

Department of Technology, Management and Budget
Facilities & Business Services Administration
Design and Construction Division
For
Michigan Department of Corrections
Richard A. Handlon Correctional Facility (MTU)
Technical Energy Assessment Audit
File No. 472/12168.DCS, Index No. 02550

February, 2013



Proprietary and Confidential

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Date: February 5, 2013

*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

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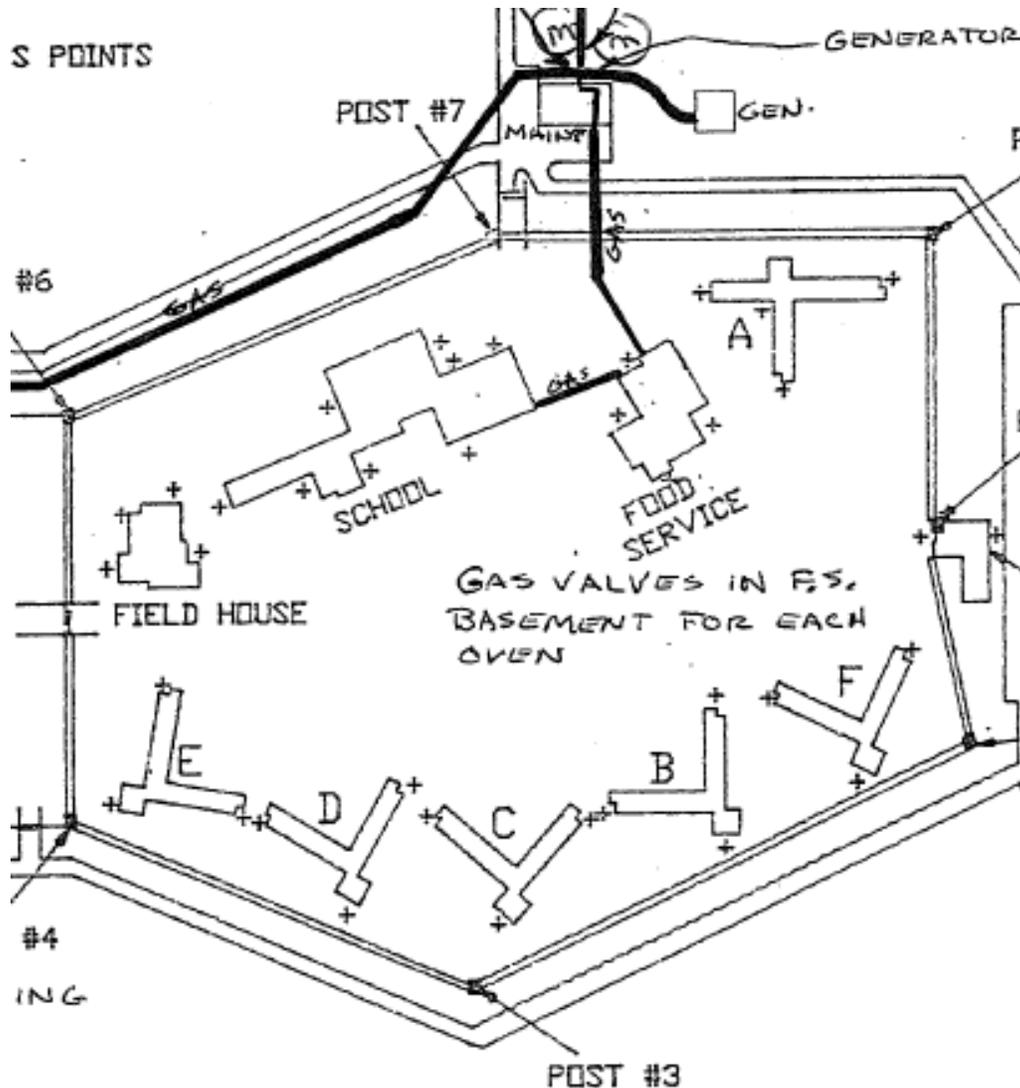
RICHARD A. HANDLON CORRECTIONAL FACILITY (MTU)

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Section 1: Existing Conditions

SUMMARY TABLE OF RECOMMENDED ENERGY AND WATER SAVINGS MEASURES

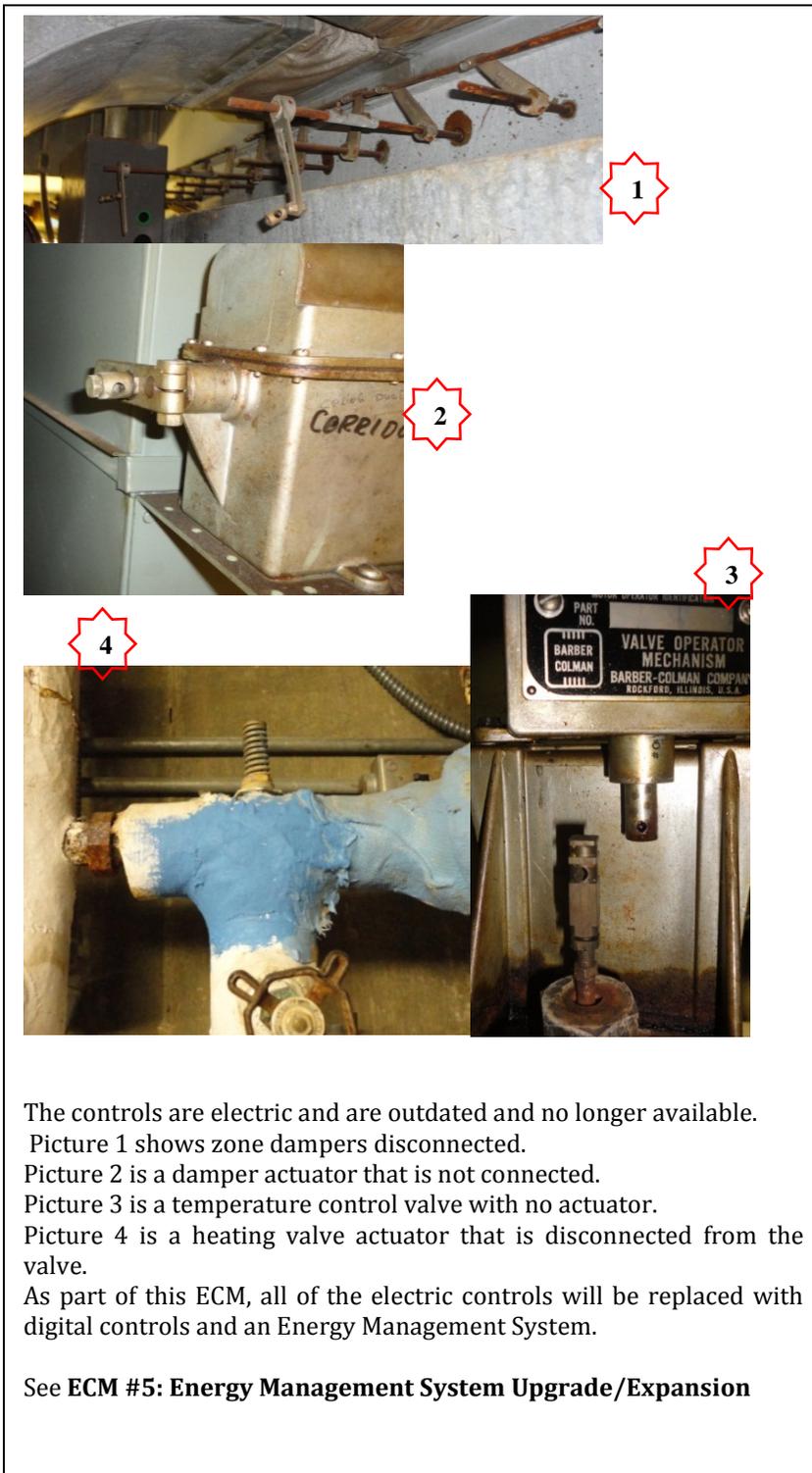


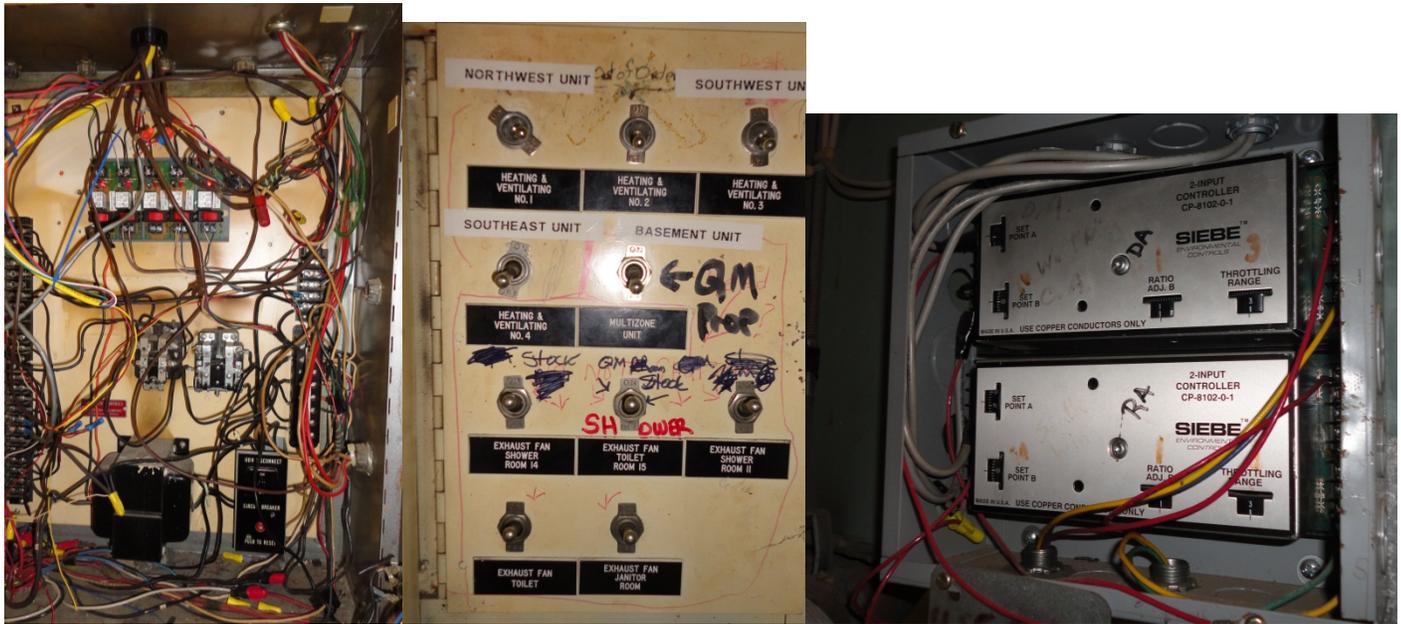
Richard A. Handlon Correctional Facility (MTU)

The following applies to all buildings unless otherwise noted.

1. The buildings were built over a 20 year period from 1954 to 1971.
2. Most of the buildings have single pane glass in poor condition.
3. Almost all of the mechanical equipment is original and in poor condition.

4. The Central Boiler Plant provides steam for heating, domestic water, clothes dryers and kitchen steam kettles. The existing underground piping is in poor condition with numerous leaks and requires regular maintenance. See **Central Boiler Plant ECM #1- Boiler Decentralization**.
5. Softened water is provided to the campus from the central water softener located in the basement of the maintenance building.
6. As in the other correctional facilities in Ionia, the city water is in poor condition and destroy fitting, especially on the softener and domestic hot water heat exchanger.
7. The steam, condensate, domestic hot water supply/return and cold water piping is provided to each building through a tunnel system that connects the buildings.





The electric controls are disabled, disconnected, outdated and no longer available. Most of the temperature controls are manually operated. As part of this ECM all of the controls will be replaced with digital controls and Energy Management System. See **ECM #5: Energy Management System Upgrade/Expansion**



One of (4) air handlers in the school gym. Only (2) air handlers are working and they are turned on manually to control the temperature. The air handler is used to heat the game room if required.

As part of this ECM (2) air handler will be recommissioned including new motor, bearings, sheaves, belts, heating coils, pump, general cleaning.

See **ECM #1: Heating System Upgrade and Mechanical Re-Commissioning**



Water-cooled compressor for the walk in cooler would be changed to air-cooled. See **ECM #4: Water and Sewer Conservation and Water Cooled Compressor Replacement**



Approximately 50 small air handlers, split systems, roof top units have been added over the years with no connection to the energy management system.

See **ECM #5: Energy Management System Upgrade/Expansion**



Existing metal halide lights will be converted to fluorescent lamps with occupancy sensors to shut off the lights when the gym is empty.

This ECM is included in
ECM #2: Lighting Upgrade

ECM's investigated but not included due to long payback:



Almost all of the windows are original single pane and in poor condition. The cost to replace with double pane insulated security glass will exceed 15 years.

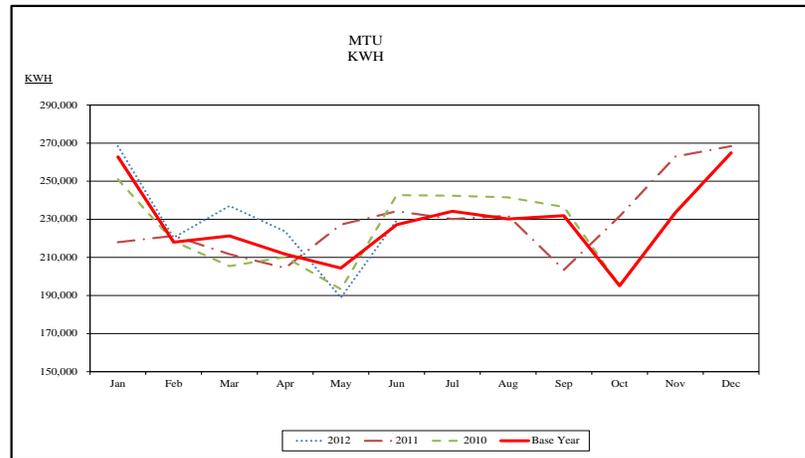
Section 2: Base Year Energy Usage

ELECTRICAL ENERGY CONSUMPTION

Power is provided by Consumers Energy with a average blended rate of \$.0946/KWH.

The following table is the electrical usage that will be used for the base year electrical usage.

| MTU Electric Summary | |
|----------------------|------------------------|
| Usage Date | Total Elec Usage (Kwh) |
| Base Year | |
| Oct-10 | 195,101 |
| Nov-10 | 233,500 |
| Dec-10 | 264,904 |
| Jan-11 | 262,800 |
| Feb-11 | 217,962 |
| Mar-11 | 221,312 |
| Apr-11 | 211,701 |
| May-11 | 204,405 |
| Jun-11 | 227,209 |
| Jul-11 | 234,226 |
| Aug-11 | 230,157 |
| Sep-11 | 231,885 |
| | 2,735,162 |



The above graph compares the base year the actual usage for 2010, 2011 and part of 2012.

NATURAL GAS UTILITY SUMMARY

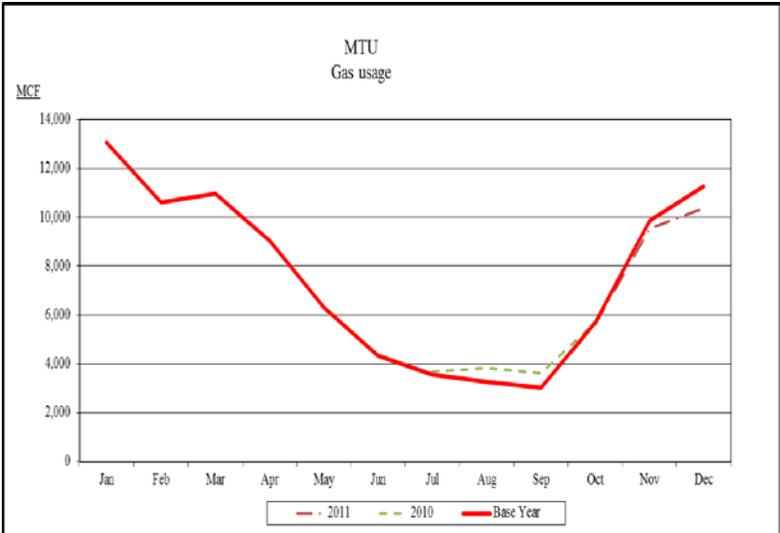
The DOC through the State of Michigan purchases gas through a broker or marketer and the gas is delivered to the facility by Consumers Energy. The price of natural gas due to recent drilling methods, a mild winter and economic recession is at an all-time low. We feel this will not continue and the cost of gas over the lifetime of the equipment will eventually rise. A report from BP (British Petroleum) projects the gas costs to rise to by 61% over the next 5 years

The estimated usage is based on inmate population and square feet. The following chart compares the estimated usage at MTU to the other facilities IBC is shown for reference only.

| Facility | Square Feet | Estimated MCF | inmates | Usage/ inmate | MCF/sq.ft. | % of Total Usage | Comments |
|--------------|------------------|----------------|--------------|---------------|--------------|------------------|-------------------------------|
| ICF | 295,000 | 53,251 | 706 | 75.43 | 0.181 | 21.40% | |
| MTU | 318,861 | 89,582 | 1,295 | 69.17 | 0.281 | 36.00% | |
| Dormitory | 62,652 | 15,428 | 240 | 64.28 | 0.246 | 6.20% | |
| RMI | 449,141 | 90,577 | 1,316 | 68.83 | 0.202 | 36.40% | Based on DOE-2 Energy Program |
| Total | 1,125,654 | 248,838 | 3,557 | 69.96 | 0.221 | | |
| IBC | 400,807 | 56,376 | 1,648 | 34.21 | 0.141 | | Shown for reference only |

The following table is a combination of metered gas usage at MTU and the estimated usage of steam provided from the Central Boiler Plant shown in the above chart.

| MTU Gas Usage Base Year | |
|-------------------------|-----------------------|
| Usage Date | Total Gas Usage (MCF) |
| Base Year | |
| Oct-10 | 5,718 |
| Nov-10 | 9,891 |
| Dec-10 | 11,284 |
| Jan-11 | 13,051 |
| Feb-11 | 10,611 |
| Mar-11 | 10,975 |
| Apr-11 | 9,039 |
| May-11 | 6,305 |
| Jun-11 | 4,343 |
| Jul-11 | 3,547 |
| Aug-11 | 3,267 |
| Sep-11 | 3,013 |
| Annual Totals = | 91,043 |



Note: Steam is provided from the central plant for heating, domestic hot water, kitchen steam kettles and clothes dryers. Steam is provided from the same central boiler plant to (3) other facilities. The usage shown for MTU is estimated based on square feet and inmate population.

WATER & SEWER UTILITY SUMMARY

MTU is provided water from the city of Ionia. Sewer is treated by the city of Ionia, and is collected and metered at a single location for the (5) facilities (IBC, ICF, RMI, MTU, Dorm). Water and sewer costs have increased in the past (2) years from \$5.72/KGAL to \$8.06/KGAL with another water increase scheduled for 2018.

The following is the actual metered usage for all water meters associated with MTU. We have assumed the sewer usage is the same as the water.

| MTU Water and Sewer Summary | |
|-----------------------------|--------------------|
| Usage Date | Total Usage (Kgal) |
| Base Year | |
| Dec-10 | 3,960 |
| Mar-11 | 3,948 |
| Jun-11 | 3,795 |
| Sep-11 | 3,940 |
| Annual Totals = | 15,643 |

UTILITY COST BASELINE & SUMMARY

The following table summarizes the base line usage and cost that will be used for the analysis energy savings.

A base year of October 2010 to September 2011 was selected.

| MTU Utility Base line Summary | | | | | | |
|-------------------------------|-------------------------|------|--------------------------------|---------------------|---------|--|
| Base Year Utility | Base Year Utility Usage | | Base Year Utility Cost (\$/yr) | Base Year Unit Cost | | Unit Cost Basis |
| Electricity | 2,735,162 | KWH | \$ 258,731 | \$0.0946 | \$/KWH | Actual blended \$/KWH based on base year costs |
| Natural Gas | 77,243 | MCF | \$ 471,956 | \$6.11 | \$/Mcf | Estimated average natural gas cost over the term of the contract |
| Water and Sewer | 15,643 | KGAL | \$ 126,083 | \$8.06 | \$/KGAL | Actual cost of water and sewer that took effect in June 2012 |
| Total | | | \$ 856,769 | | | |

Electric base year electric usage is the actual electric usage of MTU based on electric bills.

Natural gas base year usage is the actual natural gas bill serving the facilities and the estimated usage from the central plant based on inmate occupancy and square feet.

Water base year usage is the actual usage of MTU based on water bills.

