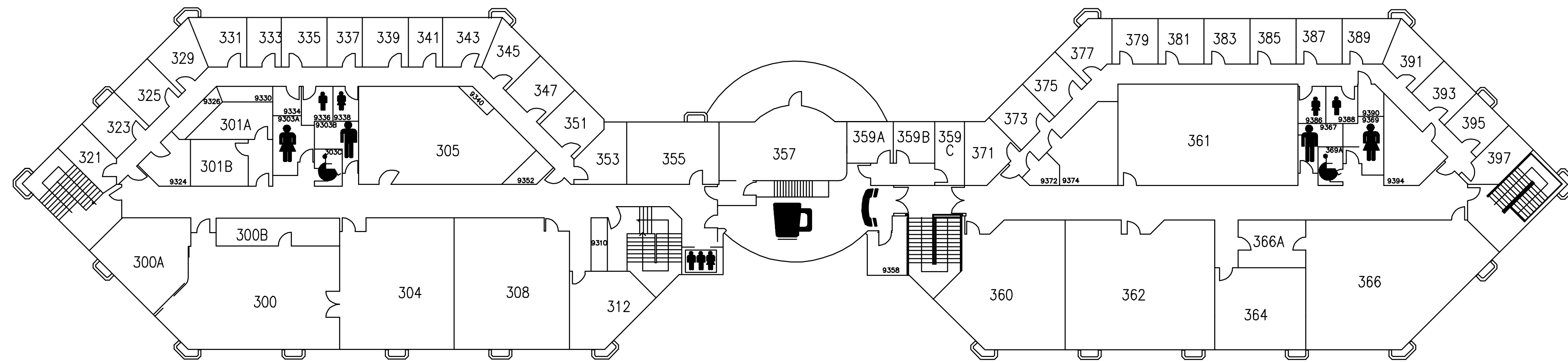


December, 2008

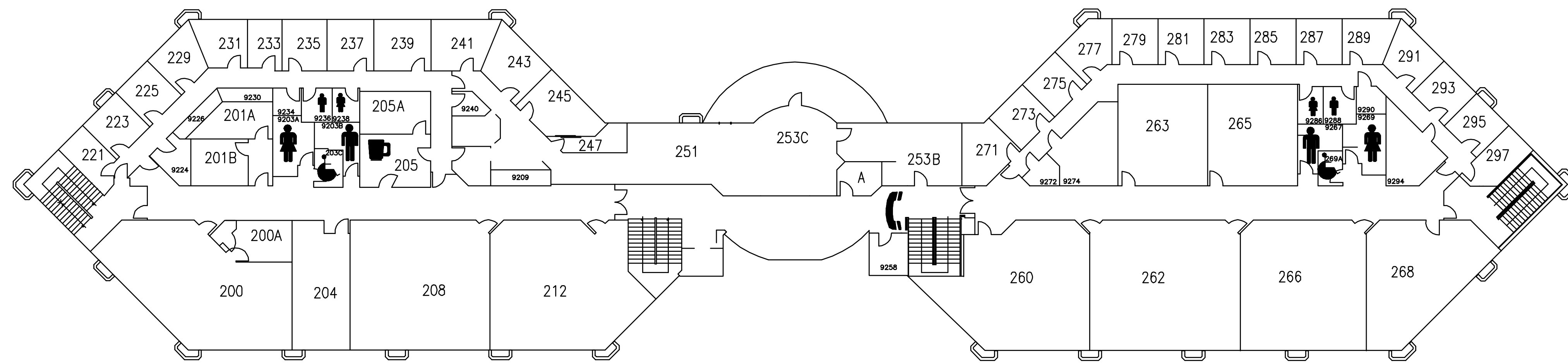


Bosman & Associates

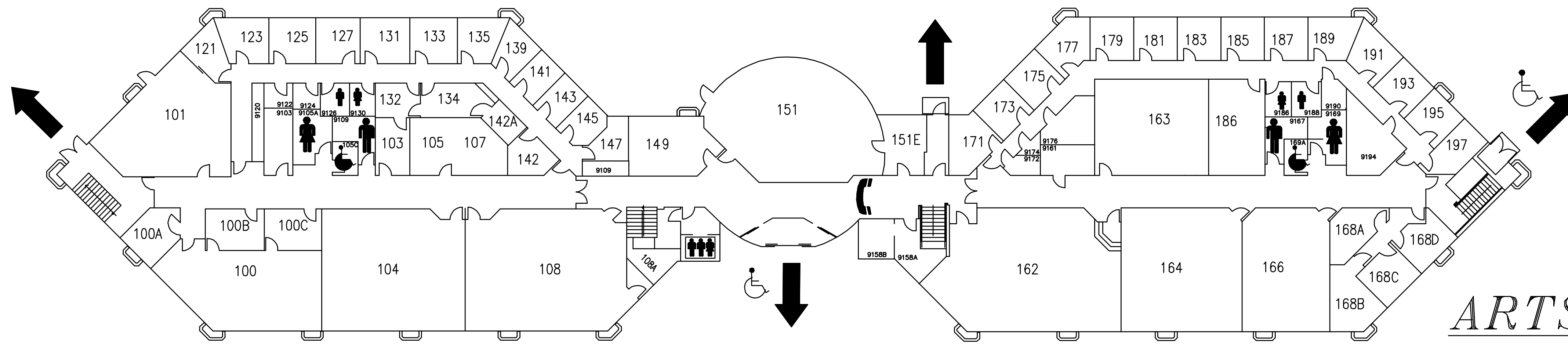
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3rd Floor











2nd Floor

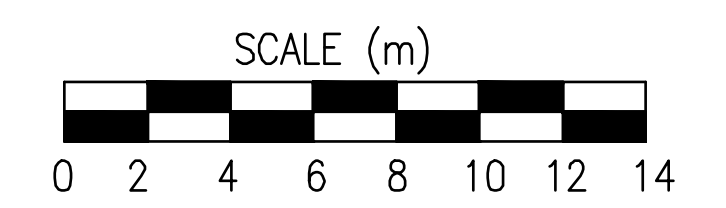


Ground Floor

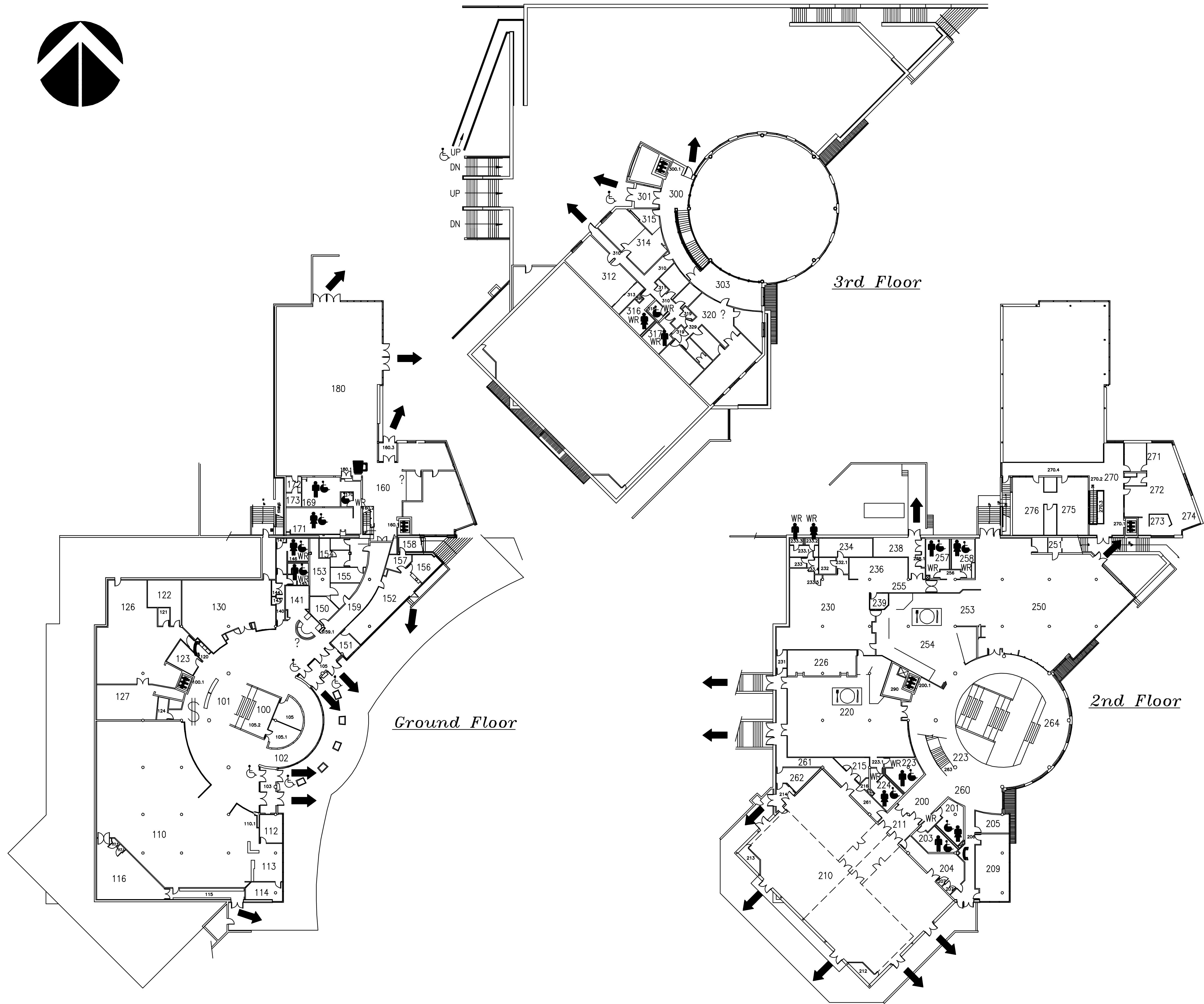
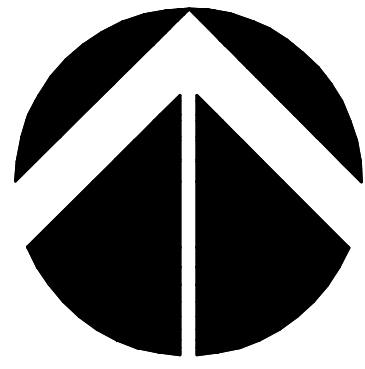
LEGEND

- You Are Here
- Information ?
- Elevator 
- Emergency Exit 
- Wheelchair Accessible Exit 
- Telephone 
- Washrooms:
- Wheelchair Accessible 
- Women's 
- Men's 
- Beverage/Snack Confectionery 

Date: July 15/09, B.Dallimore



ARTS & EDUCATION

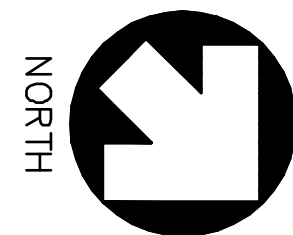


LEGEND

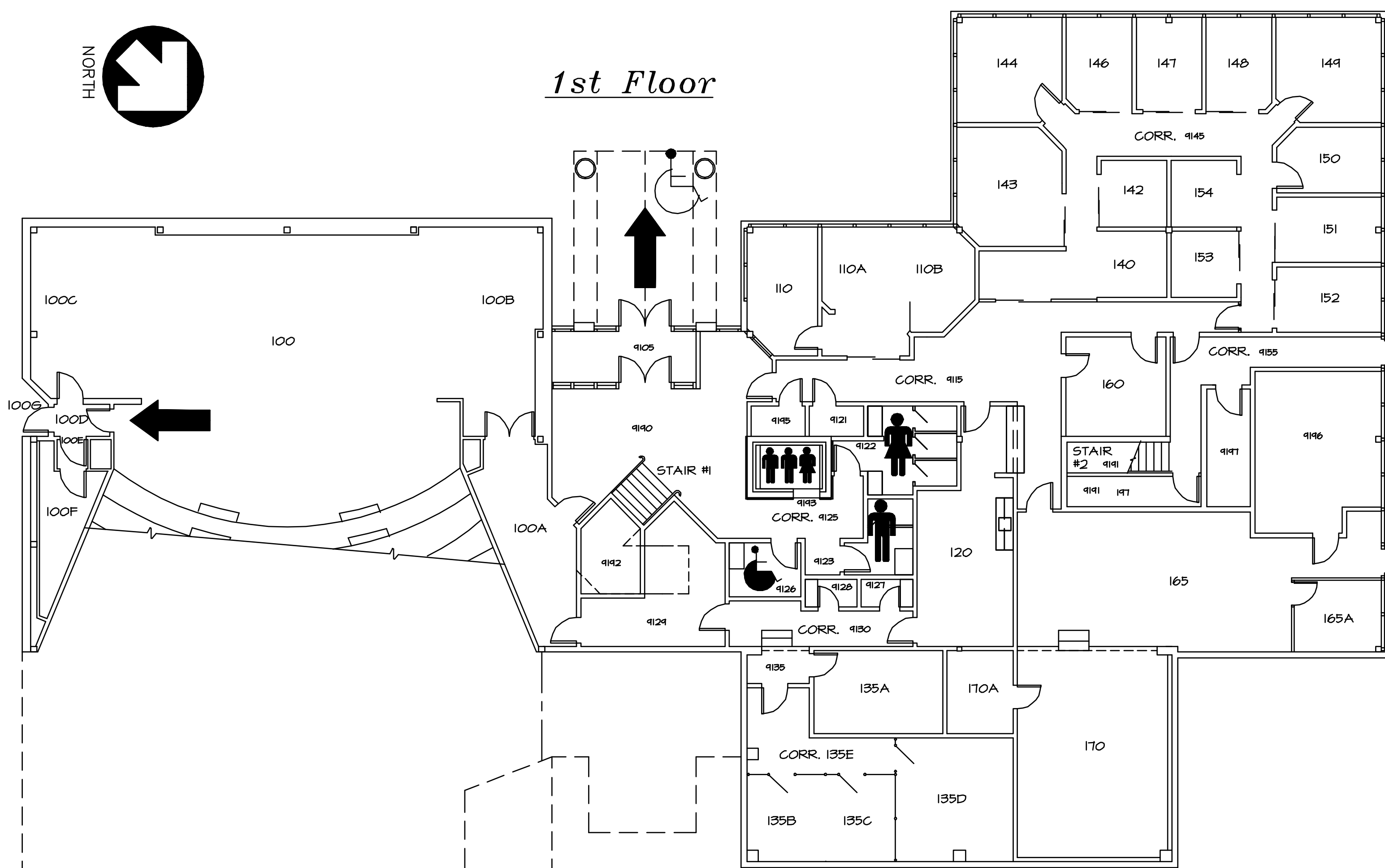
- You Are Here
- Information ?
- Automated Teller Machine \$
- Elevator
- Emergency Exit.....
- Wheelchair Accessible Exit
- Telephone
- Washrooms:
Wheelchair Accessible
- Women's
- Men's
- Food Services
- Beverage /Snack Confectionery

Date: July 21/09, B.Dallimore

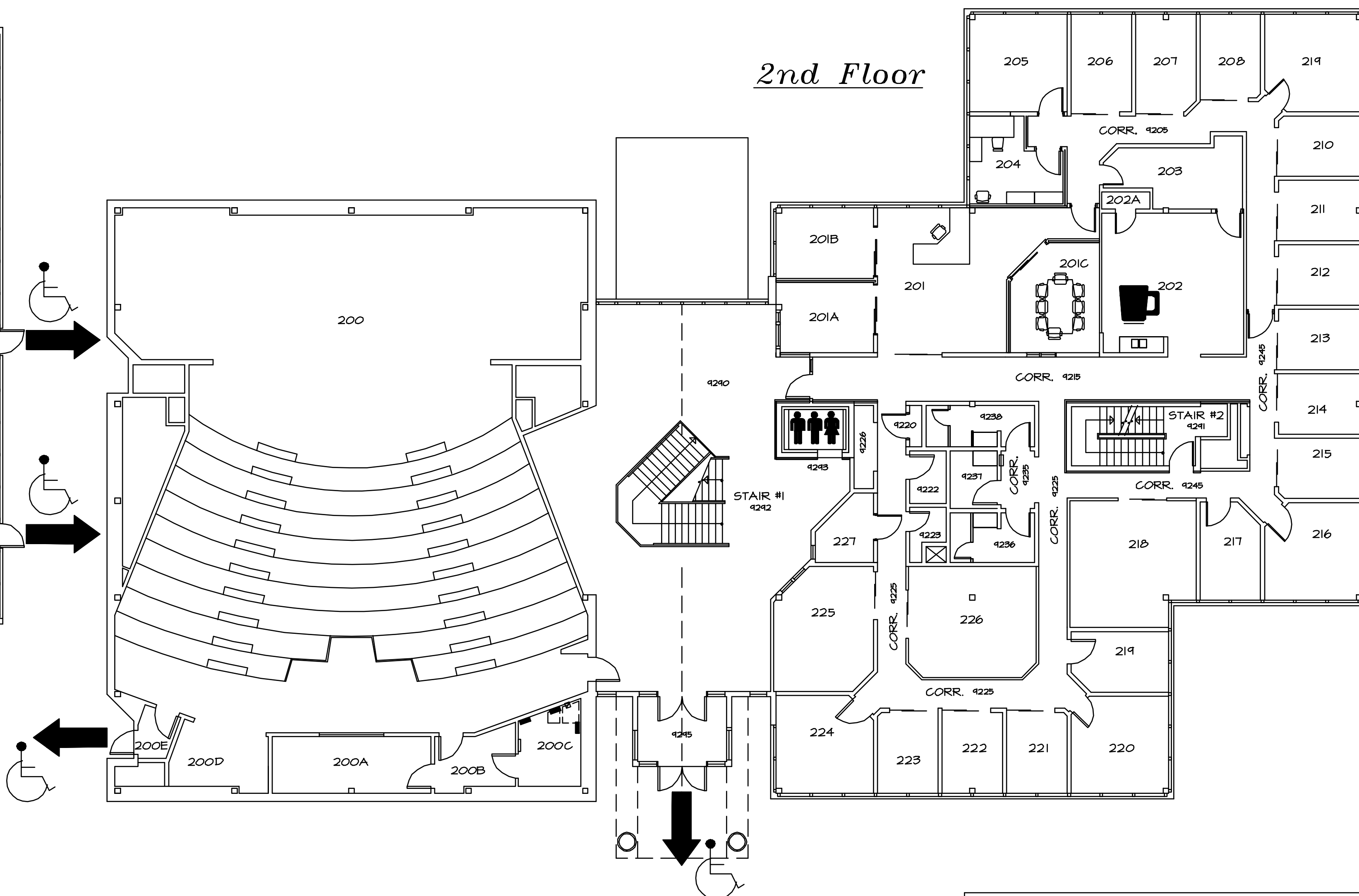




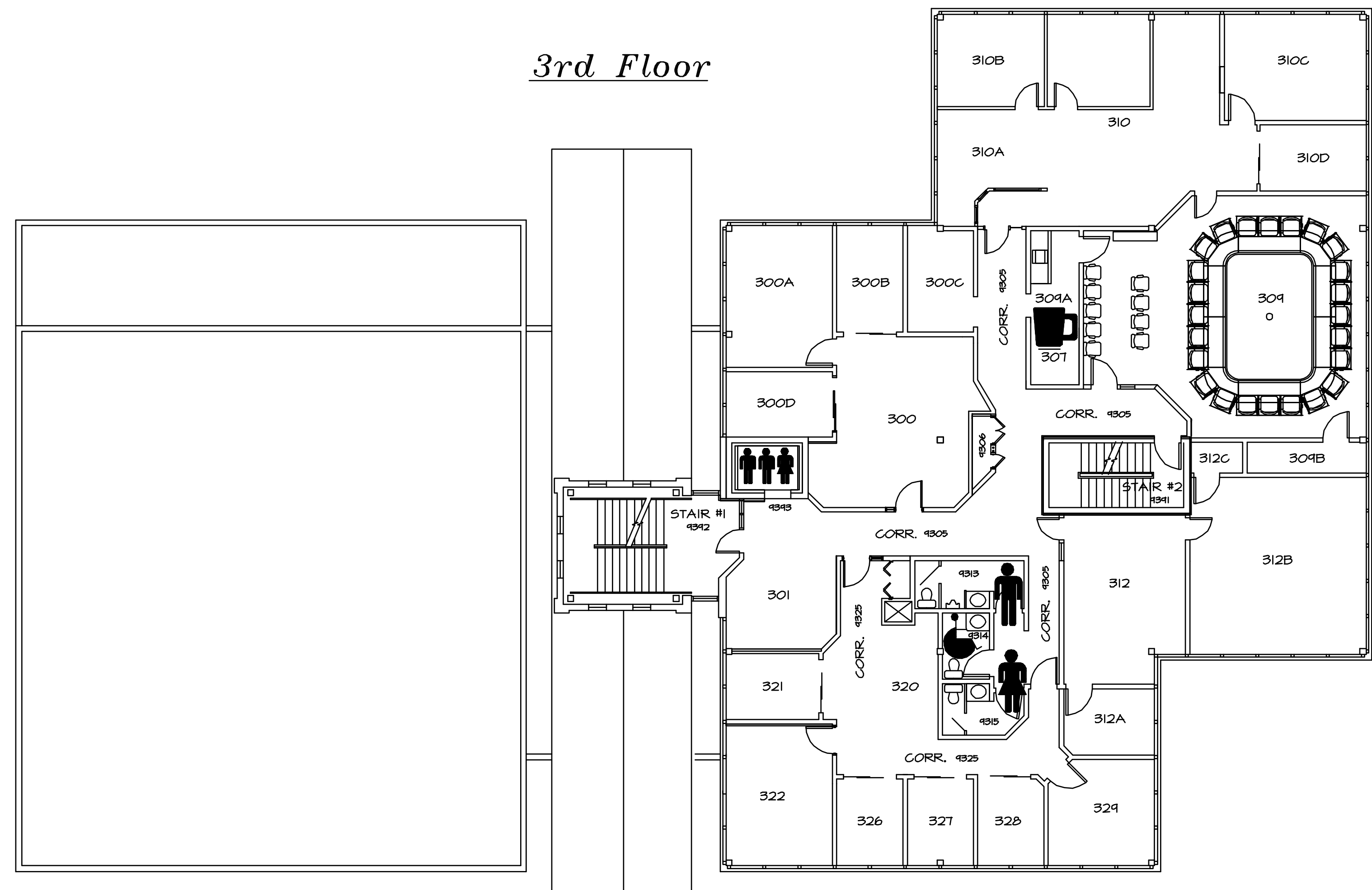
1st Floor



2nd Floor



3rd Floor



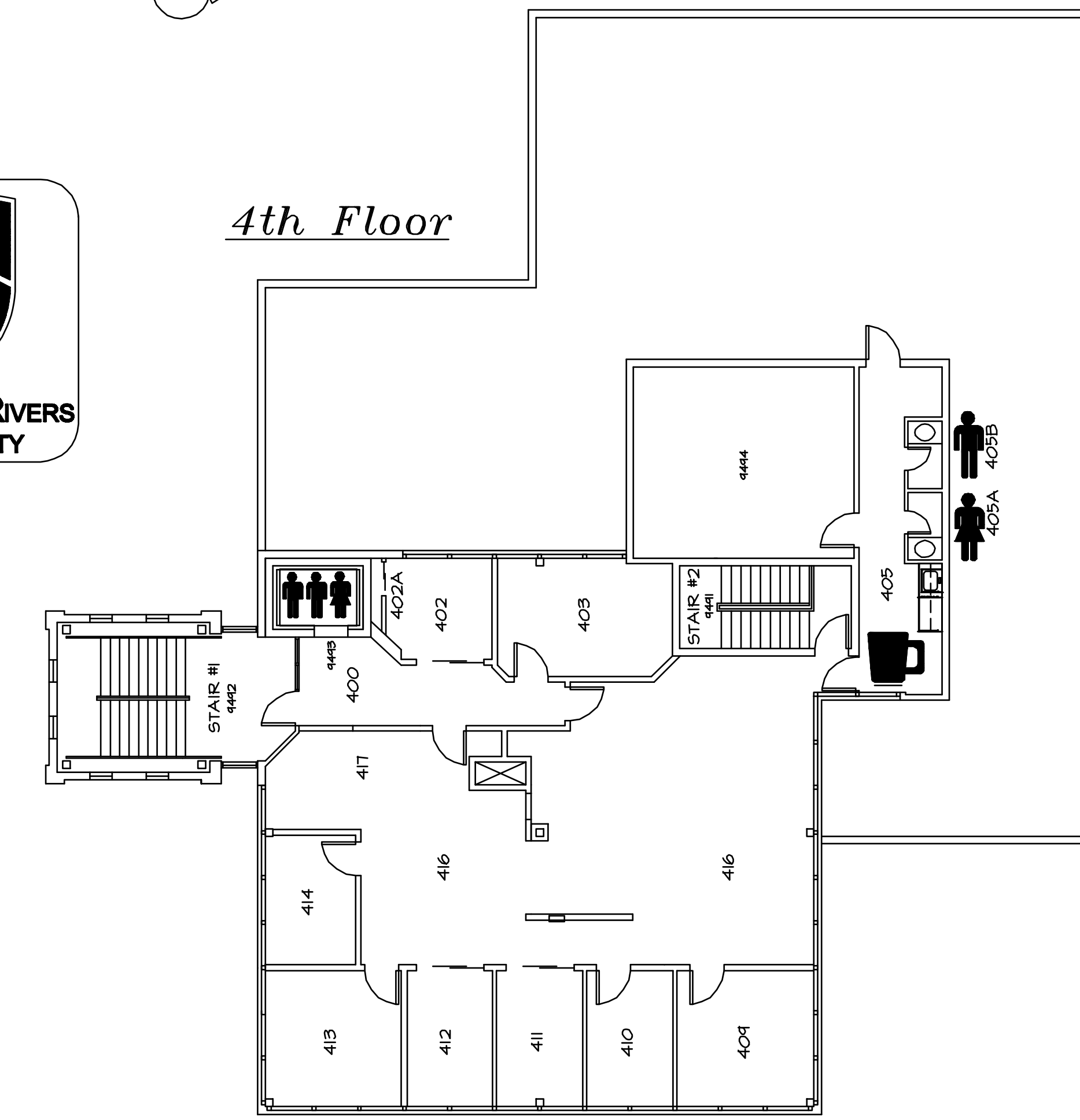
CLOCK TOWER

LEGEND

- You Are Here
- Elevator
- Emergency Exit.....
- Wheelchair Accessible Exit
- Washrooms: Wheelchair Accessible
- Women's
- Men's
- Beverage /Snack Confectionery



4th Floor





2nd Floor

Storage
9215

Bleacher Seating
(~550 Capacity)
A = 255m²

203
Gym Floor
A = 852m²
(w/o Bleachers)

101
Rec. Centre
A = 582m²

Mezzanine Seating
(~550 Capacity)
A = 300m²

Open to
Gym Below

GYMNASIUM

Ground Floor

3rd Floor

LEGEND

You Are Here

Emergency Exit ←

Elevator

Wheelchair Accessible Exit

Telephone

Washrooms:
Wheelchair Accessible

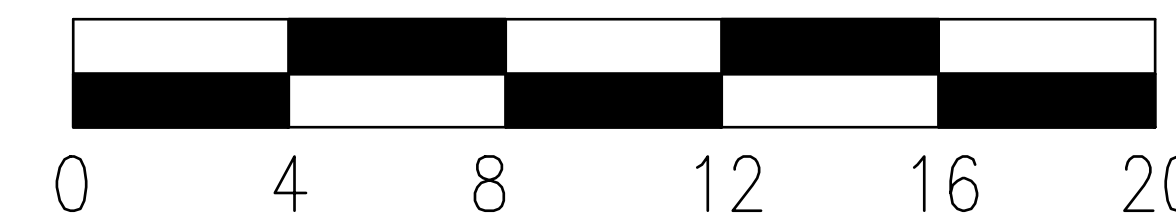
Women's

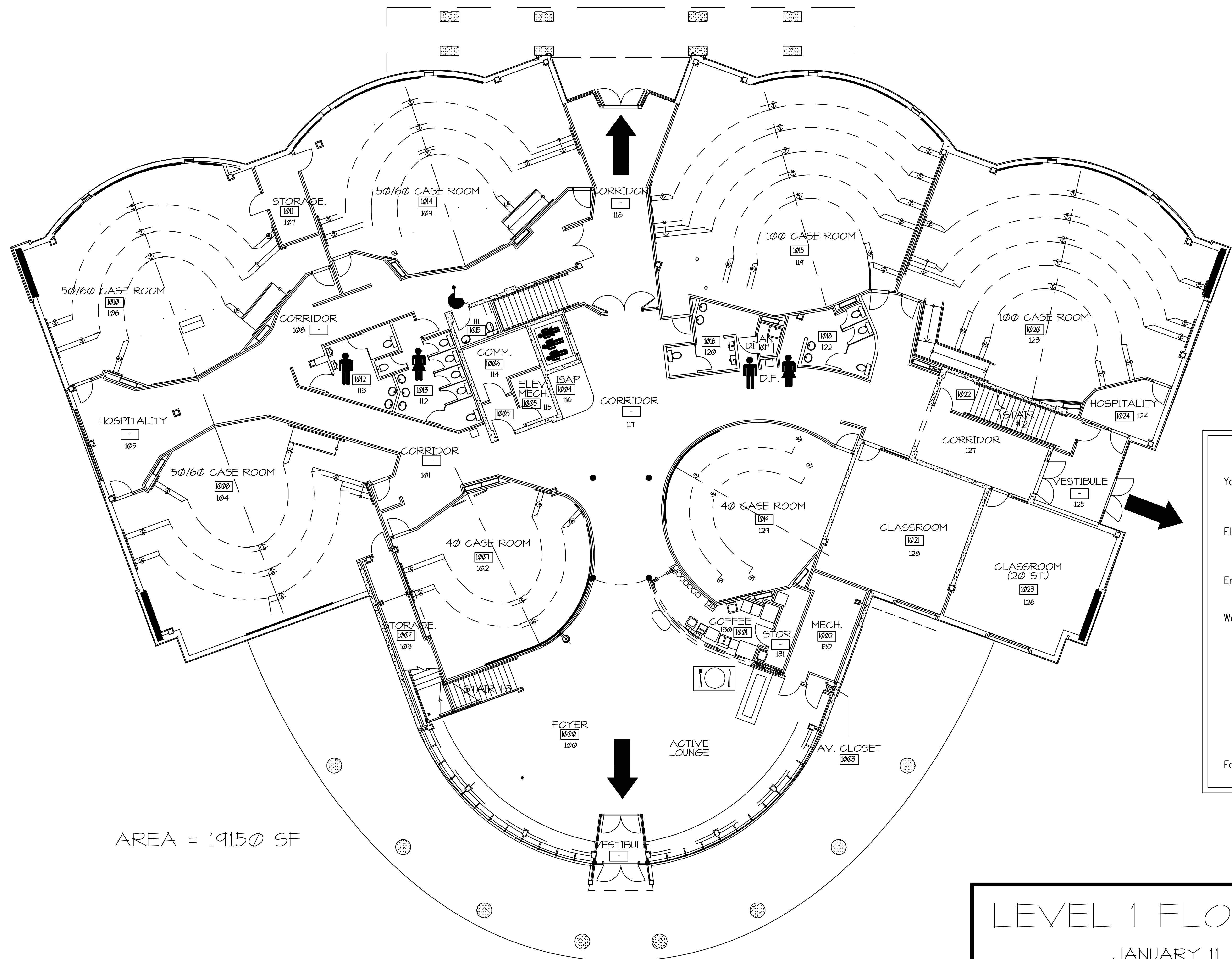
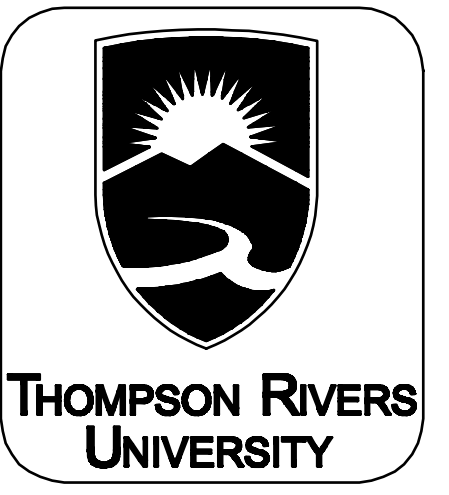
Men's

Beverage/Snack Confectionery

Date: July 27/09, B.Dallimore

SCALE (m)





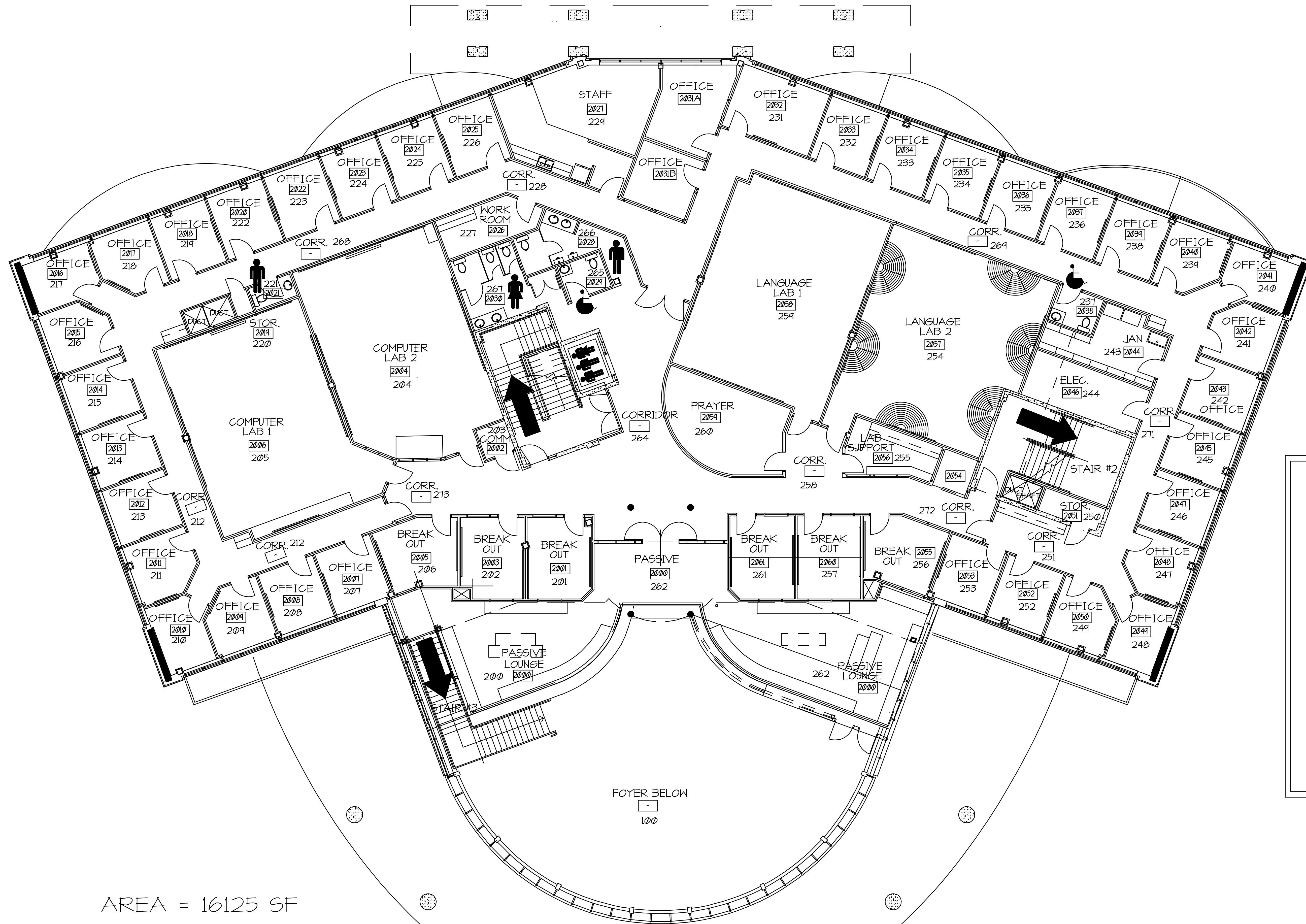
AREA = 19150 SF

LEGEND

- You Are Here
- Elevator
- Emergency Exit.....
- Washrooms:
Wheelchair Accessible
- Women's
- Men's
- Food Services

Date: July 21/09, B.Dallimore

LEVEL 1 FLOOR PLAN
JANUARY 11, 2005



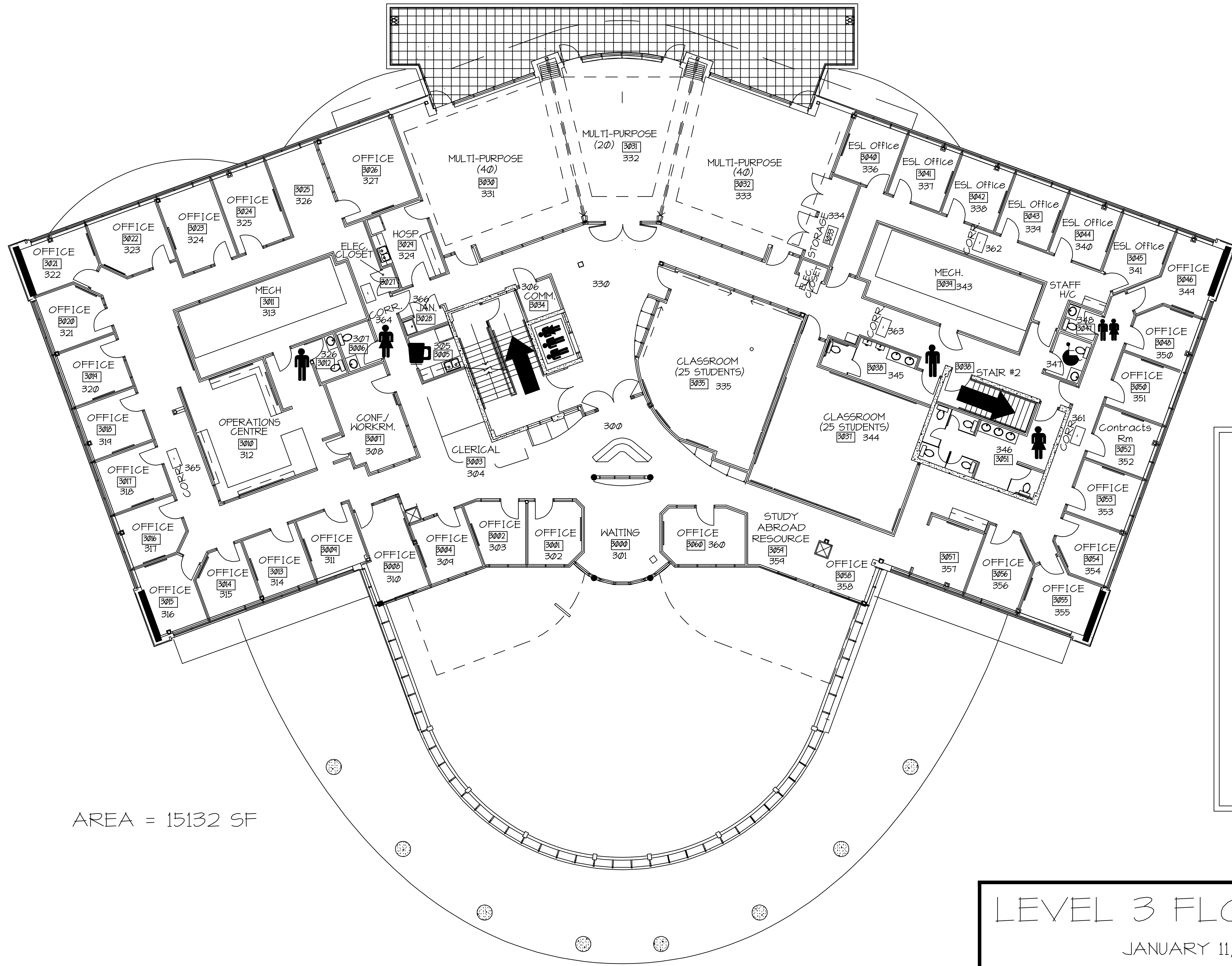
AREA = 16125 SF

LEGEND

- You Are Here
- Elevator
- Emergency Exit.....
- Washrooms:
Wheelchair Accessible
- Women's
- Men's

Date: July 21/09, B.Dallimore

LEVEL 2 FLOOR PLAN
JANUARY 11, 2005



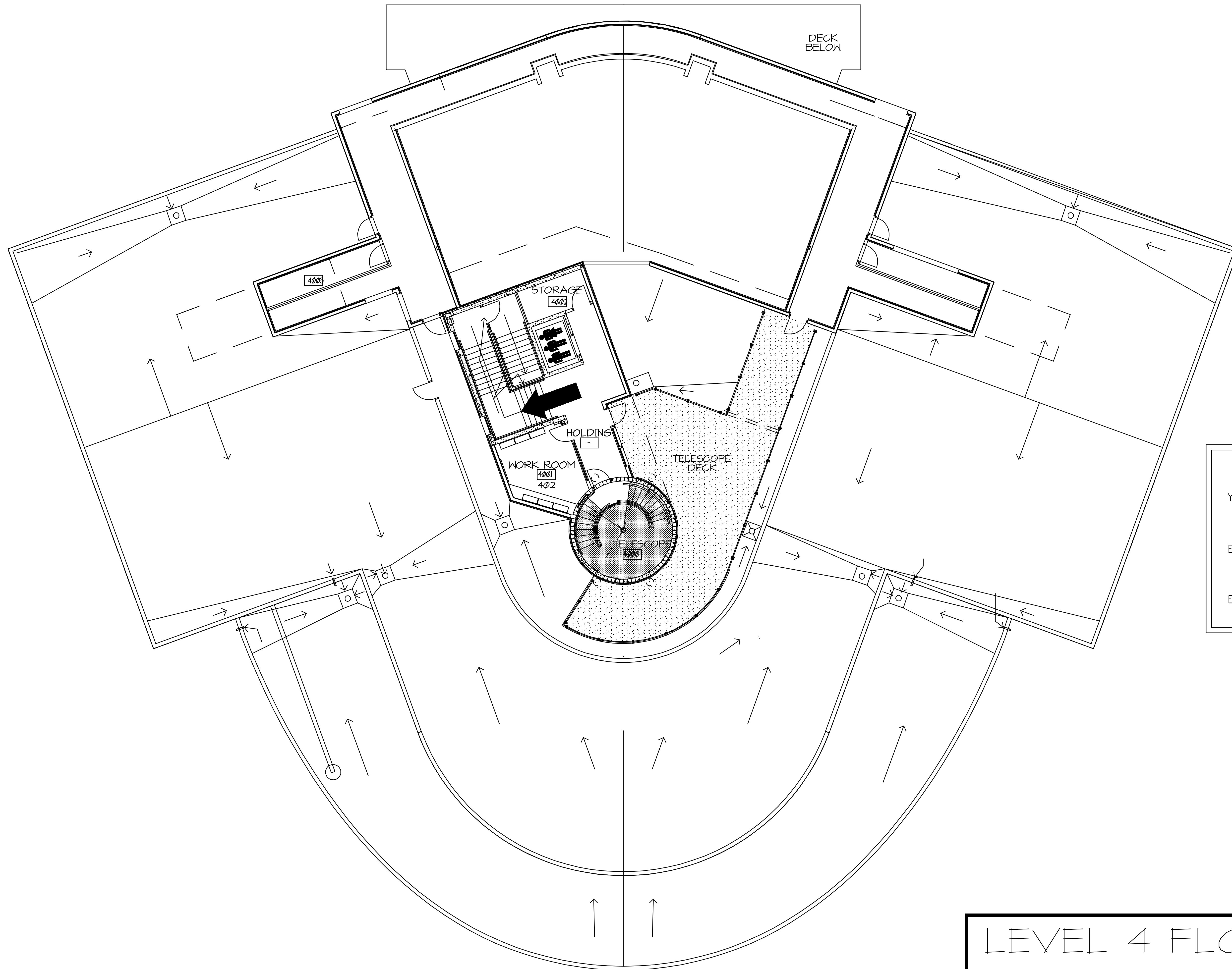
AREA = 15132 SF

LEGEND

- You Are Here
- Elevator
- Emergency Exit.....
- Washrooms:
Wheelchair Accessible
- Women's
- Men's
- Beverage /Snack Confectionery

Date: July 24/09, B.Dallamore

LEVEL 3 FLOOR PLAN
JANUARY 11, 2005



LEGEND

You Are Here

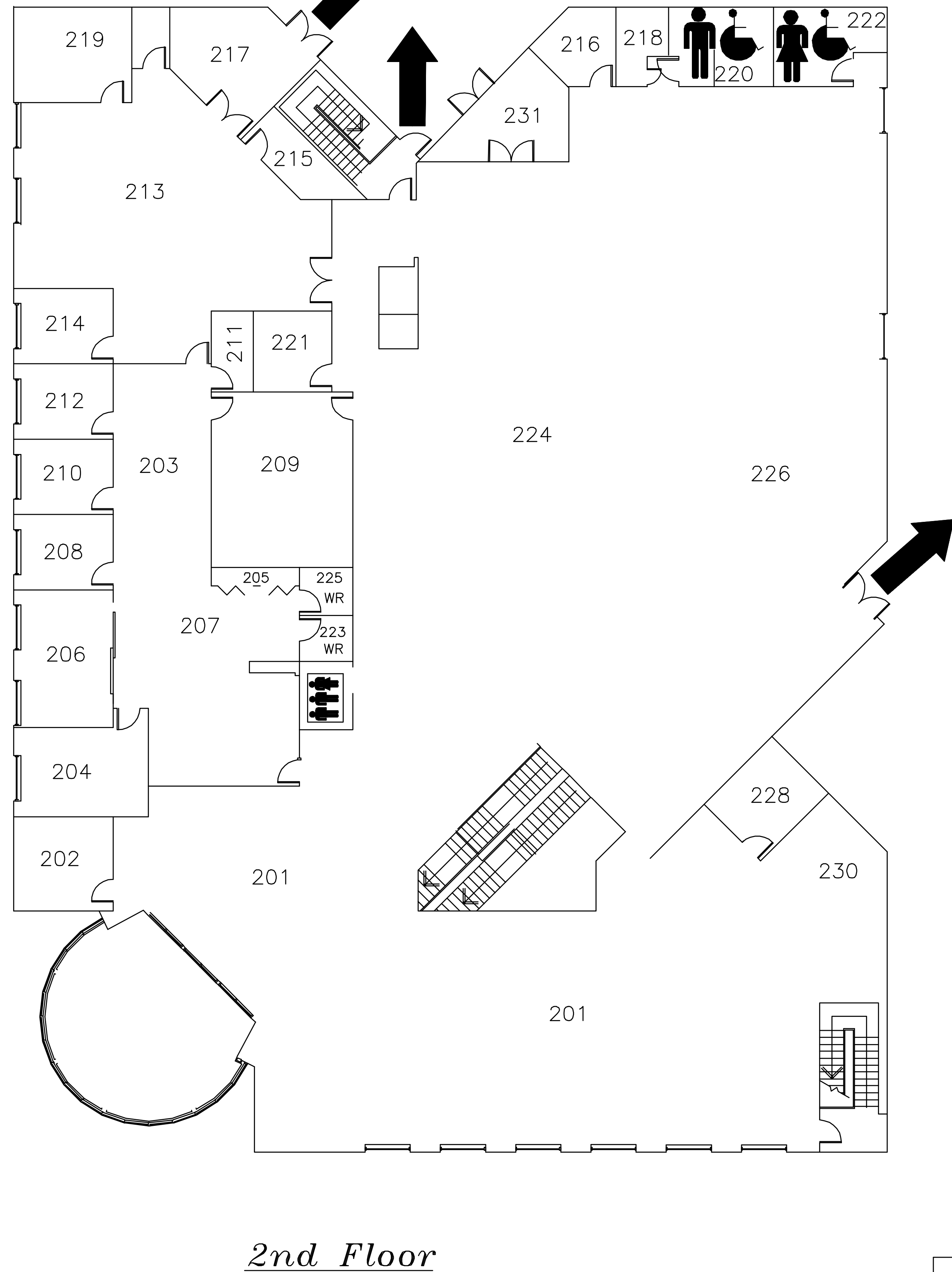
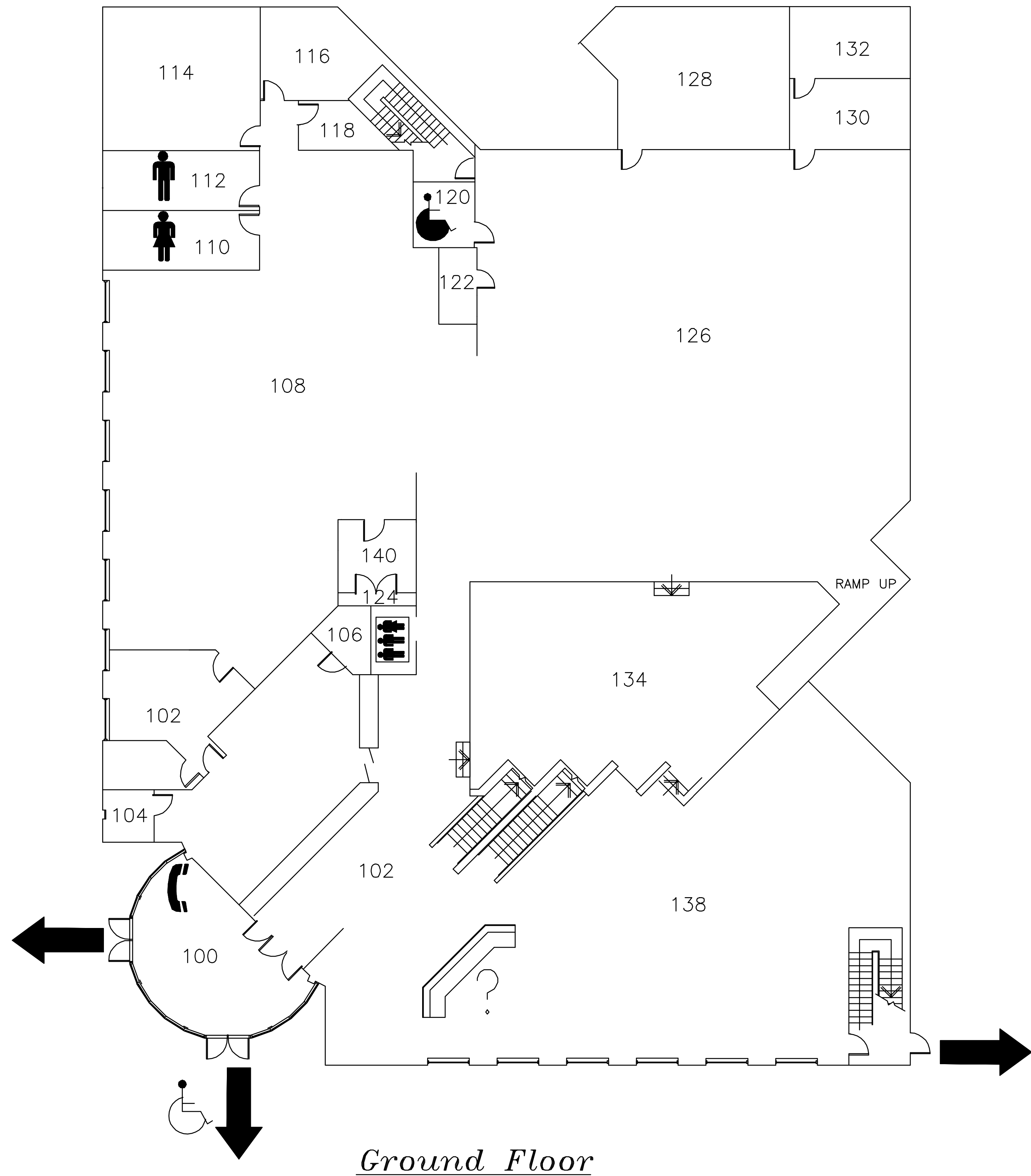
Elevator

Emergency Exit.....

Date: July 24/09, B.Dallimore

LEVEL 4 FLOOR PLAN
JANUARY 11, 2005

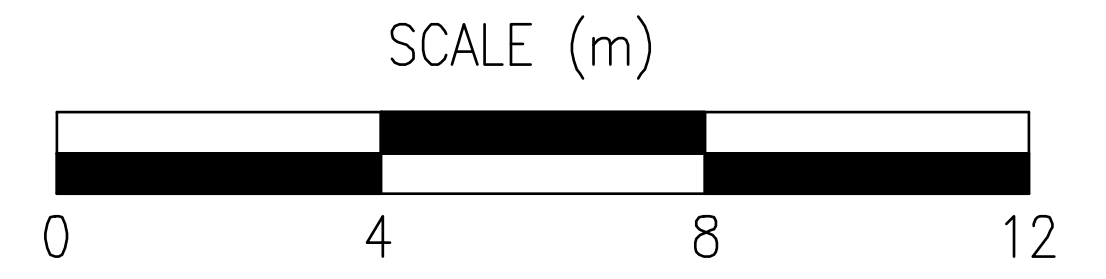
LIBRARY

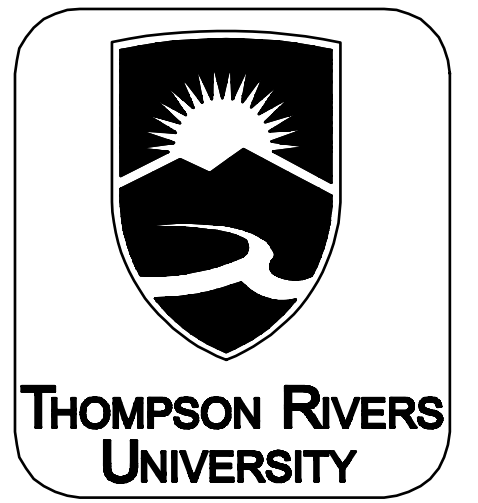


LEGEND

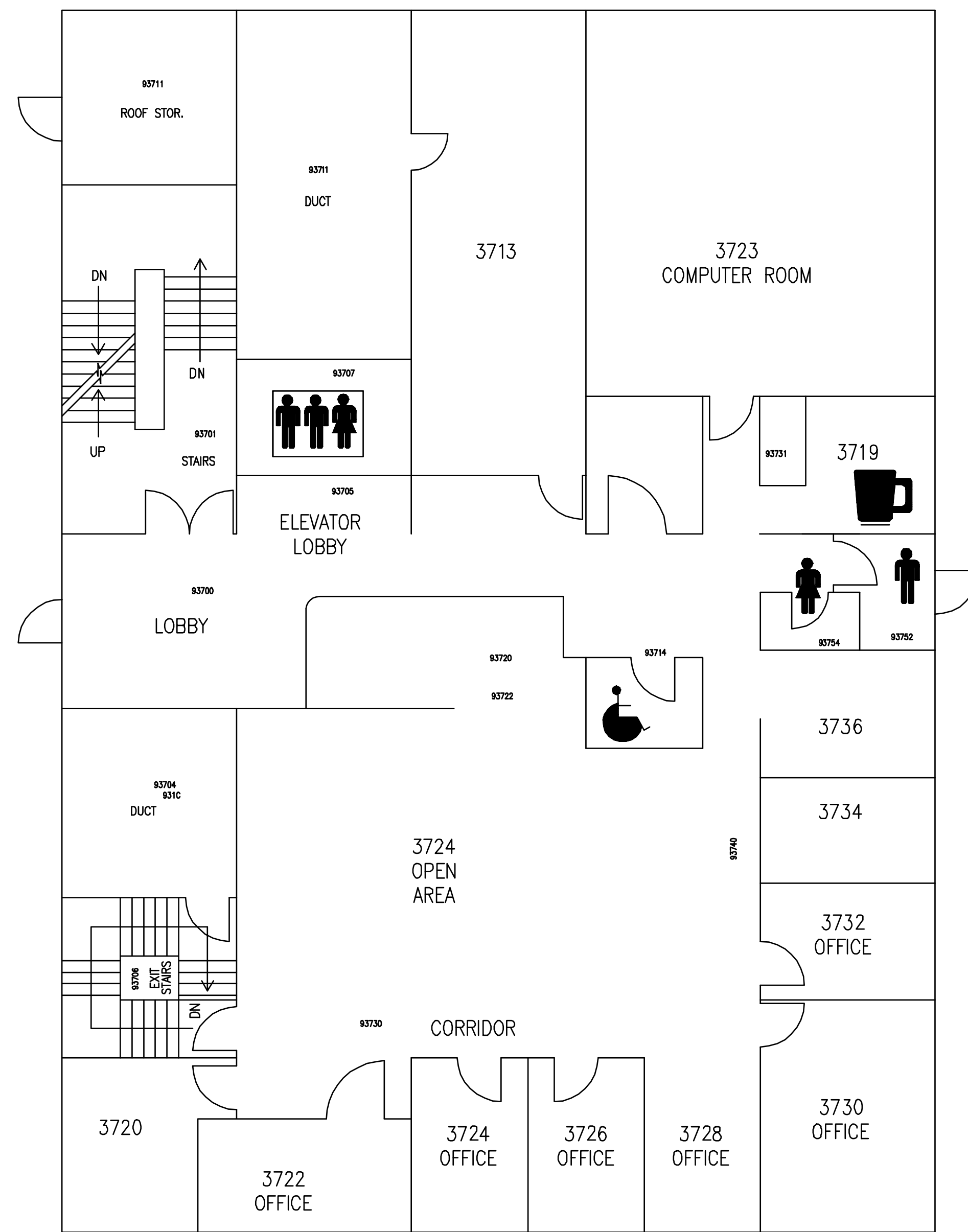
- You Are Here
- Information ?
- Emergency Exit ←
- Elevator
- Wheelchair Accessible Exit
- Telephone
- Washrooms:
 - Wheelchair Accessible
 - Women's
 - Men's

Date: July 27/09, B.Dallimore

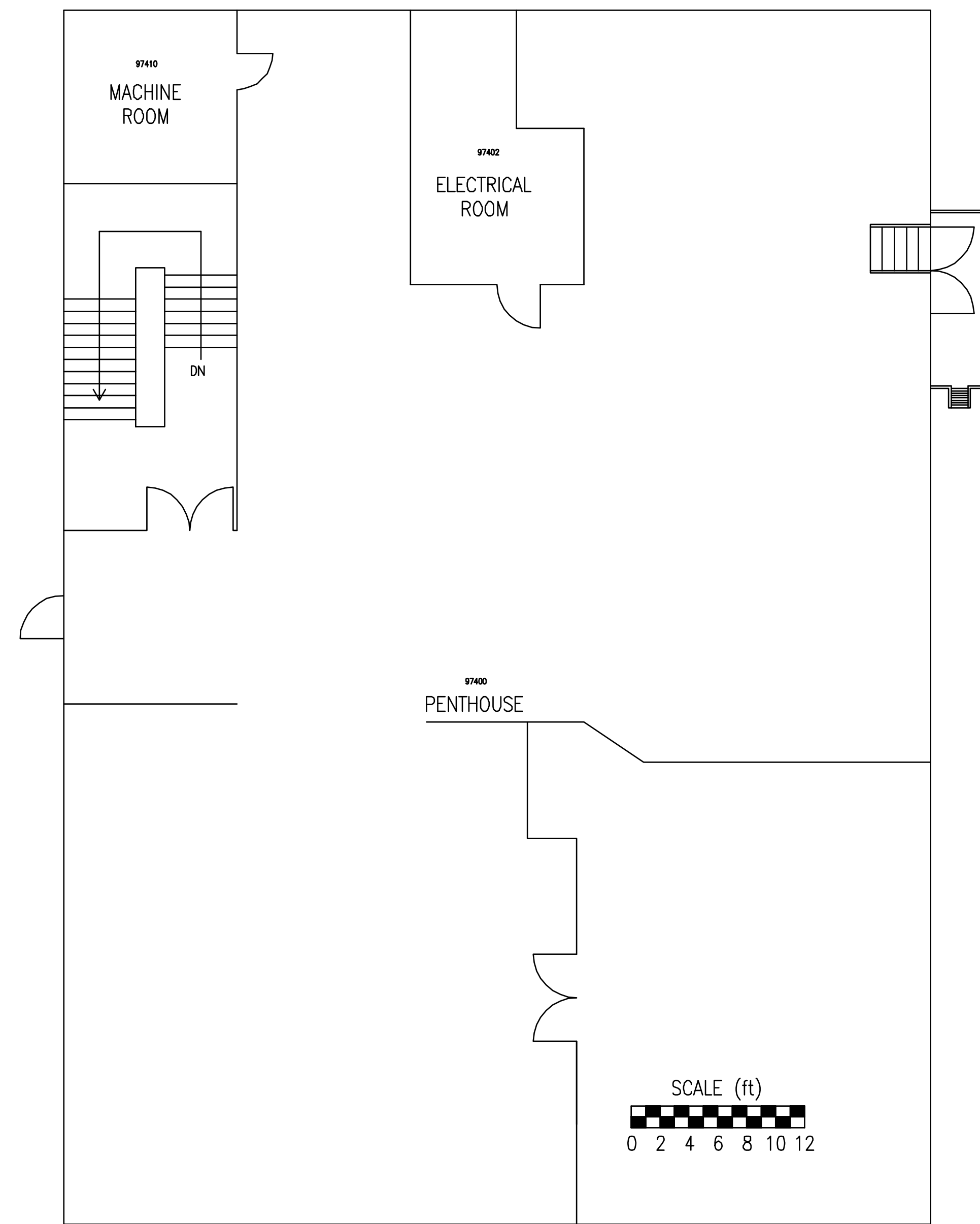




OM – A BLOCK, THIRD FL. & PENTHOUSE



THIRD FLOOR PLAN



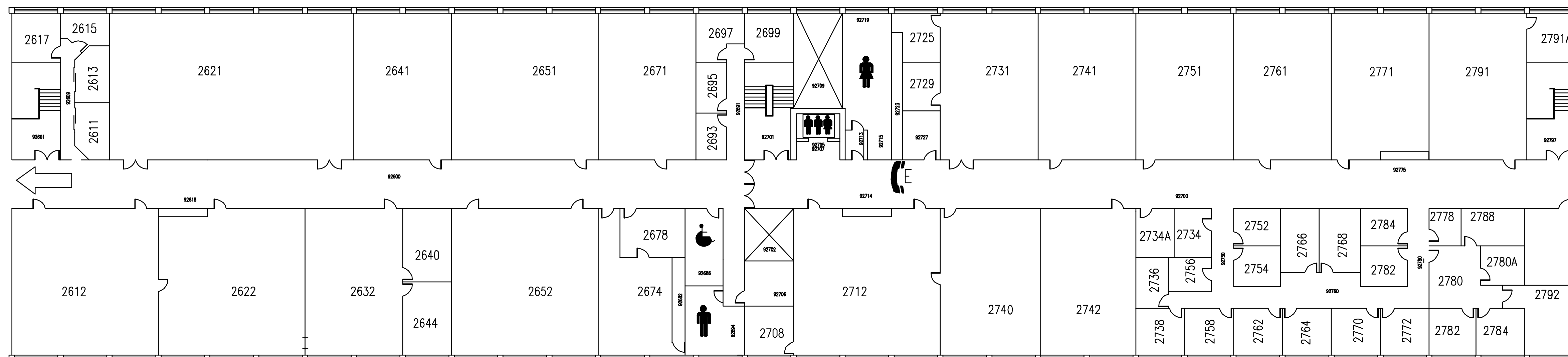
PENTHOUSE FLOOR PLAN

LEGEND

- You Are Here
- Information ?
- Elevator
- Emergency Exit
- Wheelchair Accessible Exit
- Telephone
- Emergency Telephone
- Washrooms:
- Wheelchair Accessible
- Women's
- Men's
- Beverage/Snack Confectionery

Date: July 20/09, B.Dallimore

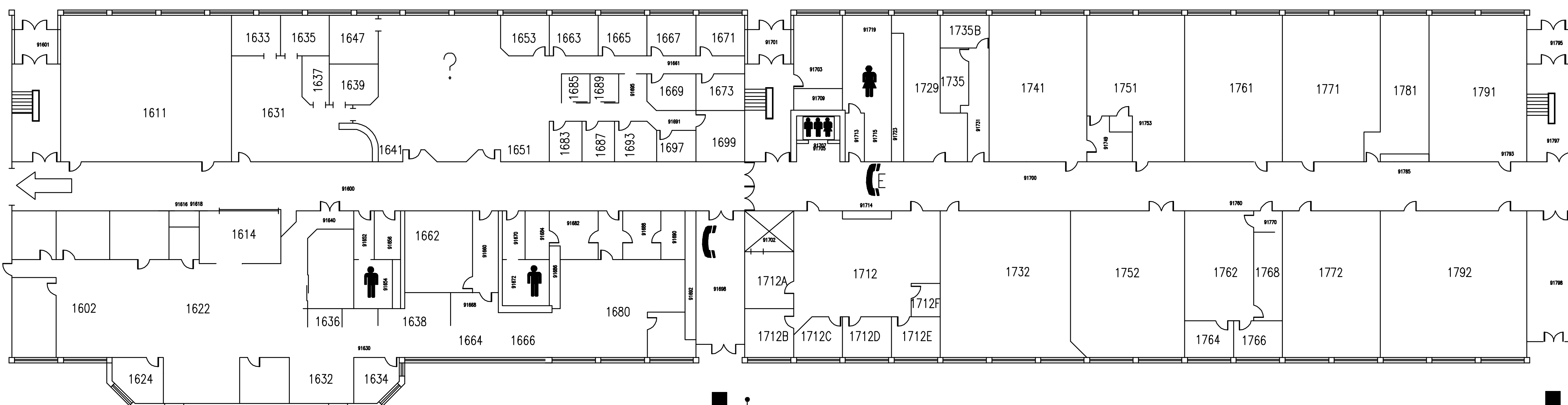




2nd Floor

(OM 1600 – OM 1700)

(OM 2600 – OM 2700) OLD MAIN



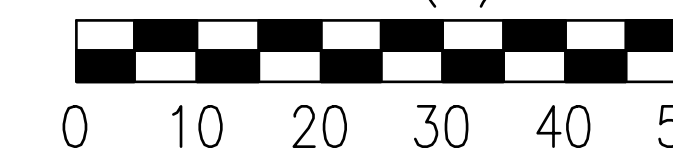
Ground Floor

LEGEND

- You Are Here
- Information ?
- Elevator
- Emergency Exit
- Wheelchair Accessible Exit
- Telephone
- Emergency Telephone
- Washrooms:
 - Wheelchair Accessible
 - Women's
 - Men's
- Beverage/Snack Confectionery

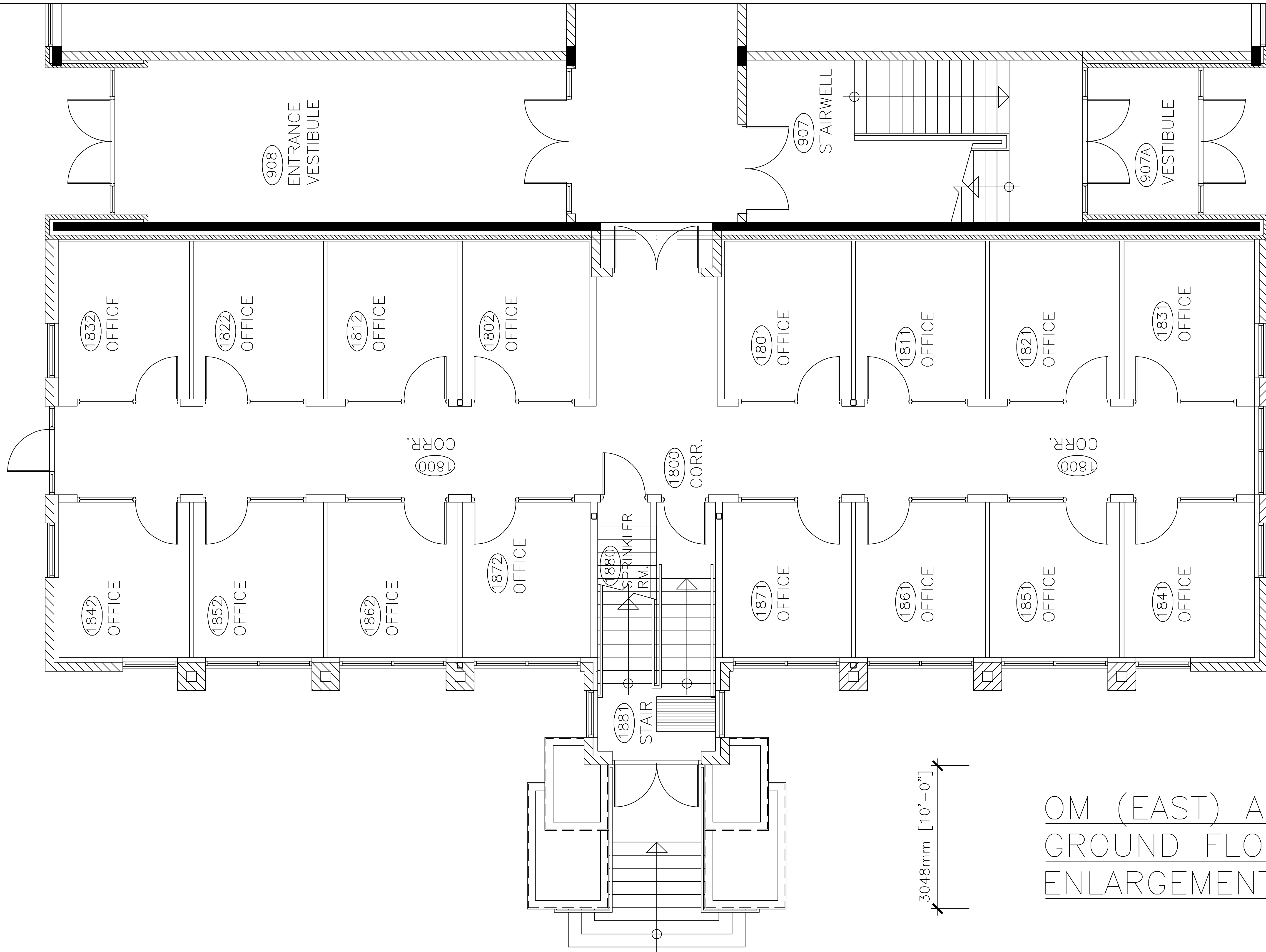
Date: July 15/09, B.Dallimore

SCALE (ft)

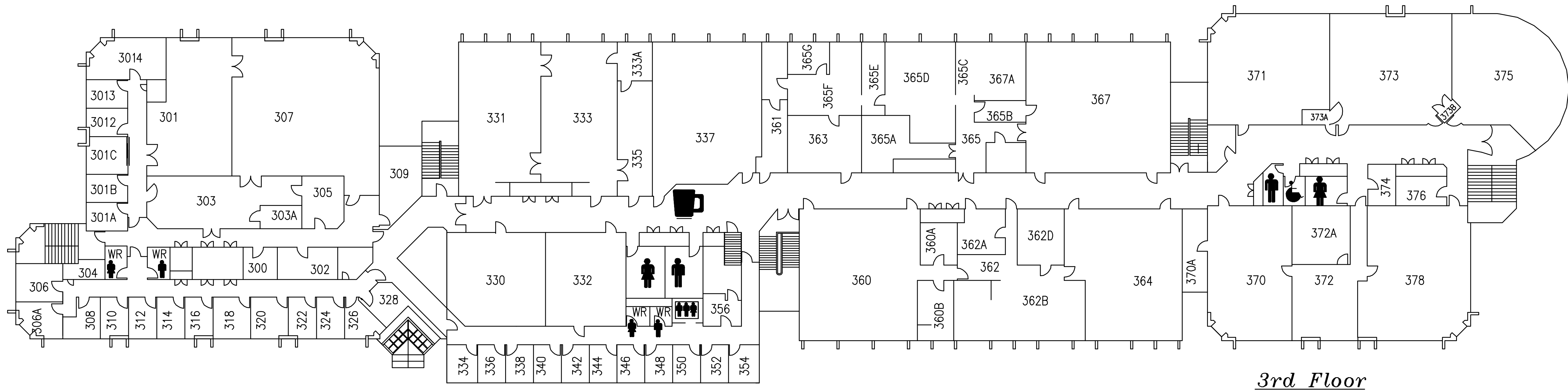


2200 to 2599

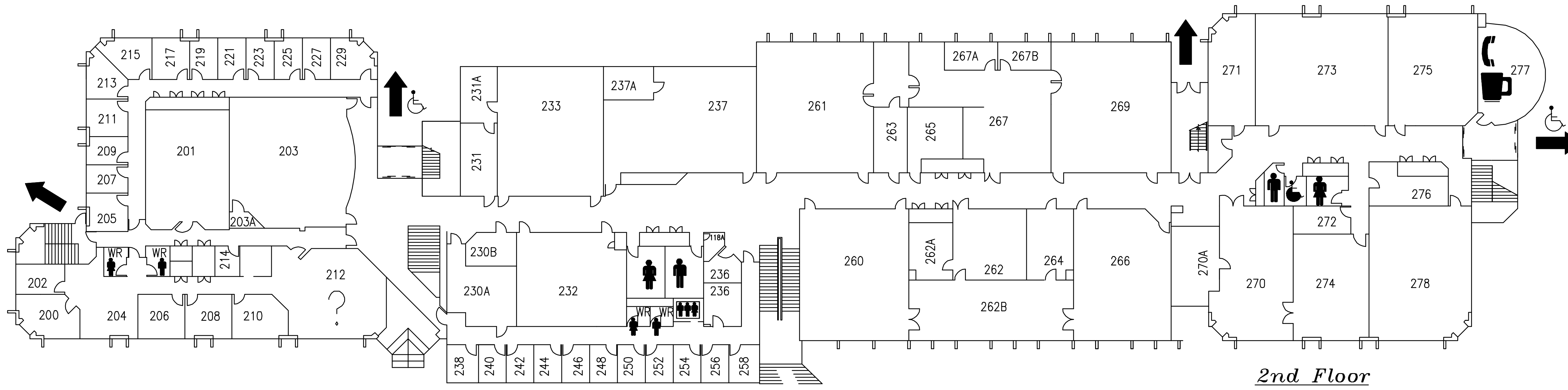
1100 to 1599



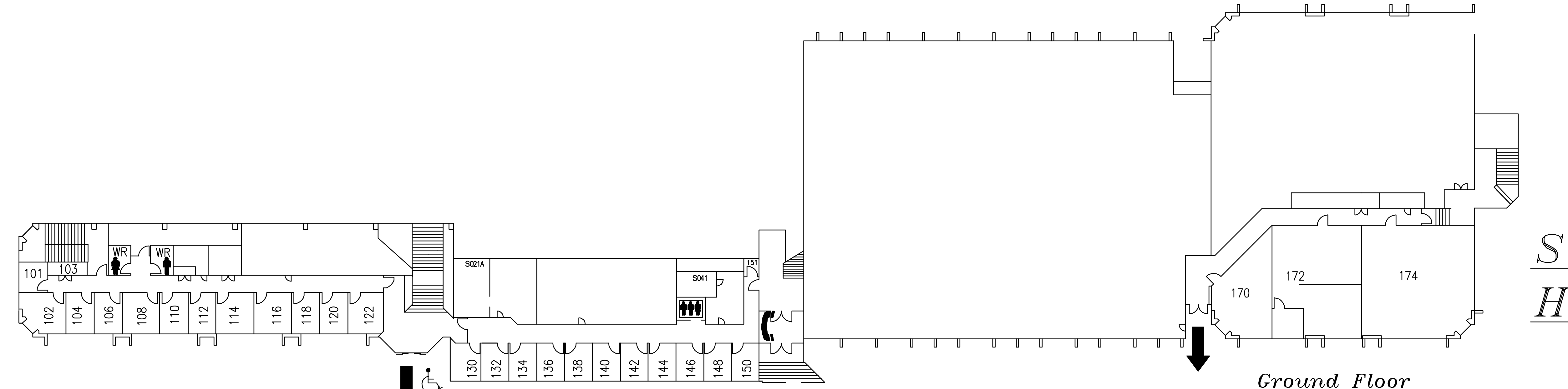
OM (EAST) ADDITION
GROUND FLOOR —
ENLARGEMENT



3rd Floor



2nd Floor



Ground Floor

LEGEND

You Are Here

Information ?

Elevator

Emergency Exit

Wheelchair Accessible Exit

Telephone

Emergency Telephone

Washrooms:

Wheelchair Accessible

Women's

Men's

Beverage/Snack Confectionery

Date: July 8/08, B.Dallimore

SCIENCES & HEALTH SCIENCES





1. Heating Plant A-Block.JPG



4. AH-1.JPG



2. Heating Plant B-Block.JPG



5. AH-2.JPG



3. Heating Plant C-Block.JPG



6. RF-1.JPG



7. AHU-7.JPG



10. AHU-2.JPG



8. AHU-3.JPG



11. A-Block Addition RTUs.JPG



9. AHU-4.JPG



12. Print Shop RTU.JPG



13. C-Block RTUs and Exh Fans.JPG



14. C-block Exhaust Fans.JPG



15. A-Block Chiller.JPG



1. Boiler B-101.JPG



4. AH-1.JPG



2. Boiler Plant B-1.JPG



5. SF1, AF2 and Cooling Towers.JPG



3. Heat Pump Loop Pump P-101.JPG



6. MAU.JPG



7. SF 103 & SF104.JPG



8. Fume Hood Fans.JPG



9. Fume Hood Fans 2.JPG



1. AHU-1.JPG



4. FC-1.JPG



2. AHU-2.JPG



5. MAU-1.JPG



3. AHU-3.JPG



6. Steam Boiler.JPG



7. Boiler Plant.JPG



10. Welding Exhaust Fans.JPG



8. Typical Transfer Fan.JPG



11. Roof top.JPG



9. Dust Collector.JPG



12. Infrared Heaters.JPG



13. Chiller.JPG



1. Rooftop Units.JPG



4. Cooling Tower.JPG



2. AHU-1.JPG



5. Chiller.JPG



3. Boiler Plant.JPG



1. AHU-1.JPG



4. Boiler Plant.JPG



2. AHU-2.JPG



5. Chiller.JPG



3. AHU-3.JPG



1. Boiler B-1.JPG



4. Loop Pump P-101.JPG



2. Boiler B-101.JPG



5. Cooling Tower (Typical of 2).JPG



3. SF-101.JPG



1. F-1.JPG



4. AHU-4.JPG



2. F-2.JPG



3. F-3.JPG



1. Attic Exhasut Fan.JPG



4. Typical VAV Bypass Box.JPG



2. Rooftop Units.JPG



3. Entrance Forced Flow heaters.JPG



1. Boiler Plant.JPG



4. F-1 (1st floor).JPG



2. Chiller.JPG



5. Theatre Rooftop Unit.JPG



3. F-2 (4th floor).JPG



1. RTU-1 and RTU-2.JPG



4. RTU-7.JPG



2. RTU-3.JPG



5. RTU-8.JPG



3. RTU-5 and RTU-6.JPG



6. Boiler.JPG

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 11/5/2010

Building Type: Educational Facility
Building Name: Animal Health
Floors: 2



ITEM		Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC		75		19	1,425	0.95	1.35	2,040	0.80	2,326
PC (DDC)		75		1	75	0.95	0.07	8,760	0.95	624
Monitor (LCD)	15 inch	20		3	60	0.95	0.06	2,040	0.65	80
	17 inch	35		14	490	0.95	0.47	2,040	0.65	650
Monitor CRT	15 inch	58		3	174	0.95	0.17	2,040	0.65	231
Switch		180		1	180	0.95	0.17	8,760	0.65	1,025
UPS	Small	700		1	700	0.20	0.14	8,760	0.40	2,453
High Speed Modem (3 Amps)			360	2	720	0.95	0.68	8,760	0.65	4,100
Computer Subtotal					3,104		2.42			7,387
Laser Printer		288		1	288	0.25	0.07	2,040	0.20	118
Laser Copier	Small	600		2	1,200	0.95	1.14	2,040	0.30	734
	Large	1000		2	2,000	0.95	1.90	2,040	0.30	1,224
Fax		25		2	50	0.25	0.01	255	0.20	3
Laser Fax		40		1	40	0.25	0.01	255	0.20	2
TV	13-20"	120		3	360	0.50	0.18	255	0.95	87
	29-36"	200		1	200	0.50	0.10	255	0.95	48
Projector		350		1	350	0.75	0.26	255	0.95	85
Office Subtotal					4,488		3.68			2,301
Fridge	Large	300		2	600	0.95	0.57	8,760	0.40	2,102
	Small	115	115	5	575	0.95	0.55	8,760	0.40	2,015
Toaster Oven			1,500	1	1,500	0.95	1.43	65	0.95	93
Microwave	Large	1500		2	3,000	0.95	2.85	65	0.95	185
	Small	600		1	600	0.95	0.57	65	0.95	37
Lunch Room Subtotal					6,275		5.96			4,432
Washer			500	5	2,500	0.50	1.25	255	0.95	606
Dryer			1,800	1	1,800	0.50	0.90	255	0.95	436
Freezer			500	4	2,000	0.95	1.90	8,760	0.40	7,008
Other Subtotal					6,300		4.05			8,050
Total					20,167		16.11			22,170

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 06/03/2010

Building Type: Educational Facility
Building Name: Arts and Education
Floors: 3



ITEM	Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC	75		195	14,625	0.95	13.89	2,040	0.80	23,868
Monitor (LCD)	15 inch	20	30	600	0.95	0.57	2,040	0.65	796
	17 inch	35	189	6,615	0.95	6.28	2,040	0.65	8,771
	19 inch	56	2	112	0.95	0.11	2,040	0.65	149
	21 inch	70	5	350	0.95	0.33	2,040	0.65	464
Monitor (LCD)	15 inch	58	5	290	0.95	0.28	2,040	0.65	385
	17 inch	61	5	305	0.95	0.29	2,040	0.65	404
Switch	180		3	540	0.95	0.51	8,760	0.65	3,075
Small Server	150		2	300	0.95	0.29	8,760	0.65	1,708
Laptop	25		1	25	0.95	0.02	2,040	0.80	41
UPS	Small	700	1	700	0.95	0.67	8,760	0.65	3,986
Computer Subtotal				24,462		23.24			43,646
Laser Printer	288		23	6,624	0.25	1.66	2,040	0.20	2,703
Ink Jet	50		2	100	0.25	0.03	2,040	0.20	41
Laser Copier	Large	1000	5	5,000	0.95	4.75	2,040	0.30	3,060
Space Heater	Small	800	4	3,200	0.95	3.04	2,040	0.20	1,306
Fax		25	3	75	0.25	0.02	255	0.20	4
Projector	Overhead	350	5	1,750	0.75	1.31	255	0.95	424
	Tabletop		100	1,500	0.75	1.13	255	0.95	363
TV	13-20"	120	2	400	0.50	0.20	255	0.95	97
	25-27"	150	2	600	0.50	0.30	255	0.95	145
TV(Hallway)	29-36"	200	-	-	0.95	-	8,760	0.95	-
Large Plasma TV		300	2	100	0.50	0.05	255	0.95	24
TV/VCR Combo		200	2	400	0.50	0.20	255	0.95	97
VCR		50	1	50	0.50	0.03	255	0.95	12
Fan		75	4	300	0.25	0.08	2,040	0.15	92
Desk Top Lamp	Inc	60	15	900	0.75	0.68	2,040	0.50	918
	CFL	13	1	13	0.75	0.01	2,040	0.50	13
Radio		15	2	30	0.75	0.02	2,040	0.50	31
Shredder		50	2	100	0.10	0.01	4	0.95	0
Scanner		40	2	80	0.10	0.01	255	0.20	4
Office Subtotal				21,222		13.50			9,334
Fridge	Small	115	10	1,150	0.95	1.09	8,760	0.40	4,030
	Large	500	10	5,000	0.95	4.75	8,760	0.40	17,520
Toaster Oven		1,500	1	1,500	0.95	1.43	126	0.95	180
Coffee Machine	Small	600	5	3,000	0.95	2.85	2,080	0.15	936
	Medium	1200	2	2,400	0.95	2.28	2,080	0.15	749
	Large	1500	1	1,500	0.95	1.43	2,080	0.15	468
Watercooler		100	2	200	0.95	0.19	8,760	0.40	701
Microwave	Large	1500	6	9,000	0.95	8.55	65	0.95	556
	Small	600	3	1,800	0.95	1.71	65	0.95	111
Vending Machine with Vending Miser	Beverage	1020	3	3,060	0.95	2.91	8,760	0.28	7,506
	Snack	210	1	210	0.95	0.20	8,760	0.28	515
	Coffee	800	1	800	0.95	0.76	8,760	0.28	1,962
Kettle		1500	2	3,000	0.95	2.85	65	0.95	185
Dishwasher		1500	2	3,000	0.95	2.85	255	0.95	727
Lunch Room Subtotal				35,620		33.84			36,145
Washer		500	1	500	0.50	0.25	255	0.95	121
Dryer		1,800	1	1,800	0.50	0.90	255	0.95	436
Large freezer		500	1	500	0.95	0.48	8,760	0.40	1,752
Other Subtotal				2,800		1.63			2,309
Total				84,104		72.21			125,269

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 3/6/2010

Building Type: Educational Facility
Building Name: Campus Activity Centre
Floors: 3



ITEM		Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC		75		39	2,925	0.95	2.78	2,040	0.80	4,774
Monitor (LCD)	15 inch	20		2	40	0.95	0.04	2,040	0.65	53
	17 inch	35		23	805	0.95	0.76	2,040	0.65	1,067
	19 inch	56		10	560	0.95	0.53	2,040	0.65	743
	21 inch	70		4	280	0.95	0.27	2,040	0.65	371
Monitor (LCD)	15 inch	58		2	116	0.95	0.11	2,040	0.65	154
	17 inch	61		1	61	0.95	0.06	2,040	0.65	81
Switch		180		6	1,080	0.95	1.03	8,760	0.65	6,150
Computer Subtotal					5,867		5.57			13,392
Laser Printer		288		7	2,016	0.25	0.50	2,040	0.20	823
Ink Jet		50		4	200	0.25	0.05	2,040	0.20	82
Laser Copier	Large	1000		4	4,000	0.95	3.80	2,040	0.30	2,448
Space Heater	Small	800		4	3,200	0.95	3.04	2,040	0.20	1,306
Fax		25		2	50	0.25	0.01	255	0.20	3
Projector	Overhead	350		5	1,750	0.75	1.31	255	0.20	89
TV	13-20"	120		1	120	0.50	0.06	255	0.95	29
	25-27"	150		1	150	0.50	0.08	255	0.95	36
	29-36"	200		1	200	0.50	0.10	255	0.95	48
TV (Hallway) (24/7)		200		1	200	0.95	0.19	8,760	0.95	1,664
Large Plasma TV		300		20	6,000	0.50	3.00	255	0.95	1,454
TV/VCR Combo		200		1	200	0.50	0.10	255	0.95	48
DVD Player		50		1	50	0.50	0.03	255	0.95	12
Fan		75		3	225	0.25	0.06	2,040	0.15	69
Radio		15		3	45	0.75	0.03	2,040	0.50	46
Shredder		50		2	100	0.10	0.01	4	0.95	0
Office Subtotal					18,506		12.37			8,157
Fridge	Small	115		3	345	0.95	0.33	8,760	0.40	1,209
	Large	500		13	6,500	0.95	6.18	8,760	0.40	22,776
Toaster		1500		1	1,500	0.95	1.43	65	0.95	93
Toaster Oven			1,500	7	10,500	0.95	9.98	65	0.95	648
Coffee Machine	Small	600		2	1,200	0.95	1.14	2,080	0.15	374
	Large	1500		6	9,000	0.95	8.55	2,080	0.15	2,808
Microwave	Large	1500		8	12,000	0.95	11.40	65	0.95	741
	Small	600		1	600	0.95	0.57	65	0.95	37
Vending Machine	Beverage	1020		6	6,120	0.95	5.81	8,760	0.40	21,444
	Snack	210		2	420	0.95	0.40	8,760	0.40	1,472
Kettle		1500		4	6,000	0.95	5.70	65	0.95	371
Dishwasher		1500		1	1,500	0.95	1.43	255	0.95	363
Lunch Room Subtotal					55,685		52.90			52,336
Arcade Machine		150		3	450	0.95	0.43	8,760	0.75	2,957
ATM			230	2	460	0.95	0.44	8,760	0.75	3,022
Other Subtotal					910		1			5,979
Total					80,968		71.71			126,222

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 3/6/2010

Building Type: Educational Facility
Building Name: Clock Tower
Floors: 3



ITEM		Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC		75		101	7,575	0.95	7.20	2,040	0.90	13,908
Monitor (LCD)	15 inch	20		62	1,240	0.95	1.18	2,040	0.80	2,024
	17 inch	35		39	1,365	0.95	1.30	2,040	0.80	2,228
	19 inch	56		4	224	0.95	0.21	2,040	0.80	366
	21 inch	70		13	910	0.95	0.86	2,040	0.80	1,485
Switch		180		2	360	0.95	0.34	8,760	0.65	2,050
Server Large		500		3	1,500	0.95	1.43	8,760	0.65	8,541
Laptop		25		2	50	0.95	0.05	2,040	0.90	92
Computer Subtotal					13,224		12.56			30,692
Laser Printer		288		17	4,896	0.25	1.22	2,040	0.20	1,998
Laser Copier Large		1000		4	4,000	0.95	3.80	2,040	0.30	2,448
Fax		25		3	75	0.25	0.02	255	0.20	4
Laser Fax		40		1	40	0.25	0.01	255	0.20	2
Projector	Overhead	350		2	700	0.75	0.53	255	0.95	170
	Tabletop		100	4	400	0.75	0.30	255	0.95	97
TV 29-36"		200		2	400	0.75	0.30	255	0.95	97
Fan		75		1	75	0.25	0.02	2,040	0.15	23
Desk Top Lamp Inc		60		6	360	0.75	0.27	2,040	0.50	367
Shredder		50		1	50	0.10	0.01	4	0.95	0
Office Subtotal					10,996		6.47			5,205
Fridge	Small	115		1	115	0.95	0.11	8,760	0.40	403
	Large	500		4	2,000	0.95	1.90	8,760	0.40	7,008
Coffee Machine	Small	600		2	1,200	0.95	1.14	2,040	0.15	367
	Medium			1	-	0.95	-	2,040	0.15	-
Watercooler		100		3	300	0.95	0.29	8,760	0.40	1,051
Microwave Large		1500		4	6,000	0.95	5.70	65	0.95	371
Vending Machine	Beverage	1020		1	1,020	0.95	0.97	8,760	0.40	3,574
	Snack	210		1	210	0.95	0.20	8,760	0.40	736
Kettle		1500		2	3,000	0.95	2.85	65	0.95	185
Dishwasher		1500		4	6,000	0.95	5.70	255	0.95	1,454
Stage Lights		500		4	2,000	0.25	0.50	24	0.95	46
Lunch Room Subtotal					21,845		19			15,194
Total					46,065		38			66,286

PLUG LOAD FORM

Project Name: Thompson River University
 Project Number: 2010098
 Date: 12/5/2010



Building Type: Educational Facility
 Building Name: Gymnasium
 Floors: 3

ITEM		Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC		75		6	450	0.95	0.43	2,040	0.80	734
Monitor (LCD)	15 inch	20		6	120	0.95	0.11	2,040	0.65	159
Computer Subtotal					570		0.54			894
Laser Printer		288		2	576	0.25	0.14	2,040	0.20	235
TV	29-36"	200		4	800	0.75	0.60	255	0.95	194
TV (Hallway)	29-36"	200		1	200	0.95	0.19	8,760	0.95	1,664
Office Subtotal					1,376		0.74			429
Fridge	Large	300		1	300	0.95	0.29	8,760	0.40	1,051
Watercooler		100		2	200	0.95	0.19	8,760	0.40	701
Microwave	Large	1500		1	1,500	0.95	1.43	65	0.95	93
Vending Machine	Beverage	1020		1	1,020	0.95	0.97	8,760	0.40	3,574
Lunch Room Subtotal					3,020		2.87			5,419
Total					4,966		4.15			6,741

