



Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION 2013

CONSTRUCTION STUDIES

CHIEF EXAMINER'S REPORT

Contents

1.	Introduction	3
1.1	The Context: The Syllabus, Legislation and the Building Regulations	3
1.2	The Examination.....	4
2.	Performance of Candidates	8
2.1	Performance of Candidates at Ordinary Level	8
2.2	Performance of Candidates at Higher Level.....	9
3.	Written Examination – Ordinary Level.....	10
3.1	Introduction	10
3.2	Performance of Candidates.....	10
3.3	Analysis of Candidate Performance	12
3.4	Conclusions	13
3.5	Recommendations for Teachers and Students.....	14
4.	Written Examination – Higher Level	15
4.1	Introduction	15
4.2	Performance of Candidates.....	15
4.3	Analysis of Candidate Performance	16
4.4	Conclusions	20
4.5	Recommendations for Teachers and Students.....	20
5.	The Practical Skills Test.....	21
5.1	Introduction	21
5.2	Performance of Candidates.....	22
5.3	Analysis of Candidate Performance	23
5.4	Monitoring of Examination Centres	24
5.5	Conclusions	25
5.6	Recommendations for Teachers and Students.....	25
6.	Coursework	27
6.1	Introduction	27
6.2	Performance of Candidates.....	29
6.3	Analysis of Candidates Performance.....	30
6.4	Observations on Coursework.....	30
6.5	Conclusions	36
6.6	Recommendations for Teachers and Students.....	36

1. Introduction

1.1 The Context: The Syllabus, Legislation and the Building Regulations

Note: This report should be read in conjunction with the examination papers and the published marking schemes. These are available on the State Examination Commission's website www.examinations.ie.

The Syllabus

The current syllabus in Construction Studies was first examined in 1985. A revised syllabus, Architectural Technology, awaits implementation.

The syllabus in Construction Studies is written in a generic manner, with the intention that it be interpreted in the context of ongoing developments in the field, thereby accommodating the significant developments that have taken place since it was first examined in 1985. Most recently, such developments include themes relevant to the environment and sustainability and to the design and construction of buildings for the 21st century. The syllabus recommends an integrated approach between theory and practical work, and states that *“it is expected that the teacher will deal with the subject in its broader aspects...pupils should be encouraged to develop positive attitudes to their architectural heritage and the impact of the construction industry on the environment.”* As well as the detailed technical knowledge required for the planning and construction of a dwelling house, the syllabus states that students are required to *“understand the aesthetic principles related to the appearance of buildings... and to have a knowledge of the principal Building Regulations”*. Students are, inter alia, also required to *“understand the principles associated with methods of heat conservation, sources of heat gain ... the importance of solar heat gain in dwellings... and the thermal requirements for human comfort”*. These are central concerns in the design and construction of sustainable buildings for the 21st century and the present examination reflects these themes.

Compliance with European Union Legislation

The examination in Construction Studies takes cognisance of the evolving Building Regulations and of the requirements governing the energy performance of buildings, the use of renewable energies and universal design principles.

Along with all EU member states, Ireland must comply with EU directives regarding the energy performance of buildings. The first Energy Performance of Buildings Directive (Directive 2002/91/EC, EPBD) was published in 2002. A recast EPBD was published in 2010 (Directive 2010/31/EU). In compliance with this directive, EU member states are required to

further upgrade their Building Regulations. Under EU rules, all new public buildings must be designed to the nearly zero energy building (NZEB) standard from 2018 and all other buildings will have to comply with this standard from 2020. The Building Regulations, first introduced in 1976 have been revised in 1991, 1997, 2002, 2005, 2008 and 2011 and are currently being revised to align with Directive 2010/31/EU to comply with the NZEB standard. The examination will continue to reflect the regulations in place at the time of examination.

1.2 The Examination

The current examination in Construction Studies, at both Ordinary Level and Higher Level, comprises three components:

- written examination
- coursework – artefact and design folio
- practical skills test.

1.2.1 Weighting and Mark Allocation – Ordinary Level and Higher Level

At Ordinary Level, the written examination represents 40% of the examination; while the coursework and the practical skills test each represents 30% of the examination.

At Higher Level, the written examination represents 50% of the examination; while the coursework and the practical skills test each represents 25% of the examination.

Table 1 shows the mark allocation for each component at each level.

	Written	Coursework	Practical	Total
Ordinary Level	200 marks	150 marks	150 marks	500
Higher Level	300 marks	150 marks	150 marks	600

Table 1: Distribution of marks – Ordinary Level and Higher Level

Determination of Levels

The coursework and the practical skills test are examined at a common level and marked using common level marking schemes. The written component is examined at two levels, Ordinary Level and Higher Level. The level at which candidates present for the overall examination is determined by the level at which they present for the written examination.

1.2.2 The Written Examination

Ordinary Level

The Ordinary Level examination is of 2.5 hours' duration and consists of a total of nine questions from which the candidate must attempt four. Question 1, a scaled drawing question, is compulsory and candidates must select any three other questions from the remaining eight.

Higher Level

The Higher Level examination is of 3 hours' duration and consists of a total of ten questions from which the candidate must attempt five. Question 1, a scaled drawing question, is compulsory and candidates must select any four other questions from the remaining nine. There is a further internal choice provided in Question 10, whereby candidates may attempt either of two versions of this question.

1.2.3 The Practical Skills Test

The Practical Skills Test is a common level examination which takes place in the school in early May. The examination is a single session examination of 4 hours' duration. This test requires candidates to interpret a drawing and mark out, process, and assemble an artefact in response to an examination paper issued by the State Examination Commission (SEC). On completion of this examination, all test artefacts are sent to the SEC headquarters in Athlone where they are marked by a team of examiners appointed and trained by the SEC.

1.2.4 Coursework

The coursework component is examined at a common level. All candidates are required to submit individual coursework, completed in school under the supervision of the class teacher. To fulfil the syllabus requirements, the coursework must consist of two components - an artefact **and** an accompanying design folio. The design folio should detail all aspects of the development of the artefact, from research to final completion. The design folio should also contain a record of three experiments undertaken by the candidate during the course of study.

The class teacher and school principal are required to verify that the coursework submitted for assessment is the candidate's own individual work, completed in school under teacher supervision. Each year, the SEC issues *Instructions to Candidates* (M77P) in A4 and A3 formats. These Instructions outline the requirements for the submission of valid coursework. Teachers choose the commencement date of the coursework, usually in year two of the Leaving Certificate programme, and may also select the completion date. However, this date may not be later than the date specified by the SEC – usually the last Friday in April of the year of the examination.

Non-Acceptance of Group Coursework

Each candidate is required to submit separate, individual coursework – artefact and design folio. Group coursework is not accepted for the purpose of assessment, as in group coursework the individual contribution of each candidate may not be determinable at either marking or appeal stage.

1.3 Participation Rates

Table 2 shows the number of candidates taking Construction Studies at Ordinary and Higher Level for each for the past five years.

