

**МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ
РОССИЙСКОЙ ФЕДЕРАЦИИ**

**КАЗАНСКИЙ ГОСУДАРСТВЕННЫЙ АРХИТЕКТУРНО-
СТРОИТЕЛЬНЫЙ УНИВЕРСИТЕТ**

Кафедра иностранных языков

ECOLOGICAL ARCHITECTURE

**Методические указания для студентов направлений подготовки
07.03.01. «Архитектура», 07.03.02 «Реставрация и реконструкция
архитектурного наследия», 07.03.03. «Дизайн архитектурной среды»**

**Казань
2018**

УДК 72;802.0
ББК 85.11;81.2Англ.
К64

К 64 Ecological architecture = Экологическая архитектура: Методические указания для студентов направлений подготовки для студентов направлений подготовки 07.03.01. «Архитектура», 07.03.02 «Реставрация и реконструкция архитектурного наследия», 07.03.03. «Дизайн архитектурной среды»/ Сост. Е.Н. Коновалова. – Казань: Изд-во Казанск. гос. архитектур.-строит. ун-та, 2017. – 23 с.

Печатается по решению Редакционно-издательского совета Казанского государственного архитектурно-строительного университета

Методические указания предназначены для студентов дневного отделения Института архитектуры и дизайна.

Основная цель методических указаний – развить навыки самостоятельной работы над текстом по специальности.

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УДК 72;802.0
ББК 85.11;81.2Англ.

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ECOLOGICAL ARCHITECTURE

TEXT A

Упражнение 1. Прочтите и переведите на русский следующие слова:

planet	cycle	generate
regulate	ecology	medicines
anatomy	genetics	gene
erosion	Haeckel	Aristotle
Hippocrates	hierarchy	

WORDS TO BE USED

human a — человеческий
soil n — почва
scientific a — научный
sustain v — поддерживать, подкреплять
scientific a — научный
well-being n — благополучие; процветание, благосостояние

WORDS TO BE UNDERSTOOD

behaviour n — поведение, манеры
feedback n — обратная связь
food n — пища, питание; еда, корм
treatise n — трактат

Упражнение 2. Прочтите текст и ответьте на следующие вопросы

1. What does ecology mean? 2. Who was the first to use this term? 3. Who were among the earliest to study the natural history of plants and animals? 4. Why is ecology important for people?

Упражнение 3. Переведите текст письменно со словарем

ECOLOGY

Ecology is the scientific study of the relation of living organisms to each other and their surroundings. Ecosystems are defined by a network of individuals that arrange into a self-organized and complex hierarchy of pattern and process. Ecosystems create a biophysical* feedback between living (biotic)* and nonliving (abiotic)* components of an environment that generates and regulates the biogeochemical cycles of the planet. Ecosystems provide goods and services that sustain human societies and general well-being. Ecosystems are sustained by biodiversity within them. Biodiversity is the full-scale of life and its processes,

including genes, species and ecosystems forming lineages that integrate into a complex and regenerative spatial arrangement of types, forms, and interactions.

Ecology is a sub-discipline of biology, the study of life. The word «ecology» was coined in 1866 by the German scientist Ernst Haeckel (1834—1919). Haeckel was a zoologist, artist, writer, and later in life a professor of comparative anatomy. Ancient philosophers of Greece, including Hippocrates and Aristotle, were among the earliest to record notes and observations on the natural history of plants and animals; the early rudiments of modern ecology. Modern ecology mostly branched out of natural history science that flourished in the late 19th century. Charles Darwin's evolutionary treatise and the concept of adaptation as it was introduced in 1859 is a pivotal cornerstone in modern ecological theory.

Ecology is not synonymous with environment, environmentalism, natural history or environmental science. Ecology is closely related to the biological disciplines of physiology, evolution, genetics and behavior.

An understanding of how biodiversity affects ecological function is an important focus area in ecological studies. Ecosystems sustain every life-supporting function on the planet, including climate regulation, water filtration, soil formation, food, medicines, erosion control, and many other natural features of historical, spiritual or scientific value.

