



# **LEAVING CERTIFICATE EXAMINATION**

**2001**

***CONSTRUCTION STUDIES***

**HIGHER AND ORDINARY LEVELS**

**CHIEF EXAMINER'S REPORT**

# Construction Studies Examination 2001

## INTRODUCTION

Construction Studies is examined at two levels – Ordinary Level and Higher Level. The examination at both levels comprises three components:

- Theory Paper.
- Project – executed in the school under the supervision of the teacher
- Skills Test in Woodwork. - four hour examination, completed in the school.

The following table shows the distribution of marks for each component:

Table 1: Distribution of Marks

	<b>Theory Paper</b>	<b>Project</b>	<b>Skills Test</b>	<b>Total</b>
Ordinary Level	200 marks	150 marks	150marks	500
Higher Level	300 marks	150 marks	150 marks	600

## Determination of Levels

The level at which candidates present for the examination is determined by the level at which they present for the Theory Paper. The Project and the Skills Test are presented at a Common Level.

## Correction of the Examination Components

### *Theory Paper and Practical Skills Test*

Examiners appointed by Examinations Branch correct both these components.

### *Project*

The class teacher marks the project component in the school. The marks awarded by the class teacher are monitored in the schools by examiners appointed by Examinations Branch.

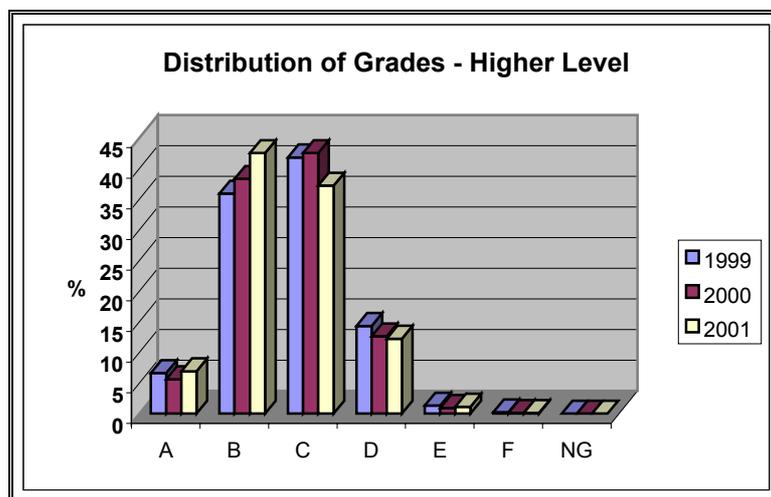
## Overall Results – Higher Level

The following table and graph show the overall distribution of grades for 1999, 2000 and 2001.

Table 2: Overall distribution of Grades - Higher Level

<b>Year</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>NG</b>	<b>TOTAL</b>
<b>1999</b>	<b>6.6</b>	<b>35.9</b>	<b>41.7</b>	<b>14.3</b>	<b>1.3</b>	<b>0.2</b>	<b>0.0</b>	<b>6245</b>
<b>2000</b>	<b>5.6</b>	<b>38.3</b>	<b>42.5</b>	<b>12.6</b>	<b>0.9</b>	<b>0.1</b>	<b>0.0</b>	<b>6456</b>
<b>2001</b>	<b>6.9</b>	<b>42.5</b>	<b>37.2</b>	<b>12.2</b>	<b>1.1</b>	<b>0.1</b>	<b>0.0</b>	<b>6209</b>

Table 3: Overall distribution of grades - Higher Level, 1999 - 2001



### Commentary – Grade Distribution at Higher Level

As can be seen from the above table, there is very little overall variation in the distribution of grades across the three years at Higher Level. While the A+B+C grades remain almost constant, there has been an increase in the percentage of candidates obtaining a B grade and a consequent decrease in the percentage of candidates obtaining a C grade.