Sewer base year usage is based on the water usage. All correctional facilities in Ionia are metered from a single location.

| Utility Rate | Regulatory Asset Recovery Surcharge | Surcharges (per month per meter) | | | Power Supply Cost Recovery (PSCR) | | Securitization | Securitization Tax | Stranded Costs | Electric Restructuring Implementation Program (ERIP) | DOE SNF Proceeds Surcharge |
|---------------|-------------------------------------|----------------------------------|--|--|-----------------------------------|----------------------|-----------------|--------------------------|-------------------------------|--|----------------------------|
| | | Renewable Energy Plan Surcharge | Energy Efficiency Electric Program Surcharge | Energy Efficiency Self-Directed Customer Surcharge | Maximum Allowable Factor | Actual Factor Billed | | | | | |
| GS Com | | \$ 14.40 | \$ 44.29 | \$ 1.17 | \$ (0.001940) | \$ (0.001940) | \$ 0.001387 | \$ 0.000682 | \$ 0.0009 | \$ 0.001134 | \$ (0.001376) |
| GS Ind | \$ 0.002916 | \$ 14.40 | \$ 44.29 | \$ 1.17 | \$ (0.001940) | \$ (0.001940) | \$ 0.001387 | \$ 0.000682 | \$ 0.0009 | \$ 0.001134 | \$ (0.001376) |
| GSD Com | | \$ 14.40 | \$ 44.29 | \$ 1.17 | \$ (0.001940) | \$ (0.001940) | \$ 0.001387 | \$ 0.000682 | \$ 0.0009 | \$ 0.001134 | \$ (0.001376) |
| GP Com | | \$ 90.00 | \$ 743.82 | \$ 17.49 | \$ (0.001940) | \$ (0.001940) | \$ 0.001387 | \$ 0.000682 | \$ 0.0009 | \$ 0.001134 | \$ (0.001376) |
| GPD Com | | \$ 90.00 | \$ 743.82 | \$ 17.49 | \$ (0.001940) | \$ (0.001940) | \$ 0.001387 | \$ 0.000682 | \$ 0.0009 | \$ 0.001134 | \$ (0.001376) |
| GML Com | | \$ 2.70 | | | \$ (0.001940) | \$ (0.001940) | \$ 0.001387 | \$ 0.000682 | | \$ 0.001134 | \$ (0.001376) |
| GUL Com | *Per light fixture | 25/luminaire | | | | | | | | \$ 0.001134 | \$ (0.001376) |
| GU Com | | \$ 1.40 | | | \$ (0.001940) | \$ (0.001940) | \$ 0.001387 | \$ 0.000682 | | \$ 0.001134 | \$ (0.001376) |
| | | | | | | | | | | | *For Customers <15kW |
| Voltage Level | Capacity Charge (per kW) | | Energy Charge (per kWh) | | | | Delivery Charge | | | Municipal Pumping Service Provision | |
| | On-Peak Summer | On-Peak Winter | On Peak Summer | On-Peak Winter | Off-Peak Summer | Off-Peak Winter | System Access | Capacity Charge (per kW) | Distribution Charge (per kWh) | On-Peak Summer (per kW) | On-Peak Winter (per kW) |
| GPD CVL3 | \$ 13.00 | \$ 11.00 | \$ 0.089475 | \$ 0.059475 | \$ 0.059475 | \$ 0.049475 | \$100/month | \$ 1.000000 | \$ 0.010443 | \$ (1.480000) | \$ (1.170000) |

*System Access charges are applicable to Full Service and Retail Open Access (ROA) Cust



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Date: February 5, 2013

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| Electric Base Year | | | | | | | | | |
|--------------------|--------------------|--------------|-------------------|----------------|-------------------------|-------------|--------------|------------|--------------|
| Facility Name | Address | Account No. | Meter No.(s) | Billing Period | On Peak Bill Demand Cap | On Peak kWh | Off Peak kWh | Max Demand | Total \$ Due |
| MTU | 1728 Bluewater Hwy | 100000351831 | 58763055/83710310 | 10/19/10 | 444 | 46,597 | 148,504 | 597 | \$ 18,950 |
| | | | | 11/19/10 | 397 | 56,692 | 176,808 | 597 | \$ 20,470 |
| | | | | 12/22/10 | 452 | 61,189 | 203,715 | 597 | \$ 22,361 |
| | | | | 01/24/11 | 450 | 65,700 | 197,100 | 597 | \$ 22,659 |
| | | | | 02/21/11 | 410 | 51,965 | 165,997 | 597 | \$ 19,473 |
| | | | | 03/22/11 | 376 | 52,584 | 168,728 | 597 | \$ 19,407 |
| | | | | 04/20/11 | 372 | 49,342 | 162,359 | 597 | \$ 18,766 |
| | | | | 05/20/11 | 409 | 49,676 | 154,729 | 597 | \$ 19,838 |
| | | | | 06/21/11 | 487 | 52,574 | 174,635 | 597 | \$ 24,189 |
| | | | | 07/21/11 | 477 | 58,931 | 175,295 | 597 | \$ 24,725 |
| | | | | 08/19/11 | 463 | 58,643 | 171,514 | 597 | \$ 24,183 |
| | | | | 09/20/11 | 454 | 51,807 | 180,078 | 488 | \$ 23,710 |
| MTU | 1960 Potters Road | 100011728142 | 88830809 | 10/19/10 | 14 | | | | \$ 21 |
| | | | | 11/19/10 | 35 | | | | \$ 28 |
| | | | | 12/22/10 | 31 | | | | \$ 18 |
| | | | | 01/22/11 | 40 | | | | \$ 24 |
| | | | | 02/22/11 | 40 | | | | \$ 25 |
| | | | | 03/22/11 | 128 | | | | \$ 35 |
| | | | | 04/20/11 | 21 | | | | \$ 22 |
| | | | | 05/20/11 | 60 | | | | \$ 27 |
| | | | | 06/20/11 | 62 | | | | \$ 28 |
| | | | | 07/20/11 | 148 | | | | \$ 40 |
| | 08/18/11 | 15 | | | | \$ 22 | | | |
| | 09/19/11 | 15 | | | | \$ 19 | | | |

| Water Base Line Year | | | | | | | | | | | | |
|----------------------|-------------------------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|--------------|
| Facility | Address | Account No. | Dec-10 | Actual cost | Mar-11 | Actual cost | Jun-11 | Actual cost | Sep-11 | Actual cost | Total | Total |
| MTU | 1728 Bluewater Hwy #Sml | 3642120000 | 2,680 | \$ 6,298.00 | 2,543 | \$ 5,976.05 | 2,605 | \$ 6,121.75 | 2,805 | \$ 6,591.75 | 10,633 | \$ 24,987.55 |
| MTU | 1728 Bluewater Hwy #Big | 3642110000 | 1,280 | \$ 3,008.00 | 1,405 | \$ 3,301.75 | 1,190 | \$ 2,796.50 | 1,135 | \$ 2,667.25 | 5,010 | \$ 11,773.50 |

| Utility Rate | Energy Efficiency | Transportation | Gas Charges | | | | | |
|--------------|-------------------|----------------|-----------------|------------------|---------------------|------------------|-------------------|----------------|
| | | | Customer Charge | Gas Distribution | Energy Optimization | Interim Increase | Gas Cost Recovery | Total per unit |
| LT-1 | 0.1601 | 0.6276 | | | | \$0.021800 | | \$0.809500 |
| GS-2 Com | | | \$18.20/month | \$1.939739 | \$0.159935 | \$0.063192 | \$5.450163 | \$7.613029 |
| GS-3 Com | | | \$180.33/month | \$1.004302 | \$0.111997264 | | \$6.3474008 | \$7.463700 |

| Gas Base Year | | | | | | | |
|---------------|--------------------|--------------|--------------|---------------|-------|--------------|------------|
| Facility Name | Address | Utility Rate | Meter No.(s) | Billing Month | Unit | Total \$ Due | \$/Unit |
| MTU | 1758 Bluewater Hwy | LT-1 | 5520490 | Jan-11 | 164.2 | \$884.15 | \$5.384592 |
| | | | | Feb-11 | 126.6 | \$684.47 | \$5.406556 |
| | | | | Mar-11 | 117.7 | \$609.26 | \$5.176381 |
| | | | | Apr-11 | 106.4 | \$562.44 | \$5.286090 |
| | | | | May-11 | 107.5 | \$582.51 | \$5.418698 |
| | | | | Jun-11 | 118.5 | \$652.58 | \$5.507004 |
| | | | | Jul-11 | 105.7 | \$586.05 | \$5.544465 |
| | | | | Aug-11 | 113.4 | \$605.65 | \$5.340829 |
| | | | | Sep-11 | 106.6 | \$558.90 | \$5.242964 |
| | | | | Oct-11 | 103.2 | \$540.25 | \$5.234981 |
| | | | | Nov-11 | 128.8 | \$645.21 | \$5.009394 |
| | | | | Dec-11 | 130.2 | \$628.13 | \$4.824347 |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

Section 3: Energy Conservation Measures

Based on conversations with DTMB and MDOC, the following are the recommended ECM's for the MTU Campus. ECM#1 is based on the 15 year option. ECM #2 through 5 can be part of the 12 or 15 year package.

ECM #1: Heating System Upgrade and Mechanical Re-Commissioning

ECM #2: Lighting Upgrade

ECM #3: Building Envelope

ECM #4: Water and Sewer Conservation and Water Cooled Compressor Replacement

ECM #5: Energy Management System Upgrade/Expansion

Construction Cost Estimate

Client MDOC and DTMB
Project MTU
Location Ionia, MI

Estimate/Rev. Date: 2-13-13
Contract #: Y12299

| | Qty. | Unit | Unit Cost | Total |
|---|------|-------|------------------|-----------|
| LIGHTING UPGRADE | | | | |
| (1) Relamps | 1 | LS | \$11,376 | \$11,376 |
| (2) Relamp/Reballast | 1 | LS | \$130,827 | \$130,827 |
| (3) Reflector Retrofits | 1 | LS | \$79,634 | \$79,634 |
| (4) New fixtures | 1 | LS | \$39,817 | \$39,817 |
| (5) LED | 1 | LS | \$290,095 | \$290,095 |
| (6) Occupancy sensors | 1 | LS | \$17,064 | \$17,064 |
| TOTAL LIGHTING UPGRADE | | | \$568,814 | |
| BUILDING ENVELOPE | | | | |
| (1) Weatherstripping, roof/wall sealing | 1 | LS | \$20,650 | \$20,650 |
| (2) | | | | \$0 |
| TOTAL BUILDING ENVELOPE | | | \$20,650 | |
| WATER/SEWER CONSERVATION | | | | |
| (1) Inmate Flush Valves | 1 | LS | \$372,395 | \$372,395 |
| (2) Inmate Lavatory Valves | 1 | LS | \$190,159 | \$190,159 |
| (3) Inmate Shower Valves | 1 | LS | \$198,083 | \$198,083 |
| (4) Staff Valves | 1 | LS | \$31,693 | \$31,693 |
| TOTAL WATER/SEWER CONSERVATION | | | \$792,330 | |
| ENERGY MANAGEMENT SYS. UPGRADE/EXPANSION/VARIABLE SPEED DRIVES | | | | |
| (1) Control points | 1 | LS | \$617,922 | \$617,922 |
| (2) Program., eng., software, computer, graphics, training, portable computer(% of control points cost) | 1 | 12.5% | \$77,240 | \$77,240 |
| (3) | | | | \$0 |
| TOTAL ENERGY MANAGEMENT SYS. UPGRADE/EXPANSION/VARIABLE SPEED DRIVES | | | \$695,163 | |

Estimates +/- 10% and are based on Means, past experience, vendor pricing and contractor review.

The above is a summary of the estimated costs for the proposed ECM's. Further information can be found in the write up and description for each section. The above are for budgetary purposes only.

ECM #1: Heating System Upgrade and Mechanical Re-Commissioning

(ECM#1 is optional and based on 15 year financing)

RECOMMENDED ACTION

Replace existing steam heating with hi efficiency hot water boilers. This eliminates the need for the underground steam piping from the existing central plant, eliminates condensate pumps, steam traps. All of the existing steam coils and equipment will be replaced with a new hot water heating system including heating coils. Existing steam clothes dryers and steam kitchen equipment will be replaced.

Replace the existing domestic hot water heating system that currently uses steam with a new hi-efficiency water heaters.

Re-commission air handlers including: new heating coils, bearing, motors, clean unit, new outside air dampers, new return air dampers, new multizone dampers, and new heating valves.

Replace exhaust fans, heating pumps.

See **Central Boiler Plant ECM #1- Boiler Decentralization** for cost and savings.

EXISTING CONDITIONS

See **Central Boiler Plant ECM #1- Boiler Decentralization**

See **MTU Mechanical Equipment Matrix** following

All of the mechanical equipment is original (1950's) and in poor condition.

PROPOSED SYSTEMS

- See **Central Boiler Plant ECM #1- Boiler Decentralization**
(Summary: remove existing condensate tanks, steam traps, steam coils, steam heat exchangers, steam valves; provide new hi efficiency hot water boilers with piping, pumps, hot water coils; replace steam to hot water heat exchanger for domestic hot water with hi efficiency domestic water heaters).

Mechanical Recommissioning (See Central Boiler Plant ECM #1- Boiler Decentralization for further information) :

- Replace supply fan bearings
- Clean supply fan blower wheels
- Replace supply fan motors with new energy efficient.
- Replace supply fan sheaves, flywheels, and belts. Replace shafts where required. Rebalance central air handler.
- Replace outside air, return air, exhaust air and relief dampers as required.
- Replace return air fan bearings
- Clean return air fan blower wheel
- Replace return air fan motors with new energy efficient
- Replace return air fan sheaves, flywheels, and belts

- Replace general exhaust fans (excluding kitchen, welding, wood, shop or other specialty exhaust fans)
- Replace multi-zone dampers.
- Replace steam coils with hot water coils
- Replace hot water control valves
- Replace pipe mounted (including domestic hot water) and base mounted pumps older than 10 years. Rebalance at pump.
- Cleaning of entire air handling unit (excluding ductwork)
- Clean fresh air intakes.
- Labeling of all equipment
- Existing hot water finned tube radiation, unit heaters, and cabinet unit heaters to be reused.
- Existing shut off valves, balancing valves, dampers to be reused where possible. Allocation for new shut off, balancing valves, thermometers, pressure reducing valves, strainers, triple duty valves, etc. as required.
- (1) Year parts and labor warranty for all new and existing equipment that will be reused.

MTU Mechanical Equipment Matrix

Key

| | |
|------|---|
| AHU | Air Handling Unit |
| DDC | Direct Digital Controls (computer control) |
| DWH | Domestic Water Heater |
| EMS | Energy Management System |
| FTR | Finned Tube Radiation |
| HP | Horsepower of Motor(s) |
| HVAC | Heat, Ventilating, Air Conditioning Equipment (AHU, pumps, air conditioning, heat exchangers) |
| HW | Hot Water heating |
| HX | Heat Exchanger |
| MUAU | Make Up Air Unit (used to provide 100% outside air for ventilation or exhaust) |
| MZ | Multizone Air Handler (outdated type of heating and cooling system) |
| VAV | Variable Air Volume Air Handler (type of heating and cooling system) |
| VFD | Variable Frequency Drive (controls speed of motor) |

| Facility | Equip. | Serves | Install Date | HP (Qty.) /Hp ea. | Design Airflow (CFM)/ % OA | Heating (HW - hot water S - steam) | Cooling (Tons) | Equipment Service Life*1 (years) | Comments | ECM included in scope of work |
|--------------|-------------------|------------------|--------------|-------------------|----------------------------|------------------------------------|----------------|--|---|---|
| Food Service | 100% MUAU | Kitchen | 1980's | (1)/7.5 | 14,000/100% | S | | Existing age 58 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | 100% MUAU | Bakery | 1954 | (1)/5 | 7500/100% | S | | Existing age 58 Expected Life 20 Remaining 0 | Do not run. Causes pilot light to go out bakery ovens | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | AHU | Directors office | 1954 | (1)/ ¾ | 1200/30% | S | | Existing age 58 Expected Life 20 Remaining 0 | Do not use. Served by split system air cond. | Remove unit ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | AHU | Dining | 1954 | (1)/5 | 7500/30% | S | | Existing age 58 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (5) Steam Kettles | | | | | | | Existing age -- Expected Life -- Remaining 0 | | Replace steam kettles with gas fired kettles ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |

| Facility | Equip. | Serves | Install Date | HP (Qty.) /Hp ea. | Design Airflow (CFM)/ % OA | Heating (HW - hot water S - steam) | Cooling (Tons) | Equipment Service Life*1 (years) | Comments | ECM included in scope of work |
|-------------|-------------------------|---------------------------|------------------|-------------------|----------------------------|------------------------------------|----------------|---|---|--|
| | Water cooled Compressor | Walk in cooler | 1980's | | | | | Existing age 20+ Expected Life 15 Remaining 0 | Once thru water cooled compressor for the walk in cooler | Replace compressor with air cooled ECM #4: Water and Sewer Conservation and Water Cooled Compressor Replacement |
| School | (12)Unit Heaters | Wood shop, auto shop | 1955 | | | S | | Existing age 57 Expected Life 20 Remaining 0 | | Replace steam with gas unit heaters ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | AHU | Library/ Inspectors Suite | 1955 | | | S | | Existing age 57 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | AHU | Shop | 1955 | | | S | | Existing age 57 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | AHU | Classrooms | 1955 | | | S | | Existing age 57 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | AHU | Auditorium | 1955 | | | S | | Existing age 57 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | Misc Offices | (3)RTU | 1990's To 2000's | | | No hgt | 4 tons each | Existing age -- Expected Life 20 Remaining -- | Cooling only, missing economizers | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | Offices | Split systems | 2000's | | | No. hgt. | | Existing age 10 Expected Life 20 Remaining 10 | | No work |
| Field House | (4)AHU | Gym | 1962 | (4)/2 | 6300 | S | | Existing age 50 Expected Life 20 Remaining 0 | (2) units do not work, (1) adequately heats the gym. Manually operated. | Mechanical Re-commissioning on (2) AHU, (2) to be removed ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |

| Facility | Equip. | Serves | Install Date | HP (Qty.) /Hp ea. | Design Airflow (CFM)/ % OA | Heating (HW - hot water S - steam) | Cooling (Tons) | Equipment Service Life*1 (years) | Comments | ECM included in scope of work |
|----------------------|---------------------------------------|----------------|--------------|-------------------|----------------------------|------------------------------------|----------------|--|--|---|
| | (3) zone Multizone AHU | Lobby/office | 1962 | (1)/5 | 5430 | S | | Existing age 50 Expected Life 20 Remaining 0 | Operated manually. | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | FTR, Convector | Offices, lobby | 1962 | | | S | | Existing age 50 Expected Life 20 Remaining 0 | Not operating properly – gym unit often used to help heat lobby. | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (5) Exhaust Fans and (4) Relief Vents | Building | 1962 | (4) fract. | 900 to 1200 | | | Existing age 50 Expected Life 15 Remaining 0 | | To be replaced ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| Housing unit D, E | (5) zone MZ | | 1968 | 5 | 6650 | S | | Existing age 44 Expected Life 20 Remaining 0 | Make up air. Ventilation for cells from windows. | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (6) zone pumps | FTR zones | 1968 | (6)/ Fract. | | HW | | Existing age 44 Expected Life 20 Remaining 0 | Pumps have been replaced as required. | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (3) Ex. Fan and (1) Relief Vents | Building | 1968 | (3)/ Fract. | | | | Existing age 44 Expected Life 15 Remaining 0 | | To be replaced ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (1) Clothes Dryer | | 1968 | | | S | | | Several steam coils have been replaced | To be replaced with gas dryers ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| Housing unit A, B, C | (6) zone MZ | Cells | 1961 | (1)/5 | 10760 | S | | Existing age 51 Expected Life 20 Remaining 0 | 6 zones | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (4) exhaust fans | Cells | 1961 | (4)/ Fract. | | | | Existing age 51 Expected Life 15 Remaining 0 | | Replace exhaust fans ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |

| Facility | Equip. | Serves | Install Date | HP (Qty.) /Hp ea. | Design Airflow (CFM)/ % OA | Heating (HW - hot water S - steam) | Cooling (Tons) | Equipment Service Life*1 (years) | Comments | ECM included in scope of work |
|----------------|--------------------------------------|-------------------|--------------|-------------------|----------------------------|------------------------------------|----------------|--|---|--|
| | (1)Clothes Dryer | | 1968 | | | S | | | Several steam coils have been replaced | To be replaced with gas dryers ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| Housing Unit F | AHU | Cells ventilation | 1971 | (1)/5 | 7000 | S | | Existing age 41 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (4) zone MZ | Day room | 1971 | (1)/5 | 6100/100% | S | | Existing age 41 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (6) zone pumps | FTR zones | 1968 | (6)/Fract. | | HW | | Existing age 44 Expected Life 15 Remaining 0 | | Replace zone pumps ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (5) exhaust fans and (1) relief vent | Cells | 1961 | (4)/Fract. | | | | Existing age 51 Expected Life 15 Remaining 0 | | Replace exhaust fans and relief vents ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | (1)Clothes Dryer | | 1968 | | | S | | | Several steam coils have been replaced | Replace steam dryers gas dryers ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| Maintenance | (6) Unit heaters | | 1957 | | | S | | Existing age 45 Expected Life 20 Remaining 0 | | Replace steam UH with gas ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | Domestic Water Heater | All buildings | 1957 | | | | | Existing age 55 Expected Life 20 Remaining 0 | Central domestic hot water for all buildings. Steam to hot water heat exchanger. (1) Heat exchanger replaced in 2012 | Replace with hi efficiency ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | Softener | All Buildings | | | | | | Existing age Expected Life 20 Remaining | Parts have been replaced as required | Existing to remain |

| Facility | Equip. | Serves | Install Date | HP (Qty.) /Hp ea. | Design Airflow (CFM)/ % OA | Heating (HW - hot water S - steam) | Cooling (Tons) | Equipment Service Life*1 (years) | Comments | ECM included in scope of work |
|----------|--------|----------|--------------|-------------------|----------------------------|------------------------------------|----------------|--|---------------------------------|--|
| Admin. | AHU | Building | 1954 | (1)/ ¾ | 2785 | HW | | Existing age 58 Expected Life 20 Remaining 0 | Heating coils has been replaced | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |
| | FTR | Building | 1954 | | | HW | | Existing age 58 Expected Life 20 Remaining 0 | | Existing to remain |
| | DWH | | 1954 | | | | | Existing age 58 Expected Life 20 Remaining 0 | | Mechanical Re-commissioning ECM #1: Heating System Upgrade and Mechanical Re-Commissioning |

Notes: *1 Service life taken from ASHRAE where listed. Expected life has been adjusted for some equipment (ex: domestic water heaters) based on correctional usage. Where equipment is not listed expected life is based on similar equipment or experience.

Table 4 Comparison of Service Life Estimates

| Equipment Item | Median Service Life, Years | | Equipment Item | Median Service Life, Years | | Equipment Item | Median Service Life, Years | |
|-------------------------------------|----------------------------|-----------------|-----------------------------------|----------------------------|---------------|------------------------------|----------------------------|---------------|
| | Abramson et al. (2005) | Akalin (1978) | | Abramson et al. (2005) | Akalin (1978) | | Abramson et al. (2005) | Akalin (1978) |
| Air Conditioners | | | Air Terminals | | | Condensers | | |
| Window unit | N/A* | 10 | Diffusers, grilles, and registers | N/A* | 27 | Air-cooled | N/A | 20 |
| Residential single or split package | N/A* | 15 | Induction and fan-coil units | N/A* | 20 | Evaporative | N/A* | 20 |
| Commercial through-the-wall | N/A* | 15 | VAV and double-duct boxes | N/A* | 20 | Insulation | | |
| Water-cooled package | >24 | 15 | Air washers | N/A* | 17 | Molded | N/A* | 20 |
| Heat pumps | | | Ductwork | N/A* | 30 | Blanket | N/A* | 24 |
| Residential air-to-air | N/A* | 15 ^b | Dampers | N/A* | 20 | Pumps | | |
| Commercial air-to-air | N/A* | 15 | Fans | N/A* | | Base-mounted | N/A* | 20 |
| Commercial water-to-air | >24 | 19 | Centrifugal | N/A* | 25 | Pipe-mounted | N/A* | 10 |
| Roof-top air conditioners | | | Axial | N/A* | 20 | Sump and well | N/A* | 10 |
| Single-zone | N/A* | 15 | Propeller | N/A* | 15 | Condensate | N/A* | 15 |
| Multizone | N/A* | 15 | Ventilating roof-mounted | N/A* | 20 | Reciprocating engines | N/A* | 20 |
| Boilers, Hot-Water (Steam) | | | Coils | | | Steam turbines | N/A* | 30 |
| Steel water-tube | >22 | 24 (30) | DX, water, or steam | N/A* | 20 | Electric motors | N/A* | 18 |
| Steel fire-tube | | 25 (25) | Electric | N/A* | 15 | Motor starters | N/A* | 17 |
| Cast iron | N/A* | 35 (30) | Heat Exchangers | | | Electric transformers | N/A* | 30 |
| Electric | N/A* | 15 | Shell-and-tube | N/A* | 24 | Controls | | |
| Burners | N/A* | 21 | Reciprocating compressors | N/A* | 20 | Pneumatic | N/A* | 20 |
| Furnaces | | | Packaged Chillers | | | Electric | N/A* | 16 |
| Gas- or oil-fired | N/A* | 18 | Reciprocating | N/A* | 20 | Electronic | N/A* | 15 |
| Unit heaters | | | Centrifugal | >25 | 23 | Valve actuators | | |
| Gas or electric | N/A* | 13 | Absorption | N/A* | 23 | Hydraulic | N/A* | 15 |
| Hot-water or steam | N/A* | 20 | Cooling Towers | | | Pneumatic | N/A* | 20 |
| Radiant heaters | | | Galvanized metal | >22 | 20 | Self-contained | | 10 |
| Electric | N/A* | 10 | Wood | N/A* | 20 | | | |
| Hot-water or steam | N/A* | 25 | Ceramic | N/A* | 34 | | | |

*N/A: Not enough data yet in Abramson et al. (2005). Note that data from Akalin (1978) for these categories may be outdated and not statistically relevant. Use these data with caution until enough updated data are accumulated in Abramson et al.

The service life of mechanical equipment where referenced to is taken from the above chart from ASHRAE (American Society of Heating, Refrigeration, and Air-conditioning Engineers). Our analysis includes no operational savings but this chart is useful to help in identifying potential energy conservation measures with operational or capital improvements. This chart is a general guide and many factors from original manufacturer to installation quality and maintenance must be considered.

