高等学校试用教材

建筑类专业英语

建筑学与城市规划

（第三册）

English in Architecture and Construction

李明章　　主编

中国建筑工业出版社

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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》编写的专业阅读教材。本册包括建筑风格、新古典主义和现代主义、高层建筑原理、安全设计、砖石工程新工艺、绿色建筑、未来城市、分区规划、装饰美学、园林设计等内容。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。语文难度大于第一、二册，并配有科技英语写作的简要说明与写作练习。供本专业学生四年级上半学期使用，也可供有关人员自学英语参考。

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《建筑类专业英语》编审委员会

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2 400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1 600个单词，基础阶段结束时应掌握的词汇量为4 000个。仅仅掌握4 000个单词，能否看懂专业英文书刊呢？还不能。据统计，掌握4 000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4 000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1 000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三、四册。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（1 000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4 000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2 000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，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》
编审委员会

Contents

UNIT ONE

Text What a Building Is

[1] A building does not express its meaning in the same way as a picture or a sculpture, because it is by nature much more complex. It demands a prior effort of analysis. In the first place, we never see a building in its totality; we can never obtain more than partial views both of the exterior and interior, with the result that we are always obliged to relate what we can see to what we cannot see to form a clear picture of the whole. ①It is impossible simply to indulge the pleasure of the eye; one has to think as well as look. To help us in this intellectual exercise we have an important tool to hand, the plan, which informs us simultaneously about exterior and interior, the whole and the part. Together with the cross section, which reveals the structure, it gives in abstract form a composite image of the building which photographs-in whatever number-could never give. ②It is therefore necessary, before anything else, to learn to read a plan and to familiarize oneself in a general way with the various means of graphic expression used in architecture (cross section, elevation, axonometric plan).

[2] The transformations to which buildings are subject constitute a second difficulty. ③ Very often we can no longer see today what the builders would have wished: projects are abandoned or modified before completion, parts that were complete are demolished, others, added later, are of a different character. Time, it is true, alters all works of art, but its effect on architecture is more noticeable because the construction of a major building takes a long time, and because buildings—always intended for use-must be adapted to the changing needs of men. We should not, therefore, look at a building completed at one stretch and still more or less intact, such as Salisbury Cathedral, in the same way as we regard an incomplete chateau, such as Brissac, or a building that has been continuously altered, such as Versailles. In the first unusual case, we are immediately in a position to appreciate the work of the builders; in the second, we have to imagine what was intended; and in the third case, we have to discover the successive stages of building to interpret correctly what we see, and not attribute to the intention of a single architect what was the product of several building campaigns. ④

[3] Finally, it should never be forgotten that even the most magnificent buildings were never intended simply as works of art, and that they are incomprehensible if one is unaware of their purpose, whether utilitarian or symbolic. The particular forms of religious buildings, houses and palaces, are always a reflection of the demands of religious cult, of everyday life, or of the exercise of power in any given society. Less independent than other artists, the architect exercises his powers of invention within a framework strictly defined by the society to which he belongs and the individuals to whom he owes each commis-

sion. Such constraints, compelling to a degree dependent on the particular age and social level (the Greek temple, the urban dwelling, are highly standardized types), impose limits on invention, but also confer on architecture an important social significance: buildings are a unique embodiment, the most durable, the most manifest—of the needs and dreams of men.

[4] We take an interest in a building to the degree to which we see in it "effects" of volume, space, rhythm and colour that please us. In certain cases—an urban dwelling or rural architecture, for example—these effects are very simple and result above all from harmony between a building and its environment. In other cases—the most interesting—these effects are extremely complex and can be attributed to one or more creative individuals who have deliberately contrived them. Between these two extremes-architecture without architects and the architecture of great masters—there are numerous degrees, but it would be pointless to distinguish them. It is more worthwhile to identify the various means of expression available to architecture: only in this way can we enrich our perception of the buildings we encounter.

[5] This perception should not be equated with aesthetic appreciation, but it is a necessary precondition. Without it, spontaneous judgments which appear to be expressions of personal opinion do no more than repeat preconceived ideas—on the "bareness" of the Romanesque, the "excesses" of the Baroque, the "frigidity" of classical churches…. Thus we could not recommend to the reader too strongly to forget such prejudices and to look with a fresh eye and open mind in order to appreciate the objectives peculiar to each style. ⑤

[6] All these observations lead to the same conclusion: a work of architecture is too complex to be understood at first glance: one has simultaneously to be aware of all its elements, to imagine its successive states (including those that were never completed), and to know what it signified to those who built it. This initial analysis must precede aesthetic appreciation. It enables one to form a clear picture of the building and to differentiate between what is due to constraints (structural necessity, existing buildings, stylistic conventions, demands of the client), and what is the product of purely artistic creation, the play of forms. ⑥

