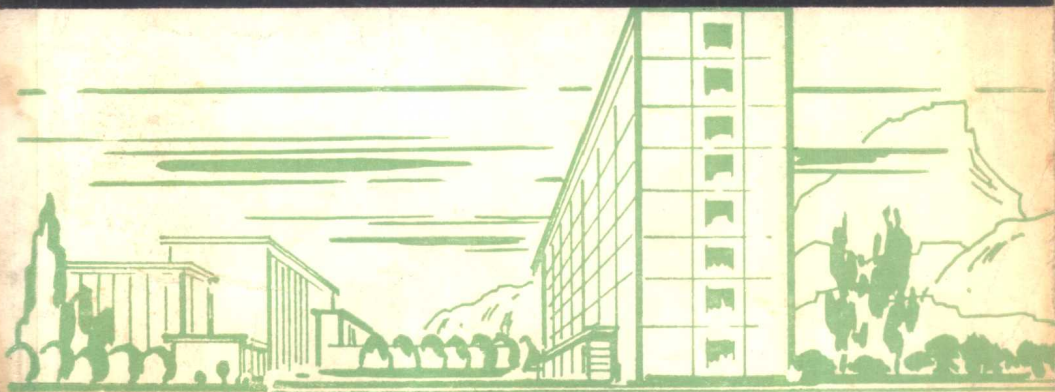


The
Civil
in

土木工程英语读本



[美]E·J·霍尔 撰

俞天玫 李献文 李棣萼 译注

中国建筑工业出版社

土木工程英语读本

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俞天玫 李献文 李棟蓁 译注

李 献 文 校

中国建筑工业出版社

本书是美国出版的一套《专业英语》丛书中的一册。全书共分九个单元，对土木工程中的建筑、结构、道桥、给水排水……等各方面都做了简要介绍。所涉及的句型和词汇多数都是土木工程中最常用的。每个单元还附有练习题，完成这些练习题可学会使用书中出现的词汇和句子结构，能提高学员用英语进行交流的能力。

译者对书中的部分词汇和难句的语法关系做了注释，并将各单元的“专业术语”和“阅读材料”译出，附在各单元后面，供读者参考。

本书是为已掌握了基础英语中级水平以上的土木工程技术人员和学生编写的。可以做大学学生“专业英语”课程的教材或课外阅读材料；也可供技术人员自学使用。

The Language of Civil Engineering in English

Eugene J. Hall

Regents Publishing Company, Inc.

1977

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俞天孜 李献文 李棣萼 译注

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译 注 者 的 话

本书是美国出版的一套《专业英语》中的一册。适合于以英语为外国语的土木工程技术人员或该专业的学生使用。为了吸收外国科学技术中对我们有用的内容，以加快我国四化建设的步伐，近年来大专院校的学生和广大技术人员广泛地学习了英语。在学完基础英语后，往往苦于找不到一本能提高用英语进行专业交流能力的教材。这本书就是为已经掌握了基础英语的中级水平以上的学员编写的，估计可能满足上述需要。

我们想对使用这本书的读者谈几点意见：

1. 这本书可供工程技术人员自学，也可做为大专院校土木工程系学生的“专业英语”教材或课外阅读材料。

由于过去学习苏联的教育制度而造成专业划分过窄的状况仍未改变，所以这本书显得专业面似乎宽了一些。但是这本书对各个专业领域的论述都是一般简介，涉及的词汇和句型多数是最常用的。因此，使用本书不但可掌握土木工程专业的各种词汇，而且可以扩大学员的知识面。此外，选用本书做基本教材后，必要时仍可补充一些内容，以适应某一具体专业的需要。

本书中各个单元是独立的。使用时可以有所取舍或颠倒顺序。

2. 我们已将书中“专业术语”和“阅读材料”翻译出来，附在每一单元后面，供读者参考。建议读者不要过早地看译文或边看英文边看译文。这样做不利于提高阅读能力。

3. 本书的一个特点是附有较多的练习题。在专业术语后面有词汇练习部分；在阅读材料后面有讨论题；每个单元结束时有复习题。建议读者认真完成这些练习题。在做这些练习题时，可以学会使用书中出现的词汇和句子结构，有利于提高用英语进行