ECM #2: Lighting Upgrade

RECOMMENDED ACTION

We recommend retrofitting the existing interior lighting with new, higher efficient lighting systems.

| | |
|--------------------------|------------------|
| Estimated Energy Savings | =562,617 KWH/yr. |
| Estimated Cost savings | =\$53,224/yr. |
| Implementation Cost | = \$823,065 |

Implementation costs includes design and engineering, project management, contingency, performance, overhead and profit.

*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

EXISTING CONDITIONS

MTU's existing lighting system consists of a blend of multiple generations of technology. Both 4 foot and 8 foot T12 and T8 lamps exist throughout the facility. T12 ballasts are a mixture of PCB containing standard magnetic, and non-PCB containing energy saving magnetic, while T8 ballasts are first generation electronic. There are also a number of high pressure sodium and metal halide high intensity discharge fixtures with magnetic ballasts throughout the buildings.

PROPOSED SYSTEMS

Proposed lighting energy conservation measures will address 3,701 fixtures and create an upgraded the fixture count of 3,494, detailed in the room by room section. A combination of replacing, relamping, reballasting, and retrofitting existing fixtures with 28 watt T8 lamps and the latest generation of high efficiency electronic ballasts. Specular reflectors will be used to retrofit and delamp wherever possible to reduce the overall quantity of lamps and ballasts throughout the facilities. Existing HID fixtures will be replaced with high bay fluorescent fixtures with high output T5 lamps and electronic ballasts. The combination of more efficient technology, standardized lamps and ballasts, and a new lighting system that will not need to be maintained for several years will result not only significant energy savings, but reduced operational and maintenance costs as well.

SAVINGS CALCULATIONS

Lighting

Refer to room by room chart for values

$$\text{KWH savings} = (\text{Existing Watts/fixture} \times \text{Existing quantity of fixtures} - \text{Proposed Watts/Fixture} \times \text{Proposed quantity of fixtures}) / 1000 \text{ KWH/Watt} \times \text{Hours}$$

$$\text{\$ Savings} = \text{KWH savings} \times \text{\$/KWH}$$

Occupancy Sensors

KWH savings Occupancy Sensor = Proposed Watts/fixture x Proposed quantity of fixtures x (non-occupancy sensor operating hours – occupancy sensor operating hours)

\$ Savings = KWH savings Occupancy sensor x \$/KWH

SCOPE

Campus Wide:

Existing 2x4 (3) and (4) T8 lamp troffers will be retrofitted with specular reflectors, F028 T8 lamps and high efficiency electronic ballasts.

Existing 2x4 (3) and (4) T8 lamp troffers, with annual hours of operation at or below 1999, will be relamped with F028 T8 lamps.

Existing 2x4 (2) T8 and T12 lamp troffers will be relamped and reballasted with F028 T8 lamps and high efficiency electronic ballasts.

Existing 2x4 (2) T8 lamp troffers, with annual hours of operation at or below 1999, will be relamped with F028 T8 lamps.

Existing 1x4 (2) T8 and T12 lamp troffers will be retrofitted with specular reflectors, F028 T8 lamps and high efficiency electronic ballasts

Existing 1x4 (2) T8 troffers, with annual hours of operation at or below 1999, will be relamped with F028 T8 lamps.

Existing 2x2 (2) T8 u-bend lamp troffers will be retrofitted with specular reflectors, F017 T8 lamps and high efficiency electronic ballasts.

Existing 4' (2), (3) and (4) T8 and T12 lamp fixtures will be relamped and reballasted with F028 T8 lamps and high efficiency electronic ballasts.

Existing 4' (2), (3) and (4) T8 lamp fixtures, with annual hours of operation at or below 2999, will be relamped with F028 T8 lamps.

Certain existing 4' (2) T8 lamp wrap fixtures will be replaced with new wrap fixtures with specular reflectors, F028 T8 lamps and high efficiency electronic ballasts.

Existing 8' (2) T8 and T12 lamp industrial fixtures will be retrofitted with specular reflectors, F028 T8 lamps and high efficiency electronic ballasts.

Existing 8' (2) T8 and T12 lamp strip fixtures will be retrofitted with specular reflectors, F028 T8 lamps and high efficiency electronic ballasts.

Existing 8' (2) T8 and T12 lamp vapor tight fixtures will be replaced with new vapor tight fixtures with specular reflectors, F028 T8 lamps and high efficiency electronic ballasts.

Existing 2x4 LED troffers are energy efficient, nothing will be done.

Existing 400 watt metal halide high bay fixtures will be replaced with new high bay fixtures with specular reflectors, F028 T8 lamps and high efficiency electronic ballasts.

Existing incandescent lamp fixtures will be relamped with compact fluorescent lamps.

Existing compact fluorescent lamps are energy efficient, nothing will be done.

Existing incandescent and compact fluorescent exit signs will be replaced with new LED exit signs.

Exterior (Attached to Building) – Existing 70 and 250 watt high pressure sodium wall pack fixtures will be replaced with new LED wall pack fixtures with high efficiency electronic drivers.

Exterior (Attached to Building) – Existing 175 watt metal halide wall pack fixtures will be replaced with new LED wall pack fixtures with high efficiency electronic drivers.

Exterior (Attached to Building) – Existing 150 watt high pressure sodium canopy fixtures will be replaced with new LED canopy fixtures with high efficiency electronic ballasts.

Exterior (Attached to Building) – Existing 100 watt metal halide recess can fixtures will be retrofitted with compact fluorescent lamps and high efficiency electronic ballasts.

Exterior (Attached to Building) – Existing 400 watt high pressure sodium flood fixtures will be replaced with new LED flood fixtures with high efficiency electronic drivers.

SITE LIGHTING OPTION

Existing 400 watt high pressure sodium flood fixtures will be replaced with new LED flood fixtures with high efficiency electronic drivers.

Existing 600 watt high pressure sodium flood fixtures are energy efficient, nothing will be done.

Existing 250 and 400 watt high pressure sodium shoebox fixtures will be replaced with new LED fixtures with high efficiency drivers.

Exterior – Existing 175 watt mercury vapor barn light fixtures will be replaced with new LED wall pack fixtures with high efficiency electronic drivers.

OCCUPANCY SENSOR OPTION

There is good opportunity to install occupancy sensors (in non-inmate areas) throughout the prison complex buildings. Many areas have long hours of operation and the use of occupancy sensors will allow these areas with lower occupancy to reduce lighting energy consumption.

Types of occupancy sensors to be installed: wall mounted, ceiling mounted low voltage, ceiling mounted line voltage and ceiling mounted dual technology.

Typical areas to have occupancy sensors installed:

Break Rooms
Receptions
Conferences
Property Rooms

Meeting Rooms
Copy Rooms
Activities Rooms
Restrooms

Offices
Mail Rooms
Gyms
Library

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC01 | HALLWAY | 1,500 | 6 | 50 | 6 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | HALLWAY | 8,760 | 3 | 50 | 3 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 8 | 50 | 8 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 8,760 | 3 | 50 | 3 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 3 | 80 | 3 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 6 | 80 | 6 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 1 | 50 | 1 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 8,760 | 1 | 50 | 1 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|------------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC01 | STORAGE | 1,000 | 7 | 50 | 7 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 8,760 | 2 | 50 | 2 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 1 | 138 | 1 | 48 | WRAP: SURFACE MOUNTED WITH NARROW 8' BODY, ICE TRAY LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | WRAP: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 8,760 | 1 | 138 | 1 | 48 | WRAP: SURFACE MOUNTED WITH NARROW 8' BODY, ICE TRAY LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | WRAP: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | LAUNDRY | 1,000 | 2 | 80 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | OFFICE / STORAGE | 1,000 | 5 | 80 | 5 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS |



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Date: February 5, 2013

*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | MECH | 1,000 | 2 | 80 | 2 | 42 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 10 | 80 | 10 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 3 | 80 | 3 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | REST | 1,000 | 1 | 50 | 1 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC01 | STORAGE | 1,000 | 3 | 50 | 3 | 22 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 34 WATT T12 LAMP, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | BREAK RM | 2,500 | 10 | 112 | 10 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | REST | 1,500 | 1 | 89 | 1 | 73 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | MEETING RM | 2,000 | 8 | 112 | 8 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 1 | 112 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | STORAGE | 500 | 1 | 112 | 1 | 98 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | HALLWAY | 2,500 | 8 | 89 | 8 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | HALLWAY | 8,760 | 2 | 89 | 2 | 48 | TROFFER: RECESS | TROFFER: |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | ENTRY | 8,760 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | RECEPTION | 8,760 | 12 | 59 | 12 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | RESTS (5) | 3,000 | 2 | 109 | 2 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | HALLWAY | 2,500 | 10 | 59 | 10 | 29 | TROFFER: RECESS MOUNTED WITH 2'X2' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 U-BEND LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X2' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 2' 17 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | HALLWAY | 8,760 | 2 | 59 | 2 | 29 | TROFFER: RECESS | TROFFER: |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | MOUNTED WITH 2'X2' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 U-BEND LAMPS, AND (1) ELECTRONIC BALLAST | UNIVERSAL 2'X2' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 2' 17 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 2 | 59 | 2 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | OFFICE | 2,000 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | DISPATCH | 3,000 | 1 | 89 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OPEN OFFICE | 2,500 | 6 | 89 | 6 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 2 | 89 | 2 | 48 | TROFFER: RECESS | TROFFER: |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 4 | 89 | 4 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OPEN OFFICE | 2,500 | 5 | 89 | 5 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | STORAGE | 2,000 | 1 | 89 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | COPY RM | 1,800 | 2 | 89 | 2 | 73 | TROFFER: RECESS | RELAMP WITH (3) |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | OFFICE | 2,000 | 4 | 89 | 4 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | REST | 3,000 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC02 | MENS REST | 1,500 | 2 | 89 | 2 | 73 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | WOMENS REST | 1,500 | 2 | 89 | 2 | 73 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | CUST | 500 | 1 | 59 | 1 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | HALLWAY | 2,500 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 2 | 112 | 2 | 48 | TROFFER: RECESS | TROFFER: |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | CONTROL RM | 2,000 | 6 | 89 | 6 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 2 | 112 | 2 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | HOLDING CELL | 8,760 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | HALLWAY | 6,550 | 2 | 59 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | REST | 1,500 | 1 | 18 | 1 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC02 | DAY RM | 3,300 | 21 | 59 | 21 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC02 | OFFICE | 2,000 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | HALLWAY | 6,550 | 3 | 59 | 3 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | HALLWAY | 8,760 | 1 | 59 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | CONTROL RM | 2,000 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | METAL DETECTOR RM | 8,760 | 2 | 59 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | ACTIVE STORAGE | 2,000 | 3 | 89 | 3 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|----------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC02 | ACTIVE STORAGE | 2,000 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | ACTIVE STORAGE | 2,000 | 2 | 59 | 2 | 50 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | HALLWAY | 2,500 | 6 | 59 | 6 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | HALLWAY | 8,760 | 2 | 59 | 2 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | MENS REST | 2,500 | 1 | 112 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | WOMENS REST | 2,500 | 1 | 112 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC02 | OFFICE | 2,000 | 6 | 112 | 6 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OFFICE | 2,000 | 3 | 112 | 3 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | MAIL RM | 2,000 | 6 | 112 | 6 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | CONFERENCE | 1,800 | 8 | 112 | 8 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | OPEN OFFICE | 2,500 | 10 | 112 | 10 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC02 | OFFICE | 2,000 | 4 | 112 | 4 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC02 | STORAGE | 500 | 2 | 112 | 2 | 98 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | OFFICE | 2,000 | 2 | 112 | 2 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC02 | EXTERIOR | 4,380 | 8 | 95 | 8 | 12 | WALLPACK: WITH (1) 70 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 12 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC02 | EXTERIOR | 4,380 | 2 | 95 | 2 | 12 | WALLPACK: WITH (1) 70 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 12 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC02 | EXTERIOR | 4,380 | 2 | 188 | 2 | 35 | WALLPACK: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC02 | EXITS | 8,760 | 2 | 15 | 2 | 2 | EXIT SIGN WITH (2) TWIN TUBE 7 WATT COMPACT FLUORESCENT LAMPS, (1) MAGNETIC BALLAST | EXIT SIGN: NEW REPLACEMENT FIXTURE WITH (1) 2 WATT LED LIGHT ENGINE, AND EMERGENCY BATTERY BACKUP |
| HC02VEND | VENDING | 8,760 | 4 | 427 | 4 | 427 | COLD VENDING MACHINE | LEAVE ALONE |
| HC03 | HALLWAY | 4,100 | 1 | 59 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | HALLWAY | 8,760 | 1 | 59 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | PROPERTY RM | 1,500 | 4 | 30 | 4 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC03 | OFFICE | 2,000 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC03 | REST | 8,760 | 1 | 59 | 1 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | REST | 8,760 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC03 | STORAGE | 500 | 3 | 59 | 3 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC03 | OFFICE | 2,000 | 1 | 112 | 1 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|---------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | |
| HC03 | STORAGE | 500 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC03 | PROPERTY RM | 3,000 | 6 | 59 | 6 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | ACTIVITIES RM | 4,100 | 7 | 59 | 7 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | ACTIVITIES RM | 8,760 | 2 | 59 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | ACTIVITIES RM | 4,100 | 20 | 59 | 10 | 84 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TANDEM RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | ACTIVITIES RM | 4,100 | 10 | 59 | 5 | 84 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TANDEM RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | ACTIVITIES RM | 4,100 | 6 | 59 | 3 | 84 | WRAP: SURFACE MOUNTED WITH | TANDEM RELAMP REBALLAST WITH |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | GYM | 3,000 | 12 | 458 | 12 | 218 | HIGHBAY: WITH (1) 400 WATT METAL HALIDE LAMP AND (1) MAGNETIC BALLAST | HIGH BAY: NEW REPLACEMENT FIXTURE WITH SPECULAR REFLECTOR, (4) LINEAR 4' 54 WATT T5HO LAMPS, (1) UNIVERSAL VOLTAGE PROGRAM START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | WEIGHT RM | 8,760 | 8 | 59 | 8 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | GYM OFFICE | 2,000 | 3 | 59 | 3 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | GYM STORAGE | 500 | 3 | 59 | 3 | 50 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC03 | INMATE REST | 4,100 | 1 | 59 | 1 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | BALLAST |
| HC03 | CUST | 500 | 1 | 15 | 1 | 15 | 15 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC03 | BARBER SHOP | 3,000 | 1 | 112 | 1 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC03 | EXTERIOR | 4,380 | 2 | 188 | 2 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC03 | EXTERIOR | 4,380 | 2 | 128 | 2 | 35 | JELLY JAR: WITH (1) 100 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC03 | EXTERIOR | 4,380 | 1 | 188 | 1 | 35 | WALLPACK: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC04 | DRY STORAGE | 6,150 | 10 | 72 | 5 | 48 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | TROFFER: UNIVERSAL 1'X8' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | DRY STORAGE | 6,150 | 1 | 72 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | INMATE REST | 1,500 | 2 | 72 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC | TROFFER: UNIVERSAL 1'X8' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | BALLAST | POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | RECEIVING | 6,150 | 2 | 123 | 2 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | RECEIVING | 6,150 | 1 | 72 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | RECEIVING | 6,150 | 1 | 72 | 1 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | KITCHEN | 6,150 | 29 | 60 | 29 | 60 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 60 WATT LED LAMP AND (1) ELECTRONIC DRIVER | LEAVE ALONE |
| HC04 | KITCHEN | 6,150 | 4 | 72 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | HOODS | 6,150 | 8 | 59 | 8 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|----------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | T8 LAMPS, AND (1) ELECTRONIC BALLAST | UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | OFFICE | 4,500 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | ACTIVE STORAGE | 6,150 | 2 | 123 | 2 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | ACTIVE STORAGE | 6,150 | 3 | 72 | 3 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | DISH RM | 6,150 | 1 | 72 | 1 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | DISH RM | 6,150 | 1 | 123 | 1 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|---------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | OFFICE | 4,500 | 4 | 89 | 4 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | CAFETERIA | 6,150 | 6 | 72 | 6 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | CAFETERIA | 6,150 | 73 | 59 | 73 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | CAFETERIA | 8,760 | 10 | 59 | 10 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | GUARD LOCKERS | 6,150 | 6 | 72 | 6 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | ENTRY | 8,760 | 2 | 123 | 2 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | DISH RM | 6,150 | 8 | 60 | 8 | 60 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (1) LINEAR 4' 60 WATT LED LAMP AND (1) ELECTRONIC DRIVER | LEAVE ALONE |
| HC04 | FREEZER | 6,150 | 2 | 72 | 2 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | FREEZER | 6,150 | 7 | 123 | 7 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | FREEZER | 6,150 | 8 | 18 | 8 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC04 | REST | 1,500 | 1 | 72 | 1 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | MISC | 6,150 | 6 | 123 | 6 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | BALLAST | START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC04 | EXTERIOR | 4,380 | 2 | 205 | 2 | 70 | WALLPACK: WITH (1) 175 WATT METAL HALIDE LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC04 | EXTERIOR | 4,380 | 6 | 188 | 6 | 35 | WALLPACK: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC05 | STORAGE BARN | 1,500 | 2 | 123 | 2 | 42 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | VAPOR TIGHT: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC05 | EXTERIOR | 4,380 | 1 | 95 | 1 | 12 | WALLPACK: WITH (1) 70 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 12 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC05 | EXTERIOR | 4,380 | 1 | 205 | 1 | 70 | WALLPACK: WITH (1) 175 WATT METAL HALIDE LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC06 | GUARD SHACKS | 4,380 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC06 | GUARD TOWERS | 4,380 | 10 | 89 | 10 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | ELECTRONIC BALLAST |
| HC07 | HALLWAY | 3,750 | 8 | 59 | 8 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | HALLWAY | 8,760 | 2 | 59 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | STAFF REST | 1,500 | 1 | 30 | 1 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC07 | OFFICE | 2,000 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC07 | STORAGE | 500 | 1 | 30 | 1 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC07 | WAITING RM | 3,750 | 2 | 59 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | OFFICE | 2,000 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC07 | MECH | 1,000 | 6 | 109 | 6 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH | INDUSTRIAL: UNIVERSAL NARROW 8' BODY |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | MECH | 1,000 | 1 | 72 | 1 | 42 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | MECH | 1,000 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC07 | DENTAL EXAM | 3,000 | 10 | 89 | 10 | 63 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, PARABOLIC LOUVER, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (3) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | OFFICE | 2,000 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC07 | OFFICE | 2,000 | 2 | 59 | 2 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC07 | MED STORAGE | 3,000 | 4 | 59 | 4 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-----------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC07 | OFFICE | 2,000 | 2 | 59 | 2 | 25 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | REST | 3,750 | 1 | 59 | 1 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | OFFICE | 2,000 | 3 | 59 | 3 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | COPY | 2,000 | 2 | 59 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X8' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | REST | 3,750 | 1 | 59 | 1 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | MEDICAL RECORDS | 3,000 | 8 | 59 | 4 | 48 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, | TROFFER: UNIVERSAL 1'X8' RETROFIT KIT WITH |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-----------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | MEDICAL RECORDS | 3,000 | 1 | 59 | 1 | 29 | TROFFER: RECESS MOUNTED WITH 2'X2' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 U-BEND LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X2' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 2' 17 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | REST | 3,750 | 1 | 59 | 1 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | CUST | 500 | 1 | 18 | 1 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC07 | KITCHEN | 3,000 | 1 | 59 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | KITCHEN | 3,000 | 2 | 59 | 2 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | OPEN OFFICE | 3,750 | 4 | 89 | 4 | 63 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) | RELAMP REBALLAST WITH (3) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | OPEN OFFICE | 3,750 | 2 | 59 | 1 | 84 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TANDEM RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC07 | STAIRWELL | 8,760 | 1 | 18 | 1 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC07 | EXTERIOR | 4,380 | 1 | 188 | 1 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCCELL |
| HC08 | HALLWAYS | 8,760 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC08 | HALLWAYS | 6,550 | 90 | 30 | 90 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC08 | HALLWAYS | 8,760 | 20 | 30 | 20 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC08 | CELLS (117) | 2,000 | 117 | 59 | 117 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC08 | ENTRY | 6,550 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC08 | TV RM | 6,550 | 13 | 112 | 13 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | BALLAST |
| HC08 | TV RM | 8,760 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC08 | OFFICES (3) | 2,000 | 3 | 112 | 3 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC08 | CUSTS | 4,000 | 2 | 72 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC08 | SHOWERS | 6,550 | 12 | 30 | 12 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC08 | STAFF RESTS | 1,500 | 3 | 59 | 3 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC08 | OFFICES | 2,500 | 12 | 112 | 12 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC08 | WORK RM | 2,500 | 6 | 112 | 6 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC08 | INMATE RESTS | 6,550 | 10 | 59 | 10 | 42 | WRAP: SURFACE MOUNTED WITH | RELAMP REBALLAST WITH |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC08 | LAUNDRY | 6,550 | 4 | 59 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC08 | CUSTS | 500 | 2 | 59 | 2 | 50 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC08 | EXTERIOR | 4,380 | 2 | 188 | 2 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC08 | EXTERIOR | 4,380 | 8 | 295 | 8 | 70 | WALLPACK: WITH (1) 250 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC09 | HALLWAYS | 8,760 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC09 | HALLWAYS | 6,550 | 90 | 30 | 90 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC09 | HALLWAYS | 8,760 | 20 | 30 | 20 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC09 | CELLS (117) | 2,000 | 117 | 59 | 117 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | BALLAST | ELECTRONIC BALLAST |
| HC09 | ENTRY | 6,550 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC09 | TV RM | 6,550 | 13 | 112 | 13 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC09 | TV RM | 8,760 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC09 | OFFICES (3) | 2,000 | 3 | 112 | 3 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC09 | CUSTS | 4,000 | 2 | 72 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC09 | SHOWERS | 6,550 | 12 | 30 | 12 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC09 | STAFF RESTS | 1,500 | 3 | 59 | 3 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC09 | OFFICES | 2,500 | 12 | 112 | 12 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | |
| HC09 | WORK RM | 2,500 | 6 | 112 | 6 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC09 | INMATE RESTS | 6,550 | 10 | 59 | 10 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC09 | LAUNDRY | 6,550 | 4 | 59 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC09 | CUSTS | 500 | 2 | 59 | 2 | 50 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC09 | EXTERIOR | 4,380 | 2 | 188 | 2 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC09 | EXTERIOR | 4,380 | 8 | 295 | 8 | 70 | WALLPACK: WITH (1) 250 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC10 | HALLWAYS | 8,760 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC10 | HALLWAYS | 6,550 | 90 | 30 | 90 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT | LEAVE ALONE |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | LAMPS AND (1) ELECTRONIC BALLAST | |
| HC10 | HALLWAYS | 8,760 | 20 | 30 | 20 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC10 | CELLS (117) | 2,000 | 117 | 59 | 117 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC10 | ENTRY | 6,550 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC10 | TV RM | 6,550 | 13 | 112 | 13 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC10 | TV RM | 8,760 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC10 | OFFICES (3) | 2,000 | 3 | 112 | 3 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC10 | CUSTS | 4,000 | 2 | 72 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC10 | SHOWERS | 6,550 | 12 | 30 | 12 | 30 | CAN: RECESSED | LEAVE ALONE |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | |
| HC10 | STAFF RESTS | 1,500 | 3 | 59 | 3 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC10 | OFFICES | 2,500 | 12 | 112 | 12 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC10 | WORK RM | 2,500 | 6 | 112 | 6 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC10 | INMATE RESTS | 6,550 | 10 | 59 | 10 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC10 | LAUNDRY | 6,550 | 4 | 59 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC10 | CUSTS | 500 | 2 | 59 | 2 | 50 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC10 | EXTERIOR | 4,380 | 2 | 188 | 2 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | LAMP AND (1) MAGNETIC BALLAST | 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC10 | EXTERIOR | 4,380 | 8 | 295 | 8 | 70 | WALLPACK: WITH (1) 250 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC11 | HALLWAYS | 8,760 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC11 | HALLWAYS | 6,550 | 90 | 30 | 90 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC11 | HALLWAYS | 8,760 | 20 | 30 | 20 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC11 | CELLS (117) | 2,000 | 117 | 59 | 117 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC11 | ENTRY | 6,550 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC11 | TV RM | 6,550 | 13 | 112 | 13 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC11 | TV RM | 8,760 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC11 | OFFICES (3) | 2,000 | 3 | 112 | 3 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | |
| HC11 | CUSTS | 4,000 | 2 | 72 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC11 | SHOWERS | 6,550 | 12 | 30 | 12 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC11 | STAFF RESTS | 1,500 | 3 | 59 | 3 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC11 | OFFICES | 2,500 | 12 | 112 | 12 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC11 | WORK RM | 2,500 | 6 | 112 | 6 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC11 | INMATE RESTS | 6,550 | 10 | 59 | 10 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC11 | LAUNDRY | 6,550 | 4 | 59 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC11 | CUSTS | 500 | 2 | 59 | 2 | 50 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC11 | EXTERIOR | 4,380 | 2 | 188 | 2 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC11 | EXTERIOR | 4,380 | 8 | 295 | 8 | 70 | WALLPACK: WITH (1) 250 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC12 | HALLWAYS | 8,760 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC12 | HALLWAYS | 6,550 | 90 | 30 | 90 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC12 | HALLWAYS | 8,760 | 20 | 30 | 20 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC12 | CELLS (117) | 2,000 | 117 | 59 | 117 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC12 | ENTRY | 6,550 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC12 | TV RM | 6,550 | 13 | 112 | 13 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC12 | TV RM | 8,760 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC12 | OFFICES (3) | 2,000 | 3 | 112 | 3 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC12 | CUSTS | 4,000 | 2 | 72 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC12 | SHOWERS | 6,550 | 12 | 30 | 12 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC12 | STAFF RESTS | 1,500 | 3 | 59 | 3 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC12 | OFFICES | 2,500 | 12 | 112 | 12 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC12 | WORK RM | 2,500 | 6 | 112 | 6 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | ELECTRONIC BALLAST | |
| HC12 | INMATE RESTS | 6,550 | 10 | 59 | 10 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC12 | LAUNDRY | 6,550 | 4 | 59 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC12 | CUSTS | 500 | 2 | 59 | 2 | 50 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC12 | EXTERIOR | 4,380 | 2 | 188 | 2 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC12 | EXTERIOR | 4,380 | 8 | 295 | 8 | 70 | WALLPACK: WITH (1) 250 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC13 | HALLWAYS | 8,760 | 2 | 18 | 2 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC13 | HALLWAYS | 6,550 | 90 | 30 | 90 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC13 | HALLWAYS | 8,760 | 20 | 30 | 20 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC13 | CELLS (117) | 2,000 | 117 | 59 | 117 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC13 | ENTRY | 6,550 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC13 | TV RM | 6,550 | 13 | 112 | 13 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC13 | TV RM | 8,760 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC13 | OFFICES (3) | 2,000 | 3 | 112 | 3 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC13 | CUSTS | 4,000 | 2 | 72 | 2 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC13 | SHOWERS | 6,550 | 12 | 30 | 12 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC13 | STAFF RESTS | 1,500 | 3 | 59 | 3 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | BALLAST | |
| HC13 | OFFICES | 2,500 | 12 | 112 | 12 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC13 | WORK RM | 2,500 | 6 | 112 | 6 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC13 | INMATE RESTS | 6,550 | 10 | 59 | 10 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC13 | LAUNDRY | 6,550 | 4 | 59 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC13 | CUSTS | 500 | 2 | 59 | 2 | 50 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC13 | EXTERIOR | 4,380 | 2 | 188 | 2 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC13 | EXTERIOR | 4,380 | 8 | 295 | 8 | 70 | WALLPACK: WITH (1) 250 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 70 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC14 | LOUNGE | 3,000 | 4 | 138 | 4 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH | INDUSTRIAL: UNIVERSAL NARROW 8' BODY |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | LOCKSMITH | 2,000 | 2 | 138 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | GARAGE | 3,000 | 21 | 138 | 21 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | CUST | 500 | 1 | 15 | 1 | 15 | 15 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC14 | OPEN OFFICE | 3,000 | 9 | 89 | 9 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | REST | 1,500 | 1 | 56 | 1 | 29 | STRIP: SURFACE MOUNTED WITH NARROW 2' BODY, NO LENS, WHITE METAL BELLY PAN, (2) LINEAR 2' 20 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 2' 17 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | HALLWAY | 3,000 | 1 | 72 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, | RELAMP REBALLAST WITH (2) LINEAR 4' 28 |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | RESTS | 1,500 | 2 | 144 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 34 WATT T12 LAMPS, AND (2) ENERGY SAVING MAGNETIC BALLASTS | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | TOOL RM | 3,000 | 11 | 109 | 11 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | STAIRWELL | 4,000 | 1 | 59 | 1 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 5 | 109 | 5 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 8,760 | 2 | 109 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 4 | 123 | 4 | 48 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | INDUSTRIAL: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 8,760 | 2 | 123 | 2 | 48 | VAPOR TIGHT: SURFACE MOUNTED WITH NARROW 8' BODY, ACRYLIC LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC BALLAST | INDUSTRIAL: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 1 | 100 | 1 | 27 | 100 WATT INCANDESCENT LAMP | RELAMP WITH (1) SPIRAL 27 WATT COMPACT FLUORESCENT LAMP |
| HC14 | BASEMENT | 8,760 | 4 | 138 | 4 | 48 | STRIP: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | STRIP: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH WHITE METAL BELLY PAN, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 2 | 138 | 2 | 48 | STRIP: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | STRIP: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH WHITE METAL BELLY PAN, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 2 | 80 | 2 | 42 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 2 | 138 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 60 WATT T12 LAMPS, AND (1) STANDARD MAGNETIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 1 | 109 | 1 | 48 | STRIP: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL BELLY PAN, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | STRIP: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH WHITE METAL BELLY PAN, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC14 | BASEMENT | 1,000 | 2 | 15 | 2 | 15 | 15 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC14 | EXTERIOR | 4,380 | 2 | 128 | 2 | 35 | JELLY JAR: WITH (1) 100 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC14 | EXTERIOR | 4,380 | 4 | 188 | 4 | 35 | WALLPACK: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC15 | STORAGE | 1,000 | 19 | 109 | 19 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC15 | REST | 1,000 | 1 | 59 | 1 | 50 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 4' BODY, NO LENS, WHITE METAL REFLECTOR, (2) | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | |
| HC15 | OFFICE | 1,000 | 4 | 144 | 4 | 42 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 34 WATT T12 LAMPS, AND (2) ENERGY SAVING MAGNETIC BALLASTS | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC15 | OFFICE | 1,000 | 4 | 144 | 4 | 42 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 34 WATT T12 LAMPS, AND (2) ENERGY SAVING MAGNETIC BALLASTS | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC15 | EXTERIOR | 4,380 | 1 | 188 | 1 | 35 | WALLPACK: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC15 | EXTERIOR | 4,380 | 1 | 95 | 1 | 12 | WALLPACK: WITH (1) 70 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 12 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC16 | GENERATOR BUILDING | 1,000 | 18 | 109 | 18 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC16 | EXTERIOR | 4,380 | 3 | 188 | 3 | 35 | WALLPACK: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC17 | RECREATION SHACK | 2,900 | 4 | 72 | 4 | 42 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 34 WATT T12 LAMPS, AND (1) ENERGY SAVING MAGNETIC | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | BALLAST | BALLAST |
| HC17 | REST | 2,900 | 2 | 15 | 2 | 15 | 15 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC17 | EXTERIOR | 4,380 | 1 | 95 | 1 | 12 | WALLPACK: WITH (1) 70 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 12 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | T8 LAMPS, AND (1) ELECTRONIC BALLAST | LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 16 | 59 | 4 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,200 | 24 | 59 | 6 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OPEN OFFICE | 2,500 | 5 | 59 | 5 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | FILE RM | 1,800 | 1 | 30 | 1 | 30 | CAN: RECESSED WITH (2) 13 WATT | LEAVE ALONE |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | |
| HC18 | OFFICE | 1,700 | 2 | 59 | 2 | 50 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OFFICE | 2,000 | 4 | 59 | 4 | 25 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 1'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (1) LINEAR 4' 28 WATT T8 LAMP AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLOSET | 500 | 1 | 30 | 1 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC18 | CUST | 500 | 1 | 30 | 1 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC18 | REST | 3,750 | 4 | 59 | 1 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | REST | 3,750 | 1 | 59 | 1 | 48 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 8' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | ELECTRONIC BALLAST |
| HC18 | LIBRARY | 3,640 | 28 | 59 | 7 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | LIBRARY | 3,640 | 6 | 59 | 6 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | LIBRARY | 3,640 | 2 | 112 | 2 | 84 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (4) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | AUDITORIUM | 3,640 | 24 | 128 | 24 | 34 | CAN: RECESSED WITH (1) 100 WATT METAL HALIDE LAMP AND (1) MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) 32 WATT COMPACT FLOURESCENT LAMP AND (1) HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | AUDITORIUM | 3,640 | 16 | 18 | 16 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC18 | CLOSET | 500 | 1 | 18 | 1 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC18 | STAGE | 1,000 | 8 | 128 | 8 | 34 | CAN: RECESSED WITH (1) 100 WATT METAL HALIDE LAMP AND (1) MAGNETIC BALLAST | RELAMP REBALLAST WITH (1) 32 WATT COMPACT FLOURESCENT LAMP AND (1) HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLOSET | 500 | 1 | 59 | 1 | 50 | TROFFER: RECESS MOUNTED WITH 1'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|--|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | ELECTRONIC BALLAST | |
| HC18 | OFFICES (5) | 2,000 | 10 | 59 | 10 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | REST | 3,760 | 4 | 59 | 1 | 95 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WRAP: NEW NARROW 16' BODY REPLACEMENT FIXTURE WITH ACRYLIC LENS, SPECULAR REFLECTOR, (4) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 4 | 112 | 4 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OFFICE | 2,000 | 4 | 112 | 4 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OFFICE | 2,000 | 4 | 112 | 4 | 98 | WRAP: SURFACE MOUNTED WITH WIDE 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (4) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (4) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | CUST | 500 | 2 | 30 | 2 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC18 | REST | 1,500 | 1 | 30 | 1 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| HC18 | OFFICE | 2,000 | 8 | 59 | 8 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OPEN OFFICE | 2,500 | 6 | 59 | 6 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OPEN OFFICE | 2,500 | 5 | 89 | 5 | 73 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OFFICE | 2,000 | 2 | 109 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 1 | 109 | 1 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 2 | 109 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|----------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | ELECTRONIC BALLAST |
| HC18 | COPY | 1,800 | 1 | 89 | 1 | 73 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OFFICE | 2,000 | 2 | 89 | 2 | 73 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OFFICE | 2,000 | 2 | 89 | 2 | 73 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | HALLWAY / REST | 3,750 | 6 | 59 | 6 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | HALLWAY / REST | 8,760 | 2 | 59 | 2 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | AUTO SHOP | 3,300 | 35 | 109 | 35 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,300 | 5 | 59 | 5 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, | RELAMP REBALLAST WITH (2) LINEAR 4' 28 |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | COMPUTER LAB | 3,300 | 6 | 59 | 6 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | MACHINE SHOP | 3,300 | 67 | 109 | 67 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | TOOL RM | 3,300 | 2 | 109 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | TOOL RM | 3,300 | 2 | 109 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,000 | 6 | 59 | 6 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|--------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | BALLAST | ELECTRONIC BALLAST |
| HC18 | WELDING | 3,300 | 24 | 109 | 24 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,000 | 6 | 59 | 6 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | WOODSHOP | 3,300 | 63 | 109 | 63 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 1 | 59 | 1 | 50 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | SHOP RMS (2) | 3,300 | 4 | 109 | 4 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CUST | 500 | 1 | 18 | 1 | 18 | 18 WATT COMPACT FLUORESCENT LAMP | LEAVE ALONE |
| HC18 | VENDING | 3,750 | 2 | 109 | 2 | 64 | INDUSTRIAL: | INDUSTRIAL: |



