MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
DNIPRO UNIVERSITY OF TECHNOLOGY

PRE-DIPLOMA PRACTICAL TRAINING PROGRAM

GUIDELINE FOR PASSING THE PRACTICAL TRAINING AND WRITING A REPORT

Dnipro
Dnipro University of Technology
2020

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
DNIPRO UNIVERSITY OF TECHNOLOGY

FACULTY OF CONSTRUCTION
Department of Construction, Geotechnics and Geomechanics

PRE-DIPLOMA PRACTICAL TRAINING PROGRAM

GUIDELINE FOR PASSING THE PRACTICAL TRAINING AND WRITING A REPORT

for students of the specialty 192 "Building and Civil Engineering"

Dnipro
Dnipro University of Technology
2020

Pre-Diploma Practical Training Program (guideline for passing the practical training and writing a report) for students of the specialty 192 “Building and Civil Engineering”/ O. Solodyankin, O. Khalymendik, E. Maksymova, K. Kravchenko, M. Vyhodin, O. Grygoriev, K. Zhabchyk – Dnipro: DUT, 2020. – 26 p.

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Approved by the methodological commission for specialty 192 Building and Civil Engineering (protocol №5 of 22.04.2020) as requested by the Department of Construction, Geotechnics and Geomechanics (protocol №11 of 16.04.2020).

The basic requirements and recommendations for the pre-certification practice are given. Methodological recommendations are given on the report and preparation of the qualifying work of the bachelor's degree.

Responsible for publications: S. Hapieiev, Head of the Department of Construction, Geotechnics and Geomechanics, Doctor of Technical Sciences, Professor.

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INTRODUCTION

Pre-certification practice is the final stage in the formation of a future bachelor in specialty 192 Building and Civil Engineering, which allows you to collect the necessary material for writing a qualifying work.

The main condition for passing the pre-certification practice and writing a report is the appointment by the head of the topic of qualification work or determining it during the practice for the actually collected volume of materials provided by the practice base.

In general, a student in an organization, institution or enterprise, is the basis of pre-certification practice, must collect the necessary amount of materials to complete the structural parts of qualification work for the development of architectural and construction drawings; calculations and design of elements of buildings, structures or technological equipment; development of organizational and technological documentation for certain types of work and for the construction of a specific facility (or complex) as a whole; performance of technical and economic calculations; substantiation of labor protection measures and assessment of environmental impact during the period of construction and installation work; development of estimate documentation for the cost of construction.

It should also be noted that the report on the passage of pre-certification practice, the collection and processing of materials for its writing is a necessary component for the performance of the qualifying work of a bachelor.

The basic normative document regulating the organization of the educational process at the university is the "Regulations on the organization of the educational process of the National Technical University" Dnipro Polytechnic "and the Regulations on the practice of applicants for higher education of the Dnipro University of Technology, approved by the Academic Council on 11.12.2018 (Protocol No. 15).

1. GENERAL PROVISIONS FOR PRE-CERTIFICATION PRACTICE

According to the current regulations, the general management and responsibility for organizing the practice are borne by the dean of the faculty together with the head of the industrial practice of the university. The student receives advice on educational and methodological issues at the Department of Construction, Geotechnics and Geomechanics, and the direct leadership from the university is entrusted to the teachers of the department.

The distribution of students to places of practice, setting the dates for the beginning and end of the practice is approved by the order of the University.

The determination of the bases of practice is carried out by the department of the University on the basis of direct contracts with enterprises (Annex 1), organizations, institutions, regardless of their organizational and legal forms and forms of ownership.

The procedure for hiring, work schedule, working hours and other working conditions for student trainees are established in accordance with the legislation on working conditions of temporary workers. The internal labor regulations of an enterprise (organization) also apply to students.

Violation of the rules established at work, labor and industrial discipline, safety measures, entails a certain penalty, up to expulsion from the University.

Organizations, which are the bases of practice, organize the work of students, assist them in the selection of materials for writing a report on practice, create conditions for the use of technical documentation and special literature, ensure and control students' compliance with the internal regulations are fully responsible for accidents with students, ensure high-quality conducting briefings on labor protection, involve them in rationalization work.

Before leaving for practice, the student must receive a referral from the dean's office (Annex 2), a diary (Annex 4) and an individual assignment from the head of the practice; be instructed on the procedure for passing the internship and familiarize yourself with the main provisions on labor protection.

