

Construction industry suicides: numbers, characteristics, and rates

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CONTENTS

Executive Summary	
Aim	1
Rationale	1
Rationale for re-examining the definition of the construction industry	
Rationale for clarifying the prevalence and rate of suicide in the construction industry	
Methods	2
Ethics and confidentiality	2
Determination of suicide	2
Suicide data sources	2
Defining the industry	3
Data presentation and analysis	3
Calculation of rates	3
Results I: Total suicides by year	4
Results II: Suicides in the construction industry	5
Restriction to 'employed at time of death' - NCIS case inclusion process	5
Annual construction industry suicides (closed cases)	7
Gender of suicides by those employed at death	8
Age of suicides by those employed at death	8
Ethnicity of suicides by those employed at death	9
Marital status of suicides by those employed at death	10
Inquest held or chambers findings	10
Recommendations or warning made by the coroner	11
Occupational Socioeconomic Status	12
Suicides by geographic region	13
Suicides by Australian & New Zealand Standard Classification of Occupation (ANZSCO)	15
Results III: Active cases latest Coronial data	19
Results IV: Rates of suicide	21
Discussion and conclusion	25
References	26
Appendix A	
Appendix B	
Appendix C	

LIST OF TABLES

Table 1: Total suicides by financial year (01 July - 30 June the following year): three data sources	4
Table 2: MATES defined construction industry suicides compared with all suicides total and by financial year	7
Table 3: Sex of construction industry suicides compared with all suicides	8
Table 4: Age of construction industry suicides compared with all suicides	8
Table 5: Ethnicity* of construction industry suicides compared with all suicides	9
Table 6: Marital status of construction industry suicides compared with all suicides	10
Table 7: Number of cases that are resolved by inquest or chambers findings	10
Table 8: Number of cases with recommendations or warnings made by coroner	11
Table 9: NZSEI Occupational Socioeconomic Scores	12
Table 10: Closed suicide cases by DHB of residence	13
Table 11: Closed suicide cases by Coroners' court	15
Table 12: Number of suicides by the ANZSCO Level 1	16
Table 13: Number of suicides by the ANZSCO Level 2	16
Table 14: Summary of 6-digit level ANZSCO occupations with 5 or more suicides	18
Table 15: Number of active and closed cases of suicides - coroner's data	19
Table 16: Number of active and closed cases of suicides by financial year - coroner's data	19
Table 17: Number of active and closed cases of suicides by ANZSCO Major group - coroner's data	20
Table 18: Age adjusted rates of suicide (12 years 2007-2019) – construction industry compared with employed outside construction and by major occupational group	21
Table 19: Age adjusted rates of suicide (12 years 2007-2019) – construction industry compared with employed outside construction by 5 year age group	22

LIST OF FIGURES

Fig 1: NCIS case inclusion process	6
Fig 2: Example of the ANZSCO levels	15
Fig 3: Active and closed cases of construction industry suicides	20

EXECUTIVE SUMMARY

This research, funded by BRANZ and supported by MATES New Zealand, aimed to refine the definition of the construction industry, clarify its prevalence of suicide and calculate industry suicide rates.

Drawing on census and suicide data and in consultation with an expert working group comprised of construction industry professionals, we produced a refined definition of the construction industry. This definition comprises of 112 occupations at the 6-digit level of the Australian and New Zealand Standard Classification of Occupation (ANZSCO).

Drawing on data from closed cases of suicide (coded intentional self-harm) in the National Coronial Information System (NCIS) database between 01 July 2007 and 30 June 2019 we found:

- 5,814 suicide cases in the 12 years.
- 2,542 suicide cases working at the time of death.

Using the refined definition of the construction industry we found:

- 583 employed in the construction industry at the time of death.
- Construction industry suicides by year ranged from 35 to 65.

Other key facts were:

- 97.9% were male.
- The highest proportion 16% were aged 20-24, followed by 13.7% aged 45-49.
- 63.8% were New Zealand/European and 21.3% were Māori and Māori are over-represented.
- Higher numbers of suicide were found in lower socioeconomic status construction industry occupations.
- The highest number of suicides were in Auckland followed by Christchurch.
- Occupations with the highest number of suicides were builder's labourer, technician and trades workers, painting trades workers, carpenters, electricians, carpenters and joiners, plumbers.
- Age standardised rates overall for men working in the construction industry for 2007-2019 were 19.71 per 100,000 people (95% CI: 18.09-21.33) compared to 14.44 per 100,000 for men working outside of construction (95% CI: 13.71-15.17).
- Men aged 20-24 had the highest rate of suicide in construction at 32.94 per 100,000 compared to 18.72 per 100,000 for men working outside of construction.

The construction industry suffers a considerable burden from suicide and young men aged 20-24 should be considered a priority group for industry-based suicide prevention. However, in terms of evaluating industry based or other suicide prevention efforts, suicide data although indicative, is not an especially useful outcome measure due to it being a statistically rare event. For this reason, attention needs to turn to measuring other intermediate outcome measures.

AIM

The specific aims of this research were to re-examine the definition of the construction industry (and re-define if necessary), clarify the numbers of suicide in the New Zealand construction industry and calculate the industry specific suicide rate. Accurate suicide data for the industry is critical for monitoring suicide trends and providing a baseline for assessing the effectiveness of suicide prevention initiatives.

RATIONALE

Rationale for re-examining the definition of the construction industry

Previous research and media reporting on suicides in the construction industry has been frustrated by inconsistent industry definitions. Some reports of construction industry suicides have relied on data requests for a researcher defined list of occupations which can be a best guess or draw on a previously used list of occupations [1] or, an industry-based classification system to identify occupations belonging to the industry (e.g. Australian and New Zealand Standard Industry Classification - ANZSIC). Both have shortcomings, and the ANZSIC definition of 'Construction' excludes many occupations that the New Zealand construction sector agrees belong to its industry including architects, construction project managers, surveyors, many engineers who are instead classified as belonging under the Professional, Scientific and Technical Services industry.

Ideally there should be agreement about what occupations belong to the construction industry and which do not, and for reliability and replicability when reporting on suicides in the industry, the same list of occupations should be used when requesting suicide data.

The primary source of suicide data is the New Zealand Coronial Services which stores information collected by coroners investigating suspected suicides. Staff of the Coronial Services code the occupation listed in the Police report for each of the suspected suicides, to the 6-digit level of the Australian New Zealand Standard Classification of Occupations (ANZSCO). Where data on occupation is ambiguous or missing it may be clarified or filled in later by staff after a manual check with the next of kin (personal communication, Jarrod O'Brien, 2021). As a suspected suicide case progresses to a definitive finding of death by intentional self-harm (suicide), the suicide data with its accompanying ANZSCO code is then provided to the staff of the Australian and New Zealand National Coronial Information System (NCIS) database (personal communication, Jessica Bryan, 2021). Therefore, the occupation data in the NCIS should match that of the New Zealand Coronial System. Because the suicide data are coded to the ANZSCO, and because this is broadly internationally comparable with the International Standard Classification of Occupations, it makes sense to use this occupation coding system as the basis for defining the industry.

Rationale for clarifying the prevalence and rate of suicide in the construction industry

The lack of clarity and agreement around which specific occupations belong to the New Zealand construction industry has resulted in inconsistent reports of the prevalence of suicide in the industry. To address this issue, an in-depth re-examination of the number suicides drawing on several sources of suicide data was necessary. Accurate data on the prevalence of suicide in the New Zealand construction industry is critical for providing both a baseline for assessing the impact of suicide prevention initiatives and for monitoring trends. Accurate data requires a replicable industry definition – e.g. an agreed and specific list of occupations.

Also, essential to informing suicide prevention in the industry are demographic data on industry suicides. Such data can inform priority groups for targeted interventions and the design of bespoke prevention strategies or components. However, to date, as the prevalence of suicide in the construction industry has been variable according to how the industry has been defined we can not be sure we have accurate demographic data, and no rates have been calculated for the New Zealand construction industry.

For the reasons outlined above, this report documents the process for refining the definition of the construction industry for the purpose of industry focused suicide prevention and ongoing monitoring. The final list of construction industry occupations at the 6-digit level is the first key output of this exercise. We then apply this definition to the available

suicide data to provide a snapshot of the prevalence and demographic characteristics of those who were working in the construction industry at the time of death by suicide in comparison with those working in other industries drawing on the 12 years of available data. We also present rates of suicides per 100,000 population calculated at the 2-digit level ANZSCO – the most detailed possible for the New Zealand dataset.

METHODS

Ethics and confidentiality

Ethics approval was received from the University of Otago Human Ethics Committee (H19/175) and was a requirement of access to the National Coronial Information System (NCIS) data.

Ethical issues, including confidentiality and anonymity, and the security of data were thoroughly considered and remain central to this research and any reports arising from it. Unique identifiers were assigned to the data to anonymise and protect identities of the deceased. Utmost care has been exercised in handling and reporting of information to ensure identifying data is not disclosed. For this reason, small counts of <5 are suppressed (marked 's') in this report.

Determination of suicide

A person dies by suicide if the investigating coroner finds, on the balance of probabilities, that their death was self-inflicted with the intention of taking their own life and knowing the probable consequence of their actions.[2]

Suicide data sources

There are several sources of suicide data in New Zealand. Different data sources are used for the four different parts of the Results section.

Office of the Chief Coroner Website:

For Results Part I, we accessed provisional suicide figures provided by the Office of the Chief Coroner available on their website. These refer to the number of suspected suicide cases investigated by New Zealand coroners. Not all suspected cases are found after investigation, to be suicides.

Ministry of Health (MOH) Mortality Collection:

Also, for Results Part I, we extracted suicide data from the Mortality Collection held by the Ministry of Health.

The National Coronial Information System (NCIS):

We draw on this data source for Results Part 1 and all of Results II. The NCIS is a searchable database of files containing many demographic and other variables and PDFs of police narrative of circumstances, autopsy report, toxicology report, and coroners' findings on the causes and circumstances of death. Our NCIS dataset is based on cases coded as intentional self-harm (extracted 5 February 2021) and begins from 01 July 2007 (the earliest date for New Zealand data entered into the NCIS) and ends on 30 June 2019.

Data request to the Chief Coroner's Office:

For Results Part III we made a specific OIA request to the Office of the Chief Coroner towards the completion of this research to obtain the most up-to-date data on active and closed cases. Active cases are those still being investigated by coroners but are reasonably expected to have a ruling of suicide.

Defining the industry

Refining the definition of the construction industry was an iterative process detailed in Appendix A. In summary it involved the following steps to arrive at the final list of 112 occupations at the 6 -digit level ANZSCO.

Step 1	Consultation and establishment of expert working group.
Step 2	Meeting of the expert working group and researchers to discuss occupations in the Career Development Map for the Construction & Infrastructure Industry- the 'Wireframe map'[3], and follow-up.
Step 3	Compiling the final list of 213 Wireframe occupations as determined in consultation with the expert working group.
Step 4	Mapping the 213 occupations to the Australian and New Zealand Standard Classification of Occupation (ANZSCO).
Step 5	Refining list of occupations via comparison with New Zealand Census data on industry 'employer' classified as Division E Construction under the Australian New Zealand Standard Industry Classification (ANZSIC) 2006.
Step 6	Feedback of final list to MATES and refinement of list resulting in 112 6-digit level ANZSCO construction industry occupations (see Table A2 Appendix A). These occupations are hereafter called construction industry occupations in this report.

Hereafter in this report, the term construction industry, uses this definition.

Data presentation and analysis

In Results Part I we present data on all suicides for 2007-2019 by various data sources. We present more detailed data on these cases of suicide drawing on the NCIS data and Census data in Results Part II. In Results Part III we present the most up-to-date data direct from the Chief Coroner's Office to examine the number of active cases and, in Results Part IV we examine industry rates of suicide.

Calculation of rates

Given differences in age structures between those employed in the construction industry and those employed outside it, we calculated age standardised rates. Absolute numbers of suicides were too low to do a time trend of yearly or three-yearly rates over time. Age standardised rates were calculated for employed males, in person-time years, from 2007 to 2018 inclusive, calculated from 1-digit level ANZSCO by age and sex for census years 2006, 2013 and 2018, and the inner years calculated from interpolation.

Because the counts underpinning the rates were from Level 2 of the ANZSCO, there are some occupation groups which included some, but not all of the 6-digit occupations belonging to the construction industry as defined in this report. To address this, we created some estimated proportions: construction and not (from Level 6 codes but could not also split by sex or age group).

NOTE: Limitations related to events like suicides that have statistically small numbers:

Although suicide is a critical public health and social issue, statistically speaking suicide is a rare event with a low base rate. This means that the number of suicides can fluctuate yearly sometimes quite substantially however this is not a reliable indicator of a decrease or increase in rates. Furthermore, large fluctuations in rates over short periods can be unreliable. Understanding data in specific population groups, like construction is more challenging as the numbers involved are even smaller. For these reasons we have to look at patterns over very long periods to understand longer-term trends.[4]

RESULTS I: TOTAL SUICIDES BY YEAR

Table 1 shows the total numbers of suicides by financial year according to the different data sources.

Table 1: Total suicides by financial year (01 July - 30 June the following year): three data sources

Data Source	Ministry of Health mortality collection	NCIS death fields			Office of the Chief Coroner (website)	
		Total suicides (using 'Date from') ²	Total suicides (using 'Date to') ²	Total suicides (using date coroner notified)	Total 'annual provisional' from coroner's office ³	Rates per 100,000 based on 'annual provisional' stat & NZ population estimates
Financial Year 1/07 year to 30/06 following year	Total number of suicides ¹	Total suicides (using 'Date from') ²	Total suicides (using 'Date to') ²	Total suicides (using date coroner notified)	Total 'annual provisional' from coroner's office ³	Rates per 100,000 based on 'annual provisional' stat & NZ population estimates
2007/2008	509	497	492	492	540	12.20
2008/2009	504	493	498	497	531	12.04
2009/2010	524	528	525	524	541	12.26
2010/2011	497	507	509	509	558	12.65
2011/2012	532	538	536	535	547	12.34
2012/2013	517	513	516	517	541	12.10
2013/2014	509	507	506	508	529	11.73
2014/2015	543	534	533	532	564	12.27
2015/2016	547	523	524	525	579	12.33
2016/2017	549	500	499	499	606	12.64
2017/2018	*314	411	413	413	668	13.67
2018/2019		263	261	261	685	13.93
2019/2020			s		654	13.01
Total	5545	5814	5814	5812	7543	-

¹Using actual date of death.

²'Date from' and 'Date to' are date of death fields in the NCIS database. 'Date from' is a *range* as date of death is not always known.

³Using date of notification to the coroner.

*Jul 2017-Dec 2017.

's' = suppressed

Table 1 shows that provisional suicide numbers are higher than those recorded by the Ministry of Health and the NCIS for each year. This is because provisional suicide numbers released by the Office of the Chief Coroner include all suspected suicides investigated by coroners, not just those that had a finding of suicide. This data is NOT then later adjusted.

A finding of suicide can take some time to determine, so confirmed cases may not appear in the NCIS data or the Mortality data collection for some years in some cases.[2] There is also some minor variation in the suicide numbers between the Mortality Collection data and the NCIS datasets as the Mortality Collection dataset may include some provisional suicides where there is good confidence that they will have a finding of suicide.

In extracting the suicide data from the NCIS dataset we had to make a decision as to what 'cut-off' date we were going to use. There were three options: date of *death from* (a range of dates because actual date of death is not known), date of *death to*, or *date coroner was notified*. For transparency we have presented the annual number of closed cases of suicides in the NCIS for each of these cut-offs (see three middle columns). These data show that although there is some variation on a year by year basis, with the number of suicides varying between 1-5, the combined total overall years in the NCIS is almost identical (n=5814, n=5814, n=5812). However, for clarity and replicability, from this point forward we have chosen to select the earliest possible date of death *date from*.

