Contract No. 2020-1-FR01-KA202-080105 (2020-2023)



**IO1-A3b & A4**

Didactic tools for the professionalization of site managers and team leaders for building renovation sites, designed in relation to work situations.

**Instructions for carrying out observations of work situations on the renovation site:**

**Testing in the partner countries**

**Final observation Grids**

Drafted by CCCA-BTP

Paris, 15 November 2022

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# **TRANSNATIONAL FINDINGS**

### OBSERVATION VISIT TO THE WORKSITE

### PREPARATION OF THE OBSERVATION VISIT

The persons designated to test the grids for the observation of professional situations on building renovation sites, both concerning site managers (grid 1) and team leaders (grid 2), belonging either directly to partner organizations or to training centres chosen by partner organizations, have given particular importance to the careful preparation of appointments on worksites.

In most cases, appointments were made by phone and confirmed by email, sometimes accompanied by a brief document presenting the RenovUp project. The persons contacted (mainly company owners) were informed of the purpose and nature of the visit (framework, objectives, potential duration, person[s] to be mobilised, conditions for carrying out the visit). It was necessary to ensure that the companies had a good understanding of the mission, to guarantee the availability of the people once on the worksite.

At this stage, it was essential to specify that the objective is to collect the data necessary for the preparation of appropriate didactic material enabling teachers/trainers to adapt their contents and teaching methods to the realities observed on the building sites, to make the training courses as close as possible to the company needs.

In some countries, the partners went to the company to personally prepare the observation of professional situations, which was planned in a second phase. This approach is recommended especially in countries where contacts between companies and training centres are not spontaneous and where trainers do not often go to companies. In Poland, to fully explain the purpose of the procedure, as well as the essence of the RenovUp project, several additional pieces of information were provided during two conversations with the owner of the company in charge of setting up the testing.

During this preparatory phase, the following topics were tackled by phone or directly in companies:

* RenovUp project brief presentation (objectives, partners, phases, results, and their usefulness for companies and for trainers/teachers).
* Nature and purpose of the observations to be made on worksites, number of visits to be made and estimated time of each visit.
* Characteristics of the work situations and profiles we intended to visit and the reason for this choice.
* Intention to interfere as little as possible in the development of the work on renovation site.

It is important to explain the relevance of the planned observations for both: training centres and enterprises. Thus, the following aspects must be specified before the worksite visit:

* Interest in adapting the training courses to concrete work situations so that the training contents better correspond to the concerns of the companies.
* Interest in showing trainers/teachers concrete work situations and exchanging views with company staff to develop training content and methods.
* Interest in understanding the complexity of renovation sites, whatever their size and profile.

In preparing for the observation visit, it is also important to identify the constraints and reticence that will be expressed by the interlocutors, to take them into account, for example:

* Make it clear that this is a visit to explore work situations on renovation sites and, under NO circumstances, visits to evaluate the sites or personnel, but only to observe the environment and the work, and that the privacy of each worker on the site would be preserved.
* Specify that observers will not interfere in any way with the work.
* Integrate specific concerns related to the safety of outsiders who will come to the site.
* The need to adapt one's language to the work site context.

Besides, it is necessary to remain flexible because a hazard in the progress of the renovation site could have interfered with the visit at the last moment. The relational aspect is very important in the whole process of observing renovation worksite situations, as it is for any kind of relationship with the company. It is also useful to confirm appointments on site 48 hours before the visit, to ensure that there are no unforeseen circumstances.

### CONDUCT OF THE OBSERVATION VISIT

Experimental observations of work situations (one or two per country), supplemented by clarification interviews with site managers or team leaders, took place between early June and mid-July 2022. The average duration of a site visit was four hours. The following work situations were observed (not all of them in the same country):

* Preparation of the renovation site, including supply chain planning.
* Rehabilitation of the façade.
* Rehabilitation of the roof (with specific security requirements).
* Waterproofing application (execution and control).

The observation visit consisted of three phases:

1. **Explanation of the objectives, in addition to the information given beforehand** (30 minutes – one hour) – to make sure that the interlocutors have received sufficient information about the purpose of the observation visit. It is essential to explain it again to avoid any reluctance or misunderstanding on the part of team leaders or workers. It is also worth noting that the analyses should focus on renovation works and on the most significant differences from new constructions.

A time dedicated to making contact and explaining the purpose of the visit was necessary to inform and obtain the full support and collaboration of the interlocutors during the observation visit. Some time was spent on the history of the site through the following questions (non-exhaustive list), BEFORE BEGINNING THE OBSERVATION OF THE WORK SITUATION:

* What was the state of the site when the work started?
* What information did you have before coming to work on the site?
* What documents on the construction site have you been given?
* How was your first day on site?
1. **Observation of work situations with experimental grids to test them (**two hours for the site managers, one and a half hours for the team leaders) – always be careful not to give the impression that you are judging the people who work.

Th the most cases, the observation visit started with a site tour during which the interviewers and interviewees talked about the work already done and being currently doing, as well as about the difficulties encountered. The issues on how to improve the process and to overcome the difficulties were also handled.

This stage made it possible not only a simple observing of work situations, but also more in-depth discussions on technical, organisational, procurement, prevention, and safety aspects. It was fundamental to move away from the observation grids to collect unforeseen data, which is nevertheless essential for the future construction/enrichment of training paths based on work situations.

Specific attention paid to :

* The feasibility of observations in situations where specific safety requirements must be met, but where the observer is not sufficiently qualified for the task, such as working on the roof or on mobile scaffolding).
* Observation from a safe position, such as the roof access point, inside the building, but not on the roof if the observer does not have the appropriate skills for this.
* Opportunity to observe the communication skills with the team. Example: How the site manager was able to correct the work method without generating conflict among the workers on the renovation site?

The observations can be more complex since the team leaders may feel more judged than site managers. Therefore, after an adequate explanation of the object of the observation visit again, the observer must gain the trust of the workers and carry out the observation from a position that will not interfere with the normal conduct of the work (the observer should be as unobtrusive as possible). Besides, it is important not only to look at what is in the grids, but also to look at what site managers and team leaders want to show spontaneously. For example, a team leader took the investigator on to the roof to show him how the work was carried out and what solutions had been found to improve the tightness of the fixing screws before fitting the cap.

1. **Clarification interviews** (one hour maximum) to better understand the work situations observed and to place them in a wider context.

Examples of information gathered at this stage:

* Information on the status of the work: work in progress, available staff, problems, and stressful situations that have arisen, documentation handled, etc.
* Explanation of the specific managerial behaviour, like the necessity to take 20-minute breaks every 1.5 hours because of the heat in certain regions, and its influence on the global work performance.
* Analysis and comments on the renovation site documentation.

Throughout these three phases, the interviewers took notes. This notetaking was quite spontaneous, without strictly following the forms, given the difficulty or impossibility of filling them in on the spot. However, the interviewers assimilated its content well beforehand, so that no important component was forgotten during the observation.

### AFTER THE OBSERVATION VISIT

Formalising the observations by completing grids 1 and 2, without trying to fill in all the boxes, took the partners between two and four hours. It was therefore not possible to fill in the grid on site, box by box, as initially envisaged. However, after the site visit and based on all the elements collected, it was possible to complete and classify the elements collected in the various boxes of the grid. Not all the boxes were filled in and it was not the aim to do so in an exhaustive manner. Sorting the information and organising it in the grid can lead a trainer to exploit the content to produce training sequences/modules. It appears that this collection of information, guided by the axes of observation, proves to be much richer than what was initially envisaged.

**The partners realised that training in the use of the grids and their exploitation to build training content for site managers and renovation teams would be indispensable.** It will even constitute one of the keystones of the RenovUp project. The results of the tests conducted in the different countries of the partnership confirm the view that the overall structure of the proposed training is appropriate. The following is an outline of the structure proposed by ITeE Łukasiewicz (Poland) and **approved by all the other project partners**.

The preparation model intended to trainers/teachers is based on the following scheme:

**Stage 1**

f2f meeting at school/training centre

(Suggested 2 days)

**Stage 3**

f2f meeting at school/training centre

(Suggested 1 or 2 days)

**Stage 5**

f2f meeting at school/training centre (Suggested 1 or 2 days)

* RenovUp's offer for the construction staff (general presentation)
* Familiarisation with Grids 1&2 for observation and analysis of work situations
* Tips for pedagogical objectives
* Familiarisation with Grid 3 for diagnosing training needs of trainees
* Familiarisation with Grid 4 for progress evatuation
* Tips for pedagogical objectives
* Open Badges
* General feedback
* Tips for pedagogical objectives

**Stage 2**

Observation and analysis of work situations with

Grids 1 & 2 on Renovation sites (1 or 2)

Suggested ½ or 1 day

**Stage 4**

Identification and analysis of the learner’s progress with

Grids 3 & 4 (or future consolidated grid) at school or on Renovation sites (1 or 2)

Suggested ½ or 1 day

Suggested duration: 5 months maximum

The finalisation of the scheme for the preparation/professionalisation of trainers/teachers for the integration of work situations in the training courses for site managers and team leaders is the next stage of the RenovUp project, where the results of the observations described here will be integrated.

### PROPOSALS FOR IMPROVING THE OBSERVATION GRIDS

### STRENGHTS OF THE EXISTING GRIDS

* Both grids require a structured (categorized) observation that makes it easier for the observer to recognize all aspects of real work situations: environment, documents, methods, equipment, and human resources.
* They provide insight into work procedures that would never be detected with other tools (interview, survey).
* The grids give an overview of the tasks carried out by the team leader/site manager and give an overview of the site with its characteristics and criticalities
* The grids provide an understanding of the site documents that the team leader/site manager uses to follow procedures on the renovation site.

### WEAKNESSES OF THE EXISTING GRIDS

* The complexity of the grids requires a well-prepared observer (trainer/teacher) to use them. Besides, the observers must be at least a highly skilled technicians, and not only generalists.
* The grid cells are small and detailed, not very synthetic, which could paradoxically cause loss of more global information or difficulty in describing the whole complexity of the situations observed.
* Therefore, there is a danger of making incorrect generalizations from partial observations.
* The mere presence of the observer (an outsider) can influence the way in which activities are carried out: workers tend to hide problematic situations to prevent the observer from recording negative procedures.
* Difficulties in carrying out the observation at the time of the development of hazardous work (work on roofs, asbestos removal or confined spaces may be some examples).
* One difficulty is given by the 5Ms system proposed: Often the contents of the rows have nothing to do with the questions proposed in the columns. This leads the compiler to fill in cells that should or could remain empty with the risk of doing a sub-optimal job or having incorrect information
* Before entering the site and talking to the team leader/site manager, one should meet him/her in a different context to establish a friendly relationship and thus improve the site visit.

### RECOMMENDATIONS

* Appropriate selection of renovation worksites for the observation of work situations is crucial. Therefore, the criteria according to which the worksites are selected must be in line with the pedagogical objectives aimed by the teachers/trainers setting up training paths dedicated to team leaders and renovation worksite managers.
* Besides, it is always better to start with the companies the owners of which are open to the issue of professional development, and vocational education and training.
* The grid itself cannot be used as it is on a building site. It must be adapted to the circumstances and specific conditions of the situations to be observed. It is also useful to complement the general information with the human data, like the number of employees, their qualifications and professional skills and experience, and how long they cooperate with each other. This would allow to pay attention to critical elements on the construction site and predict where they may appear.
* In all cases, it is necessary to begin the visit with a history of the renovation site to understand the current state of what is going to be observed, and to collect a whole series of information to make the observation of work situations more relevant.
* When observing the work situation, the observer should stay as far away as possible so as not to alter the work carried out.
* Do not hesitate to take pictures or make videos to complete the information collected with the grids (after the prior agreement of the persons concerned, of course, and in accordance with each national regulation).
* The renovation worksite visit must be "inspiring" for the trainer/teacher by providing him/her with new material (content and context) to modify/update the training paths set before.
* Simplify the initial grids by opening the small boxes and abandoning the strict use of the 5M method, which requires more preparation of teachers/trainers in its use. Moreover, this method is more suited to the observation of the technical execution of work than to the analysis of managers' work situations on site.
* Provide a good training programme for trainers to give them all the tools to make a good observation.
* Enable potential users to become familiar with the system. A methodological guide, based on the experiments carried out by partners in different countries, could be made available.

### NEXT STEPS

|  |  |
| --- | --- |
| **End of September 2022** | Collecting results and publishing the updated version of the grids 1 and 2 after the testing: Approval of the adjusted grids by all the partners.**Partner in charge**: CCCA-BTP (FR) |
| **End of September 2022** | Clarifying on how to transform observations made in the workplaces into training objectives**Partners in charge**: CCCA-BTP (FR), FLC Asturias (ES) |
| **Mid October 2022** | Finalisation of the trainer/teacher preparation scheme**Partners in charge**: LUKASIEWICZ (PL), CCCA-BTP |
| **Mid October 2022** | Identification of teachers/trainers for the experimental preparation session**Partners concerned**: All |
| **End of October 2022** | Starting of experimental preparation of teachers/learners**Partners concerned**: All |
| **22-23 November 2022** | **Object**: 5th transnational meeting in Rome to review the actions undertaken.**Partners concerned**: All |

# **GRIDS IMPROVED AND UPDATED**

### Grid for the Observation of work situations in renovation companies experienced by Worksite Managers

GENERAL PRESENTATION

**Date of the observation visit and its duration:** ………………………………………………………………………………………….

Visitor: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Sending body: …………………………………………………………………………………………………

**Company visited:** …………………………………….…………………………………………………

Activity: …………………………………….………………………………………………..….

