FINAL REPORT
CEEP1007

Greening Ross House: A Place Where Community Groups Grow

This activity received funding from the Australian Government

Australian Government
Department of Industry and Science
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Executive Summary

The Greening Ross House project involved upgrading the heating, ventilation and air conditioning (HVAC) system in the Ross House building.

Ross House is the only self-managed and community owned not-for-profit building in Australia; a five storey heritage listed building in Flinders Lane Melbourne, which provides affordable, accessible office space to over 50 small not-for-profit groups working towards environmental sustainability and social justice.

The upgrade was identified, in an Environmental Upgrade Report provided by ARUP, as the most urgent action required in order to improve the energy efficiency of the building. At the time of reporting, the HVAC system was outdated, frequently failed and presented some significant health and non-compliance issues.

The primary objectives of the project were to:
- improve the energy efficiency of the Ross House building
- bring the HVAC system into compliance with the National Construction Code (NCC)
- support the development and implementation of an environmental behaviour change program

In order to achieve these objectives, it was determined that RHA needed to replace the building’s HVAC system (Direct Expansion (DX) units and cooling tower) with an Air Cooled Chiller and Air Handler Units (AHU) on each level and upgrade the heating hot water (HHW) boiler.

Key issues arising during the project implementation included:
- needing to run two tenders, due to the original awarded contractor rescinding their tender price
- the discovery of asbestos in the roof-space, which caused budget changes and time delays
- amendments to scope of works relating to the roof top platform due to budget constraints
- the project running into summer months, resulting in there being no operational HVAC during days of extreme heat
- the delays impacting the start date of another planned capital works project
- the main contractor (installer) going into administration before the project was complete
- cash flow issues, due to instalment timing of CEEP funding

Whilst the aforementioned issues were experienced throughout the duration of the project, overall it was executed successfully, with all objectives being met and projected energy efficiency targets exceeded, specifically:
- RHA has increased the NABERS rating of a 117 year old building from 2.5 to 4 stars
- Electricity consumption is down by 33,851 KWh per annum
- Cost savings to date are approximately $10,000 per annum
- The new HVAC system is NCC compliant
- Coefficient of performance of the HVAC system has improved from 2.4 to 3.16
- A behaviour change program has created a more responsive, environmentally conscious and engaged community
- Ross House has become a model of a community owned and managed building achieving significant improvements to energy efficiency.
Key learnings from this project are:

- that there are many unknown factors when it comes to old heritage buildings, and in future, RHA will increase the percentage of provisional sums within the capital works budget and ensure that work is scheduled well in advance of significant seasonal change and subsequent capital works projects.

- RHA will include within risk management plans, the possibility of lead contractors going into administration and what actions can be implemented in the case of this eventuating.

- a comprehensive communications campaign is critical to the success of major capital works projects at Ross House - with over 50 tenants groups in the building, many of whom are disability and senior groups, keeping them informed of a works schedule is imperative.

- Skilled project management from within the RHA staff team was also vital to ensuring the project continued to run smoothly even when issues arose.

*The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.*
Project Objectives

The primary objectives of *Greening Ross House: A Place Where Community Groups Grow* (HVAC upgrade) were to:

- improve the energy efficiency of the Ross House building
- bring the HVAC system into compliance with the National Construction Code (NCC)
- support the development and implementation of an environmental behaviour change program

In order to achieve these objectives, it was determined that an HVAC upgrade to the whole building was required. Specifically, replacing the building’s HVAC system (Direct Expansion (DX) units and cooling tower) with an Air Cooled Chiller and Air Handler Units (AHU) on each level and upgrading the heating hot water (HHW) boiler.

The objectives of this project were closely aligned with the primary objectives and benefits of the Community Energy Efficiency Program (CEEP).

By improving the energy efficiency of the Ross House building (a community owned and managed not-for-profit building), this project closely aligned with CEEP’s primary objective to support community organisations to increase the energy efficiency of community use buildings and facilities.

Additionally, RHA objectives aligned with the further primary objective of CEEP: to demonstrate and encourage the adoption of improved energy management practices within councils, organisations and the broader community. This was designed to be achieved by developing and implementing a behaviour change program, which included creating a Green Tenancy Guide and delivering a communications schedule that kept tenants informed of planned works and affirmed key environmental messages.

In addition to aligning with CEEP’s objectives, the HVAC upgrade project was also designed to contribute to the additional benefits CEEP provided:

- better services and improved amenity of buildings and community facilities
- minimising energy consumption and costs to manage the impacts of changing energy prices
- contributing to the national effort to reduce greenhouse gas emissions

Project Energy Efficiency Activities

In 2008 and 2012, RHA received environmental upgrade reports from Hyder Consulting (2008) and Arup (2012) that advised on necessary capital works required to improve the energy efficiency of the Ross House building (a five story heritage listed building located at 247-251 Flinders Lane, Melbourne). Both reports identified upgrading the heating, ventilation and air conditioning (HVAC) system to a more efficient system as the most urgent action required, as the current system was outdated, frequently failed and there were some significant health and non-compliance issues.

