

Training Programme

Rehabilitation of traditional architecture in Europe

Intellectual Output 3



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CONSTRUCTION
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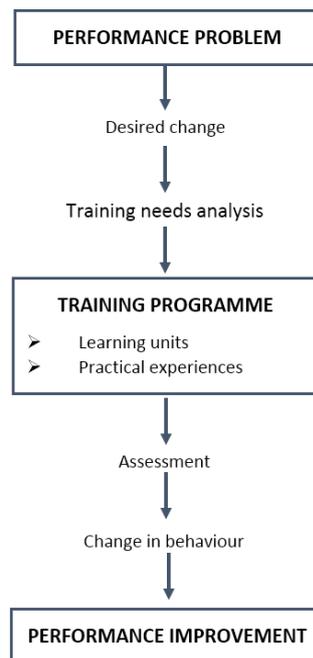
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CONCEPTUAL APPROACH

Basic principles for training design

Training is the process of bringing a person to an agreed standard of proficiency by instruction and practice.

The purpose of a training programme is developing any skills and knowledge that relate to specific useful competences in response to a performance need. Thus, training has specific goals of improving capability, capacity, productivity and performance of learners.



The renovation sector is an activity of great singularity in the building industry that **requires qualified workers with specific know-how regarding traditional methods** to undertake building renovations such as façade lining (with stone, brick, rendering, etc.), staircases made by traditional materials, restoration of vaults and roofs, carpentry, etc., especially due to the noticeable ageing of the European real estate and the relevance of the urban planning, the socio-economic impact and the new requirements set up by Europe to meet 2020 objectives.

The specific purpose of this training programme is to train **construction workers in the application of sensitive restoration techniques** to ensure a proper conservation of the traditional elements in old buildings¹, in order to secure a stable qualified manpower supply in the sector from now on in these kind of activities.

Present training programme has been designed as a *complement* to the existing official initial vocational education and training in construction, and is specifically addressed for trades involved in

¹ Under principles of the European Charter of the Architectural Heritage, drawn up by the Council of Europe Committee on Monuments and Sites, which considers that “the European architectural heritage consists not only of our most important monuments: it also includes the groups of lesser buildings in our old towns and characteristic villages in their natural or manmade settings”.

restoration activities, allowing professionals to continue training beyond initial qualification, so, at best, there could be "overlaps" which are part of the respective vocational profile or qualification pathways in involved countries (ES, PT, IT, FR, BE, DE), or which can be derived from the existing syllabuses or curricula.

COUNTRY	VET Programmes	Total hours
Spain (ES)	- <i>Basic Professional Degree in Building Reform and Maintenance</i>	2000 hours
	- <i>Technician in Interior Works, Decoration and Rehabilitation</i>	
	- <i>Construction Technician</i>	
	- <i>Construction Finishing Technician</i>	
	- <i>Masonry works</i>	
Portugal (PT)	- <i>Decorative painting in construction</i>	640 hours
	- <i>Sloped roofs</i>	650 hours
	- <i>Installation of laminated plasterboard and false ceilings</i>	550 hours
	- <i>Assistant of Conservation and Restoration</i>	1350 hours
	- <i>Conservation and Restoration of Decorative Stucco</i>	825 hours
	- <i>Construction Technician</i>	1075 hours
	- <i>Decorative Painting Technician</i>	1150 hours
- <i>Painter / Decorator</i>	2100 hours	
- <i>Stonemason</i>	825 hours	
- <i>Technician-Specialist in Conservation and Restoration of Wood</i>	1275 hours	
- <i>Technical Specialist in Energy Rehabilitation and Infrastructure Conservation (Buildings)</i>	1300 hours	

Existing official Vocational Education and Training programmes linked to restoration topics in participant countries, 2017

Methodology for training design

The method for planning and production of an effective training programme involves a systematic **step process**. To create a successful training programme it should be based on identified needs of target audience and market, be learner-focused, have measurable objectives and be goal oriented.

By gathering senior workers' knowledge and best practices along the six European countries of this partnership, tangible results with valuable information have been achieved regarding the skills needs identification, including a general description of work processes and tasks, its scope and the trades involved in restoration of antique buildings.

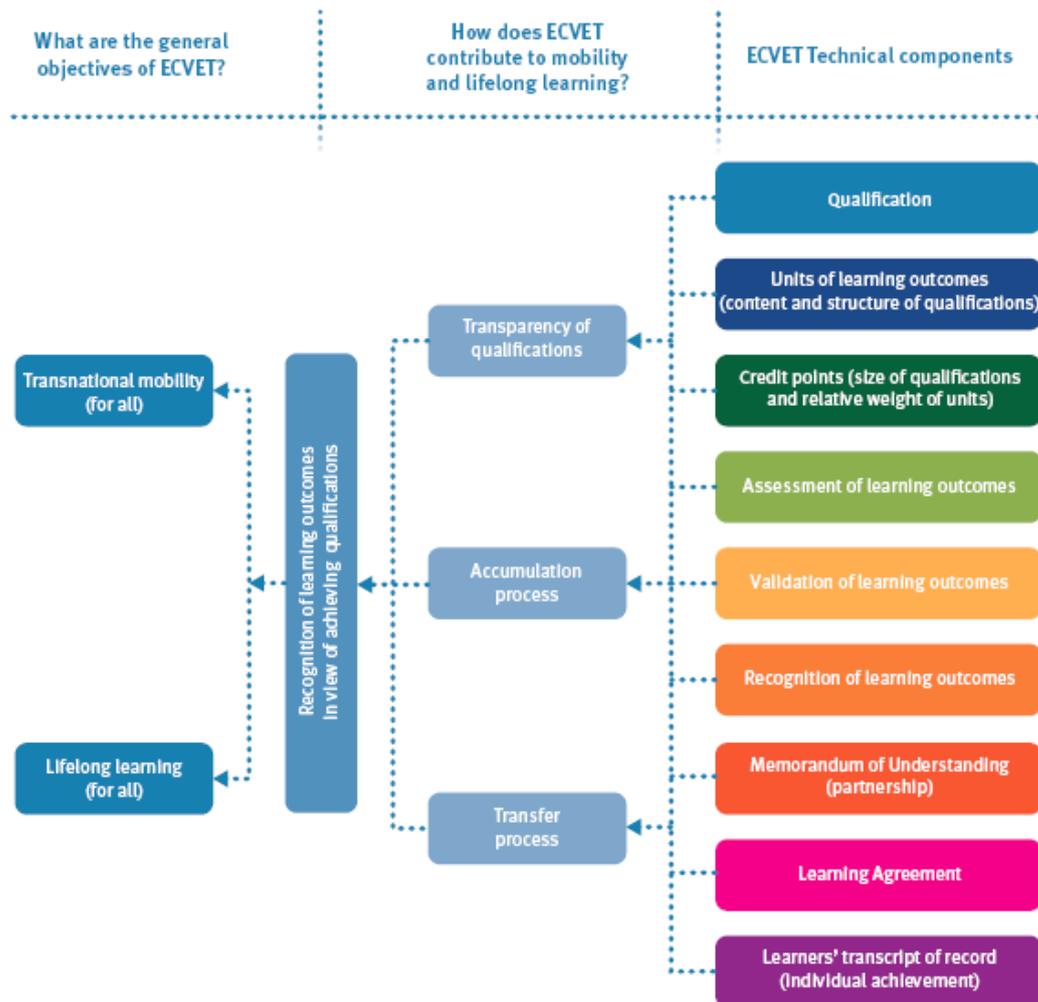
Following step for the design of the training programme has been the necessary setting of the learning outcomes, the selection of the training contents, their segregation and sequential organisation into modules or units in knowledge, skills and attitudes related, and the definition of the assessment criteria for each. This "modular" scheme is promoted by the use of the European Credit System for Vocational Education and Training (ECVET) framework and the application of the European Qualifications Framework (EQF) reference system.

a) Using ECVET framework

ECVET is based on a set of technical components that are all underpinned by the development of learning outcomes. This approach ensures a better understanding and comparability of qualifications and learning achievements across countries.



For the development of the qualification “**Rehabilitation of traditional architecture in Europe**” these technical components have been taken into account to provide to the training system with a European dimension.



ECVET framework: objectives and technical components

b) Using the EQF reference system

The European Qualifications Framework (EQF) is a common European reference framework whose purpose is to make qualifications more readable and understandable across different countries and systems. This is important to support cross-border mobility of learners and workers and lifelong learning across Europe.

The EQF uses 8 reference levels ranging from basic (Level 1) to advanced (Level 8). Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications.



The EQF level applicable to this training programme is **Level 4**, whose relevant learning outcomes are:

LEVEL 4	KNOWLEDGE
	Factual and theoretical knowledge in broad contexts within a field of work or study.
	SKILLS
	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study.
	COMPETENCES
	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change. Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

Descriptors defining Level 4 in EQF

The EQF shifts the focus from input (lengths of a learning experience, type of institution) to the learner, to what a person holding a particular qualification actually knows and is able to do while guaranteeing standardization of workers know-how across Europe.

Main elements in training design

The five main components of a quality training system include the definition of aims and contents of the qualification, the expected learning outcomes, the sequential organisation into modules or units, the assessment criteria and the credit arrangements.



Main elements in training design

a) Aims and contents

Aims are overall statements of what is expected to achieve with the training.

Aims link training design to the training needs. By setting the aims of the training will make it clear to participants what the training is trying to do and the performance gap intended to cover. Trainers use them to focus the training and to assess performance and success of participants.

Contents are a sequenced list of topics to be covered with an indication of the amount of time to be spent on each. After outlining the content domain of the training, the content of the training should be divided into modules or chapters. Each module will then be set-up as a structured lesson.

b) Learning outcomes

Learning outcomes are statements of what a learner knows, understands and is able to do on completion of a learning process. Learning outcomes are defined in terms of knowledge, skills and competences:

- **Knowledge:** In the context of EQF, knowledge is described as theoretical and/or factual.
- **Skills:** In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).
- **Competences:** In the context of EQF, competence is described in terms of responsibility and autonomy.

Writing the learning outcomes

Learning outcomes are developed in the process of designing qualifications. There are different approaches to identifying and describing learning outcomes depending on the qualifications system. Using the European framework to develop the learning outcomes provides a standardization of workers know-how enabling transfer of credits for learning outcomes from one qualification system to another, making easier for European Union (EU) citizens to gain cross-borders recognition.

Learning outcomes in curricula usually begin with *“On successful completion, the learner will be able to...”* This phrase is followed by an **action verb** usually followed by words indicating on *what* or *with what* the learner is acting and the *nature or context* of the performance required as evidence that the learning was achieved. These additional words also indicate the level of learning achieved.

Different verbs can be used to demonstrate different levels of learning regarding complexity, depth of study and/or autonomy:

- **Knowledge** - Count, define, describe, draw, find, identify, label, list, match, name, quote, recall, recite, sequence, tell, write ...
- **Skills: a) Applying Knowledge** - apply, practice, demonstrate, show, plan, design, operate, assemble, use, construct, prepare, create, compose, arrange...; **b) Communication** - write, illustrate, report, describe, discuss, explain, state, name, express, review, speak, present, interact...; **d) Judgmental** - choose, judge, identify, evaluate, analyse, assess, interpret, argue, select, compare, rate, measure, propose, appraise, estimate, examine, categorise...; **e) Learning** - evaluate own learning, proceed, study, undertake further studies, ...
- **Competence (Autonomy and Responsibility)** - Collaborate, comply, deal with, ensure, be responsible for, carry out tasks, guide, supervise, monitor, authorise, represent, advise, negotiate...



c) Units of learning outcomes

Units are a set of learning outcomes (knowledge, skills and competences) that constitute a coherent part of a qualification (CEDEFOP, 2008b)².

A unit of learning outcomes has to be designed in such a way as to provide a consistent and structured learning process, with agreed coherent learning outcomes and clear criteria for assessment.

A unit of learning outcomes (also called just “unit”) is a component of a qualification consisting of a coherent set of knowledge, skills and competence that can be assessed and validated. This presupposes that the units of learning outcomes are structured comprehensively and logically and that they can be assessed, transferred and, possibly, certified. Units of learning outcomes can be specific **components of one or more qualifications**.

Some additional information is usually provided in case units are to be used at the same time as learning modules, this is, as components of a training programme/curriculum, or in case recognition of learning outcomes acquired in non-formal or informal learning contexts is addressed.

This “modular” approach is promoted by the use of **ECVET framework**.

The ECVET recommendation suggests that the description of a unit should include, at least, the following information:

- The title of the unit,
- The title of the qualification to which the unit relates,
- The EQF level of the qualification,
- The ECVET points associated with the unit,
- The learning outcomes contained in the unit,
- The procedures and criteria for assessment of these learning outcomes,
- The validity in time of the unit, where relevant.

d) Assessment criteria

Assessment criteria relate to the standard of performance, being defined to ensure that the learning outcomes (for a qualification or learning activity/module) are met. The assessment criteria specify the observable and measurable actions that each learner will be able to demonstrate as a result of participating in the training activities.

Criteria are developed by analysing the learning outcomes and identifying the specific characteristics that contribute to the overall assignment. These are the standards by which the learning is judged. Assessment criteria can be ‘threshold assessment criteria’ leading to the decision that a student has passed or failed or they can be formulated as ‘grade assessment criteria’ that can be used for articulating different levels of achievement (leading to different grades). In both cases, it is necessary that they determine the expected level of performance.

e) ECVET points and credits

Credit arrangements in European education and training (ECVET and ECTS) build upon the learning outcomes underpinning qualifications and programmes; they link to the EQF by the use of the level descriptors expressed in learning outcomes.

² Cedefop (2008b). [Terminology of European education and training policy. A selection of 100 key terms](#). Luxembourg: Publications Office.

It is essential in implementing ECVET to ensure that learning outcomes of the qualification and units are clearly identified and described to enable mutual understanding and judgments among different countries, assuring this way the process of recognition and validation of skills by common accreditations as well as a coherent implementation at national level.

Together with units, description of learning outcomes and information about the EQF level, ECVET system supports the understanding of a qualification. Thereby, the number of ECVET points allocated to a qualification, together with other specifications, indicate for example, if the scope of the qualification is narrow or broad.

The ECVET system is a technical framework for the allocation of ECVET points to hours of training for the transfer, recognition and, where appropriate, accumulation of individuals' learning outcomes with a view to achieving a qualification. ECVET points are a numerical representation of the overall weight of learning outcomes in a qualification and of the relative weight of units in relation to the complete qualification.

