ISBN:

FOR SPECIFIC PURPOSE

English Language Textbook for Graduate Students of Civil Engineering and Architecture Faculties

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Published by

Novateur Publication

novateurpublication.com

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ENGLISH FOR SPECIFIC PURPOSE

English language textbook for graduate students of civil engineering and architecture faculties

SAMARKAND 2021

www.novateurpublication.com

Учебное пособие состоит из трех разделов: история архитектуры,современные строительные материалы и конструкции гражданских зданий. Пособие направлено на формирование и развитие навыков профессионально- ориентированной коммуникации, быстрого и точного понимания аутентичной литературы по строительству.

Предназначено для обучения английскому языку студентов строительных специальностей технических вузов.

Contents

ПРЕДИСЛОВИЕ

Данный учебник предназначен для студентов магистратуры строительного и архитектурного факультетов, а также для студентов. Учебник может использоваться как для проведения практических занятий под руководством преподавателя, так и для самостоятельной работы теми, кто хочет научиться читать и переводить научно-техническую литературу. Основной целью учебника является развитие навыков чтения и понимания оригинальной литературы Это означает, что в связи с сегодняшними формами экономического взаимодействия государств иностранный язык выходит за рамки общеобразовательного учебного предмета в вузе и становится инструментом формирования компетентностного специалиста новой формации.

Сложившаяся модель подготовки студентов в техническом вузе далеко не всегда позволяет соединить профессиональную и языковую подготовку в целостную систему и сформировать глубокое осознание конечных целей изучения иностранного языка. Проблема исследования состоит в необходимости преодоления узкофункциональной и технократической направленности обучения иностранному языку.

Основной целью учебного пособия является развитие речевой деятельности в сфере профессионального общения. В основу пособия положен принцип коммуникативно-деятельностного подхода.

Новизна учебного пособия заключается в следующем:

- задания представлены системно и наглядно от «простого к сложному»;
- задания разработаны в соответствии с требованиями i-exam
- задания предусматривают индивидуальную работу студентов, работу в парах, группах, а различные способы рассадки студентов для определенных видов работы (динамика группы) направлены на формирование навыков работы над проектами и презентациями;

• представлено достаточно заданий на отработку вокабуляра, орфографии, произношения, стилистики, сочетаемости слов;

• задания охватывают различные жанры письма (e-mail, memo, письмо-запрос, письмо-заказ, письмо-жалоба, письмо подтверждение) и имитации типичных ситуаций речевого общения;

• в зависимости от целевой установки представлено просмотровое, ознакомительное, изучающее и поисковое чтение, ориентирующее студентов на выполнение профессионально-ориентированных заданий;

• материалы отражают современные разработки в строительных технологиях;

• представлена четкая корреляция зарубежного и российского строительных рынков;

• материал охватывает полный курс обучения и направлен на выполнение студентами профессионально-ориентированных заданий;

• аудио и видео поддержка обеспечивает дидактическое качество на высоком уровне благодаря профессионально-ориентированному содержанию материала;

• интернет-поддержка ориентирует студентов на самостоятельное выполнение ими профессионально-ориентированных заданий.

PART I. THE ART OF ARCHITECTURE

"It is impossible to overestimate the important influence of natural light on the interior and exterior forms of buildings and on those who dwell in them.

So daylight is the natural beginning." Lighting Historic Buildings. Architectural Press.

Unit 1

DAYLIGHTING

Figure 1.1. Figure 1.1 The Cathedral of Christ the Light, USA

LEAD-IN

1 1 What is "window"? Rank the following according to how important you think they are. . Compare your answers with a partner:

1. vehicle for introduction of daylight ….
2. part of wondrous interior ….
3. hole for ventilation ….
4. slit windows in fortified buildings ….
5. means for panoramic view ….
6. porthole ….

2 2 In which situations would you put each point from Ex. 1 into the first place?

e.g.: I would put "a decorative part" first if I spoke about cathedrals.

3 Discuss the following:

Daylight will peep through a small hole. (Scottish proverb)

"We must not fear daylight just because it almost always illuminates a miserable world." (Rene Magritte, Belgian artist)

•Paraphrase each quotation. • Say whether you agree or not, and why.

READING

4 a) Look at the title. What does it refer to?

b)In what context do you think the following words and phrases will appear in the text?

•let in light and air •the Baroque churches •substantial progress •large panes of glass •appearance of the building •to serve military needs •fortified buildings •«indirect» daylight •roof lights

c)Read the text quickly and check your answers:

THE NATURAL BEGINNING

From the earliest caves, daylight informed the lives of the inhabitants, initially in the difference between night and day. But as

dwellings became more **sophisticated** daylighting penetrated by means of openings or windows letting in light.

The history of architecture is synonymous with the history of the window and of daylighting from the initial crude openings, letting in light and air, heat and cold. The window was the *vehicle* for the introduction of daylight, and ultimately to the wondrous interiors of the mediaeval cathedral, the Baroque churches or the many private buildings of the 18th century.

The window has developed over the centuries, but its purpose of letting in daylight has remained its **primary role**. Window openings *required* a suitable infill to modify the external climate. At first *various materials* were used, such as thin slabs of marble, sheets of mica or oiled paper. But it was not until the development of glass for windows that substantial progress could really be made.

Glass had been discovered as early as 3000 BC in Egypt, and was used for **decorative objects**, but it is known that small panes of **hand-blown** glass set into bronze frames were used for the infill to window openings during the Roman period.

It was left until the 17th century for large panes of glass to be developed in England and for larger windows to be made possible.

The appearance of buildings of all periods *reflects* the nature of the windows which have always led to innovation, and this can be seen in the **stained glass windows** of the great mediaeval cathedrals. They tell us the Christian story, where whole walls of glass were made possible by structures such as the flying buttress.

Windows had to serve military needs in fortified buildings, leading to **slit windows** from which arrows could be fired.

A further innovative means of daylighting was that developed for the lighting of the Baroque churches of southern Germany. Here 'indirect' daylight onto the ornate decorations and ornaments of the church is gained from windows concealed from the direct view of the **congregation**. Indirect daylighting is equally valid today, as used by Basil Spence at Coventry Cathedral, or by Jorn Utson at the Bagsvaerd Church in Denmark.

Whilst the vertical windows were clearly of the first importance, and continue to be so today, it was the roof lights allowing daylight

into the central parts of buildings that had an important influence on the plan form of the stately homes of the 17th and 18th centuries. These took several forms, from **domes** such as that at Keddleston Hall (1759) where light enters from the top or Chiswick House (1725) where the dome is surrounded by windows in the sides. In both cases the method of daylighting allowed architects to have more **flexibility** to plan the central areas of their buildings. It is of interest that this method of introducing daylight to the centre of buildings has a resonance with the atria which can be seen in many buildings today (Fig. 1.1 The Cathedral of Christ the Light, USA*)*.

5Read the text again and answer the questions that follow (1-–6):

1. Why is the history of architecture synonymous with the history of the window?
2. What were the first materials used for windows?
3. What do you know about the earliest usage of glass?
4. How did the stained glass windows function in the great medieval cathedrals?
5. In which way did windows serve military needs?
6. What is the importance of roof lights?

Follow-up

6 The words/phrases on the left appear in the text. Match each one to its synonym:

1 substantial progress	a) inside
2 daylight	b) obtain
3 interior	c) natural light
4 influence	d) significant advance
5 gain	e) effect

7 a) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you;

b)Find synonyms for the words in italics.

8 *Give the English equivalents and use them in small situations:*

сообщить о разнице между; посредством; известно; помещенный в бронзовую раму; средневековый; христианский; контрфорсная арка (аркбутан); желаемый эффект уменьшения контраста; витиеватые украшения; в равной степени; оказывать влияние на; быть окруженным; крытый дворик (атриум).

LANGUAGE FOCUS

9 *Use the words below to complete the sentences:*

Primitive windows were just 1) _in a wall. Later, windows were covered with animal hide, cloth, or wood. 2)that could be opened and closed came next. Over time, windows were built that both protected the 3)from the elements and transmitted
light: mullioned glass windows, which joined multiple small pieces of glass with leading, paper windows, flattened pieces of translucent animal horn, and plates of thinly sliced 4). The Romans were the first to use 5)for windows. In Alexandria ca. 100 CE, cast glass windows, albeit with poor optical properties, began to appear. Mullioned glass windows were the windows of choice among European well-to-do, whereas paper windows were 6) _ and widely used in 7) China, Korea and Japan. In England, glass became common in the windows of 8) _homes only in the early 17th century whereas windows made up of panes of flattened animal horn were used as early as the 14th century 9) ___ in Northern Britain. Modern-style 10) __became possible only after the industrial glass making process was perfected.

inhabitants, ordinary, century, holes, shutters, floor-to-ceiling, glass, ancient, marble, economical

10 *Fill in the gaps in the following passage with the suitable preposition given below:*

Daylighting is the practice 1) placing windows or other openings and reflective surfaces so that 2)the day natural light provides effective internal lighting. Particular attention is given 3)) __ daylighting while

designing a building when the aim is to maximize visual comfort or to reduce energy use. Energy savings can be achieved either 4)the reduced use 5) __ artificial (electric) lighting or 6) passive solar heating or cooling. Artificial lighting energy use can be reduced 7) __ simply
installing fewer electric lights because daylight is present, or 8) __ dimming/switching electric lights automatically 9)_ _____ response 10)_ the presence of daylight, a process known as daylight harvesting.

by (x2) , during, from (x2) , in, of (x2), to (x2)

11 Match the term with its definition:

1) double-hung sash window	a)) a window (more usually a door-sized window) where the sash tilts inwards at the top and then slides horizontally behind the fixed pane
2) casement window	b)) a window composed of pieces of colored glass, transparent, translucent or opaque, frequently portraying people or scenes
3) tilt and slide window	c)) also known as a louvered window, it consists of parallel slats of glass or acryl that open and close like a Venetian blind, usually using a crank or a lever
4) transom window	d)) a window big enough and low enough so that occupants can escape through the opening in an emergency, such as a fire
5) jalousie window	e)) also known as a French door, it is really a type of door, but one which has one or more panes of glass set into the whole length of the door , meaning it also functions as a window

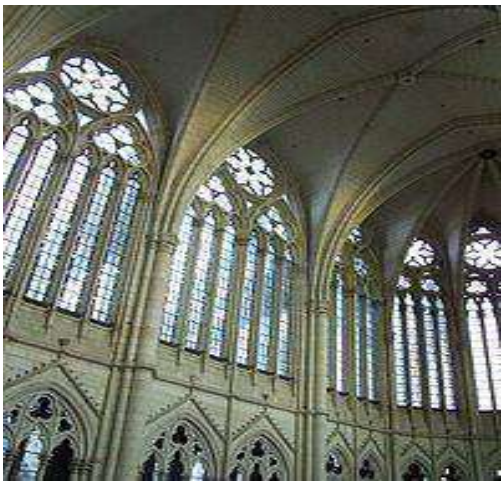
6) clerestory window	f)) the traditional style of window in the UK with two parts that overlap slightly and slide up and down inside the frame
7) fixed window	g)) a window set in a roof structure or high in a wall, used for daylighting
8) emergency exit/ egress window	h)) a window with a hinged sash that swings in or out like a door comprising either a slide-hung, top-hung, or occasionally bottom-hung sash or a combination of these types, sometimes with fixed panels on one or more slides of the sash
9) stained glass Window	i)) a window that cannot be opened, whose function is limited to allowing light to enter
10) french window	j)) a window above a door; it provides ventilation before forced air heating and cooling

12 Look at the pictures and name the type of the window using information from Ex.11:

a)_____
_____

b)

1.c)_____
_____



d)

13 Fill in the gaps with the derivatives of the words in capitals:

BenefitsofDaylighting

Daylighting has the potential to significantly improve life-cycle cost, increase user 1) , reduce emissions, and reduce operating costs: • ***Improved Life-Cycle Cost***: At an 2) incremental first cost increase of from $0.50 to $0.75 per square foot of occupied space for dimmable ballasts, fixtures and controls, daylighting has been shown to save from $0.05 to $0.20 per square foot 3)_. • ***Increased User Productivity***: Daylight enlivens spaces and has been shown to increase user satisfaction and	**PRODUCE** **ESTIMATE** **ANNUAL**

4)___comfort leading to improved performance. •***Reduced Emissions***: By reducing the need for electric electric 5) _____for lighting and cooling, the use of daylight reduces greenhouse gases and slows fossil fuel depletion. •***Reduced Operating Costs***: Electric lighting accounts for 35 to 50 percent of the total electrical energy consumption in commercial buildings. By generating wasteheat, lighting also adds to the loads imposed on a building's mechanical cooling 6). The energy savings from reduced electric lighting through the use of daylighting strategies can directly reduce building cooling energy usagean additional 10 to 20 percent. Consequently, for many institutional and 7) buildings, total energy costs can be reduced by as much as one third through the optimal integration of daylighting strategies. As with all energy-efficient design strategies, there are some costs associated with the use of daylighting. 8)_	**VISION** **CONSUME** **EQUIP** **COMMERCE** **DESIGN** **PLACE**

must be sure to avoid glare and overheating when 9) ___ __windows. More windows do not automatically result in more daylighting. That is, natural light has to be controlled and distributed properly throughout the workspace. Also, for cost savings to be realized, controls have to be in proper functioning order. Poor 10) , commissioning, orOperations and Maintenance (O&M) practices can all lead to sub-optimum performance. *(by Gregg D. Ander, FAIA)*	**INSTALL**

WRITING

Summary Writing

STRATEGY POINT: Introduction to Summary Writing

- *Before doing anything, read the summary question carefully.*
- *Next read the two texts and underline any information which is relevant to the summary question.*
- *When writing your summary, avoid using exact words from the texts. Always try to paraphrase the information, using synonymous phrases and different structures.*

STRATEGY POINT: Introduction to Summary Writing

- *Make Before your summary doing any easy thing , to read comprehend the summary by question using sequence carefully. Is takes words (firstly,• finally, etc.).Remember that spelling and grammatical m*

Which • Next interrfe read the with two communication texts and underline will lose any your information points, which has always is relev to the summary question.

Check your work.

Summary Writing

14 a) Read the texts and summary questions below:

1. What does capacity for change lead to?
2. What natural changes are mentioned?
3. What is said about modelling of a shape?
4. What is the most usual daylight modelling derived from?
5. What is the role of change and modelling in daylighting?

CHANGE	**MODELLING**
Capacity for change leads to the infinite variety in appearance of the daylit interior. Change is at the heart of daylighting, the human body has a capacity for adaptation, particularly in vision, and the need to exercise this response. Perception reacts to a degree of change; it is the natural order of things that the appearance of interior spaces alter with time; an entirely different measure of experience to the static qualities of spaces lit entirely by artificial sources of light during the day; or where there is no access to the daylight outside. There is a natural process of renewal in the photochemical processes of the eye as it adapts to accommodate changes in daylight. First there is the natural change from	Modelling of a shape derives from its physical form, whether round, square or otherwise, coupled with the way in which light plays on its surfaces. This is referred to as its modelling and when this derives from daylight or sunlight, giving light from a single direction, this provides a form which is perceived by the eye as having meaning, unambiguous. This is a different experience again from the form of an object or space resulting from a room lit by artificial light, where the overall light may be received from a multitude of light sources. The most usual daylight modelling is that derived from vertical windows at the side of a room, giving light from a single direction; this may be helped by windows from an adjacent wall which adds to the modelling; as the light will still be from the same overall direction, but adding to the total modelling. Two examples

day to night, from first light until dark and the need for artificial sources to take over when daylight fades. Then there are the changes associated with changes of the weather; from bright sunny days to dark and cloudy or rainy days, there is little doubt that the human spirit soars when rising in the morning on a bright day, an experience which is less likely to happen when it is dark and gloomy outside. Closely associated with changes in the weather are those of the changes of season, from the winter snows to summer sunlight. The world outside, as experienced through the window, provides necessary information of the variety of the exterior world; whilst leading to subtle changes in the appearance of the interior.	might be used to emphasize this, the first, a Greek Doric column where the light of day gives modelling to the entasis on the rounded surfaces of the column; light which emphasizes its particular rounded quality together with its verticality. The second example is the original David statue by Michelangelo seen in its setting in the art gallery in Florence, lit from daylight above, where the form changes in time as the day goes by. Daylight by its nature gives meaning and aids our understanding of a shape or space by its directional flow. Interior spaces are judged to be pleasant, bright or gloomy as a result of the effects of modelling and interiors are judged by the way in which the spaces and the objects within them are seen during the day to be natural, or accord to our experience of the natural world.

b) In a paragraph of 120-–150 words, and using your own words as far as possible, summarize the role of change and modelling in day lighting.

LISTENING

15 ***Listen to Greg Deale - – the general manager of the Daylight Designs Designs – - and answer the questions given:***

1. Where can Solatube Daylighting Systems (SDS) be applied?

2. What are the benefits of SDS?
3. Due to which property can SDS be applied not only in a one-storey but a five-storey building and more?
4. How much time does it take to install SDS product? Are there any problems to install it?
5. What accessories can be added to the SDS product?
6. How many years is warranty for the SDS product covered by?

VIDEO

16 ***Watch the video "Solatube interview at the Better Homes & Gardens Live expo - – Sydney 2010". Present the main idea of the video in 4-5 sentences using the expressions from Appendix***

SPEAKING

17 ***Make up a dialogue using the information from the Ex. 19, 20. One of the students is Solatube Daylighting Systems manager and another one is a customer.***

18 ***Study the table and put the materials in the order of your preference. Discuss it with your partner using the expressions from Appendix 1:***

FRAME and SASH CONSTRUCTION

Frames and sashes can be made of the following materials:

Material	Thermal resistance	Durability	Mainte-nance	Cost	Recycled content	Comment
wood	very good	variable	high	high	low	shrinks and swells

						with humidity change

vinyl or pvc	very good	good*	low	low	very low	
aluminum	bad**	good	very low	low	typically >95% %	used in most large structures
steel	medium	superior	very low	high	>98% %	typically welded at corner joints
fiberglass	very good	very good*	very low	high	medium	

** Vinyl and fiberglass frames perform well in accelerated weathering tests. Because vinyl is not as strong as other materials, some vinyl frames are reinforced with metal or composite materials to improve their structural strength.

** Modern aluminium window frames are typically separated by a thermal break made of a polyamide. This greatly increases thermal resistance, while retaining virtually all of the structural strength.

19 ***Express your opinion on the problem raised in Ex. 15 and discuss it with your partner using the expressions from Appendix 1.***

20 ***Read the abstract from a report "Solatube® Daylighting System" by Y. Selyanin and summarize it in 100-–150 words in English. Use clichés and word combinations from Appendix 2:***

Новые энергоэффективные системы дневного освещения “Solatube® Daylighting System” изменяют традиционные подходы к организации освещения помещений естественным светом и оказывают большое влияние на архитектуру и современное строительство в мире.

Работа системы Solatube® основана на современных техно- логиях передачи максимального количества дневного света, па- дающего на крышу дома, во внутренние помещения, с целью увеличения естественной освещенности от восхода до заката.

Система Solatube® состоит из светособирающего купола, располагаемого на крыше здания, выполненного из ударопрочно- го материала, который защищает от ультрафиолетового излучения; флешинга (адаптера под различные типы кровли); светодиода, представляющего собой набор стыкуемых алюминиевых труб прямолинейной или же изогнутой формы, покрытых изнутри многослойной пленкой из полимера, которая обеспечивает почти идеальную светопередачу 99,7% %; и диффузора (светорассеивателя), который устанавливается в потолке освещаемого помещения.

Система солнечного (естественного) освещения Solatube® обеспечивает максимальную передачу света без потерь на рас- стоянии до 20-ти метров с минимальным притоком солнечного тепла. С соотношением энергетической эффективности более чем в 2 раза большей, чем большинство светодиодов, Solatube® является наилучшим выбором для обеспечения естественного освещения любого помещения или пространства.

Система Solatube® имеет дополнительные опции

(регулиро- вание интенсивности светового потока), световой комплект для ночного времени суток, вентиляционный комплект), использование которых значительно расширяет практику ее применения в инновационном строительстве.

Использование технологий Solatube® в инвестиционных проектах обеспечит снижение эксплуатационных расходов, способствуя оздоровлению окружающей среды.

When summarizing the article use these words and word combinations:

энергоэффективный – power efficient, ; работа – operation; передача максимального количества дневного света – maximum daylight transfer; светособирающий купол – light-collecting dome; ударопрочный материал – impact material; ультрафиолетовое излучение – ultraviolet light; стыкуемые алюминиевые трубы – joining aluminium pipes; многослойная пленка – composite film; минимальный приток солнечного тепла – minimum solar heat gain; снижение эксплуатационных расходов – lowering maintenance costs.

21 *Topics for projects and presentations:*

1. Types of windows.
2. Evolution of window production.
3. Stained-glass windows.
4. Window constructions and modern technologies. 5.Advanced technologies in window development.

Word List toUnit 1

slit window	щелевое окно
fortification, *n*	крепость
porthole, *n*	небольшое отверстие
pane, *n*	оконное стекло
dwelling, *n*	жилище
sophisticated, *adj*	утонченный, изысканный
vehicle, *n*	средство передачи
ultimately, *adv*	в конечном счете, в конце концов
mediaeval cathedral	средневековый кафедральный собор
infill, *n*	заполнение

external climate	внешняя окружающая среда
a slab of marble	пластина/кусок мрамора
sheets of mica	листы слюды
oiled paper	промасленная бумага
crude, *adj*	необработанный
domestic building	жилое здание
appearance, *n*	внешний вид, наружность

elevation, *n*	фасад
linger, *v*	сохраняться, не полностью исчезать
flying buttress	аркбутан (наружная подпорная арка)
serve military needs	служить военным целям
arrow, *n*	стрела
splayed sides	расходящиеся стены
interior wall surface	внутренняя поверхность стены
ornate decorations	богато украшенные убранства
dome, *n*	купол
flexibility, *n*	адаптивность, приспосабливаемость
atrium, *n*, *sing.*; atria, *n*, *pl*.	атриум, крытый дворик
inhabitant, *n*	житель, обитатель
shutters, *n*	жалюзи
CE (Christian Era, Common Era)	новой эры, нашей эры, н.э.; от Рождества Христова
cast glass	литое стекло
property, *n*	свойство
mullion window	многостворчатое окно со стойками
polyurethane foam	полиуретановая пена, пенополиуретан
weatherproof, *adj*	устойчивый к атмосферным влияниям
surface, *n*	поверхность
external, *adj*	внешний
internal, *adj*	внутренний
artificial lighting	искусственное освещение

double-hung sash window	подъемное окно с двумя подвижными переплетами
casement window	створное окно
slide window	раздвижное окно
transom window	окно с фрамугой
jalousie window	жалюзи
clerestory window	ленточное окно
fixed window	глухое / неоткрывающееся окно
emergency exit / egress window	выходное окно
stained glass window	витражное окно
french window	створчатое окно, доходящее до пола
life-cycle cost	(себе)стоимость с учетом периода эксплуатации
operating costs	текущие расходы; эксплуатационные расходы
performance, *n*	производительность; эффективность; КПД
greenhouse gases	парниковые газы
energy consumption	расход энергии

energy costs	затраты на энергию
thermal resistance	термическое, тепловое сопротивление; термостойкость
durability, *n*	долговечность; прочность; стойкость
maintenance, *n*	содержание; уход; текущий ремонт
recycled, *adj*	повторно используемый
fiberglass, *n*	стекловолокно
structural strength	конструкционная прочность; прочность конструкции
power efficient	энергоэффективный
light-collecting dome	светособирающий купол
impact material	ударопрочный материал
ultraviolet light	ультрафиолетовое излучение

joining aluminium pipes	стыкуемые алюминиевые трубы
composite film	многослойная пленка
minimum solar heat gain	минимальный приток солнечного тепла
lowering maintenance costs	снижение эксплуатационных расходов

"Architecture is the thoughtful making of space." Louis Kahn

Unit 2

ARCHITECTURAL STYLES

Hatshepsut's Temple
The Roman Coliseum
Figure 2.1

LEAD-IN

1.1 What is "architecture"?Read the following information and compare your answer:

Architecture is often considered to be the oldest and the most useful of the fine arts, as in some respect it is a prerequisite for the other arts. Architecture can be defined, albeit unsatisfactorily, in four different ways. It is the art and method of erecting structures; it is a planned entity; it is a body or corpus of work; it is a way to

build. An observer of architecture will note that it meets requirements on functional, technological, and aesthetic levels. Throughout history, architecture has been studied through buildings that have been substantial enough to survive the test of time.

22 a) What architectural styles do you know? Define "architectural style" as you see it:

From the olden days till date, the architectural styles have undergone a massive change. When one studies the different architectural styles, one can understand the kind of creativity that existed since the ancient days. Modern architects often look up to the olden styles of architecture, which continue to inspire professionals in terms of their design and functionality. Here are the descriptions of different architectural styles.

Architectural Style	**Description**
Ancient Egyptian Architecture	Ancient Egyptian architecture is about the major use of mud bricks and stones for the architectural structures. The beautiful Egyptian temples and pyramids are some examples of this style of architecture.
Ancient Greek Architecture	Ancient Greek architecture can be distinguished by the specific elements such as the rectangular buildings and the large columns.
Baroque Architecture	Baroque architectural styles always played around with a dramatic use of light, central projections, ornamental decoration, and pear domes, etc. The works of Michelangelo created for the late Roman buildings belong to Baroque architecture.
Byzantine Architecture	The use of the circular dome is one of the typical elements of Byzantine architecture.

Chinese Architecture	Chinese architecture is all about the balance and symmetry in the design. The designs have an emphasis of the use of a horizontal axis.
Gothic Architecture	This architectural style was prominent during the high and the late medieval period and began at the Abbey of Saint-Denis. Its certain characteristics are pointed arches, large individual windows, flamboyant designs and the emphasis on the creation of vertical lines in the design.
Roman Architecture	The Roman architecture had a lot of influence from the Greek architecture. The use of the arches and domes are some of the characteristics of this style. The Roman temples, amphitheaters, baths, basilicas, etc. stand testimony to the greatness of this style.
Renaissance Architecture	This term refers to the architectural monuments built from the 15th century to the early 17th century. The common features of this style are the use of balance in the design, geometrical shapes, beautiful columns and domes, etc.
Russian Architecture	Russian architecture has always been predominantly religious. Some of the basic elements of Russian architecture are the sharp sloping roofs, domes that cover the structure, the tent shaped spires, etc.

b) Choose any architectural style you like and make a report on it.

33 Discuss the following:

"A proper building grows naturally, logically, and poetically out of all its conditions."
Louse Henry Sullivan (architect)

"Any design decision should be justified in at least two ways."

• Write a paraphrase of each quotation. ***• Say whether you agree or not, and why.***

READING

4a) In what context do you think the following words and phrases will appear in the text?

•techniques of working •wonder of the world •recalcitrant stones
•temple •badly corroded but still impressive •enriched with statuary
•notable monuments •superimposed terraces

2.Read the text quickly and check your answers:

EGYPTIAN ARCHITECTURE

During the Old Kingdom, the period when Egypt was ruled by the Kings of the 3d to 6th Dynasties, artists and craftsmen were drawn to the court to work under the patronage of the king and his great nobles. Techniques of working in stone, wood, and metal made tremendous progress, demonstrated by surviving large scale monuments, such as the **pyramids** of the 4th Dynasty and the sun temples built by the 5th Dynasty kings. The pyramids of the 4th Dynasty are the most spectacular of all the **funerary** works and the only remained wonder of the world. These monuments celebrated the divinity of the kings of Egypt, linking the people with the great gods of earth and sky.

This was a time when trade and the economy **flourished**. Craftsmen worked in the finest materials which were often brought great distances, and were able to experiment with recalcitrant stones as well as new **techniques** of metalworking. This enabled them by the 6th Dynasty to produce large metal figures. The earliest that survive are the copper statues of Pepi I and his son, found at Hierakonpolis. Made c. 2330 BC they are badly corroded but still impressive in their stiffly formal poses. The eyes are **inlaid**, and the crown and the kilt of the king, now missing, were probably originally made of **gilded plaster**.

During the **prosperous** period known as the middle kingdom fortresses were built to defend the southern and eastern borders, and new areas of land were brought under cultivation. Craftsmen

achieved new levels of excellence. Very little architecture remains – many royal monuments were robbed for their stone in later periods – but what has survived shows great simplicity and refinement. The example is the pyramid of Sesostris I at Lisht.

The establishment of the 18th Dynasty marked the beginning of the New Kingdom and a new **blossoming** of the arts and crafts of ancient Egypt. Craftsmen **benefited from** wider contact with other civilizations, such as those of Crete and Mesopotamia, and were also to work with imported raw materials.

The kings gave **encouragements** to artists and craftsmen by ordering great temples and palaces to be built throughout Egypt. The temple walls were covered with reliefs celebrating the achievements of the kings and the powers of the gods. The courtyards and inner sanctuaries were enriched with statuary. The most notable monuments are the Mortuary Temple of Queen Hatsheput at Deir-el-Bahari (c. . 1480 BC; Fig. 2.1), which had a series of pillared colonnades on three sides of three superimposed terraces linked by gigantic ramps and **magnificent** Great Temple at Karnak to Amon as the universal of Egypt.

Ancient Egyptian Architecture was **revived** under the Ptolemies, the successor of Alexander the Great, who built numerous temples of traditional style of which the finest examples that survive are the Temple of Horus at Etfu and the temples on the islands of Philae (c. . 323 – 30 BC).

5*5 *Read the text again and answer the questions that follow (1-–5):

1. Into what periods could ancient Egyptian architecture be classified?
2. What typical structures did the architecture of Egypt produce?
3. What is the only remained wonder of the world?
4. When did the final revival of ancient Egyptian architecture take place?
5. What are the greatest examples of the period of revival?

Follow-up

6*a) Find in the text the synonyms for the following words:* pharaohs; spectacular; gigantic; to protect; to plunder; modesty and elegance; to prosper; methods; to be adorned; impressively beautiful.

b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

7Choose the right sentence:

1. *Craftsmen worked in the finest materials.*
   a) Craftsmen used precious stones for their creations;
   b) Craftsmen used concrete in their work;
   c) It was forbidden for craftsmen to use the finest materials in their work.
2. *The copper statues of Pepi I and his son are still impressive.*
   a) These statues were made of stone;
   b) The copper statues of Pepi I and his son have nit survived;
   c) These statues have the power of affecting and gaining attention and feeling.
3. *Fortresses were built to defend the southern and eastern borders of ancient Egypt.*
   a) Fortresses were built in the west of ancient Egypt ;
   b) Fortresses were erected to protect the southern and eastern boundaries of ancient Egypt;
   c) During the Middle Kingdom many fortresses were built.
4. *The beginning of the new kingdom is associated with the blossoming of the arts and crafts of ancient Egypt.*
   a) This was a period of stagnation in the history of arts;
   b) In this period craftsmen and artists were ordered great temples and palaces to be built throughout Egypt;
   c) During the New Kingdom the arts and crafts flourished.
5. *The Ptolomies built numerous temples of traditional style.*
   a) Numerous palaces were built by the Ptolomies;
   b) Many traditional temples were constructed under the Ptolomies;

c) Ancient Egyptian architecture was revived under the lings of the 4th Dynasty.

8Give the English equivalents to the following and use them in small situations:

художники и ремесленники; под покровительством царя и знати; храмы солнца; достигать новых вершин мастерства; расцвет искусств и ремесел; поощрять художников и ремесленников; достижения, прославляющие царей и могущество богов; погребальный храм царицы Хатшепсут; преемники Александра Великого; расцвет торговли и экономики; внутреннее святилище; килт короля; защищать южные и восточные границы; храмы, сделанные в традиционном стиле.

LANGUAGE FOCUS

9Fill in the gaps in the following passage with a suitable preposition given below:

ROMAN ARCITECTURE Part I

Modern knowledge of Roman Architecture derives primarily 1)) __ extant remains scattered 2) __ the area of the empire. Some are well preserved, and others are known only in fragments and by theoretical restoration. Another source of information is a vast store of records. Especially important is a book 3) architecture 4) __ the ancient Vitruvius. His *De Architectura* (c. 27 BC) is the only treatise survived 5) ancient times. It consists 6) __ 10 10 books and covers almost every aspect on architecture.

Pervasive Roman predilection was for spatial composition – the organization of lines, surfaces, masses, and volumes 7) __ space. In this the Romans differed 8)their predecessors 9) __ the ancient Mediterranean world, and, however freely they used the elements of earlier styles, in Rome or in the provinces they recast them according 10) __ their own taste.

in (x2), throughout, from (x3), by, on, to, of

10Choose the correct word to fill in the gap:

ROMAN ARCITECTURE Part II

In Roman architecture there were three types of 1) ___: the domus; the insula, and the villa.

The domus, or town house, consisted of 2) __of rooms grouped around a central hall, or atrium, to which were often added further suites at the rear, grouped around a 3) __ court, or peristyle. In Rome the chief examples of domus are the house of Vestals in the Forum in Rome and that of Livia on the Palatine Hill.

Great blocks of flats or 4) _were called insulae. Excavations at Ostia, Italy, have revealed the 5) __ of these blocks. Planed on three or four floors with strict regard to economy of space, they depended on light from the 6) as well as from a central 7). Independent apartments had separate 8) _with direct access to the street.

The Latin word villa pertained to an estate, complete with house, grounds, and 9) buildings. Hadrian's Villa at Tivoli, began about AD 123, was a sumptuous 10) __ with parks and gardens on a large scale.

court, tenements, houses, residence, suites, colonnaded, subsidiary, exterior, entrances, design

11Fill in the gaps with derivatives of the words in capitals:

ROMAN ARCITECTURE Part III

The Romans were great 1) and engineers famous for their factories, roads, aqueducts and bridges, grand thermae and amphitheatres, theatres and temples.	**BUILD**

The 2) _____ surviving circular temple of antiquity, and in many respects the most important Roman building, is the Pantheon in Rome. It consists of rotunda about 142 feet in diameter 3)) __ by concrete walls 20 feet thick, in which are alternate circular and rectangular niches. Light is admitted through a central 4))_, or oculus, about 28 feet across, at the crown of the dome. The largest and most important amphitheatre of Rome was the Coliseum, built by the emperors Vespasian, Titus, and Domitian in about AD 75 – 85. Covering six acres (2.4. hectares), it had seating for about 50.000 spectators, and its 80 5))were so arranged that the building could be cleared quickly. The whole is 6)of concrete, the exterior faced with travertine and the interior with precious marbles. Other important amphitheatres are those at Verona, Italy; Pula, Yugoslavia; and Arles, France. 7) __ thermae were more than baths. They were immense 8) __ of great magnificence, with facilities for every gymnastic	**GREAT** **SURROUND** **OPEN** **ENTER** **BUILD**
exercise and halls in which 9)) _ ___, poets, rhetoricians, and those who wished to hear them gathered. The best preserved are the Baths of Caracalla (begun c. AD 217), which covered an area about 1.000 feet square, and those of Diocletian (c. AD 298–306), with 10))for 3.200 bathers.	**IMPERIUM** **ESTABLISH** **PHILOSOPHY** **ACCOMMODATE**

12 ***Choose the right term for the following definition:***

1. **town-house**	a) forum	b) domus	c) basilica
2. **central hall**	a) villa	b) rotunda	c) atrium
3. **block of flats**	a) insula	b) order	c) thermae
4. **suburban or country house**	a) interior	b) villa	c) domus
5. **a colonnaded court**	a) façade	b) peristyle	c) thermae

LISTENING

13 ***"Architecture and Design" Louis Kahn.***

Listen to the information twice and answer the questions given (1-–5):

1)1. What is Louis Kahn famous for?
2)2. What materials did he work on?
3)3. What is the core of design?
4)4. What is the unique work of Kahn?
5)5. Can you describe the building given?

VIDEO

14 ***Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.***

WRITING

Summary Writing

STRATEGY POINT: Tackling detail questions *When trying to answer detail questions, follow these steps:*

- *Make sure you understand the question fully.*

- *Scan the text to find the part where the answer is contained.*
- *Highlight the relevant part.*
- *Paraphrase the relevant parts and make your answer as brief as possible.*

15 ***a) Read the following passages and underline the parts where the answer to each of the following questions is contained*:**

1. What are remarkable monuments of Egyptian and Roman architecture?
2. What are they famous for?
3. What examples of personification are given in the text?
4. How are these texts interrelated?

FACTS about ROMAN PANTHEON	**GREAT SPHINX**
The Pantheon of Rome is a marvelous example of ancient Roman architecture. This building has been in use for over 2000 years. The Roman Pantheon is famous for its design, size and its huge dome. The Roman Pantheon is a massive circular structure made with bricks. Corinthian- style columns support the gabled roof in the front. The most amazing feature of this monument is its huge concrete dome. The Pantheon dome was thought to be largest, until the recent times. The doors are made of bronze and are over 26 feet high. The doorway of the Pantheon is about 40 feet high and 20 feet wide. A point worthy of mentioning is, the Greeks greatly influenced the Roman art and architecture.	From the 15th century AD European travelers carried home tales of the mysterious and amazing remains of the civilization of Egypt. One of its most remarkable monuments, which still evoke this sense of awe and might, is the Great Sphinx of Gizeh, the oldest surviving sphinx, dating from c. 2550 BC, carved from a rock with the crouching body of a lion and a human face. The concept of the king as a powerful lion goes back into

The hemispherical dome of this monument exhibits the charm and influence of Greek architecture and also the Greco-Roman idea of the "Cosmos". There is an oculus in the center of the dome known as the "Great Eye", which opens to the sky. The dome is intricately designed and decorated with bronze rosettes. The coffers of the dome were considered as the vault of the Heaven.	prehistoric times. The sphinx was a natural development, personifying the divine power of the king as a force protecting his land and repelling the power of evil. The great Sphinx is one of the most distinctive and dominant of all the images of
The historians believe that the "Great Eye" symbolized that the Heavens guarded the entire Roman Empire. The architectural harmony of this awe-inspiring structure is well balanced and it was achieved by keeping the diameter of the dome equivalent to its distance from the floor. The weight of the dome was greatly reduced by the sunken panels known as the coffers and also by using cement made from pumice and pozzolanic ash (volcanic ash).	ancient Egypt, which is perhaps the source of the misconception that sphinxes are of central importance in Egyptian culture. However, those that have survived are among the most impressive as well as intriguing examples of Egyptian sculpture.

b) In a paragraph of 120-–150 words, and using your own words as far as possible, summarize what the two passages tell us about marvelous examples of Egyptian and Roman architecture.

16 ***Your company is organizing a conference "World Architectural Masterpieces" using materials from Appendix 3.***

a) write memo to your subordinates and inform them about the meeting you will hold the next day to discuss the details of organizing and conducting the conference.

b) send e-mails to your partners to inform them about the date, place, purpose and other details of the conference.

SPEAKING

17 ***Summarizing information about Egyptian and Roman architecture.***

a)Say in other words:

1. Artists and craftsmen were given orders by the pharaohs;
2. The pyramids of the 4th Dynasty are the most spectacular monuments of the Old Kingdom;
3. Many Royal Monuments of the Middle Kingdom were plundered;
4. They built fortresses to protect the southern and the eastern borders;
5. Techniques of working in stone, wood, and metal were used in gigantic monuments.

b)Prove the following statements:

1. "De Architectura" by Vitruvius is the source of information on Roman architecture.
2. There were three types of houses in ancient Rome.
3. The Pantheon is the greatest temple of antiquity.
4. The Coliseum was the largest and the most impressive amphitheatre of Rome.
5. Imperial thermae were immense establishments of great magnificence.

18 ***Study the following quotations and use them in your own situations:***

1.1. “There are three forms of visual art: painting is art to look at, sculpture is art you can walk around, and architecture is art you can walk through” (Dan Rice).
2.2. “Architecture, of all arts, is the one which acts the most slowly, but the most surely on the soul” (Ernest Dimnet).
3.3. “An architect is the drawer of dreams” (Grace McGarvie).
4.4. “Our architecture reflects truly as a mirror’ (Louis Henri Sullivan).
5.5. “Architecture is the work of nations” (John Ruskin).
6.6. “Architecture is a social act and the material theater of human activity” (Spiro Kostof).

19 ***Render this text in English:***

КОЛИЗЕЙ

Амфитеатр Флавиев, обычно называемый Колизеем, уже много веков является символом величия и могущества Рима, а также одним из наиболее знаменитых памятников древности во всем мире. Колизей начал строиться в 72 г. н.э., его архитектор неизвестен, но некоторые отождествляли его с архитектором Ра- бирием, построившим дворец Домициана. Подобно другим рим- ским амфитеатрам, Амфитеатр Флавиев представляет в плане эл- липс, середина которого занята ареной (также эллиптической формы) и окружающими ее концентрическими кольцами мест для зрителей. От всех сооружений такого рода Колизей отличает- ся своей величиной. Это самый грандиозный античный амфите- атр: длина его наружного эллипса - – 524 м, большая ось — – 187,77 77 м, малая ось — – 155,64 м, длина арены — – 85,75 м, ее ширина 53,62 м; высота стен — – от 48 до 50 метров. При таких размерах он мог вместить в себя до 125 000 зрителей. Амфитеатр Флавиев был построен на бетонном фундаменте толщиной в 13 метров.

