МИНОБРНАУКИ РОССИИ
Тверской государственный технический университет

ROAD BUILDING

АВТОМОБИЛЬНЫЕ ДОРОГИ. СТРОИТЕЛЬСТВО

Учебно-методическая разработка по развитию иноязычной компетенции
(английский язык) для студентов 2-го курса
направления 270 800 Строительство
(профиль – автомобильные дороги и аэродромы)

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Учебно-методическая разработка «Автомобильные дороги. Строительство» по английскому языку для студентов II курса направления 270 800 Строительство (профиль автомобильные дороги и аэродромы) предназначена для студентов направления 270 800 Строительство (профиль – автомобильные дороги и аэродромы) всех форм обучения. Учебно-методическая разработка охватывает профессиональную сферу общения и включает в себя комплекс специализированных текстов с обучающими и контролирующими упражнениями. В каждой теме имеются упражнения как для развития устной речи, практики перевода, так и коррекции и развития навыков использования основных грамматических форм и конструкций. Разработка также включает в себя комплекс обучающих и контролирующих упражнений на различные грамматические темы. В системе упражнений каждой темы имеются упражнения как для развития устной речи, так и для практики перевода.

При составлении упражнений использовались современная английская литература, периодические издания, а также интернет-источники.

Учебно-методическая разработка обсуждена и рекомендована к изданию на заседании кафедры иностранных языков (протокол № 8 от 04.07.2011 года).

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PART I. HISTORY OF ROADS AND ROAD BUILDING

Text 1 The History of Roads

Pre-text exercises

Ex. 1.

a) Read the words, paying attention to ”c”:

[s]: necessary, civilization, centralization, city, center, century, cycle;

[k]: construct, collection, connect, capital, carriage, combustion, create;

b) Read the words, paying attention to”ch”:

[ʧ]: which, cherish, China, channel, chamber;

[k]: techniques, chemistry, character, Christmas;

c) Pay attention to the pronunciation of the word vehicle ['vi:ikl].

Ex. 2. *Read the international words and guess their meaning:*

Civilization, centralization, population, collection, techniques, center, military, provinces, material, final, mix, asphalt, standard, motor, cycle, system.

Ex. 3. *Find the roots of the following words and translate them:*

Specially, powerful, network, independence, relatively, usually, haphazardly, highway, poorly, highwaymen, particularly, impracticable, iron-rimmed, three-layer, roadbed, finally, gentleman, rainwater, everywhere, mouthful, eventually.

Read the text and translate it. The vocabulary notes following the text will be helpful:

Road is a specially constructed route for wheeled vehicles to travel on. Reinforced tracks became necessary with the invention of wheeled vehicles in about 3000 BC and most ancient civilizations had some form of road network.

Early history

The history of roads has been related to the centralizing of populations in powerful cities, which the roads have served for military purposes and for trade, the collection of supplies, and tribute. In the Middle East, in Mesopotamia, scientists have found evidence of a network of roads dating back to perhaps 3000 B.C. In Persia, between 500 and 400 B.C., all the provinces were connected with the capital, Susa, by roads, one of them 1,500 mi (2,400 km) long. The ancient Greeks, cherishing the independence of their city-states and opposing centralization, did relatively little road making.

The first major road was the Persian Royal Road from the Gulf to the Aegean Sea, more than 2,800 km/4,480 mi long, used from 3500 BC. Ancient China also had an extensive road network. The Romans developed engineering techniques that were not equaled for another 1,400 years. Roman roads were usually straight, and composed of large flat stones, topped with a layer of gravel and a hard surface. During the Middle Ages, the quality of roads was deteriorated. By

the late 18th century most European roads were haphazardly maintained, making winter travel difficult. In England the Statute for Mending the Highways (1555) required all members of the parish to spend four days a year working on mending the roads, but the work was poorly done or not done at all, and travelers complained of ruts, mud, accidents, and highwaymen. Roads were particularly impracticable for heavy or bulk transport, and iron-rimmed wagon wheels broke up the road surface, despite legislation to try to increase the width of wheels.

Improvements after 1700

Wherever you go in the world, and as far back as 4,000 BC, stone is the common ingredient in roads. Simple stone roads were often rough, uneven, and pitted with ruts and holes that filled up with rain and mud in the winter. It wasn't until the 1700s that the smooth, even roads we know today became possible. We have three Scottish engineers and their improved road building techniques to thank.

Although he was blind, John Metcalfe was able to design and build firm, three-layer roads. First he placed large stones on the bottom layer, then he took the materials excavated from the roadbed such as smaller rocks and earth and used them for the middle layer, and finally he spread a layer of gravel on top.

A second Scottish gentleman by the name of Thomas Telford designed a way to raise the center of the road so that rainwater would drain down the sides. He also devised a method to analyze how thick the road stones had to be to withstand the weight and volume of the horses and carriages that were common in his day. The last of the three, John McAdam, mixed the necessary road stones with tar. The tar "glued" all the stone together and created a harder and smoother surface for the carriage wheels to roll on. "Tarmacadam roads" became the standard used everywhere until the 1870s when asphalt took over. "Tarmacadam" was a mouthful, so eventually people shortened the word to "tarmac."

Modern roads

The bicycling craze of the late 19th century and the development of the internal combustion engine and motor car led to the improvement of road systems after 1900. Road builders began to use asphalt to create a smooth, durable surface that would not create dust.

Vocabulary

1. route	путь, шоссе, магистраль
2. wheel	колесо
3. vehicle	транспортное средство
4. travel	ехать, ездить
5. reinforced	усиленный, укреплённый
6. track	путь, трасса, дорога
7. network	сеть

8. relate	относиться, иметь отношение, быть связанным
9. purpose	назначение, цель
10. trade	торговля
11. supply	снабжение, поставка
12. tribute	дань, подать
13. evidence	подтверждение, свидетельство
14. cherish	заботливо относиться, ухаживать
15. oppose	возражать, быть против
16. major	более важный, значительный, крупный
17. extensive	громадный, большой
18. equal	равняться, быть равным
19. straight	прямой
20. flat	плоский, ровный
21. layer	слой
22. gravel	гравий
23. deteriorate	ухудшать(ся), портить(ся)
24. haphazardly	бессистемно, случайно
25. statute for mending	закон о ремонте (починке)
26. parish	церковный округ, приход
27. complain	жаловаться, выражать недовольство
28. pit	колея, борозда, след от колеса
39. mud	грязь, слякоть
30. impracticable	невозможный, неосуществимый
31. bulk transport	транспорт для перевозки наливного или насыпного груза
32. rim	обод, наружная часть колеса
33. legislation	законодательство
34. width	ширина
35. rough	неровный, грубый
36. uneven	неровный, шероховатый
37. pitted	изрытый, в ямах
38. smooth	гладкий, ровный
39. bottom	низ, нижняя часть, нижний
40. spread	рассеивать, распространять
41.withstand	выдержать, противостоять
42. carriage	повозка, карета, экипаж
43. tar	гудрон, дёготь
44. glue	клеить, склеивать
45. mouthful	труднопроизносимое слово
46. craze	мания
47. dust	пыль
48. internal combustion engine	двигатель внутреннего сгорания

Assignments:

Ex. 1. *Answer the following questions:*

1. What is a road?
2. When did reinforced tracks become necessary?
3. What has the history of roads been related to?
4. What have the roads have served for?
5. What evidence have scientists found?
6. What techniques have the Romans developed?
7. What were the Roman roads composed of?
8. What did the Statute for Mending the Highways require?
9. What did the travelers complain of?
10. Why were roads particularly impracticable?
11. Who is to be mentioned in relation with the road improvement?
12. What roads was John Metcalfe able to design and build?
13. What did the Scottish gentleman by the name of Thomas Telford design?
14. What did John McAdam mix?

