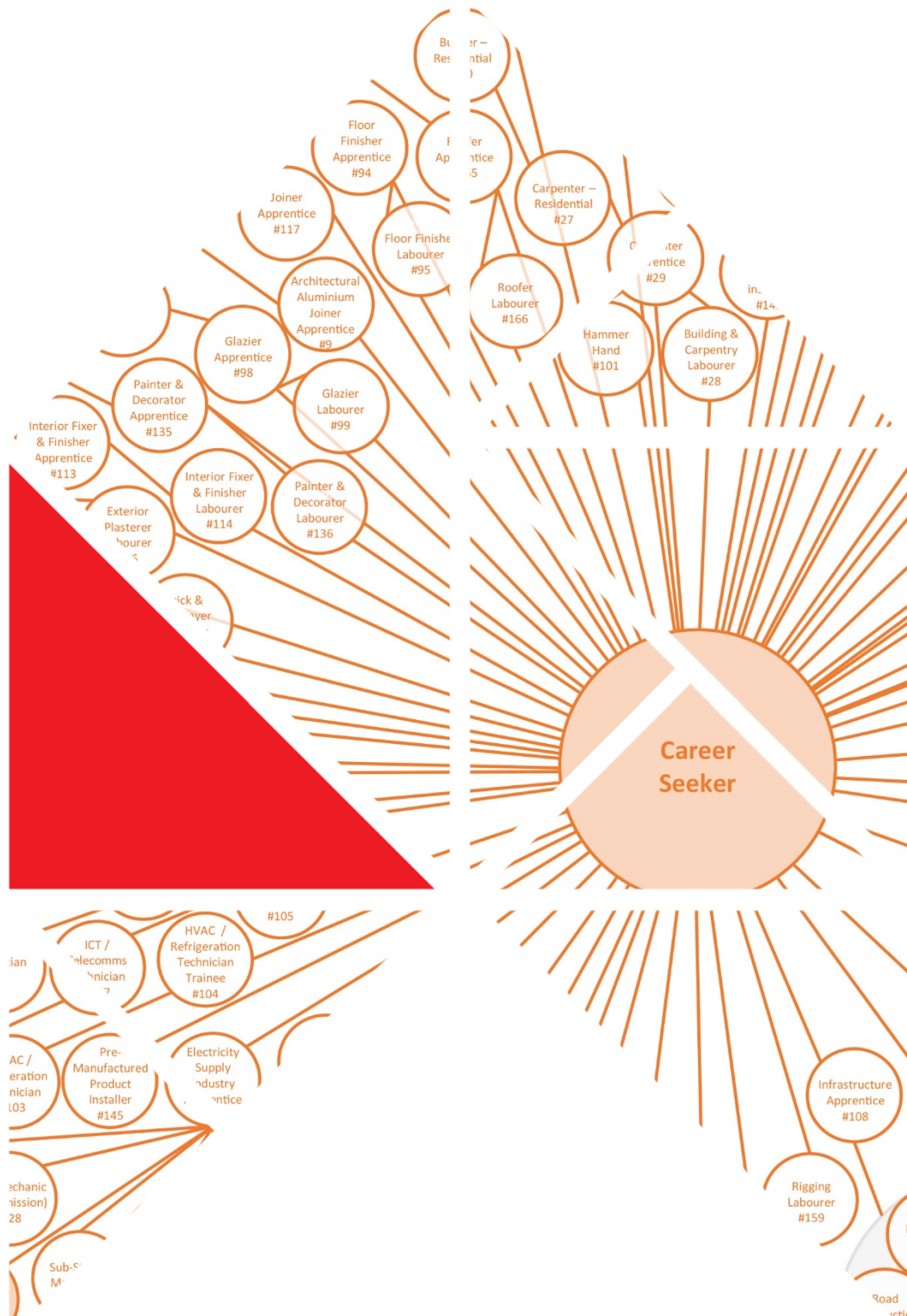


Career Development Map for the Construction & Infrastructure Industry: Phase One – Wireframe

Lee Bint, Tara McDonald and Matthew Curtis





1222 Moonshine Rd
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240
New Zealand
branz.nz



The work reported here was funded by BRANZ from the Building Research Levy.



BRANZ Group has Diamond certification to the Landcare Research [Enviro-Mark[®]NZ](#) programme

© BRANZ 2016
ISSN: 1179-6197

Preface

During 2013, Dr Lee Bint was nominated onto the Sustainable Business Council Future Leaders Programme (FLP). The 2013 FLP was tasked with the social role of business and how business can support youth transitions to employment.

“The team explored how a social enterprise can work and identified how this business model can provide opportunities for traditional businesses to contribute to community economic development. The team also looked at shared value and impact assessment models which help businesses to better understand their impacts and dependencies on the communities in which they operate” (Sustainable Business Council, 2013).

Participants presented their recommendations to the Sustainable Business Council and senior executives from their organisations on the youth transition to employment. These findings and recommendations have been published in the *All In* report (Baldwin, Kidd, Black, & McDonald, 2013).

Additional to the group-based exercises outlined above, each participant was challenged to determine how they could contribute through their own organisation and/or industry. Through the FLP group investigations and examination, a number of interviews were undertaken as well as research on existing initiatives around the world. It was identified that, at an individual level for the construction and infrastructure industry, there is no overarching map or understanding of:

- entry and growth pathways for a career in construction and infrastructure
- holistic representation of the full variety of roles that exist in construction and infrastructure.

This Career Development Map for the Construction & Infrastructure Industry, Phase One – Wireframe project aims to fill this gap by building on existing information to create a wireframe – a Career Development Map.

This is the final study report for the first phase of the Career Development Map for the Construction & Infrastructure Industry project. The second phase is digitisation and implementation of the wireframe with continued industry support.

Acknowledgements

This work was funded by the Building Research Levy. The collaboration and input from the stakeholder working group is highly acknowledged in this research.

Abbreviation	Organisation	Individuals
-	Auckland ITP/ITO Alliance	Graham Hodge and Heather Stonyer
BCITO	Building and Construction Industry Training Organisation	Andrew Kear
BOINZ	Building Officials Institute of New Zealand	Nick Hill and Tony Conder
CATE	Career and Transition Education Association	Hamish Davidson
CNZ	Careers New Zealand	Chris Travers and Ned Wotherspoon
HRINZ	Human Resources Institute of New Zealand	Chris Till
MBIE	Ministry of Business, Innovation and Employment	Adrian Bennett and Joseph Randall
MOE	Ministry of Education	Geoff Keith
NZIOB	New Zealand Institute of Building	Sean Irion
NZQA	New Zealand Qualifications Authority	Eve McMahon
NZRAB	New Zealand Registered Architects Board	Warwick Bell
-	Rob Law Max Recruitment	Pat Quin
Skills	Skills Organisation	Ross Petersen and Stephen Bocock
SBC	Sustainable Business Council	Kate Alcock
TEC	Tertiary Education Commission	Judy Zhang

There has also been additional input and support from the following people and organisations. We are most grateful for this input, which has provided a solid foundation for the Career Development Map:

Abbreviation	Organisation	Individuals
ADNZ	Architectural Designers New Zealand	Astrid Anderson
-	AECOM	Kerry Griffiths
ATEED	Auckland Tourism, Events and Economic Development	Leanna Covacich and Claire Gomas
BRAC	Building Research Advisory Council	In attendance at meeting presentation
BRANZ	Building Research Association of New Zealand	In attendance at internal BRANZ workshop
CCNZ	Civil Contractors New Zealand	Alan Stevens
CCCA	Climate Control Companies Association	Paul Town
-	Competenz	Joanne Verry
-	Connexis	Nicky van der Bergh
-	Dreamcatcher	Jane Doherty
FMANZ	Facilities Management Association of New Zealand	Des Brennan and Vince Morgan
-	Fletcher Building	Christina MacPherson
-	Hawkins	Tracey Standing and Nancy McConnell
IPENZ	Institute of Professional Engineers New Zealand	Graham Dilks and Angela Christie
-	LT McGuinness	Dan McGuinness
MIT	Manukau Institute of Technology	Stuart Middleton
NZGBC	New Zealand Green Building Council	Susan Blayney
NZIA	New Zealand Institute of Architects	John Albert
NZIQS	New Zealand Institute of Quantity Surveyors	Marilyn Moffatt
NZMCPA	New Zealand Master Concrete Placers Association	Ngairé Riddell
-	OPUS	Nicholas Hewer-Hewitt
-	PrefabNZ	Pamela Bell
RLNZ	Refrigerant License New Zealand	Matt Allfree
RANZ	Roofing Association of New Zealand	John Seamer
SARNZ	Scaffolding and Rigging New Zealand	Wain Chambers
STCF	Specialist Trade Contractors Federation	Victoria Troake
SCNZ	Steel Construction New Zealand	Dawn Headley
-	Team Architects	Warwick Bell
-	The Southern Initiative – Auckland Council	Robert Mitford-Burgess
-	Unitec	Graham Hodge and Heather Stonyer
-	Water New Zealand	Lesley Smith
WelTec	Wellington Institute of Technology	Sean Irion
-	WorkSafe New Zealand	Vadim Spice

Last, but certainly not least, are the 1,000+ people who undertook the online survey, providing valuable information about information needs, content requirements and career pathways and experience.

Thank you!

Career Development Map for the Construction & Infrastructure Industry – Phase One: Wireframe

BRANZ Study Report SR334

Authors

Lee Bint, Tara McDonald and Matthew Curtis

Reference

Bint, L., McDonald, T. & Curtis, M. (2015). *Career Development Map for the Construction & Infrastructure Industry: Phase One – Wireframe*. BRANZ Study Report SR334. Judgeford, New Zealand: BRANZ Ltd.

Reviewers

BRANZ	Roman Jaques, David Sharp, Ian Page, Lynda Amitrano
Careers New Zealand	Chris Travers
Unitec; Auckland ITP/ITO Alliance	Heather Stonyer

Abstract

The New Zealand construction and infrastructure industry is labour intensive and dependent on the availability of skilled labour to meet demand and maintain quality. Therefore, it is critical that careers in these industries are identifiable and attractive to job seekers. There are multiple points of entry but no overarching plan or map of the range of roles that exist within the industries or of the career paths through the industry.

This project identifies construction and infrastructure industry interactions, career pathways and opportunities available for potential and current industry members. This will allow career seekers to enter into an industry where the skills required match their own skillset and interests. It will also provide relevant information allowing them to then progress within the industry.

Industry interviews, discussions, workshops and an online survey were used to identify the current roles that exist in the construction and infrastructure industry. This has laid the groundwork for a Career Development Map – which promises to be a tool for industry, by industry.

The completed Career Development Map provides entry and growth pathways and insights to five target audiences: Not in Education, Employment or Training (NEET) & Disengaged; Youth & Learner; Informer/Influencer; Worker & Employee; Business &



Industry. It also highlights the full variety of roles that exist within the industry, providing transitional and progressional information for all career seekers.

The map aims to inform and attract well-suited people to the construction and infrastructure workforce and highlight 'next step' opportunities for those already in this workforce.

Keywords

Careers information, education, skills demand, career development map

Contents

1.	INTRODUCTION	1
1.1	New Zealand construction & infrastructure industry.....	1
1.2	Identifying the need	2
1.3	Concept idea.....	3
1.4	Vision.....	4
1.5	Report structure.....	4
2.	EXISTING INFORMATION AND GAP ANALYSIS.....	6
2.1	New Zealand information	7
2.2	International information	11
3.	MAP DEVELOPMENT METHODOLOGY	13
3.1	Communication, collaboration and data collection	13
3.1.1	Stakeholder working group.....	13
3.1.2	Online survey	14
3.2	Development and population of the wireframe.....	15
3.2.1	Industry representation for development of pathways.....	15
3.2.2	Resulting overarching wireframe	15
4.	ONLINE SURVEY.....	18
4.1	Career advice informers	18
4.2	Influence of information sources.....	19
4.3	Future career and employment information sources	20
4.4	Quality of the online information.....	21
4.5	Desired information for career decisions.....	22
4.6	Attraction into a specific pathway	23
4.7	Career foresight	23
4.8	Staff turnover and skill shortages.....	24
5.	KEY REQUIREMENTS.....	25
5.1	Target audiences.....	25
5.2	Key objectives of the project	27
5.3	Information, data and content.....	28
5.4	Linkages with existing frameworks & classifications.....	29
6.	WIREFRAME FOR CAREER DEVELOPMENT MAP	32
6.1	Roles & Pathways.....	32
6.2	Training & Qualifications	35
6.3	NCEA & Vocational Pathways.....	35
7.	DIGITISATION & IMPLEMENTATION PREPARATION.....	37
7.1	Digitisation of the wireframe	37
7.1.1	User interface requirements.....	37
7.1.2	Prototype testing	37
7.1.3	Careers New Zealand	38
7.1.4	Replication for other industries	38
7.2	Ongoing industry commitment.....	39
8.	LEARNINGS AND OPPORTUNITIES	40
8.1	Additional learnings.....	40

8.2 Future opportunities	41
REFERENCES	42
APPENDIX A: ABBREVIATIONS AND TERMINOLOGY	47
APPENDIX B: CAREER DEVELOPMENT MAP AND BRANCHES	48
APPENDIX C: ROLE INFORMATION	81
APPENDIX D: QUALIFICATION INFORMATION	83

Figures

Figure 1. Existing publications, activities and initiatives.....	6
Figure 2. Whiteboard notes from initial workshop in December 2014.	14
Figure 3. Wireframe to represent the construction and infrastructure industry.	16
Figure 4. Who key groups would expect to go to for career advice.	19
Figure 5. Sources of future career and/or employment information.....	21
Figure 6. Information most helpful with career path decisions.....	22
Figure 7. Did respondents know what they wanted to do before beginning their study?.....	23
Figure 8. Layers of the Career Development Map.....	32
Figure 9. Wireframe Career Development Map.....	33
Figure 10. Example of sector pathways (Carpentry & Building sector).....	34
Figure 11. Vocational Pathways 'wheel' (Ministry of Education, 2016b).	39

Tables

Table 1. Number of online survey responses.....	18
Table 2. Factors attracting respondents.	23
Table 3. Engagement plan.	26
Table 4. Aspects and requirements for the Career Development Map.....	27
Table 5. Information, data and content requirements by target audience.....	29
Table 6. ANZSIC sectors and subsectors.....	30

1. Introduction

AIM: To inform and attract well-suited persons to the construction and infrastructure workforce and highlight 'next step' opportunities for those already in this workforce.

Information about roles in the construction and infrastructure industry is crucial to attract and retain people suited to these industries. Quality information exists, distributed across numerous isolated and disconnected sources.

This project identifies the expanse of roles that exist in the New Zealand construction and infrastructure industry. It identifies and highlights where information can be found on each role and possible education, training and experience associated with each role. It aims to develop a map linking these datasets together in a meaningful way.

A stakeholder working group has come together with representation from 15 organisations across the construction, infrastructure and education sectors. The stakeholder working group provides advice on the project and particular facets within the industry.

The map provides a holistic view of roles to enable, among other things, greater visibility of each role, its skill requirements and entry and growth pathways. This will increase the understanding of the roles that exist within the construction and infrastructure industry. It will also provide key information to attract suitable people to the roles and the industry in general.

The second phase of the larger project will digitise an interactive vocation-centric online map. This will provide career/vocational pathways, entry requirements and transitional criteria through a visually explorative interactive online map as well as important information to aid business/industry. The majority of this information, content and data is sourced and framed through the wireframe in phase one, in preparation for the digitisation in phase two.

It is envisioned that the Career Development Map will sit on the Careers New Zealand website. The project team is currently developing a business case in collaboration with Careers New Zealand to progress to digitisation.

The Career Development Map also provides a prototype demonstration for other industries within New Zealand, as well as providing real data to assist in further construction and infrastructure industry research.

1.1 New Zealand construction & infrastructure industry

MBIE's *The New Zealand Sectors Report 2013: Construction* (Ministry of Business, Innovation and Employment, 2013) found the following:

"The Construction Sector is one of the largest sectors in the [New Zealand] economy, employing 171,000 people, which is 7.6% of the workforce. It generates around \$30 billion of gross revenues annually.

Residential and non-residential building together employ 44,000 workers, close to half of whom are self-employed. Residential building is mainly made-up of self-employed builders or small building firms that typically build two or three houses a year, as well as a range of alteration and repair work. Non-residential firms

tend to be larger in size to accommodate scale projects such as offices and industrial buildings. Construction services is a large and diverse subsector, employing some 96,000 workers, 37% of whom are self-employed. Included are many occupations which typically are subcontracted to both small and large building projects. These include electricians, plumbers, concreters, carpet layers, plasterers, joiners and so on. Heavy and civil engineering firms specialise in large infrastructure projects such as roads, dams, tunnels, telecommunications and electricity networks. The subsector has 35 large firms (employing more than a hundred people) and these account for 72% of employment, or 20,000 workers. The sector includes some of New Zealand's largest firms, such as Fulton Hogan.

The construction sector faces some well-documented challenges. These are the subject of a significant amount of work by both the sector and government, such as the work of the Building and Construction Productivity Partnership. Productivity growth has generally been below that for the economy as a whole. For every hour worked in the sector, \$34 of GDP is generated (2010). This is significantly below the all-sector labour productivity average of \$48 per hour worked. The sector experiences the highs and lows of the business cycle more acutely than the economy as a whole. In times of high demand there are bottlenecks with the supply of trained and skilled labour, with immigration often filling the gaps. During a downturn, experience and skilled labour is often lost to the industry. In addition, the high volatility appears to be a disincentive to firms investing in training and in capital equipment. The greatest challenge is the unprecedented workload that will be placed on the industry in the next few years, driven by the Canterbury rebuild, the demand in Auckland for housing and infrastructure investment and weather-tightness remedial work. Industry identified concerns both over its capacity to meet the demand and maintain quality during the peak, and the risk to the viability of firms once the peak has passed.

Low skill levels have been identified as a constraint on productivity. The cyclical nature of the sector may discourage firms from taking on permanent employees and investing in their development. Industry interviewees noted issues around basic numeracy and literacy. Some larger firms have invested significantly in improving the numeracy and literacy of their workforce. Interviewees also had concerns regarding the management and capability of smaller firms, particularly in terms of their capacity to manage the expected high workloads in Canterbury and Auckland. There has been an increase of 8,000 apprentices in the trades area. This has been supported by the Government's Apprenticeship Re-Boot for new apprentices. Through Skills for Canterbury, an initiative that supports expanded trades training at institutions across the country, the Government has significantly increased funding for priority trades to ensure we have the necessary skills coming into the workforce. This includes many trades in the construction sector (e.g. carpentry, painting, brick and block laying, plumbing, etc.)."

1.2 Identifying the need

The Construction and Infrastructure Sponsor Group has identified the skills demand and the effort required to ensure a balanced and complete workforce throughout the cyclical nature of this industry.

"Growth in the sector in some occupations MUST come from existing workforce. Helping establish the training plans for existing workforce to become supervisors, future leaders, etc. is an important part of this. Most of the workforce in the

industry in the future (162,000 currently) is already in the sector. The predicted growth in Auckland is around 32,000 – so we need to make sure that we are getting good information across for job-movers/job-advancers” (Ministry of Business, Innovation and Employment, 2013).

There is also the need to ensure that well-suited persons are attracted to the construction and infrastructure industry by providing good-quality, accessible information. Youth unemployment in New Zealand is at the top of OECD numbers. Professor Natalie Jackson of Waikato University believes that “youth will be more sought after, harder to find, and more expensive to secure from now on” (Jackson, 2011). However, young people are finding it difficult to access advice to decide what school subjects and NCEA credits they should be aiming for to set up their future (Baldwin, Kidd, Black, & McDonald, 2013).

Through the Sustainable Business Council Future Leaders Programme in 2013, discussions with employers, tertiary institutes, secondary schools and their career advisors highlighted the apparent need for an overarching career map. At present, people of all levels do not have an effective or holistic resource to enable visual exploration of career pathways, career transitions and options, specific role requirements and so on.

Currently, there are a range of career advice websites, institutes of technology and polytechnics (ITPs), industry training organisations (ITOs) and federations or associations within the construction and infrastructure industry. However, the roles they support and promote are very specific. There is no overarching plan or mapping of the broad range of roles that exist to enable career seekers to compare or visualise interlinkages and/or progressions.

Throughout this project, there has been a high level of interaction with the construction and infrastructure industry and the education sector. In talking with a wide variety of organisations, it has become apparent, at CEO level, that there is a high priority for work of this nature to take place. Wide ranging and strong support has been received for this project, again highlighting the gap identified and endorsing the starting point this project provides leading to one of many possible solutions.

This project identifies the construction and infrastructure industry role interactions, career pathways and opportunities available for potential and current industry members. This will allow career seekers to enter into the industry where the skills required match their own skillsets and interests and provide relevant information. Hence, they are enabled to then progress within the industry in their desired pathway.

1.3 Concept idea

In scoping this project, a thorough investigation of online career resources and a broad coverage of information about careers was sought.

As an example of what might be achieved, the Hospitality Guild career map in the United Kingdom (Hospitality Guild, 2014) was identified as a starting point. This allows a visualisation of overarching information that might be achieved. The construction and infrastructure industry in New Zealand differs significantly from the United Kingdom hospitality industry. However, an overarching map showing interlinkages between roles and their progressions was a factor identified early in this project as a key component.

The basis of this project is the identification of all the roles and their progressions (pathways). The second phase of this work will be the digitisation of the pathways identified in this report and formalising ongoing industry commitment.

Key requirements of the online map to be created are ease of use, visual pathways, bi-directionality between users and industry highlighted and accurate emphasis of the transitions between roles. This will be scoped at the completion of this first phase.

1.4 Vision

The project vision is to “inform and attract well-suited persons to the construction and infrastructure workforce and highlight ‘next step’ opportunities for those already in this workforce”.

Five key audiences were identified for this project:

- Not in Education, Employment or Training (NEET) & Disengaged
- Youth & Learner
- Informer/Influencer
- Worker & Employee
- Business & Industry.

To achieve this, the project required a clear scope and boundary. Roles directly encompassed in and specific to the construction and infrastructure industry define the scope. The project is based on the roles, although specialisations may be identified within a role. There were a number of valuable ideas that fell outside of the scope. These have been collated with the intention to revisit either as an extension of this project or as a subsequent phase, pilot or project that could be picked up elsewhere. Roles that do not undertake duties within the construction and infrastructure industry as their primary source of work have not been included or have been identified as peripheral or supporting roles (refer to section 3 for more detail).

To assess the construction and infrastructure industry, all residential and non-residential sectors were included.

1.5 Report structure

This report is intended to provide a record of the work undertaken to create the wireframe of the Career Development Map. It also provides key insights, learnings and outcomes from the research. The report is structured as follows:

Section 1 introduces the need, concept idea, aim and vision for this work.

Section 2 highlights the vast array of existing work and literature that is being or has been conducted around New Zealand. This section is concluded with a gap analysis, highlighting that most of the work to date is fragmented and operating in isolation.

Section 3 outlines the methodology employed for developing the Career Development Map.

Section 4 provides insight on user needs, based on the online survey, which ran between December 2014 and March 2015.

Section 5 discusses the key requirements, in terms of vision, scope and specific aims and objectives of the end product.

Section 6 demonstrates the wireframe of the Career Development Map, what the different layers of this look like and where the need for new information lies.

Section 7 proposes the implementation strategy and industry commitment for systematic changes in this sphere, for the construction and infrastructure sectors specifically.

Section 8 synthesises additional learnings from undertaking this research and future opportunities.

Appendix A provides a list of abbreviations and terminology used throughout this report.

Appendix B portrays the wireframe of the Career Development Map roles and pathways.

Appendix C lists the existing content for the individual roles within the Career Development Map.

Appendix D lists the existing qualifications in support of the roles in Appendix C.

2. Existing information and gap analysis

The need for the proposed Career Development Map has been identified through earlier investigation within the 2013 Future Leaders Programme. Through an initial workshop (9 December 2014) and discussions with key industry stakeholders, this need was reinforced. It was also collectively agreed that the Career Development Map must build on, support and integrate existing initiatives (for more on this, see section 5).

Hence, a key aim of this project was to avoid duplication and to add value. To do this, existing work needed to be identified to understand where current information lies and what gaps still exist.

Some of these works have been plotted on Figure 1. These have been ranked in terms of their application level (practical application versus theoretical application) along the vertical axis against their target audience along the horizontal axis.

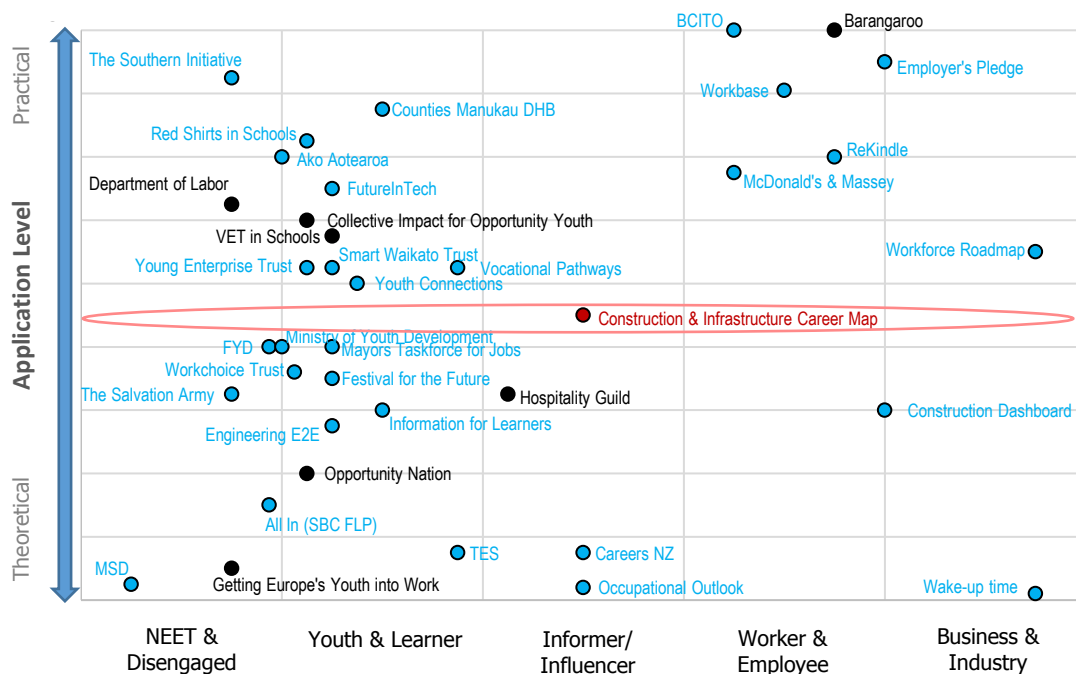


Figure 1. Existing publications, activities and initiatives.

Numerous publications, activities and initiatives have been identified, both within New Zealand and internationally. However, the New Zealand-specific works are quite isolated and/or fragmented around the country with no real unified intermediary. In a sense, that is what the Career Development Map is proposing to do – to be an intermediary to existing sources of information in New Zealand.

It is proposed that the Career Development Map will fit into the very centre of Figure 1 as shown. It will have a partially theoretical application but will also be very practical – based on the need for industry to be actively involved in maintaining practical guidance for career seekers.

2.1 New Zealand information

There is a wide range of isolated publications, activities and initiatives occurring around New Zealand. These have been outlined below, with information quoted directly from each source, to provide an indication of what currently exists.

Ako Aotearoa

"Youth transitions, the labour market and entry into employment for priority learners – some reflections and questions" (Keep, 2015).

All In (Sustainable Business Council Future Leaders Programme)

"In 2013, the Sustainable Business Council Future Leaders explored solutions to one of New Zealand's most pressing social issues: youth unemployment. This paper sets out their key findings and recommendations. The focus of this paper is why business should care and how they can get involved in solving the problem" (Baldwin, Kidd, Black, & McDonald, 2013).

BCITO

"BCITO manages apprenticeships for people who want a career in building and construction. Check out detailed career, qualification, time and cost information for your trade of choice" (BCITO, 2015).

Careers New Zealand

"Careers New Zealand is a Crown entity established under the Education Act 1989, and governed by a board that reports to the Minister of Education, Hon Hekia Parata. Funding comes from Vote Education" (Careers New Zealand, 2014).

Construction Dashboard

"The Construction Dashboard is a new web-based tool intended to help industry bodies, individual builders, government and training providers understand what is happening in the industry today, and where it is headed tomorrow" (BRANZ, 2015).

Engineering Education-to-Employment Programme (E2E)

"The field of engineering and technology is critical to New Zealand's future success. It offers some of the most rewarding, challenging and exciting careers, yet we are facing a shortage of students enrolling in engineering qualifications – particularly in Level 6 and 7 courses. The Engineering E2E Programme is about working together to address this shortfall and to give engineering the support and profile it deserves. By working together to improve the understanding and perception of engineering, we make it easier for people to find a career path that can offer them every opportunity in the world" (IPENZ, 2015).

Festival for the Future

"Imagine if every young New Zealander unleashed their potential to change the world" (Inspiring Stories, 2015).

Foundation for Youth Development (FYD; now Graeme Dingle Foundation)

“We aim to inspire all school age New Zealand children to reach their full potential through programmes that help build self-esteem, promote good values and which teach valuable life, education and health skills. Current programmes include Kiwi Can, Stars, Career Navigator and Project K” (Foundation for Youth Development, 2015).

FutureInTech (IPENZ)

“The FutureInTech programme’s main focus is on bringing people who already work in technology, engineering and science-related industries into schools. By sharing their experiences and pathways, we can inspire young New Zealanders to explore careers in areas where there is strong demand for people with the right skills” (IPENZ, 2014).

Information for Learners (TEC)

“A cross government initiative. Making better information available to prospective learners, their families and advisors, to enable more informed tertiary education enrolment decisions” (Tertiary Education Commission, 2014).

