Міністерство освіти і науки України
Національний університет водного господарства та природокористування
Кафедра іноземних мов

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МЕТОДИЧНІ ВКАЗІВКИ

та навчальні завдання
з розвитку англомовного професійного спілкування
до практичних занять і самостійної роботи
для здобувачів вищої освіти першого (бакалаврського)
рівня за освітньо-професійними програмами
«Гідроенергетика» спеціальності G4 Енерговиробництво,
ОПП «Гідротехнічне будівництво, водна інженерія та
водні технології» спеціальності G19 «Будівництво та
цивільна інженерія», ОПП «Теплоенергетика»
спеціальності G4 Енерговиробництво
усіх форм навчання

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Методичні вказівки та навчальні завдання з розвитку англомовного професійного спілкування для практичних занять і самостійної роботи для здобувачів вищої освіти першого (бакалаврського) рівня за ОПП «Гідроенергетика» спеціальності G4 Енерговиробництво, ОПП «Гідротехнічне будівництво, водна інженерія та водні технології» спеціальності G19 «Будівництво та цивільна інженерія», ОПП «Теплоенергетика» спеціальності G4 Енерговиробництво усіх форм навчання [Електронне видання] / Крутько Т. В. Рівне : НУВГП, 2025. 29 с.

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Схвалено на засіданні кафедри іноземних мов, протокол № 2 від 18 вересня 2025 р.

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ПЕРЕДМОВА

Методичні вказівки та навчальні завдання з розвитку англомовного професійного спілкування для практичних занять і самостійної роботи призначені для здобувачів першого (бакалаврського) рівня вищої освіти усіх форм навчання НУВГП, які навчаються за ОПП «Гідроенергетика» галузі знань G Інженерія, виробництво та будівництво за спеціальністю G4 Енерговиробництво (G4.03 Відновлювані джерела енергії та гідроенергетика), ОПП «Гідротехнічне будівництво, водна інженерія та водні технології» «Гідротехнічне будівництво» спеціальності галузі знань G «Інженерія, виробництво та будівництво» за спеціальністю G19 «Будівництво та цивільна інженерія», ОПП «Теплоенергетика» галузі знань G – Інженерія, виробництво та будівництво спеціальності G4 – Енерговиробництво (за спеціалізацією G4.02 – Теплоенергетика).

Методичні вказівки розроблено для надання допомоги здобувачам першого рівня вищої освіти у плані розвитку лінгвістичної компетенції в процесі вивчення англійської мови на основі професійно-орієнтованого матеріалу.

Метою методичних вказівок є підвищення мовної грамотності студентів, вдосконалення загальних та професійно орієнтованих мовленнєвих компетенцій для забезпечення професійного спілкування англійською мовою в усній та письмовій формі.

При підготовці методичних вказівок були використані автентичні тексти, опубліковані у виданнях, які індексуються у наукометричній базі даних Scopus.

Unit 1

Task 1. Read and translate the abstract

In this paper, the construction process of the diversion tunnel of Er-Jia-Gou Reservoir in Harbin is numerically simulated. Based on Biot consolidation theory and porous elastic medium theory, considering the influence of groundwater seepage during the construction process, a three-dimensional fluid solid coupling model of the tunnel is established to simulate the seepage field, stress field and displacement field changes during the construction process.

According to the calculation results, the distribution of pore water pressure and stress around the tunnel during the construction process is analyzed, and the variation rules of pore water pressure, stress and the displacement of the vault and arch bottom of the tunnel are obtained when the shallow tunnel construction passes through the sudden change area of rock mass. Finally, the influence range of the sudden change area of rock mass grade in the tunnel construction process is determined: pore water pressure, stress and vertical displacement will be affected at 20 m from the sudden change area. The results of the paper can provide reference for the safe construction of shallow tunnels[2].