Following the [ECVET Recommendation](#)³ to enable a common approach for the use of ECVET points for a given qualification, the allocation of ECVET points should be based on:

- The use of the convention according to which **60 points** are allocated to the learning outcomes expected to be achieved in **one year of formal full time VET**.
- The **selection** of one **formal learning programme as a point of reference**. It is up to the competent institutions in charge of designing qualifications to decide which specific programme will be chosen as a point of reference (e.g. the initial VET or the most common programme). For qualifications which do not have a formal learning pathway reference, ECVET credit points can be allocated through estimation by comparison with another qualification which has a formal reference context.

This way, the duration of the selected reference programme together with the “convention” on ECVET points, will give the number of ECVET points to be allocated to the qualification as a whole, and then, to its units according to their relative weight within the qualification.

The relative weight of a unit of learning outcomes, with regard to the qualification, should be established according to the following criteria or to a combination thereof:

- The relative importance of the learning outcomes which constitute the unit for labour market participation, for progression to other qualification levels or for social integration;
- The complexity, scope and volume of learning outcomes in the unit;
- The effort necessary for a learner to acquire the knowledge, skills and competence required for the unit.

The ultimate stage of ECVET arrangements is **recognition and validation** of the learning outcomes achieved **through crediting** by way of the assessment. It can be considered as part of a quality assurance process. Credit transfer and accumulation process is underpinned by ECVET documents: the Memorandum of Understanding⁴, the Learning Agreement and the Personal Transcript.

³ Recommendation of the European Parliament and of the Council of 18 June 2009 on the establishment of a European Credit system for Vocational Education and Training (ECVET).

⁴ A MoU is an agreement between competent institutions which sets the framework for credit transfer. It formalises the ECVET partnership by stating the mutual acceptance of the status and procedures of competent institutions involved. It also establishes partnership's procedures for cooperation.

QUALIFICATION

Rehabilitation of traditional architecture in Europe

Description: Aims and contents

Key competence to be acquired

To organize and carry out the renovation and rehabilitation works in antique buildings at foundations, structure, facades, roofs, sanitation and plumbing and interior design, for their integrated conservation, complying with the established conditions and deadlines as well as the requirements of quality, safety and environment.

Sequencing and distribution of professional modules

	HOURS	ECVET
<i>“Rehabilitation of traditional architecture in Europe”</i>	350	22
- Module 1 Integrated conservation of antique buildings	10	1
- Module 2 Rehabilitation activities at foundations, structure and facades	100	6
- Module 3 Rehabilitation activities at roofs	100	6
- Module 4 Sanitation and plumbing interventions for rehabilitation	75	5
- Module 5 Finishing works and restoration of decorative elements	65	4

Occupations involved / target groups

- Masons/ Bricklayers
- Stoneworkers / Stonecarvers
- Locksmiths / Metalworkers (steel, lead, copper and zinc metal sheeting)
- Woodworkers / Carpenters
- Slate workers
- Ceramists / Pottery Tilers
- Plasterers
- Painters
- Glassworkers

EQF level

The learning outcomes relevant to **level 4** are defined by a set of descriptors:

- **Knowledge:** Factual and theoretical knowledge in broad contexts within the field of work or study.
- **Skills:** A range of cognitive and practical skills required to generate solutions to specific problems in the field of work or study.
- **Competences:** a) Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; b) Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.



Learning Outcomes

Within the framework described, upon successful completion of the curriculum, trainees should be able to:

- Know sensitive restoration techniques and choose the appropriate functions, materials, and tools.
- Cut customized pieces of stone.
- Construct the rows (courses) of brick walling: rigging according to required specifications.
- Construct the false work/shoring scaffolds.
- Carve and configure structural lintels.
- Set the arch or vault elements, anchors and encounters to other construction elements.
- Rehabilitate staircases and other special elements: configure its structural elements.
- Place the components of a gable structure.
- Place tiles and plate covering.
- Execute finishing works, roof aprons and parapet walls.
- Resolute roof encounters.
- Install and repair gutters, downpipes and system components.
- Execute joints, encounters and anchors to other construction elements in sanitation installations.
- Finish encounters of roof plumbing with other building elements.
- Treat the seams and joints in facades and interior architecture.
- Configure finishes and decorative elements in masonry (stone, brick).
- Restore and place other finishes and decorative elements.
- Paint decorations: selection of pigments and application of colour, lacquers and varnishes.
- Elaborate and apply templates and moulds for decorative fittings.



Module 1: Integrated conservation of antique buildings

LEARNING UNITS

Unit 1. Rehabilitation activities at foundations, structure and facades.

Unit 2. Rehabilitation activities at roofs.

Unit 3. Sanitation and plumbing interventions for rehabilitation.

Unit 4. Finishing works and restoration of decorative elements.

HOURS / ECVET POINTS

10 h / 0.6 point

Unit 1. Rehabilitation activities at foundations, structure and facades

GENERAL DESCRIPTION

Understand the basis of potential rehabilitation activities that can be applied to foundations, structure and facades of an antique building, paying attention to its main elements such as stone applications, brick walling, arches, lintels, staircases, etc.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know the different types of natural stones and mortars for processing thereof.
	K2. Know the key requirements of existing structures, foundations, walls and components made of masonry.
	K3. Recognize editing systems scaffolding prefabricated frame to be realized for the renovation (i.e. ribs).
	K4. Identify key types of frequently used structural lintels and their construction method.
	K5. Know the functions of arch/vault elements.
	K6. Know the key aspects for the reconstruction of staircases.
Skills	S1. Distinguish natural and artificial stones before processing.
	S2. Distinguish different masonry and foundation works.
	S3. Identify key types of shoring scaffolding and ribs.
	S4. Understand the function of structural lintels.
	S5. Understand the functions of arches, vaults and abutments and each encounters with others elements of the building.
	S6. Be aware of the importance of renovating staircase suitable for users.
Competences	C1. Be aware of the importance of esthetical, historical, cultural and artistically aspects related to stones, brick walling, arches, vaults, staircases, etc., for antique buildings.



OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) The basics of stone	Natural and artificial stones, the use of hand tools and machines for stone working and the technical principles for the static and constructive capacities of parts made of stone.	Basic knowledge of the different types of natural stone and their characteristics Basic knowledge of the different mortars for processing with natural stones;
b) The basics of brick work	Different foundations and walls in the structure, types of mortars and kinds of brickwork.	Basic knowledge about brick walling and its structural component.
c) The basics of scaffolds	Different types of shoring scaffolds and ribs for constructing false-work for arched structures.	Basic knowledge about temporary structures for supporting arches or times during their installation.
d) The basics of structural lintels	Carving and configuration of structural lintels that support the materials of the wall above a bay, a door or a window.	Basic knowledge about structural lintel and its supporting and decorative function.
e) The basics of arches and vaults	Types of arches and vaults: structural function of the components.	Basic knowledge of arches and vaults their encounters to other construction elements.
f) The basics of staircases	Reconstruction of staircases: configuration of its structural elements.	Basic knowledge about the structural behaviour of a staircase.

ASSESSMENT

- Is able to recognize natural and artificial stones.
- Is able to distinguish different masonry and foundation brick works.
- Is able to recognize temporary structures (scaffolds and ribs).
- Is able to understand the functions of structural lintels.
- Is able to understand the functions of arches and vaults.
- Is able to realize the importance of the structural behaviour of a staircase.

Unit 2. Rehabilitation activities at roofs

GENERAL DESCRIPTION

Know the basis of potential rehabilitation activities that can be applied to roofs, paying attention to main elements such gable structure, encounters and aprons, different material for covering, etc.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:



Knowledge	K1. Know the main components of a gable structure
	K2. Identify the different materials composing traditional coverings: inclination walls formation, boards and covering material (tiles and plates).
	K3. Identify the finish elements of the traditional coverings or roofs: eaves, ridge tiles, hip rafters, parapet walls, edge tiles...
	K4. Identify encounters of traditional coverings or roofs with other constructive elements.
Skills	S1. Know about basic materials resistance.
	S2. Understand the different functions of layers, elements and material used for covering traditional roofs.
	S3. Identify the damages affecting the finish elements of the traditional coverings and the reparation needed according to each damage.
	S4. Identify the damages affecting the encounter of traditional coverings with other constructive elements and the needed restoration according to each damage.
Competences	C1. Be aware of the importance of esthetical, historical, cultural and artistically aspects of traditional coverings.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) The basics of the gable structure	Exterior wall with a triangular end, which supports, in traditional frame (wall to wall), the horizontal beams (purlin).	Basic knowledge of the gable structure and its components. Basic knowledge of placing of straps and others components of the gable structure.
b) The basics of roof coverings	Different traditional roof coverings, materials used and potential dysfunctions.	Basic knowledge about roof covering and its components. Basic knowledge about tiles and plate covering.
c) The basics of finishes and roof aprons	Different execution of finishes and roof aprons: eaves, ridges, valley, overhangs, etc.	Basic knowledge about the execution of finishes and roof aprons. Basic knowledge about elements dysfunctions.
d) The basics of roof encounters	Resolution of roof encounters: repair of construction valley and damaged encounters on gable roofs, overhangs, fireplaces, dormer rooms, etc.	Basic knowledge about the resolution of roof encounters. Basic knowledge about damages in the roof encounters.

ASSESSMENT

- Is able to recognize different components of the gable structure.
- Is able to distinguish different traditional roofs and components.
- Is able to recognize different execution finishes and roof aprons.
- Is able to identify damage in roof encounters.



Unit 3. Sanitation and plumbing interventions for rehabilitation

GENERAL DESCRIPTION

Know the basis of potential rehabilitation activities that can be applied to sanitation and plumbing installations, paying attention to elements such as guttering, downpipes, system components, joints, encounters and anchors with other building elements, etc.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Distinguish the different types of sanitation and plumbing facilities used in rehabilitation, their performance and incompatibilities.
	K2. Identify joints, encounters and anchors with other constructive elements in sanitation installations.
	K3. Distinguish the different types of pluvial water drainage systems used in rehabilitation, their performance and incompatibilities.
Skills	S1. Identify the pathologies that affect the sanitation and plumbing installations.
	S2. Identify the pathologies that affect the encounters of plumbing and sanitation installations with other constructive elements of the building.
	S3. Identify the pathologies that affect the various elements used in the drainage of pluvial water (clogging of gutters, degradation of welds and materials).
Competences	C1. Be aware of the importance of esthetical, historical, cultural and artistically aspects of sanitation, plumbing and guttering installations.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) The basics of guttering, downpipes and system components	Installation and repairs of guttering, downpipes and system components according to the original construction.	Basic knowledge of guttering, downpipes and system components Basic knowledge about cleaning and reparation works.
b) The basics of joints, encounters and anchors	Execution of joints, encounters and anchors to other construction elements in sanitation installations according to the original construction.	Basic knowledge about execution of joints, encounters and anchors to other construction elements in sanitation installations Basic knowledge about pathologies and clearing works of materials.
c) The basics of finishes of encounters of roof plumbing	Different finishes of encounters of roof plumbing that need to be framed with other constructive elements.	Basic knowledge about the execution of finishes encounters of roof plumbing. Basic knowledge cleaning and reparation of guttering, downpipes and system components.

ASSESSMENT

- Is able to identify different components of guttering, downpipes and system components.
- Is able to recognize joints, encounters and anchors to other construction elements in sanitation installations and roof plumbing.



- Is able to distinguish different pathologies and problems in guttering and plumbing installations.
- Is able to expose the adequate technique for the renovation or replacement of the plumbing installations.

Unit 4. Finishing works and restoration of decorative elements

GENERAL DESCRIPTION

Know the basis of finishing works and potential restoration of decorative elements activities that can be applied to different parts of the building, paying attention to elements such seams and joints, stone carving, decorative painting and fittings, etc.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Distinguish different types of interior/exterior seams and joints.
	K2. Identify different kind of stones that can be carved by the stonemason.
	K3. Know different finishing that can be applied to restore a given element or parament.
Skills	S1. Identify different diseases that may affect the building: gutted grouts, parasites, salts, lichen, vegetation, grout chalking, cracking, fouling...
	S2. Understand the techniques of the stonemasons for the integration of sculptural and decorative elements in stone.
	S3. Distinguish the main types of finishing and fittings such as glazing, whitewashing, crystallizing, coating, lacquering.
Competences	C1. Be aware of the importance of esthetical, historical, cultural and artistically aspects of finishing works and decorative elements of the building.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) The basics of seams and joints	Surface treatment of the spaces between the masonry elements which guarantees water tightness and avoids the proliferation of undesirable mosses and vegetation that can degrade the masonry.	Basic knowledge about the treatment of joints and seams. Basic knowledge about different diseases that may cause joints.
b) The basics of decorative stone elements	Restoration of decorative stone elements (stone carving) of the superficial layer without a structural function, according to the original version.	Basic knowledge about different types of stones. Basic knowledge about and stone carving techniques.
c) The basics of finishing and decorative fittings	Restoration of decorative elements in plaster, decorative painting, and others decorative fittings.	Basic knowledge about existing finishing for antique buildings. Basic knowledge about decorative painting and fittings.

ASSESSMENT

- Is able to identify seams and joints and their potential diseases.
- Is able to recognize different types of stone that may be carved by the stonemason.
- Is able to distinguish different types of finishing and decorative fittings.

Module 2: Rehabilitation activities at foundations, structure and facades

LEARNING UNITS

Unit 1. Cutting of customized pieces of stone.

Unit 2. Rows (courses) of brick walling: rigging and construction to required specifications.

Unit 3. Construction of falsework for arched structures.

Unit 4. Carving and configuration of structural lintels.

Unit 5. Setting of the arch, vault elements and anchors or encounters to other construction elements according to their required layout.

Unit 6. Reconstruction of staircases and other special elements: configuration of its structural elements.

