Standard Service Levels – Physical Plant Services

The department of Physical Plant Services works collaboratively with the University Community to plan, construct, operate and maintain the buildings, grounds and infrastructure of Queen’s University to the highest possible standards so as to create and sustain a positive, safe and welcoming environment for education and research.

Physical Plant Services has 3 units:
1. Operations and Engineering
2. Project management
3. Campus Sustainability - Waste Management

The services of the department can be summarized under 6 headings:
1. Facilities Operations, Maintenance and Grounds
2. Facilities Operations, Custodial
3. Facilities Engineering
4. Utilities Management and Central Power Plant
5. Deferred Maintenance Management
6. Project Management

NOTES:
1. AVP Facilities has security but Not really part of PPS. We would need to change the reference to AVP Facilities or to delete Campus Security
1. Facilities Operations, Maintenance and Grounds

**Description of Activity**

Maintenance activities include routine, preventative, project, and regulatory/life safety compliance maintenance routines for all campus facilities, infrastructure, and equipment. These routines are listed in the following tables and are defined by regulatory/life safety requirements and industry norms/best practises. In addition to planned maintenance work, the team provides a 24/7 response to emergency and unplanned facilities failures and problems.

The trades team is composed of the following trades:

1. **Electricians**
   - Provide comprehensive electrical services including maintaining building electrical systems and infrastructure, fire alarm, emergency generators, emergency lighting, fire safety devices, breakers, transformers, installation of electrical system to support equipment, and provision of routine and emergency call services.

2. **Plumbers**
   - Provide building plumbing services including maintenance of washroom fixtures, sinks, toilets, showers, wet labs in classrooms, building plumbing and piping systems, cooling towers, water chemical treatment systems, valves, pumps, drainage systems, piping infrastructure and provision of routine and emergency call services.

3. **Steamfitters**
   - Provide steamfitter services to the campus steam district heating system including steam piping, valves, pressure reducing stations, hot water converters, steam heating coils, steam humidifiers, underground infrastructure, expansion joints, and provide routine and emergency call services.

4. **Millwrights**
   - Provide routine and preventative maintenance to pumps, mechanical systems, bearings, belts, motors, kitchen equipment, HVAC components, alignment of shafts, sheaves, pulleys, gears, filters, supply and exhaust fans, air compressors, and provide routine and emergency call services.

5. **Elevators Mechanics**
   - Provide all required elevator services for 120 campus elevators including regulatory monthly/semi-annual/annual/five year requirements, daily checks and services, unit failures, annual safety checks, minor modifications, and respond to routine and emergency calls.

6. **Carpenters**
   - Provide building system carpentry services including work on building doors, windows, partitions, shelving, benches, furniture, minor renovations, drywall, tiles, framing, fume hoods, flooring, boarding of broken glass, floor mouldings, door hardware including door closers, panic hardware, locksets, hinges, access control system and provide response to routine and emergency calls.
7. Painters
   - Provide painting services to campus surfaces including walls, ceiling, doors, windows, exterior building components, shelving etc.

8. Controls Mechanics
   - Provide routine and preventative maintenance to building automation control systems which control HVAC (heating, ventilation and air conditioning), control system components on valves, variable air volume boxes, variable frequency drives, motors, pumps, fans, temperature/humidity controls, direct digital control (DDC) systems, and provide response to routine and emergency calls.

9. Refrigeration Mechanics
   - Provide routine and preventative maintenance to building air conditioning systems including computer rooms, walk in freezers and coolers, kitchen cooling equipment, reciprocating/rotary screw/centrifugal chillers, lab chillers, window a/c, rooftop units, etc and provide routine and emergency call response.

10. Welder
    - Provides Provincially recognized welding qualifications to weld steam and high pressure piping systems, general repairs, piping welding, general welding.