Year	Total Construction Studies Candidature	Number at Ordinary level	Number at Higher Level	Ordinary as % of total	Higher as % of total
2009	9130	1917	7213	21.0	79.0
2010	9037	1803	7234	19.9	80.1
2011	8710	1823	6887	20.9	79.1
2012	8208	1631	6577	19.9	80.1
2013	8113	1541	6572	19.0	81.0

Table 2: Number of candidates taking Construction Studies by level 2009-2013

As is shown in the table, 81.0 % of the cohort took Construction Studies at Higher Level and 19.0% at Ordinary Level in 2013. While the ratio has remained fairly constant over the past five years, a higher percentage of candidates took the subject at Higher Level in 2013 than in any of the previous four years.

Participation by Gender

The participation of female candidates in Construction Studies remains low and is consistent with preceding years. A total of 6.4% of the candidature were female in 2013. Thus, Construction Studies remains largely a male-dominated subject. The participation of females and males over the last five years is shown in Table 3 below.

Year	Total candidature	Number female	Number male	Female as % of total	Male as % of total
2009	9130	688	8442	7.5	92.5
2010	9037	648	8389	7.2	92.8
2011	8710	521	8189	6.0	94.0
2012	8206	509	7697	6.2	93.8
2013	8113	516	7597	6.4	93.6

Table 3: Gender composition of cohort, 2009 to 2013

2. Performance of Candidates

2.1 Performance of Candidates at Ordinary Level

Tables 4 and 5 show the overall performance of candidates at Ordinary Level over the past five years when all three components of the examination are included. As can be seen from the table, a fairly consistent pattern of grade distribution emerges across the five years. A total of 54.2% of candidates obtained a C grade or higher in 2013. However, only 0.5% of candidates achieved an A grade. A total of 86.6% of candidates achieved a D grade or higher in 2013. The percentage of candidates who achieved less than a D grade remains fairly consistent across the years, and increased slightly in 2013 – from 10.4% in 2012 to 13.4% in 2013.

Year	Number	A	B	C	ABC	D	E	F	NG	EFNG
2009	1917	0.5	16.2	38.5	55.2	32.4	8.3	3.7	0.4	12.4
2010	1803	0.4	13.8	38.8	53.0	33.0	10.4	3.4	0.2	14.0
2011	1823	0.5	15.3	38.7	54.5	31.8	10.3	3.1	0.3	13.7
2012	1631	0.4	15.3	39.8	55.5	34.1	8.1	2.1	0.2	10.4
2013	1541	0.5	15.0	38.7	54.2	32.4	9.9	3.0	0.5	13.4

Table 4: Percentage of candidates awarded each lettered grade in Ordinary Level Construction Studies, 2009 – 2013

Year	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2	D3	E	F	NG
2009	0.0	0.5	2.0	4.6	9.5	11.1	12.8	14.6	12.9	10.0	9.5	8.3	3.7	0.4
2010	0.1	0.3	1.5	4.7	7.7	11.2	13.8	13.8	13.1	10.8	9.1	10.5	3.4	0.2
2011	0.1	0.4	2.0	4.7	8.6	12.1	13.2	13.4	12.1	10.3	9.4	10.4	3.1	0.3
2012	0.0	0.4	2.1	4.5	8.7	11.7	13.6	14.5	14.0	10.4	9.7	8.1	2.1	0.2
2013	0.0	0.5	2.0	4.5	8.5	10.0	12.8	15.9	12.6	11.3	8.5	9.9	3.0	0.5

Table 5: Percentage of candidates awarded each sub-grade in Ordinary Level Construction Studies, 2009 – 2013

2.2 Performance of Candidates at Higher Level

Tables 6 and 7 show the overall performance of candidates for the past five years in Construction Studies – Higher Level, when all three examination components are included.

Year	Number	A	B	C	ABC	D	E	F	NG	EFNG
2009	7213	6.2	33.7	36.7	76.6	19.7	3.2	0.5	0.0	3.7
2010	7234	7.9	34.1	35.6	77.6	18.7	8.8	2.4	0.2	3.7
2011	6887	8.8	31.1	36.2	76.1	19.8	3.7	0.4	0.0	4.1
2012	6577	8.1	33.1	35.0	76.2	19.8	3.5	0.4	0.0	3.9
2013	6572	7.2	34.9	36.8	78.9	18.0	2.5	0.40	0.0	2.9

Table 6: Percentage of candidates awarded each lettered grade in Higher Level Construction Studies, 2009 – 2013

Year	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2	D3	E	F	NG
2009	1.7	4.5	8.5	11.6	13.6	12.6	12.4	11.7	8.7	6.0	5.0	3.2	0.5	0.0
2010	2.2	5.6	8.95	11.4	13.2	12.6	12.9	10.6	8.3	5.8	4.5	3.3	0.6	0.0
2011	3.0	5.8	9.1	10.6	11.4	12.4	12.6	11.2	7.7	6.3	5.7	3.8	0.5	0.0
2012	2.5	5.6	8.7	11.2	13.1	12.5	12.7	9.9	8.7	6.4	4.9	3.5	0.4	0.0
2013	1.9	5.3	8.7	12.4	13.8	13.3	12.8	10.8	8.0	6.0	4.0	2.5	0.4	0.0

Table 7: Percentage of candidates awarded each sub-grade in Higher Level Construction Studies, 2009 – 2013

An analysis of the data shows a consistent pattern of grade distribution across the five years. A total of 78.9% of candidates achieved a C grade or higher at Higher Level in 2013. Just 2.9% of candidates achieved lower than a D grade in 2013. There is also a consistent pattern across the other grades. 34.9% of candidates achieved a B grade in 2013 – showing an increase of 1.8% on the 2012 figure of 33.1%. A total of 36.8% of candidates achieved a C grade in 2013, also showing a consistent pattern across the five years. In 2013, a total of 97.1% of candidates achieved a D grade or higher in Construction Studies at Higher Level.

2.2.1 Performance of Candidates by Gender at Ordinary Level and at Higher Level

The majority of candidates taking Construction Studies are male. In 2013, at Ordinary Level 8.5% of the cohort was female and at Higher Level in 2013, 5.9% of the cohort sitting Construction Studies was female. There were no significant differences between the distribution of grades achieved by male and female candidates. Examination results by gender for the years 2001 to 2013 are available in the statistics section of the State Examinations Commission's website, at www.examinations.ie.

3. Written Examination – Ordinary Level

3.1 Introduction

A total of 1541 candidates sat the written examination at Ordinary Level. This represents 19.0% of the cohort taking Construction Studies in the Leaving Certificate in 2013.

3.2 Performance of Candidates

Table 8 shows the percentage of candidates achieving each lettered grade in the Ordinary Level written examination for the years 2009 – 2013. As can be seen from Table 8, the final results for 2013 accord closely with those of previous years. Over half of the candidates, (55.1%) obtained a C grade or higher in the written component in 2013 and this is consistent with the achievement of candidates across the other four years shown.

Year	Number	A	B	C	ABC	D	E	F	NG	EFNG
2009	1926	6.7	19.9	29.5	56.1	28.1	8.7	4.8	2.3	15.8
2010	1810	6.1	19.3	28.3	53.8	28.7	9.4	4.8	3.3	17.5
2011	1807	6.5	21.1	28.5	56.1	27.2	7.6	5.0	4.0	16.7
2012	1649	5.9	20.9	29.7	54.6	27.7	10.5	4.7	2.5	17.7
2013	1552	6.1	19.1	30.0	55.1	27.3	10.1	5.3	2.2	17.6

Table 8: Distribution of grades – Ordinary Level – written component, 2009 - 2013

Popularity of Questions and Performance across Questions

Table 9 shows the popularity of questions from the random sample analysed, and the average mark for each question. Question 6 was the most popular question attempted (and the highest scoring) and Question 5 was the least popular (and joint lowest scoring).