HOURS / ECVET POINTS

75h / 4.6 point

Unit 1. Cutting of customized pieces of stone

GENERAL DESCRIPTION

Shaping rough pieces of rock into accurate geometrical shapes, and arranging the resulting stones, often together with mortar, to form structures.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know and explain the basics of EQF Levels 1 - 3 (bricklayer, stonemason).
	K2. Know the different types of natural stone, their characteristics and their application; Know the different mortars for processing with natural stones.
	K3. Know the techniques for the extraction, transport, handling and processing of natural and artificial stones (with hand tools and machines).
	K4. Know the techniques for the foundation, anchoring and dowelling of natural and artificial stones.
Skills	S1. Be able to recognize and evaluate natural and artificial stones before processing (e.g. layering).
	S2. Be able to manufacture, profile and install part stones according to the customer's requirements (with hand tools and machines).
	S3. Be able to make reliefs, sculptures, deepened and sublime ornaments and writings.
	S4. Be able to manufacture and install wall cladding and flooring.
Competences	C1. Communicate knowledge and skills to workmates, lead them to independent work and supervise the execution.
	C2. Be able to take the time and material requirements and report it to the construction management as the basis for the billing.
	C3. Be able to advise customers expertly and recommend further work.



OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) The basics of natural stone	Includes the basics of masonry technique with natural and artificial stones, the use of hand tools and machines for stone working and the technical principles for the static and constructive capacities of parts made of stone.	Basic knowledge of the different types of natural stone, their characteristics and their application. Basic knowledge of the different mortars for processing with natural stones. Basic knowledge of the techniques for the extraction. Basic knowledge of the techniques for the foundation, anchoring and dowelling of natural and artificial stones.
b) Handling of artificial and natural stones on building site	In this learning unit the contents of the basic course are transferred and applied to the construction site situation.	Handling and processing of natural and artificial stones (with hand tools and machines) for several fields of application.
c) Professional management and communication on site	A hub between customers, construction management and construction sites.	Professional management under the specific conditions of renovation and restoration site.

ASSESSMENT

- Is able to recognize and evaluate natural and artificial stones before processing (e.g. layering).
- Is able to explain the areas of application and application limits of natural and artificial stones (e.g. flooring, wall cladding).
- Is able to manufacture, profile and install part stones according to the customer's requirements (with hand tools and machines).
- Is able to manufacture and install wall cladding and flooring.
- Is able to explain the specific characteristics of natural and artificial stones to customers and employees.
- Communicates knowledge and skills to partners/employees, leads them to independent work and supervises the execution.
- Is able to take the time and material requirements and report it to the construction management as the basis for the billing.
- Is able to advise customers expertly and recommend further work.
- Knows and applies health, prevention and safety measures.

Unit 2. Rows (courses) of brick walling: rigging and construction to required specifications

GENERAL DESCRIPTION

Construct masonry out of natural and artificial stones or bricks, install and assemble finished parts. To perform concrete and reinforced concrete works according to plans, for example in foundations or ceilings.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know and explain the basics of EQF Levels 1 - 3 (bricklayers, concrete workers, plasterers).
	K2. Know and explain the relevant regulations of the technical building regulations (Euro codes) and the information sheets of the WTA (Scientific-technical work group for building conservation and preservation of monuments). http://wta-international.org/?L=2
	K3. Know the functions, constructive principles and differences of foundations and the different walls in the structure.
	K4. Know and explain the various requirements of existing structures, foundations, walls and components made of masonry and the special characteristics of concrete, masonry and mortar.
Skills	S1. Be able to distinguish and characterize different masonry and foundation works.
	S2. Be able to plan, execute, control and evaluate brickwork according to the specifications of existing buildings.
	S3. Be able to explain the functions, characteristics, scopes of application and limits of foundations and walls made of masonry to customers and employees.
Competences	C1. Communicate knowledge and skills to employees, lead them to independent work and supervise the execution.
	C2. Be able to take the time and material requirements and report it to the construction management as the basis for the billing.
	C3. Be able to advise customers expertly and recommend further work.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) Basics of masonry technique	In this lecture the basics of masonry technique from EQF Levels 1-3 are repeated, supplemented and deepened.	Consolidation of basic knowledge and craftsmanship of masonry technology (Eurocode Standard).
b) Technical regulations of brickwork in existing buildings	This learning unit extends the basic knowledge about masonry in the new building by the knowledge and special features of the existing building.	Knowing the relevant regulations of the technical building regulations and the information sheets of the WTA (Scientific-technical work group for building conservation and preservation of monuments). http://wta-international.org/?L=2



Contents	Description	Learning objective
c) Solid walls	In this learning unit, the specific characteristics of solid walls made of masonry are treated: load removal and bracing, fire protection, sound insulation, etc.	Analysis of existing massive walls according to their function, constructive principles and differences of foundations and the different walls in the structure.
d) Professional construction on site	In this learning unit, the implementation of brickwork in existing buildings will be discussed, deepened and practically worked out.	Know and explain the various requirements of existing structures, foundations, walls and components made of masonry and the special characteristics of concrete, masonry and mortar.
e) Professional management and communication on site	A hub between customers, construction management and construction sites.	Professional management under the specific conditions of renovation and restoration site.

ASSESSMENT

- Is able to repeat the basic rules of the brickwork standard EN 1996 (design and construction).
- Applies safe handling of tools and equipment.
- Reliable implementation of the evaluation criteria (solder, scale, dimensions, joint pattern, etc.).
- Is able to explain differences between new and existing masonry.
- Is able to select the right materials for restoration and renovation.
- Is able to handle used building materials.
- Is able to distinguish and characterize different masonry and foundation works.
- Is able to identify the differences and characteristics of existing solid walls.
- Is able to read and explain construction drawings and static calculations.
- Is able to plan, execute, control and evaluate brickwork according to the specifications of existing buildings.
- Is able to explain the functions, characteristics, scopes of application and limits of foundations and walls made of masonry to customers and employees.
- Communicates knowledge and skills to workmates, leads them to independent work and supervises the execution.
- Is able to take the time and material requirements and report it to the construction management as the basis for the billing.
- Is able to advise customers expertly and recommend further work.

Unit 3. Construction of falsework for arched structures: shoring scaffolds

GENERAL DESCRIPTION

Position of temporary works to support spanning or arched structures in order to hold the component in place until its (re)construction is sufficiently advanced to support itself. Falsework includes the creation of suitable working areas and service passages, which make accessible any surface, even at high altitude, to be treated. Among the temporary structures there are also scaffolding and ribs, often



made of wood, through which create adequate support during installation of arches or times or sustain horizontal architectural elements (beams and slabs).

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know descriptive geometry for the design of the tracks generators for the creation of the rib of vaults and arches.
	K2. Know the theory on the structures, to identify the correct position of any supports or the structural functioning of the architectural element that includes support with the scaffolding.
	K3. Know the wood cutting theory and the mounting and joints of flexible strips and panels for the construction of curved ribs, also through the study of treatises of stereotomy of the wood.
	K4. Know editing systems scaffolding prefabricated frame to be realized for the renovation of vertical surfaces.
	K5. Knowledge of methods and theories for the de-Arching of masonry, with particular attention to the works mounted dry.
Skills	S1. Cutting wood workshop and assembly of ribs.
	S2. Design of appropriate ribs for the support of existing arcs and vaults.
	S3. Playing ribs and scaffolding described in the manuals.
	S4. Tests de-arching of works mounted dry.
Competences	C1. Creating ribs and temporary works of adequate support for every need.
	C2. Identification of the structural scheme of the architectural elements turned to be mounted on the ribs.
	C3. Identification of the structural scheme of the architectural elements to be mounted on the curved ribs.
	C4. Correct assembly of scaffolding for machining vertical surfaces in safety altitude.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning Objectives
a) Technical regulations of scaffolds	Knowing the regulations concerning a safety assembly and transformation of scaffolds.	General safety legislation on injury prevention. Conduct risk analysis of a specific context, particularly in areas with limited space and urban complications. Rules of good technique and good practice. Knowing how to read the installation plan, use and dismantling safely, executive design, project.
b) Assembly and transformation of scaffolds	Being able to realize the phases of assembly, disassembly and transformation of scaffolds.	Knowing the fall dpi: use, technical characteristics, maintenance, durability and preservation. Anchors: types and techniques. Mount-remove-turn scaffolding pipes and joints (ptg). Mount-remove-turn scaffolding prefabricated frame (ptp).



Content	Description	Learning Objectives
		Mount-remove-transform the scaffolding uprights and crossbars prefabricated (pmt). Management elements before emergency-rescue. Carry out safety checks: first installation, periodic and extraordinary.

ASSESSMENT

- Is able to read the design and prepare the assembly and dismantling plan.
- Is able to mount, dismount and transform scaffolds.
- Is able to realize anchors.
- Is able to understand the legal and regulatory part on safety.

Unit 4. Carving and configuration of structural lintels

GENERAL DESCRIPTION

Architectural element used to support the materials of the wall above a bay, a door or a window. The lintel can serve as a base for a tympanum and a discharge arc. At the beginning, made of stone and wood, raw materials found on the early sites of construction, gradually more worked, lintels have gone from the rectilinear form to curved shapes allowing greater spans and less binding loads for the materials. The lintels (mainly above doors) can be decorated elements that show a certain notoriety of the owner.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Identify different types of frequently used lintel in its region and their construction method.
	K2. Identify conditions that ensure the work stability (shapes, weight, disorders, flaws...).
	K3. Identify problems linked to the stapling.
Skills	S1. Work preparation: <ul style="list-style-type: none"> - Make technical drawings (blueprint + drawing). - Search for source and type of materials. - Note the shapes, dimensions and features of the work (type of cut).
	S2. Plan time and number of workers needed, order materials, communicate the safety and handling needs to the architect or the safety coordinator.
	S3. Work making: <ul style="list-style-type: none"> - Create and set up a template (intern formwork). - Check the stones joining on the floor. - Place elements with compassing and correct alignment. - Make a graft. - Make a stone stapling.
Competences	C1. Combine the technical knowledge linked to the heritage in order to make or repair a lintel that will meet the customer's expectations and the requirements of the global project.



OUTLINE OF UNIT CONTENTS

Content	Description	Learning objectives
a) Repair existing lintels using various appropriate techniques	<p>This unit present all types of lintels (load recovery, repair mortar, stapling, reinforcement, grafting) and the traditional techniques.</p> <p>Deals with architectural and historical technological aspects.</p> <p>Describes the different materials employed and their characteristics and properties. Describes the operating procedures and the equipment and tool used.</p> <p>Lists the uses, advantages and disadvantages of each technique.</p>	<p>Identify and characterize the different traditional techniques. The trainee must be able to recognize and give the names of the different techniques and describe their components (materials, operating procedures, tools...).</p>
b) Awareness/comprehension esthetical, historical, cultural and artistically	<p>This unit lists all the styles, their characteristics and the historical periods to which they belong.</p> <p>Deals with structural lintels, artistic and aesthetic trends to situate the different techniques in a historical context.</p>	<p>Identify the different styles or epochs and the elements that compose it.</p>
c) Structural analysis	<p>This unit analyses the stability, the aging and the different pathology of the lintels.</p> <p>Describes the different steps of the preparation and the procedures, materials and tools to be used.</p> <p>Contains a part devoted to the diagnosis and the state of degradation (stability) or conservation of the structure and the lintel itself.</p>	<p>Determine the nature and appreciation of the state of different component of the lintels.</p> <p>The trainee must be able to identify the state of the structure and the lintel son which he will work.</p> <p>It must also identify the health and structural state of the latter to consider possible intervention (consolidation, treatments, total replacement...).</p>
d) Practical works: Preparation	<p>This units comprises only practical work of realization and intervention on different types of structure.</p> <p>Allows the technical drawing (layout), calculation, fabrication and installation of support templates.</p> <p>Allows preventive or curative treatments.</p> <p>Makes possible to use the various tools, materials required.</p> <p>Focuses on organizing and planning tasks.</p>	<p>Carry out the preparation of the work according to the rules of the art the adapted techniques.</p> <p>The trainee must be able to perform all necessary interventions to produce a healthy and solid structure of working.</p>

Content	Description	Learning objectives
e) Practical works: Application	<p>This unit comprises only practical work for realization and intervention: it enables the implementation of all traditional techniques.</p> <p>Replacing the lintel by maintaining the aesthetics of the building and the history (support of the upper masonry, extraction of the lintel for analysis, choice of a material of identical provenance, installation (lifting and rigging).</p> <p>Re-joining taking into account all the elements.</p> <p>Makes possible the use of tools and materials.</p>	<p>Realise and implement the different techniques. The trainee must be able to prepare and/or replace a lintel.</p>

ASSESSMENT

- Is able to name of each type of lintels.
- Is able to describe the techniques associated with corresponding materials.
- Is able to identify the tools as their use is correctly cited.
- Is able to operate modes are restored the timeline is respected with tolerance with up to three errors.
- Is able to differentiate and/or identify and correctly associate the styles.
- Is able to analyse of the structure: the name of the disorders or pathologies is given.
- Is able to indicate and quote different techniques to be implemented.
- Is able to cite the tools and products to be used.
- Is able to mention the elements of prevention of safety; tolerance is two errors.
- Is able to read the technical drawing corresponds to the expectations: conformed and adapted aspect, absence of defect.
- Preparation and/or application procedure is respected: the chronology according to the different steps, the extraction, the choice of material and the installation.
- Organizes work: the work site is properly organized and supplied.
- Health and safety prevention: the right rules are respected or implemented.

Unit 5. Setting of the arch, vault elements and anchors or encounters to other construction elements according to their required layout

GENERAL DESCRIPTION

Arches or vaults are formed by the joining together of individual stones which are strengthened with their lateral surfaces mutually and in their entire scope against other, fixed components (abutments). In this way, openings and rooms are covered free-floating. Before the development of reinforced concrete, vaults were the only (incombustible) components with which rooms could be massively covered.



LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know and explain the basics of EQF Levels 1 - 3 (bricklayers, concrete workers, stoneworkers).
	K2. Know the functions, constructive principles and differences of arch/vault elements.
	K3. Know the static rules and principles for the construction of arches, vaults and abutments.
Skills	S1. Is able to draw the different arches in the various designs on a scale of 1: 1 (e.g. segmental arch, basket arch, gothic arch).
	S2. Is able to manufacture the scaffold and formwork and arrange the brickwork.
	S3. Is able to manufacture arches and vaults of masonry in visual quality (notice: the under view of the arch or vault is not visible during masonry work).
Competences	C1. Communicates knowledge and skills to employees, lead them to independent work and supervise the execution.
	C2. Is able to take the time and material requirements and report it to the construction management as the basis for the billing.
	C3. Is able to advise customers expertly and recommend further work.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning objective
a) The basics of arches and vaults	In this learning unit the basic knowledge about arches and vaults is treated: function of the components, specific features and differences, static rules and principles.	Basic knowledge of arches and vaults.
b) Construction of arches and vaults on the construction site	In this learning unit the knowledge from the basic course is implemented at the construction site.	Handling of tools and utensils for graphical construction. Static and structural requirements of formwork and scaffold manufacturing of high-quality masonry.
c) Professional management and communication on site	A hub between customers, construction management and construction sites.	Professional management under the specific conditions of renovation and restoration site.