Стены Колизея воздвигнуты из крупных кусков или блоков из травертинового камня или травертинового мрамора, который добывали в близлежащем городе Тиволи. Блоки соединялись ме- жду собой стальными связями общим весом

примерно 300 тонн; для внутренних частей использовались также местный туф и кирпич. С внешней стороны здание представляло собой три яруса арок. Между арками расположены полуколонны, в нижнем ярусе тосканского, в среднем ионического и в верхнем

коринфского стиля.

Колизей утратил две трети своей первоначальной массы; тем не менее, он и поныне беспримерно громаден. «Пока Колизей стоит», говорили пилигримы в VIII столетии, «будет стоять и Рим, исчезни Колизей исчезнут Рим и вместе с ним весь мир».

When rendering use these words and word combinations:

амфитеатр – amphitheatre,; величие и могущество – greatness and might, ; эллипс – ellipse / oval, ; ось – axis, ; вмещать – seat, ; травертиновый – travertine, ; добывать – mine, ; стальные связи – ties, ; туф – sinter, ; ярус – tier, ; беспримерно – unprecedentedly, ; пилигрим – pilgrim.

20 ***Express your opinion on the magnitude of the Roman Coliseum and discuss it with your partner using the expressions from Appendix 1.***

21 ***Topics for projects and presentations:***

1.1. Constructivism.
2.2. Residential buildings.
3.3. Public buildings.
4.4. Renovation and restoration.
5.5. Architecture and ecology.

Word List to Unit 2

temple, *n*	храм
fine art	изобразительное искусство
prerequisite, *n*	предпосылка
erecting, *n*	возведение, сборка

undergo, *v*	испытывать; подвергаться (чему-л.)
inspire, *v*	внушать, способствовать
ancient, *adj*	древний, старинный
rectangular, *adj*	прямоугольный
dramatic, *adj*	существенный, резкий
central projection	центральная проекция
pear dome	грушевидный купол
axis, *n*	ось, осевая линия
medieval, *adj*	средневековый
pointed arch	стрельчатая, готическая арка
flamboyant, *adj*	"«пламенеющий" » стиль, яркий; стиль рококо
amphitheater, *n*	амфитеатр
spire, *n*	высокая пирамидальная крыша башни
kingdom, *n*	королевство
craftsman, *n*	ремесленник
court, *n*	двор
under the patronage	под покровительством
noble, *n*	знать
surviving, *adj*	уцелевший
large scale	крупномасштабный
funerary, *adj*	погребальный
wonder, *n*	чудо
divinity, *n*	божественность
flourish, *v*	цвести, расцветать
craftsman, *n*	ремесленник
fine, *adj*	изысканный
recalcitrant stone	непокорный камень
corroded, *adj*	подверженный коррозии
inlaid, *adj*	инкрустированный
gilded plaster	позолота
prosperous, *adj*	процветающий

southern and eastern borders	южные и восточные границы
refinement, *n*	усовершенствование
benefit from	выигрывать от

raw material, *n*	сырье
encouragement, *n*	воодушевление, поощрение
relief, *n*	поверхность, характер местности
courtyard, *n*	внутренний двор
inner sanctuary	внутреннее святилище
enrich, *v*	украшать
pillared, *adj*	поддерживаемый столбами, колоннами
ramp, *n* скат,	скат, уклон
revive, *v*	возрождать
successor, *n*	преемник
derive, *v*	происходить
remains, *n*, *pl*	руины, развалины
scattered, *adj*	разбросанный (в беспорядке); раскиданный
treatise, *n*	трактат, научный труд
domus, *n*	одноэтажное строение, в котором живет одна семья
insula, *n*	многоквартирный дом
villa, *n*	усадьба
atrium, *n*	атрий, атриум атриум, крытый дворик
peristyle, *n*	перистиль: колоннада, обрамляющая площадь или двор дома, храма, общественного здания
tenement, *n*	сдаваемый в аренду многоквартирный дом
reveal, *v*	открывать; обнаруживать
separate entrance	отдельный вход
direct access	прямой доступ
pertain, *v*	принадлежать, иметь отношение
estate, *n*	поместье, имение
subsidiary buildings	дополнительные постройки

aqueduct, *n*	акведук
thermae, *n, pl*	термы
antiquity, *n*	античность
immense, *adj*	безмерный, очень большой, огромный
facilities, *n, pl*	приспособления
forum, *n*	форум (общественная и торговая площадь в Древнем Риме)
rotunda, *n*	ротонда; круглое здание

PART II. BUILDING MATERIALS

"We move through negative spaces and dwell in positive spaces."
Matthew Frederick (architect)

Unit 3

BRICKS and BRICKWORK

Exterior detail *Interior detail*

Figure 3.1 Evry Cathedral, Essonne, France

LEAD-IN

1a) Explain how the following words are connected with "bricks":

ceramic, clay, lime, heat and cooling, firing temperature, kiln, iron content.

b) Read the information below and compare your answers:

A “brick” is is a block of ceramic ceramic material used in masonry masonry construction, usually laid using various kinds of mortar. It has been regarded as one of the longest lasting and strongest building materials used throughout history.

“"Bricks”" for building may be made from clay, shale, soft slate, calcium silicate, concrete, or shaped from quarried stone. However, true bricks are ceramic, and therefore created by the action of heat and cooling.

Clay is the most common material, with modern clay bricks formed in one of three processes – soft mud, dry press, or extruded. Normally, brick contains the following ingredients:

• Silica (sand) – 50% to 60% % by weight;
• Alumina (clay) – 20% to 30% % by weight;
• Lime – 2 to 5% % by weight;
• Iron oxide – 5 to 6% % (not greater than 7% %) by weight;
• Magnesia – less than 1% % by weight.

The fired colour of clay bricks is influenced by the chemical and mineral content of raw materials, the firing temperature and the atmosphere in the kiln. For example, pink coloured bricks are the result of high iron content, white or yellow bricks have higher lime content. Most bricks burn to various red hues, if the temperature is increased the colour moves through dark red, purple and then to brown or grey at around 1,300 °C. Calcium silicate bricks have a wider range of shades and colours, depending on the colourants used.

2 Find information about history, methods of manufacture, and characteristics of bricks and make a report.

3 Discuss the following:

It's like talking to a brick wall.
(Spanish proverb)

Bricks and mortar make a house, but the laughter of children makes a home.
(Irish proverb)

•Write a paraphrase of each proverb. • Say whether you agree or not, and why.

READING

4 a) In what context do you think the following words and phrases will appear in the text?

•hand-moulded •moist clay •firing •manufacturing process

•quarry •extraction •cement mortar •surmounted by a corbelled structure

b) Read the text quickly and check your answers:

Originally, bricks were hand-moulded from moist sun clay and then sun-baked, as is still the practice in certain arid climates. The firing of clay bricks dates back well over 5000 years, and is now a sophisticated and highly controlled **manufacturing process**; yet the principle of burning clay, to convert it from its natural plastic state into a dimensionally stable, durable, low-maintenance ceramic material, remains unchanged. The quarrying of clay and brick manufacture are high-energy processes, which involve the emission of **considerable quantities** of carbon dioxide and other pollutants including sulphur dioxide. The extraction of clay also has long-term environmental effects, although in some areas former clay pits have now been converted to bird sanctuaries or put to recreational use. However, well-constructed brickwork has a long life with low maintenance, and although the use of Portland cement mortar prevents the recycling of **individual bricks**, the crushed material is frequently **recycled** as aggregate in further construction.

The elegant cathedral at Evry near Paris (Fig. 6.1), designed by Mario Botta, **illustrates the modern use of** brickwork. The cathedral of Saint Corbinian, built with 670,000 bricks, was dedicated in 1997. The building **exhibits fine detailing** both internally and externally. Externally the cylindrical form rises to a circle of trees. Internally the altar is surmounted by a corbelled structure leading one's view upwards to the central rooflight. Three-dimensional internal brickwork is finely detailed to **generate the desired acoustic response**.

5 Read the text again and answer the questions that follow (1-–5):

1. What was the original process of brick manufacture?
2. How can you describe a modern manufacturing process?
3. What environmental effects does a modern manufacturing process cause?
4. What have you read about recycling?
5. What are the examples of the modern use of brickwork? Why do these cathedrals impress visitors?

Follow-up

6 ***a) Find in the text the synonyms for the following words:***

initially, complex, still without changes, high-activity, to discharge, long-dated environmental impact, to use again, to produce.

b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

7 ***Give the English equivalents to the following and use 5 of them in small situations:***

кирпич ручного формования; высушенный на солнце; пре-вращать (из одного состояния в другое); безусадочный; прочный; добыча глины; загрязняющие вещества; зумпф для глинистого бурового раствора; раствор портландцемента; дробленый про- дукт; спроектированный кем-либо; как

изнутри, так и снаружи; быть увенчанным; выступающая / ступенчатая структура.

8 ***Read and translate the text and make 5 questions to it:***

COLOURED MORTARS

Mortar colour has a profound effect on the overall appearance of the brickwork as, with stretcher bond and a standard 10 mm joint, the mortar accounts for 17% % of the brickwork surface area. A wide range of light-fast coloured mortars is available which can be used to match or contrast with the bricks, thus highlighting the bricks as units or creating a unity within the brickwork. The coloured mortars contain inert pigments, which are factory-blended to a tight specification to ensure close colour matching between batches. Occasionally, black mortars may bloom due to lime migration to the surface. Coloured mortars can be used creatively to enhance the visual impact of the brickwork and even create designs on sections of otherwise monochromatic brickwork. The quantity of pigment should not exceed 10% % by weight of the cement. Mortar colours may also be modified by the use of stains after curing; however, such applications only penetrate 2 mm into the surface, and therefore tend to be used more for remedial work. Through-body colours are generally more durable than surface applications.

*(*From "*Materials for Architects and Builders")*

LANGUAGE FOCUS

9 ***Use the words below to complete the sentences:***

CLAY BRICKS Part I

The main constituents of brick-making clays are silica (sand) and 1), but with varying quantities of chalk, 2) , iron oxide and other minor constituents such as fireclay, according to their source.

There are five main processes in the manufacture of 3) _ bricks: a) extraction of the raw material; b) forming processes; c)) drying; d) firing; e) packaging and distribution.

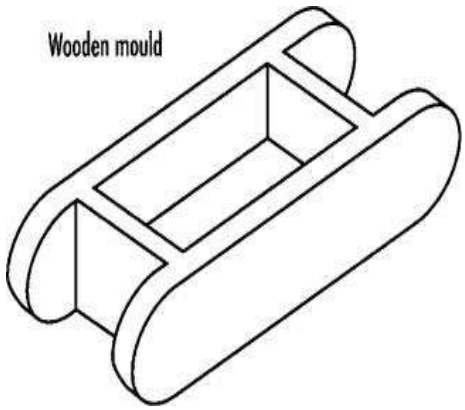
The process begins with the 4)of the raw material from the quarry and its transportation to the works, by conveyor belt or road transport. Topsoil and 5)overburden are removed first and used for site reclamation after the 6) __ clay is removed.

The handmade process involves the throwing of a suit ably sized clot of wet clay into a wooden 7) __ on a bench. The surplus clay is struck off with a framed wire and the green brick removed. The bricks produced are 8) __ in shape with soft arises and interestingly folded surfaces. Two variations of the process are 9) __ moulding and slop moulding.

clay, irregular, lime, unsuitable, mould, extraction, pallet, alumina, usable

10Fill in the gaps with derivatives of the words in capitals:

CLAY BRICKS Part II



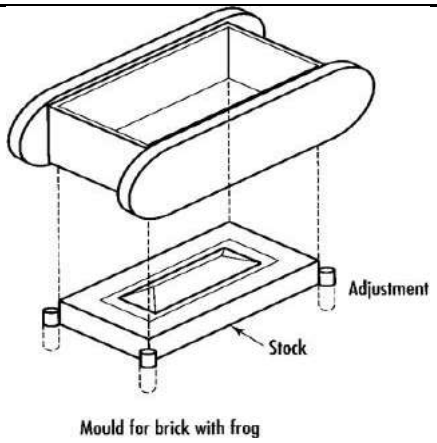


Figure 3.2. Moulds for handmade bricks

FIX
HIGH

DEPRESS

In pallet moulding, a stock board, the size of the bed face of the brick, is 1) __ to the bench. The mould fits loosely over the stock board, and is adjusted in 2) to give appropriate thickness to the green brick. The mould and board are sanded to ease removal of the green brick which, is produced with a frog or 3) on one face. In the case of slop moulding, the stock mould is placed directly on the bench, and is usually wetted rather than sanded to allow removal of the green brick which, 4) __ the pallet moulded brick, is smooth on both bed faces (Fig. . 3.2).

LIKE

SHRINK

HUMID

USE

To prevent cracking and distortion during the firing process, green bricks produced from wet clays must be allowed to dry out and shrink. 5) _is typically 10% % on each dimension depending upon the moisture content. Drying temperatures and 6) levels are carefully controlled to ensure shrinkage without distortion.

COOL
FIRE

Both intermittent and continuous kilns are 7) __for firing bricks. The former is a batch process in which the single kiln is loaded, fired, 8) and unloaded. In continuous kilns, the 9) process is always active; either the green bricks are moved through a fixed firing zone, or the fire is gradually moved around a series of 10)) __ chambers to the unfired bricks. Both continuous systems are more

CONNECT

energy efficient than the intermittent processes.	

11Fill in the gaps in the following passage with a suitable preposition given below:

CLAY BRICKS Part III

Damaged or cracked bricks are removed prior 1) packing. Most bricks are now banded and shrink-wrapped 2) packs of between 300 and 500, 3) __ easy transportation by forklift truck and specialist road vehicles. Special shapes are frequently shrink-wrapped 4)wooden pallets.

To meet the consistent standards 5) quality required 6) __ clients, many brick manufacturers are now operating quality assurance systems. These require manufacturers to document all their operational procedures and set 7) _ standards to which products must adhere. Quality is controlled 8) __ a combination

9) _ an internal self-monitoring system and two 10) __ four independent spot-check reviews per year.

by (x2) , for , into , of (x2), onto , out, to (x2)

12Look at the text, separate the words to make sense:

CLAY BRICK PAVING

Many clay brick manufacturers produce arrange of plain and chamfered paving bricks.

2.2) Bricks for flexible paving are usually nibbed to set the spacing correctly.

3.3) Typical patterns include herring bone running bond stack bond basket – weave and the use of borders and bands(Figure3.3).

4.4) Profiled brick designs include decorative diamond and chocolate bar pattern sand pedestrian management texturing.

5.5) The paving bricks may be laid on a hard base with mortar jointsor alternative lyona flexible base with fine sand brushed between the pavers.

6.6) Edge restraint is necessary to prevent lateral spread of the units.

(From "*Materials for Architects and Builders"*)

Figure 3.3. Typical range of clay pavers.
Photographs: Courtesy of Baggeridge Brick plc

LISTENING

13 Listen to "A Method of Brick Construction" and do theassignments given below: **Before listening**

1.a) Match the words and their definitions:

1. multistory	1.a) a right-angled support attached to a wall for holding a shelf, lamp, or other object
2. cladding	2.b) a gap in steel or concrete to allow for thermal expansion
3. bracket	3.c) (of a building) having several stories
4. shelf angle	4.d) a steel angle which supports the weight of brick or stone veneer and transfers that weight onto the main structure of the building
5. expansion joint	5.e) a covering or coating on a structure or material

Whilelistening

2.b) Listen to the information and present the main idea of it.

c) Listen again and put the words given in the table into the certain gaps in the text:

*1)*a) brick coursing; b) wind pressures; c) frames; d) expansion joint; e) method; f) stainless steel; g) brackets; h) inner concrete block wall; i) stability; j) shelf angles.

Multistory 1)may be cladding brickwork or stone using a range of propriety systems based on specially designed 2) and restrained devices.

The most common 3) __ of attaching brickwork to steel frames is by the use of 4) fitted either to the slab edge or to plates welded on to the edge beams.

The shelf angles are usually made from 5). The method of attachment of the shelf angle allows for vertical adjustment to suit the

6)_____.

Brickwork is constructed on the shelf angles and attached to the columns and to the 7)using brick ties.

Windposts are sometimes incorporated to give improved 8) __ particularly in tall buildings subject to high 9) __ or the large size panels are used.

An 10) is used at the top of the panels to take up relative movements between a building frame and brickwork.

Afterlistening

d)Answer the questions:

1) 1. What types are multistory frames divided into?
2) 2. What is the common method of attaching brickwork to steel frame?
3) 3. What material are shelf angles made of?
4) 4. What does the method allow?
5) 5. What are the functions of windposts?

VIDEO

14Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.

WRITING

Rendering

15a) Read the following passages and underline the parts where the answer to each of the following questions is contained:

b)1. Where are these types of bricks usually used?

c)2. What are their functions except esthetic one?

d)3. What have you read about the forms of face bricks?

e)4. What common information is given in these texts?

f) 5. What is the difference in the usage of these types of bricks?

6.Comparing the texts can you say that you are speaking of one and the same type of bricks? Prove or disprove it.

ФАСАДНЫЙ КИРПИЧ

Сейчас **фасадный кирпич** применя- ется для **облицовки** зданий, загородных домов и других строительных сооруже- ний. Каждый человек хочет, чтобы его **жилище** выделялось и показывало от- личный вкус самого хозяина дома. Ог- ромные возможности фасадного кирпича позволяют **улучшить внешний дизайн здания**, и он давно уже сместил на вто- рое место использование керамики. Об- лицовка дома фасадным кирпичом – это залог **тепла и комфорта** вашего жили- ща. Фасадный кирпич имеет **различные расцветки**, как с рисунком, так и без не- го, что позволяет подобрать тот вид кир- пича, который вам больше всего подхо- дит. К тому же фасадный кирпич имеет **высокую морозостойкость** и очень низ- кий процент **впитывания влаги**. Фа- садный кирпич изготавливается не толь- ко в виде стандартных кирпичей **прямо- угольной формы**, но также может быть **закругленной формы**, в виде **трапеции** и **фигурной формы**, благодаря чему фа- садный кирпич можно

ЦВЕТНОЙ ОБЛИЦОВОЧНЫЙ КИРПИЧ

Процесс производства кирпичей осуществляется путем **обжига глины** при очень высоких температурах, что дает этому строительному материалу довольно **высокую прочность**. Цвет- ной облицовочный кирпич получается путем **добавления цветных пигмен- тов,** которые способны придать кир- пичу желаемых цвет. В последнее время, такой кирпич стал очень попу- лярен при строительстве новых **со- временных и жилых элитных домов**. Не меньше популярности цветной об- лицовочный кирпич получил и в строительстве **загородных коттеджей** и домов. В этой области строительства он используется не только для обли- цовки фасадов, но также прекрасно смотрится в виде дополнения к **до- рожкам** или как **оформление окон- ных и дверных проемов**.

Некоторые виды цветного облицо- вочного кирпича могут применяться также для **облицовки внутренних по- мещений** и зданий. Все чаще

использовать как для облицовки зданий, так и для **ландшафтных работ** и отделки любого интерьера. Использование фасадного кирпича для облицовки здания позволяет увеличить прочность основного материала для строительства и сохраняет тепло в доме.	используются разные цвета и оттенки, которые замечательно **дополняют друг друга** при **одновременном использовании и чередовании**. **Большой выбор** цветного облицовочного кирпича открывает для строителей **широкие возможности**.

Comparing the texts can you say that you are speaking of one and the same type of bricks? Prove or disprove it.ФАСАДНЫЙ КИРПИЧ *Сейчас фасадный кирпич применя- ется для облицовки зданий, загородных домов и других строительных соору- жений. Каждый человек хочет, чтобы*	**ЦВЕТНОЙ ОБЛИЦОВОЧНЫЙ КИРПИЧ** Процесс производства кирпичей осуществляется путем **обжига глины** при очень высоких температурах, что дает этому строительному материалу довольно **высокую прочность**. Цветной облицовочный кирпич получается путем **до-**

его жилище выделялось и показывало отличный вкус самого хозяина дома. Огромные возможности фасадного кирпича позволяют улучшить внешний дизайн здания, и он давно уже сместил на второе место использование кера- мики. Облицовка дома фасадным кирпичом – это залог тепла и комфорта вашего жилища. Фасадный кирпич име- ет различные расцветки, как с рисунком, так и без него, что позволяет по- добрать тот вид кирпича, который вам больше всего подходит. К тому же фасадный кирпич имеет высокую морозостойкость и очень низкий процент впитывания влаги. Фасадный кирпич изготавливается не только в виде стандартных кирпичей прямоугольной формы, но также может быть закругленной формы, в виде трапеции и фи- гурной формы, благодаря чему фасад- ный кирпич можно использовать как для облицовки зданий, так и для ланд- шафтных работ и отделки любого интерьера. Использование фасадного кирпича для облицовки здания позволя- ет увеличить прочность основн го материала для строительства и со- храняет	**бавления цветных пигментов,** которые способны придать кирпичу желаемых цвет. В последнее время, такой кирпич стал очень популярен при строительстве новых **современных и жилых элитных домов**. Не меньше популярности цветной облицовочный кирпич получил и в строительстве **загородных коттеджей** и домов. В этой области строительства он используется не только для облицовки фасадов, но также прекрасно смотрится в виде дополнения к **дорожкам** или как **оформление оконных и дверных проемов**. Некоторые виды цветного облицовочного кирпича могут применяться также для **облицовки внутренних помещений** и зданий. Все чаще используются разные цвета и оттенки, которые замечательно **дополняют друг друга** при **одновременном использовании и чередовании**. **Большой выбор** цветного облицовочного кирпича открывает для строителей **широкие возможности**.

тепло в доме.	

b) Find English equivalents to the expressions in bold given in the texts.

c) In a paragraph of 120-–150 words, and using Ex. 13 (b) and your own words as far as possible, summarize and render in English what the two passages tell us about the usage of face bricks and colour front bricks.

16Your company wants to place an order with the brick-making plant. Write the letter of inquiry in which you should ask about:

□)•***consignment;***

□)•***terms of payment and discounts;***

□)•***terms of delivery;***

□)•***terms of guarantee delivery within a certain period of receiving orders.***

Look at the example of the letter of inquiry and use expressions from Appendix 3.

SPEAKING

17a) Study the table, match the words and use them in your own sentences or situations:

a)1. pane	1.a)камин
b)2. airtight	b)шпаклевка
c)3. double-glazing	c)оконное стекло
d)4. putty	d)дуб
e)5. groove	e)герметичный
f)6.hinge	f) прорез, вырез
g)7. handle	g)эскиз
h)8. draft	h)ручка
i)9.mantelpiece (fireplace)	i) ипотека
j)10. oak	j) шпингалет
k)11. mortgage	k)двойное остекление

b) Put the following words into the certain gaps ():

oak (2), handles, panes, drafts, mortgage, walls, mantelpiece, grooves, garage.

c) Read and translate the dialogue:

***Customer*:** I would like to order a countryside house. Here is the project.

***Foreman*:** Let's see. A two-storey house with a 1). Ten rooms and two staircases. What will the foundation be made of? Concrete?

C.: Yes, ferro-concrete.

***F.*:** And what about the 2)?

C.: I want red brick walls. The windows are large. By the way, the 3)should be airtight. I want them to be double-glazing.

F.: We'll make them hermetic with putty. We put it in the 4) _, and then fix the panes.

C.: Excellent. The hinges and 5) ______should be bronze.

F.: Ok. What type of roof would you like?

C.: I want the roof to be flat, with a small garden.

F.: Do you have an interior designer?

C.: Yes, but the 6) _____ aren't ready.

F.: What idea does he have?

C.: There will be a 7)in the hall and the walls will be decorated with panels.

F.: Plastic panels?

C.: Oh, no. Panels must be made of wood.

F.: What wood do you prefer?

C.: I think, 8) _____ is the best.

F.: How do you pay the construction?

C.: I've got a 9)_____ for 25 years from the bank.

F.: So we'll make 10)_____ panels then.

d)Learn the dialogue by heart.

18 *Study the Table 3.1 and find information about each property:*

Table 3.1 Physical Properties of Brick

PHYSICAL PROPERTIES OF BRICK					
Compressive strength	Water absorption and suction	Moisture and thermal movement	Thermal conductivity	Fire resistance	Acoustic properties

19 *Work in pairs. Student A will talk about the following question for about two minutes. Student B will comment briefly on what has been said and add something new. Use the*

***linking words/phrases from Appendix 2.The questions for discussion*:**

1. Brick fence: pros and cons.
2. Environmental problems as a result of brick manufacture process.
3. Types of bricks.
4. Why do people like brick houses?

20Read the text and say what category of bricks is preferable in the territory you live in according to the climate conditions in and why:

FROST RESISTANCE

Bricks are classified into one of the three categories, F2, F1 and F0 according to their frost resistance within a standardized freezing test (Table 3.2).

Table 3.2 Designation of freeze/thaw resistance and active soluble salts content for clay bricks

Durability designation	**Freeze/thaw resistance**
F2	masonry subjected to severe exposure
F1	masonry subjected to moderate exposure
F0	masonry subjected to passive exposure
Active soluble salts content	
S2	sodium/potassium 0.06% %, magnesium 0.03
S1	sodium/potassium 0.17% %, magnesium 0.08
S0	no requirement

Only category F2 bricks are totally resistant to repeated freezing and thawing when in a saturated condition. Category F1bricks are durable, except when subjected to repeated freezing and thawing under saturated conditions. Therefore, category F1 bricks should not be used in highly exposed situations such as below damp- proof courses, for parapets or brick-on-edge copings, but they are suitable for external walls which are protected from saturation by appropriate detailing. Category F0 bricks must

only be used where they are subject to passive exposure, as when protected by cladding or used internally.

21Topics for projects and presentations:

1. Optimal dimension, characteristics, and strength.
2. Brick tinting.
3. World masterpieces made of brick.
4. Concrete bricks and concrete brickworks.
5. Calcium silicate bricks.

Word list to unit 3

brick, *n*	кирпич
clay, *n*	глина
lime, *n*	известь
firing temperature	температура обжига
kiln, *n*	печь для обжига и сушки
iron content	содержание железа
masonry construction	каменная конструкция
mortar, *n*	строительный раствор
shale, *n*	сланец
soft slate	мягкий аспидный сланец
calcium silicate	силикат кальция
concrete, *n*	бетон
quarried stone	камень, добытый в карьере
heat and cooling	нагрев и охлаждение
soft mud	пластичная керамическая масса
dry press	пресс полусухого прессования
extruded	полученный выдавливанием, экструдированный
silica, *n*	кварц, кремнезем
sand, *n*	песок
alumina, *n*	окись алюминия; глинозем
magnesia, *n*	окись магния, жженая магнезия
raw materials	сырье
hue, *n*	оттенок

hand-moulded brick	кирпич ручного формования
cement mortar	цементный раствор
arid climate	сухой климат
manufacturing process	производственный процесс
high-energy process	высокоэнергетический процесс
carbon dioxide	углекислота, углекислый газ
pollutant, *n*	загрязняющее вещество
sulphur dioxide	диоксид серы, сернистый газ
clay pit	зумпф (емкость для сбора воды) для глинистого бурового раствора
portland cement	портландцемент
crushed material	дробленый продукт
corbelled structure	ступенчатая структура
batch, *n*	партия товара
enhance, *v*	усиливать
exceed, *v*	превышать
stain, *n*	краситель
penetrate, *v*	проникать

remedial work	ремонтные работы
constituent, *n*	составная часть, компонент
pallet, *n*	поддон
quarry, *n*	карьер
conveyor belt	лента конвейера
clot, *n*	комок
bench, *n*	верстак, прощадка
green brick	кирпич-сырец, свежепрессованный, необожженный кирпич
folded surface	складчатая поверхность
cracking, *n*	растрескивание, образование трещин
distortion, *n*	искажение; искривление; перекашивание; искаженная, неправильная форма

shrinkage, *n*	усадка, усушка
moisture, humidity	влажность, сырость; влага, мокрота
intermittent kiln	печь периодического действия
continuous kiln	печь непрерывного действия
packing, *n*	упаковка
ork lift truck	вилочный погрузчик (подъемно-транспортное средство, поднимающее и перевозящее грузы с помощью вилочного захвата)
road vehicle	дорожное транспортное средство
high frost resistance	высокая морозостойкость
absorption, *n*	впитывание
high strength	высокая прочноть
airtight, *adj*	герметичный
putty, *n*	оконная замазка, шпаклевка
compressive strength	прочность на сжатие
severe / moderate / passive exposure	сильное / умеренное / слабое воздействие
soluble salts	растворимые соли
sodium, *n*	натрий
potassium, *n*	калий
magnesium, *n*	магний
thawing, *n*	таяние, оттаивание
damp-proof course	гидроизоляционная прослойка
cladding, *n*	плакировка, покрытие

"Beauty is due more to harmonious relationships among the elements of a composition than to the elements themselves." Matthew Frederick (architect)

Unit 4

a) *b)* *c)*

concrete

cement

lime

a)concrete *b) cement* *c) lime*

Figure 4.1

LEAD-IN

1.1 a) Match the words with the pictures (more than one answer is possible):

Mixture, to harden, calcium oxide, gravel, combination of, composite construction material, Portland, to bind, burnt in kilns, aggregates.

b) ***Match the terms with definitions*:**

1. cement	1.a) calcium-containing inorganic materials, in which carbonates, oxides and hydroxides predominate
2. concrete	2.b) a powdery substance made by calcining lime and clay, mixed with water to form mortar or mixed with
	sand, gravel, and water to turn into a solid
3. lime	3.c) a mixture of cement, water, sand and gravel (stones,

	crushed rock)

2 Read the following information and offer your ideas of further development and usage of cement:

Современный цемент был изобретен сравнительно недавно. В 1822 году после Отечественной войны 1812 года, Москва стре- мительно строилась. К вновь возводимым каменным зданиям предъявлялись повышенные требования по прочности и надеж- ности. Деревянных построек после памятного пожара, который устроили отступающие французы, старались не возводить. Рус- ский строитель Егор Челиев (по некоторым данным Делиев), про- водя эксперименты с обожженным составом извести и глины, по- лучил сухую строительную смесь способную затвердевать в воде до состояния камня. Так был изобретен современный цемент.

3 Discuss the following:

«Concrete tsunami is wiping out Russian heritage».

(From guardian.co.uk)

Clay and lime conceal much evil.

(Spanish proverb)

•Write a paraphrase. • Say whether you agree or not, and why.

READING

4a) Transcribe the following words:

hydraulic cement, carbon dioxide, lime mortar, aqueduct, artificial pozzolanas, argillaceous, calcium carbonate, carboniferous, iron oxide, polypropylene fibres.

b) In what context do you think the following words and phrases will appear in the text?

• adhesives •mortar •volcanic ashes •kiln •decarbonisation •plastic material •shape of the mould •absorption of water •frost damage

• ***c) Read the text and check your answers:***

LIME, CEMENT and CONCRETE

In the broadest sense, the term cement refers to materials which act as adhesives. However, in this context, its use is **restricted to** that of a *binding agent* for sand, stone and other aggregates within the manufacture of mortar and concrete. Hydraulic cements and limes set and harden by internal chemical reactions when mixed with water. Non-hydraulic materials will harden slowly by absorption of carbon dioxide from the air.

Lime was used as a binding agent for brick and stone by the ancient civilisations throughout the world. The concept was brought to Britain in the first century AD by the Romans, who used the material to produce lime mortar. Outside Britain, the Romans frequently mixed lime with volcanic ashes, such as pozzolana from Pozzuoli in Italy, to *convert* non-hydraulic lime into **hydraulic cement** suitable for use in constructing aqueducts, baths and other buildings. However, in Britain, lime was usually mixed with *artificial* pozzolanas, for example crushed burnt clay products, such as pottery, brick and tile.

Lime is manufactured by **calcining** natural calcium carbonate, typically hard-rock carboniferous limestone. The mineral is quarried, crushed, ground, washed and screened to the *required* size range. The limestone is burnt at approximately 950 °C in either horizontal rotary kilns or vertical shaft kilns which drive off the carbon dioxide to produce the lime products.

Portland cement is manufactured from calcium carbonate in the form of crushed limestone or chalk and an argillaceous material such as clay, marl or shale. Minor constituents such as iron oxide or sand may be added depending on the composition of the **raw materials** and the exact product required. In principle, the process involves the decarbonisation of calcium carbonate (chalk or limestone) by **expulsion of the carbon dioxide**, and sintering, at

the point of incipient fusion, the resulting calcium oxide (lime) with the clay and iron oxide. Depending on the raw materials used and their water content at extraction, four key variations in the manufacturing process have been developed: the wet, semi-wet, semi-dry and the dry processes.

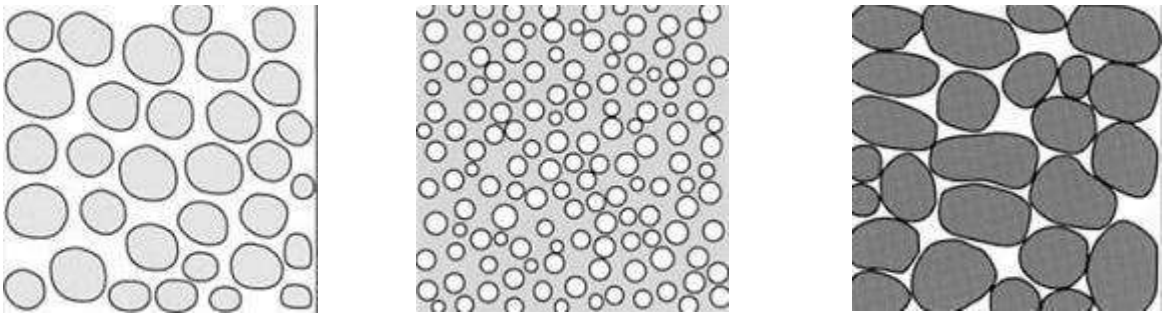
Concrete is a *mixture* of cement, *aggregates* and water together with any other admixtures which may be added to *modify* the placing and curing processes or the ultimate physical properties. Initially, when mixed concrete is a plastic material, which takes the shape of the mould or formwork. When hardened it may be a dense, load- bearing material or a lightweight, thermally insulating material, depending largely on the aggregates used. It may be **reinforced or prestressed** by the incorporation of steel.

Most concrete is *crushed and recycled* at the end of its useful life, frequently as hard core for new construction work. However, a growth in the use of **recycled aggregates** for new concrete can be anticipated, as this will have a *significant* environmental gain in reducing the demand on new aggregate extraction.

Aggregates for concrete are normally classified as lightweight, dense or high-density. Standard dense aggregates are classified by size as fine (i.e. sand) or coarse (i.e. gravel). Additionally, steel or polypropylene fibres or gas bubbles may be *incorporated* into the mix for specialist purposes.

Natural stone aggregate concretes typically have **densities** within the range 2200–2500 kg/m^3, but where densities below 2000 kg/m^3 are required, then an appropriate lightweight concrete must be used.

The three general categories of lightweight concrete are lightweight aggregate concrete, aerated concrete and no-fines concrete (Fig. 4.2).



Lightweight concrete *Aerated concrete* *No-fines concrete*

Figure 4.2. Lightweight concretes

Weak, permeable concrete is *particularly* vulnerable to the absorption of water into capillary pores and cracks. On freezing, the ice formed will expand causing frost damage. The use of **air-entraining agents**, which produce discontinuous pores within concrete, reduces the risk of surface frost damage. Concrete is *particularly* vulnerable to frost damage during the first two days of early hardening. Where new concrete is at risk, frost *precautions* are necessary to ensure that the mix temperature does not fall below 5 °C until strength of 2 MPa is achieved.

5Read the text again and answer the questions that follow (1-–10):

1. How is concrete defined in this context?
2. What are the ways of hardening of hydraulic and non-hydraulic materials?
3. What is “artificial pozzolana”?
4. Can you describe lime manufacturing?
5. How is Portland cement manufactured?
6. What is the connection between concrete and the incorporation of steel?
7. What happens to concrete at the end of its useful life?
8. What is said about aggregates?
9. There are three general categories of lightweight concrete, aren’t there? What are they?
10. What is the use of air-entraining agents?

Follow-up

6 ***a) Find the synonyms for the words in italics.***

*2.**b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.***

7 ***Give the English equivalents to the following and use 5 of them in small situations*:**

застывать; дробленный; искусственный пуццолан; добавки; размельченный; промытый; просеянный; до обязательных размеров; известковая глина; аргиллитовый сланец; второстепенные компоненты; спекание (агломерация); начальное плавление; включение (добавление) стали; щебень; восприимчивый к разрушению от мороза.

8 ***Read and translate the text and make 5 questions to it:***

Portland cement is produced from a slurried mixture of limestone and clay, burned at a high temperature in a kiln and the resulting clinker is then ground up, with ground calcium sulphate added to regulate its set. It is highly processed partly to ensure no variation in product.

The essential feature of a lime mortar or plaster is that it needs to carbonate in order to cure. A transformation takes place within it as calcium hydroxide changes to calcium carbonate, a process that requires moisture, as carbon dioxide in the atmosphere has to be carried into the lime plaster in solution. A hydraulic lime has the extra feature of also having a chemical set, so that it can feel hard to the touch within a few hours to a couple of days, depending on the strength of the hydraulic lime. It can remain workable for several hours or days, but it still needs to carbonate after it has set. Lime strengths vary greatly depending on the type of lime used, but it takes about 28 days to reach full strength.

Cement does not carbonate. It hardens because of a chemical reaction with water, usually setting within half an hour to an hour, after which time it cannot be re-worked. It takes about 28 days to

reach its full strength, and is generally very much stronger than lime.

LANGUAGEFOCUS

9 Use the words below to complete the sentences:

Cement is a bonding agent used in conjunction with sand, water, and 1) (crushed stone) to create mortar and/or concrete. You need cement for a variety of projects – to set 2) __for decking or fences, to fill a sidewalk, or to patch a blemish in your house's foundation. If you are doing a project that requires concrete or 3)) __ application, you will need to know how 4) _the cement that bonds the materials together. It's a good idea to take a look at the *Decorate Concrete Overlay Guide* - – you'll learn 5) that can improve the look of everything from concrete steps to sidewalks and more! Here is how you mix cement.

Materials: Portland Cement. This is pure cement mix. You will need to buy enough sand and aggregate to match the amount of cement you are buying (in the correct 6) __) to mix in. Read the back of the manufacturer's label to find the cement sand mix ratio and match the amounts needed for the project at hand. This is the cheapest option for creating a concrete or mortar, but it involves more physical work and 7). The basic formula for a cement mix ratio is1 part Portland cement, 1 part 8) , and 1 part crushed stone; the amount of water to add is not so clear cut – add 9) water so that the mix is not too wet and not too dry - – a little like cake mix. Some cement products 10)how much water to use per bag.

mortar, specify, sand, aggregate, enough, time, proportions, techniques, footings, to mix

10 Fill in the gaps with derivatives of the words in capitals:

MASONRY CEMENTS Portland cement mortar is 1) strong and	**UNNECESSARY**

concentrates any differential movement within brickwork or blockwork into a few large cracks, which are unsightly and may increase the risk of rain	
2). Masonry cement produces a weaker mortar,	**PENETRATE**
which accommodates some differential movement and ensures a 3)of hairline cracks within joints, thus	
4) __ the integrity of the bricks	**DISTRIBUTE**
and blocks. Masonry cements contain water-retaining	**PRESERVE**
mineral fillers, usually ground limestone, and air-entraining agents to give a 5)workability than unblended Portland cement. They should not	
normally	**HIGH**
be blended with further admixtures but 6) __ with	
building sand in ratios between 1 : 4 and	**MIX**
1: 6½ depending upon the degree of 7) _ _____of the	
brick or blockwork. The air entrained during	**EXPOSE**
mixing increases the durability and frost resistance of	
the 8)) _____mortar. Masonry cement is also	
appropriate for use in renderings but not for floor	**HARDEN**
screeds or concreting. It is therefore 9)used as an	
alternative to Portland cement with hydrated lime	**GENERAL**
or plasticiser. 10) __ pigments, except those containing carbon black, may be incorporated for visual effect.	**ORGANIC**

11 Fill in the gaps in the following passage with a suitable preposition given below:

PROPERTIES of CEMENT

- Not permeable. Creates a sealed surface that does not allow vapour passage.
- Rigid. Requires expansion joints to allow 1) _ _____natural earth movement without cracking.
- Hard. A great property 2) _the right place but often cement is too strong for the materials it is used with.

•Waterproof. Completely seals mortar joints or walls.

• Susceptible 3)_frost. Will crack in very cold conditions and therefore if used in foundations, needs to be in deep trenches that make contact with the warmth 4) _ the earth to avoid problems associated with frost heave.

•Attracts moisture. Other materials around cement need to be protected 5)it as it holds water and can cause rot to develop.

• Does not deal 6) __ moisture. Can cause condensation problems in bathrooms, kitchens, bedrooms as it does not regulate moisture.

• Does not have a long history. It was invented in the mid 19th 19th century and began to be used extensively 7) __1930 onwards. We are seeing some major damp and durability problems now, caused 8) __ the inappropriate use of cement from 50 or so years ago e.g. collapse of cob walls re-plastered with cement, the need to re-inforce some motorway bridges, excessive cracking in town houses leading 9)difficulty in re-selling.

