

2020 LEED Performance

Reliable Controls Corporation - South Annex

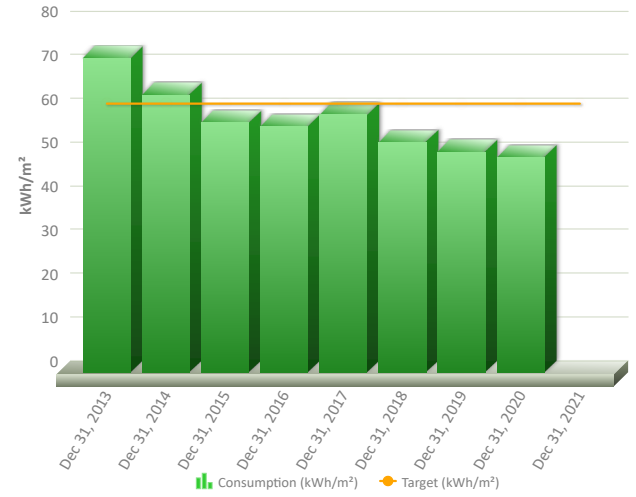
Reliable Controls has occupied the LEED platinum South annex for over eight years now, with a steadily growing number of occupants (prior to the arrival of COVID-19). During those years, many improvements were made to the sequence of operation of mechanical and electrical systems. The flexibility of the MACH-System means that changes are easy to implement, and the results are easy to monitor.

The chart to the right shows the track record for energy consumed from 2013 to 2020, expressed in units of Energy Use Intensity (EUI). In 2020, the EUI was well below the design goal (58.8 kWh/m²), ending with **49.2 kWh/m²**.

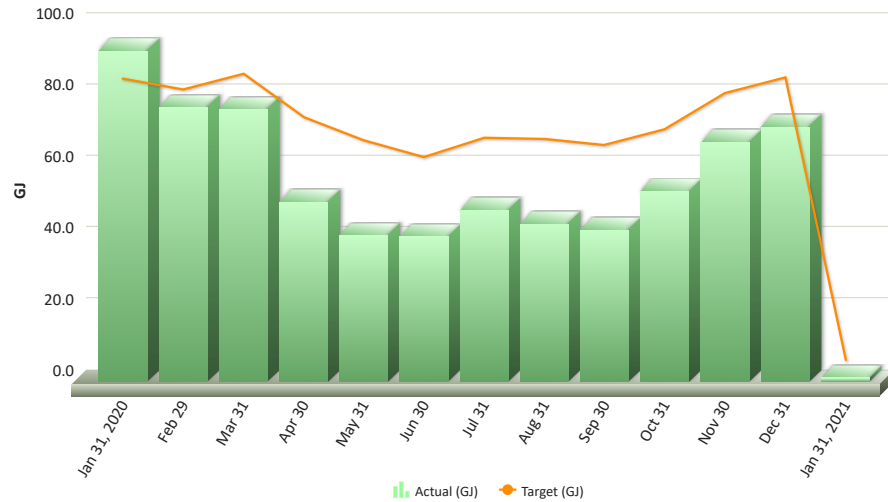
In 2020, energy consumption started off with three typical months...then COVID-19 hit, and most of the South Annex staff switched to working from home. Although occupancy remained low for the remainder of the year, the building needed to be kept at setpoint with most lights on during occupied hours as required to keep the employees that were reporting for work at the office comfortable. The year ended with another record low energy consumption...although not as low as anticipated.

In terms of resource consumption, there are many 'silver linings' in the COVID-19 'cloud', as detailed below.