Ko Awatea Health Scholarships 2016

“Over the last eight years, Counties Manukau DHB has provided a number of scholarships to assist people in the community with their journey towards an exciting health career. The goal of the Ko Awatea Scholarship programme is to grow the Maori and Pacific health workforce from the local community. The programme supports recipients through study with the view of providing an employment outcome within Counties Manukau DHB” (AUT, 2016).

McDonald’s and Massey University

“The two organisations have signed an agreement that creates a pathway for McDonald’s staff to complete a Bachelor of Business Studies or Diploma or Certificate in Business Studies. The unique agreement recognises McDonald’s in-house education and allows staff to cross-credit their prior learning towards an undergraduate qualification at Massey University” (Massey University, 2013; Jones, 2013).

Mayors Taskforce for Jobs

“Support Mayoral leadership to promote the healthy transition of every young person towards adulthood, ensuring all young people are engaged in appropriate education, training, work or positive activities in their communities” (Mayors Taskforce for Jobs, 2014).

Ministry of Social Development (MSD)

“Guidance, financial and support for all New Zealanders, through financial, practical and theoretical mechanisms as well as free recruitment and employer services” (Work and Income, 2015).

Ministry of Youth Development (MYD)

“Develops and promotes active youth citizenship. This is young people, aged between 12 and 24 years old, to develop and use their knowledge, skills and experience to participate confidently in their communities” (Ministry of Social Development, 2015).

Occupation Outlook (MBIE)

“Contains education, employment and income information on 60 key occupations in New Zealand to give job seekers and students a clearer picture of possible career paths. These 60 were chosen for their size, popularity and potential future growth” (Ministry of Business, Innovation and Employment, 2016).

The Warehouse Red and Blue Shirts in Schools Gateway Programmes

“Gateway programmes based on the Customer Service Award. The programmes provide students with a 10-day in-store experience at either The Warehouse or Warehouse Stationery. Credits gained by students participating on the programmes can be used towards the New Zealand Certificate in Retail (Level 2)” (ServiceIQ, 2015).

Rekindle

“Works to support creation of paid work and learning opportunities through community partnerships that actively enable people to engage with meaningful activity” (Rekindle, 2015).

Smart Waikato Trust

“FutureForce Action Network (FAN) is the ground-breaking Smart Waikato Trust initiative for employers, educators, government and community organisations. FAN aims to ease youth transitions into the workplace by providing employers with the tools, strategies and networks to enable them to offer best practice work experience, internships, apprenticeships, cadetships and jobs” (Smart Waikato, 2016).

“Principal for a Day leaders build relationships with school in a number of ways including mentoring the board, staff or students, offering work experience to students, hosting staff visits and leading other Smart Waikato projects such as Joining the Dots and Get on the Bus!” (Smart Waikato, 2014).

“The Lion Foundation Young Enterprise Scheme (YES) is a unique and exiting programme helping students develop knowledge and operating a small business, team building, relationship management, meeting procedures, record keeping, the legal requirements for running a business and the process of reporting company performance” (Smart Waikato, 2015).

Tertiary Education Strategy

“The Tertiary Education Strategy 2014–19 sets out the Government’s long-term strategic direction for tertiary education. This strategy highlights the need to build international relationships that contribute to improved competitiveness, support business and innovation through development of relevant skills and research and improve outcomes for all” (Ministry of Education, 2016a).

The Salvation Army New Zealand

“Passionate about turning troubled youth and children’s lives around and building solid foundations for life. Specialised programmes empower those who are struggling with homelessness or unemployment, or lack of direction and self-esteem” (The Salvation Army, 2016).

The Southern Initiative

“This is a trades training programme, engaging Maori and Pasifika learners aged 18–34 pursuing careers in the infrastructure and related industry sectors essential for Auckland’s economic development.

The Southern Initiative will focus on South Auckland and is designed to improve:

- educational achievement
- economic development
- job growth
- public transport
- housing
- social conditions.

The Southern Initiative is being developed in partnership with government agencies, the local community and other key stakeholders” (Auckland Council, 2016a).

University of Waikato

Wake-up time: Kiwi complacency about the costs of the ageing population.

“Elements of the wake-up call” as presented by Natalie Jackson, University of Waikato (Jackson, 2011). This outlines the growing age gap in New Zealand and the value young people have when appropriately introduced and integrated into an organisation.

Vocational Pathways (Ministry of Education)

“The Vocational Pathways provide new ways to achieve NCEA Levels 1, 2 and 3 and develop pathways that progress to further study, training and employment. Achieving NCEA Level 2 is the foundation for success in further education and the world of work. Level 3 builds upon this through shared opportunities across school, tertiary, and industry training. The Vocational Pathways provide a framework for students to show how their learning and achievement is valued in the workplace by aligning learning to the skills needed for industry” (Auckland Council, 2016b).

Workbase

“A not-for-profit trust with more than 20 years’ experience in developing adult literacy skills and helping organisations to work smarter and safer” (Workbase, 2015).

Workchoice Trust

“New Zealand’s longest-standing charity focused on youth employment and engage with hundreds of schools and businesses nationwide each year – since

inception have seen over 160,000 participants in the Workchoice programmes” (Workchoice Trust, 2015).

Workforce Roadmap

“To assist the tertiary vocational education providers better respond to employment growth associated with the construction activity in Auckland during the period through to 2018. It focuses primarily on industry sector skills growth in the next five years” (Construction and Infrastructure Sponsor Group, 2014).

Young Enterprise Trust

“Provides a range of enterprise programmes and financial literacy resources that can be used by teachers throughout New Zealand. Each resource is designed for a specific age group, and aligns to the New Zealand Curriculum” (Young Enterprise Trust, 2016).

Youth Connections

“Work with local businesses, youth services and schools to create connections between young people and employers. Provides leadership and solutions to local issues and encourages the business community to take a leading role for the future of their workforce” (Auckland Council, 2016b).

Youth Employer Pledge

“The Youth Employer Pledge is a key initiative in Auckland’s Youth Employment Plan, which exists to get more young talent into work and career pathways. Leading Auckland businesses have made the pledge to show their commitment to employing our young talent – it’s good for business and good for the community” (Auckland Tourism, Events & Economic Development Ltd, 2015).

2.2 International information

There are also many international exemplars that can be used and built upon to support the New Zealand Career Development Map for the Construction & Infrastructure Industry.

Barangaroo (Australia)

“80% of the social return on investment is related to new employment, skills and training opportunities for the community provided by the Barangaroo development in Sydney. Focussing on capacity building through school, industry, trade and tertiary skills programmes. Building indigenous capacity through professional job creation, lifelong education and minority recruitment” (Barangaroo South, 2015).

Collective Impact for Opportunity Youth (USA)

“For the first time in decades, there is authentic focus and a strong call to action from the highest levels of government, pushing us to break down institutional silos and pull together across sectors on behalf of, and with, Opportunity Youth” (Corcoran, Hanleybrown, Steinberg, & Tallant, 2012).

Department of Labor (USA)

“Connecting Youth and Business Toolkit. This toolkit provides step-by-step instructions designed to guide companies on options for supporting, training and employing disconnected youth” (Gap Inc., 2012).

Getting Europe’s Youth into Work (Europe)

“Youth unemployment across the European Union remains unacceptably high, to the detriment of current and future generations. Addressing it requires understanding its causes and then relentlessly pursuing solutions” (Mourshed, Patel, & Suder, 2014).

Hospitality Guild (United Kingdom)

“The interactive career map illustrates the huge variety of opportunities within hospitality and tourism. Learn more about the industries, job roles and available training” (Hospitality Guild, 2014).

Opportunity Nation (USA)

“Every one of us can work together and take concrete steps to ensure young Americans are thriving in their jobs, schools and communities. Generated by the priorities of our diverse, cross-sector coalition and an extensive listening tour with key partners, Opportunity Nation is releasing our plan to tackle the U.S. youth employment crisis” (Opportunity Nation, 2016).

VET in Schools (Australia)

“3-year programme of research, Vocations: the link between post-compulsory education and the labour market, which is investigating the educational and occupational paths that people take and examining how their study relates to their work” (Clarke, 2014).

3. Map development methodology

This section outlines the approach and methods used to collect information and data, avoid duplication and add value through the Career Development Map work. Before work could begin, a project webpage was established outlining the work being undertaken and providing invitations for discussion and a link to the online survey.

The first stage of the project involved communication with key stakeholders and beneficiaries, undertaking online surveys, collaboration with training providers and identification of industry sectors.

The second stage developed the wireframe of the proposed framework, which was then populated with the information and data collected in the first stage. A second phase has been scoped throughout the first two stages of this work. A business case is to be prepared for the digitisation of the Career Development Map.

3.1 Communication, collaboration and data collection

It was recognised that, in order for this project to be successful, a broad industry and stakeholder engagement was critical throughout the project.

To gain an understanding of the expanse of roles that exist, as well as entry requirements and pathways for each role, communication with a wide range of organisations was undertaken. Telephone, email, a teleconference and in-person meetings were the primary form of communication and information gathering.

A workshop brought the key stakeholders together for consultation and guidance to maintain the integrity and direction of the project and to ensure alignment with existing programmes and research. These key stakeholders form the stakeholder working group.

3.1.1 Stakeholder working group

The stakeholder working group was created to inform and guide the research through advice on the requirements and scope. This group included personnel from a range of industry organisations, government organisations, education and training providers and businesses across New Zealand. A full list of the stakeholder working group members is provided in the Acknowledgements.

The group met early in the research programme to discuss the key requirements, scope and aspects of the Career Development Map. The group met again once all of the information had been collated to provide final critique of the wireframe for the map.

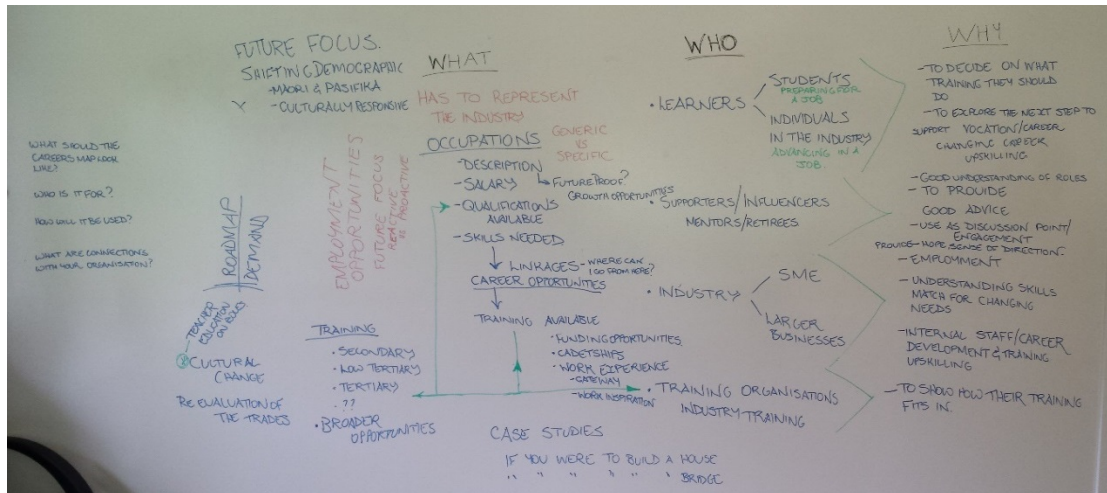


Figure 2. Whiteboard notes from initial workshop in December 2014.

The December workshop outcomes provided the project key requirements – to add value, to avoid duplication and to represent the sector. The workshop attendees also agreed on the five target audiences: NEET & Disengaged; Youth & Learner; Informer/Influencer; Worker & Employee; Business & Industry.

Additionally, an online survey was undertaken to gauge a wider view of the requirements for career seekers and those employed in the construction and infrastructure industry.

3.1.2 Online survey

An online survey through SurveyMonkey sought to gain perspectives from individuals who might benefit from the Career Development Map and those who might contribute to its development. The online survey sought information on existing career paths, skill requirements, opportunities, needs of students and trainees and further real-life examples or feedback.

To ensure a wide distribution of the online survey and collect a reflective and wide-ranging set of responses, numerous methods of distribution were used:

- Emails containing information about the project and a link to the online survey were sent to:
 - secondary schools found on the New Zealand school directory that had provision for students aged between 13 and 18 (Education Counts, 2015)
 - ITPs identified through the NZQA website (no specific restrictions for age)
 - the BRANZ mailing list, which has thousands of individuals subscribed from the construction and infrastructure industry.
- Advertisements in BRANZ and industry newsletters of organisations, associations and stakeholders representing key groups of interest.

The NEET & Disengaged target audience was a difficult audience to engage with throughout the project. There is no central representative body or association to disseminate information through, other than the Ministry of Social Development. Therefore, a number of questions targeted at this specific audience were incorporated into the online survey. Parents and teachers were also very difficult to engage with independently.

For more information and the findings from the online survey, refer to section 4.

Training providers and ITOs provided a number of questions and challenges. These were incorporated into the online survey and included ensuring nationwide coverage, sector variety, range in secondary school decile and location and accessibility by different personality types.

3.2 Development and population of the wireframe

Wider industry engagement was sought to ensure an accurate representation of the career pathways found in a range of sectors within the construction and infrastructure industry.

One of the primary objectives for this research is 'sector representation' and for the final outcome to be seen as 'by industry, for industry'. The initial aim was to invite industry associations and representatives onto the stakeholder working group to develop or assist in developing the progressional pathways for their specific sector. A wireframe of the Career Development Map, in the form of a static map showing each progressional pathway, was drafted from the information gathered.

The draft pathways were sent to organisations within the industry for critique. Care was taken to ensure that at least one organisation was included for each specific sector identified within the industry.

3.2.1 Industry representation for development of pathways

The Business & Industry target group was split into three subgroups: industry associations, small-to-medium enterprises (SMEs) and large corporations. The industry associations were approached first, as an initial point of contact and representative for their specific industry sector. This meant the pathways could be less specific to what happens in one organisation and would be more generic or representative of that sector.

Once all of the above methods were undertaken, data was collected and consolidated and pathways drafted. The final step in the process was putting the information out for a final critique. At this time, the individual organisations were approached, along with industry associations and the stakeholder working group. Individual organisations (both SMEs and large corporations) were more difficult to engage with. This was particularly due to SMEs generally not having the capacity to deal with such questions and requests.

On top of this, industry organisations, associations and providers were asked to suggest their level of commitment for implementation and guidance in this space.

These final steps were undertaken through a second workshop (17 March 2015) and through email and/or phone communications.

3.2.2 Resulting overarching wireframe

From the individual pathways, an overarching wireframe map was developed to represent the construction and infrastructure industry (refer to Figure 3 and Appendix B).

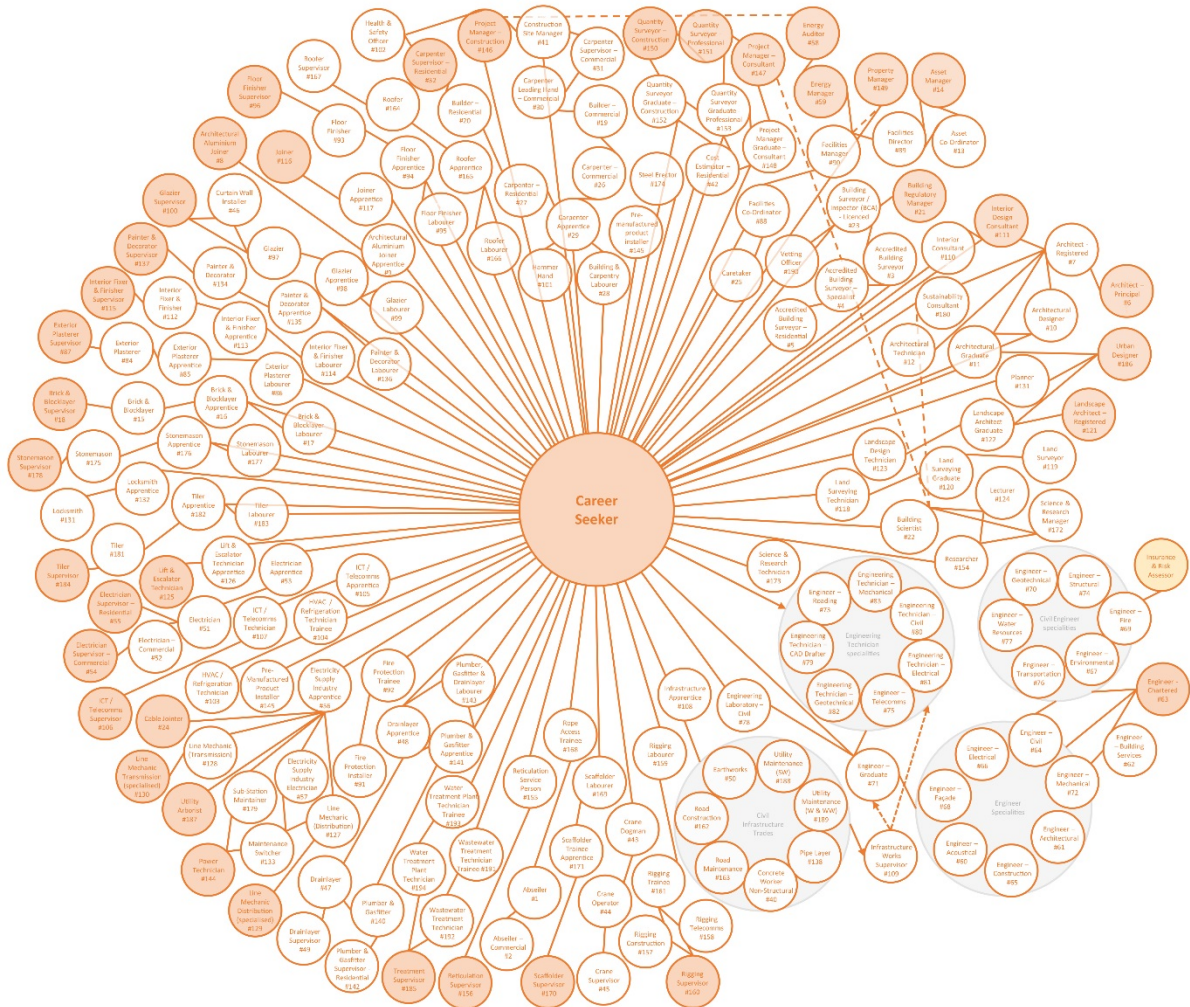


Figure 3. Wireframe to represent the construction and infrastructure industry.

To determine the most appropriate way to represent the Career Development Map, a number of layouts, formats and frameworks were considered and tested. These include:

- shaping the map to represent the levels of ANZSCO and NZSCED.
- positioning a business owner/CEO at the centre of the map.

These were tested against the initial key requirements, and results are discussed in section 5.4.

Another consideration that was thoroughly scrutinised was representation of other roles to the Career Development Map. The key focus for the initial high-level overarching map was to demonstrate the most common, logical and direct pathways into a specific vocation. For accurate representation, a decision was made to exclude from the map:

- business-oriented roles, which would require the inclusion of roles and studies in business or management sectors – possible next steps into the business areas are included within the lower details layer of the map (refer to Appendix C).
- non-logical pathways – every person has a different experience and a different story to tell, and if implemented, this would essentially join every role with every other role on the map and provide no real clear lines of sight



- roles not primarily within the construction and infrastructure industry (for example, manufacturing).

These roles were noted and sometimes placed on the blurry edge of the industry or placed within the 'parking area'.

4. Online survey

An online survey aimed to gain the perspectives of individuals who might benefit from this Career Development Map and those who might contribute to its development. This was published using the online survey tool SurveyMonkey between Friday 5 December 2014 and Monday 2 March 2015.

Information was sought on existing career paths, skill requirements, opportunities, needs of students and trainees and further real-life examples or feedback.

Methods used to seek survey responses included advertisements on the Careers New Zealand website, an email to those in the industry, secondary schools, tertiary providers and ITPs and emails to the BRANZ mailing list. (Given a link to the online survey was published on the Careers New Zealand website, there may be a bias in overstating the use of the Careers New Zealand website.)

The number of responses for each key group is illustrated in Table 1. Where response numbers are low, the margin of error is much higher.

Table 1. Number of online survey responses.

Key groups	Responses
Employers and employees	607
Secondary school students	276
Tertiary and ITP students	105
Unemployed	40

Key overall findings from the online survey include:

- family/friends, career advisors/teachers and industry sources are the expected key sources of career advice for all key groups
- respondents typically stated that they relied on online sources for future career and employment information
- career progression information was seen as the most useful – realistic job descriptions and income expectations were also commonly stated information requirements for all key groups.

This supports the intent of the online survey – to gain an understanding of what is needed to make informed career decisions, whether that information currently exists or not.

In turn, the findings from the online survey provide insight for the wider project to ensure target audience needs are considered and met through the Career Development Map.

4.1 Career advice informers

Family/friends, career advisors/teachers and industry sources are the expected 'go to' sources for career advice for all key groups. The primary source of expected career advice did vary across the key groups:

- Secondary school students were more likely to expect to go to career advisors or teachers (53%), closely followed by family and friends (32%).

- Tertiary and ITP students were more likely to expect to go to career advisors or teachers (32%), followed by the industry they wish to work in (28%) and family and friends (23%).
- Unemployed people were more likely to expect to go to family and friends (32%), followed by career advisors (26%).
- People employed in the construction and infrastructure industry were most likely to expect to go to colleagues, peers or the industry itself (26%).

This shows overall that career advisors, teachers, family and friends are seen as key informers across all groups. This is further highlighted in Figure 4.

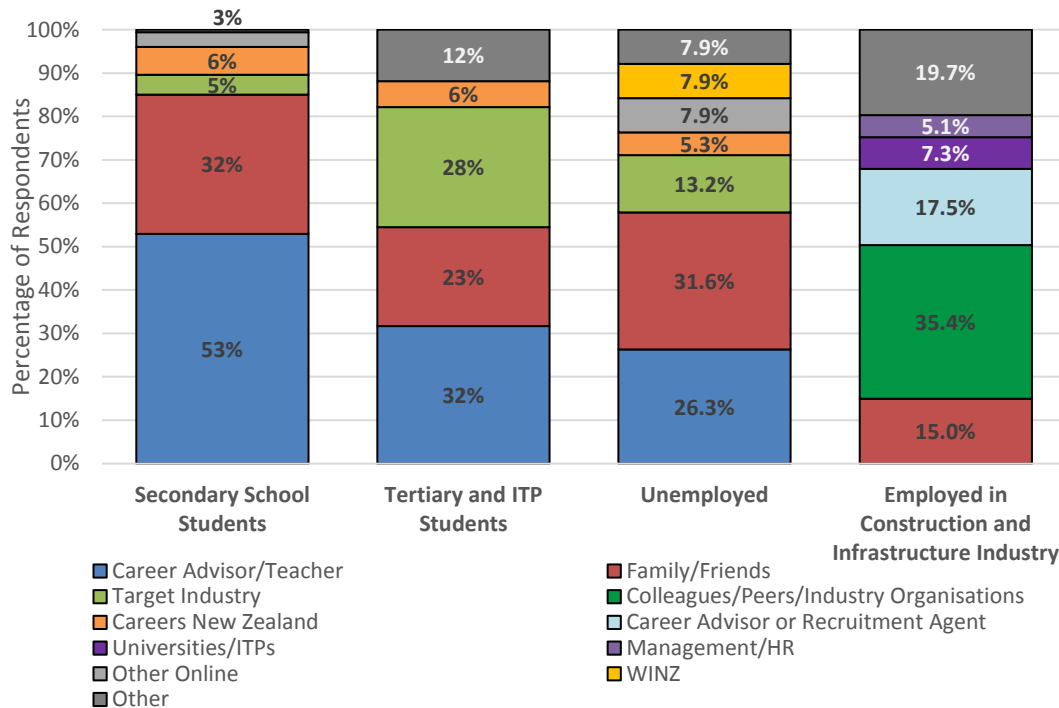


Figure 4. Who key groups would expect to go to for career advice.

As people transition from being a student into employment within the industry, it appears colleagues, peers and industry organisations become increasingly important. Those unemployed perhaps do not have the same access to career advisors or peers and therefore tended to rely a lot more on family or friends.

Tertiary and ITP students tended to approach a wider range of people for career advice. The action of approaching a particular industry directly noticeably increased in this group. This may be due to them having a better idea of what industry they wish to pursue. This was typically stated as ‘talking to an employer in the industry’ or ‘approaching an industry organisation’.

4.2 Influence of information sources

The survey also sought to determine how much specific information sources influenced respondents’ career decisions. Parents, career advisors and online information have a large influence on the career decisions of those currently in study (either at secondary school or tertiary providers and ITPs).

As people progress, industry organisations and peers become more important. This means industry organisations need to have a clear understanding of their roles and the roles that exist within their sector and industry.

Key findings from each target audience:

- For secondary school students, the common career decision influencers were parents and career advisors.
- For tertiary and ITP students, top influencers are industry organisations, parents and online information.
- For employers and employees, top influencers are industry organisations, peers and online information.
- For the unemployed, top influencers are industry organisations, parents, other family members and online information.

It was also found that online advertisements (for example, marketing advertisements, such as for the New Zealand Army), TV advertisements and social media had less influence on career decisions across all key groups.

4.3 Future career and employment information sources

Respondents typically stated that they relied on online sources. This was largely recruitment and job advertisement websites such as Rob Law Max Recruitment, Seek or Trade Me. However, general Google searches were common, as well as the use of websites such as Careers New Zealand, which provide a more general overview.

The top sources of expected career advice varied across the key groups (see Figure 5):

- Secondary school students were more likely to search Careers New Zealand (39%), followed by seeking advice from career advisors or teachers (31%).
- Tertiary and ITP students heavily relied on online resources and were more likely to search other online websites (44%), followed by searching on the Careers New Zealand website (27%).
- Unemployed people were also more likely to search other online websites (45%), followed by searching on the Careers New Zealand website (18%).
- People employed in the construction and infrastructure industry were also more likely to search other online websites (54%), followed by seeking advice from colleagues, peers and industry organisations (22%).

Overall, the online presence of information is becoming more and more important to all key groups. However, there is a clear distinction between quality information and marketing advertisements in terms of the reported (conscious, at least) influence on making career decisions.

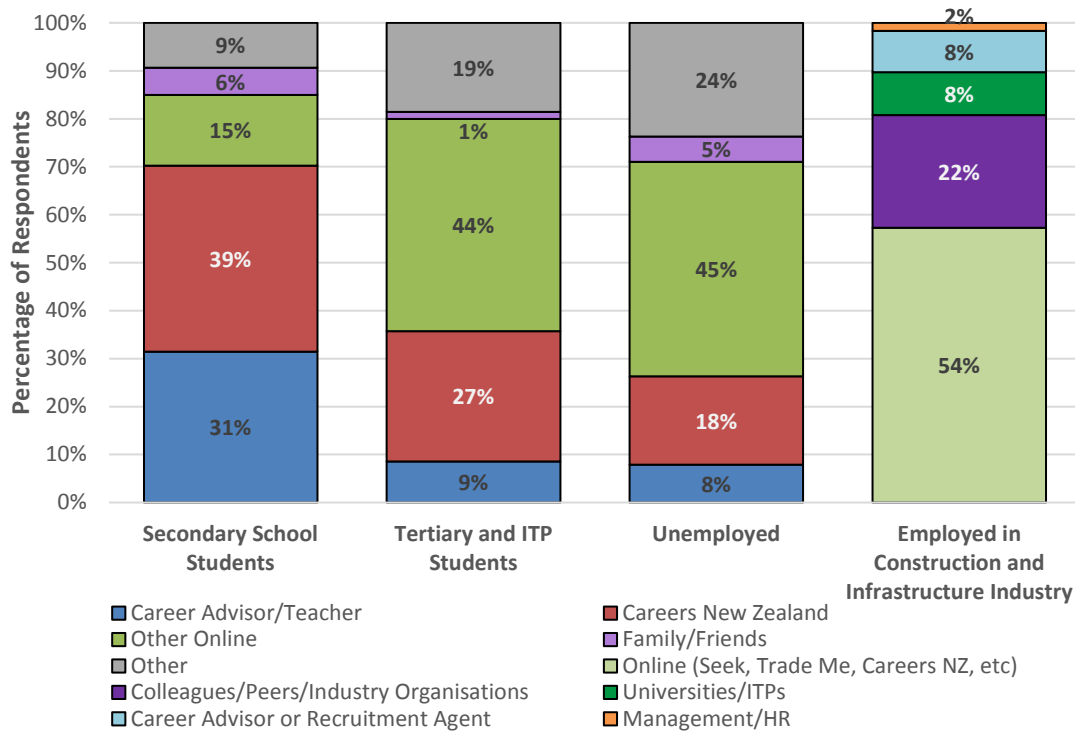


Figure 5. Sources of future career and/or employment information.

4.4 Quality of the online information

Careers New Zealand was seen by the respondents as the best source of quality online career information currently available. It was well used by students and the unemployed but less so by employers and employees. Job advertisements were a commonly used source of career information. This indicates the importance of job availability beyond actively looking for a new job, as it allows workers to be aware of employment opportunities and demand.

Key findings about the quality of the online information from each of the target groups:

- Secondary school students rated Careers New Zealand as the best source of quality online career information. Over 90% of respondents stated that they used Careers New Zealand, and the majority of those respondents rated it as a good source. Other New Zealand sources were the second highest rated. However, less than 50% of respondents reported using them as a source. The second most commonly used source was job advertisements.
- Approximately 75% of tertiary and ITP students reported using Careers New Zealand and/or job advertisements. Careers New Zealand was rated the best-quality online career information source. Training providers, job advertisements and overseas information followed.
- Employers and employees rated the Careers New Zealand website as the best source of online career information. However, it was not widely used. Job advertisements were the most common source of online career information. The percentage of employers and employees using websites for career information is lower than for students and the unemployed. This suggests that those in employment rely more heavily on colleagues and peers.
- The Careers New Zealand website and recruitment agencies were the most common sources of online career information for the unemployed. The best-rated source was

the Careers New Zealand website. Both Youth Guarantee and recruitment agencies rated highly as well.