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 13/5/2010

Building Type: Educational Facility
Building Name: International Building
Floors: 4



ITEM	Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC	75		189	14,175	0.95	13.47	2,040	0.80	23,134
Monitor (LCD) 15 inch	20		195	3,900	0.95	3.71	2,040	0.65	5,171
Monitor CRT 15 inch	58		3	174	0.95	0.17	2,040	0.65	231
Switch	180		15	2,700	0.95	2.57	8,760	0.65	15,374
Computer Subtotal				20,949		19.90			43,910
Laser Printer	288		21	6,048	0.25	1.51	2,040	0.20	2,468
Copier Medium	210		10	2,100	0.95	2.00	8,760	0.30	5,519
Shredder	50		5	250	0.25	0.06	65	0.25	4
TV 29-36"	200		13	2,600	0.50	1.30	255	0.95	630
TV (Hallway) (24/7)	200		2	400	0.95	0.38	8,760	0.95	3,329
Fan	75		3	225	0.25	0.06	2,040	0.15	69
Office Subtotal				11,623		5.31			12,018
Fridge Large	300		6	1,800	0.95	1.71	8,760	0.40	6,307
Toaster	1500		2	3,000	0.95	2.85	65	0.95	185
Toaster Oven		1,500	1	1,500	0.95	1.43	65	0.95	93
Coffee Machine Small	600		6	3,600	0.95	3.42	2,040	0.15	1,102
Watercooler	100		2	200	0.95	0.19	8,760	0.40	701
Microwave Large	1500		4	6,000	0.95	5.70	65	0.95	371
Vending Machine Beverage	1020		3	3,060	0.95	2.91	8,760	0.40	10,722
Vending Machine Snack	210		2	420	0.95	0.40	8,760	0.40	1,472
Lunch Room Subtotal				19,580		18.60			20,952
Total				52,152		43.81			76,879

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 12/5/2010

Building Type: Educational Facility
Building Name: Library
Floors: 2



ITEM		Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC		75		62	4,650	0.95	4.42	2,040	0.80	7,589
Monitor (LCD)	15 inch	20		63	1,260	0.95	1.20	2,040	0.65	1,671
Monitor CRT	15 inch	58		4	232	0.95	0.22	2,040	0.65	308
Switch		180		3	540	0.95	0.51	8,760	0.65	3,075
Computer Subtotal					6,682		6.35			12,642
Laser Printer		288		4	1,152	0.25	0.29	2,040	0.20	470
Copier	Medium	210		6	1,260	0.95	1.20	8,760	0.30	3,311
Shredder		50		3	150	0.25	0.04	65	0.25	2
TV	29-36"	200		2	400	0.50	0.20	255	0.95	97
Fan		75		1	75	0.25	0.02	2,040	0.15	23
Office Subtotal					3,037		1.74			3,904
Fridge	Large	300		1	300	0.95	0.29	8,760	0.40	1,051
Toaster		1500		1	1,500	0.95	1.43	65	0.95	93
Toaster Oven			1,500	1	1,500	0.95	1.43	65	0.95	93
Coffee Machine	Small	600		1	600	0.95	0.57	2,040	0.15	184
Watercooler		100		1	100	0.95	0.10	8,760	0.40	350
Microwave	Large	1500		1	1,500	0.95	1.43	65	0.95	93
	Small	600		1	600	0.95	0.57	65	0.95	37
Vending Machine	Beverage	1020		1	1,020	0.95	0.97	8,760	0.40	3,574
	Snack	210		1	210	0.95	0.20	8,760	0.40	736
Lunch Room Subtotal					7,330		6.96			6,210
Total					17,049		15.05			22,756

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 3/6/2010

Building Type: Educational Facility
Building Name: Old Main
Floors: 3



ITEM		Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC		75		745	55,875	0.95	53.08	2,040	0.80	91,188
Monitor (LCD)	15 inch	20		7	140	0.95	0.13	2,040	0.65	186
	17inch	35		742	25,970	0.95	24.67	2,040	0.65	34,436
	21 inch	70		5	350	0.95	0.33	2,040	0.65	464
Monitor CRT	15 inch	58		80	4,640	0.95	4.41	2,040	0.65	6,153
Switch		180		19	3,420	0.95	3.25	8,760	0.65	19,473
Small Server		150		5	750	0.95	0.71	8,760	0.65	4,271
Laptop		25		2	50	0.95	0.05	2,040	0.80	82
Computer Subtotal					91,195		86.64			156,252
Laser Printer		288		96	27,648	0.25	6.91	2,040	0.20	11,280
Laser Copier	Large	1000		28	28,000	0.95	26.60	2,040	0.30	17,136
Space Heater	Small	800		4	3,200	0.95	3.04	2,040	0.20	1,306
Laser Fax		40		2	80	0.25	0.02	255	0.20	4
Fax		25		15	375	0.25	0.09	255	0.20	19
Projector	Overhead	350		47	16,450	0.75	12.34	255	0.95	3,985
	Tabletop		100	14	1,400	0.75	1.05	255	0.95	339
TV	29-36"	200		11	2,200	0.50	1.10	255	0.95	533
TV (Hallway) (24/7)		200		4	800	0.95	0.76	8,760	0.95	6,658
TV (Security)		120		3	360	0.95	0.34	8,760	0.95	2,996
VCR		50		4	200	0.50	0.10	255	0.95	48
DVD Player		50		10	500	0.50	0.25	255	0.95	121
Fan		75		8	600	0.25	0.15	2,040	0.15	184
Desk Top Lamp	Inc	60		40	2,400	0.75	1.80	2,040	0.50	2,448
	CFL	13		21	273	0.75	0.20	2,040	0.50	278
Undercabinet Light	Fluorescent	35		17	595	0.75	0.45	2,040	0.50	607
Radio		15		6	90	0.75	0.07	2,040	0.50	92
Plotter		70		1	70	0.10	0.01	2,040	0.10	14
Cash Register		320		3	960	0.95	0.91	2,040	0.25	490
Scanner		40		9	360	0.10	0.04	255	0.20	18
Office Subtotal					86,561		56.23			48,556
Fridge	Small	115		6	690	0.95	0.66	8,760	0.40	2,418
	Large	500		20	10,000	0.95	9.50	8,760	0.40	35,040
Toaster		1500		6	9,000	0.95	8.55	65	0.95	556
Toaster Oven			1,500	5	7,500	0.95	7.13	65	0.95	463
Coffee Machine	Small	600		7	4,200	0.95	3.99	2,040	0.15	1,285
	Large	1500		4	6,000	0.95	5.70	2,040	0.15	1,836
Watercooler		100		15	1,500	0.95	1.43	8,760	0.40	5,256
Microwave	Large	1500		16	24,000	0.95	22.80	65	0.95	1,482
	Small	600		7	4,200	0.95	3.99	65	0.95	259
Vending Machine	Beverage	1020		14	14,280	0.95	13.57	8,760	0.40	50,037
	Snack	210		4	840	0.95	0.80	8,760	0.40	2,943
	Coffee	800		1	800	0.95	0.76	8,760	0.40	2,803
	Ice Cream	1700		1	1,700	0.95	1.62	8,760	0.40	5,957
Kettle		1500		12	18,000	0.95	17.10	65	0.95	1,112
Dishwasher		1500		5	7,500	0.95	7.13	255	0.95	1,817
Lunch Room Subtotal					110,210		104.70			113,264
Kiln	1.7 kW		1,700	1	1,700	0.50	0.85	255	0.95	412
	16.5 kW		16,500	1	16,500	0.50	8.25	255	0.95	3,997
	11.5 kW		11,500	2	23,000	0.50	11.50	255	0.95	5,572
ATM			230	1	230	0.95	0.22	8,760	0.75	1,511
Arcade Machine		150		10	1,500	0.95	1.43	8,760	0.75	9,855
Washer			500	1	500	0.50	0.25	255	0.95	121
Dryer			1,800	1	1,800	0.50	0.90	255	0.95	436
Leco Lights		300		2	600	0.50	0.30	255	0.95	145
Photography Lights	CFL	13		2	26	0.50	0.01	255	0.95	6
Other Subtotal					45,856		23.71			22,056
Total					333,822		271.27			431,337

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 06/03/2010

Building Type: Educational Facility
Building Name: Science
Floors: 3



ITEM	Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC	75		222	16,650	0.95	15.82	2,040	0.80	27,173
Monitor (LCD)	15 inch		45	900	0.95	0.86	2,040	0.65	1,193
	17 inch		205	7,175	0.95	6.82	2,040	0.65	9,514
	19 inch		4	224	0.95	0.21	2,040	0.65	297
	21 inch		9	630	0.95	0.60	2,040	0.65	835
Monitor (LCD)	15 inch		9	522	0.95	0.50	2,040	0.65	692
	17 inch		1	61	0.95	0.06	2,040	0.65	81
Switch	180		5	900	0.95	0.86	8,760	0.65	5,125
Small Server	150		2	300	0.95	0.29	8,760	0.65	1,708
Laptop	25		1	25	0.95	0.02	2,040	0.80	41
UPS	700		1	700	0.95	0.67	8,760	0.65	3,986
Computer Subtotal				27,387		26.02			46,659
Laser Printer	288		28	8,064	0.25	2.02	2,040	0.20	3,290
Ink Jet	50		3	150	0.25	0.04	2,040	0.20	61
Laser Copier	1000		6	6,000	0.95	5.70	2,040	0.30	3,672
Space Heater	800		9	7,200	0.95	6.84	2,040	0.20	2,938
Fax	25		3	75	0.25	0.02	255	0.20	4
Projector	Overhead	350	8	2,800	0.75	2.10	255	0.95	678
	Tabletop		100	2,100	0.75	1.58	255	0.95	509
TV	13-20"	120	4	800	0.50	0.40	255	0.95	194
	25-27"	150	3	900	0.50	0.45	255	0.95	218
TV(Hallway)	29-36"	200	3	600	0.95	0.57	8,760	0.95	4,993
Large Plasma TV	300		2	100	0.50	0.05	255	0.95	24
TV/VCR Combo	200		7	1,400	0.50	0.70	255	0.95	339
VCR	50		1	50	0.50	0.03	255	0.95	12
Fan	75		6	450	0.25	0.11	2,040	0.15	138
Desk Top Lamp	Inc	60	24	1,440	0.75	1.08	2,040	0.50	1,469
	CFL	13	1	13	0.75	0.01	2,040	0.50	13
Radio	15		3	45	0.75	0.03	2,040	0.50	46
Shredder	50		3	150	0.10	0.02	4	0.95	1
Scanner	40		2	80	0.10	0.01	255	0.20	4
Office Subtotal				32,417		21.74			18,603
Fridge	Small	115	13	1,495	0.95	1.42	8,760	0.40	5,238
	Large	500	16	8,000	0.95	7.60	8,760	0.40	28,032
Toaster Oven		1,500	1	1,500	0.95	1.43	126	0.95	180
Coffee Machine	Small	600	6	3,600	0.95	3.42	2,080	0.15	1,123
	Medium	1200	2	2,400	0.95	2.28	2,080	0.15	749
	Large	1500	1	1,500	0.95	1.43	2,080	0.15	468
Watercooler	100		3	300	0.95	0.29	8,760	0.40	1,051
Microwave	Large	1500	8	12,000	0.95	11.40	65	0.95	741
	Small	600	4	2,400	0.95	2.28	65	0.95	148
Vending Machine with Vending Miser	Beverage	1020	4	4,080	0.95	3.88	8,760	0.28	10,007
	Snack	210	1	210	0.95	0.20	8,760	0.28	515
	Coffee	800	1	800	0.95	0.76	8,760	0.28	1,962
Kettle	1500		5	7,500	0.95	7.13	65	0.95	463
Dishwasher	1500		1	1,500	0.95	1.43	255	0.95	363
Lunch Room Subtotal				47,285		44.92			51,042
Washer		500	3	1,500	0.50	0.75	255	0.95	363
Dryer		1,800	1	1,800	0.50	0.90	255	0.95	436
Aquarium Pump	20		6	120	0.95	0.11	8,760	0.75	788
Large freezer	500		1	500	0.95	0.48	8,760	0.40	1,752
Other Subtotal				3,920		2.24			3,340
Total				111,009		94.92			167,345

PLUG LOAD FORM

Project Name: Thompson River University
Project Number: 2010098
Date: 27/5/2010

Building Type: Educational Facility
Building Name: Trades and Technology
Floors: 2



ITEM		Avg Wattage	Name Plate Wattage	Quantity	Total W	Diversity Factor (DF)	Peak Demand kW after DF	Operating Hours	SOF	kWh
PC		75		177	13,275	0.95	12.61	2,040	0.80	21,665
PC (Left On)		75		17	1,275	0.95	1.21	8,760	0.80	8,935
Monitor (LCD)	15 inch	20		238	4,760	0.95	4.52	2,040	0.65	6,312
	17 inch	35		20	700	0.95	0.67	2,040	0.65	928
Monitor CRT	15 inch	58		6	348	0.95	0.33	2,040	0.65	461
Server	Small		150	2	300	0.95	0.29	8,760	0.65	1,708
	Large		500	1	500	0.95	0.48	8,760	0.65	2,847
Switch		180		10	1,800	0.95	1.71	8,760	0.65	10,249
High Speed Modem (3 Amps)			360	2	720	0.95	0.68	8,760	0.65	4,100
Computer Subtotal					23,678		22.49			57,205
Laser Printer		288		16	4,608	0.25	1.15	2,040	0.20	1,880
Large Copier	Large	1000		4	4,000	0.95	3.80	2,040	0.30	2,448
Desk Lamp	Inc.	60		2	120	0.50	0.06	2,040	0.50	122
Scanner		40		3	120	0.50	0.06	2,040	0.50	122
Fax		25		6	150	0.25	0.04	255	0.20	8
Projector	Overhead	350		5	1,750	0.75	1.31	255	0.95	424
	Tabletop		100	20	2,000	0.75	1.50	255	0.95	485
VCR		50		1	50	0.50	0.03	255	0.95	12
DVD Player		50		1	50	0.50	0.03	255	0.95	12
Radio		15		1	15	0.75	0.01	2,040	0.50	15
Shredder		50		1	50	0.10	0.01	4	0.95	0
Space Heater	Small	800		3	2,400	0.95	2.28	2,040	0.20	979
TV	13-20"	50		2	100	0.50	0.05	255	0.95	24
	29-36"	200		12	2,400	0.50	1.20	255	0.95	581
TV (Hallway)		200		4	800	0.95	0.76	8,760	0.95	6,658
TV/VCR Combo		200		4	800	0.50	0.40	255	0.95	194
Micro Image Viewer		20		5	100	0.10	0.01	255	0.95	24
Office Subtotal					19,513		12.69			13,989
Fridge	Small	115		1	115	0.95	0.11	8,760	0.40	403
	Large	300		4	1,200	0.95	1.14	8,760	0.40	4,205
Blender		300		2	600	0.50	0.30	65	0.95	37
Toaster		1500		3	4,500	0.95	4.28	65	0.95	278
Coffee Machine	Small	600		9	5,400	0.95	5.13	2,040	0.15	1,652
Watercooler		100		2	200	0.95	0.19	8,760	0.40	701
Microwave	Large	1500		4	6,000	0.95	5.70	65	0.95	371
	Small	600		6	3,600	0.95	3.42	65	0.95	222
Vending Machine	Beverage	1020		9	9,180	0.95	8.72	8,760	0.40	32,167
	Snack	210		2	420	0.95	0.40	8,760	0.40	1,472
	Coffee	360		1	360	0.95	0.34	8,760	0.40	1,261
Dishwasher		1500		1	1,500	0.95	1.43	255	0.95	363
Lunch Room Subtotal					33,075		31.15			43,132
					Total		66.33			114,327

APPENDIX C: UTILITY RATES AND ENERGY HISTORIES

1. Electrical Rates
2. Natural Gas Rates
3. Annual Building Energy Consumption Summary
4. Detailed Monthly Meter Electrical History
5. Detailed Monthly Meter Fuel History
6. Regression Charts
7. CUSUM Charts

SCHEDULE 1200, 1201, 1210, 1211 – GENERAL SERVICE (35 KW AND OVER)

Availability: For all purposes. Supply is 60 hertz, single or three phase at secondary or primary potential. BC Hydro reserves the right to determine the potential of the service connection.

Applicable in: Rate Zone I and Rate Zone IB.

Rate: Basic Charge 17.16 ¢ per day

Demand Charge

First 35 kW of billing demand per month @ \$0.00 per kW
Next 115 kW of billing demand per month @ \$4.18 per kW
All additional kW of billing demand per month @ \$8.02 per kW

plus

Energy Charge

First 14800 kW.h per month @ 8.16 ¢ per kW.h
All additional kW.h per month @ 3.93 ¢ per kW.h

Discounts

1. A discount of 1½% shall be applied to the above rate if a Customer's supply of electricity is metered at a primary potential.
2. A discount of 25¢ per month per kW of billing demand shall be applied to the above rate if a Customer supplies transformation from a primary potential to a secondary potential.
3. If a Customer is entitled to both of the above discounts, the discount for metering at a primary potential shall be applied first.

ACCEPTED: APR 0 2010

ORDER NO. 647 10



COMMISSION SECRETARY

- Billing Codes: Schedule 1200 applies if a Customer's supply of electricity is metered at a secondary potential and BC Hydro supplies transformation from a primary potential to a secondary potential.
- Schedule 1201 applies if a Customer's supply of electricity is metered at a primary potential and BC Hydro supplies transformation from a primary potential to a secondary potential.
- Schedule 1210 applies if a Customer's supply of electricity is metered at a secondary potential and the Customer supplies transformation from a primary potential to a secondary potential.
- Schedule 1211 applies if a Customer's supply of electricity is metered at a primary potential and the Customer supplies transformation from a primary potential to a secondary potential.
- Billing Demand: The Demand for billing purposes shall be the highest kW demand in the billing period.
- Monthly Minimum Charge: 50% of the highest maximum demand charge billed in any month wholly within an on-peak period during the immediately preceding eleven months. For the purpose of this provision an on-peak period commences on 1 November in any year and terminates on 31 March of the following year.
- Special Condition: A demand meter will normally be installed. Prior to the installation of such a meter, or if such a meter is not installed, the demand for billing purposes shall be the assessed demand estimated by BC Hydro.
- Rate Rider: The Deferral Account Rate Rider as set out in Rate Schedule 1901 applies to all charges payable under this Rate Schedule, before taxes and levies.
- Interim Increase: Effective April 1, 2010 the Rates and Minimum Charge under these schedules include an interim increase of 6.11% before rounding, approved by BCUC Order No. G-47-10.

ACCEPTED: APR 8 2010
ORDER NO. 647 10


COMMISSION SECRETARY

NATURAL GAS RATES

Rates Effective: July 1, 2010
 Date Updated: June 8, 2010

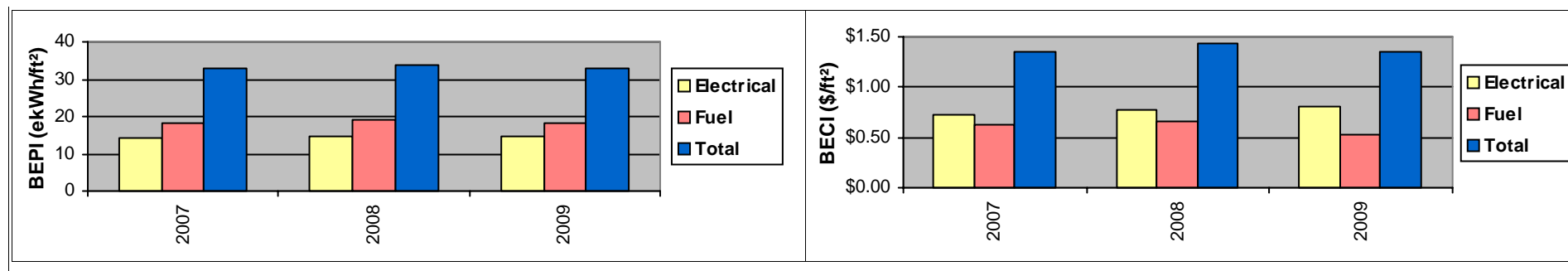
Rate Schedule	Description	Fixed Monthly Basic & Administration Charges		Variable Prices Per Gigajoule / Demand Charges			Sample Annual Bill (Lower Mainland)
				LM	Inland	Columbia	
1	Residential (Individually Metered Residential)	\$11.84	Delivery Midstream Cost of Gas Total	\$3.145	\$3.145	\$3.145	\$1,077 95 GJ
				\$1.725	\$1.704	\$1.764	
				\$4.976	\$4.976	\$4.976	
				\$9.846	\$9.825	\$9.885	
1U	Residential (Individually Metered Residential)	\$11.84	Delivery Midstream Cost of Gas Total	\$3.145	\$3.145	\$3.145	n/a n/a GJ
				\$1.725	\$1.704	\$1.764	
				As negotiated with Marketer			
				\$4.870	\$4.849	\$4.909	
2	Small Commercial (Up to 2000 GJ/Year)	\$24.84	Delivery Midstream Cost of Gas Total	\$2.604	\$2.604	\$2.604	\$3,060 300 GJ
				\$1.628	\$1.607	\$1.668	
				\$4.976	\$4.976	\$4.976	
				\$9.208	\$9.187	\$9.248	
2U	Small Commercial (Up to 2000 GJ/Year)	\$24.84	Delivery Midstream Cost of Gas Total	\$2.604	\$2.604	\$2.604	n/a n/a GJ
				\$1.628	\$1.607	\$1.668	
				As negotiated with Marketer			
				\$4.232	\$4.211	\$4.272	
3	Large Commercial (Over 2000 GJ/Year)	\$132.52	Delivery Midstream Cost of Gas Total	\$2.219	\$2.219	\$2.219	\$25,323 2,800 GJ
				\$1.281	\$1.266	\$1.324	
				\$4.976	\$4.976	\$4.976	
				\$8.476	\$8.461	\$8.519	
3U	Large Commercial (Over 2000 GJ/Year)	\$132.52	Delivery Midstream Cost of Gas Total	\$2.219	\$2.219	\$2.219	n/a n/a GJ
				\$1.281	\$1.266	\$1.324	
				As negotiated with Marketer			
				\$3.500	\$3.485	\$3.543	
4	Seasonal (Agriculture, Pools, Paving) (Standard rate is for Apr to Oct use only)	\$439.00 Authorized Extension	Delivery Cost of Gas Total	\$0.853	\$0.853	\$0.853	\$39,734 5,400 GJ
				\$5.936	\$5.926	\$5.981	
				\$6.789	\$6.779	\$6.834	
5	General Firm Service (High Volume w/ Demand Charge) (Demand applies to calculated peak volume)	\$587.00	Delivery Cost of Gas Total Demand	\$0.637	\$0.637	\$0.637	\$81,721 9,700 GJ
				\$5.936	\$5.926	\$5.981	
				\$6.573	\$6.563	\$6.618	
				\$15.554	\$15.554	\$15.554	
6	Vehicle Service (NGV Stations)	\$61.00	Delivery Cost of Gas Total	\$3.604	\$3.604	\$3.604	\$26,965 2,900 GJ
				\$5.442	\$5.440	\$5.440	
				\$9.046	\$9.044	\$9.044	
7	Interruptible Service (Fixed Price Option)	\$880.00	Delivery Cost of Gas Total	\$1.051	\$1.051	\$1.051	\$67,155 8,100 GJ
				\$5.936	\$5.926	\$5.981	
				\$6.987	\$6.977	\$7.032	
22	Large Volume Transportation (12,000 GJ take or pay)	\$3,664.00 \$78.00	Delivery	\$0.776	\$0.776	\$0.776	\$407,533 422,966 GJ
23	R3 Transportation (Large Commercial)	\$132.52 \$78.00	Delivery	\$2.219	\$2.219	\$2.219	\$11,624 4,100 GJ
25	R5 Transportation (High Volume w/ Demand Charge)	\$587.00 \$78.00	Delivery Demand	\$0.637	\$0.637	\$0.637	\$12,158 17,819 GJ
				\$15.554	\$15.554	\$15.554	
27	R7 Transportation (Interruptible)	\$880.00 \$78.00	Delivery	\$1.051	\$1.051	\$1.051	\$68,205 47,047 GJ
1	Revelstoke Residential (Individually Metered Residential)	\$11.84	Delivery Cost of Gas Total		\$3.145		\$1,030 50 GJ
					\$14.613		
					\$17.758		
2	Small Commercial (Up to 2000 GJ/Year)	\$24.84	Delivery Cost of Gas Total		\$2.604		\$4,330 250 GJ
					\$13.522		
					\$16.126		
3	Large Commercial (Over 2000 GJ/Year)	\$132.52	Delivery Cost of Gas Total		\$2.219		\$72,425 4,500 GJ
					\$13.522		
					\$15.741		

NOTES:

- This spreadsheet is a summary of common rates in effect at time of printing. Rates are subject to revision. Refer to Terasen Gas Tariff for detailed conditions.
- Rates include riders and adjustments, but do not include taxes or franchise fees. Contact Terasen Gas for clarification of rates.
- We believe this information to be correct and accurate, however Terasen Gas assumes no liability for errors or omissions.

Annual Energy Performance - Project Summary (2007 - 2009)

Project: 2010098 - Thompson Rivers University - Kamloops Campus



Year	Area ft²	Electrical					Fuel					Total			
		kWh	ekWh	Cost	BEPI	BECI	GJ	ekWh	Cost	BEPI	BECI	ekWh	Cost	BEPI	BECI
2007	1,048,966	15,104,403	15,104,403	\$768,311	14.4	\$0.73	69,384	19,273,195	\$652,108	18.4	\$0.62	34,377,598	\$1,420,419	32.8	\$1.35
2008	1,048,966	15,283,229	15,283,229	\$805,817	14.6	\$0.77	71,706	19,918,306	\$692,330	19.0	\$0.66	35,201,535	\$1,498,148	33.6	\$1.43
2009	1,048,966	15,367,200	15,367,200	\$852,349	14.6	\$0.81	68,832	19,120,111	\$559,001	18.2	\$0.53	34,487,312	\$1,411,350	32.9	\$1.35

Consumption and Cost (GST excluded) are for fiscal year(s) ending at the end of December

* meter missing data more than 5% of a full year

BEPI in ekWh/ft²

BECI in \$/ft²

Meter History - Electrical (2007 - 2010)

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus

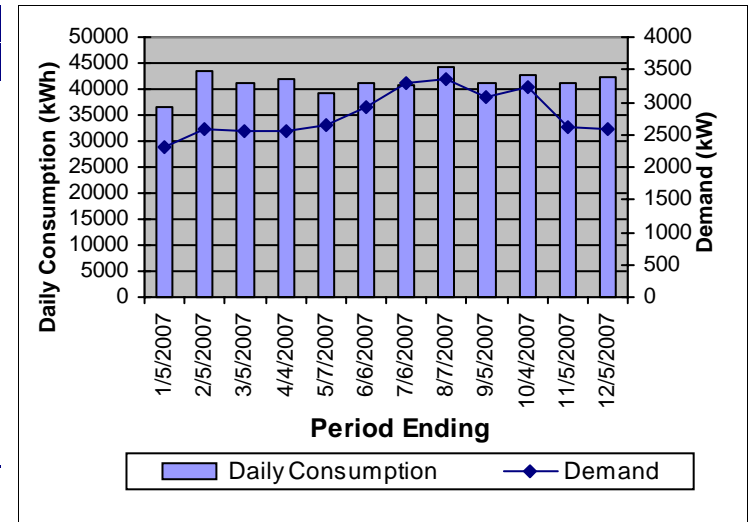
Meter: MAIN-ELEC-01 (2741787)

Meter type: Electrical

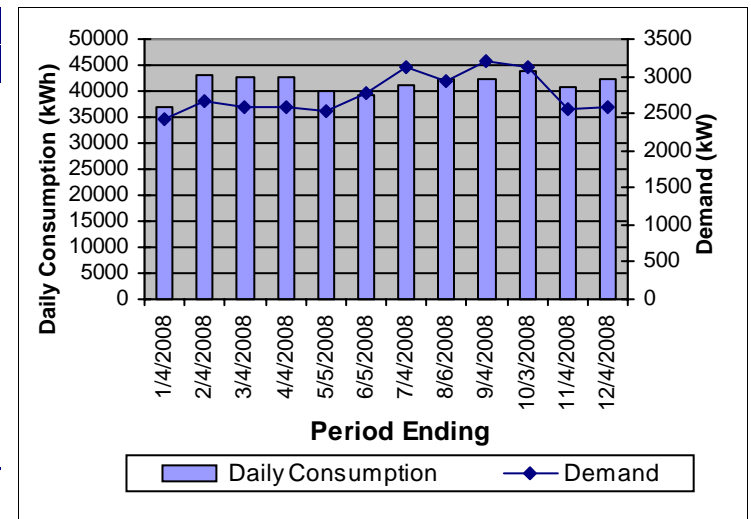
Rate: ELEC004

Vendor: BC HYDRO

Start date	Read date	Days	Demand Consump.		Cost		Daily	
			kW	kWh	\$	\$/kWh	kWh	Cost
06-Dec-06	05-Jan-07	31	2,323.0	1,130,400	\$57,156	\$0.051	36,465	\$1,844
06-Jan-07	05-Feb-07	31	2,582.0	1,346,400	\$64,820	\$0.048	43,432	\$2,091
06-Feb-07	05-Mar-07	28	2,565.0	1,154,400	\$58,117	\$0.050	41,229	\$2,076
06-Mar-07	04-Apr-07	30	2,560.0	1,262,400	\$61,870	\$0.049	42,080	\$2,062
05-Apr-07	07-May-07	33	2,642.0	1,300,800	\$63,784	\$0.049	39,418	\$1,933
08-May-07	06-Jun-07	30	2,918.0	1,238,400	\$64,771	\$0.052	41,280	\$2,159
07-Jun-07	06-Jul-07	30	3,304.0	1,224,000	\$66,974	\$0.055	40,800	\$2,232
07-Jul-07	07-Aug-07	32	3,357.0	1,411,200	\$74,044	\$0.052	44,100	\$2,314
08-Aug-07	05-Sep-07	29	3,074.0	1,195,200	\$64,324	\$0.054	41,214	\$2,218
06-Sep-07	04-Oct-07	29	3,244.0	1,238,400	\$65,751	\$0.053	42,703	\$2,267
05-Oct-07	05-Nov-07	32	2,611.0	1,317,600	\$64,159	\$0.049	41,175	\$2,005
06-Nov-07	05-Dec-07	30	2,577.0	1,274,400	\$62,409	\$0.049	42,480	\$2,080
2007 total:		365		15,093,600	\$768,178	\$0.051	41,352	\$2,105



Start date	Read date	Days	Demand Consump.		Cost		Daily	
			kW	kWh	\$	\$/kWh	kWh	Cost
06-Dec-07	04-Jan-08	30	2,426.0	1,106,400	\$55,465	\$0.050	36,880	\$1,849
05-Jan-08	04-Feb-08	31	2,654.0	1,339,200	\$65,203	\$0.049	43,200	\$2,103
05-Feb-08	04-Mar-08	29	2,592.0	1,236,000	\$61,156	\$0.049	42,621	\$2,109
05-Mar-08	04-Apr-08	31	2,587.0	1,324,800	\$64,777	\$0.049	42,735	\$2,090
05-Apr-08	05-May-08	31	2,532.0	1,243,200	\$64,950	\$0.052	40,103	\$2,095
06-May-08	05-Jun-08	31	2,762.0	1,219,200	\$67,061	\$0.055	39,329	\$2,163
06-Jun-08	04-Jul-08	29	3,115.0	1,190,400	\$68,613	\$0.058	41,048	\$2,366
05-Jul-08	06-Aug-08	33	2,937.0	1,396,800	\$75,137	\$0.054	42,327	\$2,277
07-Aug-08	04-Sep-08	29	3,213.0	1,231,200	\$70,902	\$0.058	42,455	\$2,445
05-Sep-08	03-Oct-08	29	3,127.0	1,276,800	\$70,581	\$0.055	44,028	\$2,434
04-Oct-08	04-Nov-08	32	2,553.0	1,308,000	\$67,524	\$0.052	40,875	\$2,110
05-Nov-08	04-Dec-08	30	2,575.0	1,274,400	\$66,431	\$0.052	42,480	\$2,214
2008 total:		365		15,146,400	\$797,798	\$0.053	41,497	\$2,186



GST excluded from costs Fiscal year ends at the end of December

Meter History - Electrical (2007 - 2010)

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus

Meter: MAIN-ELEC-01 (2741787)

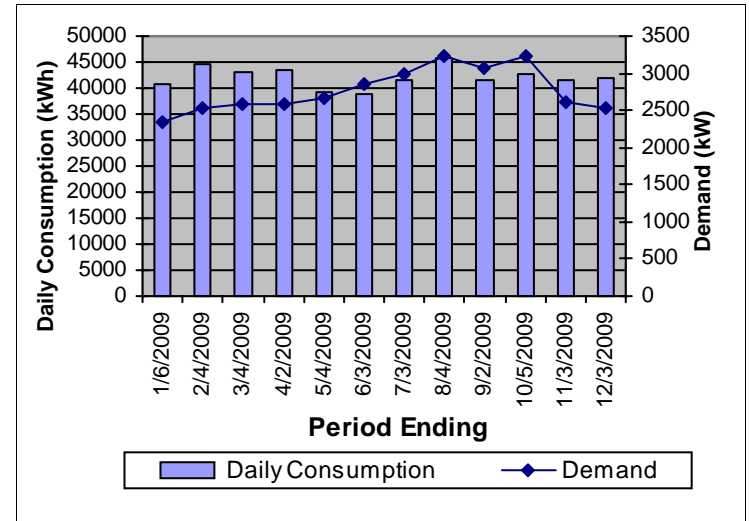
Meter type: Electrical

Rate: ELEC004

Vendor: BC HYDRO

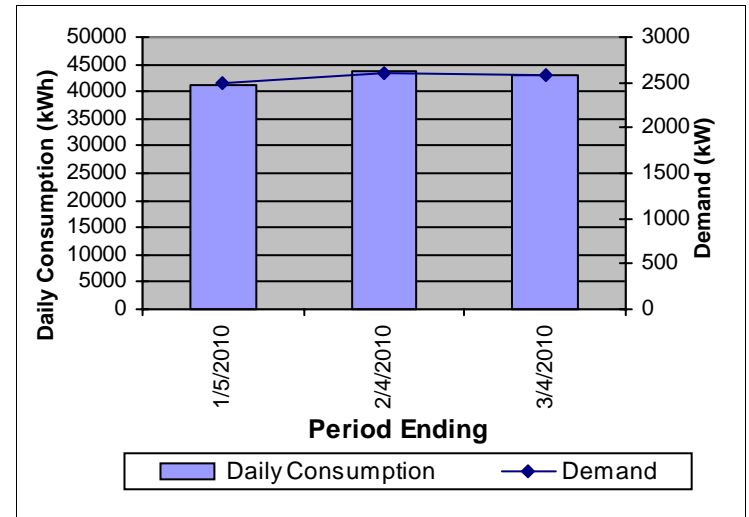
Start date	Read date	Days	Demand Consump.		Cost		Daily	
			kW	kWh	\$	\$/kWh	kWh	Cost
05-Dec-08	06-Jan-09	33	2,352.0	1,339,200	\$68,554	\$0.051	40,582	\$2,077
07-Jan-09	04-Feb-09	29	2,544.0	1,291,200	\$66,830	\$0.052	44,524	\$2,304
05-Feb-09	04-Mar-09	28	2,582.0	1,204,800	\$63,884	\$0.053	43,029	\$2,282
05-Mar-09	02-Apr-09	29	2,587.0	1,264,800	\$63,930	\$0.051	43,614	\$2,204
03-Apr-09	04-May-09	32	2,678.0	1,255,200	\$69,554	\$0.055	39,225	\$2,174
05-May-09	03-Jun-09	30	2,856.0	1,161,600	\$68,617	\$0.059	38,720	\$2,287
04-Jun-09	03-Jul-09	30	2,988.0	1,243,200	\$72,905	\$0.059	41,440	\$2,430
04-Jul-09	04-Aug-09	32	3,228.0	1,468,800	\$83,775	\$0.057	45,900	\$2,618
05-Aug-09	02-Sep-09	29	3,072.0	1,204,800	\$72,036	\$0.060	41,545	\$2,484
03-Sep-09	05-Oct-09	33	3,242.0	1,413,600	\$81,687	\$0.058	42,836	\$2,475
06-Oct-09	03-Nov-09	29	2,599.0	1,207,200	\$67,071	\$0.056	41,628	\$2,313
04-Nov-09	03-Dec-09	30	2,527.0	1,260,000	\$68,577	\$0.054	42,000	\$2,286

2009 total: 364 15,314,400 \$847,419 \$0.055 42,073 \$2,328



Start date	Read date	Days	Demand Consump.		Cost		Daily	
			kW	kWh	\$	\$/kWh	kWh	Cost
04-Dec-09	05-Jan-10	33	2,486.0	1,353,600	\$71,916	\$0.053	41,018	\$2,179
06-Jan-10	04-Feb-10	30	2,596.0	1,317,600	\$71,358	\$0.054	43,920	\$2,379
05-Feb-10	04-Mar-10	28	2,589.0	1,207,200	\$66,994	\$0.055	43,114	\$2,393

2010 total: 91 3,878,400 \$210,267 \$0.054 42,620 \$2,311



GST excluded from costs Fiscal year ends at the end of December

Meter History - Fuel (2007 - 2010)

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus

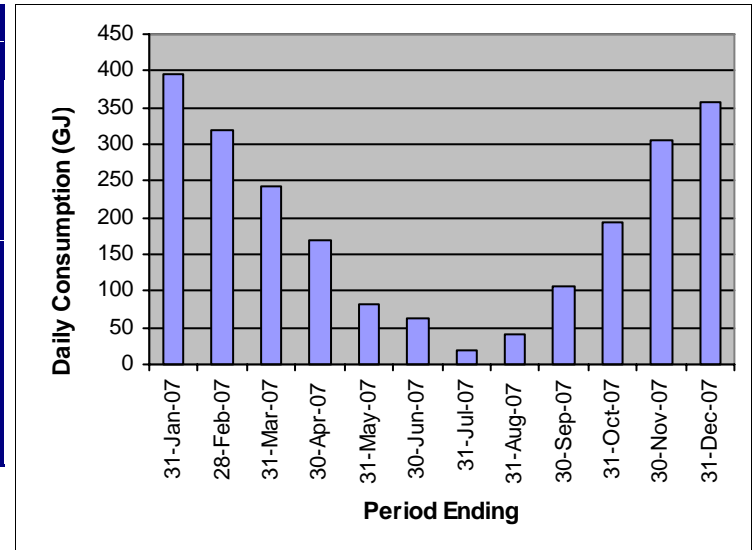
Meter: MAIN-GAS-01 (1178101)

Meter type: Natural Gas

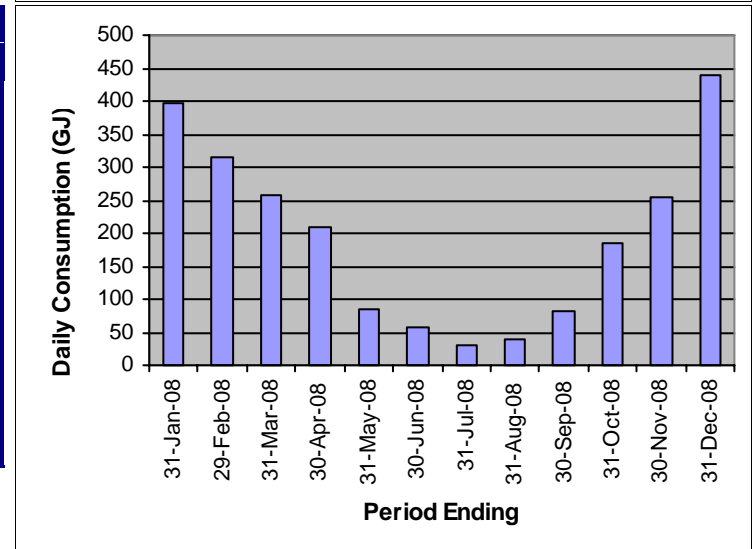
Rate: 25 - R5 Transport

Vendor: Terasen Gas

Start date	Read date	Days	Billed	Equiv.	Cost		Daily	
			GJ	GJ	\$	\$/GJ	GJ	Cost
01-Jan-07	31-Jan-07	31	12,217.0	12,217.0	\$114,177	\$9.35	394.1	\$3,683
01-Feb-07	28-Feb-07	28	8,904.8	8,904.8	\$83,379	\$9.36	318.0	\$2,978
01-Mar-07	31-Mar-07	31	7,552.0	7,552.0	\$70,801	\$9.38	243.6	\$2,284
01-Apr-07	30-Apr-07	30	5,103.0	5,103.0	\$48,029	\$9.41	170.1	\$1,601
01-May-07	31-May-07	31	2,517.8	2,517.8	\$23,991	\$9.53	81.2	\$774
01-Jun-07	30-Jun-07	30	1,877.9	1,877.9	\$18,041	\$9.61	62.6	\$601
01-Jul-07	31-Jul-07	31	589.6	589.6	\$6,062	\$10.28	19.0	\$196
01-Aug-07	31-Aug-07	31	1,235.1	1,235.1	\$12,064	\$9.77	39.8	\$389
01-Sep-07	30-Sep-07	30	3,199.2	3,199.2	\$30,327	\$9.48	106.6	\$1,011
01-Oct-07	31-Oct-07	31	6,009.9	6,009.9	\$56,462	\$9.39	193.9	\$1,821
01-Nov-07	30-Nov-07	30	9,127.2	9,127.2	\$85,447	\$9.36	304.2	\$2,848
01-Dec-07	31-Dec-07	31	11,050.0	11,050.0	\$103,326	\$9.35	356.5	\$3,333
2007 total:		365	69,383.5	69,383.5	\$652,108	\$9.40	190.1	\$1,787



Start date	Read date	Days	Billed	Equiv.	Cost		Daily	
			GJ	GJ	\$	\$/GJ	GJ	Cost
01-Jan-08	31-Jan-08	31	12,324.1	12,324.1	\$115,173	\$9.35	397.6	\$3,715
01-Feb-08	29-Feb-08	29	9,149.2	9,149.2	\$81,139	\$8.87	315.5	\$2,798
01-Mar-08	31-Mar-08	31	7,939.3	7,939.3	\$70,487	\$8.88	256.1	\$2,274
01-Apr-08	30-Apr-08	30	6,308.9	6,308.9	\$65,422	\$10.37	210.3	\$2,181
01-May-08	31-May-08	31	2,632.4	2,632.4	\$27,641	\$10.50	84.9	\$892
01-Jun-08	30-Jun-08	30	1,716.3	1,716.3	\$18,227	\$10.62	57.2	\$608
01-Jul-08	31-Jul-08	31	915.7	915.7	\$11,462	\$12.52	29.5	\$370
01-Aug-08	31-Aug-08	31	1,213.7	1,213.7	\$15,001	\$12.36	39.2	\$484
01-Sep-08	30-Sep-08	30	2,464.0	2,464.0	\$29,847	\$12.11	82.1	\$995
01-Oct-08	31-Oct-08	31	5,753.9	5,753.9	\$55,095	\$9.58	185.6	\$1,777
01-Nov-08	30-Nov-08	30	7,668.6	7,668.6	\$73,232	\$9.55	255.6	\$2,441
01-Dec-08	31-Dec-08	31	13,619.8	13,619.8	\$129,606	\$9.52	439.3	\$4,181
2008 total:		366	71,705.9	71,705.9	\$692,330	\$9.66	195.9	\$1,892



GST excluded from costs Fiscal year ends at the end of December

Meter History - Fuel (2007 - 2010)

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus

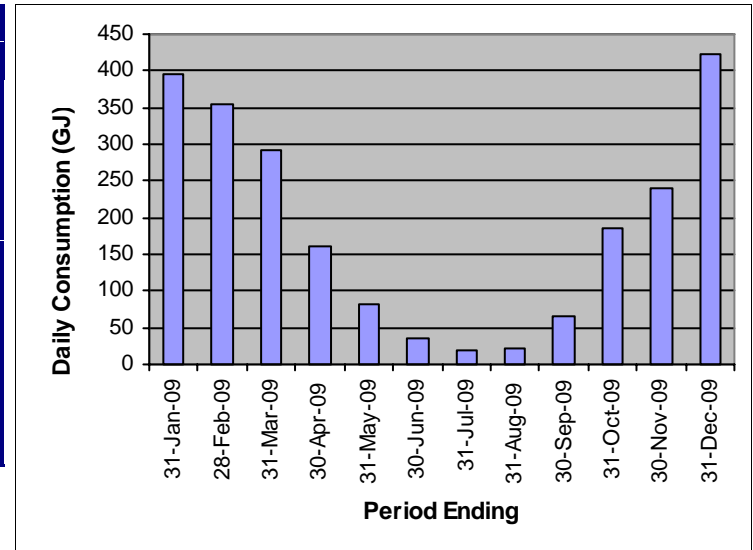
Meter: MAIN-GAS-01 (1178101)

Meter type: Natural Gas

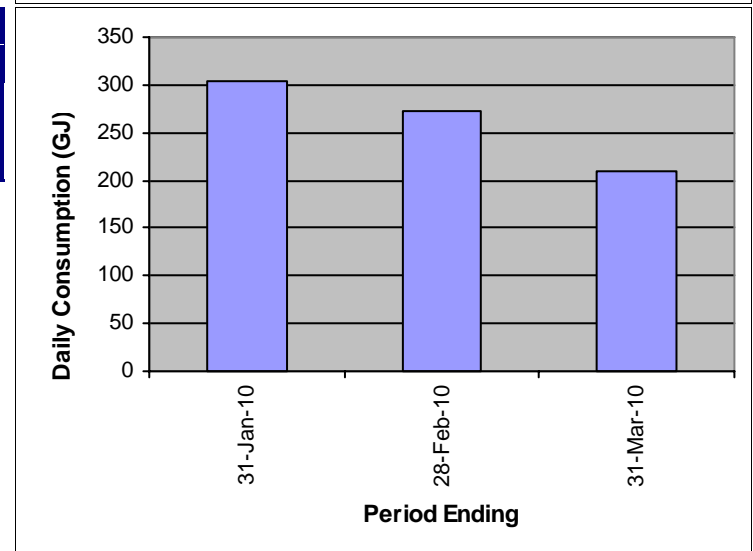
Rate: 25 - R5 Transport

Vendor: Terasen Gas

Start date	Read date	Days	Billed	Equiv.	Cost		Daily	
			GJ	GJ	\$	\$/GJ	GJ	Cost
01-Jan-09	31-Jan-09	31	12,278.8	12,278.8	\$115,425	\$9.40	396.1	\$3,723
01-Feb-09	28-Feb-09	28	9,923.8	9,923.8	\$93,409	\$9.41	354.4	\$3,336
01-Mar-09	31-Mar-09	31	9,036.9	9,036.9	\$85,118	\$9.42	291.5	\$2,746
01-Apr-09	30-Apr-09	30	4,802.0	4,802.0	\$37,350	\$7.78	160.1	\$1,245
01-May-09	31-May-09	31	2,553.6	2,553.6	\$20,156	\$7.89	82.4	\$650
01-Jun-09	30-Jun-09	30	1,032.7	1,032.7	\$8,525	\$8.26	34.4	\$284
01-Jul-09	31-Jul-09	31	562.2	562.2	\$4,927	\$8.76	18.1	\$159
01-Aug-09	31-Aug-09	31	675.6	675.6	\$5,795	\$8.58	21.8	\$187
01-Sep-09	30-Sep-09	30	1,950.5	1,950.5	\$15,544	\$7.97	65.0	\$518
01-Oct-09	31-Oct-09	31	5,755.8	5,755.8	\$38,430	\$6.68	185.7	\$1,240
01-Nov-09	30-Nov-09	30	7,176.7	7,176.7	\$47,762	\$6.66	239.2	\$1,592
01-Dec-09	31-Dec-09	31	13,083.8	13,083.8	\$86,558	\$6.62	422.1	\$2,792
2009 total:		365	68,832.4	68,832.4	\$559,001	\$8.12	188.6	\$1,532



Start date	Read date	Days	Billed	Equiv.	Cost		Daily	
			GJ	GJ	\$	\$/GJ	GJ	Cost
01-Jan-10	31-Jan-10	31	9,409.0	9,409.0	\$66,571	\$7.08	303.5	\$2,147
01-Feb-10	28-Feb-10	28	7,600.7	7,600.7	\$53,898	\$7.09	271.5	\$1,925
01-Mar-10	31-Mar-10	31	6,506.4	6,506.4	\$46,228	\$7.11	209.9	\$1,491
2010 total:		90	23,516.1	23,516.1	\$166,697	\$7.09	261.3	\$1,852



GST excluded from costs Fiscal year ends at the end of December

Base Period Analysis

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus

Location: Kamloops (BC)

Weather Station: Kamloops (BC)

Meter: MAIN-ELEC-01 (2741787)

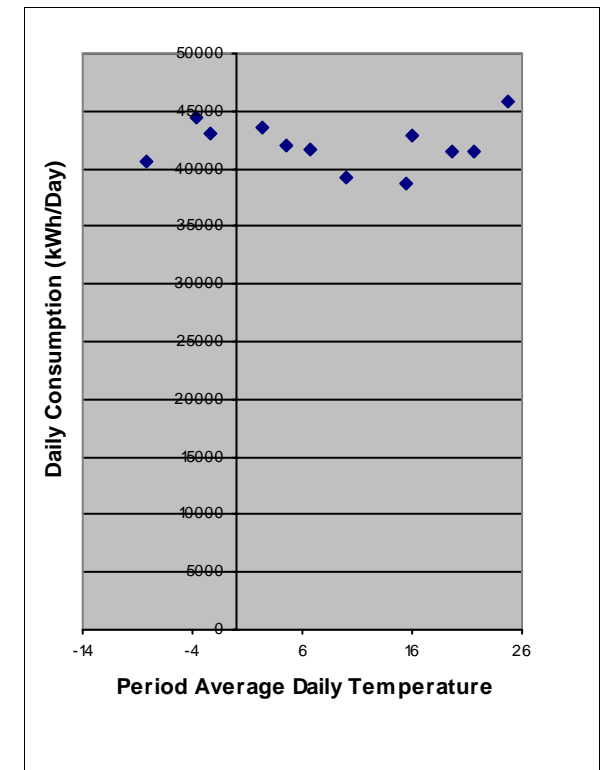
Meter type: Electrical

Analysis: Non-Weather Related

Analysis Period: 05-Dec-08 to 03-Dec-09 Parameter: Dry Bulb Temperature Type: Non-Weather Related Consumption

Base Value: N/A Base Load: 42072.5275 kWh per day Weather Sensitivity: 0 kWh/HDDs R²: 0.0000

Read Date	Days	Consumption kWh	kWh/Day	AVG Temp	Incl	Mult.	Offset	Baseline	% Deviation	Adjusted Baseline	% Deviation
1/6/2009	33	1,339,200.0	40,581.8	-8.2	✓	1	-5E+04	1,388,393.4	3.7%	1,339,200.0	0.0%
2/4/2009	29	1,291,200.0	44,524.1	-3.7	✓	1	71100	1,220,103.3	-5.5%	1,291,200.0	0.0%
3/4/2009	28	1,204,800.0	43,028.6	-2.4	✓	1	26770	1,178,030.8	-2.2%	1,204,800.0	0.0%
4/2/2009	29	1,264,800.0	43,613.8	2.3	✓	1	44700	1,220,103.3	-3.5%	1,264,800.0	0.0%
5/4/2009	32	1,255,200.0	39,225.0	9.9	✓	1	-9E+04	1,346,320.9	7.3%	1,255,200.0	0.0%
6/3/2009	30	1,161,600.0	38,720.0	15.4	✓	1	-1E+05	1,262,175.8	8.7%	1,161,600.0	0.0%
7/3/2009	30	1,243,200.0	41,440.0	19.6	✓	1	-2E+04	1,262,175.8	1.5%	1,243,200.0	0.0%
8/4/2009	32	1,468,800.0	45,900.0	24.7	✓	1	1E+05	1,346,320.9	-8.3%	1,468,800.0	0.0%
9/2/2009	29	1,204,800.0	41,544.8	21.7	✓	1	-2E+04	1,220,103.3	1.3%	1,204,800.0	0.0%
10/5/2009	33	1,413,600.0	42,836.4	16.0	✓	1	25210	1,388,393.4	-1.8%	1,413,600.0	0.0%
11/3/2009	29	1,207,200.0	41,627.6	6.7	✓	1	-1E+04	1,220,103.3	1.1%	1,207,200.0	0.0%
12/3/2009	30	1,260,000.0	42,000.0	4.6	✓	1	-2180	1,262,175.8	0.2%	1,260,000.0	0.0%
Total	364	15,314,400.0						15,314,400.0	0.0%	15,314,400.0	0.0%



Regression equation: kWh = [0 x HDDs] + [42072.5275 x Days]

Base Period Analysis

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus

Location: Kamloops (BC)

Weather Station: Kamloops (BC)

Meter: MAIN-GAS-01 (1178101)

Meter type: Natural Gas

Analysis: Heating Analysis 2007

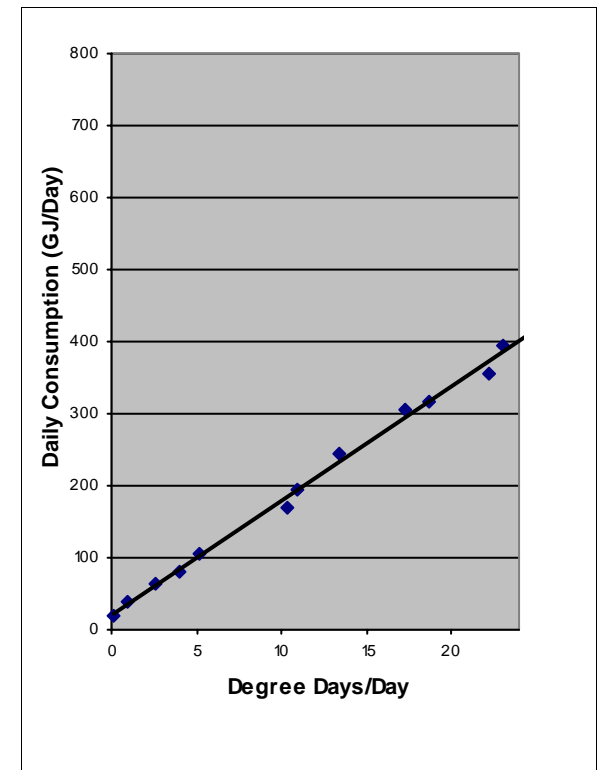
Analysis Period: 01-Jan-07 to 31-Dec-07

Parameter: Dry Bulb Temperature Type: Heating Consumption

Base Value: 19.5 °C Base Load: 20.8906 GJ per day

Weather Sensitivity: 15.8335 GJ/HDDs R²: 0.9960

Read Date	Days	Consumption GJ	GJ/Day	DD/Day	Incl	Mult.	Offset	Baseline	% Deviation	Adjusted Baseline	% Deviation
1/31/2007	31	12,217.0	394.1	23.1	☑	1	0	11,963.8	-2.1%	11,963.8	-2.1%
2/28/2007	28	8,904.8	318.0	18.8	☑	1	0	8,903.9	0.0%	8,903.9	0.0%
3/31/2007	31	7,552.0	243.6	13.4	☑	1	0	7,242.3	-4.1%	7,242.3	-4.1%
4/30/2007	30	5,103.0	170.1	10.3	☑	1	0	5,517.7	8.1%	5,517.7	8.1%
5/31/2007	31	2,517.8	81.2	4.0	☑	1	0	2,620.5	4.1%	2,620.5	4.1%
6/30/2007	30	1,877.9	62.6	2.6	☑	1	0	1,847.5	-1.6%	1,847.5	-1.6%
7/31/2007	31	589.6	19.0	0.1	☑	1	0	699.9	18.7%	699.9	18.7%
8/31/2007	31	1,235.1	39.8	0.9	☑	1	0	1,103.6	-10.7%	1,103.6	-10.7%
9/30/2007	30	3,199.2	106.6	5.1	☑	1	0	3,068.2	-4.1%	3,068.2	-4.1%
10/31/2007	31	6,009.9	193.9	10.9	☑	1	0	6,018.3	0.1%	6,018.3	0.1%
11/30/2007	30	9,127.2	304.2	17.3	☑	1	0	8,857.0	-3.0%	8,857.0	-3.0%
12/31/2007	31	11,050.0	356.5	22.2	☑	1	0	11,537.9	4.4%	11,537.9	4.4%
Total	365	69,383.5						69,380.5	0.0%	69,380.5	0.0%



Regression equation: $GJ = [15.8335 \times HDDs] + [20.8906 \times Days]$

CUSUM Analysis - Meter

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus Meter: MAIN-GAS-01 (1178101)

CUSUM Name: Gas 2006

Heating Analysis 2006

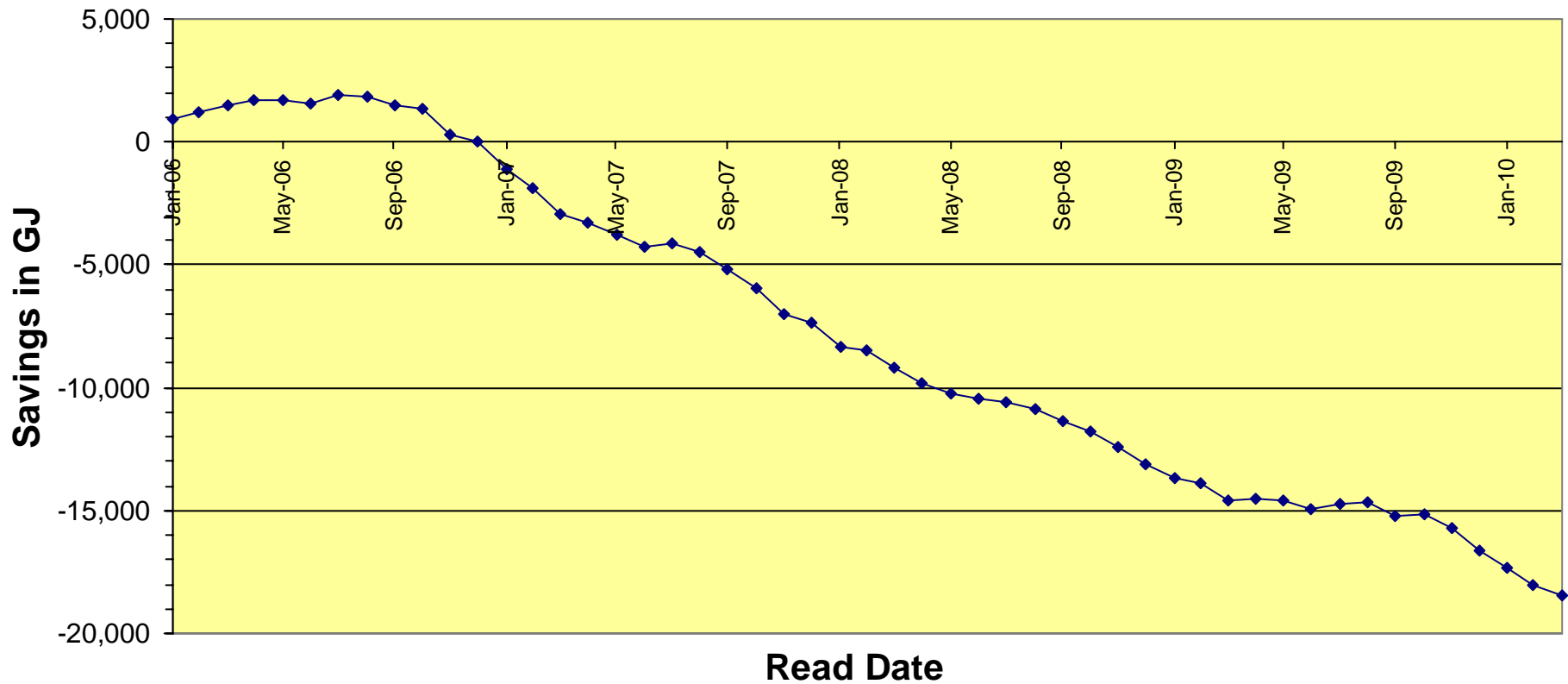
Consumption = 15.5307 x HDDs+ 22.9422 x Days (Base Temperature of 18C, Correlation Coefficient = 0.9819)

CUSUM Reading Period: 1/1/2006

To: 3/31/2010

Baseline Period: 1/1/2006

To: 12/31/2006



CUSUM Analysis - Meter

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus Meter: MAIN-GAS-01 (1178101)

CUSUM Name: Gas 2006

Heating Analysis 2006

Consumption = 15.5307 x HDDs+ 22.9422 x Days (Base Temperature of 18C, Correlation Coefficient = 0.9819)

CUSUM Reading Period: 1/1/2006

To: 3/31/2010

Baseline Period: 1/1/2006

To: 12/31/2006

Period	ReadDate	Days	DD	Baseline	Baseline Adjustments	Adjusted Baseline	Actual	Savings	CUSUM
1	1/31/2006	31	491.5	8,344.5	0.0	8,344.5	7,451.4	893.1	893.1
2	2/28/2006	28	504.6	8,479.2	0.0	8,479.2	8,175.8	303.4	1,196.5
3	3/31/2006	31	413.1	7,126.9	0.0	7,126.9	6,814.6	312.3	1,508.9
4	4/30/2006	30	217.9	4,072.4	0.0	4,072.4	3,907.5	164.9	1,673.8
5	5/31/2006	31	132.2	2,764.4	0.0	2,764.4	2,706.2	58.2	1,731.9
6	6/30/2006	30	16.3	941.4	0.0	941.4	1,105.6	-164.2	1,567.7
7	7/31/2006	31	5.8	801.3	0.0	801.3	490.1	311.2	1,878.9
8	8/31/2006	31	5.6	798.2	0.0	798.2	834.7	-36.5	1,842.4
9	9/30/2006	30	85.6	2,017.7	0.0	2,017.7	2,380.5	-362.8	1,479.6
10	10/31/2006	31	295.8	5,305.2	0.0	5,305.2	5,440.5	-135.3	1,344.3
11	11/30/2006	30	505.4	8,537.5	0.0	8,537.5	9,568.0	-1,030.5	313.8
12	12/31/2006	31	579.3	9,708.1	0.0	9,708.1	10,003.2	-295.1	18.7
13	1/31/2007	31	668.2	11,088.8	0.0	11,088.8	12,217.0	-1,128.2	-1,109.5
14	2/28/2007	28	483.4	8,149.9	0.0	8,149.9	8,904.8	-754.9	-1,864.3
15	3/31/2007	31	370.0	6,457.6	0.0	6,457.6	7,552.0	-1,094.4	-2,958.8
16	4/30/2007	30	263.9	4,786.8	0.0	4,786.8	5,103.0	-316.2	-3,274.9
17	5/31/2007	31	82.7	1,995.6	0.0	1,995.6	2,517.8	-522.2	-3,797.2
18	6/30/2007	30	46.0	1,402.7	0.0	1,402.7	1,877.9	-475.2	-4,272.4
19	7/31/2007	31	1.1	728.3	0.0	728.3	589.6	138.7	-4,133.7
20	8/31/2007	31	13.6	922.4	0.0	922.4	1,235.1	-312.7	-4,446.4
21	9/30/2007	30	114.9	2,472.7	0.0	2,472.7	3,199.2	-726.5	-5,172.8
22	10/31/2007	31	292.7	5,257.0	0.0	5,257.0	6,009.9	-752.9	-5,925.7
23	11/30/2007	30	474.8	8,062.2	0.0	8,062.2	9,127.2	-1,065.0	-6,990.6
24	12/31/2007	31	641.3	10,671.0	0.0	10,671.0	11,050.0	-379.0	-7,369.6
25	1/31/2008	31	686.1	11,366.8	0.0	11,366.8	12,324.1	-957.3	-8,326.9
26	2/29/2008	29	536.3	8,994.4	0.0	8,994.4	9,149.2	-154.8	-8,481.6

CUSUM Analysis - Meter

Project: 2010098 - Thompson Rivers University - Kamloops Campus

Site: Thompson Rivers University - Kamloops Campus Meter: MAIN-GAS-01 (1178101)

CUSUM Name: Gas 2006

Heating Analysis 2006

Consumption = 15.5307 x HDDs+ 22.9422 x Days (Base Temperature of 18C, Correlation Coefficient = 0.9819)

CUSUM Reading Period: 1/1/2006

To: 3/31/2010

Baseline Period: 1/1/2006

To: 12/31/2006

Period	ReadDate	Days	DD	Baseline	Baseline Adjustments	Adjusted Baseline	Actual	Savings	CUSUM
27	3/31/2008	31	421.2	7,252.7	0.0	7,252.7	7,939.3	-686.6	-9,168.2
28	4/30/2008	30	321.2	5,676.7	0.0	5,676.7	6,308.9	-632.2	-9,800.4
29	5/31/2008	31	97.3	2,222.3	0.0	2,222.3	2,632.4	-410.1	-10,210.4
30	6/30/2008	30	51.5	1,488.1	0.0	1,488.1	1,716.3	-228.2	-10,438.6
31	7/31/2008	31	4.0	773.3	0.0	773.3	915.7	-142.4	-10,581.0
32	8/31/2008	31	15.6	953.5	0.0	953.5	1,213.7	-260.2	-10,841.2
33	9/30/2008	30	80.9	1,944.7	0.0	1,944.7	2,464.0	-519.3	-11,360.5
34	10/31/2008	31	298.7	5,350.2	0.0	5,350.2	5,753.9	-403.7	-11,764.2
35	11/30/2008	30	405.9	6,992.2	0.0	6,992.2	7,668.6	-676.4	-12,440.6
36	12/31/2008	31	785.7	12,913.7	0.0	12,913.7	13,619.8	-706.1	-13,146.7
37	1/31/2009	31	712.7	11,779.9	0.0	11,779.9	12,278.8	-498.9	-13,645.6
38	2/28/2009	28	582.8	9,693.7	0.0	9,693.7	9,923.8	-230.1	-13,875.7
39	3/31/2009	31	490.0	8,321.3	0.0	8,321.3	9,036.9	-715.6	-14,591.3
40	4/30/2009	30	268.1	4,852.0	0.0	4,852.0	4,802.0	50.0	-14,541.3
41	5/31/2009	31	113.1	2,467.7	0.0	2,467.7	2,553.6	-85.9	-14,627.2
42	6/30/2009	30	4.0	750.4	0.0	750.4	1,032.7	-282.3	-14,909.5
43	7/31/2009	31	2.5	750.0	0.0	750.0	562.2	187.8	-14,721.6
44	8/31/2009	31	2.5	750.0	0.0	750.0	675.6	74.4	-14,647.2
45	9/30/2009	30	44.6	1,380.9	0.0	1,380.9	1,950.5	-569.6	-15,216.8
46	10/31/2009	31	326.7	5,785.1	0.0	5,785.1	5,755.8	29.3	-15,187.5
47	11/30/2009	30	382.4	6,627.2	0.0	6,627.2	7,176.7	-549.5	-15,737.0
48	12/31/2009	31	740.8	12,216.4	0.0	12,216.4	13,083.8	-867.4	-16,604.4
49	1/31/2010	31	514.0	8,694.0	0.0	8,694.0	9,409.0	-715.0	-17,319.4
50	2/28/2010	28	402.3	6,890.4	0.0	6,890.4	7,600.7	-710.3	-18,029.8
51	3/31/2010	31	347.9	6,114.3	0.0	6,114.3	6,506.4	-392.1	-18,421.8

APPENDIX D: GREENHOUSE GAS REDUCTION ANALYSIS

1. General Information on Greenhouse Gas Emissions Factors
2. Greenhouse Gas Emissions Factors for Project
3. Greenhouse Gas Emissions Summary

GENERAL INFORMATION ON GREENHOUSE GAS EMISSIONS FACTORS

To calculate the impact of the various gases involved in global warming using a single unit of measurement, all emissions are converted to equivalent CO₂. The data in the table below represent the latest Global Warming Potentials for the Intergovernmental Panel on Climate Change Update on Radiative Forcing. They are used as standards by environment Canada for determining GHG emissions in the preparation of Canada's National GHG Inventory.

Latest Global Warming Potential

Greenhouse Gas	Global Warming Potential (Based on a 100 year period)
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous Oxide (N ₂ O)	310

All energy-related emissions factors have been drawn from the Environment Canada publication, Canada Greenhouse Gas Inventory, 1997 Emissions and Removals Trends⁶, unless otherwise specified.

Indirect emissions from electricity will depend on the type of generation and fuel used.

⁶ Canada Greenhouse Gas Inventory, 1997 Emissions and Removals Trends (Draft Report). By F. Neitzert, K. Olsen and P. Collas. Pollution Data Branch, air Pollution Prevention Directorate, Environment Canada, 1999.

Greenhouse Gas Emissions Factors

Factor Reference: NRCan

Province	Fuel Type	Effective Date	Factor	Units
ALL	Natural Gas	1/1/1900	0.04986430	Tonnes/GJ

Factor Reference: BC Hydro

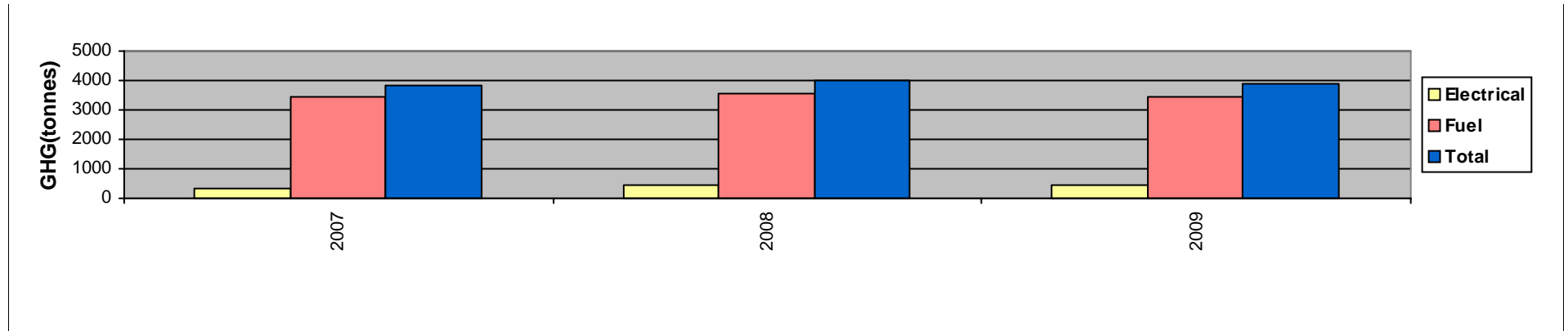
Province	Fuel Type	Effective Date	Factor	Units
BC	Electrical	1/1/2008	0.00002800	Tonnes/kWh

GHG emissions factor's most recent effective date(s) is used in all subsequent reading periods.

The BC HYDRO GHG emissions factors for dates prior to January 1, 2001 are estimated.

Annual Greenhouse Gas Emissions - Project Summary (2007 - 2009)

Project: 2010098 - Thompson Rivers University - Kamloops Campus



Year	Area ft ²	Electrical			Fuel			Total	
		kWh	ekWh	GHG(tonnes)	GJ	ekWh	GHG (tonnes)	ekWh	GHG (tonnes)
2007	1,048,966	15,104,403	15,104,403	347.4	69,384	19,273,195	3,459.8	34,377,598	3,807.2
2008	1,048,966	15,283,229	15,283,229	427.9	71,706	19,918,306	3,575.6	35,201,535	4,003.5
2009	1,048,966	15,367,200	15,367,200	430.3	68,832	19,120,111	3,432.3	34,487,312	3,862.6

Consumption is for fiscal year(s) ending at the end of December

GHG emissions factors reference : BC Hydro

* meter missing data more than 5% of a full year

APPENDIX E: LIGHTING ANALYSIS

1. Description of Lighting Reports
2. Legend and Explanation of Lighting Reports
3. Lighting Retrofit Project Summary
4. Lighting Retrofit Project Summary (per square foot of floor area)
5. Lighting Retrofit Cost Summary
6. Detailed Lighting Retrofit Report – No Compact Fluorescent Screw base or Controls
7. Detailed Lighting Retrofit Report – Screw base Compact Fluorescents Only
8. Lighting Controls Retrofit Report by Building
9. New Luminaire Schedules
10. Locked Room Report

Description of Lighting Reports

No.	Report	Description
2	Legend and Explanation of Lighting Reports	Explains how to read the retrofit reports
3	Lighting Retrofit Project Summary	Summarizes the retrofit project
4	Lighting Retrofit Project Summary (per square foot of floor area)	Summarizes the retrofit project per square foot
5	Lighting Retrofit Cost Summary	Summarizes the costs and savings for items related to the same lighting retrofit code
6	Detailed Lighting Retrofit Report – No Compact Fluorescent Screw base or Controls	Excludes the costs and savings related to Compact Fluorescents and controls
7	Detailed Lighting Retrofit Report – Screw base Compact Fluorescents Only	Only shows retrofits where Compact Fluorescents are utilized
8	Lighting Controls Retrofit Report by Building	Only shows costs & savings relating to control measures
9	New Luminaire Schedule	Describes new luminaires to be installed under the retrofit
10	Locked Room Report	Lists the locked rooms throughout the buildings

**LIGHTING RETROFIT PROJECT SUMMARY**

The Lighting Retrofit Project Summary Table summarizes the overall lighting design. The information on this page includes existing electrical use, and projected savings. The table below outlines the column names and outputted results:

Lighting Project Summary Table

Building Code:	Building ID Code
Building Name:	Name of Building
Floor Area (ft²)	Floor area of building is square feet
Power Exist (kW)	Existing electrical demand
Energy Exist (kWh)	Existing electrical consumption
Power Post (kW)	Projected post-retrofit electrical demand
Energy Post (kWh)	Projected post-retrofit electrical consumption
Power Save (kWh)	Projected post-retrofit demand savings
Energy Save (kWh)	Projected post-retrofit electrical consumption
Extd Matl Cost (\$)	Projected total material cost
Extd Labour Cost (\$)	Projected total labour cost
Total Cost (\$)	Projected total cost
Energy Savings (\$)	Projected post-retrofit savings
Pay-back (yrs)	Projected pay-back years
% kWh Save	Projected post-retrofit savings as a percentage of existing values.

Totals are listed for each of the columns at the bottom of each column.



DETAILED LIGHTING RETROFIT REPORTS

This report summarizes the line-by-line existing lighting conditions in the building, the proposed retrofit selection choices, existing annual lighting hours of operation existing and new demand, consumption, and percent reduction of consumption, costs and pay back.

Room Summary Table

Room: Building room number; as existing or assigned during audit.
Room Type: Main occupancy use or room name.

Existing Luminaire/Lamp Data

Type Code See Table 1 below for type code definitions.
Description General Descriptor for luminaire type, light source and size.
Luminaire Quantity: Number of existing luminaires.
Lamp Code: Internal Prism Engineering luminaire code.
Lamp Description: Lamp quality and description based on lamp type and ballast type. See Table 2 below for code definitions.
Annual Hours: Existing annual lighting hours of operation per year.

Retrofit Data Table

Lamp Code: Internal Prism Engineering luminaire code design choice.
Lamp Description: Luminaire retrofit description based on lamp type and ballast type. See Table 2 below for code definitions.
Luminaire Quantity: Resultant number of luminaires based on retrofit action selection.
New Controls Indicates whether new controls will be added.
Unit (Watt): Electrical demand per retrofitted luminaire.
Existing (kW): Existing electrical demand measured in kilowatts (includes only demand on-peak).
New (kW): Projected electrical demand measured in kilowatts (includes only demand on-peak).
Existing (kWh): Existing electrical consumption measure in kilowatt-hours.
Retrofi (kWh): Projected electrical consumption measured in kilowatt-hours.
Energy Save (kWh) Projected post-retrofit consumption savings in kilowatt-hours.
% kWh Save: Projected post-retrofit consumption savings.
Energy Saver (\$) Annual Energy Savings for this row.
Material (\$) Capital costs estimate for materials.
Labour (\$) Capital costs estimate for labour.
Controls (\$) Included Capital costs estimate for controls included in material and labour estimates.
Total (\$) Installation cost not including contingencies, engineering, project management.
Payback (yrs) Simple payback.



Table 1: Existing Luminaire Three-Letter “Type Code” Definitions

Type Code		Description
First Letter (Lamp Type)	Second Letter (Luminaire Type)	
C		Compact Fluorescent
	C	Wall sconce – Decorative surface mounted luminaire, (various configurations).
	D	Recessed or semi-recessed downlight.
	S	Surface mounted luminaire (cylinder, dog dish, dome, etc).
	T	Troffer - Recessed fluorescent luminaire, with lens or louvre captively held.
	V	Vapourproof – Surface or pendent mounted luminaire with gasketted lensing.
	X	Exit light
F		Fluorescent
	B	Box - Surface mounted rectangular box with solid siding, with lens or louvre.
	C	Cubelight – Solid channel body with wraparound white opal lens.
	G	Gymnasium – Surface mounted box luminaire with impact resistant lens.
	I	Industrial – Surface or pendent mounted luminaire with white-painted reflector, exposed lamps.
	K	Classroom – Surface or pendent mounted fluorescent luminaire with large cell louvres.
	L	Linear – Surface or pendent mounted decorative direct/indirect luminaire.
	S	Striplight – Surface mounted fluorescent channel with no lens, exposed lamps.
	R	Striplight with reflector.
	T	Troffer - Recessed fluorescent luminaire, with lens or louvre captively held.
	V	Vapourproof – Surface or pendent mounted luminaire with gasketted lensing.
	W	Wrap – Surface mounted luminaire with a wraparound style lens.
	X	Exit light
I		Incandescent
	B	Bathroom bar – Surface mounted luminaire with either exposed lamps or decorative wraparound glass lens.
	C	Wall sconce – Decorative surface mounted luminaire, (various configurations).
	D	Round recessed or semi-recessed downlight.
	E	Square recessed or semi-recessed downlight.
	G	Pendent globe fixture with either white opal globe lens or other cover.
	J	Jam jar – Wall mounted luminaire with screw on glass or plastic “jar” cover.
	L	Keyless lampholder - Surface mounted socket. Swivel lampholder - Surface mounted socket with rotatable swivel head.
	M	Any luminaire surface-mounted.
	R	RLM dome – Metal or glass domes. Lensed or open at the bottom.
	S	Surface or pendent mounted cylindrical or square luminaries.
	T	Trackhead - Adjustable lampholder mounted to power track.
	V	Vandal proof – Surface mounted with impact resistant lens. Vapourproof – Surface or pendent mounted luminaire with gasketted lensing.
	X	Exit lights
H		High Pressure Sodium
M		Metal Halide
V		Mercury Vapour
	C	Cylinder – Cylindrically shaped luminaries with solid opaque sides.
	D	Recessed or semi-recessed downlights.
	F	Floodlight – Specialized light to direct light in a forward throw.
	H	High/ Low Bay – Suspended metal or acrylic luminaire used in high ceiling applications.
	L	Linear – Surface or pendent mounted decorative direct/indirect luminaire.
	P	Post Top – Lamps mounted in housing atop a pole.
	T	Troffer - Recessed fluorescent luminaire, with lens or louvre captively held.
	V	Vapourproof – Surface or pendent mounted luminaire with gasketted lensing.
	W	Wall pack - Wall mounted, rectangular outdoor area light.
	X	Light Pipe (Metal halides only) – luminaire in which light is projected out the sides of a fibre optic tube; lamp is located at one end of the tube and a reflector at the other end.
L	P	All low-pressure sodium luminaries.