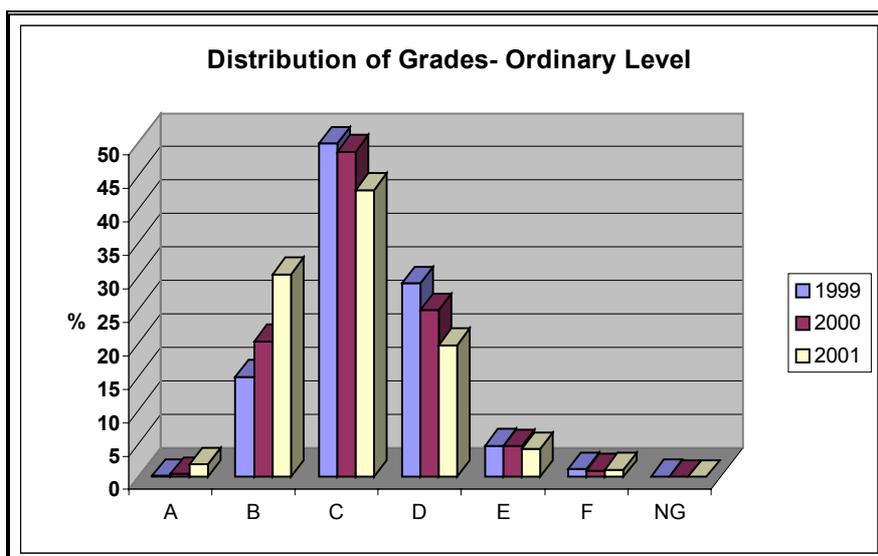
### Overall Results – Ordinary Level

The following table and graph show the overall distribution of grades for 1999, 2000 and 2001.

Table 4: Overall distribution of grades - Ordinary Level

Year	A	B	C	D	E	F	NG	TOTAL
1999	0.2	15.0	49.8	28.9	4.8	1.2	0.1	2403
2000	0.5	20.3	48.6	24.9	4.7	1.0	0.0	2243
2001	1.9	30.3	42.8	19.7	4.2	1.1	0.0	2202

Table 5: Overall distribution of grades - Ordinary Level, 1999 - 2001



### Commentary – Grade Distribution at Ordinary Level

The distribution of grades at Ordinary Level shows an increase in the percentage of candidates obtaining an A and B grade and a corresponding decrease in the percentage of candidates obtaining a C and D grade. The percentage of candidates who did not obtain a

D grade remains constant, showing a slight decrease (0.7%) since 1999. The improved performance of candidates at Ordinary Level is a result of an increase in the grade profile in the theory paper. This is attributed to:

- a revised layout of the theory paper to assist candidates complete all parts of each question
- the availability of detailed marking schemes in schools and on the Department's website.

### Project Work.

The syllabus stipulates the type of project work that may be presented for assessment:

- (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, 2000)*

### Project Type – Validity

To fulfil the requirements of the syllabus, a Written/Drawn project must be supported by a practical artefact, which may consist of a scale model or detail from the subject under investigation.

A Written/Drawn project on its own - folio only - does not meet the requirements of the syllabus and is not acceptable for assessment as a project within the definition for (iii) above and therefore constitutes an invalid project.

### Distribution of Grades for the Project Component – 2001

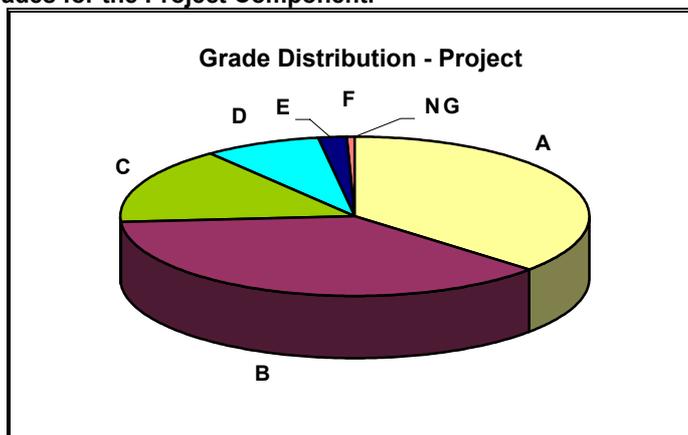
The following table shows the distribution of Grades for the Project Component for 2001

Table 6 - Distribution of Grades for the project component

Grade	A	B	C	D	E	F	NG
Number	3054	3070	1293	680	151	50	4
Percent	36.79	36.98	15.57	8.19	1.82	0.60	0.05
	89.34			8.19	2.47		

