

September 2020

Building Future Skills

The Demand for Skills in Ireland's
Built Environment Sector to 2030

> Appendices



National Skills Council



Expert Group on
Future Skills Needs

> Table of Contents

Appendix V.	Core and Niche Built Environment Occupations	1
Appendix VI.	Built Environment Employment Forecast Model	3
Appendix VII.	Built Environment Education: Education and Training Board Provision	6
Appendix VIII.	Built Environment Education: Higher Education Institutions	17
Appendix IX.	Core, Niche and Emerging Occupation Descriptions	27

Appendix V

> Core and Niche Built Environment Occupations

Table 8.1: Core, Niche and Emerging Occupations Mapped to Sub-Major Occupations

Sub-Major Occupation Group	Relevant Occupations
Business And Public Service Associate Professionals	Health And Safety Officers
Business, Media And Public Service Professionals	Architects
	Chartered Architectural Technologists ¹
	Construction Project Managers And Related Professionals
	Management Consultants And Business Analysts
	Business And Financial Project Management Professionals
Corporate Managers And Directors	Production Managers And Directors In Construction
	Purchasing Managers And Directors
Elementary Administration And Service Occupations	Refuse And Salvage Occupations
	Elementary Cleaning Occupations N.E.C.
Elementary Trades And Related Occupations	Elementary Construction Occupations
Other Managers And Proprietors	Waste Disposal And Environmental Services Managers
	Managers And Proprietors In Other Services N.E.C.
Process, Plant And Machine Operatives	Construction Operatives N.E.C.
	Energy Plant Operatives
	Water And Sewerage Plant Operatives
Science, Engineering And Technology Associate Professionals	Architectural And Town Planning Technicians
Science, Research, Engineering And Technology Professionals	Civil Engineers
	Programmers And Software Development Professionals
	Design And Development Engineers

¹ To note- while this is the occupational SOC-code used by the Central Statistics Office, no 'Charter of Architectural Technologists' exists in Ireland. Individuals using the title 'Chartered Architectural Technologist' in Ireland are members of a UK professional body. The Royal Institute of Architects in Ireland has a membership class 'Architectural Technologist' who has a recognised qualification accredited by the RIAI or equivalent and practical experience. Membership of either professional body is not necessary to practice as an architectural technologist in Ireland. All references to 'Chartered Architectural Technologist' throughout this report should therefore be read as 'Architectual Technologist'.

Sub-Major Occupation Group	Relevant Occupations
Skilled Construction And Building Trades	Construction And Building Trades N.E.C.
	Carpenters And Joiners
	Bricklayers And Masons
	Construction And Building Trades Supervisors
	Plasterers
	Plumbers And Heating And Ventilating Engineers
	Painters And Decorators
	Floorers And Wall Tilers
	Roofers, Roof Tilers And Slaters
	Glaziers, Window Fabricators And Fitters
	Electricians And Electrical Fitters
Skilled Metal, Electrical And Electronic Trades	Electricians And Electrical Fitters
	Air-Conditioning And Refrigeration Engineers
	Pipe Fitters
	Welding Trades
Transport And Mobile Machine Drivers And Operatives	Van Drivers
	Crane Drivers
	Mobile Machine Drivers And Operatives N.E.C.

Source: Analysis of (Office of National Statistics (UK), 2010)

Appendix VI

> Built Environment Employment Forecast Model

This section explains the model used to forecast future Built Environment employment as part of this study. The model outputs future employment forecasts based upon fundamental assumptions from the same year. A time-series forecast was used in this instance based upon data from the period 1998-2018 for which sector employment data was available from the Labour Force Survey. The broadest possible dataset was used to increase the accuracy of the employment forecast. This was done to overcome the inflationary impact of the property price bubble in 2007 on employment figures, which may, in turn, inflate future forecasts.

In the development of the forecasts, the objective was to root future estimates in three variables:

- Population ('000);
- GNI* per Capita ('000) (in real 2016 prices); and,
- Time

Both 'Population' and 'GNI* per Capita' were selected via step-wise regression. The rationale is explained in full in the following paragraphs.

Population

Population, the first variable, is expected to have a positive relationship with the demand for Built Environment services, and therefore, in turn, employment. As the population increases, so too does the need for Built Environment Services, e.g. a higher population should increase the need for housing, transport infrastructure, and the supply of utilities.

As part of the model, there was also experimentation with variations of the population, such as population growth. However, it was found that the population figures were statistically significant, whereas population growth was not. This outcome was logical as Built Environment services did not only need to support the expansion of existing capital stock but maintenance and replacement of the existing base.

Future population estimates for the forecasts were based upon CSO population estimates, which were based upon the 2016 Census. The CSO produced three variations of this forecast for high, central and low growth

GNI* per Capita (2016 Prices)

The second variable selected was GNI* per Capita. This variable gauges the health of the economy and the ability of individuals and business to purchase built environment services. Construction is considered a procyclical sector. It grows disproportionately well when the economy is doing well. Conversely, when the economy performs poorly; it contracts more severely.

GNI* is calculated from company revenues minus non-sage costs. It, therefore, provides an indicative idea of the capital available (or perception of future availability) to consumers and businesses. GNI* is derived from the same data used to calculate GDP statistics. However, GNI* strips out as a significant portion of the non-domestic activity. This modification is essential as the non-domestic activity is not reliant upon domestic infrastructure.

GNI* was adjusted to remove inflationary effects, i.e. changes in the value of money relative to goods. GNI* was converted to 2016 prices to provide a common base. Inflation should otherwise distort the perception of real growth. GNI* was then adjusted for population growth to normalise the data relative to population growth.

GNI* per Capita has been forecast for the period 2020-2030 based upon the long-run average, netting out procyclical swings.

Time

The final variable is time. A time-series analysis indexes data points according to time order to explain temporal trends. The analysis has found a statistically significant negative temporal trend where built environment employment is declining over time, holding all other factors constant. In reality, this most likely is related to the growing population base as the capital needs of the existing population are most likely less intensive when compared to that required for population expansion.

Model Outputs

Overall the model produced from these variables was found to be extremely robust. Table 8.2 identifies the outputs of our time-series regression model. These outputs provide insight into the strength and robustness of the model