2. SELECTION OF THE TOPIC OF QUALIFICATION WORK AND COLLECTION OF INITIAL DATA FOR WRITING A REPORT

As noted in the introductory part, a prerequisite for undergoing pre-certification practice is the choice of the topic of qualifying work or its determination during the course of the practice for the actually collected volume of materials provided by the practice base.

Directly the topic for consideration can be designed by a building under construction (preferably) or constructed (allowed) a building or structure for civil, industrial or agricultural purposes. In addition to new construction projects, buildings or structures that are being reconstructed, overhauled or are at the stage of technical re-equipment or technical re-equipment can be taken for development in qualification work.

The amount of material required for writing a report and developing a qualification work at this stage is determined in accordance with the "Bachelor qualification thesis methodical recommendations of Bachelors in specialty 192 Construction and Civil Engineering". In fact, the pre-certification practice and the materials collected during its passage and presented in the form of a report are the first step in the performance of qualifying work.

The initial data for writing a report and developing a qualification work can be:

- design and estimate documentation for the construction of an object (including a construction organization project, a detailed design or working documentation)
- project for the production of work for the construction of the facility;
- preliminary design or preprojective processing;
- feasibility study or feasibility study;
- information about organizations performing general construction and special works, in terms of their arrangement with special machinery, mechanisms and equipment;
- assignment for the design of organizations and enterprises, in favours of which qualification work is performed;
- analogous projects, if the object is being developed in the qualification work, there is no project documentation;
- materials of research and development of specialists in the architectural and construction and organizational and technological sectors of construction production, including managers of qualification work;
- projects of safe operation of lifting mechanisms;
- technical report on engineering-geological and hydrogeological conditions;

- technical reports based on the results of a survey or technical inspection of the condition of buildings and structures.

3. RECOMMENDED CONTENT OF THE REPORT

The composition of the design and estimate documentation for construction must comply with the requirements [1], and the procedure for its formalization - [2-4].

The approximate distribution of the material by its parts is shown in Table 1.

Table 1 - Recommended content of the report

Name of parts	Distribution of material in parts	
	Specific weight of the part, %	Drawings, approximate number of sheets
1. Contents	–	–
2. Introduction and general information	1	–
3. Architectural and construction part	25	1
4. Settlement and constructive part *	25	1
5. Organizational and technological part (including health and safety, prevention of emergency situations * environmental protection *)	38	1-2
6. Technical and economic part *	10	1
7. List of reference sources	1	–
Total	100	4 - 5
** The presence of a parts (subdivision) is agreed with the head of the practice of a higher educational institution in accordance with the assignment for practice*		

4. RECOMMENDATIONS FOR DESIGNING GRAPHIC AND TEXT PARTS

The report should be written in a technically competent language and in accordance with generally accepted technical terminology.

A printed report is drawn up on A4 office paper [5]. Its graphic part must be made in the form of drawings and meet the repair requirements [2, 4].

An example of formatting the content of the report and the design of the title page is given in Appendix 4, 5.

5. RECOMMENDATIONS FOR THE IMPLEMENTATION OF SEPARATE PARTS OF THE REPORT

5.1. Introductory part

The introductory part reflects the following questions:

a) brief information about the design object, geotechnical, hydrogeological and geodetic construction conditions;

b) the specifics of the construction area, information about the main participants in the construction;

c) information about new and original design solutions;

d) other questions at the discretion of the student, certifying his competence and reflect the level of knowledge.

5.2. Architectural and construction part

The architectural and construction part must contain:

a) a brief description of the specific conditions of the site of the object's binding (climatic, hydrogeological conditions, engineering arrangement of the territory, etc.);

b) a description of the master plan;

c) a description of the technological or functional processes at the stage of operation of the building with the main parameters, for example, the types and number of apartments (for residential buildings);

d) characteristics of the space-planning solution (dimensions in plan, height, building configuration)

e) a description of the structural design of the building with a justification of the types of structural schemes and materials used;

f) solution for lighting, ventilation, thermal conditions, fire safety, including a brief description of the relevant engineering systems;

g) characteristics of floors in various rooms, taking into account the requirements of hygiene, durability, sound insulation and maintainability;

h) description of interior decoration of premises and exterior decoration of facades;

j) a solution to ensure energy efficiency conditions and heat engineering calculation of the enclosing structures of walls, roofs and ceilings.

