

高等学校试用教材

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建筑类 专业英语

给水排水与环境保护
(第三册)

Architecture

English in
and Construction



9.4

张文洁 濮宏魁 主编

中国建筑工程出版社

高等学校试用教材

建筑类专业英语

给水排水与环境保护

第三册

张文洁	濮宏魁	主编
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本书按国家教委颁布的《大学英语专业阅读阶段教学基本要求》编写的专业英语教材。本册包括给水排水设备、水质监测、水污染及废水三级处理、人类及其环境、环境伦理学、生态学、环保面向未来等方面内容。全书安排 16 个单元,每单元除正课文外,还有两篇阅读材料,均配有必要的注释。正课文还配有词汇表和练习,书后附有总词汇表、参考译文和练习答案。语言难度大于一、二册,并配有科技英语写作的简要说明与写作练习。

本书可供本专业学生四年级上半学期使用,也可供有关专业人员自学英语参考。

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前 言

经过几十年的探索,外语教学界许多人认为,工科院校外语教学的主要目的,应该是:“使学生能够利用外语这个工具,通过阅读去获取国外的与本专业有关的科技信息。”这既是我们建设有中国特色的社会主义的客观需要,也是在当前条件下工科院校外语教学可能完成的最高目标。事实上,教学大纲规定要使学生具有“较强”的阅读能力,而对其他方面的能力只有“一般”要求,就是这个意思。

大学本科的一、二年级,为外语教学的基础阶段。就英语来说,这个阶段要求掌握的词汇量为2400个(去掉遗忘,平均每个课时10个单词)。加上中学阶段已经学会的1600个单词,基础阶段结束时应掌握的词汇量为4000个。仅仅掌握4000个单词,能否看懂专业英文书刊呢?还不能。据统计,掌握4000个单词,阅读一般的英文科技文献,生词量仍将有6%左右,即平均每百词有六个生词,还不能自由阅读。国外的外语教学专家认为,生词量在3%以下,才能不借助词典,自由阅读。此时可以通过上下文的联系,把不认识的生词猜出来。那么,怎么样才能把6%的生词量降低到3%以下呢?自然,需要让学生增加一部分词汇积累。问题是,要增加多少单词?要增加哪一些单词?统计资料表明,在每一个专业的科技文献中,本专业最常用的科技术语大约只有几百个,而且它们在文献中重复出现的频率很高。因此,在已经掌握4000单词的基础上,在专业阅读阶段中,有针对性地通过大量阅读,扩充大约1000个与本专业密切有关的科技词汇,便可以逐步达到自由阅读本专业科技文献的目的。

早在八十年代中期,建设部系统院校外语教学研究会就组织编写了一套《土木建筑系列英语》,分八个专业,共12册。每个专业可选读其中的3、4册。那套教材在有关院校相应的专业使用多年,学生和任课教师反映良好。但是,根据当时的情况,那套教材定的起点较低(1000词起点),已不适合今天学生的情况。为此,在得到建设部人事教育劳动司的大力支持,并征得五个相关专业教学指导委员会同意之后,由建设部系统十几所院校一百余名外语教师和专业课教师按照统一的编写规划和要求,编写了这一套《建筑类专业英语》教材。

《建筑类专业英语》是根据国家教委颁发的《大学英语专业阅读阶段教学基本要求》编写的专业阅读教材,按照建筑类院校共同设置的五个较大的专业类别对口编写。五个专业类别为:建筑学与城市规划;建筑工程(即工业与民用建筑);给水排水与环境保护;暖通、空调与燃气;建筑管理与财务会计。每个专业类别分别编写三册专业英语阅读教材,供该专业类别的学生在修完基础阶段英语后,在第五至第七学期专业阅读阶段使用,每学期一册。

上述五种专业英语教材语言规范,题材广泛,覆盖相关专业各自的主要内容:包括专业基础课,专业主干课及主要专业选修课,语言材料的难易度切合学生的实际水平;词汇

以大学英语“通用词汇表”的 4000 个单词为起点，每个专业类别的三册书将增加 1000—1200 个阅读本专业必需掌握的词汇。本教材重视语言技能训练，突出对阅读、翻译和写作能力的培养，以求达到《大学英语专业阅读阶段教学基本要求》所提出的教学目标：“通过指导学生阅读有关专业的英语书刊和文献，使他们进一步提高阅读和翻译科技资料的能力，并能以英语为工具获取专业所需的信息。”