交流的能力。是学习中必不可少的组成部分。

4. 在注释中除必要的词汇外,对部分难句的语法关系也进行了注释。非外语专业的学生和成年人学习语法对掌握一门外语的技能是有利的。可是学习语法完全是为了使用,为了阅读、写作或听、说,假如一个句子或一个段落是一目了然的,不必再去字字追究,句句分析。何况有时合乎语法的句子不一定都是对的,不合乎语法的句子不一定是错的。往往在英语中有很多习惯说法,语言是活的,而语法不能违背活的语言。因此,要注意学习活的语言,语法分析要做到适可而止。

在书后我们将书中出现过的词汇注释汇编在一起,以便于学习过程中或日后查阅。

由于我们水平有限,谬误之处望广大读者指正。

译 注 者

于北京建筑工程学院

1982年5月

FOREWORD

This book is one of a series of texts called *English for Careers*. The series is intended to introduce students of English as a foreign language to a number of different professional and vocational fields. The career areas that are covered are those in which English is widely used throughout the world—air travel, computer programming, international trade, or in the case of this particular book, engineering and specifically civil engineering.

Each book in the series serves several purposes. The first, of course, is to introduce the student to the particular vocational area in which he or she is involved. The duties of different kinds of jobs are discussed, as well as the problems that might be encountered at work. In this book, different phases of the civil engineering field are discussed, together with some of the methods involved in designing structures for a number of different purposes. The aptitudes and education that an engineer must have are also discussed, as well as some of the specific job areas in which he or she may work. The book is not intended as a detailed training manual, but rather as a broad introduction to the different kinds of work in the field of civil engineering.

From the point of view of teaching English as a foreign language, these books are intended for a student at the high intermediate or advanced level. In other words, the student who uses these books should be acquainted with most of the

structural patterns of English. His or her principal goals as a learner should be mastering vocabulary, using the various patterns in a normal mixture, and improving his or her ability to communicate in English.

These books address themselves to all of these needs. Each unit begins with a glossary of special terms in which pertinent words and expressions are defined. The special terms are followed by a vocabulary practice section in which the student is asked questions whose answers will help him or her to use the special terms. In the reading which follows, these terms are used again within a contextual frame of reference. Each reading in turn is followed by questions for discussion which give the student the opportunity to use in a communicative situation both the vocabulary items and the structural patterns that have occurred in the reading.

Each unit ends with an exercise or exercises, some of which pose problems that might occur if the student were actually working in the field. In this book, for instance, he or she is asked to identify different kinds of bridges and their structural characteristics, or to identify defects in design and explain why the designs are defective. In doing such exercises, he or she will also practice the specialized vocabulary, as well as other vocabulary items and structural patterns.

A great deal of successful language learning comes from experiences in which the learning is largely unconscious. In offering these books, it is hoped that the student's interest in the career information presented will increase his or her ability to communicate more easily in English.

EUGENE J. HALL
Washington, D. C.

前 言

本书是成套教科书《专业英语》中的一册，这套教科书向以英语为外国语的学员介绍一些不同的专业和职业领域，包括在世界范围内都广泛使用英语的那些事业，如航空旅行，计算机程序编制，国际贸易，或者如本册书中所涉及的工程，特别是土木工程。

本套书的每一册都适用于几个目的。首先当然是向学员介绍他或她所从事的那个职业的领域，论述各种不同工作的职责，以及在工作中可能遇到的各种问题。本册就论述了土木工程领域内的各个不同方面，同时也论述了各种不同用途的建筑物的一些设计方法。本书还议论到作为工程师所应具备的教育水平和能力，以及学员可能从事的一些特殊工作领域。本书并不是一本详尽的专业手册，而只是土木工程领域中各种不同工作的简介。

从以英语做为外语进行教学的观点来看，这套书适合于中上水平或高级水平的学员使用。换句话说，使用本书的学员应熟悉英语的大部分句型结构。他们学习的首要目标应是掌握词汇，正规地混合使用各种不同的句型，和提高使用英语进行交流的能力。

这套书致力于满足上述需要。每一个单元的开始是专业术语词汇表，对一些词汇和用语作了解释。其后是词汇练习部分，在这部分中向学员提出一些问题，回答这些问题会有助于学员使用专业术语。在其后的阅读材料中，这些术语又在有上下文参照的情况下再次使用。每篇阅读材料之后，又有讨论题，这种讨论为学员提供了在与人交往的情况下使用阅读材料中出现的词汇和句子结构的机会。

每个单元以练习题结束。有些练习题提出学员在实际所从

事的业务范围内可能会遇到的一些问题。例如，本册书内就有要求学员识别不同种类的桥梁及其结构特点的练习题，或者要求学员找出设计中的缺点，并说明为什么设计是有缺陷的练习题。在做这种习题时，学员不仅可以练习专业词汇，也可以练习其它词汇和句型。