Question	Popularity (% attempts)	Rank order in popularity	Average mark, out of 50	Rank order in average mark	Theme
1	75	2	35	3	Flat roof design
2	38	5	29	6	External insulation
3	60	3	38	2	Plumbing layout
4	18	7	25	7*	Foundation design
5	5	9	25	7*	Scale drawing – partition
6	85	1	42	1	Safety and safety on site
7	10	8	25	7*	Cold bridge design
8	40	4	32	4	Technical definitions
9	35	6	30	5	Design of double doors

Table 9: Popularity of and average mark for each question, Ordinary Level Construction Studies

3.3 Analysis of Candidate Performance

The following commentary is based on the observations of examiners together with an analysis of the random sample of 120 scripts.

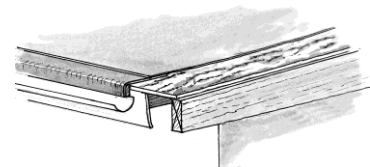
The 6.1% A grade in the written examination is consistent with the outcomes of recent years. There is also a reasonably consistent pattern across the other grades – the A+B+C grades remaining fairly consistent and is at 55.1% in 2013.

A total of 17.6% of candidates achieved less than a D grade in the written examination in 2013 and this grade distribution remains fairly consistent across the five years shown. Examiners reported that candidates who achieved less than a D grade at Ordinary Level rarely attempted the required four questions and were not able to obtain sufficient marks from the questions completed to achieve a D grade or higher.

Although 17.6% of candidates achieved less than a D grade in the written examination in 2013, a total of 13.4% of candidates achieved less than a D overall – when all three components are included – in Construction Studies at Ordinary Level. Thus, candidates performed better in the coursework component and in the skills test than in the written examination.

The following is a question by questions commentary based on the observations of the Examiners and on the results of a random sample of 120 scripts.

Question 1 is a compulsory scale drawing question. It was attempted by 75% of the sample. Candidates who did not attempt this question could only receive credit for three questions and this significantly reduces a candidate's chance of doing well in the examination. All candidates are advised to attempt Question 1. The question was generally well answered and had the third highest average mark of 35. Almost all candidates succeeded in giving the required detailing for the cavity wall and many understood the requirements for a flat roof. Some candidates omitted the detailing for the removal of rainwater and, as this detailing was specifically required, candidates lost marks when this detail was omitted. Candidates are advised to read all questions carefully and to refer to the accompanying sketches as an aid to understanding the text.



The most popular question was Question 6, on site safety, and was attempted by 85% of the sample. It was also the best answered question, with an average mark of 42. Examiners reported that most candidates had a good knowledge of site safety procedures and attempted

all three parts of the question. Examiners commented on the topicality of the question and on the need to raise an awareness of safety issues among candidates.

The third most popular question was Question 3 – on plumbing. This question was attempted by 60% of the sample and was also well answered – having the second highest average mark of 38. In most cases candidates understood the required plumbing layout. Examiners particularly commended the answering of part 3(b), where candidates were required to design a tap for a person with limited hand mobility. Examiners commented that this was generally well answered, with some candidates offering very good design solutions.

Question 8, referring to technical definitions, was the fourth most popular question and was also well answered, having the fourth highest average mark of 32.

Question 2 on external insulation had an attempt rate of 38% and was the fifth most popular question. Candidates scored reasonably well on this question, and the average mark was 29.

Question 9, which featured the design of oak double doors, was attempted by 35% of the sample, ranking sixth in popularity, and had the fifth highest average mark of 30. Examiners reported that some candidates answered well on the advantages of the location of the double doors, citing increased borrowed light and greater flexibility of movement by a person in a wheelchair, reflecting candidate awareness of universal design principles and their growing importance in house design



Question 4, Question 7 and Question 5 all had an average mark of 25. Question 4 on foundation design, was attempted by 18% of the sample, Question 7 on cold bridge detailing, was attempted by 10% of the sample and Question 5, a scale drawing question on first floor and stud partition design, was the least popular question and had an attempt rate of just 5%.

3.4 Conclusions

- Candidates attempted a wide range of questions. Question 6 on safety-on-site was the most frequently attempted question and was well answered.
- Questions on environmental themes, design for disability, insulation methods and plumbing were popular with candidates.
- Freehand sketching was generally not sufficiently used by candidates.
- Candidates who did not attempt Question 1 did not do well. If Question 1 is not attempted, candidates can only obtain credit for a total of three questions.

- Candidates sometimes did not give a note and a sketch where both were required.

3.5 Recommendations for Teachers and Students

It is recommended that teachers:

- advise students to attempt all four questions, and to pay particular attention to attempting the compulsory Question 1
- advise students of the importance of careful reading of the questions
- practise freehand sketching, colouring and rendering of sketches with students.

It is recommended that students:

- read all the examination questions carefully and refer in particular to the accompanying sketches for assistance in understanding the text
- attempt Question 1, which is compulsory
- attempt the required four questions and thus maximise their chances of doing well
- use coloured and rendered freehand sketching to convey design detailing – paying particular attention to the quality of the freehand sketches presented
- include both notes and sketches where the question asks for both.

4. Written Examination – Higher Level

4.1 Introduction

A total of 6,553 candidates sat the written examination at Higher Level, representing 81% of the cohort taking Constructions Studies in the Leaving Certificate in 2013.

4.2 Performance of Candidates

The following commentary is based on an analysis of a random sample of 420 scripts. As can be seen from Table 10, there is consistency in the distribution of grades across the five years at Higher Level.

Year	Number	A	B	C	A, B, C	D	E	F	NG	E, F, NG
2009	7207	5.8	19.8	28.6	54.2	26.8	12.6	5.5	0.8	19.0
2010	7220	6.2	22.0	28.1	56.3	24.8	12.5	5.2	1.3	19.0
2011	6895	6.4	22.2	25.7	54.4	26.2	10.3	7.5	1.6	19.4
2012	6569	6.1	21.8	26.8	54.7	25.0	11.8	6.8	1.6	20.2
2013	6553	6.1	21.1	28.3	55.4	27.6	12.6	4.0	0.4	17.0

Table 10: Distribution of grades – Higher Level – written component, 2009 – 2013

A total of 55.4% of candidates achieved a C grade or higher in 2013 and the A grade at 6.1% remains fairly consistent with other years. It is noted that 17% of candidates achieved less than a D grade in the written examination in 2013. Examiners reported that many of these candidates were challenged by the complexity of the questions at Higher Level and/or did not attempt the required five questions and thus could not achieve a D grade.

Popularity of Questions and Performance across Questions

Table 11 and shows the popularity of questions and the average mark for each question in the Higher Level paper in 2013.

