

APPLYING NAMS.AU BUILDINGS PRACTICE NOTE PRINCIPLES TO A LARGE SCALE BUILDING PORTFOLIO

Steve Lyons, steve.lyons@spmassets.com.au, Managing Director, SPM

This is one of a series of case studies being published by NAMS.AU as a resource to assist asset management practitioners. The contribution of these case studies by our NAMS.AU Consultant Supporters is gratefully acknowledged.

Abstract

Over the past few years Spotless Services Ltd has been maintaining buildings and grounds for a government organisation that owns over 1,000 Sites and 2,500 buildings. As part of their contract, they were required to prepare a comprehensive asset register for these assets, assess their condition, determine the extent of backlog works, and produce a 10 year renewals plan. Considering the scale of this planning activity, Spotless engaged SPM Consultants Ltd (SPM) to provide the process and systems to assess the assets, create an electronic asset register, and to produce the various reports needed. Although many of the buildings are old, they had been cared for very well by the client over the years and the results of the survey showed that the majority were in a good condition and that only a relatively minor extent of backlog maintenance and renewals works was required. Now that the assets are well identified and described, both Spotless and the client are now using it to determine annual budgets, justify projects, and have evidence based long term planning.

Introduction

Spotless Services Ltd (Spotless) was awarded a Facilities Management contract a few years ago to look after buildings and associated non-infrastructure assets at all sites owned and managed by a large scale government agency. One of the Contract requirements was to undertake a 'condition audit' of defined assets.

Buildings and Grounds on about 1000 Sites have been assessed in a joint approach between the client, Spotless and SPM. The approach was based on the NAMS principles for assessing the quality of property assets and SPM provided the asset planning and data collection software applications. It was important for both the client and Spotless that a proven and recognised approach was implemented due to the significant resource investment that would be required.

This was the first time that such a comprehensive survey of the portfolio was undertaken. To put this into perspective, the

extent of the asset base is likely to be equivalent to the entire asset base throughout New Zealand considering the similar population served.

Requirements

The FM contract required the following:

- Condition Audit of building systems, services and structures installed or constructed at each Site. To submit a prioritised program to undertake the required backlog maintenance and capital works projects, with priority given to safety and areas that if not rectified, may adversely affect the Principal's business processes.
- Strategic planning involving the formulation of life cycle strategies and costs for the management and delivery of facilities management services, maintenance and minor capital works over a 10-year period of financial interest.

The purpose was to assess the current quality of the property so that the future quality can be predicted and costed based on levels of service statements. The assessment process also collects component level data that can be used to establish an Asset Register for both valuation and depreciation purposes.

The survey also provided Spotless with information to establish effective maintenance regimes on specific building components. It also provided an accurate asset register of grounds, buildings, and components associated with each of the sites.

The primary outcome from the survey provided the client with whole of life costs over a 20 year period considering initial backlog maintenance and longer term capital expenditure required to achieve the desired quality standards.

NAMS principles applied

To address the Contract requirements, Spotless engaged SPM to establish the NAMS condition assessment techniques and to produce the associated analytical reports.

The key principles applied can be summarised as follows:

- Identify and describe the quality of buildings. This is a paradigm shift from the traditional condition assessment method where surveyors only assess the works required.
- Undertook an Information Management Strategy (IMS) that identified the quality of existing data and confirmed the extent of additional data needed to address the Contract requirements.
- Applied the data collection strategy to a small group of properties as a pilot study and then fine tuned the IMS for a full roll out across the portfolio.
- Agreed on the information technology early in the IMS to ensure that all processes were aligned with the system's

standard functionality without the need for further development.

- Undertook the surveys of each Site following the Pre-audit, Site-audit and Post-audit phases.
- Summarised the portfolio's current state focusing on condition, compared this to what is needed through agreeing the levels of service, and determining a range of possible projects that could address the shortfalls.
- Consultation to determine what's needed now, what is sustainable in the longer term and how to prioritise considering prioritisation by health & safety, and by funding.

The level of detail

The IMS proposed a level of detail that was considered through the pilot survey and later agreed. There were two main areas considered. Firstly, should all rooms in all buildings be separated out or bundled together as one property record. Secondly, should all assets from door handles to window hinges, to roofing material be surveyed.

