Developing English Skills for Students of Civil Engineering

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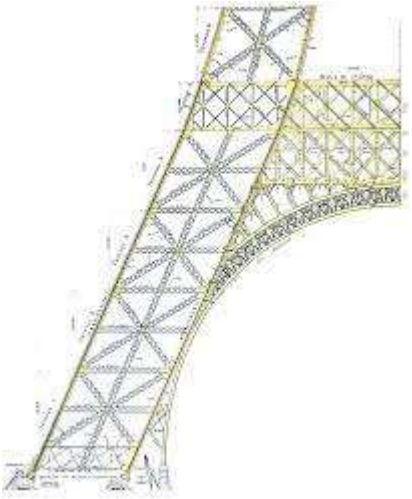
Zagreb, 2021

Contents:

1. The magician of iron – Gustave Eiffel

https://www.youtube.com/watch?v=rYgxAKXuvKI



Erected for Paris exhibition of 1889 the 1000 feet tall tower of Gustave Eiffel ____1._____today the most popular tourist attraction in Paris, a __2._____tribute to one of the most ___3._____engineers of 19th century.

Eiffel was born in Dijon in 1832, the son of a prosperous family in the ____and ____business. After the graduation from the Engineering School he joined the railroad _____company and by 1926 was _____the building of railroad bridge _____the Giron river at Bordeaux.

He _____ his own company and enjoyed the growing reputation as a careful builder of factories and bridges most of which were constructed using ____iron.

His bridge over the Druoro river in Portugal gracefully _____across a 200 foot deep gorge with _____supported span, 500 feet long.

When F.B. _____his Statue of Liberty, his gift to US, needed help supporting his coppership_____, he turned ____ young G.E. Result was wrought iron _____that has stood firm for a century.

As plans for a centennial celebration of the French revolution ____to materialise, E. held the competition for 300 tall tower to serve as a _____for exhibition. He won, hands down. Enthusiasm was not_____, however. A petition from some of France's most _____artists and sculptors protested with all their might, with all their indignation against the erection of _____, monstrous E tower in the heart ___ the capital.

Using 2000 sections _____at his plant in the Paris suburbs, Eiffel erected a tower ____ over 2 years. It was a huge hit. Two million _____visitors in the next few months virtually wiped-out builder's _____.

In his later years G.E. _____the gigantic locks of ill-fated French Panama Canal company. As that _____, he became interested in aeronautics_____ wind tunnel for testing the propellers. He died in 1923.

Translate:

G. Eiffel je stvorio glavno obilježje Pariza. 15. prosinca 1832. u Dijonu rođeni inženjer omogućio je svojom tehnikom gradnje sa željezom konstrukciju građevina o kojima je čovječanstvo prije moglo samo sanjati. 300 metara visok toranj u Parizu, koji je dobio ime po njemu, svojedobno najviša građevina, nastao je povodom svjetske izložbe 1889., te je slavljen kao čudesno djelo tehnike i napretka. Koristeći svoja iskustva u gradnji mostova, Eiffel je dao tornju, koji je u 16 mjeseci izgrađen od prethodno izrađenih elemenata, najveću moguću vjetropropusnost, tako da je mogao izdržati i najjače oluje. Eiffel, koji je također razvio i čelični skelet za kip slobode u New Yorku, bavio se od 1890. u svom laboratoriju na gornjoj platformi Eiffelovog tornja sa aerodinamičkim problemima. On je umro

CORRECT OR COMPLETE

1. A curtain wall constructors were using _____as an outer covering of a building.
2. A deck structure was been built as _____
3. A skeleton of the building is consisted of horizontal elements…..
4. The Marseille aqueduct completed in 1847.

2. Brunelleschi's Dome

Comprehension exercise

https://www.youtube.com/watch?v=_IOPlGPQPuM

Materials used:_____

Structure itself: _____

Construction members: _____

Machinery used: _____

Skills: _____

Procedure used: _____

Time line:_____

Who was Brunelleschi?_____

Mystery: _____

Layout:_____

Translation exercise:

Izgradnja kupole – prethodne konstrukcijske tehnike

Prije Brunelleschijeve ideje za kupolu „Duoma“, izgradnja samopotporne konstrukcije veličine kupole Duoma bila je nemoguća. Tehnike koje su Rimljani koristili pri izgradnji konstrukcija kao što je Panthenon već su davno bile zaboravljene, a u Brunelleschijevo doba jedan način za izgradnju kupole te većine bilo je korištenje kontrafora koji su bili odbačeni u talijanskim konstrukcijama.