很多效果好的学习语言的方法，来自这种经验，即主要是在不知不觉中进行学习，提供这些书是希望学员对书中所介绍的专业知识的兴趣会有助于提高他更顺利地用英语进行交流的能力。

尤金·J·霍尔

华盛顿特区

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UNIT ONE

THE ENGINEERING PROFESSION^[1]

Special Terms^[2]

Engineering: The practical application of the findings^[3] of theoretical science so that^[4] they can be put to work^[5] for the benefit of^[6] mankind. An *engineer* is a member of the engineering profession, although this term is also used to refer to^[7] someone who operates or maintains^[8] certain kinds of equipment—a *railroad locomotive engineer*^[9], for example. In the latter context^[10], the person referred to^[11] is a technician rather than^[12] a professional engineer.

Profession: An occupation^[13], such as law, medicine, or engineering^[14], that requires specialized^[15] education at the university level^[16].

Empirical Information^[17]: Information that is based on^[18] observation^[19] and experience rather than theoretical knowledge.

Civil Engineering: The branch of engineering that deals with^[20] the design and construction of structures that are intended to^[21] be stationary^[22], such as buildings, dams, and bridges. Among its subdivisions^[23] are *structural engineering*^[24], dealing with permanent structures^[25]; *hydraulic engineering*^[26], dealing with the

flow of water and other fluids[27]; and *environmental/sanitary engineering*[28], dealing with water supply[29], water purification[30], and sewer systems[31], as well as[32] urban[33] planning and design.

Mechanical Engineering[34]: The branch of engineering that deals with machines and their uses.

Mining[35] and **Metallurgy**[36]: The branch of engineering that deals with extracting[37] metal ores[38] from the earth and refining[39] them.

Chemical Engineering: The branch of engineering that deals with processes[40] involving reactions among the *elements*, the basic natural substances[41]. *Petroleum engineering*[42] is a subdivision which deals specifically with processes involving petroleum.

Electrical and Electronic Engineering[43]: The branch of engineering that deals with the effects[44] and processes that result from[45] the behavior[46] of tiny particles of matter called electrons[47].

Nuclear Engineering[48]: A modern branch of engineering that deals with the processes that result from breaking up[49] some particles of matter.

Aqueduct[50]: A structure that is used for transporting[51] water over long distances.

Stress[52]: Physical pressure[53] or other forces exerted[54] on an object. The force of gravity, the natural pull of the earth[55], for example, is one of the stresses that acts on an object.

Silt[56]: Sand or earth transported from one location[57] by water and deposited[58] as sediment[59] at a second location.

Environmental Impact Study^[60]: A study that shows the effect a proposed structure^[61] will have on its surroundings^[62], the air, water, human, animal, and plant life, for example. Such studies are now required for most major construction projects^[63] in the United States.

Quantification^[64]: Putting data^[65] (pieces of information^[66]) into^[67] exact mathematical terms.^[68]