It was determined that replacing the building’s HVAC system (Direct Expansion (DX) units and cooling tower) with an Air Cooled Chiller and Air Handler Units (AHU) on each level and upgrading the heating hot water (HHW) boiler was the most efficient and viable option given:

- the unique nature of the building (heritage listed and multi-tenanted community building)
- RHA had decided to remove the existing cooling tower as it was situated only three meters from a residential building, it was at its end of lifespan, and it required regular and costly
maintenance due to common health risks associated with cooling towers (i.e. legionella disease)

The new system was designed to offer simple modern design, with no mix of technologies, providing significant improvement in terms of energy efficiency and achieving building code compliancy; including the adequate provision of fresh air into the building. The previous HVAC system provided levels well below the minimum National Building Code requirements of 10 litres of outside air circulated per person/per second, whereas the new HVAC system provides approximately 20 litres per person/per second.

The HVAC upgrade was implemented via the following schedule:

- Preliminary administration
  - Energy efficiency assessment
  - Development of Environmental Upgrade Report
  - Design and scope of work developed
  - Tender process for mechanical installation

- Preliminary works
  - Removal of asbestos

- Construction Phase 1
  - Installation of new outside air fan and alterations to outside air riser

- Construction Phase 2
  - Installation of riser and roof pipework

- Construction Phase 3
  - Supply and install of new rooftop platform
  - Supply and install chiller, boiler, pumps for chilled water and heating hot water
  - Supply and install acoustic louvres and wrap compressor
  - Run pipework from riser to roof top platform
  - Decommission of cooling tower and boiler

- Construction Phase 4
  - Remove existing DX units
  - Supply and install new air handler units
  - Upgrade wiring and mechanical boards
  - Supply and install controls

- Commissioning Phase
  - Conduct balancing
  - Undertake survey
  - Provision of as-built drawings and operational and maintenance manuals.

- Review and Monitoring
  - Initial testing for four weeks
  - Extended testing phase up to three months
  - Final certification and audit of HVAC system
  - Extended testing phase for 12 months
Implementation Issues

The original scope of works called for the roof and asbestos clad walls of the plant room to be removed, the new chiller and new louvers installed and the old roof reinstated. However during tender, the various building contractors stated that they would have to demolish the entire structure and rebuild the plant room – this saw costs rise from approximately $30,000 to between $120,000 - $150,000.

In order to keep the tender price down, RHA commissioned a structural report on building a new roof top plant room next to the old one and leaving the old one in situ – this did not pose any access issues, danger or health risks and brought the costs back down.

Subsequent to this, we were alerted to the fact that the preferred contractor had misrepresented themselves in their tender submission and were the ‘service’ arm of the company and intending to subcontract the entire mechanical installation out. This issue was finally resolved by engaging with the correct division of the company who would perform the actual installation - however, the week the contracts were due to be signed, the preferred contractor rescinded their original tender price forcing RHA to undertake a second tender process.

In order to avoid these tender issues again, RHA will stipulate in future tender documents, that the contractor cannot subcontract out the main activities relating to the tender project (ie. mechanical installation), and that the tender company is the installer.

As is the nature of old buildings, unexpected site specific issues were also experienced.

During preliminary works, asbestos was located in the roof-space along with hundreds of old light fittings and building debris (covered in asbestos dust) dating back to approximately the 1930’s. To enable construction of the new roof top platform, the roof-space needed to be cleared of all asbestos and building debris and deemed safe for access. RHA undertook an inspection report and went to tender for the removal of asbestos. This caused an additional $90,000 in costs to the project, however the RHA Committee of Management were resolute in their decision to commit the additional funds to the project, recognising the urgency and necessity to ensure a safe and hazard free workplace.

The discovery of asbestos in the roof-space also led to significant delays which extended construction and installation into summer months, resulting in further issues:

- there were occurrences during extreme hot weather days that some floors of the Ross House building were without air conditioning
- the building industry close down for an extended period of time during December and January, resulting in no work being undertaken for a number of weeks
- the building industry complies to a strict heat policy, therefore there were many days that the contractors did not work past 9am
- the delays impacted the start date of another major capital works project: the heritage restoration project

Tenant communication was paramount leading up to and during the asbestos removal period, and also during the delay period. Tenant feedback regarding communications was that they felt very well informed and safe during the asbestos removal and experienced very little disruption due to our scheduling the bulk of the removal to take place over a weekend.
In order to cope with limited air-conditioning during extreme heat conditions, RHA provided additional temporary cooling aids and regular advice relating to weather forecasts. RHA management also negotiated an earlier return to work date with the lead contractor, which included weekend hours, in a hope to mitigate further delays with the installation over the summer months.