The following pie-chart shows the distribution of grades for the project component, 2001

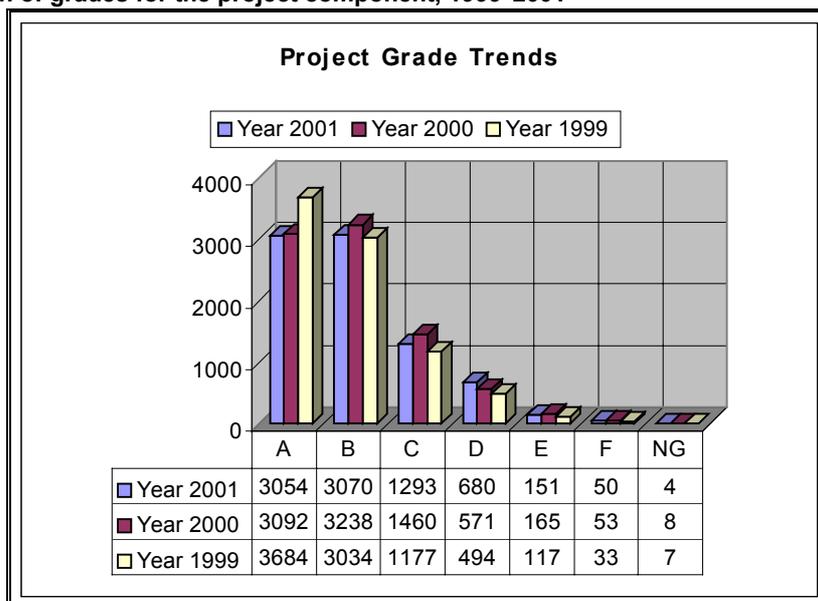
Table 7: Distribution of grades for the Project Component.



### Project Work - Grade Trends, 1999 – 2001.

The following graph shows the distribution of grades for the project component.

Table 8 - Distribution of grades for the project component, 1999-2001



### Observations - Distribution of Grades for the Project Component – 2001

A total of 89.34% of candidates achieved a C grade or higher in the project component, with a total of 36.79% of candidates achieving an A grade. As can be seen from the bar chart, the distribution of grades has remained reasonably consistent for the past three years, with a slight decrease in the percentage of A grades since 1999.

As with project work generally, the grades obtained in project work are higher than those obtained in the written component of the examination, with the distribution concentrated towards the A and B grades in the project component. When the other two components, the practical test and the theory, are included to compute the overall results, a wider distribution of grades is obtained.

Candidates continue to commit much time and energy to project work. It is obvious that they endeavour to obtain as high a mark as possible in the project component, before attempting the other two components within the confines of defined examination time limits.

However, it is recommended that candidates plan their time management carefully. Some candidates spend too much time on project work at the expense of the theory component. It is noted that candidate performance in the theory component is a greater indicator of overall grade achievement than candidate performance in the project component.

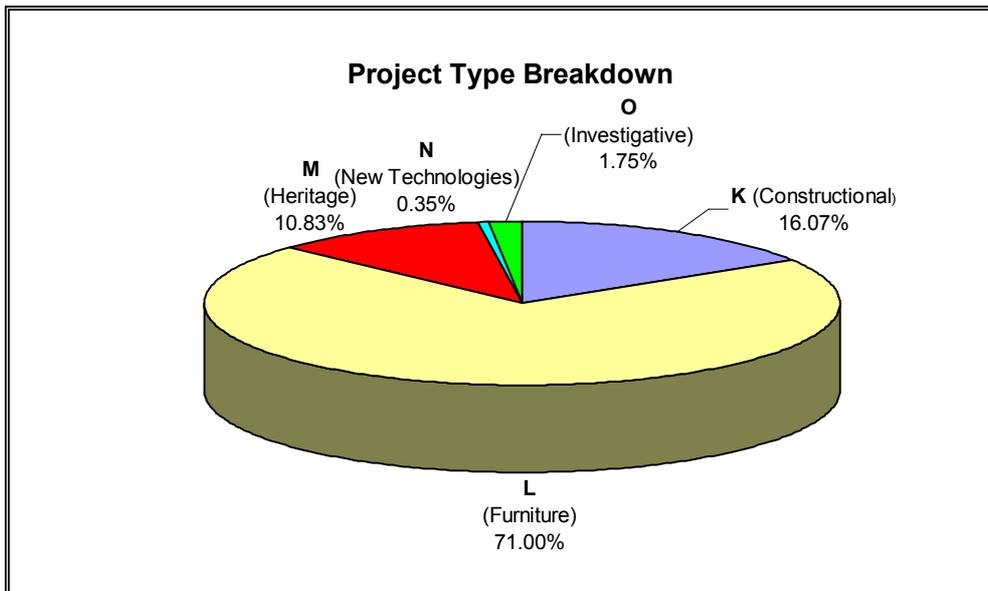
### Types of Project Work Presented for Assessment.