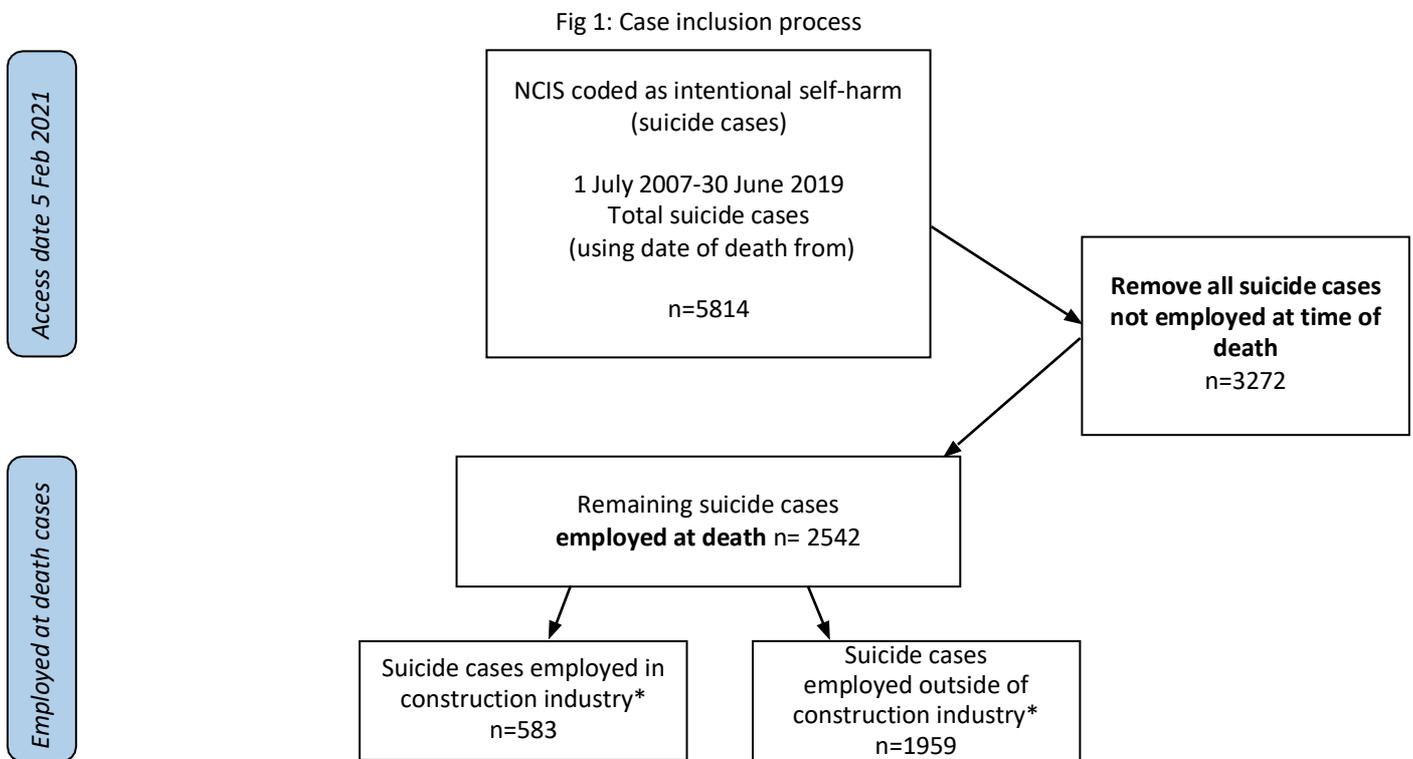
We also note that the annual provisional data released by the Office of the Chief Coroner is based on the *date of notification to the coroner*. Table 1 also gives rates of suicide calculated by the Office of the Chief Coroner (final column), based on the annual *provisional* data and, for the denominator data, Statistics New Zealand population estimates derived from the Census.

RESULTS II: SUICIDES IN THE CONSTRUCTION INDUSTRY

As one of the key aims of the research was to clarify the prevalence of suicides by those working in the construction industry and examine their characteristics, we restricted the dataset to those **employed at the time of death**, according to NCIS records. This mirrors the strategy used for MATES in construction in Australia.[5] This meant excluding all other closed cases (retired, unemployed, student, and not working at the time of death) from our analyses. We did this so that we could compare the demographics of cases of construction industry suicides with a comparable group, those working in other industries (and all cases of suicides employed at the time of death). We preferred this over trying to compare construction industry with another industry, which would then require trying to decide what would be an acceptable comparable industry.

Restriction to 'employed at time of death' - NCIS case inclusion process

Fig 1 shows our process of NCIS case inclusion and restriction of the dataset to those employed at the time of death. All New Zealand closed cases officially recorded in the NCIS as intentional self-harm were extracted on 5 February 2021. These cases are hereafter referred to as suicide cases.



*Construction industry as defined by MATES New Zealand (Appendix A).

As Fig 1 shows there were 5814 suicide cases in the 12 years. We then removed all those not classified as working at the time of death according to the NCIS data, leaving 2542 closed suicide cases employed at the time of death. We then removed all those not in the MATES definition of the construction industry, leaving a total of 583 suicide cases in the New Zealand construction industry.

Annual construction industry suicides (closed cases)

Restricting NCIS suicide data to all those employed at the time of death and using the refined MATES definition of the construction industry, Table 2 provides the number of suicide cases from the construction industry compared with those not in the construction industry. And Table 3 provides this data by financial year.

Table 2: Construction industry suicides compared with all suicides total and by financial year

NCIS employed at time of death	In construction				All employed	
	Yes		No		N	%
	N	%	N	%		
Closed cases	583	22.9	1959	77.1	2542	100.0
Financial year from						
2007/08	56	24.6	172	75.4	228	100.0
2008/09	60	28.2	153	71.8	213	100.0
2009/10	49	22.4	170	77.6	219	100.0
2010/11	35	17.3	167	82.7	202	100.0
2011/12	39	18.5	172	81.5	211	100.0
2012/13	53	25.0	159	75.0	212	100.0
2013/14	44	19.9	177	80.1	221	100.0
2014/15	56	23.0	187	77.0	243	100.0
2015/16	51	21.3	189	78.8	240	100.0
2016/17	65	27.8	169	72.2	234	100.0
2017/18	37	19.4	154	80.6	191	100.0
2018/19	38	29.7	90	70.3	128	100.0

For the 12 financial years from 2007/09 to 2018/2019 there were 583 closed cases of suicide amongst those employed in the construction industry at time of death.

Although fewer cases for the years 2017-2019 are closed and available for review, the construction industry suicides as a proportion of all suicides amongst those employed, ranged from 17.3% for 2010-11, 29.7% for 2018/2019. Construction industry suicides by year range from 35 to 65.

Gender of suicides by those employed at death

Table 3 shows the gender of suicides for those employed in and outside of the construction industry at death.

Table 3: Gender of Construction industry suicides compared with all suicides

NCIS employed at time of death	In construction				All employed	
	Yes		No		N	Col%
	N	Col%	N	Col%		
Female	12	2.1	448	22.9	460	18.1
Male	571	97.9	1511	77.1	2082	81.9
Total	583	100.0	1959	100.0	2542	100.0

As expected, women comprised a very small proportion (2.1%) and number (n=12) of construction industry suicides compared to those working outside the industry (22.9%). Another important fact is that suicides by men in construction accounted for 27.4% of all employed male suicides.

Age of suicides by those employed at death

Table 4 shows the age distribution by 5-year age bands of the two comparison groups.

Table 3: Sex of Construction industry suicides compared with all suicides

NCIS employed at time of death	In construction				All employed	
	Yes		No		N	Col%
	N	Col%	N	Col%		
Age at Death 5 yr bands						
15-19 yrs	25	4.3	102	5.2	127	5.0
20-24 yrs	93	16.0	229	11.7	322	12.7
25-29 yrs	72	12.3	182	9.3	254	10.0
30-34 yrs	72	12.3	201	10.3	273	10.7
35-39 yrs	59	10.1	189	9.6	248	9.8
40-44 yrs	64	11.0	215	11.0	279	11.0
45-49 yrs	80	13.7	242	12.4	322	12.7
50-54 yrs	53	9.1	241	12.3	294	11.6
55-59 yrs	42	7.2	181	9.2	223	8.8
60-64 yrs	19	3.3	126	6.4	145	5.7
>=65 yrs	s	s	<55	s	55	2.2

s= suppressed

The highest number of construction industry suicides were in the 20-24 age group at 16%, followed by mid-age 45-49 group at 13.7%. This compares to the highest number of suicides for those not working in the construction industry being in the 45-49 and 50-54 age groups. Additional data on age and ethnicity and age and location are provided in Appendix C.

Ethnicity of suicides by those employed at death

Table 5 shows the ethnicity data for the three comparison groups.

Table 5: Ethnicity* of Construction industry suicides compared with all suicides

NCIS employed at time of death	In construction				All employed	
	Yes		No		N	Col%
	N	Col%	N	Col%		
Ethnicity from Coroner						
European not further defined	27	4.6	79	4.0	106	4.2
NZ European/Pakeha	372	63.8	1271	64.9	1643	64.6
Other European	22	3.8	106	5.4	128	5.0
NZ Māori	124	21.3	314	16.0	438	17.2
Pacific Island	21	3.6	67	3.4	88	3.5
Asian	13	2.2	104	5.3	117	4.6

*Ethnicity as recorded by the coroner is only classified into one ethnic group

The majority of suicides in and outside of the construction industry were by people of New Zealand European/Pakeha ethnicity at 63.8%. However, the construction industry had a higher proportion of Māori suicides than those working outside the construction industry. Out of 583 construction industry suicides 21.3% (n=124) were Māori and 3.6% were of Pacific Island ethnicities. For those working outside the construction industry the proportions were 16% Māori, 3.6% Pacific Island ethnicities. Additional data on age and ethnicity and age and location are provided in Appendix C.

Marital status of suicides by those employed at death

Table 6 shows the marital status data for the three comparison groups. We thought this useful to include given that relationship termination is one of the key contributing factors to suicides amongst men working in construction.[1]

Table 6: Marital status of Construction industry suicides compared with all suicides

NCIS employed at time of death		In construction				All employed	
		Yes		No		N	Col%
		N	Col%	N	Col%		
Marital Status	Marital Status_1						
1	Never married	236	40.5	692	35.3	928	36.5
2	Widowed	s	s	<26	s	26	1.0
3	Divorced	26	4.5	120	6.1	146	5.7
4	Separated	73	12.5	214	10.9	287	11.3
5	Married / De facto	222	38.1	832	42.5	1054	41.5
9	Unlikely to be known	22	3.8	78	4.0	100	3.9

s= suppressed

The highest proportion 40.5% of construction suicides were 'never married' (compared with 35.3% of those outside the industry), however the construction industry has a higher proportion of younger men.

Inquest held or chambers findings

Overall, around 10% of suicide cases go to full inquest with the great majority of suicides determined in chambers or 'on the papers'. [2] Table 7 shows the difference in the numbers of full inquests held, compared to findings made in chambers, for the three comparison groups. Cases go to full inquest for a number of reasons, for example, if there is contradictory evidence, or if the family pursues an inquest. [7]

Table 7: Number of cases that are resolved by inquest or chambers findings

NCIS employed at time of death		In construction				All employed	
		Yes		No		N	Col%
		N	Col%	N	Col%		
Full inquest held							
Yes		27	4.6	92	4.7	119	4.7
No		556	95.4	1867	95.3	2423	95.3
Total		583	100.0	1959	100.0	2542	100.0

There was very little difference in the number of cases that went to full inquest for those in or out of construction industry at death, which we would expect.

Recommendations or warnings made by the coroner

Table 8 shows the number of cases where recommendations or warnings were made by the coroner. We did not examine what these looked like.

Table 8: Number of cases with recommendations or warnings made by coroner

NCIS employed at time of death	In construction				All employed	
	Yes		No		N	Col%
	N	Col%	N	Col%		
Recommendation or warning						
No	543	93.1	1849	94.4	2392	94.1
Yes	40	6.9	110	5.6	150	5.9
Total	583	100.0	1959	100.0	2542	100.0

Only a small proportion 6.9% of construction industry suicides (n=40) contained any warnings or recommendations made by the coroner. This was marginally higher than the proportion of cases of suicide by those employed elsewhere at 5.6% (n=110). We include this data as future research could examine what kinds of recommendations have been made by Coroners in cases of suicide by men in the construction industry, and to whom these recommendations were directed. This would involve an analysis of the 40 cases where recommendations were made.

Occupational Socioeconomic Status

To examine and compare the socioeconomic positions of those who died by suicide we assigned socioeconomic status (SES) scores to individuals on the basis of their recorded occupation at death at the 3-digit level of the Australian New Zealand Standard Classification of Occupation (ANZSCO) using the New Zealand Socioeconomic Index of Occupations (NZSEI). [6]

The NZSEI is an occupation-based measure of socioeconomic status based on a mathematical formula assessing education level and income for named occupations and adjusted for age. [5] At the 10-group level of the NZSEI, the socioeconomic status of an occupation (and therefore assigned to the individual in that occupation) is ranked from 1 to 10, with 1 being the highest and 10 being the lowest socioeconomic status.

Table 9: NZSEI Occupational Socioeconomic Status

NCIS employed at time of death	In construction				All employed	
	Yes		No		N	Col%
	N	Col%	N	Col%		
NZSEI 2018 (10 group level)						
. missing	0	0	219	11.2	219	8.6
1 High SES	0	0	144	7.4	144	5.7
2	11	1.9	99	5.1	110	4.3
3	30	5.1	68	3.5	98	3.9
4	0	0	224	11.4	224	8.8
5	38	6.5	61	3.1	99	3.9
6	85	14.6	74	3.8	159	6.3
7	30	5.1	215	11.0	245	9.6
8	77	13.2	249	12.7	326	12.8
9	189	32.4	226	11.5	415	16.3
10 Lowest SES	123	21.1	380	19.4	503	19.8
Total	583	100.0	1959	100.0	2542	100.0

Table 9 shows higher numbers of suicides in many lower socio-economic status occupations. In fact, 53.5% of construction industry suicides are in the lowest (NZSEI groups 9 and 10) socioeconomic status occupations.

Suicides by geographic region

We chose to present DHB of residence as data were very similar to DHB on incident location. We also present data by location of coroner's office.

Table 10: Closed suicide cases by DHB of residence

NCIS employed at time of death		In construction				All employed	
		Yes		No		N	Col%
		N	Col%	N	Col%		
DHB	DHB of Residence						
.		8	1.4	16	0.8	24	0.9
1	Northland	23	3.9	74	3.8	97	3.8
2	Waitemata	64	11.0	163	8.3	227	8.9
3	Auckland	41	7.0	174	8.9	215	8.5
4	Counties Manukau	49	8.4	143	7.3	192	7.6
5	Waikato	37	6.3	165	8.4	202	7.9
6	Lakes	17	2.9	61	3.1	78	3.1
7	Bay of Plenty	43	7.4	107	5.5	150	5.9
8	Tairāwhiti	5	0.9	31	1.6	36	1.4
9	Taranaki	17	2.9	69	3.5	86	3.4
10	Hawke's Bay	25	4.3	92	4.7	117	4.6
11	Whanganui	9	1.5	37	1.9	46	1.8
12	Midcentral	23	3.9	91	4.6	114	4.5
13	Hutt	17	2.9	55	2.8	72	2.8
14	Capital and Coast	21	3.6	103	5.3	124	4.9
15	Wairarapa	7	1.2	37	1.9	44	1.7
16	Nelson Marlborough	14	2.4	54	2.8	68	2.7
17	West Coast	s	s	<33	s	33	1.3
18	Canterbury	94	16.1	232	11.8	326	12.8
19	South Canterbury	11	1.9	38	1.9	49	1.9
20	Otago	34	5.8	112	5.7	146	5.7
21	Southland	20	3.4	76	3.9	96	3.8

s= suppressed

The highest number and proportion of suicides were in Canterbury DHB, for both those working in and out of construction. We also examined DHB of incident and observed the same pattern.