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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,000 | 16 | 109 | 16 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 2 | 109 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,000 | 20 | 109 | 20 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | CLASS | 3,000 | 6 | 59 | 6 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | LOUNGE | 3,750 | 9 | 109 | 9 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH | INDUSTRIAL: UNIVERSAL NARROW 8' BODY |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 3 | 59 | 3 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OFFICE | 2,000 | 3 | 59 | 3 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OPEN OFFICE | 2,500 | 3 | 89 | 3 | 73 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | OPEN OFFICE | 2,500 | 4 | 89 | 4 | 73 | WRAP: SURFACE MOUNTED WITH NARROW 4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (3) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | LOUNGE | 3,750 | 16 | 109 | 16 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | LOUNGE | 8,760 | 2 | 109 | 2 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OPEN OFFICE | 2,500 | 4 | 89 | 4 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | HALLWAY | 2,500 | 5 | 89 | 5 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | HALLWAY | 8,760 | 1 | 89 | 1 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | INMATE REST | 1,500 | 1 | 30 | 1 | 30 | CAN: RECESSED WITH (2) 13 WATT COMPACT FLUORESCENT LAMPS AND (1) ELECTRONIC BALLAST | LEAVE ALONE |
| HC18 | OFFICE | 2,000 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 2 | 89 | 2 | 48 | TROFFER: RECESS | TROFFER: |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|-------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OFFICE | 2,000 | 2 | 89 | 2 | 48 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (3) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | TROFFER: UNIVERSAL 2'X4' RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START NORMAL POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | TV RM | 3,750 | 6 | 109 | 6 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | OPEN OFFICE | 2,500 | 6 | 59 | 6 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | MUSIC CLASS | 3,000 | 6 | 59 | 6 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | CLASS | 3,000 | 6 | 59 | 6 | 50 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP WITH (2) LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | HALLWAY | 3,750 | 39 | 59 | 39 | 50 | TROFFER: RECESS | RELAMP WITH (2) |



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| Area Information | | | Existing | | Proposed | | Description | |
|------------------|---------------|--------------------|------------|-------------------|-----------|-------------------|---|--|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | LINEAR 4' 28 WATT T8 LAMPS |
| HC18 | HALLWAY | 8,760 | 19 | 59 | 19 | 42 | TROFFER: RECESS MOUNTED WITH 2'X4' BODY, ACRYLIC LENS, WHITE METAL REFLECTOR, (2) LINEAR 4' 32 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | RELAMP REBALLAST WITH (2) LINEAR 4' 28 WATT T8 LAMPS AND (1) UNIVERSAL VOLTAGE INSTANT START LOW POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | STORAGE | 500 | 4 | 109 | 4 | 64 | INDUSTRIAL: SURFACE MOUNTED WITH NARROW 8' BODY, NO LENS, WHITE METAL REFLECTOR, (2) LINEAR 8' 59 WATT T8 LAMPS, AND (1) ELECTRONIC BALLAST | INDUSTRIAL: UNIVERSAL NARROW 8' BODY RETROFIT KIT WITH SPECULAR REFLECTOR, (2) LINEAR 4' 28 WATT T8 LAMPS, AND (1) UNIVERSAL VOLTAGE INSTANT START HIGH POWER HIGH EFFICIENCY ELECTRONIC BALLAST |
| HC18 | EXTERIOR | 4,380 | 1 | 188 | 1 | 35 | WALLPACK: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 35 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC18 | EXTERIOR | 4,380 | 5 | 188 | 5 | 18 | CANOPY: WITH (1) 150 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | CANOPY: NEW REPLACEMENT FIXTURE WITH (1) 18 WATT LED LIGHT ENGINE, (1) ELECTRONIC DRIVER AND (1) PHOTOCELL |
| HC18 | EXTERIOR | 4,380 | 1 | 95 | 1 | 12 | WALLPACK: WITH (1) 70 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | WALLPACK: NEW REPLACEMENT FIXTURE WITH (1) 12 WATT LED LIGHT ENGINE AND (1) ELECTRONIC DRIVER |
| HC18 | EXITS | 8,760 | 1 | 40 | 1 | 2 | EXIT SIGN WITH (2) TUBULAR 20 WATT INCANDESCENT LAMPS | EXIT SIGN: NEW REPLACEMENT FIXTURE WITH (1) 2 WATT LED LIGHT ENGINE, AND EMERGENCY BATTERY BACKUP |
| HC18VEND | VENDMISERS | 8,760 | 1 | 427 | 1 | 427 | COLD VENDING MACHINE | LEAVE ALONE |
| HC19 | SITE LIGHTING | 4,380 | 132 | 458 | 132 | 143 | FLOOD: WITH (1) 400 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | FLOOD: NEW REPLACEMENT FIXTURE WITH (1) 143 WATT LED LIGHT ENGINE AND (1) UNIVERSAL |

| Area Information | | | Existing | | Proposed | | Description | |
|------------------|---------------|--------------------|------------|-------------------|-----------|-------------------|--|---|
| Bldg. | Description | Hours of Operation | Qty. Fixt. | Watts per Fixture | Qty Fixt. | Watts per Fixture | Existing Fixture | Proposed Fixture |
| | | | | | | | | VOLTAGE ELECTRONIC DRIVER |
| HC19 | SITE LIGHTING | 4,380 | 56 | 700 | 56 | 700 | FLOOD: WITH (1) 600 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | LEAVE ALONE |
| HC19 | SITE LIGHTING | 4,380 | 12 | 295 | 12 | 79 | SHOEBOX: WITH (1) HIGH PRESSURE SODIUM LAMP AND (1) HIGH EFFICIENCY ELECTRONIC BALLAST | FLOOD: NEW REPLACEMENT FIXTURE WITH (1) 79 WATT LED LIGHT ENGINE AND (1) UNIVERSAL VOLTAGE ELECTRONIC DRIVER |
| HC19 | PARKING LOT | 4,380 | 10 | 458 | 10 | 143 | FLOOD: WITH (1) 400 WATT HIGH PRESSURE SODIUM LAMP AND (1) MAGNETIC BALLAST | FLOOD: NEW REPLACEMENT FIXTURE WITH (1) 143 WATT LED LIGHT ENGINE AND (1) UNIVERSAL VOLTAGE ELECTRONIC DRIVER |
| HC19 | PARKING LOT | 4,380 | 3 | 205 | 3 | 48 | BARN LIGHT: WITH (1) 174 WATT MERCURY VAPOR LAMP AND (1) MAGNETIC BALLAST | FLOOD: NEW REPLACEMENT FIXTURE WITH (1) 48 WATT LED LIGHT ENGINE AND (1) UNIVERSAL VOLTAGE ELECTRONIC DRIVER |
| HC19VEND | VENDMISERS | 8,760 | 2 | 427 | 2 | 427 | COLD VENDING MACHINE | LEAVE ALONE |
| | | | 3,701 | | 3,494 | | | |
| | | | | | | | | |

ECM #3: Building Envelope

RECOMMENDED ACTION

We recommend sealing all gaps, cracks, and holes using appropriate materials such as Fire Retardant, Poly Urethane Foam, caulks, and appropriate weather stripping.

Estimated Gas Savings = 445 MCF/yr.

Estimated Gas Cost Savings = \$2,717/yr.

Implementation Cost = \$29,880

Implementation costs includes design and engineering, project management, contingency, performance, overhead and profit.

*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

EXISTING CONDITIONS

Air leakage is defined as: “the uncontrolled migration of conditioned air through the building envelope”. Caused by pressure differences due to wind, chimney effect and mechanical systems, it has been shown to represent the single largest source of heat loss or gain through the building envelopes of nearly all types of buildings. Along with these effects on a building envelope, the following can enlarge the heat loss issues:

- a) Deteriorating door weather stripping can lead to a larger air transfer, creating heat loss that will cause increases in heating loads and heating costs.
- b) Seals around windows will corrode over time. This also leads to a larger transfer of conditioned air, causing increases in heating costs.
- c) Incorrect sealing at the roof/wall connection point on a building structure can also create heat loss and depressurize a building from the outside environment.

Many of these issues can be solved by creating better seals around doors, windows, roof/wall connections, etc.

Many of the doors and frames are in poor condition with rust holes making it impossible to adequately seal the door with weather stripping. Door and frame replacement are not included in this scope or work.

Some studies have shown that upwards of 20% to 40% of heat loss could be attributed to air leakage. Typical savings, however, tend to be in the 10% to 25% range. Beyond the realized utility savings costs, air leakage can also affect thermal comfort of occupant’s air quality from exterior contaminants, moisture migration, and imbalance of mechanical systems.

PROPOSED SYSTEMS

There are two aspects of the proposed retrofit, first, sealing all doors and windows to create an air tight environment in both inmate and public occupied areas. Second, to seal all roof/wall connection points in the public occupied buildings.