11. Trades helpers
    - Provide assistance to above trades for non-licensed work at lower cost

12. Apprentices
    - Currently 2 employees in apprenticeship programs which provide trade service at a reduced incrementally increased cost from 55% trade rate year 1 to 100% trade rate in year 5
    - Refrigeration/Plumbing/Steamfitter/Elevator Mechanic

13. Grounds
    - Maintains the university campus hard/soft landscaping surfaces, flower beds, trees, including grass cutting, weeding, seasonal planting, snow removal, garbage removal, small item pickup, fencing, lock stone, and various other grounds related services. Performs snow removal and surface treatment for paths and sidewalks around the campus to render the campus safe and navigable in winter.
## Service Level Definitions - Operations and Engineering - Operations and Building Maintenance

<table>
<thead>
<tr>
<th>Description of Activity</th>
<th>Planned Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilities Operations and Maintenance</strong></td>
<td></td>
</tr>
<tr>
<td>Fire System testing and maintenance</td>
<td></td>
</tr>
<tr>
<td>- fire alarms</td>
<td>monthly/bi-annual/annual</td>
</tr>
<tr>
<td>- sprinkler systems</td>
<td>annual</td>
</tr>
<tr>
<td>- fire standpipe inspections</td>
<td>annual</td>
</tr>
<tr>
<td>- emergency exit lighting</td>
<td>monthly</td>
</tr>
<tr>
<td>- fire separation maintenance</td>
<td>ongoing</td>
</tr>
<tr>
<td>- fire pump inspection / maintenance</td>
<td>bi-weekly/yearly</td>
</tr>
<tr>
<td>- fire monitoring signal verification</td>
<td>annual</td>
</tr>
<tr>
<td>- fire department standpipe and sprinkler connections</td>
<td>annual</td>
</tr>
<tr>
<td>- emergency generator testing</td>
<td>bi-weekly/monthly/yearly</td>
</tr>
<tr>
<td>- fire hydrant preventative maintenance</td>
<td>annual</td>
</tr>
<tr>
<td>- FM200 fire protection systems</td>
<td>annual</td>
</tr>
<tr>
<td>- kitchen fire suppression systems</td>
<td>annual</td>
</tr>
<tr>
<td><strong>Building Automation Controls Systems</strong></td>
<td></td>
</tr>
<tr>
<td>- Building Automation controls maintenance</td>
<td>ongoing</td>
</tr>
<tr>
<td>- calibration/verification of control points</td>
<td>annual</td>
</tr>
<tr>
<td>- operational maintenance</td>
<td>annual</td>
</tr>
<tr>
<td>- check of temp/humidity/gauges/transmitters/ sensors</td>
<td>annual</td>
</tr>
<tr>
<td>- check operation of valves/dampers</td>
<td>annual</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td></td>
</tr>
<tr>
<td>- filter inspection/changes</td>
<td>condition based</td>
</tr>
<tr>
<td>- belts/bearings/seals/couplings/pulleys</td>
<td>annual</td>
</tr>
<tr>
<td>- general preventative maintenance</td>
<td>annual</td>
</tr>
<tr>
<td>- heating season preparation</td>
<td>annual</td>
</tr>
<tr>
<td>- cooling season preparation</td>
<td>annual</td>
</tr>
<tr>
<td>- routine maintenance</td>
<td>as required</td>
</tr>
<tr>
<td>- heat recovery wheels - cleaning/checking/adjusting</td>
<td>bi-annual</td>
</tr>
<tr>
<td>- VAV (Variable Air Volume) box maintenance</td>
<td>as required</td>
</tr>
<tr>
<td><strong>Fume hoods</strong></td>
<td></td>
</tr>
<tr>
<td>- verification of face velocity</td>
<td>annual</td>
</tr>
<tr>
<td>- calibration/verification of control points</td>
<td>annual</td>
</tr>
<tr>
<td>- preventative maintenance</td>
<td>annual</td>
</tr>
<tr>
<td>- sash maintenance</td>
<td>annual</td>
</tr>
<tr>
<td>- check lubrication exhaust fan bearings/motors/belts</td>
<td>annual</td>
</tr>
<tr>
<td>- check pulleys / ductwork</td>
<td>annual</td>
</tr>
<tr>
<td>- adjust airflows as required</td>
<td>annual</td>
</tr>
<tr>
<td>Heat Pumps (1800 units)</td>
<td></td>
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<tr>
<td>---------------------------------</td>
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</tr>
<tr>
<td>- inspect / change filters</td>
<td>annual</td>
</tr>
<tr>
<td>- lubricate bearings</td>
<td>annual</td>
</tr>
<tr>
<td>- check control operations</td>
<td>annual</td>
</tr>
<tr>
<td>- preventative maintenance</td>
<td>annual</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Air Conditioning Systems</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- water treatment of cooling towers &amp; closed loop systems</td>
<td>weekly</td>
<td></td>
</tr>
<tr>