ПРИМЕЧАНИЯ

1. biotic— жизненный, живой, биотический; взаимозависимый
2. abiotic— абиотический; неживой; нежизненный
3. biophysics— биофизика

Упражнение 4. Объясните образование следующих слов:

biotic, abiotic, biophysical, feedback, well-being, sub-discipline, cornerstone

ТЕХТ В

Упражнение 1. Прочтите и переведите на русский следующие слова:

drainage	financial	membrane
barrier	technology	module
debate	container	absorb
flora	fauna	photovoltaic

WORDS TO BE USED

black water — сточная вода (из туалета)

cool roof — неотапливаемая крыша, холодная крыша

cause 1) n — причина, мотив (for) 2) v — быть причиной, причинять, вызывать

fauna n — фауна

flood n — наводнение

flora — флора
green roof — зеленая крыша
graywater, greywater — сточная вода (не из туалета)
harm n — вред; ущерб
improve v — улучшать(ся)
layer n — слой
living roof — живая крыша
plant 1) n — растение 2) v — сажать (растения)
planting n — насаждение, озеленение
pot n — цветочный горшок
refer v — относиться

shingle n — кровельная дранка; гонт
sod roof n — дерновая крыша
vegetation n — растительность
waterproof a — водонепроницаемый, непромокаемый
wildlife n — живая природа (лес, поле, пустыня, океан и их обитатели)

WORDS TO BE UNDERSTOOD

combat v — сражаться, бороться (against — против чего-л.; for — за что-л.)
concern v — касаться, иметь отношение
environmentalism n — энвайронментализм (учение об окружающей среде)
habitat n — родина, место распространения, среда обитания (животного, растения); естественная среда
heat island effect — тепловой остров, тепловой купол (над городом)
manage v — руководить, управлять
sod n — дерн
trend n — тенденция
urban heat island (UHI) — городская территория, в которой значительно теплее, чем в сельской местности
sustainable — 1. устойчивый; жизнеспособный 2. (экологически) устойчивый, экоустойчивый (не наносящий ущерба окружающей среде)
ecologically sustainable development — экологически устойчивое развитие
sustainable agriculture — экологически рациональное сельское хозяйство, устойчивое сельское хозяйство
sustainable economic growth — устойчивый экономический рост
sustainable forestry — экологически рациональное лесопользование, устойчивое лесопользование
sustainable use of natural resources — рациональное использование природных ресурсов
sustainability — устойчивость; устойчивое развитие
ecological / environmental sustainability — экологическая устойчивость, устойчивость окружающей среды (предполагает поддержание экологической

целостности и запасов природных ресурсов)
economic sustainability — экономическая устойчивость
financial sustainability — финансовая устойчивость
the Royal Award for Sustainability — Королевская премия за устойчивое развитие (государственная награда в Великобритании; вручается предпринимателям)

Упражнение 2. Прочтите текст и напишите его резюме на русском или английском языке

Упражнение 3. Прочтите текст и ответьте на следующие вопросы:

1. What is sustainable landscape architecture? 2. What does it include? 3 Why is the design of a sustainable urban drainage system very important? 4. What roofs are sustainable? 5. What roofs are referred to as "green roofs"? 6. What is a "container garden" 7. How is greywater used? 8. What else does the living roof serve? 9. What is the sod roof covered with? 10. What are the two types of green roofs?

SUSTAINABLE LANDSCAPE ARCHITECTURE

Sustainable landscape architecture is a category of sustainable design concerned with the planning and design of outdoor space.

This can include ecological, social and economic aspects of sustainability. For example, the design of a sustainable urban drainage system can improve habitats for fauna and flora; improve recreational facilities, because floods cause severe financial harm.

The design of a green roof or a roof garden can also contribute to the sustainability of a landscape architecture project. The roof will help manage surface water, provide for wildlife and provide for recreation.

Green roof is a roof of a building that is partially or completely covered with vegetation, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems. (The use of "green" refers to the growing trend of environmentalism and does not refer to roofs which are merely colored green, as with green roof tiles or roof shingles.) On the sod roof sod is planted.

