

# POST OCCUPANCY EVALUATION

## PAPAMOA COLLEGE PAPAMOA, TAURANGA



June 2016

 **greenstar**

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Date: June 2016  
Reference: 1-46083.00  
Status: FINAL

# **CONTENTS**

<b>1</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
1.1	SCOPE OF POST OCCUPANCY EVALUATION .....	3
1.2	BACKGROUND .....	3
1.3	CONCLUSION .....	3
1.4	KEY OUTCOMES .....	4
1.5	GENERAL RECOMMENDATIONS .....	4
1.6	PAPAMOA COLLEGE – SPECIFIC COMMENTS.....	4
<b>2</b>	<b>SURVEY METHODOLOGY.....</b>	<b>6</b>
<b>3</b>	<b>BACKGROUND OF THE SCHOOL.....</b>	<b>7</b>
<b>4</b>	<b>EVALUATION .....</b>	<b>8</b>
4.1	ACCESSIBILITY .....	8
4.2	HEALTH AND SAFETY .....	10
4.3	MODERN LEARNING ENVIRONMENTS .....	12
4.4	SUSTAINABILITY .....	14
<b>5</b>	<b>APPENDICES.....</b>	<b>16</b>
5.1	AS-BUILT SITE PLAN .....	16
5.2	DESIGN FLOOR PLAN- GROUND FLOOR.....	17
5.3	DESIGN FLOOR PLAN- FIRST FLOOR.....	18
5.4	CLIENT SUPPLIED INFORMATION .....	19

# **1 EXECUTIVE SUMMARY**

## **1.1 SCOPE OF POST OCCUPANCY EVALUATION**

The Ministry of Education (MoE) commissioned Opus International Consultants Ltd to undertake a Post Occupancy Evaluation (POE) of the buildings and immediate exterior at Papamoa College – Stages 1 & 2, Tauranga. The purpose of the review in accordance with the commissioning brief was to:

- Evaluate the effectiveness of the design and procurement process.
- Evaluate the end product of the completed school facility in terms of its compliance with the MoE guidelines.
- Evaluate the performance of the completed school as a suitable learning environment.

The aim of the evaluation survey is to identify the positive and negative aspects of the new school project and give recommendations that will increase the effectiveness of future school development projects. These aspects have been identified through an interview with key school staff, observations made by the survey team, and ad-hoc discussions with staff and users during the survey of the school. The key recommendations identified have been categorised into two sections, general and school specific.

This report and evaluation has been prepared based upon the MoE standards, the building code and relevant NZ standards in place at the time of the design and construction of the school. Comparing the school's design and specification to these sources provides comparative observations which will help inform the continued evolution of the MoE's guidelines.

## **1.2 BACKGROUND**

New education facilities in the form of Papamoa College were established to serve the growing population of the Papamoa. Located in the eastern suburbs of Tauranga and along the coastline of Papamoa Beach Reserve, the College is in a predominantly residential area of new sub-divisions and easily accessible from both Tara Road and Doncaster Drive.

Papamoa College was designed by ASC architects, and constructed by Hawkins. The school was constructed over two stages, the first stage was completed in 2011 for Years 7-9 and the second stage was completed in 2013 for Years 10-13. The College currently has a roll of 1150 students.

## **1.3 CONCLUSION**

Papamoa College is contemporary and appealing according to staff, delivering insight into the future of education through its modern learning environments and emphasis on sustainability.

There are many positive aspects within the school which are the result of a good approach to design and appropriate specification. For example all areas of the buildings and grounds are highly accessible, and consideration was paid to safety and visual transparency of protective barriers at roadsides and boundaries. The library space and outdoor seating areas have been popular with students due to their flexibility. The limited involvement of the end user due to the appointment of the principal halfway through the design-build cycle has potentially led to shortfalls in aspects of the design relating to the general arrangement and functionality of spaces and facilities.

Findings from the survey, the interview and general staff discussions indicate that the schools needs are for the most part met. The head of school reported that they are generally happy with the facilities. There is some room for improvement, specifically through better education of the users with regard to the design features and operation of the buildings.

## **1.4 KEY OUTCOMES**

A number of specific design elements were identified at Papamoa College that show good practice. These include:

- The College received a 5 star Green Rating Education Built rating in 2015, signifying “New Zealand Excellence” in the sustainable aspects of the school as constructed.
- The library space functions well as both a library and as a work space for students outside of class time. Staff believe that this is as a result of it being centrally located, easily accessible and flexible in terms of the types of spaces provided.
- The users reported that the electric sliding doors to interior spaces at Papamoa College are easy to operate by all users and have operated reliably since completion of the build.
- The perimeter metal pool-type fencing around the site is highly resilient been effective at securing the boundary according to staff. It has also worked well as a barrier between the adjacent road, drop-off zone and pedestrian pathways due to its transparency.

