Polskie Stowarzyszenie Gipsu

Instytut Technologii Eksploatacji – Państwowy Instytut Badawczy

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Installation of dropped ceiling systems 712[06].S1.04

Teacher's Guidebook

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This Guidebook provides methodological guidance for the modular unit program 712[06].S1.04 “Installation of Dropped Ceiling Systems”, being a part of the modular training program for the occupation of Bricklayer 712[06].

Publisher:
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1. INTRODUCTION

We are providing you with a “Teacher’s Guidebook” - “Installation of Dropped Ceiling Systems”, which will help teachers in conducting lessons within the school training in the occupation of Bricklayer (712[06]).

The Guidebook contains:

- prerequisite skills,
- list of occupational skills that a student acquires in the course of the training,
- samples of lesson scenarios,
- recommended tasks which aim at teaching a student practical skills,
- list of literature that students can use in the process of training,

It is recommended that different teaching methods should be used in the process of training with particular focus on:

- demonstration with explanation,
- guiding text method,
- learning through projects,
- practical classes.

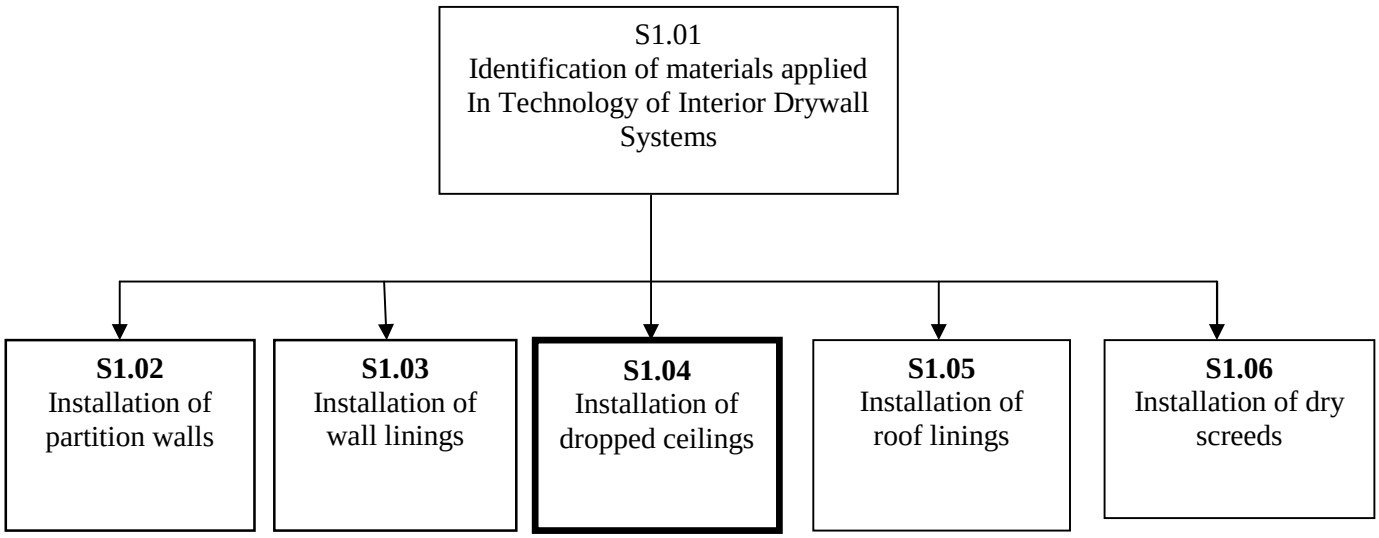
The forms in which students’ work is organised can vary, ranging from students’ independent work to team work.

In order to check students’ knowledge and skills, the teacher can use test tasks included in Chapter 6 and containing different types of tasks.

The said Chapter contains also:

- test plan in a tabular form,
- evaluation scale (points) for tasks and grading scheme,
- proposed grading standards,
- instructions for the teacher,
- instructions for a student,
- answer sheet,
- set of test tasks.

Diagram of modular units



2. PREREQUISITE SKILLS

Before starting the modular unit program “Installation of dropped ceiling systems”, a student should be able to:

- use technical building terminology,
- read and construe technical building drawings,
- use technical building documentation,
- organize the workplace in line with rules of ergonomics and safety,
- ensure the proper transportation of building materials,
- use different sources of information,
- identify materials used in technology of interior drywall systems,
- prepare gypsum mortar,
- select tools and equipment for assembly works,
- take basic measurements in building works,
- make scaffolding for building works.

3. LEARNING OBJECTIVES

Upon completion of the modular unit program, a student should be able to:

- prepare the workplace for installation of dropped ceiling systems,
- prepare a place where materials for the installation of dropped ceiling systems can be stored,
- ensure the proper transportation of materials used for dropped ceiling systems,
- determine the positioning of dropped ceilings,
- prepare and cut to size the boards used for dropped ceiling systems,
- select and assemble steel profiles appropriate for the installation of dropped ceiling systems,
- attach the plasterboards to the steel profiles,
- fit insulation material between the boards,
- complete finish works such as filling, finishing internal angles, board cleaning,
- observe occupational health and safety rules, fire regulations as well environmental law requirements.

4. SAMPLES OF LESSON SCENARIOS

Lesson scenario 1

Person in charge: …….
Modular training program: Bricklayer 712[06]
Specialisation module: Technology of Interior Drywall Systems 712[06].S1.
Modular unit: Installation of dropped ceiling systems 712[06].S1.04

Subject: Selecting of a supporting structure for a dropped ceiling.

General Objective: Getting familiar with materials and structures used for supporting structures of plasterboard –made dropped ceilings.

