工业与民用建筑英语

邓贤贵 编

华中理工大学
出 版 社

CIC

Technical English For
Civil and Industrial
Construction

工业与民用建筑英语

邓贤贵 编

责任编辑 孙晓萍

•

华中理工大学出版社出版发行

（武昌喻家山）

新华书店湖北发行所经销

湖北省通城县印刷厂印刷

开本：850×1168 1/32 印张：12.25 字数：305 000

1989年2月第1版 1989年2月第1次印刷

印数：1-3 000

ISBN 7-5609-0255-3/H·39

定价：2.20元

前　言

本书是为土木工程（特别是工业与民用建筑）专业的学生和专业人员选编的专业英语教材。它包括结构，建筑，工程材料，地基基础，施工，招标，投标和其他有关方面的文章。全书按学生接触专业的先后共编排15课作为课堂教学用，每篇约有600—800个英语词。课文后附有生词，词组和注解；阅读材料后面附有词组和注释。另附有12篇补充阅读材料作为机动教材或自学材料。另外，在书末还附有最常用的专业技术词汇便于阅读时查用。

本书可用作从事土木工程的管理干部和工程技术人员提高英语的辅助材料。

本书在编写中曾得到美国教师李军（Eric Thomas Larkin）和金中梅（Katherine Golden）的协助，为了便于自学还配了录音。另外还得到我校建工系的杨锡琪、赵传智、沈仪贞等副教授的协助，西南交大建工系方根生教授审阅了书稿，并提出了宝贵意见。在此表示感谢。书中错漏之处一定不少，编者衷心欢迎读者提出批评和建议。

邓贤贵

1987年3月于武汉

CONTENTS

LESSON 1

TEXT

Civil Engineering and the Civil Engineer

Engineering is the practical application of the findings of theoretical science so that they can be put to work for the benefit of mankind[1]. Engineering is one of the oldest occupations in the history of mankind. Without the skills that are included in the field of engineering, our present-day civilization could never have evolved.

Civil engineering is a branch of engineering that deals with the design and construction of structures that are intended to be stationary, such as buildings and houses, dams, tunnels, bridges, canals, sanitation systems and the stationary parts of transportation systems—highways, airports, port facilities, and road beds for railroads. Among its subdivisions are structural engineering, dealing with permanent structures; hydraulic engineering, dealing with the flow of water and other fluids; and environmental/sanitary engineering, dealing with water supply, water purification, and sewer systems, as well as urban planning and design. The term civil engineering originally came into use to distinguish it from military engineering. Civil engineering dealt with permanent structures for civilian use, whereas military engineering dealt with temporary structures for military

use.

Civil engineering offers a particular challenge because almost every structure or system that is designed and built by civil engineers is unique. One structure rarely duplicates another exactly. Even when structures seem to be identical, site requirements or other factors generally result in modification. Large structures like dams, bridges, or tunnels may differ substantially from previous structures.

An engineer is a member of the engineering profession. The word engineer is used in two ways in English. One usage refers to the professional engineer who has a university degree and an education in mathematics, science, and one of the engineering specialties. Engineer, however, is also used to refer to a person who operates or maintains an engine or machine. An excellent example is the railroad locomotive engineer, who operates a train. Engineers in this sense are essentially technicians rather than professional engineers.

Engineers must be willing to undergo a continual process of education and be able to work in other disciplines. They must also adapt themselves to two requirements of all engineering projects. First, the system that engineers produce must be workable not only from a technical but also from an economic point of view. This means that engineers must cooperate with management and government officials who are very cost-conscious. Therefore engineers must accommodate their ideas to the financial realities of a project. Second, the public

in general has become much more aware of the social and environmental consequences of engineering projects, and of the hidden or delayed hazards in new products, processes, and many other aspects of civil engineering systems.

Engineers are required to have solid knowledge of mathematics, physics, and chemistry. Mathematics is very important in all branches of engineering, so it is greatly stressed. A current trend is to require students to take courses in the social sciences and the language arts. The work performed by an engineer affects society in many different and important ways, of which he or she should be aware.[2] An engineer also needs a sufficient command of language to be able to prepare reports that are clear and, in many cases, persuasive. An engineer engaged in research will need to be able to write up his or her findings for scientific publications.