[1] profession: /prə'feʃən/(n)职业, 专门职业。(过去这个词只限于指神学、法律、医学等职业, 科学发达后, 它的范围扩大了, 指所有从事脑力劳动, 或受过专门训练的人的职业。)[2] term: tɜ:m/(n) 术语, 专门名词。[3] findings: /'faɪndɪŋz/(n) (finding的复数形式) 研究(调查)的结果、成果。[4] so that: 为了, 以便。是一从属连词, 引出目的状语从句, 从句之前为主句, 这一主句是个省略句, (Engineering is) The practical application... 在Special Terms这一部分中, 每一词条之后的词解中, 都用这种省略句, 以后不再一一加以注释。[5] be put to work: (work是n.) 使……工作(起作用)。[6] for the benefit of: 为了……的利益。[7] refer to: /rɪ'fə:/(v) (referred, referring) 指的就是。[8] maintain: /men'tein/(v) 维护, 保养。[9] railroad: /'reɪlrouɪd/(n) (美) = railway 铁路。locomotive: /'ləʊkə, mɔʊtɪv/(n) 机车, 火车头。railroad locomotive engineer: 铁路机车机械师; 机械师。[10] context: /'kɒntekst/(n) 上下文。in the latter context: 后一情况; 在后者的意义上。[11] referred to: 过去分词短语做定语用, 修饰前边的 person。[12] is…… rather than: 应是……而不是……[13] occupation: /'ɒkjʊ'peɪʃən/(n) 职业。从 occupy /'ɒkjʊpaɪ/(v) 占据) 构成名词, 指日常需要占用一定时间所从事的工作。[14] such as... engineering, such as (象……这种的, 例如……) 引出的是 occupation 的同位语。[15] specialized: /'speʃəlaɪzd/(a) 专门的, 专科的。[16] at the university level: 大学水平(程度)的。[17] empirical: /em'pɪrɪkəl/(a) (根据) 经验的、实验的, 以实验为根据(基础)的。information: /ɪnfə'meɪʃən/(n) 资料; 知识 (通常指从他人、书本、观察、经验所得来的零星知识)。empirical information: 经验知识。[18] be based on: 以……为基础, 根据。[19] observation: /'ɒbzə'veɪʃən/(n) 观察, 观测。[20] deal with: 研究, 讨论; 涉及; 论述。[21] be intended to + 动词原形: 意图是使……, 是打算使……。[22] stationary: /'steɪʃənəri/(a) 固定的; 稳定的。[23] subdivision: /'sʌbdɪ'vɪʒən/(n) (sub-前缀, 表示“下”、“次”、“再”、“分”等) 分支; 分部。[24] structural engineering: 结构工程。[25] permanent: /pə'mənənt/(a) 永久的; 固定的。dealing with permanent structures: 这是个现在分词短语, 做定语用, 以逗号隔开, 因此是个非限定性定语, 这种结构在翻译时常可译成一个独立句。这个短语可译成: 它是研究永久性建筑的。[26] hydraulic: /haɪ'drɒ'lik/(a) 水力的; 液压的。hydraulic engineering: 水利工程。[27] fluid: /'fluɪd/(n) 流体。[28] environmental: /ɪn'veɪərən'menti/(a) 环境的。sanitary: /'sænɪtəri/(a) (环境) 卫生的。斜线号“/”置于两字之间, 表示二者中任何一字之义均可运用。相当于 or。 environmental/

sanitary engineering: 环境工程或卫生工程。[29] water supply: 给水。[30] purification: /ˌpjuːrɪfɪˈkeɪʃən/(n) 净化(作用)。water purification: 水净化。

[31] sewer: /ˈsjʊə/(n) 污水管, 排水管, 下水道。sewer system: 排水系统。

(32) as well as: (并列连词) 以及, 不仅……而且。这个连词强调所连接的两个同等成分的前者, 所以翻译时, 通常先译后面的词。此句可译为: 不仅研究城市规划及设计, 而且研究给水, 水净化和各种排水系统。[33] urban: /ˈɜːbən/(a) 城市的; 市区(内)的。[34] mechanical engineering: 机械工程。[35] mining: /ˈmaɪnɪŋ/(n) 采矿, 矿业。[36] metallurgy: /meˈtælədʒi/(n) 冶金学。[37] extract: /ɪksˈtrækt/(v) 采掘, 开采。本句是动名词形式, 和其后面的名词构成名词短语, 作 deals with 的宾语。[38] ore: /ɔː/(n) 矿石, 矿物。[39] refine: /rɪˈfaɪn/(v) 提炼, 精炼 [40] process: /ˈprəʊses, (美)ˈproʊses/(n) 变化的过程; 过程。[41] substance: /ˈsʌbstəns/(n) 物质, the basic natural substances: 基本自然物质, 这个短语是 elements 的同位语。[42] petroleum: /piˈtrɒljəm/(n) 石油。petroleum engineering: 石油工程。[43] electronic: /ɪlekˈtrɒnɪk/(a) 电子的, 电子学的。electrical and electronic engineering: 电机和电子工程。[44] effect: /ɪˈfekt/(n) 效果, 结果。[45] result from: 由……引起(造成, 产生)。[46] behavior: /biˈheɪvjə/(n) 变化过程, 工作情况。[47] electron: /ɪˈlektrɒn/(n) 电子。[48] nuclear: /ˈnjuːkliə/(a) 原子核的, 核的。nuclear engineering: 核子工程。[49] break up: 分裂。[50] aqueduct: /ˈækwɪdʌkt/(n) (高架) 水渠, 输水道, 水道桥。(人工水道, 尤指用石头或砖造的跨越河或谷之间的那种水道。)[51] transport: /trænsˈpɔːt/(v) 输送, 运输。[52] stress: /stres/(n) 受力(状态, 作用) 应力。[53] physical: /ˈfɪzɪkəl/(a) 自然(界)的, 按自然法则的, 物质的, 物理的。physical pressure: 物理压力。[54] exert: /ɪɡˈzɜːt/(v) 施加(力), 作用(力)。[55] the natural pull of the earth: 这一短语是 gravity 的同位语。[56] silt: /sɪlt/(n) 淤泥, 泥沙(浆)。[57] location: /ləuˈkeɪʃən/(n) 地点, 位置。[58] deposit: /dɪˈpɒzɪt/(v) 沉积。[59] sediment: /ˈsedɪmənt/(n) 沉积(物), 沉淀(物)。[60] impact: /ɪmˈpækt/(n) 影响, 效果。environmental impact study: 环境影响研究。[61] propose: /prəˈpəʊz/(v) 提议, 计划, 打算。proposed structure: 计划建造的建筑物, 拟用建筑物。[62] surrounding: /səˈraʊndɪŋ/(n) (常用复数) (周围) 环境, 周围的事物。[63] major construction project: 大型建筑工程计划, 重点建筑工程计划。[64] quantification: /ˌkwɒntɪfɪˈkeɪʃən/(n) 定量(法), 量化。[65] data: /ˈdeɪtə/(n) (datum /ˈdeɪtəm/ 的复数) 资料, 信息, 数据。[66] pieces of information: 数份资料。information 是不可数名词, 因此用于可数的情况下时, 就用 a piece of information (一份资料), 或 pieces of information (数份资料)。[67] put... into: 把……翻译为……, ……以……表示。[68] terms: /tɜːm/(n) (用作数学名词时比例或方程式的) 项。