RHA has learnt that there are many unknown factors when it comes to old heritage buildings, and in future will increase the percentage of provisional sums within the capital works budget and ensure that work is scheduled well in advance of significant seasonal change and subsequent capital works projects.

Another site specific issue, that impacted the original design, was access requirements for the crane. The size of the crane required for the necessary works meant that it could not use the adjacent laneway as first thought, as it was too large. The crane had to use Flinders Lane which required road closures and resulted in the position of the new plant room being closer to the street than originally intended - this poses no danger or health risks, but was a slight deviation from the original plans.

A final issue experienced throughout this project was that the mechanical installers went into administration a week before final completion – installation was complete but commissioning was incomplete. RHA immediately re-engaged with the previous incumbent mechanical services contractor, Auscool, who were able to complete the commissioning and minor outstanding works and now hold the maintenance contract for Ross House. When planning future capital works projects, RHA will include within risk management plans, the possibility of lead contractors going into administration and what actions can be implemented in the case of this eventuating.

Project Demonstration and Communications Activities

The objectives of the HVAC upgrade communication plan were to:

- Inform RHA tenants, members and facility users of planned works at Ross House and advise of scheduled access restrictions (if applicable)
- Inform tenants of current and future projects aimed at improving the energy efficiency of Ross House and provide details and resources of how tenants can contribute to reducing their environmental footprint within the building
- Promote and showcase Ross House, to the broader community, as a model for retrofitting heritage buildings and creating a sustainable community building

The target audience for communications were identified as (primary audience) Ross House tenants, members and facility users and (secondary) the broader Melbourne community, owners of heritage and community buildings, and industry professionals and associations.

Communications to the primary audience used a variety of tools: email, newsletter, website, social media, posters, brochures and Ross House community forums. Communications to the secondary audience included, social media, posters, brochures and website (RHA and partner websites).

Key messages identified in the communications plan were:

- Ross House is the only community owned and managed building in Australia and is dedicated to resourcing small organisations committed to social justice and the environment.
- Ross House Association has a long-term plan to green the Ross House building and achieve an accredited 4-star NABERS energy rating.
• Reducing the environmental impact of Ross House ensures that work practices are in line with RHA values and that RHA can fulfil its purpose as a model of a sustainable community building.

• Updating the HVAC system is part of the Greening Ross House project and will increase the energy efficiency of the Ross House building and create a healthier environment for us all to work in. It is part of the long term plan to retrofit the entire building, bringing it to a high green standard. This activity received funding from the Australian Government.

Whilst email was used predominantly to advise the primary audience of scheduled works and disruptions to the building throughout the project, other communications tools were used to communicate a broader environmental message to the community. The development of Greening Ross House: Your Tenancy Guide (The guide) was particularly helpful in disseminating further information regarding ways in which the Ross House community and the broader community can assist in improving the energy efficiency of Ross House and additionally, contribute to the national effort to reduce greenhouse gas emissions. The guide encourages a “switch off” attitude throughout the building and encourages tenants to support and inspire behaviour change and acknowledge and reward those that make change happen: it is a guide to help facilitate change in their office space.

The guide was made available in both hard copy and soft copy formats; each tenant received a hard copy and an email with a downloadable link. It was also made available via www.rosshouse.org.au, the City of Melbourne (1200 Buildings Program) and AIRAH (Australian Institute of Refrigeration, Airconditioning and Heating) websites, allowing for broader community access.

Ross House community forums also allowed for more extensive dialogue regarding not only the scheduled works, but how the HVAC upgrade project sat within the long-term plan to green Ross House and how tenants played a vital role in improving the energy efficiency of the building.

The communications campaign was critical to the success of the HVAC upgrade project. With over 50 tenants groups in the building, many of whom are disability and senior groups, keeping them informed of the works schedule was imperative. The communications campaign commenced in August 2013 with preliminary advice being given to tenants and members of the proposed works schedule for the subsequent ten months. Communications continued throughout the entire duration of the HVAC project and were increased prior to demolition and construction phases to ensure adequate notice was given to any disruptions that may be experienced.

Communications to the wider community commenced prior to the demolition phase and continued throughout and beyond the construction phase, especially in regard to planned road closures due to crane works.

Communications supporting the environmental behaviour change program are ongoing and will continue to empower the RHA community to take steps in creating a more environmentally sound workplace, which will in turn educate the wider community on environmental learnings gained from the Ross House green retrofit.
Outcomes and Benefits of the Project

RHA has met all of its objectives for this upgrade project and has also demonstrated an irrefutable and significant contribution to CEEP's objectives of this program. The HVAC upgrade project was completed in May 2014 when RHA received a Certificate of Final Inspection; a statement verifying that the installation of the new HVAC system meets design intentions and building code requirements.