Main characteristics (age, number of employees, governance): …………………………………………………………………………………

Main contact person: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Other people met: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Renovation worksite located at: …………………………………….………………………………………………

Total number of workers present at the worksite visited: ……………, incl. in-house workers ……….., sub-contracting labour force: ………………...

Main trades present on the site: ……………………………………………………………………………………….

Other relevant information: …………………………………………………………………………………

STATE OF THE ART

**Environment of the activities to be observed:**

*Describe the type of building (or part of a building) to be renovated: individual house, apartment building, commercial premises, offices, monument, etc.; its condition and immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements influence the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste disposal methods, etc.)*

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Nature of the renovation being carried out: ………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

Renovation work achieved: ……………………………………………………………………………………………………………………………………………………………………………………….

Renovation work to be achieved in the forthcoming weeks: ……………………………………………………………………………………………………………………………………..

**Methods observed:**

*Identify and describe the techniques, processes or operating modes used on the renovation site (or on the part of the renovation site observed). Note any elements that seem useful or relevant to consider in the design of future training paths).*

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**Equipment:**

*Identify and describe the tools, measuring instruments, machines or equipment etc. used during the work situation observed. If necessary, note the materials used.*

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**Staffing**:

*Indicate the number and profile of the people involved in the activity observed, and their qualifications and specialisation.*

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**Documents:**

*Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents to be able to work from them during future learning sequences.*

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**PLEASE SELECT, FROM THE LIST BELOW, THE ACTIVITIES/WORK SITUATIONS OBSERVED, AND DESCRIBE THEM**

**COMBINING OR SECTIONING THE COMPONENTS IS ALLOWED**

### BLOCK 1: Preparing a renovation site

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 1 | Component 1.1: Literature review of the renovation project components | * Identify and collect documents specifically related to renovation projects
 |  |
| * Analyse data and identify critical points
 |
| * Report back and propose improvements, changes, or solutions if necessary
 |
| Component 1.2. Diagnostic methods for existing buildings and premises prior to intervention | * Identify the different diagnostic procedures/methods/techniques possible in renovation projects
 |  |
| * Determine / select appropriate diagnostic method(s)
 |
| Component 1.3. Visit to the site of the future renovation: Preparation, observation methods and analysis of the observed elements  | * Identify, list, and locate elements to be observed during the visit
 |  |
| * Determine the diagnostic methods to be used and the possible contributors or materials required
 |
| * Carry out the visit, identify and notify critical points
 |
| * Analyse the critical points and propose the necessary solutions or adjustments
 |
| Component 1.4. Preparation of the renovation site plan and its layout (marking out, fencing and preparation of the site area)  | * Identify/characterise specific elements of renovation sites
 |  |
| * Integrate the specific elements of renovation into the design and layout of intervention sites.
 |
| Component 1.5. Planning and phasing of the team's work on renovation sites  | * Identify/characterise specific elements of renovation sites
 |  |
| * Integrate the specific elements of renovation into the planning, procedures, and phasing of interventions
 |

### BLOCK 2: Managing communication and relations on a renovation site

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 2 | Component 2.1. Management of teams on renovation sites: Monitoring of assignments and tasks and anticipation of complex and potentially conflictual situations with internal staff and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |
| * Anticipate, develop, and propose solutions
 |
| * Informing team leaders
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations (e.g. adaptation to site constraints, verification and monitoring of material supplies, verification of delivery times, consideration of energy efficiency, final efficiency, etc.).  | * Identify and characterise the different types of constraints or problems specific to renovation projects
 |  |
| * Anticipate, develop, and propose solutions and inform team leaders
 |
| Component 2.3. Follow-up of relations with the client, the company manager, the architect, the design office & the CSS (health and safety coordinator). | * Characterise the specificities of the different protagonists of a renovation project
 |  |
| * Integrate these specificities in the exchanges/procedures between stakeholders
 |
| Component 2.4. Mental management of workload, including management of stress and tension at work. | * Identify the particularities and specificities of the tensions linked to renovation projects
 |  |
| * Develop facilitative or anticipatory strategies
 |

### BLOCK 3: Management of technical and organisational aspects of the renovation site

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal management of a renovation project. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects
 |  |
| * Integrate these specificities in the management of the site
 |
| Component 3.2. Management and control of on-site protection of workers and buildings, including erection/dismantling of scaffolding, work at height, difficult access and use of hazardous materials on renovation sites. | * Identify specific and critical situations
 |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.3. Waste management on renovation sites: planning and management of waste bins, sorting and recycling. operations (circular economy), and the use of appropriate monitoring tools. | * Identify specific situations
 |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.4: Integration of energy saving standards in renovation projects and use of appropriate monitoring tools. | * Identify specific situations
 |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.5. Continuous quality control of renovation sites: quality of intermediate phases and quality of finished works. | * Identify the critical points to be considered
 |  |
| * Identify quality criteria and develop specific control procedures
 |

### BLOCK 4: Acceptance of renovation work and quality control

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 4 | Component 4.1 Quality control of renovation results and client approval | * Identify and characterise the points of attention to be considered
 |  |
| * Develop the necessary control procedures
 |
| Component 4.2. Evaluation of the working process and results, including evaluation, valorisation, and improvement of the team. | * Evaluate the final deliverables and processes implemented
 |  |
| * Valuing work with team leaders and teams
 |

**Other observations or ideas to be implemented when designing the planned training pathways:**

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### Grid for the Observation of work situations in renovation companies experienced by Team Leaders

GENERAL PRESENTATION

**Date of the observation visit and its duration:** ………………………………………………………………………………………….

Visitor: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Sending body: …………………………………………………………………………………………………

**Company visited:** …………………………………….…………………………………………………

Activity: …………………………………….………………………………………………..….

Main characteristics (age, number of employees, governance): …………………………………………………………………………………

Main contact person: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Other people met: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Renovation worksite located at: …………………………………….………………………………………………

Total number of workers present at the worksite visited: ……………, incl. in-house workers ……….., sub-contracting labour force: ………………...

Main trades present on the site: ……………………………………………………………………………………….

Other relevant information: …………………………………………………………………………………

STATE OF THE ART

**Environment of the activities to be observed:**

*Describe the type of building (or part of a building) to be renovated: individual house, apartment building, commercial premises, offices, monument, etc.; its condition and immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements influence the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste disposal methods, etc.)*

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Nature of the renovation being carried out: ………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

Renovation work achieved: ……………………………………………………………………………………………………………………………………………………………………………………….

Renovation work to be achieved in the forthcoming weeks: ……………………………………………………………………………………………………………………………………..

**Methods observed:**

*Identify and describe the techniques, processes or operating modes used on the renovation site (or on the part of the renovation site observed). Note any elements that seem useful or relevant to consider in the design of future training paths).*

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**Equipment:**

*Identify and describe the tools, measuring instruments, machines or equipment etc. used during the work situation observed. If necessary, note the materials used.*

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**Staffing**:

*Indicate the number and profile of the people involved in the activity observed, and their qualifications and specialisation.*

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**Documents:**

*Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents to be able to work from them during future learning sequences.*

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**PLEASE SELECT, FROM THE LIST BELOW, THE ACTIVITIES/WORK SITUATIONS OBSERVED, AND DESCRIBE THEM**

**COMBINING OR SECTIONING THE COMPONENTS IS ALLOWED**

### BLOCK 1: Preparing a renovation site

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 1 | Component 1.1. Preparation of a renovation site and diagnostic methods of existing buildings and places before the intervention | * Implement specific technical protocols or diagnostic methods
 |  |

### BLOCK 2: Mastering communication and relations on a renovation site

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 2 | Component 2.1. Monitoring teams on renovation sites: Anticipation of potentially conflictual situations with the team and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |
| * Anticipate, develop, and propose solutions to your team
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations, including co-activity. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |
| * Anticipate, develop, and propose adaptation solutions
 |
| Component 2.3. Follow-up of relations with the client, the hierarchy, and external partners. | * Characterise the specificities of the different protagonists of a renovation project
 |  |
| * Integrate these specificities in exchanges with different stakeholders
 |
| Component 2.4. Evaluation of the working process, including evaluation, valorisation, and improvement of the team. | * Evaluate the final deliverables and processes implemented
 |  |
| * Valuing work with team leaders and teams
 |

### BLOCK 3: Mastering the technical and organisational aspects of teamwork

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal aspects of the tasks entrusted to team leaders on renovation sites. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects
 |  |
| * Integrate these specificities in the management of the site
 |
| Component 3.2. Organisation and control of on-site protection of workers and buildings, including erection/dismantling of scaffolding, work at height, difficult access, and use of hazardous materials on renovation sites. | * Identify specific and critical situations
 |  |
| * Identify the current standards or regulations
 |
| * Develop and/or implement resolution strategies
 |
| Component 3.3. Organisation of waste treatment on renovation sites: planning and management of waste containers, pre-separation and collection of waste, principles of GOZ on site and use of appropriate tools for its monitoring. | * Identify specific situations
 |  |
| * Identify the current standards or regulations
 |
| * Implementing appropriate techniques
 |
| Component 3.4: Integration of energy saving standards in renovation works and use of appropriate monitoring tools. | * Identify specific situations
 |  |
| * Identify the current standards or regulations
 |
| * Apply resolution strategies
 |
| Component 3.5. Continuous quality control of the intermediate phases and the quality of the finished work. Compliance with the acceptance conditions: control of temperature conditions, humidity, sequence of work, technological times, control of delivery dates and quantities, how and where materials are stored. | * Respecting quality criteria and developing specific control procedures
 |  |

### BLOCK 4: Acceptance of renovation work and quality control

|  |  |
| --- | --- |
| **THE TEACHER OR TRAINER OBSERVES AND WRITES DOWN:** | **Topics to be observed for each selected component:**Environment: Type of space, geographical location, condition, access, etc. specific to the activity observed.Methods: Techniques, processes, and operating modes used related to the activity observed.Equipment: Tools, instruments, machines, equipment, and materials used.Staffing: Number of people, qualification and role in the process observedDocuments: Identify and collect the different documents used when fulfilling the activity observed.Others (If relevant) |
| BLOCK 4 | Component 4.1: Quality control of results and client approval, considering the priority ranking: construction of the building, waterproofing, thermal insulation, acoustic insulation, others. | * Checking the final deliverables and the processes implemented
 |  |

**Other observations or ideas to be implemented when designing the planned training pathways:**

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# **ANNEX 1: NATIONAL REPORTS**

### FRANCE

The management of the training body BTP CFA Pays de la Loire contacted, at the end of May 2022, companies working in the renovation of buildings, and **people with whom there is already a good relationship** and for whom it was felt that there was a good potential for the nature of the building sites to be observed in order to test grids 1 and 2, as agreed during the transnational meeting held in Paris, on 11 and 12 May 2022. The relational aspect is very important in the whole process of observing renovation worksite situations, as it is for any kind of relationship with the company.

**Prior to the visit:**

* Two companies were contacted by Philippe Dreyfus (development director of the regional training organisation - Pays de la Loire) and by Mickael Prioux (trainer, specialist in building renovation sites). They were informed of the purpose and nature of the visit (purpose, potential duration, person(s) to be mobilised, conditions for carrying out the visit). It was necessary to ensure that the companies had a good understanding of the mission, the necessary cooperation and the availability of the people contacted. Contacts were made by telephone and confirmed by e-mail.
* Two appointments were set: 7 and 8 June 2022, at specific locations (directly at the sites) and within a short timeframe to avoid any no-shows. A confirmation of the appointments was made in the 48 hours preceding the visit.

It is necessary to remain flexible because a hazard in the progress of the site could have interfered with the visit at the last moment, which fortunately did not happen. In both cases, the interviewers (Philippe Dreyfus and Mickael Prioux already mentioned, and Pierre Touillon of the CCCA-BTP) were very well received and the people on site had been well informed of their visit and their mission.

**During the visit:**

* A time dedicated to making contact and explaining the purpose of the visit was taken with the site manager in the 1st case, and with the team leader and his worker in the 2nd case. **This time was necessary to inform and obtain the full support and collaboration of the interlocutors** during the exchanges and the visit. It was clearly indicated that the observations and elements collected should then be used in training sessions to be as close as possible to real and realistic concrete situations of renovation sites. We were able to benefit (in the 1er case) from the site meeting room to settle down and discuss in a quiet place. In the second case, we had to make do with the basic conditions of reception, which did not, however, affect the smooth running of the interviews.
* A second time was devoted to **the history of the site** through the following questions:
* What was the state of the site when the work started?
* What information did you have before coming to work on the site?
* What documents on the construction site have you been given?
* How was your first day on site?