Nakon izgradnje katedrale „Santa Maria del Fiore“ postalo je jesno da će izgradnja kupole biti veliki pothvat znanosti i inženjerstva. „The Opera de Duomo“ , koja je nadzirala gradnju , raspisala je natječaj za onog tko može riješiti problem postavljanja kupole na vrh katedrale. Pristiglo je par konstruktivnih ideja koje su sadržavale zapunjavanje središta katedrale sa zemljom i izgradnja kupole na vrhu te nakupine, kako bi zamijenili potrebne podupore, ali Brunelleschi koji je otišao u „Operu“ s nacrtima, a skriveni plan u kojem tvrdi da može izgraditi kupolu bez podupora, nije detaljno razradio.

Unatoč njegovoj tajanstvenosti, odabrali su Brunelleschijev plan, i radovi na Brunelleschijevoj kupoli mogli su započeti.

Kada je Brunelleschi započeo izgradnju svoje kupole većina je ljudi u Firenci odmahivala rukom i govorila da je to nemoguće. Nije postojao zamisliv način izgradnje kupole te veličine koja bi bila samopotporna. Brunelleschi je bio neustrašiv te je njegov plan počeo poprimati oblik.

Brunelleschijev nacrt sadržavao je dvije ljuske, unutarnja ljuska izgrađena je od lakog materijala i vanjske ljuske od teškog materijala otpornog na vjetar. Izgradnjom dvije kupole Brunelleschi je riješio problem težine prilikom izgradnje jer su radnici mogli sjediti na unutarnju konstrukciju dok su gradili vanjsku konstrukciju kupole.

Kao potporanj kupoli Brunelleschi je postavio famozni prsten i rebrasti potporanj od hrastovine. Iako se ovaj princip često primjenjuje u modernog izgradnji, njegova ideja i razumijevanje da sile trebaju držati kupolu bila je revolucionarna. Prstenovi idu oko oba dijela kupole, a potpornji dijelovi kroz njih. Osim par zamjena dotrajalog drveta, potpornjaci i dalje nose cijelu kupolu.

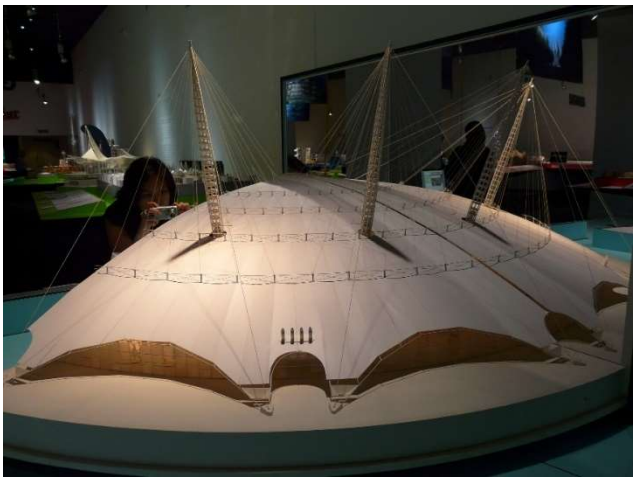
Fill in the words:

The _____ used domes but, moving _____ to the 6th century, the great dome Sofia _____ the compression dome near _____ practical limits.
Buckminster Fuller built octahedrons _____ of lightweight materials.
The interior is left free of structural _____ which makes it ideal structure for _____ large groups of people.
The geodetical domes have found many _____ as botanical gardens and sport-arenas.
The materials _____ steel, fiberglass, plastic or reinforced concrete.

Correct the sentences where it is necessary and translate Croatian parts

1. The use of technology influenced on architecture an engineering.
2. An engineer Rondlet in 19th century codifyed projectant methods which can make it possible to satisfy society needs.Schinkel started using difficult steel elements for the town Berlin in 1816, on the begining of his engineering career.
3. A bridge was completed by Wilson s design.
4. Telford ended his career with wearhouses on the st Catherine port in London.
5. Pored upotrebe u katedralama, porijeklo ojačanja od kovanog željeza kod zidanih konstrukcija nalazimo u Parizu u18 stoljeću.
6. In the meanwhile the earliest french application of iron for bridge had appeared with the building of Pont des Arts over Seine, erected by the design of Cessart on 1803.
7. In areas of pressure brick naturally predominated.
8. žičano pojačanje