It was agreed that if a building had more than 6 separate rooms, then each room would be recorded as a property record and components assigned. Where a building had 1 to 5 rooms, then the building would be assessed as one property record and all components assessed accordingly. A building with 5 rooms resulted in up to 20 components, whereas a building with say 7 rooms had up to 80 components.

Deciding on which components to survey was purely based on adopting the NAMS Building Component Guidelines (BCGs). And yes, door handles were excluded from the survey.

Information available and needed

The Site location and descriptions were available through the existing asset register and was used to create the high level data

model, i.e. each Site was categorised by region and suburb.

Internal Hydra's were used alongside Google-Earth to identify the Site and establish the number buildings so that the data model could further be developed.

Where the existing information identified the Sites, further data was needed to identify the components associated with each building and grounds. Although the client undertook a 30% sample audit in 2006, this was used at the end of the survey to compare results. Therefore, to assess the condition of components, Spotless needed to start from scratch.

The software applications used

The IMS was based on using four software applications. :

- The client's corporate asset management system used across all asset types and stores the master data.
- Spotless' WMS – manages the daily work schedules including reactive works and planned maintenance.
- SPM Property – holds to the property records and component data from the survey and predicts the timing and costs of future works to provide the agreed quality standards. The data is shared between both DES and the client's system.
- SPM Survey – is the survey tools used by the surveyors that links directly with SPM Property to avoid double handling or manual entry of data. This is also being used to update the data as part of a rolling survey process.

The SPM software was chosen due to its direct linkages to the Contract requirements, i.e. collection of the data, development of an asset register, and production of the backlog and strategic planning reports. Although data can be stored in DES and the client's system, SPM Property was needed to analyse the data and produce the required reports.

The survey process

A team of surveyors was trained on the outcome of the pilot study, the IMS and the use of the technology including the survey tool and the main database application provided by SPM.

They started auditing each Site from mid 2008 and completed the project in early 2009. The key steps in the survey were:

1. **Pre-audit phase** – Sites selected for a 2 week schedule, survey packs prepared for each surveyor or survey team, a hierarchy of buildings/rooms on the Site was established by desktop, and then the surveyor downloaded a data model from SPM and developed their more detailed survey plan.
2. **Site-audit phase** – the surveyor travels to the Site and becomes familiar with the buildings including safety inductions, updated the data model on the mobile data collection device as needed, chose the appropriate survey type considering small unmanned sites or large manned sites with multiple buildings, and undertook the survey process.

The survey process was based on completing one building at a time, starting with the external fabric, then surveying the internal components by room where appropriate and then completing the survey with assessing the grounds. Specific work orders were written up during the audit and logged with the Spotless Help Desk if they were seen to be a possible safety issues. Before the surveyor left the Site, they self validated the data, re-armed the alarms and secured the Site.

The survey tool used in the field was SPM Survey. It allowed surveyors to create the initial data model in the office and then fine tune it on site. Room and building templates were created on site and copied or cloned to similar rooms or property records. It meant that surveyors could build their data models quickly so that they could focus their attention on

assessing condition and making comments.

3. **Post-audit phase** – the audit is only completed once the surveyor uploads the collected data and completes a range of checks and tidy ups. This includes writing commentaries, uploading photos, and generally reviewing all data collected including condition grades, quantities, assessed remaining lives, confidence grades and general commentaries. They also realign the data model hierarchy to ensure that any new property records are aligned, e.g. rooms are linked to buildings and buildings are linked to grounds.

The surveyor also determined the Capital Replacement Value (CRV) for each building they surveyed to ensure that the overall portfolio CRV could be determined in a consistent way. This was based on the floor area surveyed, the type of building and applying floor area rates from Rawlinson's Australian Construction Handbook.

All data and information was stored in the SPM software for subsequent validation, analysis and reporting by the Project Manager.

Overview of assets surveyed

Of the 1000 sites, over 2,500 buildings, 4,500 property records, and over 45,000 components have been assessed.

In general, the condition of the buildings and grounds are good to very good. This reflects the dedication of the client over the years to address issues as they arise.

Data quality has been measured through the following three parameters.

- 95% - completeness. Further Spotless activities will improve the completeness.
- 95% - accuracy. Structured interviews with Facility Manager's confirmed that the accuracy of the surveyor's judgements is within expectations. Spotless are also

currently improving the accuracy of roofing condition grades, and roller doors.