If the object is described already built, it is advisable to make a comparative analysis of existing solutions with those used in this case.

5.3. Computational and constructive part

The Settlement and constructive part should contain the calculation and design of load-bearing elements, which can be: foundations, walls, columns, floors, elements

of roofs and roofs, stairs and other structures. Calculations are performed using computer programs in accordance with applicable industry standards and regulations.

5.4. Technological part

In this part, fundamental decisions on the technology of building a building should be worked out and individual construction processes are presented in detail. Should contain sections: analysis of the conditions for the implementation of construction; substantiation of methods for performing work on the construction of an object; development of technological maps.

a) Analysis of the conditions for the implementation of construction.

From the standpoint of the construction and installation work, an assessment of the climatic, engineering-geological and hydrogeological conditions of the construction site is given; its connections with external communication routes; the presence of factors affecting the limitation of the zones of action of the mechanisms; sources of water, energy resources and material resources; specific and difficult construction conditions, etc.

b) Review and justification of the methods of production of work on the construction of the facility.

Based on the recommendations of the technical and reference literature, it is necessary to select and describe the methods of performing work at all stages of the construction of the object, which is designed, from preparatory work (site planning) to finishing work and landscaping.

Each complex of works is subject to processing, the result of which is the intermediate completed construction products (open pit, pile field, foundations, building box, roof, etc.). For each complex, it is necessary to substantiate the methods of performing the work included in the complex, select traction and auxiliary mechanisms, the composition of performers and briefly describe the technology for performing the work, including issues of labor protection, environmental protection, and develop measures to reduce the duration of construction. When describing the work packages for which technological maps have been developed, give a link to the corresponding pages of the explanatory note and the numbers of sheets with technological maps.

All calculations related to the design of the construction and installation work technology must be accompanied by an indication of formulas, diagrams, tables, graphs and references to regulatory and technical literature.

c) Development of technological charts.

In agreement with the head of the future qualification work, the student collects materials for the development of 1-4 technological charts. As a rule, technological charts are developed for zero-cycle work, for the construction of a building box, that is, for complex construction processes. In this case, several technological charts are developed for one construction process. For example, zero-cycle works are independent, but interrelated, therefore, technological charts can be developed for the construction of a pit, for a pile foundation and for the construction of a foundation slab or grillage. At the choice of the student or by order of the enterprise, technological charts can be developed for the device of the roof, floor, for what type of finishing work, and so on.

To understand the volume of the required material, in APPENDIX 6 contains the composition and content of the technological chart. The composition of the technological charts must comply with the requirements [6, 7]. The technological charts (TC), as a rule, consists of the following sections:

- application area;
- tools and equipment for work performance;
- organization and technology of work performance;
- requirements for the quality of work;
- the need for material and technical resources;
- safety engineering and labor protection;
- environmental protection;
- technical and economic indicators.

5.5. Organizational part

This section should include materials for calculating: a calendar plan for the construction of a typical floor (for multi-storey buildings) a calendar plan for the production of works on the construction of an object; object building master plan.

The *schedule* for the construction of a building (object schedule), in addition to general construction work, should include: special work (electrical and sanitary), the implementation of which is provided in two stages (before and after finishing work); preparatory work; other (unaccounted for) work; improvement.

The *object construction master plan* covers the territory of the construction site of one object. On it, they clarify and detail the decisions of the general construction site plan.

Initial data for the development of general construction site plan: general plan of the construction site; materials of geological, hydrogeological, engineering-geological and economic surveys; estimate; a consolidated schedule of an

explanatory note on the methods of performing work; calculations of the need for temporary buildings and structures, storage areas, etc.

Initial data for the development of the construction site plan: general site construction site plan; calendar plans and flow charts with the project for the implementation of the work of this facility; refined calculations of resource requirements; working drawings of a building or structure.

Any construction plan consists of a graphic part and a calculation and explanatory note.

The organizational and technological part also includes the following divisions.

Occupational safety

In this section, the issues of ensuring occupational safety at the stage of operation and construction of the facility should be systematically set out in accordance with the current regulatory documents.

Decisions made on all aspects of labor protection in the architectural and construction, computational and constructive, organizational and technological parts of the project should be reflected in its graphic part (on the corresponding sheets) and in the corresponding parts of the report in the form of a risk card.

