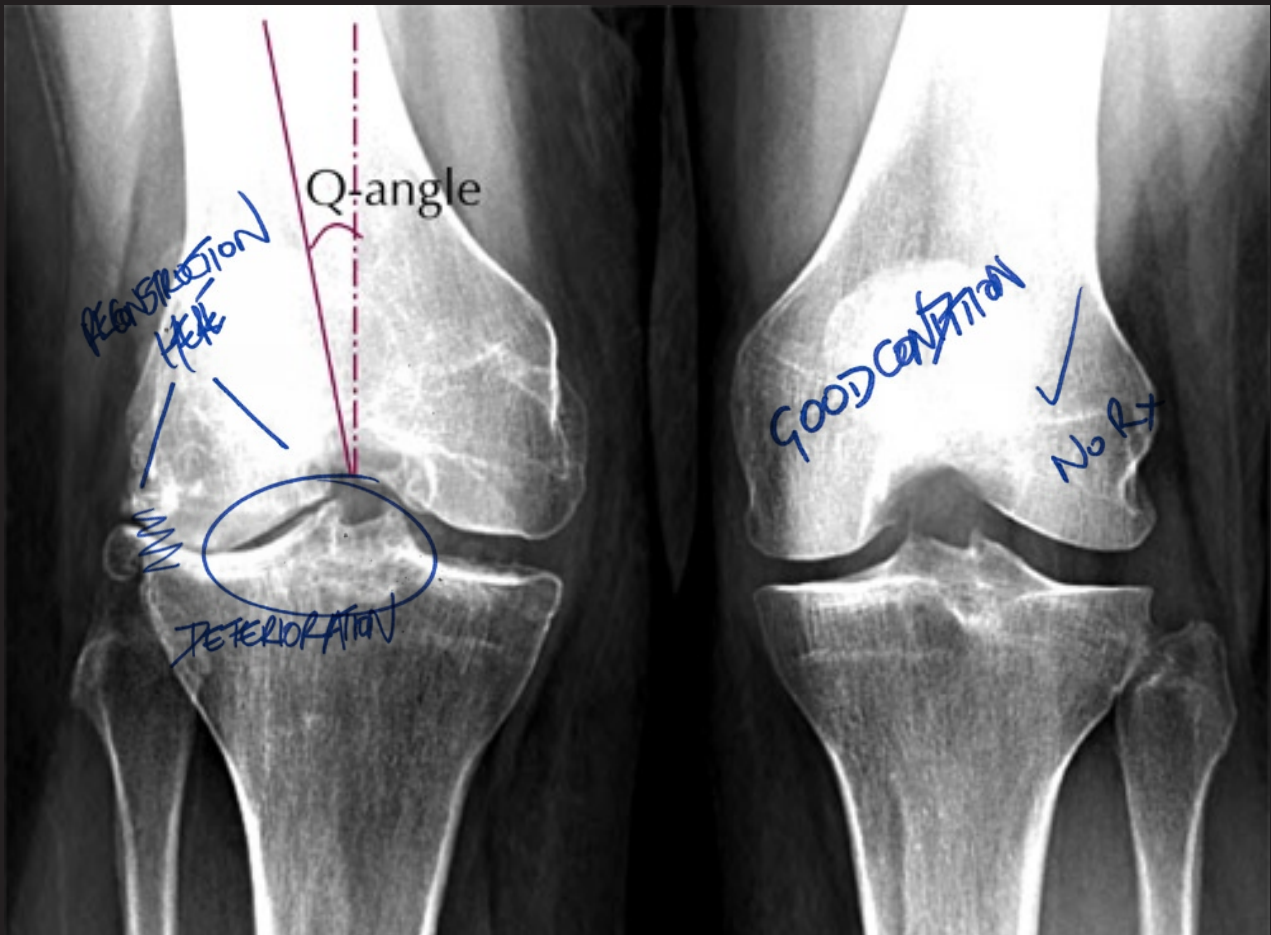


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**PUBLIC
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Issue: 0805

**SHOULD I STAY OR
SHOULD I GO NOW?**



Should I Stay or Should I Go Now?