The following table and chart shows type of project work submitted for assessment.

Table 9: Type of project work submitted.

Project Type	Construction (K)	Furniture (L)	Heritage (M)	New Technologies (N)	Investigative (O)
Percent	16.07	71	10.83	0.35	1.75

Table 10: Type of project work submitted.



### Observations - Type of Project Work Submitted for Assessment

As can be seen from the pie chart above, furniture is the most frequent type of project presented and the new technology applications, introduced with the Leaving Certificate Vocational Programme (LCVP), is the least frequently attempted. The growth in furniture type projects at Leaving Certificate level has increased significantly since the introduction of project work in Materials Technology Wood. However, the Leaving Certificate Construction Studies syllabus provides for a much wider choice of project work and the recent expansion of the furniture type project diminishes this choice.

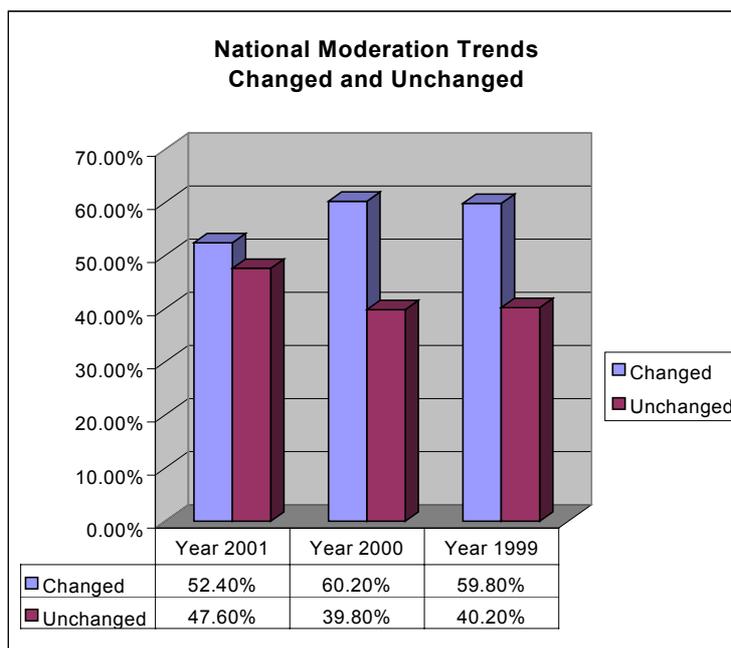
The skills of investigation and research are essential elements in project work, particularly at higher level. Many of the furniture type projects do not provide sufficient opportunities for the development of these important skills.

It is recommended that teachers encourage students to undertake a wide range of project types and, in so doing, provide opportunities for the development of the full range of research skills provided for in the syllabus.

### Moderation of Project Work.

The class teacher marks each project submitted for assessment and examiners/monitors appointed by the Department of Education and Science moderate this marking. This moderation ensures consistency of the marking process on a national basis.

The following graph shows the percentage of project work for which the marks were both changed and remained unchanged for the past three years, because of the external moderation process.



**Table 11: Result of external moderation of the project work.**

### **Authenticity of Project Work**

The support of teachers is essential in ensuring the integrity of project work presented for assessment in Construction Studies. The Department of Education and Science has issued a number of Circulars to schools (Circulars S70/99, S73/00) together with large format posters, outlining to candidates the requirements for the submission of project work. Teachers who are unable to authenticate project work as the candidate’s own unaided work sign a form P20. The assistance of the teachers in maintaining the integrity of the assessment process is very much appreciated by the Department.