A mandatory requirement for the development of a section is the specification of the developed activities. For example, when working on fire safety at the stage of building operation, it is necessary to indicate the presence of smoke-free stairs in projects, the size and direction of opening doors from apartments, and so on.

Emergency prevention

The measures of this part should be worked out in two directions: protection of the population in emergencies of natural and man-made character at the stage of operation of the facility is being designed; the same at the stage of its construction.

By agreement with the head of the practice and with the consultant of the department of labor protection, the student can handle one of the following questions:

- the organization of the construction of a buried storage facility is quickly reduced;
- calculation of structures of shelters and shelters;
- assessment of the feasibility of arranging a shelter for workers and employees in the basement floor;
- organization of construction work with the construction of buildings and engineering networks in special conditions (at night, with limited labor or material and technical resources, in a short time)
- development of basic recommendations on fire safety in emergency situations when organizing the construction of a structure;
- development of recommendations for elimination of the consequences of possible emergency situations.

Environmental protection

This part should contain a description of the following activities:

- removal and preservation of the fertile soil layer;
- environmental safety of the operation of machines and mechanisms;
- preservation of green spaces;
- limiting the level of noise, dust and harmful emissions;
- collection and disposal of construction waste.

5.6. Technical and economic part

The section should contain calculations of local, object estimates and lists of resources for them for general construction work and the determination of the contract price and the consolidated estimated cost of the object [10] are made using the software package "Construction Technologies - estimate" or its analogue.

In addition, in the technical and economic part, the student must give an economic assessment of the decisions made in the architectural and construction, computational and constructive and organizational and technological parts, develop measures to reduce the duration of construction, and also calculate the economic effect due to these measures or others, agreed with the head of qualification work.

6. RESULTS OF PRACTICE

After the end of the internship period, applicants for higher education report on the implementation of the program and individual assignment. The form for reporting the applicant for higher education on the passage of internship - written.

The assessment of the work by the head of the practice is carried out by an expert method using the criteria regulated by the Regulations on the assessment of learning outcomes of applicants for higher education Dnipro University of Technology, taking into account the specifics of the specialty and the volume of materials collected on the student's internship base.

The result of the student's practice is obtaining a differential credit (according to the current standards and norms). The condition for obtaining is the presence of a completed diary with a positive characteristic of the manager from the enterprise.

The head of practice from the university (department) takes credit from applicants for higher education at the university during the first two days, simultaneously with the beginning of the qualification work.

The final mark for the internship is calculated as an average score based on the results of the general part of the report, an individual assignment and taking into account the recall of the head of the internship base.

Evaluation of the results of students' practice is carried out on a 100-point scale with the obligatory transfer of point assessments into the institutional scale. The

mark for the practice is entered in the transcript and examination record and the record book of the applicant for higher education, signed by the head of the practice from the department.

Bibliographic list

1. DBN A.2.2-3-2.4. "Design. Composition, procedure for development, coordination and approval of design documentation for construction."/ ДБН А.2.2-3-2.4. «Проєктування. Склад, порядок розроблення, погодження та затвердження проєктної документації для будівництва».
2. DSTU BA.2.4.-4-99. "Basic requirements for design and working documentation."/ДСТУ БА.2.4.-4-99. «Основні вимоги до проєктної та робочої документації».
3. DSTU BA.2.4-6-95. "Rules for the implementation of working documentation for general plans of enterprises, structures and housing and civil objects."/ДСТУ БА.2.4-6-95. «Правила виконання робочої документації генеральних планів підприємств, споруд та житлово-цивільних об’єктів».
4. DSTU BA. 2.4.-7-95. "Rules for the implementation of architectural and construction working drawings."/ ДСТУ БА. 2.4.-7-95. «Правила виконання архітектурно- будівельних робочих креслень».
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6. Guide to DBN A.3.1-5-96. "On the development of projects for the organization of construction and projects for the production of work."/ Посібник до ДБН А.3.1-5-96. «По розробленню проєктів організації будівництва та проєктів виконання робіт».
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9. DSTU BD.1.1-1: 2013 "Rules for determining the cost of construction». / ДСТУ Б.Д.1.1-1:2013 «Правила визначення вартості будівництва».
10. DSTU 2155-93. Energy saving. Methods for determining the economic efficiency of energy saving measures. / ДСТУ 2155-93. Енергозбереження. Методи визначення економічної ефективності заходів по енергозбереженню.