ASSESSMENT

- Is able to draw the different arches in the various designs on various scales (e.g. segmental arch, basket arch, Gothic arch).
- Is able to explain the specific features of arches, their application areas and application limits.
- Is able to draw the different arches in the various designs on a scale of 1: 1 (e.g. segmental arch, basket arch, Gothic arch).
- Is able to manufacture the scaffold and formwork and arrange the brickwork.
- Is able to manufacture arches and vaults of masonry in visual quality (notice: the under view of the arch or vault is not visible during masonry work).



- Is able to explain the functions, characteristics, scopes of application and limits of arches and vaults made of masonry to customers and employees.
- Communicates knowledge and skills to employees, lead them to independent work and supervise the execution.
- Is able to take the time and material requirements and report it to the construction management as the basis for the billing.
- Is able to advise customers expertly and recommend further work.

Unit 6. Reconstruction of staircases and other special elements: configuration of its structural elements

GENERAL DESCRIPTION

Reconstruction of structural elements damaged through the use of identical materials to the original (or similar and compatible) aimed at ensuring the structural integrity of the article and its usability.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know the basic principles on the static and dynamic behaviour of the structures, to identify and classify the elements to replace and reproduce.
	K2. Know the dimensional standards for the construction of staircases suitable for the correct use.
	K3. Know the theory on the intrinsic and extrinsic characteristics and quality of the material to be used (stone, brick, concrete, wood...) for the formation of structural elements.
	K4. Classify and define case studies emblematic of wider application.
	K5. Know descriptive geometry of two-dimensional and three-dimensional structural element design.
	K6. Know the stone stereotomy for the construction of complex stone stairs.
	K7. Know the production modules of the stone structural elements through the manufacturing procedure Cad - Cam, with the use of numerical control machines.
Skills	S1. Create models that reproduce theoretical applications.
	S2. Discuss on possible alternative modes of execution of case studies.
	S3. Classify of reconstruction interventions, identify the major issues in relation to the materials used, and choose the best solutions and the best performing material for each type of intervention.
	S4. Work on the definition of the structural elements in stone through the practice of the techniques of the stonemasons.
	S5. Create structural elements through the production Cad-Cam, with the use of numerical control machine.
Competences	C1. Engage in identification of structural members deteriorated to replace.
	C2. Produce structural elements in stone through the use of the stonemasons' techniques.
	C3. Produce structural elements in stone through the use of CAD - CAM techniques.

C4. Deal with the assembly of the structural elements (steps of a ladder, lintel replacement, etc.) by managing the static behaviour of the same and the surrounding structures.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning Objectives
a) Cutting, shaping and assembling of steel reinforcement	Realize the metal reinforcements of the various structural elements by cutting, shaping and assembling the steel rods as well as expected by elaborate design graphics.	<ul style="list-style-type: none"> - Interpret processed executive design and construction details graphics inherent in the carpentry for the choice and machining of steel bars to be used in the realization of the structural elements. - Mount the counter or work the metal reinforcements cut and shaped, tying or welding the various elements in the respect of the design documents. - Shape the steel rods as indicated by the drawings, realizing longitudinal rods, brackets and other reinforcement elements, using hand tools or machines bender. - Place the metal reinforcement cages in the shuttering.
b) Realization in work	Building wooden shuttering or assembling prefabricated formwork made containers of structural castings of concrete and the support temporary works, following the design guidelines.	<ul style="list-style-type: none"> - Read and interpret the executive technical drawings of the works in order to understand the geometric development of artefacts and organize their work. - Assembling the elements realizing the support structures necessary and following the eventual assembly instructions. - Build the formwork by nailing the boards and other wooden elements, realizing the support structures and scaffolds necessary and curing the verticality and horizontality of the structural elements. - Cut the wooden boards and other elements following the indicated measures, using the tools / machines / suitable equipment (circular saws, greenhouses etc.). - Treat the timber or prefabricated panels with any products that facilitate disarmament.

Content	Description	Learning Objectives
<p>c) Preparation and casting of making concrete</p>	<p>To concrete and execute the conglomerate castings inside the formwork selecting, dosing and mixing the components, ensuring the consistency of the jets.</p>	<ul style="list-style-type: none"> - Measure out the materials for the packaging of the concrete (binders, aggregates, additives) in relation to the type, the amount, particle size and the type of use and provided resistance. - Mix the components of the concrete with the aid of machines (cement mixer, kneader, etc.), controlling the characteristics of the mixtures obtained with particular reference to the ratio between water and cement and workability. - Perform the concrete castings inside the formwork, curing the homogeneous distribution around the armour and compacting the conglomerate by manual or mechanical vibration, in order to favour the compactness and filling that increase the characteristics of resistance. - Organize the transit zones, handling and execution of jets in the case of use of ready-mixed concrete, provided with external mixers.
<p>e) Disarmament of reinforced concrete structures built</p>	<p>Disarm the reinforced concrete structures built by removing the formwork and the provisional support structures and applying any surface finishing treatments.</p>	<ul style="list-style-type: none"> - Check the seasoning of the works of reinforced concrete, in accordance with the times indicated by the project and the indications of the direction of the work, evaluating possible variables in relation to climatic conditions. - Disarming the reinforced concrete structures built by removing the formwork and support works, on time of maturation and the static behaviour of structures. - Retrieve the elements of prefabricated formwork and possibly the reusable timber, cleaning the surfaces. - Finish the concrete outer surfaces by applying any treatments. - Check the exterior surfaces of the concrete eliminating any imperfections.

ASSESSMENT

- Is able to correctly read the drawing, the understanding of mounting defects to be avoided.
- Has adequate knowledge of wood and its proper handling.
- Is able to recognize the characteristics of materials and their use, dosages and enforcement procedures in order to choose and mix the components of the concrete.
- Knows the principles of static behaviour of the materials.
- Is able to manage operational procedures and tools for the execution of concrete castings, transport and compaction.
- Is able to Knowing the operating procedures and tools for the disarmament of reinforced concrete works.

Module 3: Rehabilitation activities at roofs

LEARNING UNITS

Unit 1. Placement of straps and components of the gable structure.

Unit 2. Placement of tiles and plate covering.

Unit 3. Execution of finishes and roof aprons.

Unit 4. Resolution of roof encounters.

HOURS / ECVET POINTS

75 / 4.6 point

Unit 1. Placement of straps and components of the gable structure

GENERAL DESCRIPTION

The gable is the exterior wall with a triangular end, which are supporting, in traditional frame (wall to wall), the horizontal beams (purlin). The gable is perpendicular to the lateral wall which is receiving the water ledges.

The gable can:

- *Be higher than the roof in a straight-lined way or "sawtooth".*
- *Be covered by the roof.*

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Take into account the stability to resist the lateral forces due to winds and the load of the roof.
	K2. Know regulation about common walls.
	K3. Know functions and flaws in insulation.
	K4. Know about basic materials resistance.
	K5. Know regulation for works-at-height (work on a scaffold...).
Skills	S1. Work preparation: <ul style="list-style-type: none"> - Make the exact blueprint of masonry. - Cut the bricks at a regular angle.
	S2. Place the insulation.
	S3. Make decorative masonry.
	S4. Put stable and precise slope markers.
Competences	C1. Combine the technical knowledge linked to the heritage in order to make a gable structure that will meet the customer's expectations and the requirements of the global project.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning objective
a) Repair existing gable components using various appropriate techniques	This unit presents all types of gable and the traditional techniques. It deals with architectural and historical technological aspects. It describes the different materials employed and their characteristics and properties. It describes the operating procedure and the equipment and tools used. It lists the uses, advantages and disadvantages of each technique.	Identify and characterize the different traditional techniques. The trainee must be able to recognize and give the names of the different techniques and describe their components (materials, operating procedures, tools...).
b) Awareness/comprehension esthetical, historical, cultural and artistically	This unit lists all the styles, their characteristics and the historical periods to which they belong. It deals with gable components, artistic and aesthetic trends to situate the different techniques in a historical context.	Identify the different styles or epochs and the elements that compose it.
c) Structural analysis	This unit analyses the stability and the different pathology of the gable components. It describes the different steps of the preparation and the procedure, materials and tools to be used. It contains a part devoted to the diagnosis and the state of degradation or conservation of the structure itself (Dimensions and geometry, supports (states, position)). Make sketches and site surveys. Verify the conditions for implementation of the site (environment, safety, etc.).	Determine the nature and appreciation of the state of different component of the gable. The trainee must be able to identify the state of the structure of the gable which he will work. It must also identify the health and structural state of the support (state, position...).
d) Practical work: preparation	The units comprises only practical work of realization and intervention on different types of structure. It allows the technical drawing, calculation, tracing and cutting of pieces of wood. Tracing: it means to make a draft of the size of the work and draw to scale, draw the pieces on the drawing, trace the pieces of wood according to a template and mark wood pieces.	The drawing of the sketches is precise and exploitable. The plotting of parts is accurate and operable by a third party. The calculations of the edge lengths and the angle values are exact. The marking conforms to the lifting plans. The pieces of wood executed ere adequately conform to the drawings. The basic safety rules are fully respected.

Content	Description	Learning objective
	The cutting: Sawing the various cuts, mortising, notching and drilling to ensure the connections...	The work is executed within the time allowed.
e) Practical work : Application	<p>This unit contains only practical work for realization and intervention: Install assemblies and hardware, go up templates and verify the accuracy of the entire draft.</p> <p>Replace or restore defective items, install and permanently fix the connections and anchorages, fixing the coatings and the wood boards.</p> <p>Treat the wood by different techniques (dipping and staining).</p>	The trainee must be able to make an assembly according to the plans, to position the hardware stores and to realize the work in the time allowed.

ASSESSMENT

- Is able to name each type of gable component.
- Is able to describe the techniques associated with corresponding materials.
- Is able to identify the tools and their use.
- Is able to differentiate and/or identify the styles and are well associated with the correct use of tools and materials.
- Is able to analyse the structure: Calculate lengths, angles, grades, plumbs and check the condition and position of the support.
- Is able to name of the disorders or pathologies.
- Is able to indicate and quote the techniques to be implemented.
- Is able to cite he tools and products to be used.
- Is able to mention the elements of prevention of safety.
- Is able to realize a sketch and do site readings which can be used for manufacturing.
- The technical drawing corresponds to the expectations: conformed and adapted aspect, absence of defect (by hand and by computer).
- The procedure is respected: the chronology of steps is consistent, the marking is conformed, and the equipment is properly maintained.
- Preparation and/or application procedure is respected: the chronology according to the different steps, the dismantling, the choice of material and the installation.
- Health safety prevention: the appropriate rules are respected.

Unit 2. Placement of tiles and plate covering

GENERAL DESCRIPTION

Placement of tiles and other covering materials by placing the tiles or covering pieces, as a general rule, in horizontal strings on the support, perpendicular to the ridge, following the line of maximum slope and bottom up, ensuring the correct overlap of the Pieces and fixing them, if necessary and according to the type of covering material, by paste or mortar or by nails or hooks on screens.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

	K1. Interpret the planes and to know the content of the documentation of the construction projects, particularly, in the relative thing to technical definition, graphic representation and requirements of water tightness, insulation and covering resistance.
	K2. Understand the functions of the coverings and its performance in the presence of water, wind and passage of heat: flow of water/water flow laws/rights, surface-tension, overflow, absorption and capillarity; the wind action and the suction power of the wind; insulating materials and thermal bridges.
	K3. Identify the different materials composing traditional coverings: inclination walls formation, boards and covering material.
	K4. Distinguish the different types of traditional coverings: mounting systems, special pieces, properties, performance and incompatibilities.
	K5. Identify the damages which affect the coverings and to define the repairs needed according to each damage.
Knowledge	K6. Know the execution procedures of the traditional coverings: materials and construction methods of skirts, boards and its components.
	K7. Identify the traditional solutions of coverings, inclined coverings by tiles (ceramic tiles and slates tiles) and by metal plates (zinc, copper...).
	K8. Identify the tools used in the placement of coverage materials for inclined coverings: types, function, management and safety requirements.
	K9. Define the acceptance or rejection conditions of covering materials which are dismantled for its exploitation on restoration of the covering.
	K10. Distinguish the types of construction and demolition wastes that can be generated on restoration works of the traditional coverings and its correspondent treatment.
	K11. Identify the labour risks associated to the restoration Works of inclined coverings, and to know the preventive and protection measures needed for its control.
Skills	S1. Describe the development of execution Works of traditional coverings; specifying the different functions of layers and elements, material used, construction methods of the skirts and the boards and the placement sequence of coverage material...); explaining the realization of singular elements and its importance; by linking the causes of the dysfunctions detected in the covering and the needed reparations and identifying the measurements that need to be respected.
	S2. Accomplish the dismantling of the covering materials, preventing from any damage to the removed materials and other constructive elements that must be kept, watching the manipulation conditions and supply of different materials, applying the acceptance criteria of the original elements dismantled for its reutilization, and verifying the state and resistance of the plank, the support structure and the rest of the elements of the covering.
	S3. Determine setting outs and to apply traditional techniques of coverage in inclined coverings, according to each original material of coverage; ceramic or slates tiles, copper

strips, zinc...; identifying the configuration to be executed (distribution and overlapped pieces...); interpreting the relevant technique documentation; using the suitable materials; applying the solution and adopted execution sequence; respecting the original fixation system (Spiking, on batten support frames, glues for plasterboards, dry conditions...); solving convergences and special elements of the covering; analysing the conditions required on water tightness, insulation and the covering ventilation; and selecting and using the proper way the work equipment for the mechanization and placement of the covering pieces.