Along with bringing the system into compliance with the National Construction Code, analysis of 12 months of energy data (from the date of completion), indicates that RHA is progressing well in making significant and positive environmental change.

The HVAC upgrade project also provided a tremendous opportunity to initiate a behaviour change within the building, specifically with the development of a green tenancy guide. This guide has not only educated the Ross House community on the steps they can take to lessen their environmental footprint, but has also extended the learning to the broader community, via various partner websites promoting and providing links to the guide.

Along with fulfilling the primary objectives of the project, numerous benefits have also been achieved:

- contribution to the national effort to reduce greenhouse gas emissions;
- reduced running costs associated with operating a five-story community building – in order for Ross House to continue providing affordable resources it was necessary to become a more environmentally sustainable and efficient building;
- improved Ross House environment, ensuring a healthy and safe workplace is maintained – the previous outdated HVAC system provided sub-standard conditions: frequent failure, inconsistent temperature control, regular flooding and low outside air levels;
- work practices are in-line with RHA values and RHA is fulfilling its purpose as a model of a sustainable community building;
- RHA can continue to provide affordable resources and services to small not-for-profit community groups – this means that more than 50 tenant groups can remain in the building, small groups can continue to apply for membership and tenancy and afford meeting rooms and use of other resources, and the provision of vital social justice services to the community are maintained;
- Ross house has become a model for retrofitting heritage buildings within the city of Melbourne

Testament of the positive impact this project has had in improving the energy efficiency of the Ross House building, reducing greenhouse gas emissions nationally and supporting a behaviour change program, Ross House Association was awarded the CitySwitch New Signatory of the Year (VIC) award in November 2014, in recognition of our sustainability efforts. Ross House was also featured as a 'CitySwitch Hero’ as part of the 2015 Sustainable Living Festival in Melbourne. (See Appendix 1)

Energy Efficiency Outcomes

At the commencement of this project it was difficult for RHA to forecast an improvement in energy consumption due to the previous HVAC system running below the requirements of the National Construction Code (NCC), specifically the previous system did not provide the minimum level of outside air circulation of 10 litres per person/per second. Running below NCC regulation (inadequate outside air flow) resulted in relatively low building energy consumption rates, therefore it was
anticipated that upgrading to a more efficient and NCC compliant system may result in an increase to energy consumption.

The new HVAC system however, was forecast to improve the coefficient of performance (the ratio of heating/cooling provided to electrical energy consumed) from 2.4 to 3 and result in significant change to operation expenses relating to energy, labour, equipment maintenance and chemical expenses.

The removal of the cooling tower was expected to create the most significant change in operating expenses, specifically: the water treatment contract would become redundant reducing labour and equipment maintenance expenses (including chemical expenses) by $5271 per year. It was also expected that water usage expenses would be reduced significantly.

Despite our expectation of increased energy consumption, Ross House has experienced a significant reduction in electricity consumption since the completion of the HVAC upgrade. Billing data analysis verifies a reduction of 33,851.71 KWh in the 12 months following completion of the upgrade which is estimated to be a cost saving of $2,376.68.

Maintenance costs have also been reduced significantly, with a saving of $7597 being achieved since completion of the upgrade.

Coefficient of performance of the HVAC system has exceeded initial forecasts and sits at 3.16, our CO₂ emissions have been reduced by 32.4% and we have improved our simulated NABERS rating of 2.5 to an official NABERS rating of 4 stars – which is an extraordinary accomplishment for a 117 year old, heritage listed, not-for-profit building. (See Appendix 2 & 3)

*Please refer to Attachment A – Project Energy Efficiency Improvement Template*

The ancillary benefits to the community, as a result of this project, are also significant. Undertaking the HVAC upgrade has had a tremendous impact on the health and wellbeing of the Ross House community. Tenants and facility users, previously endured sub-standard conditions provided by the outdated HVAC system, mainly in the form of frequent breakdowns and low outside air levels. It is well documented that good ventilation is essential for a comfortable, healthy, productive and sustainable indoor environment and the National Building Code requires a minimum level of 10 litres of outside air to be circulated into the building per person/per second. The previous HVAC system provided an inadequate rate, well below national regulations, whilst the new HVAC system provides approximately 20 litres of outside air per person/per second. The overall environment with the Ross House building has been improved significantly, with tenant complaints regarding issues with inconsistent temperatures virtually ceasing.

Additionally, whilst traces of asbestos found in the roof-space never posed a risk to members, tenants or facility users, it did inhibit access for maintenance personnel – it prevented the repair of issues such as roof leaks and was necessary in order to complete the HVAC upgrade. Despite there being no risk to members, tenants and facility members, completing a comprehensive asbestos removal gives reassurance that RHA is providing a safe and healthy workplace.
Demonstration and Communications Outcomes

As mentioned above, undertaking the HVAC upgrade has had a tremendous impact on the health and wellbeing of the Ross House community. Not only have airflow rates improved and been brought into line with national building code regulations, the environment overall has improved significantly thanks to a strategic communications plan and the development of a behaviour change program.