<td>- seasonal startup - filling checking chemical treatment of piping systems</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- chiller startup - verification of controls / operations/checks</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- chiller preventative maintenance</td>
<td>monthly</td>
<td></td>
</tr>
<tr>
<td>- cooling tower checks - motor/belts/sensors/levels/controls</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- chilled water coils filling/treatment flushing</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- seasonal shutdown - drainage of systems and winter prep layup</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- preventative maintenance on refrigeration detection systems</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- replacement of Pressure Relief Valves</td>
<td>5 years</td>
<td></td>
</tr>
<tr>
<td>- verification of electrical components</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- condenser system cleaning / tube brushing / power spraying</td>
<td>annual</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Heating Systems</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- seasonal preparation of heating systems</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- filter changes/ pump service/ valve service/ control verifications</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- gas fired equipment checks</td>
<td>Annual/semi-annual</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elevators</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- regular inspections</td>
<td>monthly/quarterly/semi-annual</td>
<td></td>
</tr>
<tr>
<td>- periodic and annual TSSA inspection</td>
<td>annual</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sump/Sewage Pumps</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- check operation / level controls / connections</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- verify operation of ERC alarming points</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>- Transformer / oil switch testing</td>
<td>annual</td>
<td></td>
</tr>
<tr>
<td>- transformer testing /inspection/cleaning</td>
<td>5 year</td>
<td></td>
</tr>
<tr>
<td>- electrical panels - inspection/checking/infrared scan/panel verifications</td>
<td>5 year</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Air Compressors</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- check inspect building air compressors</td>
<td>annual</td>
</tr>
<tr>
<td>- lubricate/belt changes/cleaning/service</td>
<td>annual</td>
</tr>
<tr>
<td>- air dryer preventative maintenance</td>
<td>annual</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Kitchen Equipment Maintenance</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- fridges/ovens/freezers/belt lines/general equipment</td>
<td>annual</td>
</tr>
<tr>
<td>- grease trap and sewer line maintenance</td>
<td>monthly</td>
</tr>
<tr>
<td>- gas fired appliances</td>
<td>semi-annual</td>
</tr>
<tr>
<td>- preventative maintenance routines on various</td>
<td>per required freq.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Preparation of external services</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- draining of irrigation systems</td>
<td>annual</td>
</tr>
<tr>
<td>- exterior hose bib shutoffs</td>
<td>annual</td>
</tr>
<tr>
<td>- exterior hose bib turn on</td>
<td>annual</td>
</tr>
<tr>
<td>- catch basin cleaning / clearing</td>
<td>as required</td>
</tr>
<tr>
<td>- ramp heating on/off</td>
<td>seasonal</td>
</tr>
<tr>
<td>- heat tracing systems on/off</td>
<td>seasonal</td>
</tr>
<tr>
<td>- external lighting</td>
<td>as required</td>
</tr>
<tr>
<td>- grounds related activities - bedding/trees/grass/snow/garbage</td>
<td>as required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Roofing</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- cleaning of roof drains</td>
<td>annual</td>
</tr>
<tr>
<td>- roof inspections</td>
<td>annual</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Steam System Infrastructure</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- manhole maintenance</td>
<td>annual</td>
</tr>
<tr>
<td>- valve/expansion joint/piping/steam trap service</td>
<td>annual</td>
</tr>
<tr>
<td>- safety valve check</td>
<td>annual</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Various Departmental Services</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- for example - cage washer/washing machine/walk in freezer/ etc. etc.</td>
<td>as required</td>
</tr>
</tbody>
</table>
Available Resources