Upon completion of the training, a student is able to:
- identify types of supporting structures used in dropped ceiling systems made of plasterboards,
- explain the way in which a supporting structure is selected for dropped ceiling systems made of plasterboards,
- identify the structure of particular types of dropped ceilings.

Teaching-learning methods:
- guiding text method.

Forms of student's work organisation:
- individual work,

Teaching aids:
- sets of tasks developed by the teacher for students,
- instruction how to use the guiding text method,
- guiding questions,
- drawing instruments.

Time: 150 min.

Lesson plan:

Task for a student
The aim of the task is to identify supporting structure solutions for dropped ceilings made of plasterboards.

PRELIMINARY STAGE
Activities related to the organisation and management of the lesson, giving the lesson subject, familiarising students with the guiding text method.

PROPER STAGE
INFORMATION GATHERING
1. When is the use of dropped ceiling systems justified?

2. What conditions of the dropped ceiling performance determine the fact that their execution is different from, e.g. partition walls?
3. What types of supporting structures are used in dropped ceilings made of plasterboards?
4. What conditions are taken into account when a supporting structure for a dropped ceiling is designed?
5. What types of supporting structures are selected for dropped ceilings made of plasterboards?

PLANNING
1. Determine the time needed for the task completion.
2. Establish the sources where one can find information on dropped-ceiling system technologies.

ARRANGEMENTS
1. The teacher and students establish the sequence of activities.
2. Students are provided with the resources indispensable for task completion.
3. The teacher determines criteria of the completed work.

TASK PERFORMANCE
1. Write a list of materials used for making supporting structures for dropped ceilings.
2. Identify conditions of plasterboard performance in dropped ceilings.
3. Identify conditions which must be taken into account when a supporting structure for dropped ceilings is designed.
4. Draw cross-sections of commonly used supporting structures for dropped ceilings.

CHECKING
1. Were the selecting criteria of a supporting structure identified correctly?
2. Were the supporting structures for particular kinds of dropped ceilings identified correctly?

FINAL STAGE

Students and the teacher together indicate which stages of the task turned out to be most difficult for them. The teacher sums up the whole task and points out the new important skills which were developed in the course of the task performance as well as shortcomings which occurred.

Homework

In available sources find drawings or photographs depicting different plasterboard-made supporting structures of dropped ceilings. Bring the materials you have found and present them in the classroom.

The way to receive feedback from students after the classes have ended:
- anonymous evaluation sheets concerning the way of conducting the classes, difficulties encountered during the task, acquired skills and reference materials used,
- analysis of students' activity during the classes.

Lesson scenario 2

Person in charge: …….
Modular training program: Bricklayer 712[06]
Specialisation module: Technology of Interior Drywall Systems 712[06].S1.
Modular unit: Installation of dropped ceiling systems 712[06].S1.04

Subject: Installation of a cross-tee two-level supporting structure for a dropped ceiling made of plasterboards.

General Objective: developing skills of assembling a supporting structure for a dropped ceiling made of plasterboards.

Upon completion of the training, a student is able to:
- select materials and equipment needed for the installation of a dropped ceiling supporting structure,
- organize the workplace for the assembly in line with the occupational safety rules,
- assemble a cross-tee two-level supporting structure,
- assess the work completed by himself.

Teaching-learning methods:
- demonstration with instructions.

Forms of student's work organisation:
- team work,

Time: 240 min.

Teaching aids:
- a model of a supporting structure,
- technical documentation,
- profiles,
- accessories,
- basic measuring equipment,
- electric screwdriver,
- drilling machine,
- industrial safety rules,
- reference material from Chapter 7 of Techer's Guidebook.
- drawing instruments.

Lesson plan:
1. Organizational issues.
2. Referring to the lesson subject, discussing lesson objectives.
3. Industrial safety instruction.
4. Organization of the workplace for task performance.
5. Following the lesson plan:

PHASE 1
The teacher:

- familiarizes students with technical documentation of a dropped ceiling,
- discusses a selected type of a supporting structure,
- determines positioning of the dropped ceiling,
- marks location of the supporting structure elements,
- selects materials (profiles, accessories) and tools,
- fixes profiles to structural elements of the room.

PHASE 2

-selected students assemble the supporting structure

PHASE 3

- all students assemble the supporting structure fragment,
- the teacher assesses assembly activities performed by students.

After the assembly has been completed, students ask questions, express doubts and voice problems.

The end of the lesson:

1) each student indicates his strengths and weaknesses,
2) the teacher analyzes students' works and decides whether the task was performed correctly.
3) students present their works in the sequence they were performed.
4) a team together with the teacher assess their work.

5. TASKS

5.1. Dropped ceiling systems

5.1.1. Tasks

Task 1

Identify the elements of the dropped ceiling system depicted in a drawing provided by the teacher.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:

To do this task a student should:

1) get familiar with the structure of dropped ceilings fixed on CD60 profiles (reference material from Chapter 4.1.1),
2) get familiar with a drawing provided by the teacher,
3) identify elements of the dropped ceiling structure depicted in the drawing,
4) present the completed task,
5) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:

- demonstration with instructions,
- the guiding-text method

Teaching aids:

- reference material from Chapter 4.1 of Student's Handbook,
- drawing instruments,
- drawings of dropped ceiling systems.

Task 2

Draw a projection and a cross-section of a ceiling lining installed on CD60 profiles.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:

To do this task a student should:

1) get familiar with the structure of a ceiling lining installed on CD60 profiles (reference material from Chapter 4.1.1),
2) organize the workplace for task performance,
3) draw a projection and a cross-section of a wall lining,
4) present the completed task,
5) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:
- demonstration with explanation,
- the guiding-text method

Teaching aids:
- sketch pad, size A4,
- drawing instruments,
- reference material from Chapter 4.1 of Student's Handbook.