Table 2: Lamp Descriptions

Abbreviation	Definition
Lamp Type	
RSFl	Rapid Start Fluorescent
Inc.	Incandescent
HPS	High Pressure Sodium
MH	Metal Halide
CF (quad, double, triple)	Compact fluorescent
LPS	Low Pressure Sodium
MV	Mercury Vapour
QI	Quartz-sided Incandescent halogen lamp
G	Globular
PS	Pear-shaped
SL	Slim-line Fluorescent Lamp – 8" single-pin socket
HO	High Output Fluorescent Lamp
T	Tubular
A	Arbitrary, standard incandescent lamp shape
MR	Mini-Rim reflector lamp
R	Reflector
PAR	Parabolic Aluminised Reflector
LED	Light Emitting Diode
Ballast	
Std	Standard, electromagnetic
EE	Energy Efficient, electromagnetic
EL	High frequency, solid state electronic
NBF	Normal Ballast Factor electronic ballast
LBF	Low Ballast Factor electronic ballast, lower light output
HBF	High Ballast Factor electronic ballast, higher light output
Suffix	
-RS	Rapid Start, briefly heats cathodes before start
-IS	Instant Start, cathodes not preheated before start
Sh	Shared ballast between 2 or more luminaires
Sh # Lamp Bal	# Lamp ballast shared between two or more luminaires
1&2	A 1 lamp ballast and 2 lamp ballast in one luminaire.
2&2	2 – 2 lamp ballasts per luminaire
WhRef	Complete with white reflector
SI	Screw in base
Adapt SI	Separate screw-in adaptor in which lamp is socketted.
Flood	Floodlight
Ref	Lamp unit with reflector

Lighting Retrofit Project Summary

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Code	Building Name:	Existing Data			Retrofit Data									
		Floor Area (ft ²):	Power Exist (kW):	Energy Exist (kWh):	Power Post (kW):	Energy Post (kWh):	Power Save (kW):	Energy Save (kWh):	Extd Matl Cost:	Extd Labour Cost:	Total Cost:	Energy Saving (\$):	Pay-back (yrs)	% kWh Save
AAE	Arts and Education	65,715	91.5	223,987	59.5	141,872	32.0	82,115	\$66,327	\$27,164	\$93,491	\$6,388	14.6	36.7%
AHT	Animal Health Technology	12,731	12.6	36,111	10.8	31,432	1.8	4,679	\$2,151	\$1,958	\$4,109	\$364	11.3	13.0%
CAC	Campus Activity Centre	77,638	78.8	317,103	67.5	253,740	11.2	63,363	\$41,271	\$36,161	\$77,432	\$3,637	21.3	20.0%
CTB	Clock Tower Building	34,507	34.4	102,914	21.0	68,422	13.3	34,492	\$21,259	\$14,401	\$35,660	\$2,670	13.4	33.5%
GYM	Gymnasium	40,986	36.0	121,786	24.1	89,600	11.9	32,185	\$33,854	\$11,574	\$45,428	\$2,443	18.6	26.4%
INB	International Building	70,092	50.3	200,384	45.5	167,690	4.8	32,694	\$17,931	\$6,953	\$24,883	\$1,782	14.0	16.3%
LIB	Library	37,741	51.6	276,241	26.6	146,413	25.0	129,828	\$22,592	\$22,059	\$44,651	\$7,641	5.8	47.0%
OMB	Old Main Building	212,172	216.6	753,840	169.0	518,174	47.6	235,666	\$128,423	\$47,521	\$175,944	\$14,083	12.5	31.3%
SCB	Science Building	116,467	106.9	258,473	92.4	210,040	14.5	48,433	\$24,811	\$12,556	\$37,367	\$3,349	11.2	18.7%
TAT	Trades and Technology	113,233	124.5	440,344	92.4	287,943	32.1	152,401	\$68,557	\$35,038	\$103,595	\$9,239	11.2	34.6%
Project Summary for 10 Bldgs:		781,281	803.1	2,731,182	608.7	1,915,326	194.4	815,856	\$427,175	\$215,384	\$642,560	\$51,597	12.5	29.9%

Retrofit Project Summary (per square foot of floor area)

Company Name: Thompson Rivers University Kamloops

Project Number: 2010098



Code	Building Name:	Existing (per ft ²)			Retrofit (per ft ²)									
		Floor Area (ft ²):	Power Exist (W):	Energy Exist (kWh):	Power Post (W):	Energy Post (kWh):	Power Save (W):	Energy Save (kWh):	Extd Matl Cost:	Extd Labour Cost:	Total Cost:	Energy Saving (\$):	Pay-back (yrs)	%kWh Reduce
AHT	Animal Health Technology	12,731	1.0	2.84	0.8	2.47	0.1	0.37	\$0.17	\$0.15	\$0.32	\$0.01	24.4	13.0%
AAE	Arts and Education	65,715	1.4	3.41	0.9	2.16	0.5	1.25	\$1.01	\$0.41	\$1.42	\$0.04	31.6	36.7%
CAC	Campus Activity Centre	77,638	1.0	4.08	0.9	3.27	0.1	0.82	\$0.53	\$0.47	\$1.00	\$0.03	33.9	20.0%
CTB	Clock Tower Building	34,507	1.0	2.98	0.6	1.98	0.4	1.00	\$0.62	\$0.42	\$1.03	\$0.04	28.7	33.5%
GYM	Gymnasium	40,986	0.9	2.97	0.6	2.19	0.3	0.79	\$0.83	\$0.28	\$1.11	\$0.03	39.2	26.4%
INB	International Building	70,092	0.7	2.86	0.6	2.39	0.1	0.47	\$0.26	\$0.10	\$0.36	\$0.02	21.1	16.3%
LIB	Library	37,741	1.4	7.32	0.7	3.88	0.7	3.44	\$0.60	\$0.58	\$1.18	\$0.12	9.6	47.0%
OMB	Old Main Building	212,172	1.0	3.55	0.8	2.44	0.2	1.11	\$0.61	\$0.22	\$0.83	\$0.04	20.7	31.3%
SCB	Science Building	116,467	0.9	2.22	0.8	1.80	0.1	0.42	\$0.21	\$0.11	\$0.32	\$0.01	21.4	18.7%
TAT	Trades and Technology	113,233	1.1	3.89	0.8	2.54	0.3	1.35	\$0.61	\$0.31	\$0.91	\$0.05	18.9	34.6%
Project Summary for 10 Bldgs:		781,281	1.03	3.50	0.78	2.45	0.25	1.04	\$0.55	\$0.28	\$0.82	\$0.04	21.9	29.9%

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
Building Name: Arts and Education

Project Number: 2010098
Building Code: AAE



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
2044	1-13w CF spiral SI (Screw in)	21	1.2	0.3	695	151	544	78%	\$112	\$278	\$129	\$407	3.6
2400	1-18w triple CF	7	0.5	0.2	1,573	322	1,251	80%	\$86	\$536	\$362	\$898	10.4
2826	1-28w 4' RSFI T8 ES HE EL-LBF	15	0.3	0.1	1,413	830	582	41%	\$35	\$603	\$368	\$971	28.1
2833	2-28w 4' RSFI T8 ES HE EL-IS NEW	48	3.3	2.2	30,494	15,516	14,978	49%	\$712	\$7,622	\$1,621	\$9,243	13.0
2838	2-28w 4' RSFI T8 ES HE EL-LBF	154	9.0	5.2	21,730	11,976	9,754	45%	\$762	\$7,477	\$3,856	\$11,333	14.9
2839	2-28w 4' RSFI T8 ES HE EL-LBF NE	2	0.1	0.1	423	240	183	43%	\$13	\$218	\$49	\$267	20.2
2848	3-28w 4' RSFI T8 ES HE EL-LBF 1&	456	49.5	27.6	83,315	45,415	37,900	45%	\$3,628	\$39,915	\$16,946	\$56,860	15.7
2856	4-28w 4' RSFI T8 ES HE EL-LBF	4	0.6	0.3	817	464	353	43%	\$38	\$241	\$172	\$413	11.0
2891	3-28w RSFI T8 ES EL-IS LBF 1&2	4	0.4	0.3	635	386	248	39%	\$26	\$303	\$147	\$450	17.0
2926	1-Relamp with 28w 4' RSFI T8 ES la	3	0.1	0.1	815	683	131	16%	\$7	\$13	\$18	\$31	4.7
2933	2-Relamp with 28w 4' RSFI T8 ES la	101	5.7	5.0	19,937	14,610	5,326	27%	\$280	\$2,442	\$1,113	\$3,555	12.7
2939	3-Relamp with 28w 4' RSFI T8 ES la	50	4.2	3.7	8,480	6,917	1,563	18%	\$113	\$932	\$381	\$1,313	11.6
2940	3-Relamp with 28w 4' RSFI T8 ES la	48	3.6	3.2	5,504	4,585	919	17%	\$77	\$847	\$332	\$1,179	15.2
3116	2-25w RSFI T8 EL-IS	5	0.4	0.2	1,658	1,017	641	39%	\$39	\$284	\$123	\$406	10.4
3766	1-17w RSFI T8 HE EL-LBF	2	0.1	0.0	296	143	153	52%	\$9	\$83	\$49	\$132	14.8
3771	2-17w RSFI T8 HE EL-HBF WhRef	54	3.6	2.1	14,197	8,225	5,972	42%	\$387	\$3,708	\$1,326	\$5,034	13.0
8000	0-Install Lighting Controls Device Onl	37	0.8	0.8	5,386	3,770	1,616	30%	\$65	\$827	\$172	\$998	15.3
9000	0-No Action	201	8.2	8.2	26,622	26,622	0	0%	\$0	\$0	\$0	\$0	0.0
Summary for Building:			91.5	59.5	223,987	141,872	82,115		\$6,388	\$66,327	\$27,164	\$93,491	14.6

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
Building Name: Animal Health Technology

Project Number: 2010098
Building Code: AHT



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
2030	1-23w CF Spiral SI (Screw in)	1	0.1	0.0	281	65	216	77%	\$16	\$26	\$6	\$33	2.1
2933	2-Relamp with 28w 4' RSFI T8 ES la	110	5.5	4.9	15,934	14,043	1,890	12%	\$139	\$931	\$781	\$1,712	12.3
2939	3-Relamp with 28w 4' RSFI T8 ES la	11	0.9	0.8	1,224	1,073	151	12%	\$17	\$140	\$68	\$207	12.1
2940	3-Relamp with 28w 4' RSFI T8 ES la	26	2.1	1.8	5,759	5,089	670	12%	\$50	\$330	\$160	\$490	9.8
2946	4-Relamp with 28w 4' RSFI T8 ES la	6	0.6	0.6	1,885	1,649	236	13%	\$17	\$102	\$354	\$456	26.5
9000	0-No Action	53	1.4	1.4	6,534	6,534	0	0%	\$0	\$0	\$0	\$0	0.0
9427	2-Delamp to 2 - 28w 4' RSFI T8 ES I	24	2.0	1.3	4,495	2,979	1,516	34%	\$125	\$622	\$589	\$1,212	9.7
Summary for Building:			12.6	10.8	36,111	31,432	4,679		\$364	\$2,151	\$1,958	\$4,109	11.3

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
 Building Name: Campus Activity Centre

Project Number: 2010098
 Building Code: CAC



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
2009	1-15w CF ref fl SI (Screw in)	21	1.5	0.3	11,466	2,293	9,173	80%	\$485	\$333	\$1,240	\$1,573	3.2
2826	1-28w 4' RSFI T8 ES HE EL-LBF	43	1.8	0.9	8,807	3,177	5,630	64%	\$310	\$3,055	\$1,385	\$4,440	14.3
2828	1-28w 4' RSFI T8 ES HE EL-LBF Sh	6	0.2	0.1	2,260	442	1,819	80%	\$85	\$565	\$270	\$835	9.8
2838	2-28w 4' RSFI T8 ES HE EL-LBF	65	2.2	1.2	8,307	4,743	3,564	43%	\$238	\$3,206	\$1,960	\$5,166	21.7
2850	3-28w 4' RSFI T8 ES HE EL-LBF	16	1.9	1.0	4,059	2,137	1,922	47%	\$162	\$872	\$491	\$1,363	8.4
2926	1-Relamp with 28w 4' RSFI T8 ES la	6	0.2	0.1	949	796	153	16%	\$9	\$25	\$37	\$62	7.0
2933	2-Relamp with 28w 4' RSFI T8 ES la	59	3.2	2.8	13,309	11,730	1,579	12%	\$100	\$499	\$415	\$915	9.1
2939	3-Relamp with 28w 4' RSFI T8 ES la	13	1.1	1.0	1,007	882	124	12%	\$18	\$165	\$80	\$245	13.6
2940	3-Relamp with 28w 4' RSFI T8 ES la	23	1.9	1.7	3,225	2,850	375	12%	\$36	\$292	\$141	\$433	12.0
3748	2-32w RSFI T8 HE EL-LBF	1	0.0	0.0	12	5	7	60%	\$2	\$68	\$25	\$92	45.0
3769	2-17w RSFI T8 HE EL-LBF	2	0.0	0.0	32	14	18	56%	\$2	\$96	\$49	\$145	60.6
3770	2-17w RSFI T8 HE EL-HBF	1	0.0	0.0	12	10	1	11%	\$1	\$48	\$25	\$73	143.4
3855	1-28w 4' RSFI T8 ES Dimmable Sh	176	7.2	4.3	6,811	4,118	2,693	40%	\$381	\$12,080	\$13,633	\$25,713	67.4
5308	1-320w PS MH	8	0.4	0.3	15,768	12,895	2,873	18%	\$122	\$1,360	\$589	\$1,950	15.9
5500	1-55w QL Induction	8	1.0	0.4	7,571	2,242	5,329	70%	\$270	\$4,263	\$871	\$5,133	19.0
5522	1-165w QL Induction	8	2.2	1.3	17,006	9,610	7,396	43%	\$391	\$4,867	\$1,013	\$5,879	15.0
5524	2-165w QL Induction	8	3.4	2.5	26,208	13,453	12,755	49%	\$603	\$7,648	\$1,313	\$8,961	14.9
8000	0-Install Lighting Controls Device Onl	3	0.1	0.1	841	336	505	60%	\$20	\$112	\$28	\$139	6.8
9000	0-No Action	1,050	47.4	47.4	182,914	177,672	5,242	3%	\$212	\$732	\$11,615	\$12,348	58.3
9427	2-Delamp to 2 - 28w 4' RSFI T8 ES I	36	2.9	1.9	6,409	4,248	2,161	34%	\$182	\$933	\$884	\$1,817	10.0
9430	2-Delamp to 2 - 28w 4' RSFI T8 ES I	4	0.1	0.1	132	87	44	34%	\$5	\$51	\$98	\$149	32.6
Summary for Building:			78.8	67.5	317,103	253,740	63,363		\$3,637	\$41,271	\$36,161	\$77,432	21.3

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
Building Name: Clock Tower Building

Project Number: 2010098
Building Code: CTB



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
1003	1-1 Watt LED Exit light NEW	1	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2
2009	1-15w CF ref fl SI (Screw in)	18	1.1	0.3	1,755	405	1,350	77%	\$137	\$286	\$111	\$396	2.9
2044	1-13w CF spiral SI (Screw in)	14	0.5	0.1	961	212	750	78%	\$67	\$185	\$86	\$271	4.0
2836	2-28w 4' RSFI T8 ES HE EL-IS WhR	32	4.3	1.5	9,984	3,248	6,735	67%	\$546	\$3,465	\$1,508	\$4,973	9.1
2838	2-28w 4' RSFI T8 ES HE EL-LBF	149	9.2	5.4	22,483	13,115	9,368	42%	\$747	\$6,857	\$5,828	\$12,686	17.0
2842	2-28w 4' RSFI T8 ES HE EL-LBF Wh	13	1.3	0.5	2,761	786	1,975	72%	\$156	\$1,639	\$473	\$2,111	13.5
2926	1-Relamp with 28w 4' RSFI T8 ES la	2	0.1	0.0	543	456	88	16%	\$4	\$8	\$12	\$21	4.7
2933	2-Relamp with 28w 4' RSFI T8 ES la	51	2.8	2.5	6,130	5,403	727	12%	\$61	\$432	\$346	\$778	12.7
2939	3-Relamp with 28w 4' RSFI T8 ES la	6	0.5	0.4	1,438	1,260	178	12%	\$13	\$76	\$37	\$113	8.6
3116	2-25w RSFI T8 EL-IS	2	0.1	0.1	1,314	806	508	39%	\$26	\$113	\$49	\$163	6.3
3769	2-17w RSFI T8 HE EL-LBF	3	0.1	0.1	410	248	162	40%	\$11	\$139	\$74	\$213	18.7
3770	2-17w RSFI T8 HE EL-HBF	11	0.5	0.4	1,762	1,614	148	8%	\$10	\$524	\$270	\$794	83.4
3771	2-17w RSFI T8 HE EL-HBF WhRef	8	0.5	0.3	1,703	1,126	577	34%	\$39	\$544	\$196	\$740	19.2
3857	2-28w 4' RSFI T8 ES Dimmable	33	2.3	1.6	5,227	3,775	1,452	28%	\$119	\$4,530	\$2,354	\$6,884	58.0
5522	1-165w QL Induction	2	0.8	0.3	3,876	1,445	2,431	63%	\$149	\$1,217	\$147	\$1,364	9.2
9000	0-No Action	159	3.6	3.6	23,382	23,382	0	0%	\$0	\$0	\$0	\$0	0.0
9419	2-Delamp to 2 - 28w 4' RSFI T8 ES I	72	6.0	3.6	17,483	10,296	7,187	41%	\$525	\$914	\$2,652	\$3,566	6.8
9427	2-Delamp to 2 - 28w 4' RSFI T8 ES I	5	0.4	0.3	1,001	663	338	34%	\$27	\$130	\$123	\$252	9.4
9429	2-Delamp to 2 - 28w 4' RSFI T8 ES I	2	0.2	0.1	439	165	274	63%	\$21	\$133	\$98	\$231	11.2
Summary for Building:			34.4	21.0	102,914	68,422	34,492		\$2,670	\$21,259	\$14,401	\$35,660	13.4

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
Building Name: Gymnasium

Project Number: 2010098
Building Code: GYM



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
2826	1-28w 4' RSFI T8 ES HE EL-LBF	4	0.1	0.1	883	397	487	55%	\$26	\$161	\$98	\$259	10.0
2836	2-28w 4' RSFI T8 ES HE EL-IS WhR	10	1.5	0.5	4,860	1,440	3,420	70%	\$242	\$1,021	\$307	\$1,328	5.5
2838	2-28w 4' RSFI T8 ES HE EL-LBF	174	13.3	6.5	19,605	9,663	9,941	51%	\$1,061	\$8,419	\$4,273	\$12,692	12.0
2933	2-Relamp with 28w 4' RSFI T8 ES la	9	0.5	0.4	2,102	1,852	249	12%	\$16	\$76	\$55	\$131	8.3
3381	8-32w RSFI T8 EL-HBF 4&4 NEW	44	14.5	12.1	62,424	52,061	10,363	17%	\$650	\$19,305	\$5,029	\$24,334	37.4
3755	6-32w RSFI T8 HE EL-HBF 2L & 4L	8	2.2	1.7	9,629	7,181	2,448	25%	\$154	\$2,410	\$767	\$3,177	20.7
3771	2-17w RSFI T8 HE EL-HBF WhRef	35	2.0	1.4	16,120	11,202	4,918	31%	\$257	\$2,379	\$860	\$3,239	12.6
9000	0-No Action	69	1.2	1.2	5,390	5,390	0	0%	\$0	\$0	\$0	\$0	0.0
9425	2-Delamp to 2 - 28w 4' RSFI T8 ES I	5	0.5	0.3	773	414	359	46%	\$38	\$85	\$184	\$269	7.0
Summary for Building:			36.0	24.1	121,786	89,600	32,185		\$2,443	\$33,854	\$11,574	\$45,428	18.6

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
Building Name: International Building

Project Number: 2010098
Building Code: INB



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
2044	1-13w CF spiral SI (Screw in)	4	0.0	0.0	1,051	228	823	78%	\$35	\$53	\$25	\$77	2.2
2404	1-26w triple CF	4	0.2	0.1	650	290	360	55%	\$28	\$238	\$196	\$435	15.7
2832	2-28w 4' RSFI T8 ES HE EL-IS	2	0.2	0.1	1,472	841	631	43%	\$32	\$81	\$49	\$131	4.1
2926	1-Relamp with 28w 4' RSFI T8 ES la	12	0.3	0.3	1,541	879	662	43%	\$32	\$390	\$200	\$590	18.5
2933	2-Relamp with 28w 4' RSFI T8 ES la	337	17.5	15.4	61,931	49,668	12,263	20%	\$694	\$6,393	\$2,833	\$9,226	13.3
2939	3-Relamp with 28w 4' RSFI T8 ES la	32	2.7	2.4	7,484	6,570	914	12%	\$68	\$406	\$196	\$603	8.8
2940	3-Relamp with 28w 4' RSFI T8 ES la	34	2.8	2.5	8,508	7,240	1,268	15%	\$82	\$541	\$231	\$772	9.4
2945	4-Relamp with 28w 4' RSFI T8 ES la	47	5.0	4.6	13,160	12,220	940	7%	\$72	\$796	\$289	\$1,084	15.0
2946	4-Relamp with 28w 4' RSFI T8 ES la	6	0.6	0.6	1,680	1,470	210	13%	\$16	\$51	\$37	\$88	5.4
5522	1-165w QL Induction	6	1.7	0.9	10,715	4,238	6,477	60%	\$331	\$4,047	\$833	\$4,880	14.7
8000	0-Install Lighting Controls Device Onl	81	4.0	4.0	24,917	19,204	5,712	23%	\$231	\$4,016	\$1,298	\$5,315	23.0
9000	0-No Action	269	13.2	13.2	61,554	61,554	0	0%	-\$6	\$0	\$0	\$0	0.0
9427	2-Delamp to 2 - 28w 4' RSFI T8 ES I	23	1.9	1.2	4,825	2,954	1,871	39%	\$136	\$700	\$581	\$1,281	9.4
9428	1-Delamp to 1 - 28w 4' RSFI T8 ES I	2	0.1	0.1	722	177	544	75%	\$27	\$193	\$135	\$328	12.0
9430	2-Delamp to 2 - 28w 4' RSFI T8 ES I	2	0.1	0.1	176	157	18	10%	\$2	\$25	\$49	\$75	38.2
Summary for Building:			50.3	45.5	200,384	167,690	32,694		\$1,782	\$17,931	\$6,953	\$24,883	14.0

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Library

Building Code: LIB



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
1003	1-1 Watt LED Exit light NEW	2	0.1	0.0	526	35	491	93%	\$25	\$132	\$74	\$206	8.2
2044	1-13w CF spiral SI (Screw in)	1	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
2801	0-Delamp to 1 x 26w CF lamp. Reus	6	0.3	0.2	1,647	767	880	53%	\$53	\$0	\$324	\$324	6.2
2826	1-28w 4' RSFI T8 ES HE EL-LBF	1	0.0	0.0	377	193	184	49%	\$9	\$40	\$25	\$65	6.9
2832	2-28w 4' RSFI T8 ES HE EL-IS	160	17.8	6.7	81,118	29,958	51,161	63%	\$3,131	\$11,803	\$7,162	\$18,965	6.1
2846	3-28w 4' RSFI T8 ES HE EL-IS	1	0.1	0.1	700	238	462	66%	\$26	\$204	\$55	\$259	10.1
2852	4-28w 4' RSFI T8 ES HE EL-IS	2	0.3	0.2	1,401	909	492	35%	\$29	\$115	\$86	\$201	6.9
2864	2-28w 4' RSFI T8 ES HE EL-HBF	1	0.1	0.1	409	350	59	14%	\$4	\$47	\$25	\$71	20.3
2933	2-Relamp with 28w 4' RSFI T8 ES la	22	1.2	1.1	6,142	5,266	876	14%	\$49	\$266	\$147	\$413	8.4
2946	4-Relamp with 28w 4' RSFI T8 ES la	1	0.1	0.1	981	858	123	13%	\$6	\$17	\$6	\$23	3.7
3771	2-17w RSFI T8 HE EL-HBF WhRef	48	2.8	1.8	14,444	9,451	4,993	35%	\$296	\$3,263	\$1,972	\$5,235	17.7
5522	1-165w QL Induction	3	0.8	0.5	3,837	2,168	1,669	43%	\$102	\$1,825	\$380	\$2,205	21.6
9000	0-No Action	39	0.5	0.5	9,744	9,744	0	0%	\$0	\$0	\$0	\$0	0.0
9425	2-Delamp to 2 - 28w 4' RSFI T8 ES I	104	10.6	5.7	61,917	33,103	28,814	47%	\$1,635	\$2,053	\$5,720	\$7,772	4.8
9429	2-Delamp to 2 - 28w 4' RSFI T8 ES I	155	15.5	8.8	87,303	49,325	37,978	44%	\$2,177	\$2,624	\$5,710	\$8,334	3.8
9430	2-Delamp to 2 - 28w 4' RSFI T8 ES I	15	1.1	0.8	5,681	4,046	1,635	29%	\$98	\$190	\$368	\$559	5.7
Summary for Building:			51.6	26.6	276,241	146,413	129,828		\$7,641	\$22,592	\$22,059	\$44,651	5.8

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
Building Name: Old Main Building

Project Number: 2010098
Building Code: OMB



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
2044	1-13w CF spiral SI (Screw in)	13	0.5	0.1	1,106	249	857	78%	\$73	\$172	\$80	\$252	3.4
2045	2-13w CF spiral SI (Screw in)	4	0.1	0.0	221	72	149	68%	\$11	\$106	\$25	\$130	11.6
2820	1-28w 4' RSFI T8 ES HE EL-IS	5	0.2	0.1	797	569	228	29%	\$14	\$175	\$123	\$297	21.6
2832	2-28w 4' RSFI T8 ES HE EL-IS	135	8.5	5.6	26,559	15,493	11,066	42%	\$730	\$6,028	\$3,823	\$9,850	13.5
2836	2-28w 4' RSFI T8 ES HE EL-IS WhR	202	16.3	9.0	59,256	24,401	34,855	59%	\$2,106	\$24,968	\$7,000	\$31,968	15.2
2839	2-28w 4' RSFI T8 ES HE EL-LBF NE	116	8.9	4.6	82,239	33,628	48,611	59%	\$2,375	\$22,593	\$3,807	\$26,399	11.1
2844	3-28w 4' RSFI T8 ES HE EL-IS 1&2	6	0.6	0.4	2,337	1,116	1,221	52%	\$68	\$685	\$246	\$931	13.7
2846	3-28w 4' RSFI T8 ES HE EL-IS	98	9.3	6.2	21,053	14,167	6,887	33%	\$570	\$5,081	\$4,695	\$9,775	17.2
2852	4-28w 4' RSFI T8 ES HE EL-IS	27	2.6	1.7	2,742	1,805	937	34%	\$124	\$1,557	\$1,160	\$2,717	22.0
2859	4-28w 4' RSFI T8 ES HE EL-HBF 2&	20	4.0	2.8	14,112	9,946	4,166	30%	\$281	\$1,672	\$1,152	\$2,824	10.0
2916	4-28w RSFI T8 ES EL-IS	4	0.1	0.1	599	408	191	32%	\$12	\$231	\$147	\$378	31.1
2926	1-Relamp with 28w 4' RSFI T8 ES la	84	2.5	2.1	4,697	3,939	758	16%	\$69	\$355	\$516	\$871	12.7
2933	2-Relamp with 28w 4' RSFI T8 ES la	383	17.6	15.0	80,120	61,845	18,275	23%	\$986	\$5,338	\$3,275	\$8,613	8.7
2939	3-Relamp with 28w 4' RSFI T8 ES la	711	59.9	52.5	115,578	101,304	14,275	12%	\$1,286	\$9,027	\$4,365	\$13,392	10.4
2940	3-Relamp with 28w 4' RSFI T8 ES la	99	7.6	6.7	23,272	18,076	5,196	22%	\$295	\$1,680	\$1,219	\$2,899	9.8
2946	4-Relamp with 28w 4' RSFI T8 ES la	80	7.6	6.7	20,530	17,964	2,566	13%	\$195	\$1,354	\$2,012	\$3,366	17.2
3116	2-25w RSFI T8 EL-IS	3	0.2	0.1	1,971	1,209	762	39%	\$39	\$170	\$74	\$244	6.3
3370	6-32w RSFI T8 EL-IS 2 - 3L bal	11	3.0	1.8	8,653	5,222	3,431	40%	\$252	\$1,159	\$769	\$1,928	7.7
3755	6-32w RSFI T8 HE EL-HBF 2L & 4L	26	9.0	5.4	23,153	13,702	9,451	41%	\$722	\$8,691	\$2,215	\$10,906	15.1
3764	1-17w RSFI T8 HE EL-IS	1	0.0	0.0	210	140	70	33%	\$4	\$41	\$25	\$66	18.5
3770	2-17w RSFI T8 HE EL-HBF	2	0.1	0.1	30	21	9	31%	\$4	\$96	\$49	\$145	39.8
3771	2-17w RSFI T8 HE EL-HBF WhRef	37	2.1	1.4	16,434	10,971	5,462	33%	\$281	\$2,813	\$945	\$3,757	13.4
5500	1-55w QL Induction	10	1.2	0.5	11,388	4,818	6,570	58%	\$334	\$5,290	\$553	\$5,843	17.5
5520	1-85w QL Induction	29	5.8	2.3	53,348	15,115	38,233	72%	\$1,875	\$18,846	\$3,284	\$22,130	11.8
8000	0-Install Lighting Controls Device Onl	92	3.5	3.5	24,619	15,763	8,856	36%	\$358	\$5,283	\$648	\$5,931	16.6
9000	0-No Action	793	29.7	29.8	123,675	123,255	420	0%	\$8	\$430	\$74	\$503	60.0
9100	0-Remove and cover	3	0.1	0.0	288	0	288	100%	\$25	\$79	\$74	\$153	6.2
9419	2-Delamp to 2 - 28w 4' RSFI T8 ES I	29	2.4	1.4	7,521	4,394	3,127	42%	\$222	\$368	\$1,068	\$1,436	6.5
9425	2-Delamp to 2 - 28w 4' RSFI T8 ES I	2	0.1	0.1	86	46	40	46%	\$8	\$34	\$74	\$108	14.2
9427	2-Delamp to 2 - 28w 4' RSFI T8 ES I	153	12.3	8.3	25,329	17,382	7,948	31%	\$702	\$3,966	\$3,758	\$7,723	11.0
9429	2-Delamp to 2 - 28w 4' RSFI T8 ES I	2	0.2	0.1	1,093	586	508	46%	\$30	\$34	\$74	\$108	3.6
9430	2-Delamp to 2 - 28w 4' RSFI T8 ES I	8	0.5	0.4	825	569	256	31%	\$27	\$102	\$196	\$298	11.0
Summary for Building:			216.6	169.0	753,840	518,174	235,666		\$14,083	\$128,423	\$47,521	\$175,944	12.5

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
 Building Name: Science Building

Project Number: 2010098
 Building Code: SCB



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
1003	1-1 Watt LED Exit light NEW	1	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2
2044	1-13w CF spiral SI (Screw in)	15	0.7	0.2	1,133	245	887	78%	\$91	\$198	\$92	\$290	3.2
2826	1-28w 4' RSFI T8 ES HE EL-LBF	35	0.4	0.2	1,004	514	490	49%	\$39	\$1,407	\$860	\$2,267	58.4
2832	2-28w 4' RSFI T8 ES HE EL-IS	31	3.0	1.3	19,964	8,540	11,424	57%	\$629	\$2,345	\$761	\$3,106	4.9
2838	2-28w 4' RSFI T8 ES HE EL-LBF	78	3.9	2.1	9,869	4,656	5,213	53%	\$382	\$3,939	\$1,916	\$5,855	15.3
2933	2-Relamp with 28w 4' RSFI T8 ES la	504	27.6	24.3	45,713	40,290	5,424	12%	\$533	\$4,266	\$3,524	\$7,790	14.6
2939	3-Relamp with 28w 4' RSFI T8 ES la	134	11.4	9.9	23,174	20,151	3,023	13%	\$265	\$1,701	\$823	\$2,524	9.5
2940	3-Relamp with 28w 4' RSFI T8 ES la	240	19.8	17.3	32,327	28,358	3,969	12%	\$395	\$3,047	\$1,474	\$4,521	11.5
3104	1-25w RSFI T8 EL-IS	3	0.1	0.1	221	156	66	30%	\$6	\$100	\$74	\$174	30.2
3736	1-32w RSFI T8 HE EL-LBF	2	0.0	0.0	89	52	37	42%	\$2	\$79	\$49	\$128	54.0
3764	1-17w RSFI T8 HE EL-IS	1	0.0	0.0	37	22	15	41%	\$2	\$41	\$25	\$66	40.8
3771	2-17w RSFI T8 HE EL-HBF WhRef	99	6.4	3.9	43,054	25,971	17,083	40%	\$931	\$6,730	\$2,431	\$9,161	9.8
3784	2-28w 4' RSFI T8 ES HE EL-IS 1&1	12	0.9	0.6	1,230	750	480	39%	\$54	\$838	\$442	\$1,280	23.5
9000	0-No Action	392	32.6	32.6	80,318	80,318	0	0%	\$0	\$0	\$0	\$0	0.0
9100	0-Remove and cover	2	0.1	0.0	77	0	76	100%	\$10	\$53	\$49	\$102	9.9
Summary for Building:			106.9	92.4	258,473	210,040	48,433		\$3,349	\$24,811	\$12,556	\$37,367	11.2

* Control costs and savings are included in this report.

Lighting Retrofit Cost Summary*

Client Name: Thompson Rivers University Kamloops
 Building Name: Trades and Technology

Project Number: 2010098
 Building Code: TAT



Lighting Code	Design Description	Qty	Pre. (kW)	Post (kW)	Pre. (kWh)	Post (kWh)	Savings (kWh)	Savings (%)	Savings (\$)	Materials	Labour	Total	Pbk.
1003	1-1 Watt LED Exit light NEW	1	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2
2412	1-42w triple CF	8	1.0	0.4	4,921	1,272	3,649	74%	\$207	\$635	\$467	\$1,101	5.3
2826	1-28w 4' RSFI T8 ES HE EL-LBF	2	0.1	0.0	753	385	368	49%	\$19	\$80	\$49	\$130	6.9
2832	2-28w 4' RSFI T8 ES HE EL-IS	101	8.6	4.3	22,090	11,729	10,361	47%	\$833	\$5,580	\$3,499	\$9,079	10.9
2836	2-28w 4' RSFI T8 ES HE EL-IS WhR	4	0.2	0.2	609	495	114	19%	\$9	\$533	\$123	\$656	76.3
2838	2-28w 4' RSFI T8 ES HE EL-LBF	16	1.1	0.6	2,120	1,236	883	42%	\$79	\$736	\$393	\$1,129	14.2
2857	2-28w 4' RSFI T8 ES HE EL-HBF NE	21	2.8	1.5	22,473	8,315	14,158	63%	\$698	\$4,070	\$600	\$4,670	6.7
2926	1-Relamp with 28w 4' RSFI T8 ES la	8	0.2	0.2	307	258	50	16%	\$5	\$34	\$49	\$83	15.6
2933	2-Relamp with 28w 4' RSFI T8 ES la	345	17.7	15.6	54,507	42,719	11,788	22%	\$678	\$3,863	\$6,813	\$10,676	15.7
2940	3-Relamp with 28w 4' RSFI T8 ES la	26	2.0	1.9	3,633	3,317	316	9%	\$24	\$330	\$160	\$490	20.2
2946	4-Relamp with 28w 4' RSFI T8 ES la	218	23.0	20.2	47,905	37,733	10,172	21%	\$687	\$5,624	\$2,364	\$7,989	11.6
3325	4-32w RSFI T8 EL-HBF 2&2 NEW	6	1.4	0.9	5,139	3,295	1,844	36%	\$122	\$911	\$686	\$1,596	13.1
3742	2-32w RSFI T8 HE EL-IS	56	3.8	2.9	17,660	9,443	8,217	47%	\$419	\$1,253	\$4,555	\$5,808	13.9
3755	6-32w RSFI T8 HE EL-HBF 2L & 4L	114	40.2	23.8	155,120	78,498	76,621	49%	\$4,664	\$40,486	\$11,225	\$51,711	11.1
5308	1-320w PS MH	3	0.1	0.1	6,388	5,224	1,164	18%	\$49	\$510	\$320	\$830	16.8
5522	1-165w QL Induction	2	0.1	0.0	2,763	1,562	1,202	43%	\$51	\$1,217	\$213	\$1,430	28.0
8000	0-Install Lighting Controls Device Onl	85	2.5	2.6	19,471	13,638	5,833	30%	\$231	\$570	\$215	\$785	3.4
9000	0-No Action	268	9.9	10.2	57,083	57,005	78	0%	-\$24	\$0	\$4	\$4	-0.2
9425	2-Delamp to 2 - 28w 4' RSFI T8 ES I	14	1.2	0.8	2,728	1,786	943	35%	\$80	\$237	\$516	\$753	9.4
9426	3-Delamp to 3 - 28w 4' RSFI T8 ES I	40	3.3	2.9	3,612	3,192	420	12%	\$53	\$508	\$982	\$1,490	27.9
9427	2-Delamp to 2 - 28w 4' RSFI T8 ES I	34	2.7	1.8	5,119	3,477	1,642	32%	\$148	\$881	\$835	\$1,716	11.6
9429	2-Delamp to 2 - 28w 4' RSFI T8 ES I	24	2.3	1.4	5,362	3,136	2,227	42%	\$183	\$406	\$884	\$1,290	7.0
9430	2-Delamp to 2 - 28w 4' RSFI T8 ES I	2	0.2	0.1	316	210	107	34%	\$10	\$25	\$49	\$75	7.8
Summary for Building:			124.5	92.4	440,344	287,943	152,401		\$9,239	\$68,557	\$35,038	\$103,595	11.2
Summary for Client:			803.1	608.7	2,731,182	1,915,326	815,856		\$51,597	\$427,175	\$215,384	\$642,560	12.5

* Control costs and savings are included in this report.

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
100	Classroom	FTJ	F2x4 Rec	9	3264	3 - 32w RSFI T8 EL-IS	1,000	2940	3-Relamp with 28w 4' RSFI T	9	76	0.7	0.6	774	684	90	12%	\$12	\$114	\$55	\$170	14.3
100	Classroom	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	177	156	21	12%	\$3	\$25	\$18	\$44	15.9
100A	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
100B	Interview Room	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	1,530	2940	3-Relamp with 28w 4' RSFI T	4	76	0.2	0.2	526	465	61	12%	\$4	\$51	\$25	\$75	17.2
100C	Interview Room	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	1,530	2940	3-Relamp with 28w 4' RSFI T	4	76	0.2	0.2	526	465	61	12%	\$4	\$51	\$25	\$75	17.2
101	Lab	FTJ	F2x4 Rec	14	3264	3 - 32w RSFI T8 EL-IS	714	2940	3-Relamp with 28w 4' RSFI T	14	76	1.1	1.0	860	760	100	12%	\$17	\$178	\$86	\$264	15.7
103	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
104	Classroom	FTJ	F2x4 Rec	15	3264	3 - 32w RSFI T8 EL-IS	2,000	2940	3-Relamp with 28w 4' RSFI T	15	76	1.2	1.1	2,580	2,280	300	12%	\$26	\$190	\$92	\$283	11.0
104	Classroom	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	2,000	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	472	416	56	12%	\$5	\$34	\$25	\$58	12.1
105/107	Locked	FTJ	F2x4 Rec	8	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2848	3-28w 4' RSFI T8 ES HE EL-L	8	64	0.9	0.5	920	512	408	44%	\$54	\$690	\$295	\$985	18.4
105A	Women's Washroom	FBG	F1x4 Box	2	3244	2 - 32w RSFI T8 EL-IS	3,570	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	421	371	50	12%	\$3	\$17	\$12	\$29	8.9
105B	Men's Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	3,570	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	211	186	25	12%	\$2	\$8	\$6	\$15	8.9
105C	H/C Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
108	Classroom	IDG	Downlight Round	16	1170	1 - 150w Inc PS25	460	9000	0-No Action	16	0	2.3	2.3	1,104	1,104	0	0%	\$0	\$0	\$0	\$0	0.0
108	Classroom	FTD	F1x4 Rec	29	3244	2 - 32w RSFI T8 EL-IS	2,000	2933	2-Relamp with 28w 4' RSFI T	29	52	1.6	1.4	3,422	3,016	406	12%	\$35	\$245	\$178	\$424	12.1
109	Storage	FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
120	Electrical Storage	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
121	Lab	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,960	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	451	251	200	44%	\$17	\$172	\$74	\$246	14.2
122	Sprinkler Room	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
123	Office	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	4	64	0.4	0.2	635	353	282	44%	\$30	\$345	\$147	\$492	16.4
124	Janitor Room	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	765	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	55	32	23	42%	\$2	\$46	\$25	\$71	42.9
125	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
126	Men's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	3,570	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	257	150	107	42%	\$7	\$46	\$25	\$71	10.0
127	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
130	Women's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	3,570	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	257	150	107	42%	\$7	\$46	\$25	\$71	10.0
131	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
132	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
133	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
134	Locked Room	FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	99	58	41	42%	\$4	\$46	\$25	\$71	16.0
135	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
139	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
141	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
142	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
142A	Locked Room	FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	99	58	41	42%	\$4	\$46	\$25	\$71	16.0
143	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
145	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
147	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
149	Study Room	FTJ	F2x4 Rec	6	3480	3 - 34w RSFI T12 - EE 1&2	1,960	2848	3-28w 4' RSFI T8 ES HE EL-L	6	64	0.7	0.4	1,352	753	600	44%	\$52	\$517	\$221	\$738	14.2
151	Lab	FTJ	F2x4 Rec	19	3480	3 - 34w RSFI T12 - EE 1&2	714	2848	3-28w 4' RSFI T8 ES HE EL-L	19	64	2.1	1.2	1,560	868	692	44%	\$116	\$1,638	\$700	\$2,338	20.1
151E	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
162	Classroom	FTD	F1x4 Rec	35	3244	2 - 32w RSFI T8 EL-IS	2,000	2933	2-Relamp with 28w 4' RSFI T	35	52	2.0	1.7	4,130	3,640	490	12%	\$42	\$296	\$215	\$511	12.1
162	Classroom	IDF	Downlight Round	12	1170	1 - 150w Inc PS25	460	9000	0-No Action	12	0	1.7	1.7	828	828	0	0%	\$0	\$0	\$0	\$0	0.0
163	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	2,000	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	2,136	1,872	264	12%	\$23	\$152	\$74	\$226	10.0
164	Classroom	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	2,000	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	472	416	56	12%	\$5	\$34	\$25	\$58	12.1
164	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	2,000	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	2,136	1,872	264	12%	\$23	\$152	\$74	\$226	10.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
168A	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
168B	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
168C	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
168D	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
171	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
173	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
175	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
177	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
179	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
181	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
183	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
185	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
186	Office	FTJ	F2x4 Rec	6	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	6	78	0.5	0.4	737	646	91	12%	\$10	\$76	\$37	\$113	11.7
187	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
189	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
191	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
193	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
195	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
197	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
1-Disp C Display Cases Near Main		FCE	F1x4 Cubelight	1	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	377	193	184	49%	\$9	\$40	\$25	\$65	6.9
1-Disp C Display Cases Near Main		FSE	F4' striplight	3	3208	1 - 32w RSFI T8 EL-IS	8,760	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	815	683	131	16%	\$7	\$13	\$18	\$31	4.7
1-East H East Hallway		FTG	F2x2 Rec	2	3497	2 - 34w RSFI T12U EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.1	0.1	1,261	841	420	33%	\$21	\$207	\$49	\$256	12.0
1-East H East Hallway		FTG	F2x2 Rec	5	3497	2 - 34w RSFI T12U EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	5	48	0.3	0.2	3,154	2,102	1,051	33%	\$53	\$518	\$123	\$641	12.0
1-East H East Office Hallway		FTG	F2x2 Rec	8	3497	2 - 34w RSFI T12U EE	3,570	3771	2-17w RSFI T8 HE EL-HBF W	8	41	0.5	0.3	2,056	1,171	885	43%	\$58	\$544	\$196	\$740	12.7
1-Elev L Elevator Lobby		CDN	Downlight	1	2213	2 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
1-Elev L Elevator Lobby		CDN	Downlight	1	2213	2 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry Entry Vestibule		CDN	Downlight	1	2213	2 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry Entry Vestibule		CDN	Downlight	1	2213	2 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry Hallway		CDN	Downlight	7	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	7	0	0.2	0.2	1,962	1,962	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry Hallway		CDN	Downlight	3	2213	2 - 13w CF	8,760	9000	0-No Action	3	0	0.1	0.1	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry Hallway		CDN	Downlight	3	2213	2 - 13w CF	8,760	9000	0-No Action	3	0	0.1	0.1	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry Hallway		IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry Hallway		CDN	Downlight	9	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	9	0	0.3	0.3	2,523	2,523	0	0%	\$0	\$0	\$0	\$0	0.0
1-Exit H Exit Vestibule		FTF	F2x2 Rec	1	3445	4 - 20w RSFI T12 - EE 2 b	8,760	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	806	359	447	55%	\$23	\$105	\$25	\$130	5.7
1-West West Hallway with Display		FSA	F2' striplight	2	3436	1 - 20w RSFI T12 - Std	5,096	3766	1-17w RSFI T8 HE EL-LBF	2	14	0.1	0.0	296	143	153	52%	\$9	\$83	\$49	\$132	14.8
1-West West Hallway with Display		IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
1-West West Hallway with Display		FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.2	0.1	1,551	841	710	46%	\$36	\$207	\$49	\$256	7.1
1-West West Hallway with Display		FTG	F2x2 Rec	5	3497	2 - 34w RSFI T12U EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	4	48	0.3	0.2	3,154	1,682	1,472	47%	\$75	\$415	\$98	\$513	6.9
1-West West Office Hallway		FTG	F2x2 Rec	4	3497	2 - 34w RSFI T12U EE	3,570	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.3	0.2	1,028	585	443	43%	\$29	\$272	\$98	\$370	12.7
1-West West Office Hallway		FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	3,570	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.2	0.2	843	585	257	31%	\$17	\$272	\$98	\$370	21.8
1-West West Office Hallway		FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	3,570	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	421	293	129	31%	\$8	\$136	\$49	\$185	21.8
200	Computer Lab	FTJ	F2x4 Rec	13	3480	3 - 34w RSFI T12 - EE 1&2	2,550	2848	3-28w 4' RSFI T8 ES HE EL-L	13	64	1.4	0.8	3,812	2,122	1,691	44%	\$129	\$1,121	\$479	\$1,600	12.4
200A	Storage	FTJ	F2x4 Rec	3	3480	3 - 34w RSFI T12 - EE 1&2	510	2848	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.1	0.0	176	98	78	44%	\$7	\$259	\$111	\$369	54.1
201	Hallway	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	2,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	147	86	61	42%	\$5	\$46	\$25	\$71	13.6
201A	Office	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	1,380	2856	4-28w 4' RSFI T8 ES HE EL-L	2	84	0.3	0.2	408	232	177	43%	\$19	\$121	\$86	\$207	11.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
201B	Office	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	1,380	2856	4-28w 4' RSFI T8 ES HE EL-L	2	84	0.3	0.2	408	232	177	43%	\$19	\$121	\$86	\$207	11.0
204	Boardroom	FID	F1x4 Industrial	3	3475	2 - 34w RSFI T12 EE	1,530	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	330	193	138	42%	\$14	\$138	\$74	\$212	15.4
204	Boardroom	FTJ	F2x4 Rec	5	3480	3 - 34w RSFI T12 - EE 1&2	1,530	2848	3-28w 4' RSFI T8 ES HE EL-L	5	64	0.5	0.3	880	490	390	44%	\$39	\$431	\$184	\$615	15.8
205	Office	FTJ	F2x4 Rec	3	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.3	0.2	476	265	211	44%	\$22	\$259	\$111	\$369	16.4
205A	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
208	Classroom	FTD	F1x4 Rec	5	3475	2 - 34w RSFI T12 EE	2,000	2838	2-28w 4' RSFI T8 ES HE EL-L	5	42	0.3	0.2	720	420	300	42%	\$26	\$230	\$123	\$353	13.7
208	Classroom	FTJ	F2x4 Rec	12	3480	3 - 34w RSFI T12 - EE 1&2	2,000	2848	3-28w 4' RSFI T8 ES HE EL-L	12	64	1.3	0.7	2,760	1,536	1,224	44%	\$105	\$1,035	\$442	\$1,477	14.0
212	Classroom	FTD	F1x4 Rec	5	3475	2 - 34w RSFI T12 EE	2,000	2838	2-28w 4' RSFI T8 ES HE EL-L	5	42	0.3	0.2	720	420	300	42%	\$26	\$230	\$123	\$353	13.7
212	Classroom	FTJ	F2x4 Rec	12	3480	3 - 34w RSFI T12 - EE 1&2	2,000	2848	3-28w 4' RSFI T8 ES HE EL-L	12	64	1.3	0.7	2,760	1,536	1,224	44%	\$105	\$1,035	\$442	\$1,477	14.0
221	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
223	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
225	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
229	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
231	Office	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	4	64	0.4	0.2	635	353	282	44%	\$30	\$345	\$147	\$492	16.4
233	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
235	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
237	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
239	Office	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	4	64	0.4	0.2	635	353	282	44%	\$30	\$345	\$147	\$492	16.4
241	Office	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	4	64	0.4	0.2	635	353	282	44%	\$30	\$345	\$147	\$492	16.4
243	Office	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	1,960	2848	3-28w 4' RSFI T8 ES HE EL-L	4	64	0.4	0.2	902	502	400	44%	\$35	\$345	\$147	\$492	14.2
245	Office	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	1,960	2848	3-28w 4' RSFI T8 ES HE EL-L	4	64	0.4	0.2	902	502	400	44%	\$35	\$345	\$147	\$492	14.2
247	Office	FTJ	F2x4 Rec	3	3480	3 - 34w RSFI T12 - EE 1&2	1,960	2848	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.3	0.2	676	376	300	44%	\$26	\$259	\$111	\$369	14.2
251	Office	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	2,295	2848	3-28w 4' RSFI T8 ES HE EL-L	1	64	0.1	0.1	264	147	117	44%	\$9	\$86	\$37	\$123	13.1
251	Office	FTJ	F2x4 Rec	8	3480	3 - 34w RSFI T12 - EE 1&2	2,295	2848	3-28w 4' RSFI T8 ES HE EL-L	8	64	0.9	0.5	2,111	1,175	936	44%	\$75	\$690	\$295	\$985	13.1
251A	Reception	FTG	F2x2 Rec	2	3346	2 - 32w RSFI T8/U6 EE	2,295	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	340	188	151	45%	\$12	\$136	\$49	\$185	15.3
251A	Reception	FTJ	F2x4 Rec	6	3480	3 - 34w RSFI T12 - EE 1&2	2,295	2848	3-28w 4' RSFI T8 ES HE EL-L	6	64	0.7	0.4	1,584	881	702	44%	\$56	\$517	\$221	\$738	13.1
253B	Office	CDB	Downlight	7	2213	2 - 13w CF	2,295	9000	0-No Action	7	0	0.2	0.2	514	514	0	0%	\$0	\$0	\$0	\$0	0.0
253B	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	2,295	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	528	294	234	44%	\$19	\$172	\$74	\$246	13.1
253C	Office	FTJ	F2x4 Rec	7	3480	3 - 34w RSFI T12 - EE 1&2	2,295	2848	3-28w 4' RSFI T8 ES HE EL-L	7	64	0.8	0.4	1,847	1,028	819	44%	\$66	\$604	\$258	\$861	13.1
260	Classroom	FTD	F1x4 Rec	4	3475	2 - 34w RSFI T12 EE	2,000	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	576	336	240	42%	\$21	\$184	\$98	\$282	13.7
260	Classroom	FTJ	F2x4 Rec	12	3480	3 - 34w RSFI T12 - EE 1&2	2,000	2848	3-28w 4' RSFI T8 ES HE EL-L	12	64	1.3	0.7	2,760	1,536	1,224	44%	\$105	\$1,035	\$442	\$1,477	14.0
262	Classroom	FTJ	F2x4 Rec	16	3260	3 - 32w RSFI T8 EE 1&2	2,000	2848	3-28w 4' RSFI T8 ES HE EL-L	16	64	1.6	1.0	3,424	2,048	1,376	40%	\$118	\$1,380	\$589	\$1,969	16.7
263	Classroom	FTJ	F2x4 Rec	9	3480	3 - 34w RSFI T12 - EE 1&2	2,000	2848	3-28w 4' RSFI T8 ES HE EL-L	9	64	1.0	0.5	2,070	1,152	918	44%	\$79	\$776	\$332	\$1,108	14.0
265	Classroom	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	2,000	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	236	208	28	12%	\$2	\$17	\$12	\$29	12.1
265	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	2,000	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,424	1,248	176	12%	\$15	\$102	\$49	\$151	10.0
266	Classroom	FTJ	F2x4 Rec	12	3480	3 - 34w RSFI T12 - EE 1&2	2,000	2848	3-28w 4' RSFI T8 ES HE EL-L	12	64	1.3	0.7	2,760	1,536	1,224	44%	\$105	\$1,035	\$442	\$1,477	14.0
266	Classroom	FTD	F1x4 Rec	4	3475	2 - 34w RSFI T12 EE	2,000	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	576	336	240	42%	\$21	\$184	\$98	\$282	13.7
267	Men's Washroom	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	3,570	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	514	300	214	42%	\$14	\$92	\$49	\$141	10.0
268	Classroom	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,000	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	89	78	11	12%	\$1	\$13	\$6	\$19	13.0
268	Classroom	FTJ	F2x4 Rec	9	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2848	3-28w 4' RSFI T8 ES HE EL-L	9	64	1.0	0.5	1,035	576	459	44%	\$60	\$776	\$332	\$1,108	18.4
268A	H/C Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
269	Women's Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	3,570	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	257	150	107	42%	\$7	\$46	\$25	\$71	10.0
269	Women's Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	3,570	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	257	150	107	42%	\$7	\$46	\$25	\$71	10.0
270	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
271	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
273	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
274	Utility Rooms	FID	F1x4 Industrial	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
275	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
277	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
281	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
283	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
285	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
286	Men's Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
287	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
288	Women's Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
289	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
289A	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
290	Janitor Room	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	765	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	55	32	23	42%	\$2	\$46	\$25	\$71	42.9
291	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2891	3-28w RSFI T8 ES EL-IS LBF	2	70	0.2	0.1	317	193	124	39%	\$13	\$151	\$74	\$225	17.0
292	Mechanical Room	FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
293	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
295	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
297	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
2-East H East Hallway		IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2-East H East Hallway		FTG	F2x2 Rec	6	3346	2 - 32w RSFI T8/U6 EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-I	6	48	0.4	0.3	3,889	2,523	1,367	35%	\$69	\$622	\$147	\$769	11.1
2-East H East Hallway		FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2833	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	517	420	96	19%	\$5	\$104	\$25	\$128	26.2
2-East H East Hallway		FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
2-East H East Office Hallway		FTG	F2x2 Rec	8	3346	2 - 32w RSFI T8/U6 EE	3,570	3771	2-17w RSFI T8 HE EL-HBF W	8	41	0.6	0.3	2,113	1,171	942	45%	\$62	\$544	\$196	\$740	11.9
2-East H East Office Hallway		IXL	LED Exit sign	5	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	5	0	0.0	0.0	88	88	0	0%	\$0	\$0	\$0	\$0	0.0
2-Lobby 2nd Floor Lobby		IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2-Lobby 2nd Floor Lobby		CDN	Downlight	7	2213	2 - 13w CF	8,760	9000	0-No Action	7	0	0.2	0.2	1,962	1,962	0	0%	\$0	\$0	\$0	\$0	0.0
2-Lobby 2nd Floor Lobby		CDN	Downlight	14	2213	2 - 13w CF	8,760	9000	0-No Action	14	0	0.4	0.4	3,924	3,924	0	0%	\$0	\$0	\$0	\$0	0.0
2-West West Hallway		IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
2-West West Hallway		FTG	F2x2 Rec	9	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2833	2-28w 4' RSFI T8 ES HE EL-I	9	48	0.5	0.4	4,652	3,784	867	19%	\$44	\$933	\$221	\$1,154	26.2
2-West West Hallway		FTG	F2x2 Rec	2	3346	2 - 32w RSFI T8/U6 EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	1,296	841	456	35%	\$23	\$207	\$49	\$256	11.1
2-West West Office Hallway		FTG	F2x2 Rec	9	3346	2 - 32w RSFI T8/U6 EE	3,570	3771	2-17w RSFI T8 HE EL-HBF W	9	41	0.6	0.4	2,378	1,317	1,060	45%	\$70	\$612	\$221	\$833	11.9
2-West West Office Hallway		IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
300	Classroom	FTJ	F2x4 Rec	6	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2848	3-28w 4' RSFI T8 ES HE EL-L	6	64	0.7	0.4	690	384	306	44%	\$40	\$517	\$221	\$738	18.4
300A	Classroom	FTD	F1x4 Rec	3	3475	2 - 34w RSFI T12 EE	2,000	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	432	252	180	42%	\$15	\$138	\$74	\$212	13.7
300B	Classroom	FTJ	F2x4 Rec	18	3480	3 - 34w RSFI T12 - EE 1&2	2,000	2848	3-28w 4' RSFI T8 ES HE EL-L	18	64	2.0	1.1	4,140	2,304	1,836	44%	\$158	\$1,552	\$663	\$2,215	14.0
301A	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
301B	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
304	Classroom	FTJ	F2x4 Rec	10	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2848	3-28w 4' RSFI T8 ES HE EL-L	10	64	1.1	0.6	1,150	640	510	44%	\$67	\$862	\$368	\$1,231	18.4
304	Classroom	FTD	F1x4 Rec	6	3475	2 - 34w RSFI T12 EE	1,000	2838	2-28w 4' RSFI T8 ES HE EL-L	6	42	0.4	0.2	432	252	180	42%	\$24	\$276	\$147	\$423	17.9
305	Computer Lab	FTD	F1x4 Rec	17	3475	2 - 34w RSFI T12 EE	2,550	2838	2-28w 4' RSFI T8 ES HE EL-L	17	42	1.2	0.7	3,121	1,821	1,301	42%	\$99	\$782	\$418	\$1,200	12.1
308	Classroom	FTD	F1x4 Rec	8	3475	2 - 34w RSFI T12 EE	1,000	2838	2-28w 4' RSFI T8 ES HE EL-L	8	42	0.5	0.3	576	336	240	42%	\$32	\$368	\$196	\$565	17.9
312	Classroom	FTD	F1x4 Rec	5	3475	2 - 34w RSFI T12 EE	2,000	2838	2-28w 4' RSFI T8 ES HE EL-L	5	42	0.3	0.2	720	420	300	42%	\$26	\$230	\$123	\$353	13.7
321	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
323	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
325	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
329	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
331	Office	FTJ	F2x4 Rec	3	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.3	0.2	476	265	211	44%	\$22	\$259	\$111	\$369	16.4
333	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
335	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
337	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
338	Men's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
338	Men's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
339	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
340	Communications Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
341	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
343	Office	FTJ	F2x4 Rec	3	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.3	0.2	476	265	211	44%	\$22	\$259	\$111	\$369	16.4
345	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
347	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
351	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
352	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
353	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
355	Office	FTJ	F2x4 Rec	6	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	6	64	0.7	0.4	952	530	422	44%	\$45	\$517	\$221	\$738	16.4
357	Lunch Room	IDD	Downlight Round	1	1153	1 - 100w Inc A19	2,860	2400	1-18w triple CF	1	23	0.1	0.0	286	66	220	77%	\$16	\$60	\$49	\$109	6.8
357	Lunch Room	IDB	Downlight Round	6	1146	1 - 75w Inc PAR38 Flood	2,860	2400	1-18w triple CF	6	23	0.4	0.1	1,287	395	892	69%	\$64	\$357	\$295	\$652	10.1
359	Hallway	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	2,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	147	86	61	42%	\$5	\$46	\$25	\$71	13.6
359A	Office	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
359B	Office	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	199	116	83	42%	\$9	\$92	\$49	\$141	16.0
359C	Office	FTD	F1x4 Rec	4	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	397	232	166	42%	\$18	\$184	\$98	\$282	16.0
360	Classroom	CDN	Downlight	1	2213	2 - 13w CF	2,550	9000	0-No Action	1	0	0.0	0.0	82	82	0	0%	\$0	\$0	\$0	\$0	0.0
360	Classroom	FTJ	F2x4 Rec	11	3480	3 - 34w RSFI T12 - EE 1&2	2,550	2848	3-28w 4' RSFI T8 ES HE EL-L	11	64	1.2	0.7	3,226	1,795	1,431	44%	\$109	\$948	\$405	\$1,354	12.4
361	Computer Room	FTJ	F2x4 Rec	18	3480	3 - 34w RSFI T12 - EE 1&2	2,550	2848	3-28w 4' RSFI T8 ES HE EL-L	18	64	2.0	1.1	5,279	2,938	2,341	44%	\$178	\$1,552	\$663	\$2,215	12.4
362	Classroom	FTD	F1x4 Rec	4	3475	2 - 34w RSFI T12 EE	1,000	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	288	168	120	42%	\$16	\$184	\$98	\$282	17.9
362	Classroom	FTJ	F2x4 Rec	16	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2848	3-28w 4' RSFI T8 ES HE EL-L	16	64	1.7	1.0	1,840	1,024	816	44%	\$107	\$1,380	\$589	\$1,969	18.4
364	Office	FTJ	F2x4 Rec	6	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	6	64	0.7	0.4	952	530	422	44%	\$45	\$517	\$221	\$738	16.4
364A	Hallway	FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	517	359	158	31%	\$8	\$68	\$25	\$93	11.6
366	Classroom	FTJ	F2x4 Rec	19	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2848	3-28w 4' RSFI T8 ES HE EL-L	19	64	2.1	1.2	2,185	1,216	969	44%	\$127	\$1,638	\$700	\$2,338	18.4
366	Classroom	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	230	128	102	44%	\$13	\$172	\$74	\$246	18.4
366A	Storage	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	75	44	31	42%	\$2	\$46	\$25	\$71	35.7
366A	Storage	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	150	87	62	42%	\$4	\$92	\$49	\$141	35.7
371	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
373	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
375	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
377	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
379	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
381	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
383	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
384	Utility Room	FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
385	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
386	Women's Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
387	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2891	3-28w RSFI T8 ES EL-IS LBF	2	70	0.2	0.1	317	193	124	39%	\$13	\$151	\$74	\$225	17.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
388	Men's Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
389	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
391	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
393	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
395	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
397	Office	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,380	2848	3-28w 4' RSFI T8 ES HE EL-L	2	64	0.2	0.1	317	177	141	44%	\$15	\$172	\$74	\$246	16.4
3-East H East Office Hallway		FTG	F2x2 Rec	5	3348	2 - 32w RSFI T8/U6 EL IS	3,570	3771	2-17w RSFI T8 HE EL-HBF W	5	41	0.3	0.2	1,053	732	321	31%	\$21	\$340	\$123	\$463	21.8
3-East H East Office Hallway		IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
3-East H East Hallway		FTG	F2x2 Rec	1	3346	2 - 32w RSFI T8/U6 EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	648	420	228	35%	\$12	\$117	\$25	\$141	12.2
3-East H East Hallway		FTG	F2x2 Rec	4	3346	2 - 32w RSFI T8/U6 EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	4	48	0.3	0.2	2,593	1,682	911	35%	\$46	\$468	\$98	\$566	12.2
3-East H East Hallway		IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
3-Loung Lounge (Gorman's Grotto)		CDO	Downlight	7	2009	1 - 15w CF ref fl SI (Screw	2,860	8000	0-Install Lighting Controls Dev	7	0	0.1	0.1	300	300	0	0%	\$0	\$0	\$0	\$0	0.0
3-Loung Lounge (Gorman's Grotto)		CDO	Downlight	11	2009	1 - 15w CF ref fl SI (Screw	2,860	8000	0-Install Lighting Controls Dev	11	0	0.2	0.2	472	472	0	0%	\$0	\$0	\$0	\$0	0.0
3-Loung Lounge (Gorman's Grotto)		CDO	Downlight	3	2009	1 - 15w CF ref fl SI (Screw	2,860	8000	0-Install Lighting Controls Dev	3	0	0.0	0.0	129	129	0	0%	\$0	\$0	\$0	\$0	0.0
3-Vest Louge Vestibule		FTG	F2x2 Rec	2	3346	2 - 32w RSFI T8/U6 EE	2,860	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	423	240	183	43%	\$13	\$218	\$49	\$267	20.2
3-Vest Louge Vestibule		IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
3-West West Hallway		IXL	LED Exit sign	4	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	4	0	0.0	0.0	70	70	0	0%	\$0	\$0	\$0	\$0	0.0
3-West West Hallway		FTG	F2x2 Rec	9	3346	2 - 32w RSFI T8/U6 EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	9	48	0.6	0.4	5,834	3,784	2,050	35%	\$104	\$933	\$221	\$1,154	11.1
3-West West Hallway		FTG	F2x2 Rec	3	3346	2 - 32w RSFI T8/U6 EE	8,760	2833	2-28w 4' RSFI T8 ES HE EL-L	3	48	0.2	0.1	1,945	1,261	683	35%	\$35	\$311	\$74	\$385	11.1
3-West West Office Hallway		FTG	F2x2 Rec	10	3346	2 - 32w RSFI T8/U6 EE	3,570	3771	2-17w RSFI T8 HE EL-HBF W	10	41	0.7	0.4	2,642	1,464	1,178	45%	\$78	\$680	\$246	\$925	11.9
3-West West Office Hallway		IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
9109A Utility Room		FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
9136 Men's Washroom		FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9161 Breaker Room		FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
9167 Men's Washroom		FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9169 Women's Washroom		FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	636	371	265	42%	\$16	\$92	\$49	\$141	8.7
9169A H/C Washroom		FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9172 Storage		FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	150	87	62	42%	\$4	\$92	\$49	\$141	35.7
9174 Storage		FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	150	87	62	42%	\$4	\$92	\$49	\$141	35.7
9176 Storage		FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	150	87	62	42%	\$4	\$92	\$49	\$141	35.7
9186 Women's Washroom		FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9188 Men's Washroom		FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9190 Janitor Room		FBF	F1x4 Box	1	3470	1 - 34w RSFI T12 EE	765	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	33	17	16	49%	\$1	\$40	\$25	\$65	56.2
9194 Storage		FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	150	87	62	42%	\$4	\$92	\$49	\$141	35.7
9203A Women's Washroom		FBE	F1x3 Box	2	3463	2 - 30w RSFI T12 EE	4,420	3116	2-25w RSFI T8 EL-IS	2	46	0.1	0.1	663	407	256	39%	\$16	\$113	\$49	\$163	10.4
9203B Men's Washroom		FBE	F1x3 Box	2	3463	2 - 30w RSFI T12 EE	4,420	3116	2-25w RSFI T8 EL-IS	2	46	0.1	0.1	663	407	256	39%	\$16	\$113	\$49	\$163	10.4
9203C H/C Washroom		FBE	F1x3 Box	1	3463	2 - 30w RSFI T12 EE	4,420	3116	2-25w RSFI T8 EL-IS	1	46	0.1	0.0	332	203	128	39%	\$8	\$57	\$25	\$81	10.4
9224 Utility Room		FTJ	F2x4 Rec	3	3480	3 - 34w RSFI T12 - EE 1&2	2,040	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.3	0.1	704	257	447	63%	\$38	\$230	\$74	\$304	8.0
9224 Utility Room		FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
9226 Electrical Room		FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
9230 Mechanical Room		FSF	F4' striplight	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
9236 Men's Washroom		FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9303A Women's Washroom		FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9303B Men's Washroom		FBG	F1x4 Box	2	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	636	371	265	42%	\$16	\$92	\$49	\$141	8.7
9303C H/C Washroom		FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
9310	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
9324	Storage	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	150	87	62	42%	\$4	\$92	\$49	\$141	35.7
9326	Utility Room	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
9330	Electrical Room	FBG	F1x4 Box	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
9336	Women's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9338	Men's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	4,420	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	318	186	133	42%	\$8	\$46	\$25	\$71	8.7
9339	Janitor Room	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	765	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	55	32	23	42%	\$2	\$46	\$25	\$71	42.9
9340	Comm Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	102	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	4	2	2	49%	\$1	\$40	\$25	\$65	109.8
9352	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	102	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	4	2	2	49%	\$1	\$40	\$25	\$65	109.8
9374/93	Utility Room	FSE	F4' striplight	2	3470	1 - 34w RSFI T12 EE	102	2826	1-28w 4' RSFI T8 ES HE EL-L	2	22	0.0	0.0	9	4	4	49%	\$1	\$80	\$49	\$130	109.8
966	Classroom	FTJ	F2x4 Rec	11	3265	3 - 32w RSFI T8 EL-IS 1&2	2,000	2939	3-Relamp with 28w 4' RSFI T	11	78	0.9	0.8	1,958	1,716	242	12%	\$21	\$140	\$68	\$207	10.0
Elevator	Elevator	FSE	F4' striplight	3	3200	1 - 32w RSFI T8 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	3	22	0.1	0.1	920	578	342	37%	\$17	\$121	\$74	\$194	11.2
EXT	Exterior	HPC	Post Top	2	6004	1 - 70w HPS	4,380	9000	0-No Action	2	0	0.0	0.0	797	797	0	0%	\$0	\$0	\$0	\$0	0.0
EXT	Exterior	HWC	Wall Pack	23	6004	1 - 70w HPS	4,380	9000	0-No Action	23	0	0.2	0.2	9,167	9,167	0	0%	\$0	\$0	\$0	\$0	0.0
EXT-Mai	Main Entrance	HPC	Post Top	2	6004	1 - 70w HPS	4,380	9000	0-No Action	2	0	0.2	0.2	797	797	0	0%	\$0	\$0	\$0	\$0	0.0
EXT-Mai	Main Entrance	HPE	Post Top	2	6006	1 - 100w HPS	4,380	9000	0-No Action	2	0	0.2	0.2	1,139	1,139	0	0%	\$0	\$0	\$0	\$0	0.0
EXT-Mai	Main Entrance	CDI	Downlight	4	2408	1 - 32w triple CF	4,380	9000	0-No Action	4	0	0.1	0.1	648	648	0	0%	\$0	\$0	\$0	\$0	0.0
EXT-Par	Parkade	HPE	Post Top	4	6006	1 - 100w HPS	4,380	9000	0-No Action	4	0	0.1	0.1	2,278	2,278	0	0%	\$0	\$0	\$0	\$0	0.0
STR-Ce	Centre-East Stairwell	FVD	F1x4 Vapour Resistant	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$78	\$95	15.3
STR-Ce	Centre-West Stairwell	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$78	\$95	15.3
STR-Ce	Centre-West Stairwell	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$39	\$48	15.3
STR-Ce	Centre-West Stairwell	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$39	\$48	15.3
STR-Ea	East Stairwell	FVD	F1x4 Vapour Resistant	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
STR-Ea	East Stairwell	FVD	F1x4 Vapour Resistant	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
STR-We	West Stairwell	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
STR-We	West Stairwell	FBG	F1x4 Box	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
STR-We	West Stairwell	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
STR-We	West Stairwell	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
Existing Energy Summary for Building Arts and Education:				1129					1127	88.2	57.1	223,293	153,538	69,754	31%	\$5,799	\$59,509	\$25,777	\$85,286	14.7		

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Animal Health Technology

Building Code: AHT



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
01	Basement Communication	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	51	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	6	5	1	12%	\$0	\$17	\$12	\$29	80.1
01-015	Animal Pens	CVI	CF Vandal Proof	5	2408	1 - 32w triple CF	4,380	9000	0-No Action	5	0	0.0	0.0	810	810	0	0%	\$0	\$0	\$0	\$0	0.0
01-015	Animal Pens	FVD	F1x4 Vapour Resistant	9	3244	2 - 32w RSFI T8 EL-IS	510	9000	0-No Action	9	0	0.1	0.1	271	271	0	0%	\$0	\$0	\$0	\$0	0.0
02	Basement Electrical Room	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	51	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	6	5	1	12%	\$0	\$17	\$12	\$29	80.1
03	Basement Sprinkler Room	FID	F1x4 Industrial	5	3244	2 - 32w RSFI T8 EL-IS	51	2933	2-Relamp with 28w 4' RSFI T	5	52	0.1	0.1	15	13	2	12%	\$1	\$42	\$31	\$73	80.1
101	Vestibule	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
101	Vestibule	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
102	Isolation Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,550	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	439	291	148	34%	\$11	\$52	\$49	\$101	9.0
102A	Isolation Room	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	150	133	18	12%	\$1	\$8	\$6	\$15	10.7
104/113	Hallway	FTD	F1x4 Rec	9	3244	2 - 32w RSFI T8 EL-IS	2,805	2933	2-Relamp with 28w 4' RSFI T	9	52	0.5	0.4	1,489	1,313	177	12%	\$13	\$76	\$55	\$131	10.2
104/113	Hallway	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
105	Staff Room	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	2,550	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.2	0.2	658	436	222	34%	\$17	\$78	\$74	\$151	9.0
106	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,400	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	413	274	139	34%	\$11	\$52	\$49	\$101	9.3
107	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,400	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	413	274	139	34%	\$11	\$52	\$49	\$101	9.3
108	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,400	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	413	274	139	34%	\$11	\$52	\$49	\$101	9.3
109	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,400	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	413	274	139	34%	\$11	\$52	\$49	\$101	9.3
110	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,400	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	413	274	139	34%	\$11	\$52	\$49	\$101	9.3
111	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,400	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	413	274	139	34%	\$11	\$52	\$49	\$101	9.3
112	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,400	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	413	274	139	34%	\$11	\$52	\$49	\$101	9.3
114	Women's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
115	Men's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
116	Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	102	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	9	8	1	12%	\$1	\$13	\$6	\$19	19.8
117	Lab	FTJ	F2x4 Rec	7	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	7	76	0.6	0.5	1,689	1,492	196	12%	\$14	\$89	\$43	\$132	9.2
118	Surgical Room	FTD	F1x4 Rec	6	3244	2 - 32w RSFI T8 EL-IS	2,805	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	993	875	118	12%	\$9	\$51	\$37	\$88	10.2
119	Surgical Room	FTD	F1x4 Rec	12	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	12	52	0.7	0.6	1,805	1,591	214	12%	\$16	\$102	\$74	\$175	10.7
120	Surgical Room	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	150	133	18	12%	\$1	\$8	\$6	\$15	10.7
121	Surgical Room	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	451	398	54	12%	\$4	\$25	\$18	\$44	10.7
122	Radiology Room	FTD	F1x4 Rec	6	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	354	312	42	12%	\$6	\$51	\$37	\$88	15.9
122	Radiology Room	CDI	Downlight	2	2408	1 - 32w triple CF	1,000	9000	0-No Action	2	0	0.1	0.1	74	74	0	0%	\$0	\$0	\$0	\$0	0.0
122A	X-Ray Room	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
123	Lab	FTD	F1x4 Rec	8	3244	2 - 32w RSFI T8 EL-IS	2,805	2933	2-Relamp with 28w 4' RSFI T	8	52	0.4	0.4	1,324	1,167	157	12%	\$11	\$68	\$49	\$117	10.2
124	Pharmacy Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,550	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	439	388	51	12%	\$4	\$25	\$12	\$38	9.7
125	Hallway	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,805	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	331	292	39	12%	\$3	\$17	\$12	\$29	10.2
127	Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	51	2940	3-Relamp with 28w 4' RSFI T	1	76	0.0	0.0	4	4	1	12%	\$0	\$13	\$6	\$19	72.4
128	Storage	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	51	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	3	3	0	12%	\$0	\$8	\$6	\$15	80.1
130	Janitor Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	51	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	3	3	0	12%	\$0	\$8	\$6	\$15	80.1
131	Multiuse Room	CDH	Downlight	6	2314	2 - 26w quad CF	2,805	9000	0-No Action	6	0	0.3	0.3	976	976	0	0%	\$0	\$0	\$0	\$0	0.0
131	Multiuse Room	FLD	F4' Tubelight / Linear	2	3244	2 - 32w RSFI T8 EL-IS	2,805	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	331	292	39	12%	\$3	\$17	\$118	\$135	47.2
131	Multiuse Room	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	2,805	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,885	1,649	236	13%	\$17	\$102	\$354	\$456	26.5
132	Main Entrance Vestibule	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
133	Hallway	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
133	Hallway	FTI	F2x4 Rec	14	3244	2 - 32w RSFI T8 EL-IS	2,805	2933	2-Relamp with 28w 4' RSFI T	14	52	0.8	0.7	2,317	2,042	275	12%	\$20	\$118	\$86	\$204	10.2
134	O2 Tank Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	51	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	3	3	0	12%	\$0	\$8	\$6	\$15	80.1
135	Men's Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
136	Storage	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Animal Health Technology

Building Code: AHT



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
137	Storage	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
139	Hallway/Storage	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	4	76	0.3	0.3	965	853	112	12%	\$8	\$51	\$25	\$75	9.2
141-147	Animal Pens	FBG	F1x4 Box	9	3244	2 - 32w RSFI T8 EL-IS	4,380	2933	2-Relamp with 28w 4' RSFI T	9	52	0.5	0.4	2,326	2,050	276	12%	\$17	\$76	\$55	\$131	7.8
143	Animal Pen Hallway	FBG	F1x4 Box	4	3244	2 - 32w RSFI T8 EL-IS	2,805	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	662	583	79	12%	\$6	\$34	\$25	\$58	10.2
148	Shower	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
150	Women's Washroom	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	177	156	21	12%	\$3	\$25	\$18	\$44	15.9
150	Women's Washroom	FCF	F1x4 Cubelight	3	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	177	156	21	12%	\$3	\$25	\$18	\$44	15.9
151	Classroom	CDU	Downlight	5	2408	1 - 32w triple CF	1,250	9000	0-No Action	5	0	0.2	0.2	231	231	0	0%	\$0	\$0	\$0	\$0	0.0
151	Classroom	FTJ	F2x4 Rec	11	3265	3 - 32w RSFI T8 EL-IS 1&2	1,250	2939	3-Relamp with 28w 4' RSFI T	11	78	0.9	0.8	1,224	1,073	151	12%	\$17	\$140	\$68	\$207	12.1
151	Classroom	FTJ	F2x4 Rec	1	1000	3 - No Lamp	1,250	9000	0-No Action	1	0	0.0	0.0	0	0	0	0%	\$0	\$0	\$0	\$0	0.0
152	Hallway	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	451	398	54	12%	\$4	\$25	\$18	\$44	10.7
153	Multiuse Room	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	102	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.2	0.2	26	17	9	34%	\$8	\$78	\$74	\$151	18.3
154	Animal Colony	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	482	426	56	12%	\$4	\$25	\$12	\$38	9.2
154A	Kennel	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	241	213	28	12%	\$2	\$13	\$6	\$19	9.2
156	Kennel	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	3	76	0.2	0.2	724	640	84	12%	\$6	\$38	\$18	\$57	9.2
158	Kennel	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	482	426	56	12%	\$4	\$25	\$12	\$38	9.2
158A	Kennel	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	482	426	56	12%	\$4	\$25	\$12	\$38	9.2
158B	Kennel	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,805	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	241	213	28	12%	\$2	\$13	\$6	\$19	9.2
160	Laundry Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,805	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	482	320	163	34%	\$12	\$52	\$49	\$101	8.5
162	Animal Cages/Hallway	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
162	Animal Cages/Hallway	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	2,805	9000	0-No Action	4	0	0.2	0.2	662	662	0	0%	\$0	\$0	\$0	\$0	0.0
164	Animal Cages/Hallway	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,805	9000	0-No Action	3	0	0.2	0.2	496	496	0	0%	\$0	\$0	\$0	\$0	0.0
168	Animal Cages/Hallway	FTD	F1x4 Rec	5	3244	2 - 32w RSFI T8 EL-IS	2,805	9000	0-No Action	5	0	0.3	0.3	827	827	0	0%	\$0	\$0	\$0	\$0	0.0
168	Animal Cages/Hallway	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
Perimet	Building Perimeter	HWC	Wall Pack	4	6004	1 - 70w HPS	4,380	9000	0-No Action	4	0	0.0	0.0	1,594	1,594	0	0%	\$0	\$0	\$0	\$0	0.0
Perimet	Building Perimeter	CDU	Downlight	3	2408	1 - 32w triple CF	4,380	9000	0-No Action	3	0	0.0	0.0	486	486	0	0%	\$0	\$0	\$0	\$0	0.0
Existing Energy Summary for Building Animal Health Technology:				230							230	12.5	10.8	35,830	31,367	4,463	12%	\$348	\$2,124	\$1,952	\$4,076	11.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Campus Activity Centre

Building Code: CAC



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
101	Common Area on main floo	MWB	Wall Pack	16	5006	1 - 100w MH	7,280	9000	0-No Action	16	0	2.0	2.0	15,142	15,142	0	0%	\$0	\$0	\$0	\$0	0.0
101	Common Area on main floo	DSA	Neon Tubing	40	1021	1 - Neon tubing at 12.5w p	8,760	9000	0-No Action	40	0	0.5	0.5	4,380	4,380	0	0%	\$0	\$0	\$1,322	\$1,322	0.0
101	Common Area on main floo	IXL	LED Exit sign	5	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	5	0	0.0	0.0	88	88	0	0%	\$0	\$0	\$0	\$0	0.0
101	Common Area on main floo	CDB	Downlight	8	2213	2 - 13w CF	7,280	9000	0-No Action	8	0	0.2	0.2	1,864	1,864	0	0%	\$0	\$0	\$0	\$0	0.0
101	Common Area on main floo	MWB	Wall Pack	8	5006	1 - 100w MH	7,280	9000	0-No Action	8	0	1.0	1.0	7,571	7,571	0	0%	\$0	\$0	\$0	\$0	0.0
102	Walkway in Common Area	IDO	Downlight Round	9	1203	1 - 35w MR16	7,280	9000	0-No Action	9	0	0.3	0.3	2,293	2,293	0	0%	\$0	\$0	\$0	\$0	0.0
105	Storage Under Stairs	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
105.1	Under Stairs	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
105.2	Storage Under Stairs	FSB	F2' striplight	1	3441	2 - 20w RSFI T12 EE	255	3770	2-17w RSFI T8 HE EL-HBF	1	41	0.0	0.0	12	10	1	11%	\$1	\$48	\$25	\$73	143.4
105E	Front Entrance Vestibule	CDB	Downlight	2	2213	2 - 13w CF	8,760	9000	0-No Action	2	0	0.1	0.1	561	561	0	0%	\$0	\$0	\$0	\$0	0.0
105E	Front Entrance Vestibule	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
110	Bookstore	FTJ	F2x4 Rec	36	3264	3 - 32w RSFI T8 EL-IS	2,070	9427	2-Delamp to 2 - 28w 4' RSFI T	36	57	2.9	1.9	6,409	4,248	2,161	34%	\$182	\$933	\$884	\$1,817	10.0
110	Bookstore	ITB	Track Head	32	1205	1 - 50w MR16	2,070	9000	0-No Action	32	0	1.5	1.5	3,312	3,312	0	0%	\$0	\$0	\$0	\$0	0.0
110	Bookstore	CDB	Downlight	15	2213	2 - 13w CF	2,070	9000	0-No Action	15	0	0.5	0.5	994	994	0	0%	\$0	\$0	\$0	\$0	0.0
110	Bookstore	IDB	Downlight Round	32	1146	1 - 75w Inc PAR38 Flood	2,070	9000	0-No Action	32	0	2.3	2.3	4,968	4,968	0	0%	\$0	\$0	\$0	\$0	0.0
112	Office	FTI	F2x4 Rec	2	3509	2 - 40w RSFI T12 EE	1,920	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	323	161	161	50%	\$14	\$92	\$49	\$141	10.0
113	Office	FTJ	F2x4 Rec	3	3513	3 - 40w RSFI T12 - EE 1&2	1,920	2850	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.4	0.2	772	369	403	52%	\$35	\$163	\$92	\$256	7.2
113	Office	CDB	Downlight	3	2213	2 - 13w CF	1,920	9000	0-No Action	3	0	0.1	0.1	184	184	0	0%	\$0	\$0	\$0	\$0	0.0
114	Office	FTJ	F2x4 Rec	3	3513	3 - 40w RSFI T12 - EE 1&2	1,920	2850	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.4	0.2	772	369	403	52%	\$35	\$163	\$92	\$256	7.2
116	Storage (Book Store)	FBG	F1x4 Box	11	3475	2 - 34w RSFI T12 EE	1,000	2838	2-28w 4' RSFI T8 ES HE EL-L	11	42	0.2	0.1	792	462	330	42%	\$21	\$506	\$634	\$1,140	53.7
121	Comm. Room	FID	F1x4 Industrial	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
122	Locked Room	FID	F1x4 Industrial	3	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.1	0.0	55	32	23	42%	\$3	\$138	\$74	\$212	68.6
123	Office	FTJ	F2x4 Rec	3	3480	3 - 34w RSFI T12 - EE 1&2	1,920	2850	3-28w 4' RSFI T8 ES HE EL-L	3	64	0.3	0.2	662	369	294	44%	\$26	\$163	\$92	\$256	9.9
126	Electrical Room	FID	F1x4 Industrial	7	3475	2 - 34w RSFI T12 EE	510	2838	2-28w 4' RSFI T8 ES HE EL-L	7	42	0.1	0.1	257	150	107	42%	\$9	\$322	\$172	\$494	52.8
127	Boiler Room	FID	F1x4 Industrial	6	3475	2 - 34w RSFI T12 EE	510	2838	2-28w 4' RSFI T8 ES HE EL-L	6	42	0.1	0.1	220	129	92	42%	\$8	\$276	\$147	\$423	52.8
130	Meeting Room	FTG	F2x2 Rec	20	2514	2 - 38/40w long EM-RS CF	1,150	9000	0-No Action	20	0	1.5	1.5	1,771	1,771	0	0%	\$0	\$0	\$0	\$0	0.0
130	Meeting Room	IDI	Downlight Round	27	1140	1 - 65w Inc BR30	1,150	9000	0-No Action	27	0	1.7	1.7	2,018	2,018	0	0%	\$0	\$0	\$0	\$0	0.0
130A	Storage	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	75	44	31	42%	\$2	\$46	\$25	\$71	35.7
141	Lottery Centre	CDB	Downlight	3	2213	2 - 13w CF	8,760	9000	0-No Action	3	0	0.0	0.0	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
141	Lottery Centre	CHK	Track Head	9	2312	1 - 26w quad CF	2,805	9000	0-No Action	9	0	0.1	0.1	732	732	0	0%	\$0	\$0	\$0	\$0	0.0
144/143/	Locked Rooms	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	460	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	20	10	10	49%	\$2	\$40	\$25	\$65	28.1
144/143/	Locked Rooms	FID	F1x4 Industrial	3	3475	2 - 34w RSFI T12 EE	460	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	99	58	41	42%	\$10	\$138	\$74	\$212	21.5
145	Women's Washroom	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	377	193	184	49%	\$9	\$40	\$25	\$65	6.9
145	Women's Washroom	FSE	F4' striplight	2	3470	1 - 34w RSFI T12 EE	8,760	2828	1-28w 4' RSFI T8 ES HE EL-L	2	21	0.1	0.0	753	368	385	51%	\$20	\$72	\$61	\$134	6.8
146/147	Men's Washroom	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	377	193	184	49%	\$9	\$40	\$25	\$65	6.9
146/147	Men's Washroom	CDB	Downlight	3	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	3	0	0.1	0.1	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
146/147	Men's Washroom	FSE	F4' striplight	4	3470	1 - 34w RSFI T12 EE	8,760	2828	1-28w 4' RSFI T8 ES HE EL-L	4	21	0.2	0.1	1,507	736	771	51%	\$39	\$145	\$123	\$268	6.8
151	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,250	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	266	234	32	12%	\$3	\$17	\$12	\$29	11.5
152	Catering Services Office	CDI	Downlight	5	2408	1 - 32w triple CF	2,250	9000	0-No Action	5	0	0.2	0.2	416	416	0	0%	\$0	\$0	\$0	\$0	0.0
152	Catering Services Office	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,250	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	133	117	16	12%	\$1	\$8	\$6	\$15	11.5
153	True Balance Message Th	CDI	Downlight	2	2408	1 - 32w triple CF	2,499	9000	0-No Action	2	0	0.1	0.1	185	185	0	0%	\$0	\$0	\$0	\$0	0.0
154	True Balance Message Th	CDI	Downlight	2	2408	1 - 32w triple CF	2,499	9000	0-No Action	2	0	0.1	0.1	185	185	0	0%	\$0	\$0	\$0	\$0	0.0
155	True Balance Message Th	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	2,499	2850	3-28w 4' RSFI T8 ES HE EL-L	1	64	0.1	0.1	287	160	127	44%	\$10	\$54	\$31	\$85	8.7
155	True Balance Message Th	CDI	Downlight	2	2408	1 - 32w triple CF	2,499	9000	0-No Action	2	0	0.1	0.1	185	185	0	0%	\$0	\$0	\$0	\$0	0.0
155	True Balance Message Th	CDB	Downlight	5	2213	2 - 13w CF	2,499	9000	0-No Action	5	0	0.2	0.2	400	400	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Campus Activity Centre

Building Code: CAC



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
156	Catering Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,250	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	266	234	32	12%	\$3	\$17	\$12	\$29	11.5
157	Catering Office	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,250	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	133	117	16	12%	\$1	\$8	\$6	\$15	11.5
158	Catering Room	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
160	Common Area	CDI	Downlight	8	2408	1 - 32w triple CF	7,280	9000	0-No Action	8	0	0.3	0.3	2,155	2,155	0	0%	\$0	\$0	\$0	\$0	0.0
160	Common Area	CDB	Downlight	5	2213	2 - 13w CF	7,280	9000	0-No Action	5	0	0.2	0.2	1,165	1,165	0	0%	\$0	\$0	\$0	\$0	0.0
160A	Common Area	CDI	Downlight	4	2408	1 - 32w triple CF	7,280	9000	0-No Action	4	0	0.1	0.1	1,077	1,077	0	0%	\$0	\$0	\$0	\$0	0.0
160A	Common Area	FTD	F1x4 Rec	5	3244	2 - 32w RSFI T8 EL-IS	7,280	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	2,148	1,893	255	12%	\$13	\$42	\$31	\$73	5.4
160B	Boardroom	FTD	F1x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	1,324	1,167	157	12%	\$13	\$93	\$68	\$161	12.0
169	Men's Washroom	CDI	Downlight	8	2408	1 - 32w triple CF	5,100	9000	0-No Action	8	0	0.3	0.3	1,510	1,510	0	0%	\$0	\$0	\$0	\$0	0.0
170	Handicap Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7
171	Women's Washroom	CDI	Downlight	8	2408	1 - 32w triple CF	5,100	9000	0-No Action	8	0	0.3	0.3	1,510	1,510	0	0%	\$0	\$0	\$0	\$0	0.0
171	Women's Washroom	FSE	F4' striplight	6	3208	1 - 32w RSFI T8 EL-IS	5,100	2926	1-Relamp with 28w 4' RSFI T	6	26	0.2	0.1	949	796	153	16%	\$9	\$25	\$37	\$62	7.0
180	Common Hallway	MHF	High / Low Bay	8	5012	1 - 250w MH	7,280	5522	1-165w QL Induction	8	165	2.2	1.3	17,006	9,610	7,396	43%	\$391	\$4,867	\$1,013	\$5,879	15.0
180	Common Hallway	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	7,280	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	430	379	51	12%	\$3	\$8	\$59	\$68	25.0
180	Common Hallway	CDI	Downlight	9	2408	1 - 32w triple CF	7,280	9000	0-No Action	9	0	0.3	0.3	2,424	2,424	0	0%	\$0	\$0	\$0	\$0	0.0
180B	Study Room 'Blue'	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	120	106	14	12%	\$1	\$8	\$6	\$15	12.0
180B	Study Room 'Blue'	CDI	Downlight	2	2408	1 - 32w triple CF	2,040	9000	0-No Action	2	0	0.1	0.1	151	151	0	0%	\$0	\$0	\$0	\$0	0.0
180B	Study Room 'Blue'	CCJ	Wall Sconce	1	2512	2 - 38/40w long EM-RS CF	2,040	9000	0-No Action	1	0	0.0	0.0	98	98	0	0%	\$0	\$0	\$0	\$0	0.0
180C	Coffee Shop	CDI	Downlight	3	2408	1 - 32w triple CF	2,040	9000	0-No Action	3	0	0.1	0.1	226	226	0	0%	\$0	\$0	\$0	\$0	0.0
180C	Coffee Shop	FLD	F4' Tubelight / Linear	2	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	241	212	29	12%	\$2	\$17	\$12	\$29	12.0
180C.1	Coffee shop storage	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	118	104	14	12%	\$1	\$17	\$12	\$29	32.4
180E	Elevator	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	377	193	184	49%	\$9	\$40	\$25	\$65	6.9
180G	Study Room 'Green'	CCJ	Wall Sconce	1	2512	2 - 38/40w long EM-RS CF	2,040	9000	0-No Action	1	0	0.0	0.0	98	98	0	0%	\$0	\$0	\$0	\$0	0.0
180G	Study Room 'Green'	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	120	106	14	12%	\$1	\$8	\$6	\$15	12.0
180Y	Study Room 'Yellow'	CDI	Downlight	5	2408	1 - 32w triple CF	2,040	9000	0-No Action	5	0	0.2	0.2	377	377	0	0%	\$0	\$0	\$0	\$0	0.0
180Y	Study Room 'Yellow'	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	241	212	29	12%	\$2	\$17	\$12	\$29	12.0
180Y	Study Room 'Yellow'	FSA	F2' striplight	1	2520	1 - 38/40w EI-PRS long CF	2,040	9000	0-No Action	1	0	0.1	0.1	255	255	0	0%	\$0	\$0	\$0	\$0	0.0
201	Women's Washroom	FSE	F4' striplight	5	3470	1 - 34w RSFI T12 EE	5,100	2826	1-28w 4' RSFI T8 ES HE EL-L	5	22	0.2	0.1	1,097	561	536	49%	\$31	\$201	\$123	\$324	10.4
203	Men's Washroom	FSE	F4' striplight	7	3470	1 - 34w RSFI T12 EE	5,100	2826	1-28w 4' RSFI T8 ES HE EL-L	7	22	0.3	0.1	1,535	785	750	49%	\$44	\$281	\$172	\$453	10.4
206	Hallway	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	5,100	2940	3-Relamp with 28w 4' RSFI T	4	76	0.3	0.3	1,754	1,550	204	12%	\$12	\$51	\$25	\$75	6.3
209	Meeting Room	CDB	Downlight	16	2213	2 - 13w CF	900	9000	0-No Action	16	0	0.5	0.5	461	461	0	0%	\$0	\$0	\$0	\$0	0.0
210	Ballroom - Grand Hall	IXL	LED Exit sign	8	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	8	0	0.0	0.0	140	140	0	0%	\$0	\$0	\$0	\$0	0.0
210	Ballroom - Grand Hall	ICB	Wall Sconce	18	1132	1 - 60w Inc A19	900	9000	0-No Action	18	0	1.0	1.0	972	972	0	0%	\$0	\$0	\$0	\$0	0.0
210	Ballroom - Grand Hall	ITK	Track Head	24	1151	1 - 90w Inc Par38 H Flood	900	9000	0-No Action	24	0	2.1	2.1	1,944	1,944	0	0%	\$0	\$0	\$0	\$0	0.0
210	Ballroom - Grand Hall	IGC	Pendant Globe	48	1163	1 - 150w Inc A23	900	9000	0-No Action	48	0	6.8	6.8	6,480	6,480	0	0%	\$0	\$0	\$0	\$0	0.0
210	Ballroom - Grand Hall	IDG	Downlight Round	40	1168	1 - 150w Inc PAR38 Flood	900	9000	0-No Action	40	0	5.7	5.7	5,400	5,400	0	0%	\$0	\$0	\$0	\$0	0.0
210	Ballroom - Grand Hall	FSE	F4' striplight	176	3470	1 - 34w RSFI T12 EE	900	3855	1-28w 4' RSFI T8 ES Dimmab	176	26	7.2	4.3	6,811	4,118	2,693	40%	\$381	\$12,080	\$13,633	\$25,713	67.4
211	Vestibule to Grand Hall	CDB	Downlight	4	2213	2 - 13w CF	900	9000	0-No Action	4	0	0.1	0.1	115	115	0	0%	\$0	\$0	\$0	\$0	0.0
223	Men's Washroom	FSE	F4' striplight	5	3470	1 - 34w RSFI T12 EE	920	2826	1-28w 4' RSFI T8 ES HE EL-L	5	22	0.2	0.1	198	101	97	49%	\$13	\$201	\$123	\$324	24.0
224	Women's Washroom	FSE	F4' striplight	5	3470	1 - 34w RSFI T12 EE	920	2826	1-28w 4' RSFI T8 ES HE EL-L	5	22	0.2	0.1	198	101	97	49%	\$13	\$201	\$123	\$324	24.0
230/236/	Kitchen	FTJ	F2x4 Rec	19	3264	3 - 32w RSFI T8 EL-IS	900	2940	3-Relamp with 28w 4' RSFI T	19	76	1.6	1.4	1,471	1,300	171	12%	\$24	\$241	\$117	\$358	14.8
231	Hallway	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	920	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	66	39	28	42%	\$4	\$46	\$25	\$71	18.3
232	Liquour Storage	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	510	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	59	21	37	63%	\$3	\$77	\$25	\$101	31.1
232.1	Hallway	CDB	Downlight	1	2213	2 - 13w CF	920	9000	0-No Action	1	0	0.0	0.0	29	29	0	0%	\$0	\$0	\$0	\$0	0.0
233	Janitorial Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	510	9430	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.0	0.0	44	29	15	34%	\$1	\$13	\$25	\$37	28.8

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Campus Activity Centre

Building Code: CAC



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
233.1	Locker Room	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	510	9430	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.0	0.0	44	29	15	34%	\$1	\$13	\$25	\$37	28.8
233.2	Women's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	340	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	24	14	10	42%	\$3	\$46	\$25	\$71	22.4
233.3	Men's Washroom	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	340	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	24	14	10	42%	\$3	\$46	\$25	\$71	22.4
234	Storage	FTG	F2x2 Rec	2	3354	2 - 32w RSFI T8/U6 EL-RS	255	3769	2-17w RSFI T8 HE EL-LBF	2	27	0.0	0.0	32	14	18	56%	\$2	\$96	\$49	\$145	60.6
234	Storage	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.0	59	21	37	63%	\$5	\$153	\$49	\$203	40.5
238	Kitchen Storage	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	255	9430	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.0	0.0	44	29	15	34%	\$2	\$25	\$49	\$75	37.5
250	Restaurant	CDB	Downlight	65	2213	2 - 13w CF	5,712	9000	0-No Action	65	0	2.0	2.0	11,881	11,881	0	0%	\$0	\$0	\$0	\$0	0.0
250	Restaurant	IXL	LED Exit sign	4	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	4	0	0.0	0.0	70	70	0	0%	\$0	\$0	\$0	\$0	0.0
250	Restaurant	ITB	Track Head	20	1205	1 - 50w MR16	5,712	9000	0-No Action	20	0	0.9	0.9	5,712	5,712	0	0%	\$0	\$0	\$0	\$0	0.0
251	Office	FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	2,000	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	144	84	60	42%	\$5	\$46	\$25	\$71	13.7
251	Office	CDI	Downlight	2	2408	1 - 32w triple CF	2,000	9000	0-No Action	2	0	0.1	0.1	148	148	0	0%	\$0	\$0	\$0	\$0	0.0
254/253/	Restaurant	IDA	Downlight Round	26	1132	1 - 60w Inc A19	5,712	9000	0-No Action	26	0	1.5	1.5	8,911	8,911	0	0%	\$0	\$0	\$0	\$0	0.0
254/253/	Restaurant	CDB	Downlight	28	2213	2 - 13w CF	5,712	9000	0-No Action	28	0	0.9	0.9	5,118	5,118	0	0%	\$0	\$0	\$0	\$0	0.0
254/253/	Restaurant	IRA	Inc RLM Dome	20	1132	1 - 60w Inc A19	5,712	9000	0-No Action	20	0	1.1	1.1	6,854	6,854	0	0%	\$0	\$0	\$0	\$0	0.0
254/253/	Restaurant	IDD	Downlight Round	6	1153	1 - 100w Inc A19	5,712	9000	0-No Action	6	0	0.6	0.6	3,427	3,427	0	0%	\$0	\$0	\$0	\$0	0.0
254/253/	Restaurant	CDD	Downlight	10	2756	2 - 15w CF quad SI (Screw	5,712	9000	0-No Action	10	0	0.3	0.3	1,714	1,714	0	0%	\$0	\$0	\$0	\$0	0.0
254/253/	Restaurant	ITQ	Track Head	22	1208	1 - 100w QI T3	5,712	9000	0-No Action	22	0	2.1	2.1	12,566	12,566	0	0%	\$0	\$0	\$0	\$0	0.0
257	Men's Washroom	FSE	F4' striplight	7	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	7	22	0.3	0.1	2,637	1,349	1,288	49%	\$65	\$281	\$172	\$453	6.9
258	Women's Washroom	FSE	F4' striplight	5	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	5	22	0.2	0.1	1,883	964	920	49%	\$47	\$201	\$123	\$324	6.9
260	Common Area	ITB	Track Head	3	1205	1 - 50w MR16	7,280	9000	0-No Action	3	0	0.1	0.1	1,092	1,092	0	0%	\$0	\$0	\$0	\$0	0.0
261	Hallway	FWF	F1x4 Wrap	10	3475	2 - 34w RSFI T12 EE	7,280	2838	2-28w 4' RSFI T8 ES HE EL-L	10	42	0.7	0.4	5,242	3,058	2,184	42%	\$116	\$460	\$246	\$706	6.1
264	Storage	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	500	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.1	0.0	230	84	146	63%	\$13	\$307	\$98	\$405	31.4
270	Hallway	CDI	Downlight	14	2408	1 - 32w triple CF	7,280	9000	0-No Action	14	0	0.5	0.5	3,771	3,771	0	0%	\$0	\$0	\$0	\$0	0.0
270	Hallway	IXL	LED Exit sign	3	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
270A	Common Study Area	CDI	Downlight	15	2408	1 - 32w triple CF	7,280	9000	0-No Action	15	0	0.5	0.5	4,040	4,040	0	0%	\$0	\$0	\$0	\$0	0.0
271	Office Storage	CDI	Downlight	5	2408	1 - 32w triple CF	510	9000	0-No Action	5	0	0.0	0.0	94	94	0	0%	\$0	\$0	\$0	\$0	0.0
272	Student Union Office	FTI	F2x4 Rec	14	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	14	52	0.8	0.7	2,528	2,228	300	12%	\$21	\$118	\$86	\$204	9.7
272	Student Union Office	CDI	Downlight	5	2408	1 - 32w triple CF	3,060	9000	0-No Action	5	0	0.2	0.2	566	566	0	0%	\$0	\$0	\$0	\$0	0.0
275A	Storage	FTG	F2x2 Rec	11	2512	2 - 38/40w long EM-RS CF	510	9000	0-No Action	11	0	0.1	0.1	269	269	0	0%	\$0	\$0	\$0	\$0	0.0
276/275	Student Lounge	FTI	F2x4 Rec	12	3244	2 - 32w RSFI T8 EL-IS	7,280	2933	2-Relamp with 28w 4' RSFI T	12	52	0.7	0.6	5,154	4,543	612	12%	\$32	\$102	\$74	\$175	5.4
276/275	Student Lounge	CDI	Downlight	4	2408	1 - 32w triple CF	7,280	9000	0-No Action	4	0	0.1	0.1	1,077	1,077	0	0%	\$0	\$0	\$0	\$0	0.0
300	Hallway	CDI	Downlight	4	2408	1 - 32w triple CF	7,280	9000	0-No Action	4	0	0.1	0.1	1,077	1,077	0	0%	\$0	\$0	\$0	\$0	0.0
300	Hallway	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
301	Entrance Vestibule	CDB	Downlight	2	2213	2 - 13w CF	8,760	9000	0-No Action	2	0	0.1	0.1	561	561	0	0%	\$0	\$0	\$0	\$0	0.0
303	Hallway to Executive Cente	CDI	Downlight	3	2408	1 - 32w triple CF	7,280	9000	0-No Action	3	0	0.1	0.1	808	808	0	0%	\$0	\$0	\$0	\$0	0.0
310	CURA Office	CDB	Downlight	8	2213	2 - 13w CF	1,250	9000	0-No Action	8	0	0.2	0.2	320	320	0	0%	\$0	\$0	\$0	\$0	0.0
310	CURA Office	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	1,250	2850	3-28w 4' RSFI T8 ES HE EL-L	1	64	0.1	0.1	144	80	64	44%	\$7	\$54	\$31	\$85	11.8
310A	CURA Office	CDB	Downlight	4	2213	2 - 13w CF	1,250	9000	0-No Action	4	0	0.1	0.1	160	160	0	0%	\$0	\$0	\$0	\$0	0.0
312	CURA Office	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,250	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	180	105	75	42%	\$4	\$92	\$49	\$141	31.6
313	CURA Lounge	CDB	Downlight	16	2213	2 - 13w CF	1,250	9000	0-No Action	16	0	0.5	0.5	640	640	0	0%	\$0	\$0	\$0	\$0	0.0
313	CURA Lounge	ITG	Track Head	23	1127	1 - 50w Inc PAR20 Flood	1,250	9000	0-No Action	23	0	1.1	1.1	1,438	1,438	0	0%	\$0	\$0	\$0	\$0	0.0
313A	CURA Storage	FID	F1x4 Industrial	1	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	75	44	31	42%	\$2	\$46	\$25	\$71	35.7
314	CURA Office	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,250	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	180	105	75	42%	\$4	\$92	\$49	\$141	31.6
317	CURA Storage Closet	NEL	No Existing Luminaire	1	1000	1 - No Lamp	1,040	9000	0-No Action	1	0	0.0	0.0	0	0	0	0%	\$0	\$0	\$0	\$0	0.0
318	H/C Washroom	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	510	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	22	11	11	49%	\$2	\$40	\$25	\$65	27.6