《建筑类专业英语》每册 16 个单元，每个单元一篇正课文 (TEXT)，两篇副课文 (Reading Material A & B)，每个单元平均 2000 个词，三册 48 个单元，总共约有十万个词，相当于原版书三百多页。要培养较强的阅读能力，读十万个词的文献，是起码的要求。如果专业课教师在第六和第七学期，在学生通过学习本教材已经掌握了数百个专业科技词汇的基础上，配合专业课程的学习，再指定学生看一部分相应的专业英语科技文献，那将会既促进专业课的学习，又提高英语阅读能力，实为两得之举。

本教材不仅适用于在校学生，对于有志提高专业英语阅读能力的建筑行业广大在职工程技术人员，也是一套适用的自学教材。

建设部人事教育劳动司高教处和中国建设教育协会对这套教材的编写自始至终给予关注和支持；中国建筑工业出版社第五编辑室密切配合，参与从制定编写方案到审稿各个阶段的重要会议，给了我们很多帮助；在编写过程中，各参编学校相关专业的许多专家、教授对材料的选取、译文的审定都提出了许多宝贵意见；本书在编写过程中还承王国民、周晓蔷、乐毅全等同志大力协助，谨此致谢。

《建筑类专业英语》是我们编写对口专业阅读教材的又一次尝试，由于编写者水平及经验有限，教材中不妥之处在所难免，敬请广大读者批评指正。

《建筑类专业英语》

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UNIT ONE

Text An Introduction to Water Supply and Sanitation Provisions

[1] Water is probably the most important natural resource in the world since without it life cannot exist and industry cannot operate. Unlike many other raw materials there is no substitute for water in many of its uses. Water plays a vital role in the development of communities since a reliable supply of water is an essential prerequisite for the establishment of a permanent community. Unfortunately, the liquid and solid wastes from such a community have a considerable potential for environmental pollution. In primitive civilizations the remedy for this pollution problem was simply to move the community to another suitable site. In more advanced civilizations such upheavals become impracticable and measures must be taken to protect and augment water supplies and for the satisfactory disposal of waste materials. The concept of water as a natural resource which must be carefully managed is very necessary as growing populations and industrial developments demand ever-increasing supplies of water.

[2] The importance of water supply and sanitation provisions was recognized centuries ago in ancient civilizations. Archaeological evidence shows the existence of latrines and drains in Neolithic dwellings and the Minoan civilization in Crete 2000 years B.C. had clay water and sewage pipes with flushing toilets in the houses.^① The Romans had highly developed water supply and drainage systems and their cities used large amounts of water with continuously operating fountains being a major source of supply for the majority of the population although wealthy families had their own piped supplies.^② Large aqueducts, some of which still remain, were constructed over distances up to 80 km to bring adequate supplies of good-quality water into the cities. Stone sewers in the streets removed surfacewater and collected the discharges from latrines for conveyance beyond the city limits. With the demise of the Roman Empire most of their public works installations fell into disuse and for centuries water supply and sanitation provisions were virtually non-existent.^③ In the Middle Ages, towns started to develop at important crossing points on rivers and these rivers usually provided a convenient source of water and an apparently convenient means of waste disposal. Although sewers were built in the larger towns they were intended solely for the removal of surfacewater and in the UK the discharge of foul sewage to the sewers was forbidden by law until 1815. Sanitary provisions were usually minimal; in 1579 one street in London with sixty houses had three communal latrines. Discharges of liquid and solid wastes from windows into the street were common and it is not surprising that life expectancy was less than half the current figure in the developed world. In an attempt to improve matters a law was passed in 1847 which made it obligatory in London for cesspit and latrine waste to be discharged to the sewers.^④ London's sewers drained to the Thames, from which much of the city's water was obtained, and in addition the poor state of