Table 11: Closed suicide cases by Coroners' court

NCIS employed at time of death		In construction				All employed	
		Yes		No		N	Col%
		N	Col%	N	Col%		
Court	Coroner's Office						
9000	Auckland	151	25.9	463	23.6	614	24.2
9001	Christchurch	119	20.4	338	17.3	457	18.0
9002	Dunedin	56	9.6	191	9.7	247	9.7
9003	Hamilton	38	6.5	161	8.2	199	7.8
9004	Hastings	32	5.5	141	7.2	173	6.8
9006	Palmerston North	51	8.7	200	10.2	251	9.9
9007	Rotorua	62	10.6	186	9.5	248	9.8
9008	Wellington	44	7.5	198	10.1	242	9.5
9009	Whangarei	30	5.1	81	4.1	111	4.4
Total		583	100.0	1959	100.0	2542	100.0

Auckland Coroners court had the highest number and proportions of suicides in the country, followed by Christchurch.

Suicides by Australian & New Zealand Standard Classification of Occupation (ANZSCO)

We examined suicides at a number of ANZSCO levels. The ANZSCO follows a tree structure with 9 major occupations at the 1-digit level, each splitting out into the more specific occupations in that group, at the 2, 3, 4- and 6-digit levels. See Fig 2 example.

Fig 2: Example of the ANZSCO levels

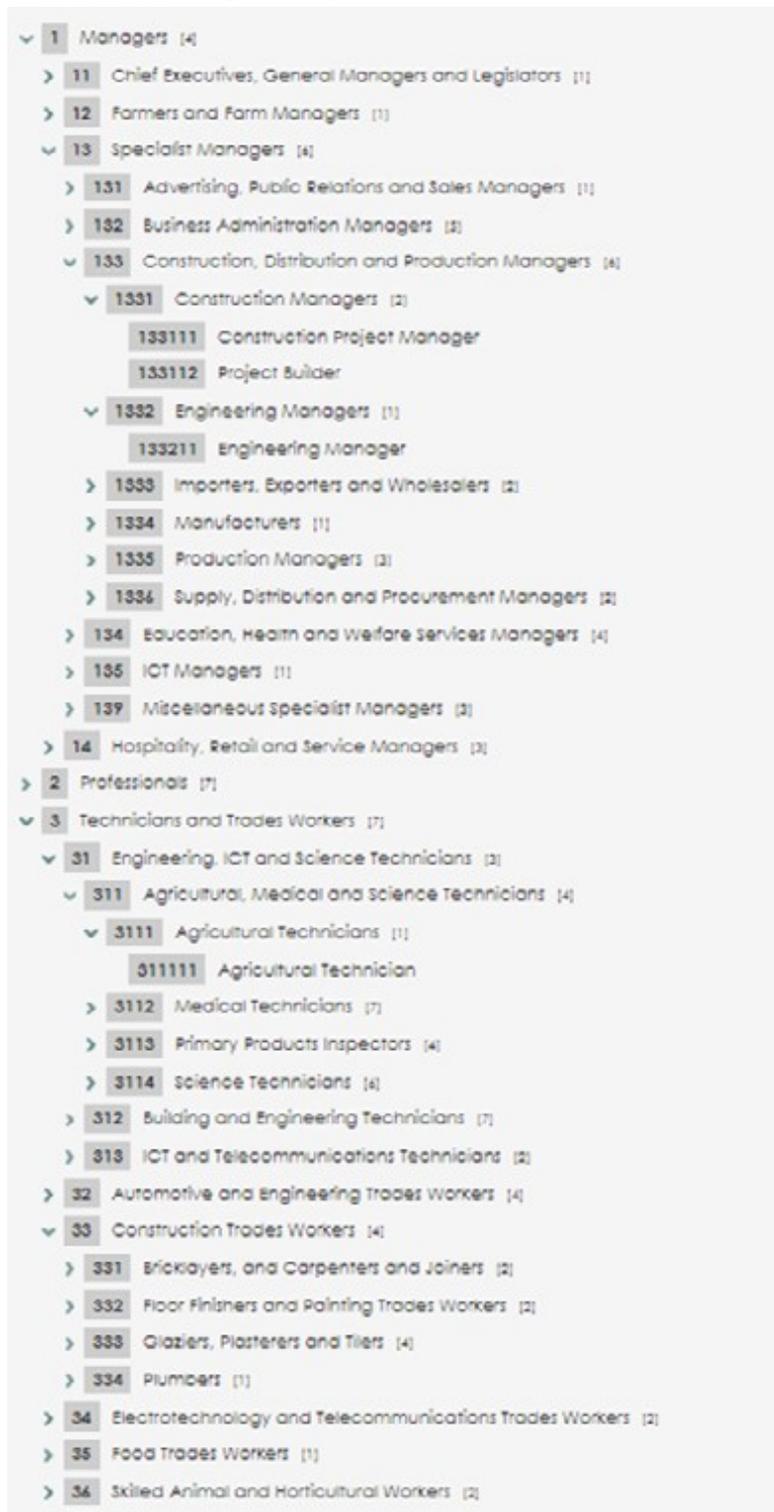


Table 12: Number of suicides by the ANZSCO Level 1

NCIS employed at time of death		In construction				All employed	
		Yes		No		N	Col%
		N	Col%	N	Col%		
Level 1 Description							
1	Managers	7	1.2	247	12.6	254	10.0
2	Professionals	40	6.9	306	15.6	346	13.6
3	Technicians and Trades Workers	312	53.5	212	10.8	524	20.6
4	Community and Personal Service Workers	0	0	183	9.3	183	7.2
5	Clerical and Administrative Workers	0	0	92	4.7	92	3.6
6	Sales Workers	0	0	125	6.4	125	4.9
7	Machinery Operators and Drivers	15	2.6	148	7.6	163	6.4
8	Labourers	209	35.8	427	21.8	636	25.0
9	Not Defined	0	0	219	11.2	219	8.6
Total		583	100.0	1959	100.0	2542	100.0

Table 12 shows that the majority of suicides in the construction industry using the MATES industry definition, fall under ANZSCO group 3-*Technician and Trades Workers* (53.5%) and group 8-*Labourers* (35.8%). There are very few construction industry suicides amongst 1-*Managers*, some amongst 2-*Professionals*, and none at occupation major groups 4, 5 and 6.

For those working outside of the construction industry the highest numbers are also for 8-*Labourers* (21.8%), then 2-*Professionals* (15.6%), 1-*Managers* (12.6%), 9-*Not Defined* (11.2%) then 3-*Technicians & Trades Workers* (10.8%).

NCIS employed at time of death		In construction				All employed	
		Yes		No		N	Col%
		N	Col%	N	Col%		
Level 2	Level 2 Description						
11	Chief Executives, General Managers and Legislators	0	0	72	3.7	72	2.8
12	Farmers and Farm Managers	0	0	75	3.8	75	3.0
13	Specialist Managers	7	1.2	49	2.5	56	2.2
14	Hospitality, Retail and Service Managers	0	0	51	2.6	51	2.0
21	Arts and Media Professionals	0	0	42	2.1	42	1.7
22	Business, Human Resource and Marketing Professionals	0	0	54	2.8	54	2.1
23	Design, Engineering, Science and Transport Professionals	40	6.9	27	1.4	67	2.6
24	Education Professionals	0	0	56	2.9	56	2.2
25	Health Professionals	0	0	83	4.2	83	3.3
26	ICT Professionals	0	0	21	1.1	21	0.8
27	Legal, Social and Welfare Professionals	0	0	23	1.2	23	0.9
31	Engineering, ICT and Science Technicians	32	5.5	39	2.0	71	2.8

Table 13: Number and percent of suicides by the ANZSCO Level 2

NCIS employed at time of death		In construction				All employed	
		Yes		No		N	Col%
		N	Col%	N	Col%		
Level 2	Level 2 Description						
32	Automotive and Engineering Trades Workers	13	2.2	69	3.5	82	3.2
33	Construction Trades Workers	181	31.0	0	0	181	7.1
34	Electrotechnology and Telecommunications Trades Workers	<43	s	s	s	43	1.7
35	Food Trades Workers	0	0	46	2.3	46	1.8
36	Skilled Animal and Horticultural Workers	5	0.9	25	1.3	30	1.2
39	Other Technicians and Trades Workers	40	6.9	31	1.6	71	2.8
41	Health and Welfare Support Workers	0	0	16	0.8	16	0.6
42	Carers and Aides	0	0	56	2.9	56	2.2
43	Hospitality Workers	0	0	32	1.6	32	1.3
44	Protective Service Workers	0	0	50	2.6	50	2.0
45	Sports and Personal Service Workers	0	0	29	1.5	29	1.1
51	Office Managers and Program Administrators	0	0	13	0.7	13	0.5
52	Personal Assistants and Secretaries	0	0	7	0.4	7	0.3
53	General Clerical Workers	0	0	9	0.5	9	0.4
54	Inquiry Clerks and Receptionists	0	0	13	0.7	13	0.5
55	Numerical Clerks	0	0	8	0.4	8	0.3
56	Clerical and Office Support Workers	0	0	19	1.0	19	0.7
59	Other Clerical and Administrative Workers	0	0	23	1.2	23	0.9
61	Sales Representatives and Agents	0	0	23	1.2	23	0.9
62	Sales Assistants and Salespersons	0	0	85	4.3	85	3.3
63	Sales Support Workers	0	0	17	0.9	17	0.7
71	Machine and Stationary Plant Operators	s	s	<42	s	42	1.7
72	Mobile Plant Operators	11	1.9	11	0.6	22	0.9
73	Road and Rail Drivers	0	0	87	4.4	87	3.4
74	Storepersons	0	0	12	0.6	12	0.5
81	Cleaners and Laundry Workers	0	0	42	2.1	42	1.7
82	Construction and Mining Labourers	<101	s	s	s	101	4.0
83	Factory Process Workers	0	0	79	4.0	79	3.1
84	Farm, Forestry and Garden Workers	0	0	248	12.7	248	9.8
85	Food Preparation Assistants	0	0	17	0.9	17	0.7
89	Other Labourers	112	19.2	37	1.9	149	5.9
99	Not Defined	0	0	219	11.2	219	8.6

Table 14: Summary of 6-digit level ANZSCO occupations with 5 or more suicides

NCIS employed at time of death				In construction	
				Yes	
				N	Col%
	Level 3 Description and Level 6 Codes				
232	Architects, Designers, Planners and Surveyors	232111	Architect	5	1.0
233	Engineering Professionals	233999	Engineering Professionals nec	22	4.4
312	Building and Engineering Technicians	312511	Mechanical Engineering Draftsperson	6	1.2
		312999	Building and Engineering Technicians nec	14	2.8
331	Bricklayers, and Carpenters and Joiners	331111	Bricklayer	8	1.6
		331211	Carpenter and Joiner	22	4.4
		331212	Carpenter	38	7.7
		331213	Joiner	7	1.4
332	Floor Finishers and Painting Trades Workers	332111	Floor Finisher	5	1.0
		332211	Painting Trades Worker	38	7.7
333	Glaziers, Plasterers and Tilers	333111	Glazier	8	1.6
		333211	Fibrous Plasterer	7	1.4
		333212	Solid Plasterer	11	2.2
		333311	Roof Tiler	10	2.0
334	Plumbers	334111	Plumber (General)	17	3.4
341	Electricians	341111	Electrician (General)	31	6.3
362	Horticultural Trades Workers	362213	Landscape Gardener	5	1.0
399	Miscellaneous Technicians and Trades Workers	399999	Technicians and Trades Workers nec	39	7.9
721	Mobile Plant Operators	721211	Earthmoving Plant Operator (General)	5	1.0
		721214	Excavator Operator	5	1.0
821	Construction and Mining Labourers	821111	Builder's Labourer	54	10.9
		821112	Drainage, Sewerage and Stormwater Labourer	6	1.2
		821211	Concreter	12	2.4
		821511	Paving and Surfacing Labourer	8	1.6
899	Miscellaneous Labourers	899999	Labourers nec	112	22.6
Total with 5 or more suicides in construction at level 6 coding				495	100.0

The top 10 are highlighted in a darker colour.

NB: Labourers nec 899999 is not included in Australian MATES data or the Bryson et al report which also used the Australian MATES definition of construction.

RESULTS III: ACTIVE CASES - LATEST CORONIAL DATA

Tables 15 and 16 compare active (suspected but undetermined) and closed suicide cases, based on our data request to Coronial Services New Zealand received from them on 12 July 2021.

Table 15: Number of active and closed cases of suicides - coroner's data

NCIS employed at time of death	In construction				All from Coroner	
	Yes		No		N	Col%
	N	Col%	N	Col%		
Status						
Active	172	22.5	1266	19.7	1438	20.0
Closed	591	77.5	5174	80.3	5765	80.0
Total	763	100.0	6440	100.0	7203	100.0

* Discrepancy due to some cases being closed since our initial NCIS data access date.

Table 16: Number of active and closed cases of suicides by financial year - coroner's data

NCIS employed at time of death	In construction						Total		
	Yes			No			Total		
	Coroners		NCIS	Coroners		NCIS	Coroners		NCIS
	Active	Closed	Closed	Active	Closed	Closed	Active	Closed	Closed
FinYr_From									
Jul2007 - Jun2008	0	56	57	0	446	440	0	502	497
Jul2008 - Jun2009	0	62	61	0	435	432	0	497	493
Jul2009 - Jun2010	0	49	49	0	487	479	0	536	528
Jul2010 - Jun2011	0	38	38	0	470	469	0	508	507
Jul2011 - Jun2012	0	40	40	0	495	498	0	535	538
Jul2012 - Jun2013	0	54	54	s	463	459	s	517	513
Jul2013 - Jun2014	0	45	45	s	465	462	s	510	507
Jul2014 - Jun2015	0	58	57	5	484	477	5	542	534
Jul2015 - Jun2016	s	51	51	<28	477	472	28	528	523
Jul2016 - Jun2017	s	67	65	<46	452	435	46	519	500
Jul2017 - Jun2018	31	45	37	185	398	374	216	443	411
Jul2018 - Jun2019	49	40	39	298	253	224	347	293	263
Jul2019 - Jun2020	56	16	0	484	70	0	540	86	0
Total	142	621	593	1045	5395	5221	1187	6016	5814

*Note some active cases may not in the end be ruled as suicides.