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Campus Activity Centre

Building Code: CAC



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data																									
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)										
318	H/C Washroom	CDB	Downlight	2	2213	2 - 13w CF	510	9000	0-No Action	2	0	0.1	0.1	33	33	0	0%	\$0	\$0	\$0	\$0	0.0										
318A	Storage	FSG	F8' tandem striplight	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6										
319	Storage Closet	CDB	Downlight	1	2213	2 - 13w CF	255	9000	0-No Action	1	0	0.0	0.0	8	8	0	0%	\$0	\$0	\$0	\$0	0.0										
320/329	Executive Centre Waiting A	CTQ	Troffer (CF)	5	2514	2 - 38/40w long EM-RS CF	900	9000	0-No Action	5	0	0.1	0.1	347	347	0	0%	\$0	\$0	\$0	\$0	0.0										
320/329	Executive Centre Waiting A	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0										
320/329	Executive Centre Waiting A	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	900	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	130	76	54	42%	\$4	\$92	\$49	\$141	39.0										
398	Hallway	FTJ	F2x4 Rec	4	3480	3 - 34w RSFI T12 - EE 1&2	900	2850	3-28w 4' RSFI T8 ES HE EL-L	4	64	0.4	0.2	414	230	184	44%	\$26	\$218	\$123	\$341	13.1										
398	Hallway	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0										
398	Hallway	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	8,760	2850	3-28w 4' RSFI T8 ES HE EL-L	1	64	0.1	0.1	1,007	561	447	44%	\$23	\$54	\$31	\$85	3.8										
398	Hallway	ITG	Track Head	4	1127	1 - 50w Inc PAR20 Flood	900	9000	0-No Action	4	0	0.2	0.2	180	180	0	0%	\$0	\$0	\$0	\$0	0.0										
398B	Men's Washroom	CDB	Downlight	1	2213	2 - 13w CF	510	9000	0-No Action	1	0	0.0	0.0	16	16	0	0%	\$0	\$0	\$0	\$0	0.0										
398B	Men's Washroom	FSE	F4' striplight	4	3470	1 - 34w RSFI T12 EE	510	2826	1-28w 4' RSFI T8 ES HE EL-L	4	22	0.2	0.1	88	45	43	49%	\$9	\$161	\$98	\$259	27.6										
399	Meeting Room	CDB	Downlight	4	2213	2 - 13w CF	900	9000	0-No Action	4	0	0.1	0.1	115	115	0	0%	\$0	\$0	\$0	\$0	0.0										
399	Meeting Room	FTJ	F2x4 Rec	6	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	6	78	0.5	0.4	481	421	59	12%	\$8	\$76	\$37	\$113	13.4										
399	Meeting Room	IDB	Downlight Round	6	1146	1 - 75w Inc PAR38 Flood	900	9000	0-No Action	6	0	0.4	0.4	405	405	0	0%	\$0	\$0	\$0	\$0	0.0										
399A	Kitchen	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	160	140	20	12%	\$3	\$25	\$12	\$38	13.4										
399B	Meeting Room	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	160	140	20	12%	\$3	\$25	\$12	\$38	13.4										
399C	Storage	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	510	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	45	40	6	12%	\$1	\$13	\$6	\$19	15.3										
399D	Meeting Room	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	160	140	20	12%	\$3	\$25	\$12	\$38	13.4										
3-Atruim Atrium		DSA	Neon Tubing	192	1021	1 - Neon tubing at 12.5w p	7,280	9000	0-No Action	192	0	2.3	2.3	17,472	17,472	0	0%	\$0	\$0	\$10,157	\$10,157	0.0										
3-Atruim Atrium		MDG	Downlight	8	5014	1 - 400w MH	7,280	5524	2-165w QL Induction	8	330	3.4	2.5	26,208	19,219	6,989	27%	\$370	\$7,618	\$1,307	\$8,925	24.1										
3-Atruim Atrium		MDB	Downlight	8	5006	1 - 100w MH	7,280	5500	1-55w QL Induction	8	55	1.0	0.4	7,571	3,203	4,368	58%	\$231	\$4,232	\$865	\$5,097	22.1										
Ext	Exterior	MPE	Post Top	1	5010	1 - 175w MH	4,380	9000	0-No Action	1	0	0.0	0.0	920	920	0	0%	\$0	\$0	\$0	\$0	0.0										
Ext	Exterior	ITK	Track Head	6	1151	1 - 90w Inc Par38 H Flood	4,380	9000	0-No Action	6	0	0.1	0.1	2,365	2,365	0	0%	\$0	\$0	\$0	\$0	0.0										
Ext	Exterior	MWB	Wall Pack	11	5006	1 - 100w MH	4,380	9000	0-No Action	11	0	0.1	0.1	6,263	6,263	0	0%	\$0	\$0	\$0	\$0	0.0										
Ext	Exterior	CDB	Downlight	10	2213	2 - 13w CF	4,380	9000	0-No Action	10	0	0.0	0.0	1,402	1,402	0	0%	\$0	\$0	\$0	\$0	0.0										
Ext	Exterior	MWE	Wall Pack	4	5010	1 - 175w MH	4,380	9000	0-No Action	4	0	0.1	0.1	3,679	3,679	0	0%	\$0	\$0	\$0	\$0	0.0										
Ext	Exterior	MFG	Floodlight	8	5014	1 - 400w MH	4,380	5308	1-320w PS MH	8	368	0.4	0.3	15,768	12,895	2,873	18%	\$122	\$1,360	\$589	\$1,950	15.9										
Ext	Exterior	CCG	Wall Sconce	16	2408	1 - 32w triple CF	4,380	9000	0-No Action	16	0	0.1	0.1	2,593	2,593	0	0%	\$0	\$0	\$0	\$0	0.0										
Ext-Stor	Storage	FSQ	F8' HO striplight	1	3706	1 - 95w HOFI T12 - Std	102	3748	2-32w RSFI T8 HE EL-LBF	1	48	0.0	0.0	12	5	7	60%	\$2	\$68	\$25	\$92	45.0										
Existing Energy Summary for Building Campus Activity Centre:				1536					1536													77.3	67.2	305,637	265,911	39,726	13%	\$2,567	\$38,359	\$34,332	\$72,691	28.3

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Clock Tower Building

Building Code: CTB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
100A	Back Stage Area	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	2,200	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	317	185	132	42%	\$11	\$92	\$49	\$141	13.1
100B/C	Stage Area	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	2,200	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	158	92	66	42%	\$5	\$46	\$77	\$123	22.9
100B/C	Stage Area	FBG	F1x4 Box	7	3475	2 - 34w RSFI T12 EE	2,200	2838	2-28w 4' RSFI T8 ES HE EL-L	7	42	0.5	0.3	1,109	647	462	42%	\$38	\$322	\$542	\$864	22.9
100B/C	Stage Area	FBN	F2x4 Box	9	3484	4 - 34w RSFI T12 - EE 2 b	2,200	2836	2-28w 4' RSFI T8 ES HE EL-L	9	48	1.3	0.4	2,930	950	1,980	68%	\$162	\$919	\$752	\$1,671	10.3
100F	Electrical Room	FBG	F1x4 Box	2	3475	2 - 34w RSFI T12 EE	102	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	15	9	6	42%	\$2	\$92	\$49	\$141	83.8
110	Private Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	523	306	218	42%	\$19	\$38	\$111	\$149	7.9
110A/11	Office	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	2,880	9419	2-Delamp to 2 - 28w 4' RSFI T	1	52	0.1	0.0	256	150	107	42%	\$8	\$13	\$37	\$50	6.5
110A/11	Office	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,880	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	510	449	60	12%	\$4	\$25	\$18	\$44	10.1
120	Kitchen	FTG	F2x2 Rec	1	3354	2 - 32w RSFI T8/U6 EL-RS	2,880	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	179	118	60	34%	\$4	\$68	\$25	\$93	21.2
120	Kitchen	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,880	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	340	300	40	12%	\$3	\$17	\$12	\$29	10.1
127	Men's Washroom	FSB	F2' striplight	1	3441	2 - 20w RSFI T12 EE	3,060	3770	2-17w RSFI T8 HE EL-HBF	1	41	0.0	0.0	141	125	15	11%	\$1	\$48	\$25	\$73	67.7
128	Women's Washroom	FSB	F2' striplight	1	3441	2 - 20w RSFI T12 EE	3,060	3770	2-17w RSFI T8 HE EL-HBF	1	41	0.0	0.0	141	125	15	11%	\$1	\$48	\$25	\$73	67.7
135A/B/	Storage	FSF	F4' striplight	10	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	10	42	0.2	0.1	184	107	77	42%	\$10	\$460	\$246	\$706	68.6
135A/B/	Storage	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
140	Open Office Area	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,880	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	495	328	167	34%	\$12	\$52	\$49	\$101	8.4
142	Copy Room	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	2,880	2836	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.3	0.1	852	276	576	68%	\$41	\$204	\$61	\$266	6.4
143	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
144	Locked Room	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.2	0.1	348	188	160	46%	\$17	\$204	\$61	\$266	15.3
146	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	174	94	80	46%	\$9	\$102	\$31	\$133	15.3
147	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	290	94	196	68%	\$17	\$102	\$31	\$133	7.8
148	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	290	94	196	68%	\$17	\$102	\$31	\$133	7.8
149	Office	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.3	0.1	580	188	392	68%	\$34	\$204	\$61	\$266	7.8
150	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	290	94	196	68%	\$17	\$102	\$31	\$133	7.8
151	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	290	94	196	68%	\$17	\$102	\$31	\$133	7.8
152	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	290	94	196	68%	\$17	\$102	\$31	\$133	7.8
153	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	290	94	196	68%	\$17	\$102	\$31	\$133	7.8
154	Office	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.3	0.1	580	188	392	68%	\$34	\$204	\$61	\$266	7.8
157	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	290	94	196	68%	\$17	\$102	\$31	\$133	7.8
160	office	FTD	F1x4 Rec	4	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	564	329	235	42%	\$20	\$184	\$98	\$282	13.8
165	Journalism Lab	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	1,960	2842	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	225	82	143	63%	\$12	\$103	\$31	\$134	10.8
165	Journalism Lab	FTJ	F2x4 Rec	8	3480	3 - 34w RSFI T12 - EE 1&2	1,960	2842	2-28w 4' RSFI T8 ES HE EL-L	8	42	0.9	0.3	1,803	659	1,145	63%	\$99	\$825	\$246	\$1,071	10.8
165	Journalism Lab	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
165A	Office	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	3,366	2842	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	387	141	246	63%	\$17	\$103	\$31	\$134	8.1
170	Journalism Lab	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	1,960	9429	2-Delamp to 2 - 28w 4' RSFI T	2	60	0.2	0.1	439	235	204	46%	\$18	\$34	\$74	\$108	6.1
170	Journalism Lab	FTK	F2x4 Rec	4	3304	4 - 32w RSFI T8 EE 2&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-L	4	48	0.5	0.2	1,129	376	753	67%	\$65	\$408	\$123	\$531	8.1
200/200	Lecture/Theatre Room	FBG	F1x4 Box	33	3475	2 - 34w RSFI T12 EE	2,200	2838	2-28w 4' RSFI T8 ES HE EL-L	33	42	2.3	1.3	5,227	3,049	2,178	42%	\$178	\$1,519	\$2,556	\$4,075	22.9
200/200	Lecture/Theatre Room	DSA	Neon Tubing	40	1020	1 - LED Neon replacement	8,760	9000	0-No Action	40	0	0.1	0.1	1,314	1,314	0	0%	\$0	\$0	\$0	\$0	0.0
200/200	Lecture/Theatre Room	IXL	LED Exit sign	4	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	4	0	0.0	0.0	70	70	0	0%	\$0	\$0	\$0	\$0	0.0
200/200	Lecture/Theatre Room	ICA	Wall Sconce	1	2213	1 - 13w CF	2,200	9000	0-No Action	1	0	0.0	0.0	70	70	0	0%	\$0	\$0	\$0	\$0	0.0
200/200	Lecture/Theatre Room	FBB	F2x2 Box	9	3016	2 - 17w RSFI T8 EL-IS	2,200	9000	0-No Action	9	0	0.3	0.3	673	673	0	0%	\$0	\$0	\$0	\$0	0.0
200/200	Lecture/Theatre Room	FBG	F1x4 Box	33	3475	2 - 34w RSFI T12 EE	2,200	3857	2-28w 4' RSFI T8 ES Dimmab	33	52	2.3	1.6	5,227	3,775	1,452	28%	\$119	\$4,530	\$2,354	\$6,884	58.0
200A	Control Room	FTJ	F2x4 Rec	2	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2842	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.0	230	84	146	63%	\$9	\$206	\$61	\$268	28.5
200B	Vestibule to Electrical Roo	FTJ	F2x4 Rec	1	3480	3 - 34w RSFI T12 - EE 1&2	1,000	2842	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	115	42	73	63%	\$10	\$103	\$31	\$134	13.9
200C	Electrical Room + Storage	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$39	\$48	198.7
200E	Exit Vestibule	CDB	Downlight	1	2213	2 - 13w CF	255	9000	0-No Action	1	0	0.0	0.0	8	8	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Clock Tower Building

Building Code: CTB



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)	
201	Office	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	3,060	2836	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.3	0.1	906	294	612	68%	\$43	\$204	\$61	\$266	6.2
201	Office	FTI	F2x4 Rec	4	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	881	514	367	42%	\$26	\$184	\$98	\$282	11.0
201	Office	FTE	F2x2 Rec	1	3012	2 - 17w RSFI T8 EE	3,060	3770	2-17w RSFI T8 HE EL-HBF	1	41	0.0	0.0	135	125	9	7%	\$1	\$48	\$25	\$73	112.9
201A	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
201B	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
201C	Meeting Room	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,500	9419	2-Delamp to 2 - 28w 4' RSFI T	4	52	0.3	0.1	395	312	83	21%	\$13	\$51	\$147	\$198	14.9
202	Staff Room	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.2	817	477	340	42%	\$24	\$38	\$111	\$149	6.1
202A	Communication Room	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	102	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	6	5	1	12%	\$0	\$8	\$6	\$15	74.3
203	Server Locked Room	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	37	21	15	42%	\$6	\$92	\$49	\$141	23.2
204	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
205	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
206	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
207	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
208	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
209	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
210	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
211	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
212	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
213	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
214	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
215	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
216	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
217	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
218	Board Room	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
218	Board Room	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,500	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	354	312	42	12%	\$4	\$34	\$25	\$58	13.8
219	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
220	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
222	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
223	Office	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	141	82	59	42%	\$5	\$46	\$25	\$71	13.8
224	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
225	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
226	Office	FTI	F2x4 Rec	4	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	564	329	235	42%	\$20	\$184	\$98	\$282	13.8
300	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	361	318	43	12%	\$3	\$17	\$12	\$29	9.7
300	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	441	257	184	42%	\$13	\$92	\$49	\$141	11.0
300A	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
300B	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
300C	Copy Room	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	2,880	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	415	242	173	42%	\$12	\$92	\$49	\$141	11.3
300D	Office	FTI	F2x4 Rec	2	3475	2 - 34w RSFI T12 EE	1,960	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	282	165	118	42%	\$10	\$92	\$49	\$141	13.8
309	Board Room	FTI	F2x4 Rec	16	3244	2 - 32w RSFI T8 EL-IS	1,500	2933	2-Relamp with 28w 4' RSFI T	16	52	0.9	0.8	1,416	1,248	168	12%	\$17	\$135	\$98	\$234	13.8
309	Board Room	IXA	Inc Exit sign	1	1102	2 - 15w Inc A15	8,760	1003	1-1 Watt LED Exit light NEW	1	2	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2
309A/30	Kitchen	FTD	F1x4 Rec	3	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	661	386	275	42%	\$19	\$138	\$74	\$212	11.0
310/310	Open Office Area	FTJ	F2x4 Rec	10	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	9419	2-Delamp to 2 - 28w 4' RSFI T	10	52	0.8	0.5	2,723	1,591	1,132	42%	\$79	\$127	\$368	\$495	6.2
310B	Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	523	306	218	42%	\$19	\$38	\$111	\$149	7.9
310C	Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	4	52	0.3	0.2	698	408	290	42%	\$25	\$51	\$147	\$198	7.9
310D	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	2	52	0.2	0.1	349	204	145	42%	\$13	\$25	\$74	\$99	7.9

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Clock Tower Building

Building Code: CTB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
310E	Office	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.2	0.2	506	335	171	34%	\$15	\$78	\$74	\$151	10.2
312	Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	1,089	955	135	12%	\$9	\$51	\$25	\$75	8.0
312A	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
312B	Office	IDN	Downlight Round	4	1202	1 - 20w MR16	1,960	9000	0-No Action	4	0	0.1	0.1	157	157	0	0%	\$0	\$0	\$0	\$0	0.0
312B	Office	IDB	Downlight Round	11	1146	1 - 75w Inc PAR38 Flood	1,960	9000	0-No Action	11	0	0.8	0.8	1,617	1,617	0	0%	\$0	\$0	\$0	\$0	0.0
320	Office	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	722	636	86	12%	\$6	\$34	\$25	\$58	9.7
321	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	11.9
322	Office	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	463	408	55	12%	\$5	\$34	\$25	\$58	11.9
326	Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.1	116	102	14	12%	\$1	\$8	\$6	\$15	11.9
327	Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.1	116	102	14	12%	\$1	\$8	\$6	\$15	11.9
328	Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.1	116	102	14	12%	\$1	\$8	\$6	\$15	11.9
329	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
400	Hallway	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	8,760	9419	2-Delamp to 2 - 28w 4' RSFI T	1	52	0.1	0.0	780	456	324	42%	\$16	\$13	\$37	\$50	3.0
400	Hallway	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
400	Hallway	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	9419	2-Delamp to 2 - 28w 4' RSFI T	1	52	0.1	0.0	272	159	113	42%	\$8	\$13	\$37	\$50	6.2
4000	Clock Tower	HDF	Downlight	3	6014	1 - 250w HPS	4,380	5522	1-165w QL Induction	2	165	0.8	0.3	3,876	1,445	2,431	63%	\$149	\$1,217	\$147	\$1,364	9.2
4000	Clock Tower	IDA	Downlight Round	1	1132	1 - 60w Inc A19	51	9000	0-No Action	1	0	0.1	0.1	3	3	0	0%	\$0	\$0	\$0	\$0	0.0
402	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	2	52	0.2	0.1	349	204	145	42%	\$13	\$25	\$74	\$99	7.9
403	Meeting Room	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	817	477	340	42%	\$24	\$38	\$111	\$149	6.2
405	Kitchen + Hallway	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	9419	2-Delamp to 2 - 28w 4' RSFI T	1	52	0.1	0.0	272	159	113	42%	\$8	\$13	\$37	\$50	6.2
405	Kitchen + Hallway	FCA	F1x2 Cubelight	1	3441	1 - 20w RSFI T12 EE	3,060	3769	2-17w RSFI T8 HE EL-LBF	1	27	0.0	0.0	141	83	58	41%	\$4	\$43	\$25	\$67	16.5
405	Kitchen + Hallway	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	361	318	43	12%	\$3	\$17	\$12	\$29	9.7
405A	Women's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	181	159	21	12%	\$2	\$8	\$6	\$15	9.7
405B	Men's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	181	159	21	12%	\$2	\$8	\$6	\$15	9.7
409	Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	523	306	218	42%	\$19	\$38	\$111	\$149	7.9
410	Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	523	306	218	42%	\$19	\$38	\$111	\$149	7.9
411	Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	523	306	218	42%	\$19	\$38	\$111	\$149	7.9
412	Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	523	306	218	42%	\$19	\$38	\$111	\$149	7.9
413	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	2	52	0.2	0.1	349	204	145	42%	\$13	\$25	\$74	\$99	7.9
414	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9419	2-Delamp to 2 - 28w 4' RSFI T	2	52	0.2	0.1	349	204	145	42%	\$13	\$25	\$74	\$99	7.9
416/417	Open Office Area	FTJ	F2x4 Rec	15	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	9419	2-Delamp to 2 - 28w 4' RSFI T	15	52	1.3	0.7	4,085	2,387	1,698	42%	\$119	\$190	\$553	\$743	6.2
416/417	Open Office Area	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
416/417	Open Office Area	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	8,760	9419	2-Delamp to 2 - 28w 4' RSFI T	2	52	0.2	0.1	1,559	911	648	42%	\$33	\$25	\$74	\$99	3.0
416/417	Open Office Area	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	9419	2-Delamp to 2 - 28w 4' RSFI T	1	52	0.1	0.0	272	159	113	42%	\$8	\$13	\$37	\$50	6.2
416/417	Open Office Area	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	181	159	21	12%	\$2	\$8	\$6	\$15	9.7
494	Utility Room+Storage	FSF	F4' striplight	3	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.1	0.0	55	32	23	42%	\$3	\$138	\$74	\$212	68.6
9115	Hallway	CDB	Downlight	6	2214	2 - 13w CF NEW	3,060	9000	0-No Action	6	0	0.2	0.2	588	588	0	0%	\$0	\$0	\$0	\$0	0.0
9115	Hallway	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9115	Hallway	IXL	LED Exit sign	2	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
9121/91	Storage	CDB	Downlight	1	2015	2 - 23w CF SI (Screw in)	255	9000	0-No Action	1	0	0.0	0.0	6	6	0	0%	\$0	\$0	\$0	\$0	0.0
9122	Women's WR	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9122	Women's WR	FCD	F1x3 Cubelight	1	3463	2 - 30w RSFI T12 EE	8,760	3116	2-25w RSFI T8 EL-IS	1	46	0.1	0.0	657	403	254	39%	\$13	\$57	\$25	\$81	6.3
9123	Men's WR	FCD	F1x3 Cubelight	1	3463	2 - 30w RSFI T12 EE	8,760	3116	2-25w RSFI T8 EL-IS	1	46	0.1	0.0	657	403	254	39%	\$13	\$57	\$25	\$81	6.3
9123	Men's WR	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9125	Hallway	FTG	F2x2 Rec	1	3354	2 - 32w RSFI T8/U6 EL-RS	3,060	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	190	125	64	34%	\$5	\$68	\$25	\$93	20.5

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Clock Tower Building

Building Code: CTB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)	
9126	utility Room	FCF	F1x4 Cubelight	1	3475	2 - 34w RSFI T12 EE	51	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	4	2	2	42%	\$3	\$46	\$25	\$71	25.3
9135	Hallway	FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9145	Hallway	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	3,060	2836	2-28w 4' RSFI T8 ES HE EL-L	1	48	0.1	0.0	453	147	306	68%	\$21	\$102	\$31	\$133	6.2
9146	Mech Room	FSF	F4' striplight	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
9150	Corridor	FTI	F2x4 Rec	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9155	Corridor	FBG	F1x4 Box	2	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	441	257	184	42%	\$13	\$92	\$49	\$141	11.0
9155	Corridor	IXL	LED Exit sign	2	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
9155	Corridor	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	8,760	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	631	368	263	42%	\$13	\$46	\$25	\$71	5.3
9190/91	Entrance Vestibule	FTG	F2x2 Rec	2	3354	2 - 32w RSFI T8/U6 EL-RS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	1,086	718	368	34%	\$19	\$136	\$49	\$185	9.9
9190/91	Entrance Vestibule	FTG	F2x2 Rec	4	3354	2 - 32w RSFI T8/U6 EL-RS	1,000	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.2	0.2	248	164	84	34%	\$11	\$272	\$98	\$370	33.5
9190/91	Entrance Vestibule	IXL	LED Exit sign	2	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
9192	Stairs	CSK	Cylinder	1	2213	1 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
9197	Common Room	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	441	257	184	42%	\$13	\$92	\$49	\$141	11.0
9205	Corridor	FTE	F2x2 Rec	3	3016	2 - 17w RSFI T8 EL-IS	3,060	9000	0-No Action	3	0	0.1	0.1	312	312	0	0%	\$0	\$0	\$0	\$0	0.0
9215	Corridor	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
9215	Corridor	FTE	F2x2 Rec	7	3012	2 - 17w RSFI T8 EE	3,060	3770	2-17w RSFI T8 HE EL-HBF	7	41	0.3	0.3	942	878	64	7%	\$5	\$337	\$172	\$509	112.9
9220	Storage	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	75	44	31	42%	\$2	\$46	\$25	\$71	35.7
9225	Hallway	FTE	F2x2 Rec	12	3016	2 - 17w RSFI T8 EL-IS	3,060	9000	0-No Action	12	0	0.4	0.4	1,248	1,248	0	0%	\$0	\$0	\$0	\$0	0.0
9225	Hallway	IXL	LED Exit sign	2	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
9245	Hallway	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
9245	Hallway	FBB	F2x2 Box	2	3012	2 - 17w RSFI T8 EE	3,060	3769	2-17w RSFI T8 HE EL-LBF	2	27	0.1	0.1	269	165	104	39%	\$7	\$96	\$49	\$145	19.9
9257	Women's Washroom	FCF	F1x4 Cubelight	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9257A	Handicap Washroom	FCF	F1x4 Cubelight	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9258	Men's Washroom	FCF	F1x4 Cubelight	2	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	441	257	184	42%	\$13	\$92	\$49	\$141	11.0
9290	Vestibule	CSF	Surface (CF)	11	2314	2 - 26w quad CF	3,060	9000	0-No Action	11	0	0.6	0.6	1,952	1,952	0	0%	\$0	\$0	\$0	\$0	0.0
9301	Waiting Area	CDU	Downlight	4	2408	1 - 32w triple CF	3,060	9000	0-No Action	4	0	0.0	0.0	453	453	0	0%	\$0	\$0	\$0	\$0	0.0
9301	Waiting Area	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
9305	Corridor	CSB	Surface (CF)	4	2213	2 - 13w CF	3,060	9000	0-No Action	4	0	0.1	0.1	392	392	0	0%	\$0	\$0	\$0	\$0	0.0
9305	Corridor	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
9305	Corridor	CDB	Downlight	1	2213	2 - 13w CF	3,060	9000	0-No Action	1	0	0.0	0.0	98	98	0	0%	\$0	\$0	\$0	\$0	0.0
9313	Men's Washroom	FCF	F1x4 Cubelight	2	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	441	257	184	42%	\$13	\$92	\$49	\$141	11.0
9314	Handicap Washroom	FCF	F1x4 Cubelight	1	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	220	129	92	42%	\$6	\$46	\$25	\$71	11.0
9315	Women's Washroom	FCF	F1x4 Cubelight	2	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	441	257	184	42%	\$13	\$92	\$49	\$141	11.0
9325	Office	CDB	Downlight	1	2213	2 - 13w CF	3,060	9000	0-No Action	1	0	0.0	0.0	98	98	0	0%	\$0	\$0	\$0	\$0	0.0
9325	Office	CDB	Downlight	3	2213	2 - 13w CF	3,060	9000	0-No Action	3	0	0.1	0.1	294	294	0	0%	\$0	\$0	\$0	\$0	0.0
9491	Stairs	FCF	F1x4 Cubelight	4	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	881	514	367	42%	\$26	\$184	\$98	\$282	11.0
9491	Stairs	FBG	F1x4 Box	4	3475	2 - 34w RSFI T12 EE	3,060	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	881	514	367	42%	\$26	\$184	\$98	\$282	11.0
9505	Hallway	CDB	Downlight	8	2213	2 - 13w CF	3,060	9000	0-No Action	8	0	0.2	0.2	783	783	0	0%	\$0	\$0	\$0	\$0	0.0
ELEV	Elevator	FSE	F4' striplight	2	3208	1 - 32w RSFI T8 EL-IS	8,760	2926	1-Relamp with 28w 4' RSFI T	2	26	0.1	0.0	543	456	88	16%	\$4	\$8	\$12	\$21	4.7
ELEV	Elevator	FSA	F2' striplight	1	3441	1 - 20w RSFI T12 EE	8,760	3770	2-17w RSFI T8 HE EL-HBF	1	41	0.0	0.0	403	359	44	11%	\$2	\$43	\$25	\$67	30.3
EXTR	Exterior Lighting	MWA	Wall Pack	1	5002	1 - 50w MH	4,380	9000	0-No Action	1	0	0.0	0.0	315	315	0	0%	\$0	\$0	\$0	\$0	0.0
EXTR	Exterior Lighting	MPF	Post Top	15	6008	1 - 150w HPS	4,380	9000	0-No Action	15	0	0.3	0.3	12,352	12,352	0	0%	\$0	\$0	\$0	\$0	0.0

Existing Energy Summary for Building Clock Tower Building:

552

551

32.8

20.6

100,198

68,211

31,987

32%

\$2,460

\$20,193

\$14,057

\$34,250

13.9

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Gymnasium

Building Code: GYM



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
101	Recreational Room & Studi	FTI	F2x4 Rec	100	3474	2 - 34w RSFI T12 - Std	500	2838	2-28w 4' RSFI T8 ES HE EL-L	100	42	7.7	4.0	4,050	2,100	1,950	48%	\$434	\$4,602	\$2,456	\$7,058	16.3
101	Recreational Room & Studi	IXL	LED Exit sign	4	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	4	0	0.0	0.0	70	70	0	0%	\$0	\$0	\$0	\$0	0.0
102	Office	FTK	F2x4 Rec	4	3483	4 - 34w RSFI T12 - Std 2 b	500	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.6	0.2	324	84	240	74%	\$53	\$324	\$98	\$422	7.9
103	Storage Room	FSF	F4' striplight	1	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	21	11	10	48%	\$1	\$46	\$25	\$71	52.8
104	Locker Room	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	4,080	2836	2-28w 4' RSFI T8 ES HE EL-L	2	48	0.3	0.1	1,322	392	930	70%	\$58	\$204	\$61	\$266	4.6
110/112/	Men's Locker Room	FVD	F1x4 Vapour Resistant	4	3240	2 - 32w RSFI T8 EE	3,120	9000	0-No Action	4	0	0.3	0.3	899	899	0	0%	\$0	\$0	\$0	\$0	0.0
110/112/	Men's Locker Room	FWF	F1x4 Wrap	18	3474	2 - 34w RSFI T12 - Std	4,080	2838	2-28w 4' RSFI T8 ES HE EL-L	18	42	1.4	0.7	5,949	3,084	2,864	48%	\$180	\$828	\$442	\$1,270	7.1
121	Old Office now Storage	FTI	F2x4 Rec	4	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.1	0.0	83	43	40	48%	\$5	\$184	\$98	\$282	52.8
201	Locked Room	FWF	F1x4 Wrap	1	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	21	11	10	48%	\$4	\$46	\$25	\$71	17.0
202/204/	Female Change/Shower/W	FVD	F1x4 Vapour Resistant	6	3244	2 - 32w RSFI T8 EL-IS	4,080	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	1,444	1,273	171	12%	\$11	\$51	\$37	\$88	8.2
202/204/	Female Change/Shower/W	FWF	F1x4 Wrap	14	3474	2 - 34w RSFI T12 - Std	4,080	2838	2-28w 4' RSFI T8 ES HE EL-L	14	42	1.1	0.6	4,627	2,399	2,228	48%	\$140	\$644	\$344	\$988	7.1
203	Gym Floor	MHG	High / Low Bay	34	5014	1 - 400w MH	4,080	3381	8-32w RSFI T8 EL-HBF 4&4	44	290	14.5	12.1	62,424	52,061	10,363	17%	\$650	\$19,305	\$5,029	\$24,334	37.4
203	Gym Floor	IXL	LED Exit sign	8	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	8	0	0.0	0.0	140	140	0	0%	\$0	\$0	\$0	\$0	0.0
203	Gym Floor	HHF	High / Low Bay	8	6014	1 - 250w HPS	4,080	3755	6-32w RSFI T8 HE EL-HBF 2	8	220	2.2	1.7	9,629	7,181	2,448	25%	\$154	\$2,410	\$767	\$3,177	20.7
205	Storage	FSF	F4' striplight	2	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	41	21	20	48%	\$3	\$92	\$49	\$141	52.8
205a	Storage	FSF	F4' striplight	2	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	41	21	20	48%	\$3	\$92	\$49	\$141	52.8
3	Staff Room	FTK	F2x4 Rec	4	3483	4 - 34w RSFI T12 - Std 2 b	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.6	0.2	894	232	662	74%	\$70	\$324	\$98	\$422	6.0
301	Office	FTD	F1x4 Rec	6	3474	2 - 34w RSFI T12 - Std	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	6	42	0.5	0.2	671	348	323	48%	\$34	\$276	\$147	\$423	12.3
302	Office	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.3	0.1	447	116	331	74%	\$35	\$162	\$49	\$211	6.0
302	Office	FTD	F1x4 Rec	2	3474	2 - 34w RSFI T12 - Std	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	224	116	108	48%	\$11	\$92	\$49	\$141	12.3
303	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,380	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	155	83	72	46%	\$8	\$17	\$37	\$54	7.0
304	Office	FTK	F2x4 Rec	4	3308	4 - 32w RSFI T8 EL-IS	1,380	9425	2-Delamp to 2 - 28w 4' RSFI T	4	60	0.4	0.2	618	331	287	46%	\$31	\$68	\$147	\$215	7.0
307	Copy Room	FTD	F1x4 Rec	2	3474	2 - 34w RSFI T12 - Std	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	224	116	108	48%	\$11	\$92	\$49	\$141	12.3
307A	Office	FTK	F2x4 Rec	4	3483	4 - 34w RSFI T12 - Std 2 b	1,380	2836	2-28w 4' RSFI T8 ES HE EL-L	4	48	0.6	0.2	894	265	629	70%	\$67	\$408	\$123	\$531	7.9
308	Office	FWH	F2x4 Wrap	2	3479	3 - 34w RSFI T12 - Std 1&	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	359	116	243	68%	\$26	\$153	\$49	\$203	7.8
312	Squash Courts	CTK	Troffer (CF)	15	2015	1 - 23w CF SI (Screw in)	920	9000	0-No Action	15	0	0.3	0.3	317	317	0	0%	\$0	\$0	\$0	\$0	0.0
313	Workout Room	CTK	Troffer (CF)	21	2015	1 - 23w CF SI (Screw in)	920	9000	0-No Action	21	0	0.5	0.5	444	444	0	0%	\$0	\$0	\$0	\$0	0.0
320	Vestibule	FTG	F2x2 Rec	6	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	6	41	0.3	0.2	3,101	2,155	946	31%	\$48	\$408	\$147	\$555	11.6
321	Athletic Department Office	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	81	72	10	12%	\$1	\$8	\$6	\$15	14.2
9105	Electrical Room	FWF	F1x4 Wrap	1	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	21	11	10	48%	\$1	\$46	\$25	\$71	52.8
9108	Hallway	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	2,040	3771	2-17w RSFI T8 HE EL-HBF W	3	41	0.2	0.1	361	251	110	31%	\$9	\$204	\$74	\$278	29.6
9116/91	Vestibule	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	3	41	0.2	0.1	1,551	1,077	473	31%	\$24	\$204	\$74	\$278	11.6
9118	Stairwell	FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.2	0.2	2,067	1,437	631	31%	\$32	\$272	\$98	\$370	11.6
9119	Main Entrance	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	1,034	718	315	31%	\$16	\$136	\$49	\$185	11.6
9119	Main Entrance	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
9120	Elevator Room	FWF	F1x4 Wrap	1	3256	2 - 32w RSFI T8 EL-RS	255	9000	0-No Action	1	0	0.0	0.0	16	16	0	0%	\$0	\$0	\$0	\$0	0.0
9120a	Elevator	FSE	F4' striplight	2	3468	1 - 34w RSFI T12 - Std	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	2	22	0.1	0.0	858	385	473	55%	\$24	\$80	\$49	\$130	5.4
9210	Stairwell	FBL	F2x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
9215	Storage	FSF	F4' striplight	4	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.1	0.0	83	43	40	48%	\$5	\$184	\$98	\$282	52.8
92B	Vestibule	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	1,034	718	315	31%	\$16	\$136	\$49	\$185	11.6
9306	Mechanical Room	FWF	F1x4 Wrap	2	3474	2 - 34w RSFI T12 - Std	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	41	21	20	48%	\$3	\$92	\$49	\$141	52.8
9309	Janitor's Room	FCE	F1x4 Cubelight	2	3468	1 - 34w RSFI T12 - Std	255	2826	1-28w 4' RSFI T8 ES HE EL-L	2	22	0.0	0.0	25	11	14	55%	\$2	\$80	\$49	\$130	70.0
9310	Stairwell	FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.2	0.2	2,067	1,437	631	31%	\$32	\$272	\$98	\$370	11.6
9315	Hallway	FTG	F2x2 Rec	5	3348	2 - 32w RSFI T8/U6 EL IS	6,116	3771	2-17w RSFI T8 HE EL-HBF W	5	41	0.3	0.2	1,804	1,254	550	31%	\$30	\$340	\$123	\$463	15.2
9315	Hallway	IXL	LED Exit sign	1	1008	1 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Gymnasium

Building Code: GYM



		Existing Luminaire/Lamp Data						Retrofit Data														
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code:	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh):	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
9316	Stairwell	FTG	F2x2 Rec	6	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	6	41	0.4	0.2	3,101	2,155	946	31%	\$49	\$408	\$147	\$555	11.4
9322	Hallway	FWF	F1x4 Wrap	1	3474	2 - 34w RSFI T12 - Std	6,116	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	495	257	239	48%	\$13	\$46	\$25	\$71	5.4
9322	Hallway	FTI	F2x4 Rec	2	3474	2 - 34w RSFI T12 - Std	6,116	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	991	514	477	48%	\$26	\$92	\$49	\$141	5.4
9325	Handicap Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
9326	Men's Washroom	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	4,080	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	1,322	392	930	70%	\$58	\$204	\$61	\$266	4.6
9328	Women's Washroom	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	4,080	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	1,322	392	930	70%	\$58	\$204	\$61	\$266	4.6
Ext	Exterior Lighting	MWA	Wall Pack	8	5002	1 - 50w MH	4,380	9000	0-No Action	8	0	0.1	0.1	2,523	2,523	0	0%	\$0	\$0	\$0	\$0	0.0
Ext	Exterior Lighting	MPA	Post Top	2	5004	1 - 70w MH	4,380	9000	0-No Action	2	0	0.0	0.0	788	788	0	0%	\$0	\$0	\$0	\$0	0.0
Ext	Exterior Lighting	IVA	Vandal Resistant	4	2000	1 - 9w CF SI (Screw-in)	4,380	9000	0-No Action	4	0	0.0	0.0	158	158	0	0%	\$0	\$0	\$0	\$0	0.0
Existing Energy Summary for Building Gymnasium:					348					358		36.0	24.1	121,786	89,600	32,185	26%	\$2,443	\$33,854	\$11,574	\$45,428	18.6

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
100	Foyer	CCB	Wall Sconce	6	2213	2 - 13w CF	6,116	8000	0-Install Lighting Controls Dev	6	0	0.2	0.2	1,174	1,174	0	0%	\$0	\$0	\$317	\$317	0.0
100	Foyer	MFF	Floodlight	6	5012	1 - 250w MH	6,116	5522	1-165w QL Induction	6	165	1.7	0.9	10,715	6,055	4,660	43%	\$258	\$3,650	\$759	\$4,410	17.1
100A	Vestibule	CDI	Downlight	2	2408	1 - 32w triple CF	8,760	9000	0-No Action	2	0	0.1	0.1	648	648	0	0%	\$0	\$0	\$0	\$0	0.0
100A	Vestibule	CCB	Wall Sconce	6	2213	2 - 13w CF	8,760	9000	0-No Action	6	0	0.2	0.2	1,682	1,682	0	0%	\$0	\$0	\$0	\$0	0.0
101	Hallway	CDI	Downlight	2	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	453	453	0	0%	\$0	\$0	\$0	\$0	0.0
101	Hallway	CTQ	Troffer (CF)	4	2514	2 - 38/40w long EM-RS CF	6,116	8000	0-Install Lighting Controls Dev	4	0	0.3	0.3	1,884	1,884	0	0%	\$0	\$0	\$0	\$0	0.0
101	Hallway	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,349	1,349	0	0%	\$0	\$0	\$0	\$0	0.0
101	Hallway	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
102	Lecture Hall "Case Room"	CDO	Downlight	1	2009	1 - 15w CF ref fl SI (Screw	2,500	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	38	38	0	0%	\$0	\$0	\$0	\$0	0.0
102	Lecture Hall "Case Room"	FLF	F8' Tubelight / Linear	6	3308	2 - 32w RSFI T8 EL-IS	2,500	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,680	1,470	210	13%	\$16	\$51	\$37	\$88	5.4
102	Lecture Hall "Case Room"	CDO	Downlight	2	2009	1 - 15w CF ref fl SI (Screw	2,500	8000	0-Install Lighting Controls Dev	2	0	0.0	0.0	75	75	0	0%	\$0	\$0	\$0	\$0	0.0
102	Lecture Hall "Case Room"	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
102	Lecture Hall "Case Room"	FRE	F4' striplight w/reflector	2	3208	1 - 32w RSFI T8 EL-IS	2,500	2926	1-Relamp with 28w 4' RSFI T	2	26	0.1	0.0	155	130	25	16%	\$2	\$8	\$12	\$21	10.8
102	Lecture Hall "Case Room"	FLD	F4' Tubelight / Linear	3	3244	2 - 32w RSFI T8 EL-IS	2,500	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	443	390	53	12%	\$4	\$25	\$18	\$44	10.9
1022 (S	Stairwell to Sprinkler Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
104	Lecture Hall	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
104	Lecture Hall	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	6	104	0.6	0.6	1,680	1,560	120	7%	\$9	\$102	\$37	\$138	15.0
104	Lecture Hall	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	2,500	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	590	520	70	12%	\$5	\$34	\$25	\$58	10.9
105	Hospitality Corridor	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,349	1,349	0	0%	\$0	\$0	\$0	\$0	0.0
105	Hospitality Corridor	CTQ	Troffer (CF)	8	2514	2 - 38/40w long EM-RS CF	6,116	9000	0-No Action	8	0	0.6	0.6	3,767	3,767	0	0%	\$0	\$0	\$0	\$0	0.0
105	Hospitality Corridor	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	6,116	9000	0-No Action	1	0	0.0	0.0	94	94	0	0%	\$0	\$0	\$0	\$0	0.0
106	Lecture Hall	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	1	104	0.1	0.1	280	260	20	7%	\$2	\$17	\$6	\$23	15.0
106	Lecture Hall	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	4	104	0.4	0.4	1,120	1,040	80	7%	\$6	\$68	\$25	\$92	15.0
106	Lecture Hall	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
106	Lecture Hall	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	2,500	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	590	520	70	12%	\$5	\$34	\$25	\$58	10.9
107	Storage	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
108	Hallway	CDI	Downlight	4	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	4	0	0.1	0.1	905	905	0	0%	\$0	\$0	\$0	\$0	0.0
108	Hallway	CTQ	Troffer (CF)	3	2514	2 - 38/40w long EM-RS CF	6,116	8000	0-Install Lighting Controls Dev	3	0	0.2	0.2	1,413	1,413	0	0%	\$0	\$0	\$0	\$0	0.0
108	Hallway	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,349	1,349	0	0%	\$0	\$0	\$0	\$0	0.0
108	Hallway	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
109	Lecture Hall	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	6	104	0.6	0.6	1,680	1,560	120	7%	\$9	\$102	\$37	\$138	15.0
109	Lecture Hall	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
109	Lecture Hall	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	2,500	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	590	520	70	12%	\$5	\$34	\$25	\$58	10.9
111	H/C Washroom	FCD	F1x3 Cubelight	1	3116	2 - 25w RSFI T8 EL-IS	1,000	9000	0-No Action	1	0	0.0	0.0	46	46	0	0%	\$0	\$0	\$0	\$0	0.0
112	Women's Washroom	FCA	F1x2 Cubelight	1	3004	1 - 17w RSFI T8 EL-IS	4,080	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	69	69	0	0%	\$0	\$0	\$0	\$0	0.0
112	Women's Washroom	CDI	Downlight	6	2408	1 - 32w triple CF	4,080	8000	0-Install Lighting Controls Dev	6	0	0.2	0.2	906	906	0	0%	\$0	\$0	\$0	\$0	0.0
113	Men's Washroom	CDI	Downlight	3	2408	1 - 32w triple CF	4,080	8000	0-Install Lighting Controls Dev	3	0	0.1	0.1	453	453	0	0%	\$0	\$0	\$0	\$0	0.0
113	Men's Washroom	FCA	F1x2 Cubelight	1	3004	1 - 17w RSFI T8 EL-IS	4,080	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	69	69	0	0%	\$0	\$0	\$0	\$0	0.0
114	Communication	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
115	Electrical Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
115A	Elevator Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
117	Lobby	IDO	Downlight Round	6	1203	1 - 35w MR16	6,116	9000	0-No Action	6	0	0.2	0.2	1,284	1,284	0	0%	\$0	\$0	\$0	\$0	0.0
117	Lobby	CTQ	Troffer (CF)	10	2514	2 - 38/40w long EM-RS CF	6,116	9000	0-No Action	10	0	0.7	0.7	4,709	4,709	0	0%	\$0	\$0	\$0	\$0	0.0
117	Lobby	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
117A	Corridor	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	6,116	8000	0-Install Lighting Controls Dev	1	0	0.1	0.1	471	471	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
117A	Corridor	CDI	Downlight	1	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	226	226	0	0%	\$0	\$0	\$0	\$0	0.0
117A	Corridor	CTQ	Troffer (CF)	4	2514	2 - 38/40w long EM-RS CF	6,116	8000	0-Install Lighting Controls Dev	4	0	0.3	0.3	1,884	1,884	0	0%	\$0	\$0	\$0	\$0	0.0
117A	Corridor	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,349	1,349	0	0%	\$0	\$0	\$0	\$0	0.0
118	Hallway	CTQ	Troffer (CF)	4	2514	2 - 38/40w long EM-RS CF	6,116	8000	0-Install Lighting Controls Dev	4	0	0.3	0.3	1,884	1,884	0	0%	\$0	\$0	\$0	\$0	0.0
118	Hallway	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	8,760	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	1,349	1,349	0	0%	\$0	\$0	\$0	\$0	0.0
118	Hallway	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
119	Lecture Hall "Case Room"	FRE	F4' striplight w/reflector	1	3208	1 - 32w RSFI T8 EL-IS	2,500	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	78	65	13	16%	\$1	\$4	\$6	\$10	10.8
119	Lecture Hall "Case Room"	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
119	Lecture Hall "Case Room"	FLF	F8' Tubelight / Linear	12	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	12	104	1.3	1.2	3,360	3,120	240	7%	\$18	\$203	\$74	\$277	15.0
119	Lecture Hall "Case Room"	CDI	Downlight	3	2408	1 - 32w triple CF	2,500	9000	0-No Action	3	0	0.1	0.1	278	278	0	0%	\$0	\$0	\$0	\$0	0.0
119	Lecture Hall "Case Room"	CDO	Downlight	2	2009	1 - 15w CF ref fl SI (Screw	2,500	9000	0-No Action	2	0	0.0	0.0	75	75	0	0%	\$0	\$0	\$0	\$0	0.0
119	Lecture Hall "Case Room"	FLD	F4' Tubelight / Linear	7	3244	2 - 32w RSFI T8 EL-IS	2,500	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	1,033	910	123	12%	\$9	\$59	\$43	\$102	10.9
120	Men's Washroom	CDI	Downlight	4	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	4	0	0.1	0.1	905	905	0	0%	\$0	\$0	\$0	\$0	0.0
120	Men's Washroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	6,116	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	190	159	31	16%	\$2	\$4	\$6	\$10	6.1
121	Janitor Locked Room	FTC	F1x4 Rec	1	3208	1 - 32w RSFI T8 EL-IS	500	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	16	13	3	16%	\$0	\$4	\$6	\$10	47.0
122	Women's Washroom	CDI	Downlight	5	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	5	0	0.2	0.2	1,131	1,131	0	0%	\$0	\$0	\$0	\$0	0.0
122	Women's Washroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	6,116	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	190	159	31	16%	\$2	\$4	\$6	\$10	6.1
123	Lecture Hall "Case Room"	CDO	Downlight	2	2009	1 - 15w CF ref fl SI (Screw	2,500	9000	0-No Action	2	0	0.0	0.0	75	75	0	0%	\$0	\$0	\$0	\$0	0.0
123	Lecture Hall "Case Room"	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
123	Lecture Hall "Case Room"	CDI	Downlight	3	2408	1 - 32w triple CF	2,500	9000	0-No Action	3	0	0.1	0.1	278	278	0	0%	\$0	\$0	\$0	\$0	0.0
123	Lecture Hall "Case Room"	FRE	F4' striplight w/reflector	2	3208	1 - 32w RSFI T8 EL-IS	2,500	2926	1-Relamp with 28w 4' RSFI T	2	26	0.1	0.0	155	130	25	16%	\$2	\$8	\$12	\$21	10.8
123	Lecture Hall "Case Room"	FLD	F4' Tubelight / Linear	5	3244	2 - 32w RSFI T8 EL-IS	2,500	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	738	650	88	12%	\$7	\$42	\$31	\$73	10.9
123	Lecture Hall "Case Room"	FLF	F8' Tubelight / Linear	12	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	12	104	1.3	1.2	3,360	3,120	240	7%	\$18	\$203	\$74	\$277	15.0
124	Vestibule to 123 "Hospitalit	CDH	Downlight	1	2314	2 - 26w quad CF	1,000	9000	0-No Action	1	0	0.1	0.1	58	58	0	0%	\$0	\$0	\$0	\$0	0.0
124	Vestibule to 123 "Hospitalit	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
124	Vestibule to 123 "Hospitalit	CTQ	Troffer (CF)	3	2514	2 - 38/40w long EM-RS CF	1,000	9000	0-No Action	3	0	0.2	0.2	231	231	0	0%	\$0	\$0	\$0	\$0	0.0
125	Vestibule	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
125	Vestibule	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,349	1,349	0	0%	\$0	\$0	\$0	\$0	0.0
126	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	2,500	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,780	1,560	220	12%	\$17	\$102	\$49	\$151	8.9
127	Corridor	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	361	318	43	12%	\$2	\$8	\$6	\$15	6.2
127	Corridor	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
127	Corridor	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	6,116	9000	0-No Action	1	0	0.1	0.1	471	471	0	0%	\$0	\$0	\$0	\$0	0.0
128	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	2,500	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	2,003	1,755	248	12%	\$19	\$114	\$55	\$170	8.9
129	Lecture Hall "Case Room"	IDI	Downlight Round	4	1140	1 - 65w Inc BR30	2,500	2404	1-26w triple CF	4	29	0.2	0.1	650	290	360	55%	\$28	\$238	\$196	\$435	15.7
129	Lecture Hall "Case Room"	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
129	Lecture Hall "Case Room"	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	1	104	0.1	0.1	280	260	20	7%	\$2	\$17	\$6	\$23	15.0
129	Lecture Hall "Case Room"	FLF	F8' Tubelight / Linear	5	3308	4 - 32w RSFI T8 EL-IS	2,500	2945	4-Relamp with 28w 4' RSFI T	5	104	0.5	0.5	1,400	1,300	100	7%	\$8	\$85	\$31	\$115	15.0
129	Lecture Hall "Case Room"	FLD	F4' Tubelight / Linear	3	3244	2 - 32w RSFI T8 EL-IS	2,500	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	443	390	53	12%	\$4	\$25	\$18	\$44	10.9
130	Café	ITB	Track Head	7	1203	1 - 35w MR16	2,500	9000	0-No Action	7	0	0.2	0.2	613	613	0	0%	\$0	\$0	\$0	\$0	0.0
130	Café	CTQ	Troffer (CF)	3	2514	2 - 38/40w long EM-RS CF	2,500	9000	0-No Action	3	0	0.2	0.2	578	578	0	0%	\$0	\$0	\$0	\$0	0.0
132	Mechanical Room	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
200/262	Passive Lounge	CDI	Downlight	37	2408	1 - 32w triple CF	6,552	9000	0-No Action	37	0	1.3	1.3	8,970	8,970	0	0%	\$0	\$0	\$0	\$0	0.0
200/262	Passive Lounge	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
201	Study Room "Break Out"	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	175	155	20	12%	\$2	\$13	\$6	\$19	10.9
202	Study Room "Break Out"	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	175	155	20	12%	\$2	\$13	\$6	\$19	10.9

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
203	Communications Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
2031A	Office	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	1,960	2940	3-Relamp with 28w 4' RSFI T	4	76	0.3	0.3	674	596	78	12%	\$7	\$51	\$25	\$75	11.1
2031B	Office/Reception	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	3,060	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	526	349	177	34%	\$12	\$52	\$49	\$101	8.1
204	Computer Lab 2	FTI	F2x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	1,986	1,750	236	12%	\$17	\$93	\$68	\$161	9.7
205	Computer Lab 1	FTI	F2x4 Rec	12	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	12	52	0.7	0.6	2,166	1,909	257	12%	\$18	\$102	\$74	\$175	9.7
2054	Office	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	1	0	0.1	0.1	106	106	0	0%	\$0	\$0	\$0	\$0	0.0
206	Study Room "Break Out"	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	351	310	41	12%	\$3	\$25	\$12	\$38	10.9
207	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
208	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
209	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
210	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
211	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
212	Corridor	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
212	Corridor	FTD	F1x4 Rec	9	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	9	52	0.5	0.4	3,247	2,862	385	12%	\$21	\$76	\$55	\$131	6.2
212	Corridor	CDI	Downlight	3	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	3	0	0.1	0.1	679	679	0	0%	\$0	\$0	\$0	\$0	0.0
212	Corridor	IXL	LED Exit sign	6	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	6	0	0.0	0.0	105	105	0	0%	\$0	\$0	\$0	\$0	0.0
213	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
214	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
215	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
216	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
217	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
218	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
219	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
221	Unisex Washroom	FCA	F1x2 Cubelight	1	3004	1 - 17w RSFI T8 EL-IS	1,000	9000	0-No Action	1	0	0.0	0.0	17	17	0	0%	\$0	\$0	\$0	\$0	0.0
222	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
223	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
224	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
225	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
226	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
227	Copy Room	CDI	Downlight	1	2408	1 - 32w triple CF	2,040	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	75	75	0	0%	\$0	\$0	\$0	\$0	0.0
227	Copy Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	351	233	118	34%	\$10	\$52	\$49	\$101	10.0
227	Copy Room	FTJ	F2x4 Rec	5	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	5	57	0.4	0.3	877	581	296	34%	\$25	\$130	\$123	\$252	10.0
231	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
232	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
233	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
234	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
235	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
236	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
237	Handicap Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
238	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
239	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
240	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
241	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
242	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
243	Janitor	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	30	27	4	12%	\$0	\$8	\$6	\$15	46.8

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
244	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
245	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
246	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
247	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
248	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
249	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
250	A/V Storage	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
251/272	Corridor	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
251/272	Corridor	IXL	LED Exit sign	5	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	5	0	0.0	0.0	88	88	0	0%	\$0	\$0	\$0	\$0	0.0
252	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
253	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
254	Computer Lab "Language	FTI	F2x4 Rec	12	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	12	52	0.7	0.6	2,166	1,909	257	12%	\$18	\$102	\$74	\$175	9.7
255	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
256	Study Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	351	318	33	9%	\$3	\$25	\$12	\$38	13.6
257	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
257	Office	CTQ	Troffer (CF)	3	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	3	0	0.2	0.2	319	319	0	0%	\$0	\$0	\$0	\$0	0.0
259	Computer Lab "Language	FTI	F2x4 Rec	12	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	12	52	0.7	0.6	2,166	1,909	257	12%	\$18	\$102	\$74	\$175	9.7
260	Prayer/Meditation Room	IDC	Downlight Round	5	1151	1 - 90w Inc Par38 H Flood	1,000	9000	0-No Action	5	0	0.4	0.4	450	450	0	0%	\$0	\$0	\$0	\$0	0.0
261	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
264	Corridor	CTQ	Troffer (CF)	10	2514	2 - 38/40w long EM-RS CF	6,116	8000	0-Install Lighting Controls Dev	10	0	0.7	0.7	4,709	4,709	0	0%	\$0	\$0	\$0	\$0	0.0
264	Corridor	CTQ	Troffer (CF)	3	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	3	0	0.2	0.2	2,024	2,024	0	0%	\$0	\$0	\$0	\$0	0.0
265	H/C Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
266	Men's Washroom	CDI	Downlight	4	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	4	0	0.1	0.1	905	905	0	0%	\$0	\$0	\$0	\$0	0.0
266	Men's Washroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	6,116	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	190	159	31	16%	\$2	\$4	\$6	\$10	6.1
267	Women's Washroom	CDI	Downlight	4	2408	1 - 32w triple CF	6,116	8000	0-Install Lighting Controls Dev	4	0	0.1	0.1	905	905	0	0%	\$0	\$0	\$0	\$0	0.0
267	Women's Washroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	6,116	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	190	159	31	16%	\$2	\$4	\$6	\$10	6.1
269/271	Corridor	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
269/271	Corridor	FTD	F1x4 Rec	7	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	2,526	2,226	300	12%	\$17	\$59	\$43	\$102	6.2
269/271	Corridor	CTQ	Troffer (CF)	5	2514	2 - 38/40w long EM-RS CF	6,116	8000	0-Install Lighting Controls Dev	5	0	0.4	0.4	2,355	2,355	0	0%	\$0	\$0	\$0	\$0	0.0
300	Reception Area/Display Ca	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	6,116	9000	0-No Action	1	0	0.1	0.1	471	471	0	0%	\$0	\$0	\$0	\$0	0.0
300	Reception Area/Display Ca	IDO	Downlight Round	2	1203	1 - 35w MR16	6,116	9000	0-No Action	2	0	0.1	0.1	428	428	0	0%	\$0	\$0	\$0	\$0	0.0
300	Reception Area/Display Ca	IDO	Downlight Round	2	1203	1 - 35w MR16	6,116	9000	0-No Action	2	0	0.1	0.1	428	428	0	0%	\$0	\$0	\$0	\$0	0.0
300	Reception Area/Display Ca	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	6,116	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	1,052	930	122	12%	\$7	\$25	\$12	\$38	5.6
300	Reception Area/Display Ca	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	6,116	9000	0-No Action	1	0	0.1	0.1	471	471	0	0%	\$0	\$0	\$0	\$0	0.0
300	Reception Area/Display Ca	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
301	Waiting Area	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	3,060	9000	0-No Action	2	0	0.0	0.0	471	471	0	0%	\$0	\$0	\$0	\$0	0.0
301	Waiting Area	IDO	Downlight Round	1	1203	1 - 35w MR16	3,060	9000	0-No Action	1	0	0.0	0.0	107	107	0	0%	\$0	\$0	\$0	\$0	0.0
301	Waiting Area	CDA	Downlight	1	2211	1 - 13w CF	3,060	9000	0-No Action	1	0	0.0	0.0	49	49	0	0%	\$0	\$0	\$0	\$0	0.0
301	Waiting Area	CDA	Downlight	1	2211	1 - 13w CF	3,060	9000	0-No Action	1	0	0.0	0.0	49	49	0	0%	\$0	\$0	\$0	\$0	0.0
301	Waiting Area	IDO	Downlight Round	3	1203	1 - 35w MR16	3,060	9000	0-No Action	3	0	0.0	0.0	321	321	0	0%	\$0	\$0	\$0	\$0	0.0
302	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
303	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
304	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	9430	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.1	0.1	176	157	18	10%	\$5	\$25	\$49	\$75	16.0
305	Kitchen	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	181	159	21	12%	\$2	\$8	\$6	\$15	9.7
306	Communication Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
307	H/C Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
308	Meeting Room	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	175	155	20	12%	\$2	\$13	\$6	\$19	10.9
308	Meeting Room	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	175	155	20	12%	\$2	\$13	\$6	\$19	10.9
309	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
310	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
311	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
312	Operation Centre	FTJ	F2x4 Rec	9	3264	3 - 32w RSFI T8 EL-IS	2,550	9427	2-Delamp to 2 - 28w 4' RSFI T	9	57	0.7	0.5	1,974	1,308	666	34%	\$51	\$233	\$221	\$454	9.0
313	Mechanical Room	FSF	F4' striplight	6	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	6	52	0.1	0.1	90	80	11	12%	\$1	\$51	\$37	\$88	60.9
314	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
315	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
316	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
317	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
318	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
320	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
321	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
322	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
323	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
324	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
325	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
326	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
326 (30)	Men's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	4,080	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	241	212	29	12%	\$2	\$8	\$6	\$15	8.2
327	Office	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	326	287	39	12%	\$4	\$34	\$25	\$58	14.2
327	Office	CDA	Downlight	3	2211	1 - 13w CF	1,380	9000	0-No Action	3	0	0.0	0.0	66	66	0	0%	\$0	\$0	\$0	\$0	0.0
327A	Electrical Closet	NEL	No Existing Luminaire	1	1000	1 - No Lamp	255	9000	0-No Action	1	0	0.0	0.0	0	0	0	0%	\$0	\$0	\$0	\$0	0.0
329	Storage	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,040	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	123	108	15	12%	\$1	\$17	\$12	\$29	31.6
331	Multipurpose Room	CTP	Troffer (CF)	9	2520	3 - 38/40w EI-PRS long CF	1,380	9000	0-No Action	9	0	1.1	1.1	1,553	1,553	0	0%	\$0	\$0	\$0	\$0	0.0
331	Multipurpose Room	IDA	Downlight Round	6	1132	1 - 60w Inc A19	1,380	9000	0-No Action	6	0	0.3	0.3	497	497	0	0%	\$0	\$0	\$0	\$0	0.0
331	Multipurpose Room	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
332	Multipurpose Room	CTP	Troffer (CF)	6	2520	3 - 38/40w EI-PRS long CF	1,380	9000	0-No Action	6	0	0.7	0.7	1,035	1,035	0	0%	\$0	\$0	\$0	\$0	0.0
332	Multipurpose Room	IDA	Downlight Round	4	1132	1 - 60w Inc A19	1,380	9000	0-No Action	4	0	0.2	0.2	331	331	0	0%	\$0	\$0	\$0	\$0	0.0
332	Multipurpose Room	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
333	Multipurpose Room	IDA	Downlight Round	5	1132	1 - 60w Inc A19	1,380	9000	0-No Action	5	0	0.3	0.3	414	414	0	0%	\$0	\$0	\$0	\$0	0.0
333	Multipurpose Room	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
333	Multipurpose Room	CTP	Troffer (CF)	6	2520	3 - 38/40w EI-PRS long CF	1,380	9000	0-No Action	6	0	0.7	0.7	1,035	1,035	0	0%	\$0	\$0	\$0	\$0	0.0
334	Classroom	FTJ	F2x4 Rec	9	3264	3 - 32w RSFI T8 EL-IS	3,570	2940	3-Relamp with 28w 4' RSFI T	9	76	0.7	0.6	2,763	2,442	321	12%	\$21	\$114	\$55	\$170	8.0
335	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	3,570	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	2,860	2,506	353	12%	\$23	\$114	\$55	\$170	7.3
336	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
337	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
338	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
339	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
340	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
341	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
343	Mechanical Room	FSF	F4' striplight	6	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	6	52	0.1	0.1	90	80	11	12%	\$1	\$51	\$37	\$88	60.9
345	Men's Washroom	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	6,116	9428	1-Delamp to 1 - 28w 4' RSFI T	2	29	0.1	0.1	722	355	367	51%	\$20	\$17	\$74	\$91	4.5
345	Men's Washroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	6,116	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	190	159	31	16%	\$2	\$4	\$6	\$10	6.1

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
346	Women's Washroom	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	1,443	1,272	171	12%	\$9	\$34	\$25	\$58	6.2
346	Women's Washroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	6,116	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	190	159	31	16%	\$2	\$4	\$6	\$10	6.1
347	H/C Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
349	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
350	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
351	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
352	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
353	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
354	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
355	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
356	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
357	Open Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	241	212	29	12%	\$2	\$17	\$12	\$29	12.0
358	Open Office	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	2,550	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.2	0.2	658	436	222	34%	\$17	\$78	\$74	\$151	9.0
359	Open Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,550	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	439	291	148	34%	\$11	\$52	\$49	\$101	9.0
360	Open Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,550	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	439	388	51	12%	\$4	\$25	\$12	\$38	9.7
361	Corridor	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	1,551	1,367	184	12%	\$9	\$25	\$18	\$44	4.7
361	Corridor	FTD	F1x4 Rec	5	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	1,804	1,590	214	12%	\$12	\$42	\$31	\$73	6.2
361	Corridor	IXL	LED Exit sign	5	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	5	0	0.0	0.0	88	88	0	0%	\$0	\$0	\$0	\$0	0.0
362	Corridor	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
362	Corridor	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	722	636	86	12%	\$5	\$17	\$12	\$29	6.2
362	Corridor	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
363	Corridor	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	1,443	1,272	171	12%	\$9	\$34	\$25	\$58	6.2
363	Corridor	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
363	Corridor	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
364/365	Corridor	FTD	F1x4 Rec	7	3244	2 - 32w RSFI T8 EL-IS	6,116	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	2,526	2,226	300	12%	\$17	\$59	\$43	\$102	6.2
364/365	Corridor	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	6,116	2940	3-Relamp with 28w 4' RSFI T	3	76	0.2	0.2	1,578	1,394	183	12%	\$10	\$38	\$18	\$57	5.6
364/365	Corridor	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	1,551	1,367	184	12%	\$9	\$25	\$18	\$44	4.7
366	Storage	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
4000	Telescope Room	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
4000	Telescope Room	ICB	Wall Sconce	7	1133	2 - 60w Inc A19	51	9000	0-No Action	7	0	0.8	0.8	43	43	0	0%	\$0	\$0	\$0	\$0	0.0
4000B	"Holding"	FBG	F1x4 Box	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
4000B	"Holding"	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
4002	Storage	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	1,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	61	54	7	12%	\$0	\$8	\$6	\$15	31.6
402	Work Room	FBG	F1x4 Box	4	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	326	287	39	12%	\$4	\$34	\$25	\$58	14.2
Back En	Back Entrance	CDI	Downlight	2	2408	1 - 32w triple CF	4,380	9000	0-No Action	2	0	0.1	0.1	324	324	0	0%	\$0	\$0	\$0	\$0	0.0
Back En	Back Entrance	MFB	Floodlight	8	5006	1 - 100w MH	4,380	9000	0-No Action	8	0	1.0	1.0	4,555	4,555	0	0%	\$0	\$0	\$0	\$0	0.0
Baseme	Basement Mechanical Roo	FSF	F4' striplight	6	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	6	52	0.1	0.1	90	80	11	12%	\$1	\$51	\$37	\$88	60.9
Elevator	Elevator	FSF	F4' striplight	2	3509	2 - 40w RSFI T12 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	1,472	841	631	43%	\$32	\$81	\$49	\$131	4.1
Ext-Mai	Main Entrance	CDI	Downlight	5	2408	1 - 32w triple CF	4,380	9000	0-No Action	5	0	0.2	0.2	810	810	0	0%	\$0	\$0	\$0	\$0	0.0
Ext-Mai	Main Entrance - High Ceili	MDE	Downlight	5	5010	1 - 175w MH	4,380	9000	0-No Action	5	0	1.0	1.0	4,599	4,599	0	0%	\$0	\$0	\$0	\$0	0.0
Perimet	Perimeter	HPE	Post Top	14	6006	1 - 100w HPS	4,380	9000	0-No Action	14	0	0.2	0.2	7,972	7,972	0	0%	\$0	\$0	\$0	\$0	0.0
Side Ent	Side Entrance	CDI	Downlight	2	2408	1 - 32w triple CF	4,380	9000	0-No Action	2	0	0.1	0.1	324	324	0	0%	\$0	\$0	\$0	\$0	0.0
Stairwell	Stairwell #1	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
Stairwell	Stairwell #1	FBG	F1x4 Box	5	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	2,584	2,278	307	12%	\$16	\$42	\$31	\$73	4.7
Stairwell	Stairwell #2	FBG	F1x4 Box	6	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	3,101	2,733	368	12%	\$19	\$51	\$37	\$88	4.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



Room: Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
Stairwell Stairwell #2	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
Stairwell Stairwell #2	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	1	0	0.1	0.1	675	675	0	0%	\$0	\$0	\$0	\$0	0.0
STR-to- Stair to 4th Floor	FBG	F1x4 Box	6	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	3,101	2,733	368	12%	\$19	\$51	\$37	\$88	4.7
STR-to- Stair to 4th Floor	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
STR-to- Stair to 4th Floor	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	1,500	9000	0-No Action	1	0	0.1	0.1	116	116	0	0%	\$0	\$0	\$0	\$0	0.0
Existing Energy Summary for Building International Building:			857				857 50.3 45.4 199,332 181,019 18,313 9% \$1,207 \$9,196 \$4,883 \$14,079 11.7														

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Library

Building Code: LIB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
100	Atrium	MHF	High / Low Bay	3	5012	1 - 250w MH	4,380	5522	1-165w QL Induction	3	165	0.8	0.5	3,837	2,168	1,669	43%	\$102	\$1,825	\$380	\$2,205	21.6
100A	Entrance Area	CDH	Downlight	4	2314	2 - 26w quad CF	4,380	9000	0-No Action	4	0	0.2	0.2	1,016	1,016	0	0%	\$0	\$0	\$0	\$0	0.0
100B	Atrium Display Case	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	377	193	184	49%	\$9	\$40	\$25	\$65	6.9
102	Circulation Desk	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	4,732	9430	2-Delamp to 2 - 28w 4' RSFI T	4	57	0.2	0.2	1,205	1,079	126	10%	\$13	\$51	\$98	\$149	11.6
102	Circulation Desk	FTJ	F2x4 Rec	11	3264	3 - 32w RSFI T8 EL-IS	4,732	9430	2-Delamp to 2 - 28w 4' RSFI T	11	57	0.9	0.6	4,476	2,967	1,510	34%	\$90	\$140	\$270	\$410	4.6
102	Circulation Desk	FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	4,732	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	279	194	85	31%	\$5	\$68	\$25	\$93	18.2
102A	Office	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	920	454	466	51%	\$31	\$151	\$49	\$200	6.4
102A	Office	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	2,838	841	1,997	70%	\$101	\$151	\$49	\$200	2.0
102A	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	4,732	2846	3-28w 4' RSFI T8 ES HE EL-I	1	72	0.1	0.1	700	341	360	51%	\$21	\$83	\$31	\$113	5.3
102B	Office	FTK	F2x4 Rec	1	3304	4 - 32w RSFI T8 EE 2&2	4,732	2864	2-28w 4' RSFI T8 ES HE EL-	1	74	0.1	0.0	409	350	59	14%	\$6	\$47	\$25	\$71	11.5
104	Storage	FWF	F1x4 Wrap	1	3240	2 - 32w RSFI T8 EE	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	72	48	24	33%	\$2	\$41	\$25	\$65	42.3
106	Elevator Machine Room	FTK	F2x4 Rec	1	3304	4 - 32w RSFI T8 EE 2&2	51	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	7	2	5	67%	\$2	\$76	\$25	\$100	40.1
108	Library	FTK	F2x4 Rec	25	3308	4 - 32w RSFI T8 EL-IS	4,732	9425	2-Delamp to 2 - 28w 4' RSFI T	25	60	2.7	1.4	13,250	7,098	6,152	46%	\$367	\$423	\$921	\$1,344	3.7
108	Library	FTK	F2x4 Rec	10	3308	4 - 32w RSFI T8 EL-IS	8,760	9425	2-Delamp to 2 - 28w 4' RSFI T	10	60	1.1	0.6	9,811	5,256	4,555	46%	\$231	\$169	\$368	\$538	2.3
108	Library	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	4,732	9425	2-Delamp to 2 - 28w 4' RSFI T	2	60	0.2	0.1	1,060	568	492	46%	\$29	\$34	\$74	\$108	3.7
108	Library	FTG	F2x2 Rec	5	3348	2 - 32w RSFI T8/U6 EL IS	4,732	3771	2-17w RSFI T8 HE EL-HBF W	5	41	0.3	0.2	1,396	970	426	31%	\$25	\$340	\$123	\$463	18.2
108	Library	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
108	Library	CDH	Downlight	1	2314	2 - 26w quad CF	4,732	9000	0-No Action	1	0	0.1	0.1	274	274	0	0%	\$0	\$0	\$0	\$0	0.0
110	Women's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	4,732	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	279	246	33	12%	\$2	\$8	\$6	\$15	7.4
110	Women's Washroom	FCF	F1x4 Cubelight	2	3475	2 - 34w RSFI T12 EE	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	681	454	227	33%	\$14	\$81	\$49	\$131	9.6
112	Men's Washroom	FWF	F1x4 Wrap	1	3475	2 - 34w RSFI T12 EE	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	341	227	114	33%	\$7	\$41	\$25	\$65	9.6
112	Men's Washroom	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	4,732	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	279	246	33	12%	\$2	\$8	\$6	\$15	7.4
112	Men's Washroom	FCF	F1x4 Cubelight	1	3475	2 - 34w RSFI T12 EE	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	341	227	114	33%	\$7	\$41	\$25	\$65	9.6
114	Books Storage	FTK	F2x4 Rec	4	3308	4 - 32w RSFI T8 EL-IS	1,000	9425	2-Delamp to 2 - 28w 4' RSFI T	4	60	0.1	0.0	269	240	29	11%	\$4	\$68	\$147	\$215	51.8
114	Books Storage	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.0	0.0	194	96	98	51%	\$7	\$151	\$49	\$200	27.6
116	Study Room	FTK	F2x4 Rec	2	3483	4 - 34w RSFI T12 - Std 2 b	2,040	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	661	196	465	70%	\$40	\$151	\$49	\$200	5.1
118	Server Room	FWF	F1x4 Wrap	1	3240	2 - 32w RSFI T8 EE	255	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	18	12	6	33%	\$2	\$41	\$25	\$65	26.8
120	Handicap Washroom	FCF	F1x4 Cubelight	2	3240	2 - 32w RSFI T8 EE	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	681	454	227	33%	\$14	\$81	\$49	\$131	9.6
122	Mechanical Room	NEL	No Existing Luminaire	1	1000	1 - No Lamp	255	9000	0-No Action	1	0	0.0	0.0	0	0	0	0%	\$0	\$0	\$0	\$0	0.0
126	Library	FTK	F2x4 Rec	10	3308	4 - 32w RSFI T8 EL-IS	8,760	9429	2-Delamp to 2 - 28w 4' RSFI T	10	60	1.1	0.6	9,811	5,256	4,555	46%	\$231	\$169	\$368	\$538	2.3
126	Library	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	4,732	9429	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	530	284	246	46%	\$15	\$17	\$37	\$54	3.7
126	Library	FTK	F2x4 Rec	62	3308	4 - 32w RSFI T8 EL-IS	4,732	9429	2-Delamp to 2 - 28w 4' RSFI T	67	60	6.6	3.8	32,859	19,023	13,836	42%	\$825	\$1,134	\$2,468	\$3,602	4.4
126	Library	FTG	F2x2 Rec	14	3348	2 - 32w RSFI T8/U6 EL IS	4,732	3771	2-17w RSFI T8 HE EL-HBF W	14	41	0.8	0.5	3,909	2,716	1,192	31%	\$71	\$952	\$344	\$1,295	18.2
126	Library	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
128	Archives	FTI	F2x4 Rec	9	3475	2 - 34w RSFI T12 EE	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	9	48	0.6	0.4	3,066	2,044	1,022	33%	\$61	\$367	\$221	\$588	9.6
130	Mechanical Room	FID	F1x4 Industrial	2	3474	2 - 34w RSFI T12 - Std	255	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.0	0.0	41	24	17	41%	\$2	\$81	\$115	\$197	87.0
132	Elec/Mech/F/A Room	FID	F1x4 Industrial	2	3474	2 - 34w RSFI T12 - Std	51	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.0	0.0	8	5	3	41%	\$2	\$81	\$115	\$197	114.5
134	Library	FTK	F2x4 Rec	14	3308	4 - 32w RSFI T8 EL-IS	4,732	9425	2-Delamp to 2 - 28w 4' RSFI T	14	60	1.5	0.8	7,420	3,975	3,445	46%	\$205	\$237	\$516	\$753	3.7
134	Library	FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	4,732	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.2	0.2	1,117	776	341	31%	\$20	\$272	\$98	\$370	18.2
138	Library	CDH	Downlight	6	2314	2 - 26w quad CF	4,732	2801	0-Delamp to 1 x 26w CF lamp	6	27	0.3	0.2	1,647	767	880	53%	\$53	\$0	\$324	\$324	6.2
138	Library	FTD	F1x4 Rec	9	3244	2 - 32w RSFI T8 EL-IS	4,732	2933	2-Relamp with 28w 4' RSFI T	9	52	0.5	0.4	2,513	2,215	298	12%	\$18	\$76	\$55	\$131	7.4
138	Library	FTK	F2x4 Rec	9	3308	4 - 32w RSFI T8 EL-IS	4,732	9429	2-Delamp to 2 - 28w 4' RSFI T	9	60	1.0	0.5	4,770	2,555	2,215	46%	\$132	\$152	\$332	\$484	3.7
138	Library	FTK	F2x4 Rec	8	3308	4 - 32w RSFI T8 EL-IS	8,760	9429	2-Delamp to 2 - 28w 4' RSFI T	8	60	0.9	0.5	7,849	4,205	3,644	46%	\$185	\$135	\$295	\$430	2.3
138	Library	FTK	F2x4 Rec	12	3308	4 - 32w RSFI T8 EL-IS	4,732	9429	2-Delamp to 2 - 28w 4' RSFI T	12	60	1.3	0.7	6,360	3,407	2,953	46%	\$176	\$203	\$442	\$645	3.7
138	Library	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Library

Building Code: LIB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)	
140	Study Room	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	4,732	2852	4-28w 4' RSFI T8 ES HE EL-I	2	96	0.3	0.2	1,401	909	492	35%	\$29	\$115	\$86	\$201	6.9
201/230	Library - Lower Ceiling Are	FTK	F2x4 Rec	34	3308	4 - 32w RSFI T8 EL-IS	4,732	9429	2-Delamp to 2 - 28w 4' RSFI T	34	60	3.6	1.9	18,019	9,653	8,366	46%	\$499	\$576	\$1,253	\$1,828	3.7
201/230	Library - Lower Ceiling Are	FTK	F2x4 Rec	4	3308	4 - 32w RSFI T8 EL-IS	8,760	9429	2-Delamp to 2 - 28w 4' RSFI T	4	60	0.4	0.2	3,924	2,102	1,822	46%	\$93	\$68	\$147	\$215	2.3
201/230	Library - Lower Ceiling Are	FTK	F2x4 Rec	10	3308	4 - 32w RSFI T8 EL-IS	4,732	9429	2-Delamp to 2 - 28w 4' RSFI T	10	60	0.6	0.3	3,180	2,839	341	11%	\$42	\$169	\$368	\$538	12.7
201/230	Library - Lower Ceiling Are	FTK	F2x4 Rec	3	3483	4 - 34w RSFI T12 - Std 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.5	0.1	2,300	681	1,618	70%	\$97	\$227	\$74	\$301	3.1
201/230	Library - Lower Ceiling Are	FTK	F2x4 Rec	5	3484	4 - 34w RSFI T12 - EE 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	5	48	0.7	0.2	3,502	1,136	2,366	68%	\$141	\$378	\$123	\$501	3.6
201A	Library - Lower Ceiling Are	FTK	F2x4 Rec	1	3483	4 - 34w RSFI T12 - Std 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.2	0.0	767	227	539	70%	\$32	\$76	\$25	\$100	3.1
201A	Library - Lower Ceiling Are	FTG	F2x2 Rec	6	3348	2 - 32w RSFI T8/U6 EL IS	4,732	3771	2-17w RSFI T8 HE EL-HBF W	6	41	0.3	0.2	1,675	1,164	511	31%	\$30	\$408	\$147	\$555	18.2
201A	Library - Lower Ceiling Are	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	1,034	718	315	31%	\$16	\$136	\$49	\$185	11.6
201A	Library - Lower Ceiling Are	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
202	Children's Books	FTI	F2x4 Rec	1	3474	2 - 34w RSFI T12 - Std	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	383	227	156	41%	\$9	\$41	\$25	\$65	7.0
203/207	Library Admin	FTK	F2x4 Rec	11	3484	4 - 34w RSFI T12 - EE 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	11	48	1.5	0.5	7,704	2,498	5,205	68%	\$310	\$832	\$270	\$1,102	3.6
203/207	Library Admin	FTK	F2x4 Rec	1	3483	4 - 34w RSFI T12 - Std 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.2	0.0	767	227	539	70%	\$32	\$76	\$25	\$100	3.1
204	Office	FTK	F2x4 Rec	3	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.4	0.1	870	282	588	68%	\$51	\$227	\$74	\$301	5.9
206	Lunchroom	FTK	F2x4 Rec	4	3484	4 - 34w RSFI T12 - EE 2 b	2,040	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.6	0.2	1,208	392	816	68%	\$69	\$303	\$98	\$401	5.8
208	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	290	94	196	68%	\$17	\$76	\$25	\$100	5.9
208	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	290	94	196	68%	\$17	\$76	\$25	\$100	5.9
209	Computer Lab/Library Sem	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	3,060	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	343	184	159	46%	\$11	\$17	\$37	\$54	4.8
209	Computer Lab/Library Sem	FTK	F2x4 Rec	5	3483	4 - 34w RSFI T12 - Std 2 b	3,060	2832	2-28w 4' RSFI T8 ES HE EL-I	5	48	0.8	0.2	2,479	734	1,744	70%	\$122	\$378	\$123	\$501	4.1
210	Office	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	580	188	392	68%	\$34	\$151	\$49	\$200	5.9
211	Storage	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	51	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	8	2	5	68%	\$3	\$76	\$25	\$100	38.5
212	Office	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	580	188	392	68%	\$34	\$151	\$49	\$200	5.9
213	Open Office	FTK	F2x4 Rec	6	3484	4 - 34w RSFI T12 - EE 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	6	48	0.8	0.3	4,202	1,363	2,839	68%	\$169	\$454	\$147	\$601	3.6
213	Open Office	FTK	F2x4 Rec	3	3484	4 - 34w RSFI T12 - EE 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.4	0.1	2,101	681	1,420	68%	\$85	\$227	\$74	\$301	3.6
213	Open Office	FTK	F2x4 Rec	7	3308	4 - 32w RSFI T8 EL-IS	4,732	9425	2-Delamp to 2 - 28w 4' RSFI T	7	60	0.7	0.4	3,710	1,987	1,722	46%	\$103	\$118	\$258	\$376	3.7
213	Open Office	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
214	Office	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	290	94	196	68%	\$17	\$76	\$25	\$100	5.9
214	Office	FTK	F2x4 Rec	1	3483	4 - 34w RSFI T12 - Std 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.2	0.0	318	94	223	70%	\$19	\$76	\$25	\$100	5.2
215	Storage	FTK	F2x4 Rec	1	3483	4 - 34w RSFI T12 - Std 2 b	51	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	8	2	6	70%	\$3	\$76	\$25	\$100	33.8
216	Storage/Office	FWF	F1x4 Wrap	2	3475	2 - 34w RSFI T12 EE	51	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.0	0.0	7	5	2	33%	\$1	\$81	\$49	\$131	104.5
217	File Room	FTK	F2x4 Rec	3	3484	4 - 34w RSFI T12 - EE 2 b	51	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.1	0.0	23	7	15	68%	\$8	\$227	\$74	\$301	38.5
217	File Room	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	8,760	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.0	0.0	981	526	456	46%	\$20	\$17	\$37	\$54	2.7
217	File Room	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
219	Office	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	141	94	47	33%	\$4	\$41	\$25	\$65	16.0
219	Office	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	1,960	9425	2-Delamp to 2 - 28w 4' RSFI T	2	60	0.2	0.1	439	235	204	46%	\$18	\$34	\$74	\$108	6.1
219A	Storage	FTG	F2x2 Rec	1	3496	2 - 34w RSFI T12U - Std	51	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.0	0.0	4	2	2	49%	\$1	\$68	\$25	\$93	88.9
220	Men's Washroom	FCF	F1x4 Cubelight	3	3475	2 - 34w RSFI T12 EE	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	1,022	681	341	33%	\$20	\$122	\$74	\$196	9.6
221	Janitor Room	FBN	F2x4 Box	1	3483	4 - 34w RSFI T12 - Std 2 b	255	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	41	12	29	70%	\$4	\$76	\$25	\$100	25.6
222	Women's Washroom	FCF	F1x4 Cubelight	3	3475	2 - 34w RSFI T12 EE	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	1,022	681	341	33%	\$20	\$122	\$74	\$196	9.6
223	Women's Washroom	FCF	F1x4 Cubelight	1	3475	2 - 34w RSFI T12 EE	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	72	48	24	33%	\$3	\$41	\$25	\$65	20.7
224/226	Library - High Ceiling Area	FTK	F2x4 Rec	28	3304	4 - 32w RSFI T8 EE 2&2	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	28	48	3.8	1.3	19,079	6,360	12,720	67%	\$759	\$2,118	\$2,169	\$4,287	5.7
224/226	Library - High Ceiling Area	FTK	F2x4 Rec	23	3329	4 - 32w RSFI T8 EL-RS 2&	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	23	48	2.7	1.0	13,496	5,224	8,272	61%	\$493	\$1,740	\$1,782	\$3,521	7.1
224/226	Library - High Ceiling Area	FTK	F2x4 Rec	4	3483	4 - 34w RSFI T12 - Std 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.6	0.2	3,066	909	2,158	70%	\$129	\$303	\$310	\$612	4.8
224/226	Library - High Ceiling Area	FTK	F2x4 Rec	23	3308	4 - 32w RSFI T8 EL-IS	4,732	9425	2-Delamp to 2 - 28w 4' RSFI T	23	60	2.4	1.3	12,190	6,530	5,659	46%	\$338	\$389	\$2,064	\$2,453	7.3
224/226	Library - High Ceiling Area	FTK	F2x4 Rec	12	3308	4 - 32w RSFI T8 EL-IS	8,760	9425	2-Delamp to 2 - 28w 4' RSFI T	12	60	1.3	0.7	11,773	6,307	5,466	46%	\$278	\$203	\$1,077	\$1,280	4.6

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Library

Building Code: LIB



Room: Room Type:	Existing Luminaire/Lamp Data						Retrofit Data																																		
	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)																					
224/226 Library - High Ceiling Area	FTG	F2x2 Rec	1	3496	2 - 34w RSFI T12U - Std	4,732	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	383	194	189	49%	\$11	\$68	\$77	\$145	12.9																				
224/226 Library - High Ceiling Area	FTG	F2x2 Rec	12	3497	2 - 34w RSFI T12U EE	4,732	3771	2-17w RSFI T8 HE EL-HBF W	12	41	0.8	0.5	4,088	2,328	1,760	43%	\$105	\$816	\$930	\$1,745	16.6																				
224/226 Library - High Ceiling Area	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	4,732	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	558	388	170	31%	\$10	\$136	\$155	\$291	28.6																				
224/226 Library - High Ceiling Area	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0																				
224b Library-Low Ceiling	FWF	F1x4 Wrap	11	3244	2 - 32w RSFI T8 EL-IS	4,732	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	3,071	2,707	364	12%	\$22	\$93	\$68	\$161	7.4																				
224b Library-Low Ceiling	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0																				
225 Men's Washroom	FCF	F1x4 Cubelight	1	3474	2 - 34w RSFI T12 - Std	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	81	48	33	41%	\$4	\$41	\$25	\$65	15.0																				
228 Group Study Area	FTK	F2x4 Rec	3	3308	4 - 32w RSFI T8 EL-IS	2,000	9425	2-Delamp to 2 - 28w 4' RSFI T	3	60	0.3	0.2	672	360	312	46%	\$27	\$51	\$111	\$161	6.0																				
231 Storage	FTK	F2x4 Rec	1	3483	4 - 34w RSFI T12 - Std 2 b	4,732	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	767	227	539	70%	\$25	\$76	\$25	\$100	4.1																				
Elevator Elevator	FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	631	420	210	33%	\$11	\$41	\$25	\$65	6.1																				
Ext Perimeter	HWC	Wall Pack	7	6004	1 - 70w HPS	4,380	9000	0-No Action	7	0	0.1	0.1	2,790	2,790	0	0%	\$0	\$0	\$0	\$0	0.0																				
Ext Perimeter	CDO	Downlight	5	2009	1 - 15w CF ref fl SI (Screw	4,380	9000	0-No Action	5	0	0.0	0.0	329	329	0	0%	\$0	\$0	\$0	\$0	0.0																				
Ext Perimeter	HPE	Post Top	9	6006	1 - 100w HPS	4,380	9000	0-No Action	9	0	0.1	0.1	5,125	5,125	0	0%	\$0	\$0	\$0	\$0	0.0																				
ST2 Stairwell #2	FWF	F1x4 Wrap	2	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	1,261	841	420	33%	\$21	\$81	\$49	\$131	6.1																				
ST2 Stairwell #2	IXA	Inc Exit sign	1	1102	2 - 15w Inc A15	8,760	1003	1-1 Watt LED Exit light NEW	1	2	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2																				
ST3 Stairwell #3	FWF	F1x4 Wrap	3	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	1,892	1,261	631	33%	\$32	\$122	\$74	\$196	6.1																				
ST3 Stairwell #3	IXA	Inc Exit sign	1	1102	2 - 15w Inc A15	8,760	1003	1-1 Watt LED Exit light NEW	1	2	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2																				
ST3 Stairwell #3	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	8,760	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	981	858	123	13%	\$6	\$17	\$6	\$23	3.7																				
Existing Energy Summary for Building Library:			555			560			51.5			26.2			276,226			147,978			128,248			46%			\$7,613			\$21,025			\$21,789			\$42,814			5.6		