Task 1.1. Write down key words

Task 1.2. Identify the verb tense and verb voice of every sentence

Task 1.3. In the above abstract change passive-voice sentences to active-voice ones

Task 1.4. Find and get down nouns with the following suffixes: tion, -sion. Make up your own sentences with the nouns

Unit 2

Task 2. Read and translate the abstract

The shield construction is a mature tunnel construction technology. Grouting behind segment wall synchronously during shield construction is an important measure to control stratum deformation, reduce ground settlement and prevent tunnel water seepage. The quality of grouting can significantly affect the quality of tunnel construction. The method of grouting quality judgment in early tunnel construction is inefficient and uncertain. To ensure the safety of tunnel structure, it is an urgent technical innovation to study the non-destructive testing technology for grouting effect of shield segment wall. Nowadays, the general Non-destructive testing methods include ground penetrating radar detection and seismic wave detection. These two methods can meet most of the needs of grouting defect detection behind the wall, but also have their own advantages and disadvantages. Therefore, this study proposes the combination of ground penetrating radar and seismic wave method of shield tunnel wall after grouting defects. Non-destructive detection method, first, ground penetrating radar is used for scanning probe shield wall after grouting, and then according to the seismic wave method is used to further verify the results for some suspected injury, while ensure the detection efficiency to improve recognition accuracy. Finally, the defect detection and verification of the proposed method was carried out based on the shield segment model test platform, and this proposed method was successfully applied to the actual project of a metro line in Foshan [2].

Task 2.1. Write down key words
Task 2.2. Identify the verb tense and verb voice of every sentence
Task 2.3. In the above abstract change passive-voice sentences to active-voice ones
Task 2.4. Find and get down nouns with the following suffixes: -ment, -logy. Make up your own sentences with the nouns

Unit 3

Task 3. Read and translate the abstract

Sanhekou Reservoir is an important water source for the Han Wei River Diversion Project, which plays a very important role in supplying water to Guanzhong area. Taking Sanhekou reservoir basin as the research object, MIKE21 model is used to simulate the water environment of the reservoir basin. MIKE21 hydrodynamic module is used to analyze the flow field characteristics of the reservoir study area in high flow year, normal flow year and low flow year. MIKE21 water quality module is used to simulate the water pollution of the reservoir, and analyze the maximum concentration value of pollutant migration in 6, 12 and 24 h under four working conditions, as well as the pollution peak value of 5 and 20 km sections. The results show that the overall velocity variation range of the study area in the wet, normal and dry years is 0–0.139 m/s, 0–0.102 m/s and 0–0.096 m/s respectively. In the four working conditions, the maximum pollutant concentration of working condition 1 is 4.76 mg/L under 6 h of pollution leakage, and the peak value of pollutants under the four working conditions of 5 km section is larger than that of 20 km section. In view of the ecological environment problems in Sanhekou basin, reasonable ecological restoration suggestions and measures are proposed [2].

Task 3.1. Write down key words

Task 3.2. Identify the verb tense and verb voice of every sentence

Task 3.3. In the above abstract change active-voice sentences to passive-voice ones

Task 3.4. Find and get down nouns with the following suffixes: -tion, -age. Make up your own sentences with the nouns

Unit 4

Task 4. Read and translate the abstract

Daily operation of a hydropower station is conducted to meet the energy requirement. The hydraulic parameters of the downstream are significantly affected by the dam operation, which has a negative impact on the aquatic system. When the multi energy complementary method is used, such as hydro-photovoltaic (hydro-PV) combined power generation, the problem will worsen. Hydropower station A (HSA) on River X was selected to investigate the impact of daily operation. HSA is a part of hydro-PV complementary power generation. The spawning and breeding period of typical fish, April to July, was selected as the study period. According to various scheduling, the changes of hydrological regime were analyzed. The results show that the maximum flow variation was 334 m3/s, and the variations in water surface width and velocity during reservoir operation were between natural conditions. The maximum daily water level variations under the two operating scenarios were 1.6 m and 3.5 m respectively. The remarkable change of water level may have a negative impact on aquatic organisms. Considering the daily variation limit of 1.2 m under natural condition, the relationship between the allowable daily variation of reservoir outflow and the reference base flow was proposed. The results in this paper serve as a technical reference for studying changes in the hydrological regime and lessening their impacts on aquatic organisms in hydro-photovoltaic complementary development [2].

Task 4.1. Write down key words

Task 4.2. Identify the verb tense and verb voice of every sentence

Task 4.3. In the above abstract change passive-voice sentences to active-voice ones

Task 4.4. Find and get down adjectives with the following suffix: - ic. Make up your own sentences with the adjectives

Unit 5

Task 5. Read and translate the abstract

The paper investigates the influence of variation of web stiffener locations on the sectional capacities of SupaCee sections under bending about the weak axis. The SupaCee is the new section made on the basis of the traditional channel section by adding several stiffeners in the web of the channel section to increase stability. The variation of stiffener locations has specific impacts on the flexural capacities of SupaCee sections about the weak axis.

