Ministry of Education and Science of Ukraine
Dnipro University of Technology

PROGRAM
OF EDUCATIONAL AND INDUSTRIAL PRACTICAL TRAINING

for students of the specialty
192 “Building and Civil Engineering”

Dnipro
Dnipro University of Technology
2020

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FACULTY OF CONSTRUCTION
Department of Construction, Geotechnics and Geomechanics

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Approved by the methodological commission for specialty 192 Construction and Civil Engineering (protocol # 5 of 22.04.2020) as requested by the Department of Construction, Geotechnics and Geomechanics (protocol # 13 of 14.04.2020).

Educational and industrial practical training is one of the most important types of educational activity aimed at training future specialists in terms of practical tasks to improve their professional skills. The materials contain basic requirements and recommendations to organize of educational and industrial practical training.

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

1. Introduction

"Program of educational and industrial practical training" is developed for second-year students of specialty 192 "Building and Civil Engineering"

Training period is four weeks.

The construction companies of different ownership forms, equipped with the cutting-edge facilities for the operation mechanization and applying advanced construction technologies, are used as the training bases.

2. Objective and tasks of the training

Objective of educational and industrial practical for second-year students is to gain basic knowledge of the technology of certain types of construction operations and to master future profession during the studying and practical training at university and enterprises.

Any practical training is based on the students' participation in the operating processes; in our case – that is the construction operations. The training includes two stages: workplace visits around the construction site of an enterprise (the selected enterprise has signed an agreement with the university) during a week and execution of construction works at the enterprise objects as the trainees under the supervision of a mentor and site engineer during three weeks or training at the enterprise departments dealing with following tasks: technological design of the construction work structuring; design and estimate works, construction work mechanization, and labour protection.

During the workplace visits, students get acquainted with key methods to execute construction operations. They also learn labour safety rules, operation techniques, principles of work site arrangement etc. In terms of the construction site, a foreman (head foreman, site engineer) gives students both theoretical and practical knowledge to form their technical understanding and practical skills which will help future specialist master the selected profession.

During the of educational and industrial practical at a construction site, students should:

- get acquainted with the construction;
- be briefed for labour safety;
- learn the scope of work;
- get acquainted with basic machinery operating at the construction site;
- get an insight into the key operation techniques.

At the same time, students should know how to:

- complete the assigned tasks at the enterprise objects properly and timely;
- (if necessary) work at the enterprise departments (i.e., complete properly basic techniques involved into the specific construction process).
- use the tools applied in the construction process;
- perform control-and-measuring operation properly.

On the training completion, students write a report and submit it to the training supervisors (at the Department of Construction, Geotechnics and Geomechanics) with its following assessment as the differentiated credit.

3. Content of the training

Educational and industrial practical training includes two stages:

1. Getting acquainted with the construction objects, technology, and organization of construction works (workplace visits).

2. Collecting design documents concerning the selected object for course paper and research work.

Students should study architectural-planning and design concepts of the object being constructed, local construction conditions, work execution design (WED) along with the adopted mechanization and sequence of work. While performing construction operations, students study thoroughly methods of the work organization, construction machines and equipment, temporary devices and different facilities.

In terms of the construction organization, students learn organization of the operation of working teams; supply schedules of metal (MS) and reinforced concrete structures (RCS) and complexity of their supply to the construction site; warehousing; structure of mechanization facilities, transportation and fleet of hoisting-transportation machinery, equipment and devices to perform installation and construction work.

Students get to know the technology and organization of construction work (process charts for basic operations – zero cycle, installation work, stonework, finishing operations, floor, roof operations etc.: construction schedule).

To improve practical skills, training supervisors (from both the university and enterprise) organize workplace visits for students to other construction objects and to the objects under reconstruction. In this context, special attention is paid to the problems of construction site arrangement, use of advanced technologies, and work site mechanization while performing specific operations.

4. Methodological instructions on educational and industrial practical training
General provisions

Dean of the Faculty and practical training supervisor on the university part are responsible for overall training organization and supervision. Students are consulted on any educational and methodological issues at the Department of Construction, Geotechnics and Geomechanics; the Department teachers are authorized to be immediate supervisors on the University part.

The order issued by the university determines students' placement to the training sites and dates of the training beginning and finishing.

Training supervisors on the enterprise part are appointed from among the engineering technicians (chef engineer or section foremaster) and approved by the corresponding order.

Employment procedure, working hours and other working conditions for the trainees are defined according to the legislation on the conditions of temporary workers. Internal rules and regulations of the enterprise (organization) are extended to the students as well.

Violation of the company rules, labour discipline and labour safety will result in certain punishments including the expulsion.

Companies being the training bases organize students work, help them collect the required material for their course papers, create conditions for studying technical documentation and special literature, provide and control students' observation of the internal rules. The companies are responsible for possible accidents with the students, provide proper instructing on labour protection, organize lecturing and reporting (along with the training supervisors on the university part), organize transportation of students to the training sites, and involve them in the labour-saving activities.

Before the training, a student should do the following: get the diary at the dean's office and individual assignment from his/her supervisor; get through the instruction concerning the training procedure; and learn essentials of labour protection.