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
1016	Security Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	4,380	9419	2-Delamp to 2 - 28w 4' RSFI T	3	52	0.3	0.1	1,169	683	486	42%	\$30	\$38	\$111	\$149	5.0
1016A	Security Office Back Room	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	4,380	9419	2-Delamp to 2 - 28w 4' RSFI T	1	52	0.1	0.0	390	228	162	42%	\$10	\$13	\$37	\$50	5.0
1100	Advising	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	3,315	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	525	318	207	39%	\$16	\$196	\$61	\$257	15.8
1100	Advising	FTJ	F2x4 Rec	1	3260	3 - 32w RSFI T8 EE 1&2	3,315	2836	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	355	159	196	55%	\$13	\$98	\$31	\$129	9.7
1100	Advising	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1100	Advising	FTJ	F2x4 Rec	6	3260	3 - 32w RSFI T8 EE 1&2	3,315	2836	2-28w 4' RSFI T8 ES HE EL-I	6	48	0.5	0.2	1,575	955	620	39%	\$49	\$587	\$184	\$771	15.8
1104	Office	FTI	F2x4 Rec	2	3240	2 - 32w RSFI T8 EE	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	282	188	94	33%	\$8	\$81	\$49	\$131	16.0
1108	Office	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	310	188	122	39%	\$13	\$196	\$61	\$257	19.9
1113	Office	FTJ	F2x4 Rec	3	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	466	282	183	39%	\$19	\$294	\$92	\$386	19.9
1117	Office	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	310	188	122	39%	\$13	\$196	\$61	\$257	19.9
1121	Office	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	310	188	122	39%	\$13	\$196	\$61	\$257	19.9
1125	Office	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	310	188	122	39%	\$13	\$196	\$61	\$257	19.9
1129	Office	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	310	188	122	39%	\$13	\$196	\$61	\$257	19.9
1135	Office	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	310	188	122	39%	\$13	\$196	\$61	\$257	19.9
1137	Office	FTJ	F2x4 Rec	3	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	466	282	183	39%	\$19	\$294	\$92	\$386	19.9
1140	Storage	FTI	F2x4 Rec	2	3240	2 - 32w RSFI T8 EE	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.0	0.0	144	96	48	33%	\$3	\$81	\$49	\$131	42.3
1141	File Room	FTI	F2x4 Rec	3	3240	2 - 32w RSFI T8 EE	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	216	144	72	33%	\$9	\$122	\$74	\$196	20.7
1144	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	169	112	57	34%	\$5	\$26	\$25	\$50	10.2
1152	Copier Room	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	391	345	46	12%	\$3	\$17	\$12	\$29	9.3
1155	Registrar and Admissions	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	525	378	147	28%	\$13	\$52	\$49	\$101	8.0
1155	Registrar and Admissions	FTJ	F2x4 Rec	4	3260	3 - 32w RSFI T8 EE 1&2	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	4	57	0.3	0.2	1,050	756	294	28%	\$25	\$104	\$98	\$202	8.0
1155A	Registrar and Admissions	FLK	F8' Tubelight / Linear	11	3308	4 - 32w RSFI T8 EL-IS	3,315	2946	4-Relamp with 28w 4' RSFI T	11	98	1.2	1.0	4,084	3,574	511	13%	\$35	\$186	\$431	\$617	17.8
1155A	Registrar and Admissions	FLD	F4' Tubelight / Linear	6	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	1,174	1,034	139	12%	\$9	\$51	\$235	\$286	30.3
1157	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
1161	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
1165	Staff Kitchen	CDB	Downlight	2	2213	2 - 13w CF	3,315	9000	0-No Action	2	0	0.1	0.1	212	212	0	0%	\$0	\$0	\$0	\$0	0.0
1201	Classroom	FTC	F1x4 Rec	3	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	163	137	26	16%	\$2	\$13	\$18	\$31	12.8
1201	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
1204	Storage	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,040	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	123	108	15	12%	\$1	\$17	\$12	\$29	31.6
1205	Possible Comm Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	51	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	3	3	0	12%	\$0	\$8	\$6	\$15	80.1
1206	Print Shop	FTK	F2x4 Rec	12	3308	4 - 32w RSFI T8 EL-IS	2,040	2946	4-Relamp with 28w 4' RSFI T	12	98	1.3	1.1	2,742	2,399	343	13%	\$29	\$203	\$74	\$277	9.5
1210	Office	FBM	F2x4 Box	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9430	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	349	223	125	36%	\$11	\$25	\$49	\$75	6.8
1214	Printing Area	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1214	Printing Area	MHG	High / Low Bay	11	5014	1 - 400w MH	2,040	3755	6-32w RSFI T8 HE EL-HBF 2	13	220	4.7	2.7	10,098	5,834	4,264	42%	\$363	\$4,345	\$989	\$5,334	14.7
1214	Printing Area	MHG	High / Low Bay	1	5014	1 - 400w MH	8,760	3755	6-32w RSFI T8 HE EL-HBF 2	1	220	0.4	0.2	3,942	1,927	2,015	51%	\$102	\$334	\$76	\$410	4.0
1214A	Office	FWI	F2x4 Wrap	1	3483	4 - 34w RSFI T12 - Std 2 b	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.2	0.0	318	94	223	70%	\$19	\$76	\$25	\$100	5.2
1218	Collating Area	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1218	Collating Area	FRH	F8' tandem striplight w/ref	30	3308	4 - 32w RSFI T8 EL-IS	2,040	2946	4-Relamp with 28w 4' RSFI T	30	98	3.2	2.8	6,854	5,998	857	13%	\$73	\$508	\$1,176	\$1,684	23.1
1218	Collating Area	FRH	F8' tandem striplight w/ref	3	3308	4 - 32w RSFI T8 EL-IS	8,760	2946	4-Relamp with 28w 4' RSFI T	3	98	0.3	0.3	2,943	2,575	368	13%	\$19	\$51	\$118	\$168	9.0
1219	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
1222	Gear Bay Booth Entry	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	51	9430	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	9	6	3	34%	\$5	\$25	\$49	\$75	13.8
1226	Booth	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9430	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$25	\$49	\$75	7.5
1232	Gear Bay	FWH	F2x4 Wrap	3	3264	3 - 32w RSFI T8 EL-IS	8,760	2940	3-Relamp with 28w 4' RSFI T	3	76	0.2	0.2	2,260	1,997	263	12%	\$13	\$38	\$177	\$215	16.1
1232	Gear Bay	FWH	F2x4 Wrap	6	3264	3 - 32w RSFI T8 EL-IS	2,250	2940	3-Relamp with 28w 4' RSFI T	6	76	0.5	0.4	1,161	1,026	135	12%	\$11	\$76	\$354	\$430	39.4
1240	Gear Garage	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)	
1240	Gear Garage	MHG	High / Low Bay	9	5014	1 - 400w MH	2,250	3755	6-32w RSFI T8 HE EL-HBF 2	12	220	3.8	2.5	9,113	5,940	3,173	35%	\$257	\$4,011	\$1,151	\$5,162	20.1
1242	Office	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	174	153	22	12%	\$2	\$13	\$6	\$19	10.1
1244	Office	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	174	153	22	12%	\$2	\$13	\$6	\$19	10.1
1246	Office	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	174	153	22	12%	\$2	\$13	\$6	\$19	10.1
1248A	Exit Vestibule from Gear G	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1248A	Exit Vestibule from Gear G	FRF	F4' striplight w/reflector	1	3244	2 - 32w RSFI T8 EL-IS	2,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	163	144	19	12%	\$1	\$8	\$6	\$15	10.3
1251	Open Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	3,315	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	1,180	1,034	146	12%	\$10	\$51	\$25	\$75	7.6
1253	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1255	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1257A	Lunch Room	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1257B	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1259	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1261	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1263	Copy Room	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	120	106	14	12%	\$1	\$8	\$6	\$15	12.0
1265	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1267	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1269	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1271	Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	3	78	0.3	0.2	523	459	65	12%	\$6	\$38	\$18	\$57	10.1
1273	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1275	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1277	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1310	Wireless Lab	FTJ	F2x4 Rec	6	3260	3 - 32w RSFI T8 EE 1&2	3,640	2844	3-28w 4' RSFI T8 ES HE EL-I	6	73	0.6	0.4	2,337	1,594	743	32%	\$49	\$454	\$221	\$675	13.9
1320	Computer Support	FBG	F1x4 Box	9	3240	2 - 32w RSFI T8 EE	3,640	2832	2-28w 4' RSFI T8 ES HE EL-I	9	48	0.6	0.4	2,359	1,572	786	33%	\$51	\$367	\$221	\$588	11.4
1320A	Office	FBM	F2x4 Box	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	419	188	231	55%	\$20	\$196	\$61	\$257	12.8
1320B	Storage	FTJ	F2x4 Rec	3	3260	3 - 32w RSFI T8 EE 1&2	500	2836	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.1	0.0	161	72	89	55%	\$8	\$294	\$92	\$386	49.3
1325	Computer Lab	FTJ	F2x4 Rec	1	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	389	175	215	55%	\$14	\$98	\$31	\$129	9.2
1325	Computer Lab	FTJ	F2x4 Rec	16	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	16	48	1.2	0.5	4,611	2,796	1,816	39%	\$137	\$1,566	\$491	\$2,057	15.0
1327	Computer Lab	FTJ	F2x4 Rec	13	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	13	48	1.0	0.4	3,747	2,271	1,475	39%	\$111	\$1,272	\$399	\$1,671	15.0
1327	Computer Lab	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	779	349	430	55%	\$28	\$196	\$61	\$257	9.2
1327A	Storage	FWI	F2x4 Wrap	1	3308	4 - 32w RSFI T8 EL-IS	255	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.0	0.0	29	15	13	46%	\$2	\$17	\$37	\$54	30.2
1329	Open Computer Lab	FTJ	F2x4 Rec	8	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	8	48	0.8	0.4	3,116	1,398	1,718	55%	\$112	\$783	\$246	\$1,029	9.2
1330	Computer Lab	FTJ	F2x4 Rec	12	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	12	48	0.9	0.4	3,459	2,097	1,362	39%	\$103	\$1,174	\$368	\$1,543	15.0
1330	Computer Lab	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	779	349	430	55%	\$28	\$196	\$61	\$257	9.2
1330	Computer Lab	FTJ	F2x4 Rec	1	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	389	175	215	55%	\$14	\$98	\$31	\$129	9.2
1335	Computer Lab	FTJ	F2x4 Rec	15	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	15	48	1.1	0.5	4,323	2,621	1,702	39%	\$128	\$1,468	\$460	\$1,928	15.0
1340	Computer Lab	FTJ	F2x4 Rec	4	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.4	0.2	1,558	699	859	55%	\$56	\$391	\$123	\$514	9.2
1340	Computer Lab	FTJ	F2x4 Rec	10	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	10	48	0.8	0.3	2,882	1,747	1,135	39%	\$86	\$979	\$307	\$1,286	15.0
1340	Computer Lab	FTJ	F2x4 Rec	1	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	389	175	215	55%	\$14	\$98	\$31	\$129	9.2
1345	Computer Lab	FTJ	F2x4 Rec	15	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	15	48	1.1	0.5	4,323	2,621	1,702	39%	\$128	\$1,468	\$460	\$1,928	15.0
1345	Computer Lab	FTJ	F2x4 Rec	4	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.4	0.2	1,558	699	859	55%	\$56	\$391	\$123	\$514	9.2
1349	Open Computer Lab	FTJ	F2x4 Rec	8	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	8	48	0.8	0.4	3,116	1,398	1,718	55%	\$112	\$783	\$246	\$1,029	9.2
1350	Computer Room	FTJ	F2x4 Rec	10	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	10	48	0.8	0.3	2,882	1,747	1,135	39%	\$86	\$979	\$307	\$1,286	15.0
1350	Computer Room	FTJ	F2x4 Rec	3	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.3	0.1	1,168	524	644	55%	\$42	\$294	\$92	\$386	9.2
1350	Computer Room	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	779	349	430	55%	\$28	\$196	\$61	\$257	9.2
1355	Computer Lab	FTJ	F2x4 Rec	3	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.3	0.1	1,168	524	644	55%	\$42	\$294	\$92	\$386	9.2

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
1355	Computer Lab	FTJ	F2x4 Rec	12	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	12	48	0.9	0.4	3,459	2,097	1,362	39%	\$103	\$1,174	\$368	\$1,543	15.0
1360	Computer Room	FTJ	F2x4 Rec	5	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	5	48	0.5	0.2	1,947	874	1,074	55%	\$70	\$489	\$153	\$643	9.2
1360	Computer Room	FTJ	F2x4 Rec	9	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	9	48	0.7	0.3	2,594	1,572	1,021	39%	\$77	\$881	\$276	\$1,157	15.0
1360	Computer Room	FTJ	F2x4 Rec	1	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	389	175	215	55%	\$14	\$98	\$31	\$129	9.2
1365	Computer Lab	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	3,640	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	430	298	131	31%	\$9	\$136	\$49	\$185	21.6
1365	Computer Lab	FTJ	F2x4 Rec	8	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	8	48	0.6	0.3	2,306	1,398	908	39%	\$68	\$783	\$246	\$1,029	15.0
1365	Computer Lab	FTJ	F2x4 Rec	1	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	389	175	215	55%	\$14	\$98	\$31	\$129	9.2
1365	Computer Lab	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	3,640	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	779	349	430	55%	\$28	\$196	\$61	\$257	9.2
1365A	Server Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	255	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.1	0.1	32	29	3	10%	\$4	\$52	\$49	\$101	25.0
1365A	Server Room	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	255	3770	2-17w RSFI T8 HE EL-HBF	2	41	0.1	0.1	30	21	9	31%	\$4	\$96	\$49	\$145	39.8
1411	Journalism	FTJ	F2x4 Rec	12	3264	3 - 32w RSFI T8 EL-IS	1,000	9427	2-Delamp to 2 - 28w 4' RSFI T	12	57	1.0	0.6	1,032	684	348	34%	\$46	\$311	\$295	\$606	13.2
1412	International Admin	FTJ	F2x4 Rec	14	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	14	57	0.8	0.6	2,954	2,645	308	10%	\$40	\$363	\$344	\$707	17.7
1412A	Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,040	9430	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.0	0.0	66	59	7	10%	\$1	\$13	\$25	\$37	47.0
1421	Peer Support	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	351	310	41	12%	\$3	\$25	\$12	\$38	10.9
1438	Lunch Room	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	2,000	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.2	0.1	382	342	40	10%	\$7	\$78	\$74	\$151	20.3
1455	Examination Room	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,000	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	86	76	10	12%	\$1	\$13	\$6	\$19	14.3
1457	Staff Kitchen	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
1459	Examination Room	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	118	104	14	12%	\$2	\$17	\$12	\$29	15.9
1461	Health and Safety Front De	FTK	F2x4 Rec	4	3309	4 - 32w RSFI T8 EL-IS 2&2	1,380	2933	2-Relamp with 28w 4' RSFI T	4	52	0.4	0.2	651	287	364	56%	\$39	\$174	\$25	\$198	5.1
1461	Health and Safety Front De	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	150	133	18	12%	\$1	\$8	\$6	\$15	10.7
1461	Health and Safety Front De	FTK	F2x4 Rec	3	3309	4 - 32w RSFI T8 EL-IS 2&2	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.3	0.1	903	398	505	56%	\$38	\$130	\$18	\$149	3.9
1461A	Health and Safety Hallway	CSB	Surface (CF)	4	2213	2 - 13w CF	2,550	9000	0-No Action	4	0	0.1	0.1	326	326	0	0%	\$0	\$0	\$0	\$0	0.0
1462	Meeting Room	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	3	78	0.3	0.2	240	211	30	12%	\$4	\$38	\$18	\$57	13.4
1463	Drug Room	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	510	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	57	31	27	46%	\$6	\$17	\$37	\$54	9.3
1464	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1465	Examination Room	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	118	104	14	12%	\$2	\$17	\$12	\$29	15.9
1466	Office	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	3	78	0.3	0.2	523	459	65	12%	\$6	\$38	\$18	\$57	10.1
1468	Aboriginal Education	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	3	78	0.3	0.2	545	477	67	12%	\$6	\$38	\$18	\$57	9.9
1471	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	220	192	27	13%	\$2	\$17	\$6	\$23	9.7
1472	ITV Classroom	FTC	F1x4 Rec	3	3200	1 - 32w RSFI T8 EE	1,750	2820	1-28w 4' RSFI T8 ES HE EL-I	3	25	0.1	0.1	184	131	53	29%	\$5	\$105	\$74	\$178	36.8
1472	ITV Classroom	FTJ	F2x4 Rec	12	3260	3 - 32w RSFI T8 EE 1&2	1,750	2846	3-28w 4' RSFI T8 ES HE EL-I	12	72	1.2	0.8	2,247	1,512	735	33%	\$68	\$622	\$368	\$990	14.6
1473	Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	116	102	14	12%	\$1	\$8	\$6	\$15	12.3
1475	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
1477	Copy Room	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,000	9429	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	112	60	52	46%	\$7	\$17	\$37	\$54	7.9
1478	AV Repair	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	419	223	196	47%	\$17	\$52	\$49	\$101	5.9
1478	AV Repair	FWF	F1x4 Wrap	7	3240	2 - 32w RSFI T8 EE	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	7	48	0.5	0.3	988	659	329	33%	\$29	\$285	\$172	\$457	16.0
1478	AV Repair	FTD	F1x4 Rec	7	3240	2 - 32w RSFI T8 EE	1,960	2832	2-28w 4' RSFI T8 ES HE EL-I	7	48	0.5	0.3	988	659	329	33%	\$29	\$285	\$172	\$457	16.0
1479	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
1482	AV Desk	FTJ	F2x4 Rec	3	3260	3 - 32w RSFI T8 EE 1&2	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.3	0.2	629	335	294	47%	\$26	\$78	\$74	\$151	5.9
1482A	AV Loan Out	FTJ	F2x4 Rec	3	3260	3 - 32w RSFI T8 EE 1&2	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.3	0.2	629	335	294	47%	\$26	\$78	\$74	\$151	5.9
1484	Office	FTJ	F2x4 Rec	2	3260	3 - 32w RSFI T8 EE 1&2	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	419	223	196	47%	\$17	\$52	\$49	\$101	5.9
1486	AV Media	FTI	F2x4 Rec	8	3240	2 - 32w RSFI T8 EE	3,315	2832	2-28w 4' RSFI T8 ES HE EL-I	8	48	0.5	0.4	1,909	1,273	636	33%	\$43	\$326	\$196	\$522	12.1
1487	CICAC	ITH	Track Head	5	1139	1 - 60w Inc PAR38 Flood	3,060	9000	0-No Action	5	0	0.3	0.3	918	918	0	0%	\$0	\$0	\$0	\$0	0.0
1487	CICAC	IDB	Downlight Round	20	1146	1 - 75w Inc PAR38 Flood	3,060	9000	0-No Action	20	0	1.4	1.4	4,590	4,590	0	0%	\$0	\$0	\$0	\$0	0.0
1494	Media Services	FTJ	F2x4 Rec	6	3264	3 - 32w RSFI T8 EL-IS	1,840	9427	2-Delamp to 2 - 28w 4' RSFI T	6	57	0.5	0.3	949	629	320	34%	\$29	\$156	\$147	\$303	10.5

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
1496	Video Library	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	51	9427	2-Delamp to 2 - 28w 4' RSFI T	4	57	0.3	0.2	18	12	6	34%	\$11	\$104	\$98	\$202	18.7
1496	Video Library	FWF	F1x4 Wrap	2	3240	2 - 32w RSFI T8 EE	51	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	7	5	2	33%	\$4	\$81	\$49	\$131	29.2
1498	Photo Room	FWF	F1x4 Wrap	8	3240	2 - 32w RSFI T8 EE	2,040	2832	2-28w 4' RSFI T8 ES HE EL-I	8	48	0.5	0.4	1,175	783	392	33%	\$33	\$326	\$461	\$787	23.6
1501	Design Studio	FTJ	F2x4 Rec	16	3264	3 - 32w RSFI T8 EL-IS	1,000	9427	2-Delamp to 2 - 28w 4' RSFI T	16	57	1.3	0.9	1,376	912	464	34%	\$61	\$415	\$393	\$808	13.2
1501	Design Studio	FTC	F1x4 Rec	3	3208	1 - 32w RSFI T8 EL-IS	1,000	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	93	78	15	16%	\$2	\$13	\$18	\$31	15.8
1505	Storage	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,040	2933	2-Relamp with 28w 4' RSFI T	4	52	0.1	0.1	245	216	29	12%	\$2	\$34	\$25	\$58	31.6
1509	Print Making	FTJ	F2x4 Rec	8	3264	3 - 32w RSFI T8 EL-IS	1,000	2940	3-Relamp with 28w 4' RSFI T	8	76	0.7	0.6	688	608	80	12%	\$11	\$102	\$49	\$151	14.3
1509	Print Making	CTQ	Troffer (CF)	5	2514	2 - 38/40w long EM-RS CF	1,000	9000	0-No Action	5	0	0.4	0.4	385	385	0	0%	\$0	\$0	\$0	\$0	0.0
1509	Print Making	FTC	F1x4 Rec	3	3208	1 - 32w RSFI T8 EL-IS	1,000	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	93	78	15	16%	\$2	\$13	\$18	\$31	15.8
1509A	Plate Room	FTJ	F2x4 Rec	1	3260	3 - 32w RSFI T8 EE 1&2	3,060	2846	3-28w 4' RSFI T8 ES HE EL-I	1	72	0.1	0.1	327	220	107	33%	\$8	\$52	\$31	\$83	11.0
1509B	Proofing	FTI	F2x4 Rec	2	3240	2 - 32w RSFI T8 EE	3,060	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	441	294	147	33%	\$10	\$81	\$49	\$131	12.7
1509C	Paint Cleaning	FWH	F2x4 Wrap	2	3260	3 - 32w RSFI T8 EE 1&2	3,060	2846	3-28w 4' RSFI T8 ES HE EL-I	2	72	0.2	0.1	655	441	214	33%	\$15	\$104	\$61	\$165	11.0
1515	Archive Room	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	4	52	0.1	0.1	217	191	26	12%	\$2	\$34	\$25	\$58	34.1
1519	Print Making	FTK	F2x4 Rec	16	3304	4 - 32w RSFI T8 EE 2&2	1,000	2852	4-28w 4' RSFI T8 ES HE EL-I	16	96	2.2	1.5	2,304	1,536	768	33%	\$101	\$923	\$688	\$1,610	15.9
1519A	Chemicals	FWF	F1x4 Wrap	2	3240	2 - 32w RSFI T8 EE	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	144	96	48	33%	\$6	\$81	\$49	\$131	20.7
1519B	Chemicals	FVD	F1x4 Vapour Resistant	2	3240	2 - 32w RSFI T8 EE	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	144	96	48	33%	\$6	\$81	\$49	\$131	20.7
1521	Office	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	2	0	0.1	0.1	213	213	0	0%	\$0	\$0	\$0	\$0	0.0
1522	Storage	FWH	F2x4 Wrap	9	3260	3 - 32w RSFI T8 EE 1&2	1,000	2846	3-28w 4' RSFI T8 ES HE EL-I	9	72	0.2	0.2	963	648	315	33%	\$20	\$467	\$276	\$743	36.6
1523	Office	FTJ	F2x4 Rec	6	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	6	78	0.5	0.4	737	646	91	12%	\$10	\$76	\$37	\$113	11.7
1523A	Storage	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	255	9000	0-No Action	2	0	0.0	0.0	39	39	0	0%	\$0	\$0	\$0	\$0	0.0
1523B	Office	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	2	0	0.1	0.1	213	213	0	0%	\$0	\$0	\$0	\$0	0.0
1530	Photo Development	FWF	F1x4 Wrap	2	3240	2 - 32w RSFI T8 EE	690	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	99	66	33	33%	\$6	\$81	\$49	\$131	22.9
1532	Photo Development	FWF	F1x4 Wrap	2	3240	2 - 32w RSFI T8 EE	255	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	37	24	12	33%	\$5	\$81	\$49	\$131	26.8
1534	Photo Development	FWF	F1x4 Wrap	2	3240	2 - 32w RSFI T8 EE	255	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	37	24	12	33%	\$5	\$81	\$49	\$131	26.8
1536	Photo Development	FWF	F1x4 Wrap	4	3240	2 - 32w RSFI T8 EE	255	9000	0-No Action	4	0	0.3	0.3	73	73	0	0%	\$0	\$0	\$0	\$0	0.0
1541	Dark Room	FTI	F2x4 Rec	4	3240	2 - 32w RSFI T8 EE	51	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	15	10	5	33%	\$9	\$163	\$98	\$261	29.2
1543	Office	FTI	F2x4 Rec	4	3240	2 - 32w RSFI T8 EE	1,380	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	397	265	132	33%	\$14	\$163	\$98	\$261	18.5
1545	Office	FTI	F2x4 Rec	4	3240	2 - 32w RSFI T8 EE	1,380	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	397	265	132	33%	\$14	\$163	\$98	\$261	18.5
1547	Office	FTI	F2x4 Rec	4	3240	2 - 32w RSFI T8 EE	1,380	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	397	265	132	33%	\$14	\$163	\$98	\$261	18.5
1549	Office	FTI	F2x4 Rec	4	3240	2 - 32w RSFI T8 EE	1,380	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	397	265	132	33%	\$14	\$163	\$98	\$261	18.5
1551	Office	FTI	F2x4 Rec	4	3240	2 - 32w RSFI T8 EE	1,380	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	397	265	132	33%	\$14	\$163	\$98	\$261	18.5
1553	Office	FTI	F2x4 Rec	4	3240	2 - 32w RSFI T8 EE	1,380	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	397	265	132	33%	\$14	\$163	\$98	\$261	18.5
1555	Copy Room	FWF	F1x4 Wrap	1	3240	2 - 32w RSFI T8 EE	765	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	55	37	18	33%	\$3	\$41	\$25	\$65	22.3
1561	Sculture Studio	MHE	High / Low Bay	9	5010	1 - 175w MH	2,760	2859	4-28w 4' RSFI T8 ES HE EL-	9	148	1.8	1.3	5,216	3,676	1,540	30%	\$113	\$752	\$519	\$1,271	11.2
1562	Studio	ITH	Track Head	25	1140	1 - 65w Inc BR30	2,760	9000	0-No Action	25	0	1.5	1.5	4,485	4,485	0	0%	\$0	\$0	\$0	\$0	0.0
1562	Studio	FWH	F2x4 Wrap	23	3260	3 - 32w RSFI T8 EE 1&2	2,760	2846	3-28w 4' RSFI T8 ES HE EL-I	23	72	2.3	1.6	6,792	4,571	2,222	33%	\$163	\$1,192	\$1,467	\$2,659	16.3
1563	Woodwork	FIO	F1x8 Industrial	11	3516	6 - 40w RSFI T12 - Std 3 b	2,760	3370	6-32w RSFI T8 EL-IS 2 - 3L b	11	172	3.0	1.8	8,653	5,222	3,431	40%	\$252	\$1,159	\$769	\$1,928	7.7
1564	Studio	FWH	F2x4 Wrap	28	3260	3 - 32w RSFI T8 EE 1&2	1,000	2846	3-28w 4' RSFI T8 ES HE EL-I	28	72	2.8	1.9	2,996	2,016	980	33%	\$129	\$1,452	\$1,785	\$3,237	25.1
1564	Studio	ITE	Track Head	19	1124	1 - 45w Inc PAR38 H - Spo	1,000	9000	0-No Action	19	0	0.8	0.8	855	855	0	0%	\$0	\$0	\$0	\$0	0.0
1565	Ceramics	MHE	High / Low Bay	9	5010	1 - 175w MH	2,760	2859	4-28w 4' RSFI T8 ES HE EL-	9	148	1.8	1.3	5,216	3,676	1,540	30%	\$113	\$752	\$519	\$1,271	11.2
1565	Ceramics	MHE	High / Low Bay	2	5010	1 - 175w MH	8,760	2859	4-28w 4' RSFI T8 ES HE EL-	2	148	0.4	0.3	3,679	2,593	1,086	30%	\$55	\$167	\$115	\$282	5.1
1565A	Ceramics	FWF	F1x4 Wrap	4	3240	2 - 32w RSFI T8 EE	2,760	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.3	0.2	795	530	265	33%	\$19	\$163	\$230	\$393	20.2
1565C	Mixer	FWH	F2x4 Wrap	2	3260	3 - 32w RSFI T8 EE 1&2	920	2846	3-28w 4' RSFI T8 ES HE EL-I	2	72	0.2	0.1	197	132	64	33%	\$9	\$104	\$61	\$165	18.4
1572	4th Year Studio	ITH	Track Head	12	1140	1 - 65w Inc BR30	3,060	9000	0-No Action	12	0	0.7	0.7	2,387	2,387	0	0%	\$0	\$0	\$0	\$0	0.0
1572	4th Year Studio	FWH	F2x4 Wrap	21	3260	3 - 32w RSFI T8 EE 1&2	3,060	2846	3-28w 4' RSFI T8 ES HE EL-I	21	72	2.1	1.4	6,876	4,627	2,249	33%	\$158	\$1,089	\$645	\$1,733	11.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
1578	Art Gallery	IDP	Downlight Round	12	1205	1 - 50w MR16	1,000	9000	0-No Action	12	0	0.6	0.6	600	600	0	0%	\$0	\$0	\$0	\$0	0.0
1578	Art Gallery	IDP	Downlight Round	27	1125	1 - 45w Inc PAR38 H - Flo	1,000	9000	0-No Action	27	0	1.2	1.2	1,215	1,215	0	0%	\$0	\$0	\$0	\$0	0.0
1584	Makeup Room	ILA	Keyless Lampholder	12	1135	1 - 60w Inc G30	690	9000	0-No Action	12	0	0.2	0.2	497	497	0	0%	\$0	\$0	\$0	\$0	0.0
1584	Makeup Room	ILA	Keyless Lampholder	40	1135	1 - 60w Inc G30	690	9000	0-No Action	40	0	0.6	0.6	1,656	1,656	0	0%	\$0	\$0	\$0	\$0	0.0
1584	Makeup Room	ILA	Keyless Lampholder	32	1135	1 - 60w Inc G30	690	9000	0-No Action	32	0	0.5	0.5	1,325	1,325	0	0%	\$0	\$0	\$0	\$0	0.0
1584	Makeup Room	FWF	F1x4 Wrap	3	3244	2 - 32w RSFI T8 EL-IS	690	2933	2-Relamp with 28w 4' RSFI T	3	52	0.0	0.0	122	108	14	12%	\$1	\$25	\$18	\$44	40.2
1587	Theatre	ISE	Cylinder	10	1170	1 - 150w Inc PS25	1,750	9000	0-No Action	10	0	0.4	0.4	2,625	2,625	0	0%	\$0	\$0	\$0	\$0	0.0
1587	Theatre	CSB	Surface (CF)	2	2213	2 - 13w CF	1,750	9000	0-No Action	2	0	0.0	0.0	112	112	0	0%	\$0	\$0	\$0	\$0	0.0
1587	Theatre	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
1587	Theatre	IMB	Dome (Dog Dish / Pill)	8	1119	2 - 40w Inc A19	1,750	9000	0-No Action	8	0	0.2	0.2	1,120	1,120	0	0%	\$0	\$0	\$0	\$0	0.0
1587	Theatre	ICA	Wall Sconce	7	1118	1 - 40w Inc A19	1,750	9000	0-No Action	7	0	0.1	0.1	490	490	0	0%	\$0	\$0	\$0	\$0	0.0
1587	Theatre	ITG	Track Head	15	1122	1 - 40w Inc PAR16 H - N S	1,750	9000	0-No Action	15	0	0.2	0.2	1,050	1,050	0	0%	\$0	\$0	\$0	\$0	0.0
1587	Theatre	FRF	F4' striplight w/reflector	56	3244	2 - 32w RSFI T8 EL-IS	1,750	2933	2-Relamp with 28w 4' RSFI T	56	52	0.8	0.7	5,782	5,096	686	12%	\$37	\$474	\$344	\$818	22.0
1587A	Theatre Back Hallway	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
1587A	Theatre Back Hallway	FWF	F1x4 Wrap	5	3244	2 - 32w RSFI T8 EL-IS	1,750	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	516	455	61	12%	\$6	\$42	\$31	\$73	12.9
1587-Bo	Box Office	CDB	Downlight	1	2213	2 - 13w CF	690	9000	0-No Action	1	0	0.0	0.0	22	22	0	0%	\$0	\$0	\$0	\$0	0.0
1587-Up	Upper Viewing Area	ICB	Wall Sconce	14	1132	1 - 60w Inc A19	1,750	9000	0-No Action	14	0	0.2	0.2	1,470	1,470	0	0%	\$0	\$0	\$0	\$0	0.0
1587-Up	Upper Viewing Area	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
1592/15	Costume Making	FBG	F1x4 Box	6	3240	2 - 32w RSFI T8 EE	690	2832	2-28w 4' RSFI T8 ES HE EL-I	6	48	0.1	0.1	298	199	99	33%	\$7	\$244	\$147	\$392	52.5
1592A	Shower	FCB	F1x2 Cubelight	1	3016	2 - 17w RSFI T8 EL-IS	255	9000	0-No Action	1	0	0.0	0.0	9	9	0	0%	\$0	\$0	\$0	\$0	0.0
1594A	Washroom	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	15	13	2	12%	\$1	\$8	\$6	\$15	20.6
1596	Finishing Show	FID	F1x4 Industrial	10	3244	2 - 32w RSFI T8 EL-IS	690	2933	2-Relamp with 28w 4' RSFI T	10	52	0.1	0.1	407	359	48	12%	\$4	\$85	\$61	\$146	40.2
1598	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,960	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	169	149	20	12%	\$2	\$13	\$6	\$19	11.1
1611	Office Student Services Ar	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1611	Office Student Services Ar	CDH	Downlight	4	2314	2 - 26w quad CF	3,315	9000	0-No Action	4	0	0.2	0.2	769	769	0	0%	\$0	\$0	\$0	\$0	0.0
1611	Office Student Services Ar	FTJ	F2x4 Rec	10	3265	3 - 32w RSFI T8 EL-IS 1&2	3,315	2939	3-Relamp with 28w 4' RSFI T	10	78	0.8	0.7	2,950	2,586	365	12%	\$25	\$127	\$61	\$188	7.6
1612	Meeting Room	CTQ	Troffer (CF)	6	2514	2 - 38/40w long EM-RS CF	900	9000	0-No Action	6	0	0.4	0.4	416	416	0	0%	\$0	\$0	\$0	\$0	0.0
1613	Office Student Services	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	349	223	125	36%	\$11	\$52	\$49	\$101	9.3
1614	Cashier Office (Finance Ar	CTQ	Troffer (CF)	5	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	5	0	0.4	0.4	3,373	3,373	0	0%	\$0	\$0	\$0	\$0	0.0
1614	Cashier Office (Finance Ar	CTQ	Troffer (CF)	1	2514	2 - 38/40w long EM-RS CF	8,760	9000	0-No Action	1	0	0.1	0.1	675	675	0	0%	\$0	\$0	\$0	\$0	0.0
1614A	Photo ID Area	CCA	Wall Sconce	2	2211	1 - 13w CF	8,760	9000	0-No Action	2	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
1614A	Photo ID Area	CDN	Downlight	1	2213	2 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
1615	Office Student Services	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1616	Office (Finance Area)	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.2	0.2	855	567	288	34%	\$20	\$78	\$74	\$151	7.7
1617	Office Student Services	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1618	Lunchroom	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	570	378	192	34%	\$13	\$52	\$49	\$101	7.7
1619	Office Student Services	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1620	Supply Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	351	233	118	34%	\$10	\$52	\$49	\$101	10.0
1622	Open Office (Finance Area	IXL	LED Exit sign	5	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	5	0	0.0	0.0	88	88	0	0%	\$0	\$0	\$0	\$0	0.0
1622	Open Office (Finance Area	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	3,315	9000	0-No Action	2	0	0.1	0.1	511	511	0	0%	\$0	\$0	\$0	\$0	0.0
1622	Open Office (Finance Area	FTJ	F2x4 Rec	14	3265	3 - 32w RSFI T8 EL-IS 1&2	3,315	2939	3-Relamp with 28w 4' RSFI T	14	78	1.2	1.0	4,130	3,620	511	12%	\$35	\$178	\$86	\$264	7.6
1622	Open Office (Finance Area	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	3,315	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	1,485	1,299	186	13%	\$13	\$68	\$25	\$92	7.3
1622A/1	Storage	FTJ	F2x4 Rec	5	3264	3 - 32w RSFI T8 EL-IS	1,000	2940	3-Relamp with 28w 4' RSFI T	5	76	0.1	0.1	430	380	50	12%	\$3	\$63	\$31	\$94	29.3
1622A/1	Storage	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,000	2940	3-Relamp with 28w 4' RSFI T	2	76	0.0	0.0	172	152	20	12%	\$1	\$25	\$12	\$38	29.3
1622A/1	Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,000	9430	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.0	0.0	64	57	7	10%	\$1	\$13	\$25	\$37	47.6

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
1624	Office (Finance Area)	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	698	612	86	12%	\$7	\$51	\$25	\$75	10.1
1626	Office (Finance Area)	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	116	102	14	12%	\$1	\$8	\$6	\$15	12.3
1626	Office (Finance Area)	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	220	192	27	13%	\$2	\$17	\$6	\$23	9.7
1630	Office	FLF	F8' Tubelight / Linear	2	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	439	384	55	13%	\$5	\$34	\$78	\$112	23.5
1632	Office	FLF	F8' Tubelight / Linear	2	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	439	384	55	13%	\$5	\$34	\$12	\$46	9.7
1633	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1634	Office	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	116	102	14	12%	\$1	\$8	\$6	\$15	12.3
1634	Office	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	220	192	27	13%	\$2	\$17	\$6	\$23	9.7
1635	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1636	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1637	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1638	Hallway	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	570	378	192	34%	\$13	\$52	\$49	\$101	7.7
1638A	Hallway/Office	CTQ	Troffer (CF)	4	2514	2 - 38/40w long EM-RS CF	3,315	9000	0-No Action	4	0	0.3	0.3	1,021	1,021	0	0%	\$0	\$0	\$0	\$0	0.0
1638A	Hallway/Office	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	3,315	9000	0-No Action	2	0	0.1	0.1	511	511	0	0%	\$0	\$0	\$0	\$0	0.0
1641	Student Services Aera	FTJ	F2x4 Rec	14	3264	3 - 32w RSFI T8 EL-IS	3,315	2940	3-Relamp with 28w 4' RSFI T	14	76	1.1	1.0	3,991	3,527	464	12%	\$32	\$178	\$86	\$264	8.4
1641	Student Services Aera	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
1641	Student Services Aera	CTQ	Troffer (CF)	7	2514	2 - 38/40w long EM-RS CF	3,315	9000	0-No Action	7	0	0.5	0.5	1,787	1,787	0	0%	\$0	\$0	\$0	\$0	0.0
1641A	Meeting Room	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	320	281	40	12%	\$6	\$51	\$25	\$75	13.4
1642	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1643	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1645	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1651	Student Services Open Offi	FTJ	F2x4 Rec	8	3264	3 - 32w RSFI T8 EL-IS	3,315	2940	3-Relamp with 28w 4' RSFI T	8	76	0.7	0.6	2,281	2,016	265	12%	\$18	\$102	\$49	\$151	8.4
1651	Student Services Open Offi	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1653	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1655	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1657	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1659	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1661	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1662	Office	CDN	Downlight	2	2213	2 - 13w CF	1,960	9000	0-No Action	2	0	0.1	0.1	125	125	0	0%	\$0	\$0	\$0	\$0	0.0
1662	Office	CDN	Downlight	1	2213	2 - 13w CF	1,960	9000	0-No Action	1	0	0.0	0.0	63	63	0	0%	\$0	\$0	\$0	\$0	0.0
1662	Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	698	612	86	12%	\$7	\$51	\$25	\$75	10.1
1662A	Office	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1662A	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
1663	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1663A	Storage	CDI	Downlight	1	2408	1 - 32w triple CF	1,040	9000	0-No Action	1	0	0.0	0.0	38	38	0	0%	\$0	\$0	\$0	\$0	0.0
1664	Hallway/Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	285	189	96	34%	\$7	\$26	\$25	\$50	7.7
1664	Hallway/Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	285	189	96	34%	\$7	\$26	\$25	\$50	7.7
1665	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	337	306	31	9%	\$3	\$25	\$12	\$38	13.8
1666	Hallway/Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	570	378	192	34%	\$13	\$52	\$49	\$101	7.7
1671	Exam Room A	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	174	153	22	12%	\$2	\$13	\$6	\$19	10.1
1673	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
1675	Exam Room B	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	182	159	22	12%	\$2	\$13	\$6	\$19	9.9
1677	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	351	233	118	34%	\$10	\$52	\$49	\$101	10.0
1679	Exam Room C	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	175	116	59	34%	\$5	\$26	\$25	\$50	10.0
1680	Open Office	FTJ	F2x4 Rec	10	3264	3 - 32w RSFI T8 EL-IS	3,315	9427	2-Delamp to 2 - 28w 4' RSFI T	10	57	0.8	0.5	2,851	1,890	961	34%	\$65	\$259	\$246	\$505	7.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
1680	Open Office	CDH	Downlight	5	2314	2 - 26w quad CF	3,315	9000	0-No Action	5	0	0.3	0.3	961	961	0	0%	\$0	\$0	\$0	\$0	0.0
1680A	Vestibule to Finance Area	FTC	F1x4 Rec	2	3208	1 - 32w RSFI T8 EL-IS	3,315	2926	1-Relamp with 28w 4' RSFI T	2	26	0.1	0.0	206	172	33	16%	\$2	\$8	\$12	\$21	9.2
1681	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1683	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1685	Office	CTQ	Troffer (CF)	4	2514	2 - 38/40w long EM-RS CF	2,040	9000	0-No Action	4	0	0.3	0.3	628	628	0	0%	\$0	\$0	\$0	\$0	0.0
1690	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	175	116	59	34%	\$5	\$26	\$25	\$50	10.0
1712	Office Area	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	2,423	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	216	189	27	12%	\$2	\$13	\$6	\$19	9.1
1712	Office Area	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	2,423	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,725	1,512	213	12%	\$17	\$102	\$49	\$151	9.1
1712	Office Area	CDH	Downlight	1	2314	2 - 26w quad CF	2,423	9000	0-No Action	1	0	0.1	0.1	141	141	0	0%	\$0	\$0	\$0	\$0	0.0
1712A	Copy Room	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1712B	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1712C	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1712D	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1712E	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	363	318	45	12%	\$4	\$25	\$12	\$38	9.9
1712F	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	175	116	59	34%	\$5	\$26	\$25	\$50	10.0
1730	Classroom	FTJ	F2x4 Rec	12	3264	3 - 32w RSFI T8 EL-IS	1,750	2940	3-Relamp with 28w 4' RSFI T	12	76	1.0	0.9	1,806	1,596	210	12%	\$19	\$152	\$74	\$226	11.6
1730	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1735	Hallway	FTD	F1x4 Rec	1	3240	2 - 32w RSFI T8 EE	3,315	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	239	159	80	33%	\$5	\$41	\$25	\$65	12.1
1735	Hallway	CDH	Downlight	2	2314	2 - 26w quad CF	3,315	9000	0-No Action	2	0	0.1	0.1	385	385	0	0%	\$0	\$0	\$0	\$0	0.0
1735A	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	351	310	41	12%	\$3	\$25	\$12	\$38	10.9
1735B	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	175	155	20	12%	\$2	\$13	\$6	\$19	10.9
1741	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
1741	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1751	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
1751	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1752	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	1,869	1,638	231	12%	\$21	\$152	\$74	\$226	10.6
1752	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1761	Classroom	FTJ	F2x4 Rec	10	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	10	78	0.8	0.7	1,558	1,365	193	12%	\$18	\$127	\$61	\$188	10.6
1761	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1762	Classroom	FTJ	F2x4 Rec	6	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	6	78	0.5	0.4	935	819	116	12%	\$11	\$76	\$37	\$113	10.6
1764	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,040	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	175	116	59	34%	\$5	\$26	\$25	\$50	10.0
1766	Assessment Testing Room	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,000	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	89	78	11	12%	\$1	\$13	\$6	\$19	13.0
1768	Assessment Centre Office	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	3,366	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	794	700	94	12%	\$6	\$34	\$25	\$58	9.2
1771	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
1771	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1772	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
1772	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1781	Classroom	FTJ	F2x4 Rec	5	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	5	78	0.4	0.4	779	683	96	12%	\$9	\$63	\$31	\$94	10.6
1791	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
1791	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1792	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,492	2,184	308	12%	\$28	\$203	\$98	\$301	10.6
1792	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
1800	1st Floor Block A East Addi	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
1800	1st Floor Block A East Addi	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	1,551	736	815	53%	\$41	\$218	\$49	\$267	6.5
1800	1st Floor Block A East Addi	FTG	F2x2 Rec	5	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	2,584	1,472	1,113	43%	\$57	\$436	\$98	\$534	9.5

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
1801	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1802	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1811	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1812	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1821	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1822	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1831	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1832	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1841	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1842	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1851	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1852	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1861	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1862	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1871	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1872	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
1880	Sprinkler Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	9000	0-No Action	1	0	0.0	0.0	15	15	0	0%	\$0	\$0	\$0	\$0	0.0
1881	Stairwell	FCF	F1x4 Cubelight	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$157	\$191	15.3
1881	Stairwell	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1-A-East Block 'A' East Hallway		IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1-A-East Block 'A' East Hallway		FTG	F2x2 Rec	10	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	9	42	0.7	0.4	6,482	3,311	3,171	49%	\$161	\$981	\$221	\$1,202	7.5
1-A-East Block 'A' East Hallway		FTG	F2x2 Rec	5	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.4	0.2	3,241	1,472	1,770	55%	\$90	\$436	\$98	\$534	5.9
1-A-Wes Block 'A' West Hallway		IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
1-A-Wes Block 'A' West Hallway		FTG	F2x2 Rec	8	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	8	42	0.6	0.3	5,186	2,943	2,243	43%	\$114	\$872	\$196	\$1,068	9.4
1-A-Wes Block 'A' West Hallway		FTG	F2x2 Rec	2	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	1,296	736	561	43%	\$28	\$218	\$49	\$267	9.4
1-A-Wes Block 'A' West Hallway		FTG	F2x2 Rec	4	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	2,593	1,472	1,121	43%	\$57	\$436	\$98	\$534	9.4
2201	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2201	Classroom	FTJ	F2x4 Rec	14	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	14	78	1.2	1.0	2,181	1,911	270	12%	\$25	\$178	\$86	\$264	10.6
2202	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2202	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	1,869	1,638	231	12%	\$21	\$152	\$74	\$226	10.6
2211	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2211	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	1,869	1,638	231	12%	\$21	\$152	\$74	\$226	10.6
2216	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2216	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	1,869	1,638	231	12%	\$21	\$152	\$74	\$226	10.6
2221	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2221	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	1,869	1,638	231	12%	\$21	\$152	\$74	\$226	10.6
2231	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2231	Classroom	FTJ	F2x4 Rec	11	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	11	78	0.9	0.8	1,713	1,502	212	12%	\$20	\$140	\$68	\$207	10.6
2232	Classroom	FBF	F1x4 Box	1	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	54	46	9	16%	\$1	\$4	\$6	\$10	12.8
2232	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	1,402	1,229	173	12%	\$16	\$114	\$55	\$170	10.6
2402	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2402	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,492	2,184	308	12%	\$28	\$203	\$98	\$301	10.6
2415	Staff Lunchroom	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	9419	2-Delamp to 2 - 28w 4' RSFI T	2	52	0.2	0.1	246	144	102	42%	\$11	\$25	\$74	\$99	9.1
2417	Staff Kitchen	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	3,120	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	736	487	250	34%	\$17	\$25	\$18	\$44	2.5
2419	Computer Stations	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	9419	2-Delamp to 2 - 28w 4' RSFI T	2	52	0.2	0.1	312	182	130	42%	\$12	\$25	\$74	\$99	8.3

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
2422	Classroom	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2422	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,492	2,184	308	12%	\$28	\$203	\$98	\$301	10.6
2425	Classroom	FBF	F1x4 Box	3	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	163	137	26	16%	\$2	\$13	\$18	\$31	12.8
2425	Classroom	FTJ	F2x4 Rec	11	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	11	78	0.9	0.8	1,713	1,502	212	12%	\$20	\$140	\$68	\$207	10.6
2451	Print Room	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	3,366	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	599	525	74	12%	\$5	\$25	\$12	\$38	7.5
2453	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2455	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2456	Classroom	FTC	F1x4 Rec	3	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	163	137	26	16%	\$2	\$13	\$18	\$31	12.8
2456	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	1,402	1,229	173	12%	\$16	\$114	\$55	\$170	10.6
2457	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2459	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2464	Meeting Room	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	900	2940	3-Relamp with 28w 4' RSFI T	4	76	0.3	0.3	310	274	36	12%	\$5	\$51	\$25	\$75	14.8
2465	Cariboo College	CTQ	Troffer (CF)	6	2514	2 - 38/40w long EM-RS CF	3,315	9000	0-No Action	6	0	0.4	0.4	1,532	1,532	0	0%	\$0	\$0	\$0	\$0	0.0
2465	Cariboo College	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	3,315	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	1,180	1,034	146	12%	\$10	\$51	\$25	\$75	7.6
2466	Classroom	FTC	F1x4 Rec	3	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	163	137	26	16%	\$2	\$13	\$18	\$31	12.8
2466	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	1,402	1,229	173	12%	\$16	\$114	\$55	\$170	10.6
2468	Classroom	FTE	F2x2 Rec	2	3016	2 - 17w RSFI T8 EL-IS	1,750	9000	0-No Action	2	0	0.1	0.1	119	119	0	0%	\$0	\$0	\$0	\$0	0.0
2468	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	1,402	1,229	173	12%	\$16	\$114	\$55	\$170	10.6
2473	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2475	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2477	Office	CTQ	Troffer (CF)	4	2514	2 - 38/40w long EM-RS CF	1,960	9000	0-No Action	4	0	0.3	0.3	604	604	0	0%	\$0	\$0	\$0	\$0	0.0
2479	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2481	Office	CTQ	Troffer (CF)	4	2514	2 - 38/40w long EM-RS CF	1,960	9000	0-No Action	4	0	0.3	0.3	604	604	0	0%	\$0	\$0	\$0	\$0	0.0
2483	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2485	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2493	Copy Room	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	2,000	2940	3-Relamp with 28w 4' RSFI T	3	76	0.2	0.2	516	456	60	12%	\$5	\$38	\$18	\$57	11.0
2494	DSD Storage	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	255	2939	3-Relamp with 28w 4' RSFI T	2	78	0.0	0.0	45	40	6	12%	\$1	\$25	\$12	\$38	50.0
2495	Office	CTQ	Troffer (CF)	3	2514	2 - 38/40w long EM-RS CF	1,960	9000	0-No Action	3	0	0.2	0.2	453	453	0	0%	\$0	\$0	\$0	\$0	0.0
2496	Classroom	FTJ	F2x4 Rec	6	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	6	78	0.5	0.4	935	819	116	12%	\$11	\$76	\$37	\$113	10.6
2496A	Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,040	2940	3-Relamp with 28w 4' RSFI T	1	76	0.0	0.0	89	79	10	12%	\$1	\$13	\$6	\$19	28.5
2498	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2499	Staff Lounge	IDD	Downlight Round	9	1153	1 - 100w Inc A19	2,000	8000	0-Install Lighting Controls Dev	9	0	0.9	0.9	1,800	1,800	0	0%	\$0	\$0	\$0	\$0	0.0
2499	Staff Lounge	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	2,000	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	308	308	0	0%	\$0	\$0	\$0	\$0	0.0
2510	Classroom	FTJ	F2x4 Rec	7	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	7	78	0.6	0.5	1,090	956	135	12%	\$12	\$89	\$43	\$132	10.6
2511	Storage	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	255	2939	3-Relamp with 28w 4' RSFI T	2	78	0.0	0.0	45	40	6	12%	\$1	\$25	\$12	\$38	50.0
2512	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2515	Classroom	FTC	F1x4 Rec	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2515	Classroom	FTJ	F2x4 Rec	6	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	6	78	0.5	0.4	935	819	116	12%	\$11	\$76	\$37	\$113	10.6
2517	Classroom	FTC	F1x4 Rec	5	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	271	228	44	16%	\$4	\$21	\$31	\$52	12.8
2517	Classroom	FTJ	F2x4 Rec	6	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	6	78	0.5	0.4	935	819	116	12%	\$11	\$76	\$37	\$113	10.6
2531	Classroom	CTQ	Troffer (CF)	5	2514	2 - 38/40w long EM-RS CF	1,750	9000	0-No Action	5	0	0.4	0.4	674	674	0	0%	\$0	\$0	\$0	\$0	0.0
2532	Open Office	FTJ	F2x4 Rec	6	3264	3 - 32w RSFI T8 EL-IS	3,366	2940	3-Relamp with 28w 4' RSFI T	6	76	0.5	0.4	1,737	1,535	202	12%	\$14	\$76	\$37	\$113	8.3
2533	"University Prep" Computer	FBF	F1x4 Box	5	3208	1 - 32w RSFI T8 EL-IS	2,860	2926	1-Relamp with 28w 4' RSFI T	5	26	0.1	0.1	443	372	72	16%	\$5	\$21	\$31	\$52	10.0
2533	"University Prep" Computer	FTI	F2x4 Rec	9	3244	3 - 32w RSFI T8 EL-IS	2,860	2933	2-Relamp with 28w 4' RSFI T	9	52	0.5	0.4	1,519	1,338	180	12%	\$13	\$114	\$55	\$170	13.0
2551	Classroom "University Pre	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	1,750	9000	0-No Action	2	0	0.1	0.1	270	270	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
2551	Classroom "University Pre	FTJ	F2x4 Rec	20	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	20	78	1.7	1.5	3,115	2,730	385	12%	\$36	\$254	\$123	\$377	10.6
2552	Classroom	FTC	F1x4 Rec	3	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	163	137	26	16%	\$2	\$13	\$18	\$31	12.8
2552	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	1,402	1,229	173	12%	\$16	\$114	\$55	\$170	10.6
2553	Meeting Room "University	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,150	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	102	90	13	12%	\$2	\$13	\$6	\$19	12.4
2558	Classroom	FTC	F1x4 Rec	3	3208	1 - 32w RSFI T8 EL-IS	1,750	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	163	137	26	16%	\$2	\$13	\$18	\$31	12.8
2558	Classroom	FTJ	F2x4 Rec	9	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	9	78	0.8	0.7	1,402	1,229	173	12%	\$16	\$114	\$55	\$170	10.6
2583	Costume Storage	FSH	F8' tandem striplight	4	3304	4 - 32w RSFI T8 EE 2&2	1,040	2916	4-28w RSFI T8 ES EL-IS	4	98	0.1	0.1	599	408	191	32%	\$12	\$231	\$147	\$378	31.1
2583A	Stairs Vestibule to Upper T	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
2583B	Upper Theatre Hallway	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2583B	Upper Theatre Hallway	IMB	Dome (Dog Dish / Pill)	5	1133	2 - 60w Inc A19	6,552	9000	0-No Action	5	0	0.6	0.6	3,931	3,931	0	0%	\$0	\$0	\$0	\$0	0.0
2583B	Upper Theatre Hallway	ICB	Wall Sconce	1	1118	1 - 40w Inc A19	6,552	9000	0-No Action	1	0	0.0	0.0	262	262	0	0%	\$0	\$0	\$0	\$0	0.0
2583B	Upper Theatre Hallway	FWF	F1x4 Wrap	6	3244	2 - 32w RSFI T8 EL-IS	6,552	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	2,319	2,044	275	12%	\$15	\$51	\$37	\$88	5.9
2592	Costume Storage	FSH	F8' tandem striplight	4	3308	4 - 32w RSFI T8 EL-IS	500	2946	4-Relamp with 28w 4' RSFI T	4	98	0.1	0.1	224	196	28	13%	\$2	\$68	\$25	\$92	37.3
2594	Practice Stage	CTQ	Troffer (CF)	12	2514	2 - 38/40w long EM-RS CF	690	9000	0-No Action	12	0	0.2	0.2	638	638	0	0%	\$0	\$0	\$0	\$0	0.0
2596	Hallway	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	391	345	46	12%	\$3	\$17	\$12	\$29	9.3
2597	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
2598	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
2611	Office	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	2	0	0.1	0.1	213	213	0	0%	\$0	\$0	\$0	\$0	0.0
2611A	Hallway	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	120	106	14	12%	\$1	\$8	\$6	\$15	12.0
2611A	Hallway	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	120	106	14	12%	\$1	\$8	\$6	\$15	12.0
2612	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,492	2,184	308	12%	\$28	\$203	\$98	\$301	10.6
2613	Office	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	2	0	0.1	0.1	213	213	0	0%	\$0	\$0	\$0	\$0	0.0
2615	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	119	79	40	34%	\$4	\$26	\$25	\$50	11.9
2617	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	119	79	40	34%	\$4	\$26	\$25	\$50	11.9
2621	Lecture Hall	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2621	Lecture Hall	FTJ	F2x4 Rec	20	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	20	78	1.7	1.5	3,115	2,730	385	12%	\$36	\$254	\$123	\$377	10.6
2621	Lecture Hall	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	156	137	19	12%	\$2	\$13	\$6	\$19	10.6
2622	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2622	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,492	2,184	308	12%	\$28	\$203	\$98	\$301	10.6
2632	Graphics Lab	ITB	Track Head	10	1205	1 - 50w MR16	1,750	9000	0-No Action	10	0	0.5	0.5	875	875	0	0%	\$0	\$0	\$0	\$0	0.0
2632	Graphics Lab	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	312	273	39	12%	\$4	\$25	\$12	\$38	10.6
2632	Graphics Lab	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	623	546	77	12%	\$7	\$51	\$25	\$75	10.6
2640	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2641	Staff Room	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	2,000	9100	0-Remove and cover	3	0.0001	0.1	0.0	288	0	288	100%	\$25	\$79	\$74	\$153	6.2
2641	Staff Room	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	2,000	9419	2-Delamp to 2 - 28w 4' RSFI T	8	52	0.7	0.4	1,424	832	592	42%	\$51	\$102	\$295	\$396	7.8
2644	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
2651	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2651	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,492	2,184	308	12%	\$28	\$203	\$98	\$301	10.6
2652	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2652	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,492	2,184	308	12%	\$28	\$203	\$98	\$301	10.6
2671	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2671	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2674	Writing Centre	FTJ	F2x4 Rec	6	3264	3 - 32w RSFI T8 EL-IS	3,060	2940	3-Relamp with 28w 4' RSFI T	6	76	0.5	0.4	1,579	1,395	184	12%	\$13	\$76	\$37	\$113	8.8
2674A	Hallway	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
2678	Meeting Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	900	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	155	137	18	12%	\$3	\$25	\$12	\$38	14.8

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
2693	Office	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	2	0	0.1	0.1	213	213	0	0%	\$0	\$0	\$0	\$0	0.0
2693A	Hallway	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
2695	Office	CTQ	Troffer (CF)	2	2514	2 - 38/40w long EM-RS CF	1,380	9000	0-No Action	2	0	0.1	0.1	213	213	0	0%	\$0	\$0	\$0	\$0	0.0
2697	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2699	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2708	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2712	Computer Lab	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	3,640	9419	2-Delamp to 2 - 28w 4' RSFI T	12	52	1.0	0.6	3,888	2,271	1,616	42%	\$106	\$152	\$442	\$594	5.6
2712	Computer Lab	CHS	Track Head	2	2512	1 - 38/40w long EM-RS CF	3,640	9000	0-No Action	2	0	0.1	0.1	349	349	0	0%	\$0	\$0	\$0	\$0	0.0
2714	Electrical Closet	ILA	Keyless Lampholder	1	2787	1 - 26w CF spiral SI (Scre	255	9000	0-No Action	1	0	0.0	0.0	7	7	0	0%	\$0	\$0	\$0	\$0	0.0
2725	Kitchen/Storage	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	255	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	45	40	6	12%	\$2	\$25	\$12	\$38	16.9
2729	Switch Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	255	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	44	29	15	34%	\$6	\$52	\$49	\$101	17.2
2731	Classroom	CHS	Track Head	4	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	4	0	0.2	0.2	336	336	0	0%	\$0	\$0	\$0	\$0	0.0
2731	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2734	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	119	79	40	34%	\$4	\$26	\$25	\$50	11.9
2734A	Office Hallway	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	196	172	23	12%	\$2	\$8	\$6	\$15	9.3
2734A	Office Hallway	FTD	F1x4 Rec	7	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	1,369	1,207	162	12%	\$11	\$59	\$43	\$102	9.3
2734A	Office Hallway	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	196	172	23	12%	\$2	\$8	\$6	\$15	9.3
2734B	Office	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	123	108	15	12%	\$2	\$13	\$6	\$19	11.7
2736	Office	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2738	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2740	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2740	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2741	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2741	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2742	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2742	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2751	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2751	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2752	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2754	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2756	Storage	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,040	9419	2-Delamp to 2 - 28w 4' RSFI T	1	52	0.0	0.0	93	54	38	42%	\$2	\$13	\$37	\$50	20.3
2758	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2761	Office	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,960	9000	0-No Action	3	0	0.1	0.1	282	282	0	0%	\$0	\$0	\$0	\$0	0.0
2761	Office	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,396	1,223	172	12%	\$15	\$102	\$49	\$151	10.1
2762	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2764	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2766	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2766	Office	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	123	108	15	12%	\$2	\$13	\$6	\$19	11.7
2768	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2768	Office	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	123	108	15	12%	\$2	\$13	\$6	\$19	11.7
2770	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2771	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2771	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2771A	Office	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,960	9000	0-No Action	3	0	0.1	0.1	282	282	0	0%	\$0	\$0	\$0	\$0	0.0
2771A	Office	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,396	1,223	172	12%	\$15	\$102	\$49	\$151	10.1

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
2772	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	237	157	80	34%	\$9	\$52	\$49	\$101	11.9
2774	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	237	157	80	34%	\$9	\$52	\$49	\$101	11.9
2776	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	237	157	80	34%	\$9	\$52	\$49	\$101	11.9
2778	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	119	79	40	34%	\$4	\$26	\$25	\$50	11.9
2778	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	119	79	40	34%	\$4	\$26	\$25	\$50	11.9
2780	Office Vestibule	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,000	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	172	114	58	34%	\$5	\$26	\$25	\$50	10.1
2780	Office Vestibule	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,000	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	172	114	58	34%	\$5	\$26	\$25	\$50	10.1
2780A	Copy Room	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	119	79	40	34%	\$4	\$26	\$25	\$50	11.9
2782	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	237	157	80	34%	\$9	\$52	\$49	\$101	11.9
2784	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	237	157	80	34%	\$9	\$52	\$49	\$101	11.9
2786	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
2788	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
2791	Classroom	CHS	Track Head	3	2512	1 - 38/40w long EM-RS CF	1,750	9000	0-No Action	3	0	0.1	0.1	252	252	0	0%	\$0	\$0	\$0	\$0	0.0
2791	Classroom	FTJ	F2x4 Rec	8	3265	3 - 32w RSFI T8 EL-IS 1&2	1,750	2939	3-Relamp with 28w 4' RSFI T	8	78	0.7	0.6	1,246	1,092	154	12%	\$14	\$102	\$49	\$151	10.6
2791A	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2800	Second Floor Block A East	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2800	Second Floor Block A East	FTG	F2x2 Rec	5	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	2,584	1,472	1,113	43%	\$57	\$436	\$98	\$534	9.5
2800	Second Floor Block A East	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	1,551	736	815	53%	\$41	\$218	\$49	\$267	6.5
2801	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2802	Office/Secretary	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
2811	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2812	Photocopy Room	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	123	108	15	12%	\$2	\$13	\$6	\$19	11.7
2821	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2822	Meeting Room	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	3	78	0.3	0.2	240	211	30	12%	\$4	\$38	\$18	\$57	13.4
2822	Meeting Room	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	900	2939	3-Relamp with 28w 4' RSFI T	1	78	0.1	0.1	80	70	10	12%	\$1	\$13	\$6	\$19	13.4
2831	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2832	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,380	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	246	215	30	12%	\$3	\$25	\$12	\$38	11.7
2841	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2842	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2851	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2852	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2861	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2862	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2871	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
2-A-East Block 'A' East Hallway		FTG	F2x2 Rec	1	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	648	368	280	43%	\$14	\$109	\$25	\$134	9.4
2-A-East Block 'A' East Hallway		FTG	F2x2 Rec	10	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	9	42	0.7	0.4	6,482	3,311	3,171	49%	\$161	\$981	\$221	\$1,202	7.5
2-A-East Block 'A' East Hallway		FTG	F2x2 Rec	5	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.4	0.2	3,241	1,472	1,770	55%	\$90	\$436	\$98	\$534	5.9
2-A-East Block 'A' East Hallway		IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2-A-Wes Block 'A' West Hallway		IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
2-A-Wes Block 'A' West Hallway		FTG	F2x2 Rec	10	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	9	42	0.7	0.4	6,482	3,311	3,171	49%	\$161	\$981	\$221	\$1,202	7.5
2-A-Wes Block 'A' West Hallway		FTG	F2x2 Rec	5	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.4	0.2	3,241	1,472	1,770	55%	\$90	\$436	\$98	\$534	5.9
3709	Filing Room	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,500	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	177	156	21	12%	\$2	\$17	\$12	\$29	13.8
3713	Meeting Room	IDP	Downlight Round	8	1128	1 - 50w Inc PAR30L Flood	900	9000	0-No Action	8	0	0.4	0.4	360	360	0	0%	\$0	\$0	\$0	\$0	0.0
3713	Meeting Room	FLF	F8' Tubelight / Linear	2	3308	4 - 32w RSFI T8 EL-IS	900	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	202	176	25	13%	\$4	\$34	\$12	\$46	12.9
3719	HR Kitchen	FSE	F4' striplight	1	3208	1 - 32w RSFI T8 EL-IS	3,315	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	103	86	17	16%	\$1	\$4	\$6	\$10	9.2

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
3719	HR Kitchen	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	196	172	23	12%	\$2	\$8	\$6	\$15	9.3
3720	HR Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
3722	HR Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
3723	HR Computer Room/Gener	FTI	F2x4 Rec	6	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	1,174	1,034	139	12%	\$9	\$51	\$37	\$88	9.3
3723	HR Computer Room/Gener	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	587	517	70	12%	\$5	\$25	\$18	\$44	9.3
3724	HR Open Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	3,315	9000	0-No Action	1	0	0.0	0.0	39	39	0	0%	\$0	\$0	\$0	\$0	0.0
3724	HR Open Office	FTI	F2x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	2,151	1,896	255	12%	\$17	\$93	\$68	\$161	9.3
3724A	HR Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
3726	HR Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
3728	HR Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,960	9000	0-No Action	1	0	0.0	0.0	23	23	0	0%	\$0	\$0	\$0	\$0	0.0
3728	HR Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	116	102	14	12%	\$1	\$8	\$6	\$15	12.3
3730	HR Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
3732	HR Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
3734	HR Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
3736	Copy Area	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	545	477	67	12%	\$5	\$25	\$12	\$38	8.0
907	Stairwell	FCF	F1x4 Cubelight	3	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	1,551	1,367	184	12%	\$9	\$25	\$18	\$44	4.7
907	Stairwell	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
907A	Entrance Vestibule	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
908	Entrance Vestibule	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	3	41	0.2	0.1	1,551	1,077	473	31%	\$24	\$204	\$74	\$278	11.6
91000	Block C Lower Seating Are	MCE	Cylinder	2	5010	1 - 175w MH	8,760	5520	1-85w QL Induction	2	85	0.4	0.2	3,679	1,489	2,190	60%	\$111	\$1,190	\$216	\$1,407	12.6
91000	Block C Lower Seating Are	MHE	High / Low Bay	22	5010	1 - 175w MH	8,760	5520	1-85w QL Induction	22	85	4.4	1.8	40,471	16,381	24,090	60%	\$1,224	\$13,093	\$2,379	\$15,472	12.6
91000	Block C Lower Seating Are	MHE	High / Low Bay	5	5010	1 - 175w MH	8,760	5520	1-85w QL Induction	5	85	1.0	0.4	9,198	3,723	5,475	60%	\$278	\$2,976	\$541	\$3,516	12.6
91000	Block C Lower Seating Are	IXL	LED Exit sign	6	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	6	0	0.0	0.0	105	105	0	0%	\$0	\$0	\$0	\$0	0.0
91000A	Block C Upper Seating Are	MHB	High / Low Bay	2	5006	1 - 100w MH	8,760	5500	1-55w QL Induction	2	55	0.2	0.1	2,278	964	1,314	58%	\$67	\$1,058	\$111	\$1,169	17.5
91000A	Block C Upper Seating Are	MHB	High / Low Bay	8	5006	1 - 100w MH	8,760	5500	1-55w QL Induction	8	55	1.0	0.4	9,110	3,854	5,256	58%	\$267	\$4,232	\$442	\$4,674	17.5
91000B	Block C Walkway by Seatin	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
91000B	Block C Walkway by Seatin	CDB	Downlight	4	2213	2 - 13w CF	8,760	9000	0-No Action	4	0	0.1	0.1	1,121	1,121	0	0%	\$0	\$0	\$0	\$0	0.0
91000B	Block C Walkway by Seatin	CDB	Downlight	29	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	29	0	0.9	0.9	8,129	8,129	0	0%	\$0	\$0	\$0	\$0	0.0
91011/0	Main Entrance Vestibules x	CSB	Surface (CF)	2	2213	2 - 13w CF	8,760	9000	0-No Action	2	0	0.1	0.1	561	561	0	0%	\$0	\$0	\$0	\$0	0.0
91017	Tim Hortons	CDB	Downlight	10	2213	2 - 13w CF	1,920	9000	0-No Action	10	0	0.3	0.3	614	614	0	0%	\$0	\$0	\$0	\$0	0.0
91017A	Tim Hortons Back Area	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,920	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	227	200	27	12%	\$2	\$17	\$12	\$29	12.4
91112	Block C Corridor Advising	CDB	Downlight	2	2213	2 - 13w CF	8,760	9000	0-No Action	2	0	0.1	0.1	561	561	0	0%	\$0	\$0	\$0	\$0	0.0
91112	Block C Corridor Advising	CDB	Downlight	7	2213	2 - 13w CF	3,315	9000	0-No Action	7	0	0.2	0.2	743	743	0	0%	\$0	\$0	\$0	\$0	0.0
91112	Block C Corridor Advising	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
91112A	Block C Corridor Advising	FTI	F2x4 Rec	3	3240	2 - 32w RSFI T8 EE	3,315	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	716	477	239	33%	\$16	\$122	\$74	\$196	12.1
91172	Block C Vestibule to Regist	CDB	Downlight	3	2213	2 - 13w CF	3,315	9000	0-No Action	3	0	0.1	0.1	318	318	0	0%	\$0	\$0	\$0	\$0	0.0
91175	Block C Staff Washroom	FWF	F1x4 Wrap	1	3240	2 - 32w RSFI T8 EE	510	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	37	24	12	33%	\$3	\$41	\$25	\$65	24.4
91184	Registrar Main Vestibule	CDB	Downlight	11	2213	2 - 13w CF	3,315	9000	0-No Action	11	0	0.3	0.3	1,167	1,167	0	0%	\$0	\$0	\$0	\$0	0.0
91213	Block C Hallway	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
91220	Block C Hallway Ground Fl	FTG	F2x2 Rec	3	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	1,945	736	1,209	62%	\$61	\$218	\$49	\$267	4.3
91220	Block C Hallway Ground Fl	FTG	F2x2 Rec	5	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.4	0.2	3,241	1,472	1,770	55%	\$90	\$436	\$98	\$534	5.9
91220	Block C Hallway Ground Fl	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
91228	Block C Hallway	FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	2,067	1,104	964	47%	\$49	\$327	\$74	\$401	8.2
91255	Mechanical Room	FRF	F4' striplight w/reflector	5	3244	2 - 32w RSFI T8 EL-IS	255	9000	0-No Action	5	0	0.1	0.1	75	75	0	0%	\$0	\$0	\$0	\$0	0.0
91279/2	Block C Corridor	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)	
91300	Block C Corridor	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	1,034	736	298	29%	\$15	\$218	\$49	\$267	17.7
91323	Block C Communications R	FWI	F2x4 Wrap	1	3308	4 - 32w RSFI T8 EL-IS	1,040	2946	4-Relamp with 28w 4' RSFI T	1	98	0.0	0.0	116	102	15	13%	\$1	\$17	\$6	\$23	25.0
91325	Block C Corridor Computer	CSB	Surface (CF)	4	2213	2 - 13w CF	8,760	9000	0-No Action	4	0	0.1	0.1	1,121	1,121	0	0%	\$0	\$0	\$0	\$0	0.0
91325	Block C Corridor Computer	CSB	Surface (CF)	7	2213	2 - 13w CF	8,760	9000	0-No Action	7	0	0.2	0.2	1,962	1,962	0	0%	\$0	\$0	\$0	\$0	0.0
91325	Block C Corridor Computer	IXL	LED Exit sign	4	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	4	0	0.0	0.0	70	70	0	0%	\$0	\$0	\$0	\$0	0.0
91369	Block C Exit Vestibule Fro	CSB	Surface (CF)	2	2213	2 - 13w CF	8,760	9000	0-No Action	2	0	0.1	0.1	561	561	0	0%	\$0	\$0	\$0	\$0	0.0
91369	Block C Exit Vestibule Fro	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91400	Block C Exit Corridor	FTG	F2x2 Rec	6	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	5	42	0.3	0.2	3,101	1,840	1,261	41%	\$64	\$545	\$123	\$668	10.4
91400	Block C Exit Corridor	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
91400	Block C Exit Corridor	FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	517	368	149	29%	\$8	\$109	\$25	\$134	17.7
91401	Block C Vestibule	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91401	Block C Vestibule	FCF	F1x4 Cubelight	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
91404	Custodial Room	FTK	F2x4 Rec	6	3308	4 - 32w RSFI T8 EL-IS	510	2946	4-Relamp with 28w 4' RSFI T	6	98	0.2	0.1	343	300	43	13%	\$4	\$102	\$37	\$138	37.0
91409	Block C Elevator Room	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	9000	0-No Action	1	0	0.0	0.0	15	15	0	0%	\$0	\$0	\$0	\$0	0.0
91429	Block C H/C Washroom	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7
91431	Women's Washroom	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
91431	Women's Washroom	FWF	F1x4 Wrap	6	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	3,101	2,733	368	12%	\$19	\$51	\$37	\$88	4.7
91433	Block C Corridor	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	1,551	1,104	447	29%	\$23	\$327	\$74	\$401	17.7
91440	Block C Vestibule to Block	CDB	Downlight	2	2213	2 - 13w CF	8,760	9000	0-No Action	2	0	0.1	0.1	561	561	0	0%	\$0	\$0	\$0	\$0	0.0
91440	Block C Vestibule to Block	CDB	Downlight	7	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	7	0	0.2	0.2	1,962	1,962	0	0%	\$0	\$0	\$0	\$0	0.0
91445	Block C Men's Washroom	FCF	F1x4 Cubelight	2	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	1,261	841	420	33%	\$21	\$81	\$49	\$131	6.1
91445	Block C Men's Washroom	FWF	F1x4 Wrap	6	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	6	48	0.4	0.3	3,784	2,523	1,261	33%	\$64	\$244	\$147	\$392	6.1
91453	Health and Safety Washro	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	15	13	2	12%	\$1	\$8	\$6	\$15	20.6
91460	Block C Hallway	FTG	F2x2 Rec	6	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	5	42	0.4	0.2	3,889	1,840	2,050	53%	\$104	\$545	\$123	\$668	6.4
91460	Block C Hallway	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
91460	Block C Hallway	FTG	F2x2 Rec	3	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	1,945	736	1,209	62%	\$61	\$218	\$49	\$267	4.3
91488	Network Room	FWF	F1x4 Wrap	1	3240	2 - 32w RSFI T8 EE	255	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	18	12	6	33%	\$2	\$41	\$25	\$65	26.8
91500	Block C Hallway	FTG	F2x2 Rec	7	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	6	42	0.5	0.2	4,538	2,208	2,330	51%	\$118	\$654	\$147	\$801	6.8
91500	Block C Hallway	FTG	F2x2 Rec	3	3346	2 - 32w RSFI T8/U6 EE	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.2	0.1	1,945	736	1,209	62%	\$61	\$218	\$49	\$267	4.3
91500	Block C Hallway	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
91504	Block B Mechanical Room	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91504	Block B Mechanical Room	FVD	F1x4 Vapour Resistant	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
91504	Block B Mechanical Room	FRF	F4' striplight w/reflector	7	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	7	52	0.1	0.1	105	93	12	12%	\$2	\$59	\$43	\$102	60.9
91520	Block B Hallway Transition	CDB	Downlight	3	2213	2 - 13w CF	8,760	9000	0-No Action	3	0	0.1	0.1	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
91531	Hallway to Dark Rooms	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91531	Hallway to Dark Rooms	FCF	F1x4 Cubelight	4	3244	2 - 32w RSFI T8 EL-IS	1,840	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	434	383	52	12%	\$5	\$34	\$25	\$58	12.6
91531A	Hallway to Dark Rooms	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91531A	Hallway to Dark Rooms	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	1,840	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	217	191	26	12%	\$2	\$17	\$12	\$29	12.6
91560/5	Arts Hallway	CSB	Surface (CF)	11	2213	2 - 13w CF	8,760	9000	0-No Action	11	0	0.3	0.3	3,084	3,084	0	0%	\$0	\$0	\$0	\$0	0.0
91560/5	Arts Hallway	IXL	LED Exit sign	5	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	5	0	0.0	0.0	88	88	0	0%	\$0	\$0	\$0	\$0	0.0
91560/5	Arts Hallway	CSB	Surface (CF)	24	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	24	0	0.7	0.7	6,728	6,728	0	0%	\$0	\$0	\$0	\$0	0.0
91580	Art Hallway	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91580	Art Hallway	CSB	Surface (CF)	2	2213	2 - 13w CF	8,760	9000	0-No Action	2	0	0.1	0.1	561	561	0	0%	\$0	\$0	\$0	\$0	0.0
91580	Art Hallway	CSB	Surface (CF)	4	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	4	0	0.1	0.1	1,121	1,121	0	0%	\$0	\$0	\$0	\$0	0.0
91581	Block C WWR Washroom I	FWF	F1x4 Wrap	1	3240	2 - 32w RSFI T8 EE	1,000	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	72	48	24	33%	\$3	\$41	\$25	\$65	20.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
91583	Block C MWR Washroom I	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
91585	Room	FIN	F1x4 Industrial	2	3264	3 - 32w RSFI T8 EL-IS	51	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	9	8	1	12%	\$2	\$25	\$12	\$38	20.2
91614A	Vault	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	51	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	4	4	1	12%	\$1	\$13	\$6	\$19	20.2
91640	Entrance to Financial Area	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91640	Entrance to Financial Area	CTQ	Troffer (CF)	3	2514	2 - 38/40w long EM-RS CF	3,640	9000	0-No Action	3	0	0.2	0.2	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
91654	Men's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
91654	Men's Washroom	FTD	F1x4 Rec	1	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	631	420	210	33%	\$11	\$41	\$25	\$65	6.1
91654	Men's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
91654A	Vestibule to Men's Washro	FTD	F1x4 Rec	1	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	631	420	210	33%	\$11	\$41	\$25	\$65	6.1
91656	Janitor Room	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	30	27	4	12%	\$0	\$8	\$6	\$15	46.8
91672	Men's Washroom	FTD	F1x4 Rec	2	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	1,261	841	420	33%	\$21	\$81	\$49	\$131	6.1
91672	Men's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
91672A	Vestibule to Men's Washro	FTD	F1x4 Rec	1	3240	2 - 32w RSFI T8 EE	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	631	420	210	33%	\$11	\$41	\$25	\$65	6.1
91682	Mail Room	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,366	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	397	350	47	12%	\$3	\$17	\$12	\$29	9.2
91684	Men's Washroom	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
91685	1st Floor South Centre Ves	FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	517	359	158	31%	\$8	\$68	\$25	\$93	11.6
91685	1st Floor South Centre Ves	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91685	1st Floor South Centre Ves	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	1,034	718	315	31%	\$16	\$136	\$49	\$185	11.6
91688	Mail Room	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	120	106	14	12%	\$1	\$8	\$6	\$15	12.0
91690	Women's Washroom	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
91701	Entrance Vestibule	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
91701A	Stairwell	FCF	F1x4 Cubelight	3	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	1,551	1,367	184	12%	\$9	\$25	\$18	\$44	4.7
91701A	Stairwell	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
91703	Electrical Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
91703	Electrical Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
91749	Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,040	2940	3-Relamp with 28w 4' RSFI T	1	76	0.0	0.0	89	79	10	12%	\$1	\$13	\$6	\$19	28.5
91785	Electrical Closet	ILA	Keyless Lampholder	1	2787	1 - 26w CF spiral SI (Scre	255	9000	0-No Action	1	0	0.0	0.0	7	7	0	0%	\$0	\$0	\$0	\$0	0.0
91895	Hallway	FBL	F2x4 Box	7	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	3,618	3,189	429	12%	\$22	\$59	\$43	\$102	4.7
92102	Women's Washroom	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	5,712	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	674	594	80	12%	\$5	\$17	\$12	\$29	6.5
92102	Women's Washroom	CDB	Downlight	2	2213	2 - 13w CF	5,712	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	366	366	0	0%	\$0	\$0	\$0	\$0	0.0
92102	Women's Washroom	CDB	Downlight	1	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
92118	Block C Mechanical Hallwa	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
92118	Block C Mechanical Hallwa	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	8,760	9429	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	981	526	456	46%	\$23	\$17	\$37	\$54	2.3
92124	Block C Electrical Room by	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	780	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	92	81	11	12%	\$1	\$17	\$12	\$29	37.6
92130	Block C Mechanical Room	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
92130	Block C Mechanical Room	FID	F1x4 Industrial	8	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	8	52	0.1	0.1	120	106	14	12%	\$2	\$68	\$49	\$117	60.9
92200/9	Stairwell	FTG	F2x2 Rec	6	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	6	41	0.3	0.2	3,101	2,155	946	31%	\$48	\$408	\$147	\$555	11.6
92220	Corridor B Hallway	CSB	Surface (CF)	5	2213	2 - 13w CF	8,760	9000	0-No Action	5	0	0.2	0.2	1,402	1,402	0	0%	\$0	\$0	\$0	\$0	0.0
92220	Corridor B Hallway	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
92220	Corridor B Hallway	CSB	Surface (CF)	10	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	10	0	0.3	0.3	2,803	2,803	0	0%	\$0	\$0	\$0	\$0	0.0
92400	Corridor B Hallway	CSB	Surface (CF)	3	2213	2 - 13w CF	8,760	9000	0-No Action	3	0	0.1	0.1	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
92400	Corridor B Hallway	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
92400	Corridor B Hallway	CSB	Surface (CF)	5	2213	2 - 13w CF	8,760	9000	0-No Action	5	0	0.2	0.2	1,402	1,402	0	0%	\$0	\$0	\$0	\$0	0.0
92401	H/C Washroom	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7
92403	Corridor B Hallway	FTG	F2x2 Rec	5	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.3	0.2	2,584	1,472	1,113	43%	\$57	\$436	\$98	\$534	9.5

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
92403	Corridor B Hallway	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
92404	Block B Storage	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
92405	Elevator	FSE	F4' striplight	2	3200	1 - 32w RSFI T8 EE	8,760	2820	1-28w 4' RSFI T8 ES HE EL-I	2	25	0.1	0.0	613	438	175	29%	\$9	\$70	\$49	\$119	13.4
92405	Elevator	FSA	F2' striplight	1	3000	1 - 17w RSFI T8 EE	8,760	3764	1-17w RSFI T8 HE EL-IS	1	16	0.0	0.0	210	140	70	33%	\$4	\$41	\$25	\$66	18.5
92409	Block B Corridor	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	1,551	1,367	184	12%	\$9	\$25	\$18	\$44	4.7
92427	H/C Washroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	510	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	16	13	3	16%	\$1	\$4	\$6	\$10	18.6
92433	Women's Washroom	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
92433	Women's Washroom	FWF	F1x4 Wrap	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
92438	Block B Crossroads	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
92438	Block B Crossroads	FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	2,067	1,104	964	47%	\$49	\$327	\$74	\$401	8.2
92438	Block B Crossroads	FTG	F2x2 Rec	9	3348	2 - 32w RSFI T8/U6 EL IS	8,760	2839	2-28w 4' RSFI T8 ES HE EL-L	8	42	0.5	0.3	4,652	2,943	1,708	37%	\$87	\$872	\$196	\$1,068	12.3
92440	Block B Skylights	CSB	Surface (CF)	4	2213	2 - 13w CF	1,000	9000	0-No Action	4	0	0.1	0.1	128	128	0	0%	\$0	\$0	\$0	\$0	0.0
92443	Men's Washroom	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
92443	Men's Washroom	FWF	F1x4 Wrap	5	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	3	52	0.3	0.1	2,584	1,367	1,218	47%	\$62	\$25	\$18	\$44	0.7
92444	Old Main Café	CDA	Downlight	7	2211	1 - 13w CF	1,920	9000	0-No Action	7	0	0.1	0.1	215	215	0	0%	\$0	\$0	\$0	\$0	0.0
92444	Old Main Café	FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	1,920	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	113	79	35	31%	\$3	\$68	\$25	\$93	30.5
92444	Old Main Café	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,920	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	113	100	13	12%	\$1	\$8	\$6	\$15	12.4
92444	Old Main Café	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	1,920	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	340	300	40	12%	\$4	\$25	\$18	\$44	12.4
92447	Block B Comms Closet	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
92454	Block B Janitor	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	60	53	7	12%	\$1	\$17	\$12	\$29	46.8
92461	Block B Hallway	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7
92467/9	Block B Stairwell	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	3	41	0.2	0.1	1,551	1,077	473	31%	\$24	\$204	\$74	\$278	11.6
92467/9	Block B Stairwell	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
92467/9	Block B Stairwell	FCF	F1x4 Cubelight	4	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	2,067	1,822	245	12%	\$12	\$34	\$25	\$58	4.7
92469	Block B Electrical Room	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
92471	Office Corridor Block B	FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	3,315	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.2	0.2	782	544	239	31%	\$16	\$272	\$98	\$370	22.8
92480	Block B Corridor	CSB	Surface (CF)	1	2213	2 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
92481	Office Corridor Block B	FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	2,040	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	120	84	37	31%	\$3	\$68	\$25	\$93	29.6
92482	Block B Corridor	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
92482	Block B Corridor	CSB	Surface (CF)	5	2213	2 - 13w CF	8,760	9000	0-No Action	5	0	0.2	0.2	1,402	1,402	0	0%	\$0	\$0	\$0	\$0	0.0
92482	Block B Corridor	FTG	F2x2 Rec	3	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	3	41	0.2	0.1	1,551	1,077	473	31%	\$24	\$204	\$74	\$278	11.6
92487	Unisex Washroom Block B	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7
92489	Unisex Washroom Block B	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7
92490	Block B Corridor	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	1,034	718	315	31%	\$16	\$136	\$49	\$185	11.6
92500	Block B Corridor	CSB	Surface (CF)	3	2213	2 - 13w CF	8,760	9000	0-No Action	3	0	0.1	0.1	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
92500	Block B Corridor	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
92500	Block B Corridor	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	2	41	0.1	0.1	1,034	718	315	31%	\$16	\$136	\$49	\$185	11.6
92500	Block B Corridor	CSB	Surface (CF)	4	2213	2 - 13w CF	8,760	8000	0-Install Lighting Controls Dev	4	0	0.1	0.1	1,121	1,121	0	0%	\$0	\$0	\$0	\$0	0.0
92519	Vestibule to Classrooms	CSB	Surface (CF)	1	2213	2 - 13w CF	3,640	9000	0-No Action	1	0	0.0	0.0	116	116	0	0%	\$0	\$0	\$0	\$0	0.0
92536	Block B Corridor	CSB	Surface (CF)	1	2213	2 - 13w CF	8,760	9000	0-No Action	1	0	0.0	0.0	280	280	0	0%	\$0	\$0	\$0	\$0	0.0
92585	Dimming Room Theatre	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
92590/9	Block B Stairwell	FTG	F2x2 Rec	7	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	7	41	0.4	0.3	3,618	2,514	1,104	31%	\$56	\$476	\$172	\$648	11.6
92618	Electrical Closet	ILA	Keyless Lampholder	1	2787	1 - 26w CF spiral SI (Scre	255	9000	0-No Action	1	0	0.0	0.0	7	7	0	0%	\$0	\$0	\$0	\$0	0.0
92686	H/C Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7
92686	H/C Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data																																																
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)																																	
92694	Men's Washroom	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	8,760	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	1,507	1,332	175	12%	\$9	\$25	\$12	\$38	4.2																																	
92694	Men's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7																																	
92694A	Men's Washroom Hallway	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7																																	
92706	Stairwell to 3rd Floor	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7																																	
92706	Stairwell to 3rd Floor	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7																																	
92719	Women's Washroom	FTJ	F2x4 Rec	1	3265	3 - 32w RSFI T8 EL-IS 1&2	8,760	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	780	666	114	15%	\$6	\$13	\$6	\$19	3.3																																	
92719	Women's Washroom	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	8,760	2940	3-Relamp with 28w 4' RSFI T	3	76	0.3	0.2	2,339	1,997	342	15%	\$17	\$38	\$18	\$57	3.3																																	
92719	Women's Washroom	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7																																	
92719A	Women's Washroom Vesti	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7																																	
92727	Janitor	FTK	F2x4 Rec	2	3304	4 - 32w RSFI T8 EE 2&2	510	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.0	147	49	98	67%	\$9	\$204	\$61	\$266	31.0																																	
93700	3rd Floor Lobby HR Depart	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0																																	
93700	3rd Floor Lobby HR Depart	CDI	Downlight	13	2408	1 - 32w triple CF	3,315	9000	0-No Action	13	0	0.5	0.5	1,595	1,595	0	0%	\$0	\$0	\$0	\$0	0.0																																	
93700	3rd Floor Lobby HR Depart	CDI	Downlight	2	2408	1 - 32w triple CF	8,760	9000	0-No Action	2	0	0.1	0.1	648	648	0	0%	\$0	\$0	\$0	\$0	0.0																																	
93700	3rd Floor Lobby HR Depart	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	196	172	23	12%	\$2	\$8	\$6	\$15	9.3																																	
93700	3rd Floor Lobby HR Depart	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	3,315	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	196	172	23	12%	\$2	\$8	\$6	\$15	9.3																																	
93714	3rd Floor H/C Washroom	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7																																	
93720	3rd Floor Reception Area	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,060	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	361	318	43	12%	\$3	\$17	\$12	\$29	9.7																																	
93752	3rd Floor Women's Washro	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7																																	
93754	3rd Floor Men's Washroom	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	27	4	12%	\$1	\$8	\$6	\$15	18.7																																	
94700	Block A Penthouse Mecha	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0																																	
94700	Block A Penthouse Mecha	FRH	F8' tandem striplight w/ref	7	3483	4 - 34w RSFI T12 - Std 2 b	255	2852	4-28w 4' RSFI T8 ES HE EL-I	7	96	0.3	0.2	289	171	118	41%	\$16	\$404	\$301	\$704	44.5																																	
94700	Block A Penthouse Mecha	FWI	F2x4 Wrap	1	3483	4 - 34w RSFI T12 - Std 2 b	255	2852	4-28w 4' RSFI T8 ES HE EL-I	1	96	0.0	0.0	25	24	0	1%	\$1	\$58	\$43	\$101	104.7																																	
94700	Block A Penthouse Mecha	FRF	F4' striplight w/reflector	2	3474	2 - 34w RSFI T12 - Std	255	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.0	0.0	41	24	17	41%	\$2	\$81	\$49	\$131	57.7																																	
94700	Block A Penthouse Mecha	FRF	F4' striplight w/reflector	5	3474	2 - 34w RSFI T12 - Std	255	2832	2-28w 4' RSFI T8 ES HE EL-I	5	48	0.1	0.1	103	61	42	41%	\$6	\$204	\$123	\$326	57.7																																	
97402	Block A Penthouse Electric	FRH	F8' tandem striplight w/ref	1	3483	4 - 34w RSFI T12 - Std 2 b	255	2852	4-28w 4' RSFI T8 ES HE EL-I	1	96	0.0	0.0	41	24	17	41%	\$2	\$58	\$43	\$101	44.5																																	
97402	Block A Penthouse Electric	FRF	F4' striplight w/reflector	1	3474	2 - 34w RSFI T12 - Std	255	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	21	12	8	41%	\$1	\$41	\$25	\$65	57.7																																	
97403	Block A Penthouse Pump	FRH	F8' tandem striplight w/ref	2	3483	4 - 34w RSFI T12 - Std 2 b	255	2852	4-28w 4' RSFI T8 ES HE EL-I	2	96	0.1	0.0	83	49	34	41%	\$5	\$115	\$86	\$201	44.5																																	
97403	Block A Penthouse Pump	FRF	F4' striplight w/reflector	1	3474	2 - 34w RSFI T12 - Std	255	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	21	12	8	41%	\$1	\$41	\$25	\$65	57.7																																	
97410	Block A Elevator Machine	ILA	Keyless Lampholder	1	2015	1 - 23w CF SI (Screw in)	255	9000	0-No Action	1	0	0.0	0.0	6	6	0	0%	\$0	\$0	\$0	\$0	0.0																																	
A-Stairw	Stairwell A	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0																																	
A-Stairw	Stairwell A	FCF	F1x4 Cubelight	7	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	3,618	3,189	429	12%	\$22	\$59	\$43	\$102	4.7																																	
A-Stairw	Stairwell C	FCF	F1x4 Cubelight	6	3474	2 - 34w RSFI T12 - Std	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	6	48	0.5	0.3	4,257	2,523	1,734	41%	\$88	\$244	\$147	\$392	4.4																																	
A-Stairw	Stairwell C	FCF	F1x4 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7																																	
A-Vestib	Vestibule A	FCF	F1x4 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	1,034	911	123	12%	\$6	\$17	\$12	\$29	4.7																																	
Elevator	Elevator in Block A	FSD	F3' striplight	3	3463	2 - 30w RSFI T12 EE	8,760	3116	2-25w RSFI T8 EL-IS	3	46	0.2	0.1	1,971	1,209	762	39%	\$39	\$170	\$74	\$244	6.3																																	
Ext-Peri	Perimeter of Building	HWC	Wall Pack	1	6004	1 - 70w HPS	4,380	9000	0-No Action	1	0	0.0	0.0	399	399	0	0%	\$0	\$0	\$0	\$0	0.0																																	
Ext-Peri	Perimeter of Building	MWA	Wall Pack	2	5002	1 - 50w MH	4,380	9000	0-No Action	2	0	0.0	0.0	631	631	0	0%	\$0	\$0	\$0	\$0	0.0																																	
Ext-Peri	Perimeter of Building	VWA	Wall Pack	19	4002	1 - 100w MV DX	4,380	9000	0-No Action	19	0	0.2	0.2	10,403	10,403	0	0%	\$0	\$0	\$0	\$0	0.0																																	
Ext-Peri	Perimeter of Building	MWB	Wall Pack	25	5006	1 - 100w MH	4,380	9000	0-No Action	25	0	0.3	0.3	14,235	14,235	0	0%	\$0	\$0	\$0	\$0	0.0																																	
Ext-Pole	Pole Mounted	HPG	Post Top	8	6020	1 - 400w HPS	4,380	9000	0-No Action	8	0	0.4	0.4	16,294	16,294	0	0%	\$0	\$0	\$0	\$0	0.0																																	
Existing Energy Summary for Building Old Main Building:				3157				3138				211.7				162.4				752,513				563,146				189,367				25%				\$12,379				\$102,442				\$43,893				\$146,335				11.8			