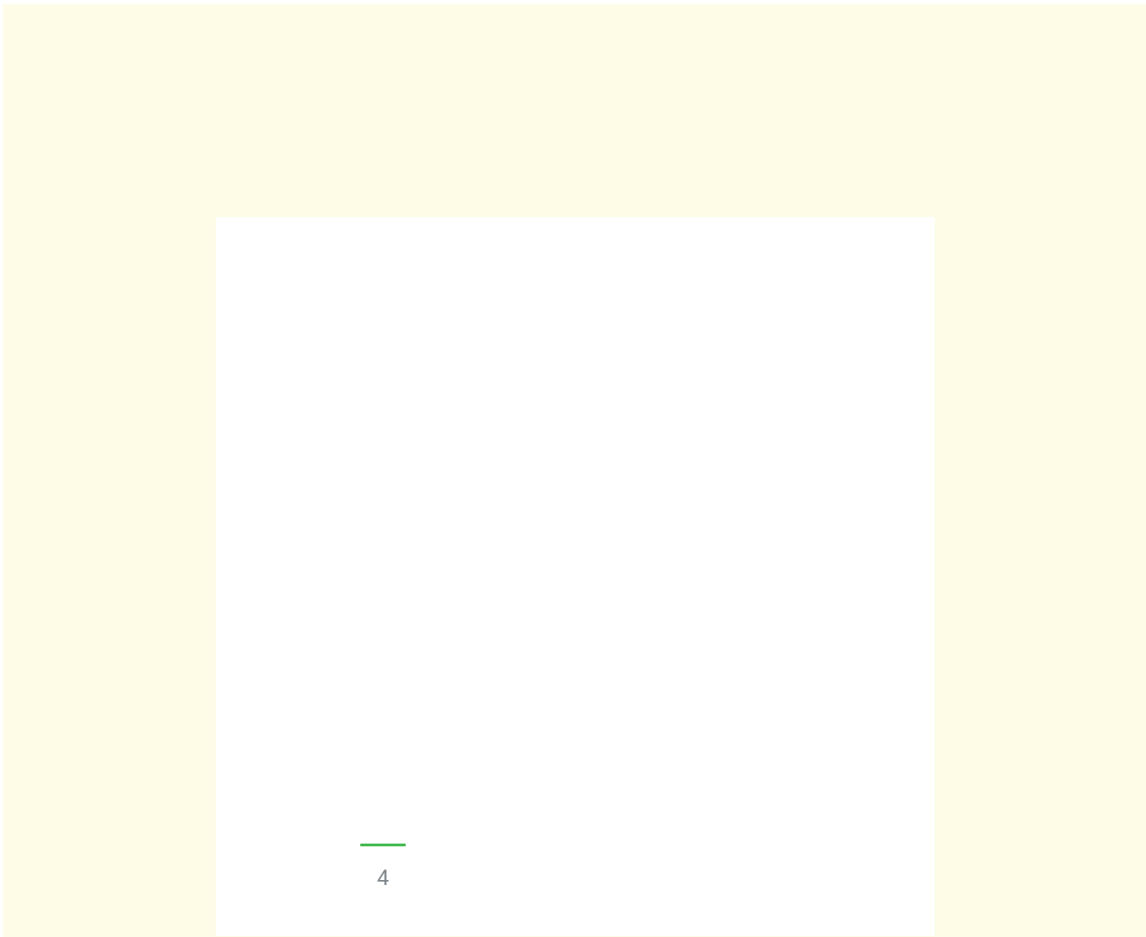


Table 8.2: Built Environment Employment Forecast Model, 2000-2018

Regression Statistics	Multiple R	0.966							
	R Square	0.933							
	Adjusted R Square	0.922							
	Standard Error	14.068							
	Observations	21							
ANOVA		df	SS	MS	F	F Significance			
	Regression	3	47107.998	15702.666	79.347	0.000			
	Residual	17	3364.291	197.899					
	Total	20	50472.290						
Regression		Coefficients	Standard Error	t Stat	P-value	Loser 95%	Upper 95%	Loser 99.0%	Upper 99.0%
	Intercept	-1148.609	167.637	-6.852	0.000	-1502.291	-794.926	-1634.458	-662.759
	Time (Years)	-18.603	2.681	-6.938	0.000	-24.260	-12.946	-26.374	-10.832
	Population ('000)	0.266	0.043	6.126	0.000	0.174	0.358	0.140	0.392
	GNI* per Capita (2016 Prices) ('000)	10.443	0.743	14.050	0.000	8.859	12.028	8.253	12.634

This data identifies that this model is a close fit for historical data, where the variables explain 92% of changes in built environment sector employment. The standard error of our forecasts according to this output is 14,068. Based on this information, the forecasts can be expected to be off by 14,000 employees based upon the data.

As a whole, our model is considered statistically significantly to a 99% confidence level based upon the F significance. The F significance takes into account the number of variables used and the observations possessed. This is a measure of the combined strength of the model. Each variable of our model was found to be statistically significant and relevant to a 99% confidence level based upon the P-Value or Pearson value. None of the coefficients of each variable crossed zero at a 99% confidence level. This confirms that it is statistically certain that these variables either have a negative or positive impact on built environment employment.

Based on the analysis of the model above, there is significant confidence in its robustness, where there is less certainty is concerning our future assumptions which can swing wildly from year to year but have been based on long-run averages.

Appendix VII

> Built Environment Education: Education and Training Board Provision

Education and Training Board	
Cavan Monaghan	<p>Apprenticeships</p> <p>Cavan Monaghan ETB delivered two Electrical Phase 2 cohorts of 14 apprentices in 2019, across its Cavan and Monaghan campuses. There was a second rollout of Electrical Phase 2 towards the end of 2019 in Cavan. In total there was a total of 55 CMETB Electrical apprentices completing phase 2 and proceeding to phase 3. Going forward, CMETB has the capacity to deliver 6 programmes of Electrical Phase 2 in the course of a each (i.e. 84 apprentices proceeding to phase 3).</p> <p>Broader Construction related FET programmes</p> <p>In 2019 14 learners finished Construction Employment Skills and 7 Concreting (with Plant Machinery Operator). Under the Back to Education Initiative, 14 learners started on a CAD/Solidworks course, while as part of evening training/Skills to Advance, 29 learners finished Autocad and 11 C&G Computer Aided Design. 11 learners started on the PLC Architectural Technology and Design course, and 16 started the Architectural Technology and Design Traineeship.</p>
City of Dublin	<p>Apprenticeships</p> <p>City of Dublin ETB ran a range of Construction related pre-2016 apprenticeships in 2019:</p> <ul style="list-style-type: none"> – Brick and Stone Laying Phase 4 with 28 starters, Brick and Stone Laying Phase 6 with 14 starters and Brick and Stone Laying Phase 7 with one starter (all Ballyfermot Training Centre) – Carpentry and Joinery with 23 starters (Finglas Training Centre), Carpentry and Joinery Phase 2 with 27 starters (Ballyfermot Training Centre) and Carpentry and Joinery Phase 7 with 13 starters (Ballyfermot Training Centre) – Electrical with 70 starters (Finglas Training Centre), Electrical Phase 2 with 84 starters (Ballyfermot Training Centre), Electrical Phase 4 with 143 starters (Ballyfermot Training Centre), Electrical Phase 6 with 112 starters (Ballyfermot Training Centre), Electrical Phase 7 with 52 starters (Ballyfermot Training Centre) and Electrical Instrumentation Phase 7 with 3 starters (Ballyfermot Training Centre) – Electronic Security Systems Phase 7 with 2 starters (Ballyfermot Training Centre) – Floor and Wall Tiling Phase 7 with 0 starters (Ballyfermot Training Centre) – Industrial Insulation Phase 4 with 8 starters (Ballyfermot Training Centre)MAMF Phase 4 with 47 starters (Ballyfermot Training Centre), MAMF Phase 6 with 48 starters (Ballyfermot Training Centre), and MAMF Phase 7 with 8 starters (Ballyfermot Training Centre)

Education and Training Board

City of Dublin

- Metal Fabrication Phase 4 with 32 starters, Metal Fabrication Phase 6 with 63 starters and Metal Fabrication Phase 7 with 4 starters (all Ballyfermot Training Centre)
- Painting and Decorating Phase 2 with 30 starters, Painting and Decorating Phase 4 with 16 starters, Painting and Decorating Phase 6 with 17 starters, Painting and Decorating Phase 7 with 5 starters (all Ballyfermot Training Centre)
- Pipe Fitting Phase 7 with 6 starters
- Plumbing with 56 starters (Finglas Training Centre), Plumbing Phase 2 with 56 starters (Ballyfermot Training Centre), Plumbing Phase 6 with 36 starters (Ballyfermot Training Centre), and Plumbing Phase 7 with 22 starters (Ballyfermot Training Centre)
- Refrigeration and Air Conditioning Phase 4 with 0 starters, Refrigeration and Air Conditioning Phase 6 with 46 starters, and Refrigeration and Air Conditioning Phase 7 starters (all Ballyfermot Training Centre)
- Sheet Metal with 27 starters (Finglas Training Centre), Sheet Metalworking Phase 4 with 16 starters (Ballyfermot Training Centre), Sheet Metalworking Phase 6 with 27 starters (Ballyfermot Training Centre) and Sheet Metal Worker Phase 7 with 1 starter (Ballyfermot Training Centre)
- Toolmaking Phase 7 with 1 starter (Ballyfermot Training Centre)
- Wood Manufacturing and Finishing Phase 4 with 56 starters, Wood Manufacturing and Finishing Phase 6 with 32 starters, and Wood Manufacturing and Fitting Phase 7 with 0 starters (all Ballyfermot Training Centre)

Plunket College also offered a Pre-Apprenticeship in Carpentry and Joinery, which had 21 starters. Colaiste Dhulaigh also offered an Engineering Technology L5 pre-apprenticeship- this had 32 starters in 2019.

Broader Construction related FET programmes

There were a range of Construction related programmes across CDETb's Training Centres and College network:

- Ballyfermot Training Centre
 - AutoCad (Introduction)- Evenings with 5 starters
 - CAD 2D (evenings) with 22 starters
 - Computer Aided Design- STP with 8 starters
 - Diploma in Steel Fixing Occupations with 16 starters
 - Domestic Gas Safety in 18 starters Domestic Heat Pump Installation with 29 starters
 - Domestic Solar Hot Water Systems Installation with 2 starters
 - Fascia, Soffit, Gutter and Rainwater Harvesting Installation- Short Course with 4 starters
 - Formworking Level 2 NVQ Diploma with 11 starters
 - General Construction Skills- Concreting with 18 starters
 - General Engineering (Milling and Turning) with 10 starters
 - Kerb Flag and Pavior Laying with 11 starters
 - Manual Metal Arc Welding (EN Certified) with 55 starters

Education and Training Board

City of Dublin

- Manual Metal Arc Welding (Intermediate Level) with 6 starters
- Manual Metal Arc Welding Advanced- Evenings with 3 starters
- Mig Welding- Evenings with 25 starters
- Milling (evenings) with 4 starters
- Oil Fired Appliances Servicing- OFTEC with 9 starters
- RGII Reassessment and Training with 21 starters
- TIG Welding- Evenings with 8 starters
- Turning (evenings) with 6 starters
- Welding with 41 starters
- Finglas Training Centre
 - Interior Design- Evenings with 11 starters
 - Manual Metal Arc Welding (EN Certified) with 11 starters
 - Revit Technician with 18 starters
 - TIG Welding- Evenings with 47 starters
 - TIG Welding (Intermediate Level Coded) with 17 starters
 - TIG Welding Advanced- Evenings with 12 starters
- Colaiste Dhulaigh
 - Preliminary Engineering (Level 5) with 14 starters
- Pearse College
 - Architectural Technology and Design Year 1 with 19 starters
 - Architectural Technology and Design Year 2 with 11 starters
 - Pre-University Engineering with 12 starters
- Plunket College
 - Carpentry and Joinery with 8 starters
 - Construction Technology with Draughting with 8 starters
- St Kevin's College
 - Engineering Technology with 2 starters

Education and Training Board

Cork

Apprenticeships

In 2019 Cork ETB provided the following apprenticeship programmes:

- Electrical Phase 2 with 112 learners
- Carpentry and Joinery Phase 2 with 56 learners, and phase 4 with 48 learners
- Plumbing Phase 2 with 28 learners
- Metal Fabrication Phase 2 with 28 learners
- Brick and Stonelaying Phase 2 with 28 learners

Additional apprentice support studies (Maths/Drawing) was provided to 22 learners.