ANNEX 1.
AGREEMENT AT THE PRACTICE

AGREEMENT NO. _____
for the practice of students of higher educational institutions

m. Dnipro **"___" _____ 20___**

We, the undersigned,
on the one hand - the **Dnipro University of Technology** (hereinafter referred to as the institution of higher education) represented by the first vice-rector Azyukovsky Alexander Alexandrovich, acting on the basis of the charter and, on the other hand

_____
(Name of the company, organization, institution)
(*Further - the base of practice*) represented by

_____
(*Position, surname, initials*)
acting on the basis _____,
(*Articles of the enterprise, orders, instructions*)
concluded an agreement among themselves:
1. The base of practice is obliged:
1.1. To accept students for practice according to the schedule:

No.	Name of specialty	Course	Type of practice	Number of students	Duration of practice	
					beginning	end

1.2. Appoint by order of qualified specialists to direct the practice.
1.3. Create the necessary conditions for students to complete the internship program, prevent their use in positions and jobs that do not correspond to the internship program and future specialty.
1.4. Provide students with a safe working environment at each workplace. Conduct mandatory instruction on labor protection: induction and at the workplace. If necessary, teach student trainees to safe working methods. Provide overalls and safety equipment in accordance with the standards established for regular employees.
1.5. Provide student interns and heads of practice of a higher education institution with the opportunity to use laboratories, offices, workshops, libraries, technical and other documentation necessary to complete practice programs.

1.6. Provide a record of student internships at work. All violations of labor discipline and internal regulations should be reported to institutions of higher education.
1.7. After completing the practice, give a description of each student-trainee and a response to the prepared report.
1.8. Additional conditions:
a) on free terms "base of practice" - "institution of higher education";
_____
_____
2. The institution of higher education undertakes:
2.1. Two months before the start of the internship, provide the internship base for approval with a program, and no later than a week - a list of student interns.
2.2. Appoint qualified teachers as practice leaders.
2.3. Ensure that students comply with labor discipline and internal labor regulations. Participate in the investigation by the commission of the base of the practice of accidents that happened to students.
3. Responsibility of the parties for non-performance of the contract:
3.1. The parties are responsible for failure to fulfil their responsibilities for organizing the practice in accordance with the current labor legislation in Ukraine.
3.2. All disputes arising between the parties are resolved in the prescribed manner.
The agreement comes into force after it is signed by the parties and is valid until the end of the professional practice in accordance with the schedule.
The agreement was drawn up in two copies - the base of the practice and the institution of higher education.

Legal addresses:

Institution of higher education:	Base of practice:
49005 Dmitry Yavornytsky Ave., 19	_____
m. Dnipro	_____
Educational part	_____
Dnipro University of Technology	_____

Signatures and seals:

Institution of higher education:	Base of practice:
_____	_____
"___" _____ 20 ___	"___" _____ 20 ___

ANNEX 2.

DIRECTIONS TO THE PRACTICE

Corner stamp location
higher education institutions

FOR THE HEAD

_____
_____
_____
_____
_____

DIRECTION TO PRACTICAL TRAINING

According to the agreement dated "___" _____ 20___ No. _____, concluded with _____
_____
_____
(Full name of the enterprise, organization, institution)
we send to practice students of the ____ course, studying in the direction of training (specialty) _____
_____
Practice name _____
Terms of practice from "_____" _____ 20____ year
to "_____" _____ 20 ____year

Head of practice Dnipro University of Technology _____ _____
(Signature) (surname and initials)

Full name of the student

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Dean's stamp Dean of the faculty (director of the institute) _____

ANNEX 3.

PRACTICAL TRAINING DIARY

Ministry of Education and Science of Ukraine
Dnipro University of Technology

DIARY OF PRACTICE

_____

(Practice name)

student _____

(Full Name)

Faculty (institute) _____

Department _____

Higher education level _____

Specialty _____

_____ course, group _____

(Group code)

Head of practice of Dnipro University of Technology_____

(Position, Full Name)

Dean's stamp

Dean of the faculty (director of the institute)

_____

(Signature)

student _____

(Full Name)

arrived "_____" _____ 20____

to the enterprise, organization, institution and started to practice.