SAVINGS CALCULATIONS

Building Envelope

The intention of this energy conservation measure is to seal the windows and doors that have a small gap which allows infiltration of air into the building. In addition there is a small gap between the roof and wall intersection which allows infiltration into the building. This calculation is fairly complicated and converts the size of the opening to a correlating amount of air flow (cfm) that can infiltrate through it then assumes this air is a heat loss to the building.
No savings has been taken for cooling.

| Facility | Natural Gas Heating Savings (MCF) | Natural gas \$/MCF | Total Savings |
|----------|-----------------------------------|--------------------|---------------|
| MTU | 445 | \$ 6.11 | \$ 2,717 |

Building Envelope/Air Leakage – Savings Calculations

| | | |
|---|-----------|---|
| Balance Point Temp (°F) | | Temperature below which heating is required |
| Heating Season (Hours) | | Hours below the Balance Point Temp based on average monthly bin data |
| Average OA Air Temp at Balance Point (°F) | | Average outside air temperature at the balance point temp |
| Space Temp (°F) | | Space temperate when occupied |
| Boiler Efficiency | | Estimated boiler efficiency at average OA temp |
| Weather Location | | MI-Detroit |
| Airflow Coefficient | 21.66 | cfm/ft ² /(PA). Calculated value based on scientific test and flow dynamics. |
| Wind in MPH | 10.00 | Average wind speed based on weather data |
| Pressure Differential (ΔP) | 12.93 | PA. Pressure difference at the average wind speed. |
| Pressure Factor | 0.65 | |
| Constant | 1.08 | Btuh/CFM/°F |
| Conversion factor | 1,000,000 | BTU/MCF |

$$\text{Airflow (CFM)} = \text{Opening Area (sq.ft.)} \times \text{Airflow Coefficient} \times (\text{Pressure Differential})^{\text{Pressure Factor}}$$

The airflow is based on empirical formulas based on building pressurization techniques:

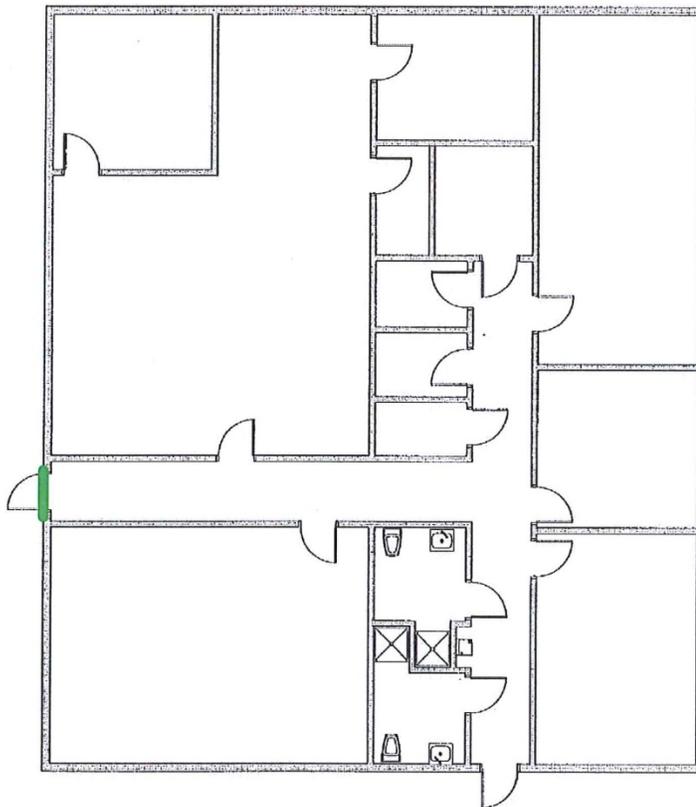
$$\text{Savings (MCF)} = \text{Airflow} \times 1.08 \text{ Btuh/CFM/F} \times \text{Heating Season Hours} \times \text{Temp Differential} / 1,000,000 \text{ BTU/MCF} / \text{Boiler Efficiency}$$

| Facility | Balance Point Temp (°F) | Heating Season (Hours) | Average OA Air Temp at Balance Point (°F) | Space Temp (°F) | Boiler Efficiency |
|----------|-------------------------|------------------------|---|-----------------|-------------------|
| MTU | 55 | 5188 | 35.5 | 72 | 87% |

| Facility | Building - Description | Length (ft.) | Gap (in.) | Opening Area (ft ²) | Airflow (CFM) | Savings (MCF) |
|----------|------------------------|--------------|-----------|---------------------------------|---------------|---------------|
| MTU | Admin - roof wall | 450 | 3/32 | 3.52 | 402 | 94.6 |
| MTU | Inmate housing doors | 1000 | 3/32 | 7.81 | 893 | 210.2 |
| MTU | Gym - doors | 140 | 1/16 | 0.73 | 83 | 19.6 |
| MTU | Gym- roof/wall | 370 | 3/32 | 2.89 | 331 | 77.8 |
| MTU | Maint- doors | 80 | 1/16 | 0.42 | 48 | 11.2 |
| MTU | Maint - oh doors | 72 | 1/8 | 0.75 | 86 | 20.2 |
| MTU | Admin - Doors | 80 | 1/16 | 0.42 | 48 | 11.2 |

- Pipe Penetrations and Shafts
- Roof/ Level Change
- Roof/ Wall Connection
- Windows
- Door Sweeps Only
- Door to be fully weather stripped inc. sweeps
- Overhead door to be fully weather stripped

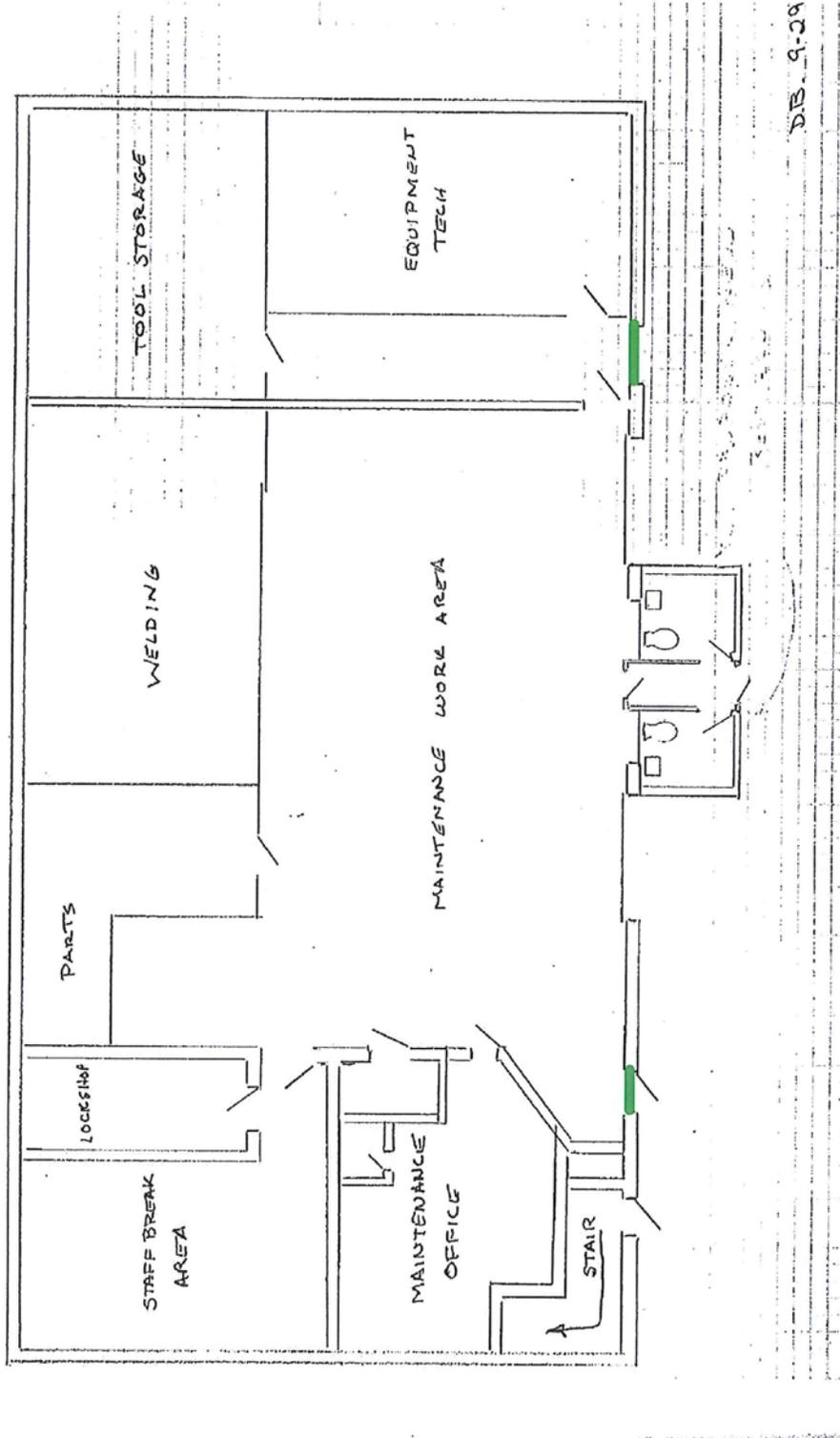
Ionia Correctional
Pre Install
9/28/12 ML

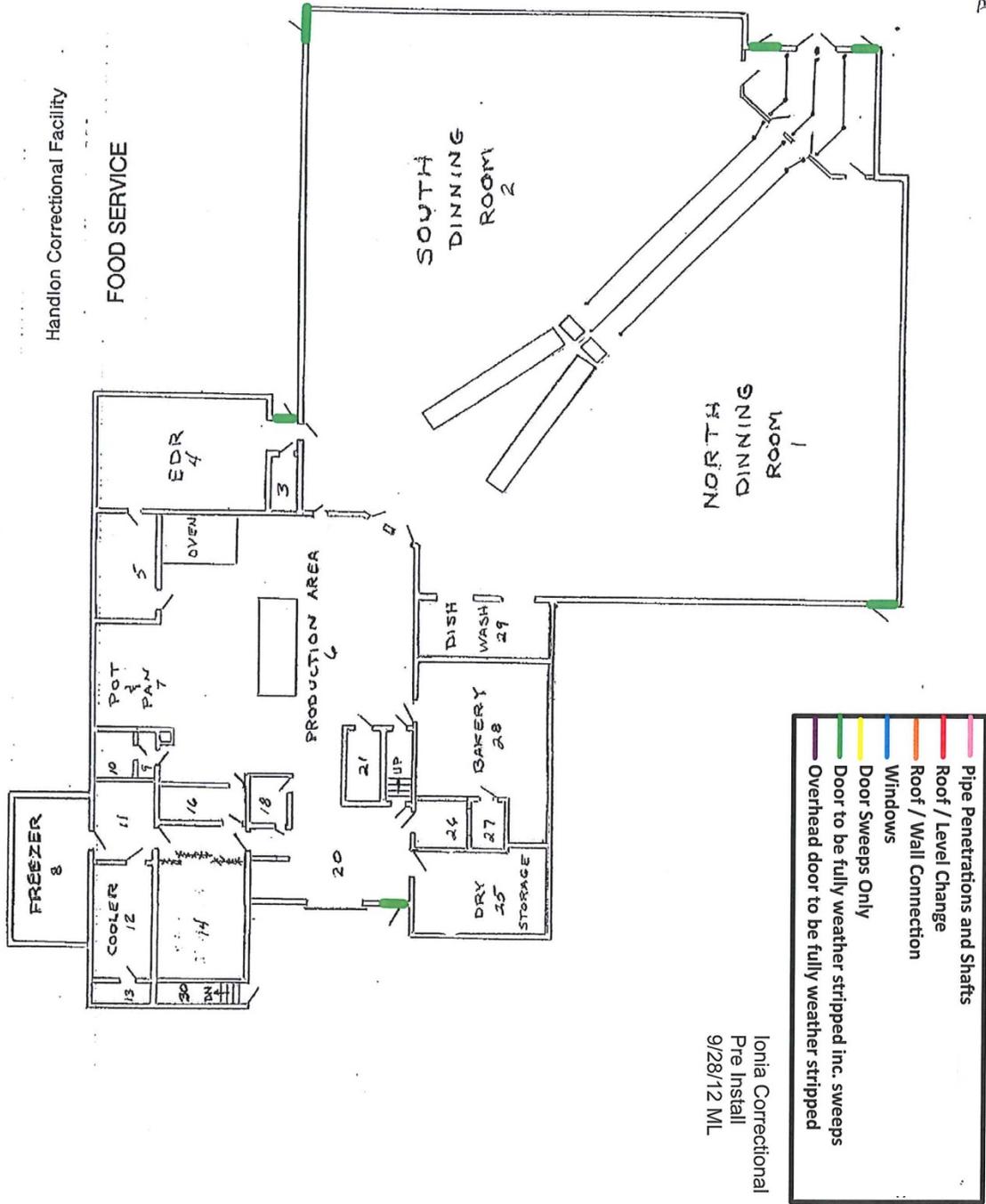


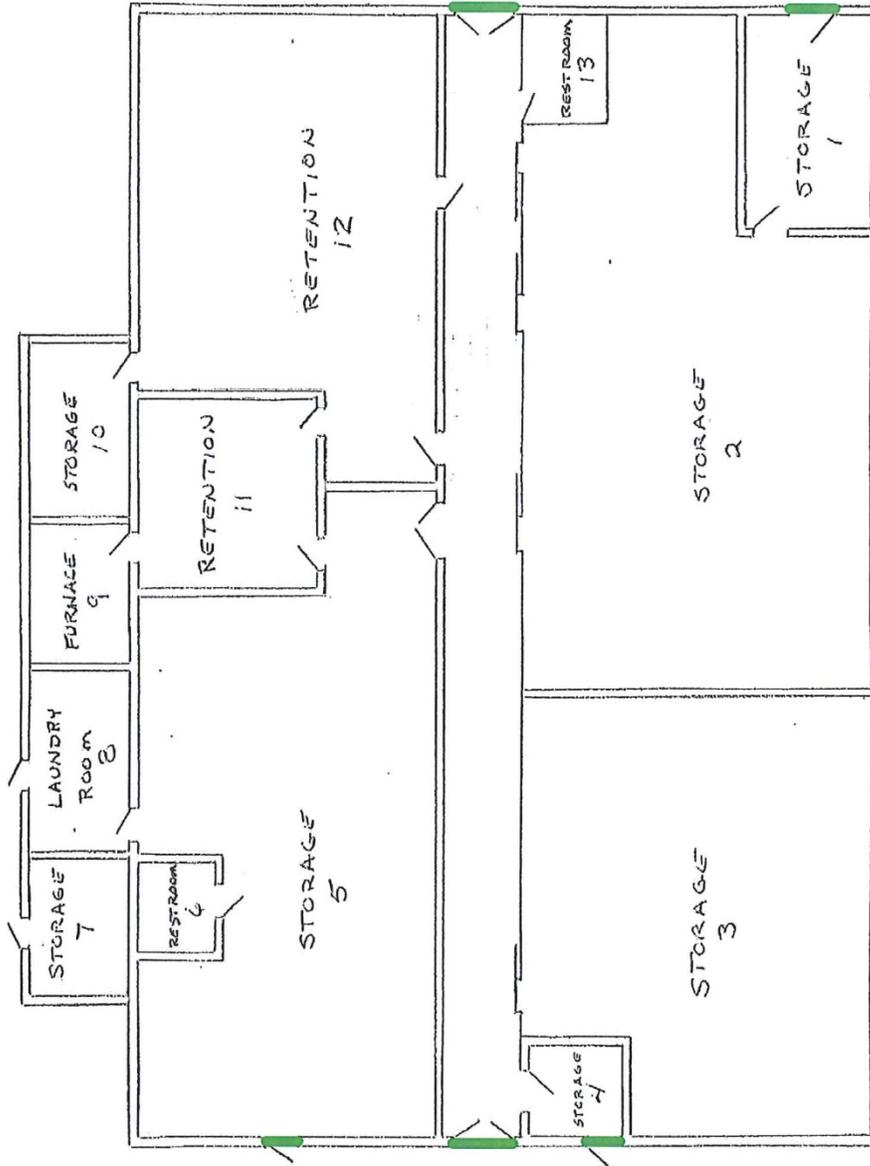
Richard A. Handlin Correctional Facility
Fire Evacuation Route Administration Annex

- Ionis Correctional
- Pre Install
- 9/28/12 ML
- Pipe Penetrations and Shafts
- Roof / Level Change
- Roof / Wall Connection
- Windows
- Door Sweeps Only
- Door to be fully weather stripped inc. sweeps
- Overhead door to be fully weather stripped

HANDLON MICHIGAN TRAINING UNIT
MAINTENANCE BLD.







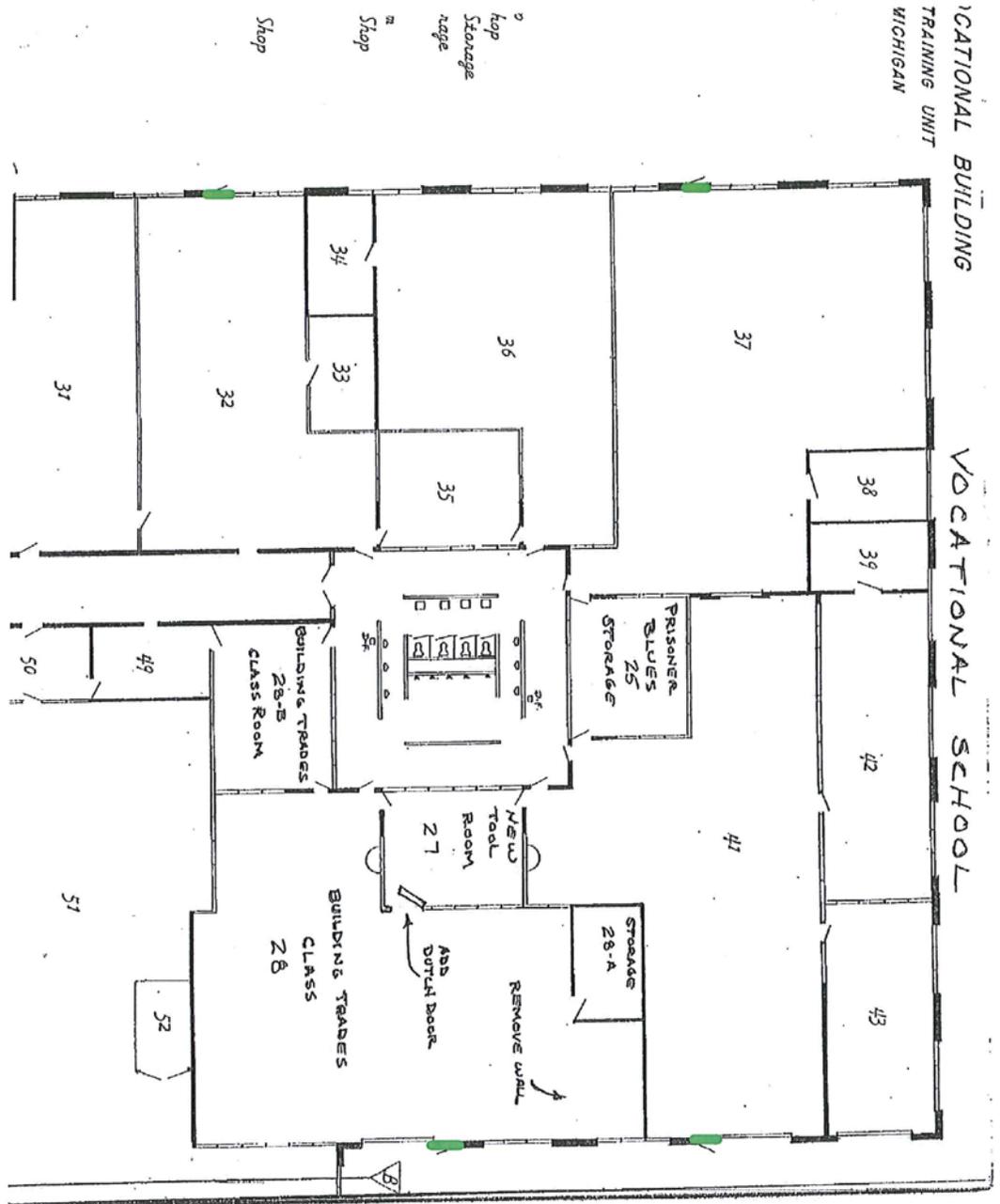
HMTU ACTIVITY BUILDING

Ionla Correctional
 Pre Install
 9/28/12 ML

| |
|---|
| Pipe Penetrations and Shafts |
| Roof / Level Change |
| Roof / Wall Connection |
| Windows |
| Door Sweeps Only |
| Door to be fully weather stripped inc. sweeps |
| Overhead door to be fully weather stripped |

VOCATIONAL BUILDING
TRAINING UNIT
MICHIGAN

HANDLON CORRECTIONAL FACILITY
VOCATIONAL SCHOOL



| | |
|---------------------------------------|---|
| — | Pipe Penetrations and Shafts |
| — | Roof / Level Change |
| — | Roof / Wall Connection |
| — | Windows |
| — | Door Sweeps Only |
| — | Door to be fully weather stripped inc. sweeps |
| — | Overhead door to be fully weather stripped |

Handlon Correctional
Pre Install
9/28/12 ML

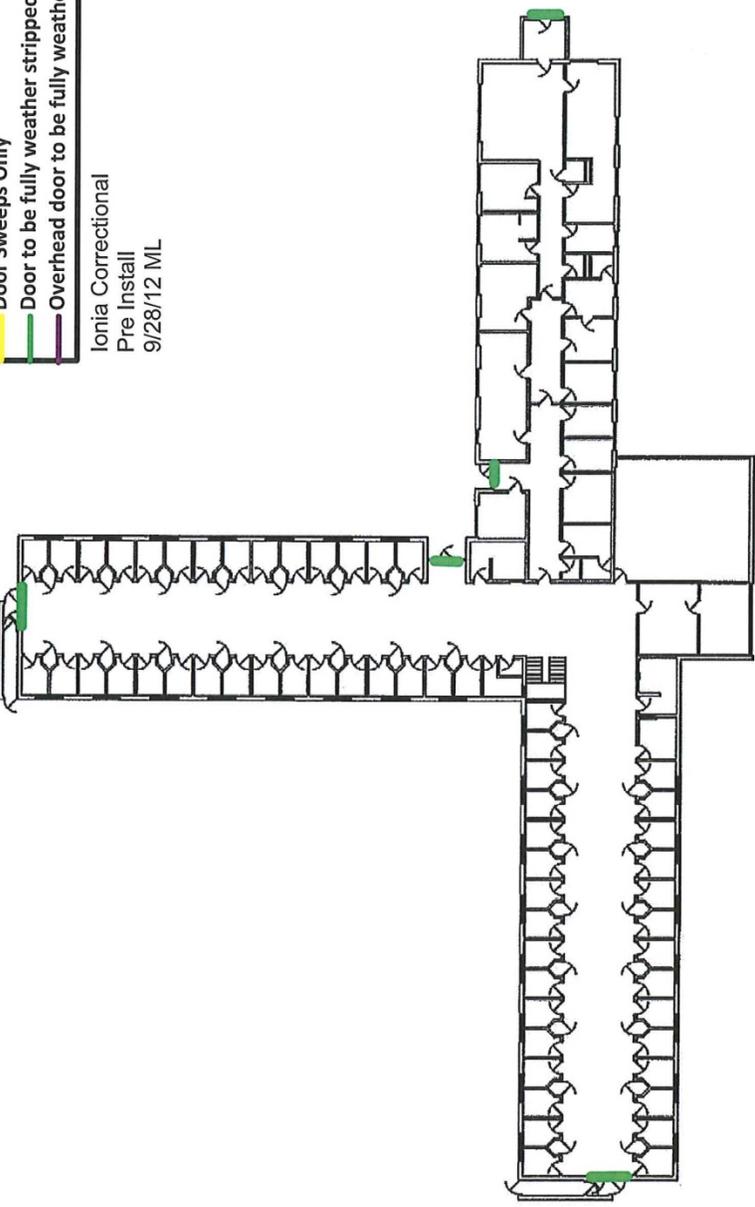
*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

- Pipe Penetrations and Shafts
- Roof /Level Change
- Roof / Wall Connection
- Windows
- Door Sweeps Only
- Door to be fully weather stripped inc. sweeps
- Overhead door to be fully weather stripped

Ionia Correctional
 Pre Install
 9/28/12 ML

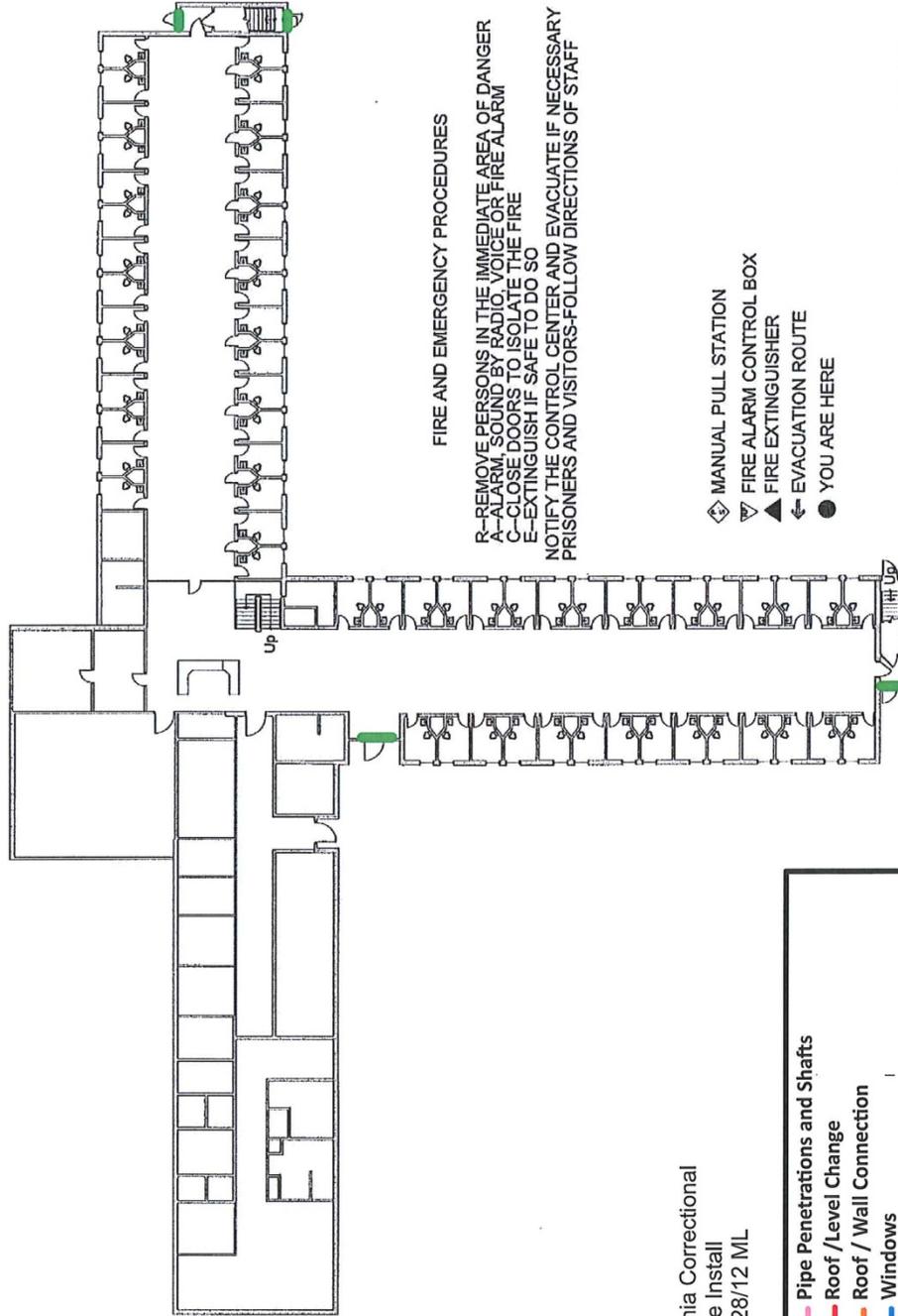
Housing - Unit A

1st Floor



*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

Richard A. Handlin Correctional Facility
 Fire Evacuation Route Housing Unit A
 First Floor