Apprenticeship phases 4 and 6 were provided in Cork Institute of Technology.

A General Learning pre-apprenticeship was also delivered to 13 learners.

Broader Construction related FET programmes

Cork ETB also delivered a Glazing upskilling course to 16 learners, and Specific Skills Training (SST) in Scaffolding, CAD, Safe Pass, Manual Handling and Oil and Gas Installation to 259 learners.

Education and Training Board

Donegal

Apprenticeships

Donegal ETB provides Phase 2 Apprenticeship training in 4 construction related pre-2016 apprenticeships:

- Electrical, Plumbing, Carpentry and Joinery, and Electronic Security systems. There is an intake of 12 classes on a yearly basis, with a total of 164 apprentices participating in the training.

Broader Construction related FET programmes

Donegal ETB also provides a range of welding courses: Basic Welding, Intermediate Welding, Advanced Coded Pipe Welding. Orbital welding has also recently been introduced to the Advanced Pipe Welding course. An average of 60 welders are trained on a yearly basis across the ETB's courses. The ETB has also started providing a number of short courses in basic construction skills e.g. Construction Operative with Tickets.

Education and Training Board

Dublin and Dun Laoghaire

Craft Apprenticeships

In 2019, there were 1,386 Standard Based Apprenticeship learners across 3 Training Centres and one College. 717 attended Phase 2/4/6 courses, 669 were supported in Phase 7 with 313 completing phase 7 and 577 completing Phases 2, 4 or 6 in 2019. Of built environment specific apprenticeships, these included:

- 5 learners on Phase 7 for Brick and Stonelaying, and 2 completions
- 137 learners on phases 2/4/6 for Carpentry, with 124 completions, as well as 60 learners on phase 7, with 23 completions.
- 48 learners on Construction Plant Fitter phases 2/4/6, and 71 completions, and 21 learners on phase 7, with 19 completions.
- 348 learners on Electrical phases 2/4/6, with 256 completions, and 163 learners on phase 7, with 100 completions.
- 36 learners on Electrical Instrumentation phases 2/4/6, with 36 completions.
- 11 learners on Painting and Decorating phases 2/4/6.
- 2 learners on Pipefitting phases 2/4/6, with 1 completion.
- 1 learner on Plastering phase 7.
- 26 learners on Refrigeration and Air Conditioning phase 7, with 23 completions.
- 17 learners on Sheet Metal Working phase 7, with 5 completions.
- 16 learners on Wood Manufacturing and Finishing phases 2/4/6, with 8 completions, and 4 learners on phase 7, with 2 completions.

Other FET Courses

One Pre-Apprenticeship course was held in Dun Laoghaire Further Education Institute (DFEI) 'Construction and Engineering Technology' at Level 5 with 14 participants. 696 learners participated in courses in the construction related courses with 407 completing the course in 2019. Courses were run across 7 locations. Courses ranged from Level 3 to Level 6 and from 3 days duration to 33 weeks and were offered full and part-time.

Number of participants

■ Architectural Technology and Design	43
■ Builders Providers Sales Traineeship	36
■ Construction Technology	29
■ Dry Lining	47
■ Engineering Skills / Technology	102
■ Forklift, Safepass & Manual Handling	134
■ Furniture Design and Making	56
■ Interior Architecture & Design	120
■ TIG Welding	75
■ Trade Sampling	15
■ Welding/Fabrication	39

Education and Training Board

Galway Roscommon

Apprenticeships

In 2019 Galway Roscommon ETB delivered:

- 2 Carpentry and Joinery apprenticeship classes with 24 apprentices;
- Electrical, Motor, and Metal Fabrication apprenticeship programmes.
- Pre-apprenticeship programme for 25 learners.
- Broader Construction related FET programmes

In 2019 GRETB also ran

- A Construction Operatives with tickets course for 12 learners, as well as a Construction Technology course for 17 learners.

Kerry

Apprenticeships

Kerry ETB offered a range of Construction related pre-2016 apprenticeships in 2019:

- Three cohorts of Carpentry and Joinery Phase 2 with 42 learners (14 were due to graduate in March 2020), three cohorts of Carpentry and Joinery Phase 4 with 48 learners and two cohorts of Carpentry and Joinery Phase 6 with 27 learners
- Nine cohorts of Electrical Phase 2 with 125 learners (42 were due to graduate in January and February 2020)
- Six cohorts of Plumbing Phase 2 with 83 learners (28 were due to graduate in March and April 2020)
- One cohort of Stonecutting and Stonemasonry Phase 2 with 10 learners and one cohort of Stonecutting and Stonemasonry Phase 4 with 6 learners

Two pre-apprenticeship programmes were also offered:

- One cohort of the Building Construction (Pre-Apprenticeship) with 6 participants (this course was scheduled for completion in May 2020)
- Two cohorts of the Carpentry and Joinery (Pre-Apprenticeship) with 8 participants and 4 participants respectively (the 4 participants are scheduled to complete in May 2020)

Broader Construction related FET provision

Kerry ETB also offered a range of Construction related FET programmes:

- AutoCad (Introduction)- Evenings with 25 participants
- Building Construction with 5 participants CAD- Computer Aided Draughting and Design with 14 participants
- CAD 2D Level 3- Evening with 7 participants
- Construction CTC (Community Training Centre) with 6 participants (scheduled to complete in November 2020)
- Construction Ground Work Skills with 39 participants (12 were scheduled to complete in February 2020)
- Engineering and Electronic Technology with 10 participants (scheduled to complete in May 2020)

Kerry	<ul style="list-style-type: none"> ■ Engineering Technology with 28 participants (4 were scheduled to complete in May 2020) ■ Safepass with 28 participants ■ Safepass and Brick and Blocklaying- Evening with 8 participants ■ Technology CTC (Community Training Centre) with 8 participants ■ Traditional Stonewall Construction with 12 participants (scheduled to complete in June 2020) and Traditional Stonewall Construction OPW with 13 participants ■ Turning- Evening with 14 participants ■ Woodpark Multi-Skills STP (Specialist Training Provider) with 4 participants (scheduled to complete in May 2020)
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Education and Training Board

Kildare Wicklow	<p>As Kildare Wicklow ETB has no training centre, there is no tradition of apprentice provision in the region. Apprenticeships (particularly wet trades) also tend to attract other construction related programmes. In 2020, as part of Skills to Advance, there are now two construction courses running in Wicklow and Naas- Construction Operatives with Tickets and Construction-Ground Work Skills.</p>
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Education and Training Board

Kilkenny Carlow	<p>Apprenticeship</p> <p>In 2019 Kilkenny Carlow ETB delivered four cohorts (56) of Electrical Phase 2.</p> <p>Broader Construction related FET provision</p> <p>In 2019 KCETB delivered a range of Construction related programmes. These were:</p> <ul style="list-style-type: none"> ■ Basic Welding- MMA Flat-Horizontal (6/7 weeks, Carlow Town) with 30 commencements ■ Engineering Skills Traineeship (Carlow Town, 37 weeks) with 8 commencements and Engineering Skills Traineeship (Kilkenny, 37 weeks) with 8 commencements ■ Forklift, Safepass and Manual Handling (3 weeks, Carlow Town) with 26 commencements and Forklift, Safepass and Manual Handling (3 weeks, Kilkenny) with 29 commencements ■ Pathway to Employment (Urlingford, 40 weeks) with 11 commencements ■ Two PLC courses were also run out of Carlow- Construction and Building with 12 commencements and Engineering Technology with 4 commencements; both are scheduled for completion in May 2020.
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Education and Training Board

Limerick Clare

Apprenticeship

In 2019 Limerick Clare ETB delivered the following apprenticeships:

- 20 courses in Electrical Phase 2, with 280 apprentices, 9 courses (in LIT) in Phase 4, with 144 apprentices, and 7 courses (in LIT) in Phase 6, with 112 apprentices
- 5 courses in Carpentry and Joinery Phase 2 with 70 apprentices, 5 courses (in LIT) in Phase 4 with 144 apprentices, and 1 course in Phase 6 with 16 apprentices.
- 4 courses in Plumbing Phase 2 with 56 apprentices.
- 3 courses in Wood Manufacturing and Finishing with 24 apprentices.
- 2 courses in Brick and Stone Laying with 24 apprentices.

Broader Construction Related FET provision

In 2019 Limerick Clare ETB also offered construction and engineering courses at NFQ Level 5 as part of PLC and Vocational Training Opportunities Scheme (VTOS).