Fig 3: Active and closed cases of construction industry suicides

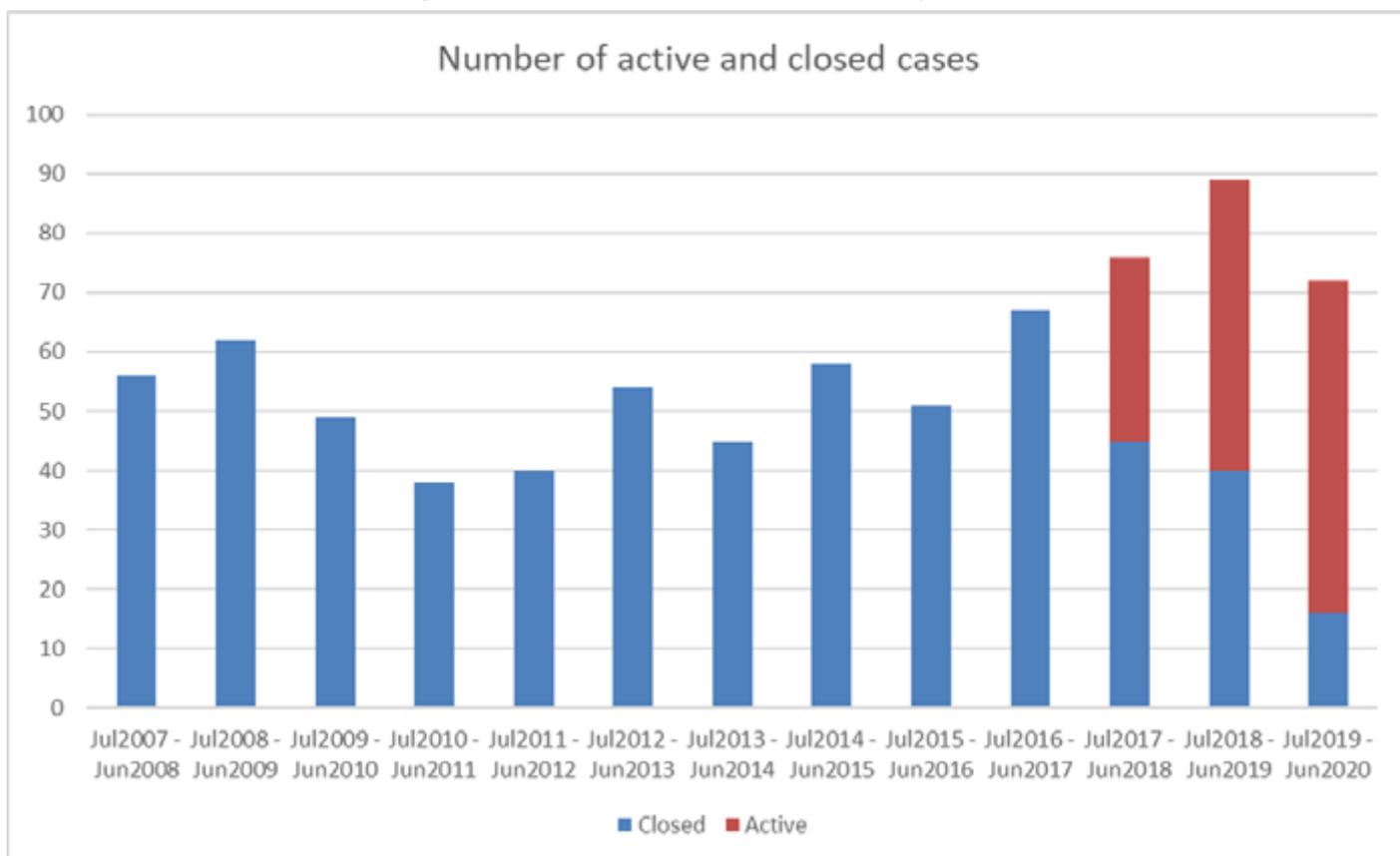


Table 17: Number of active and closed cases of suicides by ANZSCO Major group - coroner's data

NCIS employed at time of death		In construction				All from Coroner	
		Yes		No		N	Col%
		N	Col%	N	Col%		
Level 1	Level 1 Description						
.	(no occupation noted)	172	22.5	1266	19.7	1438	20.0
1	Managers	7	0.9	252	3.9	259	3.6
2	Professionals	43	5.6	326	5.1	369	5.1
3	Technicians and Trades Workers	312	40.9	219	3.4	531	7.4
4	Community and Personal Service Workers	0	0	192	3.0	192	2.7
5	Clerical and Administrative Workers	0	0	95	1.5	95	1.3
6	Sales Workers	0	0	126	2.0	126	1.7
7	Machinery Operators and Drivers	15	2.0	148	2.3	163	2.3
8	Labourers	214	28.0	438	6.8	652	9.1
9	Not Defined	0	0	3378	52.5	3378	46.9
Total		763	100.0	6440	100.0	7203	100.0

RESULTS IV: AGE ADJUSTED RATES

This section reports on the age standardised rates based on NCIS data.

Table 18: Age adjusted rates of suicide (12 years 2007-2019) – construction industry compared with employed outside construction and by major occupational group

			Deaths	Person Years	Crude Rate	Std Rate	95% CL	Prob
Sex	Level 1 Used	In Construction						
All	All Levels Combined	Yes	583	3,488,531	16.71	10.67	(9.73-11.60)	.
		No	1,959	21,810,460	8.98	9.18	(8.77-9.59)	.
		Ratio	.	.	.	1.16	(1.05-1.28)	0.0027
Male	All Levels Combined	Yes	571	2,819,988	20.25	19.71	(18.09-21.33)	.
		No	1,511	10,468,260	14.43	14.44	(13.71-15.17)	.
		Ratio	.	.	.	1.36	(1.24-1.50)	<.0001
	Level 1. Managers	Yes	7	497,368	1.41	1.11	(0.29-1.93)	.
		No	214	2,347,541	9.12	8.58	(7.35-9.82)	.
		Ratio	.	.	.	0.13	(0.06-0.28)	<.0001
	Level 2. Professionals	Yes	38	335,841	11.31	10.53	(7.16-13.90)	.
		No	194	2,002,944	9.69	9.69	(8.13-11.25)	.
		Ratio	.	.	.	1.09	(0.76-1.55)	0.6502
	Level 3. Technicians and Trades Workers	Yes	307	1,228,196	25.00	24.06	(21.36-26.77)	.
		No	190	1,168,999	16.25	15.72	(13.48-17.97)	.
		Ratio	.	.	.	1.53	(1.28-1.84)	<.0001
	Level 7. Machinery Operators and Drivers	Yes	14	164,770	8.50	7.93	(3.75-12.11)	.
		No	142	1,044,677	13.59	13.79	(11.48-16.10)	.
		Ratio	.	.	.	0.58	(0.33-1.00)	0.0498
	Level 8. Labourers	Yes	205	593,813	34.52	34.94	(30.01-39.87)	.
		No	371	1,142,872	32.46	32.70	(29.24-36.17)	.
		Ratio	.	.	.	1.07	(0.90-1.27)	0.4624
	Levels 1,2,3,7,8 i.e. those with construction work	Yes	571	2,819,988	20.25	19.71	(18.09-21.33)	.
		No	1,111	7,707,033	14.42	14.62	(13.75-15.49)	.
		Ratio	.	.	.	1.35	(1.22-1.49)	<.0001
Female	All Levels Combined	Yes	12	668,543	1.79	1.62	(0.70-2.55)	.
		No	448	11,342,200	3.95	3.92	(3.55-4.28)	.
		Ratio	.	.	.	0.41	(0.23-0.74)	0.0028

Age standardised rates overall for men working in the construction industry for 2007-2019 were **19.71** per 100,000 people (95% CI, 18.09-21.33) compared to 14.44 per 100,000 for men working outside of construction (95% CI, 13.71-15.17). This was a statistically significant difference – the rate ratio was 1.36 (95% CI, 1.24-1.50) P <.0001.

Table 19: Age adjusted rates of suicide (12 years 2007-2019) – construction industry compared with employed outside construction by 5 year age group

			Construction Yes Rate	Construction No Rate	Rate Ratio	RR Lower CL	RR Upper CL
Sex	Level1Used	Age5yr					
Male	All Levels Combined	15-19 yrs	17.16	15.10	1.14	0.73	1.78
		20-24 yrs	32.94	18.72	1.76	1.37	2.26
		25-29 yrs	23.62	14.87	1.59	1.20	2.11
		30-34 yrs	23.03	14.68	1.57	1.18	2.09
		35-39 yrs	19.52	13.48	1.45	1.07	1.96
		40-44 yrs	20.03	14.51	1.38	1.03	1.85
		45-49 yrs	24.67	15.50	1.59	1.22	2.08
		50-54 yrs	17.83	15.83	1.13	0.83	1.54
		55-59 yrs	16.21	14.61	1.11	0.78	1.57
		60-64 yrs	10.16	13.71	0.74	0.45	1.21
		>=65 yrs	2.84	5.90	0.48	0.17	1.34
	Level 1. Managers	15-19 yrs	0.00	7.69	0.00	.	.
		20-24 yrs	0.00	5.63	0.00	.	.
		25-29 yrs	0.00	6.08	0.00	.	.
		30-34 yrs	0.00	4.66	0.00	.	.
		35-39 yrs	0.00	12.13	0.00	.	.
		40-44 yrs	0.00	7.01	0.00	.	.
		45-49 yrs	2.89	11.14	0.26	0.06	1.08
		50-54 yrs	8.23	11.03	0.75	0.29	1.91
		55-59 yrs	0.00	9.96	0.00	.	.
		60-64 yrs	0.00	14.87	0.00	.	.
		>=65 yrs	0.00	5.04	0.00	.	.
	Level 2. Professionals	15-19 yrs	0.00	12.51	0.00	.	.
		20-24 yrs	3.94	6.11	0.65	0.08	5.24
		25-29 yrs	0.00	6.61	0.00	.	.
		30-34 yrs	17.06	8.30	2.06	0.87	4.86
		35-39 yrs	9.92	7.21	1.38	0.47	4.07
		40-44 yrs	12.81	6.02	2.13	0.77	5.85
		45-49 yrs	16.11	13.19	1.22	0.51	2.93
		50-54 yrs	17.43	17.09	1.02	0.43	2.42
		55-59 yrs	12.82	13.68	0.94	0.33	2.69
		60-64 yrs	16.91	9.73	1.74	0.57	5.28
		>=65 yrs	4.86	7.37	0.66	0.08	5.15

			Construction Yes Rate	Construction No Rate	Rate Ratio	RR Lower CL	RR Upper CL
Sex	Level1Used	Age5yr					
Male	Level 3. Technicians and Trades Workers	15-19 yrs	16.42	26.86	0.61	0.26	1.41
		20-24 yrs	32.04	22.32	1.44	0.89	2.31
		25-29 yrs	28.17	19.58	1.44	0.88	2.36
		30-34 yrs	27.90	15.42	1.81	1.05	3.11
		35-39 yrs	26.01	11.93	2.18	1.19	4.00
		40-44 yrs	25.88	20.51	1.26	0.76	2.08
		45-49 yrs	30.32	19.71	1.54	0.94	2.53
		50-54 yrs	21.92	12.92	1.70	0.90	3.19
		55-59 yrs	26.40	10.16	2.60	1.26	5.35
		60-64 yrs	11.60	12.32	0.94	0.37	2.37
	>=65 yrs	5.66	1.75	3.24	0.34	31.11	
	Level 7. Machinery Operators and Drivers	15-19 yrs	15.31	7.52	2.04	0.21	19.58
		20-24 yrs	18.38	14.25	1.29	0.36	4.57
		25-29 yrs	0.00	15.77	0.00	.	.
		30-34 yrs	0.00	20.14	0.00	.	.
		35-39 yrs	0.00	15.53	0.00	.	.
		40-44 yrs	16.24	20.64	0.79	0.24	2.62
		45-49 yrs	15.72	12.35	1.27	0.37	4.40
		50-54 yrs	16.22	16.14	1.01	0.30	3.38
		55-59 yrs	0.00	9.74	0.00	.	.
		60-64 yrs	8.82	9.67	0.91	0.12	7.20
	>=65 yrs	0.00	2.41	0.00	.	.	
	Level 8. Labourers	15-19 yrs	21.33	23.36	0.91	0.50	1.66
		20-24 yrs	59.06	50.10	1.18	0.82	1.70
		25-29 yrs	52.16	39.03	1.34	0.84	2.13
		30-34 yrs	47.92	45.92	1.04	0.63	1.73
		35-39 yrs	43.11	31.56	1.37	0.77	2.42
		40-44 yrs	38.78	40.11	0.97	0.56	1.66
		45-49 yrs	46.85	27.16	1.72	1.01	2.96
		50-54 yrs	20.08	30.55	0.66	0.33	1.31
55-59 yrs		17.50	29.20	0.60	0.28	1.27	
60-64 yrs		12.01	14.55	0.83	0.29	2.37	
>=65 yrs	0.00	12.94	0.00	.	.		

			Construction Yes Rate	Construction No Rate	Rate Ratio	RR Lower CL	RR Upper CL
Sex	Level1Used	Age5yr					
Male	Levels 1,2,3,7,8 i.e. those with construction work	15-19 yrs	17.16	19.32	0.89	0.56	1.42
		20-24 yrs	32.94	22.14	1.49	1.14	1.94
		25-29 yrs	23.62	15.20	1.55	1.15	2.10
		30-34 yrs	23.03	14.45	1.59	1.18	2.16
		35-39 yrs	19.52	13.11	1.49	1.08	2.05
		40-44 yrs	20.03	13.99	1.43	1.06	1.94
		45-49 yrs	24.67	14.83	1.66	1.26	2.20
		50-54 yrs	17.83	15.81	1.13	0.82	1.55
		55-59 yrs	16.21	13.25	1.22	0.85	1.76
		60-64 yrs	10.16	12.40	0.82	0.49	1.36
		>=65 yrs	2.84	5.98	0.47	0.17	1.34
Female	All Levels Combined	15-19 yrs	0.00	3.01	0.00	.	.
		20-24 yrs	0.00	5.29	0.00	.	.
		25-29 yrs	2.80	3.22	0.87	0.21	3.62
		30-34 yrs	5.19	4.79	1.08	0.39	2.99
		35-39 yrs	1.23	4.05	0.30	0.04	2.20
		40-44 yrs	1.11	3.72	0.30	0.04	2.16
		45-49 yrs	2.29	4.61	0.50	0.12	2.03
		50-54 yrs	1.32	5.21	0.25	0.04	1.83
		55-59 yrs	1.75	3.46	0.51	0.07	3.68
		60-64 yrs	0.00	2.71	0.00	.	.
		>=65 yrs	0.00	1.02	0.00	.	.

The age specific suicide rates show very high rate for those aged 20-24 at 32.94 per 100,000 compared with 18.72 per 100,000 for men working outside of construction.

DISCUSSION

In meeting the objectives for this project, we arrived at a new refined definition of the construction industry and provided a definitive list of occupations designed for use with available suicide data. Using this new definition, we have also calculated the industry specific rate of suicide in the New Zealand construction industry based on 12 years of data. Together, the refined industry definition and the rates provide a baseline of what is happening currently in terms of construction industry suicides, useful for assessing suicide prevention efforts and monitoring trends in the future.

In terms of the numbers of suicides, our 583 suicides in the New Zealand construction industry for the 12-year period (01 July 2007 to 30 June 2019), is much higher than the 300 cases reported previously for the 10 year period 2007-2017.[1] There are a number of reasons for this. Our data include an extra two years of data and our data also includes the 6-digit occupation category 899999 Labourers NEC, which has high suicide numbers (n=112) and was excluded in previous research.[1,4] As well, our revised definition of 112 occupations includes more occupations than requested previously in similar Australasian research (n=72). [1,4].

It is difficult to compare the New Zealand rates of construction industry suicides with those reported in many other countries as the definition of the construction industry varies widely. Age standardised rates overall for men working in the construction industry for 2007-2019 were 19.71 per 100,000 people (95% CI, 18.09-21.33) compared to 14.44 per 100,000 for men working outside of construction (95% CI, 13.71-15.17) and this was statistically significant ($P < .0001$). This compares to the higher age adjusted rate for men in construction in Australia for the period 2001-2018 at 25.2 per 100,000 people (95% CI, 24.3-26.1), and their lower rate for men working outside of construction at 12.8 per 100,000 (95% CI, 12.5-13.0).[4] By age group, men aged 20-24 had the highest rate of suicide at 32.94 per 100,000 compared with 18.72 per 100,000 for this age group of men working outside of construction.

Strength and limitations

We have provided a list of occupations that can be used as a baseline, and in the future to easily request, assess and monitor trends in suicide in the construction industry. This list of construction industry occupations may also be useful for monitoring other sudden deaths in the industry, all of which are investigated by New Zealand coroners.

Although we have provide rates, these can only be presented at the major group level due to small numbers. As noted in the methods, suicide, despite being a critical public health and social issue, is a statistically rare event such that increases or decreases in numbers and rates annually, need to be interpreted with caution.

Conclusion

Clearly whether looking at absolute numbers or rates, the construction industry suffers a considerable burden from suicide. Younger men aged 20-24 should be considered a priority group for industry-based suicide prevention. However, in terms of evaluating industry based or other suicide prevention efforts, suicide data although indicative, is not an especially useful outcome measure. For this reason, attention needs to turn measuring other intermediate outcome measures. These could include suicide attempts* and measures of suicidal ideation, and personal, social and economic stressors and resilience indicators, ideally collected via survey of those working in the construction industry. Another important area for future research, in terms of how and where to reach men in construction with health promotion and suicide prevention, would be to examine whether those men most at risk are self-employed, contracting or working for larger construction sector businesses.

*Given that hanging is the predominant method of suicide by men, and that hanging has high case fatality rate, any measure of suicide attempts will only be useful for the minority who choose less fatal methods.