The aim was to collect as much general information as possible, to create a relationship of trust before getting to the heart of the matter, and to ensure that the interviewers were fully interested in the problems of their work sites.

This exchange helped to create a climate of trust by showing interest in the work to be carried out, in the people involved on the site, and in the actual progress of the site.

* Another time was devoted to visiting and analysing the sites themselves. This led to more in-depth discussions on technical, organisational, procurement, prevention, and safety aspects, etc.

Throughout these exchanges, the interviewers took notes. This **notetaking was done quite spontaneously, without following the grid rigorously**, given the difficulty or impossibility of filling it in on the spot. The interviewers assimilated its content well beforehand.

**After the visit:**

It was therefore not possible to fill in the grid on site, box by box, as initially envisaged. However, after the site visit and based on all the elements collected, it was possible to complete and classify the elements collected in the various boxes of the grid. Not all the boxes were filled in and it was not the aim to do so in an exhaustive manner. However, sorting the information and organising it in the grid can lead a trainer, in a third stage, to exploit the content to produce training sequences/modules. It appears that this collection of information, guided by the axes of observation, proves to be much richer than what was initially envisaged.

Two examples of using the potential of observation grids to create training sequences or modules:

* On site 1, the site manager told how he carried out his planning considering the experience (knowledge of the work potential of each worker on the site, estimation of the duration of the tasks to be carried out) and the "handling of the site" in the first 10 days. There are many elements in this story to feed into and create a sequence dedicated to planning.
* On site 2, the team leader described how the topographical situation of the site had led him to wonder about the necessary concrete supply. He explained all the simulations and tests that had been carried out, only to end up with a completely different solution, as this supply proved to be impossible to achieve. From this he can create a complete learning sequence/practical lesson for a trainer.

**Lessons learned and proposed amendment**

* In all cases it is necessary to start the site visit with a history of the site for the following two reasons:
* Understand the current state of what is to be observed,
* Collecting a whole range of information to feed the observation axes of the grid.
* The grid itself cannot be used as it is on a building site. But it can be adapted or modified as was done. The important thing is to find all the observation axes initially chosen.
* It is necessary to allow time for future users to become familiar with the system. A methodological guide, based on the experiments carried out by partners in different countries, could be made available.
* The site visit must be "inspiring" for the trainer by providing him/her with material (content and context) that is sometimes unexpected to achieve the training objective(s) that he/she has set. Once this raw material has been reformulated and classified or ordered in the grid, specific problems can be constructed that are conducive to training situations.
* The selection of observation sites is crucial. It seems necessary to target potentially rich places with people who are open to the issue of professional development.

*Report produced on 14 June 2022 by Philippe Dreyfus, Mickael Prioux (BTP CFA Pays de la Loire), and Pierre Touillon (CCCA-BTP).*

### SPAIN (Principado de Asturias)

To carry out this experimentation, we established contact with the Asturian Construction Confederation, who provided us with the name of the company available to collaborate and which was carrying out a rehabilitation work for the envelope isolation of a high-rise building located in the centre of Gijón, which seemed ideal to implement the use of Grid 1 and Grid 2, since it met a very common type of work in our region.

The experimentation was carried out by a technician and a trainer from the FLC training area.

1. **PREPARATION OF THE VISIT**

On 21 June 2022 the manager of the company is contacted to ask for his collaboration in this experimentation and a meeting is arranged with her to explain the details of the collaboration. The meeting takes place in her office the following day on 22 June 2022 and during this first contact she is informed about:

* The RenovUp Project (objectives, partners, phases...)
* The nature and purpose of the observation, number of visits to be made and estimated time of each visit.
* The characteristics of the work situations and profiles we intended to visit and the reason for this choice.
* Our intention to interfere as little as possible in the development of the work on site.

The manager is receptive to the collaboration, although she is concerned that the presence of two people outsiders may affect the safety of the work. She contacts the safety coordinator to inform him of our presence and after his approval, she calls the site manager to agree with him on a date for the visit.

It is agreed that the site will be visited the following day, on 23 June 2022, to observe two work situations: the rehabilitation of the north façade (profile to be observed: site manager) and the rehabilitation of the roof (profile to be observed: team leader).

1. **DEVELOPMENT OF THE VISIT**

**Observation of the site manager**

The site manager was already waiting for our visit at the agreed time. He had sufficient information about the purpose of our presence and was very helpful.

Before starting the observation, we held a talk with him to obtain information on the status of the work: the workers present that day, work to be done that day, expected completion date, problems that had arisen since the start of the work.

The observation took place while the person in charge was carrying out the waterproofing application execution control and we had the opportunity to check the excellent communication skills of this professional with his team: how he was able to correct the work method without generating conflict among the workers.

In total, the observation lasted another 2 hours.

**Observation of the team leader**

This observation was the more complex since:

* Neither the manager nor the site manager had informed the team leader in advance of the visit, which initially generated in the worker a certain reservation.
* When we arrive the team leader was going to access the roof to inspect its condition and place lifelines. He was concerned about the appropriateness of two outsiders without specific training in working at heights accessing a space reserved exclusively for qualified workers.

After an adequate introduction of the object of our visit, we managed to gain the trust of the worker and carry out the observation from a safe position on the roof (at the access point to the roof, inside the building).

After the observation, we spend a few minutes gathering information on the status of the work: work in progress, available staff, problems, and stressful situations that have arisen, documentation handled, etc.

In total we stayed with the team leader for about an hour and a half.

Data collection during both visits was carried out by direct notes in a notebook.

1. **AFTER THE VISIT**

Grid 1 and Grid 2 were completed off-site, in the afternoon immediately following the visits.

With the help of the annotations the process of covering the Grids was straightforward. It was done more quickly in the second one since we were more familiar with the tool. Therefore, we believe that proper "training" of the observer is key before the visits take place.

**STRENGTHS AND WEAKNESSES OBSERVED DURING THE EXPERIMENTATION WITH THE TOOL**

* **Strengths**
* Both Grids require a structured (categorized) observation that makes it easier for the observer to recognize all aspects of real work situations: environment, documents, methods, equipment, and human resources.
* They provide insight into work procedures that would never be detected with other tools (interview, survey).
* **Weaknesses**
* The complexity of Grid 1 and Grid 2 requires a trained observer to use them.
* The size of the grid cells is very small, which makes it necessary to be brief in the description of the observation, causing potential loss of information or difficulty in describing the situations observed.
* There is a danger of making incorrect generalizations from partial observations.
* The mere presence of the observer (an outsider) can influence the way in which activities are carried out: workers tend to hide problematic situations to prevent the observer from recording negative procedures.
* Difficulties in carrying out the observation at the time of the development of hazardous work (work on roofs, asbestos removal or confined spaces may be some examples).
1. **RECOMMENDATIONS**
* Always contact directly with the workers to be observed to avoid reluctance to the visit by "catching them by surprise".
* If it is not possible to fill in the Grid directly during the visit, do so immediately afterwards so as not to forget the details observed.
* The observer should stay as far away as possible so as not to alter the observed situation
* Facilitate "observer training", e.g., by providing them with videos/recordings on which they can observe and how these observations are used to complete the Grids.

### ITALY

* + - 1. **PREPARATION OF THE VISIT**

On 01 July 2022 in the morning, Filomena Giaquinto technical manager of the construction company GG Costruzione was contacted via Zoom to ask for his collaboration in this experiment. During the meeting, we explained the purpose of the project, emphasising that the visit we were going to make to the building site was not to evaluate personnel but only to observe the environment and workings, and that privacy would be maintained. We will also not interfere with the work in any way. She liked our presentation and made an appointment for us to visit the site on 07 July at 9.30 am after hearing the site manager/team leader and getting a positive response from the construction manager. She also accepted our request to let 2 people in: Eng. Diego D4e Gisi (Formedil) and Eng. Luciano De Palma (trainer of the Construction School of Avellino).

* + - 1. **DEVELOPMENT OF THE VISIT**

**Observation of the site manager**

At 9.30 a.m. we arrive at the site where the site manager/team leader is waiting for us. We introduce ourselves and very quickly explain to him the purpose of our visit. We immediately explain to him that we are not there to judge his work or by order of GG Construction, but for a broader discourse concerning the improvement of the skills of the foremen and site leaders, and that our project starts from the observation of the environment, so we are there to test some grids we have created. We explain to him that it is us under scrutiny and not him or his co-workers. This puts him at ease and before we start talking, he takes us on a tour of the construction site and even allows us to take photos (not of everything of course).

During the site tour we talked about the work they have already done and are doing now and the difficulties they have encountered. We were told how the improvement process took place and how the difficulties that arose were handled. He took us up to the roof to show us how the work was being carried out and proudly showed us the solutions he had proposed to improve the waterproofing of the fastening screws before putting the cap on.

After about an hour because of the heat, we asked him to go to a bar near the construction site to quench our thirst. He asked all the workers to take a break and come back. At the bar he told us about the suggestion to take 20-minute break every 1.5 hours of work because of the heat. We returned to the site after 20 minutes and everyone went back to work.

During the chat at the bar, we reached a good rapport of trust during which he told us about various critical issues on the construction site.

On the way back he gave us a tour of the area where the gymnasium was to be built and told us about the difficulties in accessing this second construction site.

Immediately afterwards, he showed us all the construction site documentation he had available.

In total, the observation lasted about three hours, in fact we left at 12.45pm.

* + - 1. **AFTER THE VISIT**

During the visit we took notes which we also showed to the site manager/team leader, but the grids were filled in at the office on the afternoon of the visit. I let the trainer fill in the grids to see if any difficulties might arise. With the support of the notes and my own he had no major difficulties.

**STRENGTHS AND WEAKNESSES OBSERVED DURING THE EXPERIMENTATION WITH THE TOOL**

* **Strengths**
* The grids give an overview of the tasks carried out by the team leader/site manager and give an overview of the site with its characteristics and criticalities
* The grids provide an understanding of the site documents that the team leader/site manager uses to follow procedures
* **Weaknesses**
* The grids, even if well structured, require a trainer who is experienced.
* One difficulty is given by the 5Ms: often the contents of the rows have nothing to do with the questions proposed in the columns. This leads the compiler to fill in cells that should or could remain empty with the risk of doing a sub-optimal job or having incorrect information
* Before entering the site and talking to the team leader/site manager, one should meet him/her in a different context to establish a friendly relationship and thus improve the site visit.
	+ - 1. **RECOMMENDATIONS**
* Meet the team leader/site manager before entering the site
* Try to streamline the grid. We could amalgamate the 5 m into one grid and leave the compiler free to write.
* Provide a good training programme for trainers to give them all the tools to make a good observation.

 

 

### POLAND

**General explanations**

* Łukasiewicz-ITeE invited the Association of Finishing Works Specialists (SSRW) to pilot testing of observation tools. It brings together representatives of employers in the renovation and construction industry.
* This greatly facilitated the process of agreeing and obtaining a contractor for construction works (construction site) to participate in the experiment (the opinion on the tools proposed by RenovUp was undertaken by one of the members of the SSRW, and at the same time the owner of the renovation company experienced in performing renovation interventions).
* To fully explain the purpose of the testing itself, as well as the essence of the entire RenovUp project, several additional information was provided (2 conversations were held with the contractor - Mr. J. Blachowski).

**Notes and observations** on the usability/functionality of tool 2, used to observe the working situation of team leader performing renovation works on various types of construction sites

* The choice of construction site will be crucial for the results of observing the working situation. A different course of construction works, and thus a different type of challenges, will be observed during work on new facilities, and a completely different one when the renovation / adaptation of the old building takes place, or when we perform ad hoc repairs. Construction workers (foremen/ team leaders, managers) then collect different information about the object, necessary documents, permits and plans, and the construction process takes place differently, which in turn forces different tools and technologies. Concentration / narrowing of analyses to renovation works therefore seems right and justified.
* Collecting as much data as possible about the conditions and the construction itself is the most advisable and expedient. Therefore, it is very important and necessary to have that part of the tested tool that characterizes the construction site, the type of work performed, the state of employment, etc (page 1) is an added value.
* It seems expedient and useful to supplement this information with the human factor, i.e. the number of employees, their qualifications (documented) and professional skills / experience (not necessarily confirmed) and very important - how long they cooperate with each other. This will allow us to pay special attention to critical elements on the construction site and predict where they may appear.
* Filling in the table (total) on the construction site during the visit is practically impossible, only it is advisable to take notes and make entries later.
* Photos and videos are very useful for teaching purposes. Documenting the work situation in the form of photos or even videos - therefore the most advisable and purposeful. However, this is often unwelcome (or even forbidden) and difficult to implement. It would be necessary to convince the construction management and the recorded workers themselves that the goal is not to assess them, but rather to capture / identify difficult for them WORK SITUATIONS and show how they were dealt with or (unfortunately) what mistakes were made. Important: you should take care of GDPR issues (templates for permission etc.). It is worth taking the trouble of photographing and recording so that the faces of specific people are not visible.
* As for the observation table itself - it is rather understandable, it allows you to collect data that can be the basis for building a training program. Proposals were made for a minor correction / addition of the names of individual training units (for a greater distinction of specificity and differentiation between the foreman and the construction manager. See them in red in attached file).
* I share the opinions and observations of colleagues from France and Spain, as to the need to explain in advance to the managers of the selected construction sites the objectives of conducting observations and to discuss as accurately as possible the scenario of the course of the visit of outsiders to the construction site. This explanation should also reach other construction workers (especially those who may possibly be photographed or recorded).
* Very important – discussion of the safety of people conducting observation on the construction site (agreed health and safety rules must be strictly observed by them).
* I propose to develop a « checklist » that will allow for a repetitive assessment of the foreman's work, his skills, identification of errors and their correction, the possibility of comparing the results.
*Comment from J.Religa: this type of « checklist » are other tools prepared by the RenovUp team: FORM 3 – Positioning the student on the development path (diagnosis of training needs) and FORM 4 – Monitoring progress.*

Radom, 21.07.2022

### GREECE

To conduct the Grid’s testing, PEDMEDE contacted a VET centre (Techniki Ekpaideytiki), at the end of June 22, to convince it to voluntarily participate in the implementation of the training phase of the RenovUp project. Based on the good cooperation between the two organizations as well as the significance of the RenovUp project outputs, the PEDMEDE team achieved to persuade the VET centre colleagues, to be **voluntarily involved** in the process.