repair of many of the sewers allowed the contents to leak into the aquifer which was the other main source of water. The inevitable consequences of this state of affairs were that water sources became increasingly contaminated by sewage, the Thames became objectionable to both sight and smell, and most seriously, waterborne diseases became rampant in the city. The Broad Street Pump outbreak of cholera in 1854 which caused 10,000 deaths provided the evidence for Dr. John Snow to demonstrate the connection between sewage pollution of water and enteric diseases like cholera and typhoid. Public outcry resulted in the commissioning of the first major public health engineering works of modern times; Bazalgette's intercepting sewers which collected sewage discharges and conveyed them downstream of London for discharge to the estuary, and water abstraction from Teddington on the non-tidal part of the river. Thus by 1870 waterborne outbreaks had been largely brought under control in the UK and similar developments were taking place in Western Europe and the cities of the USA. The Industrial Revolution greatly increased the urban water demand and the late nineteenth century saw the construction of major water-supply schemes involving large upland impoundments of which the Elan Valley scheme for Birmingham and the Croton and Catskill reservoirs serving New York are examples.

[3] Only by continual and costly attention to water quality control has it been possible to virtually eradicate waterborne diseases from developed countries. Such achievements must not, however, be allowed to mask the appalling situation regarding water supply and sanitation in much of the developing world.^⑤ A survey in 1975 found that 80% of the world's rural population and 23% of the urban population had no reasonable access to a safe water supply. The sanitation situation was even worse with 85% of the rural population and 25% of the urban population having no sanitary provision at all. The growth of population in developing countries, due to the high birth rate, is such that unless strenuous efforts to increase water supply and sanitation facilities are made, the percentage of the world's population with satisfactory facilities would actually decrease in the future. The United Nations Organization has therefore designated the period 1981-90 as the International Drinking Water Supply and Sanitation Decade with the aim of providing safe water and adequate sanitation for all. Such a target will be difficult to achieve, involving as it must large investments in finance and manpower, although it has been estimated that the cost of meeting the Decade target would be about 5% of global spending on armaments during the same period.^⑥

[4] In developed countries, demands for water are now fairly static and basic water quality-control measures are well established. However, many of the existing water-supply and sewage schemes are now relatively old so that their reconstruction will pose problems in the future. In addition, as knowledge of the effects of all forms of environmental pollution increases so new potential hazards appear, for example there is current concern about the possible carcinogenic hazards arising from the presence of minute concentrations of some organic compounds in water. Thus, throughout the world, various aspects of water quality control will continue to be vital in safeguarding public health.

New Words and Expressions

provision [prəu'vɪʒən]	<i>n.</i>	设备, 装置
prerequisite * [ˌpri:'rekwɪzɪt]	<i>n.</i>	先决条件, 前提
upheaval [ʌp'hi:vəl]	<i>n.</i>	动乱, 剧变
augment * [ɔ:g'ment]	<i>vt.</i>	扩大, 增加, 加强
latrine [lə'tri:n]	<i>n.</i>	(沟形、坑形的) 厕所
dwelling ['dweliŋ]	<i>n.</i>	住宅, 住所
conveyance [kən'veiəns]	<i>n.</i>	运送, 输送
demise [di'maɪz]	<i>n.</i>	死亡, 灭亡, 终止
fall into		陷入, 陷于
foul * [faʊl]	<i>a.</i>	污浊的, 腐烂的
minimal * ['mɪnɪməl]	<i>a.</i>	最低限度的, 最小的
communal ['kɒmjʊnəl]	<i>a.</i>	公有的, 公用的
life expectancy		估计寿命, 平均寿命
cesspit ['sespɪt]	<i>n.</i>	粪坑, 污水坑
contaminate * [kən'tæmɪneɪt]	<i>vt.</i>	污染, 弄脏
objectionable * [əb'dʒekʃənəbl]	<i>a.</i>	令人讨厌、作呕的
rampant ['ræmpənt]	<i>a.</i>	蔓延的, 猖獗的
enteric [en'terɪk]	<i>a.</i>	肠的
outcry ['aʊtkraɪ]	<i>n.</i>	强烈抗议或反对
intercept * [ˌɪntə'sept]	<i>vt.</i>	截流
abstraction [æb'strækʃən]	<i>n.</i>	引水
impoundment [ɪm'paʊndmənt]	<i>n.</i>	贮水 (池)
eradicate [ɪ'rædɪkeɪt]	<i>vt.</i>	根除, 消灭, 杜绝
appalling [ə'pɔ:lɪŋ]	<i>a.</i>	令人震惊的, 骇人的
regarding [rɪ'gɑ:dɪŋ]	<i>prep.</i>	关于, 就...而论
strenuous ['strenjuəs]	<i>a.</i>	奋发的, 努力的
designate... as... *		指定, 指派
armament ['ɑ:məmənt]	<i>n.</i>	武器, 器械
pose * [pəʊz]	<i>vt.</i>	提出, 形成