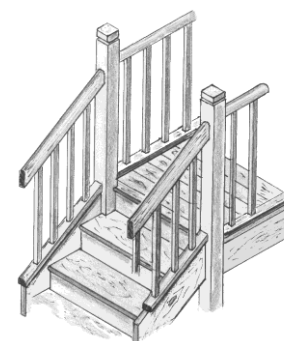
Question	Popularity (% attempts)	Rank order in popularity	Average mark, out of 60	Rank order in average mark	Theme
1	91	1	39	3*	Stairs design - Section
2	62	4	39	3*	Health and safety
3	36	6	31	8	Design of extension
4	38	5	40	2	Heating/solar design
5	63	3	39	3*	U-value calculations
6	64	2	36	5	Design for sustainability
7	29	9	44	1	Chimney/stove – Section
8	34	7	37	4	Foundation design
9	24	10	32	7	Ingress of dampness
10	31	8	34	6	Passive House design
10(alt)	10	11	22	9	Sustainable housing

Table 11: Popularity of and average mark for each question, Higher Level Construction Studies

4.3 Analysis of Candidate Performance

The examination at Higher Level reflects a broad range of themes with questions on topics such as building details, material properties and specification. It addresses current themes such as sustainable building and sustainable development and design for lifetime use.

Question 1 is traditionally a scaled drawing of a building detail and is compulsory. In 2013, Question 1, on stairs design and construction, was attempted by 91% of candidates. In previous years, approximately 98% of candidates attempted Question 1. Examiners reported that some candidates seemed not to be familiar with stair construction. However, the vast majority of candidates were



familiar with stairs design and, with an average mark of 39, the question was generally well answered.

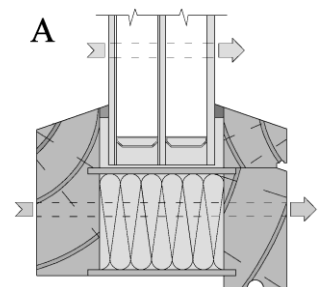
Apart from Question 1, which is compulsory, Question 6 – on low environmental impact design – was the most frequently attempted question. Examiners suggested that current classroom teaching emphasises themes such as low environmental impact design, thus making this a popular question. In Question 6(a), candidates were required to analyse a given house design and propose design features that suggested low environmental impact



design. Candidates scored well in this part and the concept was well understood by most candidates. Question 6(b) required candidates to analyse three specific conditions contingent on low impact design. This required higher order analytic skills and many candidates did less well in this part. Proposing modifications to the existing design also proved challenging for many. Though it was the most popular non-compulsory question, the average mark was 36, which is in the mid range of marks. Candidates who did little analysis and were unable to support their recommendations with cogent argument lost marks in this question.

In contrast, Question 7, though on a traditional theme - chimney design - was not popular and was attempted by 29% of the sample. However, this question had the highest average mark, at 44. Candidates were required to present a scaled design drawing through a floor, stove, chimney and flue. Examiners suggested that the majority of candidates who attempted this question knew the required design detailing and thus achieved high marks.

Question 5, on calculation of U-values for a glazing unit and window frame was the third most popular question. In Question 5(a), candidates were required to calculate two U-values from given data. Candidates who had studied this aspect of the course had little difficulty with the calculations; this part was very well answered with most candidates obtaining 25-30 marks (out of 30).

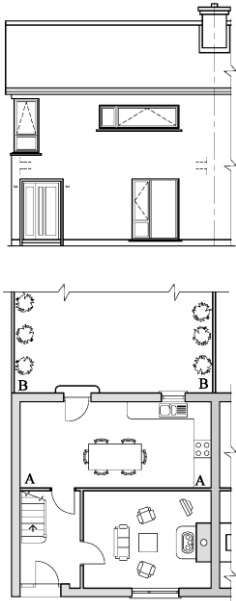


Question 5(b) was not as well answered as Question 5(a). Candidates were required to use the thermal data obtained in Question 5(a) to make comparisons between two glazing and framing systems. A considerable number of candidates did not reference their results from Question 5(a), which was required, and consequently did not achieve high marks. The higher order skills of synthesis and evaluation proved challenging for many candidates in Question 5(b).

Question 5(c) was generally well answered. However, some candidates included the cill detail rather than the head detail as was required. Most probably, such candidates did not read the question carefully and thus lost marks.

Question 2 on Health and Safety, with particular reference to safety-on-site, was a popular question and was attempted by 62% of the sample. It was also a well answered question, having an average mark of 39. Parts 2(a) and 2(b) were generally well answered; examiners commended the quality and clarity of sketching in response to part 2(b). However, part 2(c) – on safety when using electrical equipment on site – was less well answered.

Questions 3 required candidates to design an extension to a house and to reconfigure the interior space to improve the internal environment and to address thermal and visual comfort in the house. Such a design-based question first appeared in 2011 and there has been one such design-based question on the paper each year since. Each year, its popularity has increased, and in 2013 a total of 36% of candidates attempted this question. This question tests the creativity and design flair of candidates, and examiners reported much engagement by candidates with the challenges posed. The average mark achieved was 31 marks. Candidate used both 2D and 3D sketches to convey their ideas, and responses ranged from excellent to mediocre. In Question 3(b), some candidates did not provide a coherent rationale for their proposed designs.



Question 10 (first option), on the design of a Passive House, has also grown in popularity. Examiners suggested that as fossil fuel depletion becomes more urgent, teachers are engaging with design concepts that focus on fossil fuel reduction, with a consequent rise in the uptake of this question. In 2013, a total of 31% of candidates attempted this question, and it had an average mark of 34. Some candidates scored highly in this question and demonstrated a sound knowledge of the concept of Passive House design. In Question10 (a), the concepts of orientation and thermal mass in passive design were generally well understood. Few candidates understood the concept of primary energy demand. In Question 10(b), most candidates understood the design of a Mechanical Heat Recovery with Ventilation (MHRV) system and were able to present a design layout for the ducting. Question 10(c) was generally poorly answered. Though many candidates showed a location for the MHRV unit, they were often unable to provide reasons for selecting the location, did not show an understanding of the reasons for siting the MHRV unit in a preferred location and consequently lost marks.

Question 10 (second option) was the least popular question, attempted by 10% of the sample. It also had the lowest average mark of 22. Candidates were required to analyse a given statement on the challenges of environmental sustainability and building in the countryside, and to propose guidelines for sustainable housing development. A small number of candidates answered this question very well, and displayed a sound knowledge of the issues involved. Some candidates demonstrated a deep understanding of issues relating to sustainable development, analysed the given statement and proposed thoughtful guidelines. Such candidates scored very well. Other candidates did not have the in-depth understanding of the issues raised nor the analytic skills to propose and develop adequate guidelines. The responses of such candidates tended to be brief and perfunctory and did not provide sufficient analysis to achieve high marks. Again, the higher order skills of analysis, synthesis and evaluation proved challenging for the majority of candidates who attempted this question, resulting in a low average mark.

Question 8 on the design of strip and raft foundations was competently answered, with an attempt rate of 34% and an average mark of 37. In Question 8(b), the traditional strip foundation was well understood, but the raft foundation was less well understood.

Question 8(c), on best practice guidelines to ensure maximum strength of concrete, was reasonably well answered.