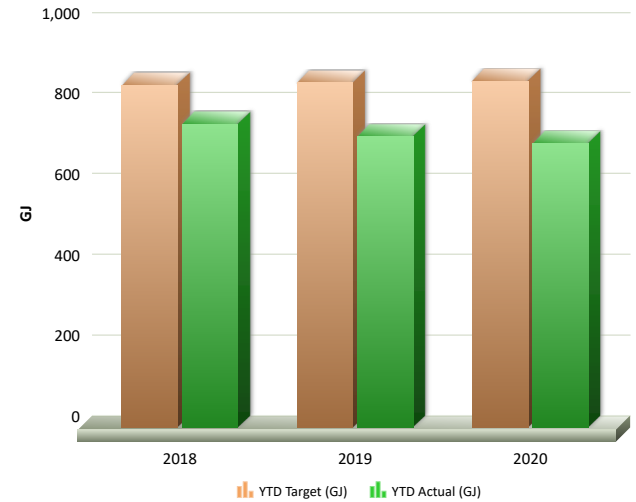
Energy Use Intensity (EUI)



Monthly Energy Consumption vs Target

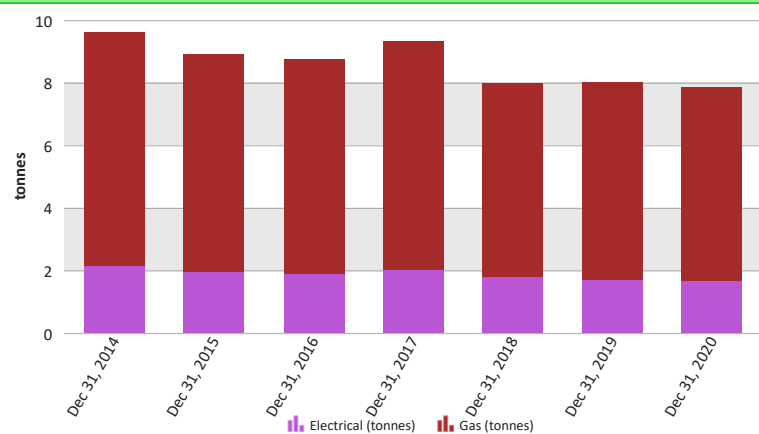


YTD Consumption Target vs Actual



Reliable Controls MACH system calculates a daily target for energy consumption, based on 50% of ASHRAE standard 90.1 (1999), adjusted for actual heating and cooling degree days. Standard 90.1 is used to predict the energy consumption of an energy efficient building in our geographical region. The actual energy consumed by the South Annex in 2020 ended up at **41%** of ASHRAE 90.1, well below goal.

Greenhouse Gas Emissions (CO₂e tonnes)



In the province of British Columbia, over 90% of the electricity consumed is produced by hydroelectric generation. That means that using electricity rather than natural gas produces far fewer tonnes of greenhouse gas per GJ of energy, about 95% less.

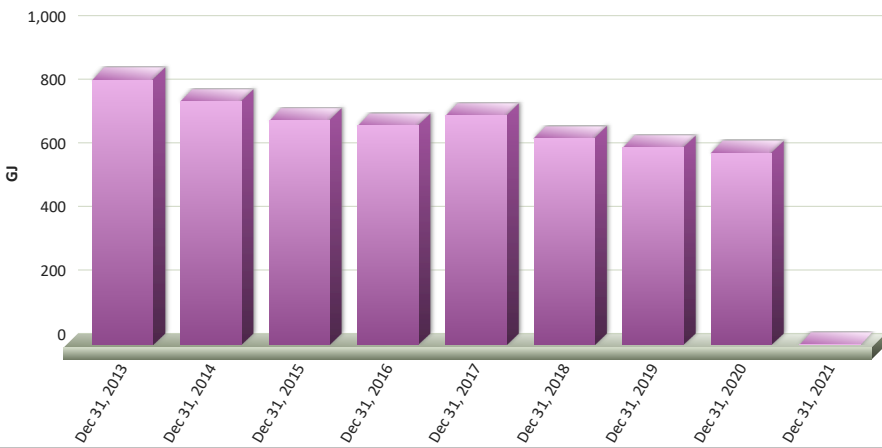
The chart on the left shows the total greenhouse gas emitted by the energy consumed by the South Annex, expressed in tonnes of CO₂ equivalent (CO₂e). CO₂ equivalent is used by the industry to compare the overall Global Warming Potential of the greenhouse gases emitted by different processes.