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APPENDIX A

Defining the construction industry

Summary of steps

Step 1	Consultation and establishment of expert working group.
Step 2	Meeting of the expert working group and researchers to discuss occupations in the Career Development Map for the Construction & Infrastructure Industry- the 'Wireframe map'[3], and follow-up.
Step 3	Compiling the final list of 213 Wireframe occupations as determined in consultation with the expert working group.
Step 4	Mapping the 213 occupations to the Australian and New Zealand Standard Classification of Occupation (ANZSCO).
Step 5	Refining list of occupations via comparison with NZ Census data on industry 'employer' classified as Division E Construction under the Australian New Zealand Standard Industry Classification (ANZSIC) 2006.
Step 6	Feedback of final list to MATES and refinement of list resulting in 112 6-digit level ANZSCO construction industry occupations (see Table A2 Appendix A). These occupations are hereafter called construction industry occupations in this report.

Step 1: Consultation and establishment of expert working group

For clarification of the occupations that belong to the construction industry, an expert working group was established by MATES. A zoom meeting was arranged and held on Wednesday 14 October 2020, with the following working group members in attendance.

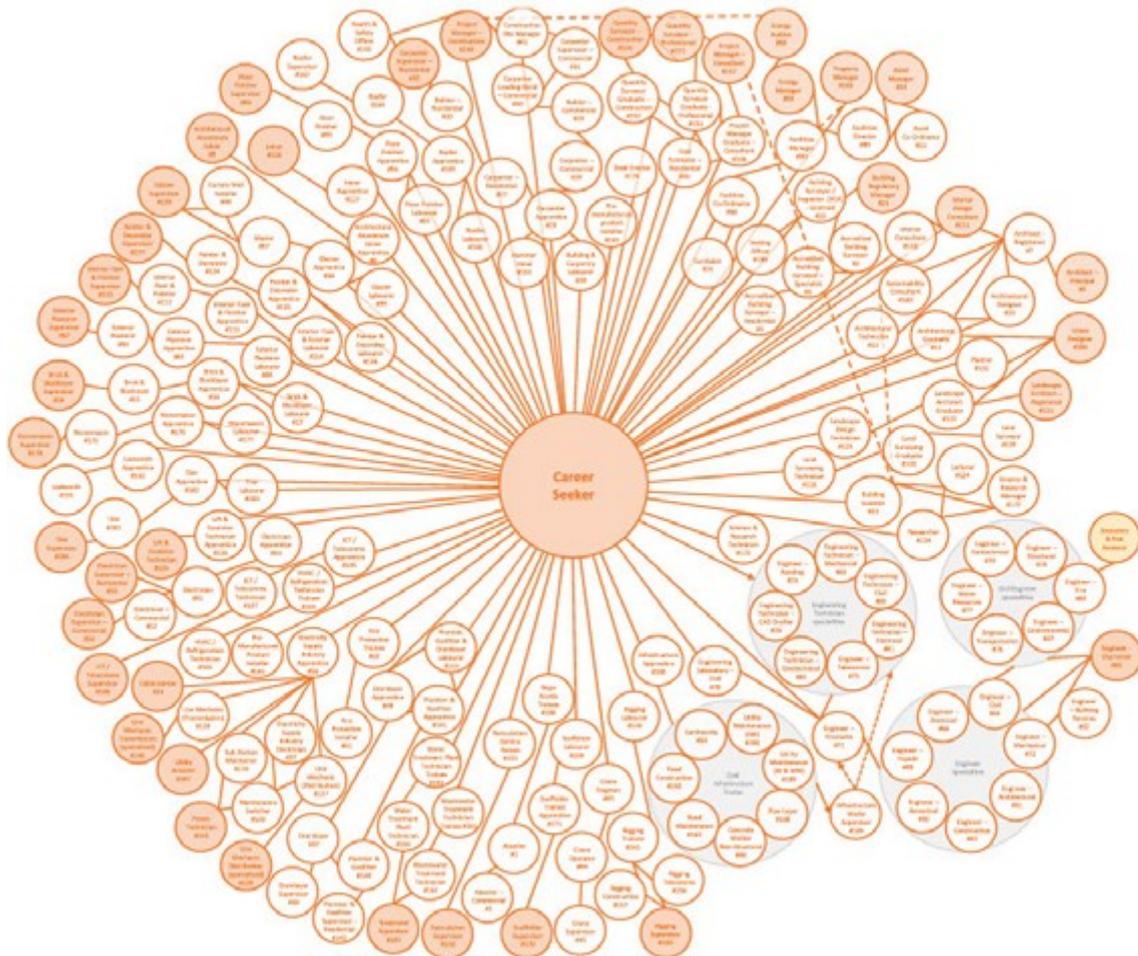
1. Victoria McArthur, CEO MATES in Construction.
2. Gloria Vetekina, Case Manager MATES in Construction.
3. Carlene McLean, Suicide Mortality Review Committee, Health Quality and Safety Commission.
4. Peter Silcock, Civil Contractors New Zealand.
5. Graham Burke, Construction Industry Council.
6. J Cheng, Suicide Mortality Review Committee, Health Quality and Safety Commission.
7. Nick Hall, Building Officials Institute New Zealand.
8. Nick Batchelor, Director, INSITE Technical Solutions.
9. Robert Brooks, Suicide Mortality Review Committee, Health Quality and Safety Commission.

The researchers:

1. Gabrielle Jenkin, Director, Suicide and Mental Health Research Group, University of Otago Wellington.
2. June Atkinson, Data Analyst, University of Otago Wellington.

In preparation for this meeting we were provided with the Wireframe graphic list of occupations in the construction sector (see Fig A1). This graphic representation of occupations was developed by a specialised leadership group working with the construction sector to 'map career development pathways in the construction industry' and to provide a 'holistic representation of the full variety of roles that exist in construction and infrastructure'. The extensive stakeholder consultation process and the methodology for the map development is documented elsewhere.[3]

Fig A1: Career Development Map for the Construction & Infrastructure Industry: 'Wireframe occupations'



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

Step 2: Meeting of the expert working group and researchers to discuss occupations in the Wireframe map, and follow-up

Working with the Wireframe map the group discussed which of the occupations were to be excluded from the construction industry, for the purposes of examining industry suicides.

Working group decisions

The working group decided that the following occupations were to come off the wireframe list:

- Insurance and Risk Assessors.
- Lecturers.
- Reticulation Service Person.
- Reticulation Supervisor.
- Wastewater Treatment Technician Trainee.
- Wastewater Treatment Technician.

Follow-up after the expert working group meeting

Further to the meeting, follow up by email to the research team was provided by MATES with a list of additional occupations for inclusion (provided by Watercare). These were:

OPERATORS:

TBM Operator
MTBM Operator
Locomotive Driver/Operator
Gantry Crane Operator
Erector Operator
Muck Loading Operator
Shotcrete Pump Operator
Shotcrete Nozzleperson
Excavator Operator

LABOURERS/SKILLED LABOURERS:

Tunnelling Leading Hand
Tunnelling Labourer
Rigger
Steel Fixer
Welder

TRADES

Tunnel Bore Machine Operator TBM / MBTM Mechanic TBM /
MTBM Electrician
Programme Logic Control (PLC) Technician (Specialist electrician)
Apprentice Mechanic
Apprentice Electrician (already in wireframe)

STATUTORY ROLES

Site Senior Executive
Ventilation Officer
Mine Surveyor
A Grade Tunnel Manager B
Grade Tunnel Manager
Electrical Superintendent
Mechanical Superintendent

ENGINEERING/TECHNICAL ROLES

Project Engineer
Site Engineer
Graduate Engineer (already in wireframe) Electrical
Engineer (already in wireframe) Mechanical Engineer
(already in wireframe) Geotechnical Engineer
(already in wireframe) Surveyor (there are surveyors
already in wireframe)
Graduate Surveyor (there are graduate surveyors in wireframe – professional and construction)

Step 3: Compiling the final list of 213 Wireframe occupations as determined in consultation with the expert working group

The final list of construction industry occupations as defined by the expert working group is given in Table A1.

Table A1 Occupations selected from Wireframe as belonging to the construction industry

	Hammer Hand #101	1
	Building & Carpentry Labourer #28	2
	Carpenter Apprentice #29	3
	Carpenter - Residential #27	4
	Builder - Residential #20	5
	Carpenter Supervisor - Residential #32	6
	Health & Safety Officer #102	7
	Project Manager - Construction #146	8
	Carpenter - Commercial #26	9
	Builder - Commercial #19	10
	Carpenter Leading Hand - Commercial #30	11
	Carpenter Supervisor - Commercial #31	12
	Construction Site Manager #41	13
	Pre-Manufactured Product Installer #145	14
	Steel Erector #174	15
	Cost Estimator - Residential #42	16
	Quantity Surveyor Graduate - Construction #152	17
	Quantity Surveyor - Construction #150	18
	Quantity Surveyor Graduate - Professional #153	19
	Quantity Surveyor - Professional #151	20
	Project Manager Graduate - Consultant #148	21
	Project Manager - Consultant #147	22
	Caretaker #25	23
	Facilities Co-Ordinator #88	24
	Facilities Manager #90	25
	Energy Manager #59	26
	Energy Auditor #58	27
	Property Manager #149	28
	Facilities Director #89	29
	Asset Manager #14	30
	Asset Co-Ordinator #13	31
	Vetting Officer #190	32
	Building Surveyor/Inspector (BCA) - Licenced #23	33

	Building Regulatory Manager #21	34
	Accredited Building Surveyor - Residential #5	35
	Accredited Building Surveyor - Specialist #4	36
	Accredited Building Surveyor #3	37
	Interior Consultant #110	38
	Interior Design Consultant #111	39
	Sustainability Consultant #180	40
	Architectural Technician #12	41
	Architectural Graduate #11	42
	Architectural Designer #10	43
	Architect - Registered #7	44
	Architect - Principal #6	45
	Planner #131	46
	Urban Designer #186	47
	Landscape Design Technician #123	48
	Landscape Architect Graduate #122	49
	Landscape Architect - Registered #121	50
	Landscape Surveying Technician #118	51
	Landscaping Surveying Graduate #120	52
	Land Surveyor #119	53
	Building Scientist #22	54
	Researcher #154	56
	Science & Research Manager #172	57
	Science & Research Technician #173	58
	Roofer Labourer #166	59
	Roofer Apprentice #165	60
	Roofer #164	61
	Roofer Supervisor #167	62
	Floor Finisher Labourer #95	63
	Floor Finisher Apprentice #94	64
	Floor Finisher #93	65
	Floor Finisher Supervisor #96	66
	Joiner Apprentice #117	67
	Joiner #116	68
	Architectural Aluminium Joiner Apprentice #9	69
	Architectural Aluminium Joiner #8	70
	Glazier Labourer #99	71
	Glazier Apprentice #98	72

	Glazier #97	73
	Curtain Wall Installer #46	74
	Glazier Supervisor #100	75
	Painter & Decorator Labourer #136	76
	Painter & Decorator Apprentice #135	77
	Painter & Decorator #134	78
	Painter & Decorator Supervisor #137	79
	Interior Fixer & Finisher Labourer #114	80
	Interior Fixer & Finisher Apprentice #113	81
	Interior Fixer & Finisher #112	82
	Interior Fixer & Finisher Supervisor #115	83
	Exterior Plasterer Labourer #86	84
	Exterior Plasterer Apprentice #85	85
	Exterior Plasterer #84	86
	Exterior Plasterer Supervisor #87	87
	Brick & Blocklayer Labourer #17	88
	Brick & Blocklayer Apprentice #16	89
	Brick & Blocklayer #15	90
	Brick & Blocklayer Supervisor #18	91
	Stonemason Labourer #177	92
	Stonemason Apprentice #176	93
	Stonemason #175	94
	Stonemason Supervisor #178	95
	Locksmith Apprentice #132	96
	Locksmith #131	97
	Tiler Labourer #183	98
	Tiler Apprentice #182	99
	Tiler #181	100
	Tiler Supervisor #184	101
	Lift & Escalator Apprentice #126	102
	Lift & Escalator Technician #125	103
	Electrician Apprentice #53	104
	Electrician #51	105
	Electrician - Commercial #52	106
	Electrician Supervisor - Commercial #54	107
	Electrician Supervisor - Residential #55	108
	ICT/Telecomms Apprentice #105	109
	ICT/Telecomms Technician #107	110

	ICT/Telecomms Supervisor #106	111
	HVAC/Refrigeration Technician Trainee #104	112
	HVAC/Refrigeration Technician #103	113
	Electricity Supply Industry Apprentice #56	115
	Cable Joiner #24	116
	Line Mechanic (Transmission) #128	117
	Line Mechanic Transmission (specialised) #130	118
	Utility Arborist #187	119
	Electricity Supply Industry Electrician #57	120
	Line Mechanic (Distribution) #127	121
	Maintenance Switcher #133	122
	Sub-Station Maintainer #179	123
	Power Technician #144	124
	Line Mechanic Distribution (specialised) #129	125
	Fire Protection Trainee #92	126
	Fire Protection Installer #91	127
	Plumber, Gasfitter & Drainlayer Labourer #143	128
	Drainlayer Apprentice #48	129
	Drainlayer #47	130
	Drainlayer Supervisor #49	131
	Plumber & Gasfitter Apprentice #141	132
	Plumber & Gasfitter #140	133
	Plumber & Gasfitter Supervisor - Residential #142	134
	Rope Access Trainee #168	135
	Abseiler #1	136
	Abseiler - Commercial #2	137
	Scaffolder Labourer #169	138
	Scaffolder Trainee Apprentice #171	139
	Scaffolder Supervisor #170	140
	Crane Dogman #43	141
	Crane Operator #44	142
	Crane Supervisor #45	143
	Rigging Labourer #159	144
	Rigging Trainee #161	145
	Rigging Construction #157	146
	Rigging Telecomms #158	147
	Rigging Supervisor #160	148
	Infrastructure Apprentice #108	149

	Infrastructure Works Supervisor #109	150
	Engineering Laboratory - Civil #78	151
	Engineer - Graduate #71	152
	Engineer - Building Services #62	153
	Engineer - Chartered #63	154
Civil Infrastructure Trades	Earthworks #50	155
	Utility Maintenance (SW) #188	156
	Utility Maintenance (W & WW) #189	157
	Pipe Layer #138	158
	Concrete Worker Non-Structural #40	159
	Road Maintenance #163	160
	Road Construction #162	161
Engineer Specialities	Engineer - Electrical #66	162
	Engineer - Civil #64	163
	Engineer- Mechanical #72	164
	Engineer - Architectural #61	165
	Engineer - Construction #65	166
	Engineer - Acoustical #60	167
	Engineer - Façade #68	168
	Engineer - Electrical #66	169
Civil Engineer Specialities	Engineer - Structural #74	170
	Engineer - Fire #69	171
	Engineer - Environmental #67	172
	Engineer - Transportation #76	173
	Engineer - Water Resources #77	174
	Engineer - Geotechnical #70	175
Engineering Technician Specialities	Engineer - Roading #73	176
	Engineering Technician - Mechanical #83	177
	Engineering Technician - Civil #80	178
	Engineering Technician - Electrical #81	179
	Engineer - Telicomms #75	180
	Engineering Technician - Geotechnical #82	181
	Engineering Technician - CAD Drafter #79	182
	Machine and plant operators	183

	Directional drillers and pilers	184
	Traffic controllers and managers	185
	Tunnellers	186
Operators	TBM Operator	187
	MTBM Operator	188
	Locomotive Driver/Operator	189
	Gantry Crane Operator	190
	Erector Operator	191
	Muck Loading Operator	192
	Shotcrete Pump Operator	193
	Shotcrete Nozzleperson	194
	Excavator Operator	195
Labourers/Skilled Labourers	Tunnelling Leading Hand	196
	Tunnelling Labourer	197
	Rigger	198
	Steel Fixer	199
	Welder	200
Trades	TBM/MTBM Mechanic	201
	TBM/MTBM Electrician	202
	Programmer Logic Control (PLC) Technician (Specialist electrician)	203
	Apprentice Mechanic	204
Statutory Roles	Site Senior Executive	205
	Ventilation Office	206
	Mine Surveyor	207
	A Grade Tunnel Manager	208
	B Grade Tunnel Manager	209
	Electrical Superintendent	210
	Mechanical Superintendent	211
Engineering/ Technical Roles	Project Engineer	212
	Site Engineer	213

Step 4: Mapping the 213 occupations to the ANZSCO

Step 4 involved the researchers, GJ and JA, mapping the final agreed Wireframe construction industry occupations to the ANZSCO classification used to report on suicide by occupation in the NCIS.