FIRE AND EMERGENCY PROCEDURES
 R--REMOVE PERSONS IN THE IMMEDIATE AREA OF DANGER
 A--ALARM, SOUND BY RADIO, VOICE OR FIRE ALARM
 C--CLOSE DOORS TO ISOLATE THE FIRE
 E--EXTINGUISH IF SAFE TO DO SO
 NOTIFY THE CONTROL CENTER AND EVACUATE IF NECESSARY
 PRISONERS AND VISITORS-FOLLOW DIRECTIONS OF STAFF

- ◆ MANUAL PULL STATION
- ▽ FIRE ALARM CONTROL BOX
- ▲ FIRE EXTINGUISHER
- ← EVACUATION ROUTE
- YOU ARE HERE

Ionia Correctional
 Pre Install
 9/28/12 ML

- Pipe Penetrations and Shafts
- Roof /Level Change
- Roof / Wall Connection
- Windows
- Door Sweeps Only
- Door to be fully weather stripped inc. sweeps
- Overhead door to be fully weather stripped

Up Dated 05/19/11

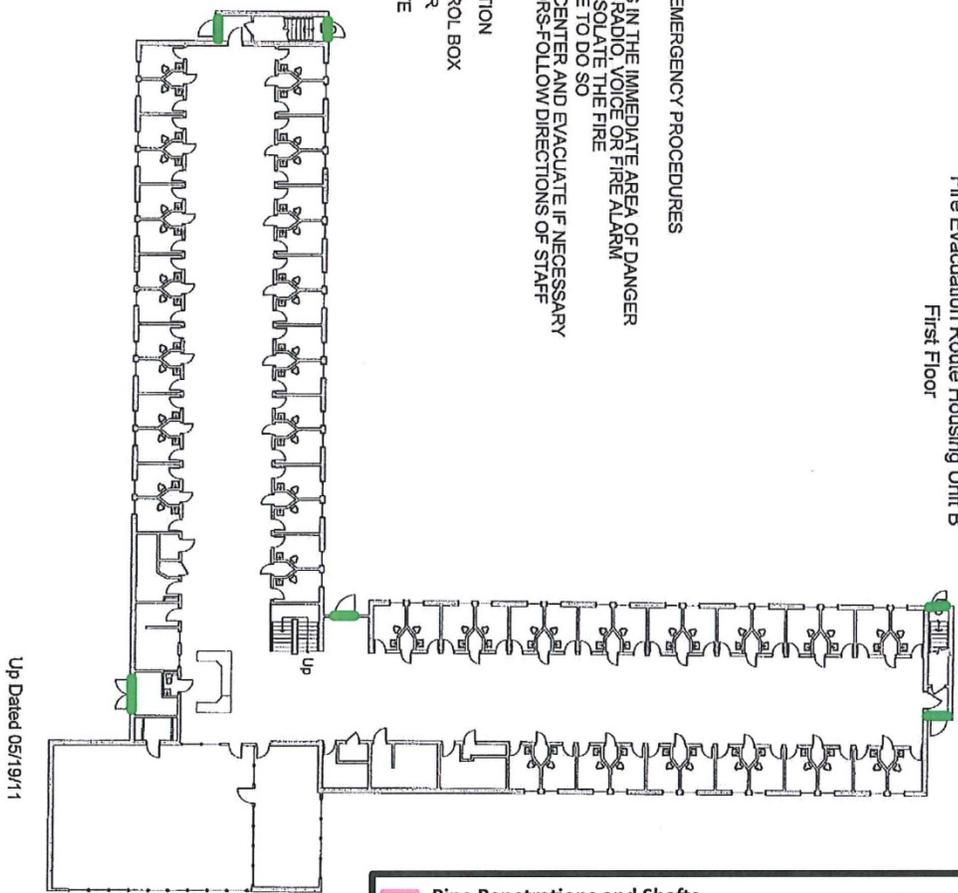
*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

Richard A. Handlin Correctional Facility
 Fire Evacuation Route Housing Unit B
 First Floor

FIRE AND EMERGENCY PROCEDURES

- R-REMOVE PERSONS IN THE IMMEDIATE AREA OF DANGER
- A-ALARM, SOUND BY RADIO, VOICE OR FIRE ALARM
- C-CLOSE DOORS TO ISOLATE THE FIRE
- E-EXTINGUISH IF SAFE TO DO SO
- NOTIFY THE CONTROL CENTER AND EVACUATE IF NECESSARY
- PRISONERS AND VISITORS-FOLLOW DIRECTIONS OF STAFF

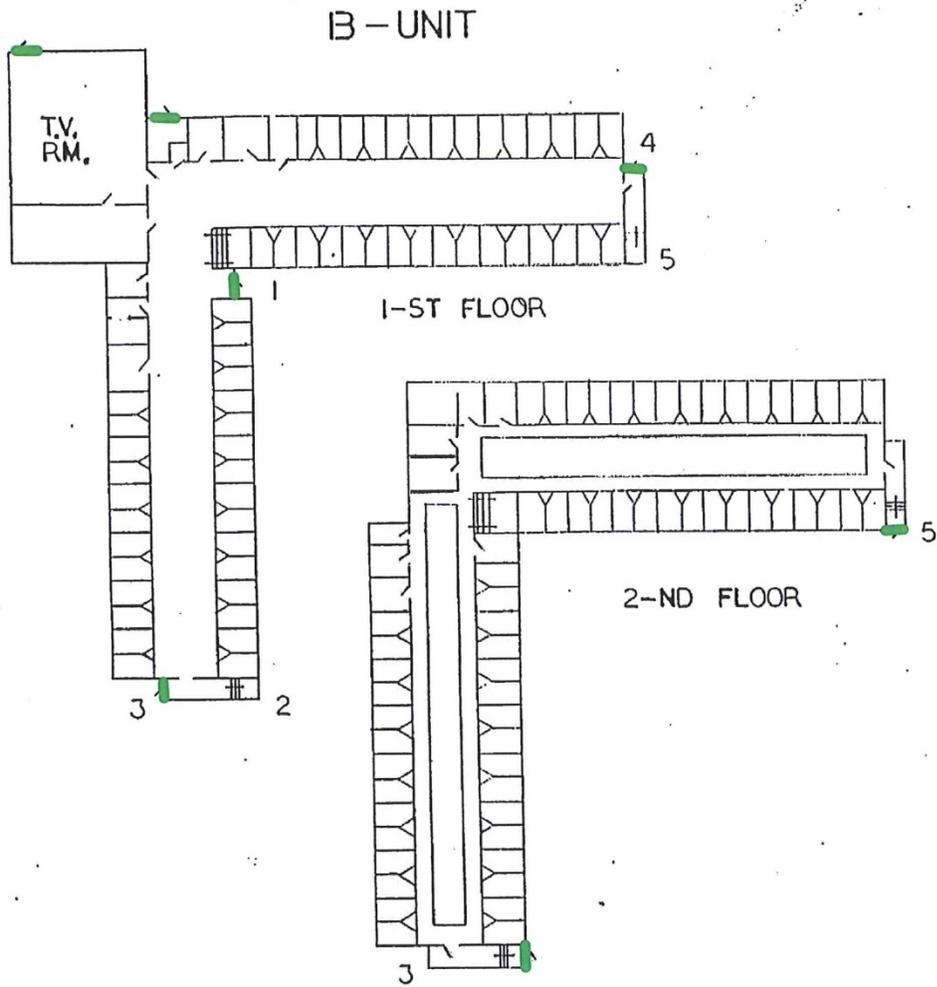
- ◆ MANUAL PULL STATION
- ▽ FIRE ALARM CONTROL BOX
- ▲ FIRE EXTINGUISHER
- ⇄ EVACUATION ROUTE
- YOU ARE HERE



- Pipe Penetrations and Shafts
- Roof/ Level Change
- Roof/ Wall Connection
- Windows
- Door Sweeps Only
- Door to be fully weather stripped inc. sweeps
- Overhead door to be fully weather stripped

Ionia Correctional
 Pre Install
 9/28/12 ML

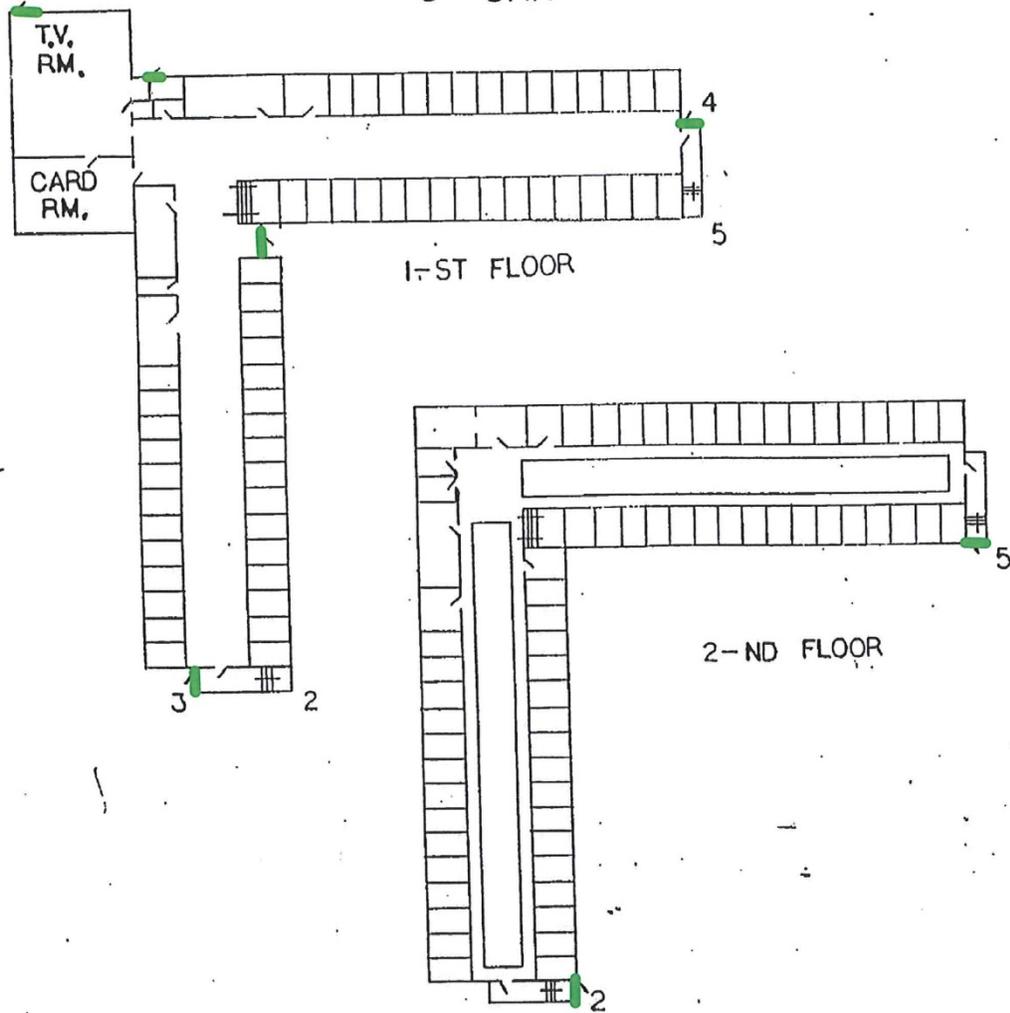
Up Dated 05/19/11



Ionia Correctional
Pre Install
9/28/12 ML

- | | |
|---------------------------------------|---|
| █ | Door to be fully weather stripped inc. sweeps |
| █ | Overhead door to be fully weather stripped |
| █ | Windows |
| █ | Door Sweeps Only |
| █ | Roof/ Wall Connection |
| █ | Roof/ Level Change |
| █ | Pipe Penetrations and Shafts |

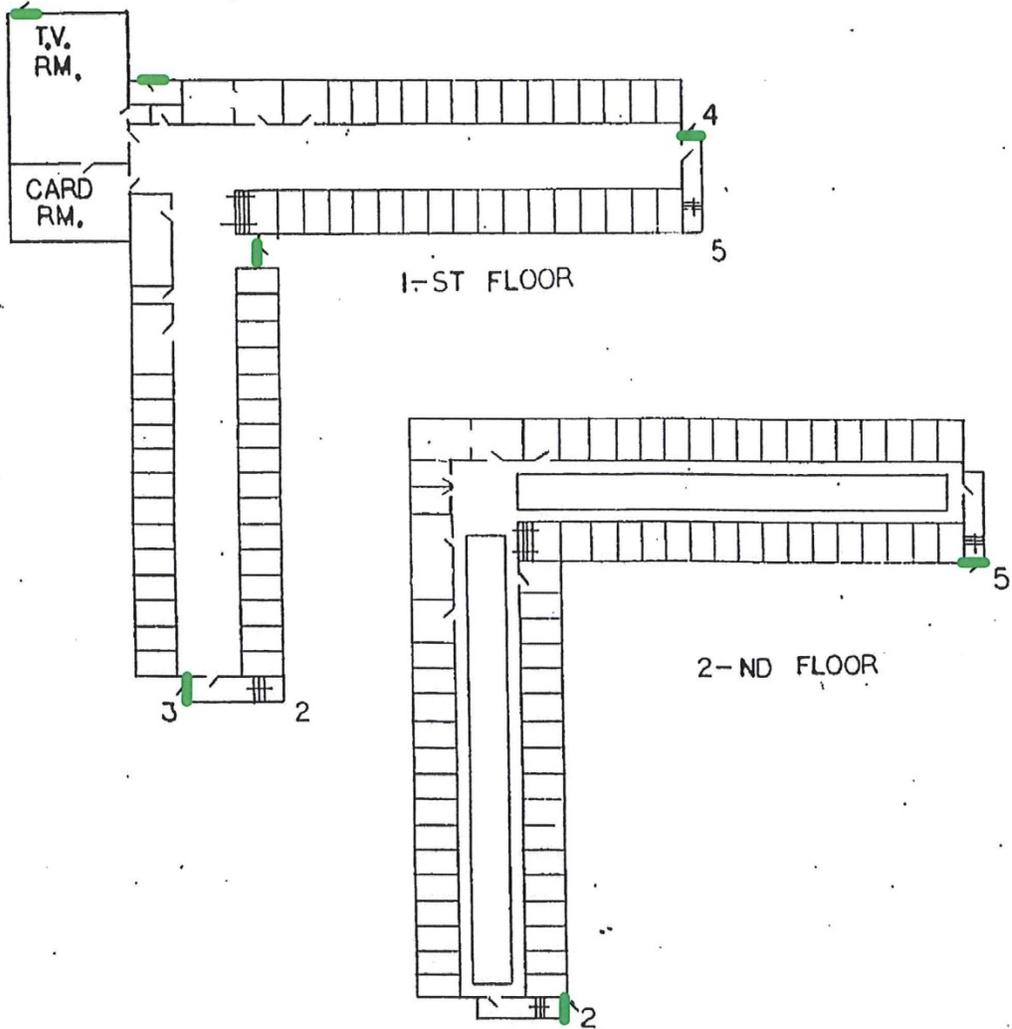
C-UNIT



Ionia Correctional
Pre Install
9/28/12 ML

- | | |
|--|---|
| | Pipe Penetrations and Shafts |
| | Roof/ Level Change |
| | Roof/ Wall Connection |
| | Windows |
| | Door Sweeps Only |
| | Door to be fully weather stripped inc. sweeps |
| | Overhead door to be fully weather stripped |

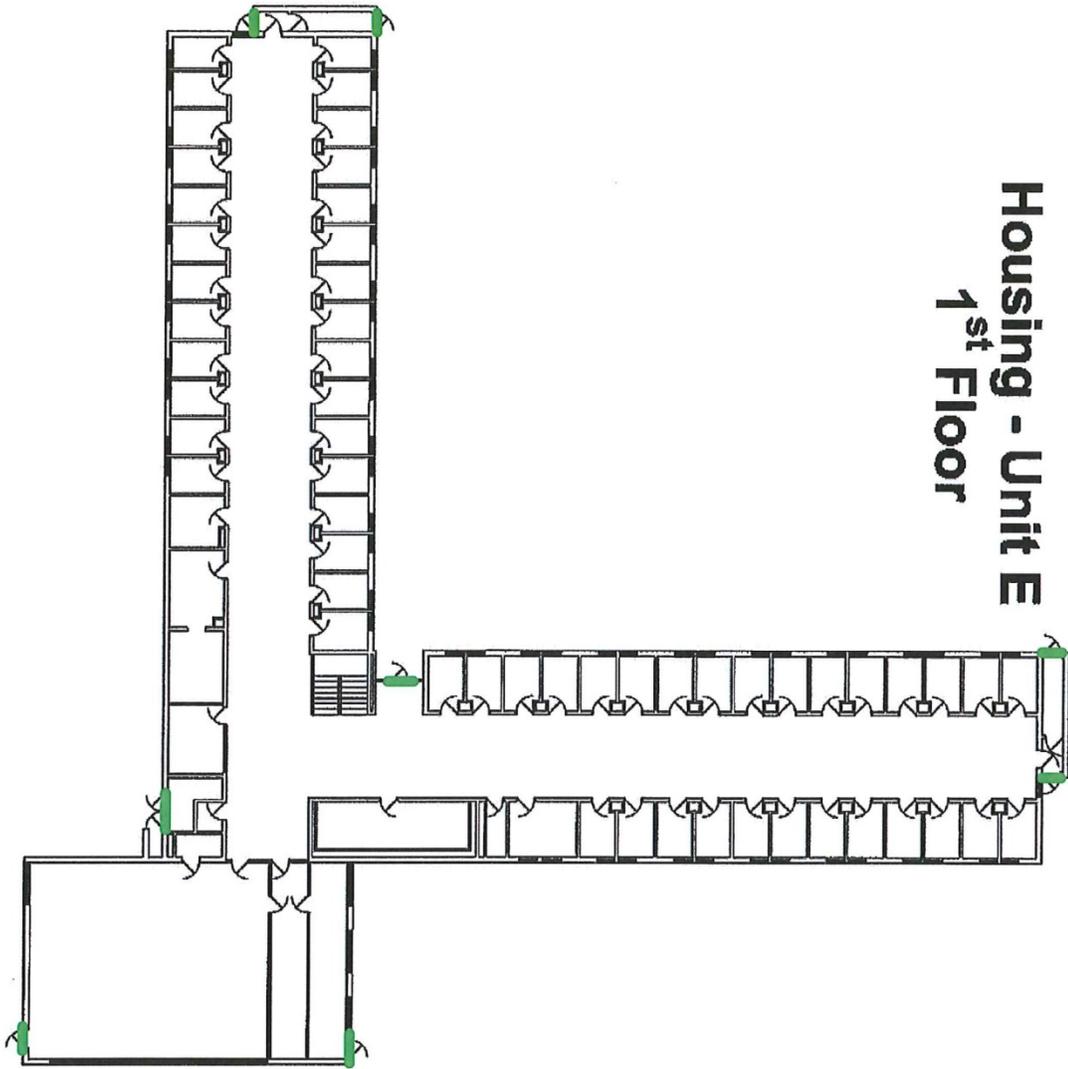
D-UNIT



Ionia Correctional
Pre Install
9/28/12 ML

- Pipe Penetrations and Shafts
- Roof/ Level Change
- Roof/ Wall Connection
- Windows
- Door Sweeps Only
- Door to be fully weather stripped inc. sweeps
- Overhead door to be fully weather stripped