## **1.5 GENERAL RECOMMENDATIONS**

A number of general recommendations have been identified as a result of the survey and interview at Papamoa College. These include:

- Users at Papamoa College suggest that the current allowance for storage for student bags and equipment is insufficient. The lack of suitable storage areas and suitable fit out of storage areas for student bags and equipment has resulted in clutter within the learning and circulation spaces. This clutter also impacts the accessibility of escape routes and building entrances, as well as the safety of specialist spaces (such as the design and food technology areas).
- Staff at Papamoa College suggest that more attention is required with regard to instruction on building operation and simplification of user manuals (for non-technical people). End users at Papamoa indicated that they were not very aware of the sustainable features and design principles of the school or the requirements of maintenance and operation of the buildings. More informed briefing and guidance at handover by way of user guides would be useful for all staff.
- When specifying certain items during the design process, such as the glass external lifts, consideration needs to be given to the ongoing maintenance cost and issues for the school. At Papamoa the multiple lifts are costly to maintain, and the scaffolding costs associated with cleaning them are much higher than the school anticipated.
- The location of the teacher work spaces within larger learning spaces needs to be considered in relation to their need for a quiet and privacy during non-contact time. Teachers at Papamoa College felt that there were insufficient quiet teacher work areas, so have adapted a space that was originally planned to be a pupil breakout space as a teacher work space.

## **1.6 PAPAMOA COLLEGE – SPECIFIC COMMENTS**

A number of comments specific to Papamoa College were identified from the survey and discussions:

- Ensure that the staff are well educated at handover about how best to make use of the design features of the school, particularly when natural systems are in place for environmental control (heat, lighting and ventilation). For example, the placement of furniture in front of opening windows that provide natural ventilation, or glazing that provides daylighting at Papamoa has limited these systems’ effectiveness. Staff have introduced pedestal fans to meet ventilation needs.
- Staff advised that the curtain-walling system for the external façade has reduced wall area for display in teaching spaces, and that the high-levels of natural day-light cause glare which can cause discomfort for occupants and difficulty in use of audio visual equipment.
- Providing a central ‘undercroft’ area between multi-storey blocks has worked well according to users because it provides a covered circulation area and a place for staff and pupils to gather and socialise. However, the

environmental effects of such a feature on the site need to be considered and mitigated at design stage. For example, the wind tunnel effect within the undercroft at Papamoa limits the use of the feature in certain conditions.

- Users have appreciated the amount of outdoor seating provided, as it has encouraged the use of external areas. Greater use of external areas, especially at the front of the school, could be achieved by providing larger areas of hardstanding rather than just a path for maintenance. This will extend the modern learning environment to the outside.



## **2 SURVEY METHODOLOGY**

The evaluation methodology is based on the UK Building Research Establishment (BRE) early stage POE methodology combined with specific MoE design requirements covering the procurement process from inception to completion, as well as relevant New Zealand and territorial requirements and standards. The three main assessment criteria used for the investigation are Process, Product and Performance.

### **PROCESS**

This aspect of the POE seeks to identify how well the project performed using both a generic construction industry assessment framework and the MoE design requirements. The information will be collated from contract documentation provided by the MoE and interviews with MoE project representatives.

### **PRODUCT**

This aspect of the evaluation seeks to understand the extent to which the facilities meet the core elements of the MoE design requirements.

### **PERFORMANCE**

The final element of the evaluation seeks to determine the contribution that the facilities make towards the MoE goal of excellent educational outcomes. Three key elements of this assessment are functionality and fitness for purpose.

The information gathered under the above assessment criteria is collected by way of an interview with key school staff using a structured template of questions, one-to-one discussion with users of the school, and observations made during a survey of the buildings and grounds. The data is then collated under four headings in order to examine how specific building features perform and compare to the MoE design criteria for:

- Accessibility
- Health & Safety
- Modern Learning Environments
- Sustainability



Figure 1

### **3 BACKGROUND OF THE SCHOOL**

Papamoa College was first opened in 2011 at 151 Doncaster Drive, Papamoa Beach, Papamoa. Located in the eastern suburbs of Tauranga and along the coastline of Papamoa Beach Reserve, the College is in a predominantly residential area of new sub-divisions and easily accessible from both Tara Road and Doncaster Drive.

Papamoa College was designed by ASC Architects and procured through a design and build contract with Hawkins Construction over two stages. The first stage was completed in 2013 consisting of three separate two storey building that are connected by a system of covered walkways. This was supplemented by another two storey building added in 2014 as stage two. It was anticipated that stage two would be used for the senior students, and as such stage two contained additional science and practical facilities. The College currently has a roll of 1150. A further third stage is planned to cater for further roll growth of up to 1500 on the site.

The Principal reported that he and the Board of Trustees were appointed part way through the design and construction process so were not able to have full input into the design. The project achieved a 5 Star NZ GreenStar rating for the environmental aspects of its design, as well as several other awards, including:

- NZIB GIB Supreme Award
- RMB 2011 Commercial Project Award - Supreme Award
- RMB 2011 Commercial Project Award - National Winner
- Waikato Bay of Plenty Award
- Coffey Projects, Educational and Arts Property Industry - Award of Merit