The South Annex has achieved a reduction of 17.8% of greenhouse gas generation from 2014 to 2020. The one remaining improvement that can be made to the South Annex that will have an impact on greenhouse gas emissions is to replace our three hydronic Force Flow heaters with electrical heaters. The existing heaters use hot water from gas-fired boilers, so switching the units to using electricity will reduce greenhouse gas significantly.

2020 LEED Performance

Electricity

Annual Electrical Consumption

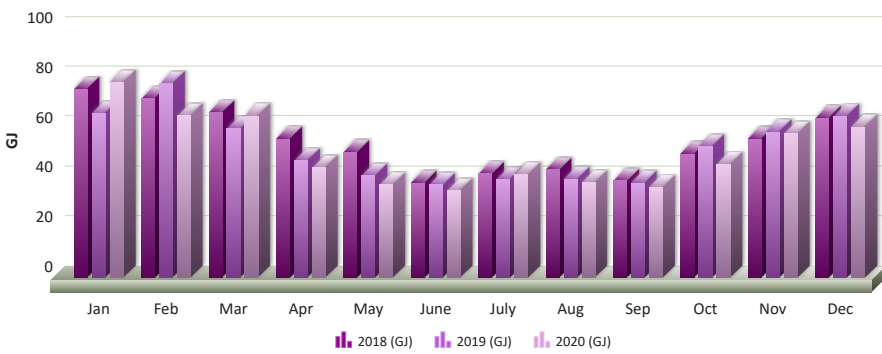


In August 2020, most of the existing T5 fluorescent fixtures in the South Annex were retrofitted with new LED tubes and drivers. This helped reduce the electrical consumption through the fall, although the impact was mitigated by reductions in consumption attributable to COVID-19.

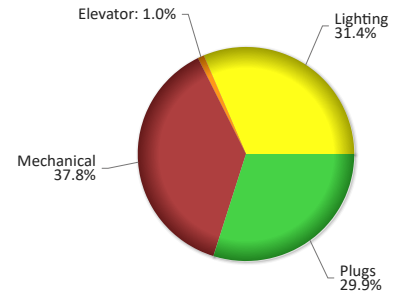
In 2019, lighting loads contributed 33.6% of the total electrical consumption. In the 2020 breakdown below, lighting contributed 31.4% of the total consumption. We anticipate this percentage to drop further in 2021 as a result of the lighting upgrade.