With the asymmetrical character of the SupaCee section about the weak axis, the behaviour of this section is analysed when the moment direction is changed. The flexural capacities of cold-formed steel SupaCee sections are determined according to the Australian/New Zealand Standard AS/NZS 4600:2018. Based on the investigated results, it is found that the behaviour of SupaCee sections depends on the moment directions. Also, the web stiffeners should be kept far from the flanges which will be more beneficial for the flexural capacities of SupaCee sections about the weak-axis [2].

Task 5.1. Write down key words

Task 5.2. Identify the verb tense and verb voice of every sentence

Task 5.3. In the above abstract change passive-voice sentences to active-voice ones

Task 5.4. Find and get down adjectives with the following suffixes: -al, -ial. Make up your own sentences with the adjectives

Unit 6

Task 6. Read and translate the abstract

Maximum displacement and the maximum interstorey drift ratio are the important factors for the measurement of the vulnerability of multistorey buildings. For this reason, in this paper a method was proposed to calculate the maximum displacement and maximum interstorey drift ratio (IDR) values. In this model, reinforced concrete multistorey structure was modeled as an equivalent flexural-shear frame. Maximum displacement and the maximum IDR were calculated according to the Equivalent Static Loads Method and The Response Spectrum Method using the continuum model and the results were tabulated. With the help of the obtained tables by this study, the maximum displacement and the maximum IDR of the regular multistorey structures can be calculated quickly and practically. The axial deformation of the vertical elements (columns and shear walls) were approximately considered in the study. The convergence of the presented method to the Finite Elements Method was investigated by two examples in the last part of the study [2].

Task 6.1. Write down key words

Task 6.2. Identify the verb tense and verb voice of every sentence

Task 6.3. In the above abstract change passive-voice sentences to active-voice ones

Task 6.4. Find and get down adjectives with the following suffixes: -al, -ial. Make up your own sentences with the adjectives

Unit 7

Task 7. Read and translate the abstract

In order to realize the resource utilization of solid waste, the principle of alkali excitation is used to prepare geopolymers with fly ash, mineral powder and wet carbide slag as the main materials to replace part of the cement as the cementing material for the pavement base. Geopolymer-stabilized crushed stone was prepared by compounding cement and aggregate with geopolymer, and the unconfined compression strength, indirect tensile strength, compression rebound modulus, scour resistance and microscopic X-ray diffraction (XRD) and scanning electron microscopy (SEM) tests were carried out to study the effect of the change of geopolymer content on the mechanical properties of geopolymer-stabilized crushed stone and its mechanism. The test results show that when adding 30% geopolymer, the mechanical properties similar to those of cement can be obtained to a certain extent. XRD and SEM analysis showed that the geopolymer provided appropriate amount of silicoalumina and calcareous components to form calcium silicate hydrate (C–S–H) and calcium silicate (aluminum) hydrate (C–(A) – S–H) condensation. The glue can form a dense structure and increase the strength of the mixture [2].

Task 7.1. Write down key words

Task 7.2. Identify the verb tense and verb voice of every sentence

Task 7.3. In the above abstract change passive-voice sentences to active-voice ones

Task 7.4. Find and get down adjectives with the following suffixes: -ic, -al. Make up your own sentences with the adjectives