Task 3

Classify dropped ceiling systems made in the technology of drywall systems from the point of view of the supporting structure assembly.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:

To do this task a student should:

1) get familiar with the types of dropped ceiling systems fixed on profiles (reference material from Chapter 4.1.1),
2) get familiar with the drawings or photographs provided by the teacher,
3) organize the workplace for task performance,
4) on each drawing/photograph write in the type of the dropped ceiling supporting structure,
5) present the completed task,
6) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:
- demonstration with explanation,
- the guiding-text method

Teaching aids:
- sketch pad, size A4,
- reference material from Chapter 4.1 of Student's Handbook,
- paper clips,
- drawings or photographs of ceilings.

5.2. Steps in the installation of dropped ceiling systems

5.2.1. Tasks

Task 1

On the basis of the technical documentation for the room, determine the positioning of a dropped ceiling of one-level structure. Mark this position on all four structural walls.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:
To do this task a student should:

1) get familiar with the techniques of fixing profiles in the dropped ceiling structure (reference material from Chapter 4.2.1),
2) get familiar with the pre-determined level of the dropped ceiling in the room,
3) organize the workplace for task performance,
4) select profiles, accessories and equipment needed for fixing profiles,
5) fix the profiles to a one-level structure,
6) present the completed task,
7) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:
- demonstration with explanation,
- the guiding-text method,
- practical tasks.

Teaching aids:
- technical documentation of the room,
- measuring tools,
- drawing instruments,
- reference material from Chapter 4.2.1 of Student's Handbook.

Task 2

On a pre-determined position of a dropped ceiling of one-level structure, fix the profiles.

Tips for task performance
Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:
To do this task a student should:

1) get familiar with the ways of fixing profiles in the dropped ceiling structure (reference material from Chapter 4.2.1),
2) get familiar with the pre-determined position of the dropped ceiling in the room,
3) organize the workplace for task performance,
4) select profiles, accessories and equipment needed for fixing profiles,
5) fix the profiles to a one-level structure,
6) present the completed task,
7) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:
- demonstration with explanation,
- the guiding-text method,
- practical tasks.

Teaching aids:
- profiles needed to install a dropped ceiling,
- tools and equipment needed to fix the profiles,
- reference material from Chapter 4.2 of Student's Handbook.

Task 3

On a pre-determined position of a dropped ceiling of two-level structure, fix the profiles.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:

To do this task a student should:

1) get familiar with the ways of fixing profiles in the dropped ceiling structure (reference material from Chapter 4.2.1),
2) get familiar with the pre-determined position of the dropped ceiling in the room,
3) organize the workplace for task performance,
4) select profiles, accessories and equipment needed for fixing profiles,
5) fix the profiles to a two-level structure,
6) present the completed task,
7) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:
- demonstration with explanation,
- the guiding-text method,
- practical tasks.

Teaching aids:
- profiles needed to install a dropped ceiling,
- tools and equipment needed to fix the profiles,
- reference material from Chapter 4.2 of Student's Handbook.

5.3. Joint filling and finishing works

5.3.1. Tasks

Task 1

Perform joint filling in a teacher indicated fragment of a dropped ceiling made of plasterboards.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:

To do this task a student should:

1) get familiar with the structure of the ceiling where joint filling is to be performed,
2) select the quality level of joint filling,

3) select the joint filling technique,
4) organize the workplace for task performance,
5) select materials and tools for joint filling,
6) perform joint filling in the indicated part of the ceiling,
7) present the completed task,
8) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:
- demonstration with explanation,
- the guiding-text method,
- practical tasks.

Teaching aids:
- fragment of a dropped ceiling made of plasterboards,
- materials for joint filling,
- tools for joint filling,
- reference material from Chapter 6 of Student's Handbook.

Task 2

Finish an internal angle between the dropped ceiling made of plasterboards and the wall.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:

To do this task a student should:
1) get familiar with the place in which the internal angle is to be finished,
2) determine the finishing technique to be used,
3) select the quality level of joint filling,
4) select a joint filling technique,
5) organize the workplace for task performance,
6) select materials and tools for joint filling,
7) select materials for making the internal angle,
8) finish the angle indicated,
9) present the completed task,
10) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:
- demonstration with explanation,
- the guiding-text method,
- practical tasks.

Teaching aids:
- fragment of the ceiling made of plasterboards,
- materials for joint filling,
- tools for joint filling,
- materials for finishing the angle,
- reference material from Chapter 6 of Student's Handbook.

Task 3

Finish a fragment of the external angle being a fragment of a dropped ceiling made of plasterboards.

Tips for task performance

Before a student starts doing the task, the teacher should discuss its scope and performance technique.

The way to do the task:

To do this task a student should:

1) get familiar with the place in which the external angle is to be finished,
2) determine the finishing technique to be used,
3) select the quality level of joint filling,
4) organize the workplace for task performance,
5) select materials and tools for the external angle finishing,
6) select material and tools for joint filling,
7) finish the angle indicated,
8) present the completed task,
9) assess correctness and aesthetics of the task completed.

Recommended teaching-learning methods:

- demonstration with explanation,
- the guiding-text method,
- practical tasks.

Teaching aids:

- fragment of the ceiling made of plasterboards,
- materials for joint filling,
- materials for making an external angle,
- tools for joint filling,
- materials for finishing the angle,
- reference material from Chapter 6 of Student’s Handbook.

6. ASSESSMENT OF STUDENTS' ACHIEVEMENTS

Examples of testing and assessment tools

TEST 1
A two-level test for the modular unit "Installation of dropped ceiling systems".