As noted previously, the online survey was advertised for a period through the Careers New Zealand website and therefore some bias may exist, the extent of which is undetermined.

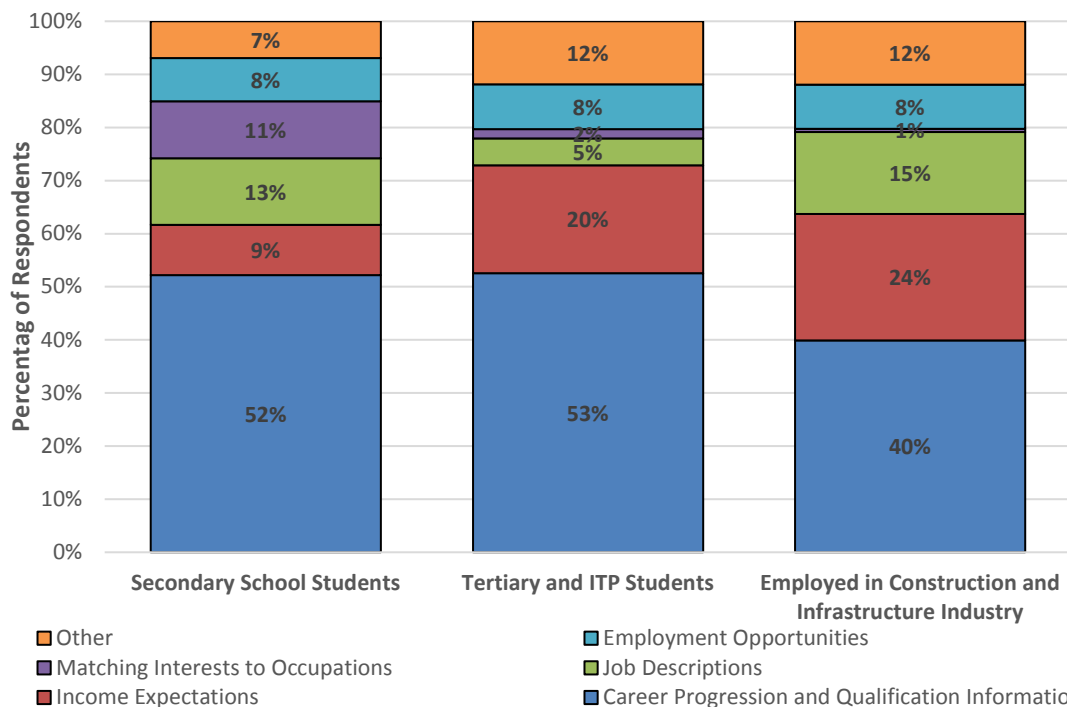
4.5 Desired information for career decisions

Respondents believed the most useful information would be career progression information, particularly for those who are studying such as secondary school or tertiary and ITP students. Realistic job descriptions and income expectations were also commonly stated information requirements.

Career progression and study or qualification information was seen to be most helpful across the groups by:

- 52% of secondary school students
- 53% of tertiary and ITP students
- 40% of those employed in the construction and infrastructure industry.

Not surprisingly, income expectations were seen as more helpful as respondents advanced from being secondary school students (9%) to being tertiary and ITP students (20%) to being employed (24%). A summary of results is in Figure 6.



**The 'Career Progression and Qualification Information' category includes any response that stated that they wanted information on how to progress between jobs. This includes what job options are available to them, what study they would need to do to change roles and what qualifications/skills are needed for each role.*

Figure 6. Information most helpful with career path decisions.

4.6 Attraction into a specific pathway

The survey also sought to find out what factors attracted respondents to a particular career pathway (see Table 2). It was found that skills match and growth potential were the two highest-rated factors overall. Factors such as salary expectations and the location were also rated rather highly.

Table 2. Factors attracting respondents.

Group	Biggest attraction(s)	Also highly rated
Secondary school students	Skills match	Growth potential Location Workplace setting Team environment Salary expectations
Tertiary and ITP students	Skills match Growth potential	Salary expectations Team environment Location Employment demand
Employees in the construction and infrastructure industry	Skills match Salary expectations	Growth potential Location
Unemployed	Skills match Salary expectations	Growth potential Typical duties

4.7 Career foresight

The majority of respondents (around 55%) knew what they wanted to do before beginning their study or qualification. Figure 7 illustrates this proportion was only slightly higher for those currently in study than those in employment.

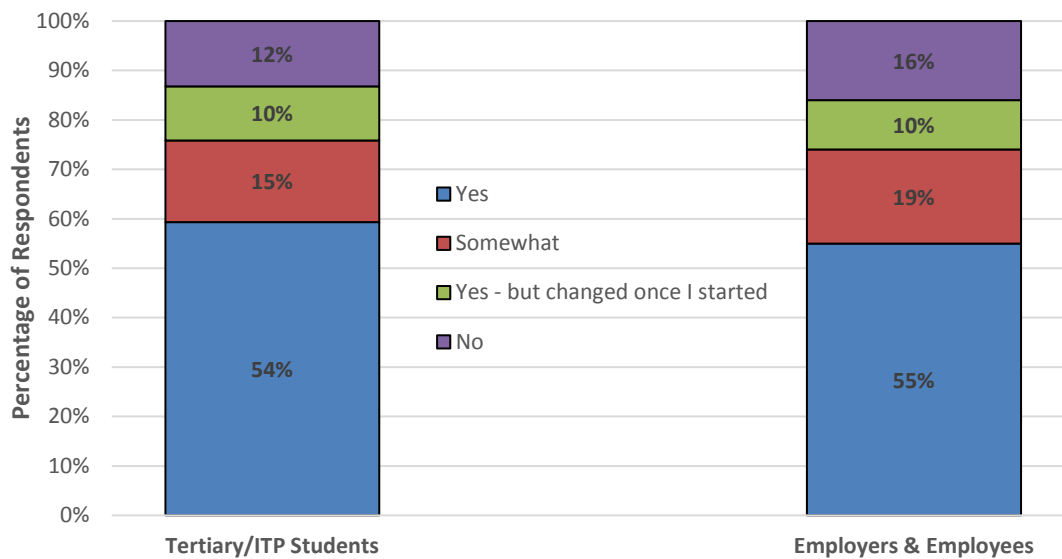


Figure 7. Did respondents know what they wanted to do before beginning their study?

In the contra, Figure 7 also demonstrates that only around half of people currently are making informed career decisions that eventuate into employment in that specific

discipline or sector. This is confirmed through BRANZ research on productivity trends and implications for the building and construction sector (Curtis & Norman, 2014).

4.8 Staff turnover and skill shortages

Respondents who identified themselves as involved in the employment of new staff were asked questions relating to staff turnover and the ease of finding suitable people to fill roles.

Generally, there does not appear to be a large staff turnover in the construction and infrastructure industry. About 90% of respondents stated that their staff turnover was relatively low. However, this contradicts the cyclic nature of the construction industry. This potentially indicates that not all types of organisations were captured through the online survey or that the current growth in the sector is providing relative stability in employment at the present time.

Approximately 47% of respondents stated that it was difficult or very difficult to find suitably qualified, trained or experienced people to employ in the construction and infrastructure industry. Thus, it may be more important for employers to retain skilled employees. This may also infer that the needs of employers are not currently being met by training providers. It could also suggest that there are not enough people entering training for these programmes, and increased awareness may be required to attract students or trainees.

The majority (81%) of respondents stated that they believed there were skills shortages within the construction and infrastructure industry. Skills shortages were reported to be highest in the Taranaki and Southland regions, with 100% of respondents stating that skills shortages exist. Whereas they were reported to be only slightly higher in the Canterbury (92%) and Auckland (89%) regions in comparison to other regions. Waikato (85%) was the next highest, through to Manawatu-Whanganui and the West Coast (50%) regions with the lowest reported. It should be noted that these are only perceived skills shortages and may not accurately reflect the regional situations.

5. Key requirements

Through the initial stakeholder working group workshop, the scope and key requirements were derived and agreed.

The target audiences were identified in terms of what, why and how the Career Development Map would support each. Key objectives were formulated together with information, data and content needs. It was deemed important to capture additional ideas through a 'parking area'.

The project also needs to consider and align with existing frameworks and classifications used in New Zealand, and a variety of approaches were tested.

5.1 Target audiences

To enable the Career Development Map to be created, the first tasks were to identify target audiences and to develop a framework that will set the scope of the project. This would allow a wireframe (a visualisation model for presenting proposed functions, structure and content) to be created.

It was recognised in the first stakeholder workshop that five target audiences exist. The project must address what these target audiences would need out of the map, why and how they would get it:

1. Business & Industry

WHAT: What to look for in potential employees. How to attract well-suited employees.

WHY: Often employers, particularly SMEs, are not up-to-date with current training and qualifications. To allow ITOs and ITPs to show how their training fits into the industry.

HOW: Understanding skills match for changing needs. For internal staff, career development and training/upskilling.

2. Worker & Employee

WHAT: Next steps in career ladder. Changing careers. Upskilling.

WHY: Often the next possible steps, training opportunities or potential branches are not obvious to those already in the workforce.

HOW: To give perspective around the next possible steps and present pathways that they might not have considered or explored.

3. Informer/Influencer

WHAT: Advising Worker & Employee, Youth & Learner and NEET & Disengaged. Providing an avenue for influencers to be informed and kept up to date.

WHY: Career advisors and other influencers lack holistic and easy-to-use tools to aid student decision making at an early life stage and those mid-career.

HOW: To aid discussions to identify steps that might be otherwise invisible to them. Give a good understanding of roles to provide good advice. The Career Development Map can be used as a discussion point for engagement.

4. Youth & Learner

WHAT: Entering post-secondary education/training/workforce.

WHY: A holistic view of the opportunities, steps, training and how the industry works can be difficult to find.

HOW: To decide how they should approach entering the workforce and what training they should/might do or need.

5. Not in Education, Employment or Training (NEET) & Disengaged

WHAT: Identify work and training opportunities and provide an exploration avenue.

WHY: To give a holistic perspective of the industry and how their skills might be suitable for a role within the selected industry sector.

HOW: To explore the first and/or next step to support selected vocation/career.

To effectively engage with the five target audiences, a number of engagement methods were used, some of which are detailed in Table 3.

Table 3. Engagement plan.

Type	Who	Level of Involvement
5 NEET & Disengaged	Gateway	Seek input through survey. Testing of tool.
	MSD/WINZ	Survey link dissemination.
4 Youth & Learner	School directory	Students to test tool and seek input through the survey.
	ITPs and StudyLink	Tools and newsletter for engagement/feedback to test tool and seek input through the survey.
	On-job trainees	Seek input through the survey.
	General	Seek input through the survey.
3 Informer/Influencer	Career advisors and teachers	Target career advisors through CATE – seek insight around current practices, what they would require for a career map and information that would be useful. Disseminate survey link to career advisors.
	Parents	Seek input through the survey.
2 Worker & Employee	<i>Build</i> mailing list	Seek input through the survey.
1 Business & Industry (SMEs)	Access through Master Builders, Certified Builders and other SMEs	Targeted newsletter survey.
	SME Business Network	Targeted newsletter survey with follow-up interviews.
Business & Industry (Large Corporations)	Building Research Advisory Council	To get support with sector representation through the Career Development Map and provide feedback as needed.
	Hawkins, Downer, NZ Steel, Fletcher, Naylor Love, other large New Zealand corporations	Consultation on the focus of the Career Development Map, their perspective, how it might be used by them or their employees. How the company sees the Career Development Map's use in terms of attracting appropriate people into the roles.
	Sustainable Business Council, etc.	Targeted newsletter survey.

5.2 Key objectives of the project

During its first meeting, the stakeholder working group also discussed a number of potential ideas and requirements to frame and bound the map to ensure it does not lose focus. This was done by clearly identifying what can realistically be included in the Career Development Map.

Three critical objectives were arrived at by the group:

- Added value
- Avoid duplication
- Sector representation.

Table 4 provides a detailed list of aspects proposed through the first meeting with the stakeholder working group, their description for inclusion and/or temporary exclusion (parking area).

Table 4. Aspects and requirements for the Career Development Map.

Aspect	Description for inclusion, but not limited to:	Description for parking area
User experience (media)	-	31 March 2015 proposal
Industries/sectors	Inclusion of both construction and infrastructure	
Pathway 'branches'	Careers New Zealand Vocational Pathways Pan-Auckland Alliance	Secondary 'branch' mapping
Existing frameworks	ANZSCO ANZSIC NCEA NZQF NZSCED Vocational Pathways	
Information, data and content	Careers New Zealand HRINZ TEC NZQA Ministry of Education Pan-Auckland Alliance Construction Dashboard (BRANZ) Occupational Outlook (MBIE)	Recommendation for information
Information layers	Pathways Specific role information Education information	
Transitional criteria	Careers New Zealand HRINZ	Recommendation for information
Supporting tests	-	Personality test Other test

Aspect	Description for inclusion, but not limited to:	Description for parking area
Sector representation	Building Research Advisory Council test Targeted interviews with key industry members Industry/public seminars	
Skills shortages	Construction Dashboard Occupational Outlook Pan-Auckland Alliance	Extrapolation from pan-Auckland Alliance
Bidirectionality	Information seekers Business & Industry	
Periphery and supply roles	-	Pan-Auckland Alliance 'families' Roles of the wider economy (e.g. transport)
Futureproofing (+5 years)	-	To be scoped for proposal

Table 4 provides a clear scope for the information that needs to be identified and/or created to fulfil the purposes of the Career Development Map. However, the necessity and/or demand for specific information, data and content is not necessarily obvious – particularly in relation to the five individual target audiences.

5.3 Information, data and content

The requirements for each target audience is vital to create a Career Development Map. To get a better understanding of this, a few methods were used:

- Mining existing literature and initiatives, such as those listed in section 2.
- Talking with key stakeholders to understand their experience with the needs of each target audience.
- Mining the responses from the targeted interviews and online survey for key messages around what is necessary for each group.

From this, a list of 16 key categories for information was produced. The categories were sent to the stakeholder working group for critique. This was in order to develop an understanding, from a supply side, of the most important needs for specific target audiences by ranking from 1 (very strong need) to 4 (no particular need). In Table 5, these content categories are listed and rank responses averaged for each target audience.

Overall, core duties and skills appeared to be the most important information needs of career seekers across the five target audiences. What is interesting is that there is a very strong need for the role description, core duties, entry requirements, pre-employment training, skills and the types of people most suited to roles. However, these are more for people entering the job market as opposed to those already employed (i.e. NEET & Disengaged, Youth & Learner and Informer/Influencer).

For those already employed within the industry, salary range, logical pathway, core duties, on-job training, skills, experience, growth potential, transition criteria and duration through pathway became the most strongly needed. This infers that the

progression through a career is not well understood for entry-level career seekers and becomes more important once a role is gained to understand the ‘next steps’.

Table 5. Information, data and content requirements by target audience.

	NEET & Disengaged	Youth & Learner	Informer/ Influencer	Worker & Employee	Business & Industry
Role description	1	1	1	2	3
Salary range	2	2	2	1	1
Logical pathway	2	1	2	1	2
Job availability	1	2	1	2	3
Core duties	1	1	1	1	2
Entry requirements	1	1	1	2	3
Pre-employment training	1	1	1	3	3
On-job training	2	2	2	1	1
Qualifications	2	1	1	3	2
Skills	1	1	1	1	1
Experience	3	3	3	1	2
Suits people like...	1	1	1	4	2
Growth potential	3	3	2	1	2
Transition criteria	3	3	3	1	3
Duration through pathway	4	2	2	1	4
Short video bio	2	2	2	3	4

Key: 1 Very strong need 2 Relatively strong need 3 Some need 4 No particular need

Table 5 also shows that, for those employing people within the industry, salary range, on-job training and skills are the most strongly needed categories of information. This also aligns well with the findings from the online survey in section 4.

5.4 Linkages with existing frameworks & classifications

Throughout Table 4, a number of existing frameworks and classifications have been referred to that currently exist in New Zealand. Where possible, the intent was to align, link to or incorporate the existing frameworks into the Career Development Map. These include:

- ANZSCO: Australia and New Zealand Standard Classification of Occupations
- ANZSIC: Australia and New Zealand Standard Industrial Classifications
- NCEA: National Certificate of Educational Achievement
- NZQF: New Zealand Qualifications Framework
- NZSCED: New Zealand Standard Classification of Education
- Vocational Pathways.

The ANZSIC framework is potentially the most important due to the definitions for types of roles and organisations within the construction and infrastructure industry. For this reason, Table 6 highlights the ANZSIC codes to be included within the Career Development Map.

There is however, a slight misalignment between Table 6 and what actually happens within the construction and infrastructure industry (i.e. what people classify their

business and work as, at a sector level, can and does differ to what is listed within Table 6).

The New Zealand Sectors Report 2013: Construction (Ministry of Business, Innovation and Employment, 2013) states that the construction industry includes “firms engaged in the construction of buildings and other structures, additions, alterations, reconstruction, installation, maintenance and repairs ... demolition or wrecking of buildings and structures and cleaning of building sites ... blasting, test drilling, landfill, levelling, earthmoving, excavating, land drainage and other land preparation”. The report then goes on to state that the manufacture, wholesaling and retailing of construction materials and mining of raw materials (such as aggregate for road building) are excluded from the construction industry. It adds that these activities are all inputs into the construction sector but fall within other ANZSIC areas.

Table 6. ANZSIC sectors and subsectors.

Subsector	ANZSIC code	Activity	Example firms
- Building Construction -			
Residential Building	E 301	Building houses and apartments; carrying out alterations, additions or renovations to houses or in organising or managing these activities.	Signature Homes; David Reid Homes; Stonewood Homes; many small firms.
Non-Residential Construction	E 3002	Building structures such as motels, hospitals, office buildings, industrial buildings and other such commercial buildings.	Fletcher Construction; Ebert Construction.
- Heavy and Civil Engineering -			
Heavy and Civil Engineering	E 310	Construction of roads, tunnels and bridges, dams, harbours, oil refineries and sports fields; includes cable laying and on-site installation and assembly of heavy electrical machinery.	Fulton Hogan; Downer; HEB Construction.
- Construction Services -			
Land Development and Site Preparation	E 321	Subdividing land into lots and servicing the land for subsequent sale; includes land-clearing, excavation, ground de-watering and trench digging.	Higgins Group; Ward Demolition.
Building Structure Services	E 322	Concreting for footpaths, foundations, kerbs and gutters; bricklaying; roofing; and erecting steel structures such as silos and tanks.	Allied Concrete; Brian Perry.
Building Installation Services	E 323	Includes plumbers and electricians; installers of air-conditioning, heating, fire and security devices as well as elevators, curtains, awnings and blinds.	Downer; Orion; Laser Electrical; Aquaheat; many small operators.
Building Completion Services	E 324	Includes plastering and ceiling services; carpentry; tiling; carpeting; wallpapering, painting and decorating; and window installation services.	Spencer Henshaw; Surfaceworks Specialist Coatings; many small operators.

Subsector	ANZSIC code	Activity	Example firms
Other Construction Services	E 329	Landscaping and construction of paths, decks and retaining walls, fences, or lawns; hiring of construction machinery with operators (such as cranes); scaffolding construction; blasting, cleaning and waterproofing of buildings.	Nelmac; Pyradeck.
- Professional, Scientific and Technical Services -			
Scientific Research Services	M 691	Firms providing services such as scientific research, architecture, engineering, law, accountancy, advertising, market research, management and other consultancy and veterinary services	
Architectural, Engineering and Technical Services	M 692		Beca; Opus.
Management and Other Consulting Services	M 696		

Although the Career Development Map must align with existing work and systems, it has found that even some existing frameworks do not align well with each other. This creates complexity when trying to find common ground and shared understanding.

Very early on, the stakeholder working group indicated that the map needed to incorporate infrastructure to align with the Vocational Pathways framework and other initiatives that were happening around New Zealand. This was suggested to avoid any confusion in industry definitions and to align between age groups and target audiences. The inclusion of infrastructure benefited the project overall, as the complexity in splitting roles that fall into both sectors (i.e. structural/civil engineer) dramatically reduced.

Both the Vocational Pathways and NCEA frameworks will be incorporated into the entry roles within the finalised Career Development Map. The alignment will ensure that secondary school students are aware of what subjects matter the most and to enable a skills and interests-matching function at a later stage.

Much work has been conducted, both by the Construction and Infrastructure Sponsor Group and others, to cross-tabulate the ANZSCO and NZSCED frameworks, with difficulty. Due to the work being undertaken elsewhere and having minor impact on the primary aim of the project, these frameworks have been noted for future opportunities. It was resolved that the ANZSCO, NZQF and NZSCED classifications will be trialled visually on the Career Development Map wireframe in Section 6.

6. Wireframe for Career Development Map

Using a wireframe to connect the necessary information subgroups demonstrates what the Career Development Map will look like. The initial high-level map shows only role titles and connectors between the role titles to reflect typical career or vocational pathways. The detail for each role has been identified and can be found in Appendix C.

Four layers were identified for the digitised Career Development Map. These are listed below in the proposed order of visibility, once live:

4. **User Interface** – attractiveness, usability and user experience.
1. **Roles & Pathways** – role titles and their linkages, detail for each role.
2. **Training & Qualifications** – pre-employment and on-job.
3. **NCEA & Vocational Pathways** – linkage to secondary school subjects.

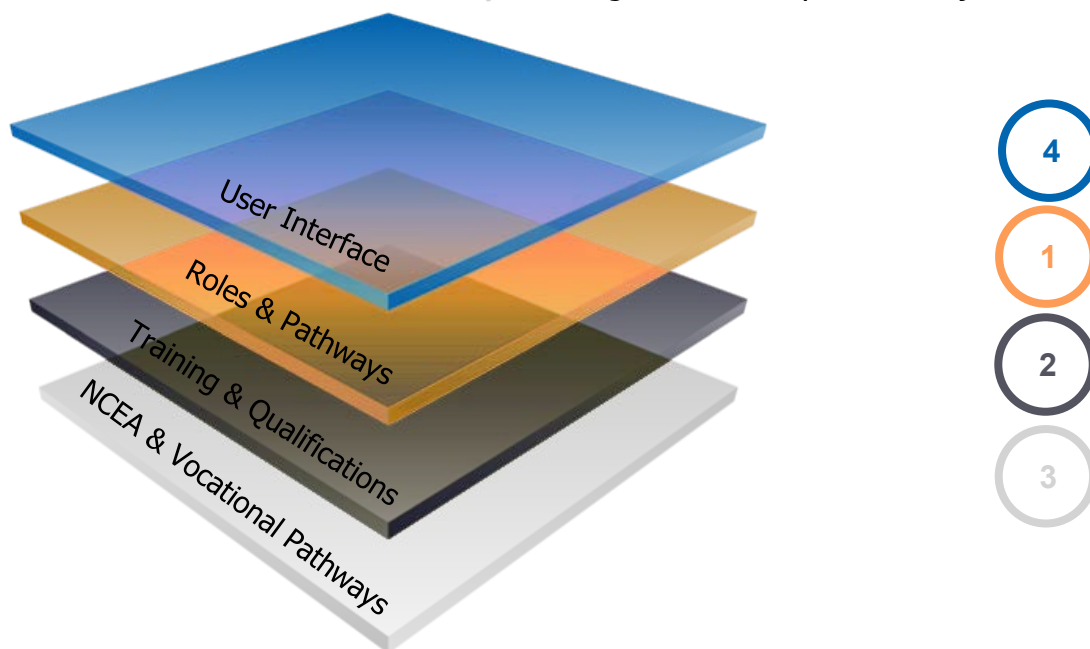


Figure 8. Layers of the Career Development Map.

For this first phase of work, encompassed in this report, Layers 2, 3 and 4 have been investigated, collated and incorporated into the wireframe. As noted in section 5.4, a number of existing frameworks and classifications have also been trialled to demonstrate their appropriateness and effectiveness when incorporated in such a map.

Layer 1, the user interface, falls into phase two of the project, where an implementation strategy has been proposed and outlined in section 7. Further work is also planned in Layers 3 and 4, as information on the qualifications and qualifications mapping becomes available through the Ministry of Education.

6.1 Roles & Pathways

This is the layer below the user interface that forms the basis of the user experience. This only shows roles included within the construction and infrastructure industry and their most common, logical and direct pathways through sectors to minimise overwhelming complexity. This is shown in Figure 9 and the Carpentry & Building sector pathway shown in Figure 10 to demonstrate individual pathways.

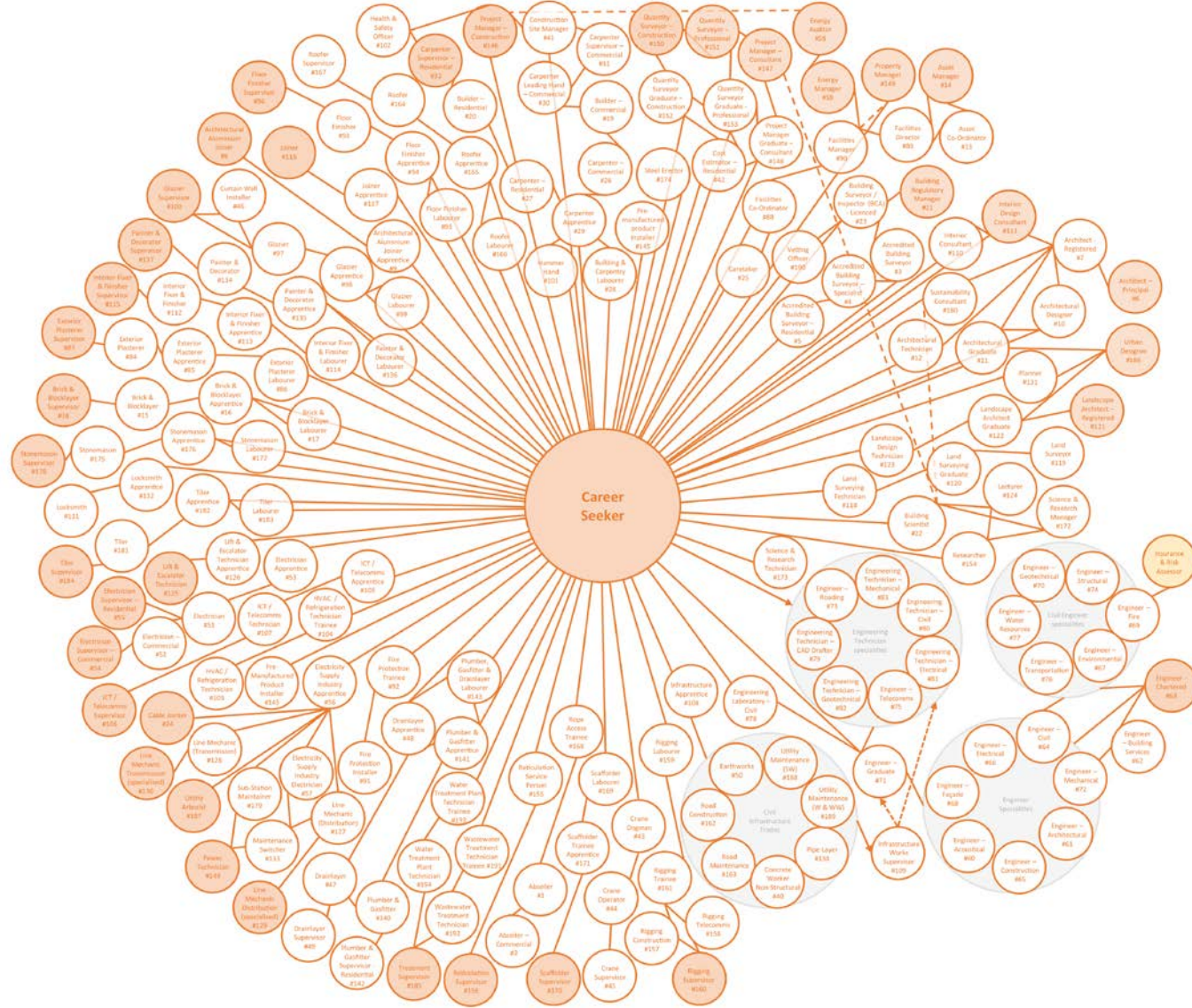


Figure 9. Wireframe Career Development Map.

