THE NEW ZEALAND DIPLOMA IN INFRASTRUCTURE ASSET MANAGEMENT QUALIFICATION – IS THIS QUALIFICATION THE BEST THING SINCE SLICED BREAD?

Author: Priyani de Silva-Currie
Business Unit Leader Asset Management, Calibre Consulting

Co-author: Dr Jonathan Morris
Technical Principal Asset Management, Opus

Abstract

Asset Management qualifications are often cited as a means of improving New Zealand asset management practices and ensuring that new asset managers have an accessible pathway to excellence. The New Zealand Diploma in Infrastructure Asset Management (NZDIAM) is an established industry qualification with multi-sector appeal, so why has this, the only Asset Management qualification in New Zealand, not become the benchmark standard for our asset managers and for aspiring asset management specialists?

Two registered NZDIAM Assessors Dr Jonathan Morris and Priyani de Silva-Currie will dissect the NZDIAM with reference to feedback from those who have gone through the process. Issues covered will include:

- The worthy and lofty objectives for this qualification – what industry said we needed for a bright asset management future!
- How well does the qualification and learning processes meet employer objectives, are the goals congruent?
- Is NZDIAM compatible with other qualifications in the global marketplace - are we leading the pack or playing catch up?
- Does NZDIAM require improvement – is it working or could it be done better, and why aren’t more people undertaking this formal asset management study?

This provocative talk will raise as many questions as answers in order to stimulate new thoughts about how New Zealand Asset Managers can benefit from existing or additional asset management qualifications.

Key Words

Asset Management, New Zealand, Diploma, NZDIAM, Connexis, NAMS, ISO55000

What is the NZDIAM?

From the Connexis (the current industry training organisation responsible for the NZDIAM) website:  
“Connexis has worked in partnership with New Zealand Asset Management Support (NAMS) to develop a qualification which recognises specialist skills for asset managers. The New Zealand Diploma in Infrastructure Asset Management represents industry best practice and is aligned to the NAMS International Infrastructure Management Manual (IIMM).

This Level 6 qualification recognises the knowledge and skills of a competent asset manager at a tactical level. It is relevant to a diverse range of assets including:

- Roads and bridges
- Water supply & wastewater systems
- Parks & recreation facilities
- Airports & ports
- Solid waste facilities
The Diploma is achieved through a blend of on-job training, appropriate work experience and professional development, and off-job training seminars held by NAMS. “

‘The Diploma is considered to be the benchmark to demonstrate competency by managers of both public and private sector assets. It is a practical “real world” qualification that is achieved through the hands on development of asset management plan and other related tasks, and provides an ideal learning pathway to gain the skills required while working within your current job’. (Connexis)

So the NZDIAM is a Level 6 Diploma that recognises the knowledge and skills of a competent infrastructure asset manager. These include core asset management skills (e.g. ability to determine levels of service, manage risk and understand financial implications) and essential supporting skills (e.g. managing contracts and dealing with people). While much of the course is mandatory, there are some elective units that allow some choice in attaining the required number of credits.

The diploma is regarded by the National Asset Management Steering Group (NAMS) as a benchmark for professional recognition. The International Infrastructure Management Manual (NAMS, 2011) does not explicitly promote the NZDIAM, possibly because the NZDIAM is a national rather than international qualification.

The rest of this paper explores whether and how well the NZDIAM is achieving these goals.

What is Infrastructure Asset Management?

Infrastructure asset management is the combination of management, financial, economic, engineering, and other practices applied to infrastructure assets with the objective of providing the required levels of service in the most cost-effective and sustainable manner. Put simply, it is a way to provide an agreed level of service, at an affordable cost over the longer term.

As noted above, infrastructure assets encompass a wide range of diverse systems and facilities. These assets are managed by organisations with very different sizes, activities and levels of sophistication, and varied ownership structures and regulatory regimes.

This means that while broad asset management requirements can be defined quite well within a Diploma and its constituent unit standards, the detailed activities and responsibilities of an individual asset manager can vary considerably both within and between organisations. This places an interesting challenge on the assessors, who have to interpret candidates’ work in the context of industry practice.

Current Position

In order to better understand how people view the NZDIAM, we contacted recent graduates, employers (including our own employers) and have taken on board the initial views of the recently started Targeted Review of Qualifications (TRoQ).