Monthly Electrical Consumption

2018 through 2020

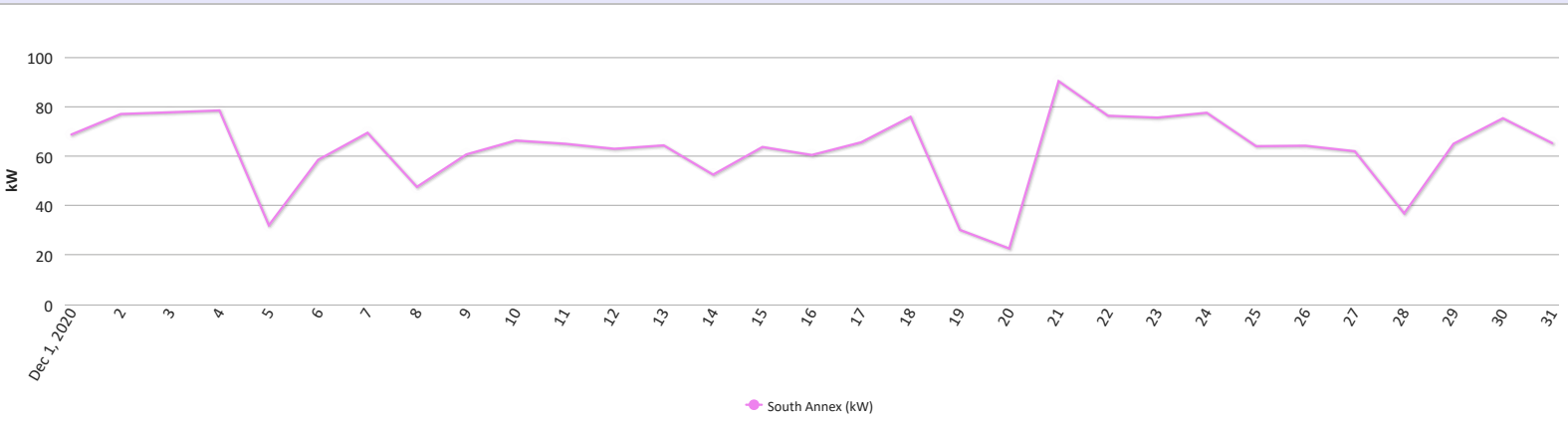


Electrical Consumption Breakdown (2020)



Daily Peak Electrical Demand

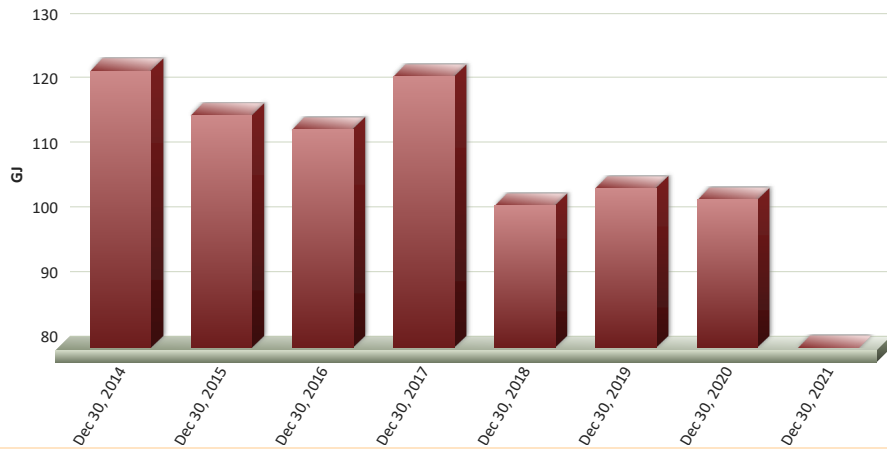
December



2020 LEED Performance

Natural Gas

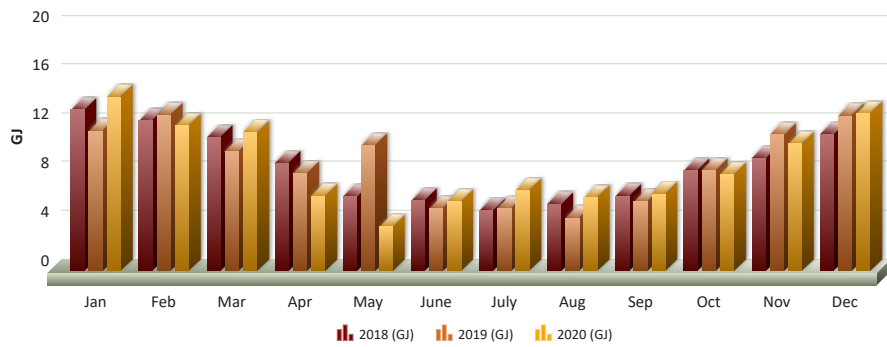
Annual Gas Consumption



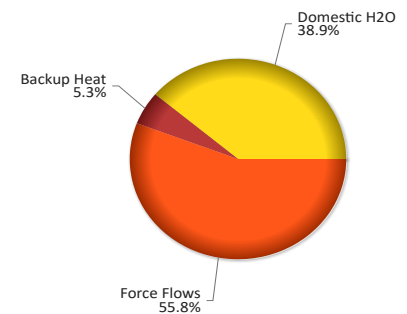
Gas consumption is very low for the South Annex, because all of the floor and ventilation heat is generated with electrical energy, using air source and heat reclaim heat pumps.