Ex. 2. *Match English and Russian equivalents:*

1. route	a. сеть
2. wheel	b. повозка
3. vehicle	c. колесо
4. track	d. гравий
5. travel	e. транспортное средство
6. network	f. плоский
7. straight	g. ехать
8. flat	h. прямой
9. layer	i. шоссе
10. gravel	j. дорога
11. carriage	k. слой

Ex. 3. *Choose the right word:*

1. Road is a specially constructed … for wheeled vehicles to travel on.
a) way b) route c) track
2. Roman roads were usually straight, and composed of large flat… .
a) stones; b) gravel; c) bricks
3. The Romans developed engineering… that were not equaled for another 1,400 years.
a) skills b) science c) techniques
4. Simple stone roads were often… .
a) smooth b) rough c) straight
5. We have three Scottish … and their improved road building techniques to thank.
a) engineers b) workers c) scientists

Ex. 4. *Fill in the blanks with the words and phrases listed below:*

1. Road is a specially constructed …. for wheeled vehicles to ….. .
2. Reinforced tracks became necessary with the … in about 3000 BC and most ancient civilizations had some form of…. .
3. Scientists have found …to perhaps 3000 BC.
4. The ancient Greeks, cherishing the independence of their city-states and opposing centralization, did relatively little…. .
5. Ancient China also had an … road network.
6. The Romans developed … that … for another 1,400 years.
7. Roman roads were usually straight, and composed of large flat …, topped with a …. and a…. .
8. During the Middle Ages, the quality of roads …. .
9. We have three Scottish engineers and their … to thank.
10. John McAdam mixed the necessary …with …. .

Road, stones, tar, improved road building techniques, was deteriorated, stones, a layer of gravel, a hard surface, engineering techniques, were not equaled an extensive, road making, evidence of a network of roads dating back, invention of wheeled vehicles, road network, route, to travel on.

Ex. 7. *Divide the text into logical parts. Find the topical sentence of each passage.*

Ex. 8. *Say what facts attracted you attention.*

Grammar exercises

Ex. 1. *Read the text once more. Find active and passive constructions in the text.*

Ex. 2. *Change the following sentences from active into passive. Translate the sentences:*

1. The ancient Greeks did little road making.
2. The Romans developed engineering techniques.
3. Scientists have found evidence of a network of roads in the Middle East.
4. Thomas Telford designed a way to raise the center of the road.
5. John McAdam mixed the necessary road stones with tar.
6. John Metcalfe placed large stones on the bottom layer.
7. Road builders excavated the materials such as smaller rocks and earth from the roadbed.
8. The builders used rocks and earth for the middle layer.
9. John Metcalfe spread a layer of gravel on top.
10. The tar "glued" all the stones together.
11. People shortened the word "Tarmacadam" to "tarmac."
12. Road builders used asphalt to create a smooth, durable surface.

Oral practice

Ex. 1. *Work in pairs. Read the dialogue, learn it by heart and act it.*

- It's nice to see you, Mary. How are you?
- Good evening, Alec. I'm fine. Hope you are well. Haven't seen you for ages. Where have you been all this time?
- I have just arrived from London. I was taking part in the Road Building Machinery Exhibition. Have you ever been to London?
- Yes, I have been there several times. It's a nice city, isn't it? I hope you have enjoyed yourself greatly.
- Oh, yes. I've had a very nice time.
- Did you go there alone?
- No, together with John, an old friend of mine. You remember him, don't you?
- Sure. Has he graduated from the University?
- No, not yet. He is in his last year. What about you? I haven't heard from you lately. How are you getting on?
- Thank you, quite all right. Come and see me some day, will you?
- I'll be delighted. So long.
- See you soon. Bye!

Ex. 2 . *Fill in the blanks with the words and phrases given below:*

- Hello, Kate. This is___, Fred Black.
- Hello, Fred. Glad ____. I'm ____.
- Hello, Kate. _____.

Words and phrases: My friend; How nice to meet you; Kate; to meet you; How do you do? What's your name?

- ____, Jack, what's your friend's____?
-____.
- Where is he from?
- He is from Cardiff. Why? *(А что?)*
- ____, I'm from Cardiff too. ____.
- Shall I ___ you to him?
- Yes, do, ____.

Words and phrases: His name is David; name; Best regards to him. You see; introduce; please.

Text 2 The Birthplace of Modern Road Building

Pre-text exercises

Ex. 1. *Mind the rules of pronunciation:*

[əː]: birthplace, first, German, surface, purpose, serve, refer, conservative, person, hurt, nerve;

[əu]: road, most, slowly, below, snow, show, grow, low, own, cold, gold, hold, follow, window;

[ʌ]: construction, brush, truck, bumper, much, such, some, front, month, other, ton, comfort, wonder, among, become, discover;

[ei]: place, pave, way, paint, rain, late, lay, grade, nature, relation, same, basic;

Pay attention to the pronunciation of the word plow [plau].

Ex. 2. *Read the key words, translate them into Russian and try to memorize them:*

Birthplace, road, modern, construction, technology, invent, pave, concrete, brick, industry, standard, paint, brush, truck, highway, industry – industrial.

Ex. 3. *Read and translate the words composed of several roots:*

Network, highway, highwaymen, roadbed, gentleman, rainwater, everywhere, birthplace, centerline, withstand, spearhead, freeway.

Ex. 4.*Guess the meaning of the words in italics:*

Construction – *to construct*; to pave – *pavement*; considerably – *to consider*; to invent – *invention*; incarnation – *to incarnate*; building – *to build*; slowly –*slow*; later – *late*; construction – *reconstruction*; recently – *recent*.

Read the text and translate it. The vocabulary notes following the text will be helpful:

With Detroit being the birthplace of the automobile, what is better than Wayne County to give birth to the modern road?

Most people are not aware that the modern era of road construction began right here in Wayne County. In fact, much of the road-related technology we take for granted today was invented by the Wayne County Road Commission.

The first mile of concrete road, 1909

When the Wayne County Road Commission paved Woodward Avenue in 1909 from McNichols to Seven Mile, it was the first time a road was paved with concrete. While not as durable as the bricks that had been used, concrete was easy to lay and considerably less expensive. Nearly 90 years later, concrete remains the industry standard.

The first center line painter, 1911

In its early incarnation, this innovation was little more than a paint brush strapped an arm on the back of a truck. Later versions were refined, such as one that dribbled paint onto a painting wheel that rolled along, marking the line as the truck slowly moved along.

The first snow plow, 1912

Like the centerline painter, this innovation seemed less than impressive at first - a board fastened to the front bumper of a truck. The idea, however, was refined and the world's first snow plow was born.

The first modern road maintenance facility & testing lab, 1910

The County's Wayne Yard on Michigan Avenue was the first road maintenance facility and included a testing lab for the concrete road building industry it created. The old complex will be demolished this year to make way for a new, $4 million state-of-the-art engineering facility.

The first superhighway, 1942

The Davison is America's first limited access, below-grade superhighway built as part of the war effort. In fact, the freeway even lured German engineers to view the design, which reportedly helped inspire the world-famous Autobahn. County road employees were not surprised recently when reconstruction began this spring on the aged freeway and the contractor needed to use dynamite to break out areas of the pavement. This is particularly impressive since the Davison, in all its 52 years, never received a major surface improvement.

Cars and roads in America also share an important link: Henry Ford was one of Wayne County's first Road Commissioners and is often credited with spearheading the "Good Roads" movement of the early 1900's that led to the creation of Michigan's Road Commissions. Perhaps the largest industry spawned by the advent of the automobile, road construction has been a huge employer for the nation. In fact, over the next three years, more than $1.9 billion will be spent in Southeast Michigan on road construction, most of which is performed by private companies.