- 80% - reliability. The base life ranges, criticality, and unit rates that have been applied globally, need further review and localisation.

It's cost effective to improve the completeness and accuracy over time as part of the FM Contract. To provide a 100% result would be too costly with little added value.

Determining a level of service

"We will proactively replace or renew critical components in a poor to very poor condition and will ensure funding is available to react to components that are highlighted for replacement within the next 5 years based on the condition based risk analysis"

The gross replacement cost of the top 55 critical components is about 25% of all components assessed. Based on the level of service statement, these critical components would be replaced before they reach a very poor condition. Critical components are therefore proactively replaced or renewed and non critical components would be repaired, replaced or renewed as part of reactive maintenance.

Analysing the data and determining the level of investment needed

The data collected was analysed considering a deterioration function, condition grades, levels of service, criticality, building importance, various weightings and unit rates. The resulting reports addressed the Contract requirements between Spotless and the client, i.e. a backlog statement and a forward investment or lifecycle replacement plan.

The following policy has been applied to the 45,000 components surveyed to define which components would be classed as backlog:

- Any component that has a resultant remaining life of 1, 2 or 3 years. Although the remaining life is calculated it also

considers the remaining life assessed by the surveyor.

- Components that have criticality criteria of between 1.6 and 5.0. This includes much of the painting that is in a poor to very poor condition.
- Components that have 1%, 2%, 3% or 4% of their conditions assessed to be in CG4 or CG5 have been excluded, i.e. these are repairs.

Therefore, the current backlog is about \$3.5 million, which is only 0.6% of the portfolio's capital replacement value. Spotless are now implementing a project to address this backlog by targeting components that would have a safety issue if they failed.

The lifecycle replacement analysis over the next 20 years showed \$4.35 million per year on average should be allowed to provide for the agreed level of service standard. This compared to the current 2009/10 budget of \$4.15 million for Facilities Maintenance Management (FMM) and a further \$5 million budgeted for 'Reactive Maintenance'. Although the FMM budget is for ongoing compliance and servicing programmed works, part of the budget is also be for planned works and will overlap with the lifecycle replacement analysis.

The desired outcome is to reduce the \$5 million reactive maintenance budget through planning works that address deteriorating components as appropriate. A possible goal would be to reduce the reactive budget by say 40% and introduce a lifecycle replacement budget of say 25% of the current budget. In time, the budgets could be 70% planned works and 30% reactive. And the ultimate goal would be to further improve the quality of the portfolio while reducing the overall maintenance budget by 5%.

Scoping and prioritising possible projects

Surveying the assets and producing the lifecycle replacement costs along with the backlog costs would normally produce a good

asset management plan. However, this only gave an understanding of specific assets. The next stage of the process was to use the asset data and resulting planning information to scope real projects that would be costed, tendered and implemented. This required moving from an asset plan to a project plan.

Rather than setting budgets solely based on historic expenditure, new budgets from 2010/11 will be based on planned projects. Therefore, a range of 'planned projects' was created by using all information available within the planning function of SPM Property.

The components assigned to each planned project, has a calculated 'priority' score that is based on its criticality criteria scores and their associated building importance score. This is shown for each project and is being used by the Project Manager to assist with the scoping process depending on the available budgets and the resulting detailed project costs.

Over 50 projects had been 'planned' with an estimated cost of \$4.3 million - the top 15 projects are associated with the larger manned sites. As an interim measure to address immediate high priority issues, a \$1.2 million budget was provided. This allowed Spotless to refine the level of service and project prioritisation process to determine which projects must be done first. Where in the past this would have been done through a workshop session with experienced staff, the projects were selected using the data and information generated.

In addition to the original level of service policy, Spotless applied a further selection criteria based on all mechanical equipment and external building fabric that have a high health and safety criticality grade. The end result has been an evidence based plan showing the following information.

- Project name and code
- Priority – the priority number that was assigned to the original scoped project considering component criticality and building importance.

- Project Cost – the Gross Replacement Cost of the Services and External Fabric components that are part of the original project, i.e. all other Building Fabric and Grounds components are excluded from this cost. Note also that this is a part cost for many components, i.e. a component could have been graded 50% in good condition and 50% in poor condition and the cost only considers the part component assigned to the project.