• Causes green house gas effect. The manufacture of cement is one of the major causes of the green house gas effect globally as it releases tonnes of carbon dioxide 10) __ the atmosphere, none of which is re-absorbed by cement plaster.

by , of, from (x2), for, in (x2), into, with, to

12 ***Find and correct 10 mistakes:***

Hydraulic Lime can be made in two ways:

Fat lime or puty lime, maded from quicklime, with a pozzolan aded to it, to make the lime hidraulicby artificial means. The Romans used pumice or others volcanic rock but ground up brik dust can also bee used.

2. Naturally occurring hydraulic lime, that is producing from limestone that is high in silika (clay) and alluminum, is slaked and used straight away.

13 ***Translate into Russian without a dictionary:***

LIME

Limes may be divided into three distinct classes:

1.1. Rich limes that contain no more than 6 percent of impurities, slake very rapidly, and entirely dependent on external agents for setting power (от внешнего фактора для застывания). These are widely used for interior plasterer's works.

a) 2. Poor limes that contain from 15% % to 30% % of useless impurities and possess the general properties of rich limes, only to a lesser degree.

b) 3. Hydraulic limes that contain certain proportions of impurities, which when calcinated, combine with the lime and endow it with the valuable property of setting under water or without external agents.

Lime is one of the basic building materials extensively used all over the world.

LISTENING

14 Listen to Rick Bohan who speaks about cement and concrete.

Answer the questions below (1-–6):

1) 1. What does Rick Bohan do?
2) 2. What are the elements of making cement?
3) 3. Can you describe the process of making cement?
4) 4. What is the difference between cement and concrete?
5) 5. What is the primary ingredient in concrete?
6) 6. Why is cement called Portland cement?

VIDEO

14 ***Watch the video and present the main idea of each episode in***

4– 5 sentences using the expressions from Appendix 2.

WRITING

16 ***Render the text in English using the expressions from Appendix 2:***

ВИДЫ КОРРОЗИИ БЕТОНА

Свойства агрессивных сред и условия их воздействия на строительные конструкции весьма разнообразны. Не менее раз- нообразны свойства бетона и железобетонных конструкций. Поэтому нет возможности перечислить все коррозионные процессы, которые могут протекать при взаимодействии внешней среды с бетоном и железобетоном. Для оценки характера коррозионного процесса и степени агрессивного действия различных веществ, содержащихся во внешней среде на бетоны, необходима классификация таких воздействий по общим признакам.

Анализ большого экспериментального материала и результа- тов исследований сооружений, подвергавшихся действию раз- личных агрессивных сред, позволил В.М. Москвину выделить три основных основных вида коррозии коррозии бетона**.** *Первый Первый вид коррозии коррозии* включает процессы, возникающие в бетоне при действии жидких сред, способных растворять ком- поненты цементного камня. Составные части цементного камня растворяются и выносятся из структуры бетона. Особенно интен- сивно эти процессы происходят при фильтрации воды через тол- щу бетона.

Второй вид коррозии включает процессы, при которых происходят химические взаимодействия – обменные реакции между компонентами цементного камня и агрессивной среды, обра- зующиеся продукты реакции или легко растворимы и выносятся из структуры в результате диффузии влаги, или отлагаются в ви- де аморфной массы.

Третий вид коррозии включает процессы, при развитии которых происходит накопление и кристаллизация малорастворимых продуктов реакции с увеличением объема твердой фазы в порах бетона. Кристаллизация этих продуктов

создает внутренние напряжения, которые приводят к повреждению структуры бетона.

When rendering use these words and word combinations:

агрессивная среда – corrosive medium; железобетонная конструкция – reinforced concrete structure; воздействие – effect; коррозионно устойчивый – corrosion-proof / corrosion-resistant; растворяться – dissolve; диффузии влаги – moisture diffusion; малорастворимый – poorly soluble; внутреннее напряжение – internal stress.

17 ***Your company is ready to place an order with the cement plant. Write the letter of order in which you should:***

- ***thank for the catalogue and price-list you got 2 days ago;***
- ***specify description, minimum and maximum quantity of goods;***
- ***specify terms of payment;***
- ***ask to send you a letter confirming your order .***

Look at the example of the letter of order and use expressions from Appendix 3.

18 ***Translate the sentences from Russian into English. Be ready to present them not looking at the English equivalents:***

1. На цементных заводах производится крупное, среднее и мел- кое дробление твердых известняковых материалов.
2. Проницаемость цементного камня определяется его пористо- стью и наличием трещин.
3. Бетоны относятся к самым массовым по применению в строительстве благодаря их высокой прочности, надежности и долговечности при работе в конструкциях зданий и соору- жений.
4. Простейшим видом древнего бетона был камневидный мате- риал из смеси глины с песком и соломой (глинобетон).

5. Под действием внешних нагрузок в бетоне возникают внут- ренние напряжения сжатия, растяжения и изгиба.

19 ***Read the text. Make up a dialogue based on the text. Use the linking words/phrases from Appendix 1:***

CEMENT VS. MORTAR

The difference between cement and mortar is that cement is the binding agent, whereas mortar is a product composed of cement, sand and lime. Both these substances have distinct purposes, such as cement is activated with water and forms a bond with other other elements elements to form one solid object, whereas mortar is useful for holding bricks or stone together, and cannot stand alone like concrete. Cement is a substance that is used to make mortar grout and concrete, etc.

There are different kinds of uses for each mortar, grout or concrete mixed with cement, such as grout can fill gaps between tiles, but if the joints in the blocks have missing pieces, you need need mortar. Cement has many types itself, such as Portland, white or Masonry cement. Portland cement is used for structural applications to form an object. Mortar, as it may contain either Portland cement with lime, or Masonry cement, lime and sand, assembles masonry units into structural systems. The mix ratio of cement and the other ingredients determines the compressive and bond strength, including the absorption potential.

Mortar contains bonding enhancers used for filling the spaces between stone, brick or concrete blocks during building. It is also used for repairing and renovating purposes. Mortar is applied as a thick paste, and it sets hard after a short time to create a tight seal between stones or bricks to prevent air and moisture from entering the structure. Mortar has the ability to bond with joint reinforcements, etc, in the bricks. It helps to make an aesthetically pleasing and structurally sound building.

21 ***Topics for projects and presentations:***

1. Cement plants.
2. Environmental impacts of cement.

3. Building with concrete.
4. Use of concrete in infrastructure.

The technology and use of hydraulic lime.

Word List to unit 4

concrete, *n*	бетон
lime, *n*	известь
predominate, *v*	преобладать, превалировать
powdery, *adj*	пылеобразный
substance, *n*	вещество
gravel, *n*	гравий
clay, *n*	глина
mortar, *n*	строительный раствор
sand, *n*	песок
solid, *n*	твердое тело
mixture, *n*	смесь
crushed rock	щебень
adhesive, *n*	связывающее вещество; клеящий материал
restrict, *v*	ограничивать
binding agent	связующее вещество
aggregate, *n*	заполнитель, инертный материал
harden, *v*	твердеть, набирать прочность (о бетоне)
absorption, *n*	поглощение, абсорбция; всасывание; впитывание
volcanic ash	вулканический пепел
pozzolana, *n*	пуццолан (гидравлическая добавка)
artificial, *adj*	искусственный
pottery, *n*	керамика, керамические изделия
tile, *n*	черепица
clayey limestone	глинистый известняк
carboniferous limestone	каменноугольный известняк
quarry, *n*	каменоломня, открытая разработка, карьер
grind, *v*	молоть, перемалывать

screen, *v*	просеивать, сортировать
rotary kiln	вращающаяся печь
vertical shaft kilns	вертикальная шахтная печь
marl, *n*	мергель; известковая глина; нечистый известняк
shale, *n*	сланец; сланцевая глина
composition, *n*	состав
raw material	сырье
expulsion, *n*	удаление (воздуха, газа, воды, пара) ; выхлоп; испарение
carbon dioxide	диоксид углерода
sintering	спекание
fusion, *n*	плавление, слияние

water content	содержание воды
extraction, *n*	экстракция, извлечение
wet, *n; adj*	сырость, влажность; мокрый, влажный, сырой
dry, *adj*	сухой
admixture, *n*	добавка; примесь
placing, *n*	кладка; укладка
curing processes	процесс затвердевания
property, *n*	свойство
mould = mold, *n*	форма; литейная форма
formwork, *n*	опалубка
dense, *adj*	плотный
load-bearing	несущий нагрузку
lightweight легкий;	легкий; легковесный
insulating material	изоляционный материал
steel, *n*	сталь
life	срок службы
reinforced concrete	железобетон
prestressed concrete	предварительно напряженный железобетон
anticipate, *v*	ожидать, предвидеть

fine aggregate	мелкий заполнитель
coarse aggregate	крупный заполнитель
polypropylene fibre	полипропиленовое волокно
gas bubble	газовый пузырь
density, *n*	плотность
aerated concrete	пористый бетон, ячеистый бетон; газобетон
permeable, *adj*	водопроницаемый
vulnerable, *adj*	восприимчивый
crack, *n*	трещина; расселина; щель
air-entraining agent	материал, добавка, вовлекающие воздух (в бетонную смесь)
slurry, *n*	глинистая суспензия; жидкая глина
plaster, *n*	штукатурка, штукатурный раствор (для внутренних работ)
solution, *n*	раствор
hair crack	волосная трещина
joint, *n*	соединение
water-retaining	водоудерживающий; гидрофильный
workability, *n*	способность (материала) подвергаться обработке; обрабатываемость
durability, *n*	долговечность; прочность; стойкость
rendering, *n* первого слоя	первый слой штукатурки, наружная штукатурка; нанесение штукатурки первого слоя

screed, *n*	(штукатурный) маяк
plasticizer, *n*	пластификатор
impurity, *n*	примесь, загрязняющее вещество
rich lime	жирная известь
poor lime	тощая известь
cement paste	цементное тесто (строительного раствора)

"A good building reveals different things about itself when viewed from different distances." Matthew Frederick (architect)

Unit 5

TIMBER

a) logging *b) sawn timber* *c) wood house*

a) logging *b) sawn timber* *c) wood house*

Figure 5.1

LEAD-IN

1a) Explain how the following words are connected with "timber":

boards, lumber, cut wood, foresters, to harvest, loggers, mill, to be processed.

•b) Read the information below and compare your answers:

Timber is another name for wood, whether still standing in the form of trees or felled and turned into boards for construction. Some people may also refer to timber as lumber, or differentiate between timber as unprocessed wood and lumber as cut wood

packaged for commercial sale. The timber industry around the world is huge, providing wood for a variety of products from paper to particle board.

Before timber is felled, it must be assessed by foresters, who determine how valuable it is and whether or not it is safe to harvest. In many regions of the world, a timber harvest plan must be filed with a government agency, indicating intent to fell trees in a particular region. If the plan is approved, a logging company sends in loggers and support staff to fell the trees and prepare them for shipment to an offsite mill. In some cases, a mill may be established in the forest, if there is a lot of timber which needs to be processed.

2 Speculate on the areas of timber application.

3 Discuss the following:

"Good timber does not grow with ease. humanity no stronger the wind, the stronger the trees.
(J. William Marriott)

"Out of the crooked timber of the humanity no straight thing was ever made."
(Immanuel Kant)

•Write a paraphrase. ***• Say whether you agree or not, and why.***

READING

4a) Transcribe the following words:

versatility, diversity, fuel, cellulose, lignin, polymers, glucose, crystalline, deciduous, knots, rustic, lacquer.

b)In what context do you think the following words and phrases will appear in the text?

•building material •versatility •diversity •paper production •photosynthesis •dry weight •commercial timbers •flooring

•knots •sealed with oil or lacquer •external timber cladding

c) Read the text and check your answers:

TIMBER AND TIMBER PRODUCTS

Timber, arguably the original *building material*, retains its prime importance within the construction industry because of its versatility, diversity and aesthetic *properties*. About 20% % of the earth's land mass is covered by forests, divided roughly two thirds as **hardwoods** in temperate and tropical climates and one third as **softwoods** within temperate and colder regions. *Approximately* a third of the annual worldwide timber harvest is used in construction, and the rest is consumed for paper production, as, or wasted during the **logging process**.

The main **constituents** of timber are cellulose, hemicellulose and lignin, which are natural polymers. Cellulose, the main *constituent* of the cell walls, is a polymer made from glucose, a direct product of photosynthesis within the leaves of the tree. Glucose molecules *join* together to form cellulose chains containing typically 10,.000 sugar units. Alternate cellulose chains, running in opposite directions to each other, form a predominantly well-ordered crystalline material. It is this crystalline chain structure which gives cellulose its **fibrous properties**, and accounts for approximately 45% % of the dry weight of the wood.

Commercial timbers are defined as hardwoods or softwoods according to their botanical classification rather than their physical strength.

Hardwoods are from broad-leafed trees, which in temperate climates are **deciduous**, losing their leaves in autumn, although in tropical climates, when there is little *seasonal variation*, old leaves are constantly being replaced by new. **Hardwood flooring** has a proven track record for durability and aesthetic impact. Both solid timber and **plywood laminates** with a 4 mm hardwood wearing layer are commercially available. The standard timbers are the European oak, beech, birch, ash, chestnut, walnut and maple, but additionally some imported hardwoods with darker **grain colours** are available and interesting effects are produced with bamboo.

The timbers are frequently offered with minimal knots and uniform graining or as rustic with knots and a larger *variation* of colour. Laminates are usually **prefinished** but solid timber may be sealed with oil or lacquer after installation on site.

Softwoods are from conifers, characteristically with needle-shaped leaves, and growing predominantly in the northern temperate *zone*. Mostly they are evergreen, with the notable exception of the European larch and they include the Californian redwood, the world's largest tree with a height of over 100 metres. Western red cedar has long been the preferred timber for external timber cladding because of its durability and warm colour. However, recently the popularity of larch and Douglas fir as softwood cladding has increased as *greater emphasis* is placed on the use of renewable resources from sustainable forests due to its moderate durability to decay and more resistance to impact damage.

1)5 Read the text again and answer the questions that follow (1-–7):

1. Why is timber considered to retain its prime importance within the construction industry?
2. What climate areas do hardwoods and softwoods cover?
3. Which are natural polymers? Characterize each of them.
4. What is commercially available among hardwoods?
5. What kinds of trees are mentioned in the text?
6. How can you characterize softwoods?
7. What softwoods are preferable for external timber cladding? Why?

Follow-up

6a) Find the synonyms for the words given in italics.

b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

7 Give the English equivalents to the following and use 5 of them in small situations:

строительная промышленность; покрыто лесами; приблизи- тельно 2/3; ежегодные лесозаготовки; природный полимер; со- ставлять около 45% %; согласно чему-либо; широколиственный; срок службы; покрытие из древесины твердых пород; наросты; преимущественно; возобновляемые ресурсы.

8 a) Scan the text, but at six points fragments have been removed. Study the list with the missing fragments and decide where they go:

Timber, as a natural product, is rarely free from blemishes or defects. Timber imperfections 1): natural, conversion and seasoning defects, according to whether they were present in the living tree, or arose during subsequent processing. Additionally, timber may be subjected to deterioration by weathering, fungal and insect attack and fire.

On prolonged exposure to sunlight, wind and rain, 2) __ their natural colours and turn grey. Sunlight and oxygen break down some of the cellulose and lignin into water-soluble materials which are then leached out of the surface leaving it grey and denatured. Moisture movements, 3)_, raise the surface grain, open up surface checks and cracks and increase the risk of subsequent fungal decay. Provided the weathering is superficial, the original appearance of the timber can be recovered by removing the denatured surface.

Wood preservatives contain pesticides in the form of insecticides and fungicides. Their use is therefore strictly controlled 4) environmental damage.

Timber is an organic material and therefore combustible. Surface treatments, 5), include antimony trioxide flame-retardant paints which are suitable for both interior and exterior use. Intumescent coatings, which swell up and char in fire, are suitable for most environments if overcoating is applied. However, 6) _ may be negated by unsuitable covering or removal by redecoration.

a) associated with repeated wetting and drying cycles;
b) to limit unnecessary or accidental;
c) which cause the evolution of non-combustible gases in fire;
d) the protection afforded by surface treatments;
e) can be divided into three main categories;
f) external timbers gradually lose.

b) Give a written literate translation of the text.

LANGUAGEFOCUS

9 Use the words below to complete the sentences:

MOISTURE CONTROL

Wood is a 1) __ material, which means it naturally absorbs and releases water to balance its internal moisture content with the surrounding environment. The moisture content of wood is measured by the 2)of water as a percentage of the oven-dry weight of the
wood fiber. The key to controlling decay is to control moisture. Once decay fungi are established, the minimum moisture content for decay to propagate is 22 to 24% %, so building experts 3) __ 19% % as the maximum safe moisture content for untreated wood in service. Water by itself does not 4) the wood, but rather, wood with consistently high moisture content enables fungal organisms to grow.

The 5) objective when addressing moisture loads is 6) __ water from entering the building envelope in the first place, and to balance the moisture content within the building itself. Moisture control by means of accepted design and construction details is a simple and practical method of 7) __ a wood-frame building against decay. Finally, for applications with a high risk of staying 8)) __, designers should specify durable materials such as naturally decay-resistant species or wood that's been treated with preservatives. Cladding, shingles, sill plates and exposed timbers or 9) __beams are examples of potential 10) __ for treated wood.

recommend, applications, to keep, wet, hygroscopic, glulam, weight, harm, primary, protecting

10 Fill in the gaps with derivatives of the words in capitals:

To avoid decay and termite 1), it is important to separate 2) __ wood from the ground and other sources of moisture. These separations are required by many 3) ___ codes and are considered necessary to maintain wood elements in permanent structures at a safe moisture content for decay 4) . When it is not possible to separate wood from the sources of moisture, 5)) often rely on preservative-treated wood. Wood can be treated with a preservative that improves service life under severe conditions without 6) __ its basic characteristics. It can also be pressure-impregnated with fire-retardant chemicals that improve its performance in a fire. Wood does not deteriorate just because it gets wet.	**INFEST** **TREAT** **BUILD** **PROTECT** **DESIGN** **ALTER**

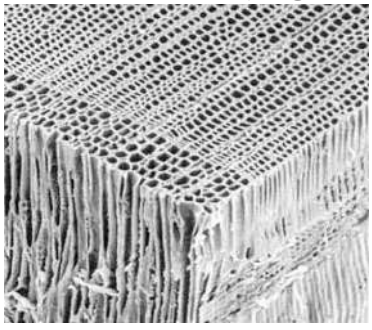
When wood breaks down, it is because an organism is eating it as food. Preservatives work by making the food source inedible to these organisms. 7)preservative-treated wood can have 5 to 10 times the service life of untreated wood. Preserved wood is used most often for railroad ties, utility poles, marine piles, decks, fences and other outdoor applications. Various 8) __ methods and	**PROPER** **TREAT**

types of chemicals are available, depending on the attributes required in the particular 9) __ and the level of protection needed. There are two basic methods of treating: with and without 10) _____. Non-pressure methods are the application of preservative by brushing, spraying or dipping the piece to be treated. Deeper, more thorough penetration is achieved by driving the preservative into the wood cells with pressure. Various combinations of pressure and vacuum are used to force adequate levels of chemical into the wood.	**APPLY** **PRESS**

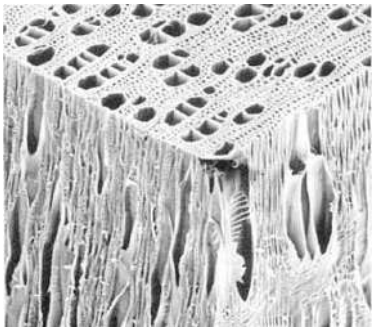
11 *Fill in the gaps in the following passage with a suitable preposition given below:*

between , of (x3), into, for, in, with, to

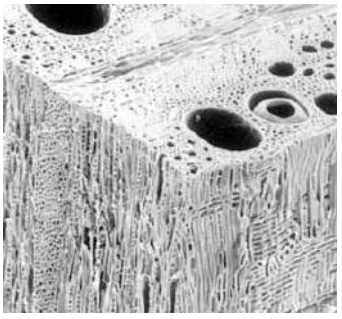
Under microscopic investigation, softwoods show only one type 1) _____ cell which varies 2) _____ size 3) _____ the rapid growth 4)) __ spring and early summer (early wood) and the slow growth 5)) __ the late summer and autumn (late wood). These cells perform the food- and water-conducting functions and give strength 6)) __ the tree. Hardwoods, however, have a more complex cell structure 7) _ __ large cells 8)the conducting functions and smaller cells providing the mechanical support. They can be divided 9) __ two distinct groups: diffuse-porous hardwoods and ring-porous hardwoods (Fig. 5.2).



Softwood –



Diffuse-porous hard-



Ring-porous

Scots Pine *wood – Birch* *hardwood – Oak*

Figure 5.2. Cell Structure

12 Puzzle out the crossword:

R	W	O	O	D	W	O	R	K	J	G	H
E	S	W	I	T	C	H	I	N	G	E	E
L	R	O	E	D	S	T	Y	U	I	O	R
I	A	S	C	A	S	E	M	E	N	T	M
E	A	S	D	K	F	G	H	J	K	L	E
F	Q	W	E	E	E	R	T	Y	U	I	T
Q	W	N	E	R	T	T	T	Y	U	I	I
A	I	H	A	N	D	L	E	E	D	V	C
P	L	U	M	B	E	R	C	E	R	T	G
B	R	G	R	O	O	V	E	R	T	Y	U
B	R	I	C	K	C	E	R	T	Y	Y	U
C	R	T	Y	U	E	C	D	W	E	R	T

1.. Деревянные части здания. 2. Рельеф. 3. Кирпич. 4. . Электро-розетка. 5. Выключатель. 6. Водопроводчик. 7. Оконная рама. 8. . Сосна. 9. Герметичный. 10. Желобок. 11. Петля дверная, оконная. 12. Ручка дверная, оконная.

13 Look at the text, separate the words to make sense:

CONTROLLING TERMITES and OTHER INSECTS

• Gradethebuildingsiteawayfromthefoundationtoprovideproperdrain age.
• Coverexposedgroundinanycrawlspaceswith6-milpolyethylenefilm.
• Supportpostcolumnsbyconcretepiers(atleastsixinchesofclearspace bet ween thewoodandexposedearth).
•
Installwoodframingandsheathinginexteriorwalls(atleasteightinchesa bo ve exposedearth).
• Removebuildingmaterialscrapsfromthejobsitebeforebackfilling.

14a) Translate into Russian without a dictionary:

TIMBER REDUCES CARBON COST

We live in an age where the impact of extracting, refining, processing and manufacturing building materials like concrete and steel is incredibly high, accounting for more than 10% % of global annual greenhouse gas emissions. So when it comes to volume house- building, you just can't get a greener building material than timber frame. It's organic, non-toxic and naturally renewable. It's carbon neutral, even allowing for transport.

It's also worth pointing out that the UK timber frame industry plays no part in the deforestation that is such a terrible and dramatic threat to our planet. 99% % of all UK timber frame homes are built using softwood from sustainably managed forests in Europe. And harvesting timber in this way is extremely beneficial for the planet because growing trees absorb so much carbon dioxide from the atmosphere. The more wood we use, the more our forests grow because in Europe, we are committed to planting more trees than we harvest.

Benefits of using timber frame construction:

- The carbon dioxide emissions from a single timber frame, three bed detached home are 16.5% % less than its brick and block equivalent.
- For every cubic metre of wood 0.8 tonnes of carbon are saved from the atmosphere. For a typical 100 m² two storey detached timber frame house, this translates into a carbon saving of four tonnes of CO_2 – about the amount produced by driving 14,.000 miles.
- House-builders using a standard 140 mm stud timber frame system achieve U-values (коэффициент теплоусвоения) between 0.30 and 0.27 using readily available and standard insulation, and using higher performance insulation and insulating breather membranes can boost these figures even more.

b) Choose ten unfamiliar expressions from the text, consult the dictionary and use them in your own story about timber.

LISTENING

14 ***Audio "Woodworking Information - – Different Types of Wood".***

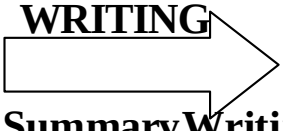
Listen to to the the information information twice twice and and fill fill in in the the table:

Type of Wood	Name	Description/Application
Softwood	1.	
	2.	
	3.	
Hardwood	1.	
	2.	
	3.	
	4.	
	5.	
	6.	
	7.	
	8.	
	9.	
Wood for carving and painting		
Exotic Wood	1.	
	2.	
	3.	
	4.	
	5.	

VIDEO

15 ***Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.***

WRITING



Summary Writing

80

STRATEGY POINT

Some summary writing questions ask you to identify ideas that are shared by both texts. This can occur in the form of "echoed ideas", where the two writers say the same thing in different ways. You may also come across questions that ask you to locate where one writer responds to a statement found in the other passage.

16a) Read the following texts on interior timber decoration and answer the questions that follow:

Your staircase is an integral piece of your home. It is usually the first thing you see when you open the front door. With timber staircases and timber handrails you can create a stunning, high-impact feature without the hassle.

A lot of people love the warm, classic feel of staircases. The choice that natural timber gives you is wide and varied. Sapele has a dark red colour, very like mahogany but not harmful to environment, and when polished, looks stunning. Oak stair parts will give you a classic, opulent timber staircase. Pine is a flexible choice as it can be stained, polished or painted, and is cheaper than hardwood timber options. However, don't feel restricted to just choosing one. Mix and match different timbers to create a beautiful yet cost effective staircases.

To achieve the feel of a classic staircase you do not need to use all timber stairparts. For your staircase balustrade you could choose decorative wrought iron or glass panels. Timber handrails will finish off an all-timber staircase to create a warm, traditional feel. Alternatively, timber handrails can also be used in stark contrast to very contemporary materials to stunning effect.

When you are building your home or commercial property there is nothing that compares to the luster and beauty of the timber floor. In fact a home nicely decorated with wooden floor gives a different kind of elegance to the entire place. In fact the flooring plays an important part in the interior decoration. Timber floor is good looking, durable and easy to clean. It is always better to go for the wood flooring because of its beauty and is also at the same

Choosing the type of hard wood that best suits the space is an important step in planning the installation of your new home. Solid wood flooring comes in three types.

There are several things to keep in mind when choosing the appropriate appropriate type of wood flooring for your home. Solid wood flooring may require a little more upkeep than engineered wood flooring, but they can always be re-sanded and refinished. If you like thin, long planks of wood, you should choose strip flooring.

If you prefer the aesthetic of very wide planks of wood, then plank flooring is the best choice. And, if you have a more decorative look in mind - perhaps a geometric design - parquet floors will be a perfect match for your taste.

To really achieve a luxury staircase you should look at continuous curved handrail. Bespoke, complex timber handrails are manufactured for each individual environment to ensure a smooth handrail. Continuous timber handrail cannot be beaten when creating a distinctive staircase.	It is important to keep the flooring user friendly so that you feel comfortable whenever you walk or move hurriedly. One of the biggest drawbacks of timber flooring is the surface deterioration of the floor due to improperly sealed joints.

1. The first text talks about “a stunning, high-impact feature”. Where is this echoed in the second text?
2. What term does the second text use to refer to “not harmful to environment” that we read in the first text?

b) In a paragraph of 120-–150 words, summarize in your own words as far as possible, how interior timber decoration make homes warm and luxurious according to the two texts. Use the expressions from Appendix 2.

17 ***You are a manager of a woodworking enterprise. Your company has been placed a large timber order with. Write a letter of confirmation. Look at the example of the letter of confirmation and use expressions from Appendix 3.***

18 ***Translate into English using your active vocabulary:***

1. Производство изделий из дерева и обработку древесины можно подразделить на следующие виды работ: лесозаготовку, мебельную промышленность и производство древесной массы, целлюлозы, бумаги и картона, а также изделий из бумаги и картона.

2. Процесс заготовки древесины начинается с отбора участка для лесоповала; затем производится лесопиление и распиловка поваленных деревьев на бревна.
3. На лесопильных предприятиях производится начальная стадия переработки бревен в пиломатериалы, которая выполняется с помощью циркулярных или ленточных станков.
4. Однако кроме пиления применяются и другие способы обработки бревен, в числе которых можно назвать фрезерование, лущение, строгание, точение, сверление и шлифование.
5. Дерево – это экологически чистый, натуральный материал, который не выделяет вредных токсичных веществ при нагревании.

SPEAKING

19 ***Read the text. Make up a dialogue based on the text and learn it by heart. Use the expressions from Appendix 1. Underlined expressions are necessary to use and be ready for a quiz:***

WOOD VS. BRICK HOUSE

Choosing the right material for building or renovating a house is the cornerstone of comfort, quality and design. Both brick and wood are beautiful and practical choices for homes. They also come in a variety of colors, finishes, treatments and styles. They are natural looking, durable and insulate well.

Location. Brick and wood are suitable for both city and country residences. Brick works well in cold climates. It retains natural heat and stays warm a long time. Brick protects well against storms and is a reliable option where storms are a threat. Wood is more convenientand appropriate in remote settings, in vales (where erosion and silt accumulation can damage brick walls) and where wood is widelyavailable. Wood is relatively light compared to brick and more flexible.

Purpose. Many varieties of brick are guaranteed to last for one or two lifetimes. However, brick is marginally more expensive than wood. Wood is biodegradable, affordable, healthy and safe. Wood

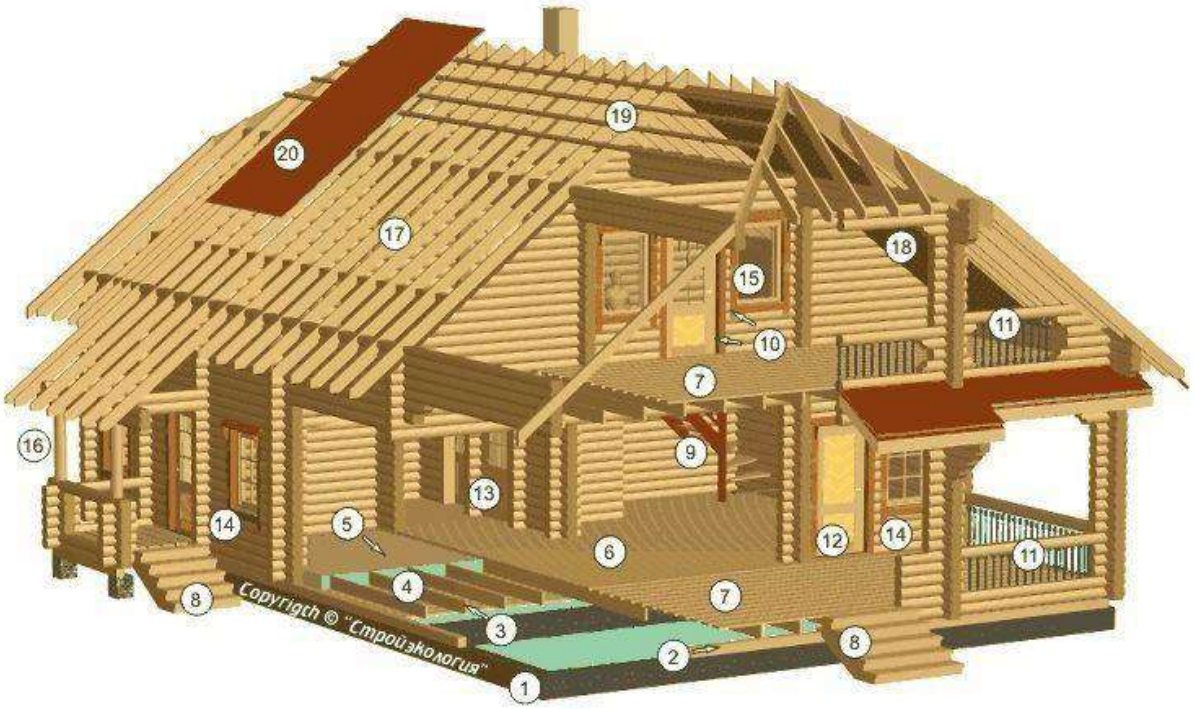
homes are easier to renovate, alter and build than brick. Thick, rot-treated logs can last up to one hundred years or more. Hardwoods and older trees are strong and durable.

Advantages. Brick has several advantages in addition to weatherproofing, heat and property value. It is fireproof, termite resistant and energy efficient. Brick is incredibly stable. It requires nomaintenance. Wood also insulates well and is safe. Its flexibility, variety and natural properties make it easy to work with. Some woods are thought to release terpenes, a substance that soothes the mind and body ("forest bath effect"). Wood is also a natural air conditioner and absorbs humidity.

Disadvantages. Poorly made bricks such as clinkers and older recycled bricks might be pitted, irregularly shaped, worn or prone tochipping. In damp or humid climates, porous brick invites mold. It suffers damage as water and ice expand and contract in its pores. Wood is vulnerable to natural disasters such as fire, infestations oftermites and decomposition through rot. Wood is susceptible to cracking when soaked.

20 ***Study the vocabulary given below and present your project of a wood house.***

1 -– base
2 -– underlaying beam
3 -– “"black”" floor
4 -– ground floor beams
5 -– floor warming
6 -– floor boards
7 -– terrace and balcony floor board
8 -– outer stairs
9 -– internal stairs
10 -– outer platband
11 -– outer barrier
12 -– outer door
13 -– internal door
14 -– window
15 -– window simple
16 -– column
17 -– rafters
18 -– ceiling of floors
19 -– roofing lathing
20 -– roofing material



21 ***Revise material of the Unit 5 and present a full characteristic of a timber.***

22 ***Topics for projects and presentations:***

1. Timber-frame construction.
2. Timber products.
3. Timber recycling.
4. Wood preservation (timber treatment).
   Illegal logging.

Word List to unit 5

logging, *n*	лесозаготовки; лесосплав
sawn timber	обработанный лесоматериал
wood, *n*	дерево; древесина; лесоматериал
felled, *adj*	срубленный
lumber, *n*	пиломатериал; строительный лес
shipment, *n*	перевозка (груза)
mill, *n*	завод; фабрика
versatility, *n*	универсальность, многосторонность
diversity, *n*	разнообразие
hardwood, *n*	древесина твердых пород
softwood, *n*	древесина мягких пород; мягкая древесина
harvest , *n; v*	лесозаготовки; заготавливать древесину
constituent, *n*	составная часть, составляющая
cellulose, *n*	целлюлоза; клетчатка
lignin, *n*	лигнин (изолирующий материал)
cell wall	стенка клетки
dry weight	вес в сухом состоянии, сухой вес
broad-leaved , *adj*	широколиственный, широколистный
temperate climate	умеренный климат
deciduous, *adj*	лиственный, листопадный
seasonal variation	сезонные колебания
track record	достижения
wearing layer	слой износа
oak, *n*	дуб
beech, *n*	бук
birch, *n*	береза (дерево и древесина)
ash, *n*	ясень
chestnut, *n*	древесина каштанового дерева
walnut, *n*	ореховое дерево
maple, *n*	клен
grain, *n*	волокно древесины
knot, *n*	нарост (о дереве)
rustic, *adj*	с грубой поверхностью

prefinish, *v*	обрабатывать начерно
seal, *v*	уплотнять; герметизировать
lacquer, *n*	масляный лак, нитроцеллюлозный лак
site, *n*	строительная площадка
conifer, *n*	дерево хвойной породы
needle-shaped, *adj*	игольчатый, иглообразный
larch, *n*	древесина лиственницы
redwood, *n*	красное дерево; секвойя; сосна

western red cedar	туя
fir, *n*	пихта; хвойный лес
renewable resource	возобновляемый ресурс
decay, *n; v*	гниль; гнить
impact damage	разрушение при ударе
blemish, *n*	дефект поверхности
eterioration, *n*	разрушение; изнашивание
fungal, *adj*	грибковый
prolonged exposure	длительное воздействие
denature, *v*	изменять естественные свойства
moisture movement	миграция влаги
superficial, *adj*	поверхностный; внешний
insecticide, *n*	препарат для уничтожения насекомых
fungicides	фунгициды (ядовитые вещества, применяемые для борьбы с грибами, разрушающими деревянные сооружения)
combustible, *adj*	воспламеняемый, горючий
treatment, *n*	обработка (технологическая); пропитка, пропитывание
antimony trioxide	сесквиоксид сурьмы
flame-retardant	огнестойкий
intumescent coating	вздувшееся покрытие
oven-dry weight	вес древесины после сушки в печи
building envelope	ограждающая конструкция здания

shingle, *n*	тонкая доска
sill plate	порог рабочих окон
glulam beam	слоистая дощатоклееная балка
railroad tie	железнодорожная шпала
utility pole	столб; опора
pile, *n*	свая
deck, *n*	настил; плита настила; платформа; палуба
fence, *n*	забор, изгородь, ограда
brushing, *n*	нанесение кистью (напр. краски)
dipping, *n*	погружение, окунание, отделка окунанием
diffuse-porous, *adj*	рассеяннопористый
ring-porous, *adj*	кольцепоровый
crawl space	полупроходное техническое подполье (высотой до 1,5 м)
film, *n*	пленка, тонкий слой

"Any aesthetic quality is usually enhanced by the presence of a counterpoint." Matthew Frederick (architect)

Unit 6

BUILDING STONE

a) granite b) stone cladding the 11th century
c) the great Zimbabwe kingdom

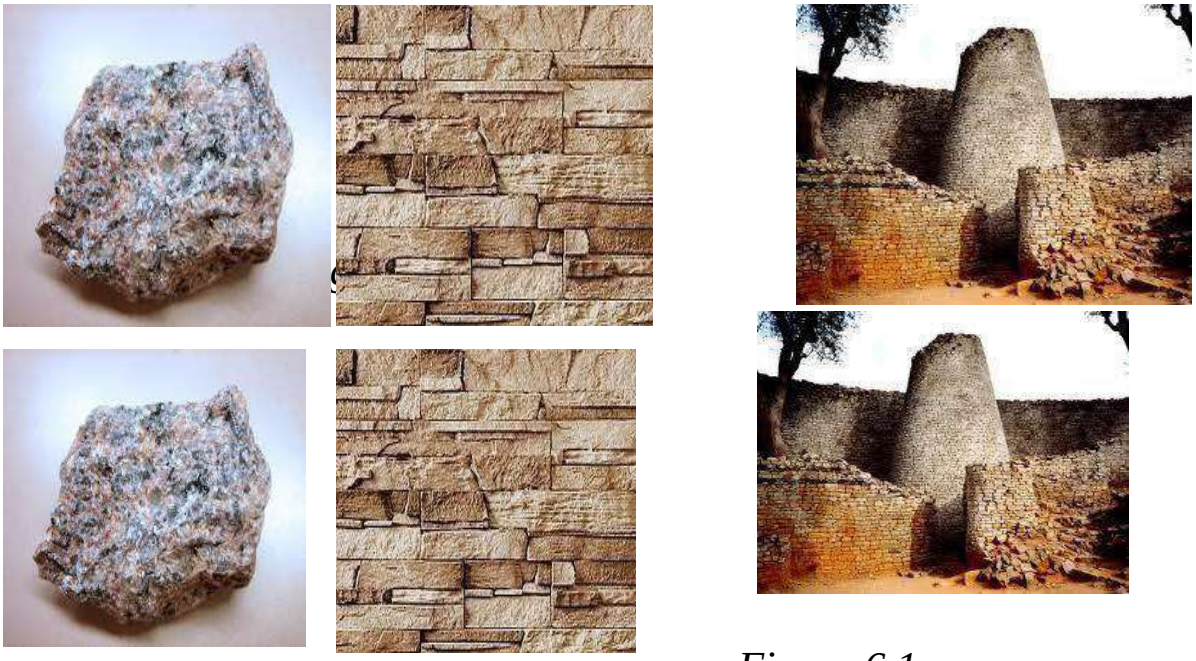


Figure 6.1

LEAD-IN

1 ***Match the terms with definitions:***

1. rock	a) hard solid non-metallic mineral matter of which rock is made, especially as a building material
2. stone	b) a building component, such as a block or lintel, made from cast concrete with a facing that resembles natural stone
3. marble	c) a very hard, granular, crystalline, igneous rock consisting mainly of quartz, mica, and feldspar and often used as a building stone
4. granite	d) any natural material, hard or soft (e.g. clay), having a distinctive mineral composition
5. cast stone	e) a hard crystalline metamorphic form of limestone, typically white with coloured mottlings or streaks, which may be polished and is used in sculpture and architecture

2 ***Read the advertisements and in two minutes be ready to speculate on stone applications. What are other areas of stone applications?***

a) Все знают, что натуральный камень очень часто используют для наружной отделки, ведь более подходящего материала для

этого дела не придумаешь: природные камни, обладающие высокими коэффициентами прочности, могут прослужить вам не одну сотню лет.

b) Искусственный камень - – широкие возможности для дизайнера. Он экологичен, доступен, легок, прост в монтаже, производится в близком от места строительства регионе и имеет широкую цветовую гамму, а его формы и фактуры идеально имитируют природные.

c) В современном строительстве все чаще для утепления используются базальтовые утеплители. Базальтовая вата, которая лежит в основе популярных утеплителей, отличается высокими изоляционными показателями, которые определяются изначально низкой теплопроводностью самих волокон и присутствующей в структуре влаги. Кроме того, утеплитель базальтовый не поддерживает горение и не выделяет токсичные вещества при нагревании, посему может использоваться для защиты промышленных трубопроводов.