Vocabulary

1. to be aware	быть осведомленным
2. take for granted	воспринимать как само собой разумеющееся
3. pave	замащивать, мостить
4. durable	надёжный, прочный
5. brick	кирпич
6. lay	класть, положить
7. considerably	значительно
8. remain	оставаться
9. incarnation	воплощение
10. truck	грузовой автомобиль, грузовик

11. refine	очищать; повышать качество
12. dribble	капать, течь тонкой струйкой
13. centerline	средняя линия
14. fasten	прикреплять,
15. snow plow	снегоочиститель
16. maintenance	поддержание; сохранение
17. facility	возможность, благоприятные условия
18. take way for	уступить дорогу, уступить (место)
19. state-of-the-art	внедрённый, достигнутый, реальный
20. access	доступ
21. below-grade	низкосортный; низкопробный, некачественный
22. freeway	скоростная автострада со сквозным движением
23. lure	завлекать, соблазнять
24. inspire	внушать, вселять (чувства); принуждать, побуждать
25. commissioner	уполномоченный,
26. spearhead	возглавлять
27. spawn	порождать
28. advent	наступление (эпохи, события), прибытие, приход
29. employer	работодатель

Assignments:

Ex. 1. *Answer the following questions:*

1. What city is considered to be the birthplace of the automobile?
2. Where did the modern era of road construction begin?
3. What was invented by the Wayne County Road Commission?
4. What road was first paved with concrete?
5. What advantages and disadvantages did the concrete have in comparison to brick pavement?
6. When did the first center line painter appear?
7. How was the world's first snow plow born?
8. What was the first superhighway?
9. What reportedly helped to inspire the world-famous Autobahn?
10. Who was one of the first Wayne County's first Road Commissioners?
11. What was the largest industry spawned by?

Ex. 2. *Find the following expressions in the text and translate them into Russian:*

The birthplace of the automobile; to give birth to the modern road; the road-related technology; to pave with concrete; not as durable as the bricks; easy to lay; to remain the industry standard; the centerline painter; the first road

maintenance facility; a board fastened to the front bumper of a truck; and the world's first snow plow; the concrete road building industry.

Ex. 3. *Give English equivalents for the following words and word combination:*

Многие люди не знают, округ Уэйн, бетонная дорога, надёжный, прочный как кирпич, значительно дешевле, оставаться промышленным стандартом, первое воплощение, доска, прикреплённая к переднему бамперу грузовика, снегоочиститель, возможность поддержания дорог, автострада низкого качества, появление автомобилей.

Ex. 4. *Complete the sentences:*

1. Detroit is … .
2. In fact, much of the road-related technology we take for granted today was invented by… .
3. It was the first time a road … .
4. While not as durable as the bricks that had been used, concrete was easy … .
5. Nearly 90 years later, concrete remains … .
6. The early incarnation of the first center line painter in 1911was little more than … .
7. The freeway even lured German engineers to view the design, which reportedly helped inspire … .
8. Perhaps the largest industry spawned by … .
9. Road construction has been a … .
10. Over the next three years, more than $1.9 billion will be spent in Southeast Michigan on road construction, most of which is performed by … .

Ex. 5. *Read the text and say if the following statements:*

- *true*
- *false*
- *there is no information in the text:*

1) The modern era of road construction began in Wayne County.
2) During the Middle Ages, the quality of roads was deteriorated.
3) The world's first snow plow was born in 1914.
4) Henry Ford was one of Wayne County's first Road Commissioners.
5) In England the Statute for Mending the Highways required all members of the parish to spend four days a year working on mending the roads.

Ex. 6. *Find the topical sentence of each passage.*

Ex. 7. *Retell the text in short using topical sentences.*

Grammar exercises

Ex. 1. *Read the text once more. Find the participles in the text. State their forms and functions.*

Ex. 2. *Translate the sentences paying attention to the forms and functions of the participles:*

1. Much of the road-related technology invented by the Wayne County Road Commission we take for granted today.
2. Asphalt concrete pavements have the lowest initial cost when compared to other alternative pavement products.
3. It is a proven fact that asphalt concrete pavements are among the quietest in the world.
4. In 1900 there were less than 15 miles of paved roads in the world.
5. Road is a specially constructed route for wheeled vehicles.
6. In the Middle East, in Mesopotamia, scientists have found evidence of a network of roads dating back to perhaps 3000 BC.
7. By the late 18th century most European roads were haphazardly maintained, making winter travel difficult.
8. Testing the engine the engineer applied new methods.
9. While working at this new device, the inventor made numerous improvements.
10. Materials having a very high resistance are called insulators.

Oral practice:

Ex. 1. *Work in pairs. Read the dialogue, learn it by heart and act it:*

- Good morning, Mr. Brown.
- Good morning, Mr. Antonov. It's so nice to see you in London again. Won't you sit down?
- Thank you.
- Have a cigarette?
- No, thank you. I don't smoke.
- Oh, good! I don't smoke either, actually. A cup of coffee, then?
- With pleasure!
- I'll tell Mary to bring us the coffee, and then we'll get down to business, shall we?

Learn this:

to get down to business – приступить к делу

Ex. 2. *Complete the dialogues inserting necessary words and phrases:*

- Hello, George. Pleased to meet you. _____?
-___, Nick! I'm fine, thanks. And how are you?
- Thanks, not so well.

- How____, Mr. Brown? It's nice to meet you. I'm Dick Smith, your new student.
- How do you do, Dick. Glad to meet you too. _____?
- I'm from Brighton.

Text 3 Invention of Asphalt

Pre-text exercises

Ex. 1. *Read the following words* (*mind the rules of pronunciation*)

Asphalt, traffic, aspect, concrete, product, project, demonstrate, depend, invent, quality, quantity, quick, equip, equipment, unique, technique, picturesque, device, designer, provide, climate, life, time, height.

Ex. 2. *Give the corresponding* verbs*, and translate according to the model.*

Model: invention—›to invent *(изобретать)*

Situation, formation, organization, exploitation, inspection, consideration, operation, application.

Ex. 3. *State to what part of speech the following words belong:*

Valuable, extremely, heady, construction, simply, invention, inventor, driver, wonderful, especially, special, primary, considerable, discovery, condition.

Ex. 4.*Guess the meaning of the words in italics:*

To drive – *driver*; warm – *warmth*; store – *storage*; to investigate – *investigator*; a question – *to question*; a place – *to place*; to decide – *decision*; strange – *a stranger*.

Ex. 5. *Read the international words and guess their meaning:*

Professor, asphalt, university, emigrating, patent, natural, boulevard, engineer, maximum, park, avenue, minor, cement, industry, construction, expert, special, pioneer, million, mile.

Read the text and translate it. The vocabulary notes following the text will help you:

Professor Edward J. de Smedt invented modern road asphalt in 1870 at Columbia University in New York City after emigrating from Belgium. He patented it (U.S. Nos. 103,581; -2) and called it "sheet asphalt pavement" but it became known as French asphalt pavement.

A natural rock known as asphalt had been used to construct buildings for many years. In 1824 large blocks of natural asphalt rock were placed on the wide boulevard in Paris known as the Champs-Élysées. This was the first time this type of rock was used for a road.

On 29 July 1870, the first sheet of Edward de Smedt's asphalt pavement was laid on William Street in Newark, New Jersey. He then engineered a modern, "well-graded," maximum-density road asphalt. The first uses of this road asphalt were in Battery Park and on Fifth Avenue in New York City in 1872. Five years later 54,000 square yards of sheet asphalt from Trinidad Lake were used on Pennsylvania Avenue, Washington D.C.

Today almost all the roads in developed countries are surfaced with De Smedt's man-made asphalt. Asphalt comes from the processing of crude oils. The word asphalt comes from the Greek "asphaltos," meaning "secure". Everything that is valuable in crude oil is first removed and put to good use. Then what remains (hydrogen and carbon compounds with minor amounts of nitrogen, sulfur, and oxygen) is made into asphalt cement for pavement.