Facilities Operations and Maintenance activities are a large proportion of the work completed within Physical Plant Services, and represents approximately 64 FTE plus contracted services of approximate $1.3M

Performance Measures

• Successful completion of various building operations and maintenance requirements as demonstrated by record keeping and regulatory inspections
• Results of external regulatory inspections including inspections from TSSA Elevating Devices/Kingston Fire Department/Electrical Safety Authority/Kingston Building Code Officials/Ministry of Labour/ Insurance inspectors/ TSSA Boiler and Pressure Vessels, Ministry of the Environment )Number of building system failures / customer complaints / disruptions of academic programs/ building shutdowns
• Number of work requests received and processed in a given year
• Number of preventative maintenance routines performed
• Number of union grievances / work interruptions / work refusals

Risks to Ability to Sustain Core Activity

• General risk associated with adjustment of service levels to accommodate salary and benefit cost increases being absorbed into the next fiscal year budget
• Inadequate operations funding coincident with new construction
• Inability to attract qualified staff

Implications to University of eliminating or reducing Building Operations and Maintenance and Grounds

The impact to the University of eliminating or reducing Building Operations and Maintenance and Grounds activities is assessed as being HIGH.

Description of Implications:

• Reduced budget and FTE would lead to slower response times to calls
• Specific budget implications would include a review of Union contracts and prevailing seniority positions of various trades at the time of budget reductions
• Reduction of FTE may increase use of 3rd party contractors at an increased cost to department and potential loss of Building Standards control.
• Lack of compliance to regulatory requirements could result in legal charges from authorities having jurisdictions and could force building/facilities shutdowns/closures
• Lack of proper building maintenance will accelerate growth of facilities related deferred maintenance on campus. All of the regulatory and compliance activities performed by Physical Plant Services are tied to mandatory code requirements. Reducing these activities could have a negative impact on funding or render the University non-compliant with its code requirements.
• Lack of compliance to regulatory requirements could affect institutional reputation
• Lack of performance of building operations and maintenance routines could affect the Health and Safety of the Queen’s community
• Lack of appropriate resources to perform required building operations and maintenance routines could lead to premature failure of campus infrastructure and significant financial losses.
• Lack of appropriate resources to perform required building operations and maintenance routines will affect the facility related research and learning environment that the University is able to provide for students.

2. Facilities Operations and Custodial Services

Description of Activity

Facilities Operations and Custodial activities are carried out to operate and clean the campus facilities. Custodial services include base building routine cleaning and planned annual/seasonal project work activities. The services also include entrance snow removal, event set ups, extra customer requested cleaning, flood/spill response and various event cleaning support.

APPA Cleaning Standards:

APPA, Association of Physical Plant Administrators founded in 1914, 4800 institutions are members is a North American standards organization specifically dedicated to educational facilities management
http://www.appa.org/index.cfm

1. Level 1 – Orderly Spotlessness – highest level of cleaning – floors/base moldings are clean/shined-no buildup in corners/along walls- all surfaces/fixtures have freshly cleaned/polished appearance- no accumulation of dirt/dust/streaks/smudges or fingerprints – washroom/shower tile free of dirt/soap scum/odors -trash containers emptied, cleaned, and odor-free

2. Level 2 – Ordinary Tidiness – base upon which APPA guidelines are established - floors/base moldings are clean/shined-no buildup in corners/along walls – can be two days of dirt/dust/stains/streaks – all surfaces cleaned but marks/dust/smudges/fingerprints noticeable with close observation – washrooms/shower tile gleam and are odor free – supplies are adequate-trash containers emptied, cleaned, and odor-free

3. Level 3 – Casual Cleanliness – lower than normal expectations – floors are swept clean – dust spots/matted carpet in walking lanes – streaks splashes on base molding. Surfaces have obvious dust/dirt/marks/smudges and fingerprints. Trash containers have old trash

4. Level 4 – Moderate Dinginess – areas are becoming unacceptable/lacks normal cleanliness. Floors are swept clean but dull. Obvious buildup of dirt/dust/floor finish in corners and along walls. Molding is dull and contains streaks/splashes. Surfaces have dust/dirt/fingerprints/marks that are difficult to remove. Trash containers stained/marked/smell and have old trash

5. Level 5 – Un-kept Neglect – lowest level – facility is always dirty, cleaning level is unacceptable. Floors carpet are dirty/visible wear/pitting. Buildup of dirt/floor finish in corners/along walls
Current budget allocation allows the planning for APPA Level 3 cleaning standard to be delivered. See Appendix A for the Customer Care Plan.

**Available Resources**

Resources include full time, 9 month term and casual employees for a total of approximately 100 FTE plus casual labour as required.

**Performance measures**

- Completion of tasks to the level and frequency planned
- Results of internal custodial audits by area as performed by supervisors and compared to APPA standards
- Customer calls and concerns

**Risks to Ability to Sustain Core Activity**

- General risk associated with adjustment of service levels to accommodate salary and benefit cost increases being absorbed into the next fiscal year budget.
- Lack of full funding for new building and renovated space

**Implications to University of eliminating or reducing facilities operations and custodial activities**

The impact to the University of eliminating or reducing custodial services is assessed as **HIGH**.