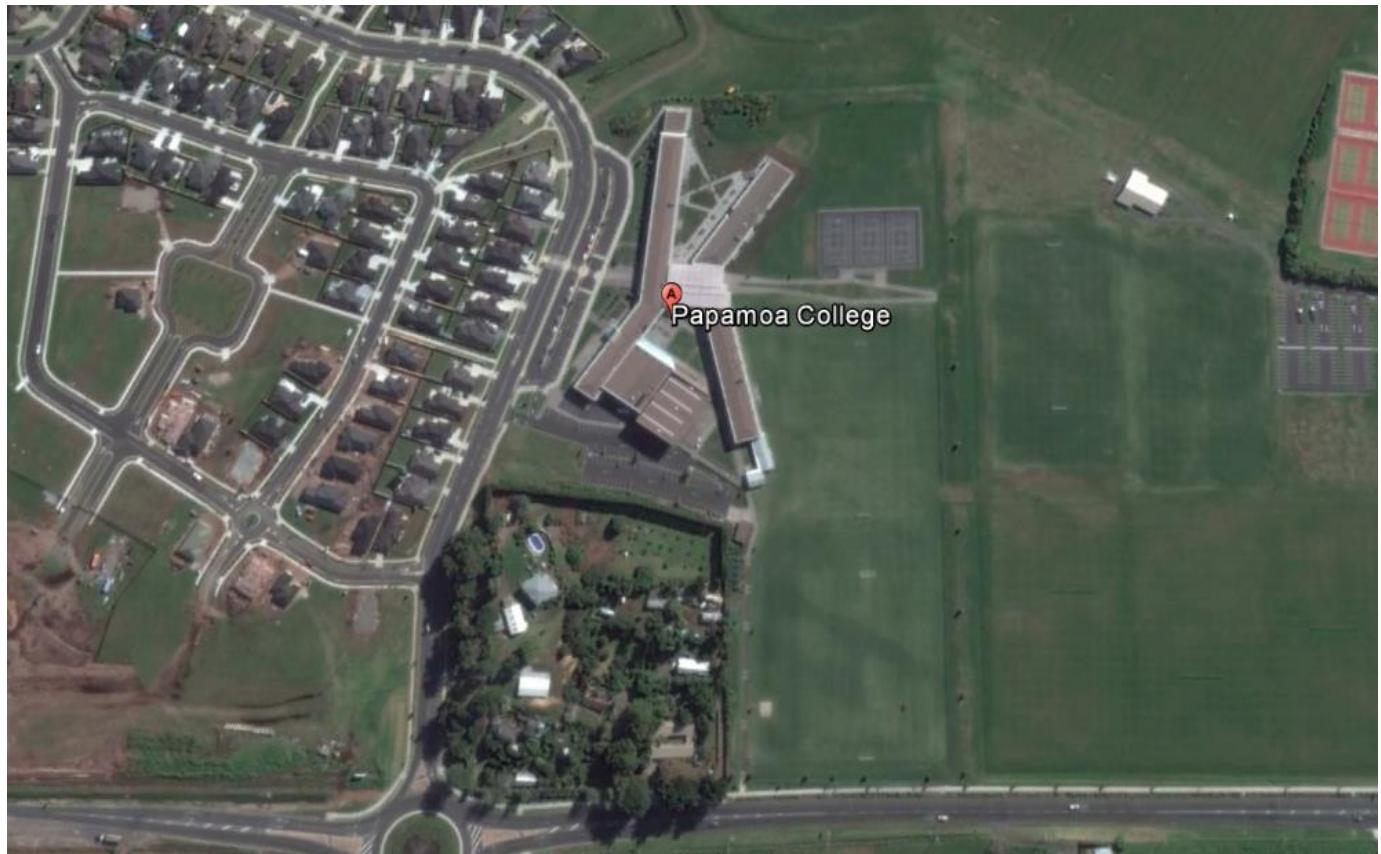


Figure 2

## 4 EVALUATION

### 4.1 ACCESSIBILITY

#### Positives:

- There is a designated drop off area to the front of the College (along the road side directly west). This is separated from the adjacent road with pavement and railings, and reportedly works well according to staff. See Figure 3.
- Users feel that the pedestrian connections from the drop off zone, car parking areas and bike stores to the College grounds and entrances are excellent. The drop-off zone, including its road entrances, is separated from the car parking areas. See Figure 3.
- The majority of the staff and visitor car parking is located off street to the south of the College buildings. The entry to the car park is clearly identified from the road and a barrier secures the car park out of hours. There are further car parking spaces and accessible parking bays located close to the entrance of the car park, which the staff report are well placed and easily accessible. The provision for car parking meets the requirements of the territorial authority. See Figure 4 of the accessible parks adjacent the road entrance and pedestrian path to the main entrance.
- The number of accessible toilets meets the requirements of the building code and MoE for the time of the design. According to staff these toilets are well placed throughout the college and there are no issues with access or layout.
- There are five lifts distributed around the buildings that provide access the first floor level for all users. These are controlled by swipe card access to limit use to disabled students and staff.
- Building entrances have level thresholds throughout the school, and users reported that the buildings and grounds are highly accessible with wide entrances, pathways and circulation routes. See Figure 5 of the exterior circulation route between school buildings.
- Unrestricted access for emergency vehicles is available to all areas of the school grounds, as required by the territorial authority and NZ Fire Service.
- Staff reported that the data and power outlets to teaching spaces are generally provided at appropriate accessible heights and locations for their use.
- The users reported that the electric sliding doors within interior spaces are easy to operate, and have operated reliably since completion of the build.
- Building services are installed without protrusions into circulation areas throughout the school. Staff reported that there have been no issues with regard to the location of building services, or their interaction with circulation areas.