Enrolments

The current nationally registered enrolment statistics for this qualification since January 2011 as provided by Connexis are compared below with figures for assessors (Jonathan Morris and Priyani de Silva-Currie). Note that the figures for Jonathan Morris include candidates registered before 2011. Connexis figures for Terminations (i.e. candidate is no longer registered) may include candidates who have withdrawn and subsequently re-registered (Connexis).
<table>
<thead>
<tr>
<th>National figures supplied by Connexis</th>
<th>Total Enrolments</th>
<th>Total Completions</th>
<th>Total Terminations</th>
<th>Continuing Trainees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opus assessor figures</td>
<td>103</td>
<td>25</td>
<td>37</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>18</td>
<td>6</td>
<td>24</td>
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</tbody>
</table>

The Opus figures have been further broken down by region and by industry sector below:

![Enrolled](chart)

Enrolled 48

![Completed](chart)

Completed 16

![Current](chart)

Current 26

![Inactive](chart)

Inactive 3

![Withdrawn](chart)

Withdrawn 3

![Prospects](chart)

Prospects 3

TOTAL 51

**OPUS MANAGED NDIAM CANDIDATES (INCLUDES CANDIDATES EARLIER THAN 2011)**

![Upper NI](chart)

Upper NI 1

![Central NI](chart)

Central NI 2

![Lower NI](chart)

Lower NI 23

![South Island](chart)

South Island 12

![Other](chart)

Other 13 (Minstry)

TOTAL 51

**LOCATION AT THE TIME OF ENROLMENT (INCLUDING PROSPECTS)**

![Local Authority](chart)

Local Authority 23

![Other Utility](chart)

Other Utility 3

![Contractor](chart)

Contractor 3

![Consultant](chart)

Consultant 7

![Government](chart)

Government 15

TOTAL 51

**EMPLOYER ACTIVITY (AT THE TIME OF ENROLMENT, INCLUDING PROSPECTS)**

The figures illustrate a broad spread of candidates from a range of industries. Not surprisingly, there are more candidates who work for people who actually own assets, and more in the North Island than in the South Island.
One of the more interesting figures is the dropout rate. Currently, 13% of the Opus candidates have withdrawn. This compares favourably with the national average of 37%, although it is believed that some of the 37% who have withdrawn have subsequently signed up again for the qualification. Such a large difference in dropout rates suggests that regional support from Connexis and the support of the individual assessors may be a decisive factor in maintaining candidate commitment.

Is this a reasonable uptake? If we assume approximately 100 local authorities and regional councils, plus other infrastructure owners, operators and service providers and an average of two potential candidates in each body there should be several hundred potential candidates. Compared with this, the uptake is possibly a little low at present, but appears to provide the basis for a more consistent intake. On the positive side, this can be more easily managed than the traditional pattern for a new course of an initial surge in numbers as existing staff get qualified, followed by a substantial drop off to a lower level in which candidate numbers are mainly driven by staff turnover and career development.

It was suggested by some delegates at the last NAMS Advanced Forum (October 2014) that the level of current uptake is reasonably good for the industry and government marketplace as a realistic representation of current demand for the qualification. Those at the forum mainly represented local authorities, central government departments and various consultancies.

**Candidate views**

A number of recent graduates provided insights into their experiences. These have been summarised below after removing information that could identify the candidate or their employer. Their experience encompasses property management, facilities maintenance and infrastructure management.