Description of implications:

- Health and safety concerns arise when custodial standards are not maintained
- Institutional reputation is affected with lowering of cleaning standard
- Reduction in funding and loss of FTE would see public area space and classroom space reduction in cleaning standards. Remaining spaces would selectively move from APPA level 3 to APPA level 4 depending on the particular building.
- Building closures in summer months would help alleviate FTE reductions

3. **Facilities Engineering**

**Description of Activity**

The team provides technical support to the Operations and Projects teams, plans underground infrastructure renewal and expansion, and maintains the campus facilities documents and drawing records
## Service Level Definitions - Operations and Engineering - Engineering

<table>
<thead>
<tr>
<th>Description of Activity</th>
<th>Planned Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide technical support to Facilities Operations</td>
<td>ongoing</td>
</tr>
<tr>
<td>Provide design review of new construction and renovation projects</td>
<td>ongoing</td>
</tr>
<tr>
<td>Perform commissioning of new facilities</td>
<td>ongoing</td>
</tr>
<tr>
<td>plan infrastructure renewal and expansion to service new facilities</td>
<td>ongoing</td>
</tr>
<tr>
<td>maintain facility document and drawing records for the campus</td>
<td>ongoing</td>
</tr>
<tr>
<td>provide technical input to deferred maintenance planning</td>
<td>ongoing</td>
</tr>
<tr>
<td>maintain Queen's Building Standards documentation</td>
<td>ongoing</td>
</tr>
<tr>
<td>ensure project compliance with Queen's Building Standards</td>
<td>ongoing</td>
</tr>
<tr>
<td>produce drawings and record documentation as required</td>
<td>ongoing</td>
</tr>
<tr>
<td>produce drawings for minor renovations and facilities improvements</td>
<td>ongoing</td>
</tr>
<tr>
<td>Plan, maintain and operate the University’s electrical power distribution system</td>
<td>ongoing</td>
</tr>
<tr>
<td>Advise and assist with energy reduction initiatives</td>
<td>ongoing</td>
</tr>
<tr>
<td>Advise and assist with the effective operation of the cogeneration system</td>
<td>ongoing</td>
</tr>
</tbody>
</table>

## Available Resources

Resources include two professional mechanical engineers/ two professional electrical engineers and two drafting/drawing CAD specialists for a total of 6 FTE

## Performance Measures

- Successful and timely reviews of new construction and renovation projects
- Successful technical support of operations activities
- Timely planning and implementation of campus infrastructure to ensure new construction and renovation work have proper infrastructure support
- Review and ensure regulatory compliance of buildings and systems
- Accurate and complete document and drawing records
- Support of student academic project work
- Maintenance of VFA facilities condition audit data base
- Minimization of unplanned electrical power outages due to equipment or system failure
**Risks to Ability to Sustain Core Activity**

- General risk associated with adjustment of service levels to accommodate salary and benefit cost increases being absorbed into the next fiscal year budget.
- Inadequate operations funding coincident with new construction
- Without sufficient funding to maintain resources internally to provide services for this core activity, external providers of engineering technical support would need to be utilized, however they are typically charged out at twice the current internal rate
- Legal framework for high voltage system operation requires a minimum level of in-house support

**Implications to University of eliminating or reducing facilities operations engineering activities**

The impact to the University of eliminating or reducing Engineering Services is assessed as **HIGH**

- Without proper ‘in house’ design review, new campus buildings and renovations will not comply with University standards and regulatory requirements
- Lack of compliance to University facilities standards introduces operationally expensive and non-standard systems and equipment to the campus
- Lack of operational technical assistance would remove a critical support service to PPS trades and Area Managers which would significantly increase operational costs
- Without technical support, buildings and systems may not comply with regulatory and life safety requirements
- External providers of engineering technical support are typically charged out at twice the current internal rate
- Increased engineering and technical support costs (at least double the internal costs)
- Increased frequency of unplanned electrical power outages due to lack of familiarity with campus needs and lack of planning by outside resources

4. **Utilities Management and Central Heating Plant (CHP)**

**Description of Activity**

Utilities Management and the Central Heating Plant includes the planning and management of the Universities utilities budget and the operation and maintenance of the Central Heating Plant which provides emergency power backup to Kingston General Hospital and parts of the campus as well as providing steam heat to two local hospitals.