Figure 3

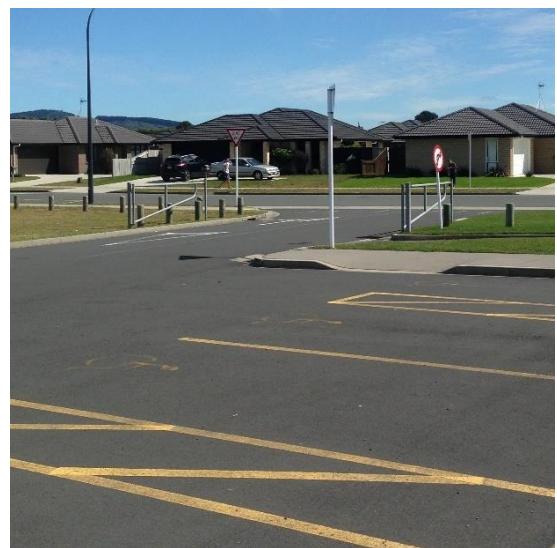


Figure 4



Figure 5

## Negatives:

- The Principal reports that the lifts are problematic, as they often fail to operate and their maintenance is costly. See Figure 6 of a non-operational lift identified during the survey. As such the use of the lifts has been limited to disabled students and staff.
- The Principal reports that the glazed exterior lift requires specialist cleaning due to safety requirements for access, and that the cost of maintenance and cleaning is a greater burden to the college than anticipated.
- Staff report that due to insufficient allowance for storage within the design, some unused accessible bathrooms are being used for storage of equipment. See Figure 7.
- Staff have reported that the accessible bathroom doors are difficult to manoeuvre through for wheelchair users. For example, in some areas the door handle is located too close to the adjacent (perpendicular) wall to allow easy operation. See Figure 8.
- According to users, wayfinding around the school grounds and buildings is difficult for visitors and new students as insufficient signage is present. This is especially relevant to the main reception, which is not clearly identified for visitors coming to the site.
- Staff advise that users struggle to open the manually operated windows because the catches are often in difficult to reach locations. Users consider that the window locations and operation was not well considered in relation to how the floor layout and furniture would be used. Staff reported these issues in the learning spaces and admin block.
- There are no emergency call buttons within the accessible toilets, and oversight into these spaces is minimal for passers-by. See Figure 7.
- Whilst not a requirement of the MoE guidelines at the time, there are no power outlets within the accessible bathrooms to allow for the potential need for hoist facilities in the future.



Figure 6

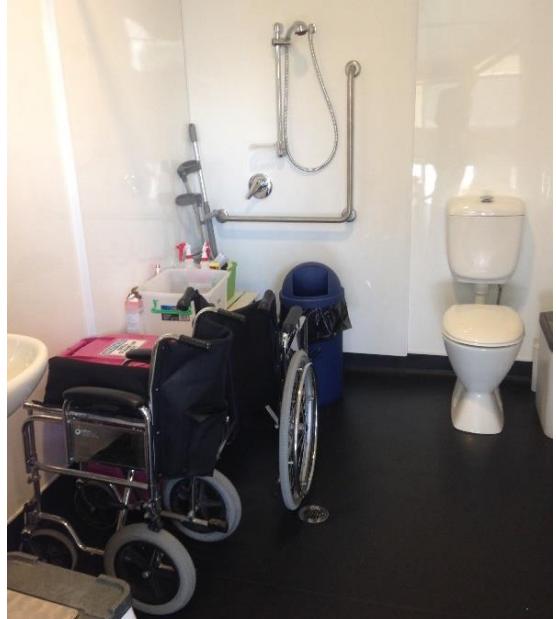


Figure 7

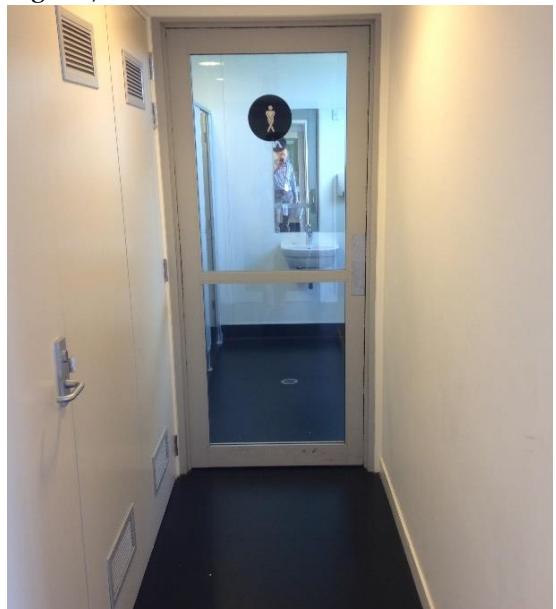


Figure 8

## 4.2 HEALTH AND SAFETY

### Positives:

- The perimeter of the site is largely secured with metal pool-type fencing, which is both resilient and effective at securing the school boundary according to staff. Metal pool type fencing also provides a transparent barrier between the main road, the school and the drop-off zone. Bollards are provided at pedestrian crossings. See Figure 9.
- The exterior of the college is equipped with CCTV cameras, which the Principal regards as an effective deterrent against vandalism.
- Building services are securely located and installed. There were no reported instances of services creating health and safety issues on site.
- There are panic buttons, sounder alarms and PA system in place for use in emergency situations such as lockdown or tsunami warning. See Figure 10.
- The exterior car parking and drop off areas are lit via overhead street lighting, which staff report is particularly effective for them during winter when they may be leaving after dark.
- Each teaching space has oversight to parts of the college grounds. Teachers reported that they appreciate the level of oversight available from the teaching spaces. See Figure 12.
- Eye wash stations and emergency showers are provided in appropriate practical areas, in line with MoE guidelines of the time. Extraction systems have been installed at the source of pollutants (e.g. science areas, near photocopiers/printers). See Figure 11 of an emergency shower.
- All toilets are naturally ventilated, which limits the reliance on mechanical ventilation. Staff felt the bathrooms were well ventilated.
- The covered area below the overhead walkway provides shelter from rain and provides a large covered outdoor space that serves multiple purposes. Staff advised that this space had been well utilised by the school at times, due to the protection from the rain it provides, despite the wind tunnel effect that occurs there.
- Heaters are located out of reach of occupants, so hot surfaces cannot be touched.
- Hot water pipes are well insulated and protected, and are not generally exposed in student-accessible areas.
- A designated health space has been provided, and staff feel this space is appropriately equipped and sized for the school.