The Test consists of 20 tasks of two difficulty levels:
- tasks 1, 2, 4, 5, 6, 8, 9, 11,12, 14, 15, 16, 17, 18, 19 - represent the basic level,
- tasks 3, 7, 10, 13, 14, 20 represent the above-basic level.

Points awarded for task completion: 0; 0.5 or 1 point

For each correct answer a student scores 1 point. A wrong or no answer score 0 points. In open tasks a student can score 0.5 point if his answer is correct in at least 50%.

The following grading standards are proposed – a student will be awarded the following school grades:
- poor – if at least 7 tasks at the basic level have been done satisfactorily,
- satisfactory – if at least 10 tasks at the basic level have been done satisfactorily,
- good – for satisfactory completion of 14 tasks including at least 3 at the level above the basic one
- very good – for completion of 16 tasks including at least 4 from the above-basic level.

Test plan **Answer key**

(Translator's remark: P = basic level; PP = the above-basic level)

Nr zadania	Operational objective (assessment of student's achievements)	Kategoria celu	Poziom wymagań	Correct answer
1.	Identify the most important advantages of dropped ceilings	A	P	-quick assembly -adjusted height of the structure -easy insulation -easy assembly of light fixtures, ventilation, etc.
2.	Identify the basic elements of a dropped ceiling structure executed in the technology of drywall systems	A	P	-plasterboards -steel profiles -insulation materials - hangers - joint filling materials

3.	Identify intervals between the screws fixed along profiles	B	PP	b
4.	Identify the main types of dropped ceiling structures.	A	P	– one-level structure. – two-level structure, – ceiling lining.
5.	Identify the ways of fixing plasterboards in dropped ceiling structures.	A	P	c) mechanical fixing
6.	Identify plasterboard arrangements in dropped ceilings.	B	P	a) crosswise arrangement,, b) lengthwise arrangement
7.	Identify the determinants of the ceiling plasterboard arrangements.	C	PP	c) direction of light
8.	Identify the dropped ceiling structure.	B	P	b) ceiling lining
9.	Identify the type of hangers used for fixing dropped ceiling profiles.	B	P	ES
10.	Identify what sets of profiles are used for constructing ceiling grids.	B	PP	c
11.	Identify the elements of a dropped ceiling structure.	B	P	a) 4-hanger b) 2- CD profile c) 3- UD profile d) 1-plasterboard
12.	Identify the type of a dropped ceiling structure.	B	P	cross-tee two level
13.	Identify the distance between a hanger and the main layer profile connection.	B	PP	b
14.	Identify the distance between places where two adjacent profiles are connected.	B	PP	c
15.	Identify the types of profiles which are fixed to the wall.	B	P	c
16.	Identify the way of cutting boards in ceiling linings to size.	B	P	c
17.	Identify the sequence of activities in joint filling QL1.	B	P	a) application of “mud” b) embedding a joint tape c) application of “mud” for the second time
18.	Identify what works must be performed for the QL 3.	B	P	c
19.	Specify the scope of works at QL 4.	B	P	Application of a thin coat (up to 3 mm) of gypsum plaster
20.	List the basic dimensional tolerances for the positioning of planes and edges which will be assessed during the construction works	B	PP	- deviation of a surface from the plane, i.e. are there any

	acceptance.			surface wall corrugations, - deviation of the plane edge from the straight line, i.e. are there any deviations vertically or horizontally in the places where two planes intersect (e.g. internal angles or external angles of the walls), - deviations of surfaces and edges from the vertical direction, - deviations of surfaces and edges from the horizontal direction, - deviation of intersecting planes from the angle specified in technical documentation

Testing procedure

Instructions for the teacher

1. Establish the date for carrying out the test at least a week in advance.
2. Discuss with students the aim of testing and assessment.
3. Familiarize students with types of tasks included in the test and with the rules of awarding points.
4. Conduct a mock test in which students will be asked to provide answers to the task types as the ones included in a real test.
5. Discuss with students the way in which answers shall be given (answer sheet).
6. Ensure conditions for students independent work.
7. Distribute question and answer sheets to students, inform them about the time limit for doing the test.
8. Create proper atmosphere during the whole test (relieve tension, encourage for checking one's potential).
9. A few minutes before the end of the test, remind students of the time left for the test completion.
10. Collect answer sheets and question sheets.
11. Check the results and enter them into a report sheet.
12. Analyze the results obtained and choose these tasks which posed most difficulty to students.
13. Establish the reasons why students had problems to acquire the knowledge and skills.
14. Work out conclusions for further work in order to avoid teaching failures – unsatisfactory results of the test conducted.

Instructions for students

1. Read the instruction carefully.
2. Sign the answer sheet with your name and surname.
3. Get familiar with test tasks.

4. The test consists of 20 tasks of different difficulty levels. It includes tasks of the following types: open, gap-fill, multiple-choice and True/False.
5. Give your answers on the enclosed answer sheet only. Put a cross (X) in the appropriate column or write the correct answer. If you make a mistake, put a circle around the incorrect answer and then put a cross (X) next to the correct answer.
6. The test consists of 2 parts containing tasks of different difficulty levels: tasks 1, 2, 4, 5, 6, 8, 9, 11, 12, 15, 16, 17, 18, 19 – represent the basic level, whereas tasks: 3, 7, 10, 13, 14, 20 – represent the above-basic level.
7. Work on your own because only then you will get satisfaction of completing the task.
8. When you find answering a question difficult, leave it for a later time and return to it when you have time.
9. You have 90 minutes to complete the test.

Good luck !

Resources for a student:

- instruction,
- set of test tasks,
- answer sheet.