Simultaneously, PEDMEDE started a thorough research throughout its member companies to identify their availability and the suitable construction site. This research entailed the explanation of the RenovUp project purpose, objectives, partners, and phases as well as a mapping of the available construction sites on the specific days that the trainers were willing to attend. The summer period did not facilitate the process of the identification as, especially in Greece, summer can be extremely hectic in terms of working activities on the sites until July while August is almost a non-working month. This delayed the project activities however, the PEDMEDE team tried to surpass this significant drawback.

**Prior to the visit:**

The selected company was contacted by PEDMEDE’s staff, Ms. Eleni Damianou. She provided more detailed information about the profiles and persons that were to participate and visit the sites, the nature of the whole process, as well as the essential steps that were to be taken to successfully complete the Grid’s testing. In that way, it was ensured that PEDMEDE’s members would have a better overview and understanding of the project’s needs, their role, and the type of collaboration needed. The manager of the company expressed his doubts regarding the impact that this visit would have on the working situation and especially the workforce, especially because a visit from non-employees would have meant for a special security process that would be called upon the employees in order to ensure that the visitors will safely perform their work. Furthermore, due to the sensitivity of the selected sites in terms of cultural and historical significance, PEDMEDE agreed that the visitors will not record or take photos of the site nor the companies’ staff at this first stage to avoid any kind of complaints as well as to first build a trust-relationship with the participants. Following this, it was agreed that the trainers will conduct the visit on the 28th of August to conduct the observation.

**During the visit:**

The participants were waiting for us at the agreed time at the working site. They had initially expressed their willingness to participate in the project activities, to their directors. During the first part of the visit, the time was devoted to the presentation of the project as well as to an ice-breaker conversation regarding the progress of the works and the daily needs of the construction site. Furthermore, as was recommended, the second part was devoted to questions about the history of the sites.

Observation of the site managers

The site managers were aware of the visit as well as was informed about its purpose. That was important to save time and proceed successfully with the next steps of the observation. However, the trainers as agreed, conducted a presentation of the project and its significance with the purpose to make explicit the importance of this observation as well as their involvement.

Before the start of the observation, they provided the trainers with information about the history and needs of the buildings, and the current works at different places of the Palace and specifically at the observation site. The observation lasted for 2 hours. The observation was conducted in the Galley Kitchen of the Tatoi Palace.

Observation of the team leaders

The team leaders were adequately informed about our presence, and in both cases, they asked multiple questions about the nature of the observation and the project. The trainers proceeded to the presentation and after its end, a long conversation started in regard to their role. When thy felt comfortable, the observation started.

The data collection was conducted through notetaking. The overall time needed for the observation was eighty (80) minutes in the first case and almost one hour and a half for the second. A challenge that was raised was the fact that the trainers highlighted that it was almost impossible to write directly at the grid. Nevertheless, since the trainers had an in-depth view of the grids before the visit, they were able to take the necessary information

**After the visit:**

The Grids (1&2) were filled following the completion of the visit but being a voluntary work, their delivery was a bit delayed due to other commitments.

The trainers classified the collected information during the visit among the boxes of the grid. Unfortunately, it was impossible to fill all the boxes of grids.

Worth to note is that the following day of the visit, PEDMEDE conducted an interview with the trainers to be updated on the whole experience and get introduced at the outputs of the visit. The conduction of these interviews was very crucial for us. The transfer of the information and the whole experience to us was important for the output of the Greek deliverable.

**Lessons learned**

* The existence of an ice-breaker conversation has been crucial, and it helped built a trustful relationship with the workers and makes them feel comfortable and act on a workable basis.
* It is important to inform the workers about an upcoming visit way in advance regarding its purpose, and its conditions to save time at the beginning of the visit and ensure all relevant health & safety measures have been taken.
* The completion of the Grids during the visit was impossible due to the great amount of information and the time constraints.
* There was a risk about the safety of the trainers. Their presence had to be approved by the H&S Responsible.

# **ANNEX 2: GRIDS TESTED NATIONALLY**

### FRANCE

**Case 1**

Company: BENAITEAU

Company activity: Restoration of heritage and historical monuments

Main characteristics (age, number of employees, governance): Company created in 1920. It is managed by 3 co-managers - limited liability company status. It has 50 employees.

Contact person : Laurent BAUDIN Function : Manager

Phone : XXXXXXXX Email : XXXXXXXX

Site located at : Château de la Touche - 44310 La Limouzinière (France)

Day of the site visit: Wednesday 8 June 2022

Contact: Johan MOREAU - **Site Manager**

Environment of the renovation site: Describe the type of building (or part of a building) to be renovated: individual house, apartment building, commercial premises, offices, monument, etc.; its condition and immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements influence the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste disposal methods, etc.) They will provide the teaching sequences with elements of reflection relevant to the learners.

Restoration of a 12th century building originally used as the home of a local lord.

Access : short communal road following the communal road at 1 km from the village. Site located in the middle of a rural area accessible without difficulty to any type of vehicle that can deposit the necessary material. Presence of a telescopic crane on trailer.

The building is made of ashlar of the time, part of which is partially destroyed with stones scattered around.

Presence of big bags for waste disposal.

The building belongs to the community of La Limouzinière (small village). The work was obtained by the company after a call for tender. All work is subject to the agreement of the historical monuments and is monitored by an architect of the buildings of France.

Nature of the work: reconstruction of the collapsed part of the tower which was initially used as a dovecote in the upper part and as a grain tank in the lower part + repair of part of the open courtyard.

Documents : Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents so that you can work from them in future learning sessions.

The specifications of the public tender issued by the client.

Response to the call for tender and administrative documents (managed by the manager and the works manager).

Plans drawn up by the architects and validated by the historical monuments then transmitted to the works manager and then the team leader.

The plans were drawn up progressively as the stones in the vicinity were found after clearing the brush.

Photos taken on site.

Methods: Identify and describe the techniques, processes or operating procedures used on the renovation site. Note any elements that you find useful or relevant.

1st step: Safety of the site due to a partially collapsed part. Demarcation of the site by archaeologists.

2nd step: Clearing and earthwork to locate the scattered stones. This is essential to finalise the plans and to use the original raw material as a priority.

3st step: Sorting of stones. Regular site meetings to validate the use of the stones or not.

4th step: Erection of selected stones with lime mortar + additional supplied stones. The usual techniques for checking the verticality of the walls are not used (lead). Everything is done visually.

Ancillary activity: Restore the building to its original appearance by filling in the openings made over time and recreating the initial openings (disjointing the stones, re-cutting the stones, and then harpooning).

Description of the difficulties encountered: architectural respect of the tower and of the curves, considering a wider base.

Definition of solutions, with whom, how: Proposal of templates by the team leader and validation at the site meeting by the architect.

Equipment: Identify and describe the tools, measuring instruments, machines, or equipment, etc. used during the intervention. If necessary, note the materials used.

1st step: securing the site: installation of herringbone fences to enclose the site, regulatory signs (no public access to the site, helmets must be worn, etc.).

2nd step: Clearing: thermal equipment and landscaping type materials. Earthworks using a mini excavator.

3rd step: Manual sorting and selection of stones.

4th step: Assembly of the stones. Setting up scaffolding around the tower by an approved subcontractor. The scaffolding was set up on one of the walls of the building by the company itself. The whole was approved by the subcontractor. Use of a telescopic crane on a trailer to supply the stones (temporarily stored before being placed on the scaffolding platforms), as well as the mortar containers.

Use of a thermal concrete mixer to make mortar (water supply nearby). Conventional hand tools.

Staffing: Indicate the number and profile of people involved in the production process observed, as well as their qualifications and specialisation.

5 people were present on the site:

1 team leader (who acts as site manager and stonecutter)

1 skilled mason stoneworker

1 apprentice in stone cutting

2 temporary workers

Distribution of roles between team leader, site manager, contractor (in terms of drawing up estimates, managing the necessary materials and tools, defining the daily schedule, etc.), and description of the interactions between the various players:

On this site: the team leader is also the site manager. Everything that concerns the call for tenders, the estimate, the management of the work material, the management of the equipment, and the overall planning is the responsibility of the works manager (who visits the site once a week).

The team leader manages the weekly needs of the site by passing on information to the works manager. He manages the tasks of his team. He takes part in the site meetings every two weeks.

**Case 2**

Company : FERU TRADITIONS

Company activity: Renovation of masonry in private homes - new construction on the margin

Main characteristics (age, number of employees, governance): Company created in 1978. It is run by 2 co-managers - SARL status. It has 20 employees, including 16 skilled masonry workers.

Contact person : Stéphane GOUARIN Function : Co-manager - former works manager

Tel: XXXXXXX Email : XXXXXXX

Site located at: Impasse du Closio - 44420 Piriac sur Mer

Day of the site visit: Thursday 9 June 2022

Contact: Quentin BERTHAUD - **Team Leader**

Environment of the renovation site: Describe the type of building (or part of a building) to be renovated: individual house, apartment building, commercial premises, offices, monument, etc.; its condition and immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements influence the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste disposal methods, etc.) They will provide the teaching sequences with elements of reflection relevant to the learners.

Private house type 1950 on the beach to renovate. Inaccessible to any vehicle on the west side (beach), as well as on the north and south sides (close to the neighbourhood).

Only access on the east side: very narrow cul-de-sac not allowing access to vehicles larger than a standard van. Possibility to park 2 vans in the garden.

Waste removal by van.

Presence of a blockhouse in the garden, partially buried and partly owned by the neighbour.

Nature of the work : Creation of an enclosed garage at the entrance of the property and complete renovation of the house with the creation of new openings on each end of the house and on the first floor.

Documents : Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents so that you can work from them in future learning sessions.

Brief specifications defined by a Parisian architectural firm (in conjunction with the client) in collaboration with a local project manager.

Existing plans and project plans produced by the project management team (Parisian architect + local firm)

The plans were updated during the project following the discovery of a structural failure in the upper floor of the ground floor.

Photos taken on site.

Methods: Identify and describe the techniques, processes or operating procedures used on the renovation site. Note any elements that you find useful or relevant.

1st step: Unsecured site (accessible from the beach and from the dead end), no regulatory sign, scaffolding accessible from the beach without a sign. The owner stole his barbecue.

2nd step: Construction of a new garage at the entrance to the property.

3rd step: Complete demolition of the existing rooms of the house and installation of the new spaces.

4th step: Creation and re-creation of openings at each end of the house, as well as on the upper floor.

Description of the difficulties encountered: Discovery of a structural failure of the high floor of the ground floor. Frame in poor condition.

Definition of solutions, with whom, how: Report made to the project management team. Solution proposed by the co-manager - works manager, which consists of the customised manufacture and installation of metal posts and beams to support the existing framework. Amendment made by the co-manager and validated by the client.

Direct consequence: the general schedule was postponed by one year (due firstly to the delay in the supply of raw materials, then to the ban on work in the seaside resort from July to August).

Equipment: Identify and describe the tools, measuring instruments, machines, or equipment, etc. used during the intervention. If necessary, note the materials used.

1st step: Installation of scaffolding at the edge of the beach + scaffolding at the new construction.

2nd step: Laying out the garage construction using a theodolite and chalk lines. Laying the foundations with a mini-excavator and the screed using planks, a concrete mixer, and traditional mason's tools. Assembling the breezeblocks and checking the verticality of the assembly with a plumb line.

3rd step – 1st phase: Demolition work: conventional equipment with little volume: PPE (pig's nose mask, gloves, goggles, overalls, helmet, safety shoes), crowbar, hammers and sledgehammers, chisels, sabre saws, angle grinder. Clearing of waste as and when required by the vans. New locations were marked out with wooden sticks according to the plan using a theodolite.