New Words and Expressions

sculpture	['skʌlptʃə]	*n.* 雕刻，雕塑
totality	[təu'tæliti]	*n.* 整体，总体
indulge	[in'dʌldʒ]	*v.* 满足，沉溺
plan	[plæn]	*n.* 平面图
composite*	['kɔmpəzit]	*a.* 合成的，混合的
graphic	['græfik]	*a.* 图（解）的，用图表示的
elevation	[ˌeli'veiʃən]	*n.* 正视图

axonometric [æksənə'metrik]	*a.*	三向投影的
demolish [di'məliʃ]	*v.*	拆毁，推翻
intact * [in'tækt]	*a.*	完整的，未受损的
Salisbury Cathedral		索尔兹伯里主教堂
chateau ['ʃɑ:təu]	*n.*	[法] 城堡
Palais de Versailles		凡尔赛宫
incomprehensible [in,kɔmpri'hensəbl]	*a.*	不可理解的，不易领会的
utilitarian [,ju:tili'tɛəriən]	*a.*	功利主义的；实用的
symbolic [sim'bɔlik]	*a.*	象征主义的
cult [kʌlt]	*n.*	信仰，崇拜
constraint * [kən'streint]	*n.*	限制，约束
confer [kən'fə:]	*v.*	授与
manifest ['mænifest]	*a.*	直观的，明白的
contrive [kən'traiv]	*v.*	发明，设计
aesthetic [i:s'θetik]	*a.*	美学的，审美的
differentiate * [difə'renʃieit]	*v.*	区别，区分
stylistic [stai'listik]	*a.*	风格的，文体的
perception [pə'sepʃən]	*n.*	理解（力）
precondition ['pri:kən'diʃən]	*n.*	前提，先决条件
preconceive ['pri:kən'si:v]	*vt.*	预想，预先想到
Romanesque [,rəumə'nesk]	*n.*	罗马式建筑
Baroque [bə'rəuk]	*n.*	巴罗克式建筑
frigidity [fri'dʒditi]	*n.*	索然无味，冷淡
to hand		手边
cross section		剖面图
axonometric plan		三向投影图
at one stretch		一口气，连续地
confer sth. on sb		授与某人某物

Notes

(1)本句 that 从句中包含句型 relate sth. (what--从句) to sth. (what--从句)

(2)主句中的主语 it 指代上文中的 the plan。主句部分的结构为 give sth. in abstract form。由于宾语 sth. 部分太长而后置。

(3)be subject to sth. 易受到……的。

(4)attribute to the invention…several building campaigns 原句句型为 attribute A to B，“将 A 归于 B”。直接宾语是从句 What was the product of several building campaigns. 由于太长而后置。

(5)…could not…too …… 并不过分；越……越好。

(6)本句结构 It enables one to from…and to differentiate between A (what—从句) and B (what—从句)。句末的 the play of forms 为 purely artistic creation 的同位语。

Exercises

Reading Compre hension

Ⅰ. Say whether the following statements true (T) or false (F) according to the text.

1. To understand a building in its totality, one must learn to read a plan and other various means of graphic expression used in architecture. ( )
2. Though time alters all works of art, the graphic expressions can be transformed to buildings without much difficulty. ( )
3. Buildings are special works of art, and one can not understand them without the realization of their purpose. ( )
4. Some buildings are results of the demands of the clients while some are products of purely artistic creation. ( )
5. In order to appreciate the objectives peculiar to each style, one should forget the prejudices but keep in mind the ideas concerned with each style. ( )

Ⅱ. Read the text carefully and then complete each of the following statements with your own words.

1. _____ and _____ give in abstract form a composite image of the building.
2. To appreciate such a building as Versailles, one should not _____ the product of several building compaigns to a sing architect.
3. The architect's powers of creation are confined within _____ defined by the society and his client.
4. Architecture is of an important social significance in that it is a _____ of the needs and dreams of men.
5. _____ or _____ bears the pleasing _____ that result from the harmony between a building and its environment.
6. We should not look at a building completed in the _____ way as we regard an incomplete chateau or a building that has been continuously altered.
7. Buildings are _____ if one is unaware of their purpose.

Vocabulary

Ⅰ. Match the words in Column A with their corresponding definitions in Column B.

Column A	Column B
1. cross section	a. of an system of literature or art which uses a sign, shape or object to represent a person, idea, value, etc.

2. elevation	b. a graphic expression formed by a plane cutting through an object, usually at right angles to an axis.
3. symbolic	c. a flat upright side of a building
4. Romanesque	d. an artistic style current in about 1550—1700, marked by massive forms and elaborate decoration.
5. Baroque	e. the style of building with round arches and thick pillars, common in Western Europe in about 11th century.
6. sculpture	f. the art (or the work by this art) of shaping solid figures out of stone, wood, clay, metal, etc.