3 3 ***Discuss the following:***

"Leave no stone unturned."
(Euripides)

A rolling stone gathers no moss.
(Proverb)

Write a paraphrase. ***• Say whether you agree or not, and why.***

READING

4a) Transcribe the following words:

igneous, metamorphic, sedimentary, plutonic, granite, pumice, dolerite, bedding planes, calcium carbonate, silica, iron dioxide, dolomite, calcareous, siliceous, ferruginous, quartzite, ochre.

b) In what context do you think the following words and phrases will appear in the text?

•natural rocks •sophisticated use •magma •solidification
•aggregates •by the weathering and erosion •strength and durability

•range in colour •recrystallisation of older rocks •metamorphosed •flooring material

c) Read the text and check your answers:

STONE and CAST STONE

The term stone refers to natural rocks after their removal from the **earth's crust**. The significance of stone as a building material is illustrated by widespread prehistoric evidence and its sophisticated use in the early civilisations of the world, including the Egyptians, the Incas of Peru and the Mayans of Central America. Geologically, all rocks can be classified into one of three groups: *igneous*, *metamorphic* and *sedimentary*, according to the natural processes by which they were produced within or on the earth's surface.

Igneous rocks are the oldest, having been formed by the **solidification of the molten core** of the earth or magma. They form about 95% % of the earth's crust, which is up to 16 km thick. Depending on whether solidification occurred slowly within the earth's crust or rapidly at the surface, the igneous rocks are defined as plutonic or volcanic, respectively. In the plutonic rocks, slow cooling from the molten state allowed large crystals to grow, which are characteristic of the granites. Volcanic rocks such as pumice and basalt are **fine-grained** and individual crystals cannot be distinguished by eye. Dolerites, formed by an intermediate rate of cooling, exhibit a medium-grained structure.

Basalt is a fine-grained stone nearly as hard as granite. It can be melted at 2400 °C and cast into tile units which are deep steel grey in colour. . **Annealing in a furnace** produces a hard virtually maintenance-free, shiny textured surface flecked with shades of green, red and bronze.

Although basalt and dolerite have not been used widely as building stones they are frequently used as **aggregates**, and cast basalt is now being used as a reconstituted stone.

Sedimentary rocks are produced by the weathering and erosion of older rocks. The natural bedding planes associated with the formation of the deposits may be thick or thin but are potentially weak; this is used to advantage in the quarrying process.

Deposits of sand cemented together by calcium carbonate, silica, iron oxide and dolomite produce calcareous, siliceous, ferruginous and

dolomitic sandstones, respectively. Depending on the nature of the original sand deposit, the sandstones may be fine or coarse in texture. Sandstones range in colour from white, buff and grey through to brown and shades of red depending on the natural cement; they are generally **frost-resistant**.

Limestones consist mainly of calcium carbonate, either crystallised from solution as calcite or formed from accumulations of **fossilised shells** deposited by various sea organisms.They are generally classified according to their mode of formation. Many colours are available ranging from off-white, buff, cream, grey and blue.

Metamorphic rocks are formed by the recrystallisation of older rocks, when subjected to intense heat or pressure or both, within the earth's crust. Clay is metamorphosed to slate, limestone to marble and sandstone to quartzite.

Slate is derived from fine-grained sand-free clay sediments. Slate can be split into thin sections (typically 4–10 mm for roofing slates) giving a natural riven finish, or it may be sawn, sanded, fine rubbed, honed, polished, flame textured or bush hammered.

Marble is metamorphosed limestone in which the calcium carbonate has been recrystallised into a mosaic of approximately equal-sized calcite crystals.

Quartzite is metamorphosed sandstone. The grains of quartz are recrystallised into a matrix of quartz, producing a durable and very hard-wearing stone used mainly as a **flooring material**. The presence of mica allows the material to be split along smooth **cleavage planes**, producing a **riven finish**. Quartzite is available in white, grey, grey-green, blue-grey and ochre colours.

5Read the text again and answer the questions that follow (1-–10):

1. What does the term "stone" refer to?
2. How long has stone been used as a building material?
3. How can all rocks be classified geologically?
4. What is igneous rock?
5. What is the difference between plutonic and volcanic rocks? Give the examples of stones.

6. How are sedimentary rocks produced? What stones are defined as sedimentary?
7. Metamorphic rocks are formed by recrystallisation of young rocks, aren't they?
8. Can you describe slate?
9. What happens to limestone when metamorphosed?
10. What is quartzite usually used as? Why?

Follow-up

6a) Find the synonyms for the following words:

excavation, quickly, feature, recognize, show, reconstructed, tint, enable, composed of, aggregation, nearly, equal in size, finish, long-lived.

1)b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

7 Give the English equivalents to the following and use 5 of them in small situations:

термин относится к …; земная кора; значимость камня; демонстрируется/показывается; классифицируется в/на …; согласно …; формируется путем затвердевания; определяется как …; соответственно; визуально менее интересный; плавится при температуре …; блестящая текстурированная поверхность; плоскость наплавления; ассоциируется с …; получить максимальную прочность и долговечность; стадия образования; в диапазоне от …; происходить от …; раскалываться/ расщепляться на …; рекристаллизоваться в …; зависеть в большей степени от … .

8 Read and give a literate translation of the text and make 5 5 questions to it:

SLATE

Slate is one of nature's more interesting products, being used as a building stone for centuries. Its laminar nature makes it easy to shape and work, rendering it a popular choice for roofing and walling.

The formation of slate within the Earth's crust started more than 500 million years ago. A fine-grained, metamorphic rock, slate is formed through a sedimentary process, stacking clay, volcanic ash and other elements to create a shale-type, foliated stone. Slate typically offers two lines of breakability, a cleavage and a grain line, making it easily possible to split the stone into thin, durable sheets.

Since it is formed in layers, it can easily be split to expose a beautifully textured surface. The colors of slate tend to be earthy, comprised of shades and mixtures of browns, beiges, yellows, blacks, dark grays and green grays. There are also a number of exotic slates which feature pinks, purples and copper tones. Combining slate with other materials emphasizes the qualities and attractiveness of both.

Slate has been used for centuries as the material of choice to create unique paving, landscaping and roofing applications.

LANGUAGE FOCUS

9 Use the words below to complete the sentences:

CAST STONE

Cast stone is a type of 1)__ material designed to imitate different types of real stone. Created in the middle ages, cast stone is now used throughout modern construction and, with the right ingredients, can 2) __ a wide variety of real 3) __at a reduced cost and with greater strength.

Cast stone is both strong and highly customizable. While the 4) __ingredient of most cast stone is Portland cement, makers add a variety of other 5) _, including sand, various grains of other minerals and even 6) __ pigments to change the color. As a result, cast stone can be made to resemble limestone, granite, quartz, blue stone, marble and many other types of real stone at a more affordable price. It can even replace brick or be 7)into a brick pattern that looks authentic but lasts longer than real bricks. This makes cast stone a versatile substance that can be used throughout a building.

Cast stone should not be confused with architectural 8) concrete. They are used for similar projects, but the purpose of cast

stone is to 9) or function as a type of real stone, while precast concrete is always concrete gray and made of similar materials. Precast concrete is a more affordable option, especially when 10) the outside of houses or buildings in which there is no need to replicate the look of a particular type of stone.

base, imitate, components, building, coloring, precast, decorating, resemble, molded, minerals

10 ***Fill in the gaps with derivatives of the words in capitals:***

Marble is metamorphosed limestone in which the calcium carbonate has been recrystallised into a mosaic of approximately equal-sized calcite crystals. The process, if complete, will remove all traces of fossils, the size of the crystals being 1)dependent on the duration of the process. Some limestones which can be 2)are 3)__ as marble, but true marble will not contain any fossillised remains. Calcite itself is white, so a pure marble is white and translucent. The colour sand veining characteristics of many marbles are associated with impurities within the 4)limestone; they range from red, pink, violet, brown, green, beige, cream and white to grey and black.Marble is attacked by acids; therefore honed, rather than 5)surfaces, are recommended for external 6) __. Marbles are generally hard and dense, although fissures and veins sometimes require filling with epoxy resins. For external 7) __above first floor level 40- mm-thick slabs are used, although 20 mm may be appropriate for internal linings and external cladding up to first floor level. 8)___ cramps and hooks should be in 9) steel, phosphor bronze or copper. Floors labs, to a minimum 10)of 30 mm, should be laid on a minimum 25 mm bed. Marble wall and bathroom floor tiles are usually between 7 mm and 10 mm in thickness. Marble is metamorphosed limestone in which the calcium carbonate has been recrystallised into a mosaic of	**LARGE** **POLISH** **SELL** **ORIGIN** **HIGH** **APPLY** **CLAD** **FIX** **STAIN**

approximately equal-sized calcite crystals. The process, if complete, will remove all traces of fossils, the size of the crystals being 1) dependent on the duration of the process. Some limenstones which can be as marble, but true marble will not contain any fossillised remains. Calcite itself is white, so a pure marble is white and translucent. The colour sand veining characteristics of many marbles are associated with impurities within the 4)limestone; they range from red, pink, violet, brown, green, beige, cream and white to grey and black. Marble is attacked by acids; therefore honed, rather than 5)surfaces, are recommended for external 6). Marbles are generally hard and dense, although fissures and veins sometimes require filling with epoxy resins. For external 7)above first floor level 40-mm-thick slabs are used, although 20 mm may be appropriate for internal linings and external cladding up to first floor level. 8) cramps and hooks should be in 9) steel, phosphor bronze or copper. Floors labs, to a minimum 10)of 30 mm, should be laid on a minimum 25 mm bed. Marble wall and bathroom floor tiles are usually between 7 mm and 10 mm in thickness	**THICK**

11 ***Fill in the gaps in the following passage with a suitable preposition given below:***

Granite is a common and widely occurring type of intrusive, felsic, igneous rock. Granite has a medium to coarse texture, occasionally 1) __ some individual crystals larger than the groundmass forming a rock known as porphyry. Granites can be pink ***2)***__ dark gray or even black, depending 3) _ _____their chemistry and mineralogy. Outcrops of granite tend to form tors, and rounded massifs. Granites sometimes occur 4)circular depressions surrounded

5) a range of hills, formed 6) _____ the metamorphic aureole or hornfels.

Granite is an igneous rock and is formed 7) __ magma. Granitic magma has many potential origins but it must intrude other rocks. Most granite intrusions are emplaced 8) depth 9) the crust, usually greater than 1.5 kilometers and 10) 50 km depth within thick continental crust.

at , by (x2), from, in, on, to, up, to, with, within

12 ***Puzzle out the crossword:***

1.. Механик. 2. . Часть, элемент. 3. . Замок. 4. . Мост. 5. . Крыша. 6. . Площадка. 7. . Строить. 8. . Бетон. 9. . Строительство. 10. . Лесома-териал. 11. Пещера.12. Глина. 13. Сплав.14. Город-ской. 15. Кирпич. 16. Газ. 17. Архитектура. 18. Видоизменение. 19.. Цемент. 20. . Викторина. 21. Стекольщик.

E	M	E	C	H	A	N	I	C	L	A	Y
L	N	E	R	G	Y	O	G	A	S	L	C
E	C	G	Q	U	I	Z	L	S	C	L	O
M	O	D	I	F	I	C	A	T	I	O	N
E	N	I	E	N	E	L	Z	L	L	Y	C
N	S	R	R	O	E	S	I	E	L	O	R
T	T	B	C	A	V	E	E	T	O	O	E
I	R	O	O	F	O	B	R	I	C	K	T
A	U	R	B	A	N	A	S	I	T	E	E
U	C	E	M	E	N	T	N	I	N	I	O
S	T	I	M	B	E	R	Z	E	E	G	O
A	R	C	H	I	T	E	C	T	U	R	E

13

13Find and correct 10 mistakes, both spelling and grammar, in each text:

a)) Most granites are hardly and dense, and thus form high durable building materials, virtually impermeable to water, resistant in impact damage and stable within industrial environments. The appearance of granite is significantly affect by the surface finish which may be saw, rough punched, picked, fine tooled, honed or polished. It is, however, the highly polished form of granite which are most effective at displaying the intensity of the colours and reflectivity of the cristals. Granite is available for flooring and for hard landscaping including pavings, setts and kerbs. Polish granite is also useing as a kitchen countertop material due to its strengf, durability and high-quality finish *(10 mistakes)*.

b) The use of cast stone begins in the second century in Europa, where it was maked specifically for castles and churches. The molds allowed masons to be much most precise in their sculpting and to repeat the same kreation over and over again. As the centuries pass, cast stone became more popular as a component of manors and mansions, where builders used it to add designs to the corners of builders or to provided a stone sheet to cover brik walls. By the 1900s, cast stone had been using in a variety of construction projects *(10 mistakes)*.

LISTENING

14Audio "Igneous, Sedimentary and Metamorphic Rocks".

Listen to the information twice and be ready to answer the questions below (1-–12):

1. What types are rocks grouped into?
2. Where does igneous rock form?
3. What is magma? What is the difference between magma and lava?
4. What igneous rock is formed below ground level?
5. Where is basalt formed?
6. What are sediments?
7. How is sedimentary rock formed?
8. How are limestone and chalk appeared?
9. When did carboniferous period exist?
10. What are the perfect conditions for the organisms to form carboniferous limestone?
11. How are sandstone and clay formed?
12. How are marble and slate formed?

VIDEO

15 Watch the video and present the main idea of each episode in 4-–5 sentences using the expressions from Appendix 2.

WRITING

16 a) Read the following passage and underline the parts where the answer to each question is contained:

1. What is quartzite?
2. Is a range of colours wide? What does it depend on?
3. What are its physical characteristics?
4. Why is quartzite widely used as an ornamental stone?
5. What are the examples of dark red quartzite application?

b) Find English equivalents to the expressions in bold given in the texts.

c) In a paragraph of 120-–150 words, and using the expressions from Appendix 2 and your own words as far as possible, summarize and render in English what is said about natural quartzite.

•17 ***Translate into Russian without a dictionary:***

a) 1. Натуральным камнем называют все горные породы, используемые используемые в строительстве, такие как мрамор, гранит, туф, сланец, песчаник, ракушечник и оникс.

b) 2. Природный камень износостоек, морозоустойчив и почти не впитывает влагу.

c) 3. Мраморные камины и лестницы сегодня являются отличным решением для того чтобы устроить красоту и роскошь в своем доме.

d) 4. Элементы из малинового кварцита использовались при отделке только самых красивых и значительных зданий Российской империи – таких, как Зимний Дворец, Исаакиевский и Казанский Соборы, Михайловский Замок, Московский Кремль.

e) 5. Базальт Базальт используют как сырье для щебня, производства производства базальтового волокна базальтового волокна (для производства теплозвукоизоляционных материалов), каменного литья и кислотоупорного порошка, а также в качестве наполнителя для бетона.

SPEAKING

18a) Read the text and express its main idea in 3-–4 sentences:

Stone cladding is a thin layer of stone applied to a building or other structure made of a material other than stone. Stone cladding is sometimes applied to concrete and steel buildings as part of their original architectural design.

Stone cladding often refers to lightweight simulated stone products with a concrete type base. These stone cladding products are often fitted to light weight substrates to reduce the material cost of construction.

A lightweight substrate would typically be a timber stud frame, it would then have a waterproof barrier attached, then fibre cement

sheet, expanded metal mesh, a mortar scratch coat, and then using a mortar mix, the stone cladding would be adhered to the wall.

Pouring concrete into stone cladding molds allows you to create panels that look like real stone masonry. You can buy these molds from a number of suppliers, or you can make your own, using a pourable mold-making compound. Making your own cladding molds can be cost-effective, because you need to cast several panels even to cover a small wall, and each panel takes three days to fully cure. So the more molds you have, the faster you can produce the panels you need.

b) Read the instruction how to make a stone cladding. But the phases are messed up. Arrange them into correct order: Things You'll Need:

- Masonry stones
- Board, 6 inches wide by 12 feet long
- Plywood sheet, 2 feet by 4 feet
- Nails
- Hammer
- Spray polyurethane sealant
- Pourable 2-part urethane mold-making compound
- Mixing bucket and stick

a) Allow the urethane to cure for 48 hours.
b) Pour the mold compound over the stones in the box. The compound should cover the stones to a depth of at least one inch. If you have not mixed enough, immediately mix more; you have about 30 minutes to add additional compound before it begins to set.
c) Arrange the stones in the bottom of the box, facing up, the way you would want to see them in the cast duplicates. Place them about as far apart as you intend to install them on the wall. Leave a oneinch margin between the outside edge of the group of stones and the wall of the pour box. Seal the stones with the spray sealer.
d) Build a pour box. Cut the board into two, four-foot lengths and two, two-foot lengths. Nail them together to form a two- by 4-foot frame that is six inches deep. Nail the plywood over one side of this

frame. Seal the inside of the box with polyurethane spray sealer.
e) Wait an additional five to seven days before using the mold to make casts; this will allow the urethane to reach its full strength.
f) Mix equal amounts of both parts of the urethane molding compound in a clean bucket. Mix enough to cover the stones in the box to a depth of at least one inch. Stir thoroughly until the mixture color becomes.
g) Invert the pour box and shake slightly to allow the urethane mold and the stones to drop out of the box. Remove the stones and wash any residue from the mold.

c) Talk about stone cladding.

19 ***Read the text. Make up a dialogue based on the text using the expressions from Appendix 1:***

CAST STONE VS. NATURAL LIMESTONE

When comparing manmade cast stone products to quarried stone, three factors need to be taken into consideration: Time, Cost and Durability.

When making cut stone parts with intricate design work, such as a Corinthian capital, the same amount of time is involved in reproducing each individual part.

When using cast stone, once the original design work is complete on the first stone produced, the time is dramatically reduced on all following cast stones produced. Because of the speed and ease of producing additional pieces, the cost is substantially lower as well.

Cast stone is more durable than natural limestone due to the process by which it is produced. By hand-forging each part, casted stone gains strength and durability without the air pockets that are common in natural stone.

20 ***Topics for projects and presentations:***

1. Stone masonry constructions.
2. Interior stone.
3. Exterior stone.

4. Engineered stone.
5. Architectural cast stone.

WordListtoUnit 6

stone cladding	облицовочный камень
rock, *n*	горная порода
marble, *n*	мрамор
granite, *n*	гранит
cast stone	бетонный камень
exterior finish	наружная отделка (здания)
strength factor	коэффициент прочности
heat insulation material	утеплитель
earth's crust	земная кора
igneous rock	вулканические породы; изверженные породы
metamorphic rock	метаморфическая порода
sedimentary rock	осадочная горная порода
solidification, *n*	застывание, отвердевание, затвердевание
molten core	расплавленное ядро
occur, *v*	происходить, случаться
pumice, *n*	пемза, пористый вулканический материал
fine-grained, *adj*	мелкозернистый
dolerite, *n*	долерит, крупнозернистый базальт
annealing, *n*	отжиг
fleck, *v*	покрывать пятнами
erosion, *n*	эрозия, выветривание; разъедание; размывание
bedding plane	плоскость подстила, плоскость напластования
deposit, *n*	отложение, осадок
sill, *n*	подоконник
string course	перевязка каменной кладки, поясок
calcareous sandstone	известковый песчаник
siliceous sand	кремнистый песок

ferruginous sandstone	песчаник, содержащий железо
dolomitic sandstone	доломитовый песчаник
accumulation, *n*	накопление
fossilised shells	затвердевшие раковины
slate, *n*	аспидный сланец
sediment, *n*	осадок
riven, *adj*	расколотый
fossil, *n*	ископаемое
mica, *n*	слюда
cleavage plane	плоскость скалывания, плоскость скола
ochre, *n*	охра (вид краски, бледно-желтый цвет)
laminar, *adj*	слоистый; пластинчатый

stacking clay	глина, уложенная слоями
foliated stone	слоистый камень
cleavage, *n*	расщепление, раскалывание
paving, *n*	мостовая; мощение улиц
customizable, *adj*	удовлетворяющий требованиям заказчика
blue stone	медный купорос
precast concrete	сборный железобетон
translucent, *adj*	прозрачный; просвечивающий; светопрозрачный
acid, *n*	кислота
slab, *n*	плита
copper, *n n*	медь
intrusive rock	интрузивная порода
porphyry, *n*	порфир
chemistry, *n*	химия
mineralogy, *n*	минералогия
hornfels роговиковая	роговиковая горная порода
kerb, *n*	бордюр
lightweight substrate	легкая основа
mesh	арматурная сетка

scratch coat	обрызг (первый слой трехслойной штукатурки по драни или сетке)

"Color theory provides a framework for understanding the behavior and meaning of colors." Matthew Frederick (architect)

Unit 7

PAINTS, WOOD STAINS, VARNISHES and COLOUR

Figure 7.1. Varnishes and Paints

LEAD-IN

a)*1 *Match the terms with definitions:

1. paint	1.a) a commercially produced substance for colouring
2. colour	2.b) a substance used for removing an unwanted stain, mark, or coating from a surface
3. varnish	3.c) a substance used to give something a particular colour
4. wood stain	4.d) a coloured substance which is spread over a surface and dries to leave a thin decorative or protective coating
5. remover	5.e) resin dissolved in a liquid for applying on wood, metal, or other materials to form a hard, clear, shiny surface when dry

2 Read the following passages and offer your ideas to complete them:

- A wood stain can enhance the natural beauty of any wood species, from hardwoods to soft and porous woods like cedar or redwood. There is a perfect stain for every project, but using the wrongwood stain will have upsetting results that isn't easy to fix later …
- Appropriate interior paint colors can revitalize every surface of your home, from the walls and ceilings to the doors, paneling, and trim. Thousands of combinations are available …
- Clear wood finishes are both beautiful and tuff, providing a high degree of chemical and abrasion resistance. All act as a wood sealer, protecting the wood fibres from water and cleaning chemicals. They can be applied to …

3 Discuss the following:

Black and white

Grass is always greener on the other side

•Write a paraphrase of each idiom. • Say whether you agree or not, and why.

READING

4a) Transcribe the following words:

varnishes, specification, ceiling, exposure, oxidize, vinyl, hydrocarbon, ester, barite, zinc, copper naphthenate, dichlorofluanid, tribiborate, hexylene, glycol, octaborate, tetrahydrate, ultraviolet, polyurethane, beeswax, larch.

b) In what context do you think the following words and phrases will appear in the text?

•color system •1950 colors •six pure colors •blend of components •paint film •solidify by drying •pigments •preservative basecoat •penetrate •protection from weathering

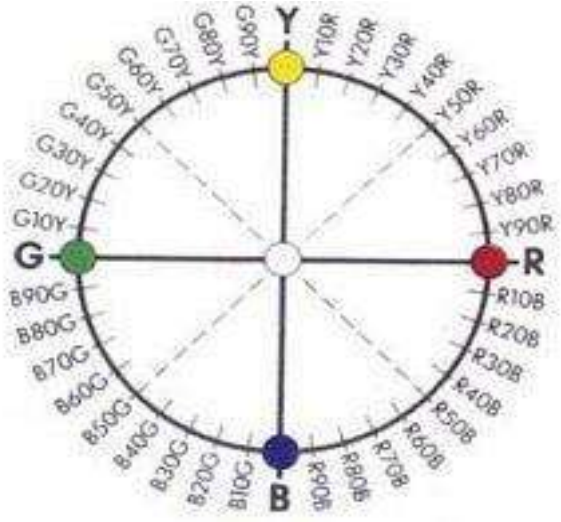
c) c) Read the text and check your answers:

PAINTS, WOOD STAINS, VARNISHES and COLOUR

Colour being a key feature of architectural design is an important factor in the description of paints, wood stains and varnishes.

The Natural Color System®© (NCS) was developed by the Scandinavian Colour Institute in the 1980s and modified in 1995 with a second edition in which extra colours were added and some removed leaving a total of 1950 colours. It is a colour language system which can describe any colour by a **notation**, communicable in words without the need for **visual matching**. It has been used by architects, builders and designers who need to coordinate colour specification across a broad range of building products. A range of materials can be colour-referenced using the system; these include wall, floor and ceiling tiles, carpets, fabrics, **wall coverings**, flexible floor finishes, paints, **architectural ironmongery** and metalwork, sanitary fittings, laminates and furniture.

The Natural Color System®© is based on the **assumption** that for people with normal vision there are six pure colours; yellow, red, blue, green, white and black. The four colours, yellow, red, blue and green are arranged around the colour circle, which is then subdivided into 10 % steps. For example, yellow changes to red through orange, which could be described as Y50R (yellow with 50 % red) (Fig. 7.2).



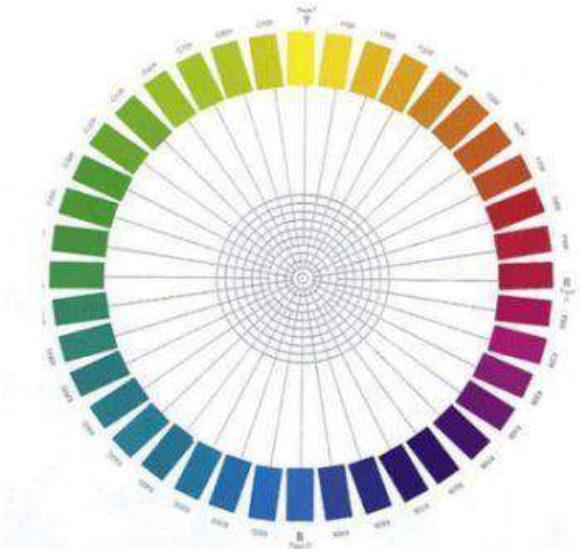


Figure 7.2. Natural Color System

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Paints consist of a **blend of components**, each with their specific function. Commonly, these include the binder (or medium), solvent, base, extenders, pigments and driers, although other additives may be incorporated into specialist paints.

The binder is solidified to produce the paint film. Traditionally, the binder was natural linseed oil, which set by gradual oxidation on exposure to air. However, linseed oil has now largely been replaced by alkyd resins which oxidise in air, or vinyl and acrylic resins which solidify by drying. To ensure adequate fluidity of the paint during application by brushing or spraying, either water or organic solvents (hydrocarbons, ketones or esters) are incorporated; paint thinners have the same effect. The base material, usually white titanium dioxide, **produces the required opacity**, although the body of the paint may be increased by the incorporation of inert extenders such as silica, calcium carbonate, china clay or barytes. Colouring materials are frequently a mixture of organic and inorganic dyes and pigments. Driers which induce the polymerization of the binder ensure a rapid drying process.

Natural wood finishes include wood stains, varnishes and oils. Wood stains are pigmented resin solutions which penetrate into the surface and may then build up a **sheen finish**. Varnishes are unpigmented resin solutions which are intended to create a surface film.

Most wood stain systems for exterior use include a water- or solventbased **preservative basecoat** which controls rot and mould growth.

Typical formulations include zinc or copper naphthenate, dichlorofluanid, tri-(hexylene glycol) biborate and disodium octaborate tetrahydrate. Wood stain finishes are either low-, medium- or high-build systems, according to the particular application. They usually contain iron oxide pigments to absorb the ultraviolet light which otherwise causes the **surface degradation** of unprotected timber. Generally, for rough-sawn timber, deeply penetrating wood stains are appropriate, whereas for smooth-planed timber a medium or high build system gives the best protection from weathering. Products are based on acrylic and/or alkyd resins.

Traditional varnishes are combinations of resins and drying oils, but most products are now based on modified alkyd resins. Polyurethane varnishes are available in matt, satin or gloss finishes, based on either water or solvent-based systems.

Wood finishes entirely composed of natural products are also available. These are based on blends of beeswax, larch resin, vegetable oils, and may incorporate minerals and earth pigments for colour and opacity.

5 ***Read the text again and complete the sentences (1-–10):***

1. The Natural Color System was … .
2. It is a color language system describing … .
3. There are six pure colors … .
4. Paints consist of … which include … .
5. The binder … .
6. Coloring materials are … .
7. Natural wood finishes include … .
8. Vanishes are … which … .
9. Most wood satin systems … which … .
10. Wood finishes are based on … .

Follow-up

6 **a*) Paraphrase the following words:***

color specification, flexible floor finishes, sanitary fittings, normal vision, subdivided into, additives may be incorporated into, natural linseed oil, gradual oxidation on exposure of air, to ensure adequate fluidity, base material, coloring materials, natural wood finishes, exterior use, to cause, modified alkyd resins, composed of.

b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

7 ***Give the English equivalents to the following and use 5 of them in small situations:***

основной характерный признак; естественная система цвета; добавить и удалить; передаваемый словами; исключая необходимость визуального сопоставления; определенная функция; алкидная смола (полимер); окисляться на воздухе; застывать (густеть) при высыхании; увеличиться за счет наполнителей; смесь орга-

нических и неорганических красок и пигментов; вызывать (приводить к) полимеризацию; проникать в поверхность; контролировать гниение и плесень (грибок); в зависимости от конкретного применения; смесь пчелиного воска; смолы лиственницы и растительных масел.

8 ***Read and give a literate translation of the text and make 5 questions to it:***

Polyurethane varnishes are typically hard, abrasion-resistant, and durable coatings. They are popular for hardwood floors but are considered to be difficult or unsuitable for finishing furniture or other detailed pieces. Compared to simple oil or shellac varnishes, polyurethane varnish forms a harder, decidedly tougher and more waterproof film. However, a thick film of ordinary polyurethane may de-laminate if subjected to heat or shock, fracturing the film and leaving white patches. This tendency increases with long exposure to sunlight or when it is applied over soft woods like pine. This is also in part due to polyurethane's lesser penetration into the wood.

Unlike drying oils and alkyds which cure, after evaporation of the solvent, upon reaction with oxygen from the air, true polyurethane coatings cure after evaporation of the solvent by a variety of reactions of chemicals within the original mix, or by reaction with with moisture moisture from from the the air.

Water exposure, humidity, temperature extremes, and other environmental factors affect all finishes. In other words, the only coat of varnish with near perfect durability is the one stored in a vacuum, in darkness, at a low and unvarying temperature. Otherwise, care and upkeep are required.

LANGUAGE FOCUS

9 ***Use the words below to complete the sentences:***

Wood finishing refers to the process of embellishing and/or protecting the surface of a wooden material. The process starts with 1)) __ preparation, either by sanding by hand, scraping, or planing. Imperfections or nail holes on the surface may be filled using wood

putty or pores 2) __. Often, the wood's colour is changed by staining, 3) _____ , ammonia fuming and a number of other techniques. To avoid blotching, a barrier coat such as shellac or "“wood conditioner" ” is 4) __ before the stain. Gel stains are also used to avoid blotching.

Once the wood surface is prepared and stained, a number of 5) __ of finish may be applied, often sanding between coats. Commonly used wood finishes include wax, shellac, 6) (such as linseed oil or tungoil), lacquer, varnish, or paint. Other finishes called "“oil finish" ” or "“Danish oil" ” are actually thin 7) with a relatively large amount of oil and solvent. Water-based finishes can cause what is called "“raising the grain" ” where surface fuzz emerges and requires sanding down.

Finally the surface may be 8)or buffed using steel wool, pumice, rotten stone and other polishing or rubbing 9) depending on the shine desired. Often, a final coat of wax can be applied over the finish to add a slight amount of protection.

Special tools used to apply wood 10) __ include rags, rubbing pads, brushes, and spray guns.

bleaching, finishes, coats, surface, drying oils, filler, polished, applied, varnishes, compounds

10 ***Fill in the gaps with derivatives of the words in capitals:***

Wood stain is a product 1)for protecting wooden surfaces and giving them a decorative finish. Wood staining can be used to obtain the desired colour, to accentuate the 2) __ beauty and texture of the wood, to imitate precious wood or conceal blue stain damage and other 3). In 4) to that, wood stains are used for protective purposes. The stains for surfaces indoors help to prevent 5) caused by the UV 6) __; the stains for surfaces outdoors also protect the wood from the adverse effects of weather. Most of wood 7) _ are transparent or semi-transparent and only tone the wood without masking it, but 8) __ opaque, fully masking stains are also available. However, even opaque stains leave the texture of the wood visible. Stains are available in a 9)of tones from 10)) __wood tones to various bright modern colours.	**DESIGN** **NATURE** **DEFECT** **ADD** **YELLOW** **RADIATE** **STAIN** **NEAR** **VARY**

11 ***Fill in the gaps in the following passage with a suitable preposition given below:***

PIGMENT

Two different types of pigment go 1) _a can of paint. First are "prime" pigments. These provide color and hide. Second are low- cost "extender" pigments. 2) _ comparison, they add bulk 3)
) __ the product, but have little value as it relates 4)color.

Higher-quality paints have more 5) __ the all-important, yet more expensive prime pigments – all the things that 6)the end give you easier application as well as better durability and color retention.

Pigments are defined as any insoluble solid 7) __ coating materials. They are typically the colorant portion 8) __ a coating material, but can also perform other functions.

Some pigments provide corrosion protection, stability in ultraviolet (UV) light, or protection 9) _ __ mold, mildew or bacteria.

Others can be used 10)_ conductive ability, texture, or metallic or pearlescent appearance.

by , from , for, in (x2), into, of (x2), to (x2)

1212 ***Correct 10 mistakes, both spelling and grammar. Translate the text in a written form:***

VARNISHES

Varnish is resin dissolved in turpentine or in a mixture of turpentine and a drying oil such as linseed oil. There is several resins available with which to make a varnish, and the selection of a resin is guided by use.

Picture Vanish is used as a final coating for a painting to protect the picture and unify the appearance of the surface. It can, for example, make the surface appear either matte or shine, or protect the paint film from chemical reactions with the atmosphere and from mechanical abrasion. Retouch Varnish is using to give a full and wet look to the surface of the unfinished painting before work is resumed. This prevent the eye from been fooled by the unevenness of the light reflected from parts of the painting's surface.

Mixing Varnish is use as an additive to the painting medium to accelerate the drying time, to add gloss, and to given body to a glaze.

Isolating Varnish is a resin that is soluble in turpentine or mineral spirits. When this varnish is applied to a paint film, it will protects it from being affected by the turpentine or mineral spirits in the next layer of paint to be applied.

13 ***Translate into Russian without a dictionary:***

PAINT and VARNISH REMOVERS

Chemical paint and varnish removers are available in a variety of semi-paste and liquid forms. Almost all chemical removers are referred to as "“paint removers" ” or "“paint strippers”." There are several basic types of paint removers:

• Liquids are primarily for clean coatings and removing one or two layers of paint. This formula dries too quickly to remove

multiple layers of paint. Good for detail areas or irregular surfaces. Also good for the stubborn spots after a washable has been used.

□□• Brushables are a thick, paste-like formula that allows the paint remover to be applied in heavy layers so that it stays wet in order to strip multiple layers (up to 10 or more) in one application. Allows remover to cling to vertical or even overhead surfaces. Some paint removers are the "wash away" or "water wash" types. These terms simply indicate that the paint remover formula includes an emulsifier that permits the chemicals to mix with water and be rinsed away with a hose.

14Puzzle out the crossword:

E	H	Y	D	R	O	L	O	G	Y	B
W	N	A	N	I	C	Q	F	G	V	U
T	R	G	O	H	G	I	S	S	E	I
R	E	S	I	T	E	L	V	K	P	L
O	S	O	D	N	U	Z	O	I	B	D
O	E	U	A	R	E	A	Q	O	L	E
P	A	R	J	S	H	E	L	T	E	R
Y	R	C	S	E	W	E	R	A	G	E
R	C	E	I	O	E	N	G	I	N	E
S	H	S	U	R	V	E	Y	I	N	G
C	O	N	T	R	A	C	T	O	R	G

1)) the profession of applying scientific principles to the design, construction, and maintenance of engines, cars, machines, etc. (11 letters);
2)) something that provides cover or protection, as from weather or danger (7 letters);
3)) a subdivision of a cavalry squadron or artillery battery of about platoon size (5 letters);
4)) a person who builds (7 letters);
5)) any flat, curved, or irregular expanse of a surface (4 letters);
6)) the piece of land where something was, is, or is intended to be located (4 letters);

7)) a person or firm that contracts to supply materials or labor, esp. for building (10 letters);
8)) any machine designed to convert energy, esp. heat energy, into mechanical work (6 letters);
9)) the study of the distribution, conservation, use, etc., of the water of the earth and its atmosphere, particularly at the land surface (9 letters);
10)) an arrangement of sewers (8 letters);
11)) the study or practice of measuring altitudes, angles, and distances on the land surface so that they can be accurately plotted on a map (9 letters);
12)) the point or place from which something originates (6 letters);
13)) a dome-shaped Inuit house, usually built of blocks of solid snow (5 letters);
140 14) systematic investigation to establish facts or principles or to collect information on a subject (8 letters);
15)) of the ordinary life of citizens as distinguished from military, legal, or ecclesiastical affairs (5 letters).

LISTENING

151 Audio "White Stain Varnish -- – Panelling Indoors".

Listen to the information twice and be ready to answer the questions below (1-–7):

1. What equipment is needed for proper panel indoor varnishing?
2. What is pain consumption on untreated wood?
3. What is the drying time of varnish and optimal temperature?
4. What recommendations should be met for proper varnishing?
5. Why shouldn't a brush be put deeply into a pot?
6. Can you describe the process of varnishing?
7. Why should the cloth after work be watered before throwing it away? How should the brushes be looked after?

VIDEO

16Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.

WRITING

17 ***Render the text in English using the expressions from Appendix2:***

ЛАКОКРАСОЧНЫЕ МАТЕРИАЛЫ В СТРОИТЕЛЬСТВЕ

Ремонтно-строительные работы – это постройка новых зданий, дорог, мостов, жилых домов, а также ремонт уже сданных в эксплуатацию сооружений.

Для проведения таких работ используют множество лакокрасочных материалов, таких как лаки, эмали, фасадные краски.

Алкидные смолы и полимеры легко образуют пленку, получаемую с помощью поликонденсации многоатомных спиртов, таких как пентаэритрита и глицерина, с ортофталевой кислотой.

Алкидные материалы вместе с масляными красками составляют 65% % общего потребления лакокрасочных материалов. Всем хорошо известно, что покрытие на основе масляных и густотертых красок уступают покрытию на основе алкидных по основным показателям. Основное преимущество масляных красок – это низкая цена, но при этом их расход очень высок, нежели во время использования алкидных эмалей. Да и сохнут они значительно дольше, чем алкидные, что приводит к увеличению сроков окрасочных работ.

Для увеличения скорости работы рекомендуют использовать нитроэмали и нитролаки, так как их пленки стают тверже уже через 1-–2 часа после окрашивания. При непосредственном окрашивании применяются пневмораспылители, потому что отвердевание пленки усложняет нанесение нитроэмали кистью.

-

Покрытия на основе нитроэмали обладают отличными физи ко-химическими свойствами только в том случае, если их наносить на подготовленную поверхность. Стены необходимо хорошо помыть моющим средством и оставить высыхать. Если где-то еще не совсем отпала старая краска, ее нужно тщательно убрать, используя скребок, затем аккуратно выровнять поверхность шпатлевкой. Эмали такого типа выпускают в готовом для использования виде. Если есть необходимость, их можно разбавить растворителем.

When rendering use these words and word combinations:

лакокрасочные материалы – paint-and-lacquer materials, ремонтно-строительные работы – repair-and-construction work, алкидная смола – alkyd resin, полимер – polymer, глицерин – glycerine, ортофталевая кислота – orthophthalic acid, масляные и густотертые краски – oil-base and paste paints, пневмораспылитель – compressed-airatomizer, физико-химические свойства – physicochemical properties, моющее средство – detergent/washing agent, скребок – paint scraper, разбавить растворителем – to thin with solvent.

18Translate the sentences from Russian into English. Be ready to present them not looking at the English equivalents:

1. Существует несколько цветовых шкал, удобных для применения в различных отраслях; для измерения цвета используют колориметры и спектрофотометры. На практике в промышленном производстве, полиграфии используются атласы цветов.
2. Малярные работы – нанесение окрасочных составов на поверхности конструкций зданий и сооружений с целью увеличения срока их службы, улучшения санитарно-гигиенических условий в помещениях и придания им красивого внешнего вида.

-

3. Протравы – водные растворы солей металлов, при воздействии на древесину в результате химической реакции солей с дубильными веществами происходит окрашивание поверхностей
4. Если предполагается, что краска будет использоваться в аг рессивной среде, то в ее состав обязательно добавляют биоциды, способные противостоять воздействию плесени и различных микроорганизмов.
5. Вспучивающиеся лаки – это лаки, содержащие в своем составе вещества, которые при воздействии пламени разлагаются с образованием CO2.

SPEAKING

19 ***Read two passages and analyze the problem raised. To study the problem more thoroughly find additional information on safety rules:***

ТЕХНИКА БЕЗОПАСНОСТИ ПРИ МАЛЯРНЫХ РАБОТАХ

При производстве внутренних малярных работ необходимо соблюдать следующие элементарные правила:

1. При окрашивании поверхностей лакокрасочными материалами, содержащими летучие растворители, нужно работать в четырехслойной марлевой повязке, смоченной в воде, а так- же открывать окна.
2. При применении масляных и эмалевых красок, образующих при высыхании ядовитые летучие пары, в зоне работ запрещается курить и пользоваться открытым огнем.
3. В помещениях, выкрашенных масляными и эмалевыми красками, нельзя находиться больше 4 часов, так как можно получить отравление.
4. Нельзя оставлять открытой посуду с разбавителями для лаков и красок.