The communications campaign was critical to the success of the HVAC upgrade project due to the diverse tenant community within Ross House – we needed to ensure that any possible negative impact caused by the works schedule on our tenants was as minimal as possible. Communications were frequent and key messaging consistent. Feedback from tenants regarding how informed they felt during the HVAC upgrade process was 100% positive, with comments such as:

“Communication from staff was excellent by email and lift signage - keeping tenants regularly informed as to next steps and the overall process.” Collective of Self-Help Groups

“The information provided was very clear and handled excellently.” Retina Australia (VIC)
“I was very grateful for the early warning and information. 5 stars!” Australian China Friendship Society

“All tenants were kept well informed and up to date with process and activities.” Tree Project

The development and implementation of an environmental education program has also had a tremendous impact. The green tenancy guide, developed in June 2014, opened up a dialogue between management and tenants regarding making positive environmental change and it has positioned Ross House as a model of a sustainable community building that is taking a leadership role in the domain of green retrofitting.

Then tenants’ response since receiving the guide has been very positive, encouraging and most of all effective in initiating behaviour change.

Ross House welcomes an estimated 70,000 visitors to the building each year, has 55 tenant groups with a collective membership of over 13,000 individuals, almost 600 active groups and makes over 5000 meeting room bookings each year for vital advocacy, education and training programs. Our reach to the broader community is with no doubt vast, however difficult to validate.

To date, statistics relating to the circulation of the green tenancy guide are as follows:

- 100 copies of the guide have been disseminated
- Facebook post announcing the launch of the green tenancy guide, remains one of our highest ranking posts – resulting in a 265% increase in post reach and a 633% increase in post likes/shares (figures were calculated using insight data from all previous facebook posts)
- Following an email advising that the green tenancy guide was available for download via our website on July 14th 2013, www.rosshouse.org.au experienced a 360% increase in website visitation (See Appendix 4)
- Facebook post announcing our CitySwitch award remains the 3rd most popular post, resulting in an 872% increase in post reach and over 1000% increase in post likes/shares (figures were calculated using insight data from all previous facebook posts)
Our involvement with the City of Melbourne’s 1200 Buildings Program and CitySwitch has enabled RHA to reach a broader audience showcasing to other similar organisations or building owners the achievable energy efficiency improvements that can be implemented into an existing heritage building with multiple tenancies.

When RHA partnered with CitySwitch in 2014, we became part of a diverse network of organisations which share a mutual goal – to improve the environmental footprint of their buildings. This partnership allows RHA to connect with other building owners which may be facing the same hurdles, allows us to draw on experience learned from other groups and in turn allows us to impart information and expertise we have learned along the way.

As a model of a community owned and managed asset, RHA regularly provides free advice to government and community organisations and has been showcased through City of Melbourne’s 1200 Buildings Program, Heritage Victoria and the 2015 Sustainable Living Festival, which attracted over 115,000 visitors.

Testament of our efforts in improving the energy efficiency of the building, RHA were awarded New Signatory of the Year (VIC) at the 2014 National CitySwitch Awards.

“Ross House has undergone a transformation with lighting, controls and HVAC upgrades resulting in impressive savings. The building’s 53 tenants have been a focal point – with a new guide to help make the most of the investment.” Victoria CitySwitch judging panel

Winning this award, gave the Ross House community a sense of pride and RHA management have witnessed greater recycling and composting activity amongst the tenants and in general, further improvement to the “switch off” attitude that the behaviour change program initiated.

Budget

Despite set-backs with the main contractor going into administration towards the end of the project, the HVAC upgrade was achieved within budget:

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<td><strong>Total Project budget (As proposed in original application)</strong></td>
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Please note: all figures in the above table are inclusive of GST

* This includes the final contribution amount from the Australian Government of $44,000 (inc GST). This is due upon acceptance of this final report.

After the initial funding application was signed in March 2013, the budget changed slightly due to alterations to the scope of works relating to changes to the roof-top plant room and the discovery of asbestos in the roof-space. A Deed of Variation was signed in October 2013 and no changes to the budget have occurred since this time.

The only issues experienced with co-contributions to the project were due to the timing of funding instalments from the Australian Government, being dependent on the submission of milestone reports. Due to the staggered timing of these instalments, RHA experienced cash flow issues throughout the duration of the project, and as a result RHA’s contribution amount has always been in excess of what was originally budgeted for. In future, RHA will work with major funding contributors to schedule payments more frequently, taking into consideration forecast cash flow issues.