The term green roof may also be used to indicate roofs that use some form of «green» technology, such as a cool roof, a roof with solar thermal collectors or photovoltaic modules. Green roofs are also referred as eco-roofs, vegetated roofs, living roofs.

Container gardens on roofs, where plants are maintained in pots, are not generally considered to be true green roofs, although this is an area of debate. Rooftop ponds are another form of green roofs which are used to treat greywater.

Also known as "living roofs", green roofs serve several purposes for a building, such as absorbing rainwater, providing insulation, creating a habitat for wildlife, and helping to lower urban air temperatures and combat the heat island effect (An urban heat island (UHI) is a metropolitan area which is significantly warmer than

its surrounding rural areas).

There are two types of green roofs: intensive roofs, which are thicker and can support a wider variety of plants but are heavier and require more maintenance, and extensive roofs, which are covered in a light layer of vegetation and are lighter than an intensive green roof.

Упражнение 4. Используйте словосочетания с sustainability и sustainable при обсуждении ландшафтной архитектуры. Объясните (по-английски), что они означают

Упражнение 5. Объясните образование следующих слов: waterproofing, greywater, rainwater, container, rooftop

Упражнение 6. Переведите на русский язык, обращая внимание на подчеркнутые слова

1. The church is lower than the tower. 2. The architect had to lower the roof. 3. There are many plants in the garden. 4. This tree was planted last year.

Упражнение 7. Какие виды крыш вы знаете? Опишите их по-английски. Какая разница между ними?

TEXT C

Упражнение 1. Прочтите текст C и ответьте на следующие вопросы

What is the difference between a roof garden and a green roof? 2. What are their purposes? 3. What are they made of? 4. What plants grow there? 5. What is a living roof?

ROOF GARDEN AND GREEN ROOF.

A **roof garden** is any garden on the roof of a building. Besides the decorative benefit, roof plantings may provide food, temperature control, hydrological benefits, architectural enhancement, habitats or corridors for wildlife, and recreational opportunities.

A roof garden is actually very different from a green roof, although the two terms are often and incorrectly used interchangeably. A roof garden is an area that is generally used for recreation, entertaining, and as an additional outdoor living space for the building's residents. It may include planters, plants, dining and lounging furniture, outdoor structures such as pergolas and sheds, and automated irrigation and lighting systems. A roof garden reestablishes the relationship between humans and nature that can be lost in urban environments.

It is different from a **green roof** in that the considerations are primarily of an aesthetic or recreational nature, whereas a green roof is usually constructed to cover a large area in the most economical and efficient means possible with an emphasis

towards improving the insulation or improving the overall energy efficiency of cooling and heating costs within a building.

The panels of a green roof are generally no more than a few inches up to a foot in depth, since weight is an important factor when covering an entire roof surface. The plants that go into a green roof are usually, sedum or other shallow-rooted plants that will tolerate the hot, dry, windy conditions that prevail on most rooftop gardens. With a green roof, «the plants layer can shield off as much as 87% of solar radiation while a bare roof receives 100% direct exposure».

The planters* on a roof garden, on the other hand, can generally range anywhere from 6 in up to 3 ft (0.15 to 0.9 m) in depth, depending on the weight-bearing capacity of the roof, and would be placed more for aesthetic purposes. These planters can hold a range of ornamental plants, anything from trees, shrubs, vines, or an assortment of flowers. Since the planters on a roof garden are placed in random fashion, it would be much less likely to provide the environmental and energy benefits of a green roof.

A living roof is a roof which is covered in turf, flowers, grasses, and sometimes shrubs or trees. Living roofs have been used in home building in many parts of the world for thousands of years. A rising interest in sustainable or green architecture in the late 1990s led to a rising demand for living roofs on homes and offices.

ИЯ

ПР	1. sedum - очиток, или седум, или грыжная трава, или лихорадочная трава
ИМ	2. planter- горшок, кашпо (для цветов); декоративная кадка (для больших
ЕЧ	комнатных растений)
АН	
ТЕХТ	

ДУпражнение 1. Прочтите текст и перескажите его по-английски

ДЕРНОВАЯ КРОВЛЯ.