In a number of cases, where the teacher was unable to authenticate the project as the candidate’s own unaided effort, marks were withheld by the Department of Education and Science for the project component of the Construction Studies examination. This ensures that marks are only awarded for the authentic work of the candidate. The continued co-operation of teachers is essential in maintaining the integrity of the examination process and in ensuring that the work assessed is solely that of the candidate. Teachers and school authorities are advised to bring to the attention of all candidates the regulations contained in the above circulars and posters.

### **Appeals**

To ensure the integrity of the appeals process, school authorities are requested to retain all project work in school until the completion of the appeals process, as outlined in Circular S30/01;

*“on completion of the monitoring the candidates’ work should be retained in a safe place under lock and key, until the closing date for applying for a review of Leaving Certificate results. At that stage the projects may be returned to the candidates, except in the cases of those candidates for whom an appeal has been lodged. In such cases it will be necessary to securely retain the projects until the review has been conducted and the outcome advised to the school”.*

## The Portfolio

The portfolio is a record of the work of each candidate and it should contain all the details of the project work from the initial ideas to the overall conclusions. Sketches, photographs and written descriptions of work in progress all form a vital part of the record and ensure that examiners can readily verify from the portfolio that all the work submitted for assessment is uniquely that of the candidate.

In many instances, the quality of the portfolios submitted was very high and many candidates committed 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. It was obvious, in many instances, that the portfolio was written up after the making of the practical artefact and contained only a description of the work undertaken.

It is recommended that the portfolio be developed in tandem with the development of the artefact and that it includes a coherent record of analysis, background research and final conclusions.

### **Sketching**

The ability to convey technological information by means of freehand sketches is an essential competence in the study of Construction Studies. Well executed and properly proportioned freehand sketches convey information that is difficult to convey in words. Sketches should be shaded, rendered and coloured, as appropriate. Particular emphasis should be placed on the development of freehand sketching.

The facility to produce competent freehand sketches takes time and practice to develop. A sketchpad for recording architectural details and buildings of interest in the locality, from both observation and memory, is a useful aid for the development of sketching competencies.

The portfolio provides a context for the expression of sketching abilities and marks are awarded when design ideas and detailing are cogently expressed with the aid of freehand sketches.

### **Experiments**

Candidates are required to record in the portfolio descriptions and results of experimental work undertaken during the course of study. The syllabus provides broad guidelines for the type of experimental work to be undertaken. The most fruitful learning occurs when the candidate relates the experimental work to some aspect of the project work undertaken.

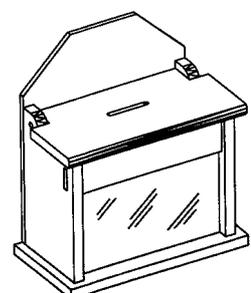
Experimental work that is not related to some aspect of the project work frequently lacks focus.

Experiments are often included as an addendum rather than as an integral part of the project work. The number of experiments recorded varies greatly.

It is recommended that experimental work be related to the project work submitted and that a **minimum of three** experiments be undertaken and recorded for assessment by each candidate.

## The Practical Skills Test

This test consists of a four-hour test in the interpretation of drawings, the marking-out, processing and assembly of an artefact. A total of 25% of



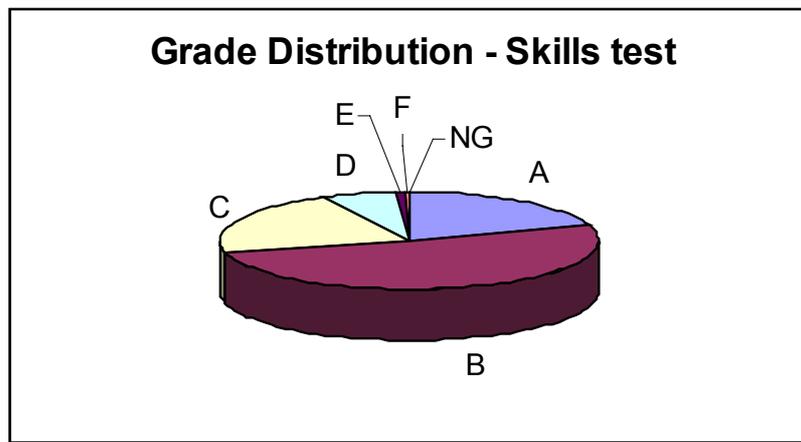
the overall marks is awarded for this test at Higher Level.