Unit 8

Task 8. Read and translate the abstract

In order to solve the problem of high-value utilization of coal-to-oil residual direct coal liquefaction residual asphalt, it is compounded with SBS and aromatic oil to modify the matrix asphalt, and 9 compounding schemes are designed using orthogonal experimental methods. Dynamic frequency sweep tests using DSR and a simplified Carreau equation model fitted to the complex viscosity to obtain its zero shear viscosity; the creep recovery rate, irrecoverable creep flexibility and irrecoverable creep flexibility difference of each modified asphalt were determined by MSCR at different temperatures and stress levels, and the high temperature rheological properties of 9 composite modified asphalts were evaluated by grey correlation analysis of zero shear viscosity and high temperature rheological parameters. Bending beam rheological experiments were carried out on the aged composite modified asphalt to analyse its low temperature rheological properties based on the viscoelastic parameters and linear fitting of the Burgers model. The results show that: The high temperature deformation resistance of DCLR composite modified asphalt are better than the matrix asphalt, the most influential modifier is SBS, and the higher the dose, the stronger the high temperature deformation resistance. The unrecoverable creep flexibility Jnr3.2 at 70 °C can better respond to the high temperature performance of asphalt, the ratio of 9% DCLR + 4% SBS + 2% aromatic oil DCLR composite modified asphalt with the best high temperature performance. Burgers model can better reflect the creep process of asphalt, DCLR composite modified asphalt has some defects in low temperature performance, the higher the dose of DCLR, the poorer the low temperature performance of the composite modified asphalt. The low temperature sensitivity of DCLR composite modified asphalt has been reduced, low temperature crack resistance has been slightly enhanced [2].

Task 8.1. Write down key words

Task 8.2. Identify the verb tense and verb voice of every sentence

Task 8.3. In the above abstract change passive-voice sentences to active-voice ones

Task 8.4. Find and get down nouns with the following suffixes: -ance, -ity. Make up your own sentences with the nouns

Unit 9

Task 9. Read and translate the abstract

In order to investigate the anti-corrosion effect of coated steel of steel bridge, Q345 steel plate specimens with three types of coatings, including zinc coating, aluminum coating and zinc-aluminum coating, are produced by the arc spraying technology. In the present study, chlorine corrosion tests are performed to investigate the influence law of different coating material and its thickness on the corrosion degree. Then the calculation results of two corrosion indicators are compared and analyzed. It is shown that the two corrosion indicators reflect the same corrosion law of three kinds of coating steel. The corrosion of all coated specimens is obviously severe in the early stage and gradually gentle in the later stage. It is also found that during the whole corrosion cycle, the corrosion rate of aluminum coating is smaller and change slower than the other two kinds of coatings, whereas the coating thickness of 200 μm of aluminum coating changes significantly. Therefore, aluminum coating is recommended as a priority, and the recommended coating thickness range of which is 100–150 μm [2].

Task 9.1. Write down key words
Task 9.2. Identify the verb tense and verb voice of every sentence
Task 9.3. In the above abstract change passive-voice sentences to active-voice ones
Task 9.4. Find and get down nouns with the following suffixes: -or, -ity. Make up your own sentences with the nouns

Unit 10

Task 10. Read and translate the abstract

Guangzhou metro line 1 is one of the first to adopt floating slab track in the Chinese mainland, it has been in operation for more than 20 years up to now. In order to obtain the vibration reduction performance of the floating slab track after long service, systematic field test and laboratory test are carried out. The results show that: (1) The rubber bearing of floating slab track keeps good appearance. (2) The measurement results of shore hardness and elongation at break show that, the rubber bearing has a certain degree of hardening after long service. Other mechanical properties of the rubber bearing still meet the design requirements. (3) The first natural frequency of the floating slab track is 33.9 Hz, its vibration reduction effect keeps good, the test result is 12.9 dB. The effective damping frequency band of the floating slab track is above 35 Hz. (4) The vertical dynamic displacement amplitude of rail and track bed is lower than the limit value given in relevant specifications. (5) The test results show that after 20 years of service, the floating slab track is in good condition, it's still qualified to maintain normal service [2].

Task 10.1. Write down key words

Task 10.2. Identify the verb tense and verb voice of every sentence

Task 10.3. In the above abstract change passive-voice sentences to active-voice ones

Task 10.4. Find and get down adjectives with the following suffixes: -ese, -al, -ive. Make up your own sentences with the adjectives

Unit 11

Task 11. Read and translate the abstract

In order to study the influence of the arrangement of thermal insulation floor on the thermal insulation and mechanical properties of hollow slab, ABAQUS is used to establish the model of thermal analysis and mechanical behavior of hollow slab. By investigating distribution of temperature, distribution of heat flux, damage and deformation of floor, deformation of mid-span deflection and other characteristics of the floor section, it is concluded that although the transmission of heat can be effectively obstructed by the thermal insulation slab, the heat will be transferred to the interior of the floor through the gap between the thermal insulation slabs. The arrangement of thermal insulation slab is not the main factor which affect the thermal insulation properties of the floor with the same coverage area. Different arrangement of the thermal insulation slab has a certain impact on the mechanical performance of floor. It is recommended to arrange the thermal insulation slab in equal sections to fully improve the contact area between steel bar and concrete, which can effectively provide the bearing capacity of the floor [2].