A civil engineer is a member of the civil engineering profession. They may work in research, design, construction supervision, maintenance, or even in sales or management. Each of these areas involves different duties, different emphases, and different uses of the engineer's knowledge and experience.

Much of the work of civil engineers is carried on outdoors, often in rugged and difficult terrain or under dangerous conditions. Surveying is an outdoor occupation, for example, and dams are often built in wild river valleys or gorges. Bridges, tunnels, and skyscrapers under construction can also be dangerous places

to work. In addition, the work must progress under all kinds of weather conditions. The prospective civil engineer should be aware of the physical demands that will be made on him or her.

WORDS AND PHRASES

1. findings ['faindiŋz] *n.* 研究（调查）的结果，成果
2. occupation [ɔkju'peiʃən] *n.* 占有，职业，专业
3. skill [skil] *n.* 技能，技巧，技艺
4. civilization [sivilai'zeiʃən] *n.* 文明，文化，开化
5. stationary ['steiʃənəri] *a.* 不动的，固定的
6. highway ['haiwei] *n.* 公路，大路，道路
7. subdivision ['sʌbdiviʒən] *n.* 细分，分部，分支
8. permanent ['pə:mənənt] *a.* 永久的，固定的
9. structure ['strʌktʃə] *n.* 结构，结构物，构造
10. environmental [in,vaiərən'mentl] *a.* 环境的，环境产生的
11. military ['militəri] *a.* 军事的，军用的
12. civilian [si'viljən] *a.* 民间的，民用的
13. temporary ['tempərəri] *a.* 临时的，暂时的
14. challenge ['tʃælindʒ] *n.* 问题，课题，挑战
15. unique [ju(:)'nik] *a.* 独特的，独一无二的
16. duplicate ['dju:plikeit] *vt.* 复制，使重复
17. identical [ai'dentikəl] *a.* 同一的，完全相同的
18. modification [mədifi'keiʃən] *n.* 更改，修改，改变
19. professional [prə'feʃənl] *a.* 职业的，专业的
20. specialty ['speʃəlti] *n.* 专业，特长，专门研究
21. locomotive ['loukəmoutiv] *n.* 火车头，机车
22. discipline ['disiplin] *n.* 纪律，学科，科目

23. persuasive [pə'sweisiv] *a.* 有说服力的，劝导性的
24. construction [kən'strʌkʃən] *n.* 建造，施工，建筑物
25. supervision [ˌsju:pə'viʒən] *n.* 监督，管理
26. maintenance ['meintinəns] *n.* 保持，维修，保养
27. terrain ['terein] *n.* 场所，范围，地带
28. valley ['væli] *n.* 山谷，凹地，屋谷
29. gorge [gɔ:dʒ] *n.* 山峡，峡谷
30. civil engineering 土木工程
31. deal with 论述，涉及，研究
32. sanitation system 卫生系统
33. port facilities 港口设备，港口设施
34. hydraulic engineering 水利工程
35. sewer system 排水系统，污水管道系统
36. urban planning 城市规划
37. come into use 开始使用，获得应用，采用
38. refer to 指的是，关于，参照
39. rather than 而不是，宁可不

NOTES

[1]…so that they can be put to work for the benefit of mankind

…因此，可使之(它们)为人类造福。

When the modal verbs "can", "may", "should", etc. appear in clauses introduced by "so that" and there is no comma before "so that", these clauses are usually regarded as adverbial clauses of purpose, but here, according to the logical meaning, it should be considered as an adverbial clause of result.

[2]The work performed by an engineer affects society

in many different and important ways of which he or she should be aware。--个工程师所做的工作会在他（她）应当意识到的许多不同而且重要的方面影响社会。

"be aware" --having knowledge or realization (of, that) A noun clause or an "of" phrase usually follows。

EXERCISES

I. *Put the following long sentences into Chinese。*

1. Many of the early branches of engineering, however, were based not on science but on empirical information, that is, information that depended on observation and experience rather than theoretical knowledge。
2. Scientific research and the practical applications of its results have given the civil engineer new and stronger materials, mathematical formulas which can be used to calculate the stresses that will be encountered in a structure, and machines that make possible the construction of skyscrapers, dams, tunnels, and bridges that could never have been built before。
3. Civil engineers work with specialists in aerospace, nuclear, and electrical engineering in teams which are often headed by a systems engineer who understands and has experience in several different fields of engineering, and who coordinates the contributions of all members of the team as well as the work on systems or projects that involve two or more engineering speciali-

ties.