Introducing a New Assessment Tool to Assist in the Appraisal of Existing Building Stock

Written by Graham Legerton

Article at a glance

Are you responsible for the management and maintenance of existing buildings or estates? Are you faced with a dilemma of deciding how funding should be best apportioned to achieve the optimum return and improvement to an estate of university or health buildings? Are you in the process of determining a project brief that is reliant on a retention, refurbishment or demolition component? If so, how are you quantifying and qualifying the extent of each category and how are you prioritising the most appropriate buildings for retention, demolition or refurbishment? This paper proposes a new assessment tool for education and health facilities, which facilitates the appraisal of existing building stock and decisions of whether to retain, refurbish or demolish. Application of the tool is demonstrated in a real life case study of Mackay Base Hospital.

Introduction

Education and health redevelopments share many similarities: both have a high proportion of deficient and disparately-sited building stock; both have a great need to maximise their assets; both have historically evolved with a succession of small funding packages; and both have limited budgets with which to orchestrate change. In light of such issues, the question of whether to retain and refurbish or demolish and rebuild is a pertinent one to both types of redevelopment. The consequences of making the wrong decisions in regard to 'refurb or rebuild' can be significant—in terms of value for money, program, quality, sustainability, and future proofing—yet, to date, there have been limited tools available to assist in the decision-making process.

One tool that has been used with some success is that developed by the UK Association of University Directors of Estates (AUDE). The tool, published in April 2008, is useful in ensuring a thorough assessment is undertaken. However, it does have some deficiencies, such as using a predominantly schedule-based approach, which may result in analyses not being as accessible to a wider audience. The tool was also designed for use in the university sector with fully specified assessment criteria, which may limit its adaptability.

By drawing on the strengths of the AUDE tool and addressing its deficiencies, Woods Bagot has developed a new assessment tool that encourages a weighted assessment relative to the cost plan which can be used across both education and health projects. The benefits of having a multi-purpose tool include the ability to apply lessons learned from one redevelopment to another across education, health and science sectors.

This paper introduces the 'Retain, Refurb or Demolish Assessment Tool' (RRDAT) and shows how successful it can be in a health context, using the Mackay Base Hospital Redevelopment as a case study.

Background

Education and health estates teams face a growing number of challenges. As a result of decades of insufficient funding, poor maintenance regimes and prioritisation of new-build developments, they are faced with building stock that is becoming increasingly deficient and many are now struggling to overhaul the identity, balance and condition of their estates. In doing so, estates teams must be mindful of the need of their organisations to attract the staff, students, academics and specialists necessary to keep them in operation. This, coupled with the current pressures of the global economy, increased competition and a drive towards increasing levels of sustainable development, is elevating the outcome of 'refurb or rebuild' decisions to a new and far more widely accountable platform. Despite the increased pressure on choosing the right strategy, estates teams are often not sufficiently supported in this decision-making process.

Design teams have an inherent responsibility to question, investigate and analyse project scopes to ensure the most appropriate brief has been identified at the inception of projects. Regrettably, retention, refurbishment or demolition strategies are often adopted and implemented without a thorough investigative process during the briefing stage. Difficulties are exposed at a later date when existing building stock deficiencies emerge and the real development potential cannot be realised. In April 2008, the UK AUDE developed a comprehensive evaluation tool in an effort to address this lack of an investigative framework. The AUDE tool contains two methods of assessment: a 'front end fit for purpose filter' and an 'options appraisal'. The first is used both pre-feasibility and during feasibility to gather an initial impression of the redevelopment and ascertain the likelihood of refurbishment. Existing university buildings are appraised under the categories of Vision, Environment, Social and Economic via a decision flow matrix to give an initial indication of whether a building should be refurbished or rebuilt. Where a more detailed 'options appraisal' study is required, this is followed by a series of best practice questions under the same categories with a twenty-five per cent weighting allocated to each category.

Our critique of the tool identified the following:

- the front end filter is initially weighted towards the view of the estates team. This may lead to a predetermined answer
- the methodologies provide either a very high level view or an extremely detailed assessment
- the tool is predominantly schedule-based which may restrict understanding of the analysis by wider stakeholders
- the tool is aligned to individual building assessments in lieu of estate-wide assessments

Retain, Refurb or Demolish Assessment Tool

In an attempt to address the deficiencies in the AUDE tool and develop an assessment tool for wider use, Woods Bagot devised the 'Retain, Refurb or Demolish Assessment Tool' (RRDAT). The tool offers a less prescribed evaluation process and weightings linked to the cost plan in lieu of generic categories. The RRDAT process establishes a proposed retained, refurbished and demolition footprint which informs the design and helps to substantiate the cost plan very early on in the project.