Task 11.1. Write down key words

Task 11.2. Identify the verb tense and verb voice of every sentence

Task 11.3. In the above abstract change passive-voice sentences to active-voice ones

Task 11.4. Find and get down adjectives with the following suffix: -al. Make up your own sentences with the adjectives

Unit 12

Task 12. Read and translate the abstract

Slurry ratio is a crucial link in the construction of bored pile, which directly determines the quality of bored pile. In order to determine the key performance parameters of the slurry required to form piles in the deep sand layer, relying on Huizhou north station engineering, an orthogonal test of slurry proportioning was designed and carried out, and SPSS statistical analysis software was used to carry out bivariate correlation analysis and multivariate stepwise analysis of the test results, combined with the slurry performance index test regression equation and using MATLAB software optimization processing, slurry optimal mix ratio and verify, the research results show that: orthogonal test screening value, software calculation value, test value is not different. Conclusion: The results show that bentonite and CMC have significant influence on slurry indexes, while Na2CO3 and PHP can adjust slurry performance to meet the slurry use standard; the optimal mix ratio is 148 g bentonite, Na2CO3 5.2 g, CMC 3.5 g, PHP 0.05 g; the slurry ratio test analysis and treatment, and the optimization mix ratio is feasible and reasonable, class I pile proportion more than 98% to meet the actual engineering requirements [2].

Task 12.1. Write down key words

Task 12.2. Identify the verb tense and verb voice of every sentence

Task 12.3. In the above abstract change passive-voice sentences to active-voice ones

Task 12.4. Find and get down adjectives with the following suffixes: -al, -ial. Make up your own sentences with the adjectives

Unit 13

Task 13. Read and translate the abstract

Socket-and-socket wheel-buckle steel pipe formwork support frame is a new formwork support system, with fixed component specifications and fast erection speed, which can significantly improve the construction efficiency. Its application performance is different from that of fastener-type, bowl-buckle-type and platebuckle-type, and there are not enough experimental and numerical analysis results to consult. Therefore, based on the bearing capacity test of the basic bearing units of socket-type wheel-buckle steel pipe formwork support, the finite element software ANSYS is used to conduct numerical analysis of 12 groups of basic bearing units, and the influence degree of vertical bearing capacity of different specifications of unit supports is studied by stud spacing and wedge tightness of cross bar plug. It is pointed out that the stiffness of formwork support in the vertical and horizontal directions should not be too different in the construction process [2].

Task 13.1. Write down key words

Task 13.2. Identify the verb tense and verb voice of every sentence

Task 13.3. In the above abstract change passive-voice sentences to active-voice ones

Task 13.4. Find and get down nouns with the following suffixes: -ness, -ity, -ance. Make up your own sentences with the nouns

Unit 14

Task 14. Read and translate the abstract

Cold-formed steel structures have been widely applied in structural buildings with advantages in manufacturing, transportation and assembly. Holes can be pre-punched in the sectional members to allow technical pipes to go throughout such as electricity, water or ventilation. This affects the capacities of these such members which have been considered in the design standards in America or Australia/New Zealand. The paper, therefore, investigates the effects of web holes on the capacities of cold-formed steel channel members under compression or bending. Their capacities can be determined according to the American Specification AISI S100-16. The investigated results are the base for analysing the effects of web hole dimensions on the behaviors and capacities of cold-formed steel channel members. It was found that the capacity reductions were obtained for compressive members with the increase in hole sizes, but the flexural capacities were noticeable increase with the increase in the hole heights [2].

Task 14.1. Write down key words

Task 14.2. Identify the verb tense and verb voice of every sentence

Task 14.3. In the above abstract change passive-voice sentences to active-voice ones

Task 14.4. Find and get down adjectives with the following suffixes: -al, -able. Make up your own sentences with the adjectives

Unit 15

Task 15. Read and translate the abstract

Anti-slide pile is one of the supporting structures commonly used in landslide treatment, while the determination of pile location is empirical. A highway landslide in Yunnan Province was selected as a study case, this paper proposes a method to determine the anti-slide pile location based on the point safety factor distribution of sliding surface. The study found that the local sliding surface has a large value of point safety factor in the anti-slide section. With increase of the proportion of the anti-slide section, the anti-sliding ability of the slide surface can be fully utilized, and the reinforcement effect of the anti-slide pile will be great. Using the point safety factor to determine the pile location is a quantitative method, which enriches the design theory of landslide support structure [2].