3rd step – 2nd phase: Measurements, then manufacture in the workshop and installation of the metal posts and beams to support the existing framework (using perforators - chisels and using mortar).

4th step: Use of standard mason's equipment and materials to create and repair openings and replace lintels (disc grinders, small sledgehammer, drill, rafters, joists, and battens).

Staffing: Indicate the number and profile of people involved in the production process observed, as well as their qualifications and specialisation.

2 people were present on the site:

* 1 team leader (who also acts as a skilled worker)
* 1 skilled worker

Distribution of roles between team leader, site manager, contractor (in terms of drawing up estimates, managing the necessary materials and tools, defining the daily schedule, etc.), and description of the interactions between the various players:

On this site: the team leader is the link between the activity and the works manager, who is the co-manager. It is the latter who manages the market, quotes, the management of the work material, the management of the equipment and the overall schedule. He is in direct contact with the architect, the local project management firm, and the client.

**Grid 1 for the observation of work situations in renovation companies experienced by Site Managers**

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 1 | Component 1.1: Literature review of the renovation project components | Identify and collect documents specifically related to **renovation** projects  | Case1: Specifications for public tender + responseUpdating of plans according to excavations |
| * Analyse data and identify critical points
 |
| * Report back and propose improvements, changes, or solutions if necessary.
 |
| Component 1.2 Diagnostic methods for existing buildings and premises prior to intervention | * Identify the different diagnostic procedures/methods/techniques possible in renovation projects
 | Case2:Diagnosis, state of the art |
| * Determine / select appropriate diagnostic method(s)
 |
| Component 1.3. Visit to the site of the future renovation: Preparation, observation methods and analysis of the observed elements.  | * Identify, list, and locate the elements to be observed during the visit.
 | Case1:Identification of the materials needed for the construction site, their accessibility and storageOrganisation of logisticsIdentification of points to be securedCase2:Identification of the materials needed for the construction site, their accessibility and storageOrganisation of logisticsIdentification of points to be secured |
| * Determine the diagnostic methods to be used and any necessary personnel or equipment.
 |
| * Carry out the visit, identify and report critical points
 |
| * Analyse critical points and propose solutions or adjustments
 |
| Component 1.4. Preparation of the renovation site plan and its layout (marking, fencing and preparation of the site area)  | * Identify/characterise specific elements of renovation sites
 |
| * Integrate the specific elements of renovation into the design and layout of intervention sites.
 |
| Component 1.5. Planning and phasing of the team's work on the renovation sites  | * Identify/characterise specific elements of renovation sites
 | Case1: Sorting of stones to refine the plansRenovation of the tower |
| * Integrate the specific elements of renovation into the planning, procedures, and phasing of interventions.
 |

**BLOCK 2: Managing communication and relations on a renovation site**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 2 | Component 2.1. Management of teams on renovation sites: Monitoring of assignments and tasks and anticipation of complex and potentially conflictual situations with internal staff and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 | Case2:Interaction between the site team, the co-manager, the project management firm, the Parisian architect, and the clientComplex situation due to structural failure of the frameNegotiation of the solidification solution with steel beams and columns |
| * Anticipate, develop and propose solutions
 |
| * Informing team leaders
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations (e.g. adaptation to site constraints, verification and monitoring of material supplies, verification of delivery times, consideration of energy efficiency, final efficiency, etc.).  | * Identify and characterise the different types of constraints or problems specific to renovation projects.
 | Case2:Restricted and cramped accessManagement of the supply of metallic work materialConsequence on the planning |
| * Anticipate, develop and propose solutions and inform team leaders.
 |
| Component 2.3. Follow-up of relations with the client, the company manager, the architect, the design office & the CSS (health and safety coordinator). | * Characterise the specificities of the different stakeholders in a renovation project.
 | Case1 and case study 2:Organisation of fortnightly site meetings with historical monuments in situation 1 and with Parisian clients in situation 2 |
| * Integrate these specificities in the exchanges/procedures between stakeholders.
 |
| Component 2.4. Mental management of workload, including stress and strain at work. | * Identify the particularities and specificities of the tensions related to renovation projects
 | Case2:Planning alignment problem due to structural failure of the framework |
| * Developing facilitation or anticipation strategies
 |

**BLOCK 3: Management of technical and organisational aspects of the renovation site**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 3 | Component 3.1 Administrative, financial and legal management of a renovation project. | * Identify and collect administrative, financial and legal documents specifically related to renovation projects.
 | Case2:Drafting of an amendment after validation of the additional work by the client |
| * Integrate these specificities in the site
 |
| Component 3.2. Management and control of the protection of workers and buildings on site, including the erection/dismantling of scaffolding, working at height, and the use of hazardous materials on renovation sites. | * Identify specific and critical situations
 | Case1:Securing the site according to the rules of the artCase2: Lack of site security and consequences |
| * Identify current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.3. Waste management on renovation sites: planning of waste bins, sorting and recycling. (Circular Economy), and the use of appropriate monitoring tools. | * Identify specific situations
 | Case2:Difficulty in managing waste due to restricted access to the site . Management carried out on an ad hoc basis via vans  |
| * Identify current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.4: Integration of energy saving standards in renovation projects and use of appropriate monitoring tools. | * Identify specific situations
 | Not observed |
| * Identify current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.5. Continuous quality control of renovation sites: quality of intermediate phases and quality of finished works. | * Identify the critical points to be considered
 | Case1 and case study 2:Control by the works supervisor during regular but informal visitsControl at each site meeting |
| * Identify quality criteria and develop specific control procedures
 |

###

**BLOCK 4: Acceptance of renovation works and quality control**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 4 | Component 4.1 Quality control of renovation results and client approval | * Identify and characterise the points of attention to be considered
 | Not observed |
| * Develop the necessary control procedures
 |
| Component 4.2. Evaluation of the working process and results, including evaluation, valorisation, and improvement of the team. | * Evaluate final deliverables and processes implemented
 | Informal in both case studies |
| * Valuing work with team leaders and teams
 |

**Grid 2 for the Observation of work situations in renovation companies experienced by Team Leaders**

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 1 | Component 1.1. Preparation of a renovation project and diagnostic methods of existing buildings and places | * Implement technical protocols or specific diagnostic methods
 | Case 1: Organisation of logisticsIdentification of points to be secured, storage pointsCase2:Organisation of logisticsIdentification of points to be secured, storage points |

**BLOCK 2: Mastering communication and relations on a renovation site**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 2 | Component 2.1. Monitoring teams on renovation sites: Anticipation of potentially conflictual situations with the team and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 | Case 2:Interaction between the site team, the co-manager, the project management firm, the Parisian architect, and the clientComplex situation due to structural failure of the frameNegotiation of the solidification solution with steel beams and columns |
| * Anticipate, develop, and propose solutions to your team
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations, including co-activity. | * Identify and characterise critical situations or problems specific to renovation sites
 |
| * Anticipate, develop, and propose adaptation solutions
 |
| Component 2.3. Follow-up of relations with the client, the hierarchy, and external partners. | * Characterise the specificities of the different stakeholders in a renovation project.
 |
| * Integrate these specificities in the exchanges with the different stakeholders
 |
| Component 2.4. Evaluation of the working process, including evaluation, valorisation, and improvement of the team. | * Evaluate final deliverables and processes implemented
 | Informal in both case studies |
| * Valuing work with team leaders and teams
 |

###

**BLOCK 3: Mastering the technical and organisational aspects of teamwork**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal aspects of the tasks entrusted to team leaders on renovation sites. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects.
 | Case2: Exchange with the works manager on the implementation of the additional service (manufacture and installation of metal beams and columns)  |
| * Integrate these specificities in the site
 |
| Component 3.2. Organisation and control of the protection of workers and buildings on site, including the erection/dismantling of scaffolding, work at height, access and the use of dangerous materials on renovation sites. | * Identify specific and critical situations
 | Case1:Securing the site according to the rules of the artCase2: Lack of site security and consequences |
| * Identify current standards or regulations
 |
| * Develop and/or implement resolution strategies
 |
| Component 3.3. Organisation of waste treatment on renovation sites: planning of waste bins, sorting, and recycling operations (circular economy), and use of appropriate monitoring tools. | * Identify specific situations
 | Case2:Difficulty in managing waste due to restricted access to the site . Management carried out on an ad hoc basis via vans |
| * Identify current standards or regulations
 |
| * Implementation of appropriate techniques
 |
| Component 3.4: Integration of energy saving standards in renovation works and use of appropriate monitoring tools. | * Identify specific situations
 | Not observed |
| * Identify current standards or regulations
 |
| * Apply resolution strategies
 |
| Component 3.5. Continuous quality control of the intermediate phases and the quality of the finished work. | * Respect quality criteria and develop specific control procedures
 | Case1 and case study 2:Control by team leader informal as it is carried out with the works manager during his regular visits. Control at each site meeting. |

**BLOCK 4: Acceptance of renovation work and quality control**

|  |  |  |  |
| --- | --- | --- | --- |
| BLOCK 4 | Component 4.1: Quality control of renovation results and client approval. | * Verification of final deliverables and implemented processes
 | Informal in both case studies |

### SPAIN (Principado de Asturias)

**Case 1**

Company: …………………………………….…………………………………………………

Activity: …………………………………….………………………………………………..….

Contact person: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Construction site located at Avda. Constitución 45. 33208 Gijón (Asturias)

Description of the works carried out: Renovation of a residential building envelope

Total number of workers at the construction worksite: ……5……, incl. in-house workers ……….., sub-contracting labour force: ………………...

STATE OF THE ART

Renovation work achieved: Application of water proofing on north interior facade.

Renovation work to be achieved in the forthcoming weeks: Scaffolding disassembly.

Other information: ………………………………………………………………………………………………………………………………………………………………………………….

**Environment:** Describe the type of building (or of a piece of building) to be renovated: private house, apartment building, commercial premises, offices, monument, etc.; its condition and its immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements have an influence on the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste evacuation methods, etc.). They will allow to feed the teaching sequences with relevant elements of reflection for the learners.

Residential building with 7 and 14 floors. Year of construction 1956

Location: Avenida Constitución 45, 33207 Gijón.

Description of the location: Urban area (Corner of Avda. Constitución and Avda. Manuel Llaneza). No access difficulties. Facade of face brick (listed as BIC). Mixed roof (flat walkable and sloping 9%).

Nature of work:

* Actions to be carried out on the roof (without modification of load-bearing or structural elements):
* Inspection of the state of preservation of the roof, with special attention to singular points and junctions.
* Gutter cleaning.
* Replacement, as required, of roofing pieces, guttering, spouts and copings..
* Waterproofing of chimney connections.
* Actions to be carried out on the interior north façade (without modification of enclosure elements):
* Installation of auxiliary equipment.
* Cleaning of the north façade of the patio with pressurized water.
* Crack repair and joint repair.
* General waterproofing of the facade.

**Methods:** Identify and describe the techniques, processes or operating modes used on the renovation site. Note any elements that seem useful or relevant.

* Inspection of the current state of the building.
* Installation of auxiliary means.
* Parallel execution of work on the roof and interior façade.

**Equipment:** Identify and describe the tools, measuring instruments, machines or equipment etc. used during the intervention. If necessary, note the materials used.

* Materials and tools : masonry tools and materials.
* Auxiliary elements: scaffolding, RCDs containers.
* Technological equipment: thermographic camera and stractometer.

**Workforce (Human Resources)** : Indicate the number and profile of the people involved in the production process observed, and their qualifications and specialisation.

* 1 site manager
* 1 team leader
* 3 workers

**Documents:** Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents to be able to work from them during future learning sequences.

* Project design
* ITE Report (Technical Inspection of Buildings).