Дерновая (sod, turf) кровля имеет древнюю историю. В настоящее время альтернативная технология строительства дерновой кровли возрождена и сейчас ее часто называют Living Roof (живая крыша), т.к. на крышах в настоящее время устраивают не только лужайки, но и целые сады.

Сады на крышах являются порождение больших городов. В шумном и хаотичном городе остро чувствуется потребность в небольшом тихом уголке. Родоначальником садов на крышах является Берлин. В 1867 году берлинский архитектор Карл Рабитц удивил публику на всемирной выставке в Париже. Его зелёные насаждения на крыше парижская публика восприняла с восторгом. Тогда-то и вошло в архитектурный обиход понятие живая крыша.

Преимущества дерновой кровли:

- эстетические особенности дерновой кровли позволяют дому органично вписываться в окружающую среду;

- живая крыша создает особенный микроклимат;
- при строительстве дерновой кровли используются местные натуральные и дешевые материалы.

Недостатки дерновой кровли:

- очень большой вес, требующий прочной конструкции стропил и опорных колонн или стен;
- большая трудоемкость ремонта в случае недостаточно качественного устройства гидроизоляции.

TEXT E

Упражнение 1. Переведите текст письменно со словарем.

Sustainable architecture is a general term that describes environmentally conscious design techniques in the field of architecture. Sustainable architecture is framed by the larger discussion of **sustainability** and the pressing economic and political issues of our world. In the broad context, sustainable architecture seeks to minimize the negative environmental impact of buildings by enhancing efficiency and moderation in the use of materials, energy, and development space. Most simply, the idea of sustainability, or ecological design, is to ensure that our actions and decisions today do not inhibit the opportunities of future generations. This term can be used to describe an energy and ecologically conscious approach to the design of the built environment.

Green building (also known as **green construction** or **sustainable building**) refers to the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and demolition. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. New technologies are constantly being developed to complement current practices in creating greener structures, the common objective is that green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment.

TEXT F

Упражнение 1. Прочтите текст и напишите его резюме на русском или на английском языке.

Greywater is wastewater generated from domestic activities such as laundry, dishwashing, and bathing, which can be recycled on-site for uses such as landscape irrigation and constructed wetlands. Greywater differs from water from the toilets which is designated sewage or blackwater to indicate it contains human waste. Greywater gets its name from its cloudy appearance and from its status as being between fresh potable water (known as «white water») and sewage water («black water»). In a household context, greywater is the leftover water from baths,

showers, hand basins and washing machines only. Any water from any contaminating sources such as toilets or dishwashers is considered black water.

Water purification is a process of removing undesirable chemicals, materials, and biological contaminants from contaminated water. The goal is to produce water fit for a specific purpose. The purification process of water may reduce the concentration of particulate matter including suspended particles, parasites, bacteria, algae, viruses, fungi; and a range of dissolved and particulate material derived from the surfaces that water may have made contact with after falling as rain.

PART 2

ENERGY EFFICIENT ARCHITECTURE

TEXT A

Упражнение 1. Прочтите и переведите на русский следующие слова:

techniques

filter

terminal

control

fluorescent

energy

traditional

illumination

mechanism

WORDS TO BE USED

efficient a — эффективный;

energy-efficient a — энергосберегающий

hemisphere n — полушарие

need 1) n — необходимость, недостаток, нехватка 2) v — нуждаться (в чём-л.); иметь потребность, требоваться

network n — сеть

renewable a — возобновимый, возобновляемый (о природных ресурсах и т.п.)

restrict v — ограничивать; ставить предел

shade 1) n — тень 2) v — заслонять от света; затенять ; shading n — затенение

skylight n — верхний свет; застеклённая крыша, фонарь

waste n — отбросы, отходы

WORDS TO BE UNDERSTOOD

amount n — количество

attain v — достигнуть, добиться

awning n — навес, тент
bulb n — лампочка
capture v — захватывать
effort n — усилие
gain n — увеличение
goal n — цель, задача
humidity n — сырость, влажность; влага
relieve v — облегчать, уменьшать (тяжесть, давление)
stale a — несвежий, спёртый

Упражнение 2. Прочтите текст и напишите его резюме на русском или английском языке

Упражнение 3. Прочтите текст и ответьте на следующие вопросы

1. What is the goal of efficient energy? 2. What must be done to achieve and maintain a comfortable temperature and illumination? 3. What is the most important goal of sustainable architecture? 4. What does HVAC stand for? 5. To what does it refer? 6. How are they provided for? 7. What is EfW? 8. What is the aim of passive solar building design? 9. What does the active solar design use? 10. What methods are used to warm or cool the building?