What are new domes like? **Describe the following pictures:**




Host Venue

3. Skyscrapers

https://www.youtube.com/watch?v=ybRXUq9L6RUKKqc

Listening exercise:

Each group of students has to list down the following

1. **Group: name famous skyscrapers**
2. **Group: structural parts**
3. **Passive structures**
4. **Group: materials**

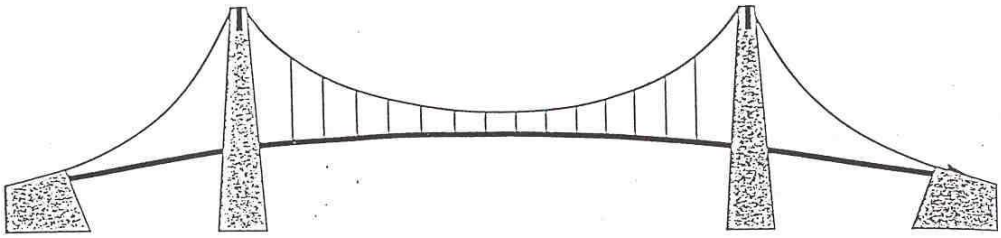
Write down the words you detected during listening:

Zidani materijali

Ogranicenja u gradnji

4. More about bridges

Let's Build a Bridge!



What materials do we need?

1. **Student Bridge Parts**
2. **A Working Bridge Parts Vocabulary**

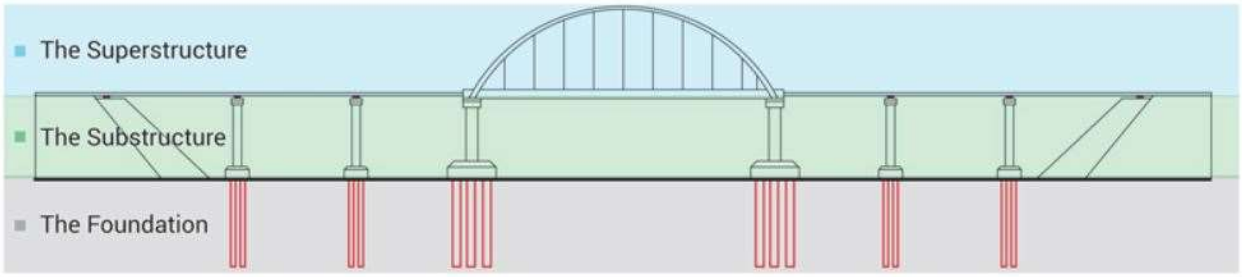
Key Vocabulary Words

A. Main (Top) Cable
B. Suspender Cable
C. Towers
D. Anchors
E. Tension
F. Compression
G. Gravity

Simulation of the Menar Bridge construction in Algiers – Summing up all the terms through the history of the Menar birdge construction

https://www.youtube.com/watch?v=zQT_Yty2muE

METHODS A-d	MATERIALS E-H	STRUCTURAL MEMBERS I-M	CONSTRUCTION PHASES N-Z



Designing your own bridge

Write down what an engineer and a designer will need to think about to ensure your bridge is safe and serves the correct purpose. Rank them in order of importance. Think about the load, purpose, width, span, who/what is crossing it?

What checks will need to be done to make sure the bridge remains safe and stable (checks on joints, checks on materials to check they haven't crumbled (concrete) or corroded (steel).

Materials

1.

2.

3.

Safety

1.

2.

3.

Load

1.

2.

External forces

- Thermal_____, for example _____
- Mechanical _____
- Wind _____
- _____

Write down what an engineer and a designer will need to think about to ensure your bridge is safe and serves the correct purpose. Rank them in order of importance. Think about the load, purpose, width, span, who/what is crossing it?

Translate

Izgradnja mostova može predstavljati velike poteškoće. Obično temelji stupova moraju počivati na čvrstoj podlozi, često ispod vode. Jedan način rada u ovim uvjetima je pomoću zagata. Stupovi napravljeni od isprepletenih čeličnih ploča su zabijeni u vodenu podlogu. Voda je zatim ispumpana iz ograđenog područja.