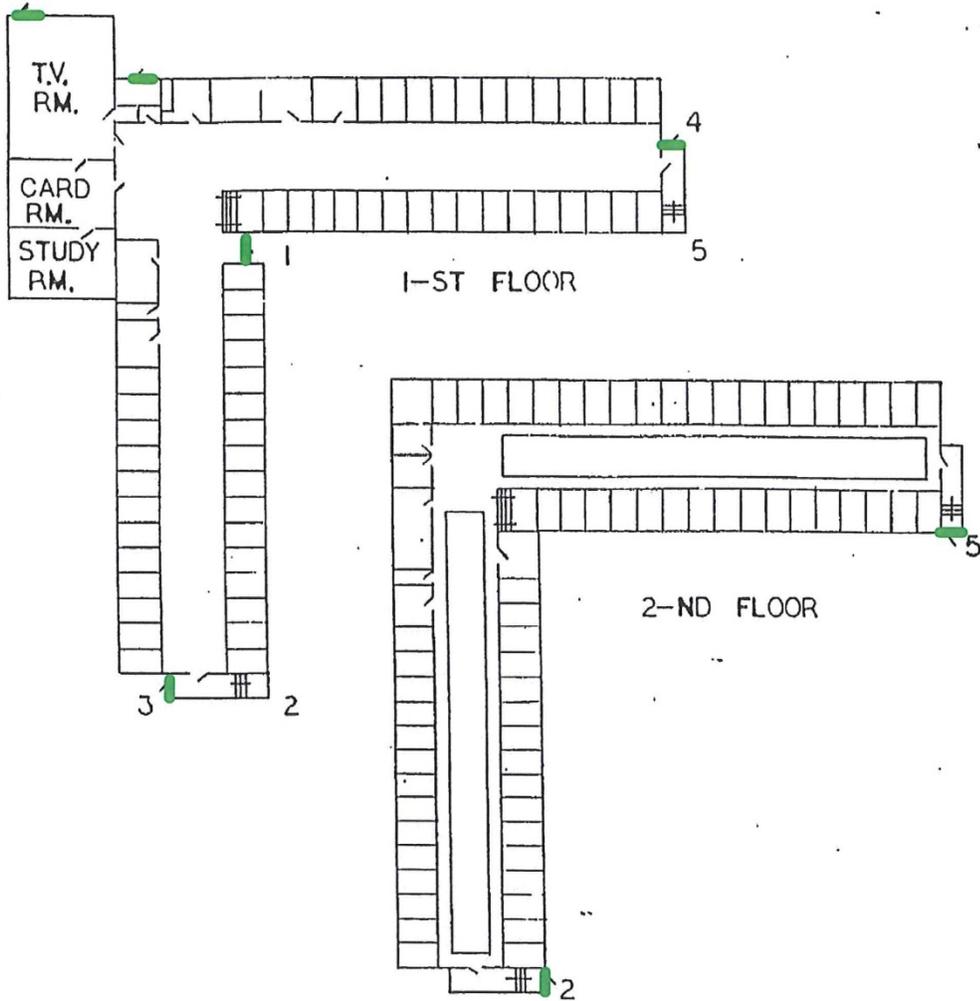
Housing - Unit E 1st Floor



Ionia Correctional
Pre Install
9/28/12 ML

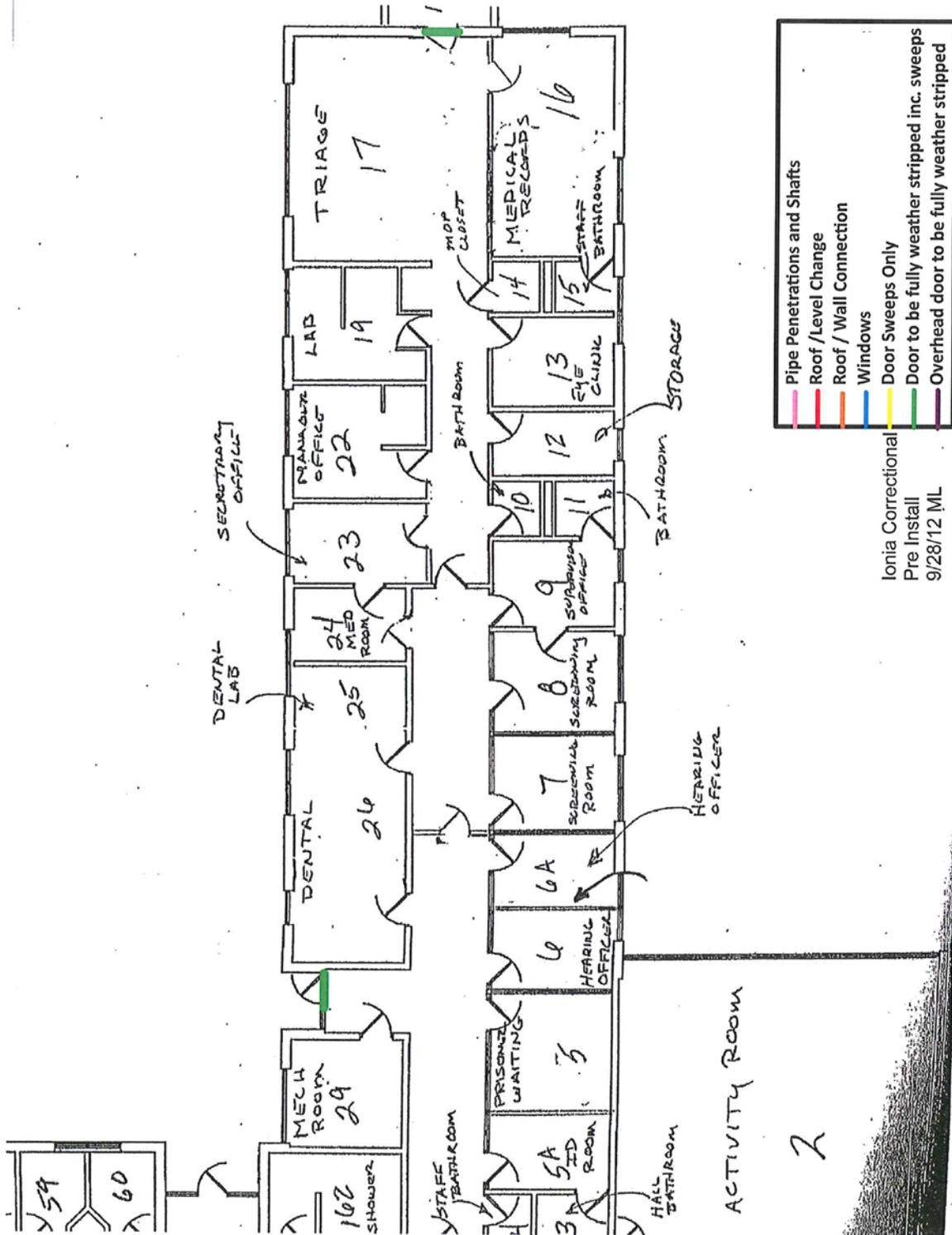
| | |
|--|---|
| | Pipe Penetrations and Shafts |
| | Roof/ Level Change |
| | Roof/ Wall Connection |
| | Windows |
| | Door Sweeps Only |
| | Door to be fully weather stripped inc. sweeps |
| | Overhead door to be fully weather stripped |

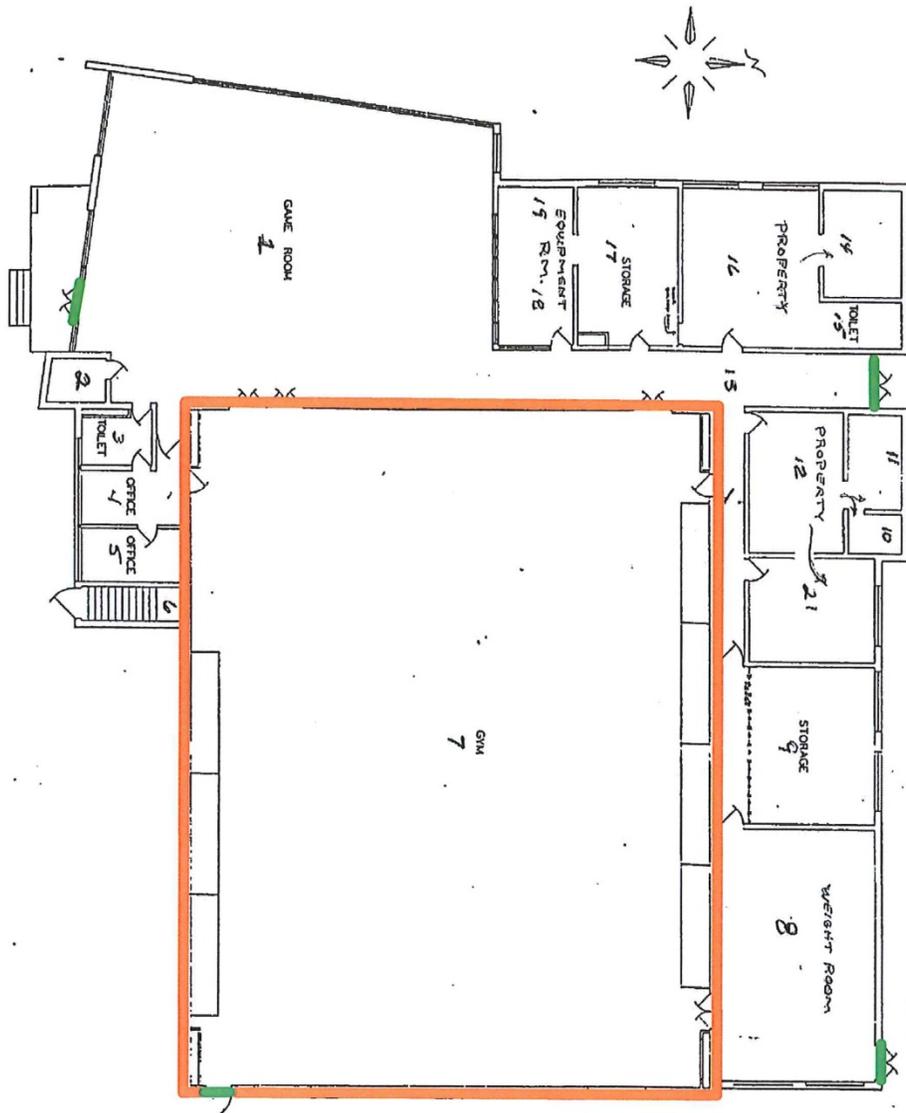
F-UNIT



Ionia Correctional
Pre Install
9/28/12 ML

- Pipe Penetrations and Shafts
- Roof/ Level Change
- Roof/ Wall Connection
- Windows
- Door Sweeps Only
- Door to be fully weather stripped inc. sweeps
- Overhead door to be fully weather stripped





ECM #4: Water and Sewer Conservation and Water Cooled Compressor Replacement

RECOMMENDED ACTION

Plumbing Fixtures

We recommend retrofitting the existing domestic plumbing fixtures with new low-flow, higher efficient plumbing savings and replacing the existing water cooled walk in cooler compressor with an air cooled compressor.

Due to a shared water pipe with a directional valve MTU and ICF share combined water feed. So these numbers are identical to each but the savings are used only once.

| | |
|------------------------------|------------------|
| Estimated Water Savings | =12,977 KGAL/yr. |
| Estimated Gas Savings | =1,088 MCF/yr. |
| Estimated Water Cost Savings | =\$104,595/yr. |
| Estimated Gas Cost Savings | =\$6,652/yr. |
| Implementation Cost | = \$1,146,489 |

Implementation costs includes design and engineering, project management, contingency, performance, overhead and profit.

Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%

EXISTING CONDITIONS

Plumbing Fixtures

MTU has approximately 1300 inmates housed within the six (6) units of the facility. The inmate areas contain two hundred forty two (242) cells configured with either stainless steel combination fixtures or separate stainless steel or porcelain lavatory and toilet fixtures. Additionally there are one hundred eleven (111) showers located throughout the inmate areas.

The existing stainless steel combination fixtures and stainless steel lavatory & toilet fixtures have been measured to average 3.5 gallons per flush. The industry average use per fixture approaches 40 flushes per day, therefore the volume of water used, and associated water and sewer costs is substantial.

Water cooled Condenser

A water cooled compressor is used to provide refrigeration for the walk in coolers. This type of a system uses water to cool the condenser then discharges down the drain.

A control valve is used to modulate the water based on head pressure or temperature but often these valves become clogged or break down and continuously discharge water down the drain. This is the last water cooled compressor at the Dorm; all of the others have been converted to air cooled.

PROPOSED SYSTEMS

Water cooled Condenser



Proprietary and Confidential

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Date: February 5, 2013

*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

We recommend replacing the water cooled condenser with an air cooled condenser and evaporator similar to the existing condensing units.

Plumbing Fixtures

We recommend utilizing I-CON systems based on our experience with the equipment and MDOC's recommendation of I-CON. The proposed retrofit measure was designed to address all of the issues and expenses identified. There are two aspects of the proposed retrofit; first, retrofitting the inmate cell areas and stainless steel fixture equipped restrooms with I-CON electronic plumbing control systems and, second, retrofitting the existing china fixtures with new more efficient systems in dorm and administration areas.

The I-CON electronic plumbing control system is being proposed for the cell areas and stainless steel fixture equipped restrooms in the facilities because the I-CON products are the only sources that can offer retrofit systems adapting to all existing plumbing fixtures at the sites. The I-CON system is the one source that can reduce gallons per flush from 3.5 gallons per flush to 1.6 gallons per flush, without the need to replace the plumbing fixture at a significant added cost. Each time the toilet is flushed, it will provide a prescribed reduction in water, and the corresponding reduction in water and sewer expense will occur.

Units A-B Retrofits

Units A and B consist of two floors each with Unit A having a total of 122 cells and Unit B having a total of 120 cells. Each set of two cells has a V-shape plumbing chase located between them that contain the flush valves and lavatory valves for the adjacent cells. The existing plumbing controls are Sloan 3.5 gpf flush valves and mechanical lavatory valves. The existing fixtures are stainless steel combination units.

The existing fixtures are stainless steel combination units. This ECM would replace the existing Stainless Steel Combination Unit 3.5 gpf Sloan Royal Flush Valve 3.5 gpf, mechanical lavatory valve .5 gpm with Icon Toilet Retrofit I-CON 1.6 gpf Flush Valve and Lavatory retrofit I-CON Lavatory Dual Manifold.

Each inmate's flush valve, Two Hundred Forty Two (242), will be retrofitted with an I-CON flush valve. The existing flush valve stop will remain. All existing fixtures will remain. Each inmate's lavatory valve, Two Hundred Forty Two (242), will be retrofitted with an I-CON lavatory dual manifold. Each inmate's existing flush valve and lavatory valve buttons will be replaced with an I-CON sensor pneumatic block button.

Electrical Requirements:

In each plumbing chase, we will be pulling low-voltage from the emergency circuit or back up power circuit to power the I-CON controllers. We will be installing a Buck Boost transformer to step power down to 24 volts. We will be installing I-CON combination lavatory/toilet controllers.

Unit E Retrofits

Units E consist of two floors with dry cells throughout the unit. The facility has converted 4 cells into wet cells. Each set of two cells has a V-shape plumbing chase located between them that contain the flush valves and lavatory valves for the adjacent cells.

The existing plumbing controls are Sloan 3.5 gpf flush valves and mechanical lavatory valves. The existing fixtures are stainless steel combination units.

ESG will replace the existing Stainless Steel Combination Unit 3.5 gpf Sloan Royal Flush Valve 3.5 gpf, mechanical lavatory valve .5 gpm with I-CON 1.6 gpf Flush Valve and I-CON Lavatory Dual Manifold.



Each inmate's flush valve, **Four (4)**, will be retrofitted with an I-CON flush valve. The existing flush valve stop will remain. All existing stainless steel combination fixture will remain. Each inmate's lavatory valve, **Four (4)**, will be retrofitted with an I-CON lavatory dual manifold. Each inmate's existing flush valve and lavatory valve buttons will be replaced with an I-CON sensor button. In locations where a block wall exists, an I-CON core drill assembly will be utilized.

Electrical Requirements

In each plumbing chase, we will be pulling low-voltage from the emergency circuit or back up power circuit to power the I-CON controllers. We will be installing a box mount transformer to step power down to 24 volts. We will be installing I-CON combination lavatory/toilet controllers.

Shower Valve Retrofits

Each **One Hundred Eleven (111)** inmate shower valve will be replaced with an I-CON VLV-SHW-5775. Each inmate's existing push button (or buttons/depending on the existing conditions) will be replaced with an I-CON SEN-1501 sensor button. Where plumbing chase access and power are not available, we will be utilizing an I-CON CTR-X11-B-01-S-001-WP 1 I/O battery controller.

Units C, D, E, and F Retrofits

Each housing unit, C, D, E, and F, has gang style restrooms on both levels of the unit which have 8 showers each. The existing shower plumbing controls are a mixture of single button metering valves and single lever mixing valves. ESG will replace the existing Mechanical Single Lever Mixing Valve or Metering Valve with I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads. Each shower valve Sixty Four (64) will be retrofitted with an I-CON VLV-SHW-5775 shower valve. Each existing shower valve button will be replaced with an I-CON SEN-1501 sensor button.

Electrical Requirements

When power is available, a box mount transformer will be utilized to step down the power to 24 volts. Where plumbing chase access and power are not available, we will be utilizing an I-CON CTR-X11-B-01-S-001-WP 1 I/O battery controller.

Each housing unit, A and B, has two Shower Rooms on both levels of the unit. It shower bank has a chase located behind each fixture. The existing shower plumbing controls are a mixture of single button metering valves and single lever mixing valves. Each shower valve **Forty Seven (47)** will be retrofitted with an I-CON VLV-SHW-5775 shower valve. Each existing shower valve button will be replaced with an I-CON SEN-1501 sensor button.

Electrical Requirements

When power is available, a box mount transformer will be utilized to step down the power to 24 volts. Where plumbing chase access and power are not available, we will be utilizing an I-CON CTR-X11-B-01-S-001-WP 1 I/O battery controller.

Low Flow Retrofit

Low Flow Plumbing Controls

| <i>Description</i> | <i>Quantity</i> |
|--------------------|-----------------|
| Toilet | 82 |
| Faucet | 140 |
| Urinals | 69 |

Water Closet Retrofits

Each, **Eighty Two (2)** existing 3.5 water closets will be replaced with Zurn Floor Mount, Floor Mount ADA, Wall Mount, Tank Type or Tank Type ADA water closets where applicable. Locations are shown on the attached application schedule. Regarding existing floor mounted toilets; all broken floor flanges will be repaired.

In the event a floor flange is beyond repair a “repair flange” will be installed prior to the new retrofit. Wall toilets will receive a new neoprene gasket prior to installation. Flush Valve type water closets will receive a new Zurn Z-6200 piston flush valve. The existing Water Closet flush valve will be removed, from the angle stop to the closet spud connection, and the new valve installed. Locations and operation of the isolation valves will be shown to the subcontractor by the facility staff. The subcontractor is not responsible for the existing conditions of said isolation valves and may require the assistance of the facility to locate additional “secondary” valves in an effort to shut down the flow of water to perform the retrofit. Tank Type toilets will also receive a new stainless steel braided supply hose. Each new toilet (not including I-CON retrofit) will receive a new toilet seat.

Staff & Inmate Lavatory Aerators

Each, **Thirty Three (33)** staff and **One Hundred Seven (107)** inmate lavatory faucets will be replaced with either a Symmons S-20, or S-244 faucet and a .5 GPM aerator for the staff or a Symmons S-60 or S-244 for the inmates. The aerators in the inmate areas will be replaced with an I-CON .5 GPM tamper proof model made for institutional use that will insure the aerator stays in place and the savings will continue on a long term basis.

Urinal Flush Valves

Each, **Sixty-Nine (69)** urinal flush valves will be replaced with a Zurn Z-6201 or Z-6203 piston flush valve. The existing Urinal flush valve will be removed, from the angle stop to the urinal fixture spud connection, and the new valve and spud installed. Locations and operation of the isolation valves will be shown to the subcontractor by the facility staff. The subcontractor is not responsible for the existing conditions of said isolation valves and may require the assistance of the facility to locate additional “secondary” valves in an effort to shut down the flow of water to perform the retrofit.

Project Totals

The total numbers of I-CON Plumbing Controls for the entire facility are as follows:

I-CON STANDALONE PLUMBING CONTROLS

| <i>Description</i> | <i>Quantity</i> |
|-------------------------------------|-----------------|
| I-CON Combination Fixture Retrofits | 246 |
| I-CON Shower Retrofits | 111 |

SAVINGS CALCULATIONS

Water Conservation Retrofit

Savings Summary (Plumbing Fixtures + Water Cooled Condenser Retrofit)

| | Kgal | Water \$/Kgal | Sewer \$/Kgal | Total Savings | MCF | \$/MCF | Total Savings |
|------------|--------|---------------|---------------|---------------|-------|---------|---------------|
| MTU | 12,977 | \$2.45 | \$5.61 | \$104,595 | 1,089 | \$6.110 | \$6,652 |

| | | |
|----------------------------|----------------|--|
| | <u>Inmates</u> | |
| MTU | 1,295 | |
| Incoming Water Temperature | 60 | |
| Mixed water temperature | 105 | |

Water and Sewer Savings Calculations

Plumbing Fixture Savings = (Use per day before x gpm before x Number of units x 365) - (Uses per day After x gpm after x number of units x 365)

Showers Savings = (Minutes per usage before x gpm before x inmates x 365) - (Minutes per usage After x gpm after x units x 365)

| Facility | Fixture Type | Inmates | GPM Before | GPM After | Gallon Savings | Plumbing Fixtures | | | Showers | | Total KGAL (per 1000 gallons) Savings Per Year |
|----------|--------------------|---------|------------|-----------|----------------|-------------------|---------------------|--------------------|--------------------------|-------------------------|--|
| | | | | | | Fixture Quantity | Uses Per Day Before | Uses Per Day After | Minutes Per Usage Before | Minutes Per Usage After | |
| MTU | I-Con Flush Valves | 1295 | 3.5 | 1.6 | 1.9 | 237 | 30 | 17 | | | 6,730 |
| | Toilet | 1295 | 3.5 | 1.6 | 1.9 | 82 | 30 | 30 | | | 1,706 |
| | Urinal | 1295 | 1.5 | 1 | 0.5 | 65 | 10 | 10 | | | 119 |
| | Lavatory | 1295 | 2.2 | 0.5 | 1.7 | 140 | | | 4 | 4 | 3,214 |
| | I-Con Lavs | 1295 | 2 | 1.5 | 0.5 | 246 | | | 4 | 4 | 945 |
| | I-Con Showers | 1295 | 3 | 2 | 1 | | | | | | 0 |
| | Shower | 1295 | 3 | 2 | 1 | | | | | | 0 |
| | Total | | | | | | | | | | |

Gas Savings from Water Usage Reduction

Total MCF Before = (Mixed Water Temp - Incoming Temp) x 1 Btu/lb/F x (GPM before/2) x Usage Before x inmates x 8.34 pounds per gallon x (365 days/year) / (1,000,000 btu/MCF) * 86% efficiency)

Total MCF After = (Mixed Water Temp - Incoming Temp) x 1 Btu/lb/F x (GPM after/2) x Usage after x inmates x 8.34 pounds per gallon x 365 days/yr. / (1,000,000 btu/MCF x 86% efficiency)

| Facility | Fixture Type | Inmates/ Staff | GPM Before | GPM After | Mixed Water Temp | Incoming Water Temp | Usage Before | Usage After | Total MCF Usage Per Year Before | Total MCF Usage Per Year After | MCF Yearly Savings |
|--------------|-------------------|----------------|------------|-----------|------------------|---------------------|--------------|-------------|---------------------------------|--------------------------------|--------------------|
| MTU | Dorm Showers | 750 | 2.8 | 2 | 105 | 60 | 8 | 6 | 1,338 | 717 | 621 |
| | Dorm Lavatories | 75 | 2.2 | 0.5 | 105 | 60 | 4 | 4 | 53 | 12 | 41 |
| | Common Showers | 350 | 2.8 | 2 | 105 | 60 | 8 | 6 | 624 | 334 | 290 |
| | Common Lavatories | 350 | 2 | 1.5 | 105 | 60 | 4 | 4 | 223 | 167 | 56 |
| | Staff Lavatories | 150 | 2.2 | 0.5 | 105 | 60 | 4 | 4 | 105 | 24 | 81 |
| Total | | | | | | | | | | | 1,089 |

Water Cooled Condenser Retrofit

The existing compressors for the kitchen freezers is water cooled. City water is used to cool the condensers on the compressors then discharged down the drain. This Energy Conservation Measure proposes to change the water cooled condensers to air cooled.