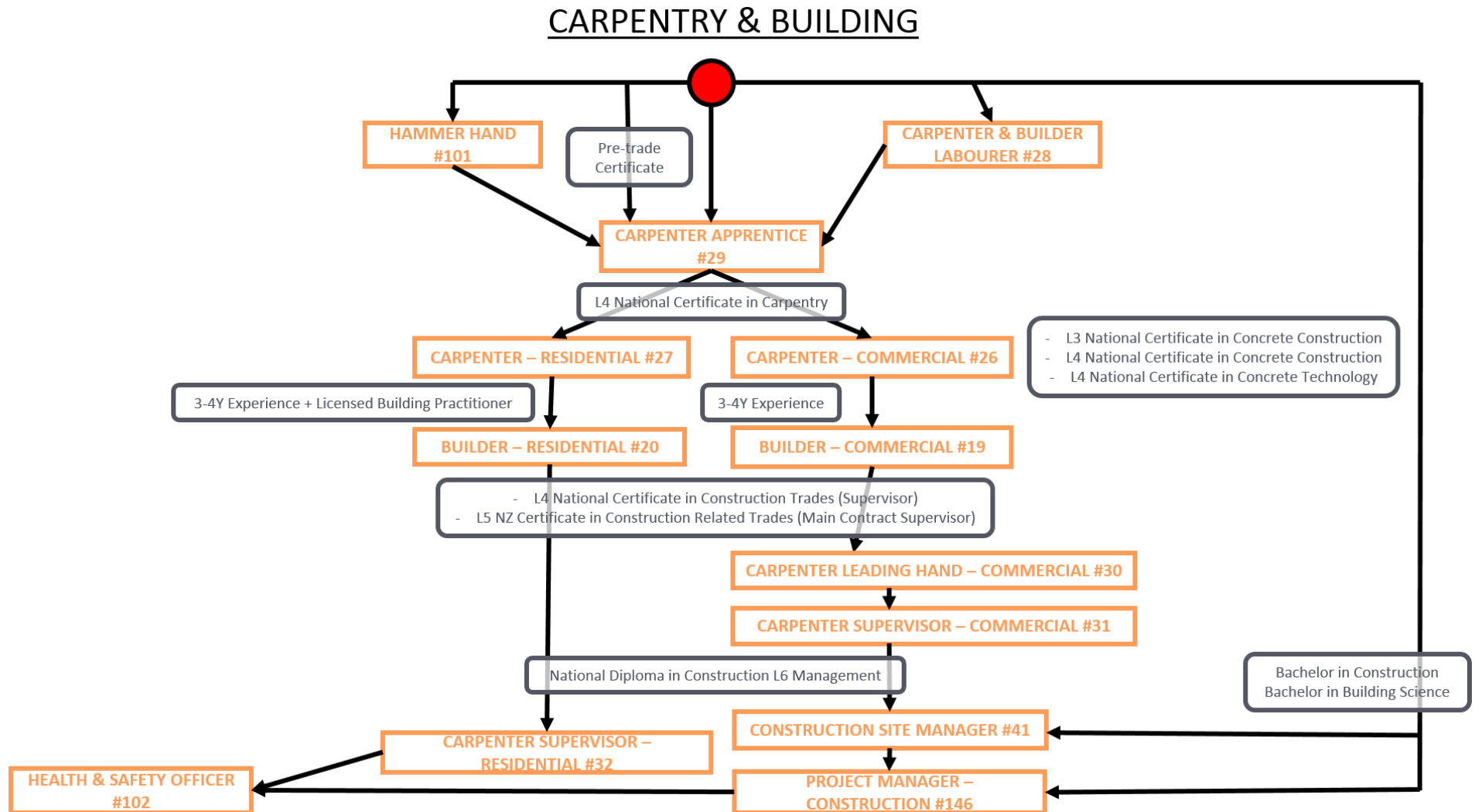


Figure 10. Example of sector pathways (Carpentry & Building sector).

Effort was put into ensuring the role titles were reflective of what is currently used within the industry. It was also important to maintain an 'also known as' field for searchability. These role titles were found to be somewhat outdated and not overly attractive to job seekers, despite being commonly used in the industry. Work is suggested in section 7.2 for ongoing systematic and industry-led change that might address this issue.

It is also proposed to trial a number of different map formats during the digitisation in phase two. This includes the following suggestions:

- London Underground map-like structure. Whereby, the career pathways become suburbs surrounding each station (representing industry sectors).
- Galactic map. Where each planet would represent a role in a career pathway, forming a galaxy (industry sector).
- Centralising the focus of each role as it is selected to enable clarity around each pathway and adjacent or transitional roles.

This information and suggestions will all be considered and worked through, in collaboration with interested parties, during phase two.

6.2 Training & Qualifications

Training and qualification information is necessary at two levels:

- Entry and transitional requirements for roles
- Qualifications mapping.

There are no pre-employment training requirements for a large proportion of entry-level roles in the construction and infrastructure industry (for example, Glazier Labourer). However most require on-job training once employed. These vary in certification level, duration and delivery method. Furthermore, a number of roles do require pre-employment training, again varying depending on discipline, provider and other factors.

The individual sector pathways, found in Appendices B.1–B.13, have integrated training and qualification information to varying extents, as demonstrated in Figure 10. This ensures all entry, growth and transitional information is transparent, and the information will continue to be built upon in phase two, as information is made available.

In a number of cases, students changed their discipline of study or progressed into further study, as highlighted in Figure 7. Therefore, mapping of qualifications is a necessary layer to enable students to explore other career and study or training options available to them through undertaking their chosen qualification. This work is shown in Appendix D.

This layer will be visualised in a similar form to the roles and pathways so that it can be approached from either a role or qualification angle. It will also provide key linkages back to secondary school qualifications.

6.3 NCEA & Vocational Pathways

Work is under way to fully map NCEA into Vocational Pathways by the Ministry of Education and across government agencies. This work will be aligned to the Career Development Map once it has been completed and shared.

It is important to provide secondary school students with this information so they are able to plan their career and to construct training pathways with clear lines of sight. The



work will also support those with no specific chosen vocation to understand skills matches and enable informed career decisions to be made.

The added complexity of this layer will again require key stakeholder input and collaboration through digitisation in phase two of this project.

7. Digitisation & implementation preparation

The next step of the Career Development Map will be to use the wireframe (Appendix B) to inform the digitisation of an online interactive tool.

This section describes the anticipated approach, requirements and strategy for the Career Development Map digitisation.

Proposed ongoing commitment options from industry and stakeholders will ensure the Career Development Map remains representative of the sectors and enable industry-wide systematic change into the future.

7.1 Digitisation of the wireframe

It is envisaged the wireframe will be an online, interactive tool that is simple and easy to use. Through the work to develop the wireframe and engagement with key stakeholders and industry, four key understandings were identified:

- User interface requirements.
- Testing of prototype/beta version of Career Development Map.
- Careers New Zealand development and hosting of the tool, including co-branding.
- Replication possibilities for other industries.

These are discussed further in the following subsections.

7.1.1 User interface requirements

The user interface or user experience requirements were discussed in the second workshop attended by the stakeholder working group and key industry personnel.

A number of key requirements were derived, including:

- navigation ease
- attractive
- not overwhelming
- selected role/qualification becomes centre of map
- gives all necessary information about the roles and qualifications
- Information for Learners (Tertiary Education Commission, 2014) learnings
- practical information based on target audience needs
- linkages to existing training providers and industry representative bodies.

These requirements will all be worked through during the digitisation and will provide a check for prototype testing feedback.

7.1.2 Prototype testing

There is a clear need for the map among target audiences. This was highlighted through interactions with secondary schools and tertiary providers and ITPs in New Zealand.

The Career and Transitional Education Association (CATE) also highlighted their desire for such a map.

A large online survey response was received from these key groups, as well as email and telephone feedback requesting availability and accessibility of the tool upon development and completion.

To ensure the tool meets the needs of these key groups:

- contact information has been retained for those wishing to provide prototype test feedback
- secondary schools contacted for the survey will be made aware during the prototype testing phase
- industry has signalled an interest to test and ensure the tool represents their sector appropriately
- CATE has indicated its need for this tool to educate its career advisors and also its desire to be part of prototype testing through dissemination through the CATE network.

Through the above testing of the tool, the aim and target audience needs will all be challenged and augmented. This will not only ensure that the user needs are being met but will also provide necessary feedback on meeting the project's key objectives.

7.1.3 Careers New Zealand

Engagement was sought through a number of identified key stakeholders for this work, including Careers New Zealand. Careers New Zealand has provided invaluable advice, guidance and assistance with the current wireframe, as have all of the key stakeholders engaged with this work.

There is an informal understanding that the Career Development Map tool, once finalised and digitised, will sit on the Careers New Zealand website. There are a number of reasons for this:

- Careers New Zealand was demonstrated as an important source of career advice and was rated highly for its quality of information through the online survey.
- BRANZ does not see itself as a career advice or education specialist. Likewise, most people would not see BRANZ as a place to go to for career advice. For this reason, it makes sense to place the tool somewhere people can easily find and access it.
- Feedback through the stakeholder working group workshops points towards Careers New Zealand for similar reasons to the above.

Once this understanding is formalised, we will work closely with Careers New Zealand to ensure the online tool works within its strategy and platform and to ensure compatibility and adaptability.

7.1.4 Replication for other industries

A keen interest has been demonstrated, particularly through the Ministry of Education and Careers New Zealand, to assist with replication of a Career Development Map for other industries. This is especially the case for providing a completed Vocational Pathways 'wheel', as shown in Figure 11, whereby construction and infrastructure primarily fits into the orange-coloured segment.

Once the Career Development Map is digitised, trialled and its success determined, the methodology and results will likely be shared to assist other industries.



Figure 11. Vocational Pathways 'wheel' (Ministry of Education, 2016b).

7.2 Ongoing industry commitment

From the very beginning of the project, there has been a high level of industry interest, including how sectors might become involved in this work. A number of organisations and industry associations stated they had directives from their boards that this is key priority topic. This was understood to be for several reasons, including:

- skills shortages identification
- niche sectors of the industry need better exposure to grow their workforce
- to demonstrate that both trades and post-secondary education are attractive, respected and fulfilling options
- many of the skills shortages are appearing at trade levels, among skilled labourers and in niche specialist sectors (Construction and Infrastructure Sponsor Group, 2014)
- access to education and ongoing professional development for career advisors is variable
- fragmented information across sectors and regions.

Suggestions for ongoing commitment from industry were proposed during the second workshop, which was attended by the stakeholder working group and key industry personnel. This included:

- Provide role information, job descriptions and opportunity changes on an ongoing basis.
- Provide strategic input for digitisation, user interface, implementation and/or ongoing development.
- Formalise stakeholder working group requirements through a periodic panel review (i.e. semi-annually or annually).
- Ensure the tool gets used by having everyone in their respective organisations aware of it and/or by distribution through your relevant networks.

It was also identified through the second workshop that, potentially, the ways entry-level roles are described or even their role titles need to be addressed. This is to ensure all roles throughout all skill levels are attractive to career seekers and also to get away from any negative stigma around being a 'labourer', as an example.

8. Learnings and opportunities

A number of additional learnings and conclusions can be made in relation to the success of this work. The first phase of the map wireframe has been completed and the ongoing industry commitment proposed by key stakeholders.

8.1 Additional learnings

The need for such work was confirmed from almost every organisation and industry association engaged in this project and many others who could not, at this time, commit resources to the project. A number of organisations and industry associations had directives from their boards to increase career development information for their specific niche or sector of the industry. This was also apparent through secondary schools, tertiary providers and ITP/ITOs and through CATE. It was confirmed that career advisors lack the tools necessary to equip their students/clients with holistic career information to create informed career decisions.

It was highlighted during the first workshop that every individual's career pathway differs and can be more retrospective than planned or foreseeable. These individual experiences are useful to understand common transitions between roles.

Although a large amount of background research had been undertaken through the FLP, there are further lessons on what could have been done differently to produce a better or more robust outcome:

- Allowing more time for stakeholder engagement. Stakeholder engagement in this work was significant, at around 80% of the workload. This was in part due to the fragmented number of initiatives and activities happening simultaneously around New Zealand with no real intermediary or consortium sharing platform.
- Better planned engagement with the following target audiences, as they were particularly hard to reach without any organisation or body directive:
 - NEET & Disengaged
 - Youth & Learner
 - Informer/Influencer.
- Requesting formal commitment to the programme from the beginning. A number of organisations, ITOs and ITPs in this work were instrumental to its success. However, the success could have been strengthened if a number of other key players were engaged early on.
- Having one representative from each sector within the industries be responsible for their specific pathways. For a number of the sectors, the augmentation and confirmation of the pathways was done through adjacent branches, such as BCITO providing support for much of the construction industry. This could have been better supported through the above lesson of formalising commitment.
- Setting up the digitisation team earlier in the programme. The development of the wireframe maps was undertaken using MS PowerPoint, as this was the most user-friendly programme available at the time of work. This limited the work somewhat and could have been performed better by a digital/graphic specialist.

It is undeniable that a large number of professional organisations in the construction and infrastructure industry are ageing, and entry requirements in professional situations are becoming more and more difficult (Baldwin, Kidd, Black, & McDonald, 2013). This is in addition to fully understanding what roles exist, who is in those roles and their entry and growth pathways.

A key learning for businesses within the construction and infrastructure industry is the need to ensure succession planning for the future workforce is undertaken. If not planned for, a large amount of knowledge will leave the business and the industry. This must be shared with the new entrant workforce before the current workforce retires or leaves when they reach the current exit age for each occupation.

8.2 Future opportunities

Throughout this work, a number of parallel, additional and complementary aspects were discussed and 'parked' for future consideration and development.

Opportunities still exist to gather further information and fill the gaps, for example:

- integration of the Workforce Roadmap – particularly around industry demand for skills now that MBIE is proposed to extrapolate the Auckland-based data to nationwide figures
- providing clear linkages to other existing tools, such as the Construction Dashboard, Seek and so on.

Some of these may be incorporated into phase two of this work. However, this is dependent on the formalised ongoing industry commitment throughout the development stages leading up to it.

Overall, it is felt that this work on the Career Development Map has provided a significant contribution to the Skills Strategy of the former Productivity Partnership and the Building a Better New Zealand Industry Research Strategy. This contribution is made in the form of understanding the labour market and skillsets required to make up the industry.

The success of this work is very much attributed to a very strong stakeholder engagement and the realisation of the key objective to create a tool 'for industry, by industry'.

References

- Auckland Council. (2016a). *The Auckland Plan*. Retrieved April 7, 2015, from Auckland Council:
<http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/plansstrategies/theaucklandplan/Pages/theaucklandplan.aspx#si>
- Auckland Council. (2016b). *Youth Connections*. Retrieved April 7, 2015, from Youth Connections: www.youthconnections.co.nz
- Auckland Tourism, Events & Economic Development Ltd. (2015). *Youth Employer Pledge*. Retrieved August 5, 2015, from
<http://www.aucklandnz.com/business/youth-employer-pledge>
- AUT. (2016). *Scholarship details - Ko Awatea Health Scholarships 2016*.
http://www.aut.ac.nz/study-at-aut/fees-scholarships-and-finance/scholarships/scholarships-and-awards/detailpage?detailCode=803065&sessionID=67155&sourceIP=&X_FORWARDED_FOR=
- Baldwin, C., Kidd, A., Black, X., & McDonald, K. (2013). *ALL IN: A New Zealand Inc. approach to solve youth unemployment*. Auckland, New Zealand: Sustainable Business Council. Retrieved April 7, 2015, from
http://www.sbc.org.nz/__data/assets/pdf_file/0003/85926/ALL-IN-FLP-2013-Paper.pdf
- Barangaroo South. (2015). *People: our training hub for construction workers*. Retrieved April 7, 2015, from Barangaroo South:
<http://www.barangaroosouth.com.au/about/discover/people/our-training-hub-for-construction-workers>
- BCITO. (2015). *Careers*. Retrieved April 8, 2015, from BCITO:
bcito.org.nz/apprenticeships/careers/
- BRANZ. (2015). *Business Management and Economics*. Retrieved August 5, 2015, from BRANZ: http://www.branz.co.nz/cms_display.php?sn=238&st=1
- Careers New Zealand. (2014, September). *About Us*. Retrieved April 7, 2015, from Careers New Zealand: <http://www.careers.govt.nz/about-careers-nz/about-us/>
- Clarke, K. (2014). *Entry to Vocations: building the foundations for successful transitions*. Adelaide, Australia: National Centre for Vocational Education Research. Retrieved April 7, 2015, from
http://www.ncver.edu.au/wps/portal/vetdataportal/restricted/publicationContent/!ut/p/a1/IZBPTwIxEMU_iweOzcyW0j_HFaJdopiIBtoLqaVKFcoClei3t2u8IjqHSSb5zbz3BizMwSZ3jC8ux21y6262fNFUdKg1w_Gd1hwbcfVwP9WPfaw4zMCC9Sm3eQUm-WPYLw4rtw_LHrbvT-vovy8dekgFVx3b-rgE4wdCUak
- Construction and Infrastructure Sponsor Group. (2014). *Workforce skills roadmap*. Retrieved April 7, 2015, from Workforce Skills Roadmap:
<http://www.workforceroadmap.org.nz/>
- Corcoran, M., Hanleybrown, F., Steinberg, A., & Tallant, K. (2012). *Collective Impact for Opportunity Youth*. Boston, MA, United States of America: FSG. Retrieved

- April 7, 2015, from http://www.aspeninstitute.org/sites/default/files/content/docs/resources/FSG_Collective_Impact_for_Opportunity_Youth_Report.pdf
- Curtis, M., & Norman, D. (2014). *Productivity trends and implications for our industry. BRANZ Study Report SR236*. Judgeford: BRANZ.
- Education Counts. (2015). *New Zealand Schools*. Retrieved April 13, 2015, from <http://www.educationcounts.govt.nz/data-services/directories/list-of-nz-schools>
- Foundation for Youth Development. (2015). *Graeme Dingle Foundation*. Retrieved April 7, 2015, from Foundation for Youth Development: <http://www.dinglefoundation.org.nz/about>
- Gap Inc. (2012). *A Toolkit for Employers: Connecting Youth & Business*. United States of America: United States Department of Labor. Retrieved April 7, 2015, from <http://www.dol.gov/summerjobs/pdf/Toolkit.pdf>
- Hospitality Guild. (2014). *Career Map*. Retrieved April 7, 2015, from Hospitality Guild: <http://www.hospitalityguild.co.uk/A-Career-in-Hospitality/Career-tools/Career-Map>
- Human Resources Institute of New Zealand. (2015, April 7). Retrieved April 7, 2015, from Human Resources Institute of New Zealand: www.hrinz.org.nz
- Inspiring Stories. (2015). *Festival for the Future*. (Inspiring Stories) Retrieved April 7, 2015, from Festival for the Future: <http://www.festivalforthefuture.org.nz/>
- IPENZ. (2014). *About FutureInTech*. Retrieved April 8, 2015, from FutureInTech: industry.futureintech.org.nz/about.cfm
- IPENZ. (2015). *About*. Retrieved April 8, 2015, from Engineering e2e Education-to-Employment: engineeringe2e.org.nz/About/
- Jackson, N. (2011). *Wake-up time: Kiwi complacency about the costs of the ageing population*. The University of Waikato, National Institute of Demographic and Economic Analysis. Hamilton, New Zealand: The University of Waikato. Retrieved April 7, 2015, from <http://docs.business.auckland.ac.nz/Doc/2011-Wake-up-call-Jackson.pdf>
- Jones, N. (2013, October 9). *McD's aims to make degree of difference*. Retrieved April 7, 2015, from New Zealand Herald: http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11137075
- Keep, E. (2015). *Youth Transitions, the Labour Market and Entry into Employment for Priority Learners - some reflections and questions*. Cardiff, United Kingdom: University of Oxford & University of Cardiff. Retrieved April 7, 2015, from <https://akoaootea.ac.nz/download/ng/file/group-5797/youth-transitions-the-labour-market--entry-into-employment.pdf>
- Massey University. (2013, October 9). *Do you want a degree with that?* Retrieved April 7, 2015, from Massey University: <http://www.massey.ac.nz/massey/about-massey/news/article.cfm?mnarticle=do-you-want-a-degree-with-that-09-10-2013>

Mayors Taskforce for Jobs. (2014). *Mission & Objectives*. Retrieved April 7, 2015, from Mayor's Taskforce for Jobs: <http://www.mayorstaskforceforjobs.co.nz/home/about-us/mission-and-objectives/>

Ministry of Business, Innovation and Employment. (2013). *The New Zealand Sectors Report 2013: Construction*. Wellington, New Zealand: Ministry of Business, Innovation and Employment. Retrieved April 8, 2015, from <http://www.mbie.govt.nz/what-we-do/business-growth-agenda/sectors-reports-series/pdf-document-library/construction-report.pdf>

Ministry of Business, Innovation and Employment. (2016). *Occupation Outlook 2015*. Retrieved April 7, 2015, from Ministry of Business, Innovation & Employment: <http://mbie.govt.nz/info-services/employment-skills/labor-market-reports/occupation-outlook>

Ministry of Education. (2016a, April 2). *Tertiary Education Strategy 2014-2019*. Retrieved April 7, 2015, from Ministry of Education: <http://www.education.govt.nz/further-education/policies-and-strategies/tertiary-education-strategy/>

Ministry of Education. (2016b). *Vocational Pathways*. Retrieved April 7, 2015, from Youth Guarantee: <http://www.youthguarantee.net.nz/vocational-pathways>

Ministry of Social Development. (2015). Retrieved April 7, 2015, from Ministry of Youth Development: <http://www.myd.govt.nz/>

Mourshed, M., Patel, J., & Suder, K. (2014, January). *Education to Employment: Getting Europe's Youth into Work*. Washington DC, United States of America: McKinsey Center for Government. Retrieved April 7, 2015, from http://www.mckinsey.com/insights/social_sector/converting_education_to_employment_in_europe

Opportunity Nation. (2016). Retrieved April 7, 2015, from Opportunity Nation: <https://opportunitynation.org/call-to-action-youth-employment/>

Rekindle. (2015). Retrieved April 7, 2015, from rekindle: <http://www.rekindle.org.nz/pages/mission>

SCIRT. (2015). *Who we are*. Retrieved August 5, 2015, from SCIRT: <http://strongerchristchurch.govt.nz/about/structure>

ServiceIQ. (2015). *The Warehouse Red and Blue Shirts in Schools Gateway Programmes*. Retrieved April 7, 2015, from ServiceIQ: <http://www.serviceiq.org.nz/schools-old/gateway/the-warehouse-red-and-blue-shirts-in-schools-gateway-programmes/>

Smart Waikato. (2014). *Principal for a Day*. Retrieved April 7, 2015, from Smart Waikato: <http://www.smartwaikato.co.nz/page/73-principal-for-a-day+principal-for-a-day>

Smart Waikato. (2015). *Young Enterprise Scheme (YES)*. Retrieved April 7, 2015, from Smart Waikato: <http://www.smartwaikato.co.nz/page/11-yes>

- Smart Waikato. (2016). *Futureforce Action Network*. Retrieved April 7, 2015, from Smart Waikato: <http://www.smartwaikato.co.nz/page/88-fan>
- Sustainable Business Council. (2013). *Future Leaders' Programme*. Retrieved April 8, 2015, from Sustainable Business Council: <http://www.sbc.org.nz/our-work/flp>
- Sustainable Business Council. (2014). *Future Leaders' Programme*. Retrieved April 8, 2015, from Sustainable Business Council: <http://www.sbc.org.nz/projects/future-leaders-programme>
- Tertiary Education Commission. (2014, October 29). *Information for Learners*. Retrieved April 7, 2015, from Tertiary Education Commission: <http://www.tec.govt.nz/Tertiary-Sector/Reviews-and-consultation/Information-for-Learners/>
- The Salvation Army. (2016). *Children & Youth*. Retrieved April 7, 2015, from The Salvation Army: <http://www.salvationarmy.org.nz/need-assistance/youth-children>
- Work and Income. (2015). *Business*. Retrieved April 7, 2015, from Work and Income: <http://www.workandincome.govt.nz/business/>
- Workbase. (2015). Retrieved April 7, 2015, from Workbase: www.workbase.org.nz
- Workchoice Trust. (2015). *Workchoice Programmes for Schools 2015*. Retrieved April 7, 2015, from Workchoice Trust: <http://www.workchoice.co.nz/assets/Resources-OLD/Workchoice-2015-Schools-Brochure.pdf>
- Young Enterprise Trust. (2016). Retrieved April 7, 2015, from Young Enterprise Trust: <http://youngenterprise.org.nz>
- YouTubeNZ. (2013, August 22). Small town big change: Dale Williams at TEDxAuckland. Auckland. Retrieved April 7, 2015, from https://www.youtube.com/watch?v=ib-raWy_TXI

Project publications

Publication	Date
<i>Build</i> 153 – April/May	Apr 2016
<i>Build</i> 147 – April/May	Apr 2015
<i>Build</i> 146 – February/March	Feb 2015
Consultation document	15 Jan 2015

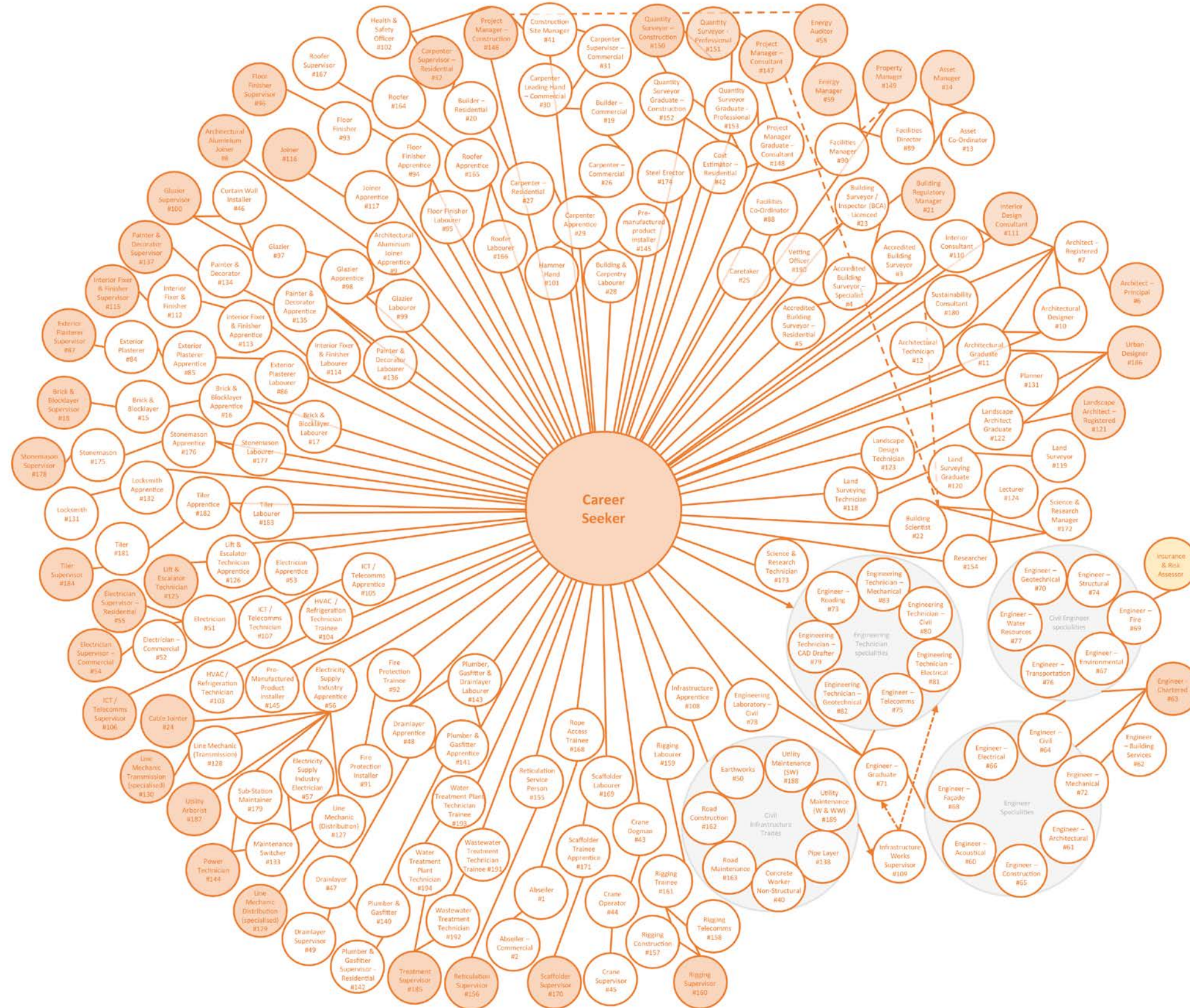
Project presentations

Audience	Date
Construction Strategy Group – BRANZ	3 Mar 2016
BRANZ Brown Bag Lunch – BRANZ	4 Mar 2015
Building Research Advisory Council (BRAC) – BRANZ	27 Feb 2015
Wellington Building Sector Group – BRANZ	18 Feb 2015
Workshop A – BRANZ	09 Dec 2014
Workshop B – Wellington Airport Conference Centre	17 Mar 2015
Fifth International Conference on Multiple Pathways and Transitions: Pathways, Transitions and Working Across Boundaries – Manukau Institute of Technology	30 Jun 2015