<table>
<thead>
<tr>
<th>Question</th>
<th>Responses</th>
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<tbody>
<tr>
<td><strong>How did you know about NZDIAM</strong></td>
<td>Staff member interest triggered management interest. Through a work colleague - Through our discussions I found out that she was doing it and I was immediately interested as we both operate in a similar asset management space. I have always wanted an asset management specific qualification. On the NAMS web site there was a write up about the then CE having done the qualification, before then I had no idea one was available. Through our National Office promoting the National Diploma in Infrastructure Asset Management.</td>
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<tr>
<td><strong>Why did you choose this qualification</strong></td>
<td>On the job training that can be done in working hours. I felt that this would be a perfect way to demonstrate my competency and experience in asset management, and gain an asset management specific qualification simultaneously. Directly relevant to my role, it provided formal recognition to skills and it transferrable across sectors. I felt it important to spend some time reviewing what I have achieved over the last 14 years of working in the field of asset management and this competency based assessment was a great way to achieve this.</td>
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</table>
| **Where does this course fit within your organisation and training needs** | NZDIAM candidates are pushing good asset management practice, which is starting to influence others. Ideas that are coming from staff working on this qualification are being listened to and implemented where achievable. An opportunity to better market our Asset Management capability through having individuals that have demonstrated competency and achieved an asset management specific qualification. I also had to carry out specific training in areas where I needed to improve my knowledge and understanding which helped me improve my overall knowledge of asset management. In [my company] Facilities Maintenance is a small part however [my company] has many FM contracts where this would add immense value. For people like myself who formerly did not have asset management or property management (there is a difference) qualifications, what I have learnt has significantly enhanced my ability to purpose my role as an asset manager and supported my organisation to implement national strategy to support our facilities to be well managed, fit for the purpose and be a high performing portfolio. [It has] aligned my thinking, focus and
| How will your organisation use your qualification | It will be in the long term. Changes to the way that we work will take time to bed in. [It provides] a point of difference when putting up teams and individuals that have the NZDIAM. Already, this qualification has been beneficial in securing asset management work. Qualification will be used more by me to enhance service delivery to our client. I do make presentations to other contracts where the qualification can be sold along with me! [To] develop, implement, and review infrastructure asset management plans for facilities and for some regional projects. Better use of the optimised decision-making process which takes into account a range of asset and non-asset factors to determine the best asset response. This includes conducting risk analysis, considering and developing levels of service etc. The extent of financial and economic analysis for asset change issues has been dramatically enhanced – while generally supporting the same outcome there is now some depth with the analysis that is occurring. Particularly with demand management analysis to support the provision, renewal and removal of infrastructure assets. |
| Who in your organisation approves your asset management undertakings | I guess I am that guy now We are fortunate to have ready access to a wide range of national and international AM experts therefore there is no shortage of asset managers to assist, coach, mentor, advise, verify and approve the work Client, external auditors, government auditors Regional Asset Manager, Asset Team Leader and Group Manager – Service Delivery- also networks /asset planning groups with analysing proposals. |
| Were there barriers to gaining this qualification or undertaking asset management practices | Not having software that supports asset management decision making / outdated imbedded processes – years of institutional processes an practice which need to be slowly changed lack of asset management understanding from the decision makers The key barrier for me was finding time in my career to allow me to complete this qualification. There are few barriers to undertaking asset management practices as there is currently a shortage of appropriately skilled and experienced asset managers meaning there is more than enough opportunity to take on asset management work [Two positions] provided me with the [skills and] experience to pass, but one role alone would not have been enough. For example many ordinations do not engaged in LoS. None apart from needing to be careful with the use of information, as some of the evidence that I used was sensitive involving risk if known externally. |
| What success did you gain in your organisation through this qualification | Limited recognition internally, but more interest from external organisations! This qualification has resulted in enhanced recognition by both peers and clients alike. I am viewed now as both a Civil Engineer and an Asset Manager as I have qualifications to support both by technical expertise and experience Formal recognition Acknowledgement of a KPI being achieved. Expanding involvement in projects which have significant asset management and political risk. Better proficiency in promoting policy change due to the skills I have obtained with doing the Diploma and being able to better outline a range of asset management interlinks and being able to debate the merits of what is under consideration. |

**Employer views**

Anedoctal evidence and discussions with employers suggest that the qualification does add positive influence to the outputs that are produced and delivered within their organisations. They accept the concept that those with this qualification are better equipped to operate in this sector and have a better idea of the quality and scope of asset management activities, concepts and methodologies. However these comments are countered with assessor and employer evidence that in some cases candidates have only a core level of competency in some asset management areas, enough to fulfil the Level 6 requirements of NZDIAM, but not necessary enough specific and detailed practice or knowledge to undertake complex asset management decisions that can affect the outcomes and asset planning of an organisation.
From our own experience, as representatives of large infrastructure asset management employers. Robust discussion with our global teams of asset management practitioners has evolved around what our organisations need from its asset managers, what clients want, and where the obvious training gaps are. We think there is a space for our young cadets and recent graduates to learn the fundamentals of asset management, in a structured way. As our organisations are large and the practitioners are geographically dispersed we could provide NZ based opportunities for our up and coming asset managers to spend one to two years on the job here to gain these skills. The Diploma provides an established pathway for this.

This would provide an opportunity to develop asset management specialists in house and to demonstrate commitment to asset management to our clients, both within New Zealand and internationally. A higher level of asset management study would be useful for those individuals who wish to progress to senior asset management roles. These more specialised people would learn in conjunction with a specific asset management role within the organisation supported by our senior and principal global asset managers and need not be NZ specific. The investment in this level of qualification is more significant but would be offset by client demand for these services and by the ability to demonstrate our commitments to providing world leading asset management services.

This raises the issue of how the NZDIAM compares with other practices outside New Zealand. Analysis of AM qualifications in the global market was completed by NAMS and industry practitioners a few years ago, but has not been updated recently. However, an opportunity now exists with the 2014/15 TRoQ working party to undertake a review of international equivalent qualifications in the market.