-

5. Следует соблюдать осторожность при использовании таких материалов, как каустическая сода, свинцовый крон, отвердители для паркетных лаков, медный купорос и растворители, которые, попав в организм, могут вызвать отравление.
6. При попадании брызг раствора каустической соды или купороса в глаза их необходимо промыть большим количеством воды.
7. Запачканные масляными или эмалевыми красками лицо и руки нельзя очищать растворителями, которые могут вызвать заболевание кожи. Краску следует удалять с помощью теп лой воды и мыла или специальных кремов.

SAFETY ISSUES

Staining wood has a few hazards that you need to be aware of. Most concerns are from using oil base stains.

- These products are flammable and rags soaked with stain can self combust. To avoid any unfortunate events put all used rags into a bucket filled with water. The rags can be put into the trash can on the scheduled pick-up day and hauled away.
- Another concern is fumes. Always supply good ventilation and never apply oil base products near open flames. This includes pilot lights and smoking.
- Keep these chemicals away from children. Stains are poisonous when in a liquid form.
- Prolonged exposure to the skin should be avoided. Use nitrile gloves and protective clothing.

20 ***Read the text and make up a dialogue using the expressions from Appendix 1:***

WHAT MAKES A WOOD STAIN "GREEN?"

"Waterborne wood stains are safer than oil-based versions," according to William and Shari Steber, owners of *Timber Pro*

-

Coatings, Portland, OR**.** "Our stains are waterborne or made primarily from bio-preferred, plant-based oils and blended with a small percentage of acrylic to boost durability."

Ever watched rain drops bead up on a flower petal? That's the design Timber Pro Coatings tries to mimic. They use natural ingredients because they believe Mother Nature knows the best way to repel water absorption.

Manufacturing environmentally safe wood stains and finishes for 17 years, Timber Pro Coatings was one of the country's first manufacturers of low toxicity wood stains. The Stebers are fully aware of industry greenwashing, and they make it a point to warn consumers about so-called green terms that are more about marketing than safety.

Shari Steber says, "The term non-toxic does not truly apply to wood stains, because non-toxic would mean you could practically drink or bathe in the product! We consider it dangerous to label a wood stain as non-toxic."

How can you know you're getting an eco-friendly stain? The best way is to ask to see the Material Safety Data Sheet (MSDS) on the product. Stores are required to keep a sheet on file for every coating product they sell.

The MSDS will also list the percentage of hazardous ingredients, which should be below 10% %. Any wood stain or sealer marked flammable is most likely not eco-friendly. Ideally, clean up should involve only soap and water. The mineral spirits needed to clean your tools and equipment after using flammable oil based stains or sealers are certainly toxic.

21 *Topics for projects and presentations:*

1. Types of paints and their properties.
2. Qualities of a good paint.
3. Siding stain.
4. Classification of varnishes.
5. Colour perception.

-

WordListtounit 7

paint, *n*	краска
varnish, *n*	лак; олифа; глазурь
wood stain	протрава для древесины
remover, *n*	состав для удаления, растворитель
wood species	древесная порода
porous wood	древесина лиственных пород
revitalize, *v*	восстанавливать
ceiling, *n*	потолок
abrasion resistance	износостойкость, износоустойчивость
feature, *n*	характерная черта; характеристика, свойство
notation, *n*	система обозначения; индексация
architectural ironmongery	архитектурная фурнитура
sanitary fittings	санитарное оборудование
binder, *n*	связующее вещество, связующий элемент
solvent, *n*	растворитель
extender, *n*	наполнитель
paint film	лакокрасочная пленка
linseed oil	льняное масло
oxidation, *n*	окисление
alkyd resin	алкидная смола
fluidity, *n*	жидкое состояние; растекаемость
ketone, *n*	кетон (растворители в лакокрасочной промышленности)
ester, *n*	сложный эфир
paint thinner	разбавитель для краски
fluidity, *n*	жидкое состояние; растекаемость
ketone, *n*	кетон (растворители в лакокрасочной промышленности)
ester, *n*	сложный эфир

-

paint thinner	разбавитель для краски
opacity, *n*	матовость, непрозрачность
china clay	каолин, фарфоровая глина
baryte, *n*	барит, тяжелый шпат
dye, *n*	краска, краситель
sheen finish	блестящая поверхность
Surface film	поверхностная пленка
Surface degradation	разрушение поверхности
rough-sawn timber	древесина с грубой поверхностью
beeswax, *n*	пчелиный воск
shellac varnish	шеллачный лак

shock, *n*	удар, ударное воздействие
fracture, *n*	разлом; излом
patch, *n*	пятно
upkeep, *n*	уход, содержание
embellish, *v*	украшать
wood putty	деревянная смазка
staining, *n*	крашение, подкрашивание
bleaching, *n*	отбелка, обесцвечивание
ammonia fume	дымовая морильня
blotch, *n; v*	пятно; замарать, запачкать
tung oil	тунговое масло
lacquer, *n*	масляный лак
rags	обтирочный материал
precious, *adj*	драгоценный
transparent, *adj*	прозрачный
opaque, *adj*	непрозрачный; светонепроницаемый
mildew, *n*	плесень
turpentine, *n*	скипидар
emulsifier, *n*	эмульгатор
hose, *n*	шланг

-

hazard, *n*	опасность, риск; опасное положение
flammable, *adj*	огнеопасный; легковоспламеняющийся
soak, *v*	вымачивать
combust, *v*	гореть, воспламеняться
poisonous, *adj*	ядовитый
nitrile gloves	нитриловые перчатки
clothing, *n*	одежда
steel wool	стальная вата
brush stroke	мазок кистью
repel, *v*	подавлять, сдерживать

PART III. ARCHITECTURE OF CIVIL BUILDINGS

"High buildings have a low foundation." Thomas Fuller (writer)

Unit 8

a) raft foundation b) strip foundation c) pad

-

foundation

a)raft foundation b) strip foundation c) pad foundation Figure 8.1. Types of Foundation

LEAD-IN

11 Match the columns:

a.1. raft foundation	a) is basically a strip, or ribbon, of insitu concrete running under all the loadbearing walls
b.2. strip foundation	b) is used to support individual point load such as that due to a structural column
c.3. pad foundation	c) is used to spread the load from a structure over a large area, normally the entire area of structure

2a) What is the purpose of foundations? Express your opinion in 3-–5 sentences.

Read the following passages and compare your ideas:

1. The main purpose of the foundation is to distribute the structural load over a large bearing area without causing bearing capacity failure and excessive settlement to obtain a level and hard strata or bed for building operations to increase the stability of the structure as a whole.

2. A good strong foundation ensures good strong stable ground for a good strong and lasting structure. If you build a house on sand and the sand around one of the corners of the house washes away due to rain water falling off your building the building will begin to sink in that corner and the result will eventually begin cascading further along the buildings edges and sides until the entire building is consumed by leaning caused by unstable ground.
3. При наших совсем не «плюсовых» зимах слой грунта сверху промерзает. Вода, содержащаяся в нем, замерзает и расширя- ется. И грунт вспучивается, в зависимости от количества воды в его замерзшем слое. Коэффициент расширения у сильнопу- чинистых грунтов иногда достигает 12% %, а обычно – около 10% %. Это означает, что при глубине промерзания 1,7 м грунт может приподняться на 10-15 см. Чтобы эти зимние вспучивания не разрушили или не перекосили дом, и нужен фундамент.

Discuss the following:

"A successful man is one who can lay a firm foundationwith the bricksothers havethrown at him. "

"The loftier the building, the deeper must the foundation be laid."

(*Thomas Kem-*

- ***Write a paraphrase.***
- ***Say whether you agree or not, and why***

READING

4 a) Transcribe the following words:

drought, load-bearing, strength, weight, artificial, endanger, plumbing, superimposed, depth, specific.

b) In what context do you think the following words and phrases will appear in the text?

•ground level •stability •protection •natural foundation •artificial foundation •loads and pressure •concrete •specific conditions of the building •types

c) Read the text quickly and check your answers:

FOUNDATIONS

The *foundation* is the part of the construction where the base of the building meets the ground.

Foundations *are* usually *placed* below **ground level** because the surrounding ground provides: stability, *protection* against impact, protection from the extremes of weather such as *excessive* rain or drought.

Although the depth will vary according to the conditions on site, the best **load-bearing ground** is normally 900 mm below the surface.

The choice of foundation depends on: the strength of the natural foundation and the weight of the building and its loads.

Foundations are divided into two types: the natural foundation (this is the ground underneath the base of the building after the excavations *are completed*); the artificial foundation (this is the structure that lies between the building and the *natural* foundation).

An *artificial* foundation transfers the loads from the building to the ground. This prevents **settlement** or **building movement**, which might cause instability and endanger the occupants.

The following building loads place the most pressure at the bottom of the building, where the artificial foundation is located:

1. Dead loads. These are the weights of all the fixed parts of the building such as the walls, floors, roofs, ceilings and services such as sanitary fittings and plumbing;

-

2. Superimposed or live loads. These are the weights of the people, furniture and machines that will *occupy* the building after the completion;
3. Wind loads. These are the pressures on the walls and roof from the wind. The pressure from wind loads on foundations is more important in tall buildings.

The artificial foundation lies between the natural foundation and the building. Its *purpose* is to transfer the building loads to the soil and **spread** the load evenly across soil that can *support* the load.

When choosing the correct type of artificial foundation the following conditions should be considered: 1.1) the load-bearing **capability** of the ground;

2.2) the depth where the suitable load-bearing soil can be founded;

3.3) the distance from trees which can affect the stability of the soil;

4.4) the level of the water table;

5.5) the normal variation in the **water table**;

6.6) the total weight of the building. If the building is heavier than the soil that was removed, then there will be some *settlement* as the soil **adjusts to** the new load.

Although concrete is the preferred material for the construction of the artificial foundations, the form will depend on the specific conditions of the building and *environment*.

Types of Foundation

Many small buildings *are constructed* with load-bearing walls on **strip foundations**. But the soil *requires* **alternative types** of foundation which are: -– concrete strip foundation;

– deep strip foundation;

– raft foundation;

– piled foundation;

– pad foundation;

– stepped strip foundation.

5 ***Read the text again and answer the questions that follow (1-–***

1. Give the definition of the term “foundation”.
2. What building loads does artificial foundation carry?
3. What is the purpose of artificial foundation?
4. What are the principle conditions when choosing the correct type of a foundation?
5. What types of foundations have you read about?

Follow-up

6 ***a) Find the synonyms for the words in italics.***

b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionary to help you.

7 ***Give the English equivalents to the following and use 5 of them in small situations:***

часть конструкции; естественное основание; искусственное основание; вызывать неустойчивость и подвергать опасности жителей; собственный вес конструкции; рабочая/подвижная на- грузка; ветровая нагрузка; учитывать следующие условия; устой- чивость грунта; уровень грунтовых вод; несущие стены; типы фундамента.

8 ***Which questions could you ask to get these answers?***

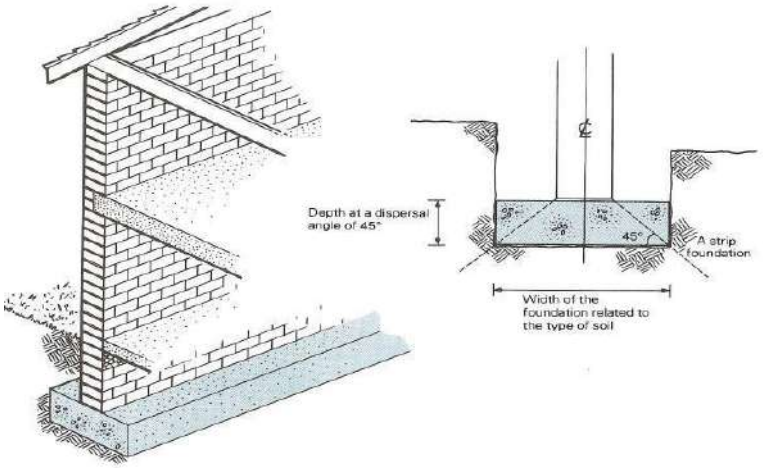
1. Geotechnical engineering, being important in many branches such as military, mining, petroleum and in our case civil engineering, concerned with the engineering behavior of earth materials.
2. The capacity of soil to support the loads applied to the ground is called bearing capacity.
3. A shallow foundation is a type of foundation which transfers building loads to the earth very near the surface, rather than to

a subsurface layer or a range of depths as does a deep foundation.

4. Piles should be placed on the center line of the walls that need support.
5. Pile foundations are used in the areas where the other kinds of foundations cannot be constructed.

9 ***Fill in the gaps with derivatives of the words in capitals:***

TYPES OF FOUNDATION **Part I** The **concrete strip foundations** in Fig. 8.2 are used most frequently. They consist of 1)mass concrete strips poured in the bottom of trenches. These foundations will support load-bearing walls which are centered on the concrete strips to spread the 2) from the walls, roofs and other floor loads evenly. The	**CONTINUE** **PRESS**



concrete strip is usually a uniform width and depth.

Figure 8.2. Concrete Strip Foundation

The foundation must be wide and deep enough to avoid soil movement that could cause 3) _____ . Depending on soil conditions, the maximum depth may be 900 mm. Building regulations may suggest the 4)) minimum width for strip foundations. The concrete must be at least as thick as its projection from the base of the wall. This ensures that the pressures of the building loads are distributed in the concrete at an angle of 45°.

The **deep strip foundation** in Fig. 8.3 is a 5) __ of strip foundations. Deep strip foundations are usually dug out with a mechanical 6) , which cuts a narrow trench that is backfilled with concrete up to ground level. These foundations use more concrete, but reduce the cost of masonry walls and may remove the need for timber support for the trenches.

STABLE

SUIT

VARY

EXCAVATE

Raft foundations are a good 7) _if the soil has a poor bearing capacity or if the building loads are quite small, because the cost of 8)separate foundations is eliminated. The oversite concrete slab that forms the ground floor of the building becomes the raft foundation (Fig. 8.4). The slab can be thickened at the edges with an edge beam and thickened underneath internal load bearing walls. Mesh 9) increases the strength of the raft foundation and distributes the pressures of the building loads 10) __.	**SOLVE** **DIG** **REINFORCE** **EVEN**

10 ***Use the words below to complete the sentences:***

TYPES OF FOUNDATION Part II

Pad foundations are isolated foundations that 1)concrete column or free-standing brick piers. A square concrete pad foundation distributes the load evenly over the ground.

If the pad is constructed of mass concrete, then the 2) __ must equal the projection from the side of the column (Fig. 8.5).

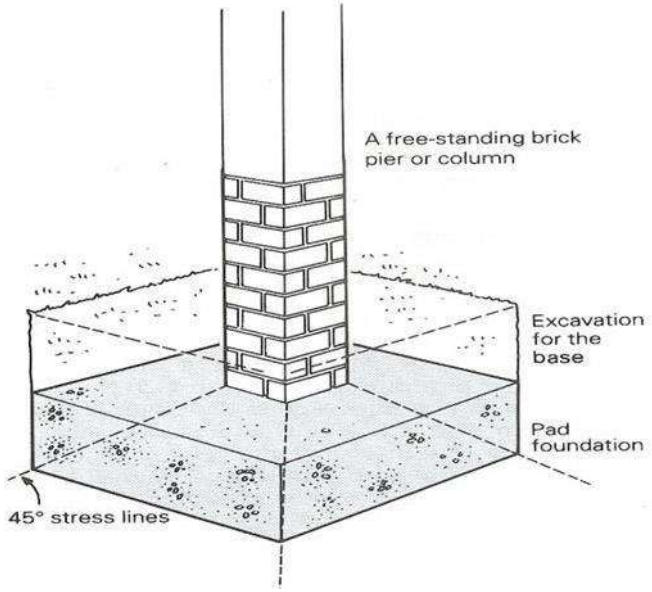
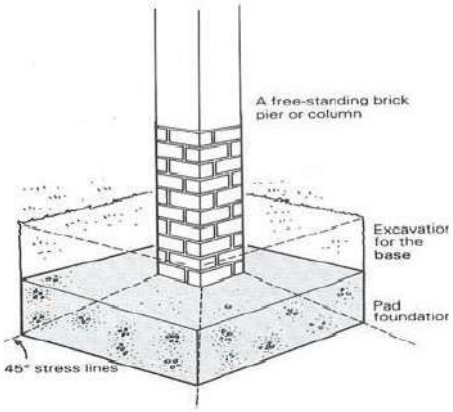


Figure 8.5. Pad Foundation



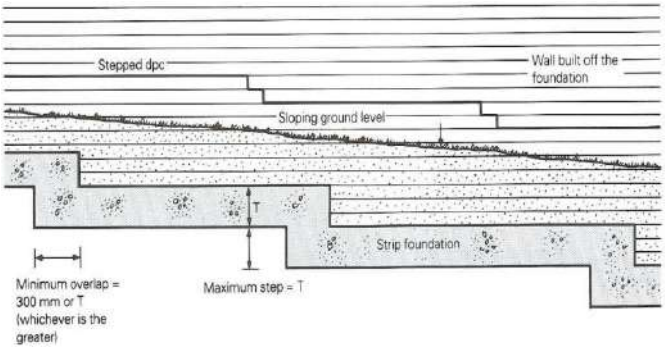


Figure 8.5 Pad Foundation *Figure 8.6 Stepped Foundation*

Stepped foundations are built on 3) sites (Fig. 8.6). This reduces the expense of constructing a foundation that is the same level around the perimeter of the building. A foundation at the higher end of the slope would be 4)deep.

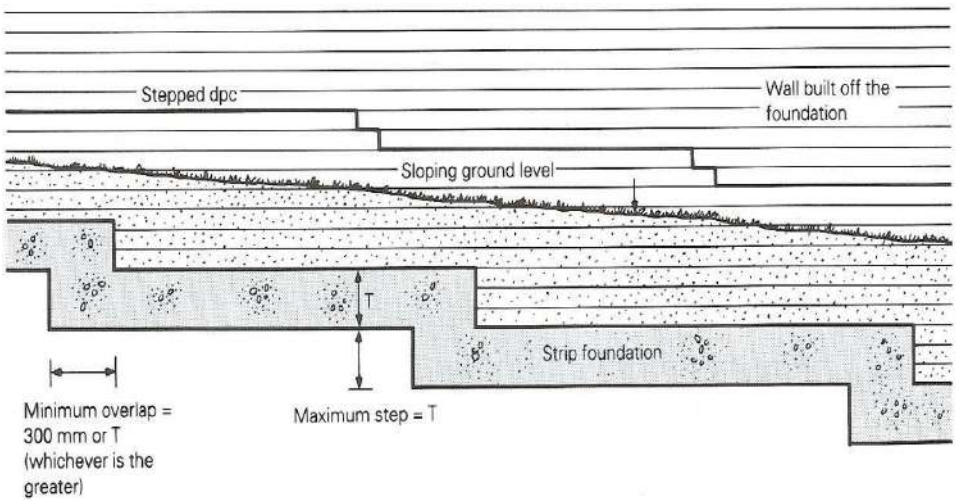


Figure 8.6. Stepped Foundation

To overcome this, the foundations should be stepped at 5) __ levels. The higher-level foundation should 6) over and meet with the lower one for a distance not less than its thickness. This should never be less than 300 mm.

The change in level should not be more than the thickness of the strip foundation. It should be measured in multiples of 75 mm, which is the height of a 7) __ course.

If soil conditions are poor near the surface, then **piled foundations** should be used. Trial holes will usually indicate the depth of suitable load-bearing soil. Since this may be as deep as 2 or 3 metres below ground, it would be quite expensive to construct 8)) __ foundations. To overcome this problem two types of piled foundation can be used to strengthen the soil:

a) *bored* or *replacement* piles, which are concrete 9)_ poured into holes in the ground at measured intervals;
b) *driven* or 10)piles, which are tree trunks that are hammered into soft ground at spaced intervals.

extent, displacement, different, conventional, support, sloping, thickness, cores, brick, extremely

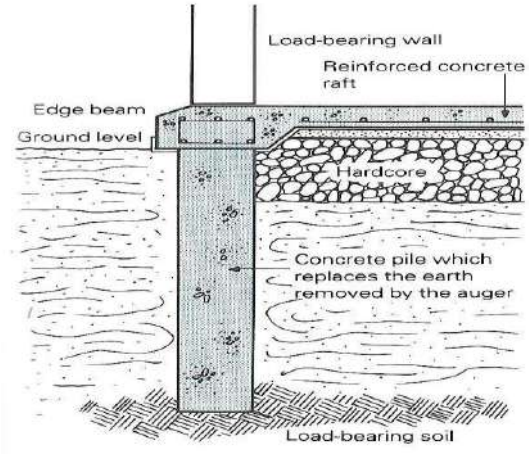
11 ***Fill in the gaps in the following passage with a suitable preposition given below:***

TYPES OF FOUNDATION Part III

Short-bored piled foundations are used 1) small houses and lightweight framed buildings constructed 2) soils that expand and contract 3)_ changes in the moisture content. These soil types include clay and black cotton.

The type of foundation shown in Fig. 8.7 can be constructed quite quickly and avoid the need to dig deep trenches. Short-bored piles are more effective and cheaper than conventional foundations if the soil responds easily to the changes 4) __ the atmosphere.

These foundations are not suitable 5) _use on rock, flint or sites with many tree roots because the holes must be straight and consistent in diameter.



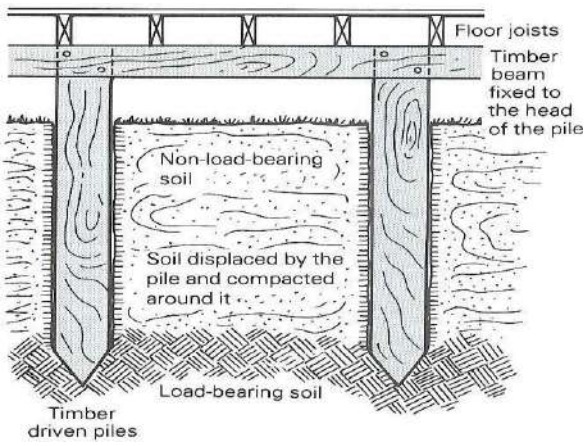


Figure 8.7 Short-bored Pile Foundation Figure 8.8 Timber Displacement Piles

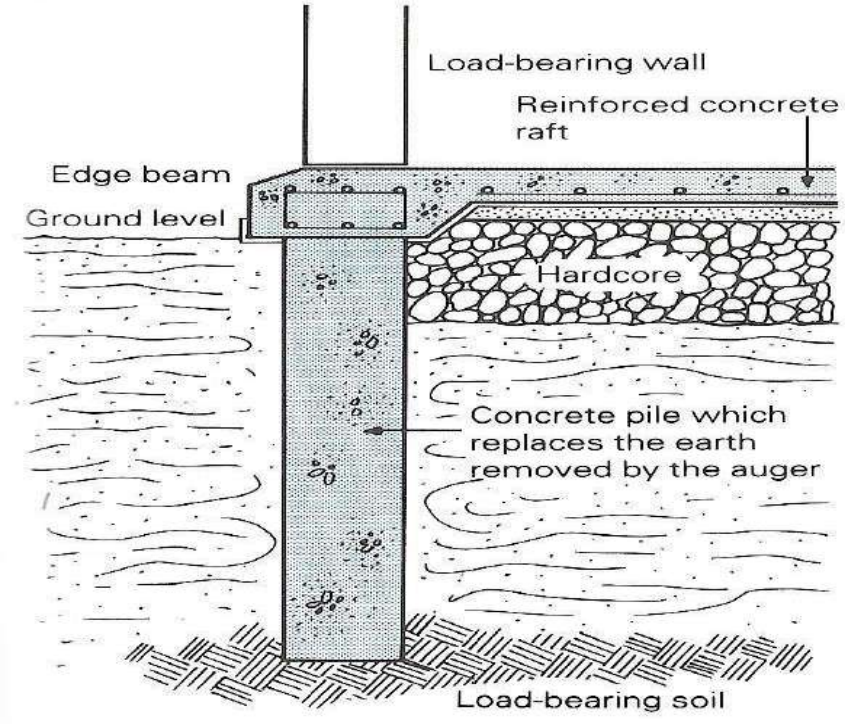


Figure 8.7. Short-bored Pile Foundation

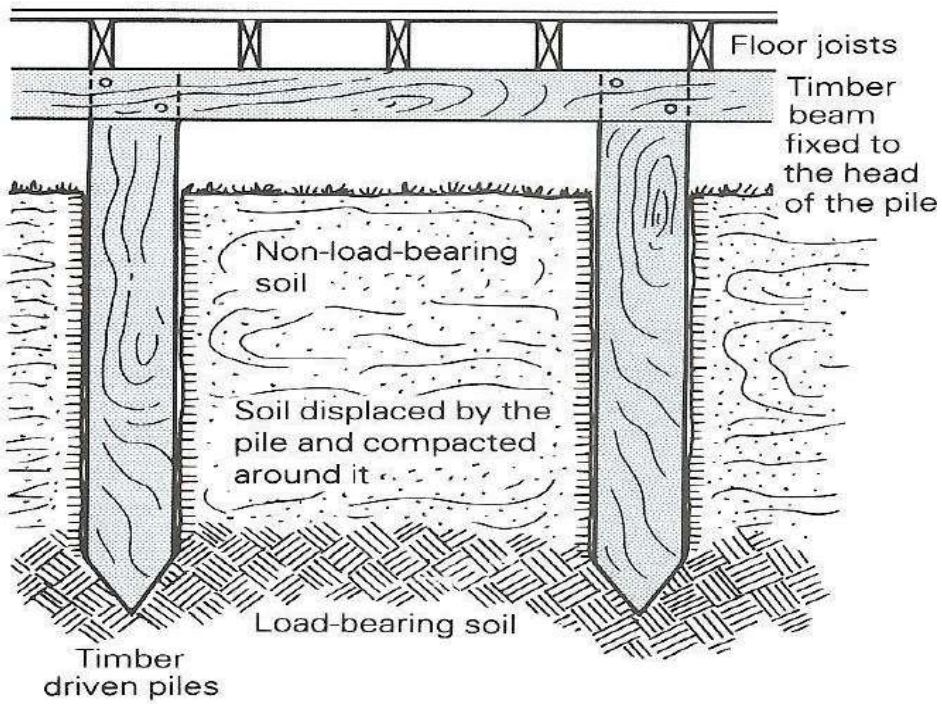


Figure 8.8. Timber Displacement Piles

These foundations are not suitable 5) __ use on rock, flint or sites with many tree roots because the holes must be straight and consistent in diameter.

The holes are dug 6)hands with an auger and then concrete is poured 7) __ them to form a column in the ground when it hardens. The concrete columns in the holes in the ground are the piles.

Fig. 8.8 represents **timber displacement piles** for lightweight buildings. For this foundation straight tree trunks should be used and treated with preservative and sharpened 8) _____the ends to drive them 9)the ground. It is better to use an auger to remove some 10)the pile-driving process is started.

at , before , by , for (x2), in (x2), into, on, with

12 Match the English terms (B) and their definitions (A).

There are two extra terms in column B:

A	B

a)) lowest load-bearing part of a building, typically below ground level	1. load
b) the size, length, or amount of something	2. concrete
c)) a weight or source of pressure borne by someone or something	3. water table
d)) the level below the surface of the ground where water can be found	4. ground
e)) a long narrow channel that is cut into the ground, for example in order to lay pipes or get rid of water	5. foundation
f)) a stiff, sticky fine-grained earth that can be moulded when wet, and is dried and baked to make bricks, pottery, and ceramics	6. pile
g) building material made from a mixture of broken stone or gravel, sand, cement, and water, which can be spread or poured into moulds and forms a stone- like mass on hardening	7. trench
h) a heavy stake or post driven vertically into the bed of a river, soft ground, etc., to support the foundations of a superstructure	8. pressure
	9. measurement
	10. clay

13 a)Fill in the table with the information from the texts about foundations and your additional info:

Foundation	Material	Measurements	Application	Additional Info

b) Say whether these statements are true (T) or false (F):

1. The natural foundation is the ground underneath the artificial foundation.
2. Artificial foundations ensure the stability of the building.
3. Load-bearing walls require strip or deep strip foundation.
4. Columns and piers require pad foundations.
5. Light loads or poor soil conditions require raft foundations.

6. Very poor conditions such as clay and sand require piled foundations.
7. The size of a foundation is determined by the pressure of the load and the strength of the soil.
8. Stepped foundations are used on sloping sites to reduce costs.
9. Piles can be: replacement piles at that are concrete-filled holes; displacement piles that are timbers driven into the ground.

LISTENING

14 ***Audio "How to Lay Foundations".***

Listen to the information twice and be ready to answer the questions below (1–-7):

1. Is it a hard job to dig a foundation?
2. Why is it necessary to dig a foundation properly?
3. What main instruments and materials are needed for foundation digging?
4. What are the parameters of footings for small walls?
5. How are trenches marked?
6. For what period should concrete be dried?
7. What are the main steps of foundation laying?

VIDEO

15 ***Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.***

WRITING

16 ***Render the text in English using the expressions from Appendix 2:***

ГИДРОИЗОЛЯЦИЯ ФУНДАМЕНТОВ

Появление большинства трещин на здании обусловлено недостаточно продуманным устройством гидроизоляции основы здания – фундамента. Перед началом серьезного строительства предварительно проводят геологические исследования на предмет глубины залегания грунтовых вод. Затем определяют наиболее эффективный вид гидроизоляции.

По назначению гидроизоляцию можно разделить на антифильтрационную и антикоррозийную. Антифильтрационная гид- роизоляция создается на неординарных объектах, где существует большая напорная нагрузка, высокий водородный показатель аг- рессивности влаги. Антикоррозийная гидроизоляция использует- ся повсеместно в тех или иных модификациях. Она в свою оче- редь различается по способу устройства на штукатурную, пропи- точную, окрасочную, монтируемую, засыпную, оклеечную и т.д.

В зависимости от влажности грунта вертикальная гидроизоляция может быть окрасочной, оклеечной или комбинированной. Предварительно на наружных боковых стенках фундамента не- обходимо устранить возможные выбоины, раковины, шерохова- тости. Если фундамент блочный, нужно тщательно заделать меж- блочные швы с применением штукатурной гидроизоляции. В случае необходимости в дополнение к обмазочной изоляции применяют рулонные защитные материалы, такие, как изоэласт, техноэласт или рубероид.

В дальнейшем по всему периметру гидроизолированного фундамента производится обратная засыпка котлована жирной глиной в качестве дополнительного гидроизолятора.

Как завершающий этап полной гидроизоляции помещения устраивается гидроизоляция между стенами и фундаментом на

уровне подготовки пола, что является еще одним барьером появ- лению возможных грибков и сырости.

When rendering use these words and word combinations:

трещина – crack; геологические исследования – geological investigations; грунтовые воды – underground waters; напорная нагрузка – pressure loading; водородный показатель – hydrogen ion exponent; агрессивность влаги – moisture aggressiveness; штукатурный штукатурный – plastering; пропиточный – impregnating/penetrating; окрасочный – painting; засыпной – insulating; оклеечная гидроизоляция – surface waterproofer; мастика – filling; заделать межблочные швы – to fill in interblock joints; рулонные защитные материалы – roll shield material; жирная глина – rich clay; грибки и сырость – fungi and dampness.

17 ***Translate the sentences from Russian into English. Be ready to present them not looking at the English equivalents:***

1. При определении типа фундамента и основания архитектор совместно с инженером руководствуется, прежде всего, харак- тером и механическими качествами грунтов, слагающих осно- вание под объект проектирования.
2. Столбчатые фундаменты возводятся под колонны каркасных зданий или под стены в тех случаях, когда грунт основания лежит глубоко и возведение ленточных фундаментов неэкономично.
3. Сплошные фундаменты обеспечивают равномерную осадку здания и защищают подвальные помещения от подпора грунтовых вод.
4. Свайные фундаменты состоят из погруженных в грунт свай, объединенных поверху ростверком в виде железобетонной балки или плиты.
5. Ленточные фундаменты устраивают под все капитальные стены здания и представляют собой заглубленные в грунт лен- ты – стены из бутовой кладки, бутобетона, бетона или желе- зобетона.

18 ***Read the text. Make up a dialogue based on the text. Use the linking words/phrases from Appendix 1:***

ВИДЫ ТИПЫ ФУНДАМЕНТОВ, ПРИМЕНЯЕМЫЕ В СТРОИТЕЛЬСТВЕ

Для сооружения фундамента используется определенный вид основания.

Ленточные основания предназначены для кирпичных, камен- ных, бетонных сооружений, а также деревянных домов, которые планируется облицевать кирпичом. Такой фундамент охватывает весь периметр здания. Он может быть как четкой прямоугольной формы, так и неправильной трапециевидной или ступенчатой. Ленточные фундаменты тяжеловесны и массивны. Они требуют большого вложения средств, но просты в изготовлении и надеж- ны, поэтому получили большое распространение.

Столбчатые конструкции используются при строительстве зданий, имеющих каркасные или щитовые стены, а также для возведения облегченных конструкций. В грунт под все углы и пересечения стен устанавливается арматура, различные сваи, по- сле чего между ними заливается цементная смесь. Специальная песчаная подушка либо каменная плита способствуют усилению фундамента. Столбчатые конструкции отличаются более низкой стоимостью, а их изготовление не столь трудоемко. Такие фун- даменты часто находят применение в зонах, где в зимнее время наблюдается промерзание почвы.

В тех районах, где имеются плавающие грунты либо высокое залегание грунтовых вод, применяются сплошные конструкции. Они представляют собой монолитные плиты или специальные решетки из железобетона. Такие фундаменты герметичны, про- сты, жестки, но при этом стоят дорого.

19 ***Topics for projects and presentations:***

1.1. Shallow foundations.
2.2. Deep foundations.
3.3. Fundex piles.

4. Socket-type foundation.
5. Modern tendencies in foundation laying.

Word List to Unit 8

concrete strip foundation	бетонный ленточный фундамент
deep strip foundation	ленточный фундамент глубокого заложения
raft foundation	сплошной фундамент
piled foundation	свайный фундамент
strip foundation	ленточный фундамент
pad foundation	столбчатый фундамент
stepped strip foundation	ленточный фундамент ступенчатой формы
distribute, *v*	распределять
structural load	нагрузка на конструкцию
bearing area	плоскость опоры; несущая поверхность
bearing capacity	несущая способность
failure, *n*	разрушение
expand, *v*	вспучиваться
frost zone	глубина промерзания (грунта)
ground level	уровень грунта
stability, *n*	устойчивость
drought, *n*	засуха
excavation, *n*	выемка грунта; рытье котлована; экскаваторные работы; земляные работы
dead load	собственный вес; постоянная нагрузка
fixed part	неподвижная часть/деталь
plumbing, *n*	слесарно-водопроводные работы
live load	временная нагрузка; рабочая нагрузка
wind load	ветровая нагрузка
soil, *n*	грунт; почва;
spread, *v*	распространить

depth, *n*	глубина
distance, *n*	расстояние
water table	уровень грунтовых вод
total weight	общий вес
adjust, *v*	регулировать, выверять
pour, *n*	бетонирование, укладка бетонной смеси
load-bearing wall	несущая стена
projection, *n*	выступ, выдающаяся часть
angle, *n*	угол
trench, *n*	котлован; траншея
backfill, *v*	засыпка выемки
concrete slab	бетонная плита
mesh, *n*	арматурная сетка
strength, *n*	прочность
brick pier	кирпичный столб
isolated foundation	отдельный фундамент
sloping site	местность с уклоном
expense, *n*	расходы, траты
measure, *v*	измерять, мерить
brick course	ряд кирпичной кладки
trial hole	контрольное отверстие
strengthen, *v* упрочнять	упрочнять
bored pile	буронабивная свая
concrete core	железобетонный каркас; цилиндрический образец бетона (вырезаемый из толщи бетонной конструкции - для испытаний)

driven pile	забивная свая
tree trunk	ствол дерева
flint, *n*	галька, галечник, кремень; мелкозернистый песчаник
tree roots	корни деревьев
auge, *n*	бур, бурав
geological investigations	напорная нагрузка геологические исследования
pressure loading	плита, уложенная вровень
slab-on-grade	плита, уложенная вровень
frost depth	глубина промерзания
shallow foundation	фундамент мелкого заложения
contractor, *n*	подрядчик

"A good designer isn't afraid to throw away a good idea. Being process-oriented, not product-driven, is the most important and difficult skill for a designer to develop."
Matthew Frederick (architect)

Unit 9

ROOFS

1.1 a) What types of roofs do you know? Use English-English dictionaries.

b) Look at the pictures. What roof would you prefer for your house? Explain your choice in 3-5 sentences:

a) Cross Gabled Roof

b) Arched Roof

c) Mansard Roof *d) Pyramid Roof*

5 *a) Cross Gabled Roof* *b) Arched Roof*

d) Mansard Roof *d) Pyramid Roof*

2Discuss the following:

Rain does not fall on the roof alone.
(Proverb)

"Compromise makes a good umbrella but a poor roof."

•Write a paraphrase. • Say whether you agree or not, and why.

READING

3a) Transcribe the following words:

retain, ensure, weighted, storage, triangular, require, joists, corrugated, securely.

b) In what context do you think the following words and phrases will appear in the text?

- topmost part • interior cool • resisting fire • supporting structure
- storage space • gable end • meet right angles • water-proof covering
- corrugated sheets • galvanized steel ties• rafter

c) c) Read the text and check your answers:

ROOFS

A roof is the topmost part of a building. It is a covering constructed over the enclosed space to:

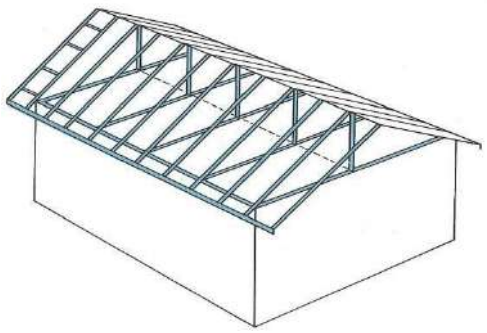
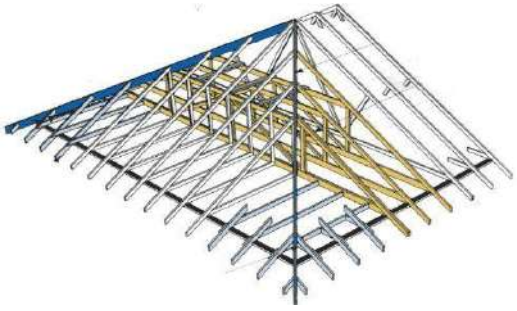
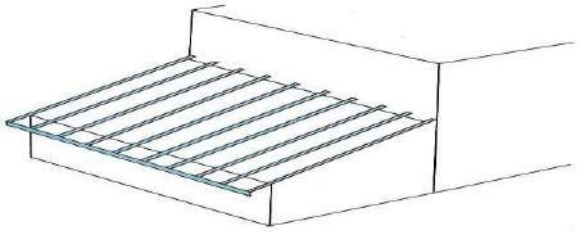
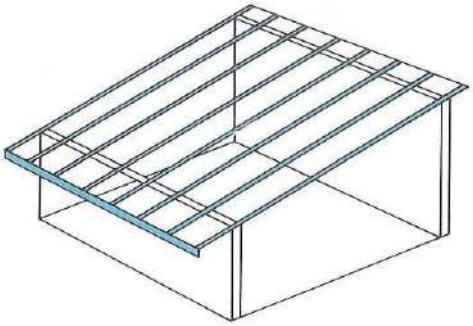
- – keep out rain and wind;
- – provide shade from the sun;
- – keep the interior cool;
- – **retain** heat in cool weather;
- – ensure that the structure is properly weighted down.

Roofs should meet the following basic standards of performance: 1) allowing rainwater to flow freely away; 2) expanding and contracting without failure; 3) resisting fire adequately; 4) providing light and ventilation; 5) **durability**.

In this unit two types of roofs are considered: pitched roofs and flat roofs.

A pitched roof is often a popular choice. The main supporting structure is timber, which is easy to work and transport. A pitched roof is stable in most weather and its **slope** disposes of rainwater quickly. Additionally, the space enclosed by the roof can add some extra living or storage space.

In simple roof construction these types of roof are usually found:

Gable roof In this type of roof the ends of the roof enclose the end walls. The triangular wall between the roof verges is called the gable end.	
Hipped roof A hipped roof is formed when two roof slopes meet right angles.	
Lean-to roof This roof has a single pitch that rests against a higher wall.	
Mono-pitch roof This roof has a pitch in one direction. The ridge does not rest against anything.	

Three parts of a pitched roof affect the structural design: *span; pitch; roof covering*.

The *span* is the distance between the **masonry** structures that support the roof. The structure of the roof becomes more complex as the span increases.