Figure 9



Figure 10



Figure 11



Figure 12

## Negatives:

- The College is located in a very high wind zone. Staff report that the building layout channels wind from every direction, stating that this is particularly prevalent in the central undercroft area between blocks, where a wind tunnel effect occurs.
- Staff advised that the large glazing panels to some learning spaces create a lot of glare, which has resulted in users experiencing headaches. Curtains and blinds have been fitted but users say that these interfere with the effectiveness of the passive ventilation.
- Users confirm that teaching spaces get very hot in summer months. Reportedly this is due in part to the direction the glazing faces. Observations showed that the placement of furniture against the perimeter of the learning spaces, which prevents access to some opening windows, as well as restricting air circulation through these windows.
- Free standing, temporary fans have been added to learning spaces to assist with air circulation, as users felt the level of ventilation provided by the passive ventilation was insufficient. The users do not like having these fans as they are noisy and their power cords present a trip hazard. See Figure 13.
- Staff advise that the floor box covers to power points within learn spaces were not robust enough and a number were damaged through general use, presenting trip hazards. The covers to these have been replaced with more robust, plywood covers at the college's expense. See Figure 13.
- There is no oversight of the college grounds from the administration block, especially toward the playing fields. Staff report that this limits the opportunity for passive surveillance when teaching spaces are not occupied.
- There were initial concerns around risk of injury to users and potential damage due to the exterior doors opening out onto circulation routes around the building, as well the effect of wind on these doors. To resolve this, external wing walls/screens have been installed at some building entrances post build. See Figure 14 of the external wing wall/screen providing protection to a building entrance.
- Some structural elements and building services have been left exposed as a learning resource for students. However, following the build these had to be covered or additional protection installed in some areas to reduce the risk of injury to users - in particular the bracing elements in the gymnasium required covering. See another example of the exposed pipes underneath the stairs in Figure 15.
- Staff reported that the exterior bollard lights were removed from the front boundary of the school as the fittings were not robust. Several had reportedly deteriorated since opening, and a few had been damaged.
- Corroded pipe supports to the central undercroft area require replacement. The level of corrosion present suggests incorrect specification for the coastal environment. See Figure 16.

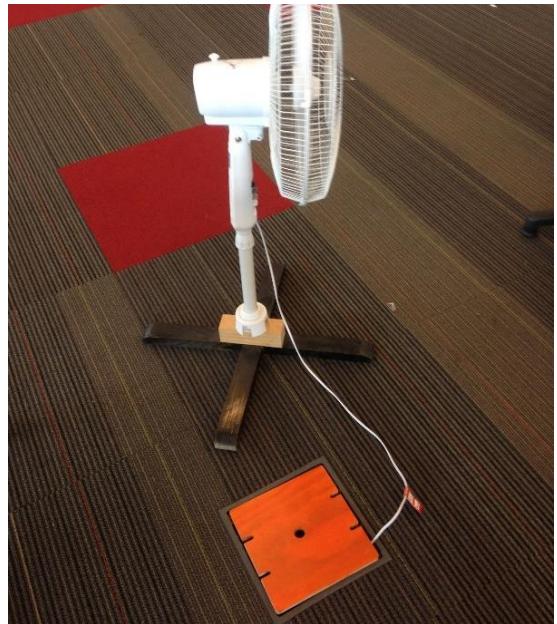


Figure 13



Figure 14



Figure 15



Figure 16

## 4.3 MODERN LEARNING ENVIRONMENTS

### Positives:

- Users confirm that ceiling mounted interior lighting is well placed and is effective in use. There were no issues around glare from artificial lighting according to staff.
- Outdoor sports facilities are fully enclosed with high fencing separating the area from the surrounding areas. Users report that this effectively contains activities within the court area, and ensures that the courts can be used without disruption to adjacent areas.
- Fixed outdoor seating is provided within the wind-sheltered grassed/paved areas between buildings. Staff report that the provision of seating to encourage use of external areas. The school has also funded additional relocatable timber tables to enhance the area. See Figure 12 and Figure 17.
- The high dependency unit (bathroom) has a hoist installed for assisting with students. Wheel chairs and a mobile hoist are provided for the users. See Figure 18.
- According to users the drinking fountains are well distributed around the grounds, and work well where placed near to the entrances to the school buildings.
- Staff feel that the wood work/materials technology and food technology rooms are well specified in respect to equipment provided for class tasks and safety. An eye wash station and emergency shower are installed in the science/technology areas as per MoE guidelines. Air extraction units are supplied at sources of potential pollutants, such as at fume cupboards and adjacent photocopiers.
- Large automatic glass sliding doors are used to separate or combine the learning spaces. This feature has been appreciated by staff as it allows for flexibility and collaboration between groups and teaching spaces.
- The library space has worked well as an additional work space for students outside of class time. Staff believe the central location and ease of access to the library has facilitated this use well.
- The large covered area under the walkway provides shelter from the elements and is used by the school as an extension of the teaching spaces. It is also a space for staff and pupils to gather and meet. See Figure 19.
- Users report that all internal and external areas are well lit throughout the school. There were no areas identified by users where lighting was insufficient for the tasks undertaken in that area.
- Uncovered bicycle locking/storage facilities (bike racks) are available on school grounds. According to staff these are well used by the students, and the location of the racks to allow oversight has been appreciated in terms of the additional security this provides. See Figure 20.
- A designated outdoor storage shed has been provided for caretaker's equipment in the form of a separate shed. The storage



Figure 17



Figure 18



Figure 19



Figure 20



Figure 21

space is reportedly sufficient for the schools needs, and the location adjacent the playing fields has been effective for the groundskeeper.

