



**COMMON LEARNING OUTCOMES  
FOR EUROPEAN MANAGERS IN CONSTRUCTION  
PART V**

**CLOEMC V**

**2019-1-PL01-KA202-064996**

**INTELLECTUAL OUTPUT 1**

Table of contents for Manuals (IO2-IO7)

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**Warsaw University  
of Technology**



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT



**AEEBC**



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## INTRODUCTION

The construction sector plays an important role in the European economy. It generates almost 10% of GDP and provides 20 million jobs. Improving the education of personnel in this sector is very important because of the efficiency and sustainability of the construction industry. There is a great migration of engineers, construction managers in the construction sector due to the different state of economic development of the EU countries. For this reason, it is extremely important that construction managers' qualification and skills are being recognized and certified in the same way all over EU. Main aim of the project is to extend - in transnational co-operation - the Construction Managers Library (19 manuals created in the previous LDV TOI projects and 6 in ERASMUS+ - all available for free at [www.cloemc.vil.pw.edu.pl](http://www.cloemc.vil.pw.edu.pl), website visited by over 27.000 beneficiaries) by creation of six new manuals. Manuals, containing full contents in 4 languages (EN, DE, PL, ES), allow their implementation and use in different countries and in EU VET education systems.

Partners of the CLOEMC V project are:

- Civil Engineering Faculty of Warsaw University of Technology, PL
- Technische Universität Darmstadt, DE
- Universitat Politècnica de València, ES
- AEEBC Limited, IE
- Polskie Stowarzyszenie Menedżerów Budownictwa, PL
- Korporacja Radex S.A., PL

Project helps to develop basic and transversal skills, such as entrepreneurship (running the small and medium construction companies across EU), management (better absorption of EU funds for construction projects) and language competences (Polish, English, German and Spanish versions of manuals allow users to improve their language skills) in fields of adult education and training. Clear structure of knowledge included in Construction Managers' Library (CML) enables developing appropriate assessment and innovative certification methods for construction managers in EU. Previous CLOEMC I-IV projects' results have already helped to create first basis of such methods by AEEBC (EurBE title) and PABM. The project promotes the use of Content and Language Integrated Learning (CLIL) to increase language competences among learners from various fields of education, as the manuals are commonly available (as previous 25) in four language versions. Contents of the manuals prepared, based on experience of international Partnership, could strengthen possibility of construction staff mobility across EU. Construction personnel will acquire additional knowledge facilitating their competences and skills needed for running both: construction enterprises in the free market economy; and construction projects co-funded from EU. It will also help them to act in the multicultural environment - relevant to the construction site and multicultural global construction companies. Project makes stronger cooperation between industry and education sector. CLOEMC V promoted access to and learning through Open Educational Resources (OER), as the manuals are available for all interested parties on the internet. EurBE card promoted by AEEBC, and PABM among 360000EU professionals is a perfect way of contributing to the development of a European Area of Skills and Qualifications. It is promoting stronger

coherence between different EU and national transparency and recognition tools, supporting recognition and validation of non-formal and informal learning.

## IO EXPECTED DURING THE PROJECT

IO1. Evidence based learning outcomes (establishing final needs and lists of contents for all manuals). Although initial contents were already recognised by the Partners in previous LdV and ERASMUS+ projects and afterwards with the use of questionnaires and other methods, there is a need for updating (due to the fast-changing economic conditions in EU) and fine tailoring (to sectoral and geographical needs) of detailed innovative contents of manuals - IO2-IO7. These evidence-based learning outcomes addresses modern skills needs of construction engineers and managers, stakeholders and associations in the construction sector, SMEs and companies (construction sector), VET providers, and technical universities, delivering the European solid, reliable and comprehensive pedagogical tool.