Education and Training Board

Laois Offaly

Broader Construction Related FET provision

Laois Offaly ETB offered a range of Construction Skills Certification Scheme (CSCS) courses in its National Construction Training Centre in 2019:

- 180° Excavator Operations for Experienced Workers with 1 learner
- 180° Excavator Operations for New Entrants with 2 learners
- 360° Excavator Operations for Experienced Workers with 29 learners
- 360° Excavator Operations for New Entrants with 5 learners
- Articulated Dump Truck Operations for New Entrants with 4 learners
- Articulated Dumper Operations for Experienced Workers with 4 learners
- Remote Controlled Self Erecting Tower Crane Operations for Experienced Workers with 1 learner
- Site Dumper Operations for Experienced Workers with 12 learners
- Site Dumper Operations for New Entrants with 15 learners
- Slinger Signaller Operations- Experienced with 4 learners
- Slinger/Signaller Operations for New Entrants with 1 learner
- Telescopic Handler for Experienced Worker with 24 learners
- Telescopic Handler Operations for New Entrants with 14 learners
- Tower Crane Operations for Experienced Workers with 16 learners
- Tower Crane Operations for New Entrants with 2 learners

In its Portlaoise Education Centre it also delivered a Construction Studies L5 course with 2 learners, and Domestic Gas Safety and Employment Skills (Building Skills) LTI courses in Laois for 7 and 10 learners respectively. In Offaly, courses were delivered in Construction Ground Work Skills- SP4 for 44 learners, Construction Skills for Employment Traineeship (1) for 13 learners, Construction Skills for Employment Traineeship (2) for 13 learners, Dry Lining Traineeship for 22 learners, and Applied Construction Skills, LTI for 36 learners.

Three CSCS courses were also delivered in Offaly- 360° Excavator Operations for Experienced Workers for 13 learners, Site Dumper Operations for Experienced Workers for 1 learner, and Telescopic Handler for Experienced Worker for 4 learners.

**Longford
Westmeath**

Apprenticeships

Longford Westmeath ETB delivered four apprenticeship programmes in 2019 in its Athlone Training Centre:

- Carpentry and Joinery Version 4 Phase 2 with 56 learners
- Electrical Version 4 Phase 2 with 56 learners
- MAMF V2 Phase 2 with 28 learners
- Metal Fabrication Version 4 with 28 learners
- Plumbing Version 4 with 56 learners

In Longford an Engineering Skills (Pre-Apprenticeship) course was also offered, with 13 learners.

Broader Construction related FET provision

Longford Westmeath ETB also offered a number of in centre Construction related FET courses:

- CAD 3D Mechanical Modelling using Solid Works with 46 learners
- Concreting and Traditional Stonewall Construction with 17 learners
- Hard Landscape Construction with 15 learners
- Kerb Flag and Paviour Laying with 15 learners
- Safe Pass Training with 360 learners
- Tig Welding with 8 learners
- Welding with 16 learners
- Welding Intermediate with 8 learners

There were also a number of evening courses, which are run three terms per year: January, April and September:

- Arc Welding with 30 learners
- Mig Welding with 30 learners
- Milling with 10 learners
- Oxy Acetylene Welding with 30 learners
- Tig Welding with 30 learners
- Turning with 10 learners

Education and Training Board

Mayo, Sligo and Leitrim

Apprenticeships

Overall, for 2019, Mayo, Sligo and Leitrim ETB facilitated 168 apprentices on phase 2, 166 on phase 4 and 151 on phase 6.

Broader Construction related FET provision

In terms of broader FET provision, the ETB offers a PLC course in Construction Technology, with a total of 28 learners in 2019. A Construction Groundwork skills course was also offered, with 38 learners. A wider range of other courses such as engineering courses, Platework Fabrication of Materials and Traditional Stonewall Construction were also offered.

Education and Training Board

Tipperary

Broader Construction related FET provision

Tipperary ETB offered a number of Construction related programmes in 2019:

- A PLC Construction Engineering and Technology with 0 starters and PLC course on Mechanical Engineering and Technology with 16 starters (scheduled for completion in April 2020) (both Clonmel)
- Specific Skills Training
 - Construction Groundworks Skills Operator (with Tickets) with 30 completions (Nenagh, Tipperary Town)
 - Construction Operator (Site Dumper/LUGS/Roadworks Health and Safety) with 21 completions (Roscrea, Carrick on Suir)
 - Dry Lining with 25 completions (scheduled for completion in February 2020) (Tipperary Town)

Traditional Stonewall Construction with 15 completions (Nenagh)

- Back to Education Initiative
 - Woodcraft 4N3185 Level 4 (Component) with 11 completions (Clonmel)
 - Woodcraft 4N3185 Level 4 (Component) with 8 starters (scheduled for completion in May 2020) (Templemore)

Education and Training Board

Waterford Wexford

Apprenticeships

Waterford Wexford ETB delivered a range of Construction apprenticeships across a number of phases in 2019:

- Brick and Stonelaying Phase 2 with 22 beneficiaries
- Carpentry and Joinery Phase 2, with 97 beneficiaries,
- Construction Phase 7 with 32 beneficiaries
- Electrical Phase 2, with 177 beneficiaries in Waterford and 47 in Wexford, Electrical Phase 4 with 144 beneficiaries, Electrical Phase 6 with 68 beneficiaries, and Electrical Phase 7 with 23 beneficiaries
- Electrical Security Systems Phase 4 with 25 beneficiaries, and Phase 6 with 13 beneficiaires
- Plastering Phase 2, with 27 beneficiaries
- Plumbing Phase 2, with 42 beneficiaries, Plumbing Phase 4 with 96 beneficiaries, and Plumbing Phase 6 with 0 beneficiaries
- Wood Manufacturing Phase 2 with 16 beneficiaries

WWETB also provided a number of pre-apprenticeship courses:

- Pathway to Apprenticeship (General Learning) WYTEC (1 year), with 61 beneficiaries in 2019; there are scheduled to be 31 beneficiaries in 2020.
- Level 1 Pre-Apprenticeship in Bricklaying with 9 beneficiaries.
- Trade Skills Preparation- Youth Training (1 year from September 2019)- there are scheduled to be 13 beneficiaries in 2020.

Broader Construction related FET provision

WWETB offered a range of other FET courses in Construction. These included:

- 2 CAD Level 2 (Evenings) with 24 beneficiaries
- AutoCad Revit with online Tutor Support and Workshop with 6 beneficiaries
- Construction Ground Work Skills- SP4 with 67 beneficiaries
- Construction Technology with 31 beneficiaries
- Electrical Testing and Verification with 70 beneficiaries
- Interior Design QQI 5M5054 with 10 beneficiaries, Interior Design Level 5 with 10 beneficiaries, Interior Design Level 5 Year 2 2018/2019 with 7 beneficiaries
- NZEB for Electricians with 18 beneficiaries, NZEB for Plumbers with 6 beneficiaries, NZEB Fundamental Awareness with 395 beneficiaries, NZEB Retrofit with 19 beneficiaries, NZEB Ventilation with 16 beneficiaries
- Parametric Modelling Level 1 (Skills to Advance) with 7 beneficiaries
- Safepass- Evenings with 308 beneficiaries
- Traditional Stone Wall Construction with 13 beneficiaries, Traditional Stone Wall Construction 2019 with 15 beneficiaries, and Traditional Stonewall Construction Skills 5S5547 with 3 beneficiaries

Appendix VIII

> Built Environment Education: Higher Education Institutions

Athlone Institute of Technology							
Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments (for latest year available) 2019-20	Number of graduates (for latest year available) 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
Construction Management		7		None	None	None	
Construction Management	1	8	Part Time	21	None	21	
Civil Engineering	1	6	Full Time	3	0	3	
Civil Engineering	2	6	Full Time	3	5	3	
Civil Engineering	1	7	Full Time	15	0	15	
Civil Engineering	2	7	Full Time	9	0	9	
Civil Engineering	3	7	Full Time	9	7	9	
Civil Engineering	Add-on Yr 1	8	Full Time	13	0	13	
Civil Engineering	Add-on Yr 2	8	Full Time	5	9	5	
Energy and Business Management	1	8	Full Time	0	0	0	
HDip in BIM for Civil Engineering and Construction (First Graduates from this programme in Nov 2020)	1	8	PART TIME	32	0	32	
Quantity Surveying	1	8	Full Time	13	0	13	
Quantity Surveying	2	8	Full Time	12	0	12	
Quantity Surveying	3	8	Full Time	9	0	9	
Quantity Surveying (First Graduates from this programme in Nov 2020)	4	8	Full Time	9	0	9	
SPA Construction Management	1	8	Part Time	24	23	24	