Drugi način je upotreba pneumatskog keisona. To je veliki cilindar sa donjim rubom koji može urezati vodenu podlogu. Oni moraju biti korišteni vrlo pažljivo. S jedne strane, radnici mogu ostati u kompresijskoj komori vrlo kratko. S druge strane, ako prebrzo izrone do atmosferskog pritiska obole od kesonske bolesti uzrokovane prevelikom količini dušika u krvi. Kada je Istočni most preko Misisipija bio u izgradnji – od 1867. do 1874., za vrijeme kada opasnosti rada u pneumatskom kesonu nisu bile znane, 14 ljudi je umrlo zbog toga.

Kada je u stupovima potrebna dodatna snaga, oni se ponekad nekad zabijaju u stjenovito dno. Ova metoda je korištena za izgradnju Golden Gate mosta u San Franciscu, koji se mora nositi sa snažnim morskim strujama i jakim vjetrovima, te se nalazi u zoni potresa. Bušenje pod vodom izveli su ronioci.

Na mjestima gdje stjenovito dno ne može biti dosegnuto, stupovi su zabijeni u vodenu podlogu. U naše vrijeme stupovi se obično grade od prednapetih betonskih greda. Jedan domišljat način, korišten u izgradnji Tappan Zee mosta preko rijeke Hudson u New Yorku, je polaganje šuplje

betonske kutije navrh stupova. Kada se kutija osuši, postaje dovoljno plutajuća da bi mogla podržati veliki dio težine mosta.

a)Correct or substitute the technical words mostly used :

b) Find out what is technically wrong in description:

PAY ATTENTION TO SUBSTITUTE THE COMMON WORD WITH THE TECHNICAL ONE

Pile is an reinforced concrete member that serves as a footing or as a supporter of the bridge. The distance between the piles is counted in a way…..

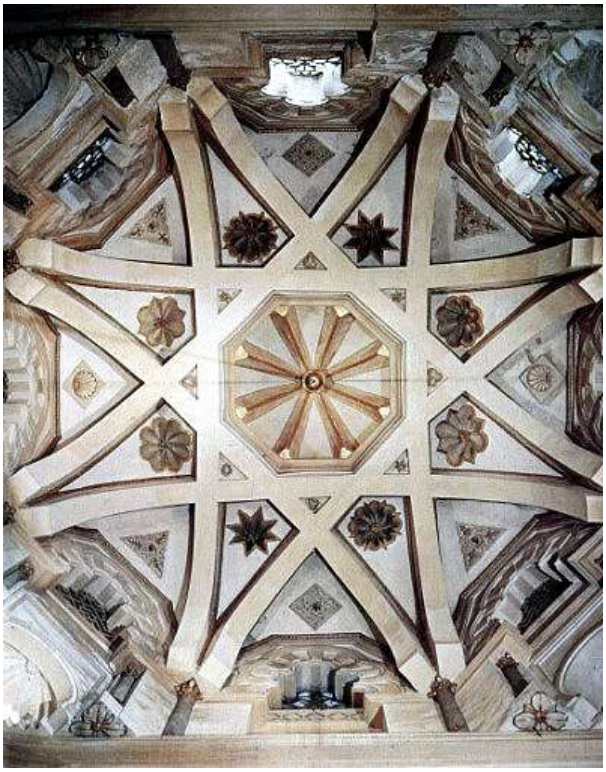
They are used to serve to transfer the weight between each (pojedinih) slabs and to….

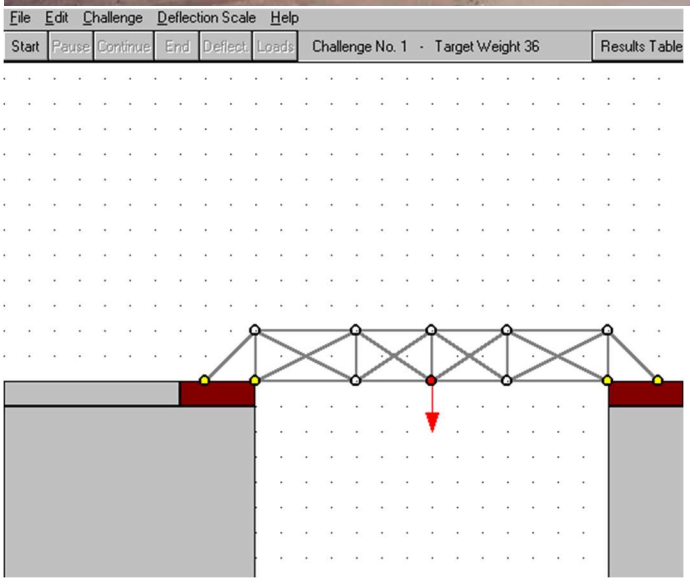
Tubes of dowels are short steel pipes that assure the mechanical connection…...