Not much is known about the life of Edward de Smedt and pictures of him are extremely rare - perhaps his fame has been occluded by such heady stars of the road construction industry as John Loudon McAdam and Thomas Telford, but experts on the history of road building will always have a special spot in their hearts for "Teddy" De Smedt, without whom our roads would simply not be the same today.

Ribbons of firm, well-drained, smoothly paved roads and highways are ready to take you and your family anywhere you want to go, thanks to the construction methods pioneered by three Scottish engineers and the invention Edward de Smedt's man-made asphalt. In the year 1900 there were less than 15 miles of paved road in the world. Today, we have millions of miles of paved roads and streets.

Vocabulary

1. patent	патентовать
2. pavement	мостовая
3. sheet	покрытие
4. engineer	проектировать, строить
5. surface	обрабатывать поверхность
6. process	подвергать процессу
7. crude	сырой, необработанный
8. oil	нефть
9. secure	прочный, надежный
10. remove	удалять
11. hydrogen	водород
12. carbon	углерод
13. nitrogen	азот
14. sulfur	сера
15. oxygen	кислород
16. occlude	преграждать
17. pave	мостить

18. drain осушать
19. highway автомагистраль, автострада

Assignments:

Ex. 1. *Answer the following questions:*

1. What did Professor Edward J. de Smedt invent in 1870?
2. How did Edward J. de Smedt call his invention?
3. What had a natural rock known as asphalt been used to construct?
4. When and where were large blocks of natural asphalt rock used for the first time?
5. Where was the first sheet of Edward de Smedt's asphalt pavement laid?
6. What did Edward de Smedt engineer then?
7. Where were the first uses of this road asphalt?
8. What does asphalt come from?
9. What does the word asphalt mean?
10. What is known about the life of Edward de Smedt?
11. How many miles of paved road were there in the world in 1900?
12. How many miles of paved road do we have today?

Ex. 2. *Match English and Russian equivalents:*

1. patent	a) проектировать, строить
2. sheet	b) впервые
3. surface	c) скоростное шоссе
4. pave	d) патентовать
5. oil	e) покрытие
6. secure	f) нефть
7. highway	g) прочный, надежный
8. for the first time	h) мостить
9. develop	i) обрабатывать поверхность
10. engineer	j) развивать

Ex. 3. *Complete the sentences with the words and phrases listed below:*

1. Professor Edward J. de Smedt invented… .
2. He patented it (U.S. Nos. 103,581; -2) and called it "…".
3. A natural rock known as asphalt had been used to … for many years.
4. In 1824 large blocks of natural asphalt rock were placed on the wide boulevard in Paris … .
5. He then engineered a modern, "well-graded", maximum-density … .
6. Today almost all the roads in developed countries are surfaced with … .
7. Asphalt comes from the processing of… .
8. The word asphalt comes from the Greek "asphaltos" … .
9. Then what remains (hydrogen and carbon compounds with minor amounts of nitrogen, sulfur, and oxygen) is made into … .
10. Today, we have millions of miles of … .

De Smedt's man-made asphalt, road asphalt, known as the Champs-Élysées, crude oils, meaning “secure”, asphalt cement for pavement, paved roads and streets, to construct buildings; “sheet asphalt pavement” modern road asphalt.

Ex. 4. *Give English equivalents for the following words and word combinations:*

Запатентовать изобретение, изобретение асфальта, использовался, чтобы строить здания, первое использование асфальта, почти все дороги в развитых странах покрыты асфальтом, обработка нефти, слово асфальт происходит от греческого «asphaltos», асфальтированные дороги и автострады.

Ex. 5. *Translate the sentences paying attention to the infinitive constructions:*

1. We know Professor Edward J. de Smedt to have invented modern road asphalt.
2. A natural rock is known to have been used to construct buildings for many years.
3. The engineers have shown this substance to be unique in its properties.
4. The workers expect the designers to improve the operation of this device.
5. We want them to compare the results of the experiments in time.
6. The engineer heard the workers discuss a new design.
7. Today almost all the roads in developed countries are known to be surfaced with De Smedt’s man-made asphalt.
8. Asphalt is certain to come from the processing of crude oils.
9. We expect the scientists to study this problem.
10. The engineers seem to work at the problem of road building.
11. Asphalt pavements prove to be the safest pavement alternative.

Ex. 6. *Make up sentences based on the text using the following phrases*:

To invent modern road asphalt, a natural rock known as asphalt, to construct buildings, asphalt pavement, to be used for a road, large blocks of natural asphalt rock, this was the first time, to engineer a modern road asphalt, to be surfaced with asphalt, the processing of crude oils, to put to good use, to be made into asphalt cement for pavement, the road construction industry, in developed countries, smoothly paved roads and highways, thanks to the construction methods.

Ex. 7. *Divide the text into logical parts and find the topical sentences of each part.*

Ex. 8. *Write a short summary of the text.*

Ex. 9. *Summarize the general ideas developed in all the texts.*

Ex. 10. *Prepare to take part in a conference. Make a report on one of the following problems:*

1. Early history of roads.
2. Professor Edward J. de Smedt and his invention.

Oral practice:

Ex. 1. *Read the dialogue:*

PART OF A BUSINESS TALK

- According to the catalogue, this model can be used for several purposes. Does that mean that you want a higher price?
- Well, the price will largely depend on the number of machines you're going to order.
- We need twenty now, but we may require many more in the near future.
- I think we could agree on the $1000 per unit. Would that suit you?
- Yes, I think so.
- Believe me, it is, without any doubt, the best equipment you can get at this price.
- Oh, yes, it meets all our requirements. There's another problem I'd like to settle today. The point is we want to have the machines very soon, not later than April.
- Well, that wouldn't be easy, but we'll make every effort to do it for you. Anything else?
- No. That's all, I think. The rest can be left to our assistants. Do you mind?
- Not at all. Oh, it's half past one already! Will you join me for lunch?
- Oh thanks, with pleasure.

Learn this: Do you mind? – Вы не возражаете?

Ex. 2. *Make up your own beginning of the dialogue and act it.*

PART II. PAVEMENTS

Text 4 Aerodromes

Pre-text exercises

Ex. 1. *Mind the rules of pronunciation:*

1) [ai]: device, designer, provide, climate, life ,time, height, science, try, derive, arise, fiber, library;

Pay attention to the pronunciation of the word height [hait];

2) *Read the words, paying attention to ”qu”:*

[kw]: quality, quantity, quick, equip, equipment, question, sequence, quite, require;

[k]: unique, technique, picturesque.

Ex. 2. *Pronounce the following words paying attention to the stress marking:*

´climate – cli´matic; ´industry – in´dustrial; ´atom – a´tomic; ´ocean – oce´anic; ´atmosphere – atmos´pheric

Ex. 3. *State to what part of speech the following words belong:*

Durability, reliability, quality, quantity, situation, conditions, formation, organization, exploitation, inspection, consideration, operation, application, directly, greatly, highly, primarily, particularly, totally, development, equipment

Ex. 4. *Practise the reading of the international words and say what Russian words helped to guess their meaning:*

Factors, structure, materials, construction, method, climatic, modern, design, aerodrome, normative, practical, situation, exploitation, adequate, inspection, result, expert, test, compressive, standards, control, organization, expansion, hydrogeological, seasonal, formation, temperature, system, transmit.

Read the text and translate it. The vocabulary notes following the text will help you:

Efficiency and durability of aerodromes’ pavements are formed by many factors: pavement’s structure, materials that the pavement was made of, construction method, climatic conditions and undercarriages’ impact.

Fatigue strength of aerodrome pavements’ bases

Modern methods of calculation and designing of aerodrome pavements are based on the conception of watertightness, thus their reliability, durability and efficiency mainly depend on the cracking-resistance. Under observing of all building conditions pavements should provide normative life time. However, in practical situations this is impossible mainly *because* after 2-3 years of exploitation pavements become non-watertight. In such conditions adequate performance of pavements is impossible without drainage layers.