Cork Institute of Technology

Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
Architectural Technology		7	Full Time	23	5	11	20 Total in Year 1
Architectural Technology		8	Full Time	57	8	24	Year 1 Full
Architecture		8	Full Time	148	38	45	Year 1 Full
Architecture (MArch)		9	Full Time	15	11	15	20
Building Information Modelling and Management (Part Time)		8	Part Time	12	0 (New Programme)	12	20 Total(40 if investment in online infrastructure)
Building Information Modelling Technologies (Short course)		7	Part Time	29	20	29	40 Total
Building Regulatory Engineering (Short course)		8	Part Time	28	30	30	40 Total
Civil Engineering		7	Full Time	105	21	42	60 Total for Year 1
Civil Engineering (Environment and Energy) (MEng) (Full and Part Time)		9	Part Time	6	0 (Delivery on a 2-Year Cycle)		15 Total
Construction (Higher Certificate)		6	Included under next row	N/A	No Graduating Cohort	N/A	N/A
Construction (Common Entry)		7	Full Time	43	No Graduating Cohort	32	40 Total
Construction Management		7	Full Time	11	7	11	20 Total in Year 3(Spare Capacity)
Construction Management		8	Full Time	92	15	38	35 Total in Year 1(Full Capacity in Year 1; Capacity in later years))
Construction Project Management MSc		9	N/A	N/A	N/A	Programme Not Running	Spare Capacity
Digital Land Surveying and GPS (short course)		7	Part Time	6	6	6	15 Total (Spare Capacity)
Engineering (Common Entry)		8	Full Time	81	N/A	80	Programme Full (one year programme)
Engineering Services Management (post-2016 apprenticeship in association with CIF led consortium)		7	Part Time	9 (only year 1 to date)	N/A	9	32 total
Environmental Engineering		7	Full Time	21	5	12	30 Total in Year 1
Engineering- Sustainable Energy Engineering		8	Full Time	68	10	20	40 Total in Year 1(Spare Capacity)
Fire Safety Certification (short course)		8	N/A	N/A	N/A	N/A	N/A
Fire Safety Engineering (short course)		8	Part Time	18	N/A	N/A	40 Total (Spare Capacity)
Interior Architecture		7	Full Time	36	6	24	First Year full
Interior Architecture		8	Full Time	82	13	30	First Year full
Mechanical and Electrical Quantity Surveying	Cert	8	Part Time	N/A	N/A	Programmes currently not running	Spare Capacity
Mechanical, Electrical and Plumbing-BIM applications		7	Part Time	N/A	N/A		20 Total (Spare Capacity)
Practical Land Surveying (short course)		7	Part Time	6	6	6	15 Total (Spare Capacity)
Quantity Surveying		7	Full Time	8	7	8	20 Total in Year 3(Spare Capacity)
Quantity Surveying		8	Full Time	119	17	34	35 Total in Year 1(Year 1 Full)
Structural Engineering (Full and Part Time)		8	Full Time	94	15	16	25 Total in Year 1(Spare Capacity)
Structural Engineering (MEng) (Full and Part Time)		9	Full and Part Time	10	3	6	15 Total (Spare Capacity)
Technical Architecture (Taught Masters and Masters by Research)		9	N/A	N/A	N/A	Programme not running	10 Total (Spare Capacity)

Dundalk Institute of Technology

Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
Architectural Technology		7	Full Time	13	N/A	16	16
Architectural Technology		8	Full Time	20	N/A	18	18
Building Surveying		7	Full Time	6	N/A	6	6
Building Surveying		8	Full Time	15	16	15	15
Civil Engineering		7	Full Time	22	23	25	15
Civil Engineering		8	Full Time	N/A	N/A	8	12
Civil Engineering Add On		8	Full Time /Part Time	14 PT Year 1 10 PT Year 2	24	Year 1: 29 Year 2: 10	No change
Construction Management		7	Full Time	13	N/A	7	7
Construction Management		8	Full Time	12	N/A	9	9

Galway Mayo Institute of Technology

Architectural Technology		7	Full Time	11	8	11	0
Architectural Technology		8	Full Time	14	13	21	7
Building Information Modelling		8	Part Time	59	12	60	1
Civil Engineering		7	Full Time	4	12	10	6
Civil Engineering		8	Full Time	27	20	38	11
Construction Management		7	Full Time	9	13	9	0
Construction Management		8	Full Time	55	12	55	0
Energy Engineering		7	Full Time	3	6	5	2
Energy Engineering		8	Full Time	12	12	15	3
Quantity Surveying and Construction Economics		7	Full Time	19	7	20	1
Quantity Surveying and Construction Economics		8	Full Time	40	19	40	0

Institute of Technology Carlow

Architectural Technology		7	Full Time	23	4	9	Yes
Architectural Technology		8	Full Time	49	5	19	Yes
Civil Engineering		7	Full Time	39	7	13	Yes
Civil Engineering		8	Full Time	33	2	7	Yes
Construction (common entry)		8	Full Time	46		15	Yes
Construction- Facilities and Building Services Management		8	Full Time	0	1	0	Yes
Construction Management with Building Services		7	Full Time	24	5	10	Yes

Institute of Technology Sligo						
Course Title	Notes	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019
Advanced Wood and Sustainable Building Technology		7	Full Time	33	15	10
Applied Construction Technology (Higher Cert.)		6	Full Time	1	1	1
Architecture		8	Full Time	39		23
BIM and Lean Construction Management- Cert.	(Online)	9	Part Time	25		25
Civil Engineering		8	Full Time	12		0
Civil Engineering (Higher Certificate)		6	Full Time	5	1	5
Construction Economics- Higher Certificate	(Offline)	6	Full Time	6	2	4
Construction Economics- Higher Certificate	(Online)	6	Part Time	57		36
Construction Law Procurement and Finance- Certificate	(Online)	9	Part Time	16		16
Construction Management- Online (with CIF)		7	Part Time	115	39	0
Construction Project Management		8	Part Time	32	24	0
MSc in Project Management		9	Part Time	18	1	5
Construction Project Management and Applied Technology		8	Full Time	5		5
Engineering- Civil Engineering		7	Full time	29	9	14
Mechanical and Electrical Quantity Surveying (Certificate)		9	Part Time	39		39
Quantity Surveying		7	Full Time	18	7	3
Quantity Surveying	(Online)	7	Part Time	49	12	0
Quantity Surveying	(Offline/Online)	8	Full Time	46	27	9
Quantity Surveying	(Offline/Online)	8	Part Time	29		0
Road Maintenance Engineering and Network Management- Postgraduate Certificate (Online)		9	Part Time	5		5
Engineering in Road and Transport Engineering	Postgraduate	9	Part Time	3	6	1
Master of Eng in Road and Transport Engineering		9	Part Time	26	9	6
Strategic Construction Management- Certificate	(offline/online)	9	Part Time	0	0	0
Institute of Technology Tralee						
Building Information Modelling- BIM with Revit		6	Online Part Time Springboard	62	2018/19 54	2019/20 62
Civil Engineering		8	Full Time	11	0	11
Civil and Environmental Engineering		7	Full Time	10	10	10
Construction Management		7	Full Time	0	0	0

Letterkenny Institute of Technology

Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
Applied Fire Safety Management		7	Blended - postponed due to Covid 19	n/a	n/a	0	25 – 50 places will be offered in coming academic year 2020/2021
BSc Architectural Technology		7	Full Time/Part Time	F 17 P 1	5	13	Course being dropped from Sept 2020
BSc (Hons) Architectural Technology		8	Full Time	4 transferred on to stage 3 of L8	New Course	0	Course being paused on CAO, 24 places from Sept 2021
BIM 4D- Navisworks (Certificate)		7	Part Time	0	n/a	0	no
BIM- Revit (Certificate)		6	Part Time	20	12	20	no
Certificate in Revit and 4D BIM The two part-time courses above have been combined into a new course for Springboard+		7	Part Time				20
Building Services and Renewable Energy		7	Full Time/Part Time	7	7	7	Dropped from CAO for Sept 2020
Civil Engineering HCI funding applied for 2020		7	Full Time/Part Time	F59 P1	11	24	32
Construction Contracts Management		8	Full Time/Part Time	0	6 (2016)	n/a	16
Introductory Construction Economics and Land Surveying		6	Part Time	2	2	2	6 (runs as modules on full-time courses)
BSc (Hons) Construction Management		8	Full Time/Part Time	17		8 (2016)	24
BEng (Hons) Fire Safety Engineering		8	Full Time/Part Time	39	5	16	20
BSc (Hons) Fire Safety Engineering		8	Full Time/Part Time	F6 P4	8	Add on	20
Quantity Surveying		7	Full Time/Part Time	F27 P2	10	17	24
Quantity Surveying		8	Full Time/Part Time	F56 P2	13	13	24
Renewable Energy and Physics Fundamentals		6	Part Time	1			6 (runs as modules on full-time courses)

Limerick Institute of Technology

Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
Architectural Technology		8	Full Time	Launching 2021			
Building Information Modelling- BIM with REVIT MEP- Classroom/OnlineAdditional numbers through Overseas cohort		6	Part Time				
Built Environment- Common EntryFT programmes have a mode of admission known as Accumulation of Credits which allow partial completion spread over several years		8	Full Time	14	N/A	14	Yes
Civil Engineering	Year 1	7	Full Time	24		24	Yes
	Year 2		Full Time	18			
	Year 3		Full Time	8	9		
Civil Engineering Management	Year 1	8	Full Time	9		9	Yes
	Year 2		Full Time	12			
	Year 3		Full Time	9			
	Year 4		Full Time	18	8		
Construction Health and Safety		7	Part Time	24		24	Limited to one cohort
Construction Management	Year 1	8	Full Time	32		32	Yes
	Year 2		Full Time	13			
	Year 3		Full Time	29			
	Year 4		Full Time	13	19		
Construction Project Management-Online		6	Part Time				
Interior Design	Year 1	8	Full Time	19		19	Limited to one cohort
	Year 2		Full Time	11			
	Year 3		Full Time	9	4		
Property Valuation and Management	Year 1	8	Full Time	24		24	Yes
	Year 2		Full Time	16			
	Year 3		Full Time	10			
	Year 4		Full Time	10	6		
Quantity Surveying	Year 1	8	Full Time	37		37	Yes
	Year 2		Full Time	40			
	Year 3		Full Time	35			
	Year 4		Full Time	32	21		
Quantity Surveying (Sustainable Public Building)		9	Full Time	22	7	22	Limited to one cohort
Renewable and Electrical Energy Engineering		8					