Implementing the planned projects

The Project Manager, responsible for implementing the immediate backlog works projects, apply the following process:

- Confirm the initial scope of the project, i.e. review the components assigned to each project.
- Produce a detailed scope through site visits and add/delete the assigned components for each project
- Gain approval for the final scoped projects including updated priority based on changes to criticality.
- Tender the projects and make any further changes to the assigned components that may arise from the tendering process
- Implement the works and make any further changes if variations are needed including asking the contractor to provide component data as part of their progress payments
- Once the works are complete, the contractor to provide updated component data and this data to be uploaded – contractor paid once this data is provided

Ongoing data maintenance

Ongoing data improvements and data maintenance is continuing to ensure that the data is current and can be relied on for producing annual replacement, renewal and maintenance budgets when needed. The primary data improvement tasks include the

following with data being updated in the three main systems regularly:

- Update data from completed works – processed in WMS, linked to SPM and entered into the client system
- Planned data improvements including unit rates, base life ranges, criticality, building importance and assigning these characteristics to different regions and suburbs.
- Regular inspections by Facility Managers – using survey forms and mobile devices to undertake planned inspections of buildings that have high value critical components that have low data confidence grades.
- Rolling condition surveys – resurvey selected components for each building every 3 to 5 years depending on the importance of the building.

Lessons learnt

- A significant amount of time was spent travelling to sites and gaining access to the buildings. These challenges must be factored into the survey budget.
- Ensure the costs to achieve the desired data quality are aligned with the benefits, i.e. to achieve 100% completeness and 100% accuracy will be too costly considering the Contract requirements.
- There were a number of missed opportunities. Planning this type of survey again, the Property Quality Standards (as defined in NAMS) would be setup early and be part of the pilot so that the full rollout would also include functional assessments right through to gaining additional data such as; entry to the site is located; the Site is Manned or Unmanned; the sign-in book is located; the building is positioned here on the site.
- Although surveys could be undertaken with the online database, it was very important to use the stand alone survey

technology on a PDA and synchronise at the end of the day. Many remote sites where in areas with limited data coverage by telcos.

- The IMS must consider the linkages of software systems during the pilot. The linkages must be documented and agreed between software suppliers to ensure the data fields are mapped, requirements are defined, and rules are applied to the data collection process to ensure the data addresses the business requirements of both systems.
- The digital photographs have proven to be a very valuable resource for locating and confirming assets with contractors. Especially considering access is now being organised for the Spotless Helpdesk Operators, Facility Managers and Contractors via web portals. This would be one of the more important activities undertaken by the surveyors.
- Considering the portfolio size, a small percentage of the sites at any one time is undergoing change. During the first visitation, a small percentage of sites were not able to be completed in their entirety and therefore, allow for revisitations to sites and to also visit new sites as they are included in the portfolio. Again, this needs to be considered in the survey and data maintenance budgets.

Conclusions

Although the portfolio is old, it is in a good condition and is generally well maintained. The amount of backlog works is minimal and

well within the client's levels of service standards. Immediate health & safety issues associated with backlog works are being addressed this financial year. The longer term expenditure requirements are also within the current budgets although, budget categories are being reviewed to ensure more planned rather than reactive maintenance regimes.

Producing an investment plan for backlog works and renewals, requires good quality data at a level of detail that can be used to produce an initial project scope and implement works. As decisions are made at a project rather than an asset or component level, the accuracy and completeness of the surveys can be 95% rather than 100%. The information management strategy now provides an ongoing business process that continually improves asset data. If a survey is seen as a one off project that may happen every three to five years, the data quality will decline rapidly and there will be a rapid decline in the confidence of the AMP and projects being recommended for next year's annual plan.

References

IPWEA / NAMS.AU Practice Note 3, Building Condition & Performance Assessment Guidelines, 2009.

NAMS NZ, NAMS Property Manual, 2006.

NAMS, International Infrastructure Management Manual (IIMM), 2006.



Author



Steve is a co-founding director and leads SPM Group as Managing Director. He is well known for implementing asset management planning processes and systems for large scale asset owners such as Councils, health organisations, social housing, and water utilities between Australia and New Zealand. Steve is the author of NAMS Property, contributing author of the IIMM, co-author of the NAMS Australia Practice Note on Buildings. He has lead a number of industry forums.