- Switchboards / electrical cables are tidily installed, well labelled and protected within locked enclosures or service cupboards. See Figure 21 of a wall-mounted racking system within a cupboard to contain the cables.
- Wi-Fi networking is installed throughout the school and students are able to connect to the network with their own devices, which staff appreciate as this offers easy access to resources. Multimedia facilities for video/audio are provided in the library and IT suites. Mobile Computers on Wheels (COW) units are used for laptop charging, and have met the needs of the users well. See Figure 22

### Negatives:

- Staff use the designated break out spaces within the learning areas as teacher work spaces. The Principal reported that that it was originally intended that teachers should be based and work in the main teaching spaces at all times, but this did not work for staff. As a result of the alternative use of the breakout rooms, there are no quiet areas (breakout spaces) available in the teaching spaces for individual or small student group lessons, confidential talks or counselling sessions. See Figure 23 of one of the breakout spaces adapted as teacher work space.
- The automated light fittings were initially problematic for staff as the lights would come on when additional light was not required, and the lights would sometimes turn off if there was little movement in the space. A manual 'off' switch was installed to the lighting controls post-construction to offer more control and flexibility to the users.
- Staff believe that the space allocated in the design for student storage within the main learning areas was insufficient and not located well. The school has installed lockers at the perimeter of the learning spaces as intended, but these restrict the available daylighting and impede natural ventilation in several locations. See Figure 24 of some lockers within the general learning area.
- Due to a lack of alternative equipment and resource storage space (according to staff), boxes and equipment are stored at the perimeter of the learning spaces in front of windows. This reportedly decreases the performance of the natural ventilation system, which staff have now supplemented with free standing and wall-mounted fans. See Figure 25.
- Staff report that there is not enough display space on the walls of the teaching spaces. The building using a floor to ceiling curtain wall (glazed) system, and as such there are few walls that can serve as student work display areas. If exterior windows are used to display work this blocks the natural light into the learning spaces.
- There is no connection in the Building Management System (BMS) between the buildings constructed in Stage 1 and Stage 2. The buildings are different in operation and are independently controlled, which is problematic for staff as they need to understand multiple systems in order to make adjustments.



Figure 22

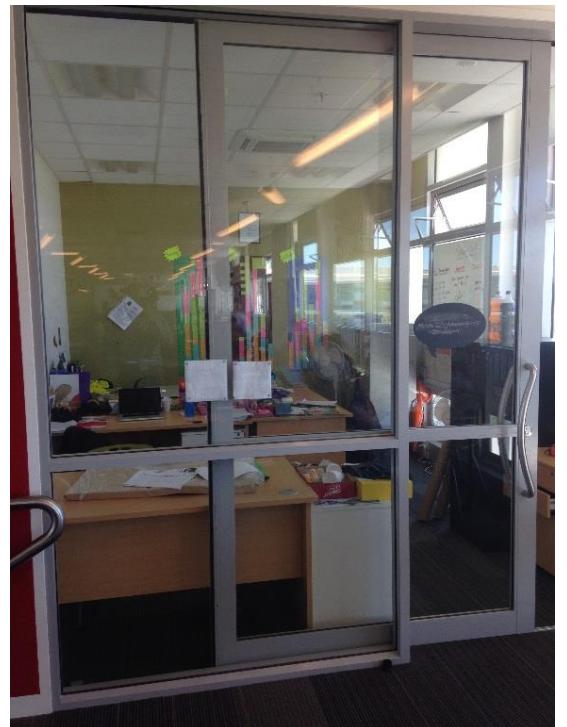


Figure 23



Figure 24

- Users reported that the acoustic performance of the music and drama spaces is not adequate for the use of the space.
- Staff felt that there was an under estimation of the space requirements for the technology (food/materials/etc.) areas of the school at the design stage. The spaces are reportedly quite cramped with a full class working in them, and there is a lack of storage space for equipment. For example, staff reported that the hot plates in the food technology areas are too close together and don't allow sufficient workspace for students.
- There is no shelter to outdoor courtyard areas, which staff felt was not ideal given the level of solar exposure on site. Reportedly the lack of shelter has also limited the use of outdoor areas as teaching spaces.
- Staff report that power outlets were not well located within the main learning spaces. Some areas with multiple computer stations do not have a sufficient number of power outlets either, and extension leads are now used in these areas which creates potential trip hazards.