Attention to the quality of slabs

The inspection results of some airdromes performed by experts revealed inadequate quality of new prestressed slabs placed instead of worn slabs. The PAG-14, PAG-18 slabs and cores that were taken from them were tested. The experts found out that most slabs failed the crack, compressive and frost resistance tests. The other deviations from standards were revealed. To avoid this situation it is necessary to control the quality of incoming slabs involving independent organizations to ensure the objectivity of control results.

Airdrome pavement with "Penopleks"

"Penopleks" extrusion foamed polystyrene slabs are successfully used in airdrome construction applied to apron expansion. In difficult hydrogeological conditions (high groundwater level, heaving soils in seasonal frost penetration area) the subgrade was constructed from non-heaving material and "Penopleks 45" slabs. The application of these slabs allowed to lower the height of heat-insulating embankment and to avoid cutting that would entail considerable expense. "Penopleks" slabs can also be used in the area of automotive and railway construction, foundation and ground floor heat insulation.

New deicing methods for aerodrome pavements

Preventing from ice covering of the runway is one of the actual problems of aerodromes' maintenance in winter period. The matter of ice formation can be solved at the expense of the Earth's low-potential abyssal heat. Taking into consideration the fact that ice-covering on the aerodromes' pavements can be formed mainly at the temperature from 0° to -6°C, the temperature voltage of the abyssal heat (approximately 8-100 C) is enough to prevent ice covering. It can be done using the system that transmits Earth's abyssal heat to pavements in required quantity and with the least capital and operational outlays.

Vocabulary

1. undercarriages	шасси
2. impact	влияние
3. fatigue strength	предел усталости
4. watertightness	водонепроницаемость
5. cracking-resistance	трещиностойкость
6. drainage	дренаж, осушение
7. slab	плита, пластина
8. prestressed	предварительно напряженный
9. frost resistance	морозостойкость
10. deviation	отклонение от стандартов
11. extrusion	экструзия, выталкивание, вытеснение
12. foamed polystyrene	пенополистерол
13. heave	вздыматься
14. frost penetration	промерзание
15. subgrade	грунт, грунтовое основание

16. heat-insulating — теплоизоляционный
17. heat insulation — теплоизоляция
18. embankment — насыпь
19. deicing — борьба с обледенением
20. runway — взлетно-посадочная полоса
21. abyssal — абиссальный, глубинный
22. outlays — издержки

Assignments

Ex. 2. *Answer the following questions:*

1. What factors are efficiency and durability of aerodromes' pavements formed by?
2. What are modern methods of calculation and designing of aerodrome pavements based on?
3. What should pavements provide under observing of all building conditions?
4. What did the inspection results of some airdromes performed by experts reveal?
5. What did the experts find out?
6. Why is it necessary to control the quality of incoming slabs?
7. What is successfully used in airdrome construction?
8. What did the application of these slabs allow to do?
9. Where can "Penopleks" slabs also be used?
10. What is one of the actual problems of aerodromes' maintenance in winter period?
11. What is enough to prevent ice covering? How can it be done?

Ex. 3. *Check up your knowledge of the following terms:*

1. fatigue strength	a) взлетно-посадочная полоса
2. watertightness	b) борьба с обледенением
3. drainage	c) насыпь
4. slab	d) водонепроницаемость
5. frost penetration	e) дренаж, осушение
6. subgrade	f) плита, пластина
7. heat insulation	g) водонепроницаемость
8. embankment	h) предел усталости
9. deicing	i) промерзание
10. runway	j) теплоизоляция

Ex. 4. *Choose the right word:*

1. Modern methods of calculation and designing of aerodrome pavements are based on the conception of … .

a) cracking-resistance; b) frost resistance; c) watertightness.

2. After 2-3 years of exploitation …. become non-watertight.

a) pavements; b) runway; c) track.

3. In such conditions adequate performance of pavements is impossible without… .
a) fatigue strength; b) watertightness; c) drainage layers.
4. It is necessary to control the quality of … .
a) incoming slabs b) prestressed slabs c) worn slabs
5. Preventing from … of the runway is one of the actual problems of aerodromes' maintenance in winter period.
a) heat insulation; b) ice covering; c) frost resistance.

Ex. 5. *Match the word-combinations with their Russian equivalents listed below:*
Operational outlays; in required quantity; modern methods; climatic conditions; their reliability and efficiency mainly depend; taking into consideration; to prevent ice covering; building conditions; life time; aerodromes' maintenance; after 2-3 years of exploitation; to avoid this situation; to control the quality

Современные методы; климатические условия; их надежность и эффективность во многом зависят; строительные условия; срок службы; после 2-3 лет эксплуатации; чтобы избежать такой ситуации; контролировать качество; техническое обслуживание аэродромов; для предотвращения ледового покрытия; принимая во внимание; в необходимо м количестве; эксплуатационные издержки.

Ex. 8. *Make up sentences based on the text using the following phrases:*
Efficiency and durability of aerodromes' pavements; construction method; the conception of watertightness; normative life time; without drainage layers; the inspection results; inadequate quality of new prestressed slabs; worn slabs; the crack; compressive and frost resistance tests; to control the quality of incoming slabs; deviations from standards; frost penetration area; to avoid cutting; ice covering of the runway; aerodromes' maintenance; operational outlays.

Ex. 9. *Make up a list of all the words and phrases used in the text for describing aerodrome pavements*.

Ex. 10. *Find the topical sentence of each passage.*

Ex. 11. *Make up a short summary of the text out of the topical sentences. Use any of the following phrases:*
1. The subject of the text is … .
2. The author of the text says that … .
3. He points out that … .
4. Next the author emphasizes the idea that … .
5. The author goes on saying that … .
6. The text ends with … .
7. The author concludes that … .

Grammar exercises

Ex. 1. *Find the gerund and the gerund phrases in the text. State their forms and functions.*

Ex. 2. *Translate the sentences paying attention to the forms and functions of the gerund and the gerund phrases:*

1. Modern methods of designing of aerodrome pavements are based on the conception of water tightness.
2. Under observing of all building conditions pavements should provide normative life time.
3. Preventing from ice covering of the runway is one of the actual problems of aerodromes' maintenance in winter period.
4. After emigrating from Belgium Professor Edward J. de Smedt invented modern road asphalt in 1870.
5. Resurfacing is the process of installing a layer of asphalt over an existing asphalt area.
6. By sealing asphalt cracks promptly you can extend the life of your asphalt pavement.
7. It prevents water from seeping down to the base material.
8. It helps to withstand traffic without cracking.
9. Motor Roads Building is a building branch concerning design, building, repairs and maintenance of motor roads, approach roads and urban streets.
10. Henry Ford is often credited with spearheading the "Good Roads" movement of the early 1900's.

Oral practice

Ex. 1. *Work in pairs. Read the dialogue, learn it by heart and act it.*

Secretary: Mr. Brown's office. Good morning.
Antonov: Good morning. Can I speak to Mr. Brown, please?
Secretary: Just a moment. I'll put you through.
Brown: Brown here.
- Good morning, Mr. Brown. This is Antonov from Moscow. We bought some machines from you a few months ago.
- Yes. I remember. What can I do for you, Mr. Antonov?
- You see, Mr. Brown, we're having some trouble with one of the machines, and I'd like to see you about it.
- When would you like to come?
- The sooner the better. Will tomorrow morning be too early?
- No, it's quite all right. Will 10 o'clock in the morning suit you?
- Yes, perfectly. Till tomorrow, then. Good-bye.
- Good-bye.

Ex. 2. *Fill in the blanks with the words and phrases given below:*

Next morning

- … . I've got … with Mr. Brown for 10 o'clock. My name is Antonov.
- Just a moment, Mr. Antonov. I'll tell Mr. Brown you're here. … and wait a little?
- Thank you.