The dowels help the transfer of weight by helping neighboring slabs to grow and tighten ……

The pillars of the bridge have been made really deep in the seabed.

Revision of vocabulary – name the structural members or the actions you see in the pictures:

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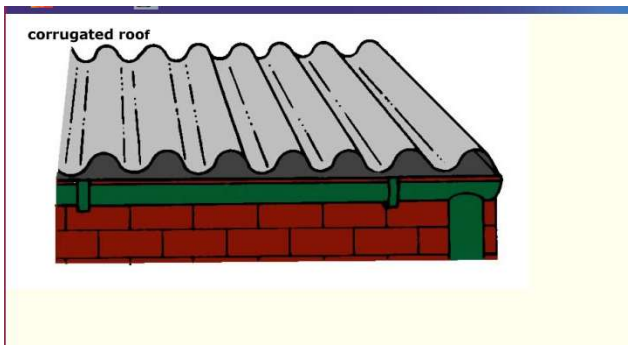
Start Pause Continue End Deflect Loads
Challenge No. 1 - Target Weight 36
Results Table



Wilmington Harbor Sheet Pile - View behind pile as project nears completion.

5. Wembley Stadium – an Arching Ambition

https://www.youtube.com/watch?v=tyluS4TZKhQ

Fill in the gaps while listening:

Towering spectacularly over west London the biggest _____ arch in the world _____ for 21 km across the city.

_____ this record breaking ____ is the most expensive ____ arena ever ____ - Wembley stadium.

This extraordinary engineering ____ ows much of ____ glory to some surprising engineering _____: a _____, a 19 century ____, a rock climber's _____, ____ gold cram and stealth _____.

How all those made _____ stadium possible?

_____ that vast arch ____ a giant 11 acre roof that _____ 90 000 seats. Each seat has _____ spectacular view. It _____ the architects and engineers __ their limits.

One of the biggest challanges was _____ every one of the 90 000 seats _____, comfortable, _____- and each with the perfect view of the ____ and with no _____, like ____ supporting the roof.

The solution ____ building a massive arch that would _____ the roof from above, so no more _____.

Norman Forster, one of the world's _____ architects wanted to build an arch that would _____ on London ____. It was ____ to be the largest single span roof _____ ever ____. Not only was this ever been tried before, but as this was ____ of the icon, the eyes of the world were not only on ____ , but as well as the engineering.

At 133 m tall Wembley is the only stadium in the world _____ beacons for _____ aircraft.

Building the arch was not the only _____; _____ up there was no walk in the park.

The engineers at Wembley ____a ____. They couldn't use traditional ____ to ____ the arch. At 1700 tons, the ____ of 700 jumbo jets, it was just too ____.

The answer to their problem ____ in a mountineer's ____ and the ____ connection ____ me to the bottom of the cliff. Climbing _____ takes me thorugh the ____. the knot is going to be ____ part .

It's called a Prussik knot ____ in 1931 by Austrian mountaineer Karl Prussik.

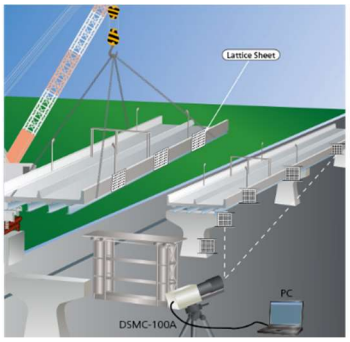
A couple of these knots are going _____ me up this ____ cliff with the ____ taking all the ____.

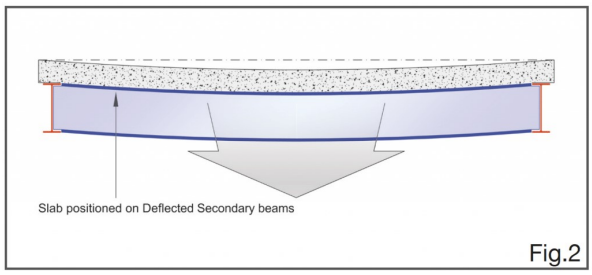
Basically, there's a lot of _____, it will hold the load. Friction stops me ____ but ____ myself on 2 of these knots _____ together, at any given _____, the load is ____ by one of them. It's got 1 anchor points, the ____ one, the ____ one.