EFFICIENT ENERGY USE

PART I

Efficient energy use, sometimes simply called energy efficiency, is the goal of efforts to reduce the amount of energy required to provide products and services. For example, insulating a home allows a building to use less heating and cooling energy to achieve and maintain a comfortable temperature. Installing fluorescent lights or natural skylights reduces the amount of energy required to attain the same level of illumination compared to using traditional incandescent light bulbs* Energy efficiency and renewable energy are said to be the *twin pillars* of sustainable energy policy.

Energy efficiency over the entire life cycle of a building is the single most important goal of sustainable architecture. Architects use many different techniques to reduce the energy needs of buildings and increase their ability to capture or generate their own energy.

HVAC stands for heating, ventilation and air conditioning and refers to the equipment, distribution network and terminals used either collectively or individually to provide fresh filtered air, heating, cooling and humidity control in a building. Site and building orientation have some major effects on a building's HVAC efficiency.

The energy recycling technologies can effectively recapture energy from waste hot water and stale air and transfer that energy into incoming fresh cold water or fresh air.

Waste-to-energy (WtE) or energy-from-waste (EfW) is the process of

creating energy in the form of electricity or heat from the incineration* of waste source.

Passive solar building design allows buildings to use the energy of the sun efficiently without the use of any active solar mechanisms. Typically passive solar building designs incorporate materials that retain heat effectively and strong insulation that works to prevent heat escape. Active solar design uses electrical or mechanical equipment, such as pumps and fans.

Low energy designs also require the use of solar shading, by means of awnings, blinds or shutters, to relieve the solar heat gain in summer and to reduce the need for artificial cooling. In the northern hemisphere a large number of south-facing windows are installed to collect direct sun while restricting the number of north-facing windows. Certain window types, such as double or triple glazed insulated windows with gas filled spaces provide much better insulation than single-pane glass windows.

ПРИМЕЧАНИЯ

1. incandescent light bulb — лампа накаливания
2. incineration— сжигание; кремация

Упражнение 4. Объясните образование следующих слов:
distribution, cooling, skylight, efficiency, renewable, recapture, heating, shading, incoming

Упражнение 5. Подберите синонимы
goal, amount, wet, need

Упражнение 6. Замените подчеркнутые слова. Поставьте заменяющие слова в нужную форму. Возможны варианты. Переведите на русский язык.

Low energy design stands for the design that saves energy. 2. Site and building orientation have effects on a building's HVAC efficiency. 3. Efficient energy use is the goal of efforts to reduce the amount of energy required to provide products and services. 4. HVAC means heating, ventilation and air conditioning. 5. Renewable energy is said to be very important.

aim, energy efficiency, influence, it is said that, mean, purpose, quantity, refer to, signify, stand for

Упражнение 7. Переведите на русский язык, обращая внимание на подчеркнутые слова

1. Waste water stands for water from baths, sinks, toilets. 2. Energy efficiency is the most important goal of sustainable architecture. 3. The energy recycling technologies can effectively recapture energy from waste hot water. 4. Renewable energy is said to be necessary. 5. We need new materials. 6. Do you need to go

there?

TEXT B

Упражнение 1. Прочтите и переведите на русский следующие слова:

excess convert solar

WORDS TO BE USED

avoid v — избегать

light shelf— световая полка

loss n — потеря убыток; ущерб

WORDS TO BE UNDERSTOOD

coniferous a — хвойный

deciduous a — лиственный, листопадный

evergreen a — вечнозелёный

fossil fuel— ископаемое топливо

heating plant— отопительная установка

pump n — насос; помпа

ratio (pl -os) n — отношение, пропорция; коэффициент; соотношение

sprawl v — растянуть(ся)

Упражнение 2. Прочтите текст и напишите его резюме на русском или английском языке

Упражнение 3. Прочтите текст и ответьте на следующие вопросы

1. What prevents excess solar gain in summer? 2. What kinds of plants do you know? 3. What protects against cold wind? 4. What is important for sustainable architecture in cold countries? 5. What kinds of energy do you know? 6. What is the difference between solar and passive energies? 7. Why are multi-winged building designs often avoided?