NUI Galway

Civil Engineering		8	Full Time	119	44	12	
Civil Engineering (ME)		9	Full Time	17	14	17	
Project and Construction Management		8	Full Time	52	8	12	

Technological University Dublin

Course Title(Undergraduate)	Number of enrolments 2019-20	Course TitleContinued Professional Development (CPD)	Number of enrolments 2019-20	Course Title(Post Graduate)	Number of enrolments 2019-20
Bachelor Engineering Tec (Ord) Civil Engineering	229	Architectural Practice Diploma (SPA)	109	Higher Certificate Building Engineering	48
Bachelor of Architecture	274	Architecture CPD PG Certs	33	Higher Certificate Buildings Management (Maintenance and Conservation)	1
Bachelor of Engineering (Hons) Building Services Engineering	28	Spatial Planning and Transport Certificates	2	Higher Certificate Higher Cert in Building Engineering	29
Bachelor of Engineering (Hons) Civil Engineering	65	Geographical Information Systems Certificate (MIN)	21	Master of Architecture Master of Architecture	15
Bachelor of Engineering (Hons) Structural Engineering	93	School of Multi Disciplinary Technologies UG CPD Certificates (MIN)	7	Master of Engineering Sustainable Infrastructure	22
Bachelor of Engineering (Ord) Bachelor of Engineering Technology (Ord)	18	School of Surveying & Construction Management CPD Certs & PG Certs	9	Master of Science Applied Building Information Modelling and Management	67
Bachelor of Science (Hons) Architectural Technology	151	Thermal Bridge Assessment Certificate (SPA)	1	Master of Science Quantity Surveying	63
BSc (Hons) in BIM (Digital Construction)	23			Master of Science Spatial Planning	9
BSc (Hons) Construction (Management)	166			Master of Science Sustainable Development	20
BSc (Hons) Environmental Planning and Management	87			Master of Science Urban Regeneration and Development	11
BSc (Hons) Geographic Science	67			Master of Science Transport & Mobility	14
BSc (Hons) Geomatics (Surveying & Mapping)	1	Apprenticeship		Postgraduate Certificate BIM Technologies	41
BSc (Hons) Quantity Surveying & Construction Economics	247	National Craft Certificate in Brickwork and Stonelaying	44	Postgraduate Certificate Building Performance (Energy Efficiency in Design)	48
BSc (Hons) Surveying (Property Economics)	171	National Craft Certificate in Plumbing	60	Postgraduate Diploma Building Performance (Energy Efficiency in Design)	12
BTech (Ord) Construction Site Management	44	Apprenticeship Painting and Decorating	38		
BTech (Ord) Construction Technology	8				

Trinity College Dublin

Course Title(Undergraduate)	Number of enrolments 2019-20		Course TitleContinued Professional Development (CPD)	Number of enrolments 2019-20		Course Title(Post Graduate)	Number of enrolments 2019-20
Applied Building Repair and Conservation		9	Part Time	10	11	10	15
Construction Law and Contract Administration		9	Part Time	23	24	23	26
Engineering BAI		8	Full Time	197	62	197	185
Engineering MAI		9	Full Time		104		
Engineering with Management BAI		8	Full Time	27	5	27	21
Engineering with Management MAI		9	Full Time		15		
Fire Safety Practice (Buildings and other Structures)		9	Part Time	17	15	17	Quota 30
Health and Safety in Construction		9	Part Time	10	9	10	Quota 30
Structural and Geotechnical Engineering (MSc)		9	Full Time Part Time	91	40	12	Quota 15
Sustainable Energy (MSc)		9	Full Time Part Time	70	20	12 12	15 15

University College Cork

Architecture (run with CIT)		8	Full Time	152	38	45	168
M Arch (run with CIT)		9	Full Time	16	11	16	30
Civil, Structural and Environmental Engineering		8					

University College Dublin							
Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
BSc Architectural Science	Stages 1-3	8	Full Time	179	49	60	To 75
Bachelor of Architectural Science	4	8	Full Time	19	0 (new programme- no graduates yet)	19	To 34
BSc Landscape Architecture	Stages 1-4	8	Full Time	87	13	23	To 30
BSc in City Planning and Environmental Policy	Stages 1-2	8	Full Time	60	0	33	To 68
BA in Planning Geography and Environmental Policy	Stages 2-3	8	Full Time	22	20	No intake- degree being phased out	N/A
BA in Planning Geography and Environmental Policy International	Stage 3	8		2	0	Transfer route from standard BA PGE- 1 student transferred in 19/20	N/A
Civil Engineering	Stages 2-4	8	Full Time	50	4	24	To 40
Civil Structural and Environmental Engineering	Stage 4	8	Full Time	7	N/A	7	To 23
Civil Structural and Environmental Engineering		9	Full Time	2	13	2	To 18
Engineering with Business Stream Stage 4 (Civil)	Stage 4	8	Full Time	14	N/A	14	Varies
ME (Engineering with Business) (Civil)	Stages 1-2	9	Full Time	4	7	1	To 9
MEngSc (Structural Engineering)	Stage 1	9	Full Time	13	9	13	To 30
MEngSc (Structural Engineering)	Stage 1	9	Part Time	2	1	2	To 4
MEngSc (Water, Waste and Environmental Engineering)	Stage 1	9	Full Time	9	12	9	To 30
MEngSc (Water, Waste and Environmental Engineering)	Stage 1	9	Part Time	1	0	1	To 3
Master of Architecture	Stages 1-2	9	Full Time	79	45	47	47
MArchSc in Landscape Studies (Inactive 19/20)	Stage 1	9	Full Time	0	0	0	0
MArchSc in Landscape Studies	Stage 1	9	Full Time	1	1	1	1
Master of Landscape Architecture	Stage 1	9	Full Time	1	0	1	11
Master of Regional and Urban Planning (A/P)	Stage 1	9	Full Time	7	5	7	Varies
Master of Regional and Urban Planning	Stages 1-2	9	Full Time	24	6	15	15
MSc in Urban Design and Planning	Stage 1	9	Full Time	26	9	23	43
MSc in Environmental Policy	Stage 1	9	Full Time	21	12	21	61
MSc in Planning, Development and Urban Design	Stage 1	9	Full Time	0 (No intake yet- new 2019)	0	0	7
MSc in Planning, Development and Urban Design	Stage 1	9	Part Time	0 (No intake yet- new 2019)	0	0	3
MSc in Architecture, Urbanism and Climate Action	Stage 1	9	Full Time	0 (No intake yet- new 2019)	0	0	16
Professional Diploma (Architecture)	Stages 1-2	9	Part Time	94	53	92	Open ended
Professional Diploma (Architecture) (Online)	Stages 1-2	9	Part Time	59	35	58	Open ended
Structural Engineering with Architecture	Stages 2-3	8	Full Time	22	0	13	To 40
Structural Engineering with Architecture	Stage 3	8	Full Time	8	17	0	N/A (phasing out)
Structural Engineering with Architecture	Stage 4	8	Full Time	8	N/A	8	To 35
Structural Engineering with Architecture		9	Full Time	10	5	10	To 37

University of Limerick

Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
Architecture		8					
Architecture MArch		9					
Construction Management and Engineering	Year 1	8		53	47	53	At capacity
Construction Management and Engineering	Year 2	8		52	47	52	At capacity
Construction Management and Engineering	Year 3	8		55	53	55	At capacity
Construction Management and Engineering	Year 4	8		46	42	46	At capacity

Waterford Institute of Technology

Course Title	Years of Study	NFQ Level	Mode (part time/Full Time)	Number of enrolments 2019-20	Number of graduates 2019	Annual intake for 2019	Potential expansion (i.e. course capacity)
BSc Architectural Technology		7	Full Time	21	0	16	9 (to 25)
BArch Architecture		8	Full Time	119	14	44	6 (to 50)
BSc Architectural and Building Information Modelling Technology		8	Full Time	46	4	10	15 (to 25)
BEng Building Services Engineering		7	Full Time and Part Time	5	3	0	N/A (Removed from CAO- potential PT option being explored)
Certificate in NZEB design		9	Part Time	12	0	12	3 (to 15) Springboard funding to be confirmed for 2020/2021
BEng Civil Engineering		7	Full Time (Potential PT option being explored)	30	9	11	N/A
MSc Construction Project Management		9	Full Time and Part Time	37	29	27	3 (To 30)
BSc Construction Management and Engineering		8	Full Time	65	16	23	17 (to 40)
Construction Site Management		7	Part Time	24	13	24	1 (to 25) Springboard funding to be confirmed for 2020/21
BEng Fire Engineering		7	Part Time	23	9	23	2 (to 25) Springboard funding to be confirmed for 2020/21
BSc Quantity Surveying		8	Full Time	75	11	25	15 (to 40)
BEng Sustainable Civil Engineering		8	Full Time	17	0	10	20 (to 30)
BEng Sustainable Energy Engineering		8	Full Time	32	6	11	19 (to 30)
MSc Sustainable Energy Engineering		9	Full Time and Part Time	20	10	16	9 (to 25)

Appendix IX

> Core, Niche and Emerging Occupation Descriptions

This appendix identifies that academic qualifications associated with each of the identified 'Core' and 'Niche' occupations. These tables were obtained from the Standard Occupational Classifications (SOC) manuals in the UK. This is vital information as there is a dearth of information identifying links between education and occupation in Ireland. This table provides insight into qualifications held by workers in each occupation and allows us to understand where investment must occur.