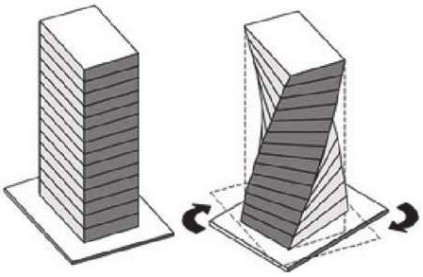
Importantly these knots _____ a secure way _____a free hanging world, making the

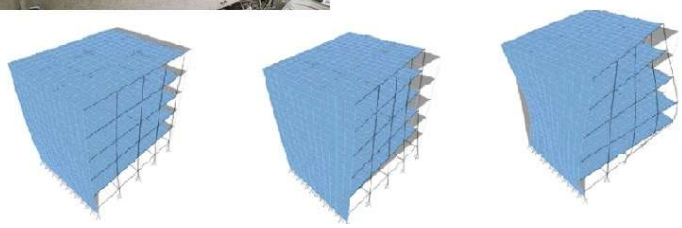
m life ____ for mountaineers.

Match the words with the following pictures: sagging, displacement, buckling, thrust, joist, twisting









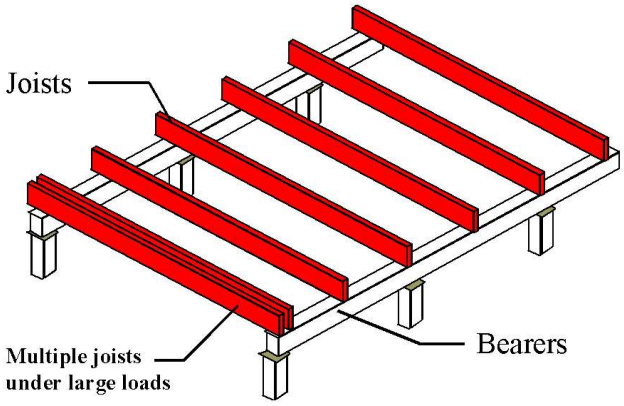

Joists
Bearers
Multiple joists
under large loads


Fig 3.

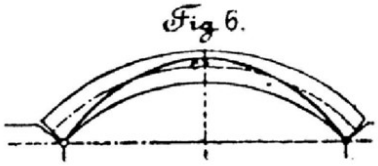


Fig 6.

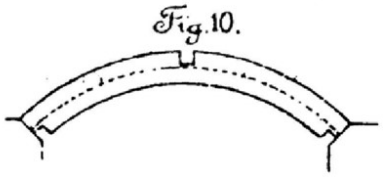


Fig.10.

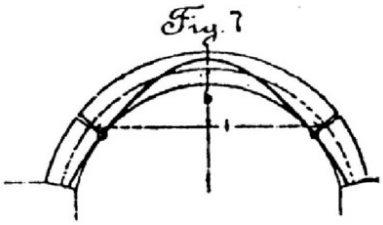


Fig. 7

Find mistakes in the following sentences:

- Post tensioning eliminates concretes' tensile weakness.
- Joseph Monier , a gardener, was the second concrete pioneer of France.
- The pressing of the significant theoretical studies by German theorists Neumann and Könen on stresses of reinforced concrete has definitely confirmed the German leadership in this type of construction.
- There are many different types of **braces** that are shaped like letters V, K, X, and they are used to stiffen the konstruction
- **Jointed** connections are easier to perform than welded connections.
- Abutment is bridge"s substructure element which role is to connect main girder and soil.
- Constructors are doing the first part of a project.
- The building lays on concrete walls, known as stiff walls
- It`s most simple tensional structure.
- If you take an old-fashioned nutcracker, with two arms hinged at the middle, and hang a weight from the hinge (Figure 11.2) you will have such a compressive structure, which acts as a simple arch.