At the moment the working party acknowledge that there is no other Asset Management qualification in NZ. We also know anecdotally that Canada and the UK have asset management qualifications which are similar to NZ, while IPWEA launched an online Professional Certificate in Asset Management Planning in March 2015. We are also aware that the University of Tasmania is phasing out its Graduate Certificate in Infrastructure Asset Management which flowed to a Bachelor of Engineering Technology with professional honours in Infrastructure Asset Management. Queensland University of Technology has a Masters of Infrastructure Management, Monash University in Melbourne has a Master of Infrastructure Engineering and Management. Our experience suggested that NZ is considered to be at the forefront of Asset Management Planning and that its IIMM framework is leading edge, the international ISO standard 55001 refers to many practices and methodologies contained in IIMM. Whether our NZ qualification can remain at the forefront of asset management training and development is yet to be determined.

Overall, this feedback indicates that the NZDIAM is useful but that it does not meet all needs. There are some indications that a two level approach of structured training at Diploma Level and experience-base assessment at Graduate level might better suit some industry and employer needs.

Stakeholder discussion over the past three TRoQ reviews indicate that there is potentially a place for a Level 7 or 8 (degree level) qualification in this sector. The obvious counter to this argument is that NZDIAM is a practical hands on qualification that candidates can gain over time in conjunction with practical work experience. This learning process combined with practical experience will enhance the candidates skills and knowledge of the sector and it could be reasonably expected that the student will, by the time they have graduated with the Diploma have enough real life skills to perform more than adequately in an asset management role for their employer.

The key measure is that the asset management activities of those organisations with qualified NZDIAM team members should be relevant, up to date, thorough, robust, defendable and verifiable. An additional benefit would also be a limited rework or validation required by a supervising practitioner.

**Stakeholder views**

The NZDIAM qualification was registered with NQF and NZQA in August 2000 and last reviewed in 2011. It is currently under review as part of the Targeted Review of Qualifications (TRoQ) in consultation with
key Tertiary Education Organisations, Private Training Providers, industry associations, and interested industry stakeholders. There was particularly good representation on the TRoQ by industry bodies, both the working group and the governance group were oversubscribed to participate in this review. This suggests that there is keen and strong interest in the development of this qualification by industry.

The purpose of the review is twofold:
- firstly to ensure that the suite of Asset Management qualifications on the NZQF are relevant and accessible, and that they meet the needs of industry, trainees and students.
- Secondly it is to create opportunities for candidates to pathway through qualifications as they progress through roles within industry.

The first formal meeting was held on 14th August 2014 and focused on developing a workforce development plan, possible qualification pathways and draft graduate profiles for the Infrastructure Asset Management sector.

Some key points from the review meeting are summarised below:

**Strategic purpose statement for Infrastructure Asset Management**

The group agreed that there was a need for qualifications for the Infrastructure Asset Management sector and developed the following strategic purpose statement for an Infrastructure Asset Management qualification -

The purpose of this qualification is to grow the Infrastructure Asset Management sector in New Zealand and to formalise and build the recognition of the specialist skills needed for Infrastructure Asset Management. It will enable a practicing career in diverse cultural settings and sectors including the consideration of social, economic and environmental factors.

(Connexis NZTA TRoQ)

Members also contributed their ideas on what existed for the graduates and the skills, knowledge and attributes they needed to demonstrate competency in the roles. The roles identified for Infrastructure Asset Management were:

- Strategic Leader/Influencer
- Project Manager (Tactical level)
- Operational core (Operations level)

**Concerns.**

- when a trainee had achieved the qualification, that was the minimum requirement to demonstrate competency and that experiential learning through time on the job was additional to the qualification.
- the experience that was required to gain expertise to operate at tactical and strategic level meant that trainees had to work over a period of time and across different employers to build their competencies and this was perceived as a barrier to qualification achievement.
- the level of engagement outside the Public Sector for these qualifications was growing, and there may be a need to broaden the scope of the qualification so that it appealed to a wider group of people.

The second meeting of the TRoQ working group was held on the 17th of October 2014 and at this meeting the new draft NZDIAM qualification outline was determined.

Early in 2015 NZQA analysed the Connexis application and approved for Approval to Develop the New Zealand Diploma in Infrastructure Asset Management (Level 6).

The TRoQ Working Group will now carry on with the developmental work required to refine the Graduate Profile Outcomes (GPO), the Strategic Purpose Statement, allocate the credits for each GPO, refine the conditions for each outcome and agree upon the consistency of graduate outcomes.
Discussion

Asset management is now accepted as a good basis for ensuring effective delivery of infrastructure-intensive services and its value is starting to be acknowledged by national government, which has previously not been an active adopter of its concepts. The value of asset management to businesses and other asset owners and operators and the potential benefits to New Zealand will not be achieved so readily (if at all) if there is a shortage of well trained and competent asset management practitioners available in the near-term and in the future. Clearly some form of training and qualification will help in delivering these specialists.