The following table and chart show the distribution of grades for the Practical Skills Test.

**Table 12: Distribution of Grades – Practical Skills Test**

Year	A	B	C	D	E	F	NG
2001	20.1 %	50.9%	21.3%	6.6%	0.9%	0.2%	0.0%
	92.3%			6.6%	1.1%		

**Table 13: Distribution of Grades – Practical Skills Test**



### Observations - The Practical Skills Test

Most candidates experienced little difficulty with the interpretation of the given drawings. A pictorial view of the assembled artefact was included in this year's examination paper to further assist candidates with the interpretation of the orthographic detailing. The marking out was well done in most instances. Candidates who were careless or inaccurate in the initial stages with the marking out were often unable to assemble the artefact. A small number of candidates were unable to set out the half-octagon on the back correctly. The standard of craft and assembly skills was generally high and most candidates succeeded in assembling the artefact. A small number of candidates did not succeed in completing the assembly of the artefact within the required time.

The mortises on the base were generally marked out accurately and well executed. Many candidates did not apply a design feature to the edges as required and consequently lost marks for this component.

Some candidates experienced difficulty in shaping the curves at the top of the sidepieces, where sharp tools and skill in the manipulation of the tools were required. A high degree of accuracy was required when fitting the top to the sides using dowels and some candidates had difficulty with the alignment of the dowel holes for the top and sides.

Candidates experienced greatest difficulty in marking-out and cutting the slot on the lid; a number of candidates did not understand the correct procedures for forming the slot and consequently the slot was poorly executed in many instances.

A small number of candidates used a mortise machine to remove the mortises on the base. This is contrary to the instructions to candidates, which state: *“Use of machinery is not allowed”*.

Where machinery was used to remove the mortises, no marks were awarded for this component.

The overall standard of craftwork was high, as is evidenced by the results the candidates obtained. Most candidates were well prepared for this examination.

## **Theory Examination - Higher Level.**

### **Observations**

The Theory Paper offered candidates a wide choice of questions on a variety of building, architectural and heritage topics. Some candidates were very well prepared and their answering was exemplary. Other candidates had not completed the necessary preparation.

Many of the 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 for this component. The marking scheme indicates the marks awarded for the sketching component.

It is recommended that candidates pay more attention to the development of freehand sketching techniques to enable them to convey the information sought through the medium of high quality freehand sketches.

### ***Question 1. Building Detail (Mandatory)***

This question was attempted by 98% of the candidates and was generally well answered. Candidates demonstrated a sound knowledge of the building details required and were generally competent in the production of scale drawings. It is obvious that this component of the course is comprehensively taught. The average score achieved was 38 out of a possible 50 marks.

### ***Question 2. Room Layout and Design Considerations***

This was a frequently attempted question and part (a) of the question was well answered. Most candidates produced a layout of the room configuration for a dwelling house. Many candidates scored well in part (a). However, candidates found part (b) of this question more testing and many experienced difficulty in giving cogent reasons for their choice of layout suggested in part (a).

Detailed analysis of aspects such as orientation, light, sunlight, frequency of occupancy, etc., needed to be addressed to obtain high marks.

**Question 3. *Definition of Architectural Terms***

This question was not frequently attempted. Candidates were asked to provide the required information using notes and sketches. In general, the quality of the sketching was poor.

Parts 1,2,3 and 5 proved particularly difficult for most candidates.

**Question 4. *Stair Design and Design Considerations***

This was a frequently attempted question. Part (a) was very well answered and many candidates demonstrated a sound knowledge of stair construction. Most candidates were competent in the production of a scaled drawing showing the required details. Part (b) required candidates to demonstrate a wider knowledge of the principles of stair design and this part was generally not as well answered. A wider knowledge of Building Regulations pertaining to stair design was not in evidence, dimensioning and design detailing were largely absent and generally candidates did not score highly in part (b).

**Question 5. *Plumbing and Heating Layout***

This was a frequently attempted question. Candidates scored well in part (a) and demonstrated a knowledge and understanding of the layout of pipe work necessary for the installation of a central heating system.