Mapping the final list of occupations to ANZSCO was done using software designed by Statistics New Zealand for this purpose. The resulting six-digit level ANZSCO codes corresponding to the MATES selection of Wireframe occupations was further examined by GJ and JA and provided back to MATES.

This revealed that the list required some further refinements which were made in an iterative process, beginning with the removal of a few occupations (e.g. office managers) and the addition of some others that were not on the final agreed Wireframe list. The final mapped occupations were then provided back to the working group for feedback.

Step 5: Refining list of occupations via Comparison with New Zealand Census data on industry 'employer'

Because in reality, many people work in more than one industry, we investigated occupations in further detail using Census data on employer. Basically, we wanted to assess if a significant proportion of each of the specific occupations on our list were working for an employer classified as belonging to the Construction industry (Division E) under the Australian New Zealand Standard Industry Classification (ANZSIC) 2006 Revision 1.0.

E Construction
30 Building construction
31 Heavy and Civil Engineering Construction
32 Construction Services

30	Building construction
31	Heavy and Civil Engineering Construction
32	Construction Services

This process involved cross tabulating ALL 6-digit level occupations with Census data on 'employers' belonging to the Construction industry (Division E) ANZSIC. In doing this we then examined the occupations looking for those where 50%, 40% 25% or 10% of those incumbents in that occupation were working for an employer in the ANZSIC Construction industry (Division E). This validated our list of occupations and highlighted a couple of instances where we had missed an industry occupation where incumbents were working predominantly for employers in the Construction industry. We also examined the free-text occupational descriptions in the NCIS dataset (that are also classified to the ANZSCO) to get a better idea of what free text occupations had been coded to the standard classification. Overall, this was an iterative process of refining the final list and it involved discussions between the two researchers and MATES CEO until we reached a consensus.

Step 6: Feedback of final list to MATES

The final list of occupations in the construction industry was decided and agreed to by GJ, JA and MATES after further checking back with a member of the working group (personal communication, Dave Burt, March 2021) on some ambiguous occupations (e.g. telecommunications related occupations).

Results: Final agreed list of MATES defined construction industry occupations

The final list comprised 112 occupations at the 6-digit level is given in Table A2. Table A3 that follows, lists all 6-digit level occupations and their final classification as construction industry or not.

Table A2: Final list of 112 construction industry occupations

6-digit level	Occupation
132411	Policy and Planning Manager
133111	Construction Project Manager
133112	Project Builder
133211	Engineering Manager
149913	Facilities Manager
232111	Architect
232112	Landscape Architect
232212	Surveyor
232312	Industrial Designer
232611	Urban and Regional Planner
233211	Civil Engineer
233212	Geotechnical Engineer
233213	Quantity Surveyor
233214	Structural Engineer
233215	Transport Engineer
233311	Electrical Engineer
233512	Mechanical Engineer
233915	Environmental Engineer
233999	Engineering Professionals nec
312111	Architectural Draftsperson
312112	Building Associate
312113	Building Inspector
312114	Construction Estimator
312115	Plumbing Inspector
312116	Surveying or Spatial Science Technician
312199	Architectural, Building and Surveying Technicians nec
312211	Civil Engineering Draftsperson
312212	Civil Engineering Technician
312311	Electrical Engineering Draftsperson
312312	Electrical Engineering Technician

6-digit level	Occupation
312411	Electronic Engineering Draftsperson
312412	Electronic Engineering Technician
312511	Mechanical Engineering Draftsperson
312512	Mechanical Engineering Technician
312999	Building and Engineering Technicians nec
313212	Telecommunications Field Engineer
313213	Telecommunications Network Planner
322211	Sheetmetal Trades Worker
322311	Metal Fabricator
322313	Welder (First Class)
323211	Fitter (General)
323313	Locksmith
331111	Bricklayer
331112	Stonemason
331211	Carpenter and Joiner
331212	Carpenter
331213	Joiner
332111	Floor Finisher
332211	Painting Trades Worker
333111	Glazier
333211	Fibrous Plasterer
333212	Solid Plasterer
333311	Roof Tiler
333411	Wall and Floor Tiler
334111	Plumber (General)
334112	Airconditioning and Mechanical Services Plumber
334113	Drainer
334114	Gasfitter
334115	Roof Plumber
341111	Electrician (General)
341112	Electrician (Special Class)
341113	Lift Mechanic
342111	Airconditioning and Refrigeration Mechanic
342211	Electrical Linesworker
342212	Technical Cable Jointer
342313	Electronic Equipment Trades Worker
342411	Cabler (Data and Telecommunications)

6-digit level	Occupation
342412	Telecommunications Cable Jointer
342413	Telecommunications Linesworker
362213	Landscape Gardener
399912	Interior Decorator
399918	Fire Protection Equipment Technician
399999	Technicians and Trades Workers nec
711111	Clay Products Machine Operator
711112	Concrete Products Machine Operator
711113	Glass Production Machine Operator
711114	Stone Processing Machine Operator
711199	Clay, Concrete, Glass/Stone Processing Machine Operators nec
711913	Sand Blaster
712111	Crane, Hoist or Lift Operator
712211	Driller
712311	Engineering Production Worker
712915	Concrete Pump Operator
721211	Earthmoving Plant Operator (General)
721213	Bulldozer Operator
721214	Excavator Operator
721215	Grader Operator
721912	Linemarker
721913	Paving Plant Operator
721915	Road Roller Operator
721999	Mobile Plant Operators nec
821111	Builder's Labourer
821112	Drainage, Sewerage and Stormwater Labourer
821113	Earthmoving Labourer
821114	Plumber's Assistant
821211	Concreter
821311	Fencer
821411	Building Insulation Installer
821412	Home Improvement Installer
821511	Paving and Surfacing Labourer
821711	Construction Rigger
821712	Scaffolder
821713	Steel Fixer
821714	Structural Steel Erector

6-digit level	Occupation
821911	Crane Chaser
821912	Driller's Assistant
821913	Lagger
821915	Surveyor's Assistant
839911	Cement and Concrete Plant Worker
899914	Electrical or Telecommunications Trades Assistant
899923	Road Traffic Controller
899999	Labourers nec

APPENDIX B: SUICIDE BY ANZSCO LEVELS 3, 4 AND 6

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 2		Level 3 Description							
11	Chief Executives, General Managers and Legislators	111	Chief Executives, General Managers and Legislators	0	0	72	3.7	72	2.8
12	Farmers and Farm Managers	121	Farmers and Farm Managers	0	0	75	3.8	75	3.0
13	Specialist Managers	131	Advertising, Public Relations and Sales Managers	0	0	s	s	s	s
		132	Business Administration Managers	s	s	<9	s	9	0.4
		133	Construction, Distribution and Production Managers	6	1.0	5	0.3	11	0.4
		134	Education, Health and Welfare Services Managers	0	0	5	0.3	5	0.2
		135	ICT Managers	0	0	s	s	s	s
		139	Miscellaneous Specialist Managers	0	0	24	1.2	24	0.9
14	Hospitality, Retail and Service Managers	141	Accommodation and Hospitality Managers	0	0	15	0.8	15	0.6
		142	Retail Managers	0	0	19	1.0	19	0.7
		149	Miscellaneous Hospitality, Retail and Service Managers	0	0	17	0.9	17	0.7
21	Arts and Media Professionals	211	Arts Professionals	0	0	32	1.6	32	1.3
		212	Media Professionals	0	0	10	0.5	10	0.4
22	Business, Human Resource and Marketing Professionals	221	Accountants, Auditors and Company Secretaries	0	0	21	1.1	21	0.8
		222	Financial Brokers and Dealers, and Investment Advisers	0	0	10	0.5	10	0.4

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 2		Level 3 Description							
		223	Human Resource and Training Professionals	0	0	s	s	s	s
		224	Information and Organisation Professionals	0	0	12	0.6	12	0.5
		225	Sales, Marketing and Public Relations Professionals	0	0	10	0.5	10	0.4
23	Design, Engineering, Science and Transport Professionals	231	Air and Marine Transport Professionals	0	0	6	0.3	6	0.2
		232	Architects, Designers, Planners and Surveyors	11	1.9	7	0.4	18	0.7
		233	Engineering Professionals	<31	s	s	s	31	1.2
		234	Natural and Physical Science Professionals	0	0	12	0.6	12	0.5
24	Education Professionals	241	School Teachers	0	0	37	1.9	37	1.5
		242	Tertiary Education Teachers	0	0	9	0.5	9	0.4
		249	Miscellaneous Education Professionals	0	0	10	0.5	10	0.4
25	Health Professionals	251	Health Diagnostic and Promotion Professionals	0	0	15	0.8	15	0.6
		252	Health Therapy Professionals	0	0	10	0.5	10	0.4
		253	Medical Practitioners	0	0	22	1.1	22	0.9
		254	Midwifery and Nursing Professionals	0	0	36	1.8	36	1.4
26	ICT Professionals	261	Business and Systems Analysts, and Programmers	0	0	11	0.6	11	0.4
		262	Database and Systems Administrators/ICT Security Specialists	0	0	s	s	s	s
		263	ICT Network and Support Professionals	0	0	9	0.5	9	0.4
27		271	Legal Professionals	0	0	14	0.7	14	0.6

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 2		Level 3 Description							
	Legal, Social and Welfare Professionals	272	Social and Welfare Professionals	0	0	9	0.5	9	0.4
31	Engineering, ICT and Science Technicians	311	Agricultural, Medical and Science Technicians	0	0	s	s	s	s
		312	Building and Engineering Technicians	<33	s	s	s	33	1.3
		313	ICT and Telecommunications Technicians	0	0	34	1.7	34	1.3
32	Automotive and Engineering Trades Workers	321	Automotive Electricians and Mechanics	0	0	43	2.2	43	1.7
		322	Fabrication Engineering Trades Workers	<12	s	s	s	12	0.5
		323	Mechanical Engineering Trades Workers	s	s	<14	s	14	0.6
		324	Panelbeaters, and Vehicle Body Builders, Trimmers and Painters	0	0	13	0.7	13	0.5
33	Construction Trades Workers	331	Bricklayers, and Carpenters and Joiners	77	13.2	0	0	77	3.0
		332	Floor Finishers and Painting Trades Workers	43	7.4	0	0	43	1.7
		333	Glaziers, Plasterers and Tilers	38	6.5	0	0	38	1.5
		334	Plumbers	23	3.9	0	0	23	0.9
34	Electrotechnology and Telecommunications Trades Workers	341	Electricians	32	5.5	0	0	32	1.3
		342	Electronics and Telecommunications Trades Workers	<11	s	s	s	11	0.4
35	Food Trades Workers	351	Food Trades Workers	0	0	46	2.3	46	1.8
36	Skilled Animal and Horticultural Workers	361	Animal Attendants and Trainers, and Shearers	0	0	17	0.9	17	0.7
		362	Horticultural Trades Workers	5	0.9	8	0.4	13	0.5
39		391	Hairdressers	0	0	5	0.3	5	0.2

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 2		Level 3 Description							
	Other Technicians and Trades Workers	392	Printing Trades Workers	0	0	9	0.5	9	0.4
		393	Textile, Clothing and Footwear Trades Workers	0	0	s	s	s	s
		394	Wood Trades Workers	0	0	6	0.3	6	0.2
		399	Miscellaneous Technicians and Trades Workers	40	6.9	8	0.4	48	1.9
41	Health and Welfare Support Workers	411	Health and Welfare Support Workers	0	0	16	0.8	16	0.6
42	Carers and Aides	421	Child Carers	0	0	7	0.4	7	0.3
		422	Education Aides	0	0	s	s	s	s
		423	Personal Carers and Assistants	0	0	46	2.3	46	1.8
43	Hospitality Workers	431	Hospitality Workers	0	0	32	1.6	32	1.3
44	Protective Service Workers	441	Defence Force Members, Fire Fighters and Police	0	0	20	1.0	20	0.8
		442	Prison and Security Officers	0	0	30	1.5	30	1.2
45	Sports and Personal Service Workers	451	Personal Service and Travel Workers	0	0	9	0.5	9	0.4
		452	Sports and Fitness Workers	0	0	20	1.0	20	0.8
51	Office Managers and Program Administrators	511	Contract, Program and Project Administrators	0	0	s	s	s	s
		512	Office and Practice Managers	0	0	9	0.5	9	0.4
52	Personal Assistants and Secretaries	521	Personal Assistants and Secretaries	0	0	7	0.4	7	0.3
53	General Clerical Workers	531	General Clerks	0	0	7	0.4	7	0.3
		532	Keyboard Operators	0	0	s	s	s	s

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 2		Level 3 Description							
54	Inquiry Clerks and Receptionists	541	Call or Contact Centre Information Clerks	0	0	6	0.3	6	0.2
		542	Receptionists	0	0	7	0.4	7	0.3
55	Numerical Clerks	551	Accounting Clerks and Bookkeepers	0	0	5	0.3	5	0.2
		552	Financial and Insurance Clerks	0	0	s	s	s	s
56	Clerical and Office Support Workers	561	Clerical and Office Support Workers	0	0	19	1.0	19	0.7
59	Other Clerical and Administrative Workers	591	Logistics Clerks	0	0	s	s	s	s
		599	Miscellaneous Clerical and Administrative Workers	0	0	20	1.0	20	0.8
61	Sales Representatives and Agents	611	Insurance Agents and Sales Representatives	0	0	12	0.6	12	0.5
		612	Real Estate Sales Agents	0	0	11	0.6	11	0.4
62	Sales Assistants and Salespersons	621	Sales Assistants and Salespersons	0	0	85	4.3	85	3.3
63	Sales Support Workers	631	Checkout Operators and Office Cashiers	0	0	s	s	s	s
		639	Miscellaneous Sales Support Workers	0	0	13	0.7	13	0.5
71	Machine and Stationary Plant Operators	711	Machine Operators	s	s	<34	s	34	1.3
		712	Stationary Plant Operators	s	s	<8	s	8	0.3
72	Mobile Plant Operators	721	Mobile Plant Operators	11	1.9	11	0.6	22	0.9
73	Road and Rail Drivers	731	Automobile, Bus and Rail Drivers	0	0	20	1.0	20	0.8
		732	Delivery Drivers	0	0	13	0.7	13	0.5
		733	Truck Drivers	0	0	54	2.8	54	2.1
74	Storepersons	741	Storepersons	0	0	12	0.6	12	0.5

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 2		Level 3 Description							
81	Cleaners and Laundry Workers	811	Cleaners and Laundry Workers	0	0	42	2.1	42	1.7
82	Construction and Mining Labourers	821	Construction and Mining Labourers	<101	s	s	s	101	4.0
83	Factory Process Workers	831	Food Process Workers	0	0	42	2.1	42	1.7
		832	Packers and Product Assemblers	0	0	7	0.4	7	0.3
		839	Miscellaneous Factory Process Workers	0	0	30	1.5	30	1.2
84	Farm, Forestry and Garden Workers	841	Farm, Forestry and Garden Workers	0	0	248	12.7	248	9.8
85	Food Preparation Assistants	851	Food Preparation Assistants	0	0	17	0.9	17	0.7
89	Other Labourers	891	Freight Handlers and Shelf Fillers	0	0	12	0.6	12	0.5
		899	Miscellaneous Labourers	112	19.2	25	1.3	137	5.4
99	Not Defined	997		0	0	17	0.9	17	0.7
		999	Not Defined	0	0	202	10.3	202	7.9