## 4.4 SUSTAINABILITY

### Positives:

- The College received a 5 star Green Rating Education Built rating in 2015, signifying "New Zealand Excellence" in the sustainable aspects of the school as constructed. Figure 26 shows the certificate on display at the school (the 5 star design rating only was on display).
- Hot water generation is by way of solar assisted electric cylinders, which reduces energy use in water heating. Hot water is temperature monitored and pipes where inspected were insulated to minimise heat loss in transfer around the school. See Figure 27 of the roof mounted solar panels.
- A BMS (Building Management System) is installed within the school, and reportedly provides an effective level of control over the mechanical systems and subsequently thermal environment within the buildings. Energy use is able to be monitored through this system.
- Solar tube skylights are used to provide daylighting within the northern education blocks. This provides daylight deeper within the floor areas of the various spaces within the buildings, which users have appreciated.
- Secured storage facilities for rubbish and recycling bins has been provided on the College grounds. This has been appreciated by staff due to the windiness of the site in particular.
- The buildings employ rainwater harvesting from the roofs, with the water used for grey water uses such as toilets. There are five 5000 gallon water storage tanks on site. See Figure 28 of the storage tanks.
- Users appreciated the aesthetic appeal and practicality of the landscaping around the school grounds. To the south the landscaping visually obscures the rainwater storage tanks – see



Figure 25



Figure 26



Figure 27



Figure 28

Figure 28. To the north the landscaping and plantings provide some relief from wind to the area between arms of the buildings.

- Users report that the external drainage on the grounds adequately drains the site during poor weather. No signs of ponding water were identified on school grounds during the survey.
- The toilet facilities are naturally ventilated, and staff report that the ventilation is effective. Mechanical extraction has been used in places within the school where natural ventilation is not an option.
- Ventilation to internal spaces is provided by means of natural ventilation. This system is simple to operate according to users, and has a low maintenance requirement compared to alternative means of ventilation.
- Heat pumps are installed in selected areas within the administration block, and are easily controlled by users via wall panels with automatic settings – see Figure 29. A decentralised gas system is used for the majority of the school. The gas supply consumption is monitored through the BMS.

#### Negatives:

- The school have found the BMS (Building Management System) to be very costly to maintain and repair. Reportedly technicians have been required often.
- Due to the limited education of staff with regard to correct operation of the building, the effectiveness of the passive ventilation system has been disrupted. Furniture has been placed at perimeters blocking the window openings and access to the controls. Staff have subsequently introduced pedestal and wall mounted fans to the learning spaces to meet ventilation needs and cope with the reduced effectiveness of the passive system.
- Cassette type (ceiling mounted) air conditioning units are used for cooling during summer. Reportedly they are effective, but lead to increased energy consumption and maintenance costs for the school during summer.
- Areas of painted concrete are delaminating. The Principal advised that this was reportedly due to the surface being inadequately primed prior to painting, but that this issue was being addressed.