IO2: Manual 26 - Mentoring and coaching in construction

IO3: Manual 27 - Archaeological and heritage protection aspects in construction

IO4: Manual 28 - Disruptive innovation in construction management

IO5: Manual 29 - Modern circular economy in construction

IO6: Manual 30 - Affordable Housing

IO7: Manual 31 - Social sustainability in construction

### **PLEASE NOTE:**

**Detailed content supposed to be confirmed by first set of Multiplier Events (1-6) and questionnaires to suit best present needs of beneficiaries and European community. Unfortunately, epidemic delayed this confirmation. Confirmation was done in 2022. On the base of discussion with beneficiaries and with agreement with FRSE – Polish Erasmus+ project Agency, partners prepared the additional manual:**

IO8: Manual 32 - Crisis management – Covid-19 in construction

## **IO2. Manual 26 – leader: WUT / co-leader PABM**

TITLE: Mentoring and coaching in construction

Authors:

Wioletta Fabrycka, Maciej Górka, Krzysztof Kosy, Mariola Książek-Nowak, Andrzej Minasowicz, Paweł Nowak, Jerzy Rosłon, Janusz Zaleski, Jacek Zawistowski

This manual covers the following aspects of Project and Construction Management, for example: mentoring and coaching techniques, soft aspects of management, case studies, etc. There is a lack of tools and examples of good practices in the field of soft skills in construction, such as mentoring and coaching. Partners experience and research show that there is a generation gap between experienced engineers and managers with long history of practice and young new employees working in construction projects. The manual gives an innovative, multicultural approach to the subject that is needed in construction sector.

The proposed contents of the book are:

1. Learning outcomes
  2. Introduction (including history, definitions, benefits)
  3. Techniques of mentoring
  4. Types of mentoring
    - Situational mentoring
    - Supervisory mentoring
    - Mentoring circles
    - Flash mentoring
  5. Corporate programs of mentoring
    - Formal programs
    - New-hire programs
    - High-potential programs
  6. Matching approaches
  7. Mentoring in education
  8. Blended mentoring
  9. Reverse mentoring
  10. Business mentoring
  11. Conclusions
- References

### **I03. Manual 27 – leader: RADEX/ co-leader WUT**

TITLE: Archaeological and heritage protection aspects in construction

Authors:

Mariola Książek-Nowak, Albert Laskowski-Słomianko, Andrzej Minasowicz, Paweł Nowak, Piotr Nowak, Jerzy Rosłon, Janusz Sobieraj, Elżbieta Sobieraj-Maciak, Janusz Zaleski; Jacek Zawistowski

This manual covers the following aspects of Project and Construction Management, for example: legal regulations related to national heritage protection, archaeologists on site, archaeology for site managers, conservatory works, smart materials, innovative approaches etc. There is a need to build a bridge between construction workers and archaeology experts due to the legal regulations both responsible for national heritage protection. The manual gives a modern, multi-sectoral view on the subject.

The proposed contents of the book are:

1. Learning outcomes
2. Introduction
3. Brief history of European archaeology
4. Types of archaeological sites
5. Archaeological process and its elements
6. Legal and organizational issues
  - EU and national regulations
  - public bodies
  - administrative procedures
  - permissions
7. Case studies
8. Conclusions

References

## **IO4. Manual 28 – leader: TUDA/ co-leader WUT**

TITLE: Disruptive innovation in construction management

Authors:

Jonas Kleiner, Abdelmoumen Norrdine, Paweł Nowak, Jerzy Rosłon, Evelyn Wehrauch, Pia Weil

This manual covers the following aspects of Project and Construction Management, for example: Disruptive innovation, Innovative IT applications in construction, Data Protection, Big Data, Augmented Reality, etc. The construction sector can hardly keep up with the rapid development of managerial, IT tools and methods. The manual shows potential beneficiaries and stakeholders in construction sector great possibilities to modernize their daily professional life.

The proposed contents of the book are:

1. Learning outcomes
2. Introduction
  - Definition
  - Review of past disruptive innovations (e.g. drawing board - CAD)
3. Applications of disruptive innovations
  - 3.1 Modular construction and prefabrication  
as a substitute for the assembly and production process on the construction site
  - 3.2 3D printing, robotics and additive manufacturing for concrete components  
as a substitute for the formwork
  - 3.3 3D printing, robotics and additive manufacturing for steel components  
as a substitute for the preassembly
  - 3.4 Sensor technology and polysensorial process identification on the construction site  
(as substitution of the analogue and manual documentation and identification of the processes)
  - 3.5 Virtual trainings for dangerous jobs at construction sites.
  - 3.6 Artificial intelligence - machine learning and deep learning in construction
4. Conclusions