- Here is Mr. Antonov to see you. He's got an appointment for exactly ten. It's a quarter to ten. He's a bit… .
- That's … all right. Please ask him to come in, …?
- Right!

Words and phrases: will you, perfectly, early, won't you sit down, an appointment, good morning.

Text 5 Benefits of Asphalt

Pre-text exercises

Ex 1. *Mind the rules of pronunciation:*

[e]: demonstrate, depend, invent, fresh, century, welcome;
[æ]: asphalt, traffic, aspect, action, abstract, understanding;
[ɔ]: concrete, product, project, common, context, long, respond, solve;
Pay attention to the pronunciation of the word asphalt [ˊæsfælt].

Ex. 2. *Pay attention to the meaning and pronunciation of the words:*

concrete [ˊkɔnkri:t] – concreat [kənˊkri:t]
concrete [ˊkɔnkri:t] бетон, бетонировать, бетонный
– concreat [kənˊkri:t] сгущаться, затвердевать;
project [ˊprɔʤekt] проект – project [`prəˊʤekt] проектировать;
conduct [ˊkɔndəkt] проведение – conduct [kənˊdʌkt] проводить;
subject [ˊsʌbʤikt] предмет– subject [səbˊ ʤekt] подвергать

Ex. 3. *Read the key words translate them into Russian and try to memorize them:*

Asphalt, concrete, product, construct, during, improve, traffic, project, design, mix, cycle, remain, stone, measure, material, life, demonstrate, maintain, advantage.

Ex. 4. *Form nouns using the suffixes and translate them:*

-*er:* to design, to organize, to own, to teach, to work, to cool, to ride;
-*or:* to construct, to operate, to protect, to invent, to object;
-*ion:* to demonstrate, to complicate, to contribute, to consolidate, to express;
-*ment:* to pave, to measure, to improve, to pay, to agree, to move, to develop, to judge.

Read the text and translate it. For help see the vocabulary notes that follow the text:

Asphalt concrete pavements have the lowest initial cost when compared to other alternative pavement products, and its life cycle costs (when measured over the entire life of the pavement) are also lower than other competitive pavement products.

Asphalt concrete pavements constructed during the day are normally ready to have traffic that same day. This allows better access to adjacent businesses and improved traffic flow through and around the projects reducing user delay while continuing to construct the project. Asphalt concrete pavements are the smoothest pavements placed in the country today.

Asphalt concrete pavements can be tailored to the specific application during the design phase of the project allowing for the unique characteristics of each project. Design lives from 5 years to in excess of 30 years can be accommodated easily. For cost sensitive projects staged construction can be a viable design alternative with asphalt concrete pavements as a way to accommodate increased traffic flow while remaining sensitive to the structural integrity of the pavement.

It is a proven fact that asphalt concrete pavements are among the quietest in the world. Special asphalt mixes such as open graded friction courses, stone mastic aggregate mixes and rubberized asphalt consistently measure the lowest noise of all pavement types.

Together with the contrast of color between the white lines and the black pavement and the use of open graded surface course mixes that accelerate draindown and minimize splash and spray asphalt pavements prove to be the safest pavement alternative.

With the advent of new design strategies, improved characterization of material performance and improved construction techniques, asphalt concrete pavements can be designed for over 40 year lives. Studies are currently underway to demonstrate that properly maintained, longer life asphalt pavements can last indefinitely (some would say perpetually).

Asphalt concrete pavements are 100% recyclable. While we still do not take full advantage of the potential recyclability of asphalt pavements, asphalt is the most recycled material in the country.

Vocabulary

1. benefit	выгода; польза; преимущество
2. initial	начальный; исходный,
3. competitive	соперничающий, конкурентный,
4. traffic	движение; транспорт
5. adjacent	расположенный рядом, соседний
6. traffic flow	транспортный поток
7. delay	приостановка; простой

8. smooth	гладкий, ровный;
9. tailor	приспосабливать
10. accommodate	приспосабливать
11. staged	ступенчатый; этапный
12. viable	жизнеспособный
13. graded	ступенчатый; этапный
14. friction	трение
15. mastic	мастика, смола мастикового дерева
16. aggregate	объединять, соединять; сосредоточивать
17. consistently	в соответствии с, сообразуясь с, согласно
18. accelerate	ускорять, убыстрять
19. draindown	осушать, отводить воду; осуществлять дренаж
20. splash	забрызгивать; брызгать, плескать
21. perpetually	бесконечно, вечно
22. recyclable	пригодный для переработки

Assignments:

Ex. 1. *Answer the following questions:*

1. What do asphalt concrete pavements have when compared to other alternative pavement products?
2. What are asphalt concrete pavements constructed during the day normally ready to do that day?
3. What is the smoothest pavement placed in the country today?
4. What can asphalt concrete pavements be tailored to?
5. What can be a viable design alternative for cost sensitive projects?
6. What accelerates draindown and minimizes splash and spray asphalt pavements?
7. Why can asphalt concrete pavements be designed for over 40 year lives?
8. What studies are currently underway?
9. What is 100% recyclable?

Ex. 2. *Find the following expressions in the text and translate them into Russian:*

Asphalt concrete pavement, the lowest initial cost; other competitive pavement products, reduce user delay while continuing to construct the project, the smoothest pavements placed in the country today, a viable design alternative, to accommodate increased traffic flow, the structural integrity of the pavement, rubberized asphalt, accelerate draindown, improved construction techniques, 100% recyclable; properly maintained.

Ex. 3. *Give English equivalents for the following words and word combinations:*

Преимущество, асфальтовое покрытие дороги, самая низкая начальная цена, конкурирующее покрытие дороги, позволять (делать возможным) лучший доступ, улучшенный транспортный поток, приспосабливать,

ступенчатое, поэтапное строительство, структурная целостность, ускорять, убыстрять дренаж (отвод воды), передовые строительные технологии.

Ex. 4. *Fill in the blanks with the words and phrases from the text:*

1. Asphalt concrete … have the lowest initial cost when compared to other alternative … products.
2. Asphalt … pavements constructed during the day are normally ready to have … that same day.
3. Asphalt concrete pavements are the … pavements … in the country today.
4. Asphalt concrete pavements can be … to the … during the design phase of the project.
5. For cost sensitive projects staged construction can be … .
6. The use of open graded surface course mixes … draindown and … splash and spray asphalt pavements.
7. Asphalt concrete pavements are 100% … .
8. The life of asphalt pavements can … (some would say…).
9. We still do not take full … of the potential… of asphalt pavements.

Ex. 5. *Read the text and say if the following statements:*

- *true*
- *false*
- *there is no information in the text*

1. Asphalt concrete pavements have the lowest initial cost when compared to other alternative pavement products.
2. Asphalt concrete pavements are the smoothest pavements placed in the country today.
3. Preventing from ice covering of the runway is one of the actual problems of aerodromes' maintenance in winter period.
4. Asphalt concrete pavements can be designed for over 10 year lives.
5. Asphalt concrete pavements are 100% recyclable.

Ex. 6. *Give the main points of the text in three sentences.*

Ex. 7. *Retell the text: a) in short; b) in detail.*

Grammar exercises:

Ex. 1. *Find the infinitive in the text. State its forms and functions.*

Ex. 2. *Translate the sentences paying attention to the forms and functions of the infinitive:*

1. Road builders began to use asphalt to create a smooth, durable surface.
2. Although he was blind, John Metcalfe was able to design and build firm, three-layer roads.

3. We have three Scottish engineers and their improved road building techniques to thank.
4. The contractor needed to use dynamite to break out areas of the pavement.
5. To avoid this situation it is necessary to control the quality of incoming slabs.
6. A natural rock known as asphalt had been used to construct buildings for many years.
7. To work in this field of science was the main task of the engineer.
8. To conduct a series of experiments on the road building materials the engineers studied the results of some other experiments.
9. The designer must test the system to be used in the laboratory.
10. The student selected all the units to be used in the experiment.