RHA committed a total of $565,517.97 (inc GST) to the project and to date has expended $609,517.97 (inc GST). This amount will be brought into line with the original budgeted amount once the final payment of $44,000 (inc GST) from the Australian Government is received upon acceptance of this final report. A separate account was opened for the CEEP project, and all income and expenditure was paid into and from this account, with the exception of the following income: $11,000 from the City of Melbourne and $15,000 from the RE Ross Trust, and expenditure to ARUP and Cardno Vic between November 2012 and August 2013 – this is due to receiving and expending this funding before the Funding Agreement with the Australian Government was finalised and a separate bank account was opened.

Undertaking the HVAC upgrade project achieved value for money as the works ceased further deterioration of the previous out-dated and non-compliant HVAC system and the need for expensive and non-efficient “band aid” repairs. Just prior to undertaking the upgrade, the previous HVAC system experienced a major failure and we were advised that further failures were imminent due to the age of the system – a major HVAC failure would have compromised the health and wellbeing of the Ross House community.

Carrying out the works when we did, ensured that the cost of the works did not increase due to inflation, that rising electricity costs were abated and that the environmental impact of the building was reduced significantly.

The merits of this project were never intended to be evaluated on a return on investment basis, but on an asset replacement basis only. Upgrading the HVAC system was a critical step in ensuring RHA continued to provide adequate essential services to the building - the previous system had reached its end of life cycle, was fully depreciated, constantly failed, provided inadequate fresh air circulation, inconsistent temperatures and was not NCC compliant or energy efficient.

Please refer to the Final Financial Report (see Appendix 5), which includes the Financial Declaration.
Project Operations, Mechanisms and Processes

The HVAC upgrade project was overseen and managed internally by the RHA General Manager and Development Program Manager. In the absence of the General Manager for four-weeks during the installation period, project management was outsourced to our mechanical engineer company, Cardno VIC.

External companies significantly involved in advisory and construction roles were Cardno VIC (engineers), JL Williams (mechanical installers, whom provided their own project manager and site foreman), Noel Arnold and Associates (asbestos auditors) and AWARE (asbestos removalist).

Despite the small size of the RHA staff team, project management of the HVAC project was successfully executed from within the Association. However, if resources allowed, RHA recognise the potential benefit of engaging an external project manager to co-ordinate the project. Key benefits would be less impact on staff hours and the expertise an external project manager would bring to the role.

Whilst the project was successfully implemented, there were periods where additional work hours were required from key staff to ensure the project continued to run smoothly; this impacted on other areas of work but was managed well through open communication within the staff team and the ability to prioritise and delegate other areas of work.

It is without doubt, that this project has enhanced the project management skills of our staff significantly, and they are more than capable of project managing a million dollar capital works project.

Key lessons from this project are:

- A Communications Plan is key to successfully executing a major capital works project on a multi-tenanted community building.
- Old buildings are unpredictable and contingency plans relating to budget changes and time delays are vital.
- Even with a small team, RHA are capable of project managing a major capital works project, but underestimated the amount of contact hours required from key staff.
- Where external funding is received incrementally, cash flow issues need to be addressed at the time of the funding agreement.

Conclusion

The HVAC upgrade project has been the most significant building upgrade in RHA history and was completed in May 2014 when RHA received a Certificate of Final Inspection; a statement verifying that the installation of the new HVAC system meets design intentions and building code requirements.

Undertaking major capital works is no mean feat for RHA - as a not-for-profit organisation, owning and managing a heritage listed building (built in 1898) with multiple tenancies requires great innovation and leadership.

As is the nature of an old building, integrating new systems and design to enable significant energy efficiency improvements can be unpredictable and difficult to execute as well as costly. However, by leveraging existing relationships and working closely with multiple partners, RHA has achieved
modern design in a community and heritage building and has demonstrated that with careful design and application, even basic systems can achieve noticeable reductions in energy usage.

Key to successfully executing the project was a skilled project management team and the implementation of a comprehensive communications plan.

Declaration

The Authorised Officer of the organisation makes the following declarations:

☑️ I declare that I am authorised to submit this Final Report (including any attachments) on behalf of ____________________________ (Name of organisation)

☑️ I declare that the information provided in this Final Report is true and accurate.

☑️ I understand, and acknowledge that giving false or misleading information in this Final Report is an offence under the Criminal Code Act 1995.

☑️ I understand that final payment will only be made in accordance with the Funding Agreement including on satisfactory completion of Milestones.

Authorised Officer Signature: ____________________________ Date: 5/6/2015

Name: Michael Griffiths

Position: General Manager

Organisation: Ross House Association

Witness Signature: ____________________________ Date: 5/6/2015

Name: Amber Moore

Position: Development Program Manager

Organisation: Ross House Assoc.