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
100	Large Locked Area	FID	F1x4 Industrial	24	3475	2 - 34w RSFI T12 EE	51	2838	2-28w 4' RSFI T8 ES HE EL-L	24	42	1.6	1.0	88	51	37	42%	\$67	\$1,105	\$589	\$1,694	25.3
101	Storage	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
102	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
102/102	Boiler Room	FID	F1x4 Industrial	4	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.1	0.0	73	43	31	42%	\$4	\$184	\$98	\$282	68.6
103	Storage	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
103A	Women's Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	500	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	26	4	12%	\$1	\$8	\$6	\$15	18.7
103B	Men's Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	500	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	26	4	12%	\$1	\$8	\$6	\$15	18.7
103C	Storage	FIC	F1x4 Industrial	2	3470	1 - 34w RSFI T12 EE	1,040	2826	1-28w 4' RSFI T8 ES HE EL-L	2	22	0.0	0.0	89	46	44	49%	\$3	\$80	\$49	\$130	46.7
103E	Electrical Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
103F	Storage	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	1,040	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	45	23	22	49%	\$1	\$40	\$25	\$65	46.7
103G	Walk in Freezer	FSE	F4' striplight	2	3470	1 - 34w RSFI T12 EE	1,040	3736	1-32w RSFI T8 HE EL-LBF	2	25	0.0	0.0	89	52	37	42%	\$2	\$79	\$49	\$128	54.0
104	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
106	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
108	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
110	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
112	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
114	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
116	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
118	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
118A	Janitor's Supply Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
120	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
122	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
123	Hallway 1st Floor	FTG	F2x2 Rec	7	3348	2 - 32w RSFI T8/U6 EL IS	6,552	3771	2-17w RSFI T8 HE EL-HBF W	7	41	0.4	0.3	2,706	1,880	826	31%	\$45	\$476	\$172	\$648	14.4
123	Hallway 1st Floor	CDB	Downlight	4	2213	2 - 13w CF	6,552	9000	0-No Action	4	0	0.1	0.1	839	839	0	0%	\$0	\$0	\$0	\$0	0.0
130	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
132	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
134	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
136	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
138	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
140	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
142	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
144	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
146	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
148	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
148A	Electrical + Elevator Room	FID	F1x4 Industrial	3	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.1	0.0	55	32	23	42%	\$3	\$138	\$74	\$212	68.6
150	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
151	Printer Room	FBG	F1x4 Box	1	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	99	58	41	42%	\$4	\$46	\$25	\$71	16.0
152	Hallway 1st floor	FTG	F2x2 Rec	7	3346	2 - 32w RSFI T8/U6 EE	6,552	3771	2-17w RSFI T8 HE EL-HBF W	7	41	0.5	0.3	3,394	1,880	1,514	45%	\$82	\$476	\$172	\$648	7.9
170	Office	IDF	Downlight Round	6	1170	1 - 150w Inc PS25	750	9000	0-No Action	6	0	0.9	0.9	675	675	0	0%	\$0	\$0	\$0	\$0	0.0
170	Office	FTI	F2x4 Rec	6	3244	2 - 32w RSFI T8 EL-IS	2,295	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	812	716	96	12%	\$8	\$51	\$37	\$88	11.4
171	First Floor Hallway	IXL	LED Exit sign	5	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	5	0	0.0	0.0	88	88	0	0%	\$0	\$0	\$0	\$0	0.0
171	First Floor Hallway	FTG	F2x2 Rec	5	3346	2 - 32w RSFI T8/U6 EE	6,552	3771	2-17w RSFI T8 HE EL-HBF W	5	41	0.4	0.2	2,424	1,343	1,081	45%	\$59	\$340	\$123	\$463	7.9
171	First Floor Hallway	CDB	Downlight	2	2213	2 - 13w CF	6,552	9000	0-No Action	2	0	0.1	0.1	419	419	0	0%	\$0	\$0	\$0	\$0	0.0
172	Lab/Classroom 1st floor	FTI	F2x4 Rec	8	3244	2 - 32w RSFI T8 EL-IS	1,530	2933	2-Relamp with 28w 4' RSFI T	8	52	0.4	0.4	722	636	86	12%	\$9	\$68	\$49	\$117	13.6
173	Basement Storage	FSE	F4' striplight	14	3470	1 - 34w RSFI T12 EE	510	2826	1-28w 4' RSFI T8 ES HE EL-L	14	22	0.2	0.1	307	157	150	49%	\$13	\$563	\$344	\$907	69.2

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
173A	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
173B	Storage	FTT	F2x2 Rec	1	3028	3 - 17w RSFI T8 EL-IS	510	9000	0-No Action	1	0	0.0	0.0	24	24	0	0%	\$0	\$0	\$0	\$0	0.0
174	Student Study Rooms	IDF	Downlight Round	5	1170	1 - 150w Inc PS25	750	9000	0-No Action	5	0	0.7	0.7	563	563	0	0%	\$0	\$0	\$0	\$0	0.0
174	Student Study Rooms	FTI	F2x4 Rec	14	3244	2 - 32w RSFI T8 EL-IS	1,530	2933	2-Relamp with 28w 4' RSFI T	14	52	0.8	0.7	1,264	1,114	150	12%	\$15	\$118	\$86	\$204	13.6
200	Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	2,040	2939	3-Relamp with 28w 4' RSFI T	3	78	0.3	0.2	726	477	249	34%	\$21	\$38	\$18	\$57	2.7
200A	2nd Floor Office Hallway	FTD	F1x4 Rec	1	3240	2 - 32w RSFI T8 EE	6,552	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	472	275	197	42%	\$11	\$46	\$25	\$71	6.6
200A	2nd Floor Office Hallway	FTG	F2x2 Rec	8	3346	2 - 32w RSFI T8/U6 EE	6,552	3771	2-17w RSFI T8 HE EL-HBF W	8	41	0.6	0.3	3,879	2,149	1,730	45%	\$94	\$544	\$196	\$740	7.9
200A	2nd Floor Office Hallway	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
200B	Hallway/Lobby	CDB	Downlight	21	2213	2 - 13w CF	6,552	9000	0-No Action	21	0	0.6	0.6	4,403	4,403	0	0%	\$0	\$0	\$0	\$0	0.0
200B	Hallway/Lobby	CTI	Troffer (CF)	2	2312	1 - 26w quad CF	6,552	9000	0-No Action	2	0	0.1	0.1	380	380	0	0%	\$0	\$0	\$0	\$0	0.0
200C	2nd Floor East Hallway	CDA	Downlight	5	2211	1 - 13w CF	6,552	9000	0-No Action	5	0	0.1	0.1	524	524	0	0%	\$0	\$0	\$0	\$0	0.0
200C	2nd Floor East Hallway	FTG	F2x2 Rec	5	3346	2 - 32w RSFI T8/U6 EE	6,552	3771	2-17w RSFI T8 HE EL-HBF W	5	41	0.4	0.2	2,424	1,343	1,081	45%	\$59	\$340	\$123	\$463	7.9
200D	Second floor hallway	CDB	Downlight	2	2213	2 - 13w CF	6,552	9000	0-No Action	2	0	0.1	0.1	419	419	0	0%	\$0	\$0	\$0	\$0	0.0
200D	Second floor hallway	FTG	F2x2 Rec	8	3346	2 - 32w RSFI T8/U6 EE	6,552	3771	2-17w RSFI T8 HE EL-HBF W	8	41	0.6	0.3	3,879	2,149	1,730	45%	\$94	\$544	\$196	\$740	7.9
200-Hall	2nd Floor Centre Hallway	FTK	F2x4 Rec	7	3304	4 - 32w RSFI T8 EE 2&2	6,552	2838	2-28w 4' RSFI T8 ES HE EL-L	10	42	1.0	0.4	6,604	2,752	3,853	58%	\$209	\$809	\$246	\$1,055	5.0
201	Computer Lab	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	1,840	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	1,965	1,722	243	12%	\$22	\$152	\$74	\$226	10.4
201A	Supplies Room	FSF	F4' striplight	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
201-Hall	2nd Floor Centre Hallway	FTK	F2x4 Rec	7	3304	4 - 32w RSFI T8 EE 2&2	6,552	2832	2-28w 4' RSFI T8 ES HE EL-L	10	48	1.0	0.5	6,604	3,145	3,459	52%	\$188	\$756	\$246	\$1,002	5.3
202	Office	FTJ	F2x4 Rec	2	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	2	78	0.2	0.1	349	306	43	12%	\$4	\$25	\$12	\$38	10.1
202-Hall	2nd Floor West Hallway	FTG	F2x2 Rec	4	3346	2 - 32w RSFI T8/U6 EE	6,552	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.3	0.2	1,939	1,075	865	45%	\$47	\$272	\$98	\$370	7.9
202-Hall	2nd Floor West Hallway	CDB	Downlight	5	2213	2 - 13w CF	6,552	9000	0-No Action	5	0	0.2	0.2	1,048	1,048	0	0%	\$0	\$0	\$0	\$0	0.0
203	Class/Lecture Room	CDB	Downlight	12	2213	2 - 13w CF	1,575	9000	0-No Action	12	0	0.4	0.4	605	605	0	0%	\$0	\$0	\$0	\$0	0.0
203	Class/Lecture Room	ITM	Track Head	3	1170	1 - 150w Inc PS25	920	9000	0-No Action	3	0	0.4	0.4	414	414	0	0%	\$0	\$0	\$0	\$0	0.0
203	Class/Lecture Room	FTI	F2x4 Rec	18	3244	2 - 32w RSFI T8 EL-IS	1,575	2933	2-Relamp with 28w 4' RSFI T	18	52	1.0	0.9	1,673	1,474	198	12%	\$19	\$152	\$111	\$263	13.5
203A	Storage	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
204	Office	FTJ	F2x4 Rec	7	3265	3 - 32w RSFI T8 EL-IS 1&2	3,060	2939	3-Relamp with 28w 4' RSFI T	7	78	0.6	0.5	1,906	1,671	236	12%	\$17	\$89	\$43	\$132	8.0
204A	Office Hallway	CDH	Downlight	3	2314	2 - 26w quad CF	6,552	9000	0-No Action	3	0	0.2	0.2	1,140	1,140	0	0%	\$0	\$0	\$0	\$0	0.0
204A	Office Hallway	CDH	Downlight	4	2314	2 - 26w quad CF	6,552	9000	0-No Action	4	0	0.2	0.2	1,520	1,520	0	0%	\$0	\$0	\$0	\$0	0.0
204B	Women's Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
204C	Men's Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
205	Office	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.3	0.1	475	210	265	56%	\$28	\$25	\$12	\$38	1.3
206	Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	698	612	86	12%	\$7	\$51	\$25	\$75	10.1
207	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
208	Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	698	612	86	12%	\$7	\$51	\$25	\$75	10.1
209	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
210	Deans Office	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,960	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	698	612	86	12%	\$7	\$51	\$25	\$75	10.1
211	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
212	Office Area	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	3,366	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	289	256	34	12%	\$2	\$13	\$6	\$19	8.3
212	Office Area	FTI	F2x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	3,366	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	2,185	1,925	259	12%	\$17	\$93	\$68	\$161	9.2
212A	Office Area	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	3,366	2940	3-Relamp with 28w 4' RSFI T	1	76	0.1	0.1	289	256	34	12%	\$2	\$13	\$6	\$19	8.3
213	Office	FTJ	F2x4 Rec	24	3264	3 - 32w RSFI T8 EL-IS	3,366	2940	3-Relamp with 28w 4' RSFI T	24	76	2.0	1.7	6,947	6,140	808	12%	\$54	\$305	\$147	\$452	8.3
214	Mail Room	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,500	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	89	78	11	12%	\$1	\$8	\$6	\$15	13.8
214A	Mechanical Room	FSE	F4' striplight	2	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	2	22	0.0	0.0	22	11	11	49%	\$1	\$80	\$49	\$130	90.0
214C	Electrical Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
215	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
217	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
219	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
221	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
223	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
225	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
227	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
229	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
230	Women's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
230A	Student Study	IDF	Downlight Round	2	1170	1 - 150w Inc PS25	750	9000	0-No Action	2	0	0.3	0.3	225	225	0	0%	\$0	\$0	\$0	\$0	0.0
230A	Student Study	FTI	F2x4 Rec	5	3244	2 - 32w RSFI T8 EL-IS	2,000	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	590	520	70	12%	\$6	\$42	\$31	\$73	12.1
230B	Silent Study Room	FTI	F2x4 Rec	5	3244	2 - 32w RSFI T8 EL-IS	2,000	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	590	520	70	12%	\$6	\$42	\$31	\$73	12.1
230C	Storage	IDF	Downlight Round	2	1170	1 - 150w Inc PS25	255	9100	0-Remove and cover	2	0.0001	0.1	0.0	77	0	76	100%	\$10	\$53	\$49	\$102	9.9
230C	Storage	FTD	F1x4 Rec	3	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.1	0.0	225	131	94	42%	\$6	\$138	\$74	\$212	35.7
231	Storage/Office	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,040	2933	2-Relamp with 28w 4' RSFI T	4	52	0.1	0.1	245	216	29	12%	\$2	\$34	\$25	\$58	31.6
232	Computer Lab	FTJ	F2x4 Rec	11	3265	3 - 32w RSFI T8 EL-IS 1&2	1,840	2939	3-Relamp with 28w 4' RSFI T	11	78	0.9	0.8	1,801	1,579	223	12%	\$20	\$140	\$68	\$207	10.4
232A	Women's Washroom	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	3,570	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	514	300	214	42%	\$14	\$92	\$49	\$141	10.0
232B	Storage	FID	F1x4 Industrial	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
232C	Women's Washroom	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	3,570	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.1	0.1	514	300	214	42%	\$14	\$92	\$49	\$141	10.0
232D	Men's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,000	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	59	52	7	12%	\$1	\$8	\$6	\$15	15.9
233	Classroom/Lab	IDF	Downlight Round	9	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	9	0	1.3	1.3	1,688	1,688	0	0%	\$0	\$0	\$0	\$0	0.0
233	Classroom/Lab	FTJ	F2x4 Rec	16	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	16	76	1.3	1.2	1,720	1,520	200	12%	\$23	\$203	\$98	\$301	13.3
236	Copy Room	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	60	53	7	12%	\$3	\$34	\$25	\$58	20.6
236A	Comm. Room	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
237/237	Classroom + Chem Lab	FTJ	F2x4 Rec	18	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	18	76	1.5	1.3	1,935	1,710	225	12%	\$25	\$229	\$111	\$339	13.3
237/237	Classroom + Chem Lab	ITM	Track Head	4	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	4	0	0.6	0.6	750	750	0	0%	\$0	\$0	\$0	\$0	0.0
237/237	Classroom + Chem Lab	FTD	F1x4 Rec	6	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	443	390	53	12%	\$6	\$51	\$37	\$88	14.7
237B	Storage	FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
238	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
240	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
244	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
246	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
248	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
250	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
252	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
254	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
256	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
258	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
260	Classroom	IDF	Downlight Round	16	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	16	0	2.3	2.3	3,000	3,000	0	0%	\$0	\$0	\$0	\$0	0.0
260	Classroom	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
260	Classroom	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,250	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	1,780	1,560	220	12%	\$25	\$203	\$98	\$301	12.1
260	Classroom	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	221	195	26	12%	\$3	\$25	\$18	\$44	14.7
260A	Utility Room	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
261	Lab/Classroom	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
261	Lab/Classroom	IDF	Downlight Round	6	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	6	0	0.9	0.9	1,125	1,125	0	0%	\$0	\$0	\$0	\$0	0.0
261	Lab/Classroom	FTI	F2x4 Rec	16	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	16	52	0.9	0.8	1,180	1,040	140	12%	\$16	\$135	\$98	\$234	14.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
262	Physics Lab	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	148	130	18	12%	\$2	\$17	\$78	\$95	48.1
262	Physics Lab	FID	F1x4 Industrial	11	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	811	715	96	12%	\$11	\$93	\$431	\$524	48.1
262A	Tech Services	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	481	424	57	12%	\$5	\$34	\$25	\$58	12.0
262B	Physics Lab	FTI	F2x4 Rec	23	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	23	52	1.3	1.1	1,696	1,495	201	12%	\$23	\$195	\$141	\$336	14.7
263	Locked Lab	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	221	195	26	12%	\$3	\$25	\$18	\$44	14.7
263A	Chemical Storage	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	4	52	0.1	0.1	120	106	14	12%	\$1	\$34	\$25	\$58	46.8
264	Physics Lab	FTI	F2x4 Rec	6	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	443	390	53	12%	\$6	\$51	\$37	\$88	14.7
265	Chem Lab	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	295	260	35	12%	\$4	\$34	\$25	\$58	14.7
265A	Mechanical Room	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
266	Physics Lab	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
266	Physics Lab	FTJ	F2x4 Rec	16	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	16	76	1.3	1.2	1,720	1,520	200	12%	\$23	\$203	\$98	\$301	13.3
266	Physics Lab	IDF	Downlight Round	16	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	16	0	2.3	2.3	3,000	3,000	0	0%	\$0	\$0	\$0	\$0	0.0
267	Chem Lab	FTI	F2x4 Rec	10	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	10	52	0.6	0.5	738	650	88	12%	\$10	\$85	\$61	\$146	14.7
267A	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	241	212	29	12%	\$2	\$17	\$12	\$29	12.0
267B	Office	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	241	212	29	12%	\$2	\$17	\$12	\$29	12.0
269	Physics Lab	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
269	Physics Lab	IDF	Downlight Round	16	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	16	0	2.3	2.3	3,000	3,000	0	0%	\$0	\$0	\$0	\$0	0.0
269	Physics Lab	FTJ	F2x4 Rec	16	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	16	76	1.3	1.2	1,720	1,520	200	12%	\$23	\$203	\$98	\$301	13.3
270	Optics Lab	IDF	Downlight Round	7	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	7	0	1.0	1.0	1,313	1,313	0	0%	\$0	\$0	\$0	\$0	0.0
270	Optics Lab	FTJ	F2x4 Rec	12	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	12	76	1.0	0.9	1,290	1,140	150	12%	\$17	\$152	\$74	\$226	13.3
270A	Office	FTJ	F2x4 Rec	6	3264	3 - 32w RSFI T8 EL-IS	2,040	2940	3-Relamp with 28w 4' RSFI T	6	76	0.5	0.4	1,053	930	122	12%	\$10	\$76	\$37	\$113	10.9
271	Chem Lab	FTI	F2x4 Rec	7	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	516	455	61	12%	\$7	\$59	\$43	\$102	14.7
271A	Storage	ILA	Keyless Lampholder	1	2400	1 - 18w triple CF	255	9000	0-No Action	1	0	0.0	0.0	6	6	0	0%	\$0	\$0	\$0	\$0	0.0
271A	Storage	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
272	Office	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	361	318	43	12%	\$4	\$25	\$18	\$44	12.0
272A	Women's Washroom	FBG	F1x4 Box	2	3244	2 - 32w RSFI T8 EL-IS	500	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	59	52	7	12%	\$2	\$17	\$12	\$29	18.7
272B	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
272C	Men's Washroom	FBG	F1x4 Box	2	3244	2 - 32w RSFI T8 EL-IS	500	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	59	52	7	12%	\$2	\$17	\$12	\$29	18.7
272D	H/C Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	500	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	30	26	4	12%	\$1	\$8	\$6	\$15	18.7
273	Chem Lab	FTJ	F2x4 Rec	16	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	16	76	1.3	1.2	1,720	1,520	200	12%	\$23	\$203	\$98	\$301	13.3
274	Chem Lab	FTJ	F2x4 Rec	10	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	10	76	0.8	0.7	1,075	950	125	12%	\$14	\$127	\$61	\$188	13.3
275	Classroom	IDF	Downlight Round	11	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	11	0	1.6	1.6	2,063	2,063	0	0%	\$0	\$0	\$0	\$0	0.0
275	Classroom	FTJ	F2x4 Rec	12	3264	3 - 32w RSFI T8 EL-IS	1,575	2940	3-Relamp with 28w 4' RSFI T	12	76	1.0	0.9	1,625	1,436	189	12%	\$19	\$152	\$74	\$226	12.2
276	Storage	FBG	F1x4 Box	4	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	4	42	0.1	0.0	300	175	125	42%	\$8	\$184	\$98	\$282	35.7
276A	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
277	Lunch Room	CDG	Downlight	6	2312	2 - 26w quad CF	2,550	9000	0-No Action	6	0	0.2	0.2	444	444	0	0%	\$0	\$0	\$0	\$0	0.0
277	Lunch Room	CTI	Troffer (CF)	3	2312	1 - 26w quad CF	2,550	9000	0-No Action	3	0	0.1	0.1	222	222	0	0%	\$0	\$0	\$0	\$0	0.0
277	Lunch Room	FTG	F2x2 Rec	7	3348	2 - 32w RSFI T8/U6 EL IS	2,550	3771	2-17w RSFI T8 HE EL-HBF W	7	41	0.4	0.3	1,053	732	321	31%	\$24	\$476	\$172	\$648	26.5
278	Computer Lab	CDH	Downlight	6	2312	2 - 26w quad CF	1,250	9000	0-No Action	6	0	0.2	0.2	218	218	0	0%	\$0	\$0	\$0	\$0	0.0
278	Computer Lab	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
278	Computer Lab	FTJ	F2x4 Rec	12	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	12	76	1.0	0.9	1,290	1,140	150	12%	\$17	\$152	\$74	\$226	13.3
278	Computer Lab	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	295	260	35	12%	\$4	\$34	\$25	\$58	14.7
300	Storage	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	75	44	31	42%	\$2	\$46	\$25	\$71	35.7
300A	Mechanical Closet	FSF	F4' striplight	1	3240	2 - 32w RSFI T8 EE	780	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	56	33	23	42%	\$2	\$46	\$25	\$71	42.4
300B	3rd Floor WestWing Hall 1,	IXL	LED Exit sign	4	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	4	0	0.0	0.0	70	70	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
300B	3rd Floor WestWing Hall 1,	CDH	Downlight	1	2314	2 - 26w quad CF	6,552	9000	0-No Action	1	0	0.1	0.1	380	380	0	0%	\$0	\$0	\$0	\$0	0.0
300B	3rd Floor WestWing Hall 1,	CDH	Downlight	12	2314	2 - 26w quad CF	6,552	9000	0-No Action	12	0	0.7	0.7	4,560	4,560	0	0%	\$0	\$0	\$0	\$0	0.0
300B	3rd Floor WestWing Hall 1,	FTG	F2x2 Rec	3	3354	2 - 32w RSFI T8/U6 EL-RS	6,552	3771	2-17w RSFI T8 HE EL-HBF W	3	41	0.2	0.1	1,219	806	413	34%	\$22	\$204	\$74	\$278	12.4
300B	3rd Floor WestWing Hall 1,	FTG	F2x2 Rec	9	3354	2 - 32w RSFI T8/U6 EL-RS	6,552	3771	2-17w RSFI T8 HE EL-HBF W	9	41	0.5	0.4	3,656	2,418	1,238	34%	\$67	\$612	\$221	\$833	12.4
300B	3rd Floor WestWing Hall 1,	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	6,552	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	773	681	92	12%	\$5	\$17	\$12	\$29	5.9
300C	3rd Floor Electrical Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
300D	Mechanical Room	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	255	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	38	12	26	68%	\$3	\$76	\$25	\$100	29.2
300E	3rd Floor West Wing Hall 3	FTG	F2x2 Rec	4	3346	2 - 32w RSFI T8/U6 EE	6,552	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.3	0.2	1,939	1,075	865	45%	\$47	\$272	\$98	\$370	7.9
300F	3rd Floor Hall East	CDB	Downlight	2	2213	2 - 13w CF	6,552	9000	0-No Action	2	0	0.1	0.1	419	419	0	0%	\$0	\$0	\$0	\$0	0.0
300F	3rd Floor Hall East	CDB	Downlight	5	2213	2 - 13w CF	6,552	9000	0-No Action	5	0	0.2	0.2	1,048	1,048	0	0%	\$0	\$0	\$0	\$0	0.0
300F	3rd Floor Hall East	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
300F	3rd Floor Hall East	FTG	F2x2 Rec	6	3348	2 - 32w RSFI T8/U6 EL IS	6,552	3771	2-17w RSFI T8 HE EL-HBF W	6	41	0.3	0.2	2,319	1,612	708	31%	\$38	\$408	\$147	\$555	14.4
300F	3rd Floor Hall East	FTK	F2x4 Rec	14	3304	4 - 32w RSFI T8 EE 2&2	6,552	2832	2-28w 4' RSFI T8 ES HE EL-I	17	48	1.9	0.8	13,209	5,346	7,862	60%	\$427	\$1,286	\$418	\$1,704	4.0
301	Classroom + Lab	FTG	F2x2 Rec	3	3346	2 - 32w RSFI T8/U6 EE	1,250	3771	2-17w RSFI T8 HE EL-HBF W	3	41	0.2	0.1	278	154	124	45%	\$14	\$204	\$74	\$278	19.8
301	Classroom + Lab	FTI	F2x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	811	715	96	12%	\$11	\$93	\$68	\$161	14.7
3012	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
3013	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
3014	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
301A	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
301B	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	231	204	27	12%	\$2	\$17	\$12	\$29	12.3
301C	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	337	298	39	12%	\$3	\$25	\$12	\$38	11.1
301D	Utility Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
302	Storage	FTK	F2x4 Rec	2	3484	4 - 34w RSFI T12 - EE 2 b	255	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.0	75	24	51	68%	\$7	\$151	\$49	\$200	29.2
302	Storage	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	255	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.0	0.0	38	12	26	68%	\$3	\$76	\$25	\$100	29.2
303	Equipment Storage	FTI	F2x4 Rec	7	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	105	93	12	12%	\$5	\$59	\$43	\$102	20.6
303A	Oxygen Storage	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
305	Equipment Storage	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	30	27	4	12%	\$1	\$17	\$12	\$29	20.6
306	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
306A	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
307	Respiratory Therapy Classr	FTI	F2x4 Rec	19	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	19	52	1.1	0.9	1,401	1,235	166	12%	\$19	\$161	\$117	\$277	14.7
307	Respiratory Therapy Classr	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	74	65	9	12%	\$1	\$8	\$6	\$15	14.7
308	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
309	Meeting Room	FTI	F2x4 Rec	5	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	407	359	48	12%	\$5	\$42	\$31	\$73	14.2
310	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
312	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
314	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
316	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
318	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
320	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
322	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
324	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
326	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	237	210	28	12%	\$3	\$25	\$12	\$38	12.8
328	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
330	Nursing Demonstration	ITM	Track Head	1	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	1	0	0.1	0.1	188	188	0	0%	\$0	\$0	\$0	\$0	0.0
330	Nursing Demonstration	ITM	Track Head	1	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	1	0	0.1	0.1	188	188	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room:	Room Type:	Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
330	Nursing Demonstration	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	1,250	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	445	390	55	12%	\$6	\$51	\$25	\$75	12.1
331	Lab + Classroom	FCF	F1x4 Cubelight	6	3541	2 - 34w RSFI T12 - EE 1&1	1,250	3784	2-28w 4' RSFI T8 ES HE EL-L	6	50	0.5	0.3	615	375	240	39%	\$27	\$419	\$221	\$640	23.5
331	Lab + Classroom	FTI	F2x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	811	715	96	12%	\$11	\$93	\$68	\$161	14.7
332	Staff Lounge	FTI	F2x4 Rec	9	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	9	52	0.5	0.4	733	646	87	12%	\$9	\$76	\$55	\$131	14.2
332a	Mechanical Closet	FID	F1x4 Industrial	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
333	Nursing Lab	FCF	F1x4 Cubelight	6	3541	2 - 34w RSFI T12 - EE 1&1	1,250	3784	2-28w 4' RSFI T8 ES HE EL-L	6	50	0.5	0.3	615	375	240	39%	\$27	\$419	\$221	\$640	23.5
333	Nursing Lab	FTI	F2x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	811	715	96	12%	\$11	\$93	\$68	\$161	14.7
333A	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
334	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
334A	3rd Floor Centre Office Hall	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
334A	3rd Floor Centre Office Hall	FTG	F2x2 Rec	1	3348	2 - 32w RSFI T8/U6 EL IS	6,552	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	387	269	118	31%	\$6	\$68	\$25	\$93	14.4
334A	3rd Floor Centre Office Hall	FTG	F2x2 Rec	9	3354	2 - 32w RSFI T8/U6 EL-RS	6,552	3771	2-17w RSFI T8 HE EL-HBF W	9	41	0.5	0.4	3,656	2,418	1,238	34%	\$67	\$612	\$221	\$833	12.4
335	Storage	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	3	52	0.0	0.0	45	40	5	12%	\$1	\$25	\$18	\$44	60.9
336	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
337	Lecture Hall	IDG	Downlight Round	8	1168	1 - 150w Inc PAR38 Flood	1,575	9000	0-No Action	8	0	1.1	1.1	1,890	1,890	0	0%	\$0	\$0	\$0	\$0	0.0
337	Lecture Hall	ITM	Track Head	3	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	3	0	0.4	0.4	563	563	0	0%	\$0	\$0	\$0	\$0	0.0
337	Lecture Hall	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,575	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	372	328	44	12%	\$4	\$34	\$25	\$58	13.5
337	Lecture Hall	FTJ	F2x4 Rec	16	3265	3 - 32w RSFI T8 EL-IS 1&2	1,575	2939	3-Relamp with 28w 4' RSFI T	16	78	1.4	1.2	2,243	1,966	277	12%	\$27	\$203	\$98	\$301	11.1
338	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
340	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
342	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
344	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
346	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
348	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
348A	Staff Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,000	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	72	42	30	42%	\$4	\$46	\$25	\$71	17.9
350	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
352	Office	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	163	144	19	12%	\$2	\$17	\$12	\$29	14.2
354	Office	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	81	72	10	12%	\$1	\$8	\$6	\$15	14.2
356	Locked Room (Office)	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	1,380	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	99	58	41	42%	\$4	\$46	\$25	\$71	16.0
360	Biology Lab + Classroom	FTJ	F2x4 Rec	16	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	16	76	1.3	1.2	1,720	1,520	200	12%	\$23	\$203	\$98	\$301	13.3
360	Biology Lab + Classroom	IDF	Downlight Round	9	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	9	0	1.3	1.3	1,688	1,688	0	0%	\$0	\$0	\$0	\$0	0.0
360A	Instrument Storage Room	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	510	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	73	43	31	42%	\$3	\$92	\$49	\$141	52.8
360B	Animal Room	FSC	F3' striplight	1	3460	1 - 30w RSFI T12 EE	1,380	3104	1-25w RSFI T8 EL-IS	1	24	0.0	0.0	58	33	25	43%	\$3	\$33	\$25	\$58	21.9
360B	Animal Room	FSA	F2' striplight	1	3438	1 - 20w RSFI T12 EE	1,380	3764	1-17w RSFI T8 HE EL-IS	1	16	0.0	0.0	37	22	15	41%	\$2	\$41	\$25	\$66	40.8
360B	Animal Room	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	1,380	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	244	215	29	12%	\$3	\$25	\$18	\$44	14.2
360C	Vestibule	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	2,040	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	147	86	61	42%	\$5	\$46	\$25	\$71	13.6
361	Lab	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	451	398	54	12%	\$4	\$25	\$18	\$44	10.7
361A	Lab	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	451	398	54	12%	\$4	\$25	\$18	\$44	10.7
362/362	Classroom + Lab	FTI	F2x4 Rec	11	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	11	52	0.6	0.5	811	715	96	12%	\$11	\$93	\$68	\$161	14.7
362A	Storage	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	500	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	72	42	30	42%	\$3	\$92	\$49	\$141	53.3
362D	Storage	FTD	F1x4 Rec	2	3475	2 - 34w RSFI T12 EE	510	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	73	43	31	42%	\$3	\$92	\$49	\$141	52.8
363	Lab	FTI	F2x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	602	530	71	12%	\$5	\$34	\$25	\$58	10.7
363	Lab	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	150	133	18	12%	\$1	\$8	\$6	\$15	10.7
363B	Lab	IDF	Downlight Round	1	1170	1 - 150w Inc PS25	2,550	9000	0-No Action	1	0	0.1	0.1	383	383	0	0%	\$0	\$0	\$0	\$0	0.0
363B	Lab	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	2,550	2940	3-Relamp with 28w 4' RSFI T	3	76	0.2	0.2	658	581	77	12%	\$6	\$38	\$18	\$57	9.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
364	Classroom	FTJ	F2x4 Rec	15	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	15	76	1.2	1.1	1,613	1,425	188	12%	\$21	\$190	\$92	\$283	13.3
364	Classroom	ITM	Track Head	2	1132	1 - 60w Inc A19	1,250	9000	0-No Action	2	0	0.1	0.1	150	150	0	0%	\$0	\$0	\$0	\$0	0.0
364	Classroom	IDF	Downlight Round	8	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	8	0	1.1	1.1	1,500	1,500	0	0%	\$0	\$0	\$0	\$0	0.0
364A	Men's Washroom	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,570	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	421	371	50	12%	\$3	\$17	\$12	\$29	8.9
364B	Women's Washroom	CDI	Downlight	1	2408	1 - 32w triple CF	3,570	9000	0-No Action	1	0	0.0	0.0	132	132	0	0%	\$0	\$0	\$0	\$0	0.0
364B	Women's Washroom	FTD	F1x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	3,570	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	421	371	50	12%	\$3	\$17	\$12	\$29	8.9
365A	Storage (High Use)	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	150	133	18	12%	\$1	\$8	\$6	\$15	10.7
365A	Storage (High Use)	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	451	398	54	12%	\$4	\$25	\$18	\$44	10.7
365B	Lab	IDF	Downlight Round	3	1170	1 - 150w Inc PS25	2,550	9000	0-No Action	3	0	0.4	0.4	1,148	1,148	0	0%	\$0	\$0	\$0	\$0	0.0
365B	Lab	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	451	398	54	12%	\$4	\$25	\$18	\$44	10.7
365D	Lab	FTI	F2x4 Rec	7	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	1,053	928	125	12%	\$10	\$59	\$43	\$102	10.7
365E	Lab	FTI	F2x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	451	398	54	12%	\$4	\$25	\$18	\$44	10.7
365F	Lab	FTI	F2x4 Rec	6	3244	2 - 32w RSFI T8 EL-IS	4,080	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	1,444	1,273	171	12%	\$11	\$51	\$37	\$88	8.2
365G	Lab	FTI	F2x4 Rec	2	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	301	265	36	12%	\$3	\$17	\$12	\$29	10.7
367	Classroom + Lab	IDF	Downlight Round	6	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	6	0	0.9	0.9	1,125	1,125	0	0%	\$0	\$0	\$0	\$0	0.0
367	Classroom + Lab	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
367	Classroom + Lab	FTI	F2x4 Rec	17	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	17	52	1.0	0.8	1,254	1,105	149	12%	\$17	\$144	\$104	\$248	14.7
367	Classroom + Lab	FTD	F1x4 Rec	4	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	295	260	35	12%	\$4	\$34	\$25	\$58	14.7
367A	Lab	FSC	F3' striplight	2	3450	1 - 25w RSFI T12 EE	2,550	3104	1-25w RSFI T8 EL-IS	2	24	0.1	0.0	163	122	41	25%	\$3	\$67	\$49	\$116	37.3
367A	Lab	FTI	F2x4 Rec	5	3244	2 - 32w RSFI T8 EL-IS	2,550	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	752	663	89	12%	\$7	\$42	\$31	\$73	10.7
370	Classroom + Lab	FTJ	F2x4 Rec	14	3265	3 - 32w RSFI T8 EL-IS 1&2	1,250	2939	3-Relamp with 28w 4' RSFI T	14	78	1.2	1.0	1,558	1,365	193	12%	\$22	\$178	\$86	\$264	12.1
370A	Radiation Room	FTJ	F2x4 Rec	3	3265	3 - 32w RSFI T8 EL-IS 1&2	4,080	2939	3-Relamp with 28w 4' RSFI T	3	78	0.3	0.2	1,089	955	135	12%	\$8	\$38	\$18	\$57	6.7
371	Classroom + Lab	FTJ	F2x4 Rec	12	3264	3 - 32w RSFI T8 EL-IS	1,250	2940	3-Relamp with 28w 4' RSFI T	12	76	1.0	0.9	1,290	1,140	150	12%	\$17	\$152	\$74	\$226	13.3
371	Classroom + Lab	IDF	Downlight Round	12	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	12	0	1.7	1.7	2,250	2,250	0	0%	\$0	\$0	\$0	\$0	0.0
371A	Electrical Room	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
372	Classroom + Lab	FTJ	F2x4 Rec	7	3265	3 - 32w RSFI T8 EL-IS 1&2	4,080	2939	3-Relamp with 28w 4' RSFI T	7	78	0.6	0.5	2,542	2,228	314	12%	\$20	\$89	\$43	\$132	6.7
372A	Classroom + Lab	FTJ	F2x4 Rec	4	3265	3 - 32w RSFI T8 EL-IS 1&2	4,080	2939	3-Relamp with 28w 4' RSFI T	4	78	0.3	0.3	1,452	1,273	180	12%	\$11	\$51	\$25	\$75	6.7
373	Classroom	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
373	Classroom	IDE	Downlight Round	12	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	12	0	1.7	1.7	2,250	2,250	0	0%	\$0	\$0	\$0	\$0	0.0
373	Classroom	FTD	F1x4 Rec	3	3244	2 - 32w RSFI T8 EL-IS	1,575	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	279	246	33	12%	\$3	\$25	\$18	\$44	13.5
373	Classroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	1,575	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	93	82	11	12%	\$1	\$8	\$6	\$15	13.5
373	Classroom	FTJ	F2x4 Rec	12	3265	3 - 32w RSFI T8 EL-IS 1&2	1,575	2939	3-Relamp with 28w 4' RSFI T	12	78	1.0	0.9	1,682	1,474	208	12%	\$20	\$152	\$74	\$226	11.1
373A	Storage	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.0	0.0	18	11	8	42%	\$1	\$46	\$25	\$71	68.6
373B	Storage Closet	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
374	Mechanical Closet with Fre	FTC	F1x4 Rec	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
374	Mechanical Closet with Fre	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	255	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	11	6	5	49%	\$1	\$40	\$25	\$65	90.0
374A	Handicap Washroom	FTD	F1x4 Rec	1	3475	2 - 34w RSFI T12 EE	500	2838	2-28w 4' RSFI T8 ES HE EL-L	1	42	0.1	0.0	36	21	15	42%	\$3	\$46	\$25	\$71	21.1
374B	Men's Washroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	3,570	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	211	186	25	12%	\$2	\$8	\$6	\$15	8.9
375	Classroom	IDE	Downlight Round	9	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	9	0	1.3	1.3	1,688	1,688	0	0%	\$0	\$0	\$0	\$0	0.0
375	Classroom	ITM	Track Head	2	1170	1 - 150w Inc PS25	1,250	9000	0-No Action	2	0	0.3	0.3	375	375	0	0%	\$0	\$0	\$0	\$0	0.0
375	Classroom	FTJ	F2x4 Rec	11	3265	3 - 32w RSFI T8 EL-IS 1&2	1,575	2939	3-Relamp with 28w 4' RSFI T	11	78	0.9	0.8	1,542	1,351	191	12%	\$19	\$140	\$68	\$207	11.1
376	Equipment Storage	FBG	F1x4 Box	2	3475	2 - 34w RSFI T12 EE	255	2838	2-28w 4' RSFI T8 ES HE EL-L	2	42	0.0	0.0	37	21	15	42%	\$2	\$92	\$49	\$141	68.6
378	Classroom + Lab	FTI	F2x4 Rec	16	3244	2 - 32w RSFI T8 EL-IS	1,250	2933	2-Relamp with 28w 4' RSFI T	16	52	0.9	0.8	1,180	1,040	140	12%	\$16	\$135	\$98	\$234	14.7
Ext	Exterior Lighting	IDF	Downlight Round	4	1170	1 - 150w Inc PS25	4,380	9000	0-No Action	4	0	0.1	0.1	2,628	2,628	0	0%	\$0	\$0	\$0	\$0	0.0
Ext	Exterior Lighting	HWC	Wall Pack	1	6004	1 - 70w HPS	4,380	9000	0-No Action	1	0	0.0	0.0	399	399	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
Ext	Exterior Lighting	CCE	Wall Sconce	5	2404	1 - 26w triple CF	4,380	9000	0-No Action	5	0	0.0	0.0	635	635	0	0%	\$0	\$0	\$0	\$0	0.0
Ext	Exterior Lighting	HPD	Post Top	15	6006	1 - 100w HPS	4,380	9000	0-No Action	15	0	0.2	0.2	8,541	8,541	0	0%	\$0	\$0	\$0	\$0	0.0
Ext	Exterior Lighting	HPB	Post Top	6	6002	1 - 50w HPS	4,380	9000	0-No Action	6	0	0.0	0.0	1,734	1,734	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR1	Stairwell 1	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR1	Stairwell 1	FTG	F2x2 Rec	1	3346	2 - 32w RSFI T8/U6 EE	8,760	3771	2-17w RSFI T8 HE EL-HBF W	1	41	0.1	0.0	648	359	289	45%	\$15	\$68	\$25	\$93	6.3
STAIR1	Stairwell 1	CCB	Wall Sconce	11	2213	2 - 13w CF	8,760	9000	0-No Action	11	0	0.3	0.3	3,084	3,084	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR2	Stairwell 2	CTS	Wallwash Troffer	2	2512	1 - 38/40w long EM-RS CF	8,760	9000	0-No Action	2	0	0.1	0.1	841	841	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR2	Stairwell 2	FTG	F2x2 Rec	4	3346	2 - 32w RSFI T8/U6 EE	8,760	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.3	0.2	2,593	1,437	1,156	45%	\$59	\$272	\$98	\$370	6.3
STAIR2	Stairwell 2	CCB	Wall Sconce	5	2213	2 - 13w CF	8,760	9000	0-No Action	5	0	0.2	0.2	1,402	1,402	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR3	Stairwell 3 + Entrance Vest	FTG	F2x2 Rec	4	3346	2 - 32w RSFI T8/U6 EE	8,760	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.3	0.2	2,593	1,437	1,156	45%	\$59	\$272	\$98	\$370	6.3
STAIR3	Stairwell 3 + Entrance Vest	CCB	Wall Sconce	4	2213	2 - 13w CF	8,760	9000	0-No Action	4	0	0.1	0.1	1,121	1,121	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR4/	Stairwell 4 and 5	CDB	Downlight	8	2213	2 - 13w CF	8,760	9000	0-No Action	8	0	0.3	0.3	2,243	2,243	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR4/	Stairwell 4 and 5	FTG	F2x2 Rec	4	3348	2 - 32w RSFI T8/U6 EL IS	8,760	3771	2-17w RSFI T8 HE EL-HBF W	4	41	0.2	0.2	2,067	1,437	631	31%	\$32	\$272	\$98	\$370	11.6
STAIR4/	Stairwell 4 and 5	FSE	F4' striplight	1	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	1	22	0.0	0.0	377	193	184	49%	\$9	\$40	\$25	\$65	6.9
STAIR4/	Stairwell 4 and 5	CCB	Wall Sconce	10	2213	2 - 13w CF	8,760	9000	0-No Action	10	0	0.3	0.3	2,803	2,803	0	0%	\$0	\$0	\$0	\$0	0.0
STAIR4/	Stairwell 4 and 5	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	517	456	61	12%	\$3	\$8	\$6	\$15	4.7
STAIR4/	Stairwell 4 and 5	IXA	Inc Exit sign	1	1102	2 - 15w Inc A15	8,760	1003	1-1 Watt LED Exit light NEW	1	2	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2
Existing Energy Summary for Building Science Building:				1515						1521	105.8	91.8	257,341	209,795	47,546	18%	\$3,259	\$24,612	\$12,464	\$37,076	11.4	

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room: Room Type:		Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
102	Storage	FID	F1x4 Industrial	4	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	4	52	0.1	0.1	60	53	7	12%	\$1	\$34	\$25	\$58	60.9
105	Classroom	IDD	Downlight Round	6	1153	1 - 100w Inc A19	460	9000	0-No Action	6	0	0.6	0.6	276	276	0	0%	\$0	\$0	\$0	\$0	0.0
105	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
105A	Storage	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
107	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,050	9000	0-No Action	2	0	0.1	0.1	122	122	0	0%	\$0	\$0	\$0	\$0	0.0
107	Classroom	FCG	F1x8 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	136	120	16	12%	\$2	\$17	\$12	\$29	15.2
107	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
107	Classroom	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	271	239	32	12%	\$4	\$34	\$25	\$58	15.2
107A	Storage	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
108	Electrical Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
109	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,150	9000	0-No Action	2	0	0.1	0.1	133	133	0	0%	\$0	\$0	\$0	\$0	0.0
109	Classroom	FCG	F1x8 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	68	60	8	12%	\$1	\$8	\$6	\$15	15.2
109	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
109	Classroom	FCE	F1x4 Cubelight	1	3244	1 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	68	60	8	12%	\$1	\$4	\$6	\$10	10.8
111	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
111	Classroom	FLD	F4' Tubelight / Linear	3	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	204	179	24	12%	\$3	\$25	\$18	\$44	15.2
113	Classroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	1,150	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	36	30	6	16%	\$1	\$4	\$6	\$10	15.1
113	Classroom	CDH	Downlight	1	2314	2 - 26w quad CF	1,150	9000	0-No Action	1	0	0.1	0.1	67	67	0	0%	\$0	\$0	\$0	\$0	0.0
113	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
113	Classroom	FCG	F1x8 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	68	60	8	12%	\$1	\$8	\$6	\$15	15.2
113A	Storage	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$78	\$95	198.7
114	Storage/Sprinkler	FID	F1x4 Industrial	3	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	3	52	0.0	0.0	45	40	5	12%	\$1	\$25	\$118	\$143	198.7
114A	Network Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
115	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,150	9000	0-No Action	2	0	0.1	0.1	133	133	0	0%	\$0	\$0	\$0	\$0	0.0
115	Classroom	FCG	F1x8 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	136	120	16	12%	\$2	\$17	\$12	\$29	15.2
115	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
115	Classroom	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	271	239	32	12%	\$4	\$34	\$25	\$58	15.2
119	Classroom	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	136	120	16	12%	\$2	\$17	\$12	\$29	15.2
119	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
120	Women's Washroom	CDH	Downlight	2	2314	2 - 26w quad CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,016	1,016	0	0%	\$0	\$0	\$0	\$0	0.0
120	Women's Washroom	CDH	Downlight	3	2314	2 - 26w quad CF	7,644	8000	0-Install Lighting Controls Dev	3	0	0.2	0.2	1,330	1,330	0	0%	\$0	\$0	\$0	\$0	0.0
120	Women's Washroom	FSF	F4' striplight	14	3244	2 - 32w RSFI T8 EL-IS	7,644	2933	2-Relamp with 28w 4' RSFI T	14	52	0.8	0.7	6,314	5,565	749	12%	\$39	\$118	\$86	\$204	5.2
120A	Shower Room	IMB	Dome (Dog Dish / Pill)	2	2045	2 - 13w CF spiral SI (Scre	255	8000	0-Install Lighting Controls Dev	2	0	0.0	0.0	13	13	0	0%	\$0	\$0	\$0	\$0	0.0
120A	Shower Room	CDH	Downlight	1	2314	2 - 26w quad CF	255	8000	0-Install Lighting Controls Dev	1	0	0.1	0.1	15	15	0	0%	\$0	\$0	\$0	\$0	0.0
120A	Shower Room	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	30	27	4	12%	\$1	\$17	\$12	\$29	20.6
124	Men's Washroom	CDH	Downlight	2	2314	2 - 26w quad CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,016	1,016	0	0%	\$0	\$0	\$0	\$0	0.0
124	Men's Washroom	CDH	Downlight	2	2314	2 - 26w quad CF	7,644	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	887	887	0	0%	\$0	\$0	\$0	\$0	0.0
124	Men's Washroom	FSF	F4' striplight	8	3244	2 - 32w RSFI T8 EL-IS	7,644	2933	2-Relamp with 28w 4' RSFI T	8	52	0.4	0.4	3,608	3,180	428	12%	\$22	\$68	\$49	\$117	5.2
124A	Shower Room	IMB	Dome (Dog Dish / Pill)	2	2045	2 - 13w CF spiral SI (Scre	255	9000	0-No Action	2	0	0.0	0.0	13	13	0	0%	\$0	\$0	\$0	\$0	0.0
124A	Shower Room	CDH	Downlight	1	2314	2 - 26w quad CF	255	9000	0-No Action	1	0	0.1	0.1	15	15	0	0%	\$0	\$0	\$0	\$0	0.0
124A	Shower Room	FSF	F4' striplight	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	30	27	4	12%	\$1	\$17	\$12	\$29	20.6
126 H/C	H/C Washroom	FSA	F2' striplight	1	3004	1 - 17w RSFI T8 EL-IS	920	9000	0-No Action	1	0	0.0	0.0	16	16	0	0%	\$0	\$0	\$0	\$0	0.0
126 H/C	H/C Washroom	IMB	Dome (Dog Dish / Pill)	1	2045	2 - 13w CF spiral SI (Scre	920	9000	0-No Action	1	0	0.0	0.0	24	24	0	0%	\$0	\$0	\$0	\$0	0.0
126 H/C	H/C Washroom	FSH	F8' tandem striplight	4	3308	4 - 32w RSFI T8 EL-IS	920	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	412	361	52	13%	\$7	\$68	\$25	\$92	12.8
129	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,150	9000	0-No Action	2	0	0.1	0.1	133	133	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
129	Classroom	FBF	F1x4 Box	1	3208	1 - 32w RSFI T8 EL-IS	1,150	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	36	30	6	16%	\$1	\$4	\$6	\$10	15.1
129	Classroom	FBG	F1x4 Box	1	3244	2 - 32w RSFI T8 EL-IS	1,150	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	68	60	8	12%	\$1	\$8	\$6	\$15	15.2
129	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,150	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	773	676	97	13%	\$12	\$102	\$37	\$138	12.0
129A	Storage	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
133	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,610	9000	0-No Action	2	0	0.1	0.1	187	187	0	0%	\$0	\$0	\$0	\$0	0.0
133	Classroom	FCG	F1x8 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	190	167	23	12%	\$2	\$17	\$12	\$29	13.4
133	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,082	947	135	13%	\$13	\$102	\$37	\$138	10.6
133	Classroom	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	380	335	45	12%	\$4	\$34	\$25	\$58	13.4
135	Classroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	1,610	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	50	42	8	16%	\$1	\$4	\$6	\$10	13.3
135	Classroom	FID	F1x4 Industrial	3	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	285	251	34	12%	\$3	\$25	\$18	\$44	13.4
135	Classroom	FCG	F1x8 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	95	84	11	12%	\$1	\$8	\$6	\$15	13.4
135	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,082	947	135	13%	\$13	\$102	\$37	\$138	10.6
135A	Storage	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
137	Classroom	FCG	F1x8 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	190	167	23	12%	\$2	\$17	\$12	\$29	13.4
137	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,082	947	135	13%	\$13	\$102	\$37	\$138	10.6
139	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,610	9000	0-No Action	2	0	0.1	0.1	187	187	0	0%	\$0	\$0	\$0	\$0	0.0
139	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,082	947	135	13%	\$13	\$102	\$37	\$138	10.6
139	Classroom	FCG	F1x8 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	95	84	11	12%	\$1	\$8	\$6	\$15	13.4
139	Classroom	FLE	F8' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	95	84	11	12%	\$1	\$8	\$6	\$15	13.4
141	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,610	9000	0-No Action	2	0	0.1	0.1	187	187	0	0%	\$0	\$0	\$0	\$0	0.0
141	Classroom	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	380	335	45	12%	\$4	\$34	\$25	\$58	13.4
141	Classroom	FCG	F1x8 Cubelight	2	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	190	167	23	12%	\$2	\$17	\$12	\$29	13.4
141	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,082	947	135	13%	\$13	\$102	\$37	\$138	10.6
146	Janitor	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	30	27	4	12%	\$0	\$8	\$6	\$15	46.8
148	Electrical Storage	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	510	9000	0-No Action	1	0	0.1	0.1	44	44	0	0%	\$0	\$0	\$0	\$0	0.0
148	Electrical Storage	FTI	F2x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	510	9000	0-No Action	1	0	0.1	0.1	30	30	0	0%	\$0	\$0	\$0	\$0	0.0
148	Electrical Storage	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	510	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	60	53	7	12%	\$2	\$17	\$12	\$29	18.7
148	Electrical Storage	FTK	F2x4 Rec	1	3484	4 - 34w RSFI T12 - EE 2 b	510	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	75	24	51	68%	\$11	\$76	\$25	\$100	9.0
149	Classroom	FCE	F1x4 Cubelight	1	3208	1 - 32w RSFI T8 EL-IS	1,610	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	50	42	8	16%	\$1	\$4	\$6	\$10	13.3
149	Classroom	CDH	Downlight	2	2314	2 - 26w quad CF	1,610	9000	0-No Action	2	0	0.1	0.1	187	187	0	0%	\$0	\$0	\$0	\$0	0.0
149	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,082	947	135	13%	\$13	\$102	\$37	\$138	10.6
149	Classroom	FCG	F1x8 Cubelight	1	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	95	84	11	12%	\$1	\$8	\$6	\$15	13.4
149A	Storage	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$78	\$95	198.7
150	Main Electrical	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.0	0.0	30	27	4	12%	\$0	\$17	\$12	\$29	60.9
152	Network Room	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	30	27	4	12%	\$1	\$17	\$12	\$29	20.6
153	Meeting Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	900	2940	3-Relamp with 28w 4' RSFI T	2	76	0.1	0.1	115	137	-22	-19%	\$0	\$25	\$12	\$38	83.9
153	Meeting Room	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	900	2940	3-Relamp with 28w 4' RSFI T	4	76	0.2	0.2	229	274	-44	-19%	\$1	\$51	\$25	\$75	83.9
153A	Kitchen	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	2,040	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	241	196	45	19%	\$4	\$267	\$61	\$328	85.9
153A	Kitchen	CDH	Downlight	1	2314	2 - 26w quad CF	2,040	9000	0-No Action	1	0	0.1	0.1	118	118	0	0%	\$0	\$0	\$0	\$0	0.0
154	Boiler Room	FWF	F1x4 Wrap	2	3256	2 - 32w RSFI T8 EL-RS	255	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.0	0.0	32	24	7	23%	\$1	\$81	\$115	\$197	205.0
154	Boiler Room	FWF	F1x4 Wrap	7	3256	2 - 32w RSFI T8 EL-RS	255	2832	2-28w 4' RSFI T8 ES HE EL-I	7	48	0.1	0.1	111	86	25	23%	\$3	\$285	\$403	\$688	205.0
155	Reception/Office	CDN	Downlight	3	2213	2 - 13w CF	3,060	9000	0-No Action	3	0	0.1	0.1	294	294	0	0%	\$0	\$0	\$0	\$0	0.0
155	Reception/Office	CDH	Downlight	4	2314	2 - 26w quad CF	3,060	9000	0-No Action	4	0	0.2	0.2	710	710	0	0%	\$0	\$0	\$0	\$0	0.0
155	Reception/Office	FTK	F2x4 Rec	3	3308	4 - 32w RSFI T8 EL-IS	3,060	2946	4-Relamp with 28w 4' RSFI T	3	98	0.3	0.3	1,028	900	129	13%	\$9	\$51	\$18	\$69	7.7
155	Reception/Office	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	3,060	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	685	600	86	13%	\$6	\$34	\$12	\$46	7.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
158	Open Office	CDH	Downlight	1	2314	2 - 26w quad CF	2,250	9000	0-No Action	1	0	0.1	0.1	131	131	0	0%	\$0	\$0	\$0	\$0	0.0
158	Open Office	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
158	Open Office	CDH	Downlight	6	2314	2 - 26w quad CF	2,250	9000	0-No Action	6	0	0.3	0.3	783	783	0	0%	\$0	\$0	\$0	\$0	0.0
158	Open Office	IDP	Downlight Round	5	1205	1 - 50w MR16	2,250	9000	0-No Action	5	0	0.2	0.2	563	563	0	0%	\$0	\$0	\$0	\$0	0.0
158	Open Office	FTK	F2x4 Rec	7	3308	4 - 32w RSFI T8 EL-IS	2,250	9429	2-Delamp to 2 - 28w 4' RSFI T	7	60	0.7	0.4	1,764	945	819	46%	\$66	\$118	\$258	\$376	5.7
158A	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	169	112	57	34%	\$5	\$26	\$25	\$50	10.2
158A	Office	IDD	Downlight Round	1	1153	1 - 100w Inc A19	1,960	9000	0-No Action	1	0	0.1	0.1	196	196	0	0%	\$0	\$0	\$0	\$0	0.0
158B	Office	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	1,960	9429	2-Delamp to 2 - 28w 4' RSFI T	2	60	0.2	0.1	439	235	204	46%	\$18	\$34	\$74	\$108	6.1
158C	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9000	0-No Action	1	0	0.0	0.0	44	44	0	0%	\$0	\$0	\$0	\$0	0.0
158C	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9429	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	220	118	102	46%	\$9	\$17	\$37	\$54	6.1
158D	Office	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	1,960	9429	2-Delamp to 2 - 28w 4' RSFI T	2	60	0.2	0.1	439	235	204	46%	\$18	\$34	\$74	\$108	6.1
158E	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9000	0-No Action	1	0	0.0	0.0	44	44	0	0%	\$0	\$0	\$0	\$0	0.0
158E	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9429	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.0	132	118	14	11%	\$3	\$17	\$37	\$54	15.8
160	Elevator Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$6	\$15	60.9
160A	Mail/Copy Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,250	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	387	257	131	34%	\$11	\$52	\$49	\$101	9.6
161	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	220	192	27	13%	\$2	\$17	\$6	\$23	9.7
162	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.1	0.1	249	223	26	10%	\$5	\$52	\$49	\$101	20.4
163	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	220	192	27	13%	\$2	\$17	\$6	\$23	9.7
164	Men's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	54	48	6	12%	\$1	\$8	\$6	\$15	16.3
165	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	220	118	102	46%	\$9	\$17	\$37	\$54	6.1
165	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	220	118	102	46%	\$9	\$17	\$37	\$54	6.1
166	Women's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	54	48	6	12%	\$1	\$8	\$6	\$15	16.3
167	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	220	118	102	46%	\$9	\$17	\$37	\$54	6.1
168	Storage	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	750	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	44	39	5	12%	\$0	\$8	\$6	\$15	38.4
170	Meeting Room	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	900	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.0	0.0	38	51	-13	-35%	\$1	\$26	\$25	\$50	66.9
170	Meeting Room	IDD	Downlight Round	6	1153	1 - 100w Inc A19	900	9000	0-No Action	6	0	0.6	0.6	540	540	0	0%	\$0	\$0	\$0	\$0	0.0
170	Meeting Room	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	900	9427	2-Delamp to 2 - 28w 4' RSFI T	3	57	0.2	0.2	232	154	78	34%	\$11	\$78	\$74	\$151	13.7
171	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	220	118	102	46%	\$9	\$17	\$37	\$54	6.1
173	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
173	Office	IDD	Downlight Round	6	1153	1 - 100w Inc A19	1,960	9000	0-No Action	6	0	0.6	0.6	1,176	1,176	0	0%	\$0	\$0	\$0	\$0	0.0
173A	Kitchen	FTG	F2x2 Rec	2	3348	2 - 32w RSFI T8/U6 EL IS	3,120	2836	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	368	300	69	19%	\$5	\$267	\$61	\$328	68.7
173A	Kitchen	CDH	Downlight	1	2314	2 - 26w quad CF	3,120	9000	0-No Action	1	0	0.1	0.1	181	181	0	0%	\$0	\$0	\$0	\$0	0.0
178	Office	IDD	Downlight Round	2	1153	1 - 100w Inc A19	1,960	9000	0-No Action	2	0	0.2	0.2	392	392	0	0%	\$0	\$0	\$0	\$0	0.0
178	Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	169	112	57	34%	\$5	\$26	\$25	\$50	10.2
180	Office	IDD	Downlight Round	1	1153	1 - 100w Inc A19	1,960	9000	0-No Action	1	0	0.1	0.1	196	196	0	0%	\$0	\$0	\$0	\$0	0.0
180	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
182	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	220	118	102	46%	\$9	\$17	\$37	\$54	6.1
182	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,960	9425	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	220	118	102	46%	\$9	\$17	\$37	\$54	6.1
184	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,960	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	337	223	114	34%	\$10	\$52	\$49	\$101	10.2
1-Entry	North Vestibule	CCF	Wall Sconce	1	2314	2 - 26w quad CF	4,420	9000	0-No Action	1	0	0.1	0.1	256	256	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry	North Vestibule	CDH	Downlight	2	2314	2 - 26w quad CF	4,420	9000	0-No Action	2	0	0.1	0.1	513	513	0	0%	\$0	\$0	\$0	\$0	0.0
1-Entry	North Vestibule	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	4,420	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	261	230	31	12%	\$2	\$8	\$6	\$15	7.7
1-Entry	North Vestibule	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	4,420	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	1,043	919	124	12%	\$8	\$34	\$25	\$58	7.7
1-Entry	1st Floor South Vestibule	CDH	Downlight	2	2314	2 - 26w quad CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,016	1,016	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa	1st Floor Hallway North	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room: Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
1-Hallwa 1st Floor Hallway North	FCE	F1x4 Cubelight	7	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	7	0	0.2	0.2	1,901	1,901	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway North	ITG	Track Head	12	2009	1 - 15w CF ref fl SI (Screw	7,644	8000	0-Install Lighting Controls Dev	12	0	0.2	0.2	1,376	1,376	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway North	FCE	F1x4 Cubelight	7	3232	1 - 32w RSFI T8 EL-RS	7,644	8000	0-Install Lighting Controls Dev	7	0	0.2	0.2	1,659	1,659	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway North	ISI	Cylinder	1	2314	2 - 26w quad CF	7,644	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	89	89	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway North	FRS	F8' HO striplight w/reflect	4	3709	1 - 110w HOFI T12 - Std	7,644	2857	2-28w 4' RSFI T8 ES HE EL-	4	74	0.5	0.3	4,281	2,263	2,018	47%	\$106	\$758	\$98	\$856	8.1
1-Hallwa 1st Floor Hallway North	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	7,644	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	902	795	107	12%	\$6	\$17	\$12	\$29	5.2
1-Hallwa 1st Floor Hallway South	CDH	Downlight	6	2314	2 - 26w quad CF	7,644	8000	0-Install Lighting Controls Dev	6	0	0.3	0.3	2,660	2,660	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway South	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway South	FCE	F1x4 Cubelight	5	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	5	0	0.1	0.1	1,358	1,358	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway South	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway South	FCE	F1x4 Cubelight	5	3232	1 - 32w RSFI T8 EL-RS	7,644	8000	0-Install Lighting Controls Dev	5	0	0.1	0.1	1,185	1,185	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway South	FRS	F8' HO striplight w/reflect	4	3709	1 - 110w HOFI T12 - Std	7,644	2857	2-28w 4' RSFI T8 ES HE EL-	4	74	0.5	0.3	4,281	2,263	2,018	47%	\$106	\$758	\$98	\$856	8.1
1-Hallwa 1st Floor Hallway South	FWF	F1x4 Wrap	2	3244	2 - 32w RSFI T8 EL-IS	7,644	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	902	795	107	12%	\$6	\$17	\$12	\$29	5.2
1-Hallwa 1st Floor Hallway South	ITI	Track Head	1	2009	1 - 15w CF ref fl SI (Screw	7,644	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	115	115	0	0%	\$0	\$0	\$0	\$0	0.0
1-Hallwa 1st Floor Hallway South	ITI	Track Head	11	2009	1 - 15w CF ref fl SI (Screw	7,644	8000	0-Install Lighting Controls Dev	11	0	0.2	0.2	1,261	1,261	0	0%	\$0	\$0	\$0	\$0	0.0
1-Locker Lockers	FLF	F8' Tubelight / Linear	8	3308	4 - 32w RSFI T8 EL-IS	7,644	2946	4-Relamp with 28w 4' RSFI T	8	98	0.9	0.7	6,849	5,993	856	13%	\$45	\$135	\$314	\$449	10.0
1-Locker Lockers	FLF	F8' Tubelight / Linear	8	3308	4 - 32w RSFI T8 EL-IS	7,644	2946	4-Relamp with 28w 4' RSFI T	8	98	0.9	0.7	6,849	5,993	856	13%	\$45	\$135	\$49	\$185	4.1
1-North North Foyer	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
1-North North Foyer	ITE	Track Head	9	2009	1 - 15w CF ref fl SI (Screw	4,420	9000	0-No Action	9	0	0.1	0.1	597	597	0	0%	\$0	\$0	\$0	\$0	0.0
1-North North Foyer	FWF	F1x4 Wrap	1	3240	2 - 32w RSFI T8 EE	4,420	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	318	212	106	33%	\$6	\$41	\$58	\$98	15.2
204/208 Heavy Duty Mechanic Sho	IXL	LED Exit sign	3	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	3	0	0.0	0.0	53	53	0	0%	\$0	\$0	\$0	\$0	0.0
204/208 Heavy Duty Mechanic Sho	MHG	High / Low Bay	4	5014	1 - 400w MH	8,760	3755	6-32w RSFI T8 HE EL-HBF 2	4	220	1.7	0.8	15,768	7,709	8,059	51%	\$409	\$1,337	\$384	\$1,721	4.2
204/208 Heavy Duty Mechanic Sho	MHG	High / Low Bay	24	5014	1 - 400w MH	3,520	3755	6-32w RSFI T8 HE EL-HBF 2	32	220	10.3	6.7	38,016	24,781	13,235	35%	\$877	\$10,696	\$3,068	\$13,764	15.7
204A Instructor Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,840	9430	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	316	210	107	34%	\$10	\$25	\$49	\$75	7.8
205 Classroom	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	180	158	23	13%	\$2	\$17	\$6	\$23	10.6
205 Classroom	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	180	158	23	13%	\$2	\$17	\$6	\$23	10.6
205 Classroom	FLD	F4' Tubelight / Linear	2	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	190	167	23	12%	\$2	\$17	\$12	\$29	13.4
205A Instructor Office	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	1,840	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	206	180	26	13%	\$2	\$17	\$6	\$23	10.0
205A Instructor Office	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	1,840	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	109	96	13	12%	\$1	\$8	\$6	\$15	12.6
209 Parts Department	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	2,070	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	122	108	14	12%	\$1	\$8	\$39	\$48	39.0
209 Parts Department	FLF	F8' Tubelight / Linear	2	3308	4 - 32w RSFI T8 EL-IS	2,070	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	464	406	58	13%	\$5	\$34	\$78	\$112	22.9
209 Parts Department	FID	F1x4 Industrial	16	3244	2 - 32w RSFI T8 EL-IS	2,070	2933	2-Relamp with 28w 4' RSFI T	16	52	0.9	0.8	1,954	1,722	232	12%	\$20	\$135	\$627	\$763	39.0
211 Mechaincal Trades Tool R	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	2,070	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	122	108	14	12%	\$1	\$8	\$39	\$48	39.0
211 Mechaincal Trades Tool R	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	2,070	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	232	203	29	13%	\$2	\$17	\$39	\$56	22.9
211 Mechaincal Trades Tool R	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	2,070	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	232	203	29	13%	\$2	\$17	\$39	\$56	22.9
211 Mechaincal Trades Tool R	FID	F1x4 Industrial	16	3244	2 - 32w RSFI T8 EL-IS	2,070	2933	2-Relamp with 28w 4' RSFI T	16	52	0.9	0.8	1,954	1,722	232	12%	\$20	\$135	\$627	\$763	39.0
212/220 Heavy Duty Mechanic	MHG	High / Low Bay	14	5014	1 - 400w MH	3,520	3755	6-32w RSFI T8 HE EL-HBF 2	18	220	6.0	3.8	22,176	13,939	8,237	37%	\$546	\$6,017	\$1,726	\$7,743	14.2
212/220 Heavy Duty Mechanic	MHG	High / Low Bay	2	5014	1 - 400w MH	3,520	3755	6-32w RSFI T8 HE EL-HBF 2	2	220	0.9	0.4	3,168	1,549	1,619	51%	\$107	\$669	\$192	\$860	8.0
212A Instructor Office	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	1,840	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	412	361	52	13%	\$5	\$34	\$12	\$46	10.0
213 Switch Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	15	13	2	12%	\$1	\$8	\$39	\$48	67.2
215 TV/VCR Viewing Room	FLF	F8' Tubelight / Linear	2	3308	4 - 32w RSFI T8 EL-IS	2,040	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	457	400	57	13%	\$5	\$34	\$12	\$46	9.5
215 TV/VCR Viewing Room	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	2,040	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	120	106	14	12%	\$1	\$8	\$6	\$15	12.0
215A Computer Lab	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	2,040	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	228	200	29	13%	\$2	\$17	\$6	\$23	9.5
215A Computer Lab	FLF	F8' Tubelight / Linear	2	3308	4 - 32w RSFI T8 EL-IS	2,040	2946	4-Relamp with 28w 4' RSFI T	2	98	0.2	0.2	457	400	57	13%	\$5	\$34	\$12	\$46	9.5
215B Office	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	1,960	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	220	192	27	13%	\$2	\$17	\$6	\$23	9.7

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
215B	Office	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	1,960	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	116	102	14	12%	\$1	\$8	\$6	\$15	12.3
219	Classroom	FLF	F8' Tubelight / Linear	1	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	180	158	23	13%	\$2	\$17	\$6	\$23	10.6
219	Classroom	FLF	F8' Tubelight / Linear	3	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	3	98	0.3	0.3	541	473	68	13%	\$7	\$51	\$18	\$69	10.6
219	Classroom	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	1,082	947	135	13%	\$13	\$102	\$37	\$138	10.6
219	Classroom	FLD	F4' Tubelight / Linear	2	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	190	167	23	12%	\$2	\$17	\$12	\$29	13.4
220	Marine Mechanic Shop	FID	F1x4 Industrial	28	3244	2 - 32w RSFI T8 EL-IS	3,520	2933	2-Relamp with 28w 4' RSFI T	28	52	1.6	1.4	5,815	5,125	690	12%	\$46	\$237	\$172	\$409	8.9
224	Janitor Room	FTD	F1x4 Rec	1	3256	2 - 32w RSFI T8 EL-RS	510	9000	0-No Action	1	0	0.0	0.0	32	32	0	0%	\$0	\$0	\$0	\$0	0.0
224	Janitor Room	FTD	F1x4 Rec	1	3256	2 - 32w RSFI T8 EL-RS	510	9000	0-No Action	1	0	0.0	0.0	32	32	0	0%	\$0	\$0	\$0	\$0	0.0
225	Handicap Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	54	48	6	12%	\$1	\$8	\$6	\$15	16.3
227	Photocopy	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,250	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	194	128	65	34%	\$5	\$26	\$25	\$50	9.6
227A	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,530	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	263	233	31	12%	\$3	\$25	\$12	\$38	12.3
228	Switch Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	2,860	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	169	149	20	12%	\$1	\$8	\$6	\$15	10.1
229	Meeting Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	900	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	155	103	52	34%	\$7	\$52	\$49	\$101	13.7
229	Meeting Room	IDA	Downlight Round	2	1132	1 - 60w Inc A19	900	9000	0-No Action	2	0	0.1	0.1	108	108	0	0%	\$0	\$0	\$0	\$0	0.0
229	Meeting Room	IDA	Downlight Round	2	1132	1 - 60w Inc A19	900	9000	0-No Action	2	0	0.1	0.1	108	108	0	0%	\$0	\$0	\$0	\$0	0.0
230	Carpentry	MHG	High / Low Bay	9	5014	1 - 400w MH	3,520	3755	6-32w RSFI T8 HE EL-HBF 2	12	220	3.8	2.5	14,256	9,293	4,963	35%	\$329	\$4,011	\$1,151	\$5,162	15.7
230	Carpentry	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
230	Carpentry	MHF	High / Low Bay	5	5012	1 - 250w MH	3,520	3325	4-32w RSFI T8 EL-HBF 2&2	6	156	1.4	0.9	5,139	3,295	1,844	36%	\$122	\$911	\$686	\$1,596	13.1
230	Carpentry	MHG	High / Low Bay	2	5014	1 - 400w MH	3,520	3755	6-32w RSFI T8 HE EL-HBF 2	2	220	0.9	0.4	3,168	1,549	1,619	51%	\$107	\$669	\$192	\$860	8.0
233	Open Office	CDH	Downlight	2	2314	2 - 26w quad CF	2,250	9000	0-No Action	2	0	0.1	0.1	261	261	0	0%	\$0	\$0	\$0	\$0	0.0
233	Open Office	FTJ	F2x4 Rec	8	3264	3 - 32w RSFI T8 EL-IS	2,250	9427	2-Delamp to 2 - 28w 4' RSFI T	8	57	0.7	0.4	1,548	1,026	522	34%	\$42	\$207	\$196	\$404	9.6
233	Open Office	FTJ	F2x4 Rec	1	3264	3 - 32w RSFI T8 EL-IS	2,250	9427	2-Delamp to 2 - 28w 4' RSFI T	1	57	0.1	0.1	194	128	65	34%	\$5	\$26	\$25	\$50	9.6
235	Electronics Lab	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	470	412	59	13%	\$7	\$68	\$25	\$92	12.3
235	Electronics Lab	FLD	F4' Tubelight / Linear	2	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	124	109	15	12%	\$2	\$17	\$12	\$29	15.6
237	Motor Control Lab	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	470	412	59	13%	\$7	\$68	\$25	\$92	12.3
237	Motor Control Lab	FLD	F4' Tubelight / Linear	2	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	124	109	15	12%	\$2	\$17	\$12	\$29	15.6
239	Rotating Equipment Lab	FLF	F8' Tubelight / Linear	6	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	6	98	0.6	0.6	706	617	88	13%	\$11	\$102	\$37	\$138	12.3
239	Rotating Equipment Lab	FLD	F4' Tubelight / Linear	3	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	186	164	22	12%	\$3	\$25	\$18	\$44	15.6
241	Rotating Equipment Lab	FLF	F8' Tubelight / Linear	3	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	3	98	0.3	0.3	353	309	44	13%	\$6	\$51	\$18	\$69	12.3
241	Rotating Equipment Lab	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	62	55	7	12%	\$1	\$8	\$6	\$15	15.6
241	Rotating Equipment Lab	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	62	55	7	12%	\$1	\$8	\$6	\$15	15.6
242	Electrician Training	FBN	F2x4 Box	1	3484	4 - 34w RSFI T12 - EE 2 b	1,840	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	272	88	184	68%	\$17	\$76	\$25	\$100	6.1
242	Electrician Training	FBN	F2x4 Box	2	3484	4 - 34w RSFI T12 - EE 2 b	1,840	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	327	177	150	46%	\$17	\$151	\$49	\$200	11.8
242	Electrician Training	FBN	F2x4 Box	6	3484	4 - 34w RSFI T12 - EE 2 b	1,840	2832	2-28w 4' RSFI T8 ES HE EL-I	6	48	0.8	0.3	1,634	530	1,104	68%	\$99	\$454	\$147	\$601	6.1
242	Electrician Training	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
242A	Electrician Training	FWF	F1x4 Wrap	3	3240	2 - 32w RSFI T8 EE	1,840	2838	2-28w 4' RSFI T8 ES HE EL-L	3	42	0.2	0.1	397	232	166	42%	\$15	\$138	\$74	\$212	14.2
242A	Electrician Training	FWF	F1x4 Wrap	13	3240	2 - 32w RSFI T8 EE	1,840	2838	2-28w 4' RSFI T8 ES HE EL-L	13	42	0.9	0.5	1,722	1,005	718	42%	\$65	\$598	\$319	\$918	14.2
242B	High Ceiling Storage	MHG	High / Low Bay	3	5014	1 - 400w MH	1,840	3755	6-32w RSFI T8 HE EL-HBF 2	3	220	1.3	0.6	2,484	1,214	1,270	51%	\$114	\$1,003	\$288	\$1,290	11.3
244	3 Phase Lab	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	470	412	59	13%	\$7	\$68	\$25	\$92	12.3
244	3 Phase Lab	FLD	F4' Tubelight / Linear	2	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	124	109	15	12%	\$2	\$17	\$12	\$29	15.6
246	Equipment Storage	MHG	High / Low Bay	1	5014	1 - 400w MH	8,760	3755	6-32w RSFI T8 HE EL-HBF 2	1	220	0.4	0.2	3,942	1,927	2,015	51%	\$102	\$334	\$96	\$430	4.2
246	Equipment Storage	MHG	High / Low Bay	3	5014	1 - 400w MH	1,840	3755	6-32w RSFI T8 HE EL-HBF 2	4	220	1.3	0.8	2,484	1,619	865	35%	\$78	\$1,337	\$384	\$1,721	22.1
246	Equipment Storage	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
247	Elworthy Tool Room	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	470	412	59	13%	\$7	\$68	\$25	\$92	12.3
247	Elworthy Tool Room	FLD	F4' Tubelight / Linear	3	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	186	164	22	12%	\$3	\$25	\$18	\$44	15.6

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room:	Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
252	Electrical Parts Room	FSF	F4' striplight	45	3244	2 - 32w RSFI T8 EL-IS	2,070	2933	2-Relamp with 28w 4' RSFI T	45	52	2.5	2.2	5,496	4,844	652	12%	\$55	\$381	\$2,657	\$3,038	55.2
252	Electrical Parts Room	FSF	F4' striplight	3	3244	2 - 32w RSFI T8 EL-IS	8,760	2933	2-Relamp with 28w 4' RSFI T	3	52	0.2	0.1	1,551	1,367	184	12%	\$9	\$25	\$177	\$203	21.7
253	PID Lab	FWF	F1x4 Wrap	5	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	310	273	37	12%	\$5	\$42	\$196	\$238	51.0
253	PID Lab	FLF	F8' Tubelight / Linear	9	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	9	98	1.0	0.8	1,058	926	132	13%	\$17	\$152	\$353	\$505	30.0
253	PID Lab	FLD	F4' Tubelight / Linear	6	3244	2 - 32w RSFI T8 EL-IS	1,050	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	372	328	44	12%	\$6	\$51	\$235	\$286	51.0
254	Motor Lab	FTK	F2x4 Rec	13	3308	4 - 32w RSFI T8 EL-IS	1,050	2946	4-Relamp with 28w 4' RSFI T	13	98	1.4	1.2	1,529	1,338	191	13%	\$24	\$220	\$80	\$300	12.3
255	Computer Lab	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	2,860	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	1,281	1,121	160	13%	\$12	\$68	\$25	\$92	8.0
255	Computer Lab	FLF	F8' Tubelight / Linear	3	3308	4 - 32w RSFI T8 EL-IS	2,860	2946	4-Relamp with 28w 4' RSFI T	3	98	0.3	0.3	961	841	120	13%	\$9	\$51	\$18	\$69	8.0
255	Computer Lab	FLD	F4' Tubelight / Linear	1	3244	2 - 32w RSFI T8 EL-IS	2,860	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	169	149	20	12%	\$1	\$8	\$6	\$15	10.1
255	Computer Lab	FLD	F4' Tubelight / Linear	6	3244	2 - 32w RSFI T8 EL-IS	2,860	2933	2-Relamp with 28w 4' RSFI T	6	52	0.3	0.3	1,012	892	120	12%	\$9	\$51	\$37	\$88	10.1
258	Electrical Department Offic	FTK	F2x4 Rec	3	3308	4 - 32w RSFI T8 EL-IS	2,250	2946	4-Relamp with 28w 4' RSFI T	3	98	0.3	0.3	756	662	95	13%	\$8	\$51	\$18	\$69	9.1
258	Electrical Department Offic	FTK	F2x4 Rec	4	3308	4 - 32w RSFI T8 EL-IS	2,250	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	1,008	882	126	13%	\$10	\$68	\$25	\$92	9.1
258	Electrical Department Offic	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	2,250	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	252	221	32	13%	\$3	\$17	\$6	\$23	9.1
258	Electrical Department Offic	FTJ	F2x4 Rec	5	3264	3 - 32w RSFI T8 EL-IS	2,250	2940	3-Relamp with 28w 4' RSFI T	5	76	0.4	0.4	968	855	113	12%	\$9	\$63	\$31	\$94	10.4
258	Electrical Department Offic	CDB	Downlight	1	2213	2 - 13w CF	2,250	9000	0-No Action	1	0	0.0	0.0	72	72	0	0%	\$0	\$0	\$0	\$0	0.0
258A	Office	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	1,500	9427	2-Delamp to 2 - 28w 4' RSFI T	2	57	0.2	0.1	258	171	87	34%	\$9	\$52	\$49	\$101	11.5
258B	Kitchen	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	2,250	9425	2-Delamp to 2 - 28w 4' RSFI T	2	60	0.2	0.1	504	270	234	46%	\$19	\$34	\$74	\$108	5.7
258C	Office	FTJ	F2x4 Rec	4	3264	3 - 32w RSFI T8 EL-IS	1,500	9427	2-Delamp to 2 - 28w 4' RSFI T	4	57	0.3	0.2	516	342	174	34%	\$18	\$104	\$98	\$202	11.5
258C	Office	IDD	Downlight Round	4	1153	1 - 100w Inc A19	1,500	9000	0-No Action	4	0	0.4	0.4	600	600	0	0%	\$0	\$0	\$0	\$0	0.0
260	Electronics Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	2,250	9429	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.0	0.0	50	135	-85	-168%	(\$2)	\$17	\$37	\$54	-21.8
260	Electronics Office	FTK	F2x4 Rec	7	3308	4 - 32w RSFI T8 EL-IS	2,250	9429	2-Delamp to 2 - 28w 4' RSFI T	7	60	0.7	0.4	1,764	945	819	46%	\$66	\$118	\$258	\$376	5.7
260	Electronics Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	2,250	9429	2-Delamp to 2 - 28w 4' RSFI T	1	60	0.1	0.1	252	135	117	46%	\$9	\$17	\$37	\$54	5.7
260	Electronics Office	CDN	Downlight	1	2213	2 - 13w CF	2,250	9000	0-No Action	1	0	0.0	0.0	14	14	0	0%	\$0	\$0	\$0	\$0	0.0
260	Electronics Office	FTK	F2x4 Rec	2	3308	4 - 32w RSFI T8 EL-IS	2,250	9429	2-Delamp to 2 - 28w 4' RSFI T	2	60	0.1	0.1	302	270	32	11%	\$7	\$34	\$74	\$108	15.4
260J	Copy Room	FTK	F2x4 Rec	1	3329	4 - 32w RSFI T8 EL-RS 2&	2,250	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	167	108	59	35%	\$7	\$76	\$25	\$100	15.3
260K	Office	FTK	F2x4 Rec	1	3329	4 - 32w RSFI T8 EL-RS 2&	1,500	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	186	72	114	61%	\$12	\$76	\$25	\$100	8.7
260L	Office	FTK	F2x4 Rec	2	3329	4 - 32w RSFI T8 EL-RS 2&	1,500	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.2	0.1	372	144	228	61%	\$23	\$151	\$49	\$200	8.7
262	Men's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	54	48	6	12%	\$1	\$8	\$6	\$15	16.3
264	Women's Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	54	48	6	12%	\$1	\$8	\$6	\$15	16.3
265	Men's Washroom	CDH	Downlight	2	2314	2 - 26w quad CF	7,644	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	887	887	0	0%	\$0	\$0	\$0	\$0	0.0
265	Men's Washroom	FSF	F4' striplight	7	3244	2 - 32w RSFI T8 EL-IS	7,644	2933	2-Relamp with 28w 4' RSFI T	7	52	0.4	0.3	3,157	2,782	375	12%	\$20	\$59	\$43	\$102	5.2
265	Men's Washroom	CDH	Downlight	2	2314	2 - 26w quad CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,016	1,016	0	0%	\$0	\$0	\$0	\$0	0.0
267	Women's Washroom	CDH	Downlight	2	2314	2 - 26w quad CF	7,644	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	887	887	0	0%	\$0	\$0	\$0	\$0	0.0
267	Women's Washroom	FSF	F4' striplight	8	3244	2 - 32w RSFI T8 EL-IS	7,644	2933	2-Relamp with 28w 4' RSFI T	8	52	0.4	0.4	3,608	3,180	428	12%	\$22	\$68	\$49	\$117	5.2
267	Women's Washroom	CDH	Downlight	2	2314	2 - 26w quad CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,016	1,016	0	0%	\$0	\$0	\$0	\$0	0.0
269	First Aid Room	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	255	2946	4-Relamp with 28w 4' RSFI T	1	98	0.0	0.0	29	25	4	13%	\$0	\$17	\$6	\$23	48.1
269	First Aid Room	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	255	2946	4-Relamp with 28w 4' RSFI T	1	98	0.0	0.0	29	25	4	13%	\$0	\$17	\$6	\$23	48.1
269A	First Aid Storage Room	FSE	F4' striplight	1	3208	1 - 32w RSFI T8 EL-IS	255	2926	1-Relamp with 28w 4' RSFI T	1	26	0.0	0.0	8	7	1	16%	\$0	\$4	\$6	\$10	60.5
272	Welding Shop	FID	F1x4 Industrial	40	3244	2 - 32w RSFI T8 EL-IS	3,520	2933	2-Relamp with 28w 4' RSFI T	40	52	2.2	2.0	8,307	7,322	986	12%	\$65	\$339	\$246	\$584	8.9
272A	Test Welder Room	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	920	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	103	90	13	13%	\$2	\$17	\$6	\$23	12.8
272B	Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	1,840	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	206	180	26	13%	\$2	\$17	\$6	\$23	10.0
272C	Welding Room	FID	F1x4 Industrial	5	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	5	52	0.3	0.2	271	239	32	12%	\$4	\$42	\$31	\$73	16.3
272D	Welding Room	FID	F1x4 Industrial	2	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	2	52	0.1	0.1	109	96	13	12%	\$2	\$17	\$12	\$29	16.3
272H	Welding Shop High Ceiling	MHG	High / Low Bay	2	5014	1 - 400w MH	8,760	3755	6-32w RSFI T8 HE EL-HBF 2	2	220	0.9	0.4	7,884	3,854	4,030	51%	\$205	\$669	\$192	\$860	4.2
272H	Welding Shop High Ceiling	MHG	High / Low Bay	12	5014	1 - 400w MH	3,520	3755	6-32w RSFI T8 HE EL-HBF 2	14	220	5.1	2.9	19,008	10,842	8,166	43%	\$541	\$4,680	\$1,342	\$6,022	11.1