EFFICIENT ENERGY USE

PART II

Preventing excess solar gain by means of solar shading devices in the summer months is important. Deciduous trees are often planted in front of windows to block excessive sun in summer with their leaves, but allow light through in winter when their leaves fall off. Louvers or light shelves are installed to allow the sunlight in during the winter (when the sun is lower in the sky) and keep it out in the summer (when the sun is high in the sky). Coniferous or evergreen plants are often planted to the north of buildings to protect against cold north winds.

In colder climates, heating systems are a primary focus for sustainable

architecture. In climates with four seasons, an integrated energy system will increase in efficiency: when the building is well insulated, when it is sited to work with the forces of nature, when heat is recaptured (to be used immediately or stored), when the heat plant relying on fossil fuels or electricity is greater than 100% efficient, and when renewable energy is used.

Active solar technologies are employed to convert solar energy into usable light, heat, cause air-movement for ventilation or cooling, or store heat for future use. They use electrical or mechanical equipment, such as pumps and fans, to increase the usable heat in a system. Solar energy collection and utilization systems that do not use external energy, are classified as passive solar technologies.

In **passive solar building design**, windows, walls, and floors are made to collect, store, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer. This is called passive solar design or climatic design because, unlike active solar heating systems, it doesn't involve the use of mechanical and electrical devices.

The key to designing a passive solar building is to take advantage of the local climate. Elements to be considered include window placement (fenestration) and glazing type, thermal insulation, and shading. Passive solar design techniques can be applied most easily to new buildings, but existing buildings can be adapted or modified.

Low energy buildings typically have a very low surface area to volume ratio to minimize heat loss. This means that sprawling multi-winged building designs (often thought to look more «organic») are often avoided to be replaced by more centralized structures.

Windows are placed to maximize the input of heat-creating light while minimizing the loss of heat through glass, a poor insulator.

Упражнение 4. Объясните образование следующих слов:
multi-winged, maximize, insulator, renewable, usable, excessive

Упражнение 5. Подберите антонимы к следующим словам:
maximize, passive, gain

Упражнение 6. Переведите на русский язык следующие словосочетания:

1. take advantage of the climate 2. elements to be considered 3. a very low surface area to volume ratio 4. renewable energy 5. are often avoided to be replaced by more centralized structures

Упражнение 7. Опишите energy efficient architecture и energy-efficient landscape design

Упражнение 8. Прочтите текст С и ответьте на вопросы.

1. What is energy-efficient landscaping? 2. What is renewable energy? 3. How can renewable energy be generated on-site? 4. What measures can reduce energy use?

TEXT C

ENERGY EFFICIENCY

Energy-efficient landscaping is a type of landscaping designed for the purpose of conserving energy. There is a distinction between the embedded energy of materials and constructing the landscape, and the energy consumed by the maintenance and operations of a landscape.

Renewable energy is energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished). In 2008, about 19% of global final energy consumption came from renewables, with 13% coming from traditional biomass, which is mainly used for heating, and 3.2% from hydroelectricity. New renewables (small hydro, i.e. the development of hydroelectric power on a scale serving a small community or industrial plant, modern biomass, wind, solar, geothermal, and biofuels) accounted for another 2.7% and are growing very rapidly. The share of renewables in electricity generation is around 18%, with 15% of global electricity coming from hydroelectricity and 3% from new renewables.

On-site generation of renewable energy through solar power, wind power, hydro power, or biomass can significantly reduce the environmental impact of the building. Power generation is generally the most expensive feature to add to a building.