RRDAT has the following objectives:

- to identify appropriate buildings for retention, refurbishment or demolition
- to reduce capital and escalation costs
- to reduce maintenance backlog
- to enhance the quality of the estate
- to prioritise safety and removal of hazardous materials
- to maximise residual life and the associated embodied energy benefits
- to identify staging and decant opportunities
- to avoid temporary works
- to minimise disruption
- to review code compliances
- to encourage stakeholder engagement
- to establish a framework and design code for the ongoing design development of the project

The RRDAT process is summarised in the following nine stages:

1. Familiarisation
2. Defining assessment criteria per discipline
3. Visit and scoring
4. Weighting applied to achieve white, grey or black designation
5. Consultant database and graphical representation
6. Cumulative analysis
7. Graphical representation
8. Aerial view
9. Design code

An understanding of these stages and their application is described in the following case study.

“The change instigated by this project team on the Mackay Base Hospital achieved a floor area saving of more than 10% compared to the original masterplan (without compromising any department areas) and a saving of more than 8% to the budget by reducing the amount of refurbishment and creating new efficient and functional facilities. Furthermore, half of the savings were retained for ESD initiatives.”

**Mark Mammarella
Project Quantity
Surveyor
DCWC**

Case Study 1:

Mackay Base Hospital Redevelopment, Queensland, Australia

Woods Bagot has recently applied RRDAT to the Mackay Base Hospital Redevelopment (MBHR); a major health project in Queensland Australia which has a project value of A\$405m.

Woods Bagot has been appointed as architect and principal consultant for this redevelopment which commenced in September 2008. At the time of inception, a masterplan strategy had been prepared by others which contained a number of retained existing buildings, proposed buildings and temporary works and as such the approved status of this masterplan provided a benchmark for the masterplan review stage. A new project team has been formed and the fixed budget has been agreed by Queensland Health and the Treasury.

Initial analysis and project establishment workshops with the client executive and design team immediately questioned the proposed retention and demolition strategy contained within the inherited scheme. During the project familiarisation process it became evident that new space was proposed whilst spare space was evident within proposed retained buildings. In addition, cost inefficiencies were apparent with more recently constructed building stock proposed for removal whilst older stock was allocated for retention. Whilst we appreciate that age is not the only determining factor, the retention strategy also appeared to constrain a number of redevelopment opportunities and all parties agreed that these apparent deficiencies merited a more detailed assessment, all within the first week of the commission. The pressures of the economy, the relatively remote location of Mackay, growing pressures on escalation costs, unavailability of local labour and rapidly increasing import costs for equipment and services, further emphasised the need to maximise value contained within the existing stock.



The current Mackay Base Hospital Redevelopment site is readily comparable in many ways to many existing university estates. The site contains multiple buildings and the initial impression conveys the classic hallmarks of a site that has evolved through the availability of smaller funding packages over a long time frame. On arrival to the site, the severity of the condition of the existing building stock is clear. The morgue, IT building and outpatient's buildings in particular are far from being fit for purpose. In terms of the estate, the existing facilities are predominantly comprised of low rise buildings of varying typology, size, quality, condition and age and it is evident that this stock is struggling to meet the clinical demands of the existing hospital, let alone the growing wider demographic needs. The extensive building facades are also exposed to a harsh marine environment, cyclonic seasons and tropical climate variations. The redevelopment scope provided a real opportunity to address deficiencies within the existing building stock whilst maximising the retention potential of a number of existing buildings that contain residual life.

The inherited masterplan was estimated as approximately 15–20% over budget. This informed the decision to align the assessment tool to the budget. As such the conception of the RRDAT tool is directly linked to the percentage cost plan allocations for architecture, services and structure, 26:44:30 respectively. This is a distinct difference to the AUDE tool. RRDAT enables the cost priorities of the building type to be factored into the assessment of each of the above mentioned disciplines. This is fundamentally important in the case of a hospital where the services content accounts for such a high proportion of the budget.