<table>
<thead>
<tr>
<th>Description of Activity</th>
<th>Planned Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation and maintenance of the Central Heating Plant providing steam heat to campus and 2 local hospitals</td>
<td>ongoing</td>
</tr>
<tr>
<td>Maintenance and operation of the steam distribution supply infrastructure network</td>
<td>ongoing</td>
</tr>
<tr>
<td>Operation and maintenance of the $25M x 15 MegaWatt Cogeneration facility providing backup emergency power to KGH and QU</td>
<td>ongoing</td>
</tr>
<tr>
<td>Task Description</td>
<td>Status</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Strategic forward 3 year procurement of natural gas fuel for the CHP</td>
<td>ongoing</td>
</tr>
<tr>
<td>Strategic forward 3 year procurement of electricity products</td>
<td>ongoing</td>
</tr>
<tr>
<td>Planning and execution of emergency cogeneration power backup plan for the Queen's campus and KGH</td>
<td></td>
</tr>
<tr>
<td>Management of planning and implementation of the 5 year CHP deferred maintenance program</td>
<td></td>
</tr>
<tr>
<td>Management of the steam sales contracts with two local hospitals</td>
<td>ongoing</td>
</tr>
<tr>
<td>Management of the cogeneration connection contract agreement with Kingston Hydro</td>
<td>ongoing</td>
</tr>
<tr>
<td>Management of the natural gas supplier agreements for gas supply from Alberta</td>
<td>ongoing</td>
</tr>
<tr>
<td>Management of the gas management contract to transport natural gas from Alberta to Kingston</td>
<td>ongoing</td>
</tr>
<tr>
<td>Management of the natural gas consulting contract related to strategic procurement</td>
<td>ongoing</td>
</tr>
<tr>
<td>Management of the Demand Response Contract between Queen's and the Ontario Power Authority</td>
<td>ongoing</td>
</tr>
<tr>
<td>Ensure compliance and reporting with/of all regulatory requirements of the CHP</td>
<td>ongoing</td>
</tr>
<tr>
<td>Management/budgeting and reporting of the $16M Queen's Utilities Budget</td>
<td>ongoing</td>
</tr>
<tr>
<td>participate in the preparation of annual audited statements</td>
<td>annual</td>
</tr>
</tbody>
</table>

**Available Resources**

Utilities and Central Heating Plant include an Energy Engineer, and central heating plant Operating Engineers for a total of 12 FTE plus contracted services of approximately $80K

**Performance Measures**

**Central Heating Plant**

- Compliance with regulatory and reporting requirements
- Compliance with various revenue program requirements Ontario Power Authority (OPA) Demand Response Three program (DR3) and existing contracts
- Plant performance/efficiency and overall reliability
- Successful completion of planned preventative maintenance routines
- Plant downtime/unavailable incidents and equipment failures
- Management of plant costs within budget
- Implementation and adherence to 5 year deferred maintenance program
- Maintaining 100% readiness capability of Cogeneration facility

**Utilities Budget**

- Management of utilities costs within budget
- Identification and enrolment in energy saving / rebate programs
- Successful procurement of forward energy products within budget
- Producing accurate forward budget models for campus utilities
- Successful contract signing with energy product suppliers
Risks to Ability to Sustain Core Activity

- Poor performance of the CHP could cause significant infrastructure failure and cost in winter months
- Inability to provide steam heat to two local hospitals could have significant health & safety/financial risk and University reputation damage in the community
- Non-compliance with regulatory requirements could result in plant shutdown, directives from regulatory agencies, and negative affect on university reputation
- Failures on the steam distribution system could cause buildings to be closed for prolonged periods of time affecting teaching and research activities
- Failure to honour contracts with suppliers, local utilities, the Province, will have significant financial consequences
- Poor management of utilities budget could cause significant unanticipated variances in annual utilities budget forecasts
- Poor hedging practices on commodities purchasing could expose the university to volatile commodity pricing and subsequent costs
- Failure of cogeneration performance could have significant health and safety issues for KGH and also Queen’s research.

Implications to University of eliminating or reducing Utilities and Central Heating Plant Operations

The impact to the University of eliminating or reducing Utilities and Central Heating Plant Operations is assessed as VERY HIGH.