Green buildings often include measures to reduce energy use. To increase the efficiency of the building envelope, (the barrier between conditioned and unconditioned space), they may use high-efficiency windows and insulation in walls, ceilings, and floors. Another strategy, passive solar building design, is often implemented in low-energy homes. Designers orient windows and walls and place awnings, porches, and trees to shade windows and roofs during the summer while maximizing solar gain in the winter. In addition, effective window placement (daylighting) can provide more natural light and lessen the need for electric lighting during the day. Solar water heating further reduces energy loads

Упражнение 9. Объясните образование следующих слов и переведите их:

embedded, renewable, sunlight, hydroelectricity, geothermal, biomass, greywater, lighting

TEXT

Дупражнение 1. Прочтите текст и ответьте на следующие вопросы:

1. Why and how should we reduce water consumption? 2. What should be

done on site? 3. What equipment can be used on-site and in the building?

WATER EFFICIENCY

Reducing water consumption and protecting water quality are key objectives in sustainable building. One critical issue of water consumption is that in many areas, the demands on the supplying aquifer* exceed its ability to replenish itself. To the maximum extent feasible, facilities should increase their dependence on water that is collected, used, purified, and reused on-site. The protection and conservation of water throughout the life of a building may be accomplished by designing for dual plumbing that recycles water in toilet flushing*. Waste-water may be minimized by utilizing water conserving fixtures such as ultra-low flush toilets and low-flow shower heads. Bidets help eliminate the use of toilet paper, reducing sewer traffic and increasing possibilities of re-using water on-site. Point of use water treatment and heating improves both water quality and energy efficiency while reducing the amount of water in circulation. The use of non-sewage and greywater for on-site use such as site-irrigation will minimize demands on the local aquifer. The sanitary facilities recommended for all dwellings by the housing law: a fixed bath or shower, wash-hand basin, and sink, all supplied with hot and cold water, and a flush toilet.

ПРИМЕЧАНИЯ

- 1.aquifer— водоносный слой, водоносный горизонт
- 2.flush toilet — сливной туалет

TEXT C

WORDS

- debris n — осколки, обломки; обрезки; лом
rammed a — утрамбованный
recycled a — повторно используемый
recycling n – 1.переработка отходов (для повторного использования) 2. сбор вторичного сырья
vermiculite n – вермикулит

Упражнение 2 Прочтите текст и ответьте на следующие вопросы:

- 1.What materials are considered to be “green”?
2. What are recycled industrial goods?
3. Where should building materials be manufactured?
4. Which method is more efficient?

MATERIALS EFFICIENCY

Building materials typically considered to be “green include rapidly renewable plant materials like bamboo (because bamboo grows quickly) and straw, lumber from forest certified to be sustainably managed, recycled stone, recycled metal, and other products that are non-toxic, reusable, renewable, and/or recyclable (e.g. limoleum, sheep wool, panels made from paper flakes, compressed earth block, adobe, baked earth, rammed earth, clay, vermiculite, flax linen, seagrass, cork, expanded clay grains, coconut, wood fibre plates, calcium sand stone, concrete, etc.) The EPA (Environmental Protection Agency) also suggests using recycled industrial goods, such as coal combustion products, foundry sand, and demolition debris in construction projects. Building materials should be extracted and manufactured locally to minimize the energy embedded in their transportation to the building site. Where possible, building elements should be minimizing waste, maximizing recycling (because manufacture is in one location), high quality elements, less noise and dust.

Упражнение 3 Опишите условия, необходимые для эффективного строительства.

TEXTS FOR SPECIAL PURPOSES

Read and translate the following texts using the dictionary.

GREEN BUILDING

Green building (also known as green construction or sustainable building) is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Although new technologies are constantly being developed to complement current practices in creating greener structures, the common objective is that green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- A) Efficiently using energy, water, and other resources
- B) Protecting occupant health and improving employee productivity
- C) Reducing waste, pollution and environmental degradation.

Green building practices aim to reduce the environmental impact of new buildings. Buildings account for a large amount of land use, energy and water consumption, and air and atmosphere alteration. Green building brings together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of new buildings on the environment and human health. It often emphasizes taking advantage of renewable resources, e.g., using sunlight through passive solar, active solar, and photovoltaic techniques and using plants and trees through green roofs, rain gardens, and for reduction of rainwater run-off. Many other techniques, such as using packed gravel or permeable concrete instead of conventional concrete or asphalt to enhance replenishment of ground water, are used as well.