Due to the magnitude of the estimated budget difference, in parallel, the design team were endeavouring to review the program to considerably reduce the original completion date of June 2014 to June 2013. This would in turn reduce the escalation costs and the affordability gap and, therefore, time was also a critical component of the tool. If the design team were to be successful in developing a revised masterplan then analysis of the existing building conditions had to be done expediently. Therefore the tool had to be conceived and implemented within a one month period in order to maintain the program and to enable sufficient time for the design to take cognisance of the results.



Application of RRDAT

01 Familiarisation

A visual assessment of existing drawings was undertaken to clarify forms of construction, existing uses, structural systems and approximate dates of construction of each building. This provided an overview of the estate prior to assessing individual buildings.

02 Defining Assessment Criteria per Discipline

The main consultants assigned evaluation criteria relative to their professional discipline. The tool is designed to enable each professional discipline the flexibility of assigning criteria that are particularly pertinent to their discipline and the specific project in lieu of a prescribed list of assessment criteria. For instance the structural engineers added a category of earthquake code compliance under their assessment due to recent changes in legislation, the services engineers focused on design life expectancy of existing plant and the architectural criteria placed a strong emphasis on hazardous construction materials, fabric performance and functionality. Whilst these items only reflect a selection of the assessment criteria, this focused short list provides an alternative strategy to the AUDE filter tool categories, with the bespoke criteria list elevating the more salient concerns to the forefront of the analysis.

This approach also enables each discipline to provide an impartial and professional view prior to the discipline assessment being amalgamated to form the cumulative recommendation. See 06 – Cumulative Analysis.

03 Visit and Scoring

Each main consultant discipline attended a site visit to walk through and review the entire hospital premises, department by department and building by building. During this process teams analysed the buildings against Fitness for Current Purpose (FFCP) and Fitness for New Purpose (FFNP) using the criteria assigned in 02 above. All criteria were scored on a scale of 0 for excellent compliance, through to 5 for medium compliance and 10 for non-compliance. This process is repeated for each building.

04 Weighting Applied to Achieve White, Grey or Black Designation

The scores, per assigned criteria, per building and per discipline are then weighted within the criteria list to ascertain a consultant score for each building. If the score is less than 2.5 the building achieves a white rating (demarcating retention potential), if the building achieves a score between 2.5 and 6.5 then a grey rating is assigned (demarcating refurbishment and/or decant potential) and finally if the building achieves a score between 6.5 and 10 then the building is assigned a black rating (demarcating demolition required). See Figure 1.