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room: Room Type:		Existing Luminaire/Lamp Data					Retrofit Data															
		Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Unit Qty:	Exist (Watt):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)	
274	Machine Shop	FBN	F2x4 Box	2	3484	4 - 34w RSFI T12 - EE 2 b	3,520	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	1,042	338	704	68%	\$47	\$151	\$155	\$306	6.6
274	Machine Shop	FBN	F2x4 Box	4	3484	4 - 34w RSFI T12 - EE 2 b	3,520	2832	2-28w 4' RSFI T8 ES HE EL-I	4	48	0.6	0.2	2,084	676	1,408	68%	\$93	\$303	\$310	\$612	6.6
274	Machine Shop	FID	F1x4 Industrial	7	3475	2 - 34w RSFI T12 EE	3,520	2832	2-28w 4' RSFI T8 ES HE EL-I	7	48	0.5	0.3	1,774	1,183	591	33%	\$39	\$285	\$542	\$827	21.1
274	Machine Shop	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
274	Machine Shop	MHG	High / Low Bay	1	5014	1 - 400w MH	8,760	3755	6-32w RSFI T8 HE EL-HBF 2	1	220	0.4	0.2	3,942	1,927	2,015	51%	\$102	\$334	\$96	\$430	4.2
274	Machine Shop	MHG	High / Low Bay	5	5014	1 - 400w MH	3,520	3755	6-32w RSFI T8 HE EL-HBF 2	5	220	2.1	1.0	7,920	3,872	4,048	51%	\$268	\$1,671	\$479	\$2,151	8.0
274 Upp	Machine Shop Upper Area	FBG	F1x4 Box	2	3475	2 - 34w RSFI T12 EE	3,520	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	507	338	169	33%	\$11	\$81	\$49	\$131	11.7
274 Upp	Machine Shop Upper Area	FID	F1x4 Industrial	20	3475	2 - 34w RSFI T12 EE	3,520	2832	2-28w 4' RSFI T8 ES HE EL-I	20	48	1.4	0.9	5,069	3,379	1,690	33%	\$112	\$815	\$491	\$1,306	11.7
274 Upp	Machine Shop Upper Area	FBN	F2x4 Box	2	3484	4 - 34w RSFI T12 - EE 2 b	3,520	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.3	0.1	1,042	338	704	68%	\$47	\$151	\$49	\$200	4.3
274 Upp	Machine Shop Upper Area	ILA	Keyless Lampholder	1	2044	1 - 13w CF spiral SI (Scre	3,520	9000	0-No Action	1	0	0.0	0.0	46	46	0	0%	\$0	\$0	\$0	\$0	0.0
274A	Robotics Lab	MHG	High / Low Bay	4	5014	1 - 400w MH	1,050	3755	6-32w RSFI T8 HE EL-HBF 2	4	220	1.7	0.8	1,890	924	966	51%	\$123	\$1,337	\$384	\$1,721	14.0
274B	Classroom in Shop	FID	F1x4 Industrial	1	3475	2 - 34w RSFI T12 EE	1,840	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	132	88	44	33%	\$4	\$41	\$25	\$65	16.4
274B	Classroom in Shop	FID	F1x4 Industrial	5	3475	2 - 34w RSFI T12 EE	1,840	2832	2-28w 4' RSFI T8 ES HE EL-I	5	48	0.3	0.2	662	442	221	33%	\$20	\$204	\$123	\$326	16.4
276/278	Robotics Lab	MHG	High / Low Bay	1	5014	1 - 400w MH	8,760	3755	6-32w RSFI T8 HE EL-HBF 2	1	220	0.4	0.2	3,942	1,927	2,015	51%	\$102	\$334	\$96	\$430	4.2
276/278	Robotics Lab	MHG	High / Low Bay	7	5014	1 - 400w MH	1,610	3755	6-32w RSFI T8 HE EL-HBF 2	9	220	3.0	1.9	5,072	3,188	1,884	37%	\$183	\$3,008	\$863	\$3,871	21.2
281	Networking Room	FTK	F2x4 Rec	5	3329	4 - 32w RSFI T8 EL-RS 2&	1,440	2832	2-28w 4' RSFI T8 ES HE EL-I	5	48	0.6	0.2	893	346	547	61%	\$57	\$378	\$123	\$501	8.8
281	Networking Room	FTK	F2x4 Rec	14	3329	4 - 32w RSFI T8 EL-RS 2&	1,440	2832	2-28w 4' RSFI T8 ES HE EL-I	14	48	1.6	0.6	2,500	968	1,532	61%	\$159	\$1,059	\$344	\$1,403	8.8
281	Networking Room	FTK	F2x4 Rec	1	3329	4 - 32w RSFI T8 EL-RS 2&	1,440	2832	2-28w 4' RSFI T8 ES HE EL-I	1	48	0.1	0.0	179	69	109	61%	\$11	\$76	\$25	\$100	8.8
282	Electronic Lab	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
282	Electronic Lab	FIN	F1x4 Industrial	33	3264	3 - 32w RSFI T8 EL-IS	1,050	9426	3-Delamp to 3 - 28w 4' RSFI T	33	76	2.7	2.4	2,980	2,633	347	12%	\$44	\$419	\$810	\$1,229	27.9
282	Electronic Lab	FIN	F1x4 Industrial	7	3264	3 - 32w RSFI T8 EL-IS	1,050	9426	3-Delamp to 3 - 28w 4' RSFI T	7	76	0.6	0.5	632	559	74	12%	\$9	\$89	\$172	\$261	27.9
282 Loc	Locker Area	CDH	Downlight	5	2314	2 - 26w quad CF	7,644	9000	0-No Action	5	0	0.3	0.3	2,217	2,217	0	0%	\$0	\$0	\$0	\$0	0.0
282A	Classroom	FLD	F4' Tubelight / Linear	4	3244	2 - 32w RSFI T8 EL-IS	1,610	2933	2-Relamp with 28w 4' RSFI T	4	52	0.2	0.2	380	335	45	12%	\$4	\$34	\$25	\$58	13.4
282A	Classroom	FLF	F8' Tubelight / Linear	4	3308	4 - 32w RSFI T8 EL-IS	1,610	2946	4-Relamp with 28w 4' RSFI T	4	98	0.4	0.4	721	631	90	13%	\$9	\$68	\$25	\$92	10.6
284	Electrical Storage	FID	F1x4 Industrial	9	3256	2 - 32w RSFI T8 EL-RS	2,185	2832	2-28w 4' RSFI T8 ES HE EL-I	9	48	0.5	0.4	1,219	944	275	23%	\$23	\$367	\$221	\$588	26.0
284	Electrical Storage	FID	F1x4 Industrial	3	3256	2 - 32w RSFI T8 EL-RS	2,185	2832	2-28w 4' RSFI T8 ES HE EL-I	3	48	0.2	0.1	406	315	92	23%	\$8	\$122	\$74	\$196	26.0
288	Open Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	2,250	2946	4-Relamp with 28w 4' RSFI T	1	98	0.1	0.1	252	221	32	13%	\$3	\$17	\$6	\$23	9.1
288	Open Office	FTK	F2x4 Rec	6	3308	4 - 32w RSFI T8 EL-IS	2,250	9425	2-Delamp to 2 - 28w 4' RSFI T	6	60	0.4	0.2	907	810	97	11%	\$21	\$102	\$221	\$323	15.4
288	Open Office	FTK	F2x4 Rec	11	3308	4 - 32w RSFI T8 EL-IS	2,250	2946	4-Relamp with 28w 4' RSFI T	11	98	1.2	1.0	2,772	2,426	347	13%	\$28	\$186	\$68	\$254	9.1
288	Open Office	FTK	F2x4 Rec	1	3308	4 - 32w RSFI T8 EL-IS	2,250	9000	0-No Action	1	0	0.0	0.0	50	50	0	0%	\$0	\$0	\$0	\$0	0.0
288	Open Office	CDN	Downlight	2	2213	2 - 13w CF	2,250	9000	0-No Action	2	0	0.1	0.1	144	144	0	0%	\$0	\$0	\$0	\$0	0.0
288	Open Office	FTJ	F2x4 Rec	6	3264	3 - 32w RSFI T8 EL-IS	2,250	2940	3-Relamp with 28w 4' RSFI T	6	76	0.5	0.4	1,161	1,026	135	12%	\$11	\$76	\$37	\$113	10.4
288	Open Office	CDN	Downlight	2	2213	2 - 13w CF	2,250	9000	0-No Action	2	0	0.1	0.1	144	144	0	0%	\$0	\$0	\$0	\$0	0.0
288	Open Office	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
288 Ves	Vestibule to Offices	CDH	Downlight	1	2314	2 - 26w quad CF	8,760	9000	0-No Action	1	0	0.1	0.1	508	508	0	0%	\$0	\$0	\$0	\$0	0.0
288A	Meeting Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	900	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	155	137	18	12%	\$3	\$25	\$12	\$38	14.8
288A	Meeting Room	IDD	Downlight Round	3	1153	1 - 100w Inc A19	900	9000	0-No Action	3	0	0.3	0.3	270	270	0	0%	\$0	\$0	\$0	\$0	0.0
288B	Copy Room	FTJ	F2x4 Rec	2	3264	3 - 32w RSFI T8 EL-IS	2,250	2940	3-Relamp with 28w 4' RSFI T	2	76	0.2	0.1	387	342	45	12%	\$4	\$25	\$12	\$38	10.4
288C	Washroom	FTD	F1x4 Rec	1	3244	2 - 32w RSFI T8 EL-IS	920	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	54	48	6	12%	\$1	\$8	\$6	\$15	16.3
288D	Lunchroom	IDD	Downlight Round	8	1153	1 - 100w Inc A19	1,380	9000	0-No Action	8	0	0.8	0.8	1,104	1,104	0	0%	\$0	\$0	\$0	\$0	0.0
288D	Lunchroom	FTJ	F2x4 Rec	3	3264	3 - 32w RSFI T8 EL-IS	1,380	2940	3-Relamp with 28w 4' RSFI T	3	76	0.2	0.2	356	315	41	12%	\$4	\$38	\$18	\$57	12.8
288D	Lunchroom	FSE	F4' striplight	3	3208	1 - 32w RSFI T8 EL-IS	1,380	2926	1-Relamp with 28w 4' RSFI T	3	26	0.1	0.1	128	108	21	16%	\$2	\$13	\$18	\$31	14.1
288E	Switch Room	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	15	13	2	12%	\$1	\$8	\$39	\$48	67.2
2-Café	Café Area	IRB	Inc RLM Dome	11	2015	1 - 23w CF SI (Screw in)	3,485	9000	0-No Action	11	0	0.2	0.2	882	882	0	0%	\$0	\$0	\$0	\$0	0.0
2-Entry	2nd Floor Entry Vestibule	CSF	Surface (CF)	2	2314	2 - 26w quad CF	8,760	9000	0-No Action	2	0	0.1	0.1	1,016	1,016	0	0%	\$0	\$0	\$0	\$0	0.0

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



Room: Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
2-Entry 2nd Floor Entry Vestibule S	FCE	F1x4 Cubelight	1	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	1	0	0.0	0.0	272	272	0	0%	\$0	\$0	\$0	\$0	0.0
2-Entry 2nd Floor Entry Vestibule S	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Middle Corridor	FRS	F8' HO striplight w/reflect	2	3709	1 - 110w HOFI T12 - Std	7,644	2857	2-28w 4' RSFI T8 ES HE EL-	2	74	0.3	0.1	2,140	1,131	1,009	47%	\$53	\$379	\$49	\$428	8.1
2-Hallwa 2nd Floor Middle Corridor	FCE	F1x4 Cubelight	2	3232	1 - 32w RSFI T8 EL-RS	7,644	8000	0-Install Lighting Controls Dev	2	0	0.1	0.1	474	474	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Middle Corridor	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Middle Corridor	FCE	F1x4 Cubelight	2	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	2	0	0.1	0.1	543	543	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Hallway South	FCE	F1x4 Cubelight	6	3232	1 - 32w RSFI T8 EL-RS	7,644	8000	0-Install Lighting Controls Dev	6	0	0.2	0.2	1,422	1,422	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Hallway South	FRS	F8' HO striplight w/reflect	6	3709	1 - 110w HOFI T12 - Std	7,644	2857	2-28w 4' RSFI T8 ES HE EL-	6	74	0.8	0.4	6,421	3,394	3,027	47%	\$158	\$1,136	\$147	\$1,284	8.1
2-Hallwa 2nd Floor Hallway South	FCE	F1x4 Cubelight	6	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	6	0	0.2	0.2	1,629	1,629	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Hallway South	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa Skylights	MCB	Cylinder	4	5006	1 - 100w MH	4,732	2412	1-42w triple CF	4	48	0.5	0.2	2,461	909	1,552	63%	\$93	\$291	\$196	\$487	5.3
2-Hallwa 2nd Floor Hallway Northwe	FCE	F1x4 Cubelight	15	3232	1 - 32w RSFI T8 EL-RS	7,644	8000	0-Install Lighting Controls Dev	15	0	0.4	0.4	3,554	3,554	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Hallway Northwe	FCE	F1x4 Cubelight	15	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	15	0	0.4	0.4	4,073	4,073	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Hallway Northwe	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Hallway South	FCE	F1x4 Cubelight	6	3232	1 - 32w RSFI T8 EL-RS	7,644	8000	0-Install Lighting Controls Dev	6	0	0.2	0.2	1,422	1,422	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa 2nd Floor Hallway South	FWF	F1x4 Wrap	1	3244	2 - 32w RSFI T8 EL-IS	7,644	2933	2-Relamp with 28w 4' RSFI T	1	52	0.1	0.0	451	397	54	12%	\$3	\$8	\$6	\$15	5.2
2-Hallwa 2nd Floor Hallway South	FRS	F8' HO striplight w/reflect	3	3709	1 - 110w HOFI T12 - Std	7,644	2857	2-28w 4' RSFI T8 ES HE EL-	3	74	0.4	0.2	3,210	1,697	1,514	47%	\$79	\$568	\$74	\$642	8.1
2-Hallwa 2nd Floor Hallway South	FCE	F1x4 Cubelight	5	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	5	0	0.1	0.1	1,358	1,358	0	0%	\$0	\$0	\$0	\$0	0.0
2-Hallwa Skylights	MCB	Cylinder	4	5006	1 - 100w MH	4,732	2412	1-42w triple CF	4	48	0.5	0.2	2,461	909	1,552	63%	\$93	\$291	\$196	\$487	5.3
2-North 2nd Floor North Hallway	FCE	F1x4 Cubelight	1	3232	1 - 32w RSFI T8 EL-RS	7,644	8000	0-Install Lighting Controls Dev	1	0	0.0	0.0	237	237	0	0%	\$0	\$0	\$0	\$0	0.0
2-North 2nd Floor North Hallway	FRS	F8' HO striplight w/reflect	2	3709	1 - 110w HOFI T12 - Std	7,644	2857	2-28w 4' RSFI T8 ES HE EL-	2	74	0.3	0.1	2,140	1,131	1,009	47%	\$53	\$379	\$49	\$428	8.1
2-North 2nd Floor North Hallway	FCE	F1x4 Cubelight	2	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	2	0	0.1	0.1	543	543	0	0%	\$0	\$0	\$0	\$0	0.0
2-North 2nd Floor North Hallway	IXL	LED Exit sign	2	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	2	0	0.0	0.0	35	35	0	0%	\$0	\$0	\$0	\$0	0.0
300 Stairs to Penthouse Mech	FSF	F4' striplight	2	3256	2 - 32w RSFI T8 EL-RS	8,760	2832	2-28w 4' RSFI T8 ES HE EL-I	2	48	0.1	0.1	1,086	841	245	23%	\$12	\$81	\$49	\$131	10.5
300A Penthouse Mechanical	FSF	F4' striplight	7	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	7	52	0.1	0.1	105	93	12	12%	\$2	\$59	\$274	\$334	198.7
300A Penthouse Mechanical	FSF	F4' striplight	1	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	1	52	0.0	0.0	15	13	2	12%	\$0	\$8	\$39	\$48	198.7
300A Penthouse Mechanical	IXL	LED Exit sign	1	1008	2 - 2 Watt LED Lightbar	8,760	9000	0-No Action	1	0	0.0	0.0	18	18	0	0%	\$0	\$0	\$0	\$0	0.0
300B Penthouse Mechanical	FSF	F4' striplight	6	3244	2 - 32w RSFI T8 EL-IS	255	2933	2-Relamp with 28w 4' RSFI T	6	52	0.1	0.1	90	80	11	12%	\$1	\$51	\$37	\$88	60.9
Elevator Elevator	FSE	F4' striplight	2	3470	1 - 34w RSFI T12 EE	8,760	2826	1-28w 4' RSFI T8 ES HE EL-L	2	22	0.1	0.0	753	385	368	49%	\$19	\$80	\$49	\$130	6.9
Exterior Exterior Perimeter	HWC	Wall Pack	1	6004	1 - 70w HPS	4,732	9000	0-No Action	1	0	0.0	0.0	431	431	0	0%	\$0	\$0	\$0	\$0	0.0
Exterior Exterior Perimeter	HPE	Post Top	6	6006	1 - 100w HPS	4,732	9000	0-No Action	6	0	0.1	0.1	3,691	3,691	0	0%	\$0	\$0	\$0	\$0	0.0
Exterior Exterior Perimeter	HFC	Floodlight	6	6004	1 - 70w HPS	4,732	9000	0-No Action	6	0	0.1	0.1	2,584	2,584	0	0%	\$0	\$0	\$0	\$0	0.0
Exterior Exterior Perimeter	CLE	Keyless Lampholder	2	2787	1 - 26w CF spiral SI (Scre	4,732	9000	0-No Action	2	0	0.0	0.0	246	246	0	0%	\$0	\$0	\$0	\$0	0.0
Exterior Exterior Perimeter	HPE	Post Top	4	6008	1 - 150w HPS	4,732	9000	0-No Action	4	0	0.1	0.1	3,558	3,558	0	0%	\$0	\$0	\$0	\$0	0.0
Exterior Exterior Perimeter	CCF	Wall Sconce	18	2314	2 - 26w quad CF	4,380	9000	0-No Action	18	0	0.1	0.1	4,573	4,573	0	0%	\$0	\$0	\$0	\$0	0.0
Ext-Out Outdoor Storage/Workshop	FID	F1x4 Industrial	28	3240	2 - 32w RSFI T8 EE	4,380	3742	2-32w RSFI T8 HE EL-IS	28	55	1.9	1.5	8,830	6,745	2,085	24%	\$128	\$293	\$2,169	\$2,461	19.3
Ext-Out Outdoor Storage/Workshop	FID	F1x4 Industrial	1	3244	2 - 32w RSFI T8 EL-IS	4,380	9000	0-No Action	1	0	0.1	0.1	258	258	0	0%	\$0	\$0	\$0	\$0	0.0
Ext-Out Outdoor Storage/Workshop	FID	F1x4 Industrial	4	3240	2 - 32w RSFI T8 EE	4,380	3742	2-32w RSFI T8 HE EL-IS	4	55	0.3	0.2	1,261	964	298	24%	\$18	\$42	\$310	\$352	19.3
Ext-Out Outdoor Storage/Workshop	FID	F1x4 Industrial	24	3240	2 - 32w RSFI T8 EE	4,380	3742	2-32w RSFI T8 HE EL-IS	24	55	1.6	1.3	7,569	5,782	1,787	24%	\$109	\$251	\$1,859	\$2,110	19.3
Ext-Peri Perimeter - Workshop Side	HPE	Post Top	1	6008	1 - 150w HPS	4,732	9000	0-No Action	1	0	0.0	0.0	890	890	0	0%	\$0	\$0	\$0	\$0	0.0
Ext-Peri Perimeter - Workshop Side	MFF	Floodlight	2	5012	1 - 250w MH	4,732	5522	1-165w QL Induction	2	165	0.1	0.0	2,763	1,562	1,202	43%	\$51	\$1,217	\$213	\$1,430	28.0
Ext-Peri Perimeter - Workshop Side	HWC	Wall Pack	12	6004	1 - 70w HPS	4,732	9000	0-No Action	12	0	0.1	0.1	5,167	5,167	0	0%	\$0	\$0	\$0	\$0	0.0
Ext-Peri Perimeter - Workshop Side	HWC	Wall Pack	3	6004	1 - 70w HPS	4,732	9000	0-No Action	3	0	0.0	0.0	1,292	1,292	0	0%	\$0	\$0	\$0	\$0	0.0
Ext-Peri Perimeter - Workshop Side	MFF	Floodlight	3	5014	1 - 400w MH	4,732	5308	1-320w PS MH	3	368	0.1	0.1	6,388	5,224	1,164	18%	\$49	\$510	\$320	\$830	16.8
South St South Stairwell	IXA	Inc Exit sign	1	1102	2 - 15w Inc A15	8,760	1003	1-1 Watt LED Exit light NEW	1	2	0.0	0.0	263	18	245	93%	\$13	\$66	\$37	\$103	8.2

Detailed Lighting Retrofit Report - No Compact Fluorescent Screw-base or Controls

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Trades and Technology

Building Code: TAT



		Existing Luminaire/Lamp Data						Retrofit Data																			
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code:	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh):	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)					
South St	South Stairwell	FCE	F1x4 Cubelight	4	3232	1 - 32w RSFI T8 EL-RS	8,760	9000	0-No Action	4	0	0.1	0.1	1,086	1,086	0	0%	\$0	\$0	\$0	\$0	0.0					
<i>Existing Energy Summary for Building Trades and Technology:</i>				1377												1398	124.5	91.6	440,344	323,131	117,213	27%	\$7,894	\$61,912	\$33,712	\$95,623	12.1
<i>Existing Energy Summary for Client Thompson Rivers University K</i>				11256												E+04	790.5	597.1	2,712,499	2,033,697	678,802	27%	\$45,970	\$373,227	\$204,431	\$577,658	12.6

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Arts and Education

Building Code: AAE



		Existing Luminaire/Lamp Data					Retrofit Data																	
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code:	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)		
125	Office	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	1,380	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	83	18	65	78%	\$7	\$13	\$6	\$19	2.8		
2-Patio	Patio	IMA	Dome (Dog Dish / Pill)	10	1132	1 - 60w Inc A19	510	2044	1-13w CF spiral SI (Screw in)	10	13	0.6	0.1	306	66	240	78%	\$52	\$132	\$61	\$194	3.7		
3-Patio	Patio	IMA	Dome (Dog Dish / Pill)	10	1132	1 - 60w Inc A19	510	2044	1-13w CF spiral SI (Screw in)	10	13	0.6	0.1	306	66	240	78%	\$52	\$132	\$61	\$194	3.7		
Summary for Building Arts and Education:							21				21			1.2	0.3	695	151	544	78%	\$112	\$278	\$129	\$407	3.6

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Animal Health Technology

Building Code: AHT



		Existing Luminaire/Lamp Data					Retrofit Data															
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code:	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh):	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
123	Lab	ILD	Keyless Lampholder	1	1153	1 - 100w Inc A19	2,805	2030	1-23w CF Spiral SI (Screw in)	1	23	0.1	0.0	281	65	216	77%	\$16	\$26	\$6	\$33	2.1
Summary for Building Animal Health Technology:				1						1		0.1	0.0	281	65	216	77%	\$16	\$26	\$6	\$33	2.1

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Campus Activity Centre

Building Code: CAC



		Existing Luminaire/Lamp Data						Retrofit Data														
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code:	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh):	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
180	Common Hallway	ISC	Cylinder	21	1145	1 - 75w Inc PAR30L H Flo	7,280	2009	1-15w CF ref fl SI (Screw in)	21	15	1.5	0.3	11,466	2,293	9,173	80%	\$485	\$333	\$1,240	\$1,573	3.2
Summary for Building Campus Activity Centre:				21																		
										21		1.5	0.3	11,466	2,293	9,173	80%	\$485	\$333	\$1,240	\$1,573	3.2

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Clock Tower Building

Building Code: CTB



Room: Room Type:	Existing Luminaire/Lamp Data						Retrofit Data														
	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
100D/10 Exit Vestibule	IDA	Downlight Round	2	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	2	13	0.1	0.0	31	7	24	78%	\$10	\$26	\$12	\$39	4.1
120 Kitchen	IDA	Downlight Round	1	1118	1 - 40w Inc A19	2,880	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	115	37	78	68%	\$6	\$13	\$6	\$19	3.5
120 Kitchen	IDA	Downlight Round	1	1132	1 - 60w Inc A19	2,880	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	173	37	135	78%	\$10	\$13	\$6	\$19	2.0
170A Storage	IDA	Downlight Round	1	1153	1 - 100w Inc A19	1,040	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	104	14	90	87%	\$6	\$13	\$6	\$19	3.4
170A Storage	IDA	Downlight Round	1	1132	1 - 60w Inc A19	1,040	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	62	14	49	78%	\$3	\$13	\$6	\$19	6.2
197 Sprinkler Room	IDA	Downlight Round	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
309 Board Room	IDI	Downlight Round	15	1140	1 - 65w Inc BR30	1,500	2009	1-15w CF ref fl SI (Screw in)	15	15	0.9	0.2	1,463	338	1,125	77%	\$114	\$238	\$92	\$330	2.9
309 Board Room	IDI	Downlight Round	3	1140	1 - 65w Inc BR30	1,500	2009	1-15w CF ref fl SI (Screw in)	3	15	0.2	0.0	293	68	225	77%	\$23	\$48	\$18	\$66	2.9
312B Office	IDA	Downlight Round	2	1132	1 - 60w Inc A19	1,960	2044	1-13w CF spiral SI (Screw in)	2	13	0.1	0.0	235	51	184	78%	\$16	\$26	\$12	\$39	2.4
328 Office	IDA	Downlight Round	1	1132	1 - 60w Inc A19	1,960	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	118	25	92	78%	\$8	\$13	\$6	\$19	2.4
9121/91 Storage	IDA	Downlight Round	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
9220 Storage	IDA	Downlight Round	1	1132	1 - 60w Inc A19	1,040	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	62	14	49	78%	\$3	\$13	\$6	\$19	6.2
9223/92 Janitorial Storage	IDA	Downlight Round	2	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	2	13	0.0	0.0	31	7	24	78%	\$3	\$26	\$12	\$39	12.0
Summary for Building Clock Tower Building:			32						32	1.6	0.4	2,716	617	2,100	77%	\$204	\$471	\$196	\$667	3.3	

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building

Building Code: INB



		Existing Luminaire/Lamp Data					Retrofit Data															
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
4000A	Telescope Deck	ICB	Wall Sconce	4	1132	1 - 60w Inc A19	4,380	2044	1-13w CF spiral SI (Screw in)	4	13	0.0	0.0	1,051	228	823	78%	\$35	\$53	\$25	\$77	2.2
Summary for Building International Building:				4						4		0.0	0.0	1,051	228	823	78%	\$35	\$53	\$25	\$77	2.2

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Library

Building Code: LIB



		Existing Luminaire/Lamp Data					Retrofit Data															
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code:	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh):	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
218	Janitor Room	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
Summary for Building Library:				1						1		0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Old Main Building

Building Code: OMB



		Existing Luminaire/Lamp Data					Retrofit Data															
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$):	Labour (\$):	Total (\$):	Paybk (yrs)
1563A	Sawdust Ext	IVA	Vandal Resistant	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	15	3	12	78%	\$5	\$13	\$6	\$19	4.1
1587B	Side Stage	IMB	Dome (Dog Dish / Pill)	4	1119	2 - 40w Inc A19	690	2045	2-13w CF spiral SI (Screw in)	4	26	0.1	0.0	221	72	149	68%	\$11	\$106	\$25	\$130	11.6
1587B	Side Stage	ILA	Keyless Lampholder	3	1118	1 - 40w Inc A19	690	2044	1-13w CF spiral SI (Screw in)	3	13	0.0	0.0	83	27	56	68%	\$4	\$40	\$18	\$58	13.8
1587-Di	Display Case Outside The	ITH	Track Head	4	1132	1 - 60w Inc A19	2,760	2044	1-13w CF spiral SI (Screw in)	4	13	0.2	0.0	662	144	519	78%	\$38	\$53	\$25	\$77	2.0
2583A	Stairs Vestibule to Upper T	IMA	Dome (Dog Dish / Pill)	1	1132	1 - 60w Inc A19	1,750	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	105	23	82	78%	\$8	\$13	\$6	\$19	2.5
2583A	Stairs Vestibule to Upper T	ICB	Wall Sconce	2	1132	1 - 60w Inc A19	1,750	2044	1-13w CF spiral SI (Screw in)	2	13	0.1	0.0	210	46	165	78%	\$15	\$26	\$12	\$39	2.5
92775	Electrical Closet	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
97410	Block A Elevator Machine	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
Summary for Building Old Main Building:				17						17		0.6	0.1	1,327	320	1,007	76%	\$84	\$278	\$104	\$382	4.5

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Retrofit Report - Screw base Compact Fluorescents Only

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Science Building

Building Code: SCB



		Existing Luminaire/Lamp Data					Retrofit Data															
Room:	Room Type:	Type Code:	Description:	Qty:	Lamp Code	Lamp Description:	Annual Hours	Lamp Code:	Lamp Description:	Qty:	Unit (Watt):	Exist (kW):	New (kW):	Exist (kWh):	Retrofit (kWh):	Energy Save (kWh)	% kWh Save:	Energy Save (\$):	Matl (\$)	Labour (\$):	Total (\$):	Paybk (yrs)
103D	Comm. Room	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
103E	Electrical Room	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
214B	Comm Room	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	255	2044	1-13w CF spiral SI (Screw in)	1	13	0.0	0.0	15	3	12	78%	\$2	\$13	\$6	\$19	12.0
333	Nursing Lab	ITH	Track Head	6	1132	1 - 60w Inc A19	1,250	2044	1-13w CF spiral SI (Screw in)	6	13	0.3	0.1	450	98	353	78%	\$40	\$79	\$37	\$116	2.9
362C	Fumehood	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	230	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	14	3	11	78%	\$5	\$13	\$6	\$19	4.1
364	Classroom	IJA	Jam Jar	1	1132	1 - 60w Inc A19	1,250	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	75	16	59	78%	\$7	\$13	\$6	\$19	2.9
365D	Lab	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	2,550	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	153	33	120	78%	\$9	\$13	\$6	\$19	2.1
370	Classroom + Lab	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	1,250	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	75	16	59	78%	\$7	\$13	\$6	\$19	2.9
372	Classroom + Lab	ILA	Keyless Lampholder	1	1132	1 - 60w Inc A19	4,080	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	245	53	192	78%	\$12	\$13	\$6	\$19	1.6
378	Classroom + Lab	IJA	Jam Jar	1	1132	1 - 60w Inc A19	1,250	2044	1-13w CF spiral SI (Screw in)	1	13	0.1	0.0	75	16	59	78%	\$7	\$13	\$6	\$19	2.9
Summary for Building Science Building:				15																		
Summary for Client Thompson Rivers University Kamloops:				112	15	0.7	0.2	1,133	245	887	78%	\$91	\$198	\$92	\$290	3.2						
					112	5.8	1.3	18,684	3,922	14,762	79%	\$1,028	\$1,650	\$1,799	\$3,449	3.4						

*Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Building Name: Arts and Education

Building Code: AAE

Room: Room Type:		Existing Conditions		Retrofit Conditions		Controls Retrofit Data							Energy Savings			BCH				
		Type Code: Description:	Ann. Hrs.:	Energy (kWh):	Description:	Qty:	Energy w/o Controls (kWh):	*Qty: Description:	Unit Labour (hrs):	Unit Matl (\$):	Add'l. Matls (\$):	Matl (\$):	Labour (\$):	**Total (\$):	% Hrs.	New Hours:	Controls Savings (kWh):	Controls Savings (\$):	Payback: (kWh):	Incentive Savings
100B	Interview Room	FTJ F2x4 Rec	1,530	526	3- Relamp with 28w 4' RSFI T8 ES lam	4	465	1.00 Passive Infrared Wallswitch Replace	0.3	\$90	\$0	\$119	\$14	\$133	30%	1071	140	\$6	18.4	140
100C	Interview Room	FTJ F2x4 Rec	1,530	526	3- Relamp with 28w 4' RSFI T8 ES lam	4	465	1.00 Passive Infrared Wallswitch Replace	0.3	\$90	\$0	\$119	\$14	\$133	30%	1071	140	\$6	18.4	140
1-East	East Hallway	FTG F2x2 Rec	8,760	3,154	2- 28w 4' RSFI T8 ES HE EL-IS NEW	5	2,102	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	631	\$25	18.9	631
1-Entry	Hallway	CDN Downlight	8,760	1,962	0- Install Lighting Controls Device Only	7	1,962	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	6132	589	\$24	11.8	589
1-Entry	Hallway	CDN Downlight	8,760	2,523	0- Install Lighting Controls Device Only	9	2,523	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	6132	757	\$31	9.2	757
1-West	West Hallway with Display	FTG F2x2 Rec	8,760	3,154	2- 28w 4' RSFI T8 ES HE EL-IS NEW	4	1,682	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	505	\$20	23.6	505
2-East	East Hallway	FTG F2x2 Rec	8,760	3,889	2- 28w 4' RSFI T8 ES HE EL-IS NEW	6	2,523	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	757	\$31	15.7	757
2-West	West Hallway	FTG F2x2 Rec	8,760	4,652	2- 28w 4' RSFI T8 ES HE EL-IS NEW	9	3,784	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	1,135	\$46	10.5	1,135
300B	Classroom	FTJ F2x4 Rec	2,000	4,140	3- 28w 4' RSFI T8 ES HE EL-LBF 1&2	18	2,304	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	1400	691	\$28	10.1	691
305	Computer Lab	FTD F1x4 Rec	2,550	3,121	2- 28w 4' RSFI T8 ES HE EL-LBF	17	1,821	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	1785	546	\$22	12.7	546
357	Lunch Room	IDD Downlight Round	2,860	286	1- 18w triple CF	1	66	0.14 Passive Infrared Wallswitch Replace	0.0	\$13	\$0	\$17	\$2	\$19	30%	2002	20	\$1	18.6	20
357	Lunch Room	IDB Downlight Round	2,860	1,287	1- 18w triple CF	6	395	0.86 Passive Infrared Wallswitch Replace	0.2	\$77	\$0	\$102	\$12	\$114	30%	2002	118	\$5	18.6	118
366	Classroom	FTJ F2x4 Rec	1,000	2,185	3- 28w 4' RSFI T8 ES HE EL-LBF 1&2	19	1,216	0.90 Dual Technology Motion Sensor - Ceil	0.9	\$204	\$0	\$269	\$50	\$320	30%	700	365	\$15	17.2	365
366	Classroom	FTJ F2x4 Rec	1,000	230	3- 28w 4' RSFI T8 ES HE EL-LBF 1&2	2	128	0.10 Dual Technology Motion Sensor - Ceil	0.1	\$21	\$0	\$28	\$5	\$34	30%	700	38	\$2	17.2	38
3-East	East Hallway	FTG F2x2 Rec	8,760	2,593	2- 28w 4' RSFI T8 ES HE EL-IS NEW	4	1,682	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	505	\$20	23.6	505
3-Loung	Lounge (Gorman's Grotto)	CDO Downlight	2,860	472	0- Install Lighting Controls Device Only	11	472	0.52 Dual Technology Sensor Wallswitch	0.2	\$92	\$0	\$121	\$10	\$131	30%	2002	142	\$6	17.7	142
3-Loung	Lounge (Gorman's Grotto)	CDO Downlight	2,860	129	0- Install Lighting Controls Device Only	3	129	0.14 Dual Technology Sensor Wallswitch	0.0	\$25	\$0	\$33	\$3	\$36	30%	2002	39	\$2	17.7	39
3-Loung	Lounge (Gorman's Grotto)	CDO Downlight	2,860	300	0- Install Lighting Controls Device Only	7	300	0.33 Dual Technology Sensor Wallswitch	0.1	\$58	\$0	\$77	\$6	\$83	30%	2002	90	\$4	17.7	90
3-West	West Hallway	FTG F2x2 Rec	8,760	5,834	2- 28w 4' RSFI T8 ES HE EL-IS NEW	9	3,784	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	1,135	\$46	10.5	1,135
966	Classroom	FTJ F2x4 Rec	2,000	1,958	3- Relamp with 28w 4' RSFI T8 ES lam	11	1,716	1.00 Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	1400	515	\$21	13.5	515
STR-Ea	East Stairwell	FVD F1x4 Vapour Resist	8,760	2,067	2- Relamp with 28w 4' RSFI T8 ES lam	4	1,822	0.67 Daylight Sensor	1.3	\$400	\$0	\$529	\$74	\$603	50%	4380	911	\$37	12.9	547
STR-Ea	East Stairwell	FVD F1x4 Vapour Resist	8,760	1,034	2- Relamp with 28w 4' RSFI T8 ES lam	2	911	0.33 Daylight Sensor	0.7	\$200	\$0	\$264	\$37	\$302	50%	4380	456	\$18	12.9	273
STR-We	West Stairwell	FBG F1x4 Box	8,760	1,034	2- Relamp with 28w 4' RSFI T8 ES lam	2	911	0.29 Daylight Sensor	0.6	\$171	\$0	\$227	\$32	\$259	50%	4380	456	\$18	11.0	273
STR-We	West Stairwell	FTD F1x4 Rec	8,760	2,067	2- Relamp with 28w 4' RSFI T8 ES lam	4	1,822	0.57 Daylight Sensor	1.1	\$343	\$0	\$453	\$64	\$517	50%	4380	911	\$37	11.0	547
STR-We	West Stairwell	FTD F1x4 Rec	8,760	517	2- Relamp with 28w 4' RSFI T8 ES lam	1	456	0.14 Daylight Sensor	0.3	\$86	\$0	\$113	\$16	\$129	50%	4380	228	\$9	11.0	137
Controls Summary for Building Arts and Education:			49,640				35,441				\$6,540	\$952	\$7,491			11,817	\$477	15.7	10,632	

*Quantities are weighted by the number of luminaires controlled by a controller.

**Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Building Name: Campus Activity Centre

Building Code: CAC

Room:	Room Type:	Existing Conditions			Retrofit Conditions		Controls Retrofit Data							Energy Savings				BCH Incentive Savings				
		Type Code:	Description:	Ann. Hrs.:	Energy (kWh):	Description:	Qty:	Energy w/o Controls (kWh):	*Qty:	Description:	Unit Labour (hrs):	Unit Matl (\$):	Add'l. Matls (\$):	Matl (\$):	Labour (\$):	**Total (\$):	% Hrs.:		New Hours:	Controls Savings (kWh):	Controls Savings (\$):	Payback: (kWh):
145	Women's Washroom	FSE	F4' striplight	8,760	377	1- 28w 4' RSFI T8 ES HE EL-LBF	1	193	0.33	Dual Technology Motion Sensor - Ceil	0.3	\$75	\$0	\$99	\$19	\$118	60%	3504	116	\$5	20.0	58
145	Women's Washroom	FSE	F4' striplight	8,760	753	1- 28w 4' RSFI T8 ES HE EL-LBF Sh	2	368	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$0	\$198	\$37	\$236	60%	3504	221	\$9	21.0	110
146/147	Men's Washroom	CDB	Downlight	8,760	841	0- Install Lighting Controls Device Only	3	841	0.38	Dual Technology Motion Sensor - Ceil	0.4	\$84	\$0	\$112	\$21	\$132	60%	3504	505	\$20	5.2	252
146/147	Men's Washroom	FSE	F4' striplight	8,760	377	1- 28w 4' RSFI T8 ES HE EL-LBF	1	193	0.13	Dual Technology Motion Sensor - Ceil	0.1	\$28	\$0	\$37	\$7	\$44	60%	3504	116	\$5	7.5	58
146/147	Men's Washroom	FSE	F4' striplight	8,760	1,507	1- 28w 4' RSFI T8 ES HE EL-LBF Sh	4	736	0.50	Dual Technology Motion Sensor - Ceil	0.5	\$113	\$0	\$149	\$28	\$177	60%	3504	442	\$18	7.9	221
201	Women's Washroom	FSE	F4' striplight	5,100	1,097	1- 28w 4' RSFI T8 ES HE EL-LBF	5	561	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	3570	168	\$7	41.3	168
203	Men's Washroom	FSE	F4' striplight	5,100	1,535	1- 28w 4' RSFI T8 ES HE EL-LBF	7	785	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	3570	236	\$10	29.5	236
257	Men's Washroom	FSE	F4' striplight	8,760	2,637	1- 28w 4' RSFI T8 ES HE EL-LBF	7	1,349	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	6132	405	\$16	17.2	405
258	Women's Washroom	FSE	F4' striplight	8,760	1,883	1- 28w 4' RSFI T8 ES HE EL-LBF	5	964	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$0	\$298	\$56	\$353	30%	6132	289	\$12	24.0	289
3-Atruim Atrium		MDB	Downlight	7,280	7,571	1- 55w QL Induction	8	3,203	0.04	Daylight Sensor	0.1	\$23	\$0	\$31	\$4	\$35	30%	5096	961	\$39	0.7	961
3-Atruim Atrium		MDG	Downlight	7,280	26,208	2- 165w QL Induction	8	19,219	0.04	Daylight Sensor	0.1	\$23	\$0	\$31	\$4	\$35	30%	5096	5,766	\$233	0.1	5,766
3-Atruim Atrium		DSA	Neon Tubing	7,280	17,472	0- No Action	192	17,472	0.92	Daylight Sensor	1.8	\$554	\$0	\$732	\$103	\$835	30%	5096	5,242	\$212	3.1	5,242
Controls Summary for Building Campus Activity Centre:				62,257				45,884						\$2,579	\$446	\$3,025			14,464	\$584	5.2	13,765

Building Name: Clock Tower Building

Building Code: CTB

Room:	Room Type:	Existing Conditions			Retrofit Conditions		Controls Retrofit Data							Energy Savings				BCH Incentive Savings				
		Type Code:	Description:	Ann. Hrs.:	Energy (kWh):	Description:	Qty:	Energy w/o Controls (kWh):	*Qty:	Description:	Unit Labour (hrs):	Unit Matl (\$):	Add'l. Matls (\$):	Matl (\$):	Labour (\$):	**Total (\$):	% Hrs.:		New Hours:	Controls Savings (kWh):	Controls Savings (\$):	Payback: (kWh):
165	Journalism Lab	FTJ	F2x4 Rec	1,960	225	2- 28w 4' RSFI T8 ES HE EL-LBF Wh	1	82	0.11	Dual Technology Motion Sensor - Ceil	0.1	\$25	\$0	\$33	\$6	\$39	30%	1372	25	\$1	31.3	25
165	Journalism Lab	FTJ	F2x4 Rec	1,960	1,803	2- 28w 4' RSFI T8 ES HE EL-LBF Wh	8	659	0.89	Dual Technology Motion Sensor - Ceil	0.9	\$200	\$0	\$264	\$50	\$314	30%	1372	198	\$8	31.3	198
170	Journalism Lab	FTK	F2x4 Rec	1,960	1,129	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	4	376	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$0	\$198	\$37	\$236	30%	1372	113	\$5	41.0	113
170	Journalism Lab	FTK	F2x4 Rec	1,960	439	2- Delamp to 2 - 28w 4' RSFI T8 ES la	2	235	0.33	Dual Technology Motion Sensor - Ceil	0.3	\$75	\$0	\$99	\$19	\$118	30%	1372	71	\$3	32.8	71
Controls Summary for Building Clock Tower Building:				3,597				1,352						\$595	\$111	\$707			406	\$16	43.1	406

*Quantities are weighted by the number of luminaires controlled by a controller.

**Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Building Name: International Building

Building Code: INB

Room:	Room Type:	Existing Conditions			Retrofit Conditions			Controls Retrofit Data							Energy Savings				BCI Incentive Savings				
		Type Code:	Description:	Ann. Hrs.:	Energy (kWh):	Description:	Qty:	Energy w/o Controls (kWh):	*Qty:	Description:	Unit Labour (hrs):	Unit Matl (\$):	Add'l. Matls (\$):	Matl (\$):	Labour **Total (\$):	% Hrs.	New Hours:	Controls Savings (kWh):		Controls Savings (\$):	Payback: (kWh):		
100	Foyer	CCB	Wall Sconce	6,116	1,174	0-	Install Lighting Controls Device Only	6	1,174	0.50	Daylight Sensor	1.0	\$300	\$0	\$397	\$56	\$452	30%	4281	352	\$14	25.0	352
100	Foyer	MFF	Floodlight	6,116	10,715	1-	165w QL Induction	6	6,055	0.50	Daylight Sensor	1.0	\$300	\$0	\$397	\$56	\$452	30%	4281	1,816	\$73	4.8	1,816
101	Hallway	CDI	Downlight	6,116	453	0-	Install Lighting Controls Device Only	2	453	0.33	Dual Technology Motion Sensor - Ceil	0.3	\$75	\$17	\$121	\$19	\$140	20%	4893	91	\$4	34.7	91
101	Hallway	CTQ	Troffer (CF)	6,116	1,884	0-	Install Lighting Controls Device Only	4	1,884	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$33	\$242	\$37	\$280	20%	4893	377	\$15	16.7	377
108	Hallway	CDI	Downlight	6,116	905	0-	Install Lighting Controls Device Only	4	905	0.57	Dual Technology Motion Sensor - Ceil	0.6	\$129	\$29	\$208	\$32	\$240	20%	4893	181	\$7	29.7	181
108	Hallway	CTQ	Troffer (CF)	6,116	1,413	0-	Install Lighting Controls Device Only	3	1,413	0.43	Dual Technology Motion Sensor - Ceil	0.4	\$96	\$21	\$156	\$24	\$180	20%	4893	283	\$11	14.3	283
112	Women's Washroom	CDI	Downlight	4,080	906	0-	Install Lighting Controls Device Only	6	906	0.86	Ultrasonic Wallswitch Replacement	0.2	\$77	\$0	\$102	\$12	\$114	30%	2856	272	\$11	8.1	272
112	Women's Washroom	FCA	F1x2 Cubelight	4,080	69	0-	Install Lighting Controls Device Only	1	69	0.14	Ultrasonic Wallswitch Replacement	0.0	\$13	\$0	\$17	\$2	\$19	30%	2856	21	\$1	17.7	21
113	Men's Washroom	FCA	F1x2 Cubelight	4,080	69	0-	Install Lighting Controls Device Only	1	69	0.25	Ultrasonic Wallswitch Replacement	0.1	\$23	\$0	\$30	\$3	\$33	30%	2856	21	\$1	30.9	21
113	Men's Washroom	CDI	Downlight	4,080	453	0-	Install Lighting Controls Device Only	3	453	0.75	Ultrasonic Wallswitch Replacement	0.2	\$68	\$0	\$89	\$10	\$100	30%	2856	136	\$5	14.2	136
117A	Corridor	CTQ	Troffer (CF)	6,116	1,884	0-	Install Lighting Controls Device Only	4	1,884	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$33	\$242	\$37	\$280	20%	4893	377	\$15	16.7	377
117A	Corridor	CTQ	Troffer (CF)	6,116	471	0-	Install Lighting Controls Device Only	1	471	0.17	Dual Technology Motion Sensor - Ceil	0.2	\$38	\$8	\$61	\$9	\$70	20%	4893	94	\$4	16.7	94
117A	Corridor	CDI	Downlight	6,116	226	0-	Install Lighting Controls Device Only	1	226	0.17	Dual Technology Motion Sensor - Ceil	0.2	\$38	\$8	\$61	\$9	\$70	20%	4893	45	\$2	34.7	45
118	Hallway	CTQ	Troffer (CF)	6,116	1,884	0-	Install Lighting Controls Device Only	4	1,884	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$50	\$364	\$56	\$419	20%	4893	377	\$15	25.0	377
120	Men's Washroom	FCE	F1x4 Cubelight	6,116	190	1-	Relamp with 28w 4' RSFI T8 ES lam	1	159	0.20	Ultrasonic Wallswitch and Box	0.3	\$26	\$0	\$34	\$17	\$51	30%	4281	48	\$2	22.2	48
120	Men's Washroom	CDI	Downlight	6,116	905	0-	Install Lighting Controls Device Only	4	905	0.80	Ultrasonic Wallswitch and Box	1.2	\$104	\$0	\$138	\$67	\$204	30%	4281	272	\$11	15.6	272
122	Women's Washroom	FCE	F1x4 Cubelight	6,116	190	1-	Relamp with 28w 4' RSFI T8 ES lam	1	159	0.17	Ultrasonic Wallswitch and Box	0.3	\$22	\$0	\$29	\$14	\$43	30%	4281	48	\$2	18.5	48
122	Women's Washroom	CDI	Downlight	6,116	1,131	0-	Install Lighting Controls Device Only	5	1,131	0.83	Ultrasonic Wallswitch and Box	1.3	\$108	\$0	\$143	\$70	\$213	30%	4281	339	\$14	13.0	339
204	Computer Lab 2	FTI	F2x4 Rec	3,060	1,986	2-	Relamp with 28w 4' RSFI T8 ES lam	11	1,750	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$50	\$364	\$56	\$419	30%	2142	525	\$21	17.9	525
205	Computer Lab 1	FTI	F2x4 Rec	3,060	2,166	2-	Relamp with 28w 4' RSFI T8 ES lam	12	1,909	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$50	\$364	\$56	\$419	30%	2142	573	\$23	16.5	573
212	Corridor	FTD	F1x4 Rec	6,116	3,247	2-	Relamp with 28w 4' RSFI T8 ES lam	9	2,862	1.50	Dual Technology Motion Sensor - Ceil	1.5	\$169	\$38	\$496	\$84	\$580	20%	4893	572	\$23	21.5	572
212	Corridor	CDI	Downlight	6,116	679	0-	Install Lighting Controls Device Only	3	679	0.50	Dual Technology Motion Sensor - Ceil	0.5	\$56	\$13	\$165	\$28	\$193	20%	4893	136	\$5	30.1	136
227	Copy Room	FTJ	F2x4 Rec	2,040	877	2-	Delamp to 2 - 28w 4' RSFI T8 ES la	5	581	0.63	Passive Infrared Wallswitch Replace	0.2	\$56	\$0	\$74	\$9	\$83	30%	1428	174	\$7	9.2	174
227	Copy Room	CDI	Downlight	2,040	75	0-	Install Lighting Controls Device Only	1	75	0.13	Passive Infrared Wallswitch Replace	0.0	\$11	\$0	\$15	\$2	\$17	30%	1428	23	\$1	14.2	23
227	Copy Room	FTJ	F2x4 Rec	2,040	351	2-	Delamp to 2 - 28w 4' RSFI T8 ES la	2	233	0.25	Passive Infrared Wallswitch Replace	0.1	\$23	\$0	\$30	\$3	\$33	30%	1428	70	\$3	9.2	70
254	Computer Lab "Language	FTI	F2x4 Rec	3,060	2,166	2-	Relamp with 28w 4' RSFI T8 ES lam	12	1,909	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$50	\$364	\$56	\$419	30%	2142	573	\$23	16.5	573
259	Computer Lab "Language	FTI	F2x4 Rec	3,060	2,166	2-	Relamp with 28w 4' RSFI T8 ES lam	12	1,909	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$50	\$364	\$56	\$419	30%	2142	573	\$23	16.5	573
264	Corridor	CTQ	Troffer (CF)	6,116	4,709	0-	Install Lighting Controls Device Only	10	4,709	2.00	Dual Technology Motion Sensor - Ceil	2.0	\$225	\$50	\$661	\$111	\$773	20%	4893	942	\$38	17.4	942
266	Men's Washroom	CDI	Downlight	6,116	905	0-	Install Lighting Controls Device Only	4	905	0.80	Ultrasonic Motion Detector - Ceiling M	1.0	\$120	\$80	\$264	\$56	\$320	50%	3058	453	\$18	18.4	272
266	Men's Washroom	FCE	F1x4 Cubelight	6,116	190	1-	Relamp with 28w 4' RSFI T8 ES lam	1	159	0.20	Ultrasonic Motion Detector - Ceiling M	0.3	\$30	\$20	\$66	\$14	\$80	50%	3058	80	\$3	26.1	48
267	Women's Washroom	FCE	F1x4 Cubelight	6,116	190	1-	Relamp with 28w 4' RSFI T8 ES lam	1	159	0.20	Ultrasonic Motion Detector - Ceiling M	0.3	\$30	\$20	\$66	\$14	\$80	50%	3058	80	\$3	26.1	48
267	Women's Washroom	CDI	Downlight	6,116	905	0-	Install Lighting Controls Device Only	4	905	0.80	Ultrasonic Motion Detector - Ceiling M	1.0	\$120	\$80	\$264	\$56	\$320	50%	3058	453	\$18	18.4	272
269/271	Corridor	FTD	F1x4 Rec	6,116	2,526	2-	Relamp with 28w 4' RSFI T8 ES lam	7	2,226	1.17	Dual Technology Motion Sensor - Ceil	1.2	\$131	\$29	\$386	\$65	\$451	20%	4893	445	\$18	21.5	445
269/271	Corridor	CTQ	Troffer (CF)	6,116	2,355	0-	Install Lighting Controls Device Only	5	2,355	0.83	Dual Technology Motion Sensor - Ceil	0.8	\$94	\$21	\$276	\$46	\$322	20%	4893	471	\$19	14.5	471
345	Men's Washroom	FCE	F1x4 Cubelight	6,116	190	1-	Relamp with 28w 4' RSFI T8 ES lam	1	159	0.33	Ultrasonic Motion Detector - Ceiling M	0.4	\$50	\$17	\$88	\$23	\$111	50%	3058	80	\$3	33.2	48
345	Men's Washroom	FTD	F1x4 Rec	6,116	722	1-	Delamp to 1 - 28w 4' RSFI T8 ES la	2	355	0.67	Ultrasonic Motion Detector - Ceiling M	0.8	\$100	\$33	\$176	\$46	\$223	50%	3058	177	\$7	29.7	106
346	Women's Washroom	FCE	F1x4 Cubelight	6,116	190	1-	Relamp with 28w 4' RSFI T8 ES lam	1	159	0.20	Ultrasonic Motion Detector - Ceiling M	0.3	\$30	\$12	\$56	\$14	\$69	50%	3058	80	\$3	21.1	48
346	Women's Washroom	FTD	F1x4 Rec	6,116	1,443	2-	Relamp with 28w 4' RSFI T8 ES lam	4	1,272	0.80	Ultrasonic Motion Detector - Ceiling M	1.0	\$120	\$48	\$222	\$56	\$278	50%	3058	636	\$26	10.6	382
361	Corridor	FTD	F1x4 Rec	6,116	1,804	2-	Relamp with 28w 4' RSFI T8 ES lam	5	1,590	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$50	\$364	\$56	\$419	20%	4893	318	\$13	29.6	318
363	Corridor	FTD	F1x4 Rec	6,116	1,443	2-	Relamp with 28w 4' RSFI T8 ES lam	4	1,272	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$50	\$364	\$56	\$419	20%	4893	254	\$10	37.0	254
364/365	Corridor	FTJ	F2x4 Rec	6,116	1,578	3-	Relamp with 28w 4' RSFI T8 ES lam	3	1,394	0.30	Dual Technology Motion Sensor - Ceil	0.3	\$68	\$15	\$109	\$17	\$126	20%	4893	279	\$11	10.1	279
364/365	Corridor	FTD	F1x4 Rec	6,116	2,526	2-	Relamp with 28w 4' RSFI T8 ES lam	7	2,226	0.70	Dual Technology Motion Sensor - Ceil	0.7	\$158	\$35	\$255	\$39	\$294	20%	4893	445	\$18	14.8	445

Controls Summary for Building International Building:		60,311	51,954	\$8,682	\$1,546	\$10,228	13,558	\$548	18.7	12,743
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*Quantities are weighted by the number of luminaires controlled by a controller.

**Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Building Name: Library

Building Code: LIB

Room:	Room Type:	Existing Conditions			Retrofit Conditions			Controls Retrofit Data							Energy Savings				BCH Incentive Savings			
		Type Code:	Description:	Ann. Hrs.:	Energy (kWh):	Description:	Qty:	Energy w/o Controls (kWh):	*Qty:	Description:	Unit Labour (hrs):	Unit Matl (\$):	Add'l. Matls (\$):	Matl (\$):	Labour (\$):	**Total (\$):	% Hrs.	New Hours:		Controls Savings (kWh):	Controls Savings (\$):	Payback: (kWh):
102A	Office	FTK	F2x4 Rec	4,732	700	3- 28w 4' RSFI T8 ES HE EL-IS	1	341	0.33	Dual Technology Motion Sensor - Ceil	0.3	\$75	\$17	\$121	\$19	\$140	30%	3312	102	\$4	30.7	102
102A	Office	FTK	F2x4 Rec	4,732	920	2- 28w 4' RSFI T8 ES HE EL-IS	2	454	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$33	\$242	\$37	\$280	30%	3312	136	\$6	46.1	136
110	Women's Washroom	FCF	F1x4 Cubelight	4,732	681	2- 28w 4' RSFI T8 ES HE EL-IS	2	454	0.67	Ultrasonic Wallswitch Replacement	0.2	\$60	\$0	\$79	\$9	\$89	30%	3312	136	\$6	12.6	136
110	Women's Washroom	FCF	F1x4 Cubelight	4,732	279	2- Relamp with 28w 4' RSFI T8 ES lam	1	246	0.33	Ultrasonic Wallswitch Replacement	0.1	\$30	\$0	\$40	\$5	\$44	30%	3312	74	\$3	11.6	74
112	Men's Washroom	FCF	F1x4 Cubelight	4,732	341	2- 28w 4' RSFI T8 ES HE EL-IS	1	227	0.33	Ultrasonic Wallswitch Replacement	0.1	\$30	\$0	\$40	\$5	\$44	30%	3312	68	\$3	12.6	68
112	Men's Washroom	FWF	F1x4 Wrap	4,732	341	2- 28w 4' RSFI T8 ES HE EL-IS	1	227	0.33	Ultrasonic Wallswitch Replacement	0.1	\$30	\$0	\$40	\$5	\$44	30%	3312	68	\$3	12.6	68
112	Men's Washroom	FWF	F1x4 Wrap	4,732	279	2- Relamp with 28w 4' RSFI T8 ES lam	1	246	0.33	Ultrasonic Wallswitch Replacement	0.1	\$30	\$0	\$40	\$5	\$44	30%	3312	74	\$3	11.6	74
206	Lunchroom	FTK	F2x4 Rec	2,040	1,208	2- 28w 4' RSFI T8 ES HE EL-IS	4	392	1.00	Passive Infrared Wallswitch Replace	0.3	\$90	\$0	\$119	\$14	\$133	30%	1428	118	\$5	21.9	118
209	Computer Lab/Library Se	FTK	F2x4 Rec	3,060	343	2- Delamp to 2 - 28w 4' RSFI T8 ES la	1	184	0.17	Dual Technology Motion Sensor - Ceil	0.2	\$38	\$8	\$61	\$9	\$70	30%	2142	55	\$2	28.5	55
209	Computer Lab/Library Se	FTK	F2x4 Rec	3,060	2,479	2- 28w 4' RSFI T8 ES HE EL-IS	5	734	0.83	Dual Technology Motion Sensor - Ceil	0.8	\$188	\$42	\$303	\$46	\$349	30%	2142	220	\$9	35.6	220
220	Men's Washroom	FCF	F1x4 Cubelight	4,732	1,022	2- 28w 4' RSFI T8 ES HE EL-IS	3	681	1.00	Ultrasonic Wallswitch Replacement	0.3	\$90	\$0	\$119	\$14	\$133	30%	3312	204	\$8	12.6	204
222	Women's Washroom	FCF	F1x4 Cubelight	4,732	1,022	2- 28w 4' RSFI T8 ES HE EL-IS	3	681	1.00	Ultrasonic Wallswitch Replacement	0.3	\$90	\$0	\$119	\$14	\$133	30%	3312	204	\$8	12.6	204
228	Group Study Area	FTK	F2x4 Rec	2,000	672	2- Delamp to 2 - 28w 4' RSFI T8 ES la	3	360	1.00	Dual Technology Sensor Wallswitch	0.3	\$175	\$0	\$231	\$19	\$250	30%	1400	108	\$4	44.4	108
Controls Summary for Building Library:					10,287			5,228					\$1,554	\$200	\$1,754			1,568	\$63	27.7	1,568	

*Quantities are weighted by the number of luminaires controlled by a controller.

**Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Building Name: Old Main Building

Building Code: OMB

Room:	Room Type:	Existing Conditions				Retrofit Conditions			Controls Retrofit Data							Energy Savings				BCI Incentive Savings		
		Type Code:	Description:	Ann. Hrs.:	Energy (kWh):	Description:	Qty:	Energy w/o Controls (kWh):	*Qty:	Description:	Unit Labour (hrs):	Unit Matl (\$):	Add'l. Matls (\$):	Matl (\$):	Labour **Total (\$):	% Hrs.	New Hours:	Controls Savings (kWh):	Controls Savings (\$):		Payback: (kWh):	
1310	Wireless Lab	FTJ	F2x4 Rec	3,640	2,337	3- 28w 4' RSFI T8 ES HE EL-IS 1&2	6	1,594	1.00	Dual Technology Sensor Wallswitch	0.3	\$175	\$0	\$231	\$19	\$250	30%	2548	478	\$19	10.0	478
1325	Computer Lab	FTJ	F2x4 Rec	3,640	389	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	1	175	0.06	Dual Technology Motion Sensor - Ceil	0.1	\$13	\$12	\$33	\$3	\$36	30%	2548	52	\$2	18.9	52
1325	Computer Lab	FTJ	F2x4 Rec	3,640	4,611	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	16	2,796	0.94	Dual Technology Motion Sensor - Ceil	0.9	\$212	\$188	\$529	\$52	\$581	30%	2548	839	\$34	18.9	839
1327	Computer Lab	FTJ	F2x4 Rec	3,640	3,747	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	13	2,271	0.87	Dual Technology Motion Sensor - Ceil	0.9	\$195	\$173	\$487	\$48	\$535	30%	2548	681	\$28	21.4	681
1327	Computer Lab	FTJ	F2x4 Rec	3,640	779	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	2	349	0.13	Dual Technology Motion Sensor - Ceil	0.1	\$30	\$27	\$75	\$7	\$82	30%	2548	105	\$4	21.4	105
1330	Computer Lab	FTJ	F2x4 Rec	3,640	389	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	1	175	0.07	Dual Technology Motion Sensor - Ceil	0.1	\$15	\$7	\$29	\$4	\$32	30%	2548	52	\$2	15.1	52
1330	Computer Lab	FTJ	F2x4 Rec	3,640	3,459	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	12	2,097	0.80	Dual Technology Motion Sensor - Ceil	0.8	\$180	\$80	\$344	\$45	\$388	30%	2548	629	\$25	15.1	629
1330	Computer Lab	FTJ	F2x4 Rec	3,640	779	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	2	349	0.13	Dual Technology Motion Sensor - Ceil	0.1	\$30	\$13	\$57	\$7	\$65	30%	2548	105	\$4	15.1	105
1335	Computer Lab	FTJ	F2x4 Rec	3,640	4,323	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	15	2,621	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	2548	786	\$32	15.1	786
1340	Computer Lab	FTJ	F2x4 Rec	3,640	1,558	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	4	699	0.27	Dual Technology Motion Sensor - Ceil	0.3	\$60	\$0	\$79	\$15	\$94	30%	2548	210	\$8	8.8	210
1340	Computer Lab	FTJ	F2x4 Rec	3,640	389	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	1	175	0.07	Dual Technology Motion Sensor - Ceil	0.1	\$15	\$0	\$20	\$4	\$24	30%	2548	52	\$2	8.8	52
1340	Computer Lab	FTJ	F2x4 Rec	3,640	2,882	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	10	1,747	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$0	\$198	\$37	\$236	30%	2548	524	\$21	8.8	524
1345	Computer Lab	FTJ	F2x4 Rec	3,640	4,323	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	15	2,621	0.79	Dual Technology Motion Sensor - Ceil	0.8	\$178	\$158	\$444	\$44	\$488	30%	2548	786	\$32	16.9	786
1345	Computer Lab	FTJ	F2x4 Rec	3,640	1,558	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	4	699	0.21	Dual Technology Motion Sensor - Ceil	0.2	\$47	\$42	\$118	\$12	\$130	30%	2548	210	\$8	16.9	210
1349	Open Computer Lab	FTJ	F2x4 Rec	3,640	3,116	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	8	1,398	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	2548	419	\$17	28.4	419
1350	Computer Room	FTJ	F2x4 Rec	3,640	2,882	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	10	1,747	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$133	\$375	\$37	\$412	30%	2548	524	\$21	21.4	524
1350	Computer Room	FTJ	F2x4 Rec	3,640	1,168	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	3	524	0.20	Dual Technology Motion Sensor - Ceil	0.2	\$45	\$40	\$112	\$11	\$124	30%	2548	157	\$6	21.4	157
1350	Computer Room	FTJ	F2x4 Rec	3,640	779	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	2	349	0.13	Dual Technology Motion Sensor - Ceil	0.1	\$30	\$27	\$75	\$7	\$82	30%	2548	105	\$4	21.4	105
1355	Computer Lab	FTJ	F2x4 Rec	3,640	1,168	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	3	524	0.20	Dual Technology Motion Sensor - Ceil	0.2	\$45	\$20	\$86	\$11	\$97	30%	2548	157	\$6	15.1	157
1355	Computer Lab	FTJ	F2x4 Rec	3,640	3,459	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	12	2,097	0.80	Dual Technology Motion Sensor - Ceil	0.8	\$180	\$80	\$344	\$45	\$388	30%	2548	629	\$25	15.1	629
1360	Computer Room	FTJ	F2x4 Rec	3,640	389	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	1	175	0.07	Dual Technology Motion Sensor - Ceil	0.1	\$15	\$13	\$37	\$4	\$41	30%	2548	52	\$2	21.4	52
1360	Computer Room	FTJ	F2x4 Rec	3,640	2,594	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	9	1,572	0.60	Dual Technology Motion Sensor - Ceil	0.6	\$135	\$120	\$337	\$33	\$371	30%	2548	472	\$19	21.4	472
1360	Computer Room	FTJ	F2x4 Rec	3,640	1,947	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	5	874	0.33	Dual Technology Motion Sensor - Ceil	0.3	\$75	\$67	\$187	\$19	\$206	30%	2548	262	\$11	21.4	262
1365	Computer Lab	FTJ	F2x4 Rec	3,640	389	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	1	175	0.08	Dual Technology Motion Sensor - Ceil	0.1	\$17	\$8	\$33	\$4	\$37	30%	2548	52	\$2	17.5	52
1365	Computer Lab	FTJ	F2x4 Rec	3,640	2,306	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	8	1,398	0.62	Dual Technology Motion Sensor - Ceil	0.6	\$138	\$62	\$264	\$34	\$299	30%	2548	419	\$17	17.5	419
1365	Computer Lab	FTJ	F2x4 Rec	3,640	779	2- 28w 4' RSFI T8 ES HE EL-IS WhRe	2	349	0.15	Dual Technology Motion Sensor - Ceil	0.2	\$35	\$15	\$66	\$9	\$75	30%	2548	105	\$4	17.5	105
1365	Computer Lab	FTG	F2x2 Rec	3,640	430	2- 17w RSFI T8 HE EL-HBF WhRef	2	298	0.15	Dual Technology Motion Sensor - Ceil	0.2	\$35	\$15	\$66	\$9	\$75	30%	2548	90	\$4	20.4	90
1800	1st Floor Block A East Ad	FTG	F2x2 Rec	8,760	2,584	2- 28w 4' RSFI T8 ES HE EL-LBF NE	4	1,472	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$200	\$562	\$56	\$618	50%	4380	736	\$30	22.9	442
1-A-Eas	Block 'A' East Hallway	FTG	F2x2 Rec	8,760	6,482	2- 28w 4' RSFI T8 ES HE EL-LBF NE	9	3,311	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$400	\$827	\$56	\$882	30%	6132	993	\$40	26.9	993
1-A-We	Block 'A' West Hallway	FTG	F2x2 Rec	8,760	5,186	2- 28w 4' RSFI T8 ES HE EL-LBF NE	8	2,943	0.80	Dual Technology Motion Sensor - Ceil	0.8	\$180	\$320	\$661	\$45	\$706	30%	6132	883	\$36	24.2	883
1-A-We	Block 'A' West Hallway	FTG	F2x2 Rec	8,760	1,296	2- 28w 4' RSFI T8 ES HE EL-LBF NE	2	736	0.20	Dual Technology Motion Sensor - Ceil	0.2	\$45	\$80	\$165	\$11	\$176	30%	6132	221	\$9	24.2	221
2800	Second Floor Block A East	FTG	F2x2 Rec	8,760	2,584	2- 28w 4' RSFI T8 ES HE EL-LBF NE	4	1,472	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$200	\$562	\$56	\$618	50%	4380	736	\$30	22.9	442
2-A-Eas	Block 'A' East Hallway	FTG	F2x2 Rec	8,760	648	2- 28w 4' RSFI T8 ES HE EL-LBF NE	1	368	0.20	Dual Technology Motion Sensor - Ceil	0.2	\$23	\$60	\$139	\$11	\$150	30%	6132	110	\$4	39.5	110
2-A-Eas	Block 'A' East Hallway	FTG	F2x2 Rec	8,760	6,482	2- 28w 4' RSFI T8 ES HE EL-LBF NE	9	3,311	1.80	Dual Technology Motion Sensor - Ceil	1.8	\$203	\$540	1,250	\$100	\$1,350	30%	6132	993	\$40	39.5	993
2-A-We	Block 'A' West Hallway	FTG	F2x2 Rec	8,760	6,482	2- 28w 4' RSFI T8 ES HE EL-LBF NE	9	3,311	2.00	Dual Technology Motion Sensor - Ceil	2.0	\$225	\$600	1,389	\$111	\$1,500	30%	6132	993	\$40	43.9	993
91000	Block C Lower Seating Are	MCE	Cylinder	8,760	3,679	1- 85w QL Induction	2	1,489	0.07	Daylight Sensor	0.1	\$41	\$41	\$109	\$8	\$117	30%	6132	447	\$18	7.3	447
91000	Block C Lower Seating Are	MHE	High / Low Bay	8,760	9,198	1- 85w QL Induction	5	3,723	0.17	Daylight Sensor	0.3	\$103	\$103	\$274	\$19	\$293	30%	6132	1,117	\$45	7.3	1,117
91000	Block C Lower Seating Are	MHE	High / Low Bay	8,760	40,471	1- 85w QL Induction	22	16,381	0.76	Daylight Sensor	1.5	\$455	\$455	1,204	\$85	\$1,288	30%	6132	4,914	\$199	7.3	4,914
91000B	Block C Walkway by Seati	CDB	Downlight	8,760	8,129	0- Install Lighting Controls Device Only	29	8,129	2.00	Dual Technology Motion Sensor - Ceil	2.0	\$225	\$600	1,389	\$111	\$1,500	30%	6132	2,439	\$99	17.9	2,439
91220	Block C Hallway Ground Fl	FTG	F2x2 Rec	8,760	3,241	2- 28w 4' RSFI T8 ES HE EL-LBF NE	4	1,472	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$600	1,091	\$56	\$1,147	50%	4380	736	\$30	49.8	442
91400	Block C Exit Corridor	FTG	F2x2 Rec	8,760	3,101	2- 28w 4' RSFI T8 ES HE EL-LBF NE	5	1,840	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$200	\$562	\$56	\$618	30%	6132	552	\$22	30.5	552
91431	Women's Washroom	FWF	F1x4 Wrap	8,760	3,101	2- Relamp with 28w 4' RSFI T8 ES lam	6	2,733	0.75	Ultrasonic Wallswitch Replacement	0.2	\$68	\$75	\$188	\$10	\$199	30%	6132	820	\$33	6.9	820
91431	Women's Washroom	FCF	F1x4 Cubelight	8,760	1,034	2- Relamp with 28w 4' RSFI T8 ES lam	2	911	0.25	Ultrasonic Wallswitch Replacement	0.1	\$23	\$25	\$63	\$3	\$66	30%	6132	273	\$11	6.9	273
91440	Block C Vestibule to Block	CDB	Downlight	8,760	1,962	0- Install Lighting Controls Device Only	7	1,962	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$200	\$562	\$56	\$618	50%	4380	981	\$40	17.2	589
91445	Block C Men's Washroom	FWF	F1x4 Wrap	8,760	3,784	2- 28w 4' RSFI T8 ES HE EL-IS	6	2,523	0.75	Ultrasonic Wallswitch Replacement	0.2	\$68	\$75	\$188	\$10	\$199	30%	6132	757	\$31	7.5	757

*Quantities are weighted by the number of luminaires controlled by a controller.

**Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



91445	Block C Men's Washroom	FCF	F1x4 Cubelight	8,760	1,261	2-	28w 4' RSFI T8 ES HE EL-IS	2	841	0.25	Ultrasonic Wallswitch Replacement	0.1	\$23	\$25	\$63	\$3	\$66	30%	6132	252	\$10	7.5	252
91460	Block C Hallway	FTG	F2x2 Rec	8,760	3,889	2-	28w 4' RSFI T8 ES HE EL-LBF NE	5	1,840	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$400	\$827	\$56	\$882	30%	6132	552	\$22	48.5	552
91500	Block C Hallway	FTG	F2x2 Rec	8,760	4,538	2-	28w 4' RSFI T8 ES HE EL-LBF NE	6	2,208	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$400	\$827	\$56	\$882	30%	6132	662	\$27	40.4	662
91560/5	Arts Hallway	CSB	Surface (CF)	8,760	6,728	0-	Install Lighting Controls Device Only	24	6,728	3.00	Dual Technology Motion Sensor - Ceil	3.0	\$225	\$800	1,951	\$167	\$2,118	50%	4380	3,364	\$136	18.0	2,018
91580	Art Hallway	CSB	Surface (CF)	8,760	1,121	0-	Install Lighting Controls Device Only	4	1,121	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	50%	4380	561	\$23	21.2	336
91654	Men's Washroom	FTD	F1x4 Rec	8,760	517	2-	Relamp with 28w 4' RSFI T8 ES lam	1	456	0.33	Ultrasonic Motion Detector - Ceiling M	0.4	\$50	\$33	\$110	\$23	\$133	60%	3504	273	\$11	12.7	137
91654	Men's Washroom	FCF	F1x4 Cubelight	8,760	517	2-	Relamp with 28w 4' RSFI T8 ES lam	1	456	0.33	Ultrasonic Motion Detector - Ceiling M	0.4	\$50	\$33	\$110	\$23	\$133	60%	3504	273	\$11	12.7	137
91654	Men's Washroom	FTD	F1x4 Rec	8,760	631	2-	28w 4' RSFI T8 ES HE EL-IS	1	420	0.33	Ultrasonic Motion Detector - Ceiling M	0.4	\$50	\$33	\$110	\$23	\$133	60%	3504	252	\$10	13.7	126
91672	Men's Washroom	FCF	F1x4 Cubelight	8,760	517	2-	Relamp with 28w 4' RSFI T8 ES lam	1	456	0.33	Ultrasonic Motion Detector - Ceiling M	0.4	\$50	\$0	\$66	\$23	\$89	60%	3504	273	\$11	6.6	137
91672	Men's Washroom	FTD	F1x4 Rec	8,760	1,261	2-	28w 4' RSFI T8 ES HE EL-IS	2	841	0.67	Ultrasonic Motion Detector - Ceiling M	0.8	\$100	\$0	\$132	\$46	\$179	60%	3504	505	\$20	7.2	252
91684	Men's Washroom	FTD	F1x4 Rec	8,760	1,034	2-	Relamp with 28w 4' RSFI T8 ES lam	2	911	1.00	Ultrasonic Motion Detector - Ceiling M	1.3	\$150	\$0	\$198	\$70	\$268	60%	3504	547	\$22	9.9	273
91690	Women's Washroom	FTD	F1x4 Rec	8,760	1,034	2-	Relamp with 28w 4' RSFI T8 ES lam	2	911	1.00	Ultrasonic Motion Detector - Ceiling M	1.3	\$150	\$0	\$198	\$70	\$268	60%	3504	547	\$22	9.9	273
92102	Women's Washroom	FWF	F1x4 Wrap	5,712	674	2-	Relamp with 28w 4' RSFI T8 ES lam	2	594	0.50	Ultrasonic Wallswitch Replacement	0.1	\$45	\$0	\$60	\$7	\$66	30%	3998	178	\$7	7.2	178
92102	Women's Washroom	CDB	Downlight	5,712	366	0-	Install Lighting Controls Device Only	2	366	0.50	Ultrasonic Wallswitch Replacement	0.1	\$45	\$0	\$60	\$7	\$66	30%	3998	110	\$4	11.7	110
92220	Corridor B Hallway	CSB	Surface (CF)	8,760	2,803	0-	Install Lighting Controls Device Only	10	2,803	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	841	\$34	14.1	841
92400	Corridor B Hallway	CSB	Surface (CF)	8,760	1,402	0-	No Action	5	1,402	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$100	\$430	\$56	\$486	30%	6132	420	\$17	28.3	420
92433	Women's Washroom	FWF	F1x4 Wrap	8,760	2,067	2-	Relamp with 28w 4' RSFI T8 ES lam	4	1,822	0.67	Ultrasonic Wallswitch and Box	1.0	\$87	\$67	\$203	\$56	\$258	60%	3504	1,093	\$44	6.2	547
92433	Women's Washroom	FCF	F1x4 Cubelight	8,760	1,034	2-	Relamp with 28w 4' RSFI T8 ES lam	2	911	0.33	Ultrasonic Wallswitch and Box	0.5	\$43	\$33	\$101	\$28	\$129	60%	3504	547	\$22	6.2	273
92438	Block B Crossroads	FTG	F2x2 Rec	8,760	4,652	2-	28w 4' RSFI T8 ES HE EL-LBF NE	8	2,943	1.00	Dual Technology Motion Sensor - Ceil	1.0	\$225	\$600	1,091	\$56	\$1,147	30%	6132	883	\$36	41.5	883
92443	Men's Washroom	FCF	F1x4 Cubelight	8,760	1,034	2-	Relamp with 28w 4' RSFI T8 ES lam	2	911	0.40	Ultrasonic Wallswitch and Box	0.6	\$52	\$40	\$122	\$33	\$155	60%	3504	547	\$22	7.5	273
92443	Men's Washroom	FWF	F1x4 Wrap	8,760	2,584	2-	Relamp with 28w 4' RSFI T8 ES lam	3	1,367	0.60	Ultrasonic Wallswitch and Box	0.9	\$78	\$60	\$183	\$50	\$233	60%	3504	820	\$33	7.5	410
92500	Block B Corridor	CSB	Surface (CF)	8,760	1,121	0-	Install Lighting Controls Device Only	4	1,121	0.67	Dual Technology Motion Sensor - Ceil	0.7	\$150	\$200	\$463	\$37	\$500	50%	4380	561	\$23	25.9	336
92500	Block B Corridor	FTG	F2x2 Rec	8,760	1,034	2-	17w RSFI T8 HE EL-HBF WhRef	2	718	0.33	Dual Technology Motion Sensor - Ceil	0.3	\$75	\$100	\$231	\$19	\$250	50%	4380	359	\$15	20.2	215
92694	Men's Washroom	FCF	F1x4 Cubelight	8,760	517	2-	Relamp with 28w 4' RSFI T8 ES lam	1	456	0.33	Ultrasonic Motion Detector - Ceiling M	0.4	\$50	\$33	\$110	\$23	\$133	60%	3504	273	\$11	12.7	137
92694	Men's Washroom	FTJ	F2x4 Rec	8,760	1,507	3-	Relamp with 28w 4' RSFI T8 ES lam	2	1,332	0.67	Ultrasonic Motion Detector - Ceiling M	0.8	\$100	\$67	\$220	\$46	\$267	60%	3504	799	\$32	8.7	399
92719	Women's Washroom	FTJ	F2x4 Rec	8,760	2,339	3-	Relamp with 28w 4' RSFI T8 ES lam	3	1,997	0.50	Ultrasonic Wallswitch and Box	0.8	\$65	\$50	\$152	\$42	\$194	60%	3504	1,198	\$48	4.3	599
92719	Women's Washroom	FCF	F1x4 Cubelight	8,760	1,034	2-	Relamp with 28w 4' RSFI T8 ES lam	2	911	0.33	Ultrasonic Wallswitch and Box	0.5	\$43	\$33	\$101	\$28	\$129	60%	3504	547	\$22	6.2	273
92719	Women's Washroom	FTJ	F2x4 Rec	8,760	780	3-	Relamp with 28w 4' RSFI T8 ES lam	1	666	0.17	Ultrasonic Wallswitch and Box	0.3	\$22	\$17	\$51	\$14	\$65	60%	3504	399	\$16	4.3	200
Controls Summary for Building Old Main Building:				210,372					125,442				\$25,703	\$2,665	\$28,368			45,292	\$1,830	15.5	37,633		

*Quantities are weighted by the number of luminaires controlled by a controller.

**Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Building Name: Trades and Technology

Building Code: TAT

Room:	Room Type:	Existing Conditions			Retrofit Conditions			Controls Retrofit Data						Energy Savings				BCH Incentive Savings		
		Type Code: Description:	Ann. Hrs.:	Energy (kWh):	Description:	Qty:	Energy w/o Controls (kWh):	*Qty: Description:	Unit Labour (hrs):	Unit Matl (\$):	Add'l. Matls (\$):	Matl (\$):	Labour (\$):	**Total (\$):	% Hrs.	New Hours:	Controls Savings (kWh):		Controls Savings (\$):	Payback: (kWh):
120	Women's Washroom	CDH Downlight	7,644	1,330	0- Install Lighting Controls Device Only	3	1,330	0.18 Ultrasonic Wallswitch Replacement	0.0	\$16	\$18	\$44	\$2	\$47	30%	5351	399	\$16	3.3	399
120	Women's Washroom	FSF F4' striplight	7,644	6,314	2- Relamp with 28w 4' RSFI T8 ES lam	14	5,565	0.82 Ultrasonic Wallswitch Replacement	0.2	\$74	\$82	\$207	\$11	\$218	30%	5351	1,669	\$67	3.7	1,669
124	Men's Washroom	CDH Downlight	7,644	887	0- Install Lighting Controls Device Only	2	887	0.20 Ultrasonic Wallswitch Replacement	0.1	\$18	\$20	\$50	\$3	\$53	30%	5351	266	\$11	5.7	266
124	Men's Washroom	FSF F4' striplight	7,644	3,608	2- Relamp with 28w 4' RSFI T8 ES lam	8	3,180	0.80 Ultrasonic Wallswitch Replacement	0.2	\$72	\$80	\$201	\$11	\$212	30%	5351	954	\$39	6.3	954
1-Hallwa 1st Floor Hallway North		FCE F1x4 Cubelight	7,644	1,659	0- Install Lighting Controls Device Only	7	1,659	0.27 Reprogram Existing Automated Contr	0.1	\$0	\$32	\$43	\$7	\$50	30%	5351	498	\$20	3.6	498
1-Hallwa 1st Floor Hallway North		ISI Cylinder	7,644	89	0- Install Lighting Controls Device Only	1	89	0.04 Reprogram Existing Automated Contr	0.0	\$0	\$5	\$6	\$1	\$7	30%	5351	27	\$1	9.6	27
1-Hallwa 1st Floor Hallway North		FRS F8' HO striplight w/	7,644	4,281	2- 28w 4' RSFI T8 ES HE EL-HBF NE	4	2,263	0.15 Reprogram Existing Automated Contr	0.1	\$0	\$18	\$24	\$4	\$29	30%	5351	679	\$27	1.5	679
1-Hallwa 1st Floor Hallway North		FWF F1x4 Wrap	7,644	902	2- Relamp with 28w 4' RSFI T8 ES lam	2	795	0.08 Reprogram Existing Automated Contr	0.0	\$0	\$9	\$12	\$2	\$14	30%	5351	238	\$10	2.1	238
1-Hallwa 1st Floor Hallway North		ITG Track Head	7,644	1,376	0- Install Lighting Controls Device Only	12	1,376	0.46 Reprogram Existing Automated Contr	0.2	\$0	\$55	\$73	\$13	\$86	30%	5351	413	\$17	7.4	413
1-Hallwa 1st Floor Hallway South		CDH Downlight	7,644	2,660	0- Install Lighting Controls Device Only	6	2,660	1.00 Reprogram Existing Automated Contr	0.5	\$0	\$15	\$20	\$28	\$48	30%	5351	798	\$32	1.8	798
1-Hallwa 1st Floor Hallway South		ITI Track Head	7,644	115	0- Install Lighting Controls Device Only	1	115	0.04 Reprogram Existing Automated Contr	0.0	\$0	\$6	\$7	\$1	\$9	30%	5351	34	\$1	9.0	34
1-Hallwa 1st Floor Hallway South		FCE F1x4 Cubelight	7,644	1,185	0- Install Lighting Controls Device Only	5	1,185	0.22 Reprogram Existing Automated Contr	0.1	\$0	\$28	\$37	\$6	\$43	30%	5351	355	\$14	4.4	355
1-Hallwa 1st Floor Hallway South		FRS F8' HO striplight w/	7,644	4,281	2- 28w 4' RSFI T8 ES HE EL-HBF NE	4	2,263	0.17 Reprogram Existing Automated Contr	0.1	\$0	\$23	\$30	\$5	\$35	30%	5351	679	\$27	1.8	679
1-Hallwa 1st Floor Hallway South		FWF F1x4 Wrap	7,644	902	2- Relamp with 28w 4' RSFI T8 ES lam	2	795	0.09 Reprogram Existing Automated Contr	0.0	\$0	\$11	\$15	\$2	\$17	30%	5351	238	\$10	2.6	238
1-Hallwa 1st Floor Hallway South		ITI Track Head	7,644	1,261	0- Install Lighting Controls Device Only	11	1,261	0.48 Reprogram Existing Automated Contr	0.2	\$0	\$62	\$82	\$13	\$96	30%	5351	378	\$15	9.0	378
1-Locke Lockers		FLF F8' Tubelight / Line	7,644	6,849	4- Relamp with 28w 4' RSFI T8 ES lam	8	5,993	2.00 Dual Technology Motion Sensor - Ceil	2.0	\$225	\$200	\$860	\$111	\$971	30%	5351	1,798	\$73	13.2	1,798
1-Locke Lockers		FLF F8' Tubelight / Line	7,644	6,849	4- Relamp with 28w 4' RSFI T8 ES lam	8	5,993	2.00 Dual Technology Motion Sensor - Ceil	2.0	\$225	\$200	\$860	\$111	\$971	30%	5351	1,798	\$73	13.2	1,798
204/208 Heavy Duty Mechanic Sho		MHG High / Low Bay	3,520	38,016	6- 32w RSFI T8 HE EL-HBF 2L & 4L B	32	24,781	1.00 Daylight Sensor	2.0	\$600	\$300	1,190	\$111	\$1,302	30%	2464	7,434	\$300	4.4	7,434
212/220 Heavy Duty Mechanic		MHG High / Low Bay	3,520	22,176	6- 32w RSFI T8 HE EL-HBF 2L & 4L B	18	13,939	1.00 Daylight Sensor	2.0	\$600	\$300	1,190	\$111	\$1,302	30%	2464	4,182	\$169	7.8	4,182
255 Computer Lab		FLF F8' Tubelight / Line	2,860	1,281	4- Relamp with 28w 4' RSFI T8 ES lam	4	1,121	0.29 Dual Technology Motion Sensor - Ceil	0.3	\$64	\$29	\$123	\$16	\$139	30%	2002	336	\$14	10.1	336
255 Computer Lab		FLD F4' Tubelight / Line	2,860	169	2- Relamp with 28w 4' RSFI T8 ES lam	1	149	0.07 Dual Technology Motion Sensor - Ceil	0.1	\$16	\$7	\$31	\$4	\$35	30%	2002	45	\$2	19.0	45
255 Computer Lab		FLD F4' Tubelight / Line	2,860	1,012	2- Relamp with 28w 4' RSFI T8 ES lam	6	892	0.43 Dual Technology Motion Sensor - Ceil	0.4	\$96	\$43	\$184	\$24	\$208	30%	2002	268	\$11	19.0	268
255 Computer Lab		FLF F8' Tubelight / Line	2,860	961	4- Relamp with 28w 4' RSFI T8 ES lam	3	841	0.21 Dual Technology Motion Sensor - Ceil	0.2	\$48	\$21	\$92	\$12	\$104	30%	2002	252	\$10	10.1	252
265 Men's Washroom		FSF F4' striplight	7,644	3,157	2- Relamp with 28w 4' RSFI T8 ES lam	7	2,782	0.78 Ultrasonic Wallswitch Replacement	0.2	\$70	\$0	\$93	\$11	\$103	30%	5351	835	\$34	2.4	835
265 Men's Washroom		CDH Downlight	7,644	887	0- Install Lighting Controls Device Only	2	887	0.22 Ultrasonic Wallswitch Replacement	0.1	\$20	\$0	\$26	\$3	\$30	30%	5351	266	\$11	2.1	266
267 Women's Washroom		FSF F4' striplight	7,644	3,608	2- Relamp with 28w 4' RSFI T8 ES lam	8	3,180	0.80 Ultrasonic Wallswitch Replacement	0.2	\$72	\$80	\$201	\$11	\$212	30%	5351	954	\$39	6.3	954
267 Women's Washroom		CDH Downlight	7,644	887	0- Install Lighting Controls Device Only	2	887	0.20 Ultrasonic Wallswitch Replacement	0.1	\$18	\$20	\$50	\$3	\$53	30%	5351	266	\$11	5.7	266
2-Hallwa 2nd Floor Middle Corridor		FCE F1x4 Cubelight	7,644	474	0- Install Lighting Controls Device Only	2	474	0.50 Reprogram Existing Automated Contr	0.3	\$0	\$0	\$0	\$14	\$14	30%	5351	142	\$6	2.4	142
2-Hallwa 2nd Floor Middle Corridor		FRS F8' HO striplight w/	7,644	2,140	2- 28w 4' RSFI T8 ES HE EL-HBF NE	2	1,131	0.50 Reprogram Existing Automated Contr	0.3	\$0	\$0	\$0	\$14	\$14	30%	5351	339	\$14	1.0	339
2-Hallwa 2nd Floor Hallway South		FRS F8' HO striplight w/	7,644	6,421	2- 28w 4' RSFI T8 ES HE EL-HBF NE	6	3,394	0.50 Reprogram Existing Automated Contr	0.3	\$0	\$20	\$26	\$14	\$40	30%	5351	1,018	\$41	1.3	1,018
2-Hallwa 2nd Floor Hallway South		FCE F1x4 Cubelight	7,644	1,422	0- Install Lighting Controls Device Only	6	1,422	0.50 Reprogram Existing Automated Contr	0.3	\$0	\$20	\$26	\$14	\$40	30%	5351	427	\$17	3.1	427
2-Hallwa Skylights		MCB Cylinder	4,732	2,461	1- 42w triple CF	4	909	1.00 Reprogram Existing Automated Contr	0.5	\$0	\$40	\$53	\$28	\$81	30%	3312	273	\$11	9.8	273
2-Hallwa 2nd Floor Hallway Northwe		FCE F1x4 Cubelight	7,644	3,554	0- Install Lighting Controls Device Only	15	3,554	1.00 Reprogram Existing Automated Contr	0.5	\$0	\$60	\$79	\$28	\$107	30%	5351	1,066	\$43	3.4	1,066
2-Hallwa 2nd Floor Hallway South		FCE F1x4 Cubelight	7,644	1,422	0- Install Lighting Controls Device Only	6	1,422	0.60 Reprogram Existing Automated Contr	0.3	\$0	\$18	\$24	\$17	\$41	30%	5351	427	\$17	3.1	427
2-Hallwa 2nd Floor Hallway South		FRS F8' HO striplight w/	7,644	3,210	2- 28w 4' RSFI T8 ES HE EL-HBF NE	3	1,697	0.30 Reprogram Existing Automated Contr	0.2	\$0	\$9	\$12	\$8	\$20	30%	5351	509	\$21	1.3	509
2-Hallwa 2nd Floor Hallway South		FWF F1x4 Wrap	7,644	451	2- Relamp with 28w 4' RSFI T8 ES lam	1	397	0.10 Reprogram Existing Automated Contr	0.1	\$0	\$3	\$4	\$3	\$7	30%	5351	119	\$5	1.8	119
2-Hallwa Skylights		MCB Cylinder	4,732	2,461	1- 42w triple CF	4	909	1.00 Reprogram Existing Automated Contr	0.5	\$0	\$0	\$0	\$28	\$28	30%	3312	273	\$11	2.5	273
2-North 2nd Floor North Hallway		FCE F1x4 Cubelight	7,644	237	0- Install Lighting Controls Device Only	1	237	0.33 Reprogram Existing Automated Contr	0.2	\$0	\$0	\$0	\$9	\$9	30%	5351	71	\$3	3.2	71
2-North 2nd Floor North Hallway		FRS F8' HO striplight w/	7,644	2,140	2- 28w 4' RSFI T8 ES HE EL-HBF NE	2	1,131	0.67 Reprogram Existing Automated Contr	0.3	\$0	\$0	\$0	\$19	\$19	30%	5351	339	\$14	1.4	339
Ext-Out Outdoor Storage/Worksho		FID F1x4 Industrial	4,380	8,830	2- 32w RSFI T8 HE EL-IS	28	6,745	0.97 Interface w other controls to be install	1.4	\$0	\$5	\$6	\$81	\$87	30%	3066	2,024	\$82	1.1	2,024
Ext-Out Outdoor Storage/Worksho		FID F1x4 Industrial	4,380	258	0- No Action	1	258	0.03 Interface w other controls to be install	0.1	\$0	\$0	\$0	\$3	\$3	30%	3066	78	\$3	1.0	78
Ext-Out Outdoor Storage/Worksho		FID F1x4 Industrial	4,380	7,569	2- 32w RSFI T8 HE EL-IS	24	5,782	0.86 Interface w other controls to be install	1.3	\$0	\$429	\$567	\$72	\$638	30%	3066	1,734	\$70	13.3	1,734
Ext-Out Outdoor Storage/Worksho		FID F1x4 Industrial	4,380	1,261	2- 32w RSFI T8 HE EL-IS	4	964	0.14 Interface w other controls to be install	0.2	\$0	\$71	\$94	\$12	\$106	30%	3066	289	\$12	13.3	289

Controls Summary for Building Trades and Technology:		161,012		117,291						\$6,646	\$1,003	\$7,648				35,187	\$1,422	5.4	35,187
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*Quantities are weighted by the number of luminaires controlled by a controller.
 **Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.