Task 15.1. Write down key words

Task 15.2. Identify the verb tense and verb voice of every sentence

Task 15.3. In the above abstract change passive-voice sentences to active-voice ones

Task 15.4. Find and get down adjectives with the following suffixes: -ing, -al. Make up your own sentences with the adjectives

Unit 16

Task 16. Read and translate the abstract

In order to improve the comprehensive performance of pervious concrete, nano-silicon and polypropylene fiber were added to pervious concrete to study the change of performance of pervious concrete. Firstly, the effect of single doped nanosilicon on the properties of cement slurry and pervious concrete was studied, and the optimal water-binder ratio and nano-silicon content were determined. Based on this, mixed polypropylene fiber with different proportions of length of 18 mm to determine the reasonable amount of polypropylene fiber. The results showed that the compressive strength of pervious concrete was the highest when the nano-silicon content was 0.5% and the water-binder ratio was 0.32. Based on this ratio, the maximum compressive strength can be obtained by adding 1.0 kg/m3 polypropylene fiber, and the compressive strength of 7d and 28d increased by 29.9% and 42.2%, respectively. Adding 1.5 kg/m3 polypropylene fiber was the most beneficial to improve the freezing resistance of pervious concrete. For example, after 300 freeze–thaw cycles, the compressive strength residual rate was 62%. That's much higher than the 40 percent that was found when nano silicon was mixed alone [2].

Task 16.1. Write down key words

Task 16.2. Identify the verb tense and verb voice of every sentence

Task 16.3. In the above abstract change passive-voice sentences to active-voice ones

Task 16.4. Find and get down adjectives with the following suffixes: -ive, -able. Make up your own sentences with the adjectives

Unit 17

Task 17. Read and translate the abstract

The preparation of seawater sea-sand recycled concrete (SSRAC) by combining seawater, sea-sand and recycled coarse aggregate is of great significance for the utilization of marine resources and environmental protection in China. The sulfate corrosion test in this paper uses dry wet cycle to simulate the alternating dry wet environment, and compares the ordinary concrete (OC) and freshwater river sand recycled concrete (RAC) to study the mechanical property deterioration characteristics of SSRAC in dry–wet cycle (30d, 60d, 90d, 120d). The results show that with the increase of the dry–wet cycle, the apparent damage of SSRAC gradually extends from the diagonal to the periphery, and finally the cracks spread all over the whole. The mass, strength and strength corrosion resistance coefficient of SSRAC show the same law as OC and RAC, which increase first and then decrease. The resistance of SSRAC to sulfate attack is lower than OC and slightly higher than RAC, and the strength corrosion resistance coefficient is lower than 75% at 120 times of dry–wet cycle [2].

Task 17.1. Write down key words

Task 17.2. Identify the verb tense and verb voice of every sentence

Task 17.3. In the above abstract change passive-voice sentences to active-voice ones

Task 17.4. Find and get down nouns with the following suffixes: -ance, -ion. Make up your own sentences with the nouns

Unit 18

Task 18. Read and translate the abstract

The application of FRP composite is quite well demonstrated in strengthening on RC structures but on strengthening of steel structures is still being investigated by many researchers. The aggressive marine environment can cause corrosion to the offshore pipelines which would affect the structural performance such as pitting corrosion which could be considered as the most destructive corrosion was simulated in this research. This study had attempted to carry out experimental investigation of effectiveness of FRP composite repair system on offshore pipelines subjected to pitting corrosion under axial compressive load. 3 groups of specimens have been categorized such as intact, corroded and repaired. Results such as compressive peak load, failure modes and load–displacement behavior were concerned in this study. The pitting corrosion has been investigated and proved that it has significant effect on the ultimate strength of pipelines. Number of CFRP layer such as 3 layers has been investigated which the results showed the FRP composite repair system capable of strengthening of corroded offshore pipelines. However, more detailed studies are required to be conducted in the future such as consideration of internal pressure in order to expand the understanding of this composite repair system [2].