Appendix A: Abbreviations and terminology

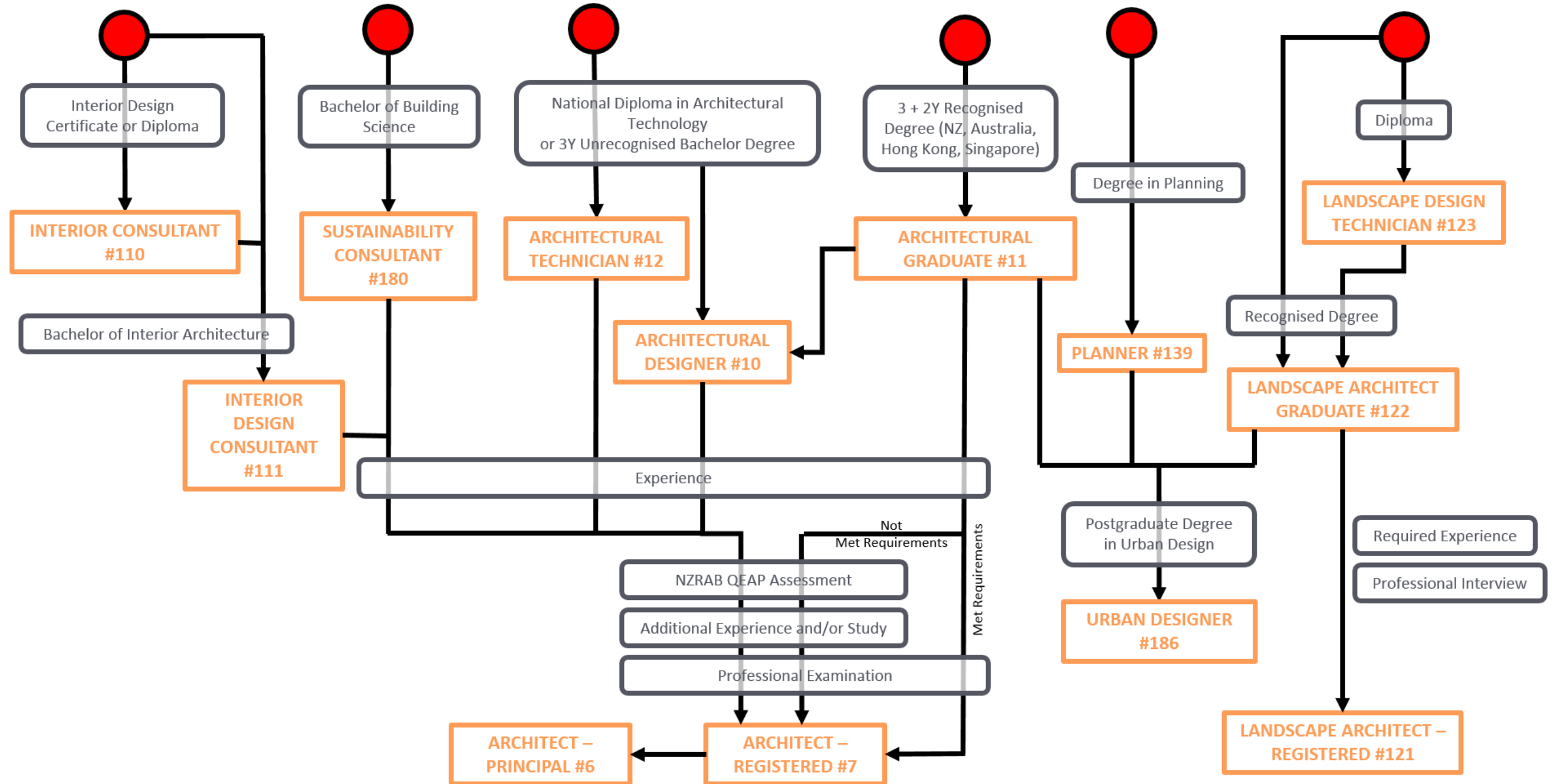
ANZSCO	Australian and New Zealand Standard Classification of Occupations
ANZSIC	Australian and New Zealand Standard Industrial Classifications
BCITO	Building and Construction Industry Training Organisation
BIM	Building information modelling
BRAC	Building Research Advisory Council
Business & Industry	Target audience group of mainly employers and supply-side information seekers
C&I	Construction and infrastructure
CAD	Computer-aided design
CATE	Career and Transition Education Association (Aotearoa)
FLP	Future Leaders Programme (through the Sustainable Business Council)
FYD	Foundation for Youth Development
HRINZ	Human Resources Institute of New Zealand
Informer/Influencer	Target audience group of mainly career advisors, parents and whanau
ITO	Industry Training Organisation
ITPs	Institutes of Technology and Polytechnics
MBIE	Ministry of Business, Innovation and Employment
MSD	Ministry of Social Development
NEET & Disengaged	Not in Education, Employment or Training (NEET) and/or those not actively seeking to do so
NZQA	New Zealand Qualifications Authority
NZQF	New Zealand Qualifications Framework
NZSCED	New Zealand Standard Classification of Education
NZWETA	New Zealand Water and Environment Training Academy
SBC	Sustainable Business Council
SME	Small-to-medium enterprise
TEC	Tertiary Education Commission
VPs	Vocational Pathways (Ministry of Education)
WINZ	Work and Income New Zealand
Worker & Employee	Target audience group of those already in employment, either considering change or transition to other roles or checking their own performance in a given role
YG	Youth Guarantee (Ministry of Education)
Youth & Learner	Target audience group of those studying towards either secondary school or tertiary and ITP education

Appendix B: Career Development Map and branches



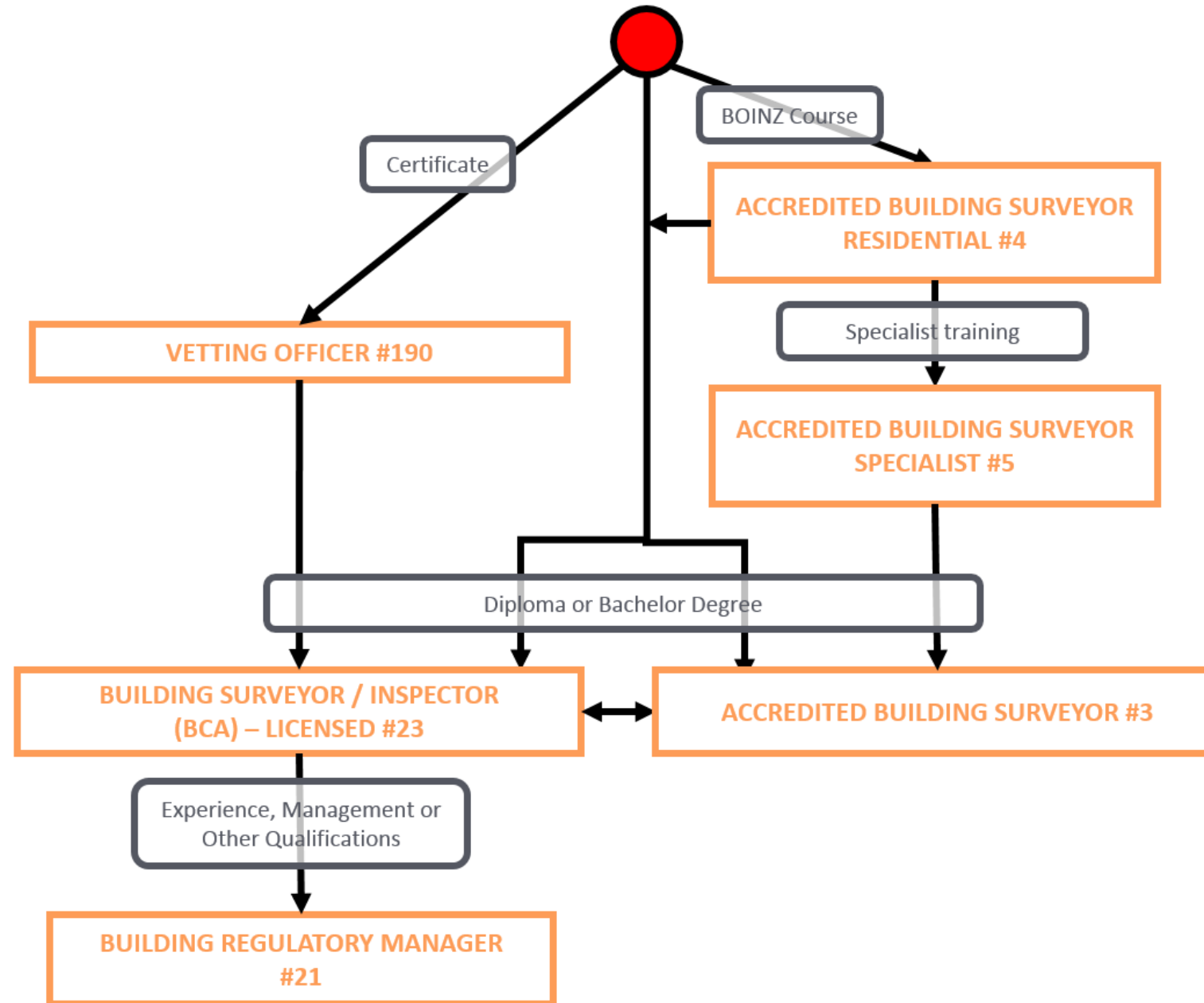
B.1 Architecture, Design, Urban Design & Planning

ARCHITECTURE, DESIGN, URBAN DESIGN & PLANNING



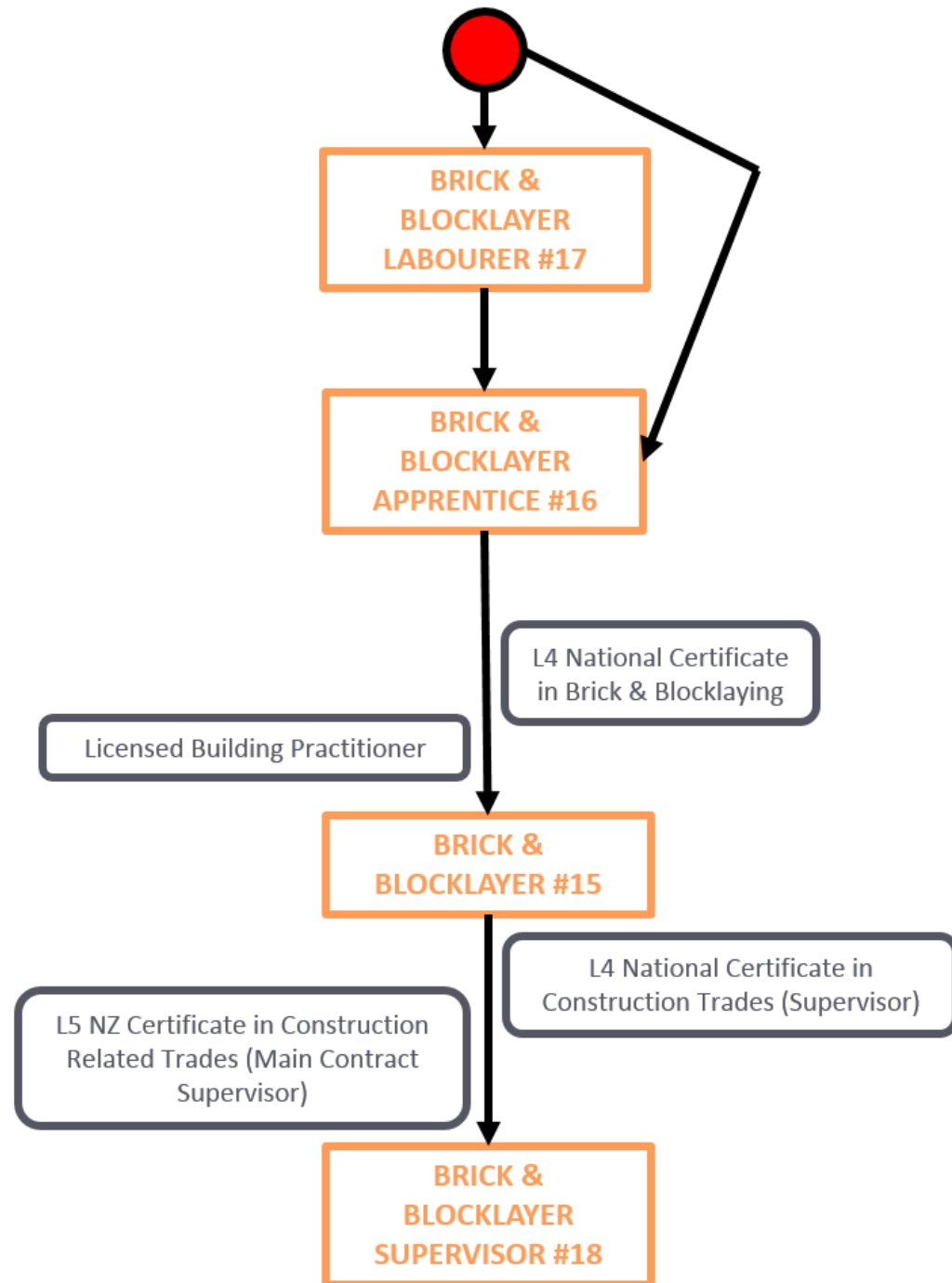
B.2 Building Officials & Building Surveying

BUILDING OFFICIALS & BUILDING SURVEYING

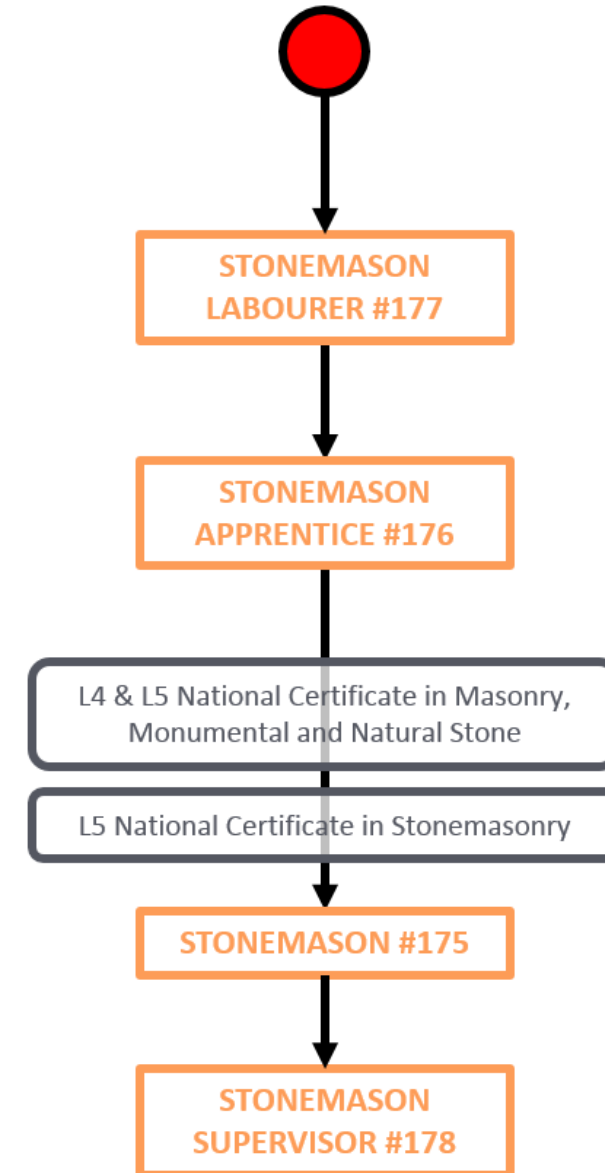


B.3 Building & Construction Trades
B.3.1 Brick & Blocklaying and Stonemasonry Trades