The use and disclosure of information provided in this Final Report is regulated by the relevant provisions and penalties of the Public Service Act 1999, the Privacy Act 1988, the Freedom of Information Act 1982, the Crimes Act 1914 and the general laws of the Commonwealth of Australia.

Information contained in the Final Report may be disclosed by the Department for purposes such as promoting the program and reporting on its operation and policy development. This information may also be used in answering questions in Parliament and its committees. In addition, the selected project information will be made publicly available. Public announcements may include the name of the grant recipient and of any project partners; title and description of the project and its outcomes; and amount of funding awarded.
### Project Energy Efficiency Improvement Template

<table>
<thead>
<tr>
<th>PROJECT TITLE</th>
<th>Greening Ross House: A Place Where Community Groups Grow</th>
<th>PROJECT ID</th>
<th>CEEP1007</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNDING RECIPIENT</td>
<td>Ross House Association</td>
<td>DATE</td>
<td>28 May 2015</td>
</tr>
</tbody>
</table>

#### Building, Facility or Site 1

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site 1</th>
<th>Ross House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location (address)</td>
<td>247 - 251 Flinders Lane, Melbourne 3000</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Five story heritage listed community building</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of HVAC system</td>
</tr>
<tr>
<td>Energy Efficiency Estimate Method</td>
<td>The simulation used to provide the estimates is based on the 2012 Building Code of Australia from JV3.</td>
</tr>
<tr>
<td></td>
<td>Billing data analysis, existing equipment specifications and onsite condition survey have been used.</td>
</tr>
<tr>
<td></td>
<td>Official NABERS assessment.</td>
</tr>
</tbody>
</table>

#### Baseline Energy Usage

- **Electricity Usage (2012 data):** 443,010 kWh
- **Natural Gas Usage (2012 data):** 365,360.95 MJ
- **Annual Electricity Consumption (2010):** 155kWh/m²*  
- **Annual Gas Consumption (2010):** 120MJ/m²*  

*Please note, these figures were provided from the ARUP report and use an estimated NLA of 3000m² for calculations*

#### Baseline Energy Efficiency

- **Annual Electricity Consumption (2010):** 155kWh/m²*  
- **Annual Gas Consumption (2010):** 120MJ/m²*  

*Please note, these figures were provided from the ARUP report and use an estimated NLA of 3000m² for calculations*

Estimated efficiency of DX units and cooling tower (coefficient of performance): 2.4

#### Energy Efficiency Improvement

- **Electricity Usage (April 2014 – March 2015 data):** 310,419.71kWh
- **Natural Gas Usage (April 2014 – March 2015 data):** 295,762.40 MJ
- **Annual Electricity Consumption (April 2014 – March 2015 data):** 103kWh/m²*
<table>
<thead>
<tr>
<th><strong>Annual Gas Consumption (April 2014 – March 2015 data):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>98MJ/m²*</td>
</tr>
<tr>
<td>*Estimated figures as per baseline usage, using an estimated</td>
</tr>
<tr>
<td>3000m² for calculations:</td>
</tr>
<tr>
<td>Actual figures as per NABERS assessment (using calculated NLA</td>
</tr>
<tr>
<td>2268.1m²)</td>
</tr>
<tr>
<td>Annual Electricity Consumption (April 2014 – March 2015 data):</td>
</tr>
<tr>
<td>136.86/m²</td>
</tr>
<tr>
<td>Annual Gas Consumption (April 2014 – March 2015 data):</td>
</tr>
<tr>
<td>130.40MJ/m²</td>
</tr>
<tr>
<td>CO₂ emissions reduced by 32.4%</td>
</tr>
<tr>
<td>Official NABERS rating: 4 stars</td>
</tr>
<tr>
<td>coefficient of performance: 3.16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Reporting Data (Measuring Energy Efficiency and Additional Data):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated NLA of 3000 m² was used for baseline calculations.</td>
</tr>
<tr>
<td>Updated calculated NLA as per official NABERS assessment is 2268.1m²</td>
</tr>
<tr>
<td>53 groups</td>
</tr>
<tr>
<td>50 per cent average operational occupancy level</td>
</tr>
<tr>
<td>Daily hours of operation: 9am to 5pm</td>
</tr>
<tr>
<td>Building construction date 1898.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Cost of Activity</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,026,567.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Estimated Cost Savings</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>$10,000 (to date)</td>
</tr>
</tbody>
</table>
BE A CITYSWITCH HERO

CitySwitch is a free program run by the City of Melbourne, to help office-based businesses reduce their energy use and environmental impact. Here’s how some individuals are already becoming CitySwitch heroes.

WHO: Michael Griffiths – General Manager

WHERE: Ross House – large office

ACTION: heating ventilation and cooling system upgrade + comprehensive lighting upgrade + green tenancy guide developed for all tenants

RESULT: Saved 90 tonnes of carbon emissions – equal to the amount of carbon that 4601 of these trees can take out of the atmosphere in a year, and contributing to the city’s goal to become carbon neutral by 2020.