Notes

- ① Neolithic [ˌni(:)əʊ'liθɪk] (公元前 10 000 年左右中东地区和以后发展至其他地区的) 新石器时代的; the Minoan [mi'nəʊən] civilization (公元前 3000~1100 年古希腊克里特为中心的青铜器时代的) 米诺斯 (Minos) 文化 (亦称克里特文化); Crete (希腊南部的) 克里

特岛。

- 2) with continuously operating fountains being a major source of supply for the majority of the population... 为独立结构, 补充说明。
- 3) Roman Empire 罗马帝国 (指公元前 27 年到公元 476 年的罗马奴隶制国家)。
- 4) ... for cesspit and latrine waste to be discharged to the sewers. 带逻辑主语的不定式短语为 which 定语从句中 made 的宾语。
- 5) ... regarding water supply and sanitation in much of the developing world. 为 situation 的定语。
- 6) ... as it must... 省略形式的方式状语从句, 意为 as it inevitably happens, 此处 “must” 为 “必然要”, “必定要”。

Exercises

Reading Comprehension

1. Are these statements true (T) or false (F) according to the text?
1. Since the demand for supplies of water is always on the increase with growing populations and industrial developments, it is necessary to form the idea that water as a natural resource must be carefully protected and managed. ()
 2. It was the Romans that recognized the importance of water supply and sanitation provisions and highly developed them, but with the collapse of the Roman Empire, all the public works installations were abandoned and water supply and sanitation provisions were no longer existent for several hundred years. ()
 3. Before 1815, it was forbidden to discharge foul sewage to the sewers by law in the UK, nor was it to discharge liquid and solid wastes from windows into the street. ()
 4. In some developed countries, achievements have been made in getting rid of waterborne diseases by continual and costly attention to water quality control, but the situation is still terrible in much of the developing world. ()
 5. It seems quite disappointing that the demands for water quality control will never be met in developed countries, for new potential hazards appear with the increasing knowledge of the effects of all forms of environmental pollution. ()
1. Match Column A with Column B to form meaningful sentences according to the text.

A

1. Many raw materials have their substitutes in many of their uses

B

- a. the percentage of the world's population with satisfactory facilities would actually decrease in the future

- | | |
|---|---|
| 2. In the Middle Ages, sanitary situation was poor and sanitation provisions were usually minimal | b. but as for water, there is none |
| 3. The Broad Street pump outbreak of cholera in 1854 caused 10,000 deaths, | c. in order to meet the urban water demand increased by the Industrial Revolution |
| 4. The major water-supply schemes involving large upland impoundments were constructed in the late 19th century | d. which provided the evidence to prove forcibly the link between sewage pollution of water and enteric diseases |
| 5. If strenuous efforts to increase water supply and sanitation facilities were not to be made | e. so the fact won't surprise you that life expectancy was less than half the current figure in the developed world |

Vocabulary

- I. Fill in the blanks with the expressions given below. Change the forms if necessary.

communal	fall	into disuse	prerequisite	strenuous
provisions	rampant	solely		

- I am afraid nobody can understand the meaning of the word, for it _____ for quite a long time.
 - Is it stated in the marriage law that everything owned by a husband and wife is considered _____ property?
 - He was thinking of resigning his position on the school paper _____ on account of his age.
 - The paper deals with the nation's problems, ranging from _____ inflation to a lowering of literacy levels.
 - A minimum _____ for this job is three years' experience and a good command of English.
- II. Complete each of the following statements with one of the four choices given below.
- The principal told the boys and girls that Mr. Wang was ill and Miss Li would be his _____ to give the English lecture to them.
A. supply B. substitute C. place D. post
 - Her knowledge of English is _____ for the job, although she is not fluent in the language.
A. perfect B. efficient C. available D. adequate