**Grid 1 for the Observation of work situations in renovation companies experienced by Worksite Managers**

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 1 | Component 1.1: Literature review of the renovation project components | * Identify and collect documents specifically related to renovation projects
 |  |  |  |  |  |  |
| * Analyse data and identify critical points
 |
| * Report back and propose improvements, changes, or solutions if necessary
 |
| Component 1.2. Diagnostic methods for existing buildings and premises prior to intervention | * Identify the different diagnostic procedures/methods/techniques possible in renovation projects
 |  |  |  |  |  |  |
| * Determine / select appropriate diagnostic method(s)
 |
| Component 1.3. Visit to the site of the future renovation: Preparation, observation methods and analysis of the observed elements  | * Identify, list, and locate elements to be observed during the visit
 |  |  |  |  |  |  |
| * Determine the diagnostic methods to be used and the possible contributors or materials required
 |
| * Carry out the visit, identify and notify critical points
 |
| * Analyse the critical points and propose the necessary solutions or adjustments
 |
| Component 1.4. Preparation of the renovation site plan and its layout (marking out, fencing and preparation of the site area)  | * Identify/characterise specific elements of renovation sites
 |  |  |  |  |  |  |
| * Integrate the specific elements of renovation into the design and layout of intervention sites.
 |
| Component 1.5. Planning and phasing of the team's work on renovation sites  | * Identify/characterise specific elements of renovation sites
 |  |  |  |  |  |  |
| * Integrate the specific elements of renovation into the planning, procedures, and phasing of interventions
 |

**BLOCK 2: Managing communication and relations on a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 2 | Component 2.1. Management of teams on renovation sites: Monitoring of assignments and tasks and anticipation of complex and potentially conflictual situations with internal staff and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 | North inner facade | Project plan | He suggests application of water repellent with a sprayer instead of a roller in certain areas. | * Roller, brush, sprayer, plastic and adhesive for window protection, wire brush, broom, ...
* PPE
 | 2 workers operating in the north inner facade  |  |
| * Anticipate, develop, and propose solutions
 |
| * Informing team leaders
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations (e.g. adaptation to site constraints, verification and monitoring of material supplies, verification of delivery times, consideration of energy efficiency, final efficiency, etc.).  | * Identify and characterise the different types of constraints or problems specific to renovation projects
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose solutions and inform team leaders
 |
| Component 2.3. Follow-up of relations with the client, the company manager, the architect, the design office & the CSS (health and safety coordinator). | * Characterise the specificities of the different protagonists of a renovation project
 | North inner facade |  | * Contact with the property to anticipate possible overlaps with other activities.
* Telephone report to the manager on the activities carried out.
 |  |  |  |
| * Integrate these specificities in the exchanges/procedures between stakeholders
 |
| Component 2.4. Mental management of workload, including management of stress and tension at work. | * Identify the particularities and specificities of the tensions linked to renovation projects
 | North inner facade. |  | Heavy rain forecast that will make outdoor work difficult: prepare alternative indoor activities. |  |  |  |
| * Develop facilitative or anticipatory strategies
 |

**BLOCK 3: Management of technical and organisational aspects of the renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal management of a renovation project. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects
 |  | * Budget of material execution.
* Extra order for water repellent product.
 | Arrangement of a date with the supplier for urgent delivery of the water repellent product. |  |  |  |
| * Integrate these specificities in the management of the site
 |
| Component 3.2. Management and control of on-site protection of workers and buildings, including erection/dismantling of scaffolding, work at height, difficult access, and use of hazardous materials on renovation sites. | * Identify specific and critical situations
 | * Storage area.
* Common areas: elevator and portal
 | * Project plan
* Safety data sheet of the products for facade renovation.
 | Verification of the right storage of the water repellent and mortar.Check the use of masks to avoid inhalation of product vapors. |  | 1 team leader2 workers | * Protection of the elevator and access portal to the building.
* Signaling and delimitation of the work area.
 |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.3. Waste management on renovation sites: planning and management of waste bins, sorting, and recycling. operations (circular economy), and the use of appropriate monitoring tools. | * Identify specific situations
 | Main access route to the city | Rental of RCDs containers | Signaling and reserving space for the container. | Marking tape, cones, traffic signs for construction sites. |  |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.4: Integration of energy saving standards in renovation projects and use of appropriate monitoring tools. | * Identify specific situations
 |  |  |  |  |  |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.5. Continuous quality control of renovation sites: quality of intermediate phases and quality of finished works. | * Identify the critical points to be considered
 | North inner facade. | Project Plan (quality plan) | Control of the execution of the water repellent coating: a thicker spray is agreed due to the porosity of the brick.Control of the dosage and mixing of filling mortars. | * Sprayer, roller.
* PPE
* Masonry tools.
 | 1 team leader |  |
| * Identify quality criteria and develop specific control procedures
 |

**BLOCK 4: Acceptance of renovation work and quality control**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 4 | Component 4.1 Quality control of renovation results and client approval | * Identify and characterise the points of attention to be considered
 |  |  |  |  |  |  |
| * Develop the necessary control procedures
 |
| Component 4.2. Evaluation of the working process and results, including evaluation, valorisation, and improvement of the team. | * Evaluate the final deliverables and processes implemented
 |  |  |  |  |  |  |
| * Valuing work with team leaders and teams
 |

**Case 2**

Company: …………………………………….…………………………………………………

Activity: …………………………………….………………………………………………..….

Contact person: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Construction site located at Avda. Constitución 45. 33208 Gijón (Asturias)

Description of the works carried out: Rehabilitación de la envolvente de un edificio de viviendas

Total number of workers at the construction worksite: …2……, incl. in-house workers ……….., sub-contracting labour force: ………………...

STATE OF THE ART

Renovation work achieved: Instalación de medios de protección en la cubierta.

Renovation work to be achieved in the forthcoming weeks: Inicio de la ejecución de los trabajos.

Other information: ………………………………………………………………………………………………………………………………………………………………………………….

**Environment:** Describe the type of building (or of a piece of building) to be renovated: private house, apartment building, commercial premises, offices, monument, etc.; its condition and its immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements have an influence on the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste evacuation methods, etc.). They will allow to feed the teaching sequences with relevant elements of reflection for the learners.

Residential building with 7 and 14 floors. Year of construction 1956

Location: Avenida Constitución 45, 33207 Gijón.

Description of the location: Urban area (Corner of Avda. Constitución and Avda. Manuel Llaneza). No access difficulties. Facade of face brick (listed as BIC). Mixed roof (flat walkable and sloping 9%).

Nature of work:

* Actions to be carried out on the roof (without modification of load-bearing or structural elements):
* Inspection of the state of preservation of the roof, with special attention to singular points and junctions.
* Gutter cleaning.
* Replacement, as required, of roofing pieces, guttering, spouts and copings..
* Waterproofing of chimney connections.
* Actions to be carried out on the interior north façade (without modification of enclosure elements):
* Installation of auxiliary equipment.
* Cleaning of the north façade of the patio with pressurized water.
* Crack repair and joint repair.
* General waterproofing of the facade.

**Methods:** Identify and describe the techniques, processes or operating modes used on the renovation site. Note any elements that seem useful or relevant.

* Inspection of the current state of the building.
* Installation of auxiliary means.
* Parallel execution of work on the roof and interior façade.

**Equipment:** Identify and describe the tools, measuring instruments, machines or equipment etc. used during the intervention. If necessary, note the materials used.

* Materials and tools : masonry tools and materials.
* Auxiliary elements: scaffolding, RCDs containers.
* Technological equipment: thermographic camera and stractometer.

**Workforce (Human Resources)** : Indicate the number and profile of the people involved in the production process observed, and their qualifications and specialisation.

* 1 site manager
* 1 team leader
* 3 workers

**Documents:** Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents to be able to work from them during future learning sequences.

* Project design
* ITE Report (Technical Inspection of Buildings).

**Grid 2 for the Observation of work situations in renovation companies experienced by Team Leaders**

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 1 | Component 1.1. Preparation of a renovation site and diagnostic methods of existing buildings and places before the intervention | * Implement specific technical protocols or diagnostic methods
 | * Inclined roof (9% slope) with several slopes.
* Curved tile roof.
 | * Roof plans
* Diagram of installations on the roof.
* ITE Report (Technical Inspection of Buildings).
* Project
* Certificate of quality of the installation/revision of anchoring elements on the roof.
 | * Visual inspection of the condition of the roof and eaves.
* Inventory of possible structural tie points on the roof.
* Inventory of existing tie-down points (with means of attachment).
* Inspection of tie-down points: bolts found to be inadequate.
* Planning of the way of access of workers to the deck.
* Planning of how to lift, place and remove materials from the roof.
 | * Stractometer for checking the condition of existing fastening points (bolts).
* PPE
 | 1 team leader |  |

**BLOCK 2: Mastering communication and relations on a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 2 | Component 2.1. Monitoring teams on renovation sites: Anticipation of potentially conflictual situations with the team and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose solutions to your team
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations, including co-activity. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose adaptation solutions
 |
| Component 2.3. Follow-up of relations with the client, the hierarchy, and external partners. | * Characterise the specificities of the different protagonists of a renovation project
 |  |  |  |  |  |  |
| * Integrate these specificities in exchanges with different stakeholders
 |
| Component 2.4. Evaluation of the working process, including evaluation, valorisation, and improvement of the team. | * Evaluate the final deliverables and processes implemented
 |  |  |  |  |  |  |
| * Valuing work with team leaders and teams
 |

**BLOCK 3: Mastering the technical and organisational aspects of teamwork**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal aspects of the tasks entrusted to team leaders on renovation sites. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects
 |  |  |  |  |  |  |
| * Integrate these specificities in the management of the site
 |
| Component 3.2. Organisation and control of on-site protection of workers and buildings, including erection/dismantling of scaffolding, work at height, difficult access, and use of hazardous materials on renovation sites. | * Identify specific and critical situations
 | * Inclined roof (9% slope) with several slopes.
* Curved tile roof.
 |  | Installation of lifelines: the worker is provided with alternatives to make up for the shortage of carabiners by tying appropriate knots. | PPEReview of available equipment:Individual protection systems against falls from height (fall arrest harness, energy absorber, blocker ...): it is noted that workers do not have energy absorbers.SlingsCarabiners : It is observed that there is a shortage of carabiners at the beginning of the work.Ropes | 1 team leader1 worker |  |
| * Identify the current standards or regulations
 |
| * Develop and/or implement resolution strategies
 |
| Component 3.3. Organisation of waste treatment on renovation sites: planning and management of waste bins, sorting, and recycling operations (circular economy), and the use of appropriate monitoring tools. | * Identify specific situations
 |  |  |  |  |  |  |
| * Identify the current standards or regulations
 |
| * Implementing appropriate techniques
 |
| Component 3.4: Integration of energy saving standards in renovation works and use of appropriate monitoring tools. | * Identify specific situations
 |  |  |  |  |  |  |
| * Identify the current standards or regulations
 |
| * Apply resolution strategies
 |
| Component 3.5. Continuous quality control of the intermediate phases and the quality of the finished work. | * Respecting quality criteria and developing specific control procedures
 |  |  |  |  |  |  |

**BLOCK 4: Acceptance of renovation work and quality control**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 4 | Component 4.1: Quality control of renovation results and client approval. | * Checking the final deliverables and the processes implemented
 |  |  |  |  |  |  |

### ITALY

Company: G.G. COSTRUZIONI S.R.L.

Activity: …………………………………….………………………………………………..….

Contact person: FILOMENA GIACQUINTO Function: TECHNICAL MANAGER

Tel.: XXXXXXXXXXXXXXX Email: XXXXXXXXXXXXXXXXXXXX

Construction site located at Sant’Agata di Solofra, via Cortine, 53 – 83029 Solofra (Avellino)

Description of the works carried out: Demolition and Construction of a School Building

Total number of workers at the construction worksite: ……8……, incl. in-house workers ……….., sub-contracting labour force: ………0………...

STATE OF THE ART

Renovation work achieved: Application of insulated sheets on roof and site installation for gymnasium construction

Renovation work to be achieved in the forthcoming weeks: Scaffolding disassembly.

Other information: Application of insulated sheets on the roof and excavation for foundations

**Environment:** Describe the type of building (or of a piece of building) to be renovated: private house, apartment building, commercial premises, offices, monument, etc.; its condition and its immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements have an influence on the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste evacuation methods, etc.). They will allow to feed the teaching sequences with relevant elements of reflection for the learners.

Demolition and reconstruction of a 3-storey school building (1 basement) and attached gymnasium

Location: Sant’Agata di Solofra, via Cortine, 53 – 83029 Solofra (Avellino)

Description of the location: Urban area (via Cortine - Solofra (Avellino). The construction site is located on a sloping road (approximately 15%). The difficulties of access are represented by this slope, the houses that are close to the construction site and a level crossing located to the north of the construction site. The roof on which the insulated sheets are being installed is made of concrete and has a slope of 4%.

Nature of work:

* Actions to be carried out on the roof (without modification of load-bearing or structural elements):
* Demolition and construction of a school building with an adjoining gymnasium
* Actions to be carried out on the interior north façade (without modification of enclosure elements):
* Roof insulation with insulating sheets
* Preparation of area for construction of gymnasium (building separate from school building)

**Methods:** Identify and describe the techniques, processes or operating modes used on the renovation site. Note any elements that seem useful or relevant.

* reinforced concrete roof inspection
* tower crane installation
* parallel execution of the gymnasium with installation of a construction site within the main construction site

**Equipment:** Identify and describe the tools, measuring instruments, machines or equipment etc. used during the intervention. If necessary, note the materials used.

* Materials and tools : insulated metal sheets
* Auxiliary elements: scaffolding, CDW containers
* Technological equipment: tower cranes, telehandlers, pallet trucks,

**Workforce (Human Resources)** : Indicate the number and profile of the people involved in the production process observed, and their qualifications and specialisation.

* 1 team leader/site manager
* 7 workers
* 1 activity manager

**Documents:** Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents to be able to work from them during future learning sequences.