We have an outstanding plan to replace the three hydronic entrance Force-Flow units with electric units. This change will save only a small amount of energy, but will reduce the greenhouse gas emissions from the South Annex by a significant percentage.

Monthly Gas Consumption 2018 through 2020



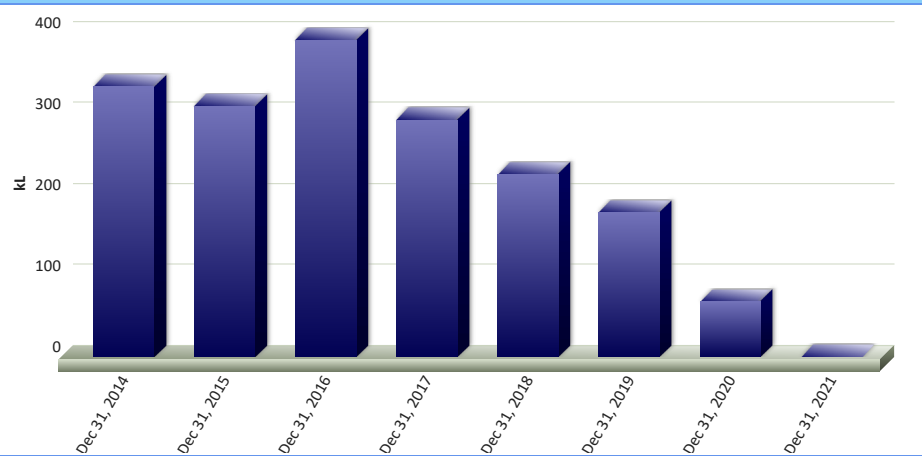
Gas Consumption Breakdown (2020)



2020 LEED Performance

Water

Annual Potable Water Consumption

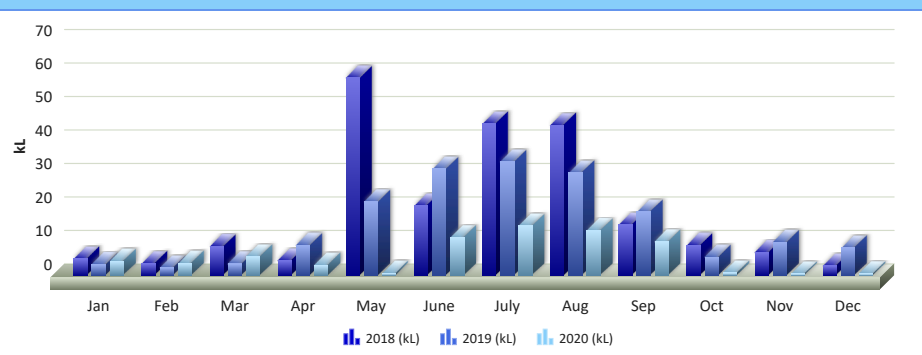


The South Annex has two large cisterns used to store rainwater. One cistern is used to flush toilets, and the other is used for irrigation in the summer.

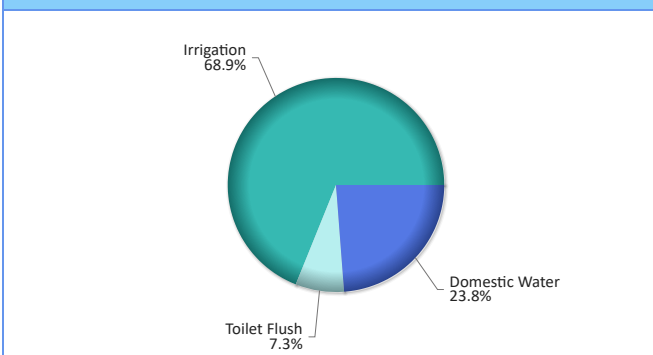
In 2019, we finally lowered our domestic water usage to the design intent, after several years of procedure improvements.