3. The European people had been carrying out a hard struggle against Fascists during the Second World War, and they won a complete victory with the _____ of the Third Reich in 1945.
A. demise B. break C. ruin D. split
4. Because of the essential role played by water in supporting human life it also has, if _____, great potential for transmitting a wide variety of diseases and illnesses.
A. augmented B. conveyed C. contaminated D. discharged
5. With the water supply and sanitation situation improved, cholera has been _____ in the region.
A. escaped B. erased C. eradicated D. erected

Writing Selecting the Key Words (1)

Key words are informative words that can give the information about what a piece of writing is mainly talking about. They are often nouns and verbs, etc.

For Example:

Read the following text and find out the key words

With the rapid industrialization of the States, air pollution is posing a problem. Fertilizer and steel plants, cement industries, thermal power plants and paper mills are among the units which cause air pollution.

Automobiles also cause air pollution as they emit smoke which contains hydrocarbon, nitrous oxide and carbon monoxide.

The Air Act was passed in Congress in 1982 and came into effect in 1983.

Key words:

Air pollution, Pollutant, Air Act

Directions: Read the text of this Unit and find out three to five key words.

Reading Material A

Water Demand

In addition to the water required for survival, other domestic uses of water are highly desirable, e. g. for personal hygiene, washing of utensils and clothes, etc. The amount of water used for these other domestic purposes will be governed by the availability of water in the community judged on both amount and cost bases. In very primitive communities water demands of around 2.5 l/person day have been recorded but as life styles develop, a water demand of about 10 l/person day is normal in the absence of a piped supply and where water has to be

carried some distance to the house. The provision of a central stand-pipe supply in a village will probably increase the water demand to about 25 l/person day and the demand with an individual house tap in a low-income community is likely to be about 50 l/person day. In developed countries and the high-value urban housing areas of developing countries the provision of multiple taps, flush toilets, washing machines and dishwashers will greatly increase water demand for domestic purposes so that demands of several hundred litres per person day are common.

Industrial processes consume considerable amounts of water and in manufacturing areas industrial water demand may equal or even exceed the domestic demand. Some typical industrial water demands are, however, very much dependent upon such factors as the age of the plant, the cost of water and the incentive for in-plant recycling. Many industrial uses of water do not require a potable supply and there is increasing use of lower-grade sources, such as a sewage effluent, to satisfy at least part of the industrial demand.^① Industrial water demand is closely related to industrial productivity and is therefore likely to be subject to change in differing economic circumstances. Increasing costs of water and charges for wastewater collection and treatment exert considerable pressures for reductions in the water used by industry.

In many developed countries all water consumers are metered so that, at least in theory, demand could be regulated by pricing policy.^② However, the UK does not have a general policy of metering individual domestic supplies although the 1973 Water Act makes provision for the installation of meters and some authorities now offer metering as an option.^③ Most domestic consumers in the UK pay for their water on the basis of a charge related essentially to the size of the property and its value so that they have no incentive to economize in their use of water.^④ It has always been argued that the cost of installing and reading meters would far outweigh the potential savings which might accrue. Indeed, evidence from other countries where domestic metering is practised is somewhat conflicting and it is by no means clear that the introduction of metering would produce a sustained reduction in water consumption.^⑤ Some form of sliding-scale tariff for metered water to discourage excessive consumption is a possibility but it must be remembered that an ample supply of safe water is a primary requirement in the maintenance of public health.^⑥ Poorer members of a community should not therefore be forced into undesirable restrictions on water usage by economic pressures.^⑦ The justification for installing domestic water meters in the UK is thus essentially related to the provision of an equitable means of payment for the service in which the consumer has some degree of control over the size of the bill.