Ⅱ. Fill in the blanks with words or expressions given below, changing the form where necessary.

aesthetic	indulge	composite	confer
contrive	constraint	manifest	preconceive

1. A building which has undergone successive alterations could have been _____ by more than one architect.
2. The initial analysis can not take the place of _____ appreciation but it is a necessary precondition.
3. If one intends to understand a building in its totality, it is impossible simply to _____ the pleasure of the eye.
4. An architect is different from other artists in that he has to perform his creative work under various _____.
5. The author of the passage has _____ three difficulties in the understanding of an architecture.
6. A building may be a _____ result of various social and environmental considerations as well as of the efforts of many people.
7. A building should be a _____ expression of human needs; otherwise it would be simply a play of forms.
8. It is not only aesthetic value but also practical purpose that is _____ onto architecture.

Writing **Selecting the Key Words**

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 an air pollution.

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

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

Key words:

Air pollution, Pollutant, Air Act

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

Reading Material A

Facades

No architectural volume, except for a pyramid, has completely smooth and "blind" surfaces. Facades are always animated by openings, by recessed or projecting features, or by contrasts of colour. The elements which are thus brought together can be of many types, but it is possible to divide them into three groups—relating to the wall, to the structure, and to decoration.

Solids and voids

The number, shape and distribution of openings to a large degree determines the character of a facade. Italian Palazzi appear massive because their windows are relatively small, whereas houses in northern Europe are more open, and appear lighter. ① At the Hotel Matignon, for example, the architect has incorporated a great number of windows whose tall, narrow proportions contrast happily with the horizontality of the mass of the building; by slightly modifying their spacing he has varied the rhythm and given greater "weight" to the lateral pavilions that terminate the facade. ②

The solid areas themselves appear more or less weighty depending on the physical surface of the wall: smooth, shiny or colored surfaces lighten a building whereas rusticated surfaces (roughened and marked by sunk joints) give an effect of solidity. ③Rustication is often used on the ground floor to form a base, or in the form of quoins, to emphasize the corners. Modern architects are also aware of the effects that can be obtained through materials alone—or, rather, through their appearance: rough concrete and faceted claddings emphasize the strength of a wall, while glass walls give buildings an insubstantial character—an effect well known to Gothic architects.

Lines of force

Most facades are articulated by some kind of membering, standing out either in relief

or in color, to provide accents and set up rhythms. Members are generally horizontal or vertical; they can even be free—standing and independent when the wall becomes simply a row of supports (in a colonnade, for instance). The facades of cathedrals clearly show the importance of membering: Reims Cathedral appears taller, more slender and more rhythmic than Notre—Dame, Paris, because its vertical members are thinner, more numerous and set closer together, and because they rise uninterrupted to the top of the towers. [4]Architecture in antiquity and the Renaissance had no sense of this dynamic linearity: classical buildings emphasize the horizontal mouldings dividing the storeys and the topmost cornice—a sharply projecting feature that clearly defines the upper limit of the volume. [5]The two traditions, Gothic and classical, came into conflict when Italian forms penetrated northwards in the 16th century: such hybrid features as windows cut through the main entablature and extending into the roof created a new, animated effect.

By adjusting the horizontal and vertical members (especially secondary ones, since the primary members are always more or less bound by the storeys), by moving them closer together or further apart, by giving them different emphasis, interesting and varied rhythms can be obtained. Architects from the Renaissance onwards have systematically explored these possibilities, using the classical system of pilasters, columns and entablatures in all manner of combinations, developing numerous kinds of bay unit and interpenetrating the Orders. [6]

Members can also be accentuated or attenuated in relief. Gothic architects used progressively finer and more ductile mouldings which seemed endowed with a life of their own on the surface of the wall, while Renaissance and later architects employed heavier, fuller members which were integral with the wall and were able to express its internal strength and tensions. Somerset House in London or the example of the Louvre indicate the varying effects that can be produced by slight alterations of relief or rhythm. [7]

Ornament

Ornament can be natural or geometric, coloured or in relief, consisting in mouldings or developed across a flat surface, confined within a frame or freely disposed. Formed of small—scale and disparate elements, ornament sets up a subtle play of light and shade, or of colour, very different from the bolder architectural effects. When it reproduces animal, vegetable, or human forms, it also brings a literal animation into the abstract world of architecture. [8]It plays very different roles, in different times and places: it can proliferate, obscure the structure or underline it. In all cases it creates its own effects which reinforce, elaborate or oppose the strictly architectural effects.