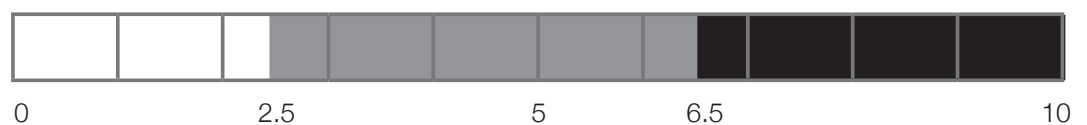
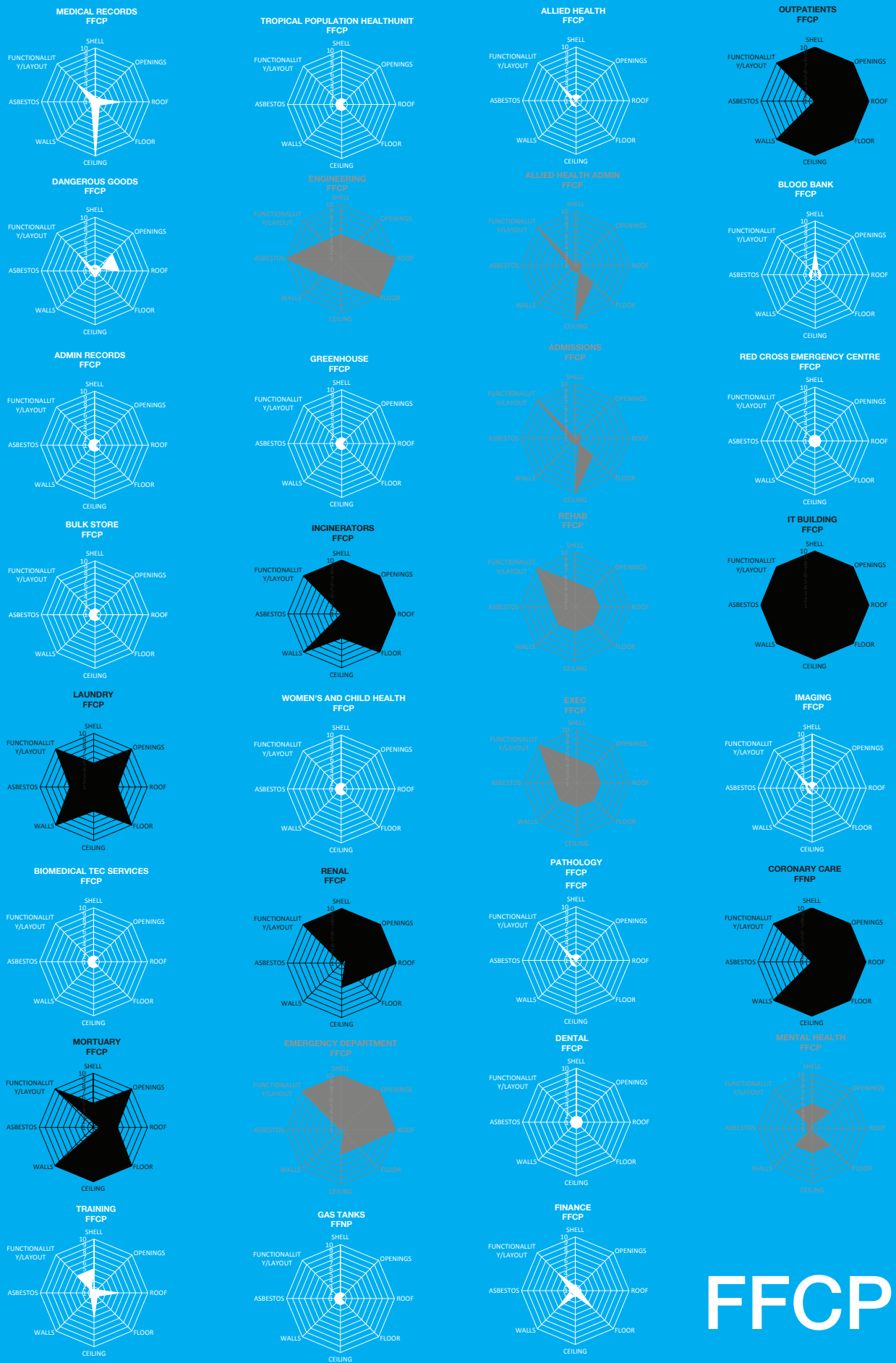


Figure 1. Building scores are weighted and given a rating. If the score is less than 2.5 the building achieves a white rating (retention potential); a score between 2.5 and 6.5 is given a grey rating (refurbishment and/or decant potential); a score between 6.5 and 10 is given a black rating (demolition required)



FFCP

Figure 2. Colour coded spider diagrams are a visual representation regarding whether facilities are fit for current purpose