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 3	Level 3 Description	Level 4	Level 4 Description						
111	Chief Executives, General Managers and Legislators	1111	Chief Executives and Managing Directors	0	0	37	1.9	37	1.5
		1112	General Managers	0	0	34	1.7	34	1.3
		1113	Legislators	0	0	s	s	s	s
121	Farmers and Farm Managers	1211	Aquaculture Farmers	0	0	s	s	s	s
		1212	Crop Farmers	0	0	6	0.3	6	0.2
		1213	Livestock Farmers	0	0	54	2.8	54	2.1
		1214	Mixed Crop and Livestock Farmers	0	0	14	0.7	14	0.6
131	Advertising, Public Relations and Sales Managers	1311	Advertising, Public Relations and Sales Managers	0	0	s	s	s	s
132	Business Administration Managers	1321	Corporate Services Managers	0	0	s	s	s	s
		1322	Finance Managers	0	0	5	0.3	5	0.2
		1323	Human Resource Managers	0	0	s	s	s	s
		1324	Policy and Planning Managers	s	s	0	0	s	s
133	Construction, Distribution and Production Managers	1331	Construction Managers	5	0.9	0	0	5	0.2
		1332	Engineering Managers	s	s	0	0	s	s
		1333	Importers, Exporters and Wholesalers	0	0	s	s	s	s
		1334	Manufacturers	0	0	s	s	s	s
		1335	Production Managers	0	0	s	s	s	s
		1336	Supply, Distribution and Procurement Managers	0	0	s	s	s	s

				In construction				All employed	
				Yes		No			
				N	Col%	N	Col%	N	Col%
Level 3	Level 3 Description	Level 4	Level 4 Description						
134	Education, Health and Welfare Services Managers	1342	Health and Welfare Services Managers	0	0	s	s	s	s
		1343	School Principals	0	0	s	s	s	s
		1344	Other Education Managers	0	0	s	s	s	s
135	ICT Managers	1351	ICT Managers	0	0	s	s	s	s
139	Miscellaneous Specialist Managers	1399	Other Specialist Managers	0	0	24	1.2	24	0.9
141	Accommodation and Hospitality Managers	1411	Cafe and Restaurant Managers	0	0	5	0.3	5	0.2
		1412	Caravan Park and Camping Ground Managers	0	0	s	s	s	s
		1413	Hotel and Motel Managers	0	0	5	0.3	5	0.2
		1414	Licensed Club Managers	0	0	s	s	s	s
		1419	Other Accommodation and Hospitality Managers	0	0	s	s	s	s
142	Retail Managers	1421	Retail Managers	0	0	19	1.0	19	0.7
149	Miscellaneous Hospitality, Retail and Service Managers	1493	Conference and Event Organisers	0	0	s	s	s	s
		1494	Transport Services Managers	0	0	s	s	s	s
		1499	Other Hospitality, Retail and Service Managers	0	0	14	0.7	14	0.6
211	Arts Professionals	2112	Music Professionals	0	0	10	0.5	10	0.4
		2113	Photographers	0	0	5	0.3	5	0.2
		2114	Visual Arts and Crafts Professionals	0	0	17	0.9	17	0.7
212	Media Professionals	2121	Artistic Directors, and Media Producers and Presenters	0	0	s	s	s	s
		2122	Authors, and Book and Script Editors	0	0	s	s	s	s

				In construction				All employed	
				Yes		No		N	CoI%
				N	CoI%	N	CoI%		
Level 3	Level 3 Description	Level 4	Level 4 Description						
		2123	Film, Television, Radio and Stage Directors	0	0	s	s	s	s
		2124	Journalists and Other Writers	0	0	s	s	s	s
221	Accountants, Auditors and Company Secretaries	2211	Accountants	0	0	21	1.1	21	0.8
222	Financial Brokers and Dealers, and Investment Advisers	2221	Financial Brokers	0	0	6	0.3	6	0.2
		2222	Financial Dealers	0	0	s	s	s	s
		2223	Financial Investment Advisers and Managers	0	0	s	s	s	s
223	Human Resource and Training Professionals	2231	Human Resource Professionals	0	0	s	s	s	s
224	Information and Organisation Professionals	2242	Archivists, Curators and Records Managers	0	0	s	s	s	s
		2243	Economists	0	0	s	s	s	s
		2244	Intelligence and Policy Analysts	0	0	s	s	s	s
		2247	Management and Organisation Analysts	0	0	s	s	s	s
		2249	Other Information and Organisation Professionals	0	0	7	0.4	7	0.3
225	Sales, Marketing and Public Relations Professionals	2251	Advertising and Marketing Professionals	0	0	s	s	s	s
		2252	ICT Sales Professionals	0	0	s	s	s	s
		2254	Technical Sales Representatives	0	0	5	0.3	5	0.2
231	Air and Marine Transport Professionals	2311	Air Transport Professionals	0	0	5	0.3	5	0.2
		2312	Marine Transport Professionals	0	0	s	s	s	s
232		2321	Architects and Landscape Architects	7	1.2	0	0	7	0.3

				In construction				All employed	
				Yes		No		N	CoI%
				N	CoI%	N	CoI%		
Level 3	Level 3 Description	Level 4	Level 4 Description						
	Architects, Designers, Planners and Surveyors	2322	Surveyors and Spatial Scientists	s	s	0	0	s	s
		2323	Fashion, Industrial and Jewellery Designers	s	s	s	s	s	s
		2324	Graphic and Web Designers, and Illustrators	0	0	s	s	s	s
		2325	Interior Designers	0	0	s	s	s	s
233	Engineering Professionals	2332	Civil Engineering Professionals	s	s	0	0	s	s
		2333	Electrical Engineers	s	s	0	0	s	s
		2335	Industrial, Mechanical and Production Engineers	s	s	0	0	s	s
		2339	Other Engineering Professionals	<24	s	s	s	24	0.9
234	Natural and Physical Science Professionals	2341	Agricultural and Forestry Scientists	0	0	s	s	s	s
		2342	Chemists, and Food and Wine Scientists	0	0	s	s	s	s
		2343	Environmental Scientists	0	0	s	s	s	s
		2345	Life Scientists	0	0	s	s	s	s
		2347	Veterinarians	0	0	s	s	s	s
241	School Teachers	2411	Early Childhood (Pre-primary School) Teachers	0	0	8	0.4	8	0.3
		2412	Primary School Teachers	0	0	13	0.7	13	0.5
		2413	Middle School Teachers \ Intermediate School Teachers	0	0	s	s	s	s
		2414	Secondary School Teachers	0	0	12	0.6	12	0.5
		2415	Special Education Teachers	0	0	s	s	s	s

				In construction				All employed	
				Yes		No		All employed	
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
242	Tertiary Education Teachers	2421	University Lecturers and Tutors	0	0	8	0.4	8	0.3
		2422	Vocational Education Teachers \ Polytechnic Teachers	0	0	s	s	s	s
249	Miscellaneous Education Professionals	2491	Education Advisers and Reviewers	0	0	5	0.3	5	0.2
		2492	Private Tutors and Teachers	0	0	s	s	s	s
		2493	Teachers of English to Speakers of Other Languages	0	0	s	s	s	s
251	Health Diagnostic and Promotion Professionals	2512	Medical Imaging Professionals	0	0	s	s	s	s
		2514	Optometrists and Orthoptists	0	0	s	s	s	s
		2515	Pharmacists	0	0	8	0.4	8	0.3
		2519	Other Health Diagnostic and Promotion Professionals	0	0	s	s	s	s
252	Health Therapy Professionals	2521	Chiropractors and Osteopaths	0	0	s	s	s	s
		2522	Complementary Health Therapists	0	0	s	s	s	s
		2523	Dental Practitioners	0	0	s	s	s	s
		2524	Occupational Therapists	0	0	s	s	s	s
		2525	Physiotherapists	0	0	s	s	s	s
253	Medical Practitioners	2531	General Practitioners and Resident Medical Officers	0	0	5	0.3	5	0.2
		2532	Anaesthetists	0	0	5	0.3	5	0.2
		2534	Psychiatrists	0	0	s	s	s	s
		2535	Surgeons	0	0	s	s	s	s

				In construction				All employed	
				Yes		No		N	CoI%
				N	CoI%	N	CoI%		
Level 3	Level 3 Description	Level 4	Level 4 Description						
		2539	Other Medical Practitioners	0	0	8	0.4	8	0.3
254	Midwifery and Nursing Professionals	2541	Midwives	0	0	s	s	s	s
		2543	Nurse Managers	0	0	s	s	s	s
		2544	Registered Nurses	0	0	31	1.6	31	1.2
261	Business and Systems Analysts, and Programmers	2611	ICT Business and Systems Analysts	0	0	6	0.3	6	0.2
		2612	Multimedia Specialists and Web Developers	0	0	s	s	s	s
		2613	Software and Applications Programmers	0	0	s	s	s	s
262	Database and Systems Administrators, and ICT Security Specialists	2621	Database and Systems Administrators, and ICT Security Specialists	0	0	s	s	s	s
263	ICT Network and Support Professionals	2631	Computer Network Professionals	0	0	7	0.4	7	0.3
		2632	ICT Support and Test Engineers	0	0	s	s	s	s
		2633	Telecommunications Engineering Professionals	0	0	s	s	s	s
271	Legal Professionals	2711	Barristers	0	0	8	0.4	8	0.3
		2712	Judicial and Other Legal Professionals	0	0	s	s	s	s
		2713	Solicitors	0	0	s	s	s	s
272	Social and Welfare Professionals	2721	Counsellors	0	0	s	s	s	s
		2722	Ministers of Religion	0	0	s	s	s	s
		2723	Psychologists	0	0	s	s	s	s
		2725	Social Workers	0	0	s	s	s	s

				In construction				All employed	
				Yes		No		N	CoI%
				N	CoI%	N	CoI%		
Level 3	Level 3 Description	Level 4	Level 4 Description						
311	Agricultural, Medical and Science Technicians	3112	Medical Technicians	0	0	s	s	s	s
		3114	Science Technicians	0	0	s	s	s	s
312	Building and Engineering Technicians	3121	Architectural, Building and Surveying Technicians	s	s	0	0	s	s
		3122	Civil Engineering Draftspersons and Technicians	5	0.9	0	0	5	0.2
		3123	Electrical Engineering Draftspersons and Technicians	s	s	0	0	s	s
		3125	Mechanical Engineering Draftspersons and Technicians	8	1.4	0	0	8	0.3
		3126	Safety Inspectors	0	0	s	s	s	s
		3129	Other Building and Engineering Technicians	14	2.4	0	0	14	0.6
313	ICT and Telecommunications Technicians	3131	ICT Support Technicians	0	0	31	1.6	31	1.2
		3132	Telecommunications Technical Specialists	0	0	s	s	s	s
321	Automotive Electricians and Mechanics	3211	Automotive Electricians	0	0	6	0.3	6	0.2
		3212	Motor Mechanics	0	0	37	1.9	37	1.5
322	Fabrication Engineering Trades Workers	3221	Metal Casting, Forging and Finishing Trades Workers	0	0	s	s	s	s
		3222	Sheetmetal Trades Workers	s	s	0	0	s	s
		3223	Structural Steel and Welding Trades Workers	7	1.2	0	0	7	0.3
323	Mechanical Engineering Trades Workers	3232	Metal Fitters and Machinists	s	s	<11	s	11	0.4
		3233	Precision Metal Trades Workers	s	s	s	s	s	s
		3234	Toolmakers and Engineering Patternmakers	0	0	s	s	s	s
324		3241	Panelbeaters	0	0	6	0.3	6	0.2

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
	Panelbeaters, and Vehicle Body Builders, Trimmers and Painters	3242	Vehicle Body Builders and Trimmers	0	0	s	s	s	s
		3243	Vehicle Painters	0	0	5	0.3	5	0.2
331	Bricklayers, and Carpenters and Joiners	3311	Bricklayers and Stonemasons	10	1.7	0	0	10	0.4
		3312	Carpenters and Joiners	67	11.5	0	0	67	2.6
332	Floor Finishers and Painting Trades Workers	3321	Floor Finishers	5	0.9	0	0	5	0.2
		3322	Painting Trades Workers	38	6.5	0	0	38	1.5
333	Glaziers, Plasterers and Tilers	3331	Glaziers	8	1.4	0	0	8	0.3
		3332	Plasterers	18	3.1	0	0	18	0.7
		3333	Roof Tilers	10	1.7	0	0	10	0.4
		3334	Wall and Floor Tilers	s	s	0	0	s	s
334	Plumbers	3341	Plumbers	23	3.9	0	0	23	0.9
341	Electricians	3411	Electricians	32	5.5	0	0	32	1.3
342	Electronics and Telecommunications Trades Workers	3422	Electrical Distribution Trades Workers	s	s	0	0	s	s
		3423	Electronics Trades Workers	s	s	s	s	s	s
		3424	Telecommunications Trades Workers	s	s	s	s	5	0.2
351	Food Trades Workers	3511	Bakers and Pastrycooks	0	0	7	0.4	7	0.3
		3512	Butchers and Smallgoods Makers	0	0	16	0.8	16	0.6
		3513	Chefs	0	0	20	1.0	20	0.8
		3514	Cooks	0	0	s	s	s	s
361	Animal Attendants and Trainers, and Shearers	3611	Animal Attendants and Trainers	0	0	9	0.5	9	0.4
		3612	Shearers	0	0	7	0.4	7	0.3
		3613	Veterinary Nurses	0	0	s	s	s	s

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
362	Horticultural Trades Workers	3622	Gardeners	5	0.9	7	0.4	12	0.5
		3623	Greenkeepers	0	0	s	s	s	s
391	Hairdressers	3911	Hairdressers	0	0	5	0.3	5	0.2
392	Printing Trades Workers	3921	Print Finishers and Screen Printers	0	0	s	s	s	s
		3923	Printers	0	0	5	0.3	5	0.2
393	Textile, Clothing and Footwear Trades Workers	3931	Canvas and Leather Goods Makers	0	0	s	s	s	s
		3932	Clothing Trades Workers	0	0	s	s	s	s
		3933	Upholsterers	0	0	s	s	s	s
394	Wood Trades Workers	3941	Cabinetmakers	0	0	s	s	s	s
		3942	Wood Machinists and Other Wood Trades Workers	0	0	s	s	s	s
399	Miscellaneous Technicians and Trades Workers	3991	Boat Builders and Shipwrights	0	0	s	s	s	s
		3992	Chemical, Gas, Petroleum and Power Generation Plant Operators	0	0	s	s	s	s
		3995	Performing Arts Technicians	0	0	s	s	s	s
		3996	Signwriters	0	0	s	s	s	s
		3999	Other Miscellaneous Technicians and Trades Workers	40	6.9	s	0.1	41	1.6
411	Health and Welfare Support Workers	4111	Ambulance Officers and Paramedics	0	0	s	s	s	s
		4113	Diversional Therapists	0	0	s	s	s	s
		4114	Enrolled and Mothercraft Nurses	0	0	s	s	s	s

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
		4115	Indigenous Health Workers	0	0	s	s	s	s
		4117	Welfare Support Workers	0	0	11	0.6	11	0.4
421	Child Carers	4211	Child Carers	0	0	7	0.4	7	0.3
422	Education Aides	4221	Education Aides	0	0	s	s	s	s
423	Personal Carers and Assistants	4231	Aged and Disabled Carers	0	0	27	1.4	27	1.1
		4233	Nursing Support and Personal Care Workers	0	0	12	0.6	12	0.5
		4234	Special Care Workers	0	0	7	0.4	7	0.3
431	Hospitality Workers	4311	Bar Attendants and Baristas	0	0	8	0.4	8	0.3
		4312	Cafe Workers	0	0	10	0.5	10	0.4
		4314	Hotel Service Managers	0	0	s	s	s	s
		4315	Waiters	0	0	s	s	s	s
		4319	Other Hospitality Workers	0	0	10	0.5	10	0.4
441	Defence Force Members, Fire Fighters and Police	4411	Defence Force Members - Other Ranks	0	0	12	0.6	12	0.5
		4412	Fire and Emergency Workers	0	0	s	s	s	s
		4413	Police	0	0	5	0.3	5	0.2
442	Prison and Security Officers	4421	Prison Officers	0	0	8	0.4	8	0.3
		4422	Security Officers and Guards	0	0	22	1.1	22	0.9
451	Personal Service and Travel Workers	4511	Beauty Therapists	0	0	s	s	s	s
		4513	Funeral Workers	0	0	s	s	s	s
		4516	Tourism and Travel Advisers	0	0	s	s	s	s
		4517	Travel Attendants	0	0	s	s	s	s