* project work
* demolition plan
* POS (Operational Safety Plan)
* PIMUS (scaffolding assembly and dismantling plan)
* DUVRI (Document for the Evaluation of Interfering Risks)

**Grid 1 for the Observation of work situations in renovation companies experienced by Worksite Managers**

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 1 | Component 1.1: Literature review of the renovation project components | * Identify and collect documents specifically related to renovation projects
 | installation of site area for the construction of the gymnasium | POS for work and interference managementDUVRI for interference management |  | tower cranes | 2 workers + Site manager/team leader |  |
| * Analyse data and identify critical points
 |
| * Report back and propose improvements, changes, or solutions if necessary
 |
| Component 1.2. Diagnostic methods for existing buildings and premises prior to intervention | * Identify the different diagnostic procedures/methods/techniques possible in renovation projects
 |  |  |  |  |  |  |
| * Determine / select appropriate diagnostic method(s)
 |
| Component 1.3. Visit to the site of the future renovation: Preparation, observation methods and analysis of the observed elements  | * Identify, list, and locate elements to be observed during the visit
 |  |  |  |  |  | the site manager/team leader did not inspect the site before the start of work, only the activity manager together with the construction manager did so |
| * Determine the diagnostic methods to be used and the possible contributors or materials required
 |
| * Carry out the visit, identify and notify critical points
 |
| * Analyse the critical points and propose the necessary solutions or adjustments
 |
| Component 1.4. Preparation of the renovation site plan and its layout (marking out, fencing and preparation of the site area)  | * Identify/characterise specific elements of renovation sites
 | site area for the construction of the gymnasium | POS for work and interference managementDUVRI for interference management |  | tower cranestrans pallet | 2 workers + Site manager/team leader |  |
| * Integrate the specific elements of renovation into the design and layout of intervention sites.
 |
| Component 1.5. Planning and phasing of the team's work on renovation sites  | * Identify/characterise specific elements of renovation sites
 |  |  |  |  |  |  |
| * Integrate the specific elements of renovation into the planning, procedures, and phasing of interventions
 |

**BLOCK 2: Managing communication and relations on a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 2 | Component 2.1. Management of teams on renovation sites: Monitoring of assignments and tasks and anticipation of complex and potentially conflictual situations with internal staff and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 | installation of insulated sheets on the roof with a 4% slope | Project planPOS for work and interference managementDUVRI for interference management | he suggests putting sheathing on the sheet-metal fixing screws before putting on the end caps | PPEtower cranestelescopic hoistscaffoldingsheathing torch | 2 workers (gymnasium)5 workers (laying insulated sheets on roof) |  |
| * Anticipate, develop, and propose solutions
 |
| * Informing team leaders
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations (e.g. adaptation to site constraints, verification and monitoring of material supplies, verification of delivery times, consideration of energy efficiency, final efficiency, etc.).  | * Identify and characterise the different types of constraints or problems specific to renovation projects
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose solutions and inform team leaders
 |
| Component 2.3. Follow-up of relations with the client, the company manager, the architect, the design office & the CSS (health and safety coordinator). | * Characterise the specificities of the different protagonists of a renovation project
 | site installation for the construction of the gymnasiuminstallation of insulated sheets on the roof | POS for work and interference managementDUVRI for interference management | He contacts the safety coordinator for any unforeseen work interference. He contacts the activity manager to propose alternative solutions at least twice a week |  | safety coordinator - activity manager |  |
| * Integrate these specificities in the exchanges/procedures between stakeholders
 |
| Component 2.4. Mental management of workload, including management of stress and tension at work. | * Identify the particularities and specificities of the tensions linked to renovation projects
 | installation of insulated sheets on the roof |  | he arranged for 20-minute break every 1.5 hours of work or whenever the workers considered it appropriate to cool down due to the excessively high temperatures (around 36°C) |  | 5 workers (laying insulated sheets on roof) |  |
| * Develop facilitative or anticipatory strategies
 |

**BLOCK 3: Management of technical and organisational aspects of the renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal management of a renovation project. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects
 | installation of insulated sheets on the roof | transport note | he checks the materials and any differences in the order placed |  | activity manager | he reports only any deviations by telephone without filling in any documentation |
| * Integrate these specificities in the management of the site
 |
| Component 3.2. Management and control of on-site protection of workers and buildings, including erection/dismantling of scaffolding, work at height, difficult access and use of hazardous materials on renovation sites. | * Identify specific and critical situations
 | installation of insulated sheets on the roof | POS for work and interference managementDUVRI for interference managementPIMUS (scaffolding assembly and dismantling plan) | He checks that the workers are working safely because of the work at height and the high temperatures. he ensures that the scaffolding has not been tampered with and that manoeuvres in and out of the construction site are carried out safely because of the uphill access road, houses too close to the construction site and the level crossing |  | 5 workers |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.3. Waste management on renovation sites: planning and management of waste bins, sorting, and recycling. operations (circular economy), and the use of appropriate monitoring tools. | * Identify specific situations
 | installation of insulated sheets on the roof | waste management plan | he sorts the various wastes into the right containers | remains insulated sheetsiron piecesCDW containers | 5 workers |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.4: Integration of energy saving standards in renovation projects and use of appropriate monitoring tools. | * Identify specific situations
 |  |  |  |  |  |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.5. Continuous quality control of renovation sites: quality of intermediate phases and quality of finished works. | * Identify the critical points to be considered
 | installation of insulated sheets on the roof | project work | Checking the laying of insulated sheets and laying of sheathing on the fixing screws before putting on the end caps | PPESheathblowpipeelectric drill | 5 workers |  |
| * Identify quality criteria and develop specific control procedures
 |

**BLOCK 4: Acceptance of renovation work and quality control**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 4 | Component 4.1 Quality control of renovation results and client approval | * Identify and characterise the points of attention to be considered
 | installation of insulated sheets on the roof | manufacturing and control planwork plan (quality plan) | He visually verifies whether what has been realised corresponds to what was designed in the manufacturing and quality plan |  |  |  |
| * Develop the necessary control procedures
 |
| Component 4.2. Evaluation of the working process and results, including evaluation, valorisation, and improvement of the team. | * Evaluate the final deliverables and processes implemented
 |  |  |  |  |  |  |
| * Valuing work with team leaders and teams
 |

### POLAND

**Observation of work situations in renovation companies experienced by Team Leaders**

**(Observation by teacher/trainer)**

Observation of work situations in companies should enable the teacher/trainer to collect realistic and concrete data to design attractive and valuable educational content for future learners (site managers and foremen). The idea is to be as close as possible to the realities of construction sites where renovation projects are carried out. Using the form below, gather the maximum amount of information, keeping in mind the 5 main observation axes (Inspired by the "**5M**" method, implemented in France): **environment, methods, equipment, workforce and documents** related to the identified work situations.

Recommended methodology

* Once the appropriate construction sites have been selected, the observer (teacher or coach) visits the sites of interest to observe and collect accurate information.
* On the construction site, the observer records (using the tool below) everything he or she can observe, including non-compliant elements (minor defects, non-compliance with safety regulations, etc. ). Do not be judgmental, the aim is to transcribe reality.
* The teacher/trainer will then be able to select the training programme/content (with 'on-the-job training' in mind). It is often necessary to observe the same activity several times in different locations or contexts in order to have all the elements needed to develop a teaching sequence.

*It is strongly advisable to take photos (with the company's permission) so as not to forget anything or if there is not enough time to record everything on site. It is very useful to have a photo of the workplace before the renovation intervention to observe and, for comparison, after the intervention. The difference between the two states allows future students to reflect on everything that might have happened between the two moments.*

*Please note that it is not mandatory to complete all 5 axes. For example, some interventions do not necessarily require specific documents. The last column ('Other') allows you to add comments or more general details. Take all necessary photos with the consent of the company and participants.*

*Depending on the workplace observed, it is possible to group several components together (column 2) or to list them item by item (column 3)*

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| The teacher/coach observes and takes notes: | Environment e.g.: type of building, geographical location, condition, access etc. | Documents Identify and collect the various documents used. | Methods Techniques, processes and modes used. | Equipment Tools, instruments, machinery, equipment, and materials used. | Human resourcesNumber of people, qualifications and role in the renovation process | Other |
| BLOCK 1 | **Unit 1.1** Site preparation and diagnostic methods for buildings, premises prior to renovation intervention  | * Uses specific technical protocols or diagnostic methods
 |  |  |  |  |  |  |

**BLOCK 2: Communicating and building relationships on a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| The teacher/coach observes and takes notes: | Environment Type of building, geographical location, condition, access, etc. | Documents Identify and collect the various documents used | Methods Techniques, processes and working modes used | Equipment Tools, instruments, machinery, and materials used | Human resourcesNumber of people, qualifications and role in the renovation process | Other |
| BLOCK 2 | **Unit 2.1** Monitor the site team: anticipate potential conflict situations with the team and subcontractors. | * Identifies characteristic critical situations or problems specific to construction sites where renovation work is being carried out
 |  |  |  |  |  |  |
| * Anticipates, develops and proposes solutions to his team
 |
| **Unit 2.2** Develop and implement procedures for the proper execution of renovation work, including activities carried out in cooperation with other | * Identifies and characterises critical situations or problems specific to construction sites where renovation work is being carried out
 |  |  |  |  |  |  |
| * Envisages, develops and proposes adaptation solutions
 |
| **Unit 2.3** Building relationships and working with customers, supervisors and external collaborators | * Characterises the specifics of the various actors involved in the implementation of renovation projects
 |  |  |  |  |  |  |
| * Integrates (uses) these specificities, especially in collaboration with stakeholders
 |
| **Unit 2.4** Evaluation of the work process, including evaluation, valorisation and team development activities | * Evaluates the renovation work carried out and its final results
 |  |  |  |  |  |  |
| * Appreciates / gives value to working with foremen and their teams
 |

**BLOCK 3: Implementation of teamwork on a renovation site – technical and organisational aspects**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| The teacher/coach observes and takes notes: | Environment Type of building, geographical location, condition, access, etc. | Documents Identify and collect the various documents used. | Methods Techniques, processes and modes used. | Equipment Tools, instruments, machinery, equipment, and materials used. | Human resourcesNumber of people, qualifications and role in the process | Other |
| BLOCK 3 | **Unit 3.1** Administrative, financial and legal aspects of the tasks entrusted to team leaders carrying out renovation work. | * Identifies and collects administrative, financial and legal documents related to renovation projects
 |  |  |  |  |  |  |
| * Integrates them into site management processes
 |
| **Unit 3.2** Organise and control the safety protection of workers and buildings on site, including scaffolding erection/dismantling, working at height, difficult access and use of hazardous materials on construction sites. | * Identifies specific and critical situations
 |  |  |  |  |  |  |
| * Identifies currently applicable standards and regulations
 |
| * Develops and proposes strategies to manage these issues
 |
| **Unit 3.3** Organising the treatment of waste on construction sites (on site) during renovation work: planning and management of waste containers, pre-separation and collection of waste, principles of GOZ on site and use of appropriate tools for its monitoring. | * Identifies specific and critical situations
 |  |  |  |  |  |  |
| * Identifies currently applicable standards and regulations
 |
| * Develops and proposes strategies for the disposition of these issues
 |
| **Unit 3.4:** Integrate energy efficiency standards into renovation work and use appropriate monitoring tools. | * Identifies specific situations
 |  |  |  |  |  |  |
| * Identifies current standards and regulations
 |
| * Develops strategies for action in this area
 |
| **Unit 3.5** Continuous quality control on site: quality of intermediate and final phases (compliance of the work carried out with the acceptance conditions: control of temperature conditions, humidity, sequence of work, technological times, control of delivery dates and quantities, how and where materials are stored on the work site - logistics at work site level). | * Respects quality criteria and develops appropriate control procedures
 |  |  |  |  |  |  |

**BLOCK 4: : Acceptance of renovation work and final quality control**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| The teacher/coach observes and takes notes: | Environment Type of building, geographical location, condition, access, etc. | Documents Identify and collect the various documents used. | Methods Techniques, processes and modes used. | Equipment Tools, instruments, machinery, equipment, and materials used. | Human resourcesNumber of people, qualifications and role in the process | Other |
| BLOCK 4 | **Unit 4.1:** Quality control of the results of the renovation work and obtaining client acceptance (taking into account the priority ranking of the acceptance of the work: construction of the building, waterproofing, thermal insulation, acoustic insulation, others, e.g. aesthetics); final acceptance of disappearing works | * Controls the processes implemented and the final results of the works, including the results of the disappearing works
 |  |  |  |  |  |  |

### GREECE

**Case 1**

Company: …………………………………….…………………………………………………

Activity: …………………………………….………………………………………………..….

Contact person: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Construction site located at **Former Royal Palace of Tatoi**

Description of the works carried out: **Internal and external restoration of public building monument**

Total number of workers at the construction worksite: **5**

STATE OF THE ART

Renovation work achieved: **Restoration of the facades of the historical palace**

Renovation work to be achieved in the forthcoming weeks: **Continuation of work execution**

Other information: ………………………………………………………………………………………………………………………………………………………………………………….

**Environment:** Describe the type of building (or of a piece of building) to be renovated: private house, apartment building, commercial premises, offices, monument, etc.; its condition and its immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements have an influence on the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste evacuation methods, etc.). They will allow to feed the teaching sequences with relevant elements of reflection for the learners.