The *pitch* is the angle of the slope of the roof measured from the horizontal. A **steeper** pitch needs more roof covering material, which increases the weight to be supported. The surface area affected by

wind is also greater. The roof needs to be strong enough to allow for these factors.

The *roof covering* material varies from lightweight sheets that weigh 12 kg/m^2 to plain clay tiles that weigh 65 kg/m^2.

Flat roofs, which can be timber or reinforced concrete, are popular forms of roofing for houses. Their advantages are:

– they are very easy to put up;

– they can create extra usable space if they are **accessible**; -

– they are easily **maintained**.

Their main disadvantages are that:

– they lose heat;

– they are not as weatherproof as pitched roofs; -

– the finishes do not last as long as roof tiles.

The structure of a flat timber roof is shown in Fig. 9.2.1 and it requires: a deck or a slab; a method for disposing of rainwater; a watertight covering; some insulation.

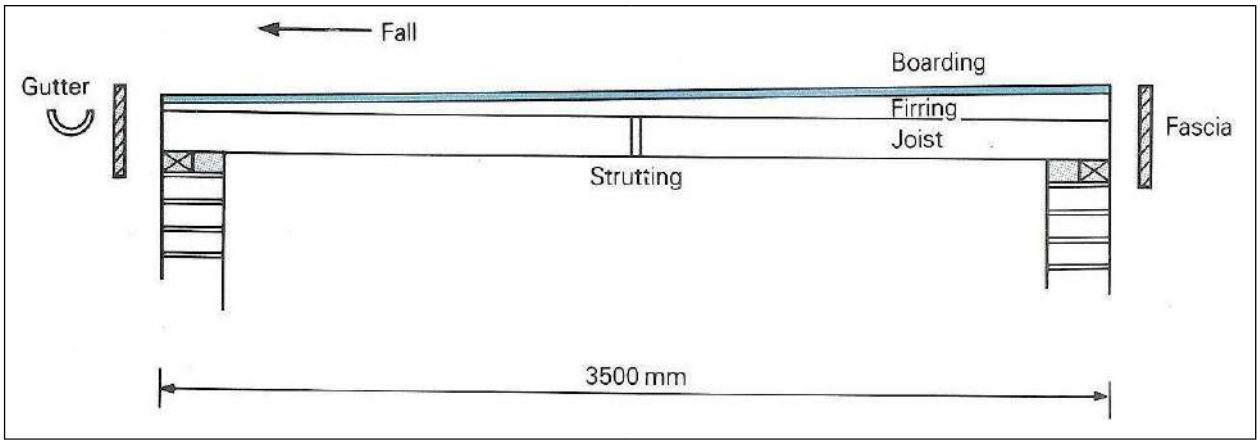


Figure 9.1. Flat Timber Roof Structure

The **joists** span between the supporting walls and boarding is fixed over the joists to form a deck for the water-proof covering. Here the deck must have enough slope to get rid of rainwater. Slopes can be made by fixing strips of wood called *firrings* to the top of the joists.

Wind pressure can **strip off** tiles, lift overhanging eaves and verges and blow off corrugated sheets. If the roof covering is fixed very securely to the roof framework, then a strong wind could lift off the timbers of the roof structure.

This can be prevented by using galvanized steel ties every 1800 mm. They should be taken across the wallplate and down the wall for 600 mm and **embedded** in mortar joint. The ties can also be taken around the rafters to secure the roof structure against the lifting action of wind.

4 ***Read the text again and answer the questions that follow (1-–8):***

1) 1. What are the purposes of roof construction?
2) 2. There are five basic standards of performance, aren't there? What are they?
3) 3. How many types of roofs are considered in this unit? Name them.
4) 4. How can you characterize types of roofs in simple roof construction?
5) 5. What affects the structural design of a pitched roof? Describe these parts.
6) 6. What are the advantages/ disadvantages of flat roofs?
7) 7. What forms a deck for the water-proof covering?
8) 8. Can you offer the ways how to cope with wind pressure?

Follow-up

5 ***a) Find the synonyms in the text and rephrase the sentences using them:***

construction, coating, satisfy criteria, to take into consideration, firm (strong), inclosed, besides, general forms, available, demand, to rid oneself of, impacted.

b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

6 ***Give the English equivalents to the following and use 5 of them in small situations:***

покрытие (обшивка); удерживать тепло; утеплять; удовлетворять основным стандартам; без повреждений; обеспечивать доступ света и вентиляции; несущая/ опорная конструкция; дополнительное пространство; края крыши; два уклона образуют

прямой (90°) угол; опираться на стену; влиять на строительное проектирование; плоская керамическая черепица; виды кровли; легко построить; легко содержать и обслуживать; стойкий против атмосферных влияний; водонепроницаемое покрытие; изоляция; несущая стена; обшивка досками; оцинкованный; стенная балка; заделанный в раствор; вокруг стропила.

7 ***Read and translate the text and make 5 questions to it:***

What most home owners desire is a roof that is not too expensive, requires no maintenance, and lasts forever. But most roofs are replaced - – or at least repaired - – every ten years. By carefully choosing your home's roofing material, you can reduce the cost of replacement.

You can realize other environmental benefits from your roofing choices. If you select a light-colored surface or a material that does not absorb heat from the sun, you significantly reduce your home's cooling needs. When your attic stays cooler, your cooling bills go down.

There is a wide choice of materials used to roof a house, ranging from thatch – dried grass, to slate – pieces of stone. Modern products like plastic, fiberglass and concrete are available, and some innovative, energy-efficient homes are being roofed with sod. New products are being developed to overcome the shortcomings of older roofing materials, meet the demands of modern building techniques, and conform to increasingly stringent building codes.

Cost alone does not determine quality. But by carefully selecting the right material, making sure it's installed properly and performing modest maintenance occasionally, you can have a roof that functions properly for 20 to 50 years – or even longer.

LANGUAGE FOCUS

8 ***Use the words below to complete the sentence:***

POPULAR ROOFING MATERIALS Part I

Wood shakes offer a 1) __ look with a lot of character. Because of variations like color, width, thickness, or cut of the wood, no two shake roofs will ever be the same.

Wood offers some 2) __ benefits, too: it helps to insulate the attic, and it allows the house to breathe, circulating air through the small openings under the felt rows on which wooden 3) _____are laid.

A wood shake roof, however demands proper 4)) _ maintenance and repair, or it will not last as long as other products. Mold, rot, and insects can be a problem. The 5) cost of a shake roof may be high, and old shakes can't be recycled.

Most wood shakes are unrated by fire 6) safety codes. Many use wipe or spray on fire 7) which offer less protection and are only effective for a few years. There are pressure-treated shakes, however, that are 8) with fire retardant and meet national fire safety standards.

Installing wood shakes is more complicated than roofing with composite shingles, and the quality of finished roof depends on the experience of the contractor as well as the 9)of the shakes you use. The best shakes come from the heartwood of large old 10) trees. Care should be taken when selecting shakes as the quality varies greatly from different shake mills.

shingles,	safety,	cedar,	natural,	impregnated,
retardants,	energy,	caliber,	lifecycle,	maintenance

9 Fill in the gaps with derivatives of the words in capitals:

POPULAR ROOFING MATERIALS **Part II** **Composition shingles** are a good choice for a clean look at an 1) __ price. Higher-quality versions made from asphalt or fiberglass shingles offer a more durable option and may be available with recycled content. Composition shingles come in a large selection of types, brands and colors. Versatile, they adapt easily to different 2). They are relatively easy to install, and in some applications can be nailed in place over an existing roof. They require low maintenance and can be walked on without 3) the material. Most brands offer Class A fire protection. On the negative side, they can blow off in high winds. Material is easy to scar if hot. Does not have the 4)) __ look of tile or shake. **Clay roofing tile** is a good choice for homes with a southwestern, Italian, or 5) __ Mission design, or even for homes with a modern, clean look. Tile lasts a long time – its 6)lifespan is	**AFFORD** **APPLY** **DAMAGE** **DIMENSION** **SPAIN**
Clay roofing tile is a good choice for homes with a southwestern, Italian, or 5) __ Mission design, or even for homes with a modern, clean look. Tile lasts a long time – its 6)_ lifespan is greater than the lifespan of the material on which the roofing rests. Tile won't rot or burn, and it can't be harmed by insects. It requires little maintenance, and comes in a variety of colors, types, styles and brands. The 7) _ drawback to clay tile can be its weight. 8) on the material used to make it, tile can be very heavy – so heavy that extra roof support can be required. With some new materials, however, color is added	**SPAIN** **EXPECT** **BIG** **DEPEND**

only on the surface of the tile, and they can fade over time. Although most modern tile is kiln- fired into the tile making the color permanent. Tiles are fragile, so walking on them can break them. That makes it more difficult to accomplish 9) like painting or cleaning rain gutters or fireplaces. Initial 10)can be more complicated than other roofing materials. Finally, tile can cost more than other roofing materials.	**MAINTAIN** **INSTALL**

10 Fill in the gaps in the following passage with a suitable preposition given below:

POPULAR ROOFING MATERIALS Part III

Concrete tile is now a roofing material. Shingles, simulated wood shakes, lighter-weight tiles and concrete panels are being manufactured 1)a variety of fiber-reinforced cement products. Some are coated 2)plastics, enamels, or thin metals, and some contain recycled material. Although the products themselves are not yet recyclable, they are a good choice 3) _____ durability and resource efficiency.

The advantages of concrete roofing vary from product 4) __ product, but generally they all have a long lifespan, require low maintenance, offer good fire protection and are resistant 5) __rot and insects. Many tiles mimic the appearance of wood shakes, while improving 6) __the durability and fire protection that real wood affords. It can approximate the look of clay tile or slate while mitigating the structural problems caused 7) __the weight of the real material.

Concrete is more expensive than some roofing materials, and early types 8) ___concrete roofing had problems with the material curling, breaking and changing color. Technology has improved, however, and these problems have mostly been overcome. Style and color choices are expanding, and 9) __ mixing the cement 10) __additives, manufacturers make lighter products.

by (x2) , from, for , of , on , to (x2), with (x2)

11 ***Match the columns to remember some technical words for parts of a roof. Figure 9.2 may help you*:**

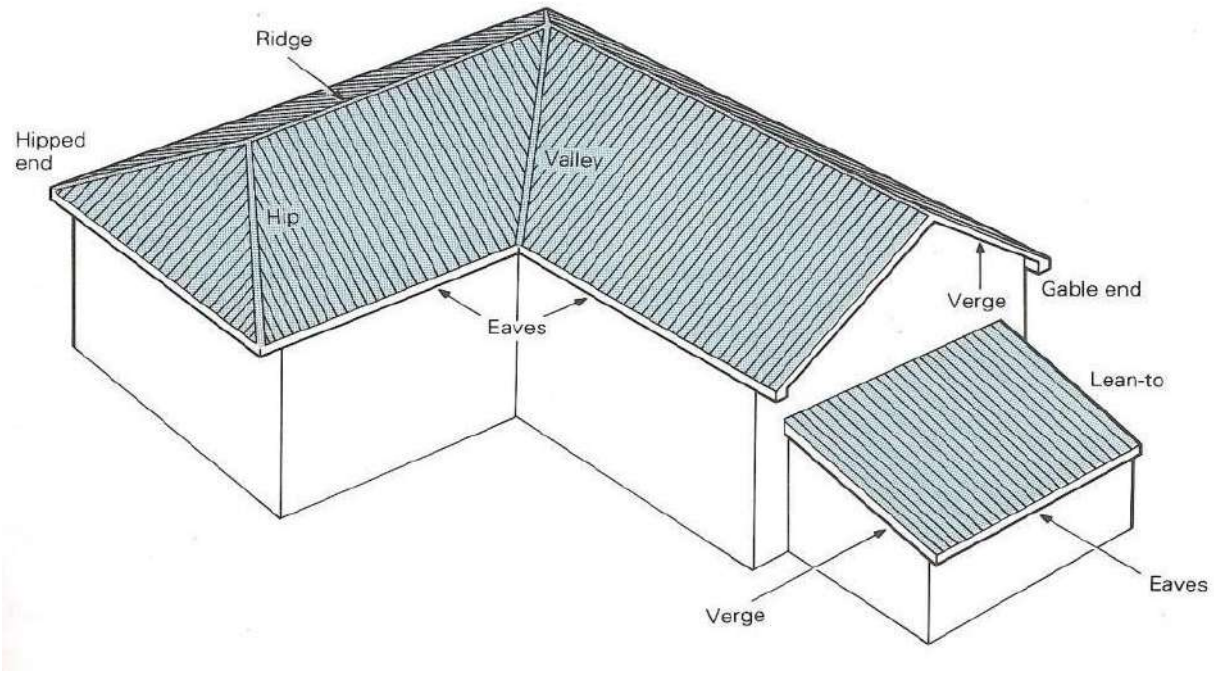


Figure 9.2 Pitched Roof Structure

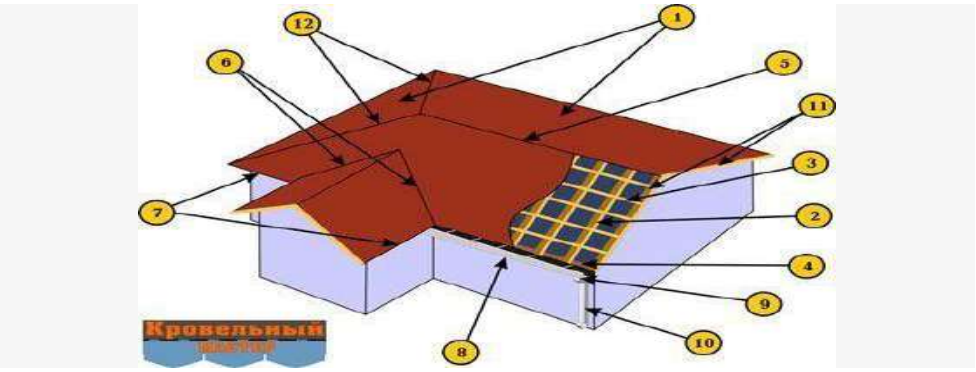
1. covering	a) a thin timber board that is fixed to the end of rafters or roof joints to support the gutters
2. eaves	b) a short rafter that spans the hip and eaves or valley and
	ridge
3. fall	c) the horizontal board that can be fixed to finish the roof structure at the eaves
4. fascia	d) it can be: a) a horizontal timber member that provides support to the rafters; b) a timber member spanning between roof trusses that supports roof

	sheets
5. hip	e) the horizontal distance between the supports of structural members such as the rafters
6. jack rafter	f) the timber member fixed to the top of a wall to secure a flat roof joist or rafter
7. pitch	g) the timber member that spans from the eaves to the ridge in a pitched roof
8. purlin	h) a timber at the apex of the roof that takes the tops of the rafters
9. rafter	i) the bottom end of the roof where it meets the wall
10. ridge	j) the point where two inclined roof surfaces meet over an internal angle
11. ridge tile	k) the external material that is laid over the roof structure to protect the inside of the building
12. soffit	l) the edge of a roof that meets a gable wall
13. span	m) a tile that caps the top of the roof
14. valley	n) the angle formed by the slope of the roof
15. verge	o) the slope required on flat roofs for water run-off
16. wall plate	p) the point where two inclined roof surfaces meet over an external angle

12 ***Translate into English without a dictionary*****:**

Крыша дома состоит из следующих элементов (см. Fig. 9.3.): наклонных плоскостей, называемых скатами (1), основой которых служат стропила (2) и обрешетка (3). Нижние концы стропильных ног опираются на мауэрлат (4). Пересечение скатов образует наклонные (12) и горизонтальные ребра. Горизонтальные ребра называют коньком (5). Пересечение скатов, образующие входящие углы, создают ендовы и разжелобки (6). Края кровли над стенами здания называют карнизными свесами (7) (располагаются горизонтально, выступают за контур наружных стен) или фронтонными свесами (11) (располагаются наклонно). Вода по скатам стекает к настенным желобам (8) и отводится через водо-

приемные воронки (9) в водосточные трубы (10) и далее в ливне- вую канализацию.



LISTENING

13 ***Audio "Components of a Proper Roofing System".***

Listen to the information twice and be ready to answer the questions below (1-5):

1. What is the most important step in roofing process?
2. Why is the quality of roof installation so important?
3. What components are needed for adequate roof functioning?
4. What is the function of the roof felt?
5. What is the role of ventilation in roof installation?

VIDEO

14 ***Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.***

WRITING

15 ***Render the text in English using the expressions from Appendix***

ВЫЯВЛЕНИЕ ДЕФЕКТОВ КРОВЛИ

Выделяют следующие дефекты и нарушения кровли:

– вздутия всего кровельного ковра или отдельных его слоев; неровности поверхности кровли (бугристость) с большим числом отслоений верхнего слоя рулонного материала от нижележащих слоев;

– отсутствие или недостаточное количество наклеиваемых слоев дополнительного кровельного ковра для усиления в местах примыканий; неоднородность структуры защитного слоя на по- верхности кровель в виде чередования полос крупнозернистой посыпки с их обмазкой битумом;

– большое количество поперечных трещин в покровном слое рубероида или другого рулонного материала с крупнозерни- стой посыпкой.

Дефекты возникают в процессе эксплуатации не только из-за отсутствия технически обоснованных проектов, но также из-за нарушения технологии устройства кровли, несоблюдения правил эксплуатации, а также в связи с изменением свойств кровельных материалов под воздействием климатических факторов.

При производстве кровельных работ, увеличения сроков службы кровель без капитального ремонта необходимы постоян- ные и периодические наблюдения за техническим состоянием кровельного покрытия. С этой целью следует проводить плано- мерную или внеочередную (срочную) экспертизу качества кро- вель и их элементов. Это может быть в период устройства, во время эксплуатации, а также при подготовке к ремонту, проведе- нии ремонтных работ и содержании кровель.

When rendering use these words and word combinations:

строительные нормы и правила – construction requirements, вздутие – bulging, неровности поверхности – undulation/ roughness, отслоение – delamination, наклеиваемый слой – paste-on layer, крупнозернистая обсыпка – coarse-grained package, обмазка – coating, правила эксплуатации – standard code, капитальный ремонт – capital repair, техническое состояние – technical state, проведение ремонтных работ – execution of repair work.

16 ***You've found out that the workers installing the roof of your house broke construction requirements. Write a letter of complaint to the building company in which:***

- *specify the problem;*
- *insist on making an examination*
- *insist on taking urgent measures.*

Look at the example of the letter of inquiry and use expressions from Appendix 3.

17 ***Translate the sentences from Russian into English. Be ready to present them not looking at the English equivalents:***

1. Для отвода воды с крыши ее верхнюю плоскость (скат) выполняют наклонной; по величине угла наклона различают три группы крыш: крутые (с уклоном ската более 15 %%), пологие (от 4 до 15 %%), плоские (2 - –3 %%).

2. Крыши с теплым чердаком выполняют с несущими конст- рукциями только из железобетона и применяют в многоэтажных жилых домах при использовании чердачного пространства в ка- честве воздухосборной камеры вентиляционной системы здания.

3. Ребра пересечения скатов имеют следующие названия - – горизонтальное верхнее - – конек крыши, выступающее наклонное - – накосное ребро, западающее наклонное - – разжелобок или ендова.

4. Висячие стропила или фермы применяют при отсутствии внутренних опор; их обязательным элементом служит затяжка, объединяющая нижние концы стропильных ног.

5. При деревянных несущих конструкциях применяют деревянное основание (обрешетку) и плитные или листовые кровельные материалы, при железобетонных - – рулонные или мастичные.

SPEAKING

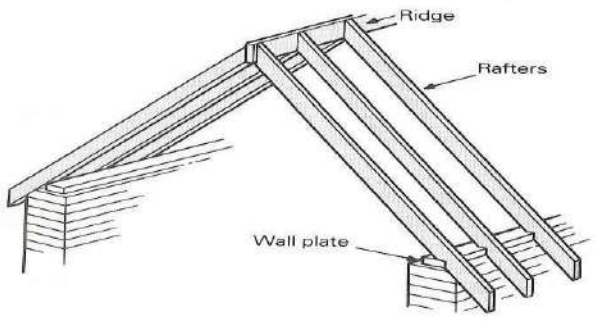
18 ***Read the text. Discuss the problem raised in the text with your partner. Use the linking words/phrases from Appendix 1:***

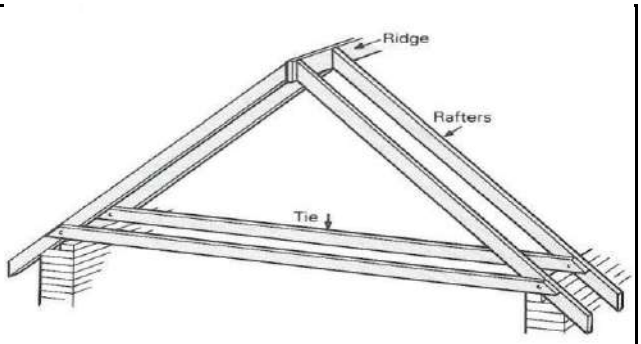
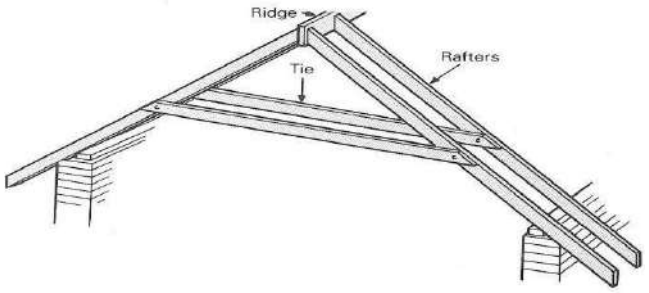
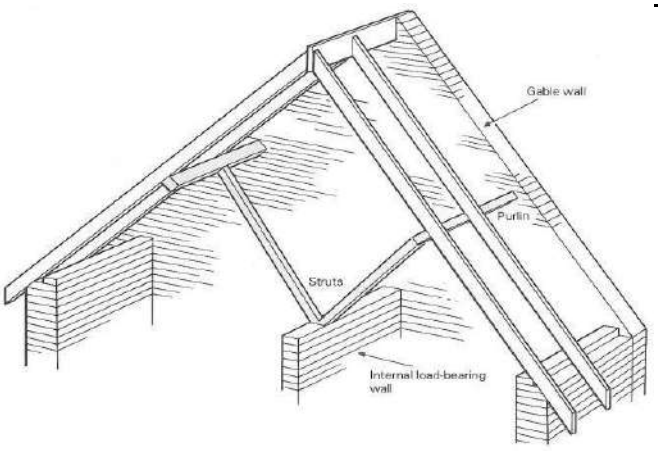
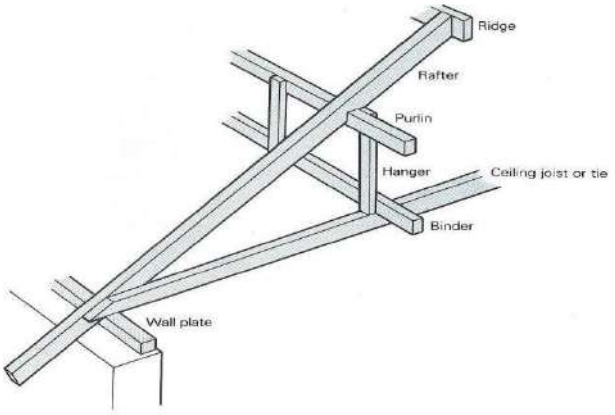
Green roofs (roofs with a vegetated surface and substrate) provide ecosystem services in urban areas, including improved storm-water management, better regulation of building temperatures, reduced urban heat-island effects, and increased urban wildlife habitat. These benefits are evident and the biotic and abiotic components contribute to overall ecosystem services. It is necessary to emphasize the potential for improving green-roof function by understanding the interactions between its ecosystem elements, especially the relationships among growing media, soil biota, and vegetation, and the interactions between community structure and ecosystem functioning. Further research into green-roof technology should assess the efficacy of green roofs compared to other technologies with similar ends, and ultimately focus on estimates of aggregate benefits at landscape scales and on more holistic cost-benefit analyses.

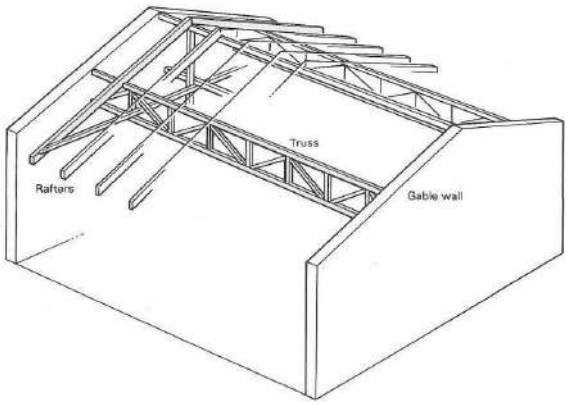
19 ***Study the information below, find additional information on each point and speculate on the problem raised in the text. Use the linking words/phrases from Appendix 1:***

DIFFERENT METHODS OF PITCHED ROOF CONSTRUCTION

Pitched roofs can be built in different ways depending on the loads and sizes. This list describes some common types of pitched roof that use different methods of construction.

Couple roof A couple roof has two timbers (called rafters) that are joined at the apex at their top end and rest on the walls at their bottom end. A couple roof is used for small spans.	

Closed couple roof In a closed couple roof a tie member connects the bottom ends of the rafters. The design stiffens the rafters to resist the loads on a larger span.	
Collar roof The collar roof has a tie member to connect the rafters higher up the slope. The design allows the roof eaves to be lower or the ceiling to be higher.	
Purlin roof A purlin roof has a horizontal timber that is supported by the external walls of the roof structure to stiffen the rafters. The purlin may be supported by struts, which rest on internal loadbearing walls.	
Trussed purlin roof Trusses replace struts as support for the purlins. Trusses, which are spaced about 1800 mm apart, are braced against external walls rather than internal load-bearing walls.	

Trussed rafter roof A trussed rafter roof combines ceiling joists with additional struts and ties for larger spans. The trussed rafters, which are prefabricated, are braced against the external walls. The use of trussed rafters eliminates the need for purlins and other supporting members.	

20 ***Topics for projects and presentations:***

1. Metal roofing.
2. Defects of roofing.
3. Solar roofs.
4. Roof gardens.
5. Roof garden vs. green roof.

Word List to Unit 9

covering, *n*	покрытие
eave(s), *n*	свес крыши
fall, *n*	уклон
fascia, *n*	сандрик (архитектурное украшение, карниз над окнами здания)
hip, *n*	ребро вальмовой крыши; конек
jack rafter	короткая стропильная нога
pitch, *n*	уклон ската крыши
purlin, *n*	обрешетина
rafter, *n*	стропило, стропильная связь
ridge, *n*	конек; коньковый брус (крыши)
ridge tile	коньковая черепица
soffit, *n*	софит; потолок; нижняя поверхность

span, *n*	пролет
valley, *n*	желоб
verge, *n*	край крыши у фронтона
wall plate	мауэрлат — элемент кровельной системы здания. представляет собой брус или бревно, уложенное сверху по периметру наружной стены. служит крайней нижней опорой для стропил.
gabled roof	остроконечная крыша
arched roof	арочная крыша
mansard roof	мансардная крыша
pyramid roof	пирамидальная крыша
shade, *n*	тень; полумрак; прохлада
retain	сохранять (напр. влагу)
performance, *n*	производительность; эффективность
rainwater, *n*	дождевая вода
pitched roof	скатная крыша
flat roof	плоская крыша, кровля
storage space	складская площадь
gable roof	двухскатная крыша
hipped roof	вальмовая крыша
lean-to roof	пристройка к односкатной крыше
monopitch roof	односкатная крыша; односкатное покрытие
masonry structure	каменная конструкция

steep pitch	крутой скат (крыши)
clay tile roofing	керамический кровельный материал
maintain, *v*	обслуживать
gutter, *n*	водосточный желоб
joist, *n*	несущая балка (крыши)
boarding, *n*	настил
firring, *n*	обшивка досками
corrugated sheets	волнистый листовой материал
galvanized steel	оцинкованная сталь

embed, *v*	вставлять, внедрять, заглублять
mortar joint	шов с заполнением строительным раствором
tie, n	шпала
thatch, n	тростник; солома
fiberglass, n	стекловолокно
sod, n	дерн
shortcoming, n	недостаток
meet the demand	удовлетворять требование
attic, n	чердак
breathe, v	дышать
shingle, n	плоская черепица, плоская кровельная черепица
composition shingle	рубероидная кровельная плитка
fragile, adj	хрупкий, ломкий
concrete tile	бетонная черепица
enamel, n	эмаль; эмалевая, лаковая краска
bulging, n	вздутие
couple roof	кровля со стропилами без затяжек
apex, n	вершина (сооружения) ; гребень; конек (крыши)
closed couple roof	стропильная ферма
collar roof	крыша с висячими стропилами
purlin roof	решетчатая крыша; обрешетина
trussed purlin roof	кровля из стропильных ферм
trussed rafter	висячее стропило, стропильная ферма

"Traditional buildings have thick exterior walls.
Modern buildings have thin walls."
Matthew Frederick (architect)

Unit 10

WALLS

10.1. Types of Walls

1 ***Explain how the following words are connected with "walls":***
internal, external, load-bearing, non-load-bearing, cladding, separation, sound insulation.

2 ***Match information to the pictures:***

1. It is a series of stone and earthen fortifications built originally to protect the northern borders of the Empire.All the walls measure 8,851.8 km. This is made up of 6,259.6 km sections of actual wall, 359.7 km of trenches and 2,232.5 km of natural defensive barriers such as hills and rivers.
2. Known also as the Western Wall, it is located in the Old City of Jerusalem at the foot of the western side of the Temple Mount. It has been a site for Jewish prayer and pilgrimage for centuries.
3. It is a defensive wall that surrounds the Kremlin, recognizable by the characteristic notches and its towers. The original walls were likely a simple wooden fence with guard towers built in 1156.
4. It was a barrier constructed in 1961 that completely separated the country. The barrier included guard towers placed along large concrete walls, which circumscribed a wide area (later known as the "“death strip") ”) that contained anti-vehicle trenches, "“fakir beds" ” and other defenses. The fall of the Wall paved the way for country reunification, which was formally concluded on 3 October 1990.
5. The wall is in Prague, Czech Republic. Once a normal wall, since the 1980s it has been filled with graffiti and pieces of lyrics from Beatles songs. Today, the wall represents a symbol of youth ideals such as love and peace.
6. It was a defensive wall first built by the Romans around Londinium, their strategically important port town on the River Thames. Until the later Middle Ages the wall defined the boundaries of the City. Today all that remains of the wall are a few fragments, some of which can be seen in the grounds of the Museum of London, in the Barbican Estate and around Tower Hill.

a)The Kremlin *b)The Great Wall* *c)The Berlin*

Wall *of* *Wall*






d)The Lennon Wall a) *The Kremlin Wall* *e)London Wall* b) *The Great Wall of China* *f)The Wailing Wall* c) *The Berlin Wall*



d) The Lennon Wall *e) London Wall* *f) The Wailing Wall*

3 Discuss the following:

Even walls may have ears.
(Russian Proverb)

To preserve friendship, one must build walls.

•Write a paraphrase. ***• Say whether you agree or not, and why.***

READING

4 ***a) Transcribe the following words:*** areas, characteristics, strength, thermal, durability, domestic,
corrugated, insulation, reasonable, majority.

b) In what context do you think the following words and phrases will appear in the text?

•enclose and separate •external and internal •weather resistance
•thermal properties •fire-resistance •load-bearing/non-load-bearing
•domestic •cladding sheets •separation •sound insulation

c) Read the text and check your answers:

WALLS

Walls are constructed to enclose areas and to separate the spaces inside and outside a building. Walls can be **external** and **internal**.

External walls should have the following characteristics:

1) strength to resist being crushed by the loads from floors and roofs;
2) **stability** to resist other forces such as wind pressure and roof loads;
3) weather resistance to keep out wind and rain;
4) thermal properties to keep the interior cool in hot weather and **retain** warmth in cool weather;
5) durability;
6) fire-resistance to provide **security** and stability in the event of fire;
7) openings for daylight and ventilation; 8)good construction and use of materials.

External walls can be divided into the *load-bearing external walls* and *non-load-bearing external walls*.

Load-bearing external walls (Fig. 10.2) are normally used for domestic buildings or other small structures that are one or two storeys high. The weight of the roof and any upper floors is supported by load-bearing masonry of brick, block or stone construction.

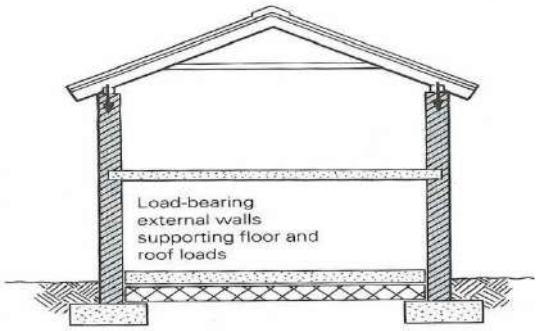


Figure 10.2 Load-bearing external external walls

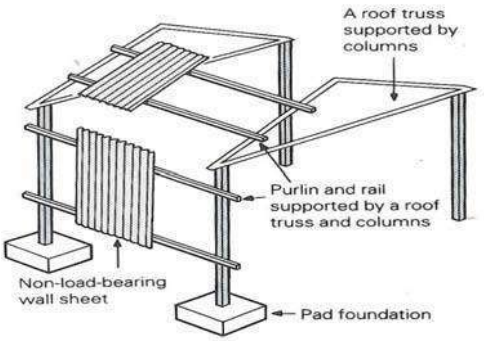


Figure 10.3 Non-load-bearing walls

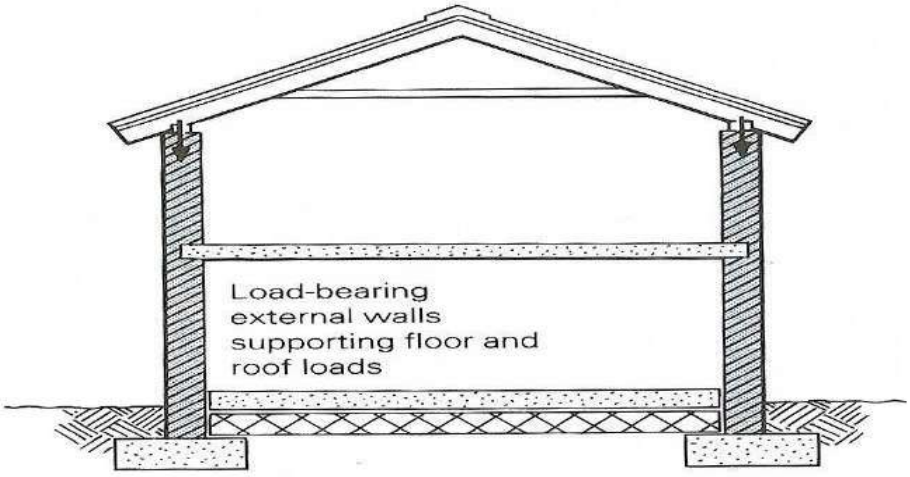


Figure 10.2. Load-bearing external walls

Non-load-bearing external walls (Fig. 10.3) are often built from **corrugated** sheet cladding that is attached to a framework of timber or steel rails and column. The cladding sheets do not support the structure of the building. Support is provided by the framework. The cladding sheets must be wind-resistant.

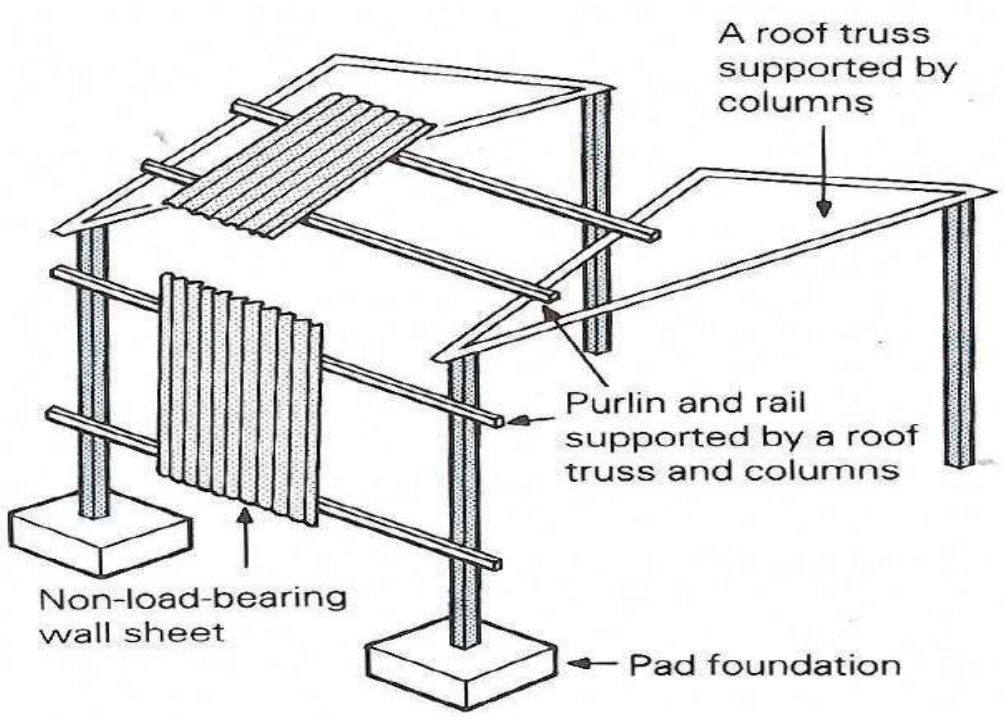


Figure 10.3. Non-load-bearing external walls

Internal walls should have the following characteristics:

1) positions that provide separation between rooms;
2) sound**insulation** that provides a reasonable level of noise control between **adjoining** rooms;
3) stability to resist normal impact and to support **fixtures** and fitting; 4)fire-resistance to **prevent** the rapid spread of fire to adjoining rooms.

Internal walls can be divided into the *load-bearing internal walls* and *non-load-bearing internal walls* (Fig. 10.4).

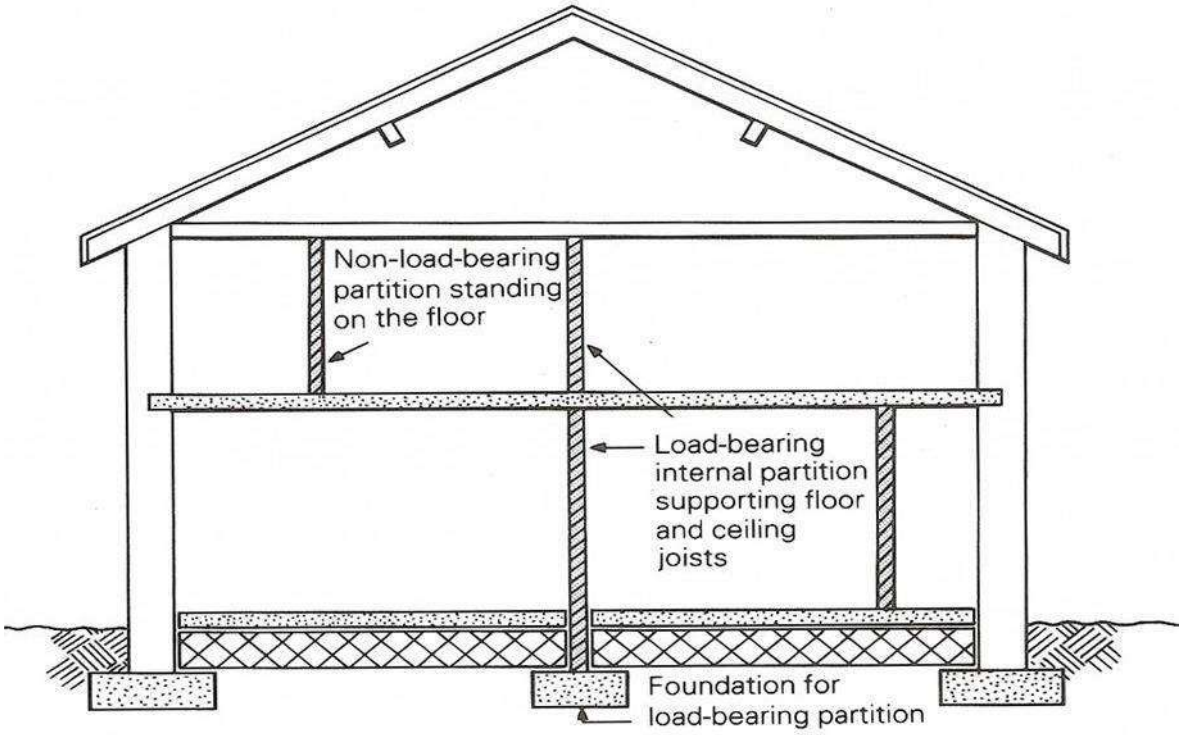


Figure 10.4. Load-bearing and non-load-bearing internal walls

Internal walls are load-bearing if additional support is needed for the roof or floors. These walls will need to be strong and stable. They usually stand on concrete foundation.

Non-load-bearing internal walls divide the internal space in buildings and stand independently of the main structure. The majority of internal walls are in this category.