In order to ensure a stream of asset managers, Asset Management should be a viable career option for students and new graduates and as a career change option. Asset Management skills should be highly valued by employers, and infrastructure-intensive industries should therefore support and encourage this sector to help achieve these worthwhile and lofty aspirations. A stronger New Zealand industry with intelligent and considered management of its public and private assets can only bode well for the sector, its supported communities and government’s effectiveness and efficiency mandate.

So how well does the current situation meet these needs?

Our considered opinion is that the evidence from candidates, providers and employers is that the NZDIAM is useful, but does not provide a complete match with market needs and needs improvement to meet the candidate’s aspirations and fulfil the employers’ objectives.

Our experience assessors and graduates (and as and as an employer) indicates that in its current form the NZDIAM is sufficiently effective to justify improvement rather than a radical overhaul. The pressure to develop a higher level qualification would support a higher level of practical learning and outcomes that can be gained from employment opportunities and experience in this industry sector. The question of whether a higher level qualification should replace or complement the existing diploma is yet to be answered. Some of the concerns raised in discussions could be addressed, for example, though a split into a diploma level structured training qualification (at Level 6) that provides the grounding required to move onto a more experience-based graduate level qualification (Level 7 or 8).

There is also an opportunity to address concerns over how well the NZDIAM integrates with other asset management related training, especially within Australia. The absence of well-established asset management development routes provides an opportunity for the strengths of the NZDIAM to be incorporated into a robust model that could be applied within Australia and New Zealand. The success of NAMS IIMM Manual illustrates that a bold and well thought out concept could potentially set a worldwide platform for asset management training and development.

The current TRoQ provides an ideal opportunity to consider at least some of these issues and to provide some of the answers.

We believe that there is a split of interest in this qualification between experienced people confirming and validating their skills and expertise, and new(er) people looking for structured training. Our understanding of the original intent of NZDIAM was to be a means to provide structured training, that could also be used to recognise existing skills and knowledge. We know NZDIAM can serve both purposes, but has a much higher uptake among more experienced practitioners (not quite exclusively but not far off in our experience). We think that the TRoQ Governance Group or Working Group should consider these differing customer needs in its review of the qualification.

Conclusions
The NZDIAM has been reasonably successful, but there are opportunities for improvement. We have identified some issues and touched on some possible solutions. The TRoQ provides the perfect opportunity to get YOUR views heard. Don’t miss it.
References

Infratrain (2014), Infratrain web site, accessed 3 September 2014
Connexis (2014), Connexis web site accessed, 1 September 2014
Connexis (August 2014), TRoQ meeting, 14 August 2014 and 17 October 2014.
Connexis, R.Thompson, (2015)

Priyani de Silva-Currie, NZDIAM (Assessor), BComMgt, NZDipBus, NZDipMgt, NZIM
Business Unit Leader Asset Management, Calibre Consulting Ltd

Priyani is a national business leader in asset manager for Calibre Consulting and has previous roles as Principal Asset Manager, global asset management and Partner within Opus. Priyani has a number of external asset management roles within industry and community. Priyani is an Independent Tertiary Education Commission asset management supplier and a Registered Assessor and TRoQ working group member for NZDIAM. She is internationally respected for her asset management and energy policy and strategy development and is the Past Chairperson of the Energy Management Association of New Zealand. In her spare time Priyani enjoys coaching netball and participating in multicultural activities, and is the IPP of Multicultural New Zealand.

Priyani de Silva-Currie
priyani@calibreconsulting.co
Calibre Consulting Ltd
Unit 1 207 Bridge Street
Nelson 7010
New Zealand

DR JONATHAN MORRIS, NZDIAM (Assessor), Eur Ing, PhD, CEng, MIMMM,
Technical Principal Asset Management, Opus International Consultants Ltd

Dr Jonathan Morris is a Chartered Materials Scientist with a special interest in how things change in service and what to do about it. He has been with Opus for eight years where he is a Senior Asset Manager and Technical Principal for Materials Durability. Jonathan is the secretary of the Opus Water Asset Management Practice Interest Network committee. Jonathan was one of the first five Registered Assessors for the NDIAM and has just signed off his 18th successful student from a total of over 46 registered diploma candidates. Jonathan also sits on the TRoQ for NZDIAM Governance Group.

Dr Jonathan Morris
Jonathan.morris@opus.co.nz