Vocabulary Practice

1. What does *engineering* mean?
2. What is a *profession*? Give some examples.

3. How does a railroad locomotive engineer differ from^[1] a professional engineer?
4. What is *empirical information*?
5. What does a *civil engineer* deal with?
6. What are some of the subdivisions of civil engineering?
With what is each of them concerned^[2]?
7. What does a *mechanical engineer* deal with?
8. What does a *mining and metallurgical engineer* deal with?
9. What does a *chemical engineer* deal with? Name a subdivision of chemical engineering.
10. What do *electrical and electronic engineers* deal with?
11. What do *nuclear engineers* deal with?
12. What is an *aqueduct*?
13. What is *stress*?
14. Define^[3] *silt*.
15. What is an *environmental impact study* concerned with?
16. What does *quantification* mean?

[1] differ from: /'dɪfə/ 不同于……, 与……有别(不一致)。[2] be concerned with: /kən'sə:n/ 牵涉到, 与……有关。[3] define: /di'fain/(v) 给……下定义, 解释。

The Engineering Profession

Engineering is one of the oldest occupations in the history of mankind. Indeed, without the skills that are included in the field of engineering, our present-day civilization could never have evolved^[1]. The first toolmakers^[2] who chipped^[3] arrows^[4] and spears^[5] from rock were the forerunners^[6] of modern *mechanical engineers*. The craftsmen^[7] who discovered metals in the earth and found ways to process^[8] and refine

them were the ancestors[9] of *mining* and *metallurgical engineers*. And the skilled technicians who devised[10] irrigation[11] systems and erected[12] the great buildings of the ancient[13] world were the *civil engineers* of their time[14]. One of the earliest names that has come down to us[15] in history is that[16] of Imhotep[17], the designer of the stepped pyramid[18] at Sakkara[19] in Egypt[20] about 3,000 B.C[21].

Engineering is often defined as[22] the practical application of theoretical sciences, such as physics or chemistry, for the benefit of mankind. Many of the early branches of engineering, however, were based not on science but on *empirical information*, that is[23], information that depended on[24] observation and experience rather than theoretical knowledge. Many of the structures that have survived[25] from ancient times[26], such as the *aqueducts* of Rome[27], exist[28] because they were built with greater strength than modern standards[29] require. But at least the Roman[30] engineers were sure that their buildings would last[31] for a long time. Probably the oldest text in engineering is the work[32] of a Roman architect[33] and engineer named Vitruvius Pollio[34], who wrote a book in the first century B.C. about the engineering practices of his day. Many of the problems encountered[35] by Vitruvius Pollio were similar to[36] those[37] that modern engineers still must confront[38].

The term *civil engineering* originally[39] came into use[40] to distinguish it from[41] military engineering[42]. Civil engineering dealt with permanent structures for civilian[43] use, whereas[44] military engineering dealt with temporary[45] structures for military use. An example of the latter is the bridge built across the Rhine[46] in 55 B.C. that is described[47]