Responsibilities of the training supervisor on the university part

Training supervisor on the university part participates in the placement of students within the training base; he/she is responsible for the training quality and compliance of the training with the program. The supervisor goes to the training site and participates in the workplace visits, theoretical teaching, and instructing on performing construction operations.

Training supervisor on the university part controls that the trainees have proper working and living conditions; he/she takes training reports, and elaborates proposals concerning the training improvements.

Responsibilities of the training supervisor on the enterprise part

Training supervisor on the enterprise part helps trainees gain the required skills during the practical training: he/she controls and assesses students' work and writes the performance appraisal report for each trainee.

Training supervisor on the enterprise part is responsible for timely instructing of trainees concerning the regulations of labor protection and fire protection activities; he/she supervises the trainees' work, organizes workplace visits, and facilitates research activities by the students.

5. Forms and means for training control

Training supervisor on the university part monitors the training process. Documents to control the training are as follows: training program, student's diary, and time sheet.

During the training, students are to observe labour discipline and help the head of a construction organization as for labour discipline observance, labour management, being stick to the construction process procedures and requirements for quality control concerning installation and construction works.

6. Requirements for the repot

To consider every day of the training, students keep their diaries of the completed operations. A supervisor on the enterprise part checks and signs the diary entries. The diary materials are one of the sources to prepare the engineering report. Each student keeps his/her diary individually. On the training completion, each trainee prepares his/her written report and submits it to the supervisor on the enterprise part. Text and calculation parts of the report should be complemented by the engineering drawing of the constructed object, method statements, process chart for certain processes and other documents concerning construction rules and techniques.

The report represents the results of the knowledge and skills gained by a trainee within the period of his/her curricular practical training. The report should reflect student's knowledge in the field of construction engineering. The report should consist of the following parts:

1. Introduction.
2. Scope-planning works and engineering solutions of the construction object.
3. Production technology for 1 – 2 operation types (according to the assignment given by the supervisor).
4. Labour protection measures at the construction objects.
5. Workplace visits.
6. Conclusions.

Introduction should contain the data on the following: name, purpose, basic characteristics (cubing, construction area, number of apartments or spans – for industrial structures, estimated value including installation and construction works). There should be also the information concerning name of the organization constructing the object, its departmental identity, and brief description of the construction conditions before the training.

Part two represents short description of architectural and structural solutions for a building or structure. Following drawings are shown: plan of the typical floor, drafts and drawings of basic structural elements, and data concerning the use of building materials and products.

Part three gives complete description of one or two operation types performed by a student during his/her practical training.

While describing the operations, a student should give detailed description of the following: all the preparatory operations, the required materials and elements; machines and mechanisms, tools, inventory, and devices; technological order and peculiarities of the operation implementation, i.e. a student describes preparatory, main, and auxiliary working processes and draws process charts of the working processes; content of the staff participation in the operations, organization of the staff

operation at the workplace, determining limits of the sites; working conditions and changes in the workers' productivity while performing specific operations, ways of the productivity improvement; work and tariff standardizing, work cards preparation; type of wages for workers and salary distribution in terms of the working team; requirements for the labour protection rules in terms of the specific operation type.

Part four considers safety measures in terms of the main operation types.

Part five represents short characteristic of the objects attended during the workplace visits.

Part six (final part) contains student's feedback concerning the improvement of labour productivity and working conditions at the construction object.

The report should be written on the standard-format sheets of paper; the report is complemented with the graphic material. The report consists of 10 – 25 pages of the typewritten text. Title page is drawn up according to the Annex 1.

7. Summarizing the practical training

Practical training of a student is summarized by getting a credit. A student gets the credit if he/she has a completed diary with positive performance review by a supervisor from the part of the enterprise. Students defend their diaries during the last two days of the training or during a week after the training.

8. List of test questions

1. What floors are not allowed for performing finishing operations?
2. What are the conditions and equipment to perform surface dedusting?
3. What is the surface strength to perform finishing operations?
4. What are the conditions to begin treatment of brick laying bedded by freezing method?
5. What are the requirements for the base (its technical requirements, deviations) prepared for painting or wallpaper hanging? What are the methods to control the process while overcoating and painting?
6. What are the methods and equipment to align the plane while performing improved and high-quality overcoating?
7. What are technical requirements and methods to control overcoating?
8. What painting type requires overall surface priming?
9. What are the conditions to begin painting (including multi-layered painting)?
10. What are technical requirements and control methods for the beginning of painting operations?
11. What are technical requirements and control methods for the facework beginning?
12. What are technical requirements for the finished coating if the surface is overcoated, painted with several paints, varnished or wallpapered?

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Annex 1.

Sample of the title page of the report of educational and industrial practical training

Ministry of Education and Science of Ukraine
Dnipro University of Technology

FACULTY OF CONSTRUCTION
Department of Construction, Geotechnics and Geomechanics

REPORT

on educational and industrial practical training

Executed by student of _____
group

_____
First Name & Last Name

Training supervisor on the department part Candidate of Engineering Sciences, Associate Professor M. Vyhodin

Dnipro
2020

Vyhodin Mykhailo
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