BRICK & BLOCKLAYING

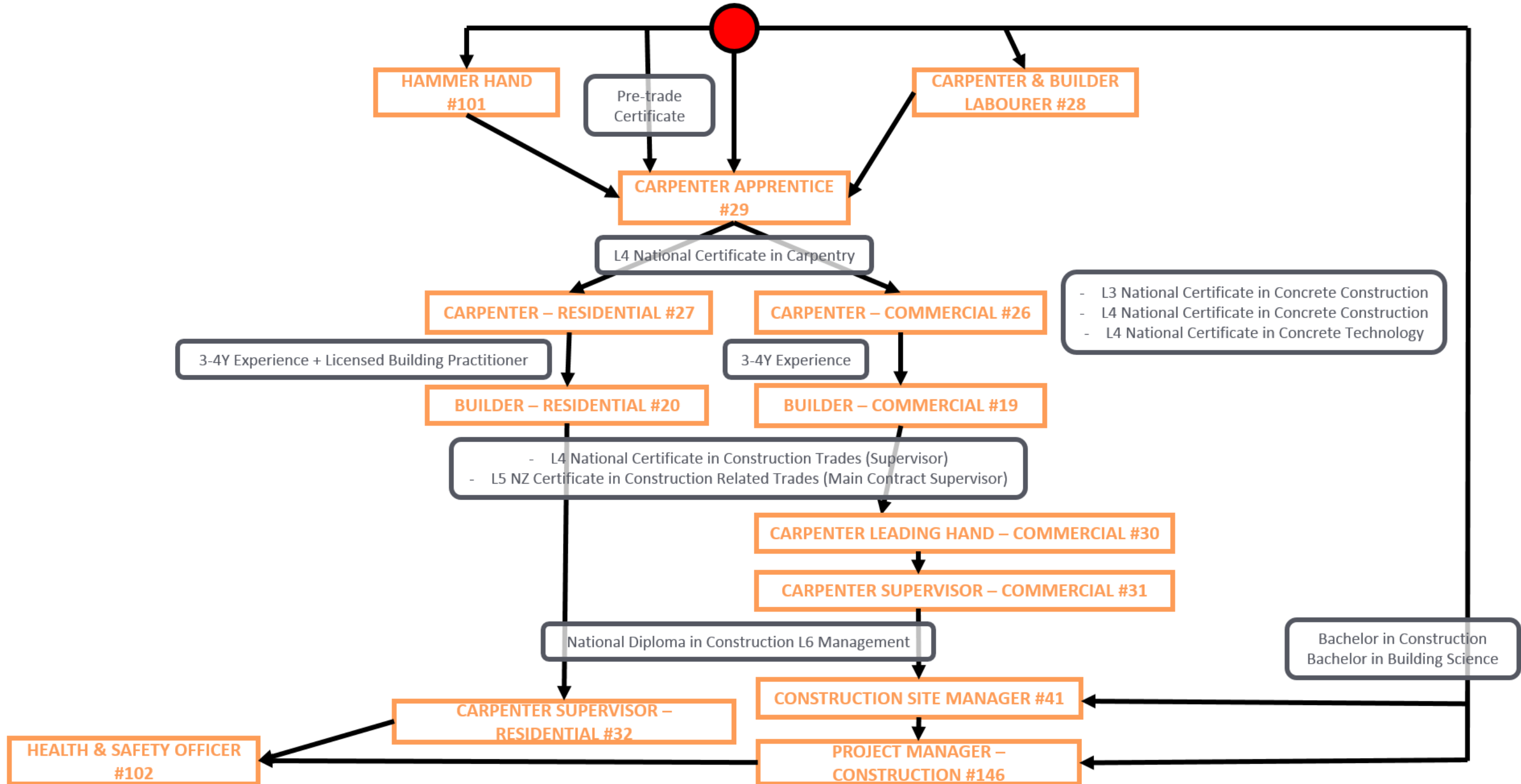


STONEMASONRY



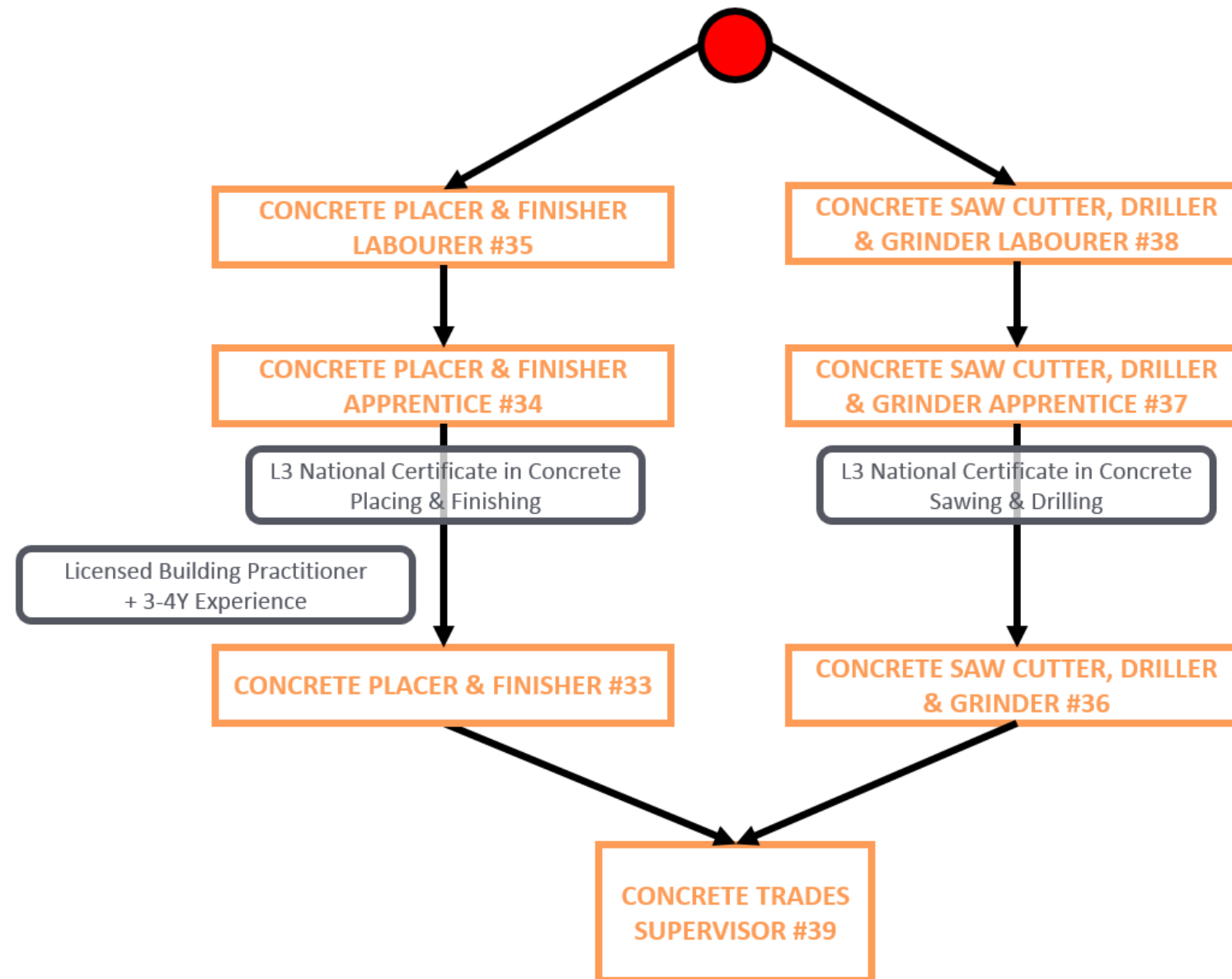
B.3.2 Carpentry & Building Trade

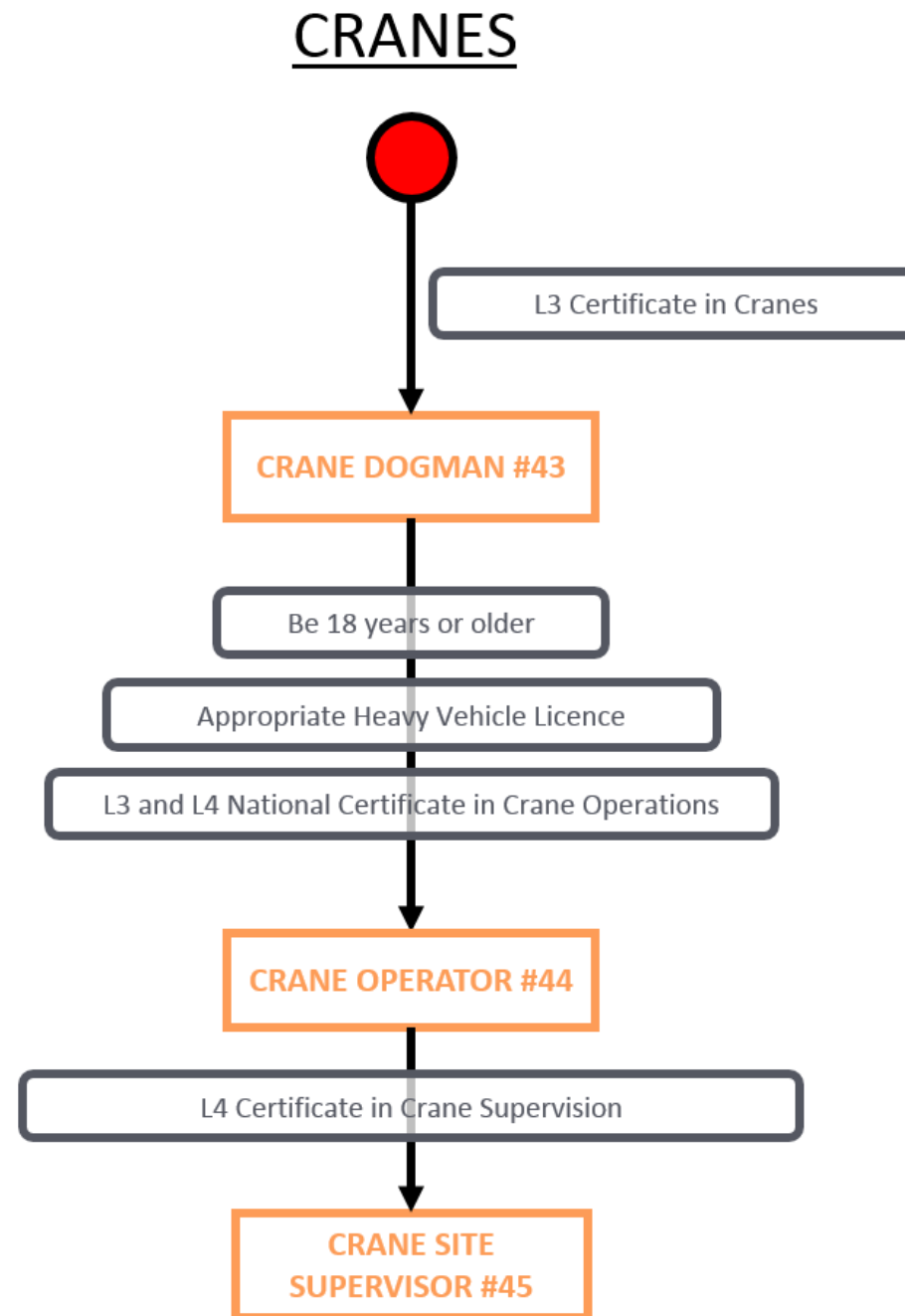
CARPENTRY & BUILDING



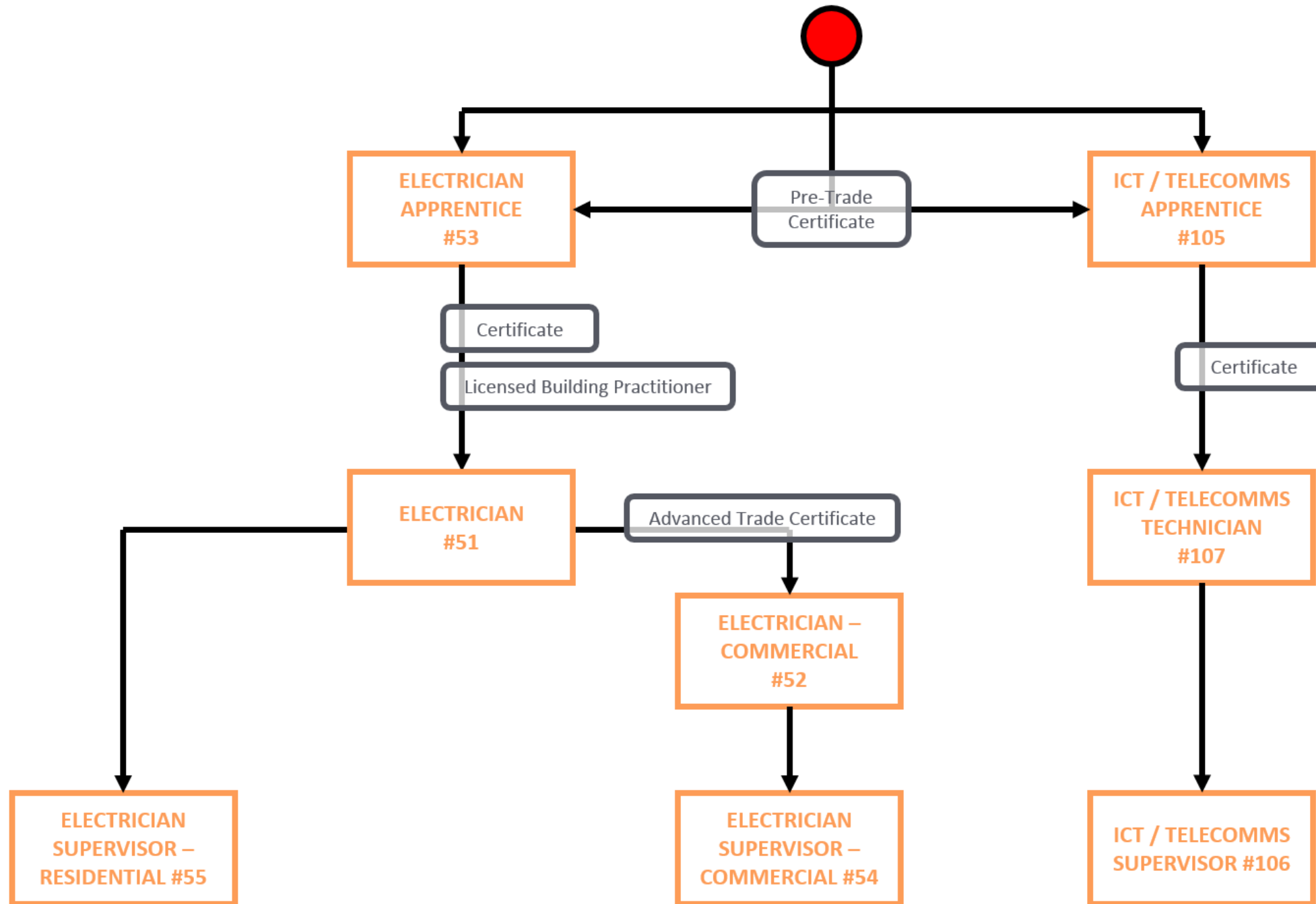
B.3.3 Concrete Trades

CONCRETE TRADES



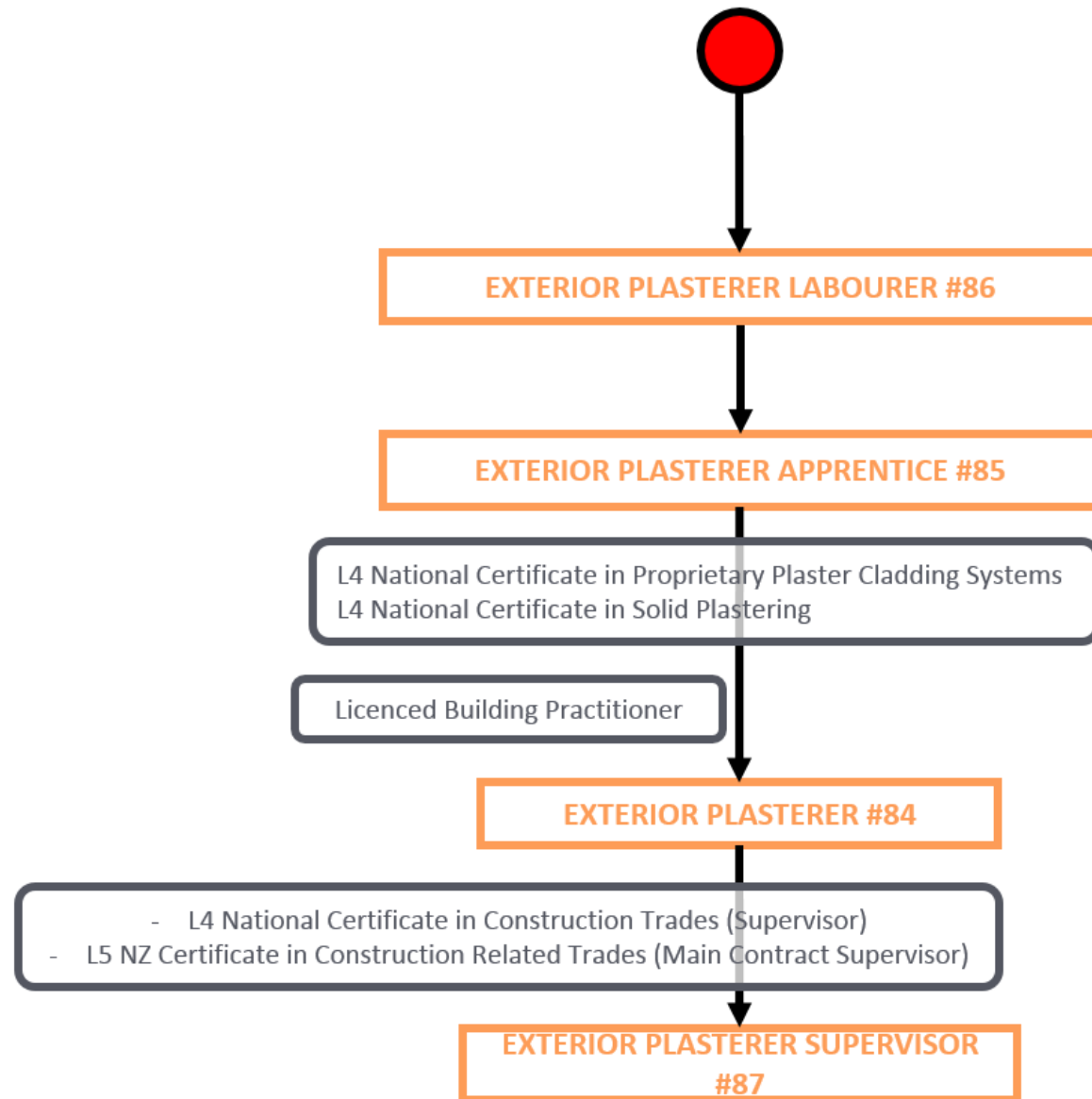


ELECTRICIAN & ICT TRADES

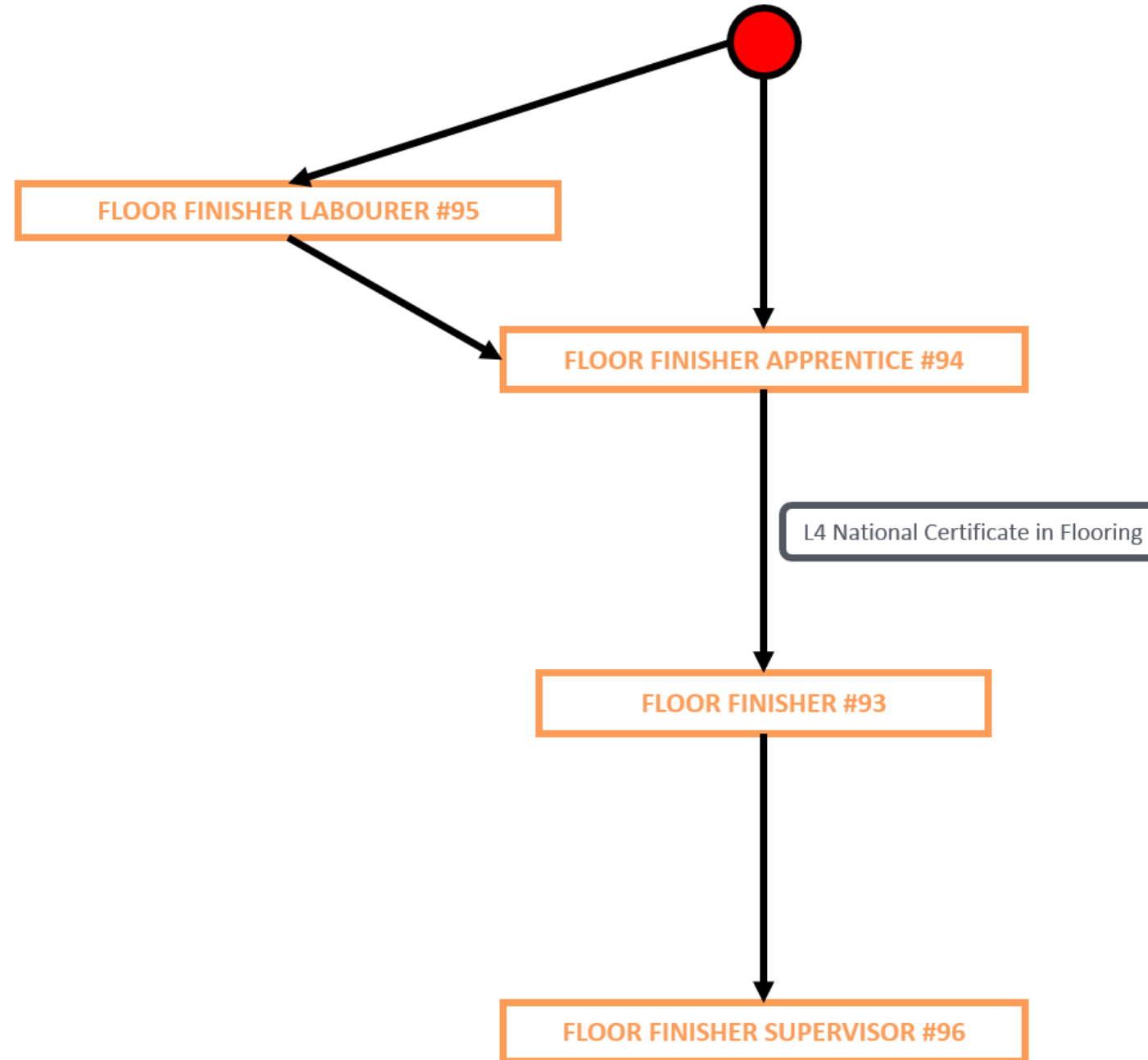


B.3.6 Exterior Plastering Trade

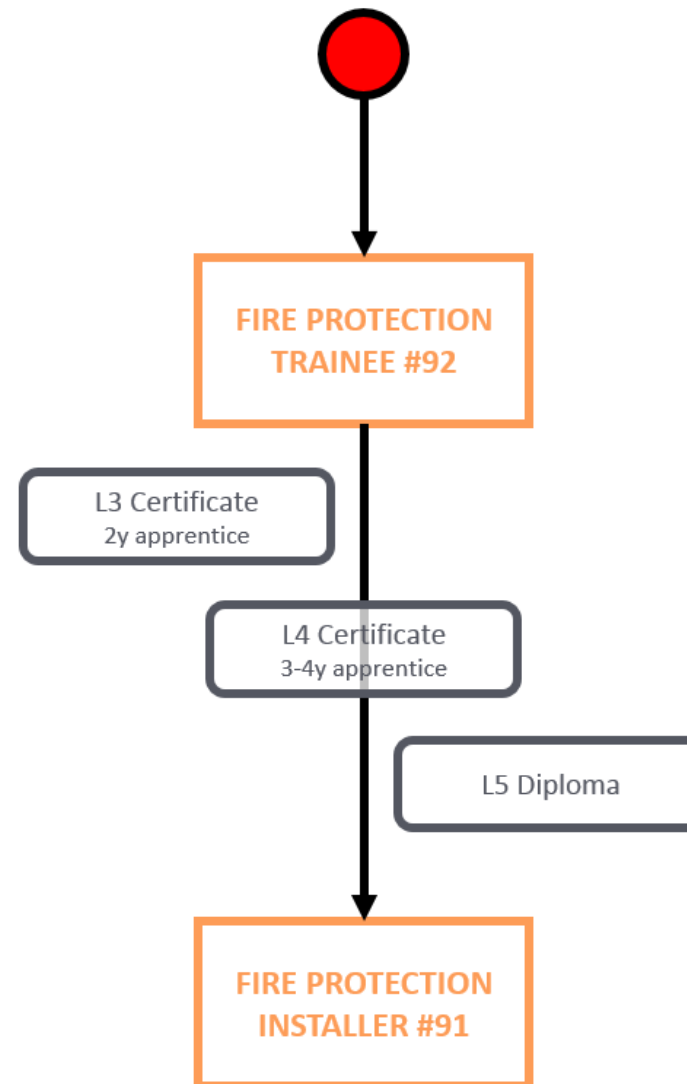
EXTERIOR PLASTERING



FLOORING FINISHING TRADE



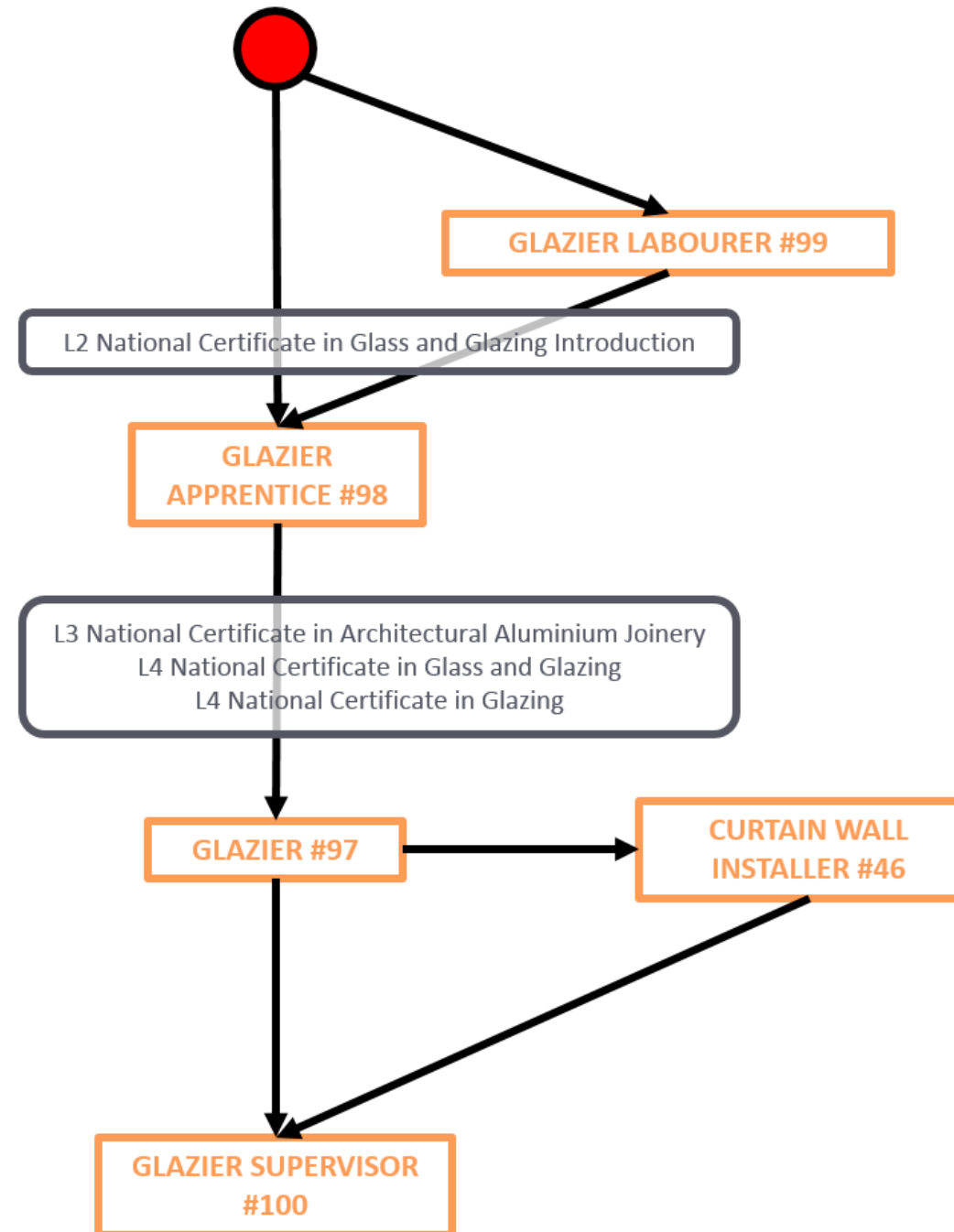
FIRE PROTECTION TRADE (install, maintain, inspect & test fire protection equipment)



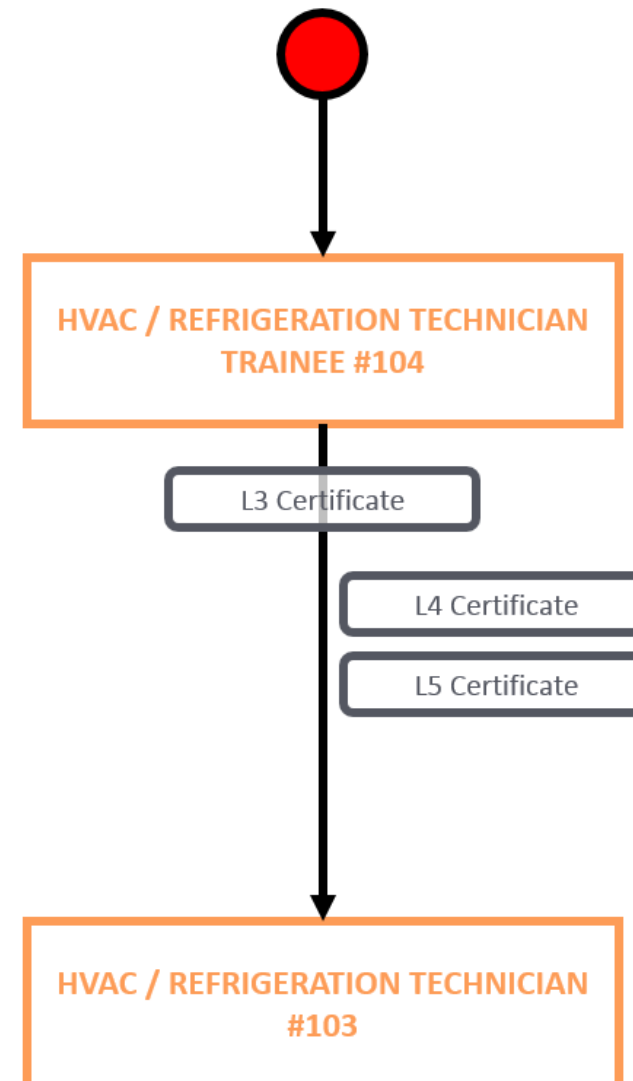
SPECIALISATIONS:

- Hand operated fire fighting equipment
- Fire detection & alarms systems
- Fixed fire protection systems
- Passive fire protection

GLASS & GLAZING



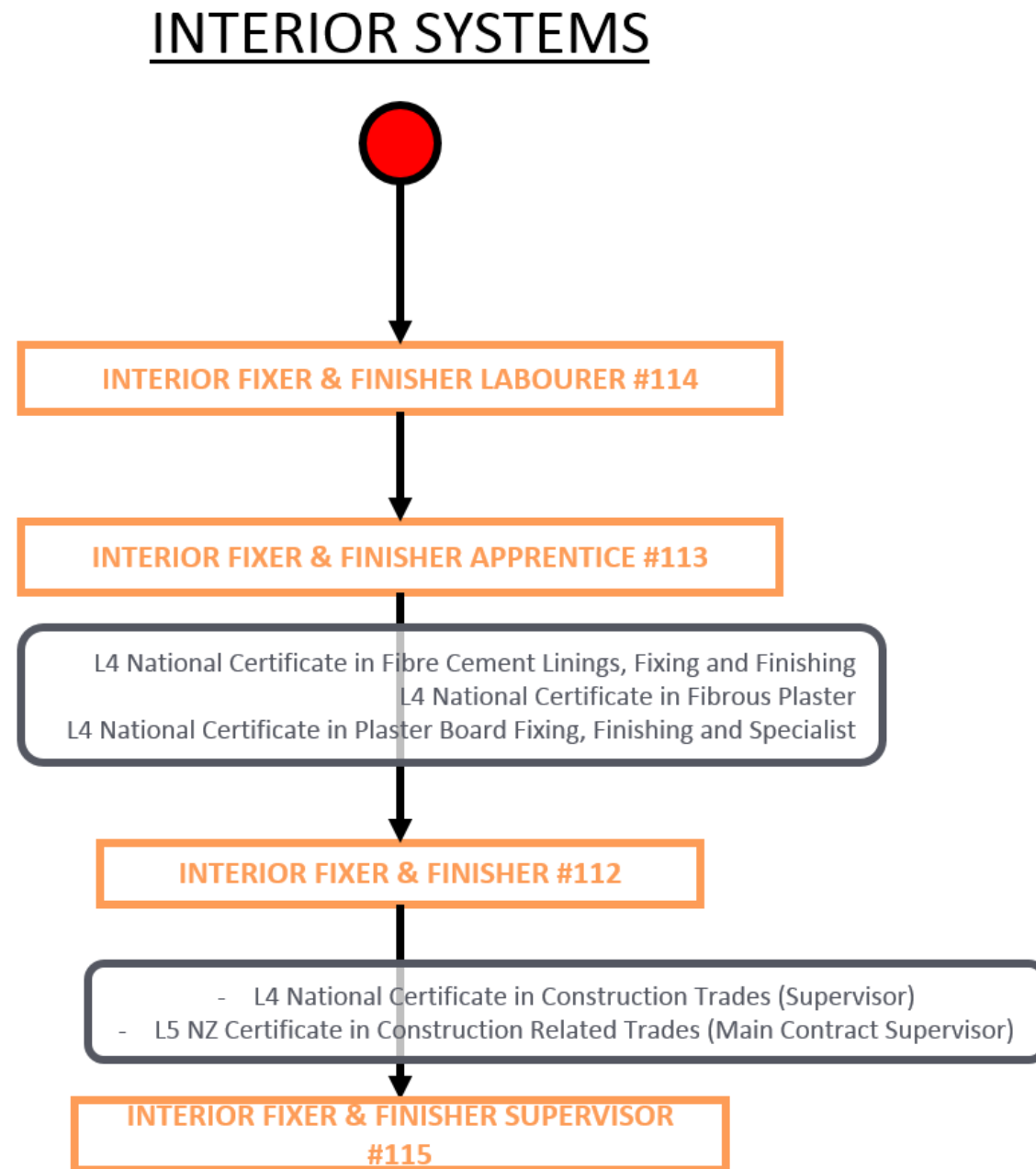
HEATING, VENTILATING & AIR-CONDITIONING AND REFRIGERATION TRADES (~~manufacturing~~, installing, maintaining)



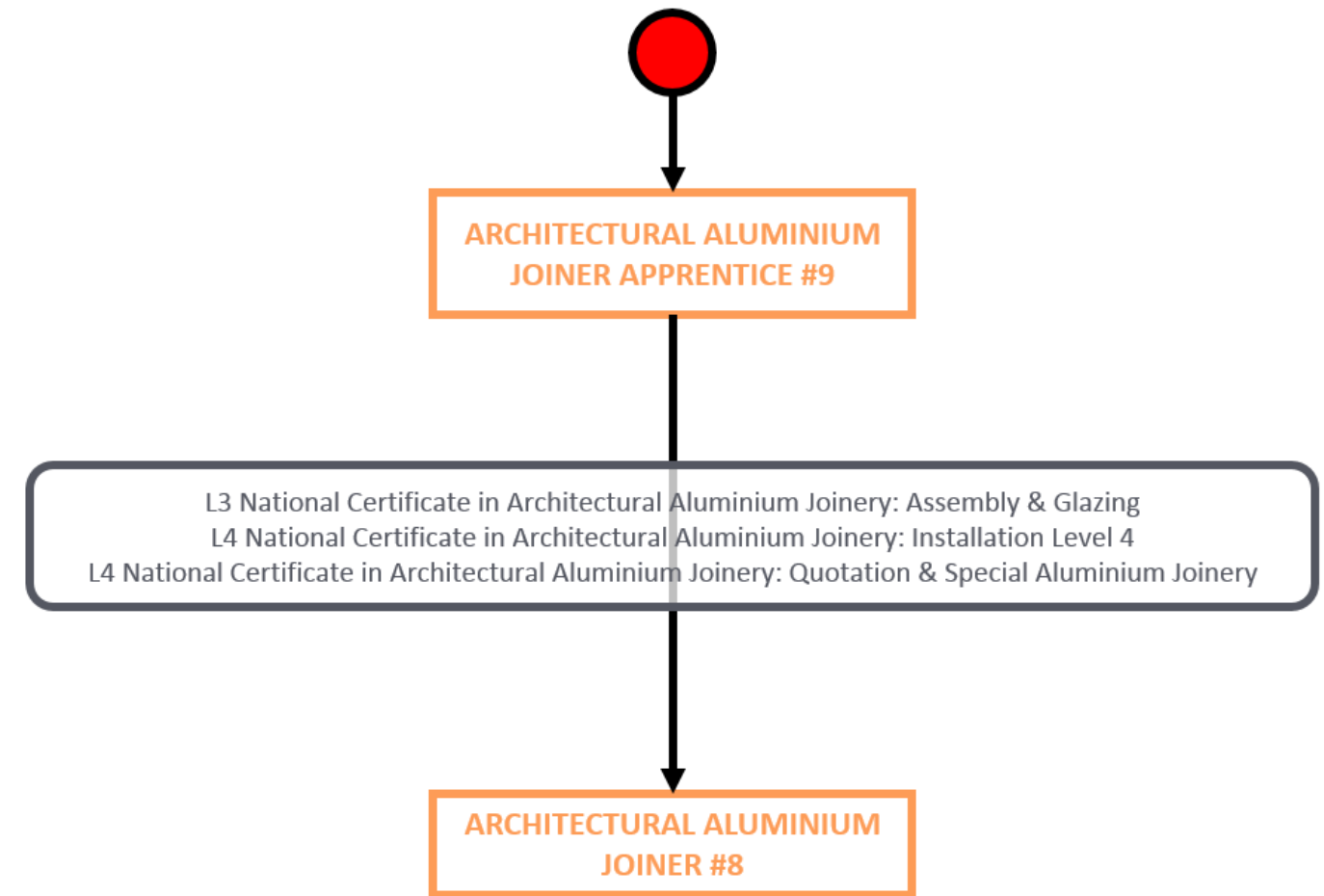
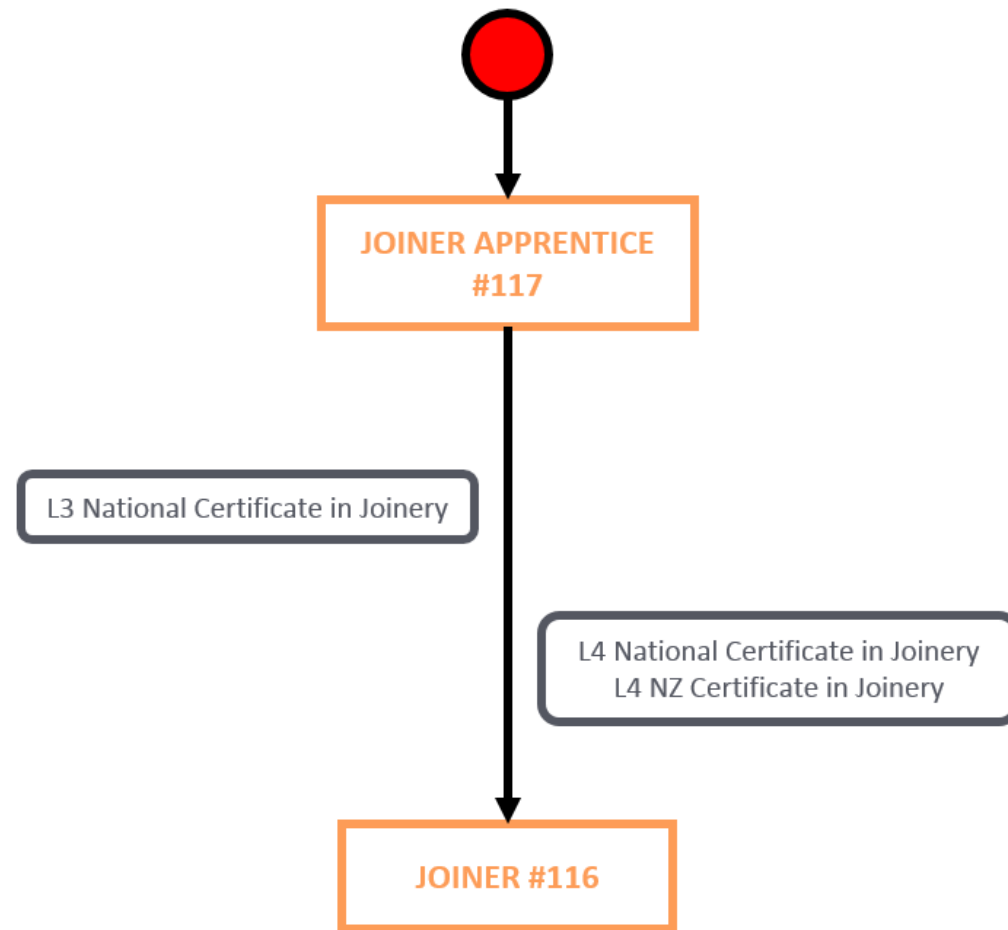
SPECIALISATIONS:

- Heating, Ventilating & Air-Conditioning
- Refrigeration & Air-Conditioning
- Split System Air-Conditioning

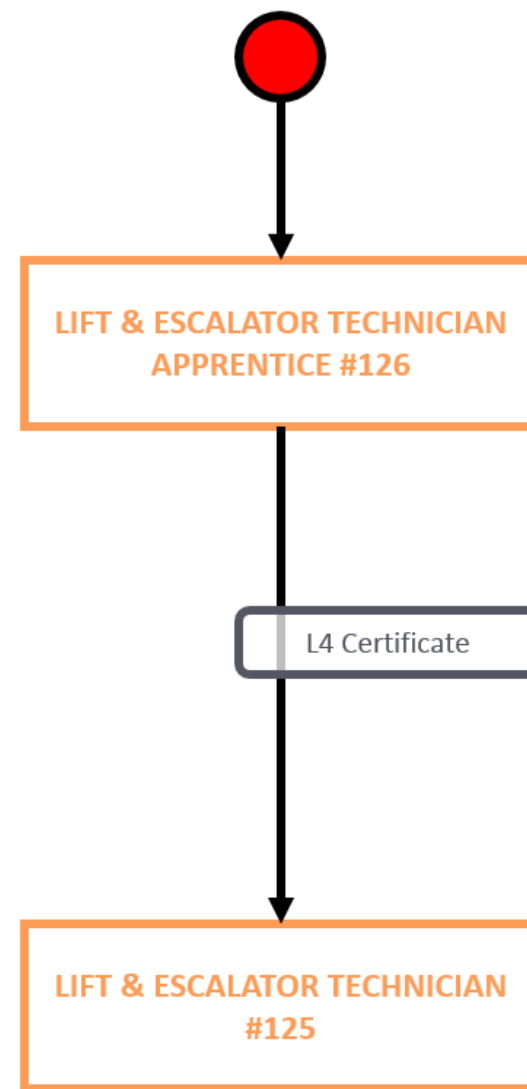
B.3.11 Interior Fixing & Finishing Trade