References

## **IO5. Manual 29 – leader: AEEBC/ co-leader WUT**

TITLE: Modern circular economy in construction

Authors:

Chris Motzko, Martin Russels – Croucher, Mateusz Frydrych, Maciej Górka, Aleksander Nicał, Paweł Nowak, Jerzy Rosłon

This manual covers the following aspects of Project and Construction Management, as implementation of the Circular Economy Action Plan 2018 advised by the European Commission for example: waste management, urban mining, demolitions legal procedures and technologies etc.). In 2018, the European Commission adopted an ambitious Circular Economy Package, which includes measures that will help to stimulate Europe's transition towards a circular economy, boost global competitiveness, foster sustainable economic growth, and generate new jobs. This innovative approach should be used in construction and is presented in the manual.

The proposed contents of the book are:

1. Learning outcomes
2. Introduction
3. Definition of a Circular Economy
4. Circular Economy concepts, including subchapters about Urban mining and BIM in LCA
5. Why a Circular Economy
  - a. European perspective -The European Green Deal
  - b. Global perspectives
6. Circular Economy
  - a. Design, including subchapter about BIM in LCA
  - b. Construction, including subchapter about BIM in LCA
  - c. Operation, including subchapter about BIM in LCA
  - d. End of life, including subchapter about BIM in LCA
7. Conclusion

References

## **IO6. Manual 30 – leader: TUDA/ co-leader WUT**

TITLE: Affordable Housing

Authors:

Laura Montalban Domingo, Aleksander Nicał, Paweł Nowak, Jerzy Rosłon, Martin Russels-Croucher, Sandra Ruhl

This manual covers the following aspects of Project and Construction Management, for example: comparison of different concepts of housing projects concerning technologies and methods, cost, time and achievable standards, renovation strategies of existing buildings, habitability, comfortability, accessibility, especially for elder and handicapped people with special needs, etc. This manual shows innovative methods of design with underlining of aspects like habitability, comfortability, accessibility. This manual is especially important because it supports needs of elder and handicapped people with special requirements as well as construction methods. Not only elder, but as well as for people with a median or below - average household income.

The proposed contents of the book are:

1. Learning outcomes
2. Introduction / Basic information
  - Statistics (housing market EU, property rights)
  - Development of housing supply
  - Social needs
3. Technological construction methods and housing typology
  - Between the poles of modular construction and handcrafted individual production
  - Housing Typology
4. Modernisation and renovation strategies of existing buildings
5. Digitalisation in the living space
  - Ambient Assisted Living (AAL)
  - Smart Home Systems
6. Case Studies
  - Poland
  - Germany
  - Spain
  - Ireland / UK
7. Conclusions

References



## **IO7. Manual 31 – leader: PUV/ co-leader PABM**

TITLE: Social sustainability in construction

Authors:

Wioletta Fabrycka, Laura Montalban Domingo, Paweł Nowak, Eugenio Pellicer, Jerzy Rosłon, Amalia Sanz, Tatiana Garcia Segura, Jacek Zawistowski, Janusz Zaleski

This manual covers the following aspects of Project and Construction Management, for example: frameworks to assess the social performance of construction projects, social criteria to be considered in construction projects, indicators used to assess the social performance of construction projects, weighting methods to assess the overall social performance of the project., etc. The goal of this book is developing a method to guide construction firms into the social assessment of construction projects, following the recommendations published by the European Commission and the United Nations Environment Programme. Construction firms are mainly focus on cost, schedule and quality to maintain competitiveness. Although they would need to respond to the sustainability challenges and become socially responsible corporations, limited attention is being addressed to empower social sustainability practices in construction firms, hindering the transformation of the industry toward the overall sustainability. Currently, the most important limitation that exists to integrate social issues in each construction project is the lack of clear and utilizable definitions about what is social sustainability in construction industry, what factors are determinant to assess it and the methodologies that can be used to do it. Therefore, this book focuses on laying the foundations to help construction firms to face the social assessment of construction projects.