Oral practice:

Ex. 1. *Read the dialogue:*

Brown: Good morning, Mr. Antonov. Pleased to meet you.
Antonov: Nice to meet you too.
- Won't you sit down?
- Thank you.
- Will you have a cup of coffee?
- With pleasure.
- (presses the button) Mary, will you bring us some coffee, please? -- So what exactly is the trouble, Mr. Antonov? We tested all the machines very carefully, and your inspectors were here during the tests, weren't they?
- Yes, that's true, and the machines operated normally for a time after we installed them at our factory. But towards the end of the first month we began to find some very funny defects in the products. I've got a list of them here. Will you have a look, please?
- Certainly. (He goes through the list) Yes, I quite agree with you. It's more than funny. You see, we've never had any trouble with this model. I'm afraid you'll have to go to the factory and discuss it there.
- Yes, actually I've thought of that, too. But I'm only staying here a week, and I wouldn't like to put off my visit to the end of my stay. The sooner I go the better.
- No problem, Mr. Antonov. It won't take me long to make arrangements. You'll be able to visit the factory tomorrow. How about that?
- Suits me perfectly! And how do I get to the factory?
- Just leave your telephone number with Mary. I'll ring you tomorrow morning, and we'll go there together.
- It's very kind of you, Mr. Brown. I'm really sorry to give you so much trouble.
- No trouble at all, Mr. Antonov. I'm interested too. Any more questions to ask me?
- No, that's all, thanks.
- Till tomorrow, then. Bye!

- Bye!

Ex. 2. *Divide the dialogue into logical parts. Make up short dialogues on the basis of the above one.*

Ex. 3. *Work in pairs. Learn your dialogues by heart and act them.*

Ex. 4. *Find the right cues to the statements given in the left column:*

1. A cup of coffee?	Suits me perfectly
2. I'm afraid I'll have to call off my appointment for today.	It's no trouble at all!
3. I'm sorry to give you so much trouble.	When do you think he'll be free?
4. Mr. Brown's in conference just now.	Shall I put you down for another day?
5. I'm a bit early, I'm afraid.	With pleasure.
6. We can go there right now. How about that?	That's perfectly all right.
7. Is that the Embassy?	Oh, has he? Give him my congratulations.
8. Fred's just got a new appointment!	Well, yes and no…
9. Are you pleased with your new appointment?	Yes, let's do it. Wednesday suits me perfectly well.
10. Let's make an appointment for 11 o'clock next Wednesday.	Quite right. What can I do for you?

Text 6 Asphalt Resurfacing

Pre-text exercises

Ex. 1. *Read the key words, translate them into Russian and try to memorize them:*
Resurfacing, pavement, water, cracks, asphalt, choice, process, install, exist, remove, replace, resurface, drainage, previously, extend, prevent, sand, growth, repair, weather, site, require, wind.

Ex. 2. *Read the following words* (*paying attention to the rules of pronunciation*):

Road, most, slowly, below, snow, plow, construction, brush, truck, bumper, much, such, some, place, pave, way, paint, rain, late, lay, grade, surface, purpose, serve, refer.

Ex. 3. *Give the verbs corresponding to the following nouns:*

Beginning, determination, exploration, expression, finishing, equipment, government, launching, lecturer, management, prediction, worker.

Ex. 4. *Form nouns from the following verbs:*

To appoint, to arrange, to demonstrate, to discuss, to classify, to elect, to enter, to graduate, to inform, to predict, to suggest, to teach, to write.

Read the text and translate it. The vocabulary notes following the text will help you:

In time, all pavements will fail. A cost effective and long term solution in many cases is to resurface the pavement. If you notice standing water on your pavement or large areas of cracks forming blocks in your pavement, asphalt resurfacing may be the right choice for you.

Resurfacing is the process of installing a layer of asphalt over an existing asphalt area. Resurfacing can give your parking lot or roadway the look and feel of new pavement; it can also extend the lifespan of the pavement without the expense and inconvenience of removing and replacing the entire area. However, *resurfacing* should not be confused with *seal coating*, which merely involves spraying a protective product on the surface of the asphalt.

Asphalt resurfacing is not always a viable option. In situations such as significant structural deterioration, an inadequate sub-base, poor drainage conditions, or areas that have been resurfaced several times previously, resurfacing may not be advisable. In other cases, resurfacing can only be recommended when combined with options such as grinding, the addition of geotextile fabric, or full-depth repairs. After a careful evaluation of your existing pavement, our expert estimators will recommend the best options for your situation.

Crack Filling

Crack filling is the placement of materials into non-working or low movement cracks to reduce the infiltration of water and other materials into the cracks. When done properly, crack filling can extend the life of your pavement. By sealing cracks in your pavement you prevent water from entering, sand and rocks from making their way to the surface, minimize crack growth, and help stop new cracks from forming. Treating the problem areas while they are small is the key to proper crack filling. Crack filling pays for itself by delaying expensive asphalt resurfacing.

By sealing asphalt cracks promptly you can extend the life of your asphalt pavement, in many situations with proper maintenance you can double the expected life.

Asphalt Patching/Repair

Patching potholes is a common repair. Potholes occur when water gets into pavement through unsealed or improperly sealed cracks. Then when the weather gets cold the water freezes and expands, as a result the crack is enlarged. When the weather warms the ice melts and the water dissipates leaving a void which then collapses and forms a pothole. Depending on the season and site location, typical repairs involve filling the potholes with either hot or cold asphalt mix and leveling.

Patching potholes may require patching during poor winter weather conditions. In these situations the repair should be considered temporary and a good strategy is to plan for a more permanent repair when the weather improves. Asphalt edge failures happen when the edge of the pavement breaks up. Edges failures can be caused by traffic loading at the edge of the pavement, infiltration of water, aggressive-growth vegetation, and wind from the atmosphere or traffic. The presence of edge failures can accelerate the normal deterioration of pavement and should be repaired as soon as possible.

Vocabulary

1. pavement	дорожное покрытие
2. fail	истощаться, вырабатываться, растрачиваться
3. long-term	долгосрочный
4. solution	решение
5. resurface	покрывать заново; асфальтировать заново (дорогу)
6. crack	трещина
7. parking lot	место стоянки автотранспорта
8. roadway	проезжая часть дороги
9. lifespan	долговечность; срок службы
10. inconvenience	беспокойство, неудобство
11. entire	полный, целый, весь
12. confuse	смешивать, путать
13. sealcoat	грунт; верхний водоизолирующий слой
14. merely	только, просто; единственно
15. viable	жизнеспособный
16. option	выбор, альтернатива, (возможный) вариант
17. significant	значительный, существенный
18. deterioration	ухудшение (состояния или качества), повреждение
19. inadequate	неадекватный; не отвечающий требованиям; недостаточный
20. sub-base	основание

21. drainage	дренаж; сток
22. grinding	дробление, измельчение, размалывание, шлифование
23. geotextile fabric	геотекстильная структура
24. filling	наполнение; засыпка; заливка
25. properly	должным образом; как следует; правильно
26. sealing	заделка; запайка; заварка; закрытие, закупорка
27. treat	обращаться, обходиться; обрабатывать, подвергать действию
28. delay	откладывать; отсрочивать
29. patch	ставить заплату; латать
30. pothole	выбоина, рытвина, яма (на дороге)
31. enlarge	увеличиваться, расширяться
32. dissipate	рассеивать
33. void	пустота; лакуна, пустое место
34. leveling	выравнивание
35. moderate	умеренный
36. permanent	постоянный, долговременный; перманентный
37. edge	кромка, край
38. failure	повреждение
39. infiltration	просачивание, проникновение
40. accelerate	ускорять, убыстрять

Assignments:

Ex. 1. *Answer the following questions:*

1. What is a cost effective and long term solution in many cases when the pavement fails?
2. What is resurfacing?
3. What look can resurfacing give a parking lot and a roadway?
4. What should resurfacing not be confused with?
5. What does sealcoating involve?
6. In what situations may resurfacing be not advisable?
7. When can resurfacing be recommended?
8. What is crack filling?
9. What crack filling can extend the life of the pavement?
10. When do potholes occur?
11. What do typical repairs involve depending on the season and site location?
12. What can edges failures be caused by?