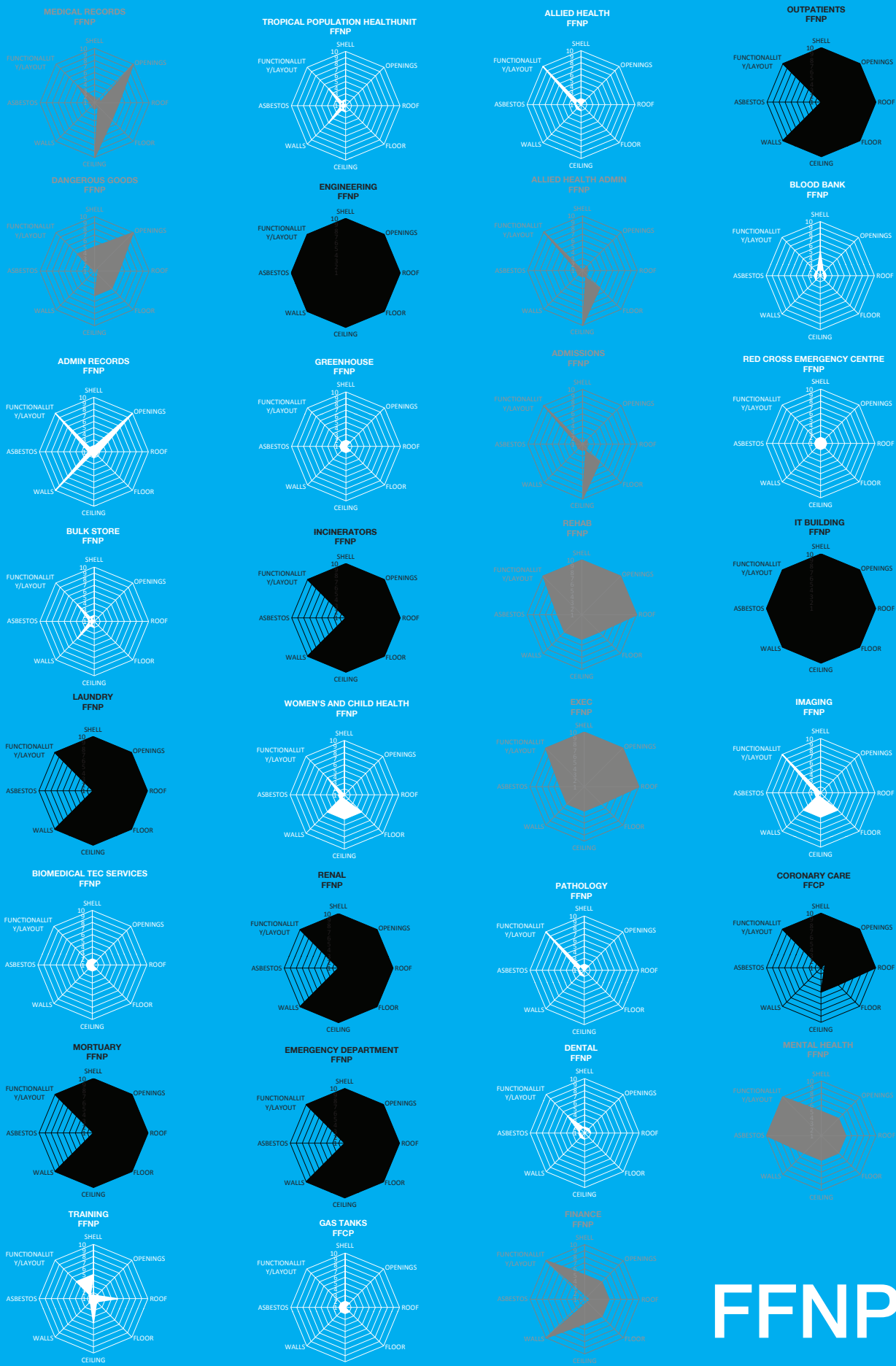


Figure 3. Colour coded spider diagrams are a visual representation regarding whether facilities are fit for new purpose

05 Consultant Database and Graphical Representation

A database per discipline for the entire building stock is generated in the form of a numerical assessment with the associated spider diagrams for FFCP and FFNP models (Figures 2 and 3) illustrating the strengths and weaknesses of each building. The spider diagrams are particularly useful as they detect scores against each of the assessment criteria per discipline and they therefore record particular characteristics of poor or good performance. This informed subsequent workshop appraisals as the views of the different consultants from building to building could be readily identified and debated. The graphics of the tool are readily comprehensible conveying the overall status of the stock through a simple application of colour.

06 Cumulative Analysis

The results of the different consultant assessments were combined to generate a cumulative recommendation that was weighted relative to the cost plan (figure 4). This tool clarified the potential retention, refurbishment and demolition strategy factoring in the fiscal hierarchy for this specific project of the 44% services, 30% structure and 26% architectural budgets. The results of retention, refurbishment and demolition were confirmed by the allocation of white, grey and black colour coding accordingly throughout the numerical and graphical data sequence .

07 Graphical Representation

A campus-wide spider diagram was generated and colour-coded to communicate the cumulative results of every building within the campus. This enabled the team to compare results from building to building and to obtain an overview of the entire estates condition of FFCP and FFNP stock.