The proposed contents of the book are:

1. Learning outcomes
2. Introduction
  - 2.1. Importance of understanding sustainability in the construction industry
  - 2.2. Definitions
  - 2.3. Organization of this book
  - 2.4. Summary
3. Social sustainability in the construction industry: issues and challenges
  - 3.1. Current state of social sustainability in the construction industry
  - 3.2. Obstacles to the implementation of social sustainable development practices in the construction industry
  - 3.3. Benefits of implementing social sustainable practices
4. Key factors of social sustainability in the construction industry
  - 4.1. Introduction
  - 4.2. Cultural heritage
  - 4.3. Employment
  - 4.4. Health and safety
  - 4.5. Local development
  - 4.6. Professional ethics
  - 4.7. Public participation
  - 4.8. Training
  - 4.9. Users' impact
5. The importance of social sustainability in the construction industry from different perspectives

- 5.1. Company perspective
- 5.2. Infrastructure Life Cycle perspective
- 5.3. Public procurement perspective
- 6. Indicators for social assessment
  - 6.1. Social indicators for assessing projects
  - 6.2. Social indicators for assessing companies
  - 6.3. Normalization methods
  - 6.4. Weighting methods
  - 6.5. Case studies
- 7. Measuring social sustainability in the construction industry: infrastructures and companies perspective
  - 7.1. Social assessment of infrastructures
  - 7.2. Social assessment of companies.
  - 7.3. Current drawbacks and need for action
- 8. Proposal of a social assessment method for public-works procurement
  - 8.1. Introduction
  - 8.2. Social criteria to be included in public-work procurement
  - 8.3. Guidance on how to include the social criteria in bidding specifications
  - 8.4. Guidance on how to assess the social criteria in public-work procurement

List of References

Further Readings

**ADDITIONAL IO8. Manual 32 – leader: WUT / co-leaders: ALL**

TITLE: Crisis management – Covid-19 in construction

Authors:

Principal Authors: Stefan Brach, Mateusz Frydrych, Tatiana García-Segura, Krzysztof Kosy, Mariola Książek – Nowak, Albert Laskowski, Paweł Nowak, Laura Montalbán-Domingo, Jerzy Rosłon, Janusz Sobieraj.

Co-authors and advisors: Amalia Sanz-Benlloch, Andrzej Minasowicz, Christoph Motzko, Piotr Nowak, Eugenio Pellicer, Martin Russell-Croucher, Elżbieta Sobieraj-Maciak, Janusz Zaleski, Jacek Zawistowski.

Manual 32 "Crisis Management Covid – 19 in Construction" wasn't planned at the application stage in March 2019, but development of epidemic from February 2020 caused significant changes in management style of construction industries. Partnership decided to prepare this manual to facilitate management of the construction companies and investment projects in crisis.

The proposed contents of the book are:

CHAPTER 1 LEARNING OUTCOMES

CHAPTER 2 ECONOMIC SITUATION DURING THE PANDEMIC

CHAPTER 3 FIGHT AGAINST PANDEMIC

3.1 INTRODUCTION

CHAPTER 4 CRISIS MANAGEMENT

4.1 INTRODUCTION

4.2 CRISIS CATEGORIES

4.3 ACTIVITIES UNDER CRISIS MANAGEMENT

4.4 HOW CRISIS MANAGEMENT CAN BENEFIT YOUR BUSINESS OR ORGANIZATION

4.5 CRISIS MANAGEMENT AND TRADITIONAL PUBLIC RELATIONS - SIMILARITIES AND DIFFERENCES

4.6 PREVENTING THE CRISIS

4.7 CRISIS PLANNING

4.8 CRISIS COMMUNICATION

4.9 PSYCHOLOGICAL ASPECTS OF CRISIS MANAGEMENT

CHAPTER 5 CONFLICT MANAGEMENT

5.1 NATURE OF CONFLICTS

5.2 THE PHASES AND THE LIFE CYCLE OF THE CONFLICT

5.3 BASIC PRINCIPLES OF CONFLICT MANAGEMENT

CHAPTER 6 CASE STUDIES

6.1 CASE FROM UK

6.2 CASE FROM GERMANY

6.3 CASE FROM SPAIN

6.4 CASE STUDY FROM POLAND

CHAPTER 7 CONCLUSIONS

EACH CHAPTER INCLUDES REFERENCES