5 ***Read the text again and answer the questions that follow (1-–7):***

1. What characteristics of external walls can you offer?
2. How can you classify external walls?
3. What is the function of load-bearing external walls?
4. What is the role of sheet cladding in non-load-bearing external walls?
5. What are the characteristics of internal walls?
6. What have you learnt about internal load-bearing walls?
7. What types of walls divide the internal space in buildings?

Follow-up

6 ***a) Find in the text the synonyms for the following words:***

principle features, to withstand, not allow to, thermic qualities, to hold warm temperature, small buildings, brickwork, plating, to be ensured, acceptable rate of sound control, to obviate fast spreading, adjacent space, extra bearer/ bearing.

b) Explain the words in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

7 ***Give the English equivalents to the following and use 5 of them in small situations:***

Делить площади/пространство; несущий; сопротивляться силам; тепловые свойства; обеспечивать безопасность и прочность; жилое здание; кирпичная кладка; блочная конструкция; каменная конструкция; прикрепляться к деревянному каркасу; звукоизоля- ция; допустимый уровень шума; арматура и фитинги; предотвра- тить быстрое распространение огня; дополнительная опора для крыши; бетонное основание.

8 ***Ask questions to the following*:**

1. Non-load-bearing external walls are often built from corrugated sheet cladding. (5)
2. Sound insulation provides a reasonable level of noise control between adjoining rooms. (5)
3. External walls should have fire-resistance to provide security and stability in the event of fire. (4)
4. Load-bearing internal walls usually stand on concrete foundation.
   (3)
5. Non-load-bearing internal walls divide the internal space in buildings. (4)

LANGUAGE FOCUS

9 ***Fill in the gaps with derivatives of the words in capitals:***

BUILDING MATERIALS for EXTERNAL WALLS **Part I** Some 1) _ methods use locally available materials and techniques that are economical and 2)) __ sound. Many different types of material are	**CONSTRUCT** **ECOLOGICAL** **REQUIRE**

available, but the two main 3) for building materials are stability and durability. The tree most common materials for external walls are: 4)_____stone, bricks, cement-based blocks. Cement-based blocks should be 5) ____in detail. They are manufactured from a 6) _____ of ingredients. The cement binds the aggregate that forms the bulk of the block into a firm 7)material. The strength and 8) _____of the block depends on the type of aggregate used with the cement. Blocks consist of natural materials that are 9) and cured such as: 1. sand (sandcrete (Portland cement and sand in a ratio of circa 1:8)). The sand is mixed with the cement in 1:4 or 1:6 proportions; 2. stone (concrete). The 10)blocks are made from a mixture of cement, sand and crushed stone.	**NATURE** **CONSIDER** **MIX** **BUILD** **DURABLE** **MOULD** **STRONG**

10 ***Use the words bellow to complete the sentences:***

BUILDING MATERIALS for EXTERNAL WALLS Part II

The external wall of a building provides weather

1) and must be durable and fire resistant even if it is not built from load- bearing materials such as brick, block and stone. *Corrugated iron sheet* or *timber*

2)is classified as non-load bearing.

Iron sheets must be supported on a 3) with columns that transfer the building loads and wind pressure from the structure to the foundation. The columns transfer point loads to the foundation, unlike the evenly distributed 4) __ transferred by the load-bearing wall to strip foundations.

Corrugated 5) sheets have disadvantages as a building material for external walls for housing:

1. very poor thermal insulation;
2. very poor 6) __ insulation;
3. they are difficult to decorate internally because they require an internal lining to attach fixtures and fittings;
4. the general appearance does not look as homely as conventional materials.

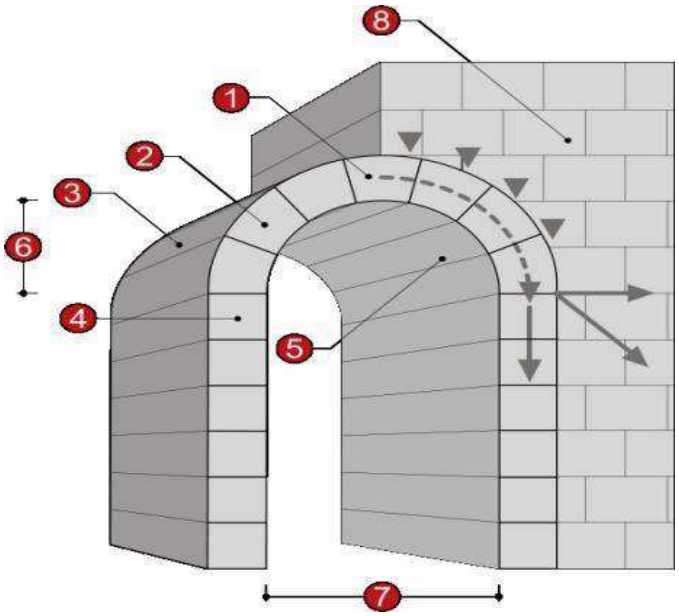
Timber cladding is the other material used for non-load-bearing external walls. The structural framework consists of a timber roof supported by timber columns on a 7) _foundation. Lightweight prefabricated timber wall frames are secured to the timber 8).

Timber cladding usually consists of plywood, chipboard or hardboard panels. They are nailed or 9) __ to the framework so that the heads of the nails or screws are below the surface of the board. The holes should be 10) so that the surface of the board is even.

cladding, loads, filled, columns, resistance, screwed, framework, iron, sound, raft

11 ***a) Match the parts of arch and words given:***

rise; abutment; keystone; back/extrados; clear span, "“Bay"; ”; voussoir; intrados; impost.



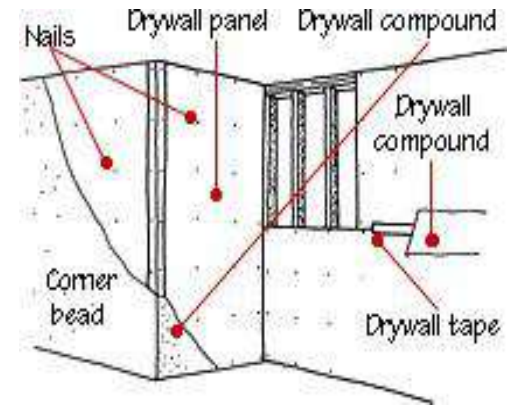
b) Match the terms with their definitions:

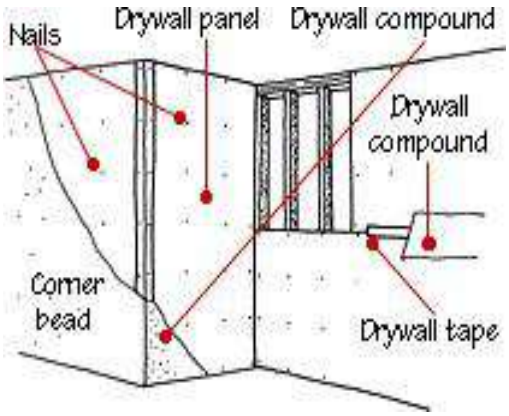
1) abutment	a)) the horizontal distance between supporting pillars, columns, or walls, being the maximum possible distance clear of obstacles
2) back/ extrados	b)) the vertical distance between the springing line of the arch and the curve of the intrados
3) clear span	c)) the uppermost part of a column or pillar supporting an arch
4) impost	d)) the central stone or brick at the top of the arch, which
	may be wedge-shaped; it holds the arch together
5) intrados	e)) the point where the ends of the arch rest on the wall and support the weight of the structure above them
6) keystone	f)) a wedge-shaped or tapered stone used to construct an arch
7) rise	g)) the undersurface or soffit of the arch
8) voussoir	h)) the outer curve or surface of an arch or vault

11 ***a) Translate into Russian without a dictionary:***

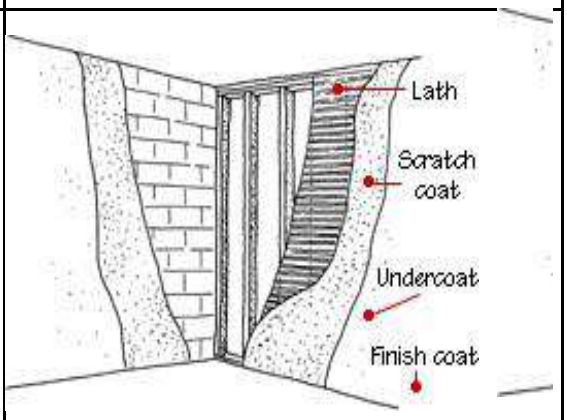
INTERIOR WALL CONSTRUCTION

Drywall sheets are applied to studs, joists, or rafters with special drywall nails, drywall screws, or adhesive. Joints between panels are taped with a paper or fiberglass tape and are coated, along with nailheads, by several layers of smooth, plaster-like wallboard compound ("mud"). Most outer corners are reinforced with metal or square- edged or rounded corner bead. The sheets, which are relatively inexpensive, are 4 feet wide, 1/4 to 5/8 inch thick, and from 6 to 16 16 feet long. The standard size is 1/2 inch thick and 8 feet long.

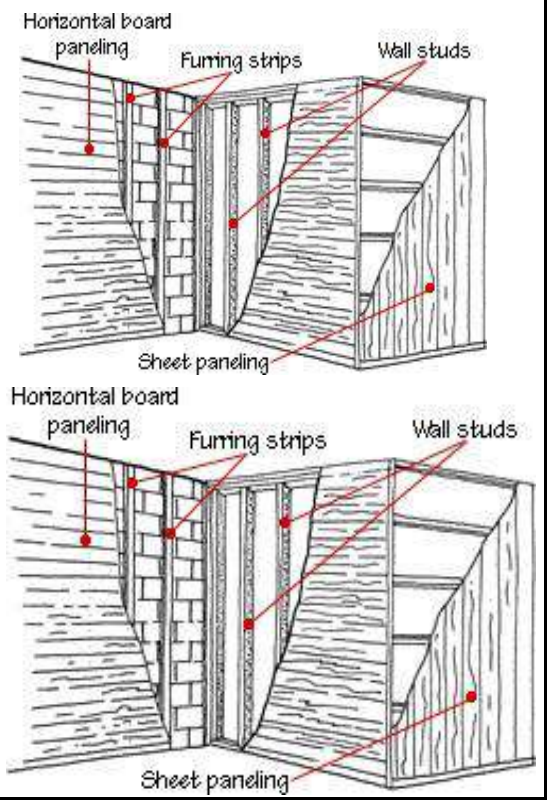




Plaster is a mixture of Portland cement, sand, and water that is applied in a thick, mud-like consistency to a base of wood or metal lath or perforated plasterboard. Plaster is applied in layers: first, a scratch coat is troweled onto the lath so that it oozes through and grips the backing when it hardens. After that dries, a second, or undercoat, is applied. Then, a finish or white coat is troweled on the



undercoat for the final, smooth

surface.	
Wood paneling has been used as a wall covering since walls have been walls, though it's now used primarily as an accent for a study or family room where its warmth and character are desired. Wood paneling is made both in sheets and in individual, interlocking strips. They're glued or invisibly nailed to existing walls or furring strips; furring is always needed when paneling is applied to masonry walls.	

b) Choose ten unfamiliar expressions from the text, consult the dictionary and use them in your own situations.

13 ***Look at the text, separate the words to make sense:***

- Modern building walls may be designed to serve a seither bearing walls or curtain walls or as a combination of both in response to the design requirements of the building as a whole.
- Both types may appear similar when complete, but their sequence of construction is usually different.
- Bearing-wall construction may be masonry, cast-in- place or precast reinforced concrete, studs and sheathing, and composite types.
- The design loads in bearing walls are the vertical loading from above, plus horizontal loads,both perpendicular and parallel to the wall plane.
- Bearing walls must be erected before supported building components above can be erected.
- Curtain wall construction takes several forms including lighter version soft hose used for bearing walls
- Thesewallscanalsocompriseassembliesofcorrugatedmetalsheets,gl asspanels,orceramic-coated metalpanels,eachlaterallysupportedbylightbylightsubframingmem bers.
- Thecurtainwallcanbeerectedafterthebuildingframeiscompleted,sin ceitreceivesverticalsupportbyspandrelbeams,orrelievingangles,att hewallline.

LISTENING

14Listen to the audio "Wall Construction" twice and be ready to answer the questions below (1-–5):

1. What are the three concepts for wind resistant wall construction?
2. What measures should be taken to resist uplift forces?
3. What forces are shear walls subjected to?

4. In which case is the wall subjected to overturning force?
5. How to resist lateral forces in wood frame construction and in concrete masonry?

VIDEO

15 Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.

WRITING

16 Render the text in English using the expressions from Appendix2:

ТРЕХСЛОЙНАЯ СТЕНА С ВЕНТИЛИРУЕМЫМ ЗАЗОРОМ

При таком конструкционном решении, между теплоизоляцией и облицовочной стенкой из кирпича, устраивают вентилируемый зазор шириной не менее 40 мм. В нижней и в верхней части стены (около цоколя и карниза), а также в зоне межоконных простенков и в подоконной зоне, устраивают отверстия для приточной и вытяжной вентиляции. Вентиляционные отверстия выполняют, не заполняя вертикальные швы между кирпичом кладочным раствором в одном слое кладки, или установив пустотелые кирпичи на ребро. Площадь вентиляционных отверстий должна составлять 0,5-–1 % % от площади стены.

Здания со стеновой конструкцией такого типа, имеют высоту не более 3-–4 этажей. Наружная облицовочная стена из кирпича, является самонесущей, стоит на фундаменте, не нагружая внутреннюю стену, выполненную из газобетонных блоков, на нее не укладывают плиты перекрытия. Высота облицовочной стены не должна превышать 3-–4 этажа.

Внизу облицовочной стены, в месте ее опирания на фундамент, необходимо предусмотреть возможность отвода воды, которая будет образовываться в виде конденсата на металлических анкерах. В этом случае выполняется фартук из рулонной гидроизоляции, уложенной на цементно-песчаный раствор, а в обли-

цовочной стене оставляют отверстия, закрытые решеткой, через которые вода может стекать с фартука наружу. Вместо отверстий в вертикальных швах, в них могут вставляться специальные вкла- дыши, которые обеспечивают отток воды. Аналогичные отвер- стия нужно оставлять также у верхнего края стены.

При принятии решения о применении такой конструкции, также необходимо провести все расчеты на выдергивающие уси- лия анкеров, деформацию кладки. Недостатком такого конструк- ционного решения является сложность устройства, удорожание по сравнению с однослойными стенами.

When rendering use these words and word combinations:

трехслойный – three-ply, зазор – gap, межоконный простенок – pier, приточная и вытяжная вентиляция – supply-and-exhaust ventilation, кладочный раствор – masonry mortar, пустотелый кирпич – cavity brick, газобетонный блоки – gas concrete blocks, отвод воды – water drainage, фартук – soaker, рулонная гидроизоляция – roll water proofing, вкладыш – infilling.

17 ***Translate the sentences from Russian into English:***

1. Любая стена жилого дома должна совмещать выполнение ряда обязательных требований и функций: конструкционная прочность, минимизация нагрузок на фундамент, тепловое сопротивление, , водопоглощение, огнестойкость, морозостойкость.
2. Самонесущие стены несут соответствующую массу в пределах всей высоты здания и передают ее на фундаментные балки.
3. Ненесущие (навесные) стены выполняют в основном ограж- дающие функции, масса их полностью передается на колонны каркаса.
4. Тепловой комфорт в помещении достигается при соблюдении минимально допустимого значения теплового сопротивления внешних стен; этот показатель прямо зависит от толщины сте- ны и теплопроводности материала.

5. Наиболее серьезными недостатками деревянных стен является пожароопасность, невысокая огнестойкость и усадочные де- формации в течение первых 2-–3 лет эксплуатации.

SPEAKING

18 ***Read the text, find additional information and speculate on the problem raised:***

ТИПИЧНЫЕ ОШИБКИ, ДОПУСКАЕМЫЕ ПРИ СТРОИТЕЛЬСТВЕ СТЕН

При возведении стен проблемы возникают довольно часто. В первую очередь нужно внимательно отнестись к материалу и подходить к его выбору основательно и не торопясь, поскольку в зависимости от этого вы можете получить тот или иной букет «случайностей».

Предположим, вы всегда мечтали иметь деревянный дом и наконец-то приступили к постройке. Учли ли вы, что дерево тре- бует дополнительной обработки во время и после возведения из него стен? Если не применить специальные препараты, то ваши стены станут прибежищем насекомых, которых вытравить будет довольно трудновато, а ведь они не будут мирно радоваться но- воселью, а станут поедать древесину. Еще более важной пробле- мой может стать горючесть дерева как материала, поэтому его так же стоит обрабатывать уже другими специальными препара- тами.

Кирпичные стены таят в себе другие неприятности. Примером таковых может служить появление белых разводов соли на стене, явления, связанного в основном с частыми и значительными перепадами температур. Прежде чем закупать кирпич для постройки, стоит основательно вникнуть в «разнообразие видов». Предлагаемый ассортимент довольно велик, и у каждого вида есть свои достоинства, впрочем, как и недостатки, а верный под- бор минимизирует возможные проблемы. Оштукатуривание фа- сада здания сложенного из кирпича также таит в себе несколько проблем, которые упорно не замечаются до их явного проявле- ния, хотя большинство из

них можно избежать на стадии плани- рования. Например, фасады покрытые штукатуркой по мокрой технологии могут быть долговечными разве что в южных краях. Следствием чего станет необходимость не просто постоянного подновления, а конкретно основательного ремонта. Не забывайте соблюдать пропорции приготовления цементно-известкового раствора: стены не должны быть ни сырыми, ни пересушенными, толщину штукатурного слоя нужно рассчитывать, а не просто наносить и т.д.

19 ***Read the text. Discuss the problem raised in the text with your partner. Use the linking words/phrases from Appendix 1:***

REMOVING A LOAD BEARING WALL

Load-bearing walls often run perpendicular to the run of floor or ceiling joists that rest on top of the wall. however, beware of walls that run parallel with floor joists. They can obscure hidden posts or columns. One can create an opening in a bearing wall much the same as openings are created in exterior walls for large windows or doors. A beam is placed over a new opening and accepts the load from above and concentrates it onto columns or posts at either end of the beam. The new columns or posts that support a new beam must rest upon solid bearing material. The weight of the structure above the beam will then be transferred to a spread footer, thickened slab, steel or wood beam, or possibly some other structural member below.

Sizing the beam and posts that support the beam should be done by a professional. A structural engineer is trained to calculate the current floor, ceiling and roof loads and possible added loads caused by snow, attic storage, and additional roof coverings. If to undersize a beam, portions of the house may sag and even in extreme cases collapse.

There are several different ways to install a new beam in a load bearing wall. in some instances the beam can be hidden within the ceiling above. This works if the beam height does not exceed the height of the floor or ceiling joists and there are no utilities that must pass through a new beam location. If to choose this method, the

floor/ceiling joists above are attached to a new beam using metal joist hangers.

The most common approach is to install a new beam bellow the floor/ceiling joists. To install a beam one need to build a temporary support wall on either side of the wall which is being removed. The temporary walls should be held back about 30 inches from each side of the old wall. Be sure to build a new beam and slide it up against the old wall before to build a last re-support wall. If to fail to do this, it is often impossible to get a new beam into position.

20 ***Topics for projects and presentations:***

1. Modern tendencies in interior wall construction.
2. Modern tendencies in exterior wall construction.
3. Wall construction types: advantages and disadvantages.
4. Decorative exterior walls.
5. Walls in popular culture.

Word List to Unit 10

load-bearing wall	несущая стена
non-load-bearing wall	не несущая стена
cladding, *n*	плакирование
sound insulation	звукоизоляция
measure, *n; v*	размер; измерять
trench, *n*	ров, канава
notch, *n*	выемка
fence, *n*	забор, изгородь
circumscribe, *v*	ограничивать, обозначать пределы
weather resistance	устойчивость к атмосферным воздействиям
thermal properties	тепловые свойства, термические свойства
fire-resistance	огнестойкость
cladding sheet	листовой материал для заполнения каркаса
enclose, *v*	загораживать, ограждать; заключать
external and internal	внешний и внутренний
stability, *n*	стабильность, устойчивость

wind pressure	ветровая нагрузка, давление ветра
roof load	нагрузка на крышу
retain, *v*	держать; удерживать, сохранять
durability, *n*	долговечность; прочность; стойкость
security, *n*	безопасность
domestic building	жилое здание
masonry, *n*	каменная или кирпичная кладка
corrugated sheet	волнистый лист
attach, *v*	прикреплять, присоединять, связывать, закреплять
framework, *n*	рамная конструкция, каркас; стержневая конструкция
rails, *n, pl*	рельсы
cladding sheet	листовой материал для заполнения каркаса
adjoining room	смежная комната
fixtures, *n*	арматура
fitting, *n*	арматурная деталь
bind, *v*	связывать; скреплять; затвердевать
bulk, *n*	основная масса
firm, *adj*	крепкий, прочный, твердый
mould, *v*	формовать, прессовать
cure, *v*	отверждать, схватывать(ся)
corrugated iron sheet	лист волнистого железа; лист рифленого железа
plywood, *n*	фанера

chipboard, *n*	древесно-стружечная плита (ДСП)
hardboard, *n*	древесно-волокнистая плита
nail, *n; v*	гвоздь; забивать гвоздь
screw, *n; v*	винт; привинчивать
even, *adj*	ровный, плоский
abutment, *n* устой	устой, опора (арки, свода); пята свода;
keystone, *n*	замковый камень (свода или арки)

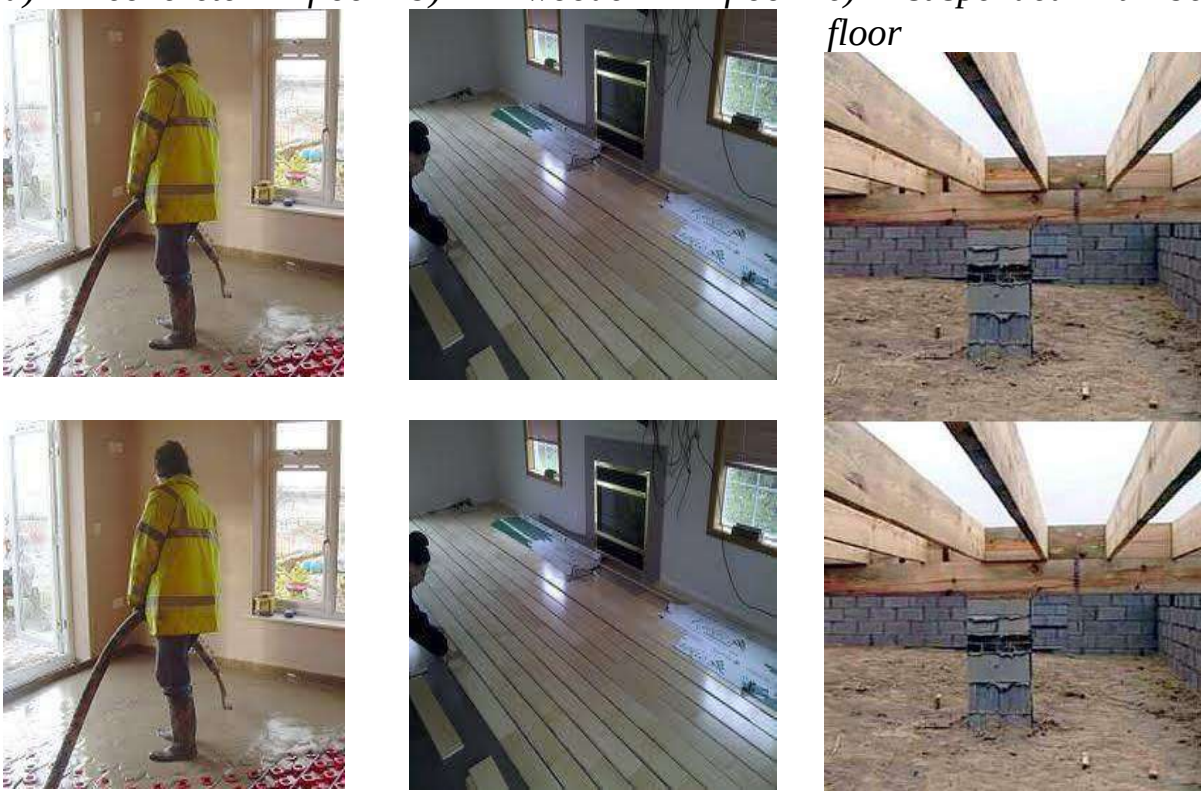
extrados, *n*	верхняя выпуклая поверхность между пятами арки, свода
clear span	пролет в свету
voussoir, *n*	клинчатый или сводчатый кирпич
intrados, *n*	внутренняя вогнутая поверхность арки от пят до замка
impost, *n*	импост; пята арки, свода;
supporting pillar	опорная стойка
springing line	линия пят арки
curve, *n*	кривая
wedge-shaped, *adj*	клинообразный
tapered, *adj*	конический; конусный
soffit = soffite, *n*	софит; нижняя поверхность
vault, *n*	свод
drywall, *n*	гипсокартон
stud, *n*	стойка (каркаса); косяк; свая
joist, *n*	несущая балка
rafter, *n*	стропило, стропильная связь
adhesive, *n*	связывающее вещество; клеящий материал
fiberglass, *n*	стекловолокно
reinforce, *v*	укреплять, усиливать
square-edged, *adj*	обрезанный на четыре канта
rounded corner bead	штапик для скругления углов
inch, *n*	дюйм
metal lath	металлическая сетка
plasterboard, *n*	гипсокартон
plaster, *n*	штукатурка
trowel, *n*	штукатурная лопатка; кельма; мастерок
finish, *n; v*	отделка поверхности; отделывать, шлифовать
gap, *n*	зазор
supply-and-exhaust ventilation	приточная и вытяжная вентиляция
soaker, *n*	фартук

"The two most important keys to effectively organizing a floor plan are managing solid-void relationships and resolving circulation." MatthewFrederick (architect)

Unit 11

FLOORS

a) concrete floor *b) wooden floor* *c) suspended timber floor*



a)concrete floor *b) wooden floor* *c) suspended timber floor*

Figure 11.1. Types of Floor

LEAD-IN

1 ***Match the idioms with the definitions and use them in your own situations*:**

1.1) to take a floor	a)) to become involved in something from the beginning
2) to get in on the ground floor	b)) to leave one's party entirely and join another party
3) to floor someone	c)) to pace nervously while waiting
4) walk the floor	d)) to stand up and address the audience
5) to cross the floor	e)) to surprise and astound someone

2 ***Explain how the following words and expressions are connected with "floors":***

ground, upper, suspended, raft foundation, shrinkage gaps, plywood, growth of vegetation, air bricks, proportion, sleeper walls, damp-proof membrane.

3 Discuss the following:

One who cannot dance blames the floor.

(Hindi proverb)

One pebble doesn't make a floor.

(Nigerian proverb)

• ***Write a paraphrase.***

• ***Say whether you agree or not, and why.***

READING

4 a) Transcribe the following words:

barrier, shrinkage, honeycomb, membrane, awkward, chequerboard pattern, bituminous, a damp-proof course, floor joists, circulate, dampness, length, availability.

b) In what context do you think the following words and phrases will appear in the text?

•concrete slabs •honeycomb sleeper • chequerboard pattern •bituminous • surface • reinforced • floor boards • raft foundation • wall plates

c) Read the text and check your answers:

FLOORS

The main functions of **floor** are:

1) to support the loads from the **finishes**, people, machines, furniture and fixtures;
2) to provide a level surface for normal uses in a building;
3) to provide a level surface for any floor finishes that are applied.

Floors are normally classified as: ground floors and upper floors.

Ground floors are either concrete slabs laid directly on the ground on **hardcore beds** or suspended timber structures supported on honeycomb sleeper walls that stand on concrete slabs.

Upper floors are either reinforced concrete slabs or suspended timber structures that are supported on **load-bearing walls**. The oversite-concrete slab

At ground-floor level, the concrete slab that rests on the ground floor must:

1) provide a total barrier to dampness in the ground by the use of a damp-proof membrane;
2) prevent termites from entering the building; 3) prevent the growth of vegetation.

Concrete **oversite slabs** are used for both suspended timber floors and concrete floors.

The difficulty with suspended timber floors on concrete oversite slabs is that extra care should be taken to achieve the three conditions. The space under timber floors at ground level must be well-ventilated and the timber treated with preservative to ensure that it stays dry and resistant to insects such as termites. Because access is awkward it is difficult to observe and control potential problems.

A typical oversite concrete floor slab that is laid directly on the ground is made from concrete (proportion: cement- sand- water – 1:3:6). Since concrete shrinks as it dries it should be laid in areas that are no larger than 3 metres by 3 metres or 10 square metres. If the concrete is placed in more than one section at a time, then be sure not to put it in **adjacent bays** at the same time. The concrete should be poured in a **chequerboard pattern** so that the spaces left after the shrinkage can be filled in as each section dries.

Concrete ground-floor slabs

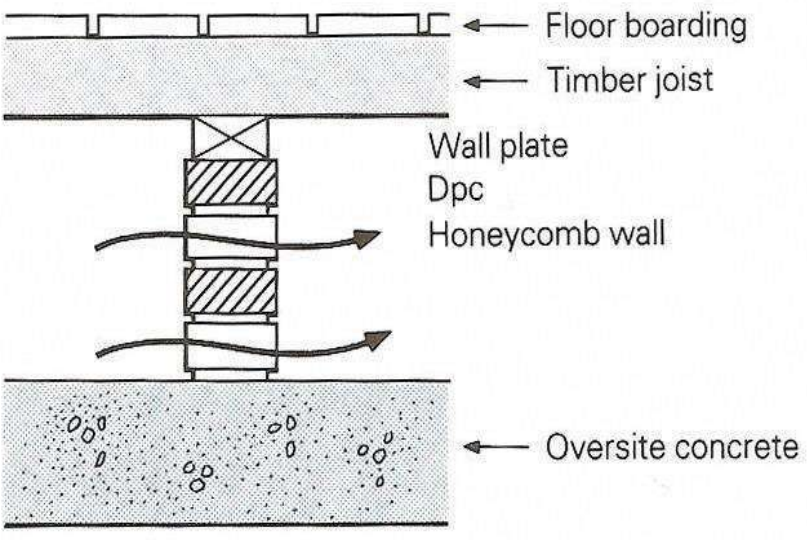
Three different types of concrete ground floor prevail:

1. an oversite concrete floor below a suspended timber floor (Fig. . 2);
2. the **ground-floor slab** in a brick or masonry building;
3. a raft foundation in a timber frame building (Fig. 11.3).

The construction process is similar for each type and here the following aspects should be provided:

- a hardcore bed;
- a blinding;
- a damp-proof membrane (dpm).

Raft foundations also need steel reinforcement.



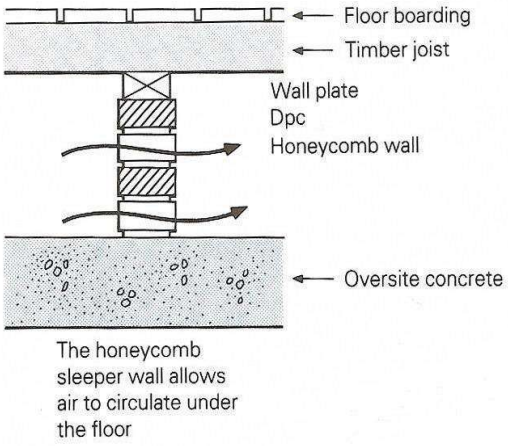
The honeycomb sleeper wall allows air to circulate under the floor

The construction process is similar for each type and here the following aspects should be provided:

a hardcore bed; a blinding;

a damp-proof membrane (dpm).

Raft foundations also need steel reinforcement.



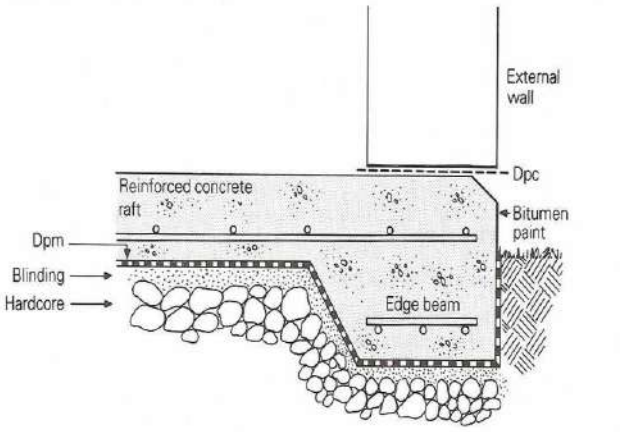


Figure 11.2 Oversite Concrete Floor Figure 11.3 Raft Foundation below a Suspended Ttimber Floor

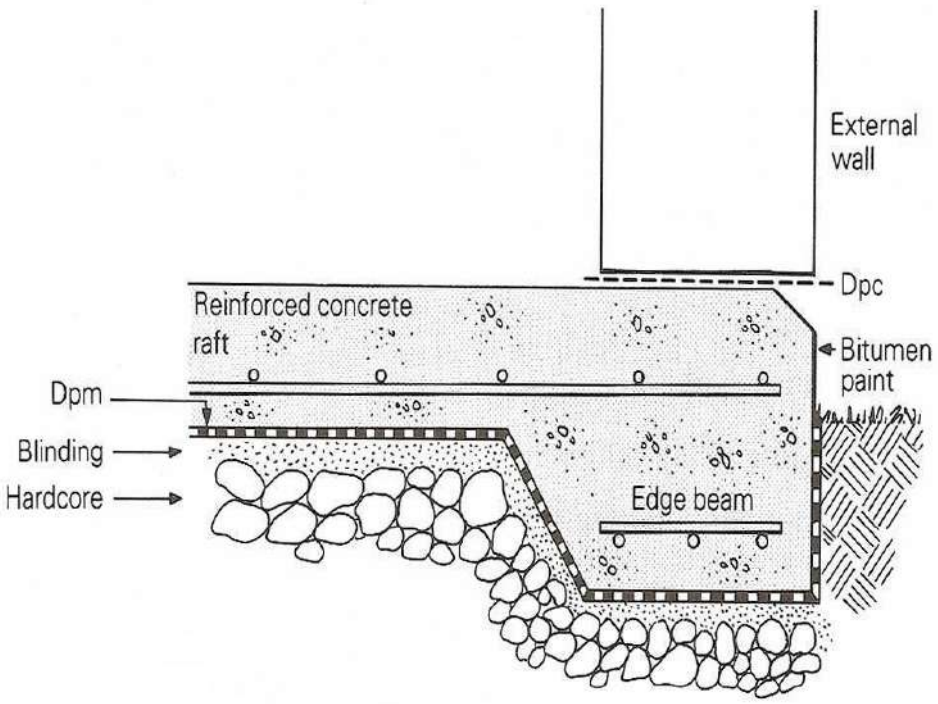


Figure 11.3. Raft Foundation

Building a suspended timber floor

The following elements are necessary for building a timber floor:

honeycomb sleeper walls; air bricks; a damp-proof course; walls plates; floor joists; floor boarding.

Honeycomb sleeper walls are brick or block walls built over the oversite concrete so that air can circulate freely in the gap to all parts of the **underfloor**.

Airbricks are special bricks with holes in them that allow air to flow through.

Damp-proof course (dpc) is usually bituminous felt laid on the sleeper walls in widths of 102.5 mm to prevent dampness entering the wall plate.

Wall plates are timber pieces about 75×100 mm that are used as bases for fixing floor joists. They are laid carefully on the dpc along the length of the sleeper walls.

Floor joists are the pieces of timber that span between the wall plates and support the **floor boards**.

The type of *floor boarding* depends on availability and preference. Standard choices are: softwood boards; plywood; blockboard; chipboard.

Softwood boards should be at least 25 mm thick and less than 100 100 mm wide. This reduces the shrinkage gaps between boards and the possibility of distortion.

5 ***Read the text again and answer the questions that follow (1-–8):***

1. What are three main functions of floor?
2. What is the normal classification of floors? Characterize it.
3. How does a concrete slab function?
4. Why is it necessary to ventilate a space under timber floors at ground level?
5. What are the requirements for a typical oversite concrete floor slab?
6. What types of concrete ground floor prevail?
7. What are the necessary elements for building a timber floor?
8. What is the appropriate size of softwood boards to reduce shrinkage gaps?

Follow-up

6 ***a) Find the synonyms in the text for the following words:***

kind, construction, obstacle, to guarantee, abutting, contraction, component, building process, straining, to penetrate.

b) Explain the expressions in bold from the text and make up sentences of your own. Use English-English dictionaries to help you.

7 ***Give the English equivalents to the following and use 5 of them in small situations:***

нижнее перекрытие; верхнее перекрытие; бетонная плита; висячая деревянная конструкция; железобетонная плита; несущая стена; хорошо вентилируемый; обработанный пропиткой, за один раз; расположенный рядом блок для бетонирования; в шахматном порядке; сплошной фундамент; несущая стена из ячеистого бетона; кирпич-сырец (пустотелый кирпич); гидроизоляционная прослойка; облицовочная стеновая панель (мауэрлат); балка пола; доска пола.

8 ***Which questions could you ask to get these answers?***

1. Upper floors are either reinforced concrete slabs or suspended timber structures that are supported on load-bearing walls.
2. Since concrete shrinks as it dries you should lay it in areas that are no larger than 3 metres by 3 metres or 10 square metres.
3. Raft foundations also need steel reinforcement.
4. Wall plates are timber pieces about 75×100 mm that are used as bases for fixing floor joists.
5. Softwood boards should be at least 25 mm thick and less than 100 mm wide.

LANGUAGE FOCUS

9 ***Use the words below to complete the sentences:***

THE HARDCORE BED

The purpose of the hardcore bed is to:

1.1) provide a 1)bed that will keep the concrete slab warm and dry;

2.2) resist the growth of vegetation;

3.3) provide a level base for the oversite concrete.

The hardcore bed consists of material that resists 2) __, such as broken brick, stone or rock.

The pieces should be large enough to ensure plenty of space so that 3) __ isn't trapped within the hardcore, the layers should be put down about 150-–200 mm thick and flattened by hand with a tool called a 4) __to consolidate them. Also the machine called a plate vibrator can be used for large areas of hardcore. *The blinding*

The finished hardcore has a rough, 5) __ surface that should be smooth before laying the damp-proof membrane. It is done by laying about 50 mm of sand, ashes or weak, dry concrete slurry called blinding over the surface of the hardcore. The surface should be carefully leveled and there are no sharp 6)_.

The damp-proof membrane

The membrane's purpose is to prevent 7) __ entering the building through the concrete slab. It is usually a heavy-duty polythene sheet that is tough enough to be handled on a building site without 8) or puncturing. The material should stay intact even when workers walk over it while they fix 9) _in the floors and lay concrete. The dpm should be laid so that the edges 10)the joints.

rammer, dampness, overlap, projections, moisture, open-textured, tearing, reinforcement, crushing, free-draining

10 ***Put the steps of making a simple raft foundation slab into the correct order:***

THE RAFT FOUNDATION SLAB

Ground-floor slabs that are also raft foundation may have steel mesh reinforcement in the slab and the edge beams. The following steps show how to make a simple raft foundation slab.

1. Support the reinforcement 25 mm above the dpm by fixing cement spacers underneath the bars so that the concrete can flow all around them.
2. Build vertical formwork on struts along the outside position of the edge beams to contain the concrete.

3. Pour the concrete so that it fills all the spaces on the slab.
4. Spread hardcore and blinding in the measured area.
5. Divide the area into 3 metre by 3 metre bays (Fig. 11.4)
6. Lay the reinforcement, the mesh for the slab and the bars in the edge beams in position.
7. Lay the dpm over the blinding.
8. Fix boards over the reinforcement to prevent the concrete leaking out.

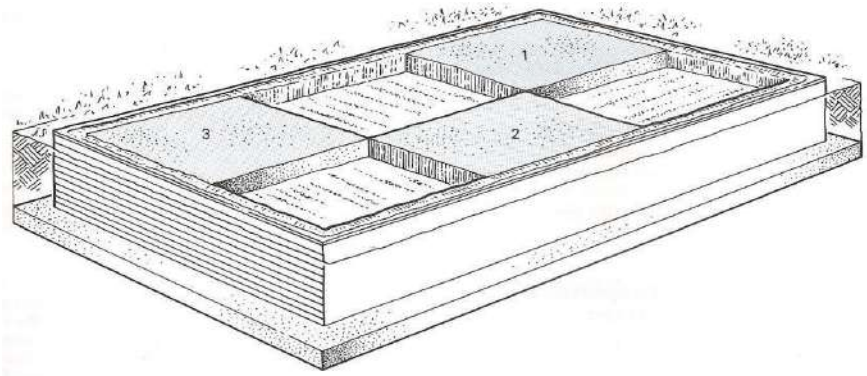


Figure 11.4 Laying the Oversite Concrete into Bays

11 ***Fill in the gaps in the following passage with a suitable preposition given below:***

UPPER FLOOR CONSTRUCTION Part I

Upper floors should not span more than 5 metres in simple buildings. The two most common types of construction 1) upper floors are timber floors and reinforced concrete floors.

Both types of floor may need additional support for larger spans.