08 Aerial View

The cumulative results were translated into plan form and 3D massing views. This aspect of the tool was particularly useful for wider stakeholder engagement where a before and after impression could be demonstrated without the detailed statistical analysis (Figure 5).

09 Design Code

The overall product established a design code for the project. Outcomes of the individual disciplines assessments were discussed and the impact of the cumulative assessment debated and visualised by all parties. The preferred masterplan subsequently evolved to complement this optimum retention, refurbishment and demolition strategy.

Conclusion

RRDAT generated a dramatically different retention, refurbishment and demolition strategy to that contained within the original approved masterplan for Mackay Base Hospital which suggests that the services element in particular had not been assessed thoroughly enough. The main frontage building that was proposed for retention has now been scheduled for demolition. This has the wider benefit of transforming the frontage, identity and way-finding of the hospital. The quantum of proposed retained areas increased and this achieved significant cost benefits, which avoided the need to compromise on the scope of the clinical services plan. In terms of process, the weighting relative to the cost plan increased the credibility of the results.

The transparency of reporting has enabled the weighting of different discipline appraisals to be understood whilst respecting the importance of a holistic, collaborative and cumulative result. The tool was visually easy to comprehend and compatible for use with multiple stakeholder consultations, that form such an integral part of health projects. This benefit will be equally applicable on education projects where extensive user group consultation is required. In the case of this project, the cumulative assessment visuals have been used to ascertain support from the executive team, models of care user groups and community reference groups. A revised masterplan was signed off in November 2008. Optimum value is now being provided with the most appropriate buildings being identified for retention, refurbishment and demolition. This decision making process is substantiated by detailed analysis and every square metre of retained stock has been maximised throughout the staging process.

The estates maintenance backlog will be reduced considerably through identification of appropriate buildings for retention and hazardous stock has been identified early in the process for removal to promote a healthier, safe environment. The residual life of recently constructed buildings and fit for purpose stock is fully utilised. This ensures a maximised return of prior capital investments with the tool identifying savings in new build area and, in turn, budget. Most importantly, this tool greatly assisted the re-alignment of the project to the approved budget whilst improving the quality of the proposed masterplan.

Grey zones have been identified as optimum decant areas which will assist the delivery and staging of the project. This has avoided the need for additional expensive and inappropriate temporary accommodation which often detracts from the quality of the environment.

Even though the extent of retained stock has increased, the siting of new accommodation relative to proposed retained accommodation has been transformed. This means that users will arrive and be greeted by the brand of a predominantly new facility.

With regard to safe and healthy spaces, all buildings will now be appropriately serviced which is essential in the tropical climate of Mackay. Changes in earthquake compliance were also covered in the assessment, again supporting the preference for a bespoke mode of assessment.

In summary, the process combined the experience of the professional teams in assigning and scoring the most appropriate criteria, with the sophistication of a data entry system that enables cumulative recommendations to be calculated and then communicated via a simple graphical representation of the outcome. It is important to note that this was a very transparent and interactive process. The tool can greatly inform the production of a robust return brief and has the capacity to challenge and investigate project scopes to ensure that the optimum redevelopment strategy is being implemented.

The shape of the Mackay Base Hospital Redevelopment has been transformed without the need for scope reductions which would have otherwise been inevitable if the original masterplan had been retained. The project has retained program and is now aligned to the budget allocation with funding for new facilities and patient care maximised.



Figure 5. a. The existing Mackay Base Hospital site. b. The revised site plan using the RRDAT Tool. Those buildings shaded in white denote retention potential; those in grey denote refurbishment potential; and those in black denote demolition.



About the Author

Graham is a Senior Associate of Woods Bagot and Director of Education for the Brisbane studio. He has extensive education project experience and is currently the project director for the A\$405m Mackay Hospital Redevelopment. Graham brings a track record of delivering major projects from inception to completion from London, including schools, colleges and high specialty office developments. Graham's research is client-centred, exploring methodologies which offer best value to his clients that are focused on real needs and delivery of the optimum outcome.

RRDAT has been conceived by Graham Legerton, Gunther De Graeve and Michael McShanag and it is the intention that these tools will be developed and refined during further case studies including education projects.

Organisations interested in participating in these studies are advised to contact Graham Legerton at graham.legerton@woodsbagot.com.au

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