In 2020, COVID-19 led to a dramatic reduction in potable water consumption. In addition, very little irrigation was required until mid-July, due to a cool and wet spring.

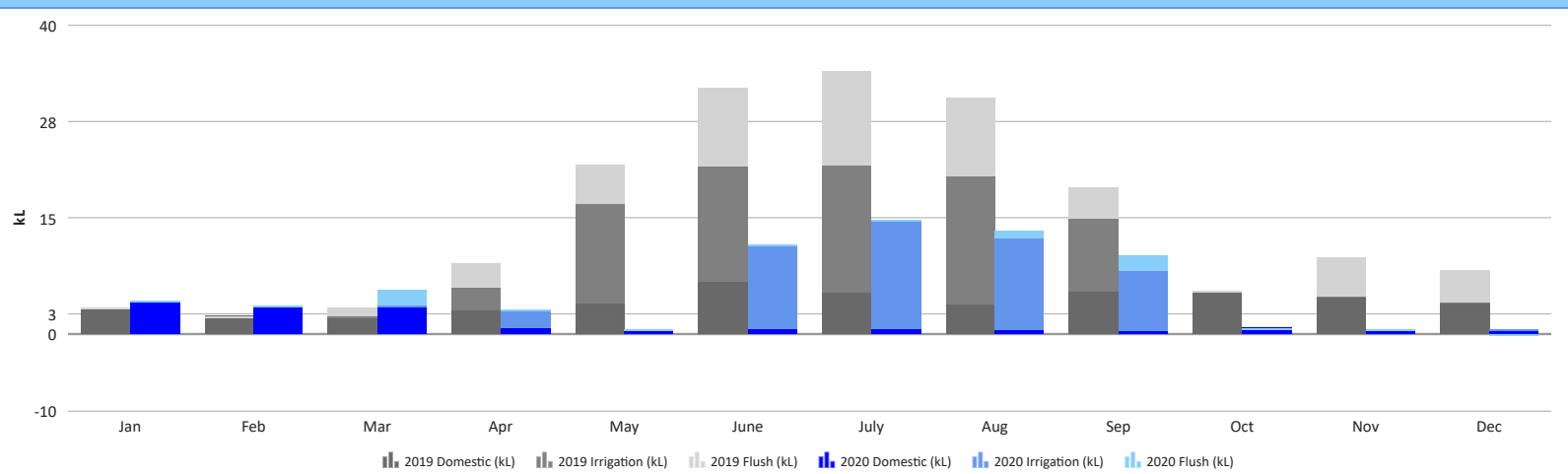
Monthly Potable Water Consumption 2018 through 2020



Potable Water Consumption Breakdown (2020)



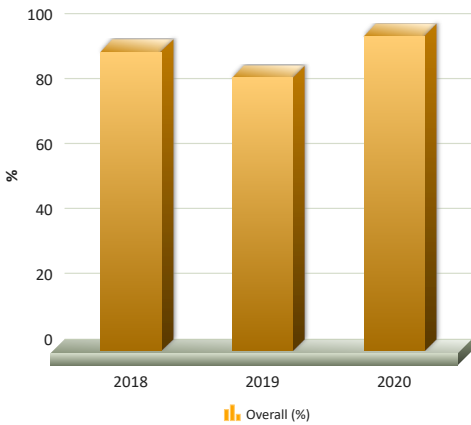
Potable Water Monthly Breakdown 2019 vs 2020



LEED Performance

Occupant Comfort

Overall Satisfaction



Displayed in this collection of charts are the results of Reliable Controls three occupant comfort surveys, carried out in October 2018, June 2019, and February 2020.