Description of Implications:

- All of the regulatory and compliance activities performed by Physical Plant Services are tied to mandatory code requirements.
- Reducing these activities could render the University non-compliant with its statutory requirements.
- Significant infrastructure failure and associated cost
- Non-performance costs associated with DR3 program
- Breach of contract with three local hospitals
- Internal plant failures and associated costs

5. Deferred Maintenance Management (DM)

Description of Activity

The Deferred Maintenance (DM) Program manages the $194.3M campus backlog in DM (composed of $164.3M campus DM and $30M infrastructure DM exclusive of Residences at $49M). The program allocates an annual centrally funded university budget and a small provincially funded budget towards prioritized campus deferred maintenance issues. Then challenge has become prioritizing this small amount of money towards an ever increasing DM backlog.

<table>
<thead>
<tr>
<th>Description of Activity</th>
<th>Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Resources</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>This work is planned/budgeted/ and implemented using various resources within Physical Plant Services. A baseline facilities condition audit provides the starting point with PPS operations management/engineering/project managers/finance staff providing input into the plan and ultimate execution of the plan.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Minimization of major facilities and infrastructure systems failures are an indication of the success of the DM plan</td>
</tr>
<tr>
<td>• Metrics associated with facilities condition audit relative to prior years and relative to industry standards and peer universities</td>
</tr>
<tr>
<td>• Compare the Facilities Condition Index (FCI) to industry benchmarks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risks to Ability to Sustain Core Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Funding of the DM budget is inadequate to maintain the campus facilities over the long-term. The industry standard is 1.5% of Current Replacement Value(CRV) or $21M for Queen’s campus</td>
</tr>
<tr>
<td>• Targeting a lower number such as 1% would result in a DM annual budget of $14M versus the current budget level of $3.7M equivalent to approximately 0.26% of CRV</td>
</tr>
<tr>
<td>• The delay in funding DM to the required level will increase the costs of building and infrastructure system repairs over the next 5-10 years. Additional funds will need to be identified if this occurs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implications to University of eliminating or reducing Deferred Maintenance Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Impact is assessed as <strong>Very High</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Inadequate funding of deferred maintenance will increase the number and frequency of infrastructure and building system failures which will subsequently disrupt the campus learning and research environment</td>
</tr>
</tbody>
</table>
• Reduced deferred maintenance funding will limit annual project spends to those related to regulatory compliance and life safety system maintenance at the expense of campus infrastructure and building system remediation projects
• Reduced funding will affect the appearance and functioning of the campus facilities which could negatively affect the University’s reputation
• Inadequate funding will result in exponential acceleration of facility conditions deteriorating over time.
• Future costs of building and infrastructure system repairs will also be exponentially higher if adequate funding levels are not maintained.

6. Project Management

Description of Activity

The Project Management Team manages projects for major/minor capital construction projects, renovation and deferred maintenance projects, in support of all the University activities. The Project Managers work with all stakeholders involved to address user requirements and deliver the project on time and on budget.

<table>
<thead>
<tr>
<th>Description of Activity</th>
<th>Planned Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Initiation Phase:</td>
<td></td>
</tr>
<tr>
<td>- Assist the Client and Campus planning in developing the Project Statement of Requirements</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Develop options to meet the Client Statement of Requirements</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Assist the Client and Campus planning in developing the Project Scope of Work</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Develop Project Timelines and Project Schedule</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Develop Project Estimates</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Develop Project Risks and Mitigations measures</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Assist Client with Business Case and Project Approval</td>
<td>ongoing</td>
</tr>
<tr>
<td>Project Development Phase:</td>
<td></td>
</tr>
<tr>
<td>- Work with Strategic Procurement Services to engage Architects and/or Engineers</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Manage and Supervise the Architects and/or Engineers during the Concept and Schematic Design Phase</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Coordinate meeting with the Client, Architects and/or Engineers and PPS Staff</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Coordinate Concept and Schematic Design Reviews with Client and PPS Staff</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Coordinate and arrange for Campus Grounds Advisory Committee project approval (if required)</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Coordinate and arrange for Campus Planning and Development Committee project approval (if required)</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Manage and Supervise the Architects and/or Engineers during the Design and preparation of construction Document Phases</td>
<td>ongoing</td>
</tr>
</tbody>
</table>
- Coordinate and conduct regular design meeting the Architects and/or Engineers and the stakeholders (Client and PPS) | ongoing