“Developing a behaviour change program has had a tremendous impact – encouraging a ‘switch off’ attitude throughout the building has achieved great environmental outcomes.”

Download free DIY toolkits and find out how you can become a CitySwitch hero

melbourne.vic.gov.au/sustainability
Ross House Association Inc. achieved 4 star NABERS Energy Whole Building rating for Ross House
247-251 Flinders Lane
MELBOURNE VIC 3000
This NABERS Energy Rating details is for:

Ross House
247-251 Flinders Lane
MELBOURNE VIC 3000

Rating type: Whole Building
Rating area: 2268.1 m²
Rated hours: 36.0 hrs/wk
No. of computers: 143
Rated period: 01/04/2014 to 31/03/2015
Rating expiry: 28/06/2016

> Energy consumption details:

Electricity: 310419.7 kWh
Green power: 0.0%
Gas: 295762.4 MJ
Diesel: 0.0 L
Coal: 0.0 kg

Your rating details

The intensity of your energy is 623 MJ/m² p.a.

Your NABERS Energy rating is 4 stars and your greenhouse gas emissions are:

Total emissions (scope 1 & 2): 381477 kg CO₂-e p.a.
Total emissions (full fuel cycle -scope 1,2 & 3): 432297 kg CO₂-e p.a.
Greenhouse gas intensity (scope 1 & 2): 168 kg CO₂-e/m² p.a.
Greenhouse gas intensity (full fuel cycle -scope 1,2 & 3): 191 kg CO₂-e/m² p.a.

NABERS Energy rating benchmarking factor:

Benchmarking factor: 234

More information on the next page
How to use your NABERS Energy rating details
The table below explains how you can use the data in this report for mandatory and voluntary reporting requirements. For each reporting requirement, use the number symbol(s) in the right column to identify the correct data to be used from 'Your rating details' table in the first page of this report.

### Mandatory scheme and reporting

**To report under the National Greenhouse Emissions Reporting (NGER) scheme**
Mandatory for constitutional corporations that meet a reporting threshold for greenhouse gases or energy use or production for a reporting (financial) year.
You can only use the greenhouse emissions information from NABERS for reporting under NGER scheme if the data for your rating was collected between 1 July to 30 June. For more information about NGER, see [www.cleanenergyregulator.gov.au](http://www.cleanenergyregulator.gov.au)

For compliance with Commercial Building Disclosure program
Mandatory for constitutional corporations that are sellers or lessors of office space of 2,000 square metres or more at the point of sale or lease. For more information about the CBD program, see [www.cbd.gov.au](http://www.cbd.gov.au)

### Voluntary scheme and reporting

**For National Carbon Offset Standard**
This is a voluntary standard for businesses to use in becoming carbon neutral or developing carbon neutral products. For more information about the NCOS program, see [www.climatechange.gov.au](http://www.climatechange.gov.au)

**For corporate annual report of energy of use and carbon footprint**
Organisations are encouraged to report their energy use and full life cycle greenhouse emissions (scope 1.2 & 3) in annual report to capture a more comprehensive picture of emissions attribute to its activities.

**For CitySwitch Signatory**
CitySwitch is a national tenant energy efficiency program that works with tenants to achieve improved office energy efficiency and reduction in greenhouse gas emissions attributed to office use. For more information, see [www.cityswitch.net.au](http://www.cityswitch.net.au)
Electricity Comparison 2012 - 2015
Ross House
247-251 Flinders Lane Melbourne VIC 3000

Note: the reduced energy consumption seen in October, November and December 2013 is due to the HVAC installation works; a number of units were not in use during this time, resulting in reduced energy consumption.
Audience Overview

- **Sessions:** 1,561
- **Users:** 1,159
- **Page Views:** 4,918
- **Pages/Session:** 3.15
- **Avg. Session Duration:** 00:02:39
- **Bounce Rate:** 49.33%
- **% New Sessions:** 67.91%

### Language Statistics

<table>
<thead>
<tr>
<th>Language</th>
<th>Sessions</th>
<th>% Sessions</th>
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</thead>
<tbody>
<tr>
<td>en-us</td>
<td>1,060</td>
<td>67.91%</td>
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<tr>
<td>en-gb</td>
<td>236</td>
<td>15.12%</td>
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<tr>
<td>en-au</td>
<td>174</td>
<td>11.15%</td>
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<tr>
<td>pt-br</td>
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<td>zh-cn</td>
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<td>en</td>
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<tr>
<td>es</td>
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</tr>
<tr>
<td>fr</td>
<td>4</td>
<td>0.26%</td>
</tr>
<tr>
<td>it-it</td>
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<tr>
<td>es-es</td>
<td>3</td>
<td>0.19%</td>
</tr>
</tbody>
</table>

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