6. What is construction management about?

Listen to the video and fill in the table:

https://www.youtube.com/watch?v=Pc40yA0eyZo

Exoplain the meaning of the pictures below

CONSTRUCTION PARTS	SPECIALISATIONS WITHIN CONSTRUCTION MANAGEMENT	TRANSLATE INTO ENGLISH	TRADESMEN	PHRASAL VERBS AND IDIOMS
		Graditelj nekretnine		
		Priključci za struju, vodu i plin		
		projekt		
		Postaviti temelje		

Tasks of a construction manager:

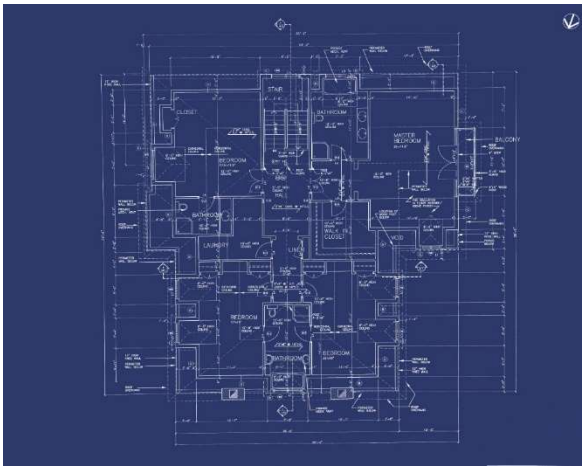
- coordinating a project from start to finish
- organizing the process
- paying attention to details
- an ability to see the "big picture"
- he should have a wide face of skills and knowledge
- organizing costs and budget
- an understanding of all facets of the construction process
- being an intermediary between his clients and his workers
- have the ability to motivate and exact good work
- knowing when a change in plans already suggest is worth fighting and when it is not

intermediary- a person who acts as a link between people in order to try and bring about an agreement; a mediator

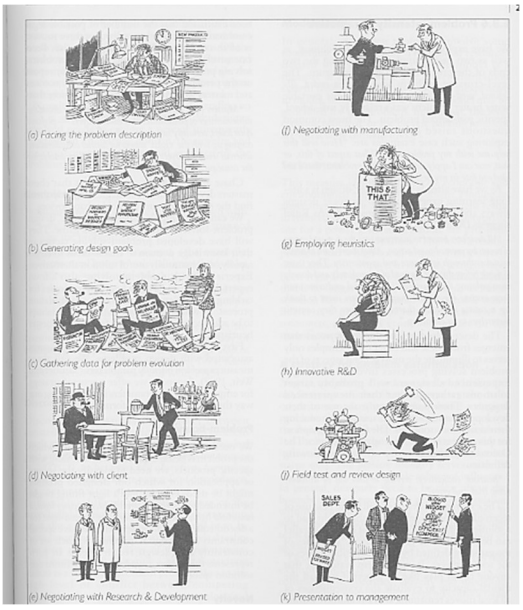
Contractors-a person or firm that undertakes a contract to provide materials or labour to perform a service or do a job

Plumbing-the system of pipes, tanks, fittings, and other apparatus required for the water supply, heating, and sanitation in a building

Blueprint- a design plan or other technical drawing



Give your comment of the drawings a – k



Translate:

Svi koji rade u građevinskoj industriji moraju se moći nositi s pritiskom koji dolazi s tim poslom, ponekad i s ogromnim pritiscima. To se jednako odnosi i na radnike, šefove, arhitekte i projektante. Uvijek je riječ o velikom novcu, kratkim rokovima i žestokoj konkurenciji, pa su povišeni tonovi na sastancima uobičajena pojava.

Make whole sentences with the required words or translate:

1. What are alternative words for changes? ________________________
2. Restraints not BUT ¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬____________________
3. Low rise and Highrise refer to ___________________
4. Planovi u slučaju nužde (vremenskih ili ratnih nepogoda)_________________
5. Hanging BRIDGE NE NEGO________________
6. steel slab NOT BUT_______________
7. project construction NOT BUT _________________
8. competition for a project is –____________________
9. Niskogradnja/visokogradnja- ______________________
10. Synonym for “Starting up a project” is _____________________
11. Stambeni kvart NE MORA BITI NOVO NASELJE: TO SU 2 DIVERGENTNA POJMA, A NE ISTA
12. Stambeni kvart ______________
13. Novo naselje _______________________
14. We are stuck again with: konstrukcija I izgradnja: Big projects are often made of precast concrete, not but __________________________
15. Znacenje rijeci graditelj _____________________-