Competences

C1. Apply traditional techniques of placing materials of coverings in restoration works; identifying the execution sequence and the original configuration of the covering which is going to be interceded; interpreting the technique documentation needed and accomplishing the requirement of projects of original coverage; selecting and applying the profited material and work equipment; applying the safety and preventive measures against the identified risks; and minimizing the impact on the environment.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) Interpretation of plans, nomenclature and requirements	<p>Technical definition, graphic representation and requirements of water tightness, insulation and covering resistance:</p> <ul style="list-style-type: none"> -Interpretation of plans and paperwork/documentation of the project. -Nomenclature and geometry applied to inclined coverings. -Water tightness requirements, insulation and wind resistance 	<p>The worker explains the configuration of the inclined traditional covering of tiles (ceramic tiles and slate tiles) or metal sheets (copper, zinc...); describes the solution taken in its construction, the used materials, the different layers function and the covering execution sequence; identifies the characteristic dimensions and links the causes of dysfunctions detected in the covering and its needed reparations.</p>
b) Elements and materials of inclined traditional coverings	<p>Composition of inclined traditional coverings: setting out, formation of slopes, board and coverage material:</p> <ul style="list-style-type: none"> -Traditional coverage materials, special pieces and finishing pieces, fastening materials -Functions of the coverings and its performance in the presence of water, wind and passage of heat. -Types of traditional coverings: mounting systems, special pieces, properties, performance and incompatibilities. -Traditional solutions of coverings, inclined coverings by tiles (ceramic tiles and slates tiles) and by metal plates (zinc, copper...). 	<p>The worker determines setting outs and applies traditional coverage techniques in inclined coverings of ceramic tiles or slate tiles, copper sheets, zinc sheets...</p>

Contents	Description	Learning objective
d) Frequent diseases and their treatment	Traditional restoration of coverings: frequent diseases and their treatment.	To identify the injuries that affect the covers and to define the necessary repair.
e) Selective deconstruction	Deconstruction or dismantle of the covering. Selective dismantling of the coverage material. Types of demolition wastes that can be generated on restoration works of the traditional coverings and its correspondent treatment.	The worker dismantles the coverage materials in secure conditions, analyzes the manipulation conditions and supply of the different materials, he selects the dismantled original materials for its reuse and verifies the state and resistance of the board, the support structure and the rest of the covering elements.
f) Placement of mating materials	Traditional techniques of placement of mating materials in inclined coverings: tiles (ceramic tiles and slate tiles) and metallic sheets (copper shits, zinc sheets...). Tools used in the placement of coverage materials for inclined coverings: types, function, management and safety requirements.	The worker identifies the configuration that needs to be executed (distribution and overlapping of pieces...); he uses the original fixation system; he solves the encounters and singular elements of the covering; he takes care of the insulation and ventilation conditions of the covering; and he selects and uses the proper work equipment for mechanization and placement of the coverage pieces.
g) Planning and organization of restoration Works	Planning and organization of the traditional covering restoration works: supplies, work equipment's, auxiliary means and protections. Execution sequence and the original configuration of the covering which is going to be interceded. Safety and preventive measures against the identified risks. Minimizing the impact on the environment.	The worker accomplishes the security and safety measures, he installs the auxiliary means and means of collective protection which are typical of its competence and uses the individual protection equipment needed.

ASSESSMENT

- Is able to interpret the plans and documentation of the work projects, and analyse the requirements of water tightness, insulation and resistance to wind required to the covers.
- Is able to identify the elements that make up the traditional inclined roofs, specifying their functions, the solutions adopted and the materials used.
- Is able to distinguish the different types of roofing from sloped roofs, and to describe the traditional laying techniques, their fixing systems and special pieces.
- Is able to describe the development of the works of execution of the cover and the sequence of placement of the covering material, explaining the realization of the singular elements.
- Is able to identify the injuries that affect the covers and define the necessary repair.



- Is capable of selectively dismantling the cover materials, avoiding damage to the materials to be maintained and observing the conditions of handling and collection.
- Is able to apply the criteria of acceptance or rejection of the cover materials from the dismantled decks for use in restoration works.
- Is able to apply the traditional techniques of placing covering materials in restoration works, solving encounters and unique elements of the cover, observing the conditions of sealing, insulation and ventilation, selecting and using properly the necessary work equipment, and applying the appropriate prevention and protection measures against occupational hazards.

Unit 3. Execution of finishes and roof aprons

GENERAL DESCRIPTION

Execution of finishes and roof aprons: rebuilding of eaves, ridges, construction valley, overhangs and other damaged elements on the covers, through the application of traditional techniques and the use of identical, similar or compatible materials to the originals.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know how to interpret the plans and to know the documentation content of work projects, particularly, to the thing related to technical definition, graphical representation and water tightness requirements, insulation and resistance of coverings and its final elements.
	K2. Identify the finish elements of the traditional coverings or roofs: eaves, ridge tiles, hip rafters, parapet walls, edge tiles...
	K3. Identify the damages affecting the finish elements of the traditional inclined coverings and to define the reparation needed according to each damage.
	K4. Know the execution procedures of the traditional coverings: materials, construction methods of the skirts and boards and its components.
	K5. Identify the execution solutions of the finishing of the traditional inclined coverings: eaves, ridge tiles, hip rafters, parapet walls, edge tiles...
	K6. Identify tools: types, function, use and security requirements.
	K7. Define the acceptance or rejection conditions of the dismantled materials for its exploitation in the finish restoration of the covering.
	K8. Distinguish the different types of construction wastes and demolition that can be generated in the restoration works of traditional coverings and its correspondent treatment.
	K9. Identify the labour risks associated to restoration Works of covering finishing and to know the preventive and protection measures needed for its control.
Skills	S1. Describe the development of finishing executions and parapet walls of the traditional coverings; specifying the different elements functions (eaves, ridge tiles, hip rafters, parapet walls, edge tiles...), the material used and the sequence of realization; linking the causes of the detected dysfunctions in those finish elements and the reparation needed.
	S2. Accomplish the dismantling of the finish elements of coverings that must be repaired or substituted, preventing from any damage to the removed materials and other covering elements that must be kept, analysing the manipulation conditions and supply of different materials, applying the acceptance criteria of the original elements dismantled for its

reutilization, and verifying the state and resistance of the support structure and the rest of the elements of the covering.

S3. Determine setting outs and to apply traditional techniques of execution of finish inclined coverings, ...); interpreting the relevant technique documentation; using the suitable materials; respecting the original configuration of the finish element that needs to be restored (eave, ridge tiles, hip rafters, parapet wall, edge tile...) analysing the conditions required when assembling with the rest of the elements of the covering and the building facing, and selecting and using properly the needed work equipment.

Competences

C1. Apply traditional techniques of finish execution and parapet walls of coverings in restoration works; identifying the original solution and interpreting the technique documentation required and accomplishing the requirement of projects; if it is needed making a selecting dismantle in order to use the original elements selecting and applying the profited material and work equipment; applying the safety and preventive measures against the identified risks; and minimizing the impact on the environment.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) Interpretation of plans, nomenclature and requirements	<p>Interpretation of plans and paperwork/documentation of the project:</p> <ul style="list-style-type: none"> - Nomenclature and geometry applied to inclined coverings. - Water tightness requirements, insulation and wind resistance. 	The worker explains the configuration of the finishes and roof aprons; describes the solution taken in its construction, the used materials, the different layers function and the finishing execution sequence; identifies the characteristic dimensions and links the causes of dysfunctions detected in the finishes and its needed reparations.
b) Elements and materials of inclined traditional coverings	Composition of inclined traditional coverings: setting out, formation of slopes, board, coverage material, encounters and finishing.	The worker describes the adopted solutions in the finish (eaves, ridge tiles, hip rafters, parapet walls, edge tiles...) accomplished in the traditional coverings: the used materials and the execution sequence.
c) Traditional restoration: frequent diseases and their treatment	Traditional restoration of coverings: frequent diseases and their treatment.	The worker identifies the characteristic dimensions and he relates the causes between of the dysfunction detected in this finish elements and the repairs needed.
d) Selective deconstruction	Deconstruction or dismantle of the covering. Selective dismantling of the coverage material.	The worker accomplishes the disassembly of the finish elements and materials of the inclined traditional coverings in safe conditions, he analyses the manipulation conditions and the supply of the different materials, he selects the original dismantled materials and he selects the original dismantled elements for its reuse and he verifies the state and resistance of the support

Contents	Description	Learning objective
		structure and the rest of the covering elements.
e) Traditional finishing techniques	Traditional finishing techniques in inclined coverings: eaves, ridge tiles, hip rafters, parapet walls, edge tiles...	The worker applies traditional finish techniques in inclined coverings of ceramic tiles or slate tiles, copper sheets, zinc sheets...; he respects the original configuration of the finish element that needs to be executed (eaves, ridge tiles, hip rafters, parapet walls, edge tiles...). The worker analyses the required conditions in the encounter with the rest of the covering elements and the face of the building; and selects and uses the work equipment required.
g) Planning and organization of restoration Works	Planning and organization of the traditional covering restoration Works: supplies, work equipment's, auxiliary means and protections.	The worker effectuates the security and safety specific measures, he installs the auxiliary means and collective protection means which are specific of its competence and uses de individual protection equipment required.

ASSESSMENT

- Is able to identify the finishing elements of the traditional covers and to describe the execution process, specifying the functions of the different finishing elements, the materials used and the sequence of realization.
- Is able to identify the injuries that affect the trim elements of the traditional covers and define the necessary repair.
- Is capable of selectively disassembling the trim elements of the covers to be repaired or replaced, avoiding damage to the materials to be maintained and observing the conditions of handling and storage.
- Is able to apply the traditional techniques of execution of the slopes of sloped roofs in restoration works, resolving the encounters with the rest of the elements of the roof and walls of the building, selecting and using correctly the necessary work equipment, and applying the appropriate prevention and protection measures against occupational hazards.

Unit 4. Resolution of roof encounters

GENERAL DESCRIPTION

Resolution of roof encounters: repair of construction valley and damaged encounters on gable roofs, overhangs, fireplaces, dormer rooms and skylights, among other salient elements, through the application of traditional techniques and the use of identical, similar or compatible materials to the originals.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know how to interpret the plans and to know the documentation content of restoration projects, particularly, to the thing related to technical definition and solvency of encounter of coverings and the requirements of water tightness, insulation and resistance.
	K2. Identify encounter of traditional coverings or roofs with other constructive elements.
	K3. Identify the damages affecting the encounter of inclined traditional coverings with other constructive elements and define the needed restoration according to each damage.
	K4. Know the execution procedures of the traditional coverings: materials, construction methods of the skirts and boards and its components.
	K5. Identify the execution solutions of valley rafters of inclined traditional coverings and the encounter with gable ends, parapet walls, chimneys, mansards, skylights...
	K6. Identify used tools, types, and function, use and security requirements.
	K7. Define the acceptance or rejection conditions of the dismantled materials for its exploitation in the restoration of encounters of coverings with other constructive elements.
	K8. Distinguish the different types of construction wastes and demolition that can be generated in the restoration works of traditional coverings and its correspondent treatment.
	K9. Identify the labour risks associated to restoration works of inclined covering and to know the preventive and protection measures needed for its control.
Skills	S1. Describe the development of works for roof encounters of traditional buildings with other constructive elements: gable ends, parapet walls, chimneys, mansards, skylights...: specifying the adopted solutions, the material used and the realization sequence; linking the causes of the detected malfunctions in this encounters and the reparations needed.
	S2. Accomplish the dismantling of the used materials in covering valley rafters and the encounter with other constructive elements that need to be repaired or substituted, preventing from damaging removed materials and the remaining covering elements, by analysing the manipulation conditions and supply of the different materials, applying the acceptance criteria of original dismantled elements for its reutilization and verifying the state and resistance of the support structure and the rest of covering elements.
	S3. Accomplish the dismantling of the used materials in covering valley rafters and the encounter with other constructive elements that need to be repaired or substituted, preventing from damaging removed materials and the remaining covering elements, by analysing the manipulation conditions and supply of the different materials, applying the acceptance criteria of original dismantled elements for its reutilization and verifying the state and resistance of the support structure and the rest of the covering elements.
Competences	C1. Apply the traditional execution techniques of the covering valley rafters and its encounter with other elements, identifying the original solution and interpreting the required technique document and accomplishing the restoration project requirements; making a selective dismantle if it is needed for the exploitation of original materials; selecting and applying the proper material and work equipment; applying the prevention and

protection measures against other identified risks and minimizing the impact on the environment.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) Interpretation of plans, nomenclature and requirements	Interpretation of plans and paperwork/documentation of the project. Nomenclature and geometry applied to inclined coverings. Water tightness requirements, insulation and wind resistance.	Interpret the plans and to know the documentation content of restoration projects. Technical definition and solvency of encounter of coverings and requirements of water tightness, insulation and resistance.
b) Composition of inclined traditional coverings	Setting out, formation of slopes, board, coverage material, and encounters with other constructive elements and finishing.	Describe the solutions in the finish (eaves, ridge tiles, hip rafters, parapet walls, edge tiles...) accomplished in the traditional coverings: the used materials and the execution sequence.
c) Traditional restoration of coverings	Traditional restoration of coverings. Frequent diseases and their treatment.	Identify the characteristic dimensions and he relates the causes between of the dysfunction detected in this finish elements and the repairs needed.
d) Deconstruction or dismantle of the materials	Deconstruction or dismantle of the materials that need to be restored in the covering encounters. Selective dismantling of the usable material.	The worker accomplishes the disassembly of the finish elements and materials of the inclined traditional coverings in safe conditions, he analyses the manipulation conditions and the supply of the different materials, he selects the original dismantled materials and he selects the original dismantled elements for its reuse and he verifies the state and resistance of the support structure and the rest of the covering elements.
e) Traditional valley rafter elaboration techniques in inclined coverings and encounters	Traditional valley rafter elaboration techniques in inclined coverings and in the encounters with other constructive elements (gable ends, parapet walls, chimneys, mansards, skylights...).	The worker determines setting outs and applies traditional finish techniques in inclined coverings of ceramic tiles or slate tiles, copper sheets, zinc sheets...; respects the original configuration of the finish element that needs to be executed (eaves, ridge tiles, hip rafters, parapet walls, edge tiles...) he analyses the required conditions in the encounter with the rest of the covering elements

Contents	Description	Learning objective
		and the face of the building; and selects and uses the work equipment required.
d) Planning and organization of the traditional covering restoration works	Planning and organization of the traditional covering restoration works: supplies, work equipment's, auxiliary means and protections.	The worker effectuates the security and safety specific measures, he installs the auxiliary means and collective protection means which are specific of its competence and uses de individual protection equipment required.