- Review and coordinate the technical review of the Design and Construction documents at 30%, 60% and 95% | ongoing

- Review design and construction documents for compliance with:
  - Client requirements | ongoing
  - Queen's Construction Standards and Guidelines | ongoing
  - Municipal bylaws | ongoing
  - Provincial/Federal Regulations | ongoing
  - Building Code | ongoing

Project Construction Phase:

- Assist Strategy Procurement Services with acquiring a General Contractor
  - Preparation of the RFP and Evaluation Criteria | ongoing
  - Tender Evaluation | ongoing
  - Tender Negotiation | ongoing
  - Tender Award | ongoing

- Manage and Supervise the General Contractor during the Construction Phase:
  This involves and is not limited to:
  - Scope Management | ongoing
  - Time Management | ongoing
  - Cost Management | ongoing
  - Financial Management | ongoing
  - Risk Management | ongoing
  - Codes, Standard and Guidelines compliance | ongoing
  - Maintain financial records and monitor financial progress | ongoing
  - Project Administration Services | ongoing
  - Ensure that the proper Permits are acquired (Demolition, Foundation, Building) | ongoing
  - Ensure that the proper Agreements are acquired (Site Plan Agreements, Easement Agreement) | ongoing
  - Coordinate and conduct site progress review meeting | ongoing
  - Review Contemplated Changes, negotiate associated cost and approve Change Orders | ongoing
  - Review Contractors progress claims and invoices and process them for payment | ongoing
  - Coordinate Site Inspections by City Officials (building Inspector and Fire Inspectors) | ongoing
  - Coordinate Site Inspections by Specialty Consultants | ongoing
  - Coordinate purchase and delivery of Furniture and equipment | ongoing
  - Coordinate move in and building occupancy | ongoing
  - Coordinate the commissioning of the facility | ongoing
  - Coordinate training (if required) | ongoing


<table>
<thead>
<tr>
<th>Project Occupancy Phase:</th>
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<tbody>
<tr>
<td>- Coordinate with the Client to ensure that deficiencies are completed</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Coordinate with PPS Staff and the General Contractor to ensure that warranty issues are resolved</td>
<td>ongoing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project Close Out Phase:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>- Ensure that the asset is registered in the financial system and appropriate database</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Ensure that &quot;as-built&quot; and reference documents is received, reviewed and provided to PPS drafting Section</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Ensure that Project Post Mortems are conducted and that Lessons Learned are documented</td>
<td>ongoing</td>
</tr>
<tr>
<td>- Ensure that the project is financially closed</td>
<td>ongoing</td>
</tr>
</tbody>
</table>

**Available Resource(s)**

To provide project management services there is a Construction Director plus 4 staff project managers and 1 contract project manager. The mix of staffing and contracted services allows the project management function to be flexible as the project volumes increase and decrease. PPS Management, Engineering, Fix-It, Financial and Administration staff provide ongoing direct support for the project managers.

**Performance Measures**

Project performance can be measured in multiple ways:

- **Schedule-** By tracking actual timeline against the initial project schedule
- **Budget-** By tracking actual cost against the project budget
- **Customer Satisfaction-** By conducting a project debrief and developing best practices
- **Compliance -** By inspection to ensure compliance with Queen's building Standards, City of Kingston code and Authority regulations

**Risks to Ability to Sustain Core Activity**

PPS have setup the Project Management department to be flexible as project volumes increase and decrease. There will always be a level of project activity to sustain the current staff compliment. The risks to sustain core activity are when a large influx of Deferred Maintenance funds is received, i.e. as in 2008 from MTCU. The volume of work required to initiate the planning and delivery of the resulting projects can cause a high workload for the project managers resulting in delays to spending the funds in the timeline required. PPS would have to plan 1-2 years ahead to be able to manage any future major increase in Deferred Maintenance funding.
Implications to University of eliminating or reducing Project Management

The Impact is assessed as Medium

Description of the Implications:

- Compliance with Building Code, Fire Code, City Bylaw, ESA and TSSA regulations will be the responsibility of external project managers

- The standards for construction, infrastructure maintenance, building systems and life and health safety systems may be compromised if no university project management oversight is in place

- The university policies and procedures may not be fully understood and followed by external contractors

- Responsibility for meeting the project schedule and budget will be passed to external contractors