Former Royal Palace of Greece (Tatoi palace) Year of construction 1889

**Location:** Acharnes, Greece

**Description of the location:**

Forested area at the foothills of Mount Parnitha at the northern edge of the Greek capital. The Tatoi palace complex includes numerous outbuildings, such as personnel quarters, outposts, storehouses, mews, apiaries, stock farms etc., which were derelict.

**Nature of work:**

* Restoration of the facades.
* Removal of the reinforced concrete and tile roofing elements added in Phase 2 on the south elevation and reinstatement of the cast iron metal elements that were present in Phase 1.
* Restoring part of the openings that were sealed in Phase 2 and sealing part of the new openings created in Phase 2.
* Restoring two of the three entrances on the north side to their original positions; and
* Reconstruction of the ornate metal roof frames.
* Restoration of the western gable to its original form.
* Interior of the building.
* Removal of some of the later walls that subdivide the large rooms into smaller spaces,
* Restoration of areas, such as the Queen Olga's Bath, which has been removed from the main halls and the main halls of the building.
* Moving and/or opening doors to their original position
* Enlargement of doors to their original dimensions.
* Investigating for evidence of the original building phase during all works.
* Conservation of surfaces of historical significance

**Methods:** Identify and describe the techniques, processes or operating modes used on the renovation site. Note any elements that seem useful or relevant.

* Documentation of the history of the building
* Comparative analysis of action prioritization for different stages
* Building Regulation Compliance Inspections
* Ongoing works at multiple levels of the building

**Equipment:** Identify and describe the tools, measuring instruments, machines or equipment etc. used during the intervention. If necessary, note the materials used.

* Masonry equipment
* Safety Equipment
* Heavy Duty Equipment

**Workforce (Human Resources)**: Indicate the number and profile of the people involved in the production process observed, and their qualifications and specialisation.

* 1 site manager
* 1 team leader
* 5 workers

**Documents:** Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents to be able to work from them during future learning sequences.

* Project Plan
* Documentation of the history of the building
* Safety Checklist & Report
* ITE Report
* Quality checklist
* Environmental monitoring forms

**Grid 1 for the Observation of work situations in renovation companies experienced by worksite managers**

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 1 | Component 1.1: Literature review of the renovation project components | * Identify and collect documents specifically related to renovation projects
 | Galley Kitchen | Documentation of the history of the building and Project plan | Masonry works  | Masonry equipment  | 1 team leader and 5 construction workers  |  |
| * Analyse data and identify critical points
 |
| * Report back and propose improvements, changes, or solutions if necessary
 |
| Component 1.2. Diagnostic methods for existing buildings and premises prior to intervention | * Identify the different diagnostic procedures/methods/techniques possible in renovation projects
 |  |  |  |  |  |  |
| * Determine / select appropriate diagnostic method(s)
 |
| Component 1.3. Visit to the site of the future renovation: Preparation, observation methods and analysis of the observed elements  | * Identify, list, and locate elements to be observed during the visit
 |  |  |  |  |  |  |
| * Determine the diagnostic methods to be used and the possible contributors or materials required
 |
| * Carry out the visit, identify and notify critical points
 |
| * Analyse the critical points and propose the necessary solutions or adjustments
 |
| Component 1.4. Preparation of the renovation site plan and its layout (marking out, fencing and preparation of the site area)  | * Identify/characterise specific elements of renovation sites
 |  |  |  |  |  |  |
| * Integrate the specific elements of renovation into the design and layout of intervention sites.
 |
| Component 1.5. Planning and phasing of the team's work on renovation sites  | * Identify/characterise specific elements of renovation sites
 |  |  |  |  |  |  |
| * Integrate the specific elements of renovation into the planning, procedures, and phasing of interventions
 |

**BLOCK 2: Managing communication and relations on a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 2 | Component 2.1. Management of teams on renovation sites: Monitoring of assignments and tasks and anticipation of complex and potentially conflictual situations with internal staff and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose solutions
 |
| * Informing team leaders
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations (e.g. adaptation to site constraints, verification and monitoring of material supplies, verification of delivery times, consideration of energy efficiency, final efficiency, etc.).  | * Identify and characterise the different types of constraints or problems specific to renovation projects
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose solutions and inform team leaders
 |
| Component 2.3. Follow-up of relations with the client, the company manager, the architect, the design office & the CSS (health and safety coordinator). | * Characterise the specificities of the different protagonists of a renovation project
 | Galley Kitchen | Safety Checklist  |  |  | 1 team leader and 5 construction workers |  |
| * Integrate these specificities in the exchanges/procedures between stakeholders
 |
| Component 2.4. Mental management of workload, including management of stress and tension at work. | * Identify the particularities and specificities of the tensions linked to renovation projects
 | Galley Kitchen |  | Due to the high temperature during the summer the workers were encouraged to take breaks and hydrate.  |  | 1 team leader and 5 construction workers |  |
| * Develop facilitative or anticipatory strategies
 |

**BLOCK 3: Management of technical and organisational aspects of the renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal management of a renovation project. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects
 |  |  |  |  |  |  |
| * Integrate these specificities in the management of the site
 |
| Component 3.2. Management and control of on-site protection of workers and buildings, including erection/dismantling of scaffolding, work at height, difficult access, and use of hazardous materials on renovation sites. | * Identify specific and critical situations
 | Galley Kitchen | Project Plan Safety Checklist | Safety equipment check  | Hearing protectionRespiratory protectionFull face shields  | 1 team leader and 5 construction workers  |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.3. Waste management on renovation sites: planning and management of waste bins, sorting and recycling. operations (circular economy), and the use of appropriate monitoring tools. | * Identify specific situations
 |  |  |  |  |  |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.4: Integration of energy saving standards in renovation projects and use of appropriate monitoring tools. | * Identify specific situations
 | Galley Kitchen | Environmental monitoring forms |  |  | 1 team leader |  |
| * Identify the current standards or regulations
 |
| * Develop and propose resolution strategies
 |
| * Informing team leaders
 |
| Component 3.5. Continuous quality control of renovation sites: quality of intermediate phases and quality of finished works. | * Identify the critical points to be considered
 | Galley Kitchen | Project PlanQuality checklist |  |  | 1 team leader |  |
| * Identify quality criteria and develop specific control procedures
 |

**BLOCK 4: Acceptance of renovation work and quality control**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 4 | Component 4.1 Quality control of renovation results and client approval | * Identify and characterise the points of attention to be considered
 |  |  |  |  |  |  |
| * Develop the necessary control procedures
 |
| Component 4.2. Evaluation of the working process and results, including evaluation, valorisation, and improvement of the team. | * Evaluate the final deliverables and processes implemented
 |  |  |  |  |  |  |
| * Valuing work with team leaders and teams
 |

**Case 2**

Company: …………………………………….…………………………………………………

Activity: …………………………………….………………………………………………..….

Contact person: …………………………………….……………………………………….. Function: …………………………………………………………………………..

Tel.: …………………………………….…………… Email: …………………………………………………………..

Construction site located at **Former Royal Palace of Tatoi**

Description of the works carried out: **Restoration of the facades**

Total number of workers at the construction worksite: 10

STATE OF THE ART

Renovation work achieved: **Restoration of the facades**

Renovation work to be achieved in the forthcoming weeks: **Continuation of work execution**

Other information: ………………………………………………………………………………………………………………………………………………………………………………….

**Environment:** Describe the type of building (or of a piece of building) to be renovated: private house, apartment building, commercial premises, offices, monument, etc.; its condition and its immediate environment (located in a small street, isolated on a plot of land, near a high-voltage line, etc.). All these elements have an influence on the life of the future renovation site (supply of materials and equipment, precautions to be taken, waste evacuation methods, etc.). They will allow to feed the teaching sequences with relevant elements of reflection for the learners.

**Location:** Acharnes, Greece

**Description of the location:**

Forested area at the foothills of Mount Parnitha at the northern edge of the Greek capital. The Tatoi palace complex includes numerous outbuildings, such as personnel quarters, outposts, storehouses, mews, apiaries, stock farms etc., which were derelict.

**Nature of work:**

* Restoration of the facades.
* Removal of the reinforced concrete and tile roofing elements added in Phase 2 on the south elevation and reinstatement of the cast iron metal elements that were present in Phase 1.
* Restoring part of the openings that were sealed in Phase 2 and sealing part of the new openings created in Phase 2.
* Restoring two of the three entrances on the north side to their original positions; and
* Reconstruction of the ornate metal roof frames.
* Restoration of the western gable to its original form.
* Interior of the building.
* Removal of some of the later walls that subdivide the large rooms into smaller spaces,
* Restoration of areas, such as the Queen Olga's Bath, which has been removed from the main halls and the main halls of the building.
* Moving and/or opening doors to their original position
* Enlargement of doors to their original dimensions.
* Investigating for evidence of the original building phase during all works.

**Methods:** Identify and describe the techniques, processes or operating modes used on the renovation site. Note any elements that seem useful or relevant.

* Documentation of the history of the building
* Comparative analysis of action prioritization for different stages
* Building Regulation Compliance Inspections
* Ongoing works at multiple levels of the building

**Equipment:** Identify and describe the tools, measuring instruments, machines or equipment etc. used during the intervention. If necessary, note the materials used.

* Masonry equipment
* Safety Equipment
* Heavy Duty Equipment

**Workforce (Human Resources)**: Indicate the number and profile of the people involved in the production process observed, and their qualifications and specialisation.

* 1 team leader
* 5 workers

**Documents:** Identify the different documents (technical instructions, plans, BIM, sketches) used by the teams. If possible, collect these documents to be able to work from them during future learning sequences.

* Project Plan
* Documentation of the history of the building
* Safety Checklist & Report
* ITE Report
* Quality checklist
* Environmental monitoring forms

**Grid 2 for the Observation of work situations in renovation companies experienced by team leaders**

**BLOCK 1: Preparing a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 1 | Component 1.1. Preparation of a renovation site and diagnostic methods of existing buildings and places before the intervention | * Implement specific technical protocols or diagnostic methods
 | Galley kitchen  | Documentation of the history of the buildingProject Plan (Facade Plan)ITE Report  | Retain original materials and featuresRetrofitting  |  | 1 team leaderand 10 workers |  |

**BLOCK 2: Mastering communication and relations on a renovation site**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 2 | Component 2.1. Monitoring teams on renovation sites: Anticipation of potentially conflictual situations with the team and subcontractors. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose solutions to your team
 |
| Component 2.2. Development and implementation of procedures for the proper execution of operations, including co-activity. | * Identify and characterise critical situations or problems specific to renovation sites
 |  |  |  |  |  |  |
| * Anticipate, develop, and propose adaptation solutions
 |
| Component 2.3. Follow-up of relations with the client, the hierarchy, and external partners. | * Characterise the specificities of the different protagonists of a renovation project
 |  |  |  |  |  |  |
| * Integrate these specificities in exchanges with different stakeholders
 |
| Component 2.4. Evaluation of the working process, including evaluation, valorisation, and improvement of the team. | * Evaluate the final deliverables and processes implemented
 |  |  |  |  |  |  |
| * Valuing work with team leaders and teams
 |

**BLOCK 3: Mastering the technical and organisational aspects of teamwork**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 3 | Component 3.1. Administrative, financial, and legal aspects of the tasks entrusted to team leaders on renovation sites. | * Identify and collect administrative, financial, and legal documents specifically related to renovation projects
 |  |  |  |  |  |  |
| * Integrate these specificities in the management of the site
 |
| Component 3.2. Organisation and control of on-site protection of workers and buildings, including erection/dismantling of scaffolding, work at height, difficult access, and use of hazardous materials on renovation sites. | * Identify specific and critical situations
 |  |  |  |  |  |  |
| * Identify the current standards or regulations
 |
| * Develop and/or implement resolution strategies
 |
| Component 3.3. Organisation of waste treatment on renovation sites: planning and management of waste bins, sorting and recycling operations (circular economy), and the use of appropriate monitoring tools. | * Identify specific situations
 |  |  |  |  |  |  |
| * Identify the current standards or regulations
 |
| * Implementing appropriate techniques
 |
| Component 3.4: Integration of energy saving standards in renovation works and use of appropriate monitoring tools. | * Identify specific situations
 | Galley kitchen | Environmental monitoring forms | Insulation of all the solid surfaces  | Tape measure for measuring the insulation Stapling tool | 10 workers |  |
| * Identify the current standards or regulations
 |
| * Apply resolution strategies
 |
| Component 3.5. Continuous quality control of the intermediate phases and the quality of the finished work. | * Respecting quality criteria and developing specific control procedures
 |  |  |  |  |  |  |

**BLOCK 4: Acceptance of renovation work and quality control**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| THE TEACHER OR TRAINER OBSERVES AND NOTES: | EnvironmentType of building, geographical location, condition, access, etc. | DocumentsIdentify and collect the different documents used. | MethodsTechniques, processes, and operating modes used. | EquipmentTools, instruments, machines, equipment, and materials used. | Workforce (Human Resources)Number of people, qualification and role in the process observed | Others |
| BLOCK 4 | Component 4.1: Quality control of renovation results and client approval. | * Checking the final deliverables and the processes implemented
 |  |  |  |  |  |  |