Lighting Controls Retrofit Report by Building

Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



Controls Summary for Client Thompson Rivers University Kamloop 557,475

382,593

\$52,298 \$6,922 \$59,220

122,292

\$4,941 12.0 111,935

**Quantities are weighted by the number of luminaires controlled by a controller.*

***Controls Cost is for Unadjusted Materials and Labour and is included in the Extended Material and Extended Labour Costs.*

New Luminaire Schedule



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



New Luminaire Type: FB-C8

Luminaire Description: 2x4 box 4 lamp NBF

Room Numbers: 230



New Luminaire Type: FG-D4

Luminaire Description: 4' Gymnasium 6 lamp HBF

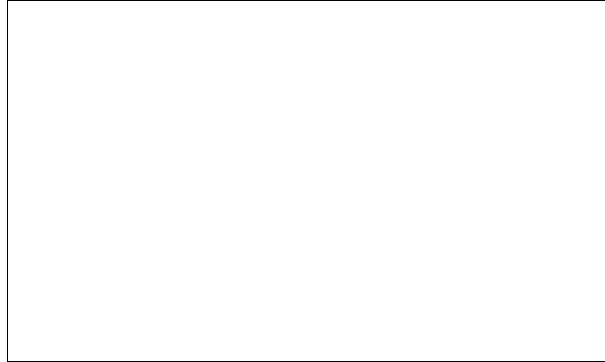
Room Numbers: 203, 203

New Luminaire Schedule



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



New Luminaire Type: FH-D1

Luminaire Description: 2'x4' Highbay 6 lamp HBF

Room Numbers: 204/208, 204/208, 212/220, 212/220, 230, 230, 272H, 242B, 246, 246, 274A, 1214, 272H, 276/278, 274, 274, 276/278, 1214, 1240



New Luminaire Type: FI-B3

Luminaire Description: 8' industrial 4 lamp HBF

Room Numbers: 1561, 1565, 1565

New Luminaire Schedule



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Photo Not Available

New Luminaire Type: FL-C4

Luminaire Description: 4' Indirect 2 lamp HBF

Room Numbers: 2-Hallway South, 2-Hallway Middle Corridor, 2-Hallway Northeast, 2-North Hallway, 1-Hallway South High Ceiling, 1-Hallway North

New Luminaire Schedule



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



New Luminaire Type: FT-F1

Luminaire Description: 2x4 T-bar K12 2 lamp NBF

Room Numbers: 1-East Hall, 1-East Hall, 1-West Hall, 1-West Hall, 2-East Hall, 2-East Hall, 2-West Hall, 2-West Hall, 3-West Hall, 3-West Hall

New Luminaire Type: FT-F11

Luminaire Description: 2x4 T-bar K12 4 lamp LBF

Room Numbers: 3-East Hallway, 3-East Hallway

New Luminaire Type: FT-F2

Luminaire Description: 2x4 T-bar K12 2 lamp LBF

Room Numbers: 173A, 1800, 1800, 2800, 1-A-East, 1-A-West, 1-A-West, 2-A-West, 2-A-East, 2-A-East, 92438, 91220, 91228, 91300, 91400, 91433, 91460, 91500, 153A, 2800, 1-A-East, 1-A-West, 2-A-East, 2-A-West, 91220, 91400, 91460, 91500, 92438, 3-Vest

New Luminaire Type: FT-F5

Luminaire Description: 2x4 T-bar K12 2 lamp LBF Shared

Room Numbers: 92403

New Luminaire Schedule



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098



New Luminaire Type: X3-3

Luminaire Description: Surface mounted Universal Thermoplastic Exit Light

Room Numbers: South Stairwell, STAIR4/5, ST3, ST2, 309

Locked Room Report



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: Animal Health Technology		
BLDG_Code:	Room Number:	Locked
AHT	108	<input checked="" type="checkbox"/>
AHT	109	<input checked="" type="checkbox"/>
AHT	110	<input checked="" type="checkbox"/>
AHT	116	<input checked="" type="checkbox"/>
AHT	127	<input checked="" type="checkbox"/>
Building Locked Rooms:		5

Building Name: Arts and Education		
BLDG_Code:	Room Number:	Locked
AAE	105/107	<input checked="" type="checkbox"/>
AAE	120	<input checked="" type="checkbox"/>
AAE	134	<input checked="" type="checkbox"/>
AAE	142A	<input checked="" type="checkbox"/>
AAE	285	<input checked="" type="checkbox"/>
AAE	287	<input checked="" type="checkbox"/>
AAE	9374/9352	<input checked="" type="checkbox"/>
Building Locked Rooms:		7

Building Name: Campus Activity Centre		
BLDG_Code:	Room Number:	Locked
CAC	122	<input checked="" type="checkbox"/>
CAC	144/143/140/150	<input checked="" type="checkbox"/>
CAC	153	<input checked="" type="checkbox"/>
CAC	154	<input checked="" type="checkbox"/>
CAC	158	<input checked="" type="checkbox"/>
CAC	310	<input checked="" type="checkbox"/>
CAC	310A	<input checked="" type="checkbox"/>
Building Locked Rooms:		7

Building Name: Clock Tower Building		
BLDG_Code:	Room Number:	Locked
CTB	144	<input checked="" type="checkbox"/>
CTB	203	<input checked="" type="checkbox"/>
Building Locked Rooms:		2

Building Name: Gymnasium		
BLDG_Code:	Room Number:	Locked
GYM	201	<input checked="" type="checkbox"/>
Building Locked Rooms:		1

Locked Room Report



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name: International Building		
BLDG_Code:	Room Number:	Locked
INB	130	<input checked="" type="checkbox"/>
Building Locked Rooms:		1

Building Name: Library		
BLDG_Code:	Room Number:	Locked
LIB	ST2	<input checked="" type="checkbox"/>
LIB	ST3	<input checked="" type="checkbox"/>
Building Locked Rooms:		2

Building Name: Old Main Building		
BLDG_Code:	Room Number:	Locked
OMB	1205	<input checked="" type="checkbox"/>
OMB	1411	<input checked="" type="checkbox"/>
OMB	1482	<input checked="" type="checkbox"/>
OMB	1487	<input checked="" type="checkbox"/>
OMB	1523	<input checked="" type="checkbox"/>
OMB	1532	<input checked="" type="checkbox"/>
OMB	1534	<input checked="" type="checkbox"/>
OMB	1536	<input checked="" type="checkbox"/>
OMB	1541	<input checked="" type="checkbox"/>
OMB	1741	<input checked="" type="checkbox"/>
OMB	1751	<input checked="" type="checkbox"/>
OMB	1752	<input checked="" type="checkbox"/>
OMB	1761	<input checked="" type="checkbox"/>
OMB	2782	<input checked="" type="checkbox"/>
OMB	2784	<input checked="" type="checkbox"/>
OMB	2791A	<input checked="" type="checkbox"/>
OMB	91453	<input checked="" type="checkbox"/>
OMB	91614A	<input checked="" type="checkbox"/>
Building Locked Rooms:		18

Building Name: Science Building		
BLDG_Code:	Room Number:	Locked
SCB	100	<input checked="" type="checkbox"/>
SCB	263	<input checked="" type="checkbox"/>
SCB	356	<input checked="" type="checkbox"/>
SCB	365G	<input checked="" type="checkbox"/>
Building Locked Rooms:		4

Locked Room Report



Client Name: Thompson Rivers University Kamloops

Project Number: 2010098

Building Name:	Trades and Technology	
BLDG_Code:	Room Number:	Locked
TAT	209	<input checked="" type="checkbox"/>
TAT	272D	<input checked="" type="checkbox"/>
Building Locked Rooms:		2
Total Locked Rooms:		49

APPENDIX F: ELECTRICAL ANALYSIS

1. Vending Machine Controls Savings
2. TV Appliance Timer Savings

VENDING MACHINE CONTROLS - Thompson Rivers University Detailed Energy Audit

Project Number: 2010098

Install Cost Per Vending Miser (Installed)	\$225.00
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Type	Qty	Watts per machine	Diversity Factor	kW total	hours pre	System on Factor	Pre kWh	savings (%)	hour post	Consumption		Demand		Est. Capital Cost	Est. Equip Life (YR)	Energy Pay-Back (YR)
										Estimated Savings kWh/yr	Estimated Savings \$/YR	Est. Savings kW	Est. Savings \$			
Cold Beverage	42	1020	0.95	40.70	8,760	0.40	150,111	30%	6,132	45,033	\$1,819	0	\$0	\$9,450	8	5.2

Vending Machine will be turned off at night (midnight to 6 am-minimum 25 % of the time)

TV Timer Controls - Thompson Rivers University Detailed Energy Audit

Project Number: 2010098

Install Cost Per Appliance Timer	\$40.00
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Type	Qty	Watts per TV	Diversity Factor	kW total	hours pre	System on Factor	Pre kWh	savings (%)	hour post	Consumption		Demand		Est. Capital Cost	Est. Equip Life (YR)	Energy Pay-Back (YR)
										Estimated Savings kWh/yr	Estimated Savings \$/YR	Est. Savings kW	Est. Savings \$			
TV	15	200	0.95	2.85	8,760	1.00	26,280	40%	5,250	10,530	\$425	0	\$0	\$600	8	1.4

Post Hours

On	7:00 AM
Off	10:00 PM
Hours/Day	15
Weeks	50
Annual Hours	5250

APPENDIX G: MECHANICAL ANALYSIS

1. Existing Equipment Inventory and Energy Estimates

Ventilation

for: Old Main Bldg

Total OA	40,114 CFM
Total Flow	194,645 CFM
Unit Area Flow	0.861101 CFM / ft2

Sub-Totals for Ventilation 2,820 GJ

Tag	Description	Qty	SA Flow CFM	OA %	Rcv'y %	Weekly Schedule	Hours / Year	SOF	TB Temp °C	HDD Period A/P	HDDs	Load GJ	AFUE %	Fuel GJ	OA CFM	Notes		
																A	B	C
AHU-1	A Block 1st floor	1	24,950	21%	70%	M.MAH1SY.ZONE	3,276	100%	16.0	P	1,211	94.2	85%	111	5,277	A-Block		
AHU-2	A Block 2nd floor	1	27,920	39%	70%	M.MAH2SY.ZONE	6,370	100%	16.0	P	2,152	347.3	85%	409	10,940			
AHU-2	C- Block Computer lab	1	25,000	30%	0%	B.AH2SY.ZONE	5,135	100%	16.0	P	1,882	694.0	85%	817	7,500			
ACU-1	C-Block Drawing room Ref. Com	1	1,600	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	24.6	85%	29	320			
ACU-2	C-Block ACU-2 Painting room	1	2,000	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	30.7	85%	36	400			
ACU-3	C-Block ACU-3 ceramics room	1	2,000	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	30.7	85%	36	400			
ACU-4	C-Block ACU-3 ceramics room	1	2,500	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	38.4	85%	45	500			
ACU-5	C-Block ACU-5 store/workrooms	1	1,600	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	24.6	85%	29	320			
ACU-6	C-Block Art Gallery	1	1,200	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	18.4	85%	22	240			
ACU-7	C-Block Darkrooms	1	800	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	12.3	85%	14	160			
ACU-8	C-Block video studio	1	250	20%	0%	B.ACSY.ZONE	4,420	100%	16.0	P	1,562	3.8	85%	5	50			
RTU-1	A-Block additions	1	2,170	20%	0%	OMA.RTU11.ZONE	5,788	100%	16.0	P	2,016	43.0	85%	51	434			
RTU-2	A-Block additions	1	1,225	20%	0%	OMA.RTU12.ZONE	5,788	100%	16.0	P	2,016	24.3	85%	29	245			
RTU-3	A-Block additions	1	1,810	20%	0%	OMA.RTU13.ZONE	5,788	100%	16.0	P	2,016	35.9	85%	42	362			
RTU-4	A-Block additions	1	1,220	20%	0%	OMA.RTU14.ZONE	5,788	100%	16.0	P	2,016	24.2	85%	28	244			
MUA-1	C-Block visual arts paint booth M	1	6,408	20%	0%	- 24/7 -	8,760	20%	16.0	A	3,253	41.0	85%	48	1,282			
RTU-1	C-Block additions	1	3,400	20%	0%	OMB.RTU15.ZONE	2,856	100%	16.0	P	966	32.3	85%	38	680			
RTU-1	C-block theatre	1	9,000	20%	0%	B.OMT.RTU1.ZONE	5,824	100%	16.0	P	1,983	175.5	85%	206	1,800			
RTU-2	C-block theatre	1	1,575	13%	0%	B.OMT.RTU2.ZONE	5,824	100%	16.0	P	1,983	19.5	85%	23	200			
RTU-3	C-block theatre	1	3,100	13%	0%	B.OMT.RTU3.ZONE	5,824	100%	16.0	P	1,983	39.0	85%	46	400			
AHU-7	A Block third floor	1	3,700	30%	0%	AHU-7	3,120	100%	16.0	P	1,087	59.4	85%	70	1,110			
AHU-3	B Block South	1	25,000	5%	0%	B.BAH3SY.ZONE	6,249	100%	16.0	P	1,537	94.4	85%	111	1,250			
AHU-4	B Block North	1	30,000	20%	0%	B.AH4SY.ZONE	6,552	100%	16.0	P	1,660	489.7	85%	576	6,000			

Fans

for: Old Main Bldg

Sub-Totals for Fans **1,038,801** kWh **kW (Summer / Winter Peak)**

Tag	Description	Qty	Motor									Unit kW	Total kW	WS	SOF	Hours / Year	Flow Profile	Mean %		Total kWh	
			HP	LF	Type	Volts	φ	Amps	FLA	Effy	PF							Flow	Power		
AHU-1	A Block 1st floor	1	30			460	3	35.7	31.7		87%	24.7	24.7	M.MAH1SY_ZONE	100%	3,276	Constant Flow	100%	100%	80,870	
AHU-2	A Block 2nd floor	1	40			460	3	46.0	41.7		87%	31.9	31.9	M.MAH2SY_ZONE	100%	6,370	Constant Flow	100%	100%	202,943	
F-1	Return fan for AHU-1 and AHU-2	1	30			460	3	29.7	33.0		84%	19.9	19.9	M.MAH2SY_ZONE	100%	6,370	Constant Flow	100%	100%	127,004	
F-2	OA w/Heat recovered - AHU-1	1	5			208	3	9.4	9.4		81%	2.7	2.7	M.MAH1SY_ZONE	100%	3,276	Constant Flow	100%	100%	9,004	
F-3	OA w/Heat recovered - AHU-2	1	10	0.80		208	3	22.3			80%	6.4	6.4	M.MAH2SY_ZONE	100%	6,370	Constant Flow	100%	100%	40,806	
F-4	Gral Exhaust A- block South	1	2			208	3	5.2	6.5		73%	1.4	1.4	M.MAH2SY_ZONE	100%	6,370	Constant Flow	100%	100%	8,600	
F-5	Gral Exhaust A- block North	1	2			208	3	3.3	6.0		62%	0.7	0.7	M.MAH2SY_ZONE	100%	6,370	Constant Flow	100%	100%	4,738	
EF-1	Block A Return Air Transfer Fan	1	0.25			120	1	5.0	4.8		66%	0.4	0.4	M.MAH2SY_ZONE	100%	6,370	Constant Flow	100%	100%	2,513	
EF-2	Block A Return Air Transfer Fan	1	0.25			120	1	4.8	4.8		65%	0.4	0.4	M.MAH2SY_ZONE	100%	6,370	Constant Flow	100%	100%	2,376	
AHU-3	B Block	1	25	0.80		480	3				92%	82%	16.2	16.2	B.BAH3SY_ZONE	100%	6,249	AHU-3	85%	71%	71,459
AHU-4	B Block	1	30	0.80		480	3				92%	83%	19.5	19.5	B.AH4SY_ZONE	100%	6,552	AHU-4	80%	62%	79,582
AHU-7	A-block 3rd floor	1	3	0.80		208	3		9.3		75%	2.0	2.0	AHU-7	100%	3,120	Constant Flow	100%	100%	6,249	
AHU-2 SF	C-Block Computer room supply fan	1	40	0.80		460	3		52.9		83%	28.1	28.1	B.AH2SY_ZONE	100%	5,135	Constant Flow	100%	100%	144,357	
AHU-2 RF	C-Block Computer room return fan	1	7.5	0.80		460	3		10.8		79%	5.4	5.4	B.AH2SY_ZONE	100%	5,135	Constant Flow	100%	100%	27,783	
AHU-2 CF	C-Block Computer room condenser fan	6	1	0.80		208	3		1.8		69%	0.4	2.1	B.AH2SY_ZONE	100%	5,135	Constant Flow	100%	100%	10,981	
ACU-1 SF	C-Block ACU-1 drawing room supply fan	1	0.75	0.80		460	1		2.1		67%	0.5	0.5	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	2,283	
ACU-1 CF	C-Block ACU-1 drawing room condenser fan	1	0.5	0.80		460	1		1.7		64%	0.4	0.4	B.ACSY_ZONE	25%	1,105	Constant Flow	100%	100%	443	
ACU-2 SF	C-Block ACU-2 Painting room supply fan	1	0.75	0.80		460	1		2.1		67%	0.5	0.5	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	2,283	
ACU-2 CF	C-Block ACU-2 Painting room condenser fan	1	0.5	0.80		208	3		1.7		64%	0.3	0.3	B.ACSY_ZONE	25%	1,105	Constant Flow	100%	100%	347	
ACU-3 SF	C-Block ACU-3 ceramics room supply fan	1	0.75	0.80		460	1		2.1		67%	0.5	0.5	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	2,283	
ACU-3 CF	C-Block ACU-3 ceramics room supply fan	1	0.5	0.80		460	1		1.7		64%	0.4	0.4	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	1,771	
ACU-4 SF	C-Block ACU-4 print shop supply fan	1	1	0.80		460	3		3.2		69%	1.4	1.4	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	6,194	
ACU-4 CF	C-Block ACU-4 print shop condenser fan	1	0.5	0.80		460	1		2.4		64%	0.6	0.6	B.ACSY_ZONE	25%	1,105	Constant Flow	100%	100%	625	
ACU-5 SF	C-Block ACU-5 store/workrooms supply fan	1	0.33	0.80		460	1		1.1		61%	0.2	0.2	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	1,091	
ACU-5 CF	C-Block ACU-5 store/workrooms condenser fan	1	0.5	0.80		460	1		1.7		64%	0.4	0.4	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	1,771	
ACU-6 SF	C-Block Art Gallery supply fan	1	0.75	0.80		460	1		2.1		67%	0.5	0.5	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	2,283	
ACU-6 CF	C-Block Art Gallery condenser fan	1	0.5	0.80		460	1		1.7		64%	0.4	0.4	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	1,771	
ACU-7 SF	C-Block Darkrooms supply fan	1	1	0.80		460	1		1.1		69%	0.3	0.3	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	1,229	
ACU-7 CF	C-Block Darkrooms condenser fan	1	0.5	0.80		460	1		1.7		64%	0.4	0.4	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	1,771	
ACU-8 SF	C-Block video studio supply fan	1	0.25	0.80		208	1		1.6		59%	0.2	0.2	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	690	
ACU-8 CF	C-Block video studio condenser fan	1	0.2	0.80		208	1		1.6		50%	0.1	0.1	B.ACSY_ZONE	100%	4,420	Constant Flow	100%	100%	588	
EF-1	C-Block EF sculptures welding	1	0.5	0.80		208	3			70%	64%	0.4	0.4	- 24/7 -	25%	2,190	Constant Flow	100%	100%	934	
EF-3	C-Block EF sculptures	1	0.5	0.80		208	3			70%	64%	0.4	0.4	- 24/7 -	25%	2,190	Constant Flow	100%	100%	934	
EF-4	C-Block EF mural toning	1	1.5	0.80		208	3			77%	71%	1.2	1.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	2,546	
EF-5	C-Block EF offices	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-6	C-Block EF darkroom	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	100%	8,760	Constant Flow	100%	100%	2,011	
EF-8	C-Block EF klin hood	1	0.75	0.80		208	3			77%	67%	0.6	0.6	- 24/7 -	25%	2,190	Constant Flow	100%	100%	1,273	
EF-9	C-Block EF glazing spray booth	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-10	C-Block EF glazing spray booth	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-11	C-Block EF glazing spray bench	1	0.75	0.80		208	3			77%	67%	0.6	0.6	- 24/7 -	25%	2,190	Constant Flow	100%	100%	1,273	
EF-12	C-Block Efelectrical room	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-13	C-Block EF painting studio	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-14	C-Block EF womens WR	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-15	C-Block EF Electrical room	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-16	C-Block EF washroom	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	100%	8,760	Constant Flow	100%	100%	2,011	
EF-17	C-Block EF ATG storage	1	0.5	0.80		208	3			70%	64%	0.4	0.4	- 24/7 -	100%	8,760	Constant Flow	100%	100%	3,734	
EF-18	C-Block EF ATG shop	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-19	C-Block EF print shop dark room	1	0.25	0.80		115	1			65%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	503	
EF-20	C-Block EF control	1	0.15	0.80		115	1			60%	50%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	336	
EF-21	C-Block EF control	1	0.15	0.80		115	1			60%	50%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	336	
EF-22	C-Block EF litho arm	1	1	0.80		208	3			77%	69%	0.8	0.8	- 24/7 -	25%	2,190	Constant Flow	100%	100%	1,697	
EF-23	C-Block EF spray booth	1	0.25	0.80		115	1			60%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	545	
EF-24	C-Block EF fume hood	1	1	0.80		208	3			77%	69%	0.8	0.8	- 24/7 -	25%	2,190	Constant Flow	100%	100%	1,697	
EF-25	C-Block EF pressure washer	1	0.25	0.80		115	1			60%	59%	0.2	0.2	- 24/7 -	100%	8,760	Constant Flow	100%	100%	2,178	
EF-26	C-Block EF litho ink slabs	1	0.75	0.80		208	3			77%	67%	0.6	0.6	- 24/7 -	25%	2,190	Constant Flow	100%	100%	1,273	
EF-27	C-Block EF emulsion	1	0.25	0.80		115	1			60%	59%	0.2	0.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	545	
EF-28	C-Block EF ceramics WR	1	0.03	0.80		115	1			50%	50%	0.0	0.0	- 24/7 -	25%	2,190	Constant Flow	100%	100%	87	
EF-29	C-Block EF store	1	0.25	0.80		115	1			60%	59%	0.2	0.2	- 24/7 -	100%	8,760	Constant Flow	100%	100%	2,178	
EF-30	C-Block EF dark room #3	1	1.5	0.80		115	1			77%	71%	1.2	1.2	- 24/7 -	25%	2,190	Constant Flow	100%	100%	2,546	

Fans
for: Science Bldg

Sub-Totals for Fans **269,253 kWh** kW (Summer / Winter Peak)

Tag	Description	Qty	Motor								Unit kW	Total kW	WS	SOF	Hours / Year	Flow Profile	Mean %		Total kWh
			HP	LF	Type	Volts	φ	Amps	FLA	Effy							PF	Flow	
SF-101	East wing MAU	1	5			480	3	3.2	4.9	73%	1.9	1.9	SC.SSF1SY_ZONE	100%	4,294	Constant Flow	100%	100%	8,372
SF-102	West wing MAU	1	5			480	3	4.7	7.2	72%	2.8	2.8	SC.SSF2SY_ZONE	100%	4,030	Constant Flow	100%	100%	11,267
SF-103	West wing MAU	1	10			480	3	15.5	14.4	84%	10.9	10.9	SC.SSF1SY_ZONE	100%	4,294	Constant Flow	100%	100%	46,646
HP-1	Rooms 008-012	1	0.33	0.80		265	1		3	65%	0.4	0.4	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	1,749
HP-2	Rooms 005-007	1	0.13	0.80		265	1		1	50%	0.1	0.1	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	292
HP-3	Rooms 001-004	1	0.33	0.80		265	1		3	65%	0.4	0.4	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	1,749
HP-4	Rooms 120, 013 & 104	1	0.33	0.80		460	3		2	65%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,980
HP-5	Rooms 105-108	1	0.33	0.80		265	1		3	65%	0.4	0.4	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	1,749
HP-6	Rooms 110, 111, 102, 137	1	0.13	0.80		265	1		1	50%	0.1	0.1	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	292
HP-7	Rooms 119-123	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	3,021
HP-8	Room 134	1	0.33	0.80		460	3		2	65%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,980
HP-9	Room 135	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-10	Rooms 128-131 & 136	1	0.33	0.80		460	3		2	65%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,980
HP-11	Rooms 124-127	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	3,021
HP-12	Rooms 203-208	1	0.33	0.80		265	1		3	65%	0.4	0.4	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	1,749
HP-13	Rooms 209-214	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	3,021
HP-14	Rooms 222, 222, 202 & 229-231	1	0.33	0.80		460	3		2	65%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,980
HP-15	Rooms 225-227	1	0.33	0.80		265	1		3	65%	0.4	0.4	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	1,749
HP-16	Room 228	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-17	Rooms 232 & 233	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-18	Rooms 154 & 156	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,832
HP-19	Rooms 152 & 153	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	3,021
HP-20	Rooms 150 & 151	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,832
HP-21	Room 171	1	0.33	0.80		265	1		3	65%	0.4	0.4	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	1,749
HP-22	Room 170	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-23	Room 169	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-24	Room 168	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	3,021
HP-25	Rooms 255, 274 & 257	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-26	Rooms 252 -254 & 267	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	3,021
HP-27	Rooms 250-251	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,832
HP-28	Rooms 273 & 267	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-29	Room 271	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-30	Room 269	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
HP-31	Room S002	1	0.5	0.80		460	3		2	70%	0.7	0.7	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	2,832
HP-32	Room S001	1	0.75	0.80		460	3		2	75%	1.0	1.0	SC.SAH1SY_ZONE	105%	4,232	Constant Flow	100%	100%	4,046
MAU-1	Second floor VAV system	1	7.5			460	3	8.1	10.0	79%	5.1	5.1	- 24/7 -	67%	5,854	Constant Flow	100%	100%	29,633
EF-1	Museum 372A	1	0.25			115	1	4.7	5.0	63%	0.3	0.3	- 24/7 -	100%	8,760	Constant Flow	100%	100%	2,991
EF-2	Rooms 360B, 362A & 362B	1	0.33			115	1	6.4	7.2	64%	0.5	0.5	- 24/7 -	15%	1,280	Constant Flow	100%	100%	602
EF-3	Laminator hood & compressor EF	1	0.25			115	1	4.8	5.0	64%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	450
EF-4	Biology AT room 360	1	0.33			115	1	6.4	7.2	64%	0.5	0.5	- 24/7 -	15%	1,280	Constant Flow	100%	100%	602
EF-5A	Rooms 372 & 372A	1	0.25			115	1	3.4	5.0	53%	0.2	0.2	- 24/7 -	15%	1,280	Constant Flow	100%	100%	267
EF-6	Physiology Rm 370	1	0.25			115	1	4.8	5.0	64%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	450
EF-2	Respiratory prep (east wing)	1	0.25			120	1	4.4	5.0	61%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	415
EF-3	West wing washrooms	1	0.75			208	3	2.2	2.2	72%	0.6	0.6	- 24/7 -	15%	1,280	Constant Flow	100%	100%	733
EF-4	Zoology lab	1	0.25			120	1	5.7	6.2	63%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	548
EF-5	Project area	1	0.2			120	1	3.4	3.6	50%	0.2	0.2	- 24/7 -	15%	1,280	Constant Flow	100%	100%	261
FE-1	Chem lab 274	1	0.5			208	3	1.4		70%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	441
FE-2	Biology lab 378	1	0.5			208	3	1.8		70%	0.4	0.4	- 24/7 -	100%	8,760	Constant Flow	100%	100%	3,903
FE-3	Biology prep	1	0.5			208	3	1.5		70%	0.4	0.4	- 24/7 -	100%	8,760	Constant Flow	100%	100%	3,314
FE-4	classroom + lab room 370	1	0.5			208	3	1.5		70%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	473
FE-5	Lab room 370A	1	0.5			208	3	1.6		70%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	506
FE-6	classroom + lab room 371	1	0.5			208	3	1.4		70%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	436

Fans

for: Science Bldg

Sub-Totals for Fans

269,253 kWh

kW (Summer / Winter Peak)

Tag	Description	Qty	Motor								Unit kW	Total kW	WS	SOF	Hours / Year	Flow Profile	Mean %		Total kWh	
			HP	LF	Type	Volts	φ	Amps	FLA	Eff'y							PF	Flow		Power
FE-7	Chem lab Rm 273	1	0.5			208	3	1.5			70%	0.4	0.4	- 24/7 -	100%	8,760	Constant Flow	100%	100%	3,270
FE-8	Chem lab Rm 273	1	0.5			208	3	2.3			70%	0.6	0.6	- 24/7 -	15%	1,280	Constant Flow	100%	100%	732
FE-9	Chem lab Rm 273	1	0.5			208	3	1.9			70%	0.5	0.5	- 24/7 -	100%	8,760	Constant Flow	100%	100%	4,124
FE-10	Chem lab Rm 571	1	0.5			208	3	1.7			70%	0.4	0.4	- 24/7 -	100%	8,760	Constant Flow	100%	100%	3,756
UF-1	Physics lab Rm 269	1	0.25			120	1	4.4	5.0		61%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	415
UF-2	Physics lab Rm 269	1	0.25			120	1	4.7	5.0		63%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	456
UF-3	Physics lab Rm 269	1	0.25			120	1	4.3	5.0		61%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	401
UF-4	Physics lab Rm 269	1	0.25			120	1	5.1	5.0		65%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	511
UF-5	Classroom + lab rm 367	1	0.25			120	1	3.9	5.0		58%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	347
UF-6	Entomology lab rm 362	1	0.5			120	1	7.1	9.2		63%	0.5	0.5	- 24/7 -	100%	8,760	Constant Flow	100%	100%	4,703
UF-7	Storage rm 362B	1	0.5			120	1	7.2	9.2		63%	0.5	0.5	- 24/7 -	15%	1,280	Constant Flow	100%	100%	701
UF-8	Biology lab rm 360	1	0.5			120	1	7.1	9.2		63%	0.5	0.5	- 24/7 -	100%	8,760	Constant Flow	100%	100%	4,703
UF-9	Classroom + lab rm 367	1	0.25			120	1	4.3	5.0		61%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	401
UF-10	Prep room 267	1	0.5			120	1	5.6	7.2		63%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	544
UF-11	Lab room 365 D	1	0.25			120	1	4.7	5.0		63%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	456
UF-12	Lab room 365F	1	0.25			120	1	4.5	5.0		62%	0.3	0.3	- 24/7 -	100%	8,760	Constant Flow	100%	100%	2,934
UF-13	Classroom + lab rm 261	1	0.25			120	1	4.5	5.0		62%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	429
UF-14	Classroom + lab rm 261	1	0.25			120	1	4.8	5.0		64%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	470
UF-15	Classroom + lab rm 261	1	0.25			120	1	4.3	5.0		61%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	401
UF-16	Chemical lab	1	0.25			120	1	4.4	5.0		61%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	415
UF-17	Classroom + lab rm 261	1	0.25			120	1	4.5	5.0		62%	0.3	0.3	- 24/7 -	15%	1,280	Constant Flow	100%	100%	429
UF-18	Classroom + lab rm 261	1	0.25			120	1	4.6			65%	0.4	0.4	- 24/7 -	15%	1,280	Constant Flow	100%	100%	459
UF-19	Chemical teaching lab rm 237	1	0.5			120	1	8.0	9.0		67%	0.6	0.6	- 24/7 -	15%	1,280	Constant Flow	100%	100%	822
UF-20	Chemical teaching lab rm 237	1	0.5			120	1	7.7	9.0		66%	0.6	0.6	- 24/7 -	15%	1,280	Constant Flow	100%	100%	779
UF-21	Chemical teaching lab rm 237	1	0.5			120	1	7.7	9.0		66%	0.6	0.6	- 24/7 -	15%	1,280	Constant Flow	100%	100%	779
UF-22	Chemical teaching lab rm 237	1	0.5			210	1	7.2	9.0		64%	1.0	1.0	- 24/7 -	15%	1,280	Constant Flow	100%	100%	1,239
B-101-B	Boiler B-101 blower	1	0.75	0.80		120	1		9.8		67%	0.6	0.6	- 24/7 -	5%	438	Constant Flow	100%	100%	275
MAU-1 CF	MAU-1 condenser fans	2		0.80		460	3		2.5		50%	0.8	1.6	- 24/7 -	15%	1,314	Constant Flow	100%	100%	2,094
CT-MM	Cooling tower main motors	2	15	0.80		460	3			90%	81%	9.9	19.9	- 24/7 -	10%	876	Constant Flow	100%	100%	17,426
CT-PM	Cooling tower main motors	2	5	0.80		460	3			82%	77%	3.6	7.3	- 24/7 -	15%	1,314	Constant Flow	100%	100%	9,563
																-				-
																-				-

Cooling

for Science Bldg

Sub-Totals for Cooling **105,573** kWh kW (**Summer** / **Winter Peak**)

Tag	Description	Qty	Compressor				Rated			Unit	Total	Weekly Schedule	SOF	Hours / Year	Chiller Profile	Mean % Power	Total kWh
			Volts	φ	RLA	PF	Tons	kW	kW/ton								
HP-1	Rooms 008-012	1	265	1	8	0.8				1.70	1.7	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	1,230
HP-2	Rooms 005-007	1	265	1	5.2	0.78				1.07	1.1	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	780
HP-3	Rooms 001-004	1	265	1	7.1	0.8				1.51	1.5	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	1,092
HP-4	Rooms 120, 013 & 104	1	460	3	4.5	0.8				2.87	2.9	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,081
HP-5	Rooms 105-108	1	265	1	8	0.8				1.70	1.7	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	1,230
HP-6	Rooms 110, 111, 102, 137	1	265	1	5.2	0.78				1.07	1.1	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	780
HP-7	Rooms 119-123	1	460	3	5.1	0.82				3.33	3.3	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,417
HP-8	Room 134	1	460	3	4.5	0.8				2.87	2.9	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,081
HP-9	Room 135	1	460	3	9	0.84				6.02	6.0	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	4,369
HP-10	Rooms 128-131 & 136	1	460	3	4.5	0.8				2.87	2.9	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,081
HP-11	Rooms 124-127	1	460	3	5.1	0.82				3.33	3.3	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,417
HP-12	Rooms 203-208	1	265	1	8	0.8				1.70	1.7	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	1,230
HP-13	Rooms 209-214	1	460	3	5.1	0.82				3.33	3.3	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,417
HP-14	Rooms 222, 222, 202 & 229-231	1	460	3	4.5	0.8				2.87	2.9	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,081
HP-15	Rooms 225-227	1	265	1	8	0.8				1.70	1.7	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	1,230
HP-16	Room 228	1	460	3	9	0.84				6.02	6.0	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	4,369
HP-17	Rooms 232 & 233	1	460	3	9	0.84				6.02	6.0	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	4,369
HP-18	Rooms 154 & 156	1	460	3	7.1	0.82				4.64	4.6	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	3,365
HP-19	Rooms 152 & 153	1	460	3	5.1	0.82				3.33	3.3	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,417
HP-20	Rooms 150 & 151	1	460	3	7.1	0.82				4.64	4.6	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	3,365
HP-21	Room 171	1	265	1	7.1	0.8				1.51	1.5	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	1,092
HP-22	Room 170	1	460	3	7.1	0.84				4.75	4.8	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	3,447
HP-23	Room 169	1	460	3	7.1	0.84				4.75	4.8	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	3,447
HP-24	Room 168	1	460	3	5.1	0.82				3.33	3.3	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,417
HP-25	Rooms 255, 274 & 257	1	460	3	7.1	0.84				4.75	4.8	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	3,447
HP-26	Rooms 252 -254 & 267	1	460	3	5.1	0.82				3.33	3.3	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	2,417
HP-27	Rooms 250-251	1	460	3	7.1	0.82				4.64	4.6	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	3,365
HP-28	Rooms 273 & 267	1	460	3	9	0.84				6.02	6.0	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	4,369
HP-29	Room 271	1	460	3	9	0.84				6.02	6.0	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	4,369
HP-30	Room 269	1	460	3	9	0.84				6.02	6.0	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	4,369
HP-31	Room S002	1	460	3	7.1	0.82				4.64	4.6	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	3,365
HP-32	Room S001	1	460	3	9	0.84				6.02	6.0	SC.SAH1SY.ZONE	18%	725	Constant Load	100%	4,369
MAU-RC	Make up air unti Ref compressors	4	460	3	8.4	0.84				5.62	22.5	- 24/7 -	10%	876	Constant Load	100%	19,699

Fans

for: TTC

Sub-Totals for Fans

341,035 kWh

kW (Summer / Winter Peak)

Tag	Description	Qty	Motor									Unit kW	Total kW	WS	SOF	Hours / Year	Flow Profile	Mean %		Total kWh
			HP	LF	Type	Volts	φ	Amps	FLA	Effy	PF							Flow	Power	
AHU-1 SF	Level 1 South supply fan	1	25			575	3	21.6	24.5		84%	18.0	18.0	V.AHU1SYS.ZONE	100%	4,030	AHU-1	75%	55%	40,153
AHU-1 GBF	Level 1 South gas burner fan	1		0.80		120	1		5.6		70%	0.4	0.4	V.AHU1SYS.ZONE	15%	605	Constant Flow	100%	100%	227
AHU-2 SF	Level 2 South SF supply fan	1	40			575	3	26.0	37.0		81%	21.1	21.1	V.AHU2SYS.ZONE	100%	4,030	AHU-2	85%	71%	59,893
AHU-2 SF	Level 2 South gas burner fan	1		0.80		120	1		8.0		70%	0.5	0.5	V.AHU2SYS.ZONE	15%	605	Constant Flow	100%	100%	325
AHU-3 SF	Levels 1 and 2 East supply fan	1	20			575	3	12.8	19.3		78%	10.0	10.0	V.AHU3SYS.ZONE	100%	4,030	AHU-3	75%	55%	22,243
AHU-3 SF	Levels 1 and 2 East gas burner fan	1		0.80		120	1		5.6		70%	0.4	0.4	V.AHU3SYS.ZONE	15%	605	Constant Flow	100%	100%	227
MUA-1	Welding shop make up	1	15			575	3	9.2	14.5		76%	7.0	7.0	- 24/7 -	25%	2,190	Constant Flow	100%	100%	15,305
FC-1	Computer Science	1	3			575	3	2.0	3.0		70%	1.4	1.4	VFC1.ZONE	100%	5,460	Constant Flow	100%	100%	7,634
SF-4	Supply fan mechanical room	1	0.5			115	1	8.1	9.4		66%	0.6	0.6	- 24/7 -	15%	1,314	Constant Flow	100%	100%	809
TF1,2&18	Transfer fans	3	0.11	0.80		115	1		1.0		50%	0.0	0.1	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	556
TF3&6	Transfer fans	2	0.5	0.70		115	1		3.6		60%	0.2	0.3	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	1,402
TF-12&12	Transfer fans	2	0.5	0.70		115	1			70%	60%	0.4	0.7	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	3,006
TF-9,10,13&14	Transfer fans	4	1	0.70		208	3			77%	65%	0.7	2.7	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	10,932
TF15,16&17	Transfer fans	3	0.5	0.80		115	1			70%	64%	0.4	1.3	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	5,154
TF-19	Transfer fans	1	0.5	0.80		115	1		3.6		64%	0.2	0.2	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	854
TF-4,5	Transfer fans	2	0.5	0.80		115	1			70%	64%	0.4	0.9	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	3,436
TF-7&8	Transfer fans	2	1	0.80		575	3			44%	69%	1.4	2.7	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	10,932
EF-13 to 15	shops gral EF	3	1	0.80		600	3	0.7			69%	0.5	1.5	V.AHU2SYS.ZONE	100%	4,030	Constant Flow	100%	100%	6,145
EF-16,25,27to	Gral EF shops	7	1	0.80		600	3	0.7			69%	0.5	3.6	- 24/7 -	30%	2,628	Constant Flow	100%	100%	9,433
EF-23	EF welding shop	1	1.5	0.80		600	3	0.9			71%	0.6	0.6	- 24/7 -	30%	2,628	Constant Flow	100%	100%	1,676
EF-32	EF Computer room	1	0.33	0.80		115	1			65%	61%	0.3	0.3	- 24/7 -	30%	2,628	Constant Flow	100%	100%	796
EF-17	EF welding shop	1	0.75	0.80		600	3			77%	67%	0.6	0.6	- 24/7 -	30%	2,628	Constant Flow	100%	100%	1,528
EF-1	Washrooms EF	1	0.75			600	3	1.1	1.2		70%	0.8	0.8	V.AHU1SYS.ZONE	100%	4,030	Constant Flow	100%	100%	3,238
EF-2	Washroom 288C EF	1	0.08	0.80		115	1			50%	50%	0.1	0.1	V.AHU1SYS.ZONE	100%	4,030	Constant Flow	100%	100%	399
EF-3	Washroom EF	1	0.25			115	1	6.2	5.8		66%	0.5	0.5	V.AHU1SYS.ZONE	100%	4,030	Constant Flow	100%	100%	1,906
EF-4,5&6	Stairwell EF	3	0.25	0.80		115	1		6.2		59%	0.3	1.0	- 24/7 -	30%	2,628	Constant Flow	100%	100%	2,637
EF-26	Elevator machine room	1	0.5	0.80		115	1		3.6		64%	0.2	0.2	- 24/7 -	15%	1,314	Constant Flow	100%	100%	279
EF-7	Comm Veh shop EF	1	5	0.80		575	3	3.8			77%	2.9	2.9	- 24/7 -	30%	2,628	Constant Flow	100%	100%	7,705
EF-8	Automotive shop EF	1	5	0.80		575	3	2.8			77%	2.1	2.1	- 24/7 -	30%	2,628	Constant Flow	100%	100%	5,579
EF-9	Automotive shop EF	1	2	0.80		575	3	1.9			73%	1.4	1.4	- 24/7 -	30%	2,628	Constant Flow	100%	100%	3,565
EF-10	Marine engine shop EF	1	2	0.80		575	3	1.3			73%	0.9	0.9	- 24/7 -	30%	2,628	Constant Flow	100%	100%	2,430
EF-11	Commercial transpot shop EF	1	2	0.80		575	3	1.5			73%	1.1	1.1	- 24/7 -	30%	2,628	Constant Flow	100%	100%	2,913
EF-12	Heavy duty Meccs shop EF	1	1.5	0.80		575	3	1.2			71%	0.9	0.9	- 24/7 -	30%	2,628	Constant Flow	100%	100%	2,312
EF-17,18	Welding booth exhaust	2	5	0.80		575	3	3.0			77%	2.3	4.6	- 24/7 -	30%	2,628	Constant Flow	100%	100%	12,122
EF-19 to 22	Welding booth exhaust	4	3	0.80		575	3	0.6			75%	0.5	1.9	- 24/7 -	35%	3,066	Constant Flow	100%	100%	5,829
EF-24	Welding booth exhaust	1	2	0.80		575	3	1.6			73%	1.2	1.2	- 24/7 -	100%	8,760	Constant Flow	100%	100%	10,157
EF-33	Welding booth exhaust	1	5	0.80		575	3	3.6			77%	2.7	2.7	- 24/7 -	35%	3,066	Constant Flow	100%	100%	8,400
UH-1, 2A	Hot water unit heaters Boiler/Mech	2	0.25	0.80		120	1			65%	59%	0.2	0.5	- 24/7 -	20%	1,752	Constant Flow	100%	100%	804
UH-2B	Hot water unit heater Mech room	1	0.17	0.80		120	1			60%	50%	0.2	0.2	- 24/7 -	20%	1,752	Constant Flow	100%	100%	290
UH-3 to 9	Gas fired unit heaters	7	0.33	0.80		120	1			68%	61%	0.3	2.0	- 24/7 -	20%	1,752	Constant Flow	100%	100%	3,588
FF-1,4	Forced flow heaters	2	0.09	0.80		120	1			50%	50%	0.1	0.2	- 24/7 -	20%	1,752	Constant Flow	100%	100%	376
FF-2	Forced flow heaters	1	0.13	0.80		120	1			50%	50%	0.2	0.2	- 24/7 -	20%	1,752	Constant Flow	100%	100%	275
FF-3	Forced flow heaters	1	0.16	0.80		120	1			55%	50%	0.2	0.2	- 24/7 -	20%	1,752	Constant Flow	100%	100%	301
FF-5,6,9	Forced flow heaters	3	0.14	0.80		120	1			50%	50%	0.2	0.5	- 24/7 -	20%	1,752	Constant Flow	100%	100%	875
FF-8	Forced flow heaters	1	0.29	0.80		120	1			65%	60%	0.3	0.3	- 24/7 -	20%	1,752	Constant Flow	100%	100%	468
DC-1	Carpentry shop dust collector	1	30	0.80		575	3		28.4		83%	18.7	18.7	- 24/7 -	25%	2,190	Constant Flow	100%	100%	41,001
RTU-15 SF	Supply fan RTU-15	1	3	0.80		575	3		3.9		75%	2.3	2.3	VR15SY.ZONE	100%	3,120	Constant Flow	100%	100%	7,245
RTU-15 CF	Condenser fan RTU-15	2	0.33	0.80		575	3		1.0		61%	0.5	1.0	VR15SY.ZONE	100%	3,120	Constant Flow	100%	100%	3,031
CH-1 CF	Chiller condenser fans CKT-1	17	1.74	0.80		575	3		2.8		72%	1.6	27.3	VCH1N2.ZONE	25%	390	Constant Flow	100%	100%	10,642

Fans

for: Arts & Education

Sub-Totals for Fans **370,929 kWh** **kW (Summer / Winter Peak)**

Tag	Description	Qty	Motor									Unit kW	Total kW	WS	SOF	Hours / Year	Flow Profile	Mean %		Total kWh
			HP	LF	Type	Volts	φ	Amps	FLA	Effy	PF							Flow	Power	
SF-1	Building make up air unit	1	15			575	3	8.3	15.0		73%	6.1	6.1	AE.ESF1SY.ZONE	100%	6,904	Constant Flow	100%	100%	41,838
SF-HP-1	Heat pump supply fan Geografy	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	8,714
SF-HP-2	Heat pump supply fan Room 108	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	7,357
SF-HP-3	Heat pump supply fan Rm 111, 115	1	0.25			208	3	1.7	1.6		66%	0.4	0.4	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	3,077
SF-HP-4	Heat pump supply fan Rm104	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	7,357
SF-HP-5	Heat pump supply fan Rm 100, corr 190	1	0.25	0.80		208	3		1.6		59%	0.3	0.3	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	1,732
SF-HP-6	Heat pump supply fan Rm 100	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	7,357
SF-HP-7	Heat pump supply fan Rm 101 111S	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	7,357
SF-HP-8	Heat pump supply fan Rm 11C, 103, 105	1	0.25	0.80		208	1		1.5		59%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	1,111
SF-HP-9	Heat pump supply fan Rm 11G, -R	1	0.5			208	3	1.9	3.2		55%	0.4	0.4	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	2,832
SF-HP-10	Heat pump supply fan Rm 211, 213, 217	1	0.75	0.80		208	3		5.4		67%	1.0	1.0	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	7,953
SF-HP-11	Heat pump supply fan Rm 290 E	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	8,714
SF-HP-12	Heat pump supply fan Rm 209, 211, 291	1	0.5	0.80		208	3		3.2		64%	0.6	0.6	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	4,481
SF-HP-13	Heat pump supply fan Rm 208	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	7,357
SF-HP-14	Heat pump supply fan Rm 211 C-H	1	0.25	0.80		208	3		1.6		59%	0.3	0.3	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	2,052
SF-HP-15	Heat pump supply fan Rm 201, 291A, 205, 290	1	0.5	0.80		208	3		3.2		64%	0.6	0.6	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	4,481
SF-HP-16	Heat pump supply fan Rm 200A, 204	1	0.75	0.80		208	3		5.4		67%	1.0	1.0	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	6,715
SF-HP-17	Heat pump supply fan Rm 211J-N	1	0.25	0.80		208	1	1.5	1.5		65%	0.2	0.2	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	1,533
SF-HP-18	Heat pump supply fan Rm 200A, 204	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	7,357
SF-HP-19	Heat pump supply fan Rm 317, cor 390	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	8,714
SF-HP-20	Heat pump supply fan Rm 321	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	8,714
SF-HP-21	Heat pump supply fan Rm 312	1	0.25	0.80		208	3		1.6		59%	0.3	0.3	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	1,732
SF-HP-22	Heat pump supply fan Rm 308, 304A	1	0.75	0.80		208	3		5.4		67%	1.0	1.0	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	6,715
SF-HP-23	Heat pump supply fan Rm 304, 304A	1	0.75	0.80		208	3		5.4		67%	1.0	1.0	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	6,715
SF-HP-24	Heat pump supply fan Rm 305	1	0.5	0.80		208	3		3.2		64%	0.6	0.6	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	4,481
SF-HP-25	Heat pump supply fan Rm 309A-E	1	0.5	0.80		208	3	1.2	3.2		37%	0.2	0.2	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	1,202
SF-HP-26	Heat pump supply fan Rm 309F-M	1	0.5	0.80		208	3		3.2		64%	0.6	0.6	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	4,481
SF-HP-27	Heat pump supply fan Rm 390, 301, 301A	1	0.5	0.80		208	3		3.2		64%	0.6	0.6	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	4,481
SF-HP-28	Heat pump supply fan Rm 300, 300B	1	1	0.80		208	3		5.8		69%	1.1	1.1	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	7,357
SF-HP-29	Heat pump supply fan Rm 3089 N-S	1	0.25			208	3	1.3	1.6		59%	0.3	0.3	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	2,100
SF-HP-30	Heat pump supply fan Rm 300A	1	0.25	0.80		208	3		1.6		59%	0.3	0.3	AE.EHP1CY.ZONE	110%	6,406	Constant Flow	100%	100%	1,732
SF-HP-31	Heat pump supply fan Rm 115	1	0.13	0.80		208	1		1.2		50%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	758
SF-HP-32	Heat pump supply fan Rm 217	1	0.13	0.80		208	1		1.2		50%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	758
SF-HP-101	Heat pump supply fan rm 100	1	0.1			208	1	0.9	0.9		50%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	710
SF-HP-102	Heat pump supply fan 101C to 101D	1	0.13			208	1	1.2	1.2		50%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	947
SF-HP-103	Heat pump supply fan 101E-J, corr 102	1	0.5			208	3	2.3	3.2		61%	0.5	0.5	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	3,828
SF-HP-104	Heat pump supply fan 107	1	0.5			208	3	2.1	3.2		58%	0.4	0.4	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	2,807
SF-HP-105	Heat pump supply fan 118 & 119	1	1			208	3	5.4	5.8		72%	1.4	1.4	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	9,012
SF-HP-106	Heat pump supply fan 101K -101N	1	0.25			208	1	1.3	1.5		61%	0.2	0.2	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	1,251
SF-HP-107	Heat pump supply fan 122	1	0.5			208	3	2.1	3.2		58%	0.4	0.4	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	2,807
SF-HP-108	Heat pump supply fan 121 & 116	1	0.25			208	1	1.7	1.5		68%	0.2	0.2	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	1,815
SF-HP-109	Heat pump supply fan 120	1	0.75			208	3	3.9	5.4		64%	0.9	0.9	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	5,732
SF-HP-110	Heat pump supply fan 108 & 116	1	0.25			208	1	4.2	1.5		81%	0.7	0.7	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	5,355
SF-HP-111	Heat pump supply fan 213C, off 231	1	0.1			208	1	0.9	0.9		50%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	710
SF-HP-112	Heat pump supply fan 231B-D	1	0.13	0.80		208	1		1.2		50%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	758
SF-HP-113	Heat pump supply fan 231E-J & 290	1	0.5			208	3	2.6	3.2		64%	0.6	0.6	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	4,582
SF-HP-114	Heat pump supply fan 217 & 290	1	0.25			208	1	1.6	1.5		66%	0.2	0.2	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	1,412
SF-HP-115	Heat pump supply fan 214 & 290	1	1			208	3	4.6	5.8		68%	1.1	1.1	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	7,262
SF-HP-116	Heat pump supply fan 231K-N	1	0.25			208	1	1.3	1.5		61%	0.2	0.2	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	1,251
SF-HP-117	Heat pump supply fan 222 & Stairway	1	0.5			208	3	2.6	3.2		64%	0.6	0.6	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	3,865
SF-HP-118	Heat pump supply fan 220 & 290	1	0.75			208	3	3.3	5.4		58%	0.7	0.7	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	4,447
SF-HP-119	Heat pump supply fan Theatre 216	1	0.75			208	3	3.9	5.4		64%	0.9	0.9	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	5,732
SF-HP-120	Heat pump supply fan 219 & 290	1	0.25			208	1	1.4	1.5		63%	0.2	0.2	AE.HP2CY.ZONE	110%	6,400	Constant Flow	100%	100%	1,174
SF-HP-121	Heat pump supply fan 323 & 331A	1	0.1			208	1	0.9	0.9		50%	0.1	0.1	AE.EHP10Y.ZONE	110%	7,588	Constant Flow	100%	100%	710

Electric Heating

for Arts & Education

Sub-Totals for Electric Heating				185,147	kWh	kW (Summer / Winter Peak)							
Tag	Load Description	Qty	Unit kW	Total kW	Weekly Schedule	SOF	Hours / Year	Total kWh	Diversity Factor		Peak Demand		
									Sum	Win	Sum	Win	
RC-HP-1	Heat pump Ref. Comp. Geografy	1	5.16	5.2	AE.ESF1SY.ZONE	20%	1,381	7,128					
RC-HP-2	Heat pump Ref. Comp. Room 108	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-3	Heat pump Ref. Comp. Rm 111, 115	1	2.08	2.1	AE.EHP1CY.ZONE	20%	1,165	2,418					
RC-HP-4	Heat pump Ref. Comp. Rm104	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-5	Heat pump Ref. Comp. Rm 100, corr	1	2.08	2.1	AE.EHP1CY.ZONE	20%	1,165	2,418					
RC-HP-6	Heat pump Ref. Comp. Rm 100	1	5.16	5.2	AE.EHP1CY.ZONE	20%	1,165	6,013					
RC-HP-7	Heat pump Ref. Comp. Rm 101 111S	1	5.16	5.2	AE.EHP1CY.ZONE	20%	1,165	6,013					
RC-HP-8	Heat pump Ref. Comp. Rm 11C, 103	1	1.45	1.4	AE.EHP1CY.ZONE	20%	1,165	1,688					
RC-HP-9	Heat pump Ref. Comp. Rm 11G, -R	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-10	Heat pump Ref. Comp. Rm 211, 213	1	4.38	4.4	AE.EHP10Y.ZONE	20%	1,380	6,036					
RC-HP-11	Heat pump Ref. Comp. Rm 290 E	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-12	Heat pump Ref. Comp. Rm 209, 211	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-13	Heat pump Ref. Comp. Rm 208	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-14	Heat pump Ref. Comp. Rm 211 C-H	1	2.08	2.1	AE.EHP1CY.ZONE	20%	1,165	2,418					
RC-HP-15	Heat pump Ref. Comp. Rm 201, 291	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-16	Heat pump Ref. Comp. Rm 200A, 20	1	4.38	4.4	AE.EHP10Y.ZONE	20%	1,380	6,036					
RC-HP-17	Heat pump Ref. Comp. Rm 211J-N	1	1.45	1.4	AE.EHP1CY.ZONE	20%	1,165	1,688					
RC-HP-18	Heat pump Ref. Comp. Rm 200A, 20	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-19	Heat pump Ref. Comp. Rm 317, coor	1	5.16	5.2	AE.EHP1CY.ZONE	20%	1,165	6,013					
RC-HP-20	Heat pump Ref. Comp. Rm 321	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-21	Heat pump Ref. Comp. Rm 312	1	2.08	2.1	AE.EHP10Y.ZONE	20%	1,380	2,864					
RC-HP-22	Heat pump Ref. Comp. Rm 308, 304	1	4.38	4.4	AE.EHP1CY.ZONE	20%	1,165	5,096					
RC-HP-23	Heat pump Ref. Comp. Rm 304, 304	1	4.38	4.4	AE.EHP1CY.ZONE	20%	1,165	5,096					
RC-HP-24	Heat pump Ref. Comp. Rm 305	1	3.64	3.6	AE.EHP1CY.ZONE	20%	1,165	4,235					
RC-HP-25	Heat pump Ref. Comp. Rm 309A-E	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-26	Heat pump Ref. Comp. Rm 309F-M	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-27	Heat pump Ref. Comp. Rm 390, 301	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-28	Heat pump Ref. Comp. Rm 300, 300	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-29	Heat pump Ref. Comp. Rm 3089 N-S	1	2.08	2.1	AE.EHP1CY.ZONE	20%	1,165	2,418					
RC-HP-30	Heat pump Ref. Comp. Rm 300A	1	2.08	2.1	AE.EHP10Y.ZONE	20%	1,380	2,864					
RC-HP-31	Heat pump Ref. Comp. Rm 115	1	1.33	1.3	AE.EHP1CY.ZONE	20%	1,165	1,547					
RC-HP-32	Heat pump Ref. Comp. Rm 217	1	1.33	1.3	AE.EHP10Y.ZONE	20%	1,380	1,832					
RC-HP-101	Heat pump Ref. Comp. rm 100	1	0.94	0.9	AE.EHP10Y.ZONE	20%	1,380	1,294					
RC-HP-102	Heat pump Ref. Comp. 101C to 101E	1	1.33	1.3	AE.EHP10Y.ZONE	20%	1,380	1,832					
RC-HP-103	Heat pump Ref. Comp. 101E-J, corr	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-104	Heat pump Ref. Comp. 107	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-105	Heat pump Ref. Comp. 118 & 119	1	5.16	5.2	AE.HP2CY.ZONE	20%	1,164	6,007					

Electric Heating

for Arts & Education

Sub-Totals for Electric Heating				185,147	kWh	kW (Summer / Winter Peak)							
Tag	Load Description	Qty	Unit kW	Total kW	Weekly Schedule	SOF	Hours / Year	Total kWh	Diversity Factor		Peak Demand		
									Sum	Win	Sum	Win	
RC-HP-106	Heat pump Ref. Comp. 101K -101N	1	1.45	1.4	AE.HP2CY.ZONE	20%	1,164	1,686					
RC-HP-107	Heat pump Ref. Comp. 122	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-108	Heat pump Ref. Comp. 121 & 116	1	1.45	1.4	AE.HP2CY.ZONE	20%	1,164	1,686					
RC-HP-109	Heat pump Ref. Comp. 120	1	4.38	4.4	AE.EHP10Y.ZONE	20%	1,380	6,036					
RC-HP-110	Heat pump Ref. Comp. 108 & 116	1	1.45	1.4	AE.HP2CY.ZONE	20%	1,164	1,686					
RC-HP-111	Heat pump Ref. Comp. 213C, off 231	1	0.94	0.9	AE.EHP10Y.ZONE	20%	1,380	1,294					
RC-HP-112	Heat pump Ref. Comp. 231B-D	1	1.33	1.3	AE.EHP10Y.ZONE	20%	1,380	1,832					
RC-HP-113	Heat pump Ref. Comp. 231E-J & 290	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-114	Heat pump Ref. Comp. 217 & 290	1	1.45	1.4	AE.EHP10Y.ZONE	20%	1,380	1,999					
RC-HP-115	Heat pump Ref. Comp. 214 & 290	1	5.16	5.2	AE.HP2CY.ZONE	20%	1,164	6,007					
RC-HP-116	Heat pump Ref. Comp. 231K-N	1	1.45	1.4	AE.HP2CY.ZONE	20%	1,164	1,686					
RC-HP-117	Heat pump Ref. Comp. 222 & Stairwa	1	3.32	3.3	AE.EHP10Y.ZONE	20%	1,380	4,583					
RC-HP-118	Heat pump Ref. Comp. 220 & 290	1	4.38	4.4	AE.HP2CY.ZONE	20%	1,164	5,091					
RC-HP-119	Heat pump Ref. Comp. Theatre 216	1	4.38	4.4	AE.HP2CY.ZONE	20%	1,164	5,091					
RC-HP-120	Heat pump Ref. Comp. 219 & 290	1	1.45	1.4	AE.HP2CY.ZONE	20%	1,164	1,686					
RC-HP-121	Heat pump Ref. Comp. 323 & 331A	1	0.94	0.9	AE.HP2CY.ZONE	20%	1,164	1,092					
RC-HP-122	Heat pump Ref. Comp. 331B-D	1	1.33	1.3	AE.EHP10Y.ZONE	20%	1,380	1,832					
RC-HP-123	Heat pump Ref. Comp. 324	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-124	Heat pump Ref. Comp. 124 & 390	1	5.16	5.2	AE.HP2CY.ZONE	20%	1,164	6,007					
RC-HP-125	Heat pump Ref. Comp. 331K-N	1	3.32	3.3	AE.HP2CY.ZONE	20%	1,164	3,866					
RC-HP-126	Heat pump Ref. Comp. 331E-J	1	1.45	1.4	AE.EHP10Y.ZONE	20%	1,380	1,999					
RC-HP-127	Heat pump Ref. Comp. 328 & stairwa	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					
RC-HP-128	Heat pump Ref. Comp. 327A & 326A	1	3.32	3.3	AE.HP2CY.ZONE	20%	1,164	3,866					
RC-HP-129	Heat pump Ref. Comp. foyer 190D	1	2.08	2.1	AE.HP2CY.ZONE	20%	1,164	2,415					
RC-HP-130	Heat pump Ref. Comp. Lobby 290D	1	2.08	2.1	AE.EHP10Y.ZONE	20%	1,380	2,864					
RC-HP-131	Heat pump Ref. Comp. comp lab 325	1	5.16	5.2	AE.EHP10Y.ZONE	20%	1,380	7,122					

Cooling

for Arts & Education

Sub-Totals for Cooling	198,228 kWh	kW (Summer / Winter Peak)
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Tag	Description	Qty	Compressor				Rated			Unit	Total	Weekly Schedule	SOF	Hours / Year	Chiller Profile	Mean % Power	Total kWh
			Volts	φ	RLA	PF	Tons	kW	kW/ton								
RC-HP-1	Heat pump Ref. Comp. Geograf	1	208	3	16.1	0.89				5.16	5.2	AE.ESF1SY.ZONE	15%	1,036	Constant Load	100%	5,346
RC-HP-2	Heat pump Ref. Comp. Room 10	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-3	Heat pump Ref. Comp. Rm 111	1	208	3	6.7	0.86				2.08	2.1	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	1,813
RC-HP-4	Heat pump Ref. Comp. Rm104	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-5	Heat pump Ref. Comp. Rm 100	1	208	3	6.7	0.86				2.08	2.1	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	1,813
RC-HP-6	Heat pump Ref. Comp. Rm 100	1	208	3	16.1	0.89				5.16	5.2	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	4,510
RC-HP-7	Heat pump Ref. Comp. Rm 101	1	208	3	16.1	0.89				5.16	5.2	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	4,510
RC-HP-8	Heat pump Ref. Comp. Rm 11C	1	208	1	8.1	0.86				1.45	1.4	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	1,266
RC-HP-9	Heat pump Ref. Comp. Rm 11G	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-10	Heat pump Ref. Comp. Rm 211	1	208	3	13.8	0.88				4.38	4.4	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	4,527
RC-HP-11	Heat pump Ref. Comp. Rm 290	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-12	Heat pump Ref. Comp. Rm 209	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-13	Heat pump Ref. Comp. Rm 208	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-14	Heat pump Ref. Comp. Rm 211	1	208	3	6.7	0.86				2.08	2.1	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	1,813
RC-HP-15	Heat pump Ref. Comp. Rm 201	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-16	Heat pump Ref. Comp. Rm 200	1	208	3	13.8	0.88				4.38	4.4	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	4,527
RC-HP-17	Heat pump Ref. Comp. Rm 211	1	208	1	8.1	0.86				1.45	1.4	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	1,266
RC-HP-18	Heat pump Ref. Comp. Rm 200	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-19	Heat pump Ref. Comp. Rm 317	1	208	3	16.1	0.89				5.16	5.2	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	4,510
RC-HP-20	Heat pump Ref. Comp. Rm 321	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-21	Heat pump Ref. Comp. Rm 312	1	208	3	6.7	0.86				2.08	2.1	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	2,148
RC-HP-22	Heat pump Ref. Comp. Rm 308	1	208	3	13.8	0.88				4.38	4.4	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	3,822
RC-HP-23	Heat pump Ref. Comp. Rm 304	1	208	3	13.8	0.88				4.38	4.4	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	3,822
RC-HP-24	Heat pump Ref. Comp. Rm 305	1	208	3	11.6	0.87				3.64	3.6	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	3,176
RC-HP-25	Heat pump Ref. Comp. Rm 309	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-26	Heat pump Ref. Comp. Rm 309	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-27	Heat pump Ref. Comp. Rm 390	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-28	Heat pump Ref. Comp. Rm 300	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-29	Heat pump Ref. Comp. Rm 308	1	208	3	6.7	0.86				2.08	2.1	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	1,813
RC-HP-30	Heat pump Ref. Comp. Rm 300	1	208	3	6.7	0.86				2.08	2.1	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	2,148
RC-HP-31	Heat pump Ref. Comp. Rm 115	1	208	1	7.6	0.84				1.33	1.3	AE.EHP1CY.ZONE	15%	874	Constant Load	100%	1,160
RC-HP-32	Heat pump Ref. Comp. Rm 217	1	208	1	7.6	0.84				1.33	1.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	1,374
RC-HP-101	Heat pump Ref. Comp. rm 100	1	208	1	5.5	0.82				0.94	0.9	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	971
RC-HP-102	Heat pump Ref. Comp. 101C to	1	208	1	7.6	0.84				1.33	1.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	1,374
RC-HP-103	Heat pump Ref. Comp. 101E-J	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-104	Heat pump Ref. Comp. 107	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-105	Heat pump Ref. Comp. 118 & 1	1	208	3	16.1	0.89				5.16	5.2	AE.HP2CY.ZONE	15%	873	Constant Load	100%	4,505
RC-HP-106	Heat pump Ref. Comp. 101K -10	1	208	1	8.1	0.86				1.45	1.4	AE.HP2CY.ZONE	15%	873	Constant Load	100%	1,264
RC-HP-107	Heat pump Ref. Comp. 122	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-108	Heat pump Ref. Comp. 121 & 1	1	208	1	8.1	0.86				1.45	1.4	AE.HP2CY.ZONE	15%	873	Constant Load	100%	1,264
RC-HP-109	Heat pump Ref. Comp. 120	1	208	3	13.8	0.88				4.38	4.4	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	4,527
RC-HP-110	Heat pump Ref. Comp. 108 & 1	1	208	1	8.1	0.86				1.45	1.4	AE.HP2CY.ZONE	15%	873	Constant Load	100%	1,264
RC-HP-111	Heat pump Ref. Comp. 213C, of	1	208	1	5.5	0.82				0.94	0.9	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	971
RC-HP-112	Heat pump Ref. Comp. 231B-D	1	208	1	7.6	0.84				1.33	1.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	1,374

Cooling

for Arts & Education

Sub-Totals for Cooling	198,228 kWh	kW (Summer / Winter Peak)
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Tag	Description	Qty	Compressor				Rated			Unit	Total	Weekly Schedule	SOF	Hours / Year	Chiller Profile	Mean % Power	Total
			Volts	φ	RLA	PF	Tons	kW	kW/ton	kW	kW						kWh
RC-HP-113	Heat pump Ref. Comp. 231E-J	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-114	Heat pump Ref. Comp. 217 & 2	1	208	1	8.1	0.86				1.45	1.4	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	1,499
RC-HP-115	Heat pump Ref. Comp. 214 & 2	1	208	3	16.1	0.89				5.16	5.2	AE.HP2CY.ZONE	15%	873	Constant Load	100%	4,505
RC-HP-116	Heat pump Ref. Comp. 231K-N	1	208	1	8.1	0.86				1.45	1.4	AE.HP2CY.ZONE	15%	873	Constant Load	100%	1,264
RC-HP-117	Heat pump Ref. Comp. 222 & S	1	208	3	10.6	0.87				3.32	3.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	3,438
RC-HP-118	Heat pump Ref. Comp. 220 & 2	1	208	3	13.8	0.88				4.38	4.4	AE.HP2CY.ZONE	15%	873	Constant Load	100%	3,818
RC-HP-119	Heat pump Ref. Comp. Theatre	1	208	3	13.8	0.88				4.38	4.4	AE.HP2CY.ZONE	15%	873	Constant Load	100%	3,818
RC-HP-120	Heat pump Ref. Comp. 219 & 2	1	208	1	8.1	0.86				1.45	1.4	AE.HP2CY.ZONE	15%	873	Constant Load	100%	1,264
RC-HP-121	Heat pump Ref. Comp. 323 & 3	1	208	1	5.5	0.82				0.94	0.9	AE.HP2CY.ZONE	15%	873	Constant Load	100%	819
RC-HP-122	Heat pump Ref. Comp. 331B-D	1	208	1	7.6	0.84				1.33	1.3	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	1,374
RC-HP-123	Heat pump Ref. Comp. 324	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-124	Heat pump Ref. Comp. 124 & 3	1	208	3	16.1	0.89				5.16	5.2	AE.HP2CY.ZONE	15%	873	Constant Load	100%	4,505
RC-HP-125	Heat pump Ref. Comp. 331K-N	1	208	3	10.6	0.87				3.32	3.3	AE.HP2CY.ZONE	15%	873	Constant Load	100%	2,899
RC-HP-126	Heat pump Ref. Comp. 331E-J	1	208	1	8.1	0.86				1.45	1.4	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	1,499
RC-HP-127	Heat pump Ref. Comp. 328 & st	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341
RC-HP-128	Heat pump Ref. Comp. 327A & 1	1	208	3	10.6	0.87				3.32	3.3	AE.HP2CY.ZONE	15%	873	Constant Load	100%	2,899
RC-HP-129	Heat pump Ref. Comp. foyer 19	1	208	3	6.7	0.86				2.08	2.1	AE.HP2CY.ZONE	15%	873	Constant Load	100%	1,812
RC-HP-130	Heat pump Ref. Comp. Lobby 2	1	208	3	6.7	0.86				2.08	2.1	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	2,148
RC-HP-131	Heat pump Ref. Comp. comp lat	1	208	3	16.1	0.89				5.16	5.2	AE.EHP10Y.ZONE	15%	1,035	Constant Load	100%	5,341

Fans

for: Animal Health Tech

Sub-Totals for Fans 78,926 kW kW (Summer / Winter Peak)

Table with columns: Tag, Description, Qty, Motor (HP, LF, Type, Volts, phi, Amps, FLA, Eff'y, PF), Unit kW, Total kW, WS, SOF, Hours / Year, Flow Profile, Mean % (Flow, Power), Total kWh. Rows include RTU-1 SF, RTU-1 CF, RTU-2 SF, RTU-2 CF, RTU-3 SF, RTU-3 CF, RTU-4 SF, RTU-4 CF, RTU-5 SF, RTU-5 CF, RTU-6 SF, RTU-6 CF, RTU-7 SF, RTU-7 CF, RTU-8 SF, EF1, EF-2, EF-3, EF-4, EF-5, EF-6, EF-7, EF-8, EF-9, EF-10, EF-11, EF-12, UH-1, FF.

APPENDIX H: PROJECT SUMMARY

1. Energy Conservation Measures Summary



Energy Measures Savings Summary

Thompson Rivers University
Utilities Consumption, Cost and Rates

Year: 2009	Annual Usage	Units	Annual Cost	Average Cost Per Unit	Marginal Cost Per Unit (PST Included)
Demand Common	-	kW	\$0		\$7.99
Electricity Common	15,367,200	kWh	\$852,349	\$0.06	\$0.04
Electricity Tenants		kWh			\$0.00
Electricity Total	15,367,200	kWh	\$852,349	\$0.06	
Fuel	68,832	GJ	\$559,001	\$8.12	\$9.06
Water		m3	\$0		

No of Utility Meters

Utility Meter	Quantity
Electrical Meters - Common	0
Electrical Meters - Tenant/Retail	0
Gas Meters	0
Water Meters	0

Performance Indexes:

		2009	Post Retrofit	Target/ Typical
BEP1	(ekWh/ft2)	33.9	30.6	
BECI	(\$/ft2)	1.4	\$1.24	
BUCI	(\$/ft2)			

BEP1 = Building Energy Performance Index
BECI = Building Energy Cost Index
BUCI = Building Utility Cost Index (Includes Water)

Campus Area	
1,017,190	ft2
94,534	m2

CO2 Factors	
0.00003048	tonnes/KWh
0.04986430	tonnes/GJ

TABLE 1: RECOMMENDED ENERGY SAVING MEASURES

Energy Measure Code:	Energy Measure:	Measure Category:	Demand and Consumption Savings				Cost Savings				Equip. & Labour Budget Costs (\$)	Design & Engineer. (\$)	Contingency (\$)	Total Budget Costs (\$)	Simple Payback (Years)	CO2 (Tonnes)	Utility Rate Escalation = 0%		Utility Rate Escalation = 2.5%	
			Demand (kW)	Electrical (kWh)	Fuel (GJ)	Water (m3)	Electrical (\$)	Fuel (\$)	Water (\$)	Total (\$)							NPV 20 yr on Total Budget	IRR 20 yr on Total Budget	NPV 20 yr on Total Budget	IRR 20 yr on Total Budget
ECM 1	Lighting Retrofit	ECM	194	693,564	-	-	\$46,659	\$0	\$0	\$46,659	\$581,000	\$50,000	\$30,000	\$661,000	14.2	21.1	-\$125,824	3.5%	-\$9,011	5.8%
ECM 2	Lighting Controls	ECM	-	122,292	-	-	\$4,941	\$0	\$0	\$4,941	\$61,500	\$1,000	\$3,000	\$65,500	13.3	3.7	-\$8,832	4.3%	\$3,537	6.6%
ECM 3	Vending Machine Usage Control	ECM	-	45,033	-	-	\$1,819	\$0	\$0	\$1,819	\$9,450	\$0	\$550	\$10,000	5.5	1.4	\$10,868	17.5%	\$15,422	19.9%
ECM 4	Appliance Timers for Corridor Televisions	ECM	-	10,530	-	-	\$425	\$0	\$0	\$425	\$600	\$0	\$50	\$650	1.5	0.3	\$4,229	65.4%	\$5,294	67.9%
ECM 5	Power Factor Correction	ECM	-	-	-	-	\$8,191	\$0	\$0	\$8,191	\$28,000	\$8,000	\$800	\$36,800	4.5	-	\$57,150	21.8%	\$77,657	24.3%
ECM 6	Holiday scheduling	ECM	-	198,381	768	-	\$8,015	\$6,963	\$0	\$14,978	\$28,000	\$3,000	\$31,000	\$44,900	2.1	44.4	\$140,794	48.3%	\$178,291	50.8%
ECM 7	Optimum Start	ECM	-	216,988	839	-	\$8,766	\$7,600	\$0	\$16,366	\$39,900	\$5,000	\$44,900	\$44,900	2.7	48.4	\$142,816	36.4%	\$183,789	38.9%
ECM 8	Summer scheduling	ECM	-	67,345	-	-	\$2,721	\$0	\$0	\$2,721	\$6,500	\$0	\$6,500	\$6,500	2.4	2.1	\$24,707	41.8%	\$31,518	44.3%
ECM 9	VAV zone isolation	ECM	-	116,332	203	-	\$4,700	\$1,843	\$0	\$6,543	\$40,000	\$10,000	\$50,000	\$50,000	7.6	13.7	\$25,050	11.6%	\$41,432	14.0%
ECM 10	Demand controlled ventilation for Classrooms and Offices Served by WS Heat Pumps	ECM	-	21,753	1,227	-	\$879	\$11,124	\$0	\$12,003	\$97,500	\$5,000	\$102,500	\$8,500	8.5	61.9	\$35,170	10.0%	\$65,220	12.3%
ECM 11	Demand Controlled Ventilation for Clock Tower Theatre	ECM	-	3,802	23	-	\$154	\$210	\$0	\$363	\$3,900	\$0	\$3,900	\$3,900	10.7	1.3	\$267	6.8%	\$1,177	9.2%
ECM 12	Align Clock Tower DDC Weekly Schedules with Typical	ECM	-	3,295	140	-	\$133	\$1,266	\$0	\$1,399	\$7,900	\$800	\$8,700	\$8,700	6.2	7.1	\$7,344	15.1%	\$10,846	17.5%
ECM 13	Trades welding booth fan operation	ECM	-	36,119	851	-	\$1,459	\$7,709	\$0	\$9,168	\$35,200	\$5,000	\$40,200	\$40,200	4.4	43.5	\$64,957	22.4%	\$87,910	24.9%
ECM 14	Woodshop dust collector occupancy controlled shutdown	ECM	-	9,885	14	-	\$399	\$130	\$0	\$529	\$4,700	\$500	\$5,200	\$5,200	9.8	1.0	\$869	8.0%	\$2,194	10.3%
ECM 15	Standby mode and DCV for Gym Ventilation Systems	ECM	-	30,053	330	-	\$1,214	\$2,987	\$0	\$4,202	\$9,900	\$3,000	\$12,900	\$12,900	3.1	17.4	\$35,291	32.5%	\$45,810	34.9%
ECM 16	Shutdown Loop Circulation Pumps at Night	ECM	-	33,815	-	-	\$1,366	\$0	\$0	\$1,366	\$6,300	\$2,000	\$8,300	\$8,300	6.1	1.0	\$7,370	15.5%	\$10,790	18.0%
ECM 17	Old Main Exhaust Fan Unoccupied Shutdown	ECM	-	7,909	364	-	\$320	\$3,298	\$0	\$3,618	\$25,100	\$2,000	\$27,100	\$27,100	7.5	18.4	\$35,170	10.0%	\$65,220	12.3%
ECM 18	Install Flue Dampers on CAC Heating Plant	ECM	-	-	1,377	-	\$0	\$12,483	\$0	\$12,483	\$6,000	\$2,000	\$8,000	\$8,000	0.6	68.7	\$135,182	156.0%	\$166,435	158.5%
Total	Recommended Measures		194	1,617,097	6,136	0	\$92,161	\$55,613	\$0	\$147,774	\$991,450	\$97,300	\$34,400	\$1,123,150	7.6	355.3	\$571,804	11.7%	\$941,764	14.1%
2009 Data for Entire Campus				15,367,200	68,832	0	\$852,349	\$559,001	\$0	\$1,411,350						3,900.7				
% Savings of Total				11%	9%		11%	10%		10%						9%				

TABLE 2: OTHER MEASURES CONSIDERED

6.1	Halogen Lamp Replacement	OTHER	28	42,364	-	-	\$4,375	\$0	\$0	\$4,375	\$13,500	\$1,000	\$500	\$15,000	3.4	1.3				
6.2	Exterior Lighting Replacement	OTHER	10	43,537	-	-	\$2,708	\$0	\$0	\$2,708	\$80,000	\$1,000	\$4,000	\$85,000	31.4	1.3				
6.3	Replace Neon Tube Lighting with LED Accent Lighting	OTHER	2	13,803	-	-	\$711	\$0	\$0	\$711	\$12,500	\$1,000	\$500	\$14,000	19.7	0.4				
6.4	Trades and Technology Overhead Door Alarm	OTHER	-	-	-	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		0.0				
6.5	Curtail Unoccupied Heating	OTHER	-	-	-	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		0.0				

TABLE 3: CAPITAL UPGRADES

7.1	Paracube Louvre Replacement With Prismatic Lens	CAPITAL	-	-	-	-	\$0	\$0	\$0	\$0	\$1,300	\$0	\$100	\$1,400		0.0				
7.2	PCB Removal	CAPITAL	-	-	-	-	\$0	\$0	\$0	\$0	\$950	\$0	\$50	\$1,000		0.0				
7.3	Improve Trades and Technology Corridor Lighting	CAPITAL	-	2	13,549	-	-	\$-701	\$0	\$-701	\$8,000	\$1,000	\$0	\$9,000	-12.8	-0.4				
7.4	Code Violation Correction	CAPITAL	-	-	-	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0						

Total	All Opportunities		232	1,703,252	6,136	-	99,254	55,613	-	154,867	\$1,107,700	\$101,300	\$39,550	\$1,248,550	8.1	357.9				
2009 Data for Entire Campus				15,367,200	68,832	-	852,349	559,001	-	1,411,350						3,901				
% Savings of Total				11%	9%					11%						9%				

Notes
 - Engineering costs of ECM 2 -6, 6.1- 6.3 and 7.1 -7.3 are based on ECM 1 proceeding
 - ECM 1 and ECM 2 have a negative NPV based on estimated implementation costs. However, incentive funding will reduce payback period and likely result in a positive NPV.

APPENDIX I: NO COST AND LOW COST ENERGY SAVING OPPORTUNITIES***Education and Awareness***

Education and awareness of staff, employees and other occupants is a critical component of an energy management program. In many cases, over 5% of the annual usage can be reduced through encouraging good energy management practices and by developing a culture of energy efficiency. Savings are related to turning off lights, reduced use of equipment when not required, purchasing practices and more.

Management and Staff

Lighting:

- lights out program when rooms and spaces not in use;
- shut off lights in storage rooms when unoccupied;
- if multiple switching exists in a room, use only the required light level and turn off outside row on sunny days.

Computers:

- Set up computers for the following:
 - Hard drives off after 15 minutes of non-use;
 - Monitors off after 30 minutes of non-use;
- shut off computers at the end of each day;
- shut off monitors when not using computers;
- program computer and monitor sleep mode if it exists (screen savers do not save energy);

Windows:

- keep windows closed unless air quality requires windows to be open;
- shut windows when vacating a room and at the end of each day.

Appliances:

- operate major electrical loads after hours to reduce peak electrical demand costs, add delay timers if required;
- do not bring in personal electric baseboard heaters – contact maintenance about heating complaints.

Heating/Thermostats:

- leave thermostats set within range set up by maintenance and advise maintenance if uncomfortable;
- do not place books and other items on top of heating units and / or block airflow;
- keep shipping doors and shop doors shut in winter.

Kitchens / Staff Rooms:

- consolidate foods in freezers and fridges and shut off kitchen equipment not in use;
- only operate hood exhaust while cooking occurs or during wash cycle;
- run full loads through the dishwasher;
- do not operate cooking equipment on hot standby – turn on only when needed;
- do not run water continuously in sinks.

Cleaning Staff

- consider reorganizing cleaning shifts so that lighting hours can be reduced;
- leave lights off until area is being cleaned (i.e. do not turn all lights on when starting a shift);
- shut off lights when finished cleaning a room;

- shut windows at the end of each day;
- plan cleaning routing to complete entire wing/floor and shut down all equipment after complete;
- report systems operating in summer to maintenance.

Maintenance Staff

Controls:

- program only hours required on weekends, not entire day and only systems required for areas being used;
- utilize temperature setback programs.

Boilers/Furnaces/Hot Water Systems:

- set up and calibrate boiler combustion efficiency annually;
- operate boilers at minimum hot water temperature to satisfy needs;
- add piping insulation where required in boiler room;
- maintain dissolved solids at an appropriate level and monitor regularly;
- maintain proper burner adjustments for furnaces;
- repair faulty heating valves and thermostats in a timely manner (i.e. quick response to overheating problems);
- shut off standing gas pilots during summer shutdown;

Air Handling Units:

- clean coils in air handling units;
- replace belts that slip;
- when replacing a motor, purchase energy efficient model;
- balance air handling systems;
- caulk and weather strip leaky windows;
- verify damper and valve operation.

Building Envelope:

- weather strip all exterior doors;
- repair leaks;
- add interlocks to shut off unit heaters when shipping doors are open.

Water:

- repair leaks.

Other:

- clean evaporator and condensers of refrigeration equipment.

Administration

- Consolidate rooms used for evening and weekend events;
- Within an office used for evenings and weekends schedule activities in close proximity to reduce the number of heating and ventilation systems required.

GLOSSARY

1. General Terms

Baseline	Utility consumption in a base year before modification to a system (a retrofit)
BEPI	Building Energy Performance Index. A measure of the buildings energy use on a per unit floor area basis.
BECI	Building Energy Cost Index. A measure of the buildings energy cost on a per unit floor area basis.
BHP or bhp	The net power required to operate a pump or a fan after the drive and motor efficiencies are considered.
Capital Projects	Upgrades and additions to a building or system due justified based on performance requirements and not energy savings
Correlation	R ² value of how accurately a trend follows a straight line linear relationship
GHG (Greenhouse Gas)	Gases that are harmful to the environment and are responsible for Global Warming and the Greenhouse Effect
HVAC	Heating, Ventilation and Air Conditioning
Occupancy control	Control based on sensing people or moving objects in an area
PCB (polychlorinated biphenyl)	A hazardous carcinogenic dielectric phased out in 1978 that was used as a coolant in transformers and capacitors typically found in magnetic ballasts for powering fluorescent lamps
Regression	Statistical method of determining dependency
Retrofit	Upgrade of an existing system with new components instead of replacing the entire system
Seismic Restraint	Fastener, restraint and/or precaution that prepares a building for any seismic activity
TOU (Time of Use)	An electrical rate used for billing different amounts for different periods of time

2. Electrical / Lighting Terms

A21	“A” is a lamp shape, commonly incandescent lamps, and “21” is cross sectional size in eighths of an inch.
Fluorescent	A medium-energy demand lamp system (i.e. T8, T12, CFI)
Footcandle	A unit of lighting illuminance. (imperial measure, 1 FC = 10.76 Lux)
HID (High Intensity Discharge)	Source of lamp often used for outside lighting and large open areas such as gymnasiums (i.e. Metal Halide, Mercury Vapour, High Pressure Sodium)
Incandescent	A high-energy demand lamp system (i.e. quartz, halogen)
Lens	Any covering for a lighting unit that diffuses light over a prescribed area
Lux	A unit of lighting illuminance (metric, 1 Lux = .093 FC)
PAR	Parabolic Aluminized Reflector (PAR) is a lamp type of halogen incandescent flood lamp.
Photocell	Lighting Control based on the amount of ambient light
Plug Load	Loads that are plugged into 120v AC (computers, copiers, microwaves, etc.)
PF (Power Factor)	Ratio of true power to apparent power measured in percent
RLM	A spun metal or metal and glass dome shaped luminaire; typically seen in restaurants and other retail type outlets.
Service Entrance	Location where electricity enters a building

3. Mechanical Terms

AC	Air Conditioning
AHU (Air Handling Unit)	Delivers conditioned air to a space by means of fan power and can include heating, cooling and mixing
Ambient temperature	Temperature of the medium (usually air) surrounding an object
BAS Control	Building Automation System
Burner	A device that introduces fuel and air into a furnace at desired velocities and turbulence to maintain proper combustion
CEP	Central energy plant
CW	Chilled water
Damper	A device used to control airflow (controlled by the DDC)
DHW	Domestic hot water
DDC (Direct Digital Control)	System used to automate functions in a building

Draft	Difference between atmospheric pressure and some lower pressure existing in the furnace or gas passage of a broiler
Enthalpy	A measure of the heat energy per unit of a material (kJ/kg)
Heat Exchanger	A device to transfer heat between two physically separated fluids
HW	Hot water
MAU (Makeup Air Unit)	Delivers 100% outdoor air to a space by means of fan power and can include heating and/or cooling
NSB (Night Set Back)	System to control usage during night hours controlled by DDC
OAT	Outside Air Temperature
Proportional Control	A control algorithm or method in which the final control element moves to a position proportional to the deviation of the value of the controlled variable from the setpoint.
Proportional-Integral Control	A control algorithm that combines the proportional (proportional response) and integral (reset response) control algorithms. Reset response tends to correct the offset resulting from proportional control. Also called "proportional-plus-reset" or "two-mode" control
PID Control (Proportional-Integral-Derivative)	A control algorithm that enhances the PI control algorithm by adding a component that is proportional to the rate of change (derivative) of the deviation of the controlled variable. Compensates for system dynamics and allows faster control response. Also called "three-mode" or "rate-reset" control.
Pneumatic Control	A control circuit that operates on air pressure, typically a 3-15 psig signal, and uses a mechanical means, such as a temperature-sensitive bimetal or bellows, to perform control functions, such as actuating a nozzle and flapper or a switching relay. The controller output usually operates or positions a pneumatic actuator, although relays and switches are often in the circuit.
PRV	Pressure Reducing Valve
RF	Return fan
RTU (Rooftop Unit)	A packaged air-handling unit mounted on the roof that provides heating, cooling and ventilation typically by means of overhead ductwork
SF	Supply fan
Transducer	A device that converts an electric signal to a pneumatic pulse of certain pressure
VAV	Variable Air Volume
VSD	Variable Speed Drive. Also known as ASD or Adjustable Speed Drive.

4. Water Terms

Aerator	A screen for water flow restriction
Flushometer	Valve to operate water usage in urinals

5. Units

% RH (Relative Humidity)	Measurement of humidity in the air
ccf (hundred cubic feet)	Metric measurement of water volume
cfm(cubic feet per minute)	Imperial measurement of air volume
CO ₂ e	Carbon dioxide equivalent
ekWh (equivalent kilowatt hour)	A method of comparing other units to the kWh, used mostly for comparing costs of consumption. i.e. Gas consumption is compared by $GJ \times 277.78 = ekWh$
GJ (giga Joule)	Standard unit of measurement for energy produced by gas energy
gpm (gallons per minute)	Imperial measurement of water volume
hp	Horsepower
kWh (kilowatt hour)	Standard unit for power consumption, equivalent to 1,000-watt hours
l / s (litre per second)	Metric measurement of air volume
mBh (1,000 BTU per hour)	BTU is a British Thermal Unit.
psi (pounds per square inch)	Imperial measurement of air volume
Watt hour	A unit of energy equal to the energy produced by one watt over one hour