Enterprise stamp,
organizations, institutions "___" _____ 20___

_____ _____

(Signature) *(position, surname and initials of the person in charge)*

Retired "_____" _____ 20____
from an enterprise, organization, institution

Enterprise stamp,
organizations, institutions "___" _____ 20___

_____ _____

(Signature) *(position, surname and initials of the person in charge)*

Feedback and evaluation of the student's work in practice

_____

(Name of the company, organization, institution)

_____
_____
_____
_____
_____
_____
_____

Head of practice from enterprise, organization, institution _____
_____

(Signature) *(surname and initials)*

Enterprise stamp,
organizations, institutions "___" _____20_

Feedback of persons who checked the practice_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Feedback of the head of the practice of the institution of higher education about the practice

_____

_____

_____

_____

_____

_____

_____

Date of credit "____" _____ 20 ____

rating:

on the institutional scale _____

(In words)

number of points _____

(In numbers)

Practice head from a higher education institution

_____ _____

(Signature) *(surname and initials)*

Practice schedule

No.	Name of work (Individual assignment)	Weeks of practice					Completion marks
		1	2	3	4	5	

Practice leaders:
from the institution of higher education

_____

(Signature) (surname and initials)

from an enterprise, organization, institution _____ _____

(Signature) (surname and initials)

ANNEX 4

RECOMMENDATIONS FOR THE REPORT

Examples of the design of figures and tables

Table 1. Requirements for formatting typewritten text

Indicator	Value
Margins (top / left / bottom / right)	2 cm / 3 cm / 1.5 cm / 1 cm
Font	Times New Roman
Font size	14
Interval	1.15 pt.
Spacing before / after paragraph	0.0 pt.
First line indent of a paragraph	1.25 cm
Body text alignment	Fit to width
Continuous numbering	At the bottom of the page

Note: When transferring a table to another sheet, it is mandatory to repeat its "heading". At the end of the report, a list of references is provided, which is also drawn up in accordance with current requirements.

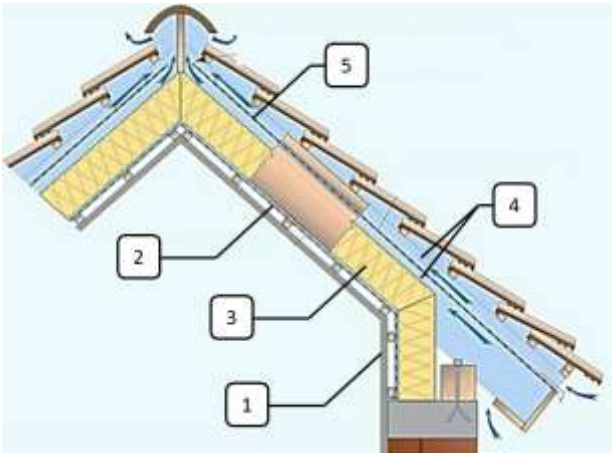

Figure 1 - Insulation of the attic floor: 1 - gypsum board, 2 - vapor barrier, 3 - insulation, 4 - air gap, 5 - waterproofing.

The bibliographic list is drawn up in accordance with the current requirements

ANNEX 5.

EXAMPLE OF APPLICATION ON THE TITLE PAGE

Ministry of Education and Science of Ukraine
Dnipro University of Technology

FACULTY OF CONSTRUCTION
Department of Construction, Geotechnics and Geomechanics

REPORT ON PRE-DIPLOMA PRACTICAL TRAINING

at "_____"
(*enterprise's name)*
in position: "_____"
from __. __. 20__ to __. __. 20__ year.

Signature / Date Fulfilled:
student of group _____
group number
_____
full name

Assessment Signature / Date
Head of practice from the University
_____
position, full name
Head of practice from enterprise, organization
_____
position, full name

Dnipro
2021

ANNEX 6.

COMPOSITION AND CONTENT OF THE WORKSHEET

1. Appointment.
2. Content.
2.1. Characteristics of the construction process.
2.2. Description of all operations performed (manual and mechanized).
2.3. Applied equipment, tools and mechanisms.
2.4. Materials used consumption rates and certification.
2.5. Quality control description:
- in progress;
- upon completion of work.
2.6. Labor protection during the construction process.
2.7. A list of all transactions performed during the working day, indicating the time.
2.8. List of used normative literature.

Educational edition

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