Part (b) tested a wider understanding of the design principles required to ensure the economical use of non-renewable fuels. This part was generally not well answered, sketches were frequently of poor quality and few candidates provided the three design features that would make the heating system more economical.

**Question 6. *Sound and Sound Insulation***

Part (a) of this question proved difficult for many candidates who did not have a clear understanding of the required terms. Precise definitions of the given terms were required in part (a).

Part (b) was generally well answered and many candidates understood the principles of sound insulation and were able to apply the principles associated with sound insulation to the example given.

**Question 7. *Heat***

Many candidates who attempted this question were familiar with the methods for obtaining the calculations and part (a), (i) & (ii) were very well answered. In general, the heat calculations and the determination of the U value were well known.

Part (iii) proved difficult for many candidates. Part (b) was challenging for most candidates, but candidates with a good understanding of the principles of double glazing scored well in this part.

**Question 8. *Renovation of an Old House***

This was a frequently attempted question with many candidates scoring high marks. Close reading of the question was required in order to answer precisely what was asked. Some candidates did not take into account the age of the house, and recommended the installation of uPVC doors and windows, etc., and proceeded to suggest renovations as if it were a modern house.

Part (b) required sketching and where sketches were not well executed, candidates lost marks. However, candidates with a good knowledge of the restoration requirements to restore sympathetically the old house scored highly in this question.

**Question 9. *Electricity /Principles of Earthing***

This was the least frequently attempted question and few candidates completed all parts of the question successfully. The wiring of a ring mains circuit proved challenging and was generally not well answered. Few candidates conveyed a detailed understanding of the principles of earthing and this part was not well answered. However, part (c), which required the safety procedures when using electricity out-of-doors, was successfully completed by most candidates. Clearly, candidates understood the safety precautions necessary when using electrical tools out-of-doors.

**Question 10(a). *Heritage***

This was a frequently attempted question. A close reading of the question was required in order to answer each component comprehensively. Candidates with an interest in this area of study presented a wide range of arguments supported by examples from their own locality or from their wider reading. These candidates achieved high marks. Many candidates attempted this question with little knowledge of architectural heritage and the environmental issues raised in the quotation. Such candidates presented few points and consequently did not achieve high marks. Some candidates wrote long essays, but many did not provide sufficient specific knowledge to enable them achieve high marks.

**Question 10(b). *Conservation Issues***

This was a frequently attempted question and attracted candidates with an interest in issues relating to the conservation of buildings. Candidates who could present ideas lucidly scored well in this question. Candidates are assessed on the quality of arguments presented and on their abilities to present and develop ideas and draw appropriate conclusions. Some candidates scored high marks in this question. Other candidates who attempted this question demonstrated little understanding of the complex issues involved. Such candidates did not present the detail required and therefore could not obtain high marks.

As with all questions, candidates need to be prepared in advance for such topics. Such a question does not present an easy option for candidates unable to attempt many of other questions on the examination paper.

## **Theory Examination - Ordinary Level**

### **Question 1. Building Detailing**

This question is compulsory and almost all candidates attempted it. Responses were generally good. The candidates were well prepared and were able to show the required building details. Most candidates were competent in the presentation of scaled drawings.

### **Question 2. Non Load-bearing Partitions**

This was the least frequently attempted, with only 10% of candidates attempting it. Most of the candidates who did attempt this question were able to demonstrate an understanding of the structure of non load-bearing partitions and walls and generally scored well. Most candidates succeeded in showing the details necessary for the inclusion of a door opening.

### **Question 3. Foundations**

Almost 40% of candidates attempted this question and it was generally well answered. Candidates showed a sound knowledge of the different foundation types and their application. Many candidates found part (b) challenging. Reasonable attempts were made at describing the soil conditions that would be considered most suitable for the different foundation types.

### **Question 4. Treatment of Sewage in a Rural Area**

This question was not frequently attempted, being the eighth most frequently attempted question out of a total of nine. Most of the candidates dealt with the septic tank only and omitted the percolation area. Part (b), dealing with the suitability of a septic tank for a rural area, proved difficult for most candidates and was generally poorly answered.