Figure 29



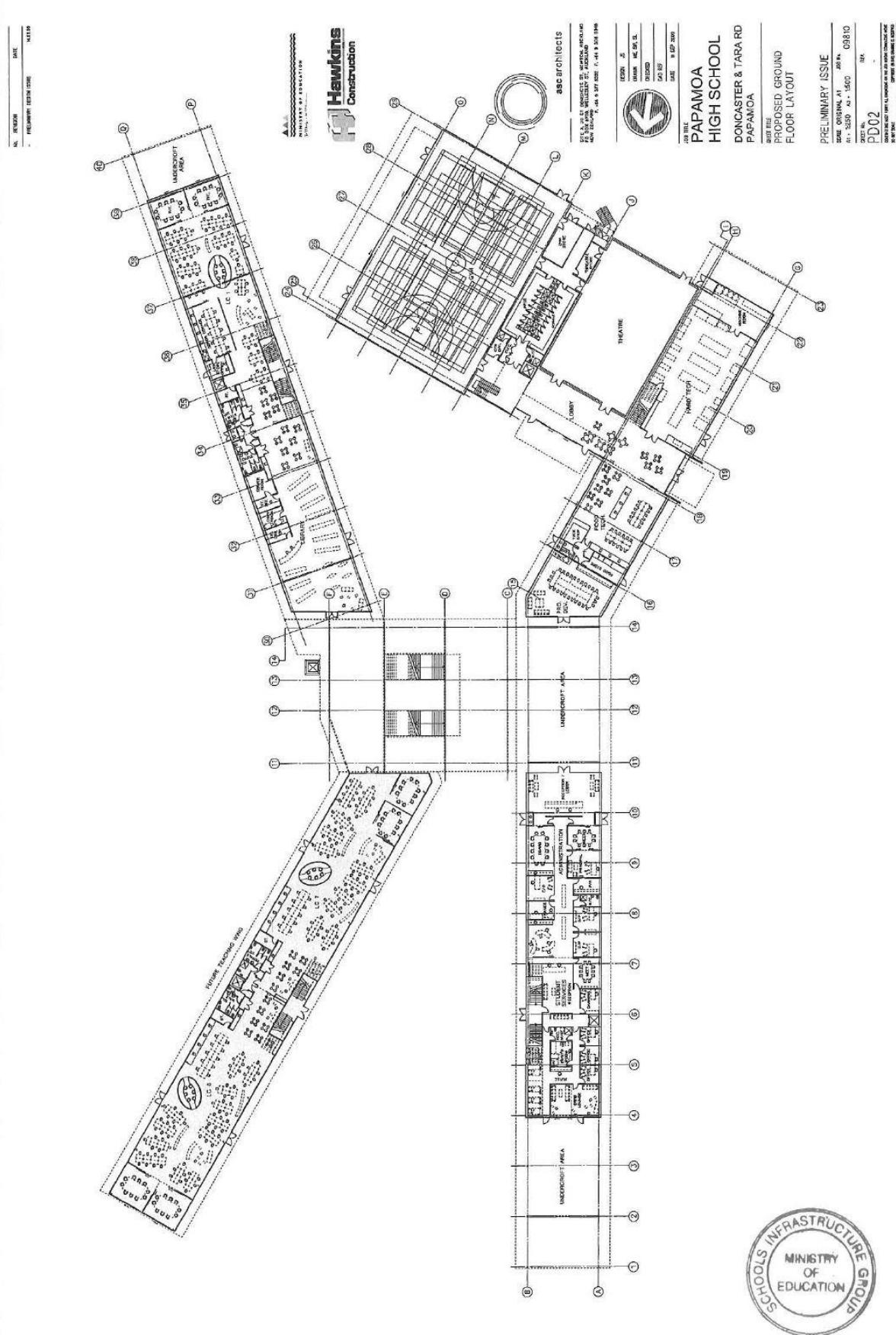
Figure 30

## **5 APPENDICES**

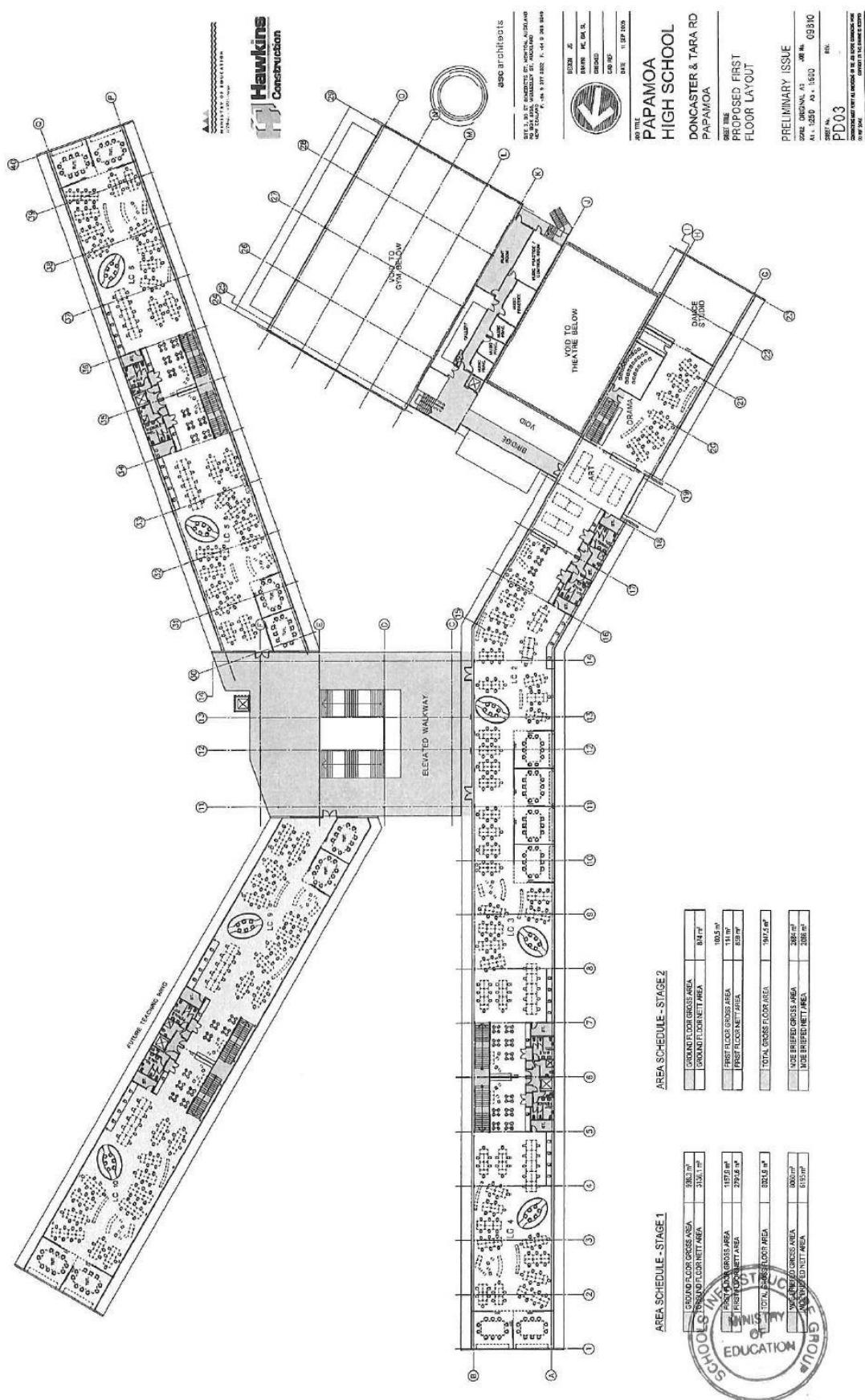
## **5.1 AS-BUILT SITE PLAN**



## 5.2 DESIGN FLOOR PLAN- GROUND FLOOR



### 5.3 DESIGN FLOOR PLAN- FIRST FLOOR



## **5.4 CLIENT SUPPLIED INFORMATION**

- Power point presentation: “New Secondary School at Papamoa – Concept Design”
- Papamoa College contract documentation
- Papamoa college funding submission
- Construction project programme
- Area allocation information for Papamoa College



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