Task 18.1. Write down key words

Task 18.2. Identify the verb tense and verb voice of every sentence

Task 18.3. In the above abstract change passive-voice sentences to active-voice ones

Task 18.4. Find and get down adjectives with the following suffixes: -al, -ant. Make up your own sentences with the adjectives

Unit 19

Task 19. Read and translate the abstract

Judging from the development status of most super-high-rise building industries in China, “outer frame + core tube” is basically adopted. The appearance of this core tube structure design concept puts forward higher requirements for the construction safety of the main structure. Combined with practical engineering projects, we analyze the safety risks and countermeasures of the outer frame column of the super high-rise steel structure, the safety risks and countermeasures of the cantilever steel beam, the safety risks and countermeasures of the waist truss, the safety risks and countermeasures of the outrigger truss, the safety risks and countermeasures of the tower crown structure are discussed one by one. It ensures the organic combination of engineering safety measures and engineering construction technology. The proposed safety measures are highly targeted and feasible, ensuring the safe construction of the project. The comprehensive application of this project confirms the feasibility of relevant countermeasures, so as to provide reference and help for subsequent similar projects [2].

Task 19.1. Write down key words

Task 19.2. Identify the verb tense and verb voice of every sentence

Task 19.3. In the above abstract change passive-voice sentences to active-voice ones

Task 19.4. Find and get down nouns with the following suffixes: -ence, -ety. Make up your own sentences with the nouns

Unit 20

Task 20. Read and translate the abstract

Using servo steel support system for active control of deformation during foundation fit excavation has high superiority. To investigate the coherence of the servo support axial force, PLAXIS 3D is used to carry out numerical analysis on the coherence of the axial force applied by the construction and compare with the field test results; Field tests were conducted on the diaphragm wall joint deformation during the axial force application based on the principle of the generation of axial force coherence. The results show that the farther away from the active axial force, from which suffered get the smaller influence, and the size of the applied axial force's effect on the support in other directions in the order of horizontal, vertical, and oblique. Moreover, the higher the application position of the active axial force of the servo support, the greater the lateral axial force loss rate generated by other supports, while the opposite in vertical axial force loss rate is true. The maximum axial force loss rate is 19%. The deformation of the diaphragm wall joint in the servo steel support zone is more significant than that in the pre-stressed steel support zone. The deformation of the joint will, in turn, affect the axial force [2].

Task 20.1. Write down key words

Task 20.2. Identify the verb tense and verb voice of every sentence

Task 20.3. In the above abstract change passive-voice sentences to active-voice ones

Task 20.4. Find and get down adjectives with the following suffixes: -ant, -ive. Make up your own sentences with the adjectives

Unit 21

Task 21. Read and translate the abstract

Different indices have various capabilities to evaluate the hightemperature performance of modified asphalt mixtures. This study aims at investigate the discriminability of high-temperature performance indices. The values of five indices were determined from wheel tracking test, Marshall test and uniaxial penetration test, including dynamic stability (DS), comprehensive stability index (CSI), maximum rutting depth (RD), Marshall stability (MS), and uniaxial penetration strength (UPS). The discriminability of five indices was further examined by entropy weight method and CRITIC method, respectively. The results show that DS, MS and UPS are not appropriate to evaluate the high-temperature performance of modified asphalt mixtures, but CSI and RD show preferable distinguishing ability to evaluate the high-temperature performance. As a consequence, RD is recommended to be employed as secondary index to supplement the CSI in wheel tracking test. The findings of this study will contribute to the optimization of evaluation on high-temperature performance of modified asphalt mixtures [2].

Task 21.1. Write down key words

Task 21.2. Identify the verb tense and verb voice of every sentence

Task 21.3. In the above abstract change passive-voice sentences to active-voice ones

Task 21.4. Find and get down nouns with the following suffixes: -ity, -ance, -tion. Make up your own sentences with the nouns

Unit 22

Task 22. Read and translate the abstract

To avoid brittle collapse of reinforced concrete (RC) structures, RC elements such as beams, columns, and shear walls are invited to ensure a minimum level of ductility. In this paper, an analytical method for predicting the curvature ductility factor of confined RC columns is developed. The stress–strain model of confined concrete provided by Eurocode 2 is adopted, and the effective lateral confining pressure is calculated according to the Eurocode 8. The curvature ductility factor is defined by the ratio of ultimate to yield curvature. In this context, a new hypothesis is adopted to calculate the yield curvature while the ultimate curvature is calculated based on axial load and the mechanical ratios of tension, web, and compression reinforcement. The results showed that the developed method has an excellent performance compared to the experimental results collected from previous researches, where the mean value and the standard deviation of the ratios predicted to experimental factors are equal to 1.02 and 0.17, respectively. Moreover, the calculated coefficient of determination is very close to 1 [2].