7. A new face of Civil Engineering

http://www.youtube.com/watch?v=cfyljO564yk

1. **Listen to the following video clip**

   a) **How would you shape curriculum vitae of the presented engineer and what are his ideas about CE's misson in general?**

   b) **Which words can be associated with which prompts?**

joined	develop
interested	attention
focus	rely
do	provide
look for	expertise

tackle	failure
research	dedicated

2. Which words and phrases refer to enviromental engineering?

3. Translate:

a) Rješavanje kompleksnih problema

b) Interdisciplinarno istraživanje

c) Zajednica

d) Zabilježba uspjeha i neuspjeha

e) Pružiti rješenje

f) Međusobno povezani sustav

g) Razviti rješenja

h) Predvidjeti stranke u sporu

i) Izvannastavne aktivnosti

j) Fokusirati se na studij

k) Predsjednik upravnog odbora

l) Društveni rad

m) Glavni sustav za prikupljanje vode

n) Pitka voda

o) Imati pristup čistoj vodi

p) Resursi vode

4. **How many places did he move to through his life?**
5. **Where is he living now?**

8. Are you ready to build a better world?

https://www.youtube.com/watch?v=j4-LWkLwoNs

1. Complete definitions:

C.E is _____art_____

C.E. is _____pushing_____

C.E. is _____fabric_____

C.E. is _____sense_____

C.E. is _____

2. Find phrasal verbs:

Create _____

Provide _____

Deal with _____

Influence _____

Sign __ ___

3. Detect expressions for:

Snabdijevati vodom

Istraživanje

Mjerilo

Najzahvalnije zanimanje

Stažiranje

Predanost poslu

Zajednica

Sudjelovanje u projektu

Promijeniti okoliš (do not use change)

Isušivanje

Zadivljujući poduhvat

Apsolvent građevine

Suočiti se s nečime

Upravljati projektom

Ovlašteni inženjer

4. Which iconic structures do you recognize in the video?

5. What is the end goal of the video?

6. What do I like about C.E?

7. What do you not get in accountancy, but you get in C.E.?

LISTENING EXERCISES – TECHNICAL AND BUSINESS VOCABULARY


project charter-feasible.mp3


Track 4.mp3


decision.mp3

Track 6

Translate:

Initiate

Feasible

Project charter

Project overview

II PLANNING

Find expressions for:

Raspodijeliti izvore (novca)

Predvidjeti troškove

Procijeniti faktore rizika

Izvođenje projekta

Uručivanje projekta

Planovi u slučaju nužde

Track 6

Match while listening:

intiate	
feasible	
overview	
Lay out	
allocate	
forecast	
evaluate	
develop	
on	
within	

Track 7

Translate:

Voditi intervju

Usmjeriti se na_____

Uključiti

Track 10 - Team leadership

Complete expressions in the Track 10

Caoutious about_____

Parameters should be _____

Approve of _____

Achieve _____

Present _____

_____the circumstances

Provide _____

_____process was _____

Leadership focuses _____

Brief _____

Sample Collocations

There are several different types of collocation. Collocations can be adjective + adverb, noun + noun, verb + noun and so on. Below you can see seven main types of collocation in sample sentences.

1. adverb + adjective

- Invading that country was an **utterly stupid** thing to do.
- We entered a **richly decorated** room.
- Are you **fully aware** of the implications of your action?

2. adjective + noun

- The doctor ordered him to take **regular exercise**.
- The Titanic sank on its **maiden voyage**.
- He was writhing on the ground in **excruciating pain**.

3. noun + noun

- Let's give Mr Jones a **round of applause**.
- The **ceasefire agreement** came into effect at 11am.
- I'd like to buy two **bars of soap** please.

4. noun + verb

- The **lion** started **to roar** when it heard the **dog barking**.
- **Snow was falling** as our **plane took off**.
- The **bomb went off** when he started the car engine.

5. verb + noun

- The prisoner was hanged for **committing murder**.
- I always try to **do my homework** in the morning, after **making my bed**.
- He has been asked to **give a presentation** about his work.

6. verb + expression with preposition

- We had to return home because we **had run out of money**.

- At first her eyes **filled with horror**, and then she **burst into tears**.
- Their behavior was enough to **drive anybody to crime**.

7. verb + adverb

She **placed** her keys **gently** on the table and sat down.

Mary **whispered softly** in John's ear.

I **vaguely remember** that it was growing dark when we left.

Crrect typical mistakes

I listened the music.

Older people just need time to recognize good music and they stopped when they saw that many people are thrilled with what they hear.

Some people discussed about the music.

They enjoyed in the music.

I can not say that I am interested about the music.

Literature:

Charles Sheppard Skyscrapers, Todtri, 2008

Valerie Lambert and Elaine Murray Everyday Technical English, Longman 2008

Mark Ibbotson, Professional English in Use, Cambridge University Press, 2009

Evan Frendo, English for Construction, Pearson, 2015