ASSESSMENT

- Is able to describe the development of the works of execution of the meetings of the traditional covers with other constructive elements, specifying the materials used and the sequence of realization.
- Is able to identify the pathologies of the building that have their origin in defects in the encounters of the traditional inclined roofs with other constructive elements, and to define the necessary repair.
- Is capable of selectively dismantling the materials used in the valley and encounters of traditional sloped roofs with other constructive elements, avoiding damage to the removed materials to be maintained and observing the conditions of manipulation and storage.
- Is able to apply the traditional techniques of execution of the valley and the encounters of the traditional inclined roofs with other constructive elements, fulfilling the requirements of the restoration project, selecting the appropriate materials and equipment of work, and applying the measures of prevention and protection against occupational hazards.

Module 4: Sanitation and plumbing interventions for rehabilitation

LEARNING UNITS

Unit 1. Installation and repairs of guttering, downpipes and system components.

Unit 2. Execution of joints, encounters and anchors to other construction elements in sanitation installations.

Unit 3. Finishing of encounters of roof plumbing with other building elements.

HOURS / ECVET POINTS

50 / 3.1 points

Unit 1. Installation and repairs of guttering, downpipes and system components

GENERAL DESCRIPTION

Diagnose, plan, implement and monitoring rehabilitation / reconstruction work of guttering, downpipes and system components, according the original construction and respecting current construction standards (technical standards / safety, health and environment).

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Interpret the constitution of a process, distinguishing its different parts in particular with respect to special technical parts within the scope of sanitation and plumbing installations.
	K2. Understand the functions of the different piping systems and their constituents, namely pipes and fittings, auxiliary seals and their reaction to water, moisture, vibration, infiltration.
	K3. Distinguishes the different types of sanitation and plumbing facilities used in rehabilitation, their performance and incompatibilities.
	K4. Identify the different types of materials used in traditional plumbing systems, their characteristics and applicability.
	K5. Identify the pathologies that affect the sanitation and plumbing installations and define a reparation plan considering the materials and processes used.
	K6. Identify the tools and the equipment used in sanitation and plumbing installations, their functions and precautions in their handling and safety requirements.
	K7. Distinguish the different types of traditional building waste that are generated and the corresponding treatment (lead, copper).
	K8. Identify the risks associated to the tasks performed in the sanitation and plumbing installations as well as the respective safety measures for their elimination or reduction. Identify individual safety measures and equipment.
	K9. Distinguish different types of costs, specially labour and material costs.
	K10. Identify issues related to Construction Site implementation (Dimensions, conditions, location and relationship with local authorities).
Skills	S1. Programme and plans the sequence of activities which must be developed and establishing precedence among them. Determine the materials to be used, determine the

	constructive processes to be adopted in view of the operationally of the construction and the anomalies and their repair needs.
	S2. Accomplish the clearing works of deteriorated materials, its packaging for further treatment, according to its hazards.
	S3. Determine setting outs and to apply traditional techniques of execution of sanitation and plumbing installations using appropriate materials and equipment taking into account their characteristics and resistance, respecting the original design of the buildings, accomplishing the development of the execution in order to guarantee the quality of the work in accordance with technical specifications.
Competences	C1. Manage and supervise the rehabilitation works of guttering, downpipes and system components, respecting the processes and techniques appropriate to each stage of the process, selecting materials, tools and equipment's to use. Be responsible for the monitoring and management of waste streams, minimize the environmental impact of the work carried out and taking prevention and safety measures.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning objectives
a) Interpretation of the written and designed parts	<p>This Learning Unit lists all questions of the written and drawn parts of the project, the regulations concerned the rehabilitation work, make the assessment of the costs of the works, and make the assessment of the work plan.</p> <p>Programmatic contents (Descriptive and justification memory / Plants, cuts, elevations and details of execution / Regulations / technical legislation / Terms and Conditions / Detailed drawings / Measurements and budgets / Perspectives / Work plan).</p>	<p>Interpret correctly the written and drawn parts of the technical installations project.</p> <p>Specify the key rules and rules that need to be followed to properly perform network renewal tasks.</p> <p>The trainee must be able to identify and consolidate the work project, verify the estimated costs and properly organize the work plan.</p>
b) Materials, Tools and Equipment	<p>This unit list the particular characteristics of the building, presents the traditional materials used in sanitation and plumbing installations (copper, galvanized iron, aluminium, zinc, pvc) versus useable materials - galvanized iron, aluminium, zinc, pvc, pex (polyethylene) polypropylene, stainless steel), and list the characteristics, properties of the materials (Ex: Insulation of pipes and conduits - Water tightness, fire resistance, corrosion resistance, Resistance to atmospheric agent's / corrosion resistance - rain, wind, pollution). Verticality.</p>	<p>Identify and characterize the different traditional materials, tools and equipment's. The trainee must be able to identify and recognize the different materials, tools and equipment's in order to indicate the most appropriate for the work to be carried out.</p>



Content	Description	Learning objectives
c) Pathologies	<p>It lists the tools and equipment.</p> <p>This unit lists the pathologies that can be found and the traditional processes / techniques that can be used in the repair / rehabilitation / reconstruction.</p> <p><u>Possible pathologies:</u> Lack of tightness; Cracks in the tubing; Problems in joints and fittings; Fixation problems.</p> <p><u>Causes:</u> Poorly fixed accessories, Breakage; Water pressure greater than the resistance of the tubing / defect in the tubing; Deficiency of materials or poor connections; Poor fixation. Deformations of walls.</p> <p><u>Traditional processes of repair / rehabilitation / reconstruction /</u> <u>Solution constructions:</u> Fitting accessories properly Repairing breakage; Replace pipes / fittings; Fix the tubing properly; Partial or complete replacement of networks.</p> <p>In maintenance work: Piping sight - revision of joints and fixation; Fissure control; Control of anchorages; Cleaning and inspection of pipes and fittings; Review of the network. Performance tests. Observation of visiting boxes. Odours Search.</p>	<p>To correctly diagnose the pathologies and, based on the diagnosis, propose the traditional processes of rehabilitation</p>
d) Repairs of guttering, downpipes and system components	<p>This unit comprises the practical work for the repair of guttering's, downpipes and system components using the appropriate materials and construction processes.</p>	<p>Realize and implement the different processes / techniques. The trainee must be able to repair properly guttering's, downpipes and system components.</p>

ASSESSMENT

- Is able to specify, recognize and list all the elements presented in the project parts and necessary to achieve the objectives / accomplishment of the works.
- Is able to specify the proposed work plan against the real characteristics of the building and according the key rules and rules that need to be followed to properly perform network renewal tasks.
- Is able to identify the phases of work, the steps of the activities, the materials, the supplies, work equipment and the times foreseen for the accomplishment of the works.
- Is able to characterize, describe, explain correctly the special characteristics of the buildings, materials, tools and equipment used and choose them according to the defined objectives / work to be done and taking into account the basic principles of rehab (- guarantee of the reversibility of recommended solutions; adoption of solutions with the least intrusion; prioritize the recovery of old processes / techniques).
- Is able to characterize, describe and explain correctly the main pathologies. Evaluate and specify (choose) the best processes / constructive techniques to develop the necessary repairs.
- Is able to prepare and / or apply the right procedure.
- Is able to organize work: the work site is properly organized and supplied (human and physical resources), respecting the principles of implementation.
- Is able to dismantle the components under safe conditions, analyses the conditions of handling and the supply of the different materials and selects the original materials disassembled for reuse.
- Health safety prevention: Respect and use the collective protection and the individual protection equipment.

Unit 2. Execution of joints, encounters and anchors to other construction elements in sanitation installations

GENERAL DESCRIPTION

Diagnose, plan, implement and monitor rehabilitation / reconstruction work in the execution of joints, encounters and anchors to other construction elements in sanitation installations, considering the original construction and respecting the current norms of construction (technical standards / safety, health and environment) and taking into account the functionality of buildings.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Interpret the constitution of a project, distinguishing its different parts in particular with respect to special technical parts within the scope of sanitation and plumbing installations.
	K2. Understand the functions of the different sanitation installations, their constituents, and their compatibility with other construction elements.
	K3. Distinguishes the different sanitation installations used in rehabilitation, their performance and incompatibilities.
	K4. Identify the different types of materials used in traditional sanitation installations, their characteristics and applicability.



	K5. Identify the pathologies that affect the sanitation installations and define a reparation plan considering the materials and processes used.
	K6. Identify the tools and the equipment used in sanitation installations, their functions and precautions in their handling and safety requirements.
	K7. Distinguish the different types of traditional building waste that are generated and the corresponding treatment.
	K8. Identify the risks associated to the tasks performed in the sanitation installations as well as the respective safety measures for their elimination or reduction. Identify individual safety measures and equipment.
	K9. Distinguish different types of costs, specially labour and material costs.
	K10. Identify issues related to Construction Site implementation (Dimensions, conditions, location and relationship with local authorities).
Skills	S1. Programme and plans the sequence of activities which must be developed and establishing precedence among them. Determine the materials to be used, determine the constructive processes to be adopted in view of the operationally of the construction and the anomalies and their repair needs.
	S2. Accomplish the works of removal of deteriorated materials, its packaging for further treatment.
	S3. Determine setting outs and to apply traditional techniques of execution of sanitation installations using appropriate materials and equipment taking into account their characteristics and resistance, accomplishing the development of the execution in order to guarantee the quality of the work in accordance with technical specifications.
Competences	C1. Manage and supervise the rehabilitation works of sanitation installations, respecting the processes and techniques appropriate to each stage of the process, selecting materials, tools and equipment's to use. Be responsible for the monitoring and management of waste streams, minimize the environmental impact of the work carried out and taking prevention and safety measures.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning objectives
a) Interpretation of the written and designed parts	<p>This Learning Unit lists all questions of the written and drawn parts of the project, the regulations concerned the rehabilitation work, make the assessment of the costs of the works, and make the assessment of the work plan.</p> <p>Programmatic contents (Descriptive and justification memory / Plants, cuts, elevations and details of execution / Regulations / technical legislation / Terms and Conditions / Detailed drawings / Measurements and budgets / Perspectives / Work plan).</p>	<p>Interpret correctly the written and drawn parts of the technical installations project.</p> <p>Specify the key rules and rules that need to be followed to properly perform network renewal tasks.</p> <p>The trainee must be able to identify and consolidate the work project, verify the estimated costs and properly organize the work plan.</p>

Content	Description	Learning objectives
<p>b) Materials, Tools and Equipment</p>	<p>This unit lists the particular characteristics of workplaces, presents the traditional materials used versus materials that can be used (copper, galvanized iron, aluminium, zinc, pvc, pex, polypropylene, stainless steel) and its characteristics / properties (Ex: Insulation of pipes and conduits - Water tightness, fire resistance, corrosion resistance, resistance to atmospheric agent's / corrosion resistance - rain, wind, pollution).</p> <p>It lists the tools and equipment.</p>	<p>Identify and characterize the different traditional materials, tools and equipment's. The trainee must be able to identify and recognize the different materials, tools and equipment's in order to indicate the most appropriate for the work to be carried out.</p>
<p>c) Pathologies</p>	<p>This unit lists the pathologies that can be found and the traditional processes / techniques that can be used in the repair / rehabilitation / reconstruction.</p> <p><u>Possible pathologies:</u> Loss of section. Corrosion. Lack of tightness; Cracks in the tubing; Problems in joints and fittings; Fixation problems.</p> <p><u>Causes:</u> Poorly fixed accessories, Breakage; Water pressure greater than the resistance of the tubing / defect in the tubing; Deficiency of materials or poor connections;</p> <p><u>Traditional processes of repair / rehabilitation / reconstruction:</u> Fitting / execution properly of encounters and anchors Repairing breakage; Replace pipes / fittings; Fix the tubing properly according to the other construction elements; Partial or complete replacement of elements networks.</p> <p><u>In maintenance work:</u></p>	<p>To correctly diagnose the pathologies and, based on the diagnosis, propose the traditional processes of rehabilitation.</p>

Content	Description	Learning objectives
	<p>Piping sight - revision of encounters and anchors fixation;</p> <p>Fissure control;</p> <p>Control of anchorages;</p> <p>Cleaning and inspection of pipes and fittings;</p> <p>Review of the network.</p> <p>Performance tests. Observation of visiting boxes. Odours search.</p>	
d) Execution of encounters and anchors to other construction elements	<p>This unit comprises the practical work for the execution of encounters and anchors to other construction elements using the appropriate materials and construction processes.</p>	<p>Realize and implement the different processes / techniques. The trainee must be able to execute encounters and anchors with other construction elements.</p>

ASSESSMENT

- Is able to specify, recognize and list all the elements presented in the project parts and necessary to achieve the objectives / accomplishment of the works.
- Is able to specify the proposed work plan against the real characteristics of the building and according the key rules and rules that need to be followed to properly perform network renewal tasks.
- Is able to identify the phases of work, the steps of the activities, the materials, the supplies, work equipment and the times foreseen for the accomplishment of the works.
- Is able to characterize, describe, explain correctly the special characteristics of the buildings, materials, tools and equipment used and choose them according to the defined objectives / work to be done and taking into account the basic principles of rehab (- guarantee of the reversibility of recommended solutions; adoption of solutions with the least intrusion; prioritize the recovery of old processes / techniques).
- Is able to characterize, describe and explain correctly the main pathologies. Evaluate and specify (choose) the best processes / constructive techniques to develop the necessary repairs.
- Is able to Indicate and explain the importance of the survey considering the security aspects and seismic characteristics of the spaces / buildings, the level and type of degradation.
- Is able to prepare and / or apply the right procedure.
- Is able to organize the work: the work site is properly organized and supplied (human and physical resources), respecting the principles of implementation. Paying special attention to the connections of the existing pipes to the new pipes.
- Environment - Dismantles the components under safe conditions, analyses the conditions of handling and the supply of the different materials and selects the original materials disassembled for reuse.
- Health safety prevention: is able to respect and use the collective protection and the individual protection equipment.