Timber floor construction

A first floor span 2)5 metres is the limit for simple timber floor construction 3)a small building.

The joists may bend 4) the load if the span is 5) 3 3 and 5 metres. A twisting joist can weaken the floor. The struts can be used to stiffen the entire floor structure. There are two methods of making struts:

- *herringbone*, which consists 6) __ two length of 50×50 mm timbers fixed so that they criss-cross the top and bottom edges of the joists and are nailed 7)_ to make a herringbone pattern;

□□•*solid*, which consists of a number of pieces of 38 mm timber of similar depth 8) the joists. They are cut to fit tightly 9)) __ adjacent joists and are skewnailed.

The types of timber floor that are suitable 10)upper floor are the same as for the ground floor.

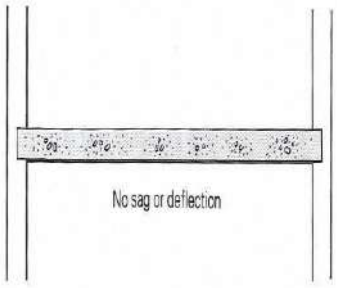
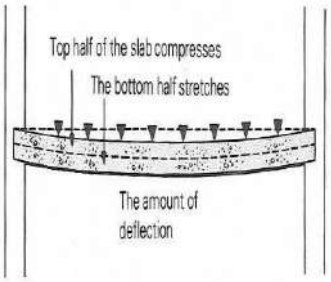
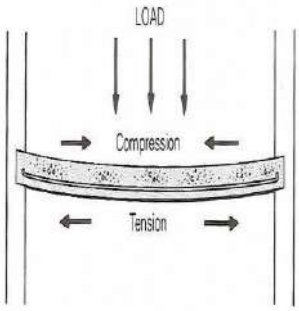
between (x2), for (x2), in, in the middle, of (x2), to , under

12 ***Fill in the gaps with derivatives of the words in capitals:***

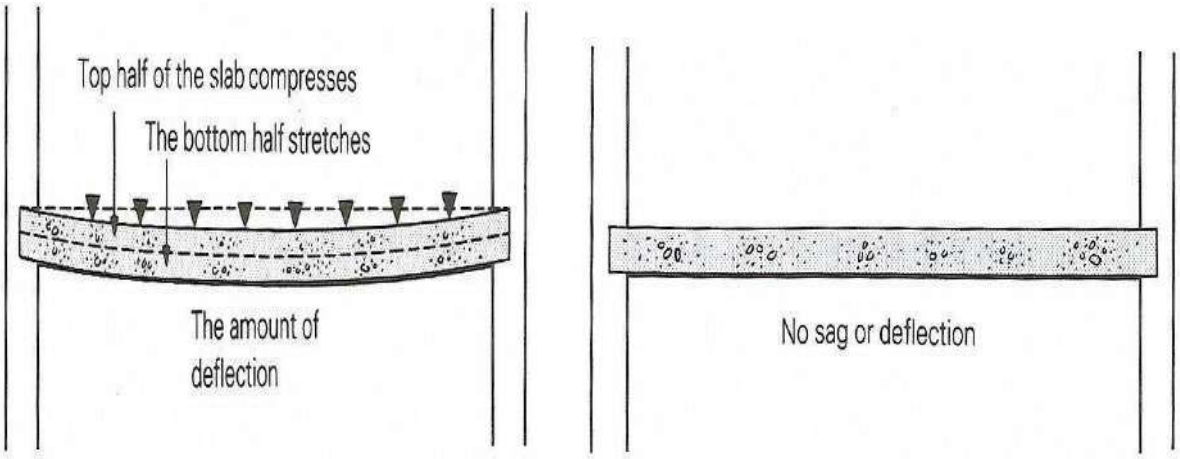
UPPER FLOOR CONSTRUCTION **Part II** *Reinforced concrete first-floor construction*	
Most reinforced concrete 1)_____floors are cast in situ. Two forms of 2) _____ are possible:	**SUSPEND**
1. a solid concrete slab with main reinforcement that spans the 3) _ _____ distance with secondary 4)) _____that spans the longer distance;	**CONSTRUCT** **SHORT**
2.a hollow pot floor with beams that span the shorter distance only.	**REINFORCE**
2. The 5) __of the concrete and size and distribution of the steel reinforcement bars are complex issues that depend on the distance to be spanned.	**THICK**
The general principles of the design of reinforced concrete suspended slabs should be followed (Fig. 11.5): •Concrete is strong when compressed, but weak under tension. It should be reinforced where subjected to 6) _____;	**TENSE**
•Concrete sags or deflects when it spans between supports. This creates 7) __ in the top half of a slab and tension in the bottom half;	**COMPRESS**
•Steel reinforcement bars will resist tension if they	**BUILD**

are 8) _____into the bottom of the slab; If the slab is laid 9)_____over an intermediate support, then the deflection is reversed, the tension moves to the top of the slab, which then 10) __ the steel reinforcement. The 5) __ of the concrete and size and distribution of the steel reinforcement bars are complex issues that depend on the distance to be spanned.	**CONTINUOUS** **REQUIRE** **THICK**

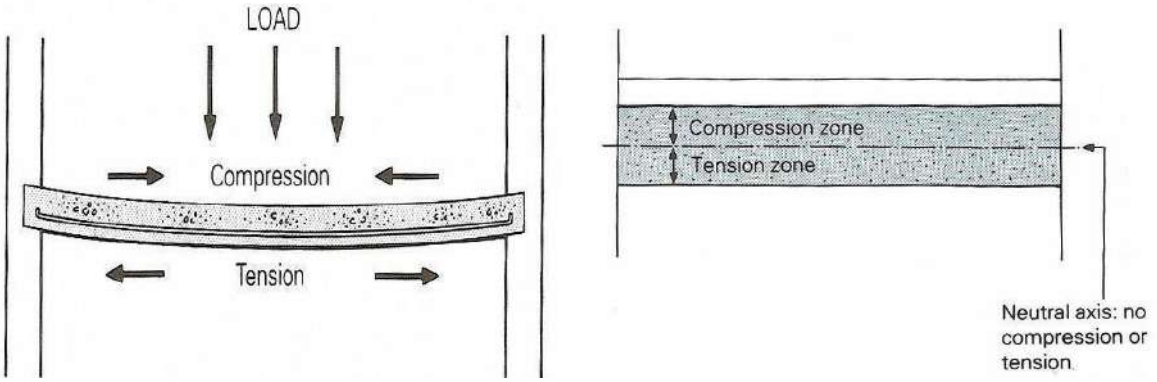
The general principles of the design of reinforced concrete suspended slabs should be followed (Fig. 11.5): 3. Concrete is strong when compressed, but weak under tension. It should be reinforced where subjected to 6) _____; 4. Concrete sags or deflects when it spans between	**TENSE**
□ supports. This creates 7)in the top half of a slab and tension in the bottom half; Steel reinforcement bars will resist tension if they are 8)_____into the bottom of the slab; •If the slab is laid 9) _____over an intermediate support, then the deflection is reversed, the tension moves to the top of the slab, which then 10) _ ____ the steel reinforcement.	**COMPRESS** **BUILD** **CONTINUOUS** **REQUIRE**

		
a)a concrete slab without loading	b)loading concrete deflecting under the load	c)putting steel in the bottom of the slab

a) a concrete slab without loading b) loading concrete deflecting under the load



c) putting steel in the bottom of the slab d) an unreinforced slab is impossible to use



e) a reinforced slab makes suspended concrete construction possible

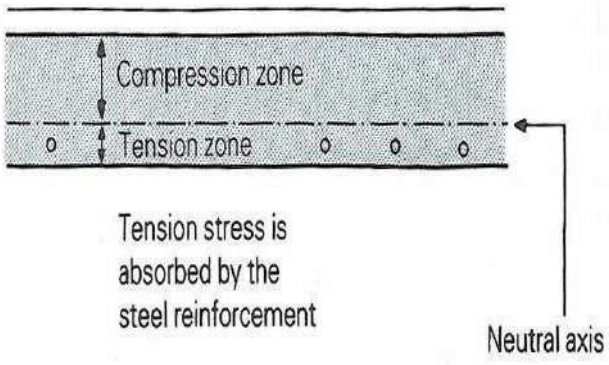
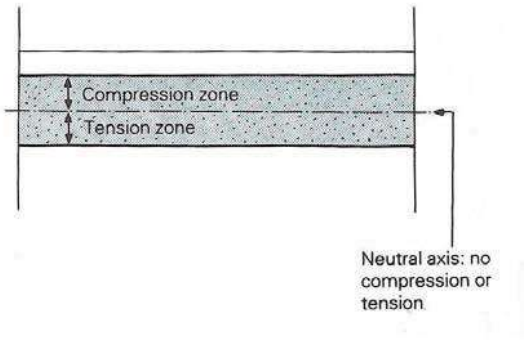


Figure 11.5. Principles of Deflection in Concrete



d) an unreinforced slab is impossible to use

13 ***Read the text and choose appropriate headings to each step:***

LAMINATE FLOORING INSTALLATION

a)Install the First Row

b)Install Threshold sand Base Molding

c)Install the Flooring

d)Clean the Subfloor, Remove Base Molding

e)Install theVapor Barrier

f)Install the Last Plank

g)Stack the Laminate Flooring before Installation

h)Trim the Door Jambs

Step1. Temperature and humidity can affect flooring planks. Acclimate the flooring in the house for 48 hours before installation. Stack the laminate flooring being used flat on the floor. Remove any plastic wrapping from the boxes and leave air space around each box. Have about 10% % more flooring than the square feet of area of the room.

Step 2. Clean the subfloor to make sure it's free of any dirt and debris. If installing on top of a new concrete floor wait until the floor is fully cured. Using a pry bar and hammer, carefully remove all base molding (if necessary) and place it out of the way.

Step 3. Start by laying out the vapor barrier one row at a time from the longest wall of the room. When joining two sheets of barrier together, follow the manufacturer's directions. Some

manufacturers will have you overlap the vapor barrier and some will have you butt each row against the previous one.

Step 4. Lay a piece of flooring flat on the subfloor and up against the door jambs. Use it as a guide to mark the jambs so that the new flooring can slide underneath the jamb. Use a “flat” saw or a coping saw to cut the jambs, making sure to cut parallel to the subfloor. This will give the floor and jamb a nice finished look without having to remove the entire jamb.

Step 5. For the best appearance, lay planks parallel to the longest wall. Install the first plank with the groove toward the wall. Place 1/2 spacers against the wall and push the first plank up against them. These spaces create an expansion gap so that the floor can "breathe" (expand and contract) and not warp or buckle. This gap will be covered later with base molding. The spacers also allow the floor to have a firm base to install against. Place the spacers about every 12 inches along the wall and at the end of each plank against adjoining walls.

Step 6. For each plank, match tongue to groove and tap it into place using a scrap piece of flooring to protect the planks. Make sure the pieces fit snugly together and that there are no gaps along the length of the planks. While installing subsequent rows, stagger the joints of the flooring. When starting a new row, offset it six to eight inches so the joints at the ends of planks are not lined up row to row (which can weaken the floor and create a too-uniform look).

Step 7. The last plank will need to be trimmed to fit. To mark the plank to the correct width place a plank directly over the next to last plank and place another on top of that and slide the top plank until it sits evenly against spacers against the wall. Draw a line along the plank below the top plank along the edge of the top plank. This will mark the width of the gap between the next to the last plank and the wall. Rip cut the plank along this line and install.

Step 8. Install any thresholds between the end of the flooring and any open doors where the flooring ends. Thresholds come in different styles to accommodate the kind and height of the flooring the new laminate floor butts up against. Remove the spacers and install base molding to cover the expansion gap.

LISTENING

14 ***Audio "Laminate Floor Installation".***

Listen to the information twice and be ready to answer the questions:

1. Where can laminate flooring be installed?
2. What typical tools are required for laminate flooring installation?
3. How should the subfloor be prepared for the cement subfloor installing?
4. When installing laminate flooring how the direction should be determined?
5. What row is most crucial to install? Why?

VIDEO

15 ***Watch the video and present the main idea of each episode in 4-– 5 sentences using the expressions from Appendix 2.***

WRITING

16 ***Render the text in English using the expressions from Appendix 2:***

ДЕРЕВЯННЫЕ ПОЛЫ

Обустройство пола – это один из основных этапов внутренней отделки любого помещения. Дерево – это натуральный, природный материал, превосходно подходящий для обустройства полов, как в городских квартирах, так и в загородных коттеджах. Дерево обладает способностью поддерживать оптимальный мик- роклимат в помещении. В условиях повышенной влажности де- ревянные полы впитывают влагу, а затем аккумулируют ее, по мере необходимости. Деревянные полы позволяют не только со- хранять тепло, но и обладают высокой звукоизоляцией. Это каче- ство делает дерево оптимальным решением для отделки пола.

Материалом для обустройства полов может стать дерево лю- бых пород, как обычная сосна, так и редкие сорта – кедр, красное дерево и т.д. Монтаж деревянных полов не потребует много вре- мени.

Прочность и надежность деревянных полов позволяет значи- тельно продлить их срок эксплуатации. В отличие от таких по- крытий, как ламинат, деревянные полы способны прослужить в течение многих лет. К тому же, деревянные полы отличаются простотой в уходе и не требуют сложного ремонта. Поверхность можно неоднократно циклевать.

Отличный внешний вид деревянных полов сочетается с лю- бым интерьером.

В зависимости от типа здания, деревянный пол может укла- дываться на следующие поверхности: перекрытия, выполненные из железобетонных плит (панельные или кирпичные квартирные дома), деревянные либо стальные балки, столбы-подпорки (част- ные дома либо коттеджи). Перед укладкой доски пропитываются специальным составом, защищающим древесину от воздействия влаги и жучков-древоточцев.

Современные деревянные полы отличаются надежностью и долговечностью. Они легко окрашиваются, либо покрываются однокомпонентным лаком. Полы из натурального дерева быстро монтируются и относительно недорого стоят, что делает их очень востребованным строительным материалом.

When rendering use these words and word combinations:

внутренняя отделка – interior trim/ finish, впитывать – to absorb, звукоизоляция – sound insulation, срок эксплуатации – service life, циклевать – to scrape, монтаж – assembly, укладывать – to lay, балка – beam, жучок-древоточец – wood fretter.

17 ***Translate the sentences from Russian into English. Be ready to present them not looking at the English equivalents:***

1. По способу устройства полы могут быть двух основных групп: монолитные и сборные.

2. Свободная стяжка не соприкасается напрямую ни с основани- ем пола, ни со стенами, т.е. такая конструкция применяется для улучшения звукоизоляции.
3. Стяжка связанной конструкции заливается непосредственно на основание бетонного перекрытия и составляет не менее 30 30 мм.
4. Гидроизоляция пола – комплекс мероприятий по его защите от разрушительного воздействия влаги, поступающей из внеш- ней среды или подвала.
5. Черновые полы в деревянном доме выполняют следующие функции: создают определенный каркас жесткости, служат основой для укладки утеплителя и чистового пола, дают воз- можность формирования воздушной подушки для сохранения тепловой энергии.

SPEAKING

18 ***Analyze Figure 11.5. and say in what case a suspended concrete structure is possible/ impossible to build and explain your choice.***

19 ***Read the questions people ask specialists from Peter Cox and suggest your own answers:***

Peter Cox - – UK Market Leaders in the repair and preservation of properties. Peter Cox, established in 1951 with almost 60 years experience in providing a range of property services, has built an enviable reputation as the market leader in the repair and preservation of all types of property from private housing to historic buildings.

1. My ground floor is suspended timber. When it rains the area below the floor fills with water. What do you suggest?
2. How to deal with damp in concrete floor?

3. My house is over 100 years and sweats. This causes mould and rotting floors and walls. How do I stop this?
4. When wood turns black, what does this mean?
5. I have fungi growing under the laminated flooring under the sink area in the kitchen. The fungi developed after the washing machine leak. The fungi is pasta type color in different sizes. Is this dangerous? What can I use to clear it?
6. What happens if I puncture the floor membrane?
7. Is the only fix for water pressure under my basement concrete floor new footer tiles?
8. Removed carpet, bare sub floor gets damp when humidity is up or it rains. No water lines run under it. It's about a foot away from any wall.

20 ***a) Read and translate the text:***

WHY ARE WE STILL HAVING PROBLEMS WITH MOISTURE AND CONCRETE FLOOR SLABS?

(*after Howard Kanare*)

Water is an essential ingredient in concrete, but uncontrolled excessive moisture can create a whole host of problems with concrete floor slabs. Some of the modes of distress include: □ □• Adhesive breakdown of adhered finish floor coverings

- Debonding of coatings
- Osmotic blisters of epoxy systems including coatings and epoxy terrazzo
- High pH (alkalai) attack of floor finishes
- Microbial growths
- Flooring expansion, such as cupping of wood strips or planks
- Reactions between incompatible floor patching/ leveling materials.

Despite the development of many excellent, longstanding practices, there are still a large number of moisture-related problems. Some contributing factors include: design professionals specify a blotter/ cushion/ subbase layer over a vapour retarder; vapor retarders are not carefully protected during construction; concrete floor slab mixes often are made with smaller than desirable aggregate and mixes are not optimized for minimum shrinkage; inappropriate

moisture tests still are specified; moisture resting is not always done correctly; some unreasonably moisture-sensitive adhesives are still on the market; there is no performance specification or test method for moisture resistance of adhesives or floor coatings; and failures of some moisture- suppression products occur because there are no performance specifications for moisture suppression products.

c) Find additional information on distresses listed and speculate on the remediation. Use the linking words/phrases from Appendix 1:

21 ***Read the information below and discuss it with your partner:***

BAMBOO FLOORING

There are many types of flooring available for people to choose from when they're considering redoing their floors. Some of the more popular flooring options include carpeting, tiles, laminate, or traditional hardwood. Most professionals agree that bamboo flooring is some of the best flooring out there.

Bamboo is an incredibly strong wood. It is naturally tough when it grows wild no matter what soil it is grown in. The fact that the bamboo always undergoes further strengthening usually in a company's factory before it is shipped out to be used as flooring ensures that you have a very strong, durable wood. It is even stronger than oak.

Bamboo is technically a grass and grows extremely quickly compared to any other type of wood. In fact, it takes a bamboo tree only 3 years to reach full maturity while with most other trees, it is twice as or three times as long. It means that bamboo can be replaced much more easily, making its use better for the environment.

Unfortunately, there are currently no official certification standards for bamboo flooring. That means that quality or hardness of the bamboo flooring can actually vary, depending on the producing company.

Bamboo floors can be easy to scratch or dent if they are damaged by heavy furniture that is moved or jolted. Many people

with rowdy children choose not to get bamboo flooring because children tend to be hard on floors.

Under direct sunlight, bamboo loses its colour easily especially if it is in naturally-lit rooms. That means it is better to use it in darker rooms where direct exposure to sunlight is kept at a minimum, which may not be an option for some people.

22 ***Topics for projects and presentations:***

1. Types of subfloor construction.
2. Floating floor.
3. Floor vibration.
4. Underfloor heating.
5. Modern tendency: glass floor.

Word List to Unit 11

floor	перекрытие; пол; настил
wooden floor(ing)	дощатый настил, дощатый пол
suspended timber floor	подвесной деревянный пол
support, *v*	выносить, выдерживать
load, *n; v*	груз, нагрузка; грузить, нагружать
finish, *n; v*	отделка поверхности; отделывать
fixtures, n	приспособление, прибор
level surface	поверхность уровня
ground floor	нижнее перекрытие
upper floor	верхнее перекрытие
concrete slab	бетонная плита
hardcore bed	твердый фундамент
suspended timber structure	висячая деревянная конструкция
honeycomb sleeper wall	несущая стена из ячеистого бетона
reinforced concrete slab	железобетонная плита
load-bearing wall	несущая стена
oversite-concrete slab = floor slab	плита (бетонного) пола, плита настила
dampness, *n*	сырость, влажность, влага

damp-proof membrane	гидроизолирующий слой, гидроизолирующая пленка
oversite-concrete slab= floor slab	плита (бетонного) пола, плита настила
dampness, *n*	сырость, влажность, влага
damp-proof membrane	гидроизолирующий слой, гидроизолирующая пленка
prevent, *v*	предотвращать, предохранять, предупреждать
space, *n*	место, пространство, зазор
preservative = preservatory, *n*	предохраняющее средство
awkward, *adj*	неудобный в использовании, затруднительный
shrink, *n; v*	усадка; давать усадку; усыхать; сжиматься
adjacent bay	расположенный рядом блок для бетонирования
chequerboard pattern	в шахматном порядке
concrete ground-floor slab	бетонная плита нижнего перекрытия
raft foundation	сплошной фундамент
blinding, *n*	выравнивающий слой, мелкий заполнитель
steel reinforcement	арматура железобетона
air brick	пустотелый кирпич; сырец
damp-proof course	гидроизоляционная прослойка
wall plate	мауэрлат, стенная балка
floor joist	балка пола
floor boarding	настил пола
wall block	стеновой бетонный блок
bituminous felt	рубероид
sleeper wall	стенка, несущая половые балки первого этажа

floor board	половица, доска пола, доска настила
blockboard	столярная плита
chipboard	древесно-стружечная плита (ДСП)
distortion, *n*	деформирование
soft wood	древесина мягкой породы; древесина хвойной породы
vegetation, *n*	растительный покров; зеленый фонд (напр. города, района)
trap, *v*	захватывать; поглощать; улавливать
flatten, *v*	выравнивать, разглаживать
rammer, *n*	трамбовка; устройство, машина для трамбования

plate vibrator	виброплита
open-textured, *adj*	пористый
projection, *n*	выступ, выдающаяся часть
heavy-duty, *adj*	мощный, предназначенный для работы в тяжелом режиме
tough, *adj*	прочный
handle, *v*	транспортировать
tear, *n*	разрыв; прорез
puncture, *n; v*	пробой; прокалывать, пробивать отверстие
intact, *adj*	неповрежденный, целый
overlap, *n; v*	напуск; заходить один на другой
spacer, *n*	монтажная арматура железобетона
strut, *n*	распорка
herringbone	елочный профиль; шевронный профиль

Appendix 1

COMMUNICATION CLICHÉS

Introducing the topic *I'd like to outline… I'm going to tell you…*	**Asking for clarification** *Are you saying that…? I'm not sure I understand. Can you explain it a bit more clearly? I don't understand what you are driving at, can you say it another way? Would you please clarify your last statement? What exactly do you mean?*
Presenting an opinion *It seems to me (that…) There is no doubt that… It strikes me that …*	**Clarifying/rephrasing** *In other words... To put it another way… In particular…*
Giving an opinion *I really think we need… There is no doubt that… I feel… is the best way to… Shouldn't we have more information?*	**Making contrasting points** *However… Nevertheless….*
Agreeing *I agree entirely. I take your point. I think so too. I have the same opinion about … You are absolutely right.*	**Interrupting** *Can I just say something here? Hang on.*

Disagreeing *I can't accept that.* *(I'm afraid)I disagree entirely. Point taken, but surely … is an important factor?* *I really can't agree with you here.*		**Resisting interruption** *No, let me finish, please.* *Can I finish the point?* *Just a moment, please.*
Making general statements *In general…* *On the whole…*		**Giving examples** *For instance* *For example* *In particular*
Asking for reaction *How do you feel about?* *What do you think?*		**Speeding up** *I think we should move on now.* *Can we come back to that?*
Keeping to the point		**Slowing down**
I'm not sure that's relevant. *Perhaps we could get back to the point.* *Let's leave that aside for a moment.*		*Hold on, we need to look at this in more detail.* *I think we should discuss this a bit more.*

Appendix 2

REVIEW CLICHÉS

1. The text runs under the title…
2. The title reads as …
3. The article is about / the author of the article speaks about …
4. The main problem raised is…
5. The author speculates on/ mentions…
6. It's interesting to mention/ to point out that
7. One should mention that …
8. I'd like to call your attention to …

9. Firstly/ secondly/ thirdly…
10. Firstly I'll give you …, after that …, finally …
11. I'd like to underline/ to say the following…
12. The idea is expressed in/by … 13.Figures/ facts speak for themselves.
14. Figures/ facts/ examples illustrate/ show the real/ present standing of …
15. On the one hand / on the other hand …
16. More than that…
17. Speaking about …
18. It results in …
19. To speak in detail …
20. For example/ for instance/ as for …
21. No doubt that …
22. By this I mean …
23. So / besides / moreover / that is why …
24. However …
25. Considering all the facts …
26. To sum up, …
27. Summing up, I can say that …
28. So to summarise …
29. I find this article/text interesting /informative/ up-to-date/ out-of-date/ of no use/ because …
30. In conclusion, I can say that …

Appendix 3

BUSINESS LETTER WRITING

1.1. Cliché

We have seen your advertisement in "…" , and would be grateful if you would let us have details of …	*Мы прочитали Ваше рекламное объявление в газете «…» и были бы Вам признательны за подробную информацию о …*
We saw your products demonstrated at the Siberia Fair this year, and would like to know	*Мы видели Ваши товары на Сибирской ярмарке в этом году и хотели*

whether you could send us …	*бы знать, не могли бы Вы прислать нам …*
Your advertisement in "…" states that you can offer …	*Из Вашего объявления в «…» мы узнали, что Вы можете предложить …*
Please inform us …	*Просим сообщить …*
We would be pleased if you could inform us …	*Были бы рады, если бы Вы нам сообщили …*
We have an enquiry for …	*Мы хотели бы получить информацию о …*
Quote prices (terms)	*Укажите цены (условия)*
We would appreciate a sample of each of the items listed above …	*Мы были бы Вам признательны, если бы Вы прислали нам по одному образцу каждого изделия, которые указаны в Вашем списке*
Will you please send us your catalogue and price-list of …	*Пожалуйста, пришлите нам свой каталог и прейскурант на …*
We would be glad to receive specifications of the goods offered …	*Были бы рады получить от вас спецификацию на предлагаемые това- ры …*
Will you please quote prices c.i.f. London for the following items in the quantities stated …	*Пожалуйста, назначьте цену на следующие изделия/ товары в коли- честве, включая СИФ (до места назначения Лондон) …*
We require the goods by … at the latest.	*Мы просим поставить товар не позднее …*
Would you be able to deliver within 3 weeks of receipt of our order?	*Просим поставить товары в течение 3 недель с момента получения нашего заказа…*

…we would like to know whether you would be willing to grant us a special discount.	*… мы хотели бы знать, будете ли Вы готовы предоставить нам специальную скидку.*

Thank you for your offer of 2 June, which we accept on the terms quoted.	*Благодарим Вас за Ваше предложение от 2-го июня, которое мы принимаем на Ваших условиях.*
Will you please arrange immediate dispatch of:	*Пожалуйста, подготовьте немедленную отправку товаров:*
Please send us the following goods:	*Пожалуйста, отправьте нам следующие товары:*
We have pleasure in ordering the following articles from your summer catalogue:	*Мы хотели бы заказать следующие товары из Вашего летнего каталога.*
We enclose our order No … for …	*Мы прилагаем наш заказ № … на товары …*
Our indent No … is enclosed.	*Наш заказ №… прилагается к письму.*
If pattern No.63 is not available please send 64 or 65 instead.	*Если товара №63 нет в наличии, пожалуйста, отправьте товары №№64,65.*
We are prepared to pay …	*Мы готовы заплатить …*
Kindly advise us when the goods are dispatched.	*Пожалуйста, известите нас об отправке товара.*
Unfortunately, your product has not performed well (the service was inadequate) because	*К сожалению, ваш товар (услуга) не отвечает необходимым требовани-ям , так как …*
I am writing to draw your attention to a problem …	*Я пишу, чтобы привлечь ваше внимание к проблеме …*
I wish to complaint in the strongest possible terms about …	*Я бы хотел выразить претензии к …*

I am writing to express my strong dissatisfaction with the goods I received this morning.	*Я пишу, чтобы выразить недовольство товарами, полученными сего- дня утром.*
The equipment I ordered has still not been delivered, despite my phone call to you last week to say that it was needed urgently.	*Заказанное оборудование все еще не доставлено, несмотря на то, что я уже звонил вам на прошлой неделе и сообщил, что оно требуется немедленно.*
To resolve the problem, I would appreciate it if you could … Enclosed are copies of my records.	*Для решения проблемы, я был бы благодарен, если вы… Копии доку- ментов прилагаются.*
I insist on a full refund otherwise I will be forced to take the matter further.	*Я настаиваю на полном возмещении расходов, иначе я буду вынужден …*

Unless I receive the goods by the end of this week, I will have no choice but to cancel my order.	*Если я не получу данный товар до конца недели, у меня не будет другого выбора, кроме как аннулировать заказ.*
I am writing to complain about the quality of	*Я пишу, чтобы выразить недовольство …*
I hope that you will deal with this matter promptly as it is causing me considerable inconvenience.	*Я надеюсь, вы разберетесь с этим делом немедленно, поскольку это доставляет мне серьезные неудоб- ства.*
We hope to hear from you soon.	*Надеемся на скорый ответ.*
We are looking forward to hearing from you.	*Были бы Вам очень благодарны за Ваш скорый ответ.*

2.2. THE LETTER OF ENQUIRY (INQUIRY)

.1. Template

Dear _____!

Your advertisement in the (month) issue of (nameof periodical) magazine is of great interest to us.

We would like to know more about the products your firmoffers and would appreciate receiving your wholesale pricelist and information regarding terms and ordering policy.

It is our desire to offer our customers the widest selection possible of (type of product), and we are thereforealways interested in new products that fall within that area.

We will look forward to your prompt response. Thank you.

1 Samples

Kugan Patil,
Services Section,
Gasom Industrial Agency,
47833, Orunda Lane,
Runadi, IU
348430th
November
2010.

Mr. Arnold Graffer,
Customer Care Officer,
Halla Business Ventures,
3474, Kobe
Avenue,Jenseem, IN
4384

Dear Sir,

SUBJECT (Re): PRODUCT INQUIRY LETTER

On behalf of the management of Gasom Industrial Agency, it is my pleasure to write this letter to you. Without taking too much of your precious time, the main purpose is to make an enquiry about the travelling package product designed by your company. Although a sales representative came from your organization to explain the product to us, he was just not explanatory enough. His explanations raised more questions than answers.

Therefore, I will appreciate it if you can send us a very detailed explanation of the product complete with all the relevant descriptions and images. These will assist us in making our decision in purchasing the product. Thanking you in anticipation of your response.

Yours faithfully,
Kugan Patil,
Services Officer,
Gasom Industrial Agency.

15 May, 2010 Damark International, Inc.
6707 Shingle Greek Parkway
Minneapolis, MN 55430
USA

Gentlemen:

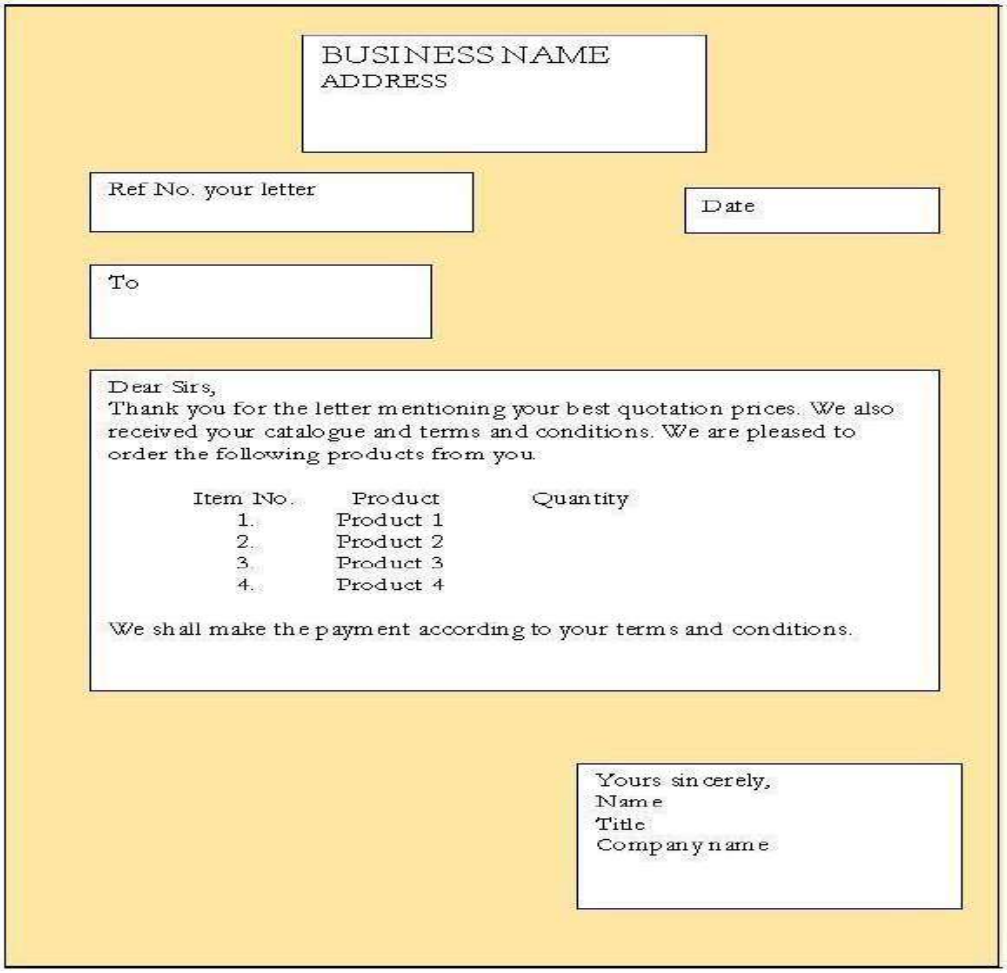
Please send us your new catalogue of Computers and Microprocessors. We also should be grateful if you would enclose free descriptive leaflets with your reply and quote your terms f.o.b. London.

Yours faithfully,

M. Davis

2 Sample

3.THE LETTER OF ORDER



Sample 2

Dear Sirs,

Many thanks for your prompt reply of 22 March to our enquiry foe bell-wire. We enclose our official order for 15,000 meters, which we understand you can supply from stock. As we pointed out in our first enquiry, the quality must be up to the sample we sent you, and the weight and colour of the cotton insulation identical to that of the sample. Our order is placed on these conditions.

Yours faithfully,

Sample 3

Dear Sirs,

Thank you for your quotation of 75p per metre for cloth No.110.

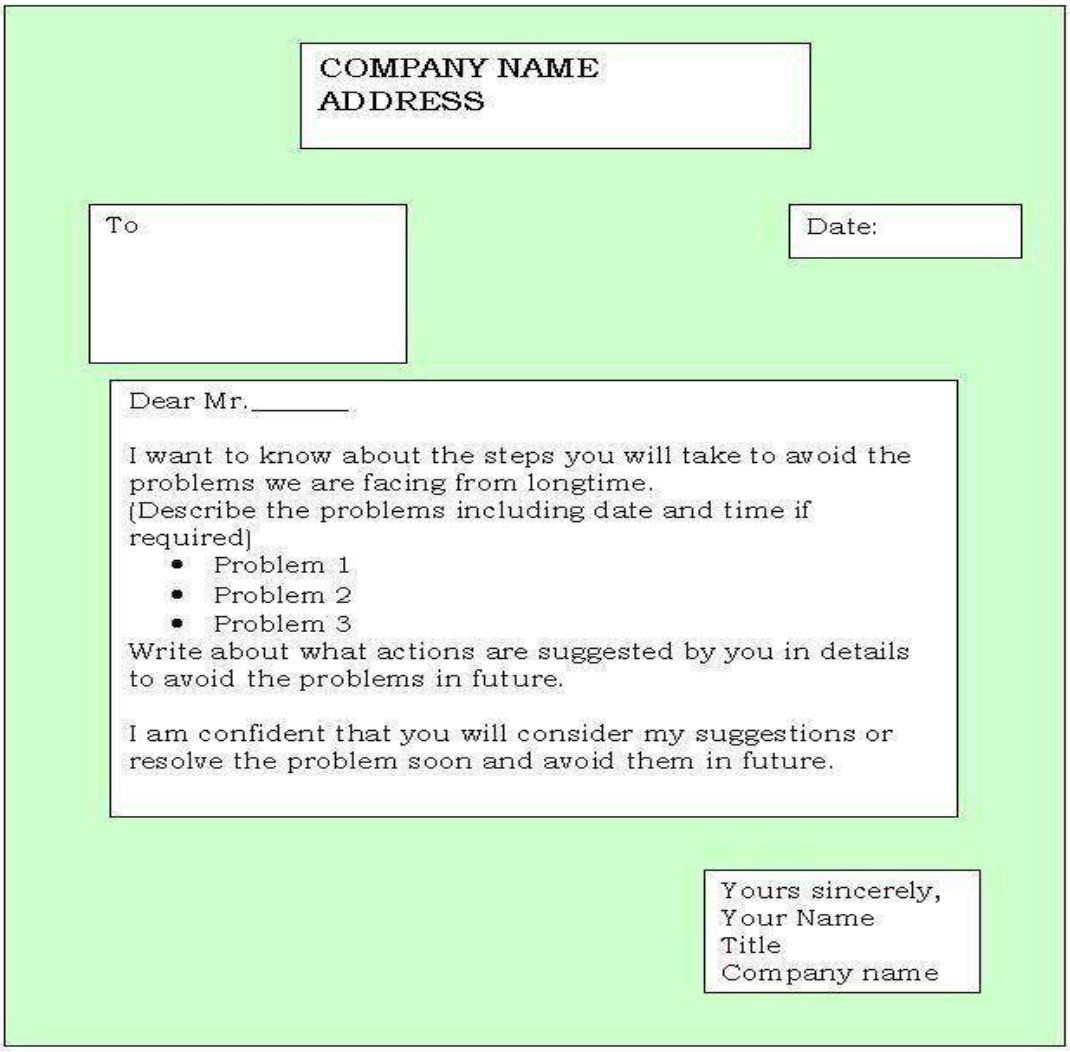
Before we place an order with you, we would like to know whether you can quote us a slightly better price for the material. We are thinking in terms of an order for some 2,000 metres, and as the cloth is for export to a highly competitive market, a keen price is essential.

A prompt reply would be greatly appreciated.

Yours faithfully,

THE LETTER OF COMPLAINT

Business Complaint letter



Sample 4

Dear Ms. Armand-Fugeot,

When you designed the interior of Twin Towers, you did so, I'm sure, with beauty and distinctiveness in mind. There is no doubt that the lobby sparkles with good looks and has elicited some rave reviews from passers-by. However, I'm afraid this is a chase of Beauty and the Beast, the "beast" being the monster the floor turns into when it becomes wet. The other day, when we had an all-day rainfall and many soaked feet trod the marble slabs, the surface became as treacherous as ice. We were fortunate indeed that, despite numerous falls, no serious injuries were sustained.

Won't you please see what can be done to coat the surface with a nonskid substance. Surely there must be some way to preserve the beauty yet eliminate the threats to life and limb. Our insurance company insists on this action.

Sincerely,

65 Market Street
Val Haven, CT 95135

June 30, 2004

Customer Service
Cool Sports, LLC
8423 Green Terrace
Road Asterville, WA
65435

Dear Sir or Madam:

I have recently ordered a new pair of soccer cleats (item #6542951) from your website on June 21. I received the order on June 26. Unfortunately, when I opened it, I saw that the cleats were used. The cleats had dirt all over it and there was a small tear in front of the part where the left toe would go. My order number is AF26168156.

To resolve the problem, I would like you to credit my account for the

amount charged for my cleats; I have already went out and bought a new pair of cleats at my local sporting goods store so sending another would result in me having two pairs of the same cleats.

Thank you for taking the time to read this letter. I have been a satisfied customer of your company for many years and this is the first time I have encountered a problem.
If you need to contact me, you can reach me at (555) 555-5555.

Sincerely,
Signature
Ken Thomas

Sample 5

THE LETTER OF CONFIRMATION

Nick Faraway
Sales Manager
King & Jones PC, Ltd
118 Park RdBirmingham
B19 1SU

Telephone: 0111 333 2222
E-mail: kjl@kingandjones.com

Birmingham, 17 March 2011

C. Friedman
57 Queen Elizabeth Street
London
SW1W 9NZ

Dear Sir or Madam,

This is to acknowledge receipt of your letter requesting us to offer devices advertised by us in the "Computer Engineering". At your request we inform you of all the data concerning our devices.
We are looking forward to your earlier reply.
Yours faithfully,
Nick Faraway
Sales Manager
King & Jones PC, Ltd

Sample 7

MEMOS

Memos are usually for internal communication. They should include the following headings: To/ From/ Subject/ Date. They should be short and include only relevant information. Points should be arranged in logical order. In longer memos, it is common to number points. The tone of the memo may be formal, informal or neutral. It is usual to end with your initials rather than a signature.

Sample 8

To : **All department heads**
From: **Pamela Lickford General Manager**

General Manager
Date: **22 December**
Subject: **Visit of German agent**

Please note that Katya Schmidt, our German agent, will be visiting the company on Friday, 29 December.

There will be a meeting on that day at 10.30 am in the Boardroom, which you should attend. Ms Schmidt will be presenting her marketing plan for expanding sales in the German market.

If you wish to join us for lunch at a local restaurant, please let me know as soon as possible.

PL

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