A SET of TEST TASKS

1. Identify the most important advantages of dropped ceilings:
   a) ……..,
   b) ……..,
   c) ……..……,
   d) ……...

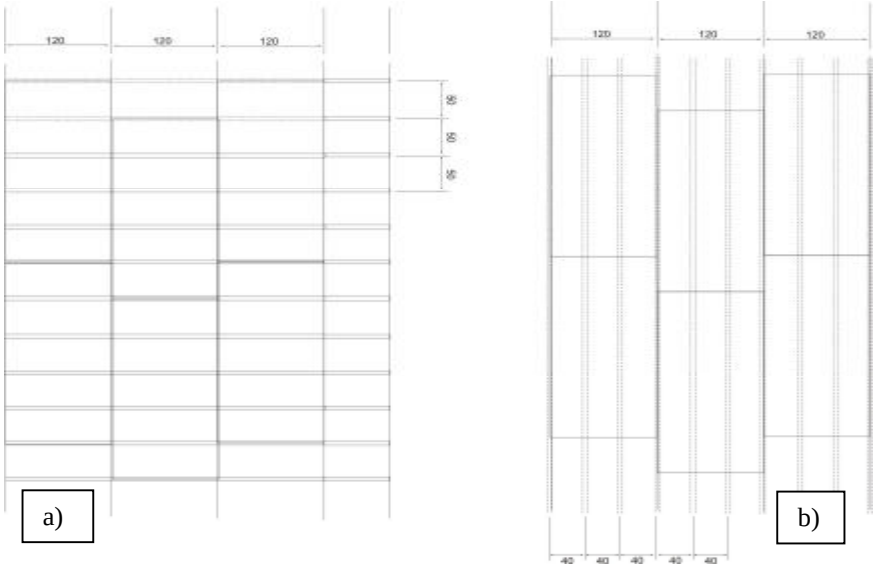
2. Identify the basic elements of the dropped ceiling structure in the technology of drywall systems.
   a) …….
   b) …….
   c) …….....
   d) ……..
   e) ……

3. The intervals between steel metal screws along profiles in a dropped ceiling are?:
   a) from 200 to 300 mm,
   b) from 150 to 200 mm,
   c) from 100 to 300 mm,
   d) from 250 to 400 mm.

4. Identify the main types of dropped ceiling structures.
   a) …….
   b) …….
   c) …….....

5. In dropped ceiling structures, plasterboards are fixed in the following ways:
   a) adhesive bonding,
   b) adhesive bonding and mechanical fixing,
   c) only mechanical fixing,
   d) depends on the type of the structure.

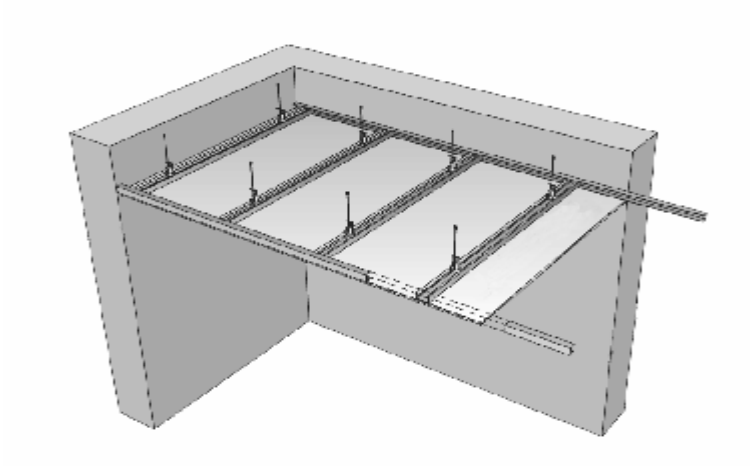
6. Identify plasterboard installation arrangements on dropped ceilings:



a) ……...,
b) ……..……,

7. What is the direction of plasterboard installation on the ceiling determined by?
   a) the size of the room,
   b) type of the dropped ceiling structure,
   c) direction of the sunlight,
   d) there are no determinants.

8. The dropped ceiling system depicted in the picture below is:



   a) a one-level structure,
   b) a ceiling lining,
   c) a two-level structure,

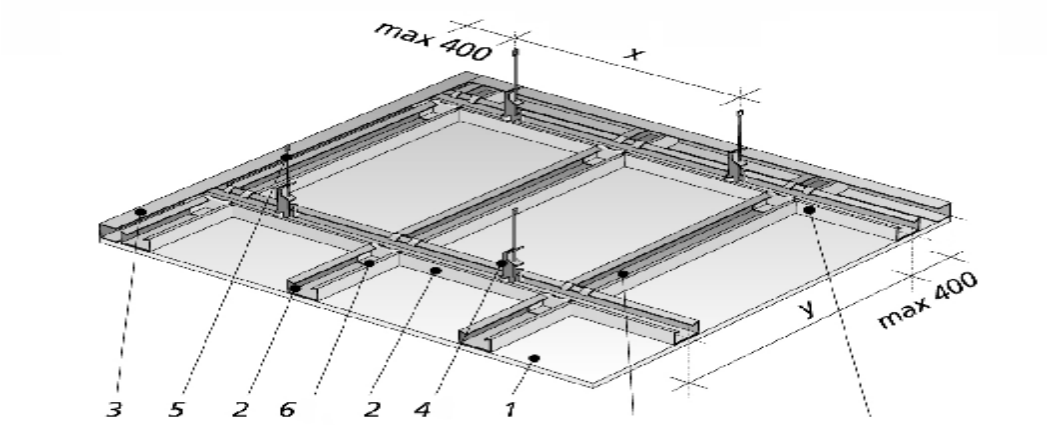
9. What type of hangers is used for fixing dropped ceiling profiles when the distance between the dropped ceiling and the main one is up to 120 mm?

   a) ……..……..