Unit 3. Finishing of encounters of roof plumbing with other building elements

GENERAL DESCRIPTION

Manage and supervise the rehabilitation works that make possible the transport of pluvial water coming from the roof of the building to the exterior through gutters or other elements that need to be framed with other constructive elements.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Identify the constitution of a process, distinguishing its different parts in particular with regard to special technical parts in the scope of pluvial water outflow.
	K2. Understand the functions of the different pluvial water drainage systems and their constituents, namely gutters, downpipes, drop tubes and other elements as well as their reaction to the surrounding environment.
	K3. Distinguish the different types of pluvial water drainage systems used in rehabilitation, their performance and incompatibilities.
	K4. Identify the different types of materials used in traditional pluvial water drainage systems, their characteristics and applicability.
	K5. Identify the pathologies that affect the various elements used in the drainage of pluvial water (clogging of gutters, degradation of welds and materials) and define a repair plan considering the materials and processes used.
	K6. Identify the tools and equipment used in pluvial water drainage works, their functions and precautions in their handling and safety requirements, in particular those relating to work at heights.
	K7. Distinguish the different types of traditional building waste that are generated in this process and the corresponding treatment (lead, copper, concrete, zinc).
	K8. Identify the risks associated with the tasks it carries out in the context of pluvial water drainage (in particular those related to working at heights and welding) as well as the respective safety measures for its elimination or reduction. Identify individual and collective safety measures and equipment.
	K9. Distinguish different types of costs, specially labour and material costs.
	K10. Identify issues related to Construction Site implementation (Dimensions, conditions, location and relationship with local authorities).
Skills	S1. Programme and plans the sequence of activities which must be developed and establishing precedence among them. Determine the materials to be used, determine the constructive processes to be adopted in view of the operation of the work, the anomalies diagnosed and the respective repairs needs.
	S2. Accomplish the work of removing the deteriorated materials, its packaging for later treatment / reuse, according to its danger.
	S3. Determine setting outs and to apply traditional techniques of execution of pluvial water drainage, the use of appropriate materials and equipment taking into account their characteristics and strength, respecting the original design of the buildings and the compatibility between elements, accomplishing the execution of the project in ensure the quality of the work in accordance with the technical specifications.
Competences	C1. Manage and supervise the rehabilitation works that make possible the transport of pluvial water coming from the roof of the building to the exterior through gutters or other elements that need to be framed with other constructive elements, respecting the processes and techniques appropriate to each phase of the process, selecting materials, tools and equipment to use. Be responsible for monitoring and managing waste streams,

minimizing the environmental impact of the work carried out and taking appropriate prevention and safety measures.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objectives
a) Interpretation of the written and designed parts	<p>This Learning Unit lists all questions of the written and drawn parts of the project, the regulations concerned the rehabilitation work, make the assessment of the costs of the works and make the assessment of the work plan.</p> <p>Programmatic contents (Descriptive and justification memory / Plants, cuts, elevations and details of execution / Regulations / technical legislation / Terms and Conditions / Detailed drawings / Measurements and budgets / Perspectives / Work plan)</p>	<p>Interpret correctly the written and drawn parts of the technical installations project.</p> <p>Specify the main rules that need to be followed to properly perform the laying tasks of gutters, downpipes and drop pipes and protection drains.</p> <p>The trainee must be able to identify and consolidate the work project, verify the estimated costs and properly organize the work plan.</p>
b) Materials, Tools and Equipment	<p>This unit list the particular characteristics of workplaces/roofs, presents the traditional materials used versus materials that can be used (copper, aluminium, zinc, pvc, vitrified stoneware/ aluminium, zinc, pvc, pex, polypropylene, stainless steel) and the characteristics / Properties of the materials (Ex: Insulation of pipes and conduits - Water tightness, fire resistance, corrosion resistance, resistance to atmospheric agent's / corrosion resistance - rain, wind, pollution).</p> <p>It describes the materials compatibility.</p> <p>It lists the tools and equipment.</p>	<p>Identify and characterize the different traditional materials, tools and equipment's. The trainee must be able to identify and recognize the different materials, tools and equipment's in order to indicate the most appropriate for the work to be carried out.</p>
c) Pathologies	<p>This unit lists the pathologies that can be found and the traditional processes / techniques that can be used in rehabilitation / reconstruction of finishing of encounters of roof plumbing with other building elements.</p> <p><u>Possible pathologies:</u></p>	<p>To correctly diagnose the pathologies and, based on the diagnosis, propose the traditional processes of rehabilitation</p>

Contents	Description	Learning objectives
	<p>Lack of tightness; Cracks in the tubing; Problems in joints and fittings; Fixation problems.</p> <p><u>Causes:</u> Ageing of the materials. Halted tubes. Clogging of pipes and guttering (from wastes and plant growth); Water pressure greater than the resistance of the tubing / defect in the tubing; Deficiency of materials or poor connections; Deformations on roofs; Poorly fixed accessories; Breakage;</p> <p><u>Traditional processes of repair / rehabilitation / reconstruction:</u> Complete revision and proper cleaning of the rainwater forwarding network; Revision of encounters and fixation; Crack control; Fixation control; Partial or complete replacement of networks.</p>	
<p>d) Repairs of guttering, downpipes and system components</p>	<p>This unit comprises the practical work for the repair of guttering's, downpipes and system components using the appropriate materials and construction processes.</p>	<p>Realize and implement the different processes / techniques. The trainee must be able to repair properly guttering's, downpipes and system components.</p>

ASSESSMENT

- Is able to correctly identify the antiquity of the building and of the observance of the state of the roof plumbing can be equated with the total renovation of these, providing the buildings with networks identical to the old buildings.
- Is able to specify, recognize and list all the elements presented in the project parts and necessary to achieve the objectives / accomplishment of the works.
- Is able to specify the proposed work plan against the real characteristics of the building and according to the key rules and rules that need to be followed to properly perform the renewal tasks.
- Is able to identify the phases of work, the steps of the activities, the materials, the supplies, work equipment and the times foreseen for the accomplishment of the works.
- Is able to characterize, describe, explain correctly the special characteristics of the buildings, materials, tools and equipment used and choose them according to the defined objectives / work to be done and taking into account the basic principles of rehab (- guarantee of the reversibility of recommended solutions; adoption of solutions with the least intrusion; prioritize the recovery of old processes / techniques).
- Is able to characterize, describe and explain correctly the main pathologies. Evaluate and specify (choose) the best processes / constructive techniques to develop the necessary repairs.

- Is able to prepare and / or apply the right procedure.
- Is able to organize of work: the work site is properly organized and supplied (human and physical resources), respecting the principles of implementation.
- Environment - Dismantles the components under safe conditions, analyses the conditions of handling and the supply of the different materials and selects the original materials disassembled for reuse.
- Is able to Health safety prevention: is able to respect and use the collective protection and the individual protection equipment (special attention on work at heights).

Module 5: Finishing works and restoration of decorative elements

LEARNING UNITS

- Unit 1. Treatment of the seams and joints in facades and interior architecture.
- Unit 2. Configuration of finishes and decorative masonry elements
- Unit 3. Restoration of decorative stone elements (stone carving).
- Unit 4. Decorative painting: selection of pigments and application of colour, lacquers and varnishes.
- Unit 5. Elaboration and application of templates and moulds for decorative fittings.

HOURS / ECVET POINTS

50 / 3.1 points

Unit 1. Treatment of the seams and joints in facades and interior architecture

GENERAL DESCRIPTION

Surface treatment of the spaces between the masonry elements which guarantees water tightness and avoids the proliferation of undesirable mosses and vegetation that can degrade the masonry. The joint produces aesthetic appearance. These joints can be treated in various ways by applying different mortars.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Identify different types of grouts according to different eras and areas.
	K2. Identify different diseases: gutted grouts, parasites, salts, lichen, vegetation, grout chalking, cracking, fouling...
	K3. List the grouts composition: sands from different sources, air lime, cement, and colouring.
Skills	S1. Work preparation: <ul style="list-style-type: none"> - Detect diseases and defects of the mortar. - Decided which technique to execute. - Identify the mortar composition with the help of qualified persons. - Copy the composition the most precisely possible. - Clean the wall (empty the grouts, remove and treat the vegetation).
	S2. Work achievement: <ul style="list-style-type: none"> - Treat the grouts (waterproof, cleaning, reinforcement...). - Prepare a homogenous and lasting pointing mortar with the right consistency. - Compact the mortar in the empty grouts.
	S3. Setting the finishing touches: <ul style="list-style-type: none"> - Put the right finishing touches. - Protect the places that do not have to be treated or the attendant materials (floors, frames...). - Protect the wall from bad weather.
Competences	C1. Combine the technical knowledge linked to the heritage in order to renovate grouts that will meet the customer's expectations and the requirements of the global project.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning objective
a) Different techniques and specific techniques of restoration	This unit presents all the traditional techniques. It deals with architectural and historical technological aspects. It describes the different materials employed and their characteristics and properties and their origin. The various types of masonry and re-joining according to the historical and regional contexts. It describes the operating procedures and the equipment and tools. It describes also the methods of implementation, pathologies and the treatments.	Identify and characteristics. The trainee must be able to recognize and give the names of the different techniques and describe their components (materials, operating procedures, tools...).
b) Aesthetic awareness/understanding historical cultural, architectural, artistic context	This unit lists all of the styles, their characteristics and the historical periods to which they belong. Its deals with decorative elements, artistic and aesthetic trends to situate the different techniques in a historical context or continuity.	Identify the different styles or epochs and the elements that compose it. The trainee must be able to determine the characteristics of a style or an era in order to situate in time the site on which must intervene.
c) Different materials	This unit allows to discover the different types of seams and joints that can be used. It defines the physicochemical characteristics and properties of each. It also discusses processes for extraction and preparation work. It discusses about the different composition and plasticity of mortars and how to realize them.	Identify different types of seams; Cite their characteristics and properties; Cite the different pathology of seams and how to treat them; Identify the mortar component.
d) Practical work: Preparation work, realization	This unit allows to discover the different techniques to identify the damages which can affect the joints and define the repairs needed according to each damage. And also, distinguish the types of construction and demolition wastes that can be generated on restoration works of the traditional treatment of seams and joints and their correspondent treatment. Detect diseases and defects of the mortar, decided which technique to execute (gumming, water-gumming...) The realization of singular elements and its importance according to	Detect different diseases and defects of the mortar; Choose the adapted technique to execute; The trainee must be able to implement the appropriate techniques, materials and various tools to make and repair a joint.

Content	Description	Learning objective
	causes of dysfunctions detected and the needed reparations and identifying the measurements that need to be respected. Copy the composition the most precisely possible. The production must allow to trainee to become familiar with the techniques, materials and various tools to master the technical gestures and to implement the operating procedures. (treat the grout, accomplish the dismantling of joint, preventing from any damage to the removed material that must be kept, applying the acceptance criteria of the original elements dismantled for its reutilization, verify the state of support structure and the rest of elements, prepare an homogenous and lasting mortar, compact the mortar in the empty grouts).	
e) Finishing work	The unit offers various steps to put the finishing touches. The trainee have to put right finishing touches, protect the places that do not have be treated, protect the Wall from bad weather.	Realize the finishing touches.

ASSESSMENT

- The name of each technique: it is correctly given and associated with the corresponding implementation.
- Identify the pathologies and describe the corresponding treatments.
- The tools are identified and their use is correctly cited.
- Define the various existing masonry techniques.
- Restore the compositions of the various mortars.
- The style are differentiated and/or identified and well associated with the corresponding epochs.
- Style characteristics are either cited or identified.
- The name and the proportion of each component of the mortar are correct.
- Explain in writing the appropriate treatments according to a specific pathology.
- Clean and prepare the wall.
- The operating mode is respected: good respect of the steps, correct use of tools and materials.
- Organization of work: the work site is properly organized and supplied.
- Health safety prevention: the right rules are respected or implemented.
- The supports must be left in a properly state.
- Aesthetics coherence: the work carried out is in harmony of the whole place.



- The work site is properly organized and supplied and respecting the principles of safety prevention.
- Health safety prevention: the right rules are respected or implemented.

Unit 2. Configuration of finishes and decorative masonry elements

GENERAL DESCRIPTION

Available finishes and masonry decorations: renovating or restoring the superficial layer, not structural, protection and decoration of vertical surfaces, exterior and interior of the buildings, as well as the reconstruction of the original form of decorative masonry.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1 Know the finishing products to determine their compatibility with the support and of the chemical composition of the same.
	K2. Know the application technique (thickness) of the products finishes in order to respond to the protection needs of the masonry.
	K3. Know stucco decoration techniques (modine types and use).
	K4. Know relevant technical and descriptive geometry for the redesign of the decorative items to complete.
	K5. Know the production modules of the stone decorative elements through the manufacturing procedure Cad - Cam, with the use of numerical control machines.
	K6. Know the techniques of the stonemasons for the integration of sculptural and decorative elements in stone.
Skills	S1. Do plaster casts of the decorative elements to the end of the shapes and volumes understanding.
	S2. Execute work through batter board decorations and plaster profiles or stucco applications.
	S4. Work on the definition of the structural elements in stone through the practice of the techniques of the stonemasons.
	S5. Create structural elements through the production Cad-Cam, with the use of numerical control machine.
Competences	C1. Take care of the identification of the decorative elements needing repair to replace.
	C2. Produce decorative elements in stone through the use of the stonemasons' techniques.
	C3. Produce decorative elements in stone through the use of CAD - CAM techniques.
	C4. Deal with the assembly of the decorative elements (sculptures, cornices, balustrades and frames ...) managing the static behaviour of the same and neighbouring structures, through the use of rods made of carbon fibber and epoxy resins, adhesives, or through the formation of special segments to anchor with mortar.