The written examination continues to be the most challenging component for candidates. In the 2013 examination, a total of 17.0% of candidates did not achieve a D grade in the written examination at Higher Level. Some candidates were very well prepared and their answering was exemplary. However, other candidates had clearly not completed the necessary preparation. Candidates are advised to ensure a balanced approach in preparation for the examination and ensure that sufficient time is given to the study of the theory component, noting that the theory component comprises 50% of the total marks at Higher Level.

Many questions require candidates to present architectural detailing using notes and freehand sketches. Frequently, the quality of the sketching was poor and consequently candidates lost marks. Where candidates are asked to provide notes and sketches, candidates are advised to include both in their answers; otherwise they will lose marks. It is recommended that candidates pay more attention to the development of freehand sketching techniques to enable them to convey technical information through the medium of high quality sketches. It is advised that candidates keep a design sketchbook throughout the two years of study to record, through freehand sketches, design detailing, for example, of local buildings of interest and of other areas of architectural importance. Such recording raises candidates'

visual awareness and helps develop their freehand sketching abilities. Candidates who elaborate on points raised are awarded the highest marks. In contrast, candidates who merely list points without adequate discussion or elaboration cannot achieve high marks.

4.4 Conclusions

- Some candidates were well prepared and their answering was exemplary. However, many candidates did not demonstrate a deep understanding of the concepts and consequently could not achieve high marks.
- There is an increased uptake of questions relating to energy use and sustainability; candidates generally demonstrated a sound understanding of the importance of environmental issues and of ecological and Passive House design.
- Sketching is an essential skill in communicating design ideas and technical detailing. In many instances, the quality of sketches was poor and consequently candidates lost marks.
- The requirement for higher order analytic skills proved challenging for many candidates.

4.5 Recommendations for Teachers and Students

It is recommended that teachers:

- ensure that sufficient time is allocated to the study of the theory component of the syllabus and that a balance is achieved between preparation for the theoretical, practical and coursework components of the course
- emphasise the importance of high quality sketches as a means of communicating architectural detailing
- encourage students to keep a design sketchbook and to practise freehand sketching on a regular basis.
- provide further opportunities for students to develop and practice higher order skills of analysis, synthesis and evaluation.

It is recommended that students:

- be mindful that the written component comprises 50% of the total marks for the

examination and ensure that they spend adequate time studying for the written component

- read the questions carefully to ensure that they respond to what is being sought
- keep a design sketchbook and pay more attention to the development of freehand sketching techniques.

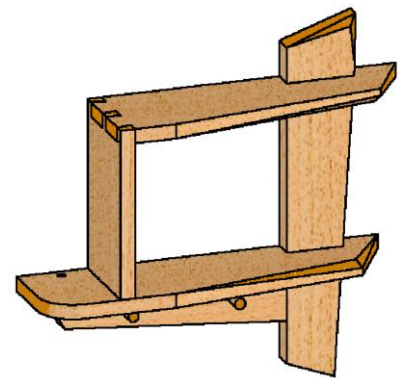
5. The Practical Skills Test

5.1 Introduction

The Practical Skills Test requires candidates to interpret, mark out, process and assemble an artefact from drawings prepared by the SEC. The examination is a single-session examination of 4 hours' duration and is conducted in schools in May. The test pieces are returned to the SEC and are marked by examiners appointed and trained by the SEC.

The Practical Skills Test is offered at a common level. To ensure full compliance with the examination regulations,

teachers are advised to bring the *Instructions to Candidates* to the attention of all candidates prior to the examination.



In particular, Instruction 2 of the *Instruction to Candidates* clearly states that the artefact must be manufactured using only the usual hand tools. It is explicitly stated in the marking scheme that if there is evidence of the use of machinery by a candidate, marks will be lost. In a small number of cases this year, there was evidence of the use of machinery and in such instances candidates lost marks. Such candidates are marked out of 50% of the marks available for the process for which the machinery was used, as outlined in the published marking scheme.

Teachers are advised to bring the *Instruction to Candidates* and the penalty for non-compliance to the attention of all candidates.

Security of examination

Due to the nature of the test and the equipment available in schools, it is not feasible for all candidates in all schools to take the examination at precisely the same time, and so the examination takes place for different candidates over a two week period. To protect the integrity of the examination, candidates are instructed as follows:

- *You may **not** bring a mobile phone, camera or any other recording equipment into the Examination Centre.*

Teachers are advised to apprise candidates of the importance of this instruction and to inform them that a candidate who brings any such equipment into the examination centre risks having their examination discounted.

All candidates are required to return the examination papers to the superintendent at the conclusion of the examination session and these examination papers should be stored securely in the school until the end of the two week examination period. This is to ensure the integrity of the examining process. Circular S46/13 states that *“Candidates must not be permitted to take the question paper/drawings from the examination room at any time. The Superintendent must collect all papers at the end of each examination and return them to the School Authority. The papers which are collected at the end of each examination must be kept separate from undistributed paper.*

The SEC acknowledges the cooperation of candidates, teachers and superintendents in ensuring the integrity of this examination. Teachers are advised to inform candidates in advance that they must hand up the examination paper to the superintendent at the end of the examination.

5.2 Performance of Candidates

Table 12 shows the overall distribution of grades for the Practical Skills Test from 2009 to 2013 inclusive. The results for 2013 accord closely with those of previous years.

Year	Number	A	B	C	ABC	D	E	F	NG	EFNG
2009	9112	20.1	41.3	24.5	85.8	9.5	3.3	1.2	0.2	4.7
2010	8992	20.7	39.0	26.0	85.8	9.7	3.0	1.3	0.2	4.5
2011	8731	20.7	39.0	26.3	85.9	9.5	3.3	1.0	0.3	4.5
2012	8205	20.0	40.4	25.8	86.3	9.8	2.7	1.1	0.2	4.0
2013	8085	20.2	39.7	25.9	85.8	9.9	3.0	0.9	0.3	4.3

Table 12: Distribution of grades for practical skills test 2009 - 2013

5.3 Analysis of Candidate Performance

The combined A+B+C grades, at 85.8% in 2013, show very little variation from those of the previous four years. The profile of the other grades is almost identical to that of previous years. The percentage of candidates who did not achieve a D grade is low at 4.3% and is consistent with that of previous years.

Examiners reported that candidates who did not achieve a D grade did little marking out and little practical work, and thus could not be credited with a higher mark.

Most candidates were well prepared for this examination, as is evidenced by the grade profile above. The overall standard was satisfactory; a number of candidates produced work of great skill and refinement and consequently obtained top marks.

Interpretation of Drawing

The majority of candidates had little difficulty in interpreting the given drawings. Most candidates succeeded in marking out the basic frame and in determining the correct lengths of the various framing components.

Marking out

The majority of candidates succeeded in marking out all the pieces. Examiners reported that there was a wide range of marking out skills in evidence. Candidates are advised to index all the pieces on both drawing and wood. This ensures that the pieces corresponding to the various lengths are correctly identified.

Candidates are advised to use the full time available for the examination, to persist with the marking out and manufacture of the artefact, as marks are awarded for all work undertaken, from marking out to manufacture to assembly.

Candidates who were inaccurate with the marking out were unable to assemble the artefact. A dovetail template was included in the equipment list to assist candidates with the speedy marking out of the slope of the dovetails. Candidates are advised to prepare in advance all templates as outlined in the materials list supplied to schools, as failure to do so results in a loss of time during the examination.