TIMBER & ALUMINIUM JOINERY

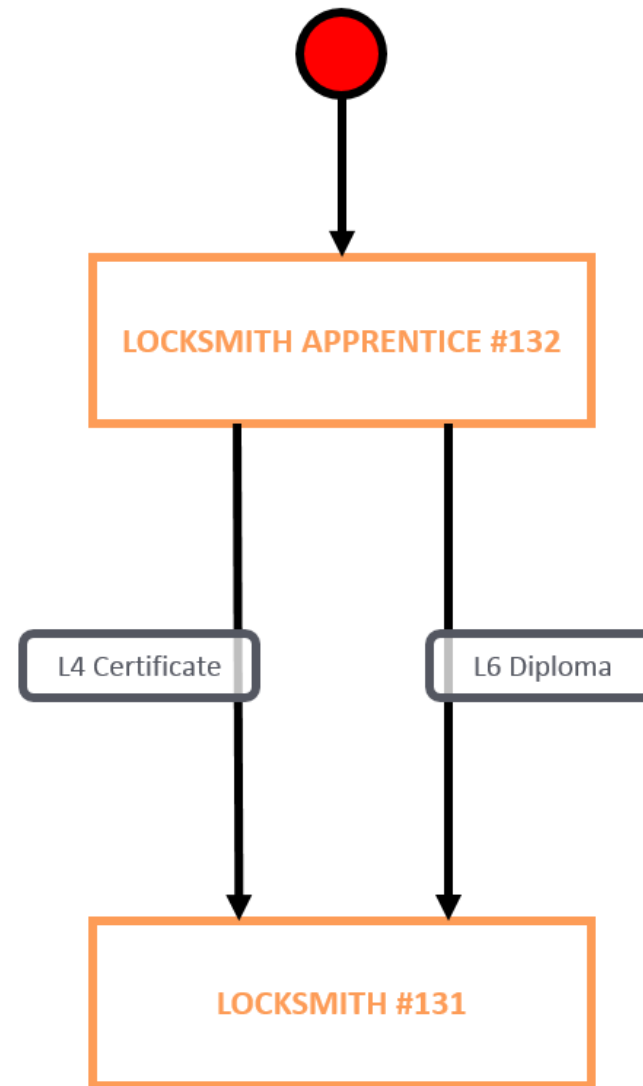


LIFTS & ESCALATORS TRADE

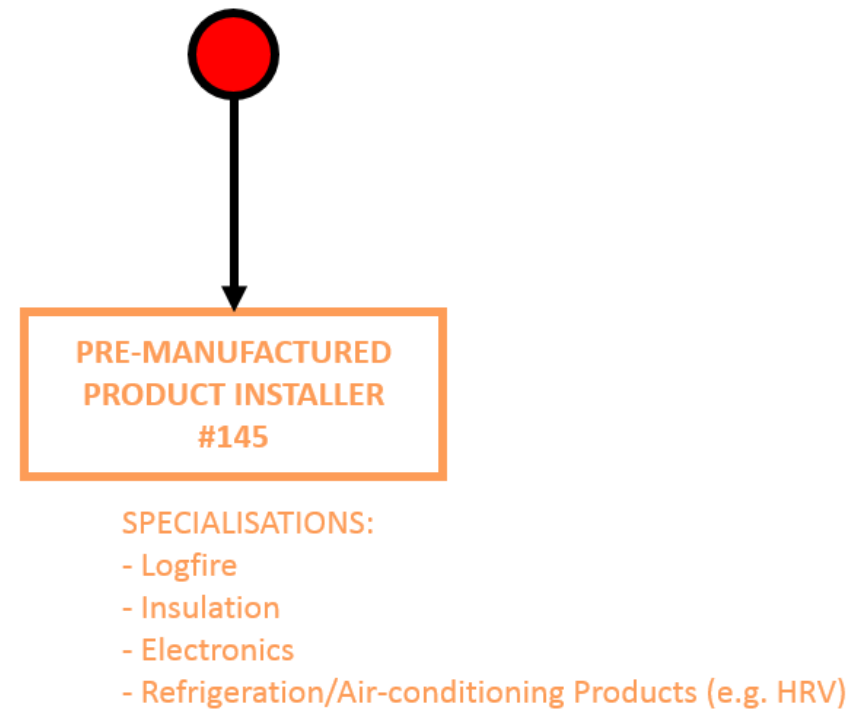


B.3.14 Locksmithing Trade

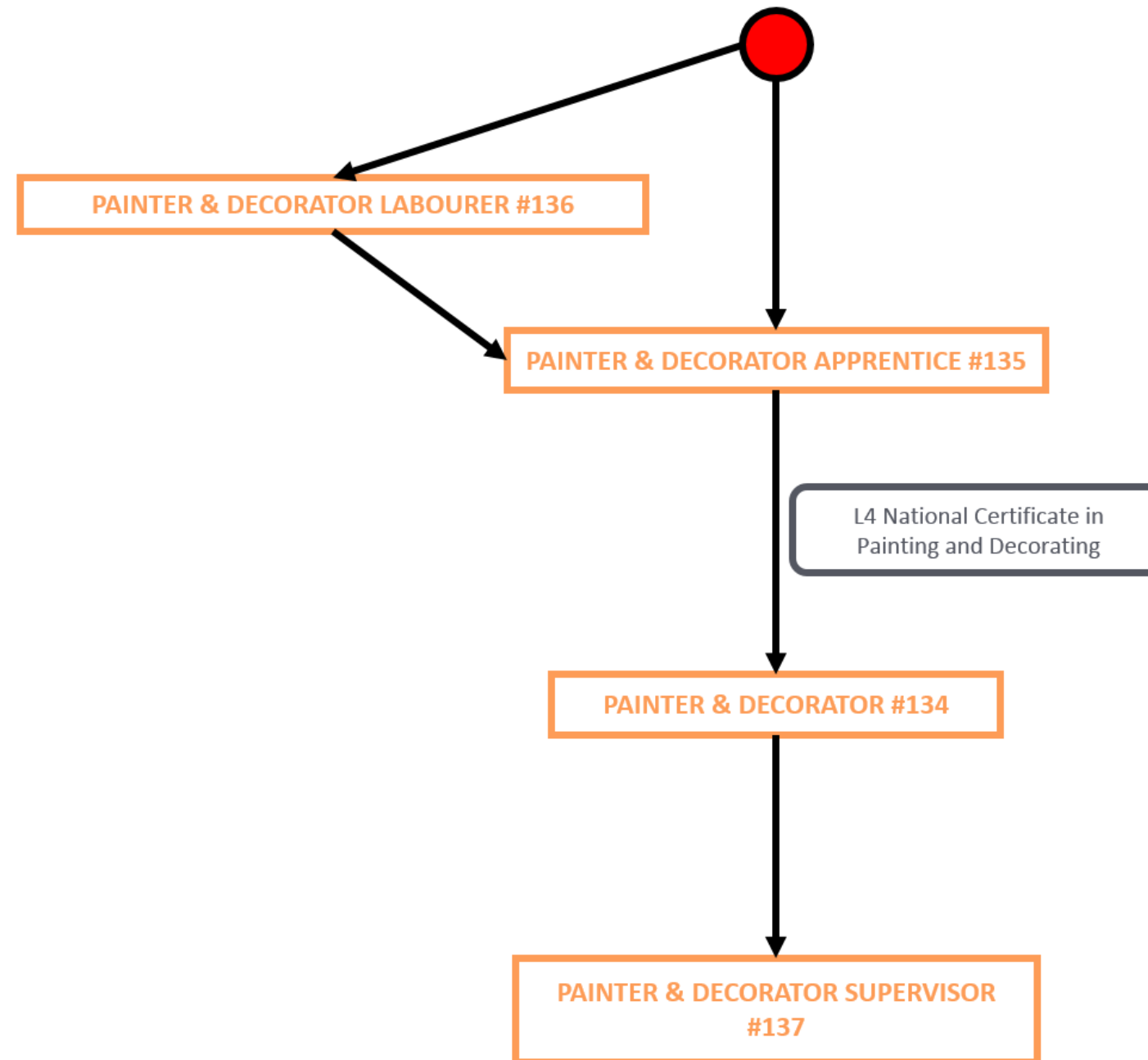
LOCKSMITHING TRADE



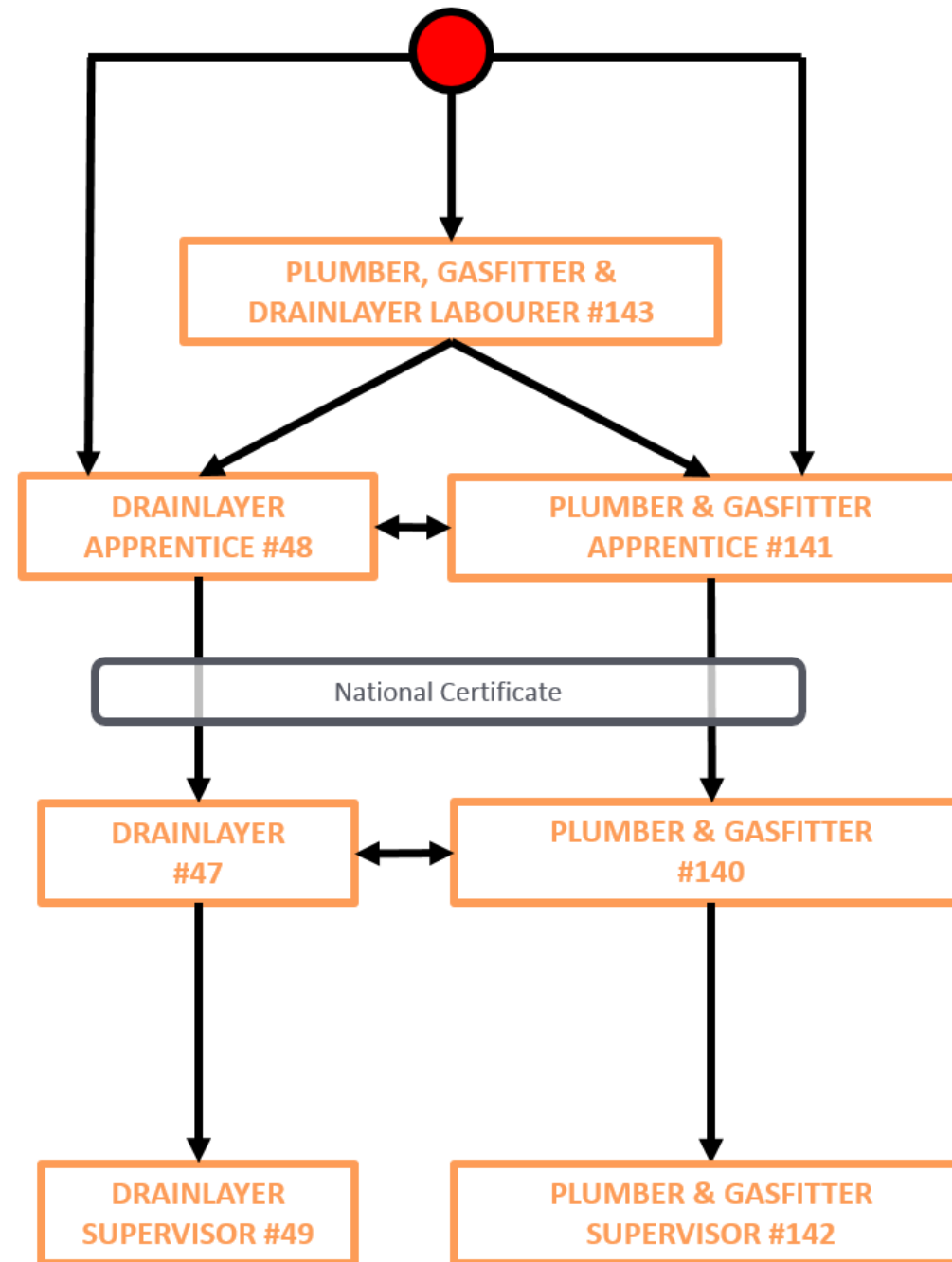
OTHER (pre-manufactured product installation) TRADES