OUTLINE OF UNIT CONTENTS

Content	Description	Learning objective
a) Techniques of cutting and ornamentation	<p>The unit presents the main techniques (manual or mechanical), existing and the stages (tracing, roughing, cutting, sculpture, finishing ...). It addresses technological and historical aspects.</p> <p>She sensitizes to different materials.</p> <p>It describes the operating procedures and proposes a complete study of the equipment and tools (saws, scissors, massettes, bushes ...) used (use, designation).</p> <p>It lists the advantages and disadvantages of each technique.</p>	<p>Identify and characterize the different techniques of size and ornamentation. The trainee must be able to recognize and give the names of the different techniques</p>
b) Aesthetic awareness / understanding historical cultural, architectural, artistic context	<p>This unit lists all the styles, their characteristics and the historical periods to which they belong.</p> <p>It deals with decorative elements, artistic and aesthetic trends to situate the different techniques in a historical context or continuity.</p>	<p>Identify the different styles or epochs and the elements that compose it. The trainee must be able to determine the characteristics of a style or an era in order to situate in time the site on which it must intervene.</p>
c) Different materials	<p>The unit allows to discover the different types of stone (limestone, granite, sandstone ...) that can be used. It defines the physico-chemical characteristics and properties of each. It gives elements of geology. It also discusses processes for extraction and preparation of raw material.</p>	<p>Identify different types of stone Cite their characteristics and properties</p>
d) Recording techniques and diagnosis	<p>The unit proposes a discovery of the techniques of survey (taking of ribs and measurements, ornamental survey). It must make it possible to read or to decode plans or notebooks of equipment. It also makes it possible to assess the state of degradation of the existing system and to provide possible solutions (consolidation, resin injections, etc.) It also presents the study of the techniques of scaffolding and access to the elements to be restored.</p>	<p>Collect and restore the data necessary for the construction and installation of a structure.</p> <p>The trainee must be able to collect all the elements (dimensions, ornamental elements, shapes ...) and information necessary for a realization.</p>

Content	Description	Learning objective
e) Techniques for attaching and removing elements	The unit allows to discover the different techniques (chemical or traditional sealing, mechanical or chemical anchoring ...) allowing the retaining of the cut elements. It allows to explore the techniques of dismantling or depositing old elements in order to be replaced or restored. It also presents the study of the techniques of scaffolding and supply of the sites.	Identify and characterize the different installation and fixing techniques. Cite the different steps of a laying or removal procedure.
f) Practical cutting techniques	This unit allows the trainee to make elements or parts of an element of a different nature and style. Different types of stone are used. The different stages are practiced (tracing, roughing, trimming, finishing) to allow the trainee to become familiar with the techniques, materials and various tools to master the technical gestures.	Making stone elements. The trainee must be able to perform data-compliant elements.
g) Practical work of installation and removal of elements	The unit offers different cases of removal, installation and fixing of the supplied cutting elements. The trainee is confronted with a variety of situations. Diagnosis and possible preparation of the supports are integrated. It focuses on organizing and planning tasks. It also presents the implementation of scaffolding techniques and the supply of construction sites.	Prepare a support. Attach stone elements or parts of elements.

ASSESSMENT

- Technical vocabulary it is correctly used.
- The tools are identified and their use is correctly cited.
- Operating modes are restored.
- Safety prevention elements are mentioned and implemented.
- The styles are differentiated and / or identified and well associated with the corresponding epochs. Style characteristics are either cited or identified. Two errors are tolerated for the whole.
- The name of the stone types is correct.
- The characteristics of each are known.
- Technical vocabulary it is correctly used.
- Materials are identified, named and characterized.
- Operating modes are restored.
- The elements of prevention of safety are mentioned.
- Technical vocabulary: it is correctly used.



- Materials are identified, named and characterized.
- The operating procedures are.
- The elements of prevention of safety are mentioned.
- The realized element corresponds to the expectations: shape, dimensions.
- The operating mode is respected: good sequence of steps.
- Organization of work: the work site is properly organized and supplied.
- Health safety prevention: the right rules are respected or implemented.
- The support has been properly prepared.
- The finish is neat: fittings are almost invisible, harmony of the whole is harmonious to the eye.
- Aesthetic coherence: the work carried out is in harmony with the whole place.
- Operating mode of fixation is respected: correct sequence of the different steps, correct use of tools and materials.
- The organization of work: the work site is properly organized and supplied and respecting the principles of safety prevention.
- Health safety prevention: the right rules are respected or implemented. The elements of prevention of safety are mentioned Tolerance for the whole one or two oversights. We cannot tolerate more than three errors.

Unit 3. Restoration and placement of decoration finishes (ornamentations)

GENERAL DESCRIPTION

Cut and ornamentation, as part of new or renovation works, exterior building elements (window sills, paving stones, stairs, ...), interior (fireplaces, ...) or decoration (cornices, balconies, balustrades) in natural minerals (sandstone, granite, limestone, slate ...) according to safety rules. Can sculpt and engrave, lay the moulded elements on the sites and carry out works of protection or restoration of the stone.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know different types of stones (limestone, granite, sandstone, resin) and materials annex (marble powder, polymers, impregnation products, etc.) and their properties.
	K2. Identify different styles and times characterizing the elements which compose of ornamentation.
	K3. Know different techniques of cutting and sculpting manually and mechanically.
	K4. Identify the tools (rock saw, chisel, mallet, bush hammer) and their functions.
	K5. Know the different techniques of sealing and fixing (dowelling traditional technic, chemical dowelling technique).
	K6. Know different additives agents (plasticizing agent, waterproofing agent, and fungicide), consolidating agents (hardening resin) and re-mineralizing agents (surfacing product) currently employed.
Skills	S1. Read, comprehend and translate plans and sketch notebooks.
	S2. Carry out the survey of elements of simple structures or of sites to be replaced or fitted out.
	S3. Cut up, carve, sculpt, assembly, polish.



	S4. Carry out disassembly or removal work.
	S5. To Carry out repairs using appropriate techniques (restoration).
Competences	C1. Being able of replacing and / or restoring old decorative or ornamental elements respecting the architectural style and the historical features of the building. This taking into account the environmental constraints and knowing at the same time how to put the intervention in the global execution of the restoration process.
	C2. Deal with the analysis of the different structural components and implementing the proper restoration techniques for civil engineering structures.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) Techniques of fabrication. Manufacturing techniques (moulds and / or templates, various plasters)	The unit presents the main existing techniques. It addresses technological and historical aspects. It describes the various materials (types of plaster: coarse plaster of construction, light plasters, plaster of plaster, modelling plaster, plaster of MOLDA type) as well as their characteristics and properties. It describes the operating procedures and the equipment and tools used. (Mixing bowl, brushes, sponges knives It describes the methods of execution for moulds (with fibre and without fibres, silicone moulds) and templates. It lists the uses, advantages and disadvantages of each technique.	Identify and characterize different manufacturing techniques The trainee must be able to recognize and give the names of the different techniques and describe their components (materials, operating procedures, tools ...).
b) Recording techniques and support analysis	The unit proposes a discovery of the techniques of reading (taking ribs and measurements, ornamental survey, sketches, impression taking, photography). It also presents a methodology for analysing the state of existing support.	Collect and restore the data necessary for the construction and installation of a structure. The trainee must be able to collect all the elements (dimensions, ornamental elements, shapes ...) and information necessary for a realization.
c) Installation and fixing techniques	The unit allows to discover the different techniques (bonding, mechanical fixing ...) allowing the maintenance of the decorative elements. The tooling is studied (various tips, chalk line, level, laser ...) It allows to discover the prefabricated elements (staff, mouldings, ornamentation) It also presents	Identify and characterize the different types of laying and fixing.

Contents	Description	Learning objective
	the study of the techniques of scaffolding and supply of the sites.	
d) Aesthetic awareness / historical cultural, architectural, artistic understanding	<p>This unit lists all the styles, their characteristics and the historical and architectural periods to which they are attached.</p> <p>It deals with decorative elements, artistic and aesthetic trends to situate the different techniques in a historical context or continuity.</p>	Identify the different styles or epochs and the elements that compose it. The trainee must be able to determine the characteristics of a style or an era in order to situate in time the site on which it must intervene.
e) Practical work of realization of elements (cornices, mouldings, rosettes ...)	<p>This unit allows the trainee to make different moulds and templates from the data provided.</p> <p>The different plasters are implemented through different techniques.</p> <p>The production of different elements in plaster (cornices, rosettes, mouldings, etc.) must allow the trainee to become familiar with the techniques, materials and various tools to master the technical gestures and to implement the operating procedures.</p>	<p>Make moulds and / or templates</p> <p>Make plaster elements and implement the appropriate techniques.</p> <p>The trainee must be able to manufacture the moulds and templates and produce the elements according to the data.</p>
f) Works of laying	<p>The unit offers various cases of installation and fixing of manufactured or prefabricated elements supplied. The trainee is confronted with a variety of situations. Diagnosis and possible preparation of the supports are integrated. It focuses on organizing and planning tasks. It also presents the implementation of scaffolding techniques and the supply of construction sites.</p>	<p>Prepare a support.</p> <p>Attach plaster elements or parts of elements.</p>

ASSESSMENT

- Technical vocabulary: it is correctly used.
 - Materials are identified, named and well associated with the corresponding techniques.
 - The tools are identified and their use is correctly cited.
 - Operating modes are restored.
 - The elements of prevention of safety are mentioned
- Tolerance for the whole one or two oversights. We cannot tolerate more than three errors.



- Technical vocabulary: it is correctly used.
- Materials are identified, named and characterized.
- Operating modes are restored.
- The elements of prevention of safety are mentioned.
- Technical vocabulary: it is correctly used.
- Materials are identified, named and characterized.
- Operating modes are restored.
- The elements of prevention of safety are mentioned.
- The styles are differentiated and / or identified and well associated with the corresponding epochs.
- Style characteristics are either cited or identified. The tolerance for the set is two errors.
- The mould and / or template realized corresponds to the expectations: shape, dimensions.
- The plaster element meets expectations: shape, dimensions, appearance...
- The operating mode is respected: good respect of the steps, drying time respected, correct use of tools and materials.
- Organization of work: the work site is properly organized and supplied.
- Health safety prevention: the right rules are respected or implemented.
- The supports have been properly prepared.
- The finishing is neat: connections almost invisible, perfect harmony of the whole.
- Aesthetic coherence: the work carried out is in harmony with the whole place.
- Fastening procedure is respected: correct sequence of the different steps, correct use of tools and materials.
- The organization of work: the work site is properly organized and supplied and respecting the principles of safety prevention.
- Health safety prevention: the right rules are respected or implemented.

Unit 4. Decorative painting: selection of pigments and application of colour, lacquers and varnishes

GENERAL DESCRIPTION

Realization of manufactured works characterized by an aesthetic and decorative component in a restoration worksite.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Know different techniques of realization of ancient patina (lead, with washes, wax coating etc.).
	K2. Identify different styles and an artistic periods together with all the elements which characterize it.
	K3. Identify different materials resources (lime, stones powder, oils, casein).
	K4. Identify different surfaces, such as white washes, coating, wood, stones.
	K5. Identify different materials and tooling (brushes and paint brushes, spatulas, smooth tool).
	K6. Know the different components: pigments, solvents, binders and dryers.
Skills	S1. Choose the execution processes et different protocols of implementation (glazing, whitewashing, crystallizing, coating, lacquering...).
	S2. Verify the nature and state of the supports.
	S3. Prepare the tools and the materials to realize a decoration.
	S4. Realize the basis/support respecting the preparatory works chronological order.
	S5. Prepare the products respecting dosages and instructions especially in regard with safety regulations.
	S6. Apply the products with adequate tools and respecting the timing and the condition to apply and let dry in the proper manner. Respect the timing of recovery - polymerization and drying time.
	S7. Realize aging patinas and decoration (wax coating, whitewashes, simulation of materials – ex marbles etc.).
	S8. To realise fitting of restoration on the worksite.
Competences	C1. Putting in place a deep analyses of the substrates, assessing their states of the art. Determining which the areas of intervention and/or restoration are. Elaborate an intervention protocol taking into account the environmental issues and the worksite conditions. Being able to repair substrates and basis supports.
	C2. Be responsible for applying the products respecting the state of the art and all the H&S issues, taking into account at the same time the worksites conditions and the unexpected situations.
	C3. Comply in realizing decorations respecting the state of the art and understanding the global harmony of the worksite.
	C4. Decoding, analysing and understanding the specifications taking into account the exigencies or the not reversibility of some techniques.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
a) Different techniques (patina, whitewashes, wax coating, etc.) and specific techniques of restoration	The unit presents all the traditional techniques. It deals with architectural and historical technological aspects. It describes the different materials (filler, binders, pigments, additives) employed and their characteristics and properties. It describes the operating procedures and the equipment and tools used. It describes the methods of execution for glazes, whitewashes and so. It lists the uses, advantages of each technique.	Identify and characterize the different traditional techniques. The trainee must be able to recognize and give the names of the different techniques and describe their components (materials, operating procedures, tools ...).
b) Awareness/comprehension esthetical, historical, cultural and artistically	This unit lists all the styles, their characteristics and the historical periods to which they belong. It deals with decorative elements, artistic and aesthetic trends to situate the different techniques in a historical context or continuity.	Identify the different styles or epochs and the elements that compose it. The trainee must be able to determine the characteristics of a style or an era in order to situate in time the site on which it must intervene.
c) Identification and preparation of supports	This unit covers all the supports that can be found in restoration (stone, plaster, wood, plaster ...) It describes the different types of preparation and the procedures, materials, materials and tools to be used. It contains a part devoted to the diagnosis and the state of degradation or conservation of the supports on which it also presents the techniques of scaffolding and supply of the sites.	Determine the nature and appreciation of the state of different supports. The trainee must be able to identify the type of support on which he will work. It must also determine the health and structural state of the latter to consider possible intervention (resumption, consolidation, treatments ...).
d) Preparation of the supports	This unit comprises only practical work of realization and intervention on different supports. It allows the implementation of techniques of recovery, consolidation and application of preventive or curative treatments. It makes it possible to use the various tools, materials and materials required. It focuses on organizing and planning tasks.	Carry out the preparation of a support and implement according to the rules of the art the adapted techniques. The trainee must be able to perform all necessary interventions to produce a healthy and solid support.

Contents	Description	Learning objective
e) Preparation and application of different products and decorative finishes (visible grain, smooth coatings, stucco coatings, and whitewashes...)	This unit comprises only practical work for realization and intervention on supports ready to receive a finish. It enables the implementation of all traditional techniques. It makes it possible to use all the tools (brushes, brushes, knives, trowel ...) and materials (scaffolding, portable tools ...) and materials (lime, sand, marble powder, binder pigments ...).	Realize and implement the different techniques. The trainee must be able to prepare and / or apply a specific finish and conform to the expected result.

ASSESSMENT

- The name of each technique: it is correctly given and associated with the corresponding implementation.
- The main characteristics are stated and associated with the corresponding technique.
- Materials are cited and well associated with the corresponding techniques.
- The tools are identified and their use is correctly cited.
- Operating modes are restored
- The timeline is respected with a tolerance with up to three errors.
- The styles are differentiated and / or identified and well associated with the corresponding epochs.
- Style characteristics are either cited or identified the tolerance for the set is