Ex. 2. *Give the Russian equivalents for the following:*

A cost effective and long term solutionб to resurface the pavement, notice standing water, installing a layer of asphalt over an existing asphalt area, parking lot or roadway, extend the lifespan of the pavement, inconvenience of removing and replacing the entire area, to involve spraying a protective product on the

surface of the asphalt, significant structural deterioration, an inadequate sub-base, poor drainage conditions, the addition of geotextile fabric, crack filling, to reduce the infiltration of water and other materials into the cracks, filling the potholes with either hot or cold asphalt mix and leveling.

Ex. 3. *Translate into English:*

Дорожное покрытие, долгосрочное решение, асфальтировать (дорогу) заново, существующий асфальтовый участок, значительное структурное ухудшение, формировать рытвины и колдобины, продлить жизнь (срок службы) дорожного покрытия, заделка (заливка) трещин.

Ex. 4. *Fill in the blanks with the words and phrases from the text:*

1. In time, all pavements will … .
2. *Resurfacing* is the process of … .
3. … should not be confused with … .
4. … merely involves spraying a protective product on the surface of the asphalt.
5. When…, crack filling can extend… .
6. By … in your pavement you prevent water from…, sand and rocks from making their way to the surface, minimize crack growth, and help stop new cracks from … .
7. By … asphalt cracks promptly you can … the life of your asphalt pavement.
8. Asphalt edge failures happen when … .
9. … can be caused by traffic loading at the edge of the pavement, infiltration of water, aggressive-growth vegetation, and wind from the atmosphere or traffic.
10. … can accelerate the normal of pavement and should be repaired as soon as possible.

Ex. 5. *Read the text and say if the following statements are:*

- *true*
- *false*
- *there is no information in the text*

1) In time, all pavements will fail.
2) *Resurfacing* is the placement of materials into non-working or low movement cracks.
3) By sealing asphalt cracks promptly you can extend the life of your asphalt pavement.
4) A natural rock known as asphalt had been used to construct buildings for many years.
5) Potholes occur when water gets into pavement through unsealed or improperly sealed cracks.

Ex. 6. *Make a list of all the words and phrases used in the text for describing asphalt resurfacing.*

Grammar exercises

Ex. 1. *Translate the sentences paying attention to the non-finite forms of the verb:*

1. The ancient Greeks, cherishing the independence of their city-states and opposing centralization, did relatively little road making.
2. The Romans developed engineering techniques that were not equaled for another 1,400 years.
3. Roman roads were usually straight, and composed of large flat stones, topped with a layer of gravel and a hard surface.
4. In England the Statute for Mending the Highways (1555) required all members of the parish to spend four days a year working on mending the roads.
5. He also devised a method to analyze how thick the road stones had to be to withstand the weight and volume of the horses and carriages that were common in his day.
6. "Tarmacadam roads" became the standard used everywhere until the 1870s.
7. To avoid this situation it is necessary to control the quality of incoming slabs involving independent organizations to ensure the objectivity of control results.
8. The application of these slabs allowed to lower the height of heat-insulating embankment and to avoid cutting.
9. To avoid this situation it is necessary to control the quality of incoming slabs involving independent organizations to ensure the objectivity of control results.
10. The application of these slabs allowed to lower the height of heat-insulating embankment and to avoid cutting.
11. Asphalt concrete pavements constructed during the day are normally ready to have traffic that same day.
12. Today almost all the roads in developed countries are surfaced with De Smedt's man-made asphalt.
13. Asphalt comes from the processing of crude oils.
14. The word asphalt comes from the Greek "asphaltos", meaning "secure".
15. A cost effective and long term solution in many cases is to resurface the pavement.
16. Depending on the season and site location, typical repairs involve filling the potholes with either hot or cold asphalt mix or leveling.
17. It must be strong enough to withstand heavy dynamic loads.
18. The macadam method of road building uses a layer of well drained and compacted subsoil to support the load weight of the roadway.
19. It had a good record for standing up to time and the elements.
20. Sealcoating acts as a waterproofing agent, minimizing the rate at which water enters the asphalt.
21. Grader is an engineering vehicle with a large blade used to create a flat surface.
22. Graders are commonly used in maintenance of unpaved roads and road construction to prepare the base course to create a wide flat surface for the asphalt to be placed on.

23. Pavement Management is a term used professionally in the Civil Engineering community to describe the process of managing pavement.

Ex. 7. *Find the topical sentence of each passage.*

Ex. 8. *Retell the text: a) in short; b) in detail.*

Oral practice:

Ex. 1. *Work in pairs. Read the dialogue, learn it by heart and act it.*

- Operator: Hello, Frank and Brothers, How can I help you?
- Peter: This is Peter Jackson. Can I have extension 3421?
- Operator: Certainly, hold on a minute, I'll put you through...
- Frank: Bob Peterson's office, Frank speaking.
- Peter: This is Peter Jackson calling, is Bob in?
- I'm afraid he's out at the moment. Can I take a message?
- Yes, could you ask him to call me at 212 456-8965. I need to talk to him about the Nuovo line, it's urgent.
- Could you repeat the number please?
- Yes, that's 212 456-8965, and this is Peter Jackson.
- Thank you Mr. Jackson, I'll make sure Bob gets this ASAP.
- Thanks, bye.
- Bye.

Learn this:
ASAP (as soon as possible) - как можно скорее

Ex. 2. *Work in pairs. Make up your own dialogues using the following expressions;*

a) Представление себя:
This is Helen. - Это Елена
Helen speaking - Говорит Елена

b) Просьба представиться:
Can I take your name, please? - Представьтесь, пожалуйста.
Can I ask who is calling, please? - Простите, могу я узнать, кто звонит?

c) Просьба соединить с кем-либо:
Can I have extension 321? - Соедините меня с номером 321.
(extensions –это внутренние номера в компании)
Could I speak to...? - Могу я поговорить с …
(Can I – менее официальная просьба / May I – более официальная просьба)
Is Jack in? – Джек в офисе?

d) Предупреждение о соединении с кем-либо:
I'll put you through - Я вас соединяю.
Can you hold the line? - Не вешайте трубку.
Can you hold on a moment? - Не могли бы вы немного подождать?
Если с абонентом нельзя соединить в данный момент:
I'm afraid ... is not available at the moment - Боюсь, сейчас я не могу вас соединить.
The line is busy... - Линия занята
Mr. Jackson isn't in...
Mr. Jackson is out at the moment... - Мистера Джексона сейчас нет на месте.

e) Предложить оставить информацию:
Could (Can, May) I take a message? - Я могу ему что-то передать?
Could (Can, May) I tell him who is calling? - Я могу ему передать, кто звонил?
Would you like to leave a message - Вы хотели бы оставить информацию?

Ex. 3. *Summarize the general ideas developed in all the texts.*

Ex. 4. *Prepare to take part in a conference. Make a report on one of the following problems:*

1. Aerodromes' pavements.
2. Asphalt concrete pavements.
3. Asphalt Repair.

ROAD BUILDING

АВТОМОБИЛЬНЫЕ ДОРОГИ. СТРОИТЕЛЬСТВО

Учебно-методическая разработка по развитию иноязычной компетенции
(английский язык) для студентов 2-го курса
направления 270 800 Строительство
(профиль – автомобильные дороги и аэродромы)

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