				In construction				All employed	
				Yes		No		All employed	
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
		4518	Other Personal Service Workers	0	0	s	s	s	s
452	Sports and Fitness Workers	4521	Fitness Instructors	0	0	7	0.4	7	0.3
		4522	Outdoor Adventure Guides	0	0	s	s	s	s
		4523	Sports Coaches, Instructors and Officials	0	0	8	0.4	8	0.3
		4524	Sportspersons	0	0	s	s	s	s
511	Contract, Program and Project Administrators	5111	Contract, Program and Project Administrators	0	0	s	s	s	s
512	Office and Practice Managers	5121	Office Managers	0	0	6	0.3	6	0.2
		5122	Practice Managers	0	0	s	s	s	s
521	Personal Assistants and Secretaries	5211	Personal Assistants	0	0	5	0.3	5	0.2
		5212	Secretaries	0	0	s	s	s	s
531	General Clerks	5311	General Clerks	0	0	7	0.4	7	0.3
532	Keyboard Operators	5321	Keyboard Operators	0	0	s	s	s	s
541	Call or Contact Centre Information Clerks	5411	Call or Contact Centre Workers	0	0	6	0.3	6	0.2
542	Receptionists	5421	Receptionists	0	0	7	0.4	7	0.3
551	Accounting Clerks and Bookkeepers	5511	Accounting Clerks	0	0	5	0.3	5	0.2
552	Financial and Insurance Clerks	5521	Bank Workers	0	0	s	s	s	s
561	Clerical and Office Support Workers	5612	Couriers and Postal Deliverers	0	0	s	s	s	s
		5613	Filing and Registry Clerks	0	0	s	s	s	s
		5614	Mail Sorters	0	0	s	s	s	s
				0	0	s	s	s	s

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
		5616	Switchboard Operators	0	0	s	s	s	s
		5619	Other Clerical and Office Support Workers	0	0	11	0.6	11	0.4
591	Logistics Clerks	5911	Purchasing and Supply Logistics Clerks	0	0	s	s	s	s
599	Miscellaneous Clerical and Administrative Workers	5991	Conveyancers and Legal Executives	0	0	s	s	s	s
		5994	Human Resource Clerks	0	0	s	s	s	s
		5995	Inspectors and Regulatory Officers	0	0	s	s	s	s
		5996	Insurance Investigators, Loss Adjusters and Risk Surveyors	0	0	s	s	s	s
		5999	Other Miscellaneous Clerical and Administrative Workers	0	0	13	0.7	13	0.5
611	Insurance Agents and Sales Representatives	6111	Auctioneers, and Stock and Station Agents	0	0	s	s	s	s
		6112	Insurance Agents	0	0	s	s	s	s
		6113	Sales Representatives	0	0	10	0.5	10	0.4
612	Real Estate Sales Agents	6121	Real Estate Sales Agents	0	0	11	0.6	11	0.4
621	Sales Assistants and Salespersons	6211	Sales Assistants (General)	0	0	45	2.3	45	1.8
		6213	Motor Vehicle and Vehicle Parts Salespersons	0	0	10	0.5	10	0.4
		6214	Pharmacy Sales Assistants	0	0	s	s	s	s
		6215	Retail Supervisors	0	0	s	s	s	s
		6216	Service Station Attendants	0	0	7	0.4	7	0.3
		6219	Other Sales Assistants and Salespersons	0	0	20	1.0	20	0.8
631	Checkout Operators and Office Cashiers	6311	Checkout Operators and Office Cashiers	0	0	s	s	s	s

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
639	Miscellaneous Sales Support Workers	6393	Telemarketers	0	0	s	s	s	s
		6395	Visual Merchandisers	0	0	s	s	s	s
		6399	Other Sales Support Workers	0	0	11	0.6	11	0.4
711	Machine Operators	7111	Clay, Concrete, Glass and Stone Processing Machine Operators	s	s	0	0	s	s
		7112	Industrial Spraypainters	0	0	s	s	s	s
		7113	Paper and Wood Processing Machine Operators	0	0	s	s	s	s
		7116	Sewing Machinists	0	0	s	s	s	s
		7117	Textile and Footwear Production Machine Operators	0	0	s	s	s	s
		7119	Other Machine Operators	s	s	<27	s	27	1.1
		712	Stationary Plant Operators	7121	Crane, Hoist and Lift Operators	s	s	0	0
		7122	Drillers, Miners and Shot Firers	s	s	0	0	s	s
		7129	Other Stationary Plant Operators	0	0	6	0.3	6	0.2
721	Mobile Plant Operators	7211	Agricultural, Forestry and Horticultural Plant Operators	0	0	s	s	s	s
		7212	Earthmoving Plant Operators	<11	s	s	s	11	0.4
		7213	Forklift Drivers	0	0	7	0.4	7	0.3
		7219	Other Mobile Plant Operators	s	s	0	0	s	s
731	Automobile, Bus and Rail Drivers	7311	Automobile Drivers	0	0	13	0.7	13	0.5
		7312	Bus and Coach Drivers	0	0	6	0.3	6	0.2

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
		7313	Train and Tram Drivers	0	0	s	s	s	s
732	Delivery Drivers	7321	Delivery Drivers	0	0	13	0.7	13	0.5
733	Truck Drivers	7331	Truck Drivers	0	0	54	2.8	54	2.1
741	Storepersons	7411	Storepersons	0	0	12	0.6	12	0.5
811	Cleaners and Laundry Workers	8111	Car Detailers	0	0	s	s	s	s
		8112	Commercial Cleaners	0	0	10	0.5	10	0.4
		8113	Domestic Cleaners	0	0	s	s	s	s
		8114	Housekeepers	0	0	s	s	s	s
		8115	Laundry Workers	0	0	s	s	s	s
		8116	Other Cleaners	0	0	23	1.2	23	0.9
821	Construction and Mining Labourers	8211	Building and Plumbing Labourers	62	10.6	0	0	62	2.4
		8212	Concreters	12	2.1	0	0	12	0.5
		8213	Fencers	s	s	0	0	s	s
		8214	Insulation and Home Improvement Installers	s	s	0	0	s	s
		8215	Paving and Surfacing Labourers	8	1.4	0	0	8	0.3
		8216	Railway Track Workers	0	0	s	s	s	s
		8217	Structural Steel Construction Workers	8	1.4	0	0	8	0.3
8219	Other Construction and Mining Labourers	0	0	s	s	s	s		
831	Food Process Workers	8311	Food and Drink Factory Workers	0	0	11	0.6	11	0.4
		8312	Meat Boners and Slicers, and Slaughterers	0	0	14	0.7	14	0.6
		8313	Meat, Poultry and Seafood Process Workers	0	0	17	0.9	17	0.7

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
832	Packers and Product Assemblers	8321	Packers	0	0	6	0.3	6	0.2
		8322	Product Assemblers	0	0	s	s	s	s
839	Miscellaneous Factory Process Workers	8394	Timber and Wood Process Workers	0	0	8	0.4	8	0.3
		8399	Other Factory Process Workers	0	0	22	1.1	22	0.9
841	Farm, Forestry and Garden Workers	8411	Aquaculture Workers	0	0	s	s	s	s
		8412	Crop Farm Workers	0	0	30	1.5	30	1.2
		8413	Forestry and Logging Workers	0	0	34	1.7	34	1.3
		8414	Garden and Nursery Labourers	0	0	24	1.2	24	0.9
		8415	Livestock Farm Workers	0	0	72	3.7	72	2.8
		8416	Mixed Crop and Livestock Farm Workers	0	0	7	0.4	7	0.3
8419	Other Farm, Forestry and Garden Workers	8419	Other Farm, Forestry and Garden Workers	0	0	78	4.0	78	3.1
851	Food Preparation Assistants	8511	Fast Food Cooks	0	0	s	s	s	s
		8512	Food Trades Assistants	0	0	6	0.3	6	0.2
		8513	Kitchenhands	0	0	7	0.4	7	0.3
891	Freight Handlers and Shelf Fillers	8911	Freight and Furniture Handlers	0	0	9	0.5	9	0.4
		8912	Shelf Fillers	0	0	s	s	s	s
899	Miscellaneous Labourers	8991	Caretakers	0	0	6	0.3	6	0.2
		8992	Deck and Fishing Hands	0	0	8	0.4	8	0.3
		8993	Handypersons	0	0	s	s	s	s
		8994	Motor Vehicle Parts and Accessories Fitters	0	0	s	s	s	s
		8996	Recycling and Rubbish Collectors	0	0	s	s	s	s
		8999	Other Miscellaneous Labourers	<116	s	s	s	116	4.6

				In construction				All employed	
				Yes		No			
				N	CoI%	N	CoI%	N	CoI%
Level 3	Level 3 Description	Level 4	Level 4 Description						
997		9970	Response Unidentifiable	0	0	17	0.9	17	0.7
999	Not Defined	9990	Response Outside Scope	0	0	105	5.4	105	4.1
		9999	Not Defined	0	0	97	5.0	97	3.8

Table B3: Number and percent of suicides by ANZSCO 6-digit level of occupation
(numbers < 5 suppressed)

NCIS employed at time of death		In construction	
		Yes	
		N	Col%
Level 6	Level 6 Description		
132411	Policy and Planning Manager	s	s
133111	Construction Project Manager	s	s
133112	Project Builder	s	s
133211	Engineering Manager	s	s
232111	Architect	5	0.9
232112	Landscape Architect	s	s
232212	Surveyor	s	s
232312	Industrial Designer	s	s
233211	Civil Engineer	s	s
233311	Electrical Engineer	s	s
233512	Mechanical Engineer	s	s
233999	Engineering Professionals nec	22	3.8
312113	Building Inspector	s	s
312114	Construction Estimator	s	s
312211	Civil Engineering Draftsperson	s	s
312212	Civil Engineering Technician	s	s
312311	Electrical Engineering Draftsperson	s	s
312312	Electrical Engineering Technician	s	s
312511	Mechanical Engineering Draftsperson	6	1.0
312512	Mechanical Engineering Technician	s	s
312999	Building and Engineering Technicians nec	14	2.4
322211	Sheetmetal Trades Worker	s	s
322311	Metal Fabricator	s	s
322313	Welder (First Class)	s	s
323211	Fitter (General)	s	s
323313	Locksmith	s	s
331111	Bricklayer	8	1.4
331112	Stonemason	s	s
331211	Carpenter and Joiner	22	3.8
331212	Carpenter	38	6.5
331213	Joiner	7	1.2
332111	Floor Finisher	5	0.9
332211	Painting Trades Worker	38	6.5
333111	Glazier	8	1.4
333211	Fibrous Plasterer	7	1.2
333212	Solid Plasterer	11	1.9
333311	Roof Tiler	10	1.7
333411	Wall and Floor Tiler	s	s
334111	Plumber (General)	17	2.9
334113	Drainer	s	s
334114	Gasfitter	s	s

NCIS employed at time of death		In construction	
		Yes	
		N	Col%
Level 6	Level 6 Description		
341111	Electrician (General)	31	5.3
341112	Electrician (Special Class)	s	s
342211	Electrical Linesworker	s	s
342313	Electronic Equipment Trades Worker	s	s
342412	Telecommunications Cable Jointer	s	s
342413	Telecommunications Linesworker	s	s
362213	Landscape Gardener	5	0.9
399912	Interior Decorator	s	s
399999	Technicians and Trades Workers nec	39	6.7
711199	Clay, Concrete, Glass and Stone Processing Machine Operators nec	s	s
711913	Sand Blaster	s	s
712111	Crane, Hoist or Lift Operator	s	s
712211	Driller	s	s
721211	Earthmoving Plant Operator (General)	5	0.9
721214	Excavator Operator	5	0.9
721999	Mobile Plant Operators nec	s	s
821111	Builder's Labourer	54	9.3
821112	Drainage, Sewerage and Stormwater Labourer	6	1.0
821113	Earthmoving Labourer	s	s
821114	Plumber's Assistant	s	s
821211	Concreter	12	2.1
821311	Fencer	s	s
821411	Building Insulation Installer	s	s
821412	Home Improvement Installer	s	s
821511	Paving and Surfacing Labourer	8	1.4
821712	Scaffolder	s	s
821713	Steel Fixer	s	s
821714	Structural Steel Erector	s	s
899999	Labourers nec	112	19.2

APPENDIX C: AGE AND ETHNICITY AND AGE AND LOCATION

Table C1: Number of suicides by age and ethnicity

		Age at death in 5 year bands - Construction Workers only										
		15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35-39 yrs	40-44 yrs	45-49 yrs	50-54 yrs	55-59 yrs	60-64 yrs	>=65 yrs
Ethnicity from Coroner												
European not further defined		s	s	s	6	s	s	s	s	s	s	s
NZ European/Pakeha		13	54	40	34	43	40	63	38	32	12	s
Other European		0	s	s	s	0	s	s	s	s	s	0
NZ Māori		9	29	19	24	11	14	6	5	s	s	0
Pacific Island		s	s	s	s	s	s	s	s	s	0	0
Asian		0	0	s	s	0	s	s	s	s	s	0
Other/Not Stated		0	s	s	0	s	0	s	0	0	0	0

s= suppressed

Table C2: Number of suicides by age and Coroners court

		Age at death in 5 year bands - Construction Workers only										
		15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35-39 yrs	40-44 yrs	45-49 yrs	50-54 yrs	55-59 yrs	60-64 yrs	>=65 yrs
Case_Court	Case_Court_D											
9000	Coronial Services Auckland	11	26	19	15	16	10	21	18	9	5	s
9001	Coronial Services Christchurch	s	20	24	18	9	13	19	5	5	s	0
9002	Coronial Services Dunedin	s	15	7	7	5	5	7	s	5	s	0
9003	Coronial Services Hamilton	s	5	s	5	s	s	6	s	6	0	s
9004	Coronial Services Hastings	s	8	s	5	s	s	s	s	s	s	0
9006	Coronial Services Palmerston North	s	7	5	6	s	6	8	7	s	s	0
9007	Coronial Services Rotorua	s	s	s	7	12	11	8	6	6	s	0
9008	Coronial Services Wellington	0	6	s	s	6	9	5	s	s	s	s
9009	Coronial Services Whangarei	s	s	s	6	s	s	5	s	s	s	0

s= suppressed

Table C3: Number of suicides by age and DHB

		Age at death in 5 year bands - Construction Workers only										
		15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35-39 yrs	40-44 yrs	45-49 yrs	50-54 yrs	55-59 yrs	60-64 yrs	>=65 yrs
District Health Board Code	DHB of Residence											
.		s	0	0	s	s	0	s	s	0	0	0
1	Northland	s	s	s	6	s	s	s	s	s	s	0
2	Waitemata	s	8	11	6	7	5	9	8	5	s	0
3	Auckland	s	7	5	s	s	s	s	10	s	s	s
4	Counties Manukau	5	12	s	5	6	6	7	s	s	s	0
5	Waikato	s	s	s	6	s	s	7	s	6	0	s
6	Lakes	s	0	0	s	5	s	s	0	s	s	0
7	Bay of Plenty	s	s	s	s	6	8	s	7	5	s	0
8	Tairāwhiti	0	s	s	0	0	s	0	s	0	0	0
9	Taranaki	s	s	s	s	s	s	s	s	s	0	0
10	Hawke's Bay	s	7	s	5	s	s	0	s	s	s	0
11	Whanganui	0	s	s	s	s	s	s	s	0	0	0
12	Midcentral	s	s	s	s	s	s	s	s	s	s	0
13	Hutt	0	s	0	s	s	s	s	s	s	s	s
14	Capital and Coast	0	s	s	s	s	6	s	0	s	0	s
15	Wairarapa	0	s	0	0	s	0	s	s	0	s	0
16	Nelson Marlborough	0	s	0	s	s	s	s	s	0	s	0
17	West Coast	0	s	s	0	0	0	s	0	0	0	0
18	Canterbury	s	14	20	13	8	12	16	s	6	s	0
19	South Canterbury	s	s	s	s	0	s	s	0	0	s	0
20	Otago	0	10	6	5	s	s	0	s	s	s	0
21	Southland	s	5	s	s	s	s	6	0	s	0	0

s= suppressed