This table initially identified the qualifications held in the UK. Each of these qualifications were then cross-referenced with the equivalent Irish qualification on a job-by-job basis. In the vast majority of cases, there was a direct equivalent Irish qualification or chartered body. In some cases where City Guild qualifications are held in the UK, results are less definitive.

Table 8.3: Core Skills of the Built Environment Sector (1 of 2)

Occupation	Description	Associated Qualifications
Carpenters and Joiners (5315)	Carpenters and joiners construct, erect, install and repair wooden structures and fittings used in internal and external frameworks and cut, shape, fit and assemble wood to make templates, jigs, scale models and scenic equipment for theatres.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Electricians and Electrical Fitters (5241)	Electricians and electrical fitters assemble parts in the manufacture of electrical and electronic equipment and install, maintain, and repair electrical plant, machinery, appliances and wiring.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Elementary Construction Occupations (9120)	Job holders in this unit group perform a variety of general labouring and construction duties to assist building, civil engineering and related trades workers in the performance of their tasks.	No academic qualifications are required. Training is typically provided on the job.
Construction and Building Trades N.E.C (5319)	Those working in construction and building trades n.e.c. undertake a variety of tasks in the construction, alteration, maintenance and repair of buildings, steeples, industrial chimneys and other tall structures, and of underwater structures not elsewhere classified in MINOR GROUP 531: Construction and Building Trades.	No academic qualifications are required. Training is typically provided on the job.
Plumbers and Heating and Ventilating Engineers (5314)	Jobholders in this unit group assemble, install, maintain and repair plumbing fixtures, heating and ventilating systems and pipes and pipeline systems in commercial, residential and industrial premises and public buildings.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Architects (2431)	Architects are Registered professionals leading the design and delivery of the built environment with responsibility for project management and administration of the construction contract. Architects' work is critical to the quality, sustainability and innovation of buildings and the public realm. They are skilled in the creative, technical, economic, ecological and social aspects of delivery of the built environment. Architects are one of seven professions recognised in Directive 2005/36/EC on the Recognition of Professional Qualifications, having responsibility to both clients and the public. As Assigned Certifier, Architects inspect and certify building works and coordinate the certification by all others including the builder.	Eligibility for admission as an architect to the Register for Architects follows successful completion of an RIAI accredited degree programme in architecture (NFQ Level 8 or 9) or equivalent followed by two years of post-graduate practical experience and a successful outcome in an RIAI accredited Professional Practice Examination.

Source: (Office of National Statistics (UK), 2010)

Table 8.4: Core Skills of the Built Environment Sector (2 of 2)

Occupation	Description	Associated Qualifications
Painters and Decorators (5323)	Those working in this unit group apply paint, varnish, wallpaper and other protective and decorative materials to the interior and exterior walls and surfaces, paint designs on wood, glass, metal, plastics and other materials, and stain, wax and french polish wood surfaces by hand.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Civil Engineers (2121)	Civil engineers undertake research and design, direct construction and manage the operation and maintenance of civil and mining engineering structures	Civil engineers usually possess an accredited three or four-year degree (Level 8 NFQ) in civil engineering or engineering science or an accredited Higher National Diploma or Certificate. The status of 'chartered engineer' (NFQ Level 9) is achieved through the completion of postgraduate training and full membership of a chartered engineering institution.
Production Managers and Directors in Construction (1122)	Production managers and directors in construction direct and co-ordinate resources for the construction and maintenance of civil and structural engineering works including houses, flats, factories, roads and runways, bridges, tunnels and railway works, harbour, dock and marine works and water supply, drainage and sewage works.	There are no pre-set entry standards. Entry is possible with either a degree or equivalent qualification and relevant experience, via apprenticeships. On-the-job training is provided, and professional qualifications are available.
Plasterers (5321)	Plasterers apply plaster and cement mixtures to walls and ceilings, fix fibrous sheets and cast and fix ornamental plasterwork to the interior or exterior of buildings.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Construction Operatives N.E.C (8149)	Workers in this unit group operate insulating equipment, fix plasterboard or dry linings to ceilings and walls, help construct, maintain, repair and demolish buildings and clean and resurface eroded stonework, lay, join and examine pipe sections for drainage, gas, water or similar piping systems and carry out a variety of other construction operative tasks not elsewhere classified in MINOR GROUP 814: Construction Operatives	No academic qualifications are required. Training is typically provided on the job.
Bricklayers and Masons (5312)	Bricklayers and masons erect and repair structures of stone, brick and similar materials and cut, shape and polish granite, marble, slate and other stone for building, ornamental and other purposes	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Mobile Machine Drivers and Operators (8229)	Job holders in this unit group supervise and undertake the operation of machines to transport, excavate, grade, level, and compact sand, earth, gravel and similar materials, drive piles into the ground and lay surfaces of asphalt, concrete and chippings, and operate other mobile machines not elsewhere classified in MINOR GROUP 822: Mobile Machine Drivers and Operatives.	No academic qualifications are required. Training is typically provided on the job. The appropriate current driving licence will be required for driving on public highways.

Source: (Office of National Statistics (UK), 2010)

Table 8.5: Niche Skills of the Built Environment Sector (1 of 3)

Occupation	Description	Associated Qualifications
Floorers and Wall Tilers (5322)	Floorers and wall tilers lay composition mixtures (other than mastic asphalt) to form flooring, plan, fit and secure carpet, underlay and linoleum and cover and decorate walls and floors with terrazzo and granolithic mixtures, tiles and mosaic panels.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Construction and Building Trades Supervisors (5330)	Construction and building trades supervisors oversee operations and directly supervise and coordinate the activities of workers in construction and building trades.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Architectural and Town Planning Technicians (3121) ²	Architectural and town planning technicians perform a variety of technical support functions to assist architects and planners with the design of buildings and the layout of urban and rural areas.	Entrants require a professional qualification in architecture that will encompass an accredited degree and postgraduate qualification (NFQ 7), and at least two years practical experience.
Quantity Surveyor (2433)	Quantity surveyors advise on financial and contractual matters relating to, and prepare bills of quantities for, construction projects and provide other support functions concerning the financing and materials required for building projects.	Entry is through professional training and membership of an appropriate professional organisation. Entrants require a professional qualification in Quantity Surveying that will encompass an accredited degree and postgraduate qualification (NFQ 8) Candidates usually undertake a period of probationary training and professional assessment.
Chartered Surveyors (2434)	Chartered surveyors conduct surveys related to the measurement, management, valuation and development of land, natural resources, buildings, other types of property, and infrastructure such as harbours, roads and railway lines.	Entrants usually possess an accredited degree, equivalent qualification and postgraduate qualification (NFQ Level 8). Entrants must also have successfully completed a probationary training period and professional assessment. Entry requirements for professional bodies vary
Refuse and Salvage Occupations (9235)	Refuse and salvage collectors supervise and undertake the collection and processing of refuse from household, commercial and industrial premises.	No academic qualifications are required. Training is provided on-the-job.
Roofers, Roof Tilers and Slaters (5313)	Job holders in this unit group cover roofs and exterior walls with felting, sheeting, slates, tiles and thatch to provide a waterproof surface.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Source: (Office of National Statistics (UK), 2010)		

² CSO have also merged Quantity Surveyors (2433) and Chartered Surveyors (2434) with Architectural and Town Planning Technicians (3121). It is not clear why this has been carried out.

Table 8.6: Niche Skills of the Built Environment Sector (2 of 3)

Occupation	Description	Associated Qualifications
Glaziers, Windows Fabricators and Fitters (5316)	Job holders in this unit group install pre-glazed wooden, metal or PVC framework, and cut, fit and set glass in windows, doors, shop fronts, and other structural frames.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Construction Project Managers and Related Professional (2436)	Job holders in this unit group manage and oversee major construction and civil engineering projects and major building contracts for quality of work, safety, timeliness and completion within budget; forecast travel patterns and develop strategies for managing the impact of traffic-related demand.	Entrants typically possess a degree in a relevant subject or equivalent qualification and substantial work experience at an appropriate level. Further Continuing Professional Development is available in some areas
Air Conditioning and Refrigeration Engineers (5225)	Jobholders in this unit group install, service and repair airconditioning and refrigeration systems in factories, offices, shops and homes.	There are no formal academic entry requirements, although some employers may request GCSEs/S grades. Training is via an apprenticeship, or BTEC, City & Guilds or other specialised qualification.
Energy Plant Operatives (8124)	Job holders in this unit group operate boilers to produce hot water or steam and attend and operate compressors, turbines, electrical substations, switchboards and auxiliary plant and machinery to fuel nuclear reactors, drive blowers and pumps, electricity generators and other equipment.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Waste Disposal and Environmental Services Managers (1255)	Waste disposal and environmental services managers plan, organise, direct and co-ordinate the operations and development of waste disposal and related environmental services facilities within private firms or public authorities.	Entry is possible with a variety of academic qualifications, including a degree or equivalent qualification in a related subject, and relevant experience. Professional qualifications are available from the Chartered Institute of Waste Management (UK) and may be mandatory in some operational management posts.
Water and Sewerage Plant Operatives (8126)	Water and sewerage plant operatives operate valves to control water supplies in mains and pipelines, attend screening, filtering, water purifying and sedimentation plant, clear any blockages and patrol and maintain sewerage systems.	There are no formal academic entry requirements. Training is provided off- and on-the-job.
Pipe Fitters (5216)	Workers in this unit group install pipe systems and maintain and repair pipes in major utilities, industrial and construction settings and sites.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.