In a complex distribution system it is inevitable that there will be a certain amount of leakage and waste. In supply systems which are fully metered it is not unusual for about 25% of the water entering the system to be unaccounted for and there is no reason to suppose that the losses would be any less in unmetered systems.^⑧ This loss is made up of leakages, fire-fighting usage, unauthorized connections, ect.^⑨

In temperate zones almost all of the domestic water supply and much of the industrial supply find their way back into the sewers so that the dry weather flow (d. w. f.) of sewage could

be expected to be of the same order as the flow of water supplied to the area.^⑩ In warm climates a proportion of the water will be used for garden watering or otherwise lost by evaporation so that only 70~80% may enter the sewers.

Treatment plants and their associated collection and distribution systems are expensive items of capital expenditure which are often designed to have a useful life of 30 years or more. For this reason and to enable efficient development and utilization of water resources it is necessary to be able to predict future water demands. Domestic water demand is the product of the *per capita* demand and the population. The *per capita* demand will tend towards a ceiling value related to the standard of living of the community and its environmental conditions. Although in many developed countries populations are more or less static in numbers the developing world is experiencing large increases in population. The economic prosperity of an area will have a considerable influence on industrial activity and hence industrial water consumption. As productivity increases, so will water consumption until the point where the cost of water becomes a significant item in overall costs and means of reducing consumption then become financially attractive. The prediction of future industrial demands for water is thus fraught with difficulties.

Notes

- ①Sewage effluent 污水厂出水。
- ②在许多发达国家中, 用户用水表计量(付费)。因此, 至少从理论上说, 用水量是可以用价格政策来调控的。to meter (v.) 用仪器计量。
- ③make provision for 为……作好准备, 采取措施。
- ④Most domestic consumers in the UK pay for their water on the basis of a charge related essentially to the size of the property and its value ... 英国国内许多用户支付水费是根据他们财产的多少和价值来确定的。……
- ⑤a sustained reduction 不断的减少。
- ⑥Some form of sliding-scale tariff for metered water to discourage excessive consumption is a possibility ...
为了阻止浪费用水, 计量用水可以采用某种浮动价目表的形式……
- ⑦因而不应迫使一社区的穷人因为经济原因而接受令人不快的用水限制。
- ⑧to be unaccounted for... 未被计入。
- ⑨unauthorized connections 未经批准(私自)安装的自来水管接头。
- ⑩to be of the same order 同一情况。

Reading Material B

Water Treatment in Developing Countries

Water is our most abundant raw material and, in its natural state, one of our purest. All the same, for many uses the available water is still not pure enough, and therefore some impurity or other often has to be treated or removed in order to make the available water fit to use. When we talk about the different properties of various waters, we are actually talking about the impurities which they contain. As a result, water treatment is a technology which is concerned with the impurities in waters, rather than with the water itself. In developing countries, every effort must be made to keep the treatment as simple as possible to try to ensure low cost, ease of construction, reliability in operation and to enable operation and maintenance to be satisfactorily undertaken by local labour. Failure to satisfy these basic aims will almost certainly produce many problems and will often lead to the abandonment of the scheme with reversion to the traditional unimproved sources.

Storage

Storage can provide a useful measure of purification for most surface waters although it cannot be relied upon to produce much removal of turbidity. The disinfecting action of sunlight normally gives fairly rapid reductions in the numbers of faecal bacteria. To obtain the maximum benefit from storage it is important to ensure that short-circuiting in the basin is prevented by suitable baffles.^① A disadvantage of storage in hot climates is the considerable evaporation losses which can occur. The design of storage facilities should be such as to prevent the formation of shallow areas at the edges which could provide mosquito-breeding sites.^② If the settlement provided by storage does not give sufficient removal of suspended matter the choice for further treatment involves consideration of chemical coagulation and/or filtration techniques.

Coagulation

The use of chemicals for coagulation brings a further level of complexity to the treatment process and should only be adopted if the necessary skills are available locally. Chemical coagulation will only be successful if the appropriate dose can be determined and then applied to the water in such a manner as to ensure adequate mixing and flocculation. The most useful form of chemical feeder is one based on hydraulic control of a solution such as the Mariotte vessel which provides a constant rate of discharge regardless of the level in the storage container.^③