On the aesthetic side of green architecture or sustainable design is the philosophy of designing a building that is in harmony with the natural features and resources surrounding the site. There are several key steps in designing sustainable buildings: specify 'green' building materials from local sources, reduce loads, optimize systems, and generate on-site renewable energy.

1. The passage suggests that:

- (A) Green building is the practice of creating structures and using processes that are environmentally resource-efficient.
- (B) Green building reduces waste, pollution and environmental degradation.

2. The passage suggests that:

- (A) Green building practices aim to reduce the environmental impact of new buildings.
- (B) Green building practices aim to increase the environmental impact of new buildings.

3. The passage suggests that:

- (A) Permeable concrete is used instead of conventional concrete in green buildings.

(B) Green building brings reduces and ultimately eliminate the impacts of new buildings on the environment and human health.

4. The passage suggests that:

(A) “Green” building materials are taken from local sources

(B) On the aesthetic side of green architecture or sustainable design is the philosophy of designing a building that is in harmony with nature.

GREEN ARCHITECTURE OF CITY

Planting of greenery cities - one of actual problems of our time. Different projects, realized in Russia and in the European countries, are called to help city municipal services, the directors of enterprises, architects and landscape designers to incarnate in life the initiatives on planting of greenery. Large cities transformed to the middle of 20th age in «stone jungles», aggressive in relation to a man. In the whole world already a long ago came to the conclusion about the necessity of harmonization of city space. Flowers on the streets of European cities became the general and ordinary phenomenon, but they not at all cheer up less than from it. Too densely standings houses and asphalted streets sometimes do not abandon a place for laying out of flower-gardens. And here the vertical planting of greenery comes for help. Suspended floral containers, balcony boxes for plants, the floor bowls of unusual forms become the necessary attribute of many city streets today. They allow economizing space and doing a little flowering oasis almost any corner of city.

But such traditional measures the vertical planting of greenery of the European cities is not limited to. A facade, thickly strung by lianas, left off to be exceptional belonging of out-of-town villa. French, German, Swiss architects, workings in this direction, as early as 80s 20th ages created the standards of combination of architecture and vegetation, and in our time this practice got wide distribution. In office building in Santyago (Chile), built Enrike Braunom and Boreas of Uydobro, lianas, risings on the trellis-works of facade, remind jalousies, protecting internal apartments from a sun.

American architect Andzhela Danadeva converted the atrium of the recently built shopping center in Seattle in real hangings, more precisely, terrace gardens, where it is possible to find a little waterfall even. As a result this garden became the favorite place of meetings for the habitants of city.

Antifunctionalism

Telling about «green architecture» it is impossible not to mention work of Fridenraykha Khundertvassera - nearly brightest figure in architecture of end of 20th age. Khundertvasser was convinced an antifunctionalist - projects built by him deny everything, that added in modern architecture by an urbanism and standardization. A house, built Khundertvasserom in Vienna from 1977 to 1986, became by the architectural manifest. For us he is interesting foremost that on all flat elements of building - roof, balconies, terraces — earth was poured and trees, bushes, flowers and simply lawn grass, are landed. As a result building looks as the forest with unusual buildings bedded in the middle of. So principle of harmonious union of man with nature, which Khundertvasser preached on words and in business, works. «Green roofs», propagandized by Khundertvasser, behave

rather to the area of the horizontal planting of greenery. However lately architects carry out tests and on planting of greenery of vertical surfaces. So, English architects Khizer Ekroyd and Dan Kharvi began the experiments from that placed the seed of plants on the wall of the abandoned shanty in the medieval mountain hamlet of Italy. In 2003 Kharvi and Ekroyd adorned a grass the interior of the neglected church of Dilston-grouv in London, in a year - are walls of burial vault XVIII ages on the city cemetery of Riga. Then, already in Sweden, the couple of architects presented a floating lawn on the court of public.

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