PAINTING & DECORATING TRADE

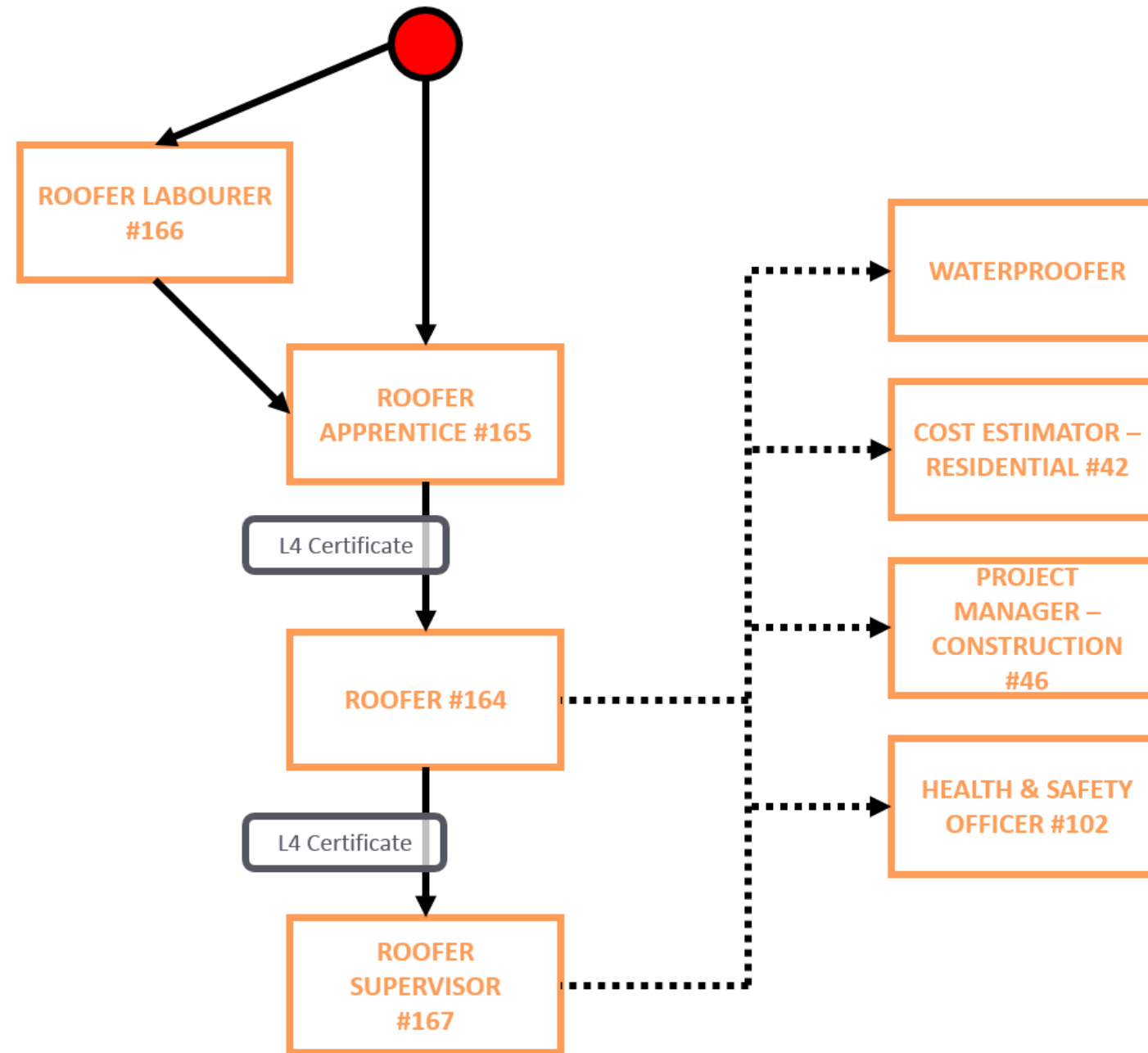


PLUMBING, GASFITTING & DRAINLAYING



B.3.18 Roofing Trade

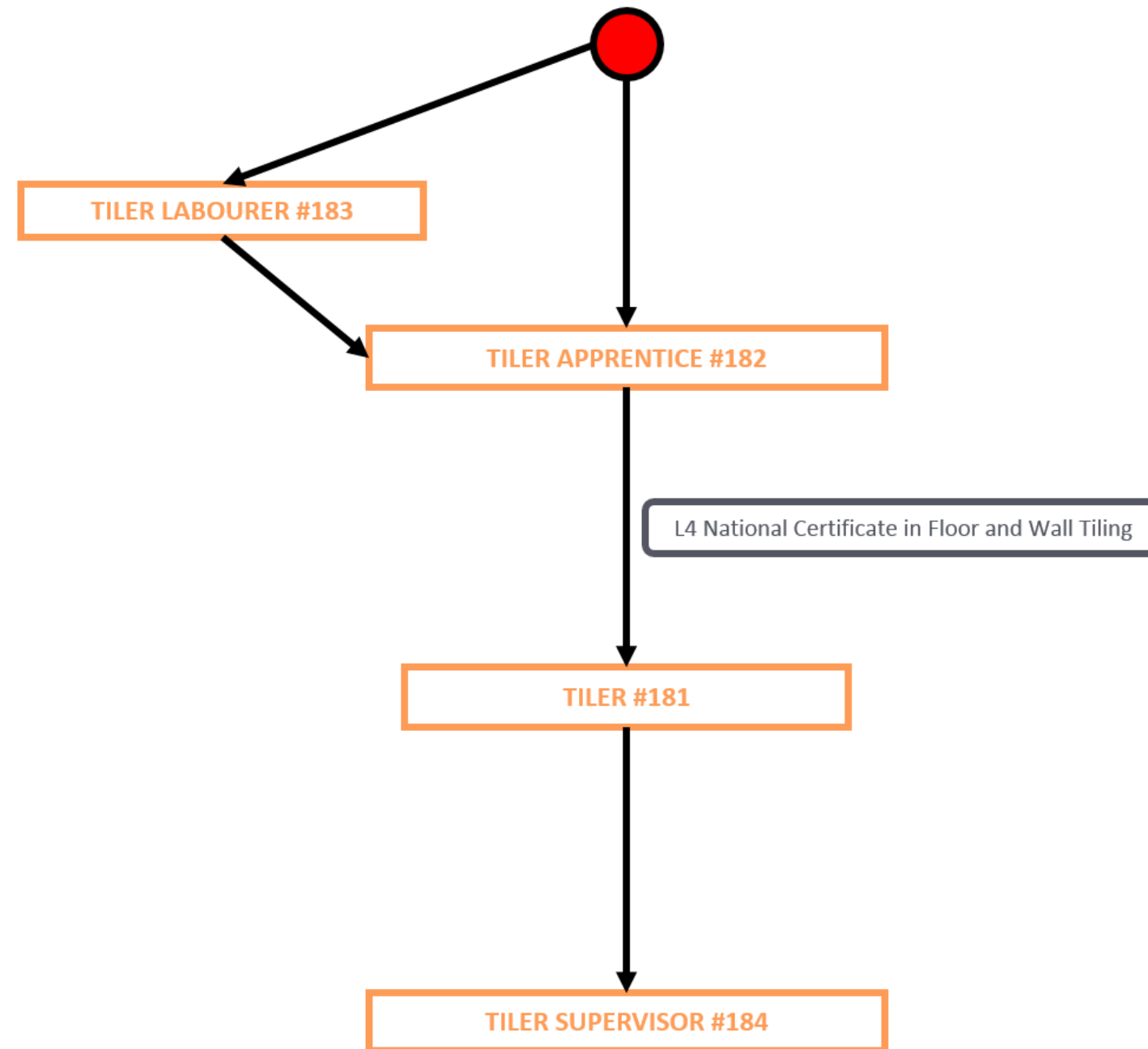
ROOFING TRADE



STEEL TRADES

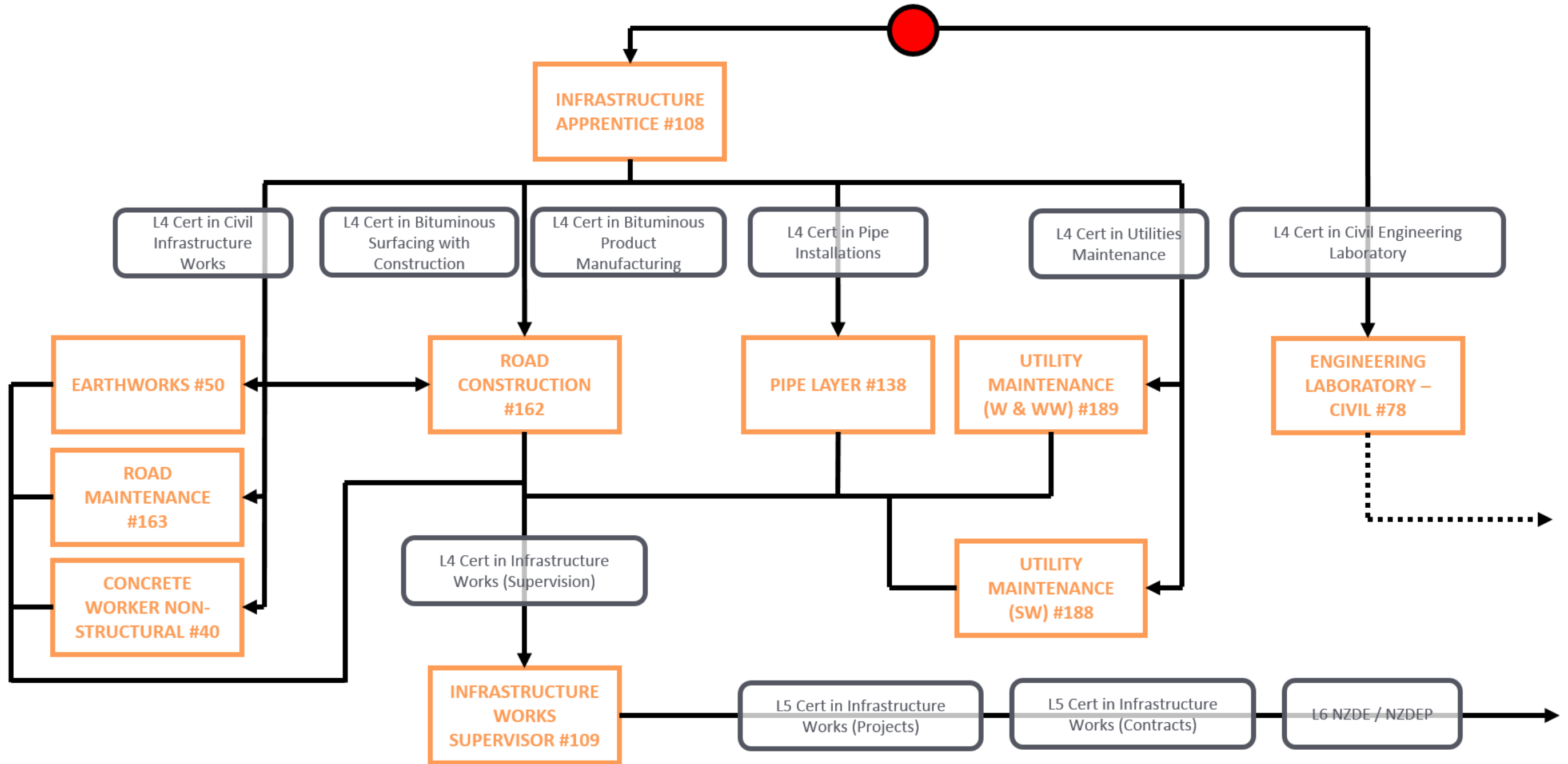


TILING TRADE



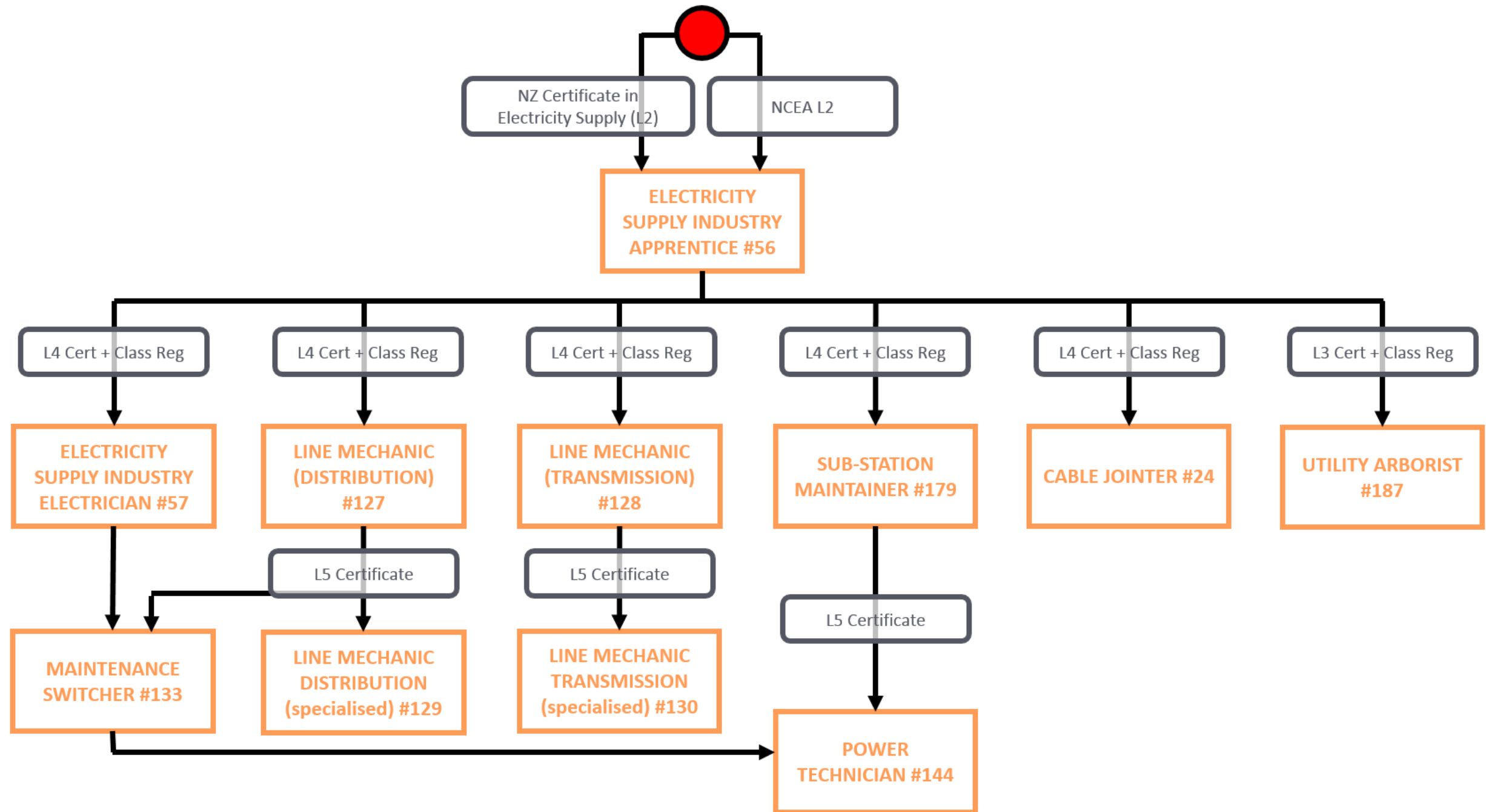
B.4 Civil Infrastructure Trades

CIVIL INFRASTRUCTURE TRADES



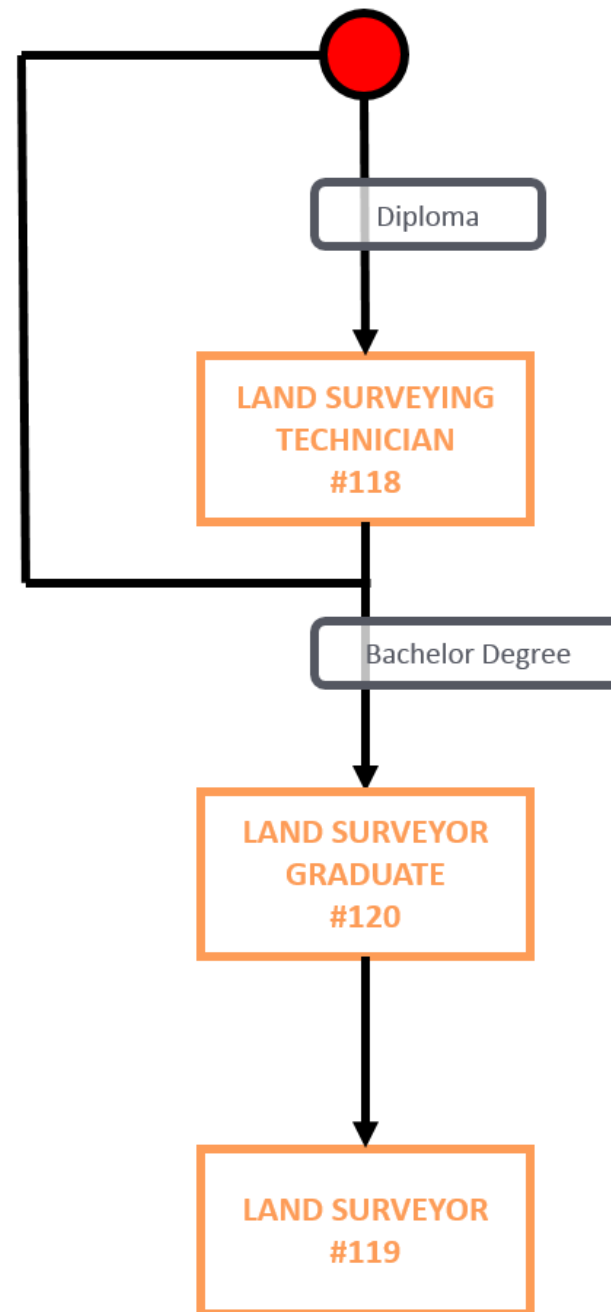
B.5 Electricity Supply Infrastructure

ELECTRICITY SUPPLY INDUSTRY



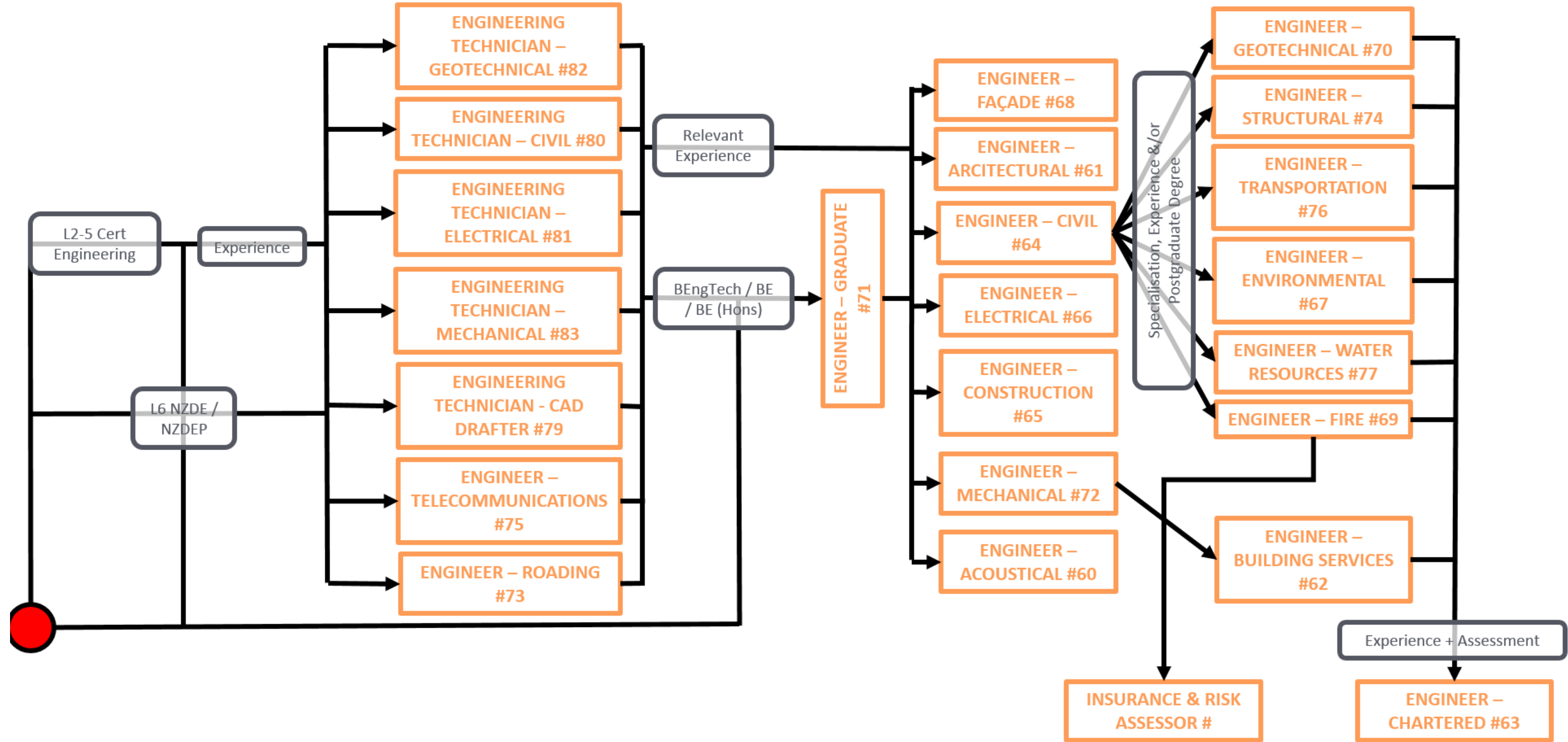
B.6 Land Surveying

LAND SURVEYING



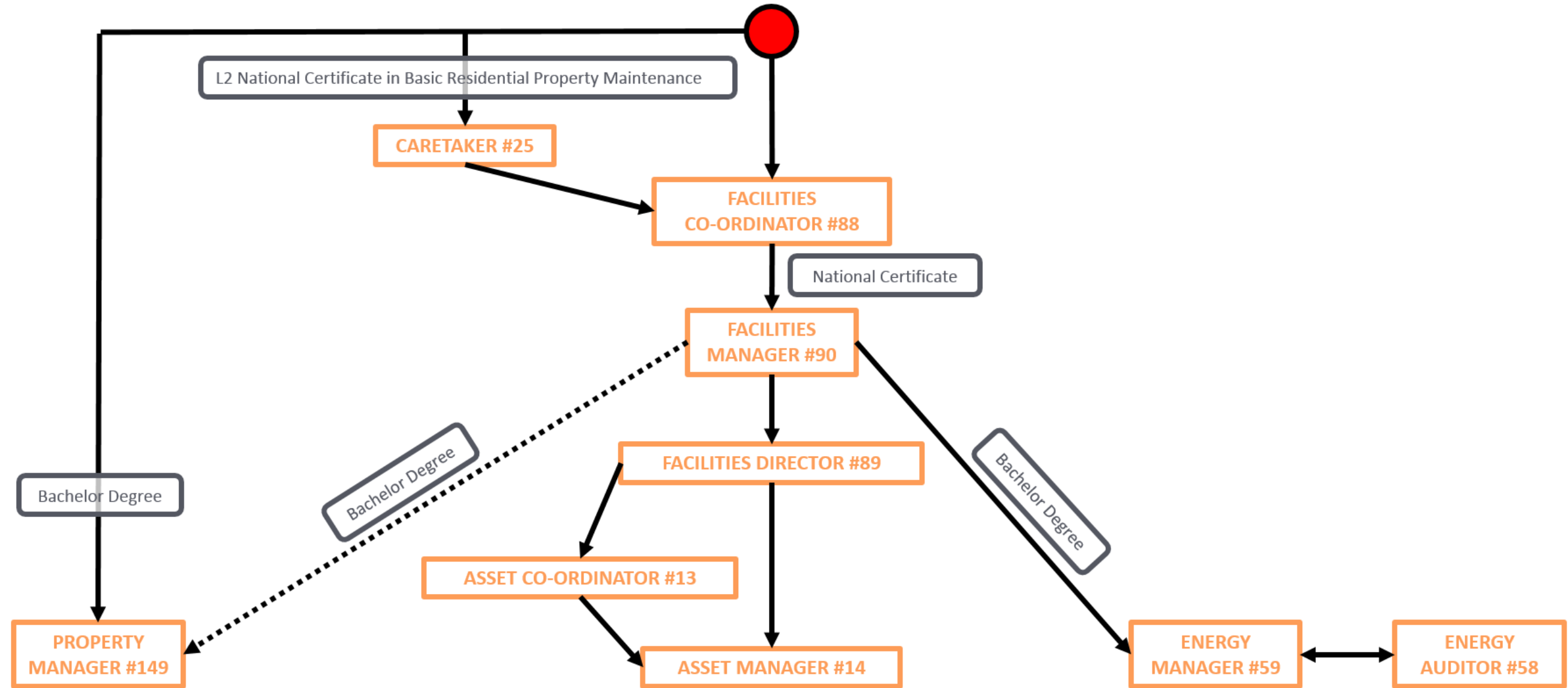
B.7 Professional Engineering

PROFESSIONAL ENGINEERING



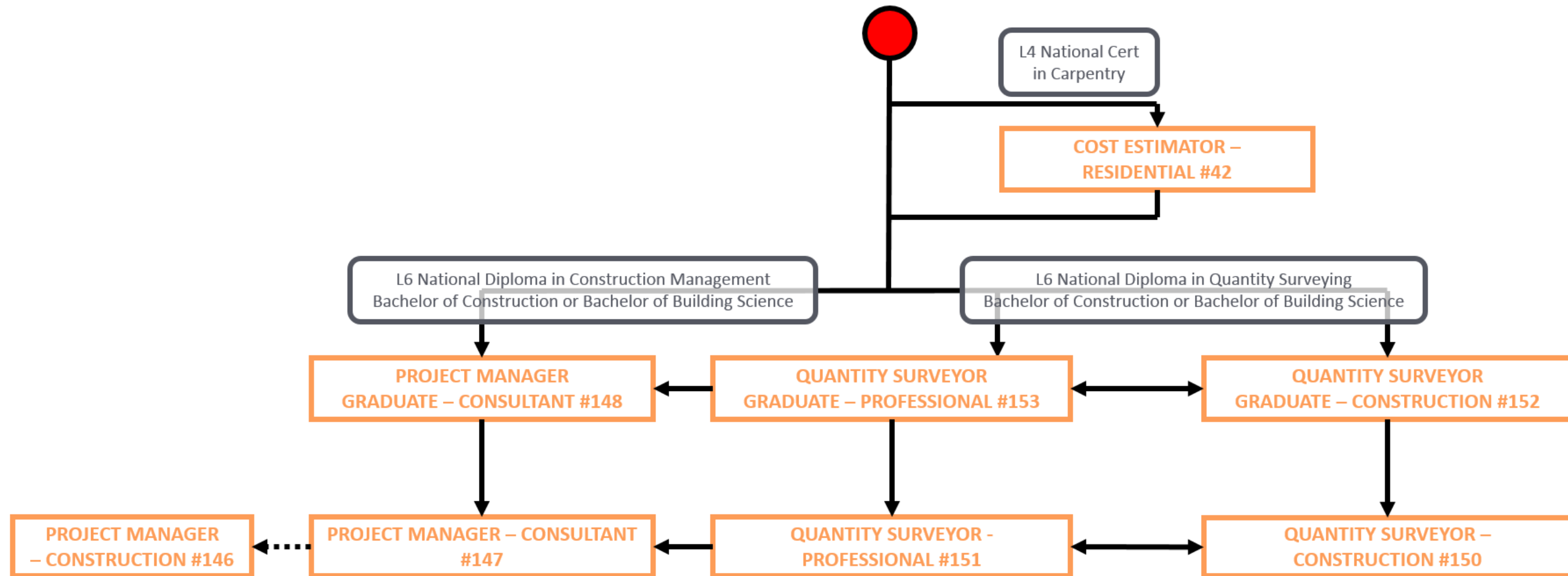
B.8 Property & Facilities Management

PROPERTY / FACILITIES MANAGEMENT

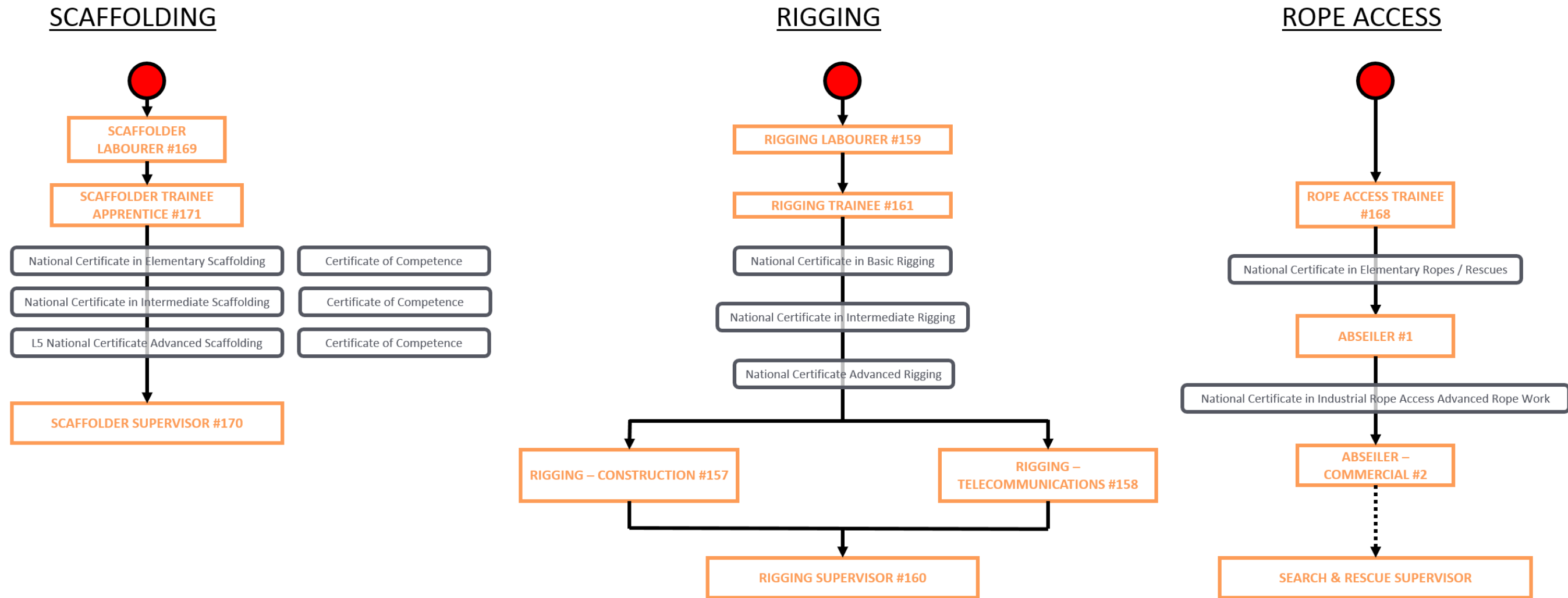


B.9 Quantity Surveying & Project Management

QUANTITY SURVEYING & PROJECT MANAGEMENT

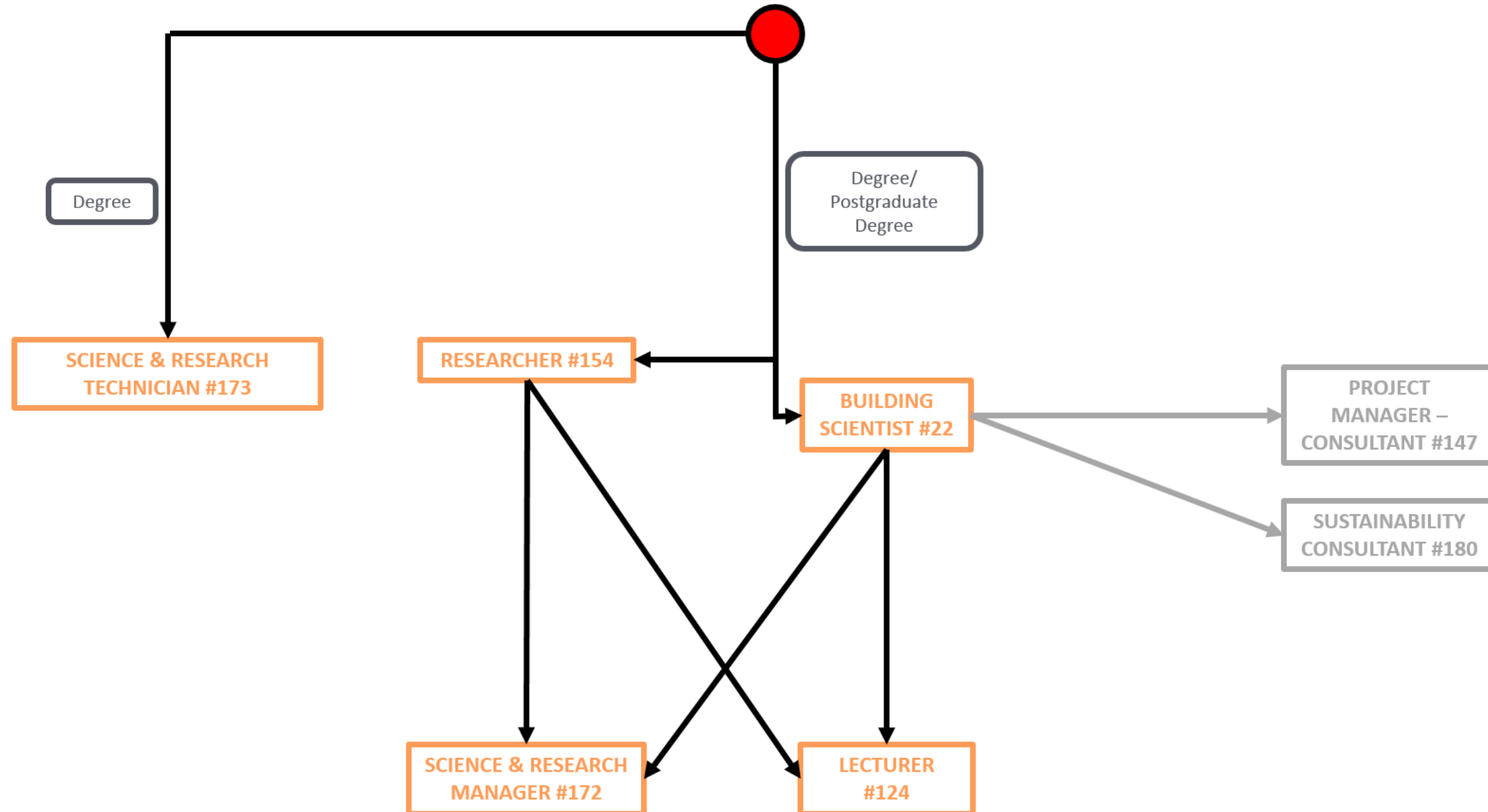


B.10 Scaffolding, Rigging & Rope Access



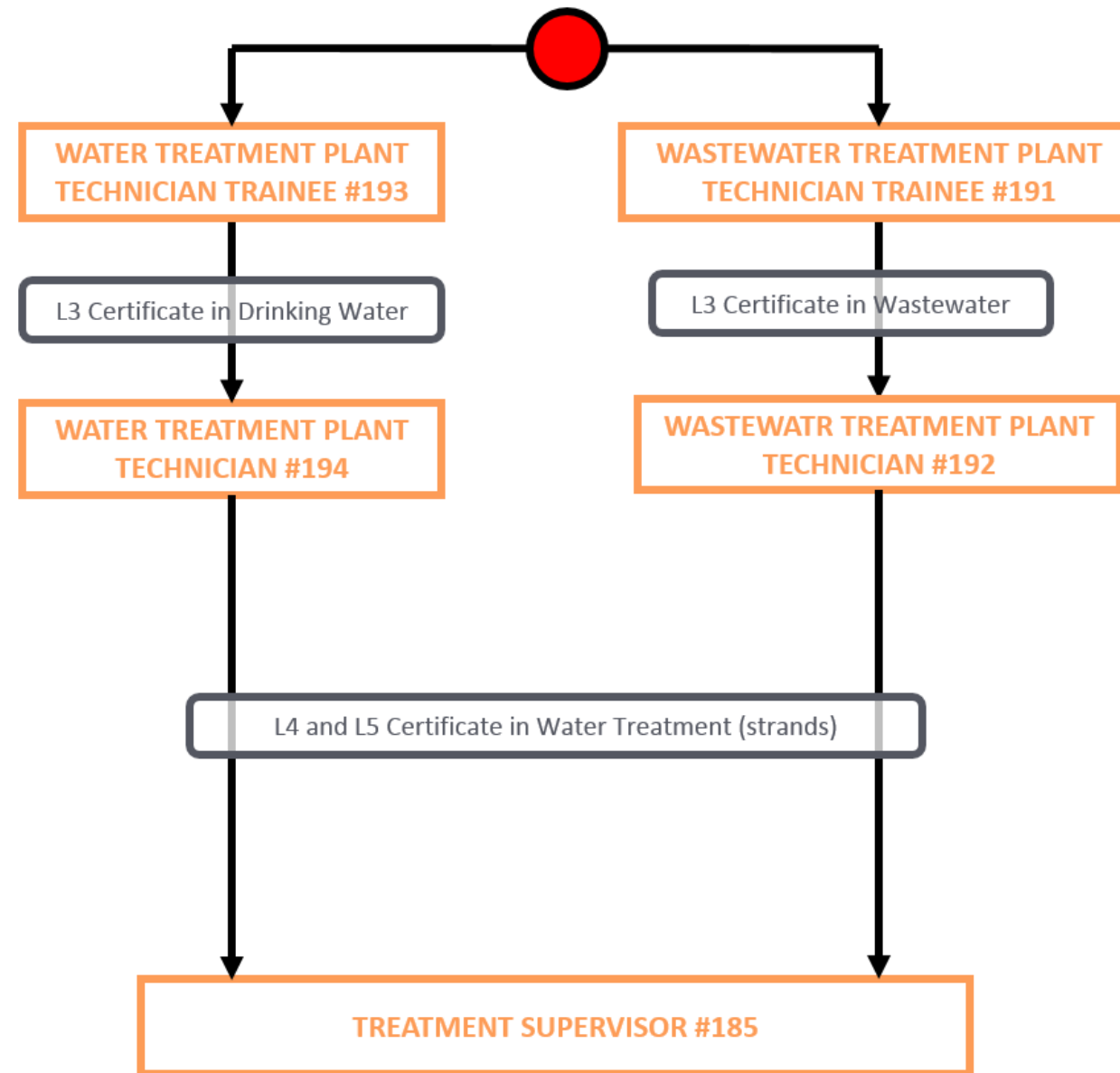
B.11 Science & Research

SCIENCE & RESEARCH



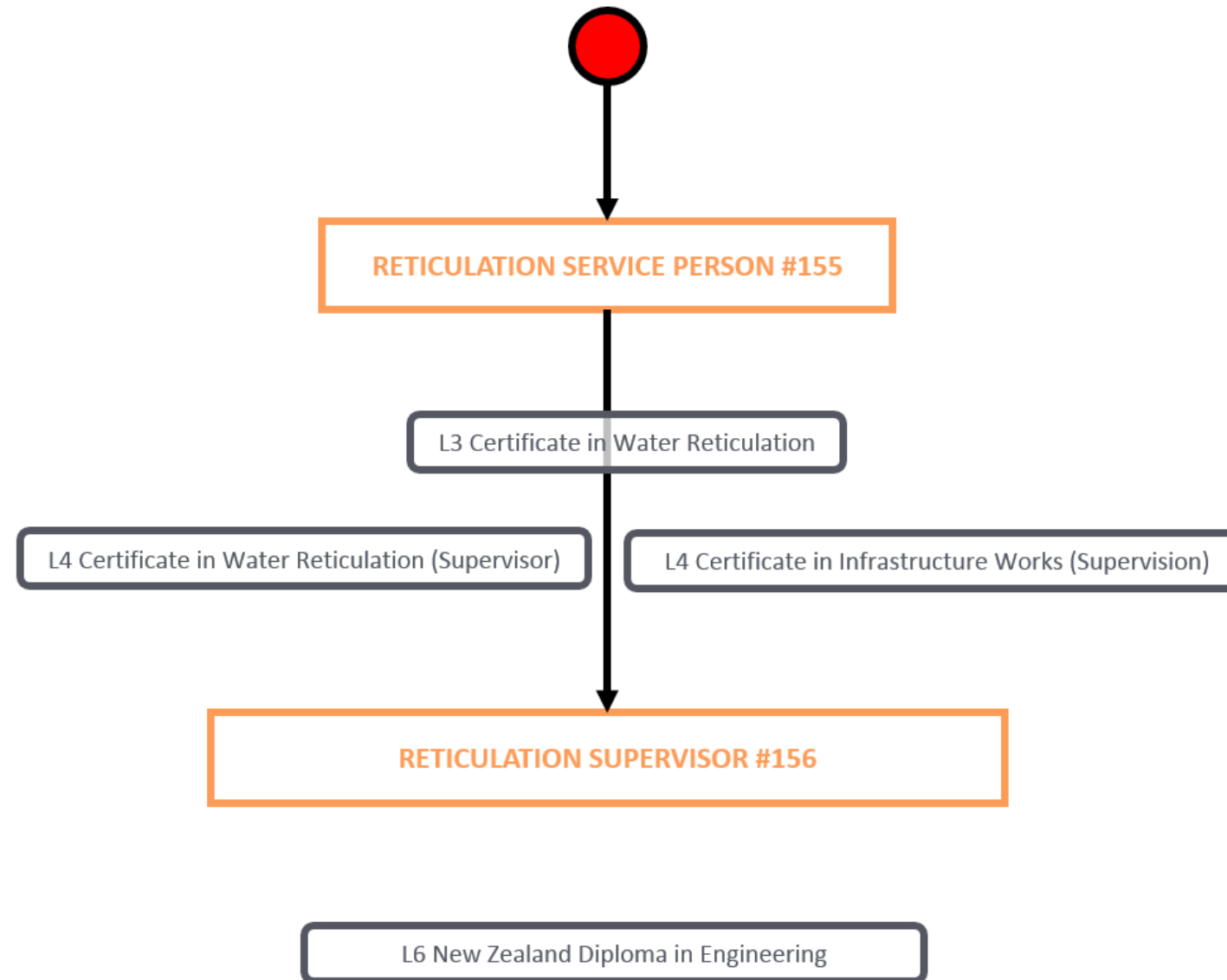
B.12 Water & Wastewater Treatment Trade

WATER & WASTEWATER TREATMENT



B.13 Water Reticulation Trade

WATER RETICULATION



Appendix C: Role information

C.12 Architectural Technician

12 Architectural Technician

Also known as	Architectural Drafter or Architectural Technologist
Industry sector	Architecture & Design
Source	Careers New Zealand
Date last updated	6 March 2015
Salary range	<ul style="list-style-type: none"> • 1–3 years’ experience usually earn \$40,000 to \$50,000 per year. • More than 3 years’ experience usually earn between \$51,000 and \$100,000 per year.
Job likelihood	Average
Personal requirements	<ul style="list-style-type: none"> • Accurate, with an eye for detail. • Well organised, patient and reliable. • Creative, yet practical. • Able to work well under pressure. • Skilled in communications and listening. • Client focused with the ability to work within customer budgets and requirements. • Good at problem solving and able to make good judgements. • Skilled in giving presentations.
Skills required	<ul style="list-style-type: none"> • Computer skills and knowledge of computer-aided design (CAD) drafting software packages. • Design skills. • Ability to interpret drawings. • Knowledge of architecture, building methods and materials. • Knowledge of the New Zealand Building Code, the New Zealand Building Act, the Resource Management Act, local by-laws and town planning regulations.
Qualifications	D.1 National Diploma in Architectural Technology
Experience	<p>Useful experiences include:</p> <ul style="list-style-type: none"> • civil, electrical or mechanical engineering drafting work • work in the building construction industry • any practical building work • interior design work.
Registration	<p>Architectural technicians can apply for a professional licence under the Licensed Building Practitioner scheme. MBIE Building Performance recognises their professional competence at three levels:</p> <ul style="list-style-type: none"> • Design 1 (houses) • Design 2 (complex commercial or residential buildings) • Design 3 (large or publicly important buildings).

Job characteristics	<p>Architectural technicians interpret sketches and designs produced by an architect, architectural designer or client. They make working drawings, such as floor plans, elevations, sections and details, and associated documentation of buildings.</p> <p>Architectural technicians may do some or all of the following:</p> <ul style="list-style-type: none"> • Make detailed drawings of building structures. • Build models of the building. • Interpret sketches and project instructions. • Research building materials. • Manage projects and carry out site observations. • Check that drawings comply with statutory and regulatory building requirements. • Check that drawings comply with manufacturer/supplier instructions. • Assist with consent processes. • Co-ordinate with other building professionals and deal with clients. • Interpret drawings on worksites. • Usually work regular hours but may be required to work overtime to meet deadlines. • Typically spend most of their time working in offices, but may have to visit building sites. • May work outside in all weather conditions. • May travel locally to building sites and to visit clients.
Specialisations	<ul style="list-style-type: none"> • Large commercial buildings. • Subdivisions. • Residential housing.
Industry representative	<p>ADNZ: www.adnz.org.nz</p> <p>NZIA: www.nzia.co.nz</p> <p>NZRAB: www.nzrab.org.nz</p>
Individual bio	Gordon Morrison – Architectural Technician (Careers New Zealand)
Employer bio	
Growth opportunities	<p>After 5 years' experience, Architectural Technicians may become Senior Architectural Technicians or lead drafting teams. As their design skills improve, they may work as Architectural Designers (10) or study for the Master of Architecture to become Registered Architects (7).</p> <p>Experienced Architectural Technicians may also start their own businesses or move into construction management.</p>

Appendix D: Qualification information

D.1 National Diploma in Architectural Technology

Qualification name	National Diploma in Architectural Technology
Also known as	NDAT
Source	NZQA
NZSCED	40199 – Architecture and Urban Environment not elsewhere classified. Courses that prepare or develop further the abilities of individuals to understand heritage and conservation, and architecture and urban environment not classified elsewhere in Narrow Field 0401 Architecture and Urban Environment.
NZQA	Level 6
Delivery	2 years full-time intramural
Entry requirements	There are no specific qualification pathways leading to this diploma. However, achievement of NCEA Level 2 standards from the Creative Industries or Construction and Infrastructure Vocational Pathways may be helpful.
Aim of qualification	<p>This qualification is for people wishing to work as architectural technicians and also provides recognition of knowledge and skills for those already working in the role.</p> <p>The qualification provides the construction industry with qualified people who have the essential knowledge and skills required to enter employment as architectural technicians who will be able to work independently on small and medium-scale building projects of limited complexity through all stages to completion. Additionally, graduates would be competent to work under the supervision of an experienced architectural technician, designer or architect on large and/or complex building projects.</p> <p>The qualification will provide employers and consumers with the confidence that working drawings are produced that meet with the requirements of New Zealand legislation, codes of practice and New Zealand and Australian standards.</p> <p>This diploma is suitable for candidates from a variety of education backgrounds, including school leavers.</p> <p>This qualification supports the Ministry of Business, Innovation and Employment (MBIE) Licensed Building Practitioner Scheme providing eligibility for a streamlined application process towards Design 2 (Category 1 and 2 buildings), in accordance with information on the MBIE website.</p>
Content	<p>Graduates of this qualification will be able to:</p> <ul style="list-style-type: none"> • apply comprehensive industry knowledge to evaluate design principles for small, medium and large building projects in a design, building or construction-related environment

- carry out feasibility studies for small, medium and large buildings
- establish the client’s requirements, develop and communicate a concept and building design and prepare approval documentation for a building project in accordance with a client’s brief
- evaluate the performance of and select materials and finishes to be used in the building process
- prepare, organise and present architectural working drawings for small and medium-sized buildings using manual and digital technologies in accordance with the statutory and regulatory environment
- understand the roles, documentation and administrative requirements of the construction industry, apply this knowledge and assist senior personnel through the tender process.

Specialisations and majors

Education provider

[Building and Construction Industry Training Organisation](#)

[Open Polytechnic](#)

[Waikato Institute of Technology](#) (Hamilton)

[Wellington Institute of Technology](#) (Lower Hutt)

Role opportunities

Architectural Technician (12)

Architectural Designer (10)

With further training and/or experience, graduates of this diploma may be able to work as a:

- Registered Architect (7)
- Interior Design Consultant (111)
- Registered Landscape Architect (121)
- Urban Designer (186)
- Design Manager
- consultant design practice owner or in another field related to Construction, Planning or Design.

Qualification progression

Graduates of this diploma may wish to undertake further tertiary study at diploma or degree level in the fields of Architecture, Design, Construction Management or Quantity Surveying, including the New Zealand Diploma in Construction with strands in Construction Management and Quantity Surveying.