



Issues for the Master's diploma exam

Field of study: **Civil engineering**

Area of study (specialization) **Construction Engineering and Management (CEM)**

Building Engineering	
No.	Issues
1	List and describe the most important steps of structural design process. Perform the comparison of mechanical characteristics of main constructional materials.
2	BIM in construction - characteristics, application possibilities
3	Aluminum-glass facades and other materials (eg. sandwich panels)
4	Idea of sustainable building and Idea of Passive building - basic and design requirements (location, shading, technical requirements etc) /
5	Heat gains and losses in building, overheating

Building Materials	
No.	Issues
1	Division and examples of high buildings known to you
2	Execution technology and description Burch Dubai building
3	Description of the tallest building in your country
4	Fiber reinforced concrete and ultra-high performance concrete
5	Industrial ground floors

Construction Engineering and Management	
No.	Issues
1	Stages of the construction process and persons responsible for their compliance with legal provisions
2	Types of FIDIC contract conditions including the risk distribution aspect
3	Outsourcing in construction
4	The specificity of recruiting employees in the current state of the economy
5	Elements of a good business plan
6	The idea of waste according to Lean Management
7	The usefulness of FMEA analysis in making decisions
8	Flexible approach in construction - practical application
9	The "bull whip" effect in the supply chain aspect
10	The importance of marginal cost in increasing the production of a given good
11	Advantages and disadvantages of ISO 9001 quality management system certification in construction companies
12	Execution of seamless thermal insulation system
13	Rules for determining the cooperation of transport machines
14	Methods of installing reinforcement
15	Strengthening the construction excavation
16	Technical requirements for architectural concrete



17	Types of vertical and horizontal transport machines
18	Prestressed constructions technologies
19	Stability conditions of retaining walls
20	Sheet piling - types of anchorages
21	Methods of assembling steel and concrete tanks
22	Methods of assembling steel constructions - general division
23	Rules for expansion joints in industrial floors
24	Glass facades - basic assembly rules
25	Rules for the performance and acceptance of the performance of internal plasters
26	Assembly, assembly components, assembly methods, types and techniques.
27	Designing assembly processes
28	Advantages and disadvantages of using traditional (formwork) formwork
29	Procedure in the event of a construction disaster
30	Basic parameters of assembly machines. Types and rules for the selection of assembly cranes
31	Types of investment effectiveness analysis methods
32	Excavator classification
33	Rules for shaping excavation slopes
34	Performing earthworks in winter conditions
35	Strengthening the slopes of permanent and temporary excavations
36	Criteria for determining the date of deformation of reinforced concrete structures
37	Methods of mounting masts and towers.
38	Assembly methods for integrated structures in multi-storey buildings
39	Construction documentation
40	Health and safety at earthworks / assembly / concrete / reinforcement works
41	Rules for the use of rollers: smooth, pickled on pneumatic
42	Legal conditions for the implementation of the demolition of building structures. Rules for the transport of concrete mix
43	Elements of logistics at the construction site
44	Network method in construction planning.
45	Work organization methods. Advantages and disadvantages of methods
46	Types of construction Schedule
47	Rules for the transport of concrete mix
48	Transportation of the concrete mix within the construction
49	Elements of building site development and the order of their location in design and implementation
50	The use of simulation methods in managing construction processes
51	Deming principles
52	Development stages in the field of quality engineering
53	Quality management tools
54	Rules for using control cards in quality management
55	Total Quality Management models



Transport Issues	
No.	Issues
1	Transportation problem - assumptions and algorithm
2	Assignment method - assumptions and algorithm
3	Fundamental diagram of traffic flow
4	Mathematical modelling
5	Linear programming - graphical method

Analysis and Design of Construction	
No.	Issues
1	Selection of static scheme for typical building and engineering constructions (columns, beams, plates, slabs, frames, shells)
2	Modeling of loads in building structures: dead load, live load and accidental loads, load combinations
3	Basic requirements for buildings and buildings construction according to Eurocode
4	Slenderness, buckling length and buckling effect in compressed elements
5	Natural frequencies and resonance effect in building structures
6	Design principles and dimensioning of steel structures and concrete structures. The interaction of steel and concrete
7	Rules for forming connections between elements of building structures. Designing the connection of the structure with the foundation and analysis of the interaction of the structure with the subsoil
8	Rules for shaping building and engineering structures (buildings, industrial halls, floors, masts, etc.) and ways to ensure spatial rigidity of the structure.