Candidates are advised to process the marking out of all the pieces as one sequence of operations and to check the marking out for accuracy prior to commencing the processing. Teachers are advised to remind candidates of the importance of completing the marking out of all pieces prior to processing and of the significant mark allocation for completing the marking out process, as shown in the published marking scheme.

The mortice and tenon joints were in general well executed. Some candidates had difficulty in marking out the dovetail joint, as required, and included finger joints instead of dovetails and consequently lost marks.

Teachers are advised to ensure that adequate time is provided for teaching the skills associated with the skills test, noting that this component comprises 25% of the total marks at Higher Level and 30% at Ordinary Level. The standard of craft and assembly skills was generally high and most candidates succeeded in assembling the artefact.

Design Feature

To allow for individual expression, candidates are required to apply and execute a design of their own choosing to specified edges. Some candidates showed excellent creativity in their designs and applied unique and individual designs. However, many candidates did not apply any design feature as required and consequently lost marks. Candidates are advised to complete all procedures, including the design feature, during the initial marking out.

5.4 Monitoring of Examination Centres

As with written examination, Examination and Assessment Managers (EAMs) from the SEC monitor the practical examinations at national level to ensure that the requirements of the SEC are complied with and to support the principle of inter-candidate equity. These EAMs reported that all examination centres monitored in 2013 were prepared as required and that the requirements of the SEC were fulfilled.

Role of the teacher

Circular S46/13 outlines the role of the teacher of Constructions Studies during the practical examination. It states that *“the Construction Studies teacher in the school should assist in*

preparing the room for the examination. The teacher should also be available in the school throughout the examination and may be admitted to the examination room to deal with the replacement of damaged tools and other matters not within the competence of the Superintendent. In the interest of inter-candidate equity, the teacher must not communicate with candidates in a manner that could confer any advantage". In the case of the centres monitored in 2013, EAMs reported that teachers of Construction Studies had diligently observed these guidelines. The SEC acknowledges the work of teachers in assisting with the preparation of the examination centres and in ensuring the smooth running of the examination.

5.5 Conclusions

- candidates were generally well prepared for this examination and the overall results reflect this preparation
- many candidates showed considerable competence in the marking out, processing and assembly of the artefact. A small number of candidates were unable to assemble the artefact, due mainly to inaccurate marking out
- in all examination centres monitored by the SEC in 2013, the examination was conducted in an exemplary manner.

5.6 Recommendations for Teachers and Students

It is recommended that teachers:

- ensure that an adequate time allocation is made available for teaching the skills associated with the Practical Skills Test
- bring the *Instruction to Candidates* to the attention of all candidates in advance and display the *Instruction to Candidates* in the classroom
- advise students of the penalties which apply for breaching these *Instructions*
- remind students of the importance of completing the marking out of all pieces prior to processing
- remind students that the use of machinery, such as the mortise machine, scroll, jig and band saws, is not permitted, and advise them also of the penalty that applies where such machinery is used
- ensure that students have only the materials specified in the cutting list and do not have access to extra or replacement pieces during the examination

- ensure that all students have prepared the necessary templates, as specified
- inform students that they may not bring any recording equipment, e.g. phone, camera, into the examination
- inform students in advance that they must hand up the examination paper to the superintendent at the end of the examination

It is recommended that students:

- prepare all specified materials and templates prior to the examination process
- mark out all the pieces as one sequence of operations at the beginning, and check the marking-out for accuracy prior to commencing the processing
- use only the prescribed tools and equipment to process the test piece
- use only the materials specified on the materials list
- ensure that they leave mobile phones, cameras, and other such recording equipment outside the examination centre
- ensure that they return the examination paper to the superintendent at the end of the examination.

6. Coursework

6.1 Introduction

The syllabus stipulates what constitutes valid coursework for the purpose of assessment in Leaving Certificate Construction Studies as follows:

(i) *A Building Detail, incorporating a minimum of three Craft Practices*

or

(ii) *A Building Science Project relating to Craft Practice*

or

(iii) *A Written/Drawn project relating to Craft Heritage or the Architectural Heritage or the Built Environment.*

Projects must be supported by written reports in the case of (i) and (ii), and by an element of practical work in the case of (iii), e.g., a scale model or detail from the subject under investigation.

(Syllabus - Construction Studies - Rules and Programmes for Secondary Schools)

In order to fulfil the requirements of the syllabus, coursework must consist of two components:

- an artefact **and**
- a design folio/report

The artefact must therefore be supported by a folio/report while written/drawing coursework must also include an artefact, such as a scale model or a detail from the subject under investigation.

The coursework, which is examined at common level, is initially marked in school by the class teacher in accordance with the marking scheme issued by the SEC and a rank order is compiled. The coursework is also marked by examiners appointed and trained by the SEC. The marks awarded by such examiners are the marks that are credited to the candidates, while the marks provided by the class teacher inform the work of the examiners. As is customary, examiners were well received in schools and, generally, the coursework was well presented.

6.1.1 Authenticity of Coursework

The obligation resides with the candidate to fulfil the requirements of the SEC regarding the submission of authentic coursework. Rule 35(2) of the Rules and Programme for Secondary Schools, together with Circulars S68/04 and S69/04 and Instructions to Candidates (M77P)

and the classroom poster, set out the position regarding acceptance of coursework for assessment as part of the certificate examinations.

In order to uphold the integrity of coursework and in the interest of inter-candidate equity, it is essential that all candidates, without exception, complete their coursework under the same conditions. Authentic coursework is the individual work of the candidate, completed in school under direct teacher supervision. Such coursework is then authenticated and signed off on by both the class teacher and the school authorities. Because coursework is executed over an extended period of time, the possibility of third party assistance, plagiarism or collusion is increased in comparison to that of a terminal written examination. Coursework completed in school is conducted within a legitimate framework of advice and guidance by the teacher, offered in a class setting and given in an open, transparent and fair manner. While acknowledging that legitimate advice and guidance can be obtained from others such as parents, guardians, siblings and friends, it is imperative that all work on the artefact be carried out in a school setting. There has to be a clear demarcation between, on the one hand, help and encouragement from a parent, guardian or friend, and, on the other, direct assistance being offered to a candidate in completing the coursework. Direct assistance of a candidate by a third party renders such coursework invalid.

Role of the Class Teacher

The role of the teacher in both the supervision and authentication of candidate work is the key to guaranteeing the integrity of coursework submitted for assessment. In fulfilment of their duty of care to their students, teachers should explain the conditions under which authentic coursework for assessment is to be produced. Teachers are advised not to permit candidates remove the coursework from the school to facilitate additional work, as the teacher cannot then authenticate coursework completed in an out-of-school setting. For the purposes of assessment, the SEC does not accept authentication of coursework by anyone other than the class teacher. If teachers are unable to authenticate certain coursework, they indicate this to the SEC by signing form P20. The SEC supports teachers in this process and greatly appreciates the co-operation of teachers in upholding the integrity of this examination component.