10. What sets of profiles are most commonly used for constructing ceiling grids:

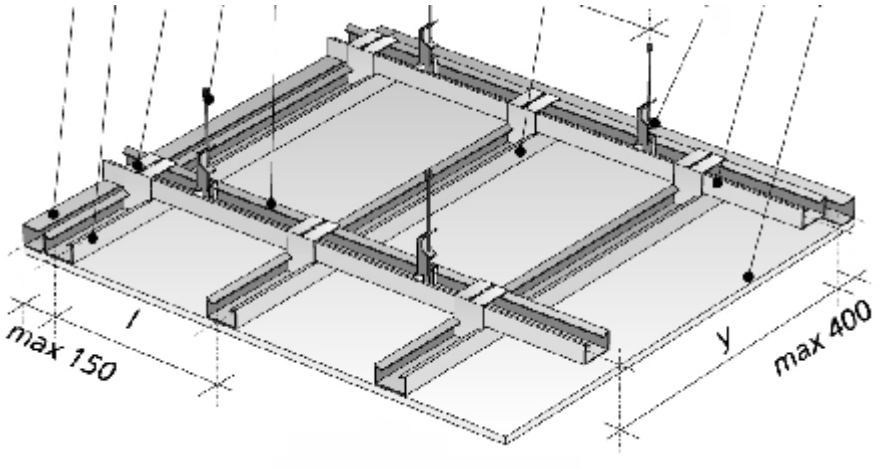
   a) CD, ES,
   b) UD, ES,
   c) CD, UD,
   d) CD, ES, UD.

11. Identify particular elements of a dropped ceiling:



   a) 4 – ……...,
   b) 2- ……..,
   c) 3- ……..,
   d) 1-……

12. What kind of a dropped ceiling structure is depicted in the picture below?



   a) …….

13. The recommended distance between a hanger and a connection of the main layer profiles is:
    a) at least 20 cm,,
    b) not more than 20 cm,
    c) it does not matter,
    d) below 30 cm.

14. A shift in the adjacent profile joining place should be:
    a) from 40 to 60 cm,
    b) at least 20 cm,
    c) at least 80 cm,
    d) from 60 to 80 cm.

15. Which profiles are used for walls:
    a) ES,
    b) CD,
    c) UD.

16. Plasterboards in ceiling linings are cut to size in such a way as to let their lateral edge rest
    a) in the middle between profiles,
    b) on the profile's end,
    c) in the middle of the profile,
    d) up to 20 cm from the profile.

17. Identify the sequence of joint filling stages for the KS type plasterboard at the gypsum board finish quality level 1:
    ……. ,
    ……. ,
    ……..,

18. Following the standard QL2 mudding, the gypsum board finish QL3 requires:
    a) elimination of all irregularities on joints,
    b) elimination of all ridges on the entire plasterboard surface,
    c) a thin layer (ca. 1 mm) mudding of the entire ceiling surface,
    d) mudding with a layer of min. 3 mm In thickness.

19. The gypsum bard finish QL4 consists in:

…….

20. Identify basic dimensional tolerances for the positioning of planes and edges completed which will be assessed during the construction works acceptance:

……,

……,

……,

……,

…….

ANSWER SHEET

Name and surname ……..

Installation of dropped ceiling systems

Mark the correct answer, write in a missing phrase or an answer.

Question number	Answers				Points scored
1	a	b	c	d	
2					
3	a	b	c	d	
4					
5	a	b	c	d	
6	a		b		
7					
8	a	b	c		
9					
10	a	b	c	d	
11	a	b	c	d	
12					
13	a	b	c	d	
14	a	b	c	d	
15	a	b	c		
16	a	b	c	d	

17	**a**		**b**	**c**	
18	**a**	**b**	**c**	**d**	
19					
20					
Total					

TEST 2
A two-level test for the modular unit "Installation of dropped ceiling systems."

The Test consists of 20 tasks of two difficulty levels:
– tasks 1, 2, 4, 5, 6, 10, 11, 12, 14, 16, 17, 18, 19, 20 – represent the basic level,
– tasks 3, 7, 8, 9, 13, 15 – represent the above-basic level.

Points awarded for task completion: 0; 0.5 or 1 point

For each correct answer a student scores 1 point. A wrong or no answer score 0 points. In open tasks a student scores 0.5 point when he answers correctly at least 50% of the task.

The following grading standards are proposed – a student will be awarded the following school grades:

- poor – if at least 7 tasks at the basic level have been done satisfactorily,
- satisfactory – if at least 10 tasks at the basic level have been done satisfactorily,
- good – for satisfactory completion of 14 tasks including at least 3 at the level above the basic one
- very good – for completion of 16 tasks including at least 4 from the above-basic level.

Test plan with an answer key

(Translator's remark: P = basic level; PP = the above-basic level)

Nr zadania	Operational objective (assessment of student's achievements)	Kategoria celu	Poziom wymagań	Correct answer
1.	Identify the best insulation material used for dropped ceilings	A	P	mineral wool
2.	Identify a dropped ceiling structure.	B	P	one-level structure
3.	Identify application of a selected ceiling structure.	B	PP	c
4.	Identify the main conditions that must be fulfilled to start the assembly of a dropped ceiling structure.	**B**	P	a) finishing "wet works" b) assembly of window frames c) maintaining suitable temperature (above 10^{o} C) d) maintaining suitable humidity (below 70%)
5.	Identify the ways of fixing plasterboards in dropped ceilings.	B	P	b