Source: (Office of National Statistics (UK), 2010)

Table 8.7: Niche Skills of the Built Environment Sector (3 of 3)

Occupation	Description	Associated Qualifications
Chartered Architectural Technologists (2435) ³	Architectural technologists are technical designers skilled in the application and integration of architectural and construction technologies in the building design process.	Entrants possess a minimum of a three year NQF level 7 qualification. Four year level 8 qualifications are also provided and may be required for some posts. Membership of professional bodies is optional. Architectural technologists in Ireland are generally members of either the RIAI or the Chartered Institute of Architectural Technologists.
Crane Drivers (8221)	Crane drivers supervise and undertake the operation of cranes, jib cranes, power driven hoisting machinery and power driven stationary engines to raise and lower mine and other cages, and to lift and move equipment, materials, machinery and containers	There are no formal academic entry requirements. Training is typically provided on-the-job, supplemented by short courses
Elementary Cleaning Occupations N.E.C. (9239)	Workers in this unit group perform elementary cleansing service occupations not elsewhere classified in MINOR GROUP 923: Elementary Cleaning Occupations	No formal academic qualifications are required. Training may be provided on-the-job.

Source: (Office of National Statistics (UK), 2010) and RIAI

³ To note- while this is the occupational SOC-code used by the Central Statistics Office, no 'Charter of Architectural Technologists' exists in Ireland. Individuals using the title 'Chartered Architectural Technologist' in Ireland are members of a UK professional body. The Royal Institute of Architects in Ireland has a membership class 'Architectural Technologist' who has a recognised qualification accredited by the RIAI or equivalent and practical experience. Membership of either professional body is not necessary to practice as an architectural technologist in Ireland. All references to 'Chartered Architectural Technologist' throughout this report should therefore be read as 'Architectural Technologist'.

Table 8.8: Emerging Skills of the Built Environment Sector (1 of 3)

Occupation	Description	Associated Qualifications
Crane Drivers (8221)	Crane drivers supervise and undertake the operation of cranes, jib cranes, power driven hoisting machinery and power driven stationary engines to raise and lower mine and other cages, and to lift and move equipment, materials, machinery and containers	There are no formal academic entry requirements. Training is typically provided on-the-job, supplemented by short courses
Production Managers and Directors in Construction (1122)	Production managers and directors in construction direct and co-ordinate resources for the construction and maintenance of civil and structural engineering works including houses, flats, factories, roads and runways, bridges, tunnels and railway works, harbour, dock and marine works and water supply, drainage and sewage works.	There are no pre-set entry standards. Entry is possible with either a degree or equivalent qualification and relevant experience, via apprenticeships. On-the-job training is provided, and professional qualifications are available.
Pipe Fitters (5216)	Workers in this unit group install pipe systems and maintain and repair pipes in major utilities, industrial and construction settings and sites.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Health and Safety Officers (3567)	Health and safety officers counsel employees to ensure and promote health and safety in the workplace and co-ordinate accident prevention and health and safety measures within an establishment or organisation	Entrants usually possess an NVQ/SVQ at Level 3 in Occupational Health and Safety Practice. Higher-level accredited qualifications (at Levels 4 to 6) are achievable via the Institute of Occupational Safety and Health.
Managers and Proprietors of Other Services (1259)	Job holders in this unit group perform a variety of managerial tasks in other service industries not elsewhere classified in MINOR GROUP 125: Managers and Proprietors in Other Services	Entry requirements vary according to the particular company and service. Some companies do not require candidates to have academic qualifications, but others require a degree or equivalent qualification. Off- and on-the-job training may be provided.
Waste Disposal and Environmental Services Managers (1255)	Waste disposal and environmental services managers plan, organise, direct and co-ordinate the operations and development of waste disposal and related environmental services facilities within private firms or public authorities.	Entry is possible with a variety of academic qualifications, including a degree or equivalent qualification in a related subject, and relevant experience. Professional qualifications are available from the Chartered Institute of Waste Management (UK) and may be mandatory in some operational management posts.
Design and Development Engineers (2156)	Design and development engineers conceive engineering designs from product ideas or requirements in mechanical, electrical and electronic engineering.	Design and development engineers usually possess an accredited university degree or equivalent qualification (Level 8 NFQ). All routes are followed by periods of appropriate training and relevant experience in order to qualify for membership of a chartered engineering institution.

Source: (Office of National Statistics (UK), 2010)

Table 8.9: Emerging Skills of the Built Environment Sector (2 of 3)

Occupation	Description	Associated Qualifications
Water and Sewerage Plant Operatives (8126)	Water and sewerage plant operatives operate valves to control water supplies in mains and pipelines, attend screening, filtering, water purifying and sedimentation plant, clear any blockages and patrol and maintain sewerage systems.	There are no formal academic entry requirements. Training is provided off- and on-the-job.
Management Consultants and Business Analysts (2423)	Jobholders in this unit group advise industrial, commercial and other establishments on a variety of management and business-related matters to assist in the formulation of financial and business policies in order to maximise growth or improve business performance.	Entry is most common with a degree or equivalent qualification, but is possible with other academic qualifications. Professional qualifications are available and is a requirement in some areas.
Elementary Construction Occupations (9120)	Job holders in this unit group perform a variety of general labouring and construction duties to assist building, civil engineering and related trades workers in the performance of their tasks.	No academic qualifications are required. Training is typically provided on the job.
Construction Project Managers and Related Professional (2436)	Job holders in this unit group manage and oversee major construction and civil engineering projects and major building contracts for quality of work, safety, timeliness and completion within budget; forecast travel patterns and develop strategies for managing the impact of traffic-related demand.	Entrants typically possess a degree in a relevant subject or equivalent qualification and substantial work experience at an appropriate level. Further Continuing Professional Development is available in some areas
Purchasing Managers and Directors (1133)	Purchasing managers and directors (not retail) plan, organise, direct and co-ordinate the purchasing functions of industrial, commercial, government organisations, and public agencies to ensure cost-effectiveness.	Although not restricted to a particular qualification, entry is most familiar with a degree or equivalent qualification (Level 8 NFQ). Off- and on-the-job training is provided, and professional qualifications are available. The chartered status may also be achieved.
Business and Financial Project Managers Professionals (2424)	Job holders in this unit group manage and oversee major projects across all sectors of modern industry, commerce and the public sector, in areas such as e-commerce, business analysis, finance, product development, marketing, human resources	Entry may be via a degree or postgraduate qualification in project management or a subject relevant to the particular sector or via significant relevant work experience in that sector.
Energy Plant Operatives (8124)	Job holders in this unit group operate boilers to produce hot water or steam and attend and operate compressors, turbines, electrical substations, switchboards and auxiliary plant and machinery to fuel nuclear reactors, drive blowers and pumps, electricity generators and other equipment.	There are no formal academic entry requirements. Training is typically by apprenticeship, incorporating technical training and practical experience.
Welding Trades (5215)	Welding trades workers join metal parts by welding, brazing and soldering, and cut and remove defects from metal using a variety of equipment and techniques.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.

Source: (Office of National Statistics (UK), 2010)

Table 8.10: Emerging Skills of the Built Environment Sector (3 of 3)

Occupation	Description	Associated Qualifications
Steel Erectors (5311)	Steel erectors fit and erect the structural metal framework for buildings and other structures such as metal chimneys.	No formal academic qualifications required. Entry is typically through an apprenticeship or traineeship approved by SOLAS corresponding to a Level 6 NFQ.
Programmers and Software Development Professionals (2136)	Programmers and software development professionals design, develop, test, implement and maintain software systems in order to meet the specifications and business objectives of the information system; they also design and develop specialist software, e.g. for computer games.	Entrants usually possess a degree or equivalent qualification, although entry with other academic qualifications and significant relevant experience is possible. There is a variety of vocational, professional and postgraduate qualifications available.
Van Drivers (8212)	Van drivers collect, transport and deliver goods in vehicles up to 7.5 tonnes in weight.	There are no formal academic entry requirements. Entrants must possess a clean car driving licence. In order to drive vehicles between 3.5 and 7.5 tonnes, entrants must pass an additional test for a category C1 licence. Minimum age restrictions apply according to the weight of the vehicle and whether the driver holds a Driver CPC (Certificate of Professional Competence).

Source: (Office of National Statistics (UK), 2010)

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