4. Faced with a completely designed civil engineering project, most civil engineering graduates should be able to analyse how it will behave under working conditions by establishing a mathematical model of the project which embodies the known mechanical laws (equilibrium, compatibility, material properties, conservation of energy).

5. It is not possible to start with a set of acceptability criteria such as are specified by codes of practice and work backwards to a unique structure or project which satisfies those criteria, without at many stages making design decisions about the shape and dimensions of the structure.

I. *Translate the following passage.*

Civil engineering is a creative profession. The role of the civil engineer is essentially one of synthesis, planning and designing, moulding and shaping the domestic and industrial environment. In order to create and synthesize, civil engineers must be fully aware of how the materials they use and the artifacts they build will behave under working conditions. The education of a civil engineer is consequently much dominated by learning how things behave and how that behaviour may be determined by analysis. Knowledge of disciplines such as structural mechanics, hydromechanics, soil mechanics and their

associated analysis techniques is an essential prerequisite for a civil engineer. Essential though a knowledge of analysis is, however, it is a mistake to think that civil engineering is an analytically dominated profession. Quite the opposite is true: analysis is important only as an adjunct of the process of synthesis.

Reading Material

The Capabilities and Careers of Civil Engineers

Until the nineteenth century, engineers genera lly were craftsmen or project organizers who learned their skills through apprenticeship, on-the-job training, or trial and error[1]. With the increase in scientific knowledge, engineering has grown into a profession. A profession is an occupation like law, medicine, or engineering that requires a specialized, advanced education. Nowadays, many engineers spend years studying at universities for advanced degrees. Yet even those engineers who do not study for advanced degrees must be aware of changes in their field and those related to it. A civil engineer who does not know about new materials that have become available can not compete successfully with one who does.

The civil engineer may work in research, which is one of the most important aspects of scientific and engineering practice. A researcher usually works as a member of a team with other scientists and engineers. He is often employed in a laboratory that is financed

by government or industry. Areas of research connected with civil engineering include soil mechanics and soil stabilization techniques, and also the development and testing of new structural materials.

All kinds of civil engineering projects are almost always unique; that is, each has its own problems and design features. Therefore, a careful study is made of each project even before design work begins. The study includes a survey of both topographical and subsoil features of the proposed site. It also includes a consideration of possible alternatives. The economic factors involved in each of the possible alternatives must also be weighed. Today, a study usually includes a consideration of the environmental impact of the project. Many engineers, usually working as a team that includes surveyors, specialists in soil mechanics, and experts in design and construction, are involved in making these feasibility studies.

Civil engineers may work in design. They are among the top people in the field of design. Civil engineers work on many different kinds of structures, so it is normal practice for one engineer to specialize in just one kind. In designing buildings, civil engineers are often invited to work as consultants to architectural or construction firms. Dams, bridges, water supply systems, and other large projects ordinarily employ several engineers whose work is coordinated by a systems engineer who is in charge of the entire project. In many cases, engineers from other disciplines are involved. In a dam

project, for example, electrical and mechanical engineers work on the design of the powerhouse and its equipment. In other cases, civil engineers are assigned to work on a project in another field; in the space program, for instance, civil engineers are necessary in the design and construction of such structures as launching pads and rocket storage facilities.

Civil engineers may work in construction and maintenance. Construction is a complicated process of almost all engineering projects. It involves scheduling the work and utilizing the equipment and the materials so that costs are kept as low as possible. Safety factors must also be taken into account, since construction can be very dangerous. After the structure has been completed, it must be kept from falling into disrepair; therefore many civil engineers work in maintenance.

Some civil engineers also work in sales. Companies that supply products or equipment for construction often employ civil engineers as part of their sales staff. The customers are engineers themselves, and so they must be given the opportunity to communicate with sales people who can understand the same technical specifications.[2] A few engineers may also go into management. Construction companies are often headed by civil engineers; some of these companies were founded by civil engineers. No matter what the path into management may be, these engineers must have administrative as well as technical skills.