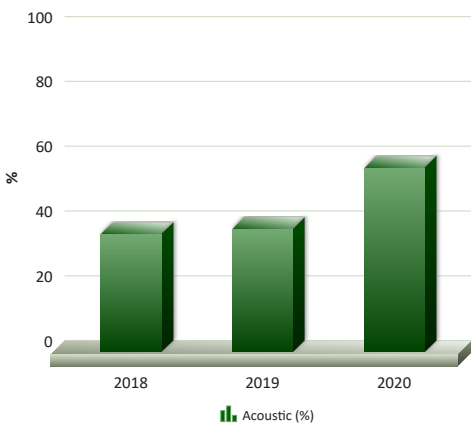
The overall satisfaction rating for the South Annex varied between surveys, but stayed above the company's 80% comfort KPI, as measured by a standard comfort survey. The South building also exceeded the KPI in three of the six individual comfort categories in 2020.

The survey results for thermal comfort were skewed somewhat in 2020, when the survey question was changed from **current** comfort to **seasonal** comfort, which will be a more useful statistic for future comparisons. In the winter 2020 survey, occupants reported an unacceptably low level of thermal comfort. The most common complaint was that the building was just too cold in the winter. To address this concern, the upper limit of set-point adjustment will be increased.

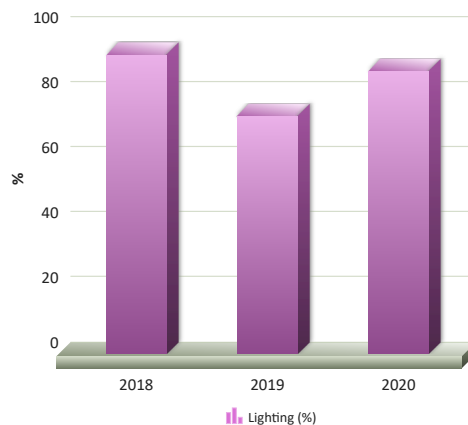
Satisfaction with acoustics in the work-space rose in each of the last two surveys. Hopefully this is a direct result of physical renovations to private offices, and also an email sent to employees following the 2019 survey on the subject of personal conversations.

Satisfaction with air quality fell in each of the last two surveys. This result is disheartening, as we are aware that the South Annex is 'top of class' with respect to the quantity of fresh air circulated. We did receive complaints about odour from the gardener's leaf blower, and addressed the problem by supplying the worker with an electric model. Unfortunately, sometimes the outdoor air is not that fresh!

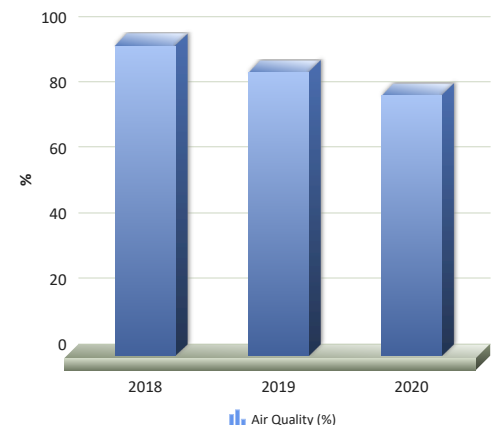
Acoustic Satisfaction



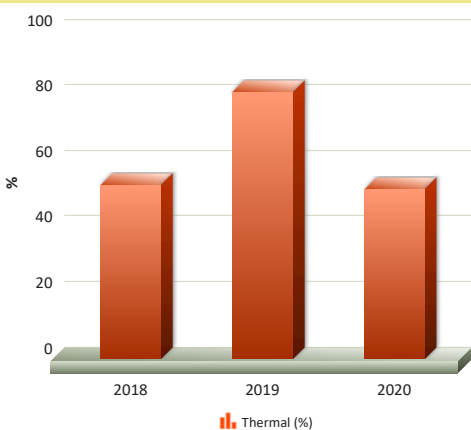
Lighting Satisfaction



Air Quality Satisfaction



Thermal Satisfaction



Cleanliness Satisfaction



Maintenance Satisfaction