Where there is a need for a student to do some investigative work in an out-of-school setting, this must be done with the prior approval of the class teacher. For example, if a candidate wishes to survey a building in the locality, the candidate has, of necessity, to conduct some of the research out-of-school. The candidate is required to record all such work in the design

folio and to keep the teacher apprised of the work in progress. In all such cases, the candidate is required to make the accompanying artefact in school under teacher supervision.

Compliance

In the 2013 examination, the vast majority of coursework submitted by candidates was completed in accordance with the SEC's regulations and duly authenticated by the class teacher and school authorities. Where there was evidence that the work submitted was not solely the individual work of the candidate or was not completed in accordance with the regulations, investigations were carried out and reports prepared on these cases. As a result, a number of candidates were not awarded any marks for the coursework component of Construction Studies in 2013. Candidates are advised to familiarise themselves with the regulations of the SEC for the submission of valid coursework and to uphold these regulations.

Presentation of coursework

Examiners noted that many teachers and candidates put considerable effort into the display of coursework, and the coursework was presented in an orderly manner. In some centres dedicated display stands were provided to enhance the presentation of coursework. Such an effort is commended and reflects respect for the effort of the candidates and also offers a showcase for the creativity and design skills of candidates. Regrettably, in a small number of examination centres, coursework was presented in a disorganised and cluttered manner and this slowed down the work of the examiner in such centres.

Completion of documentation in schools

Coursework can only be marked when candidates have signed the necessary form, Form B, declaring that the work submitted for assessment is their own individual work, authenticated by the class teacher and school authorities. Failure to complete the necessary documentation causes unnecessary delay and a possible rescheduling of the visit of the examiner. In 2013, examiners reported that the necessary documentation was duly completed in the majority of schools. Teachers of Construction Studies are advised to ensure that candidates complete and sign the necessary documentation on submission of the coursework.

6.2 Performance of Candidates

Table 13 below shows the overall distribution of grades for Coursework from 2009 to 2013 inclusive. As can be seen from the table, the results for 2013 accord closely with those of previous years.

Year	Number	A	B	C	ABC	D	E	F	NG	EFNG
2009	9018	25.1	37.0	21.3	83.5	11.0	4.2	1.1	0.2	5.5
2010	8941	26.2	39.2	20.3	85.7	9.6	3.7	1.0	0.1	4.7
2011	8629	25.3	39.5	21.3	86.1	9.2	3.6	1.0	0.0	4.6
2012	8154	25.3	38.6	21.9	85.7	10.3	3.3	0.6	0.0	3.9
2013	8050	25.1	38.0	21.6	84.7	10.6	3.8	0.8	0.1	4.7

Table 13: Distribution of grades for coursework, 2009 – 2013

6.3 Analysis of Candidates Performance

Over one in four candidates (25.1%) achieved an A grade in the coursework component in 2013. This reflects the commitment of both candidates and teachers to producing coursework of a high standard. Some candidates submitted coursework of a very high standard, demonstrating research, design and realisation skills.

A total of 84.7% of candidates achieved a C grade or higher in 2013, showing a slight reduction of 1% from the previous year. The percentage of candidates who did not achieve a D grade remains low at 4.7% of the cohort and again is broadly in line with previous years.

6.4 Observations on Coursework

The Leaving Certificate Construction Studies syllabus provides for a broad choice when selecting the type of coursework acceptable for assessment. The syllabus details the following areas from which coursework may be chosen:

- building detail
- building science relating to craft practice
- craft heritage
- architectural heritage
- built environment.

For the purpose of analysis, the coursework submitted each year is categorized into the following areas by examiners:

Categories of coursework

Construction

- all wet trades
- scaled sectional details
- planning
- scale models of timber frame construction, roofs, foundations, doors, windows, stairs etc.
- plumbing/drainage details/models.

Furniture

- internal and external furniture, other than heritage

Heritage

- buildings of historical significance
- dwellings in the vernacular tradition or from a particular period
- buildings and structures of architectural interest
- artefacts of historical significance
- building restoration and traditional skills including furniture restoration and replication.

New Technologies

- geothermal, solar, wind, MHRV, rainwater harvesting etc
- new insulation techniques
- innovative building methods
- control applications – smart meters etc.

Table 14 and the accompanying chart show the percentage of candidates presenting coursework in each of these categories in 2013.

Coursework category	Percentage
Construction (K)	30.0
Furniture (L)	59.1
Heritage (M)	7.6
New Technologies (N)	3.3

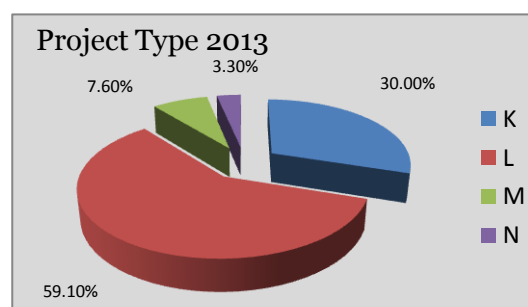


Table 14: percentage of candidates presenting coursework in each category, 2013.

Furniture continues to be the coursework type most favoured by candidates, with a total of 59.1% of candidates submitting coursework of this type. A total of 30% of candidates submitted coursework in the *Construction* category. *Heritage* coursework has increased by 1.1% from 6.5% in 2012 to 7.6 % in 2013, and *New Technology* coursework has increased by 1.1% to 3.3%. In 2013, a number of class groups presented a limited range of coursework types. The selection of a broad range of coursework types within a class enriches the experience of all candidates, as they can observe, discuss and learn from the work of other candidates. Teachers are advised to encourage candidates to engage with a broad range of types of coursework when assisting candidates with their selection. A narrow range limits the educational experience available to candidates.



Examiners commented on the high quality of coursework presented for assessment in many centres throughout the country. It is evident that both teachers and candidates invest significant time and energy in the coursework component of Construction Studies, and such work was well rewarded. Such coursework contained evidence of detailed research and planning, had a specific goal or objective, gave insights into the thought process and key decisions taken and was supported by a carefully designed and executed artefact. Where proper planning was absent, the coursework was often without focus and consequently could not achieve high marks.



Examiners observed that much of the coursework presented for assessment in the furniture category was not designed by the candidates, but consisted of realisations of existing designs, sourced from books and magazines. Such derivative work does not usually provide sufficient opportunities for the development of the higher-order skills expected of Higher Level candidates in particular.

Selection of Coursework

Candidates should select their coursework only after significant research and reflection. When selecting coursework, candidates should consider the resources available in the school, the time available and their own strengths and motivation. Candidates are advised to select coursework that best suits their abilities and skills. Teachers have an important role in

guiding and advising candidates at this stage of the process. Teacher experience and knowledge are invaluable; consequently, students should consult with and heed the advice of their teachers when selecting appropriate coursework. As it is not permitted under any circumstances to remove coursework from the school for completion, coursework should be selected taking cognisance of the material resources available in the school. A compact, well designed, elegant and carefully executed project, accompanied by a well structured design folio – recording all stages from design to final completion – will obtain the highest marks. Candidates should take care to select coursework that will allow the expression of a broad range of abilities and skills. Furthermore, candidates are advised to avoid undertaking large, poorly designed artefacts, expressing a limited range of skills and often creating storage problems in the school. Examiners reported that candidates who selected carefully the type of coursework which matched their abilities and skills and completed both the artefact and design folio scored well, and this is evident in the grade profile for coursework.