Notes

①Palazzi［意大利］府邸。

②Hotel Matignon 马提格伦府邸；pavilion *n*. 侧楼。例如，马提巴格伦府邸的建筑师配置了大量的窗户，其既高又窄的比例与建筑物厚重的水平状态形成了和谐的对比。通过略微改变间距他改变了节奏，使位于正立面两端的侧楼更具重实感。

③墙体本身是否显得厚重取决于墙体表面的处理：光滑、泛光或有色的表面使建筑显得纤巧，而粗砌的（包括有粗糙表面或有明显排水管接头的）表面则给人以坚实感。

④Reims Cathedral 兰斯市主教堂；Notre—Dame，Paris 巴黎圣母院。大教堂的正立面清楚表明构件的重要性。兰斯市主教堂比起巴黎圣母院更高，更修长，更有节奏感，因为它的垂直构件更细，数量更多，配置更紧凑，而且还由于这些构件一直向上，直达塔顶。

⑤moulding *n*.（装饰）线条；cornice *n*. 檐口。

⑥entablature *n*.（柱式的）檐部；bay *n*. 间距，架间；order *n*. 柱式（同古希腊 Ordine）

⑦Somerset House 索莫塞特大厦 Louvre 卢浮宫。

⑧literal *a*. 实在的（与下文 abstract 相对）

Reading Material B

Internal Space

Volumes and facades determine the external appearance of a building. It remains to discover what is enclosed behind those walls, that "reverse space" which is unique to architecture: "in giving definitive form to this spatial void architecture is in truth creating its own world" (Henri Focillon). ①No, photograph, unfortunately, can reproduce the impression made by a space that completely envelops the spectator and which he discovers gradually as he moves around and explores a building.

Anyone who has entered a great Gothic church has experienced the dynamic quality of its space—the predominance of vertical members, the virtual disappearance of walls, the lightness of the vaults, the rapid succession of bays; all these direct our gaze both upwards and towards the apse without any intervening obstruction. ②This taste for dynamic space recurred in another form in the domed churches of the Renaissance and the Baroque (in contrast with the internal space of the Pantheon in Rome, which is strictly static). At St. Peter's in Rome the immense space becomes ever more vast as one moves up the nave, and the broadening out at the crossing (achieved by the use of cut-away piers) and the prodigious volume of the dome (made to seem still larger by the handling of light) are gradually revealed. ③Far from weighing down on its supports, the dome appears suspended, held up by an irresistible force. The sense of movement is not the product of uninter-

rupted lines, but of the skillful coordination of increasingly large spaces.

The forms of St. Peter's are perfectly clear, with the result that the spaces, however vast, are always exactly defined. In German Baroque churches, on the other hand, space appears elusive and subject to continuous movement: the walls lose all solidity, articulation disappears, lines undulate, and an all—pervasive light sets stucco and paintings aglow: we are transported into an insubstantial, animated, vibrant world, with undefined limits.⑤

Thus each major style has its own spatial qualities that can stimulate sensations beyond those of everyday experience. In the West, the most important examples are in religious architecture because it commandeered the largest spaces, but spatial effects were also created in secular architecture—by successions of rooms of different shapes and by the elaboration of staircases. What an extraordinary sequence of this kind is afforded by the Paris Opera! After passing through two relatively low entrance foyers, the visitor suddenly finds himself in the immense space of the staircase, open to further space on three sides. As he climbs the steps and follows the staircase round, he is made aware of all that is around him, and he perceives more and more clearly the secondary spaces that extend the principal space beyond the screen of columns: before he has even entered the auditorium, he is already in the magic world of theater.

External space

Streets and squares are open—air spaces enclosed by architecture in much the same way as internal spaces. In some cases—once rare, now common—an architect uses the elements of a city to create an urban composition: he calculates his effects, places the elements in relation to one another and, if he is capable of it, contrives surprises—in compositions of this type the danger is always monotony and overstatement. In older cities, on the other hand, the layout is generally the product of many years of history. Made up of small—scale elements and disposed in a very haphazard fashion, the streets and squares give rise to a constant succession of spatial experiences—quite independent of the interest of the buildings that border them. Rather than impose an artificial regularity on such spaces, architects have often drawn inspiration from them: they have kept the site and existing buildings in mind when building anew. In this way the most interesting urban compositions have been built up gradually over the centuries—for example, the Piazza and Piazzetta of Venice, perfectly disposed around the campanile.⑥

Notes

①尚待发现墙体之后所包容的空间，即在赋予这种具有内部空间的建筑以特定形体方面对于建筑来说是独一无二的“反转空间”，确实正在创造它自己的世界。

②apse 教堂东端（或东西两端）的半圆开龛。

③Baroque 巴洛克（文艺复兴末期十七世纪的一种建筑风格）；Pantheon, Rome 罗马，万