Facility: MTU Kitchen

| | Walk in Cooler |
|--|-----------------|
| Existing HP | 1 |
| Cycle Time | 50% |
| Hours of operation | 8760 |
| GPM when operating | 1 |
| 1000 Gallons per year used | 263 |
| Water and sewer \$/1000 gallons | \$ 8.06 |
| Water and sewer cost | \$ 2,118 |
| Electrical Cost to Operate Air Cooled Cond. | |
| Existing KW/HP | 1 |
| Future KW/HP | 1.5 |
| Extra KW | 0.5 |
| KWH extra | 2,190 |
| \$/KWH | \$ 0.0946 |
| Electric cost to operate air cooled | \$ 207 |
| Net Savings | \$ 1,911 |



Proprietary and Confidential

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Date: February 5, 2013

*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

SYSTEMS RETROFIT – FLUSH VALVE & LAVATORY

Units A-B Retrofits

| Bldg | Area | Flr | Room | Qty | Existing Description | Toilet Retrofit | Lavatory Retrofit |
|--------|------|-----|------------------|-----|---|------------------------------|---------------------------------|
| Unit A | Main | 1 | Cells 1-61 | 61 | Stainless Steel Combination Unit 3.5 gpf Sloan Royal Flush Valve 3.5 gpf, mechanical lavatory valve .5 gpm | I-CON 1.6 gpf Flush Valve | I-CON Lavatory Dual Manifold |
| Unit A | Main | 2 | Cells 62- 122 | 61 | Stainless Steel Combination Unit 3.5 gpf Sloan Royal Flush Valve 3.5 gpf, mechanical lavatory valve .5 gpm | I-CON 1.6 gpf Flush Valve | I-CON Lavatory Dual Manifold |
| Unit B | Main | 1 | Cells 1-60 | 60 | Stainless Steel Combination Unit 3.5 gpf Sloan Royal Flush Valve 3.5 gpf, mechanical lavatory valve .5 gpm | I-CON 1.6 gpf Flush Valve | I-CON Lavatory Dual Manifold |
| Unit B | Main | 2 | Cells 62- 120 | 60 | Stainless Steel Combination Unit 3.5 gpf Sloan Royal Flush Valve 3.5 gpf, mechanical lavatory valve .5 gpm | I-CON 1.6 gpf Flush Valve | I-CON Lavatory Dual Manifold |

Unit E Retrofits

| Bldg | Area | Flr | Room | Qty | Existing Description | Toilet Retrofit | Lavatory Retrofit |
|--------|------|-----|-------------------|-----|---|------------------------------|---------------------------------|
| Unit E | Main | 1 | Wet Cells 1- 4 | 4 | Stainless Steel Combination Unit 3.5 gpf Sloan Royal Flush Valve 3.5 gpf, mechanical lavatory valve .5 gpm | I-CON 1.6 gpf Flush Valve | I-CON Lavatory Dual Manifold |

SYSTEMS RETROFIT – SHOWER VALVE

Units C, D, E, and F Retrofits

| Bldg | Area | Flr | Room | Qty | Existing Description | Shower Retrofit |
|--------|------|-----|-------------|-----|--|--|
| Unit C | Main | 1 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit C | Main | 2 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit D | Main | 1 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit D | Main | 2 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit E | Main | 1 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit E | Main | 2 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit F | Main | 1 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit F | Main | 2 | Shower Room | 8 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |

Units A and B Retrofits

| Bldg | Area | Flr | Room | Qty | Existing Description | Shower Retrofit |
|--------|------|-----|-------------|-----|--|--|
| Unit A | Main | 1 | Shower Room | 6 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit A | Main | 1 | Shower Room | 6 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit A | Main | 2 | Shower Room | 6 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit A | Main | 2 | Shower Room | 5 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit B | Main | 1 | Shower Room | 6 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit B | Main | 1 | Shower Room | 6 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit B | Main | 2 | Shower Room | 6 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |
| Unit B | Main | 2 | Shower Room | 6 | Mechanical Single Lever Mixing Valve or Metering Valve | I-CON Single Temp Shower Valve I-CON 2.0 gpm Institutional Shower Heads |

ECM #5: Energy Management System Upgrade/Expansion

RECOMMENDED ACTION

Replace the existing electric controls with a building automation/energy management system.

Provide new head end with updated graphics, software (2 year updates), sequences of operation and hands on training.

Estimated Electric Savings = 89,457 KWH/yr.

Estimated Electric Cost Savings = \$8,463/yr.

Estimated Gas Savings = 3,649 MCF/yr.

Estimated Gas Cost Savings = \$22,292 /yr.

Implementation Cost = \$1,005,889

Implementation costs includes design and engineering, project management, contingency, performance, overhead and profit.

Estimated electric savings based 7% of base electric usage

Estimated gas savings based on 4% of base gas usage.

*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.

EXISTING CONDITIONS

The maintenance building, kitchen, school, administration and field house have a Novar DDC system installed in the 1990's. The Novar system is operational, but outdated and provides basic energy management control (start/stop, status, space temperatures) on much of the major HVAC equipment. The existing Novar system is non-web based, non-open protocol and non-LON or bacnet compatible. The Novar system is proprietary and only Novar can maintain and make changes or additions.

The housing units have no EMS.

The electric temperature controls on most of the equipment is original (1954 to 1971), in poor/very poor condition, obsolete and no longer manufactured. Most of the controls have been disconnected and are operated manually. Electric controls are obsolete, no longer used, no longer installed and no longer manufactured.

The roof top units do not have economizers to use outside air to help cool a space in the fall to spring.

Over 50 roof top air conditioners, small air handlers, window air conditions and split system air conditions have been added over the years. Most of the equipment is stand alone with no setback or central control and operate continuously.

All of the equipment is operated continuously or shut off manually by the officers in inmate housing.



PROPOSED SYSTEM

ESG recommends all of the controls at the facility be converted to DDC. The new DDC system will be LAN/BacNet compatible, open protocol, Tridium compatible and non-proprietary allowing multiple qualified contractors or applied partners in the local geographic area to install, program, repair or maintain the system.

The new control system will provide much greater control and monitoring of the HVAC equipment. In addition, DDC provides greater flexibility in scheduling equipment, troubleshooting and optimizing energy saving strategies (start/stop, economizer, occupancy, etc.). Monitoring also optimizes the maintenance staff's utilization by allowing diagnostics and correction of many HVAC problems without going to the equipment.

Converting from electric to digital control will eliminate the outdated electrical control system, reduce costly maintenance of the system, and significantly reduce the comfort.

This upgrade will provide a new front-end graphical user interface that will allow monitoring and set point changes. The new system will provide the connectivity to the stand-alone controllers located at the individual pieces of equipment.

The existing LAN system in the building will be used to communicate between buildings and the central computer located in the maintenance shop. Off-site access via a VPN or any other means will not be permitted.

ESG believes this system will provide the proper space temperatures, ventilation requirements to meet comfort and safety needs and schedules to reduce energy consumption. Not only will the campus experience reduced electric, heating and cooling energy, but this system will allow maintenance personnel to diagnose problems sooner and make corrections faster, which will result in saved maintenance time, satisfied inmates, correctional officers and staff.

The control strategies for the buildings will include the air-handling units. The heating valve, cooling and outside air dampers will be direct digital control with monitoring and adjustment from the central computer. This will help to ensure that proper amount of air is being supplied to the areas and that greatest potential for savings is achieved.

Other control strategies that will be implemented on fan systems that are suited for these applications are:

- *Optimized Start/Stop* – the air-handling units will be individually controlled to startup for the optimum morning warm-up or cool-down start-time to reach the proper space temperature determined by the outside air temperature.
- *Space Setback Temperatures* – where applicable, space temperatures will be set up or down to maintain the predetermined space temperature to conserve energy during unoccupied periods.
- *Discharge Air Temperature Reset* – discharge air temperature set points are usually a fixed temperature for the entire year. There is a better method of supplying air in a variable volume system with reheat. The new controls will measure the position of the VAV boxes and reset the discharge air set point temperature to best optimize the correct amount of air to be supplied to the spaces.

- *Economizer Mode* – the controls will operate to take advantage of outside air temperatures to provide free cooling.

Benefits of New DDC Controls

- Energy Efficiency* – The new control system will allow the buildings to take advantage of energy savings strategies.
- Reduced Maintenance Cost* – The maintenance staff will be able to address maintenance issues from a single point. The staff can access trending data; can monitor equipment run times, alarms and schedules. In addition, all maintenance associated with the electric system will be reduced or eliminated.
- Reliability* – The electric system is old and antiquated due to equipment obsolescence, and not operating or incorrect readings of the older controls. Installing a new DDC system would assure reliable operation for the next generation of students and staff.
- Temperature Control and Comfort* – DDC provides superior temperature control and occupant comfort.
- Operating Costs* – A properly operating system will save energy.

General Scope:

- Remove existing energy management system. remove sensors, controllers. Cover sensor openings with stainless steel plate. Remove exposed wiring to above ceiling or joists. Remove all controls attached to air handlers and plug openings.
- Provide new computer, monitor, keyboard, mouse, printer and other accessories as required in area as directed by MTU.
- Provide all programming including graphics.
- Furnish and install all required network drops from control panels to LON access as directed by DOC personnel. Final connection by DOC.
- All LAN jacks to be maintained by the Michigan DOC.
- Submittal data & as-built O&M manuals shall be provided.
- Verify and record proper operation of controls to insure that all setback/up, sequences of operation and time schedules are operating properly. Provide trending of major equipment.
- Room sensors in officer or staff only areas to have temperature adjustment knob (+/- or red/blue dial- no temperature settings) with cover (no thermometer or display.) Room temperature adjustment to be limited by central computer system.
- All set points to be adjustable
- Provide sequences of operation and graphics as approved by MTU and Michigan DOC
- Remove pneumatics controls, panels, compressors, air dryers, filters and controls from the compressed air system in the school building.
- Thermostats required in inmate areas to be sensor with steel plate cover securely attached to the wall. All wiring in inmate areas to be in conduit securely attached to the wall with tamper proof screws.
- 32 hours on site training during and after installation. 16 hours on site training 6 months after completion.

- 2 year software upgrade after acceptance of installation
- Existing finned tube, convectors with pneumatic controls to be converted to self contained valve(total 12)
- Existing cabinet unit heaters with pneumatic controls to be converted to return air thermostat and aquastat (total 12)
- Not included: factory controls on gas fired heating equipment, equipment that is disconnected, self contained control valves, pipe or duct mounted gauges or thermometers, package/factory mounted domestic hot water controls.
- Provide and install variable frequency drives as listed below as manufactured by Danfoss, Toshiba, Square D or other approved equal. VFD on AHU's to have bypass. Sequences of operation to include override of VAV boxes for full speed operation. Rewire safeties to new VFD. Provide factory programming, set up and hands on training. VFD to include filters and impedance devices to prevent interference with MCU security and electrical system.
- Provide portable computer with software for access from other building within MTU. VPN or off site access not allowed.
- Provide all power as required for all devices.

Unoccupied Setback

This ECM calculates the energy savings from changing the space temperature (up in summer and down in the winter) when the spaced is unoccupied. An energy management system will act as a time clock to start, stop and cycle the equipment during the unoccupied period.

| Facility | kWh Savings | KWH \$ | kWh Savings | natural gas Savings | Natural Gas | Cost Savings |
|----------|-------------|-----------|-------------|---------------------|-------------|--------------|
| MTU | 89,457 | \$ 0.0946 | \$ 8,463 | 1,104 | \$ 6.11 | \$ 6,748 |

U = U values for wall, roof, windows, doors (See below)

A = Area of walls, roof, windows, doors (See below)

Buildings or areas that will be set back

| Equipment | Building | Area | Sq Ft | Wall Area | Wall U | stories | Roof Area | Roof U | Window Area | U | overall U value |
|----------------------------|----------|-------------------|--------|-----------|--------|---------|-----------|--------|-------------|------|-----------------|
| MTU kitchen Dining | MTU | Kitchen dining | 23,000 | 7,280 | 0.125 | 1 | 23,000 | 0.05 | 728 | 1 | 2,788 |
| MTU School building | MTU | School/Vocational | 91,900 | 14,551 | 0.125 | 1 | 91,900 | 0.05 | 1,455 | 1 | 7,869 |
| MTU Field house Building | MTU | Field house | 15,100 | 5,898 | 0.125 | 1 | 15,100 | 0.05 | 590 | 1 | 2,082 |
| MTU school HV-1 class | MTU | Classrooms | 5,000 | 3,394 | 0.125 | 1 | 5,000 | 0.05 | 339 | 1 | 1,014 |
| MTU School HV-2 class | MTU | Classrooms | 1,500 | 1,859 | 0.125 | 1 | 1,500 | 0.05 | 186 | 1 | 493 |
| MTU School HV-3 lib/off | MTU | Lib offices | 1,500 | 1,859 | 0.125 | 1 | 1,500 | 0.05 | 186 | 1 | 493 |
| MTU auditorium | MTU | Auditorium | 2,000 | 2,147 | 0.125 | 1 | 2,000 | 0.05 | 215 | 1 | 583 |
| MTU school RTU | MTU | Offices | 1,600 | 1,920 | 0.125 | 1 | 1,600 | 0.05 | 192 | 1 | 512 |
| MTU school HV-1 class | MTU | Classrooms | 5,000 | 3,394 | 0.125 | 1 | 5,000 | 0.05 | 339 | 1 | 1,014 |
| MTU School HV-2 class | MTU | Classrooms | 1,500 | 1,859 | 0.125 | 1 | 1,500 | 0.05 | 186 | 1 | 493 |
| MTU School HV-3 lib/off | MTU | Lib offices | 1,500 | 1,859 | 0.125 | 1 | 1,500 | 0.05 | 186 | 1 | 493 |
| MTU auditorium | MTU | Auditorium | 2,000 | 2,147 | 0.125 | 1 | 2,000 | 0.05 | 215 | 1 | 583 |
| MTU school clg hung | MTU | Offices | 1,000 | 1,518 | 0.125 | 1 | 1,000 | 0.05 | 152 | 0.61 | 332 |
| MTU school split offices | MTU | Offices | 600 | 1,176 | 0.125 | 1 | 600 | 0.05 | 118 | 0.61 | 249 |
| MTU Shop AHU-1 | MTU | Shop | 6,000 | 3,718 | 0.125 | 1 | 6,000 | 0.05 | 372 | 0.61 | 992 |
| Mtu Shop AHU-2 | MTU | Shop | 6,000 | 3,718 | 0.125 | 1 | 6,000 | 0.05 | 372 | 0.61 | 992 |
| MTU field house Gym AHU | MTU | GYM | 3,200 | 2,715 | 0.125 | 1 | 3,200 | 0.05 | 272 | 0.61 | 665 |
| MTU fielhouse lobby/office | MTU | Lobby /office | 4,000 | 3,036 | 0.125 | 1 | 4,000 | 0.05 | 304 | 0.61 | 765 |
| MTU units D,E MZ | MTU | Commons area | 6,000 | 3,718 | 0.125 | 1 | 6,000 | 0.05 | 372 | 0.61 | 992 |
| MTU unit F MZ | MTU | Dav Room | 6,500 | 3,870 | 0.125 | 1 | 6,500 | 0.05 | 387 | 0.61 | 1,045 |

HEATING -

Calculates the savings from setting back a building or area when unoccupied.
Temp below which building will require some heating

Existing occupied hours/week
Proposed occupied hours/week
Warm up hours
Heating season hours
% of area that will set back
Existing setback temperature
Proposed setback temperature
% heating eff
Savings (MCF)

Below this temperature the building or area will require some heating. No unoccupied heating will take place above this temperature

Existing time the building or area is occupied

Future weekly occupied time

Amount of time that system will require to warm up from setback. Generally about 25% of the setback time

Number of hours in the heating season based on the temperature below which heating will be required.

Estimated percent of the square feet that can be set back.

Existing setback temperature

Proposed setback temperature. Generally about 60 F to enable the building to be at temperature when occupied.

% heating efficiency of the heating system

= overall U value x (existing setback - proposed setback) x (existing weekly hours - future weekly hours - warm up) x
(heating season hours/168 hours/week) x % of area that will be setback /(% heating efficiency x 1,000,000 btu/mcf)

| Building | | Equipment | Temp below which building will require some heating | Existing occupied hours/week | Proposed occupied hours/week | Warm up hours | Heating season hours | % of area that will set back | Existing setback temperature | Proposed setback temperature | % heating eff | Savings (MCF) |
|----------|-------------------|--------------------------|---|------------------------------|------------------------------|---------------|----------------------|------------------------------|------------------------------|------------------------------|---------------|---------------|
| ICF | administration | ICF admin bldg 100 | 41 | 168 | 72 | 18 | 3,587 | 75% | 72 | 60 | 86% | 29.9 |
| MTU | School/Vocational | MTU School building | 45 | 168 | 66 | 16.5 | 4,059 | 90% | 72 | 60 | 86% | 204.1 |
| MTU | Field house | MTU Field house Building | 45 | 168 | 84 | 21 | 4,059 | 90% | 72 | 60 | 86% | 39.8 |
| MTU | Kitchen dining | MTU kitchen Dining | 45 | 168 | 84 | 21 | 4,059 | 90% | 72 | 60 | 86% | 53.3 |
| MTU | Day Room | MTU unit F MZ | 45 | 168 | 84 | 21 | 4,059 | 90% | 72 | 65 | 86% | 11.6 |
| MTU | Commons area | MTU units D,E,MZ | 45 | 168 | 84 | 21 | 4,059 | 90% | 72 | 65 | 86% | 11.1 |

Cooling

Calculates the savings from raising the temperature in a building or area when it is unoccupied. This ECM only applies to areas with air conditioning.

Temp above which building will require some air conditioning

Existing occupied hours/week
Proposed occupied hours/week
Cool Down hours
Cooling season hours
% of area that will set up
Existing set up temperature
Proposed set up temperature
KW/Ton
Savings (KWH)

Above this temperature the building or area will require some air conditioning. No unoccupied air conditioning will take place below this temperature

Existing time the building or area is occupied

Future weekly occupied time

Amount of time that system will require to cool down. Generally about 25% of the setback time

Number of hours in the cooling season based on the temperature above which cooling will be required.

Estimated percent of the square feet that can be set back.

Existing temperature for set up now.

Proposed setup temperature. Generally about 80 F to enable the building to be at temperature when occupied.

Air conditioning efficiency. Generally about 1 to 1.2 for RTU and unitary type air conditioning.

= overall U value x (existing set up - proposed set up) x (existing weekly hours - future weekly hours - cool down hours) x
(cooling season hours/168 hours/week) x % of area that will be setback x KW/Ton / 12,000 btu/ton

| Building | | Equipment | Temp above which building will require some air conditioning | Existing occupied hours/week | Proposed occupied hours/week | Cool Down hours | Cooling season hours | % of area that will set up | Existing set up temperature | Proposed set up temperature | KW/Ton | Savings (KWH) |
|----------|---------|--------------------------|--|------------------------------|------------------------------|-----------------|----------------------|----------------------------|-----------------------------|-----------------------------|--------|---------------|
| MTU | Offices | MTU school RTU | 71 | 168 | 60 | 15 | 1170 | 90% | 72 | 80 | 1.1 | 219 |
| MTU | Offices | MTU school clg hung | 71 | 168 | 60 | 15 | 1170 | 90% | 72 | 80 | 1.1 | 142 |
| MTU | Offices | MTU school split offices | 71 | 168 | 60 | 15 | 1170 | 90% | 72 | 80 | 1.1 | 106 |

Fan motor savings

Calculates the savings from shutting off the supply, return or exhaust fan during unoccupied periods

| | |
|------------------------------|--|
| qty | Number of fans |
| HP | Nameplate horsepower of each fan. |
| motor efficiency | Efficiency of the motor. |
| Motor Loading | Estimated load on the motor. |
| Existing occupied hours/week | Existing hours that the building or area is unoccupied |
| Proposed occupied hours/week | Future hours the building or area is unoccupied |
| Unoccupied operation | Amount of time that motor will need to run for night time cycling or warm up/cool down. |
| KWH savings | = Qty x Hp x motor loading x (Existing unoccupied hours - Proposed occupied hours - unoccupied operation) x 52 weeks/yr / motor efficiency |

| Building | | AHU | qty | HP | motor efficiency | Motor Loading | Existing occupied hours/week | Proposed occupied hours/week | Unoccupied operation | KWH savings |
|----------|---------------|----------------------------|-----|-----|------------------|---------------|------------------------------|------------------------------|----------------------|-------------|
| MTU | Classrooms | MTU school HV-1 class | 1 | 3 | 90% | 73% | 168 | 66 | 16.5 | 8,071 |
| MTU | Classrooms | MTU School HV-2 class | 1 | 1.5 | 90% | 73% | 168 | 66 | 16.5 | 4,035 |
| MTU | Lib offices | MTU School HV-3 lib/off | 1 | 1.5 | 90% | 73% | 168 | 66 | 16.5 | 4,035 |
| MTU | Auditorium | MTU auditorium | 1 | 7.5 | 90% | 73% | 168 | 30 | 7.5 | 30,796 |
| MTU | Offices | MTU school RTU | 2 | 1.5 | 90% | 73% | 168 | 60 | 15 | 8,779 |
| MTU | Shop | MTU Shop AHU-1 | 1 | 7.5 | 90% | 73% | 60 | 30 | 7.5 | 5,310 |
| MTU | Shop | Mtu Shop AHU-2 | 1 | 7.5 | 90% | 73% | 60 | 30 | 7.5 | 5,310 |
| MTU | GYM | MTU field house Gym AHU | 2 | 2 | 90% | 73% | 60 | 30 | 7.5 | 2,832 |
| MTU | Lobby /office | MTU fielhouse lobby/office | 1 | 5 | 90% | 73% | 168 | 84 | 21 | 9,911 |
| MTU | Day Room | MTU unit F MZ | 1 | 5 | 90% | 73% | 168 | 84 | 21 | 9,911 |

Ventilation Savings

Ventilation Savings from the fan not operating during unoccupied periods. Many of the dampers are original and do not fit well. Factors have been included account for CFM degradation. Savings taken for heating only.

| | |
|------------------------------|---|
| Unit Airflow CFM | Air handler design air flow x 66% to account for losses, age an inefficiencies. |
| % OA | Percent outside air based on design x 30% to account for little to no damper control and operation |
| OA cfm | Estimated outside air |
| Heating Delivered air temp. | Estimated or design discharge air temperature |
| Average OA temperature | Average outside air temperature |
| Existing occupied hours/week | Current hours that the area is occupied |
| Proposed occupied hours/week | Future hours that the area is occupied |
| Warm up hours/week | Hours that the unit needs to run to warm up the space |
| Heating season hours | Number of hours in the heating season at the average OA temp |
| MCF | = 1.1 x (heating delivered air temp - Average OA temp) x OA cfm x (Existing weekly hours of operation - Future weekly hours of operation - warm up hours) x heating season hours/168 hours/wk /(86% heating efficiency x 1,000,000 btu/MCF) |

| Building | | AHU | Heating | | Unit Airflow CFM | % OA | OA cfm | Heating Delivered air temp. | Average OA temperature | Existing occupied hours/week | Proposed occupied hours/week | Warm up hours/week | Heating season hours | MCF |
|----------|---------------|----------------------------|------------|-----------|------------------|------|--------|-----------------------------|------------------------|------------------------------|------------------------------|--------------------|----------------------|-----|
| | | | CFM Factor | OA factor | | | | | | | | | | |
| | | | 66% | 30% | | | | | | | | | | |
| MTU | Classrooms | MTU school HV-1 class | 4,323 | 30% | 1,297 | 100 | 35 | 168 | 66 | 17 | 4,095 | 225 | | |
| MTU | Classrooms | MTU School HV-2 class | 2,112 | 9% | 190 | 95 | 35 | 168 | 66 | 17 | 4,095 | 30 | | |
| MTU | Lib offices | MTU School HV-3 lib/off | 1,980 | 3% | 59 | 100 | 35 | 168 | 66 | 17 | 4,095 | 10 | | |
| MTU | Auditorium | MTU auditorium | 5,940 | 9% | 535 | 100 | 35 | 168 | 30 | 8 | 4,095 | 141 | | |
| MTU | Shop | MTU Shop AHU-1 | 8,375 | 30% | 2,513 | 95 | 35 | 60 | 30 | 8 | 4,095 | 106 | | |
| MTU | Shop | Mtu Shop AHU-2 | 7,867 | 30% | 2,360 | 95 | 35 | 60 | 30 | 8 | 4,095 | 99 | | |
| MTU | GYM | MTU field house Gym AHU | 4,158 | 9% | 374 | 105 | 35 | 60 | 30 | 8 | 4,095 | 18 | | |
| MTU | Lobby /office | MTU fielhouse lobby/office | 3,584 | 14% | 484 | 95 | 35 | 168 | 84 | 21 | 4,095 | 57 | | |
| MTU | Day Room | MTU unit F MZ | 4,620 | 5% | 236 | 95 | 35 | 168 | 84 | 21 | 4,095 | 28 | | |
| MTU | Commons area | MTU units D,E MZ | 4,389 | 5% | 224 | 95 | 35 | 168 | 84 | 21 | 4,095 | 69 | | |



Proprietary and Confidential

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*Estimated energy and cost savings are for year one only. All cost and savings are +/- 10%.