6.	Identify types of plasterboard arrangements in dropped ceilings.	B	P	
7.	Identify determinants of plasterboard arrangements in dropped ceilings.	C	PP	a
8.	Identify when ceiling profiles must be fixed more densely.	C	PP	a) fulfilling the function of a fire barrier b) additional load of lighting fixtures c) additional load of insulation material
9.	Identify properties of bolts used for fixing profiles in dropped ceilings	C	PP	must expand in the ceiling
10.	Identify profiles used for the ceiling grid construction.	B	P	a) CD b) UD
11.	Identify the elements of a dropped ceiling structure.	B	P	a) 1-supporting profile b) 2-main profile c) 3- wall profile
12.	Identify the type of a dropped ceiling structure.	B	P	cross tee two-level
13.	Select the type of a dropped ceiling structure for given conditions.	C	PP	ceiling lining
14.	Identify the length of adjacent profile connecting places.	B	P	c
15.	Identify spacing of hangers in a cross-tee two-level grid.	B	PP	c
16.	Identify the way of plasterboard cutting to size in ceiling linings.	B	P	c
17.	Identify location of elements in a cross-tee two-level structure.	B	P	a) 15 cm b) 30 cm c) 30 cm
18.	Identify plasterboards used for ceiling linings.	B	P	b
19.	Identify the rules of plasterboard placing for multiple-layer panelling of ceilings.	B	P	a shift of longitudinal and lateral joints in adjacent layers
20.	Identify the types of finishing works.	B	P	applying a priming coat to the mudded ceiling surface

Testing procedure

Instructions for the teacher

1. .Establish the date for carrying out the test at least a week in advance.
2. Discuss with students the aim of testing and assessment.
3. Familiarize students with types of tasks included in the test and with the rules of awarding points.
4. Conduct a mock test in which students will be asked to provide answers to the task types as the ones included in a real test.
5. Discuss with students the way in which answers shall be given (answer sheet).
6. Ensure conditions for students independent work.
7. Distribute question and answer sheets to students, inform them about the time limit for doing the test.
8. Create proper atmosphere during the whole test (relieve tension, encourage for checking one's potential).
9. A few minutes before the end of the test, remind students of the time left for the test completion.
10. Collect answer sheets and question sheets.
11. Check the results and enter them into a report sheet.
12. Analyze the results obtained and choose these tasks which posed most difficulty to students.
13. Establish the reasons why students had problems to acquire the knowledge and skills.
14. Work out conclusions for further work in order to avoid teaching failures – unsatisfactory results of the test conducted.

Instructions for students

1. Read the instruction carefully.
2. Sign the answer sheet with your name and surname.
3. Get familiar with test tasks.
4. The test consists of 20 tasks of different difficulty levels. It includes tasks of the following types: open, gap-fill, multiple-choice and True/False.
5. Give your answers on the enclosed answer sheet only. Put a cross (X) in the appropriate column or write the correct answer. If you make a mistake, put a circle around the incorrect answer and then put a cross (X) next to the correct answer.
6. The test consists of 2 parts containing tasks of different difficulty levels: tasks 1, 2, 4, 5, 6, 10, 11, 12, 14, 16, 17, 18, 19, 20 – represent the basic level, whereas tasks: 3, 7, 8, 9, 13, 15 – represent the above-basic level.
7. Work on your own because only then you will get satisfaction of completing the task.
8. When you find answering a question difficult, leave it for a later time and return to it when you have time.
9. You have 90 minutes to complete the test.

Good luck !

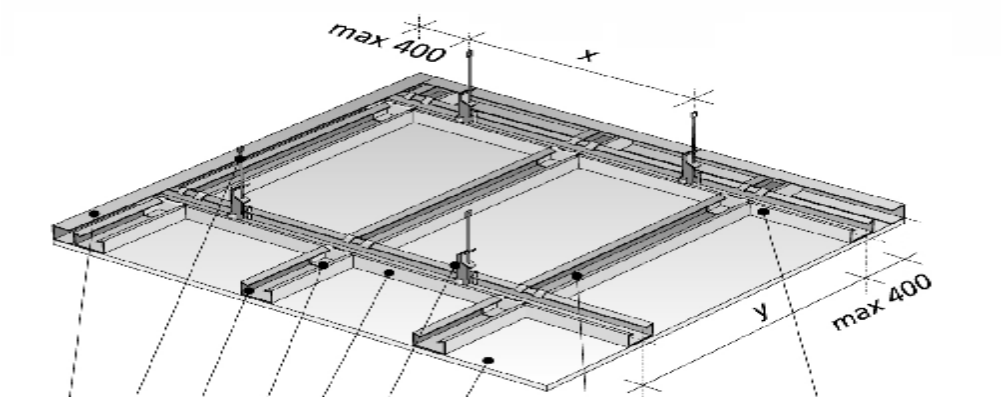
Resources for a student:

- instruction,
- set of test tasks,
- answer sheet.

A SET of TEST TASKS

1. What is the best insulation material for dropped ceilings?
   a) ……..,

2. What type of dropped ceiling structures in drywall system technology is depicted in the picture below:



   a) …….

3. What type of a dropped ceiling structure would you choose to minimize losses on reduced headroom?
   a) a one-level structure,
   b) a two-level structure,
   c) a ceiling lining.

4. Identify the main conditions that must be fulfilled to start the assembly of dropped ceilings.
   a) …….
   b) …….
   c) …….....
   d) ……..