### **Question 5. Cold-Water Supply to a Kitchen Sink**

Many candidates did not read the question closely and showed the entire hot and cold water system, instead of the cold-water connection to the kitchen sink. Candidates demonstrated an understanding of the required plumbing principles and responses to part (a) were good.

However, part (b), dealing with traps and seals, proved challenging for most candidates and was generally not as successfully answered as part (a).

### **Question 6. Penetration of Dampness**

This was the third most popular question and candidates were generally able to identify three locations where dampness could penetrate a building. Many candidates achieved high marks for this part. Some candidates merely listed the locations, did not describe the ingress of dampness in any detail and consequently lost marks.

Part (b), which asked for the precautions that should be taken at the construction stage to prevent damp penetration, proved more challenging. Some candidates confused condensation and dampness and also confused insulation and D.P.C. and consequently did not score well in this part.

### **Question 7. Planning Permission and Documentation**

This was the fourth most frequently attempted question. Most candidates had a knowledge of the documentation that is required when making a planning application and scored well in this section.

Part (b) proved more challenging and many did not understand the required planning procedures. This part of the question was generally not well answered.

### **Question 8. Safety Considerations**

This question was the second most frequently attempted question, with 90% of the candidates attempting it. Almost all candidates demonstrated a good understanding of safety procedures and scored highly. The majority of candidates obtained over 35 marks and a number of candidates achieved the maximum 50 marks for their responses. It was obvious that candidates had studied safety issues in the classroom and their knowledge of safety in the work place is commendable.

### **Question 9. Architectural Terms**

Both notes and sketches were required in the answering of this question.

The accompanying notes were generally good, although sketching was of mixed standard. Many candidates scored well in this question.

## **Recommendations**

It is recommended that:

- candidates undertake a wide range of project types and not over-concentrate on furniture, which often provides limited scope for the development of investigation and research skills
- candidates plan their time management carefully and not spend an excessive amount of time on project work, at the expense of the theory component
- candidates familiarise themselves with the guidelines of the Department of Education and Science regarding the authenticity of project work, as outlined in Circulars S70/99 and S73/00 and in the large format posters distributed to schools for display in school workshops
- the portfolio be developed in tandem with the development of the artefact and that records of analysis, background research and final conclusions be included in the portfolio
- particular emphasis be placed on the development of freehand sketching in both the portfolio and the responses to the theory paper

- sketches be shaded, rendered and coloured as appropriate, thus enhancing the graphic presentation
- experiments be related to the project work presented for assessment
- a minimum of **three** experiments be recorded for assessment by each candidate
- candidates, particularly at Higher Level, not confine their studies to elements of recall only; the higher order conceptual skills of analysis, synthesis and evaluation are necessary to support architectural detailing with reasoned argument as to why a recommended detailing is the most appropriate for the given situation
- school authorities retain all project work securely in the school until the completion of the appeals process - as outlined in Circular S30/01.

## Appendix A

### Construction Studies – Overall Grade Profile.

The following tables show the percentage breakdown of grades awarded at Higher and Ordinary Levels, 1999-2001.

**Table 14: Higher Level – Percentage breakdown of grades awarded 1999-2001**

	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2	D3	E	F	NG
<b>199</b>	1.90	4.70	8.80	12.2	14.9	16.3	14.4	11.1	7.30	4.00	3.00	1.30	0.20	0.00
<b>200</b>	1.40	4.20	8.70	13.3	16.3	17.0	14.4	11.1	6.80	3.70	2.10	0.90	0.10	0.00
<b>200</b>	1.50	5.40	10.8	14.9	16.8	15.2	12.8	9.20	6.00	3.80	2.40	1.10	0.10	0.00

**Table 15: Ordinary Level – Percentage breakdown of grades awarded, 1999-2001**

Year	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2	D3	E	F	NG
<b>1999</b>	0.00	0.20	1.40	3.50	10.1	14.9	17.8	17.1	13.4	8.60	6.90	4.70	1.20	0.10
<b>2000</b>	0.00	0.50	2.40	6.50	11.4	15.4	18.5	14.7	11.1	7.20	6.60	4.60	1.00	0.00
<b>2001</b>	0.30	1.60	5.50	11.0	13.8	15.6	14.8	12.5	9.50	6.30	3.90	4.20	1.10	0.00

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