Aim of Coursework

It is important that candidates have a clearly stated focus for their coursework: an aim, goal or a statement that outlines what they hope to achieve. Examiners reported that where candidates did not have a clearly stated aim, such coursework frequently lacked focus and cohesion and consequently could not obtain high marks.

Investigation and Research

The quality of research and investigation has a significant influence on the overall quality of the coursework. Many candidates carried out extensive research with a clear focus and this guided them in the completion of the project. Candidates are advised to engage in a range of research activities and to clearly acknowledge the research sources in the design folio. In addition to the internet, candidates are advised to look to their own locality and environment for inspiration and ideas. The local architectural and craft heritage can often provide candidates with inspiration for coursework. An analysis of local buildings, photographic surveys, interviews with local people, site visits and so on, can often enrich the learning experience and inform the choice of coursework.

The Design Folio

A design folio should accompany each artefact. Candidates should detail the preparation, planning, research and decisions taken to produce the final artefact. In the design folio, candidates should provide a record of manufacture from planning to final execution and should include freehand sketching, scaled drawings, digital media presentation and a detailed report. The design of the artefact is an important part of the process. Simply reproducing

existing designs sourced from books or the internet cannot be awarded the same marks as work which reflects a candidate's own design flair and creativity. Examiners reported that some candidates, owing to a lack of planning, attempted artefacts that were either too large or too complex to complete in the time available. Candidates are advised to develop a design folio in tandem with the artefact and to include in the folio a contemporaneous record of work in progress. The folio should also contain a final evaluation and personal reflection on the work undertaken. Some candidates, who otherwise presented practical work of a high standard, presented design folios of poor quality and thus lost significant marks. Examiners reported that it was evident that some candidates wrote up the portfolio after making the artefact; such folios were often descriptive in content and lacked critical evaluation and appraisal.

Experimental work

Experimental work accounts for 20% of the overall mark for the coursework. Experimental work continues to pose difficulties for a significant number of candidates. Candidates are required to undertake "experiments which are assigned and closely supervised by the teacher". Candidates who investigated aspects of the coursework, constructed a hypothesis, investigated this hypothesis and derived a conclusion, succeeded in obtaining high marks. However, examiners reported that some candidates invested little effort in this area and consequently the experiments were poorly defined and the conclusions unclear. If an experiment is to be considered valid, the conclusions drawn must be based on the results evidenced from the experiment. Candidates are advised to relate the experimental work to some aspect of the coursework undertaken. This provides candidates with an opportunity to form a hypothesis, construct an experiment and record the results. It also provides candidates with an opportunity to undertake unique experimental work.

Coursework and sustainability

Examiners reported an increased awareness among candidates of the importance of sustainability and of resource depletion in the selection of themes for coursework. The idea of *doing more with less* informed the coursework selection of an increasing number of candidates. Examiners reported that, using the lens of sustainability to analyse coursework selection, many candidates presented artefacts of modest scale and selected and sized the materials carefully. Such an approach is commended.

Scale models

Examiners reported that there was a notable increase in the quality of models presented for assessment this year. It is clear that candidates are researching model-making techniques and

materials. Models on themes such as renewable technologies and on Passive House detailing continue to expand, and this is commended.

Evaluation

Most candidates included an evaluation and, in some instances, this recorded the personal learning of the candidate throughout the coursework. However, in many instances the evaluation lacked depth and focus and merely reflected that the candidate enjoyed doing the coursework. Such commentary cannot command the higher marks awarded to candidates who undertake a sustained reflection on the learning, drawing conclusions and reflecting insights resulting from their engagement with coursework.

Range of Coursework Presented

The artefacts presented reflect the wide interests and aptitudes of the candidates. There is a growth in research on such issues as sustainable development, universal design, the Passive House, sympathetic retrofitting, insulation and renewable energies.

However, some class groups continue to select a limited range of coursework on similar themes and this narrow selection restricts the range of educational experiences available to the class group and limits the richness of choice facilitated by the syllabus. Teachers are advised to encourage candidates to explore a wide variety of themes before deciding on a particular coursework type. Teachers are advised to encourage candidates to explore the architectural and craft heritage of their local area. Such an exploration should provide candidates with a diverse, unique and interesting range of themes for coursework. As is outlined in the *Instructions to Candidates*, candidates should consult and discuss their proposed choice of coursework with their teachers to ensure that the resources are available in the school to complete the coursework in school under teacher supervision and within the time resources available for coursework. It should not be necessary to remove coursework from the safe custody of the school for any process. Careful pre-planning will obviate any such need.

6.5 Conclusions

- Examiners reported that many candidates demonstrated a very high standard of practical skills in the coursework presented for assessment.
- The quality of the portfolios submitted was also very high, in many instances, and many candidates devoted much time and energy to the development of the portfolio. However, some candidates who presented very good practical work paid little attention to the portfolio and thus lost significant marks.
- Some candidates managed their time poorly and thus clearly either spent an excessive amount of time on coursework or did not succeed in completing the coursework. The management of coursework provides an ideal opportunity for learning time-management skills.
- Much of the coursework presented for assessment in the furniture category was not designed by the candidates, but consisted of realisations of existing designs, sourced from books and magazines. Such derivative work does not usually provide sufficient opportunities for the development of the higher-order skills expected in particular of Higher Level candidates.

6.6 Recommendations for Teachers and Students

It is recommended that teachers:

- bring to the attention of all candidates the regulations contained in the relevant circulars and posters from the SEC and display the posters in the Construction Studies room
- ensure a balanced time provision between all three components of the course
- encourage students to plan their work in advance and to develop a coursework timeline
- encourage students to explore a wide variety of topics and themes
- direct students' attention to the rich architectural and craft heritage of their locality
- encourage students to develop a range of investigative and research skills
- advise students to develop the portfolio in tandem with the development of the artefact
- encourage students to keep a dedicated sketchpad to help develop sketching skills
- encourage candidates who are presenting work in the *Furniture* category to go beyond replicating an existing design that they have sourced elsewhere, so that they are in a

position to demonstrate higher order skills and be credited for this

- ensure that all students complete the necessary documentation prior to leaving school
- display coursework in an attractive manner, arranged in ascending examination number order
- do not permit candidates, under any circumstances, to remove the coursework from the school to facilitate additional work, as the teacher cannot then authenticate any coursework that has been completed – even in part – in an out-of-school setting.

It is recommended that students:

- study and comply with the *Instructions to Candidates* issued by the SEC
- plan their time management of the coursework carefully
- develop the design folio in tandem with the artefact
- record in the folio all sources used in researching the coursework
- carry out and record three experiments related to some aspect of the coursework
- make sure, particularly at Higher Level, that the higher-order conceptual skills of analysis, design, synthesis and evaluation are expressed in the folio
- include an evaluation and personal reflection in the design folio
- ensure that the artefact is small, well designed, elegant and expresses their highest level of design and craft skills
- if presenting coursework in the *Furniture* category, go beyond replicating an existing design sourced elsewhere, so that they are in a position to demonstrate higher order skills and receive credit for this
- display the completed coursework in an attractive manner, with examination number on both the artefact and design folio.