5. When a dropped ceiling is assembled can plasterboards be adhesive bonded?
   a) yes,
   b) no.

6. Draw a crosswise arrangement of plasterboard assembly on a dropped ceiling:

7. When plasterboards are installed on the ceiling, crosswise joints in relation to the falling sunrays are:

a) parallel,

b) perpendicular,

8. List the factors which require more dense placing of ceiling profiles:

a) ……..……..,

b) ……,

c) ……,

9. What feature should characterize the bolts for fixing dropped ceiling structures to the reinforced cement ceiling?

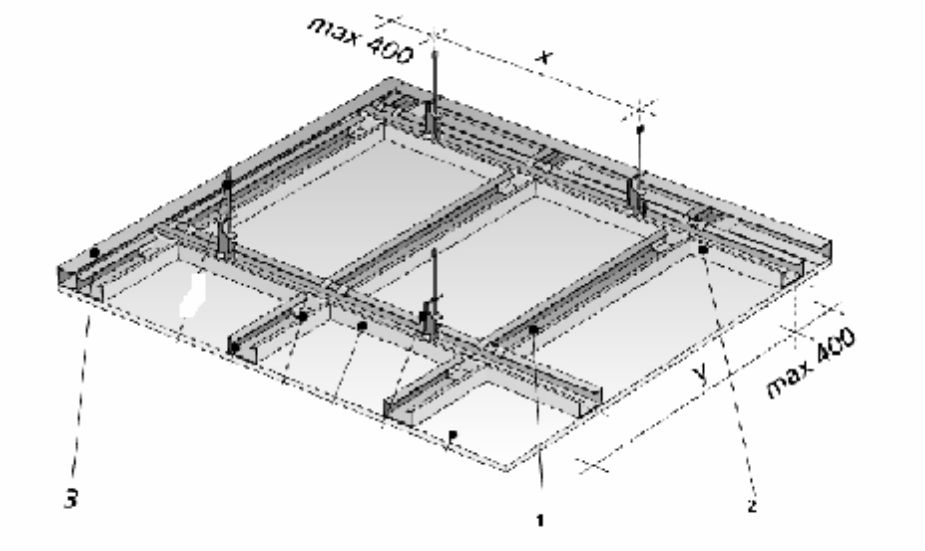
a) ……....,

10. What profiles are most commonly used for constructing ceiling grids?

a) ……..,

b) ……

11. Identify particular profiles of a dropped ceiling structure by their function:

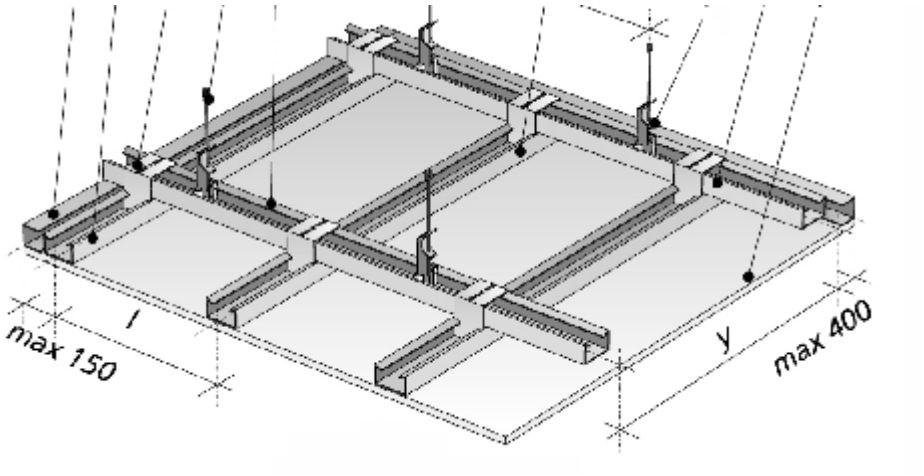


a) 1– ……...,

b) 2- ……,

c) 3- ……,

12. A dropped ceiling structure depicted in the picture below is:



…….

13. What type of a dropped ceiling structure would you use in a corridor or a small room?

…….

14. A shift in places where adjacent profiles are joined should be:

a) from 40 to 60 cm,
b) at least 20 cm,
c) at least 80 cm,
d) from 60 to 80 cm.

15. The maximum spacing between hangers that can be used in a ceiling grid of a cross-tee, two-level structure is:

a) 120 x 120 cm,
b) 50 x100 cm,
c) 90 x 100 cm,
d) 150 x 400 cm.

16. Plasterboards in ceiling linings are cut to size in such a way as to let their lateral edge rest:

a) in the middle between profiles,
b) on the profile's end,
c) in the middle of a profile,
d) max. 20 cm from a profile.

17. Identify location of elements when cross-tee two-level ceilings are constructed:

a) the maximum distance of the perimeter profile axis in the supporting (lower) layer from the wall parallel to it cannot exceed …… cm,

b) the maximum distance of the perimeter profile axis in the main (upper) layer from the wall parallel to it cannot exceed …… cm,

c) the maximum distance of the perimeter hanger (counting from the wall) on the main (upper) profile cannot exceed …… cm,

18. To install ceiling linings, we use plasterboards of the following thickness:

a) from 10 to 12.5 mm,

b) at least 12.5 mm,

c) 15 mm,

d) min. 15 mm.

19. What must be remembered when one uses many plasterboards (multiple layers) for the ceiling panelling?

……..

20. What must be done after the ceiling surface has been mudded prior to its painting or wallpapering?

…….

ANSWER SHEET

Name and surname …..……..

Installation of dropped ceiling systems

Mark the correct answer, write in a missing phrase or an answer.

Question number	Answers				Points scored
1					
2					
3	a	b	C		
4					
5	a		b		
6					
7	a		b		
8	a	b	c		
9					
10	a		b		
11	a	b	c		
12					
13					
14	a	b	c	d	
15	a	b	c	d	

16	**a**	**b**	**c**	**d**	
17	**a**	**b**	**c**		
18	**a**	**b**	**c**	**d**	
19					
20					
Total					

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