Task 22.1. Write down key words

Task 22.2. Identify the verb tense and verb voice of every sentence

Task 22.3. In the above abstract change passive-voice sentences to active-voice ones

Task 22.4. Find and get down adjectives with the following suffixes: -al, -ed. Make up your own sentences with the adjectives

Unit 23

Task 23. Read and translate the abstract

Structural applications of composite materials are used in various structures of the oil and gas industry, water supply and sewage systems and a wide range of industries, such as marine, aerospace, and military industries. This paper aims to numerically investigate the influence of local dent caused by an indenter on the buckling behaviour of glass fabric-reinforced polymer cylindrical shells when subjected to external pressure. For this purpose, 24 finite element numerical models with five layers and a stacking sequence [30/-30/30/-30/30] were simulated in ABAQUS. The effect of dent depth (2, 4, 6 and 8 mm) and orientation (0 and 90 degrees) that was created at the mid-height, the 1/3rd and the 2/3rd of the shell height on the buckling behaviour of the composite cylindrical shells were evaluated. The results underscored that whilst the location of the local dent and the depth affected the shells' buckling capacity, the dent's orientation had minimal effect on the buckling capacity of the cylindrical shells [2].

Task 23.1. Write down key words

Task 23.2. Identify the verb tense and verb voice of every sentence

Task 23.3. In the above abstract change passive-voice sentences to active-voice ones

Task 23.4. Find and get down adjectives with the following suffixes: -ing, -al, -ous. Make up your own sentences with the adjectives

Unit 24

Task 24. Read and translate the abstract

Japan is located in the international seismic zone, and is also a resource intensive country. It has unique features in the research and application of ultra-high performance concrete materials. The paper analyzes and summarizes the engineering application cases of concrete strength grade above 150 N/mm2, including structural system, mix design, production process, strength grade, etc. Silica fume composite cement, with strict calculation of sand and stone gradation, improves the compactness beyond the conventional concrete; The super high performance water reducing agent can greatly reduce the water cement ratio and improve the working performance, especially the expansion degree; Organic fiber and steel fiber are especially important in fire resistance, explosion resistance and ductility. Ultra-high performance concrete could improve the seismic performance of building structures and the utilization rate of building area, and new materials could provide more choices for design and engineering application [2].

Task 24.1. Write down key words

Task 24.2. Identify the verb tense and verb voice of every sentence

Task 24.3. In the above abstract change passive-voice sentences to active-voice ones

Task 24.4. Find and get down adjectives with the following suffixes: -al, -ic. Make up your own sentences with the adjectives

Unit 25

Task 25. Read and translate the abstract

BIM technology has been widely used in practical engineering construction projects, especially in the application scenario of mechanical and electrical pipeline synthesis. In residential projects, the electromechanical pipeline in the basement part is the most complex and concentrated in the whole project. Therefore, this paper studies and summarizes the comprehensive application of electromechanical pipeline of BIM technology in residential basement project. This paper mainly studies the implementation process of BIM electromechanical pipeline comprehensive application of four actual residential basement construction projects, analyzes the problems found and solved in the comprehensive application of electromechanical pipeline in residential basement based on BIM, and summarizes the key points that the project construction party needs to grasp in order to complete such projects with high efficiency, high quality and high standard. In addition, according to the implementation experience of actual engineering projects, this paper also puts forward some suggestions on the implementation process of BIM-based residential basement electromechanical pipeline comprehensive project [2].

Task 25.1. Write down key words

Task 25.2. Identify the verb tense and verb voice of every sentence

Task 25.3. In the above abstract change passive-voice sentences to active-voice ones

Task 25.4. Find and get down adjectives with the following suffixes: -al, -ing. Make up your own sentences with the adjectives

Task 26. What suffixes are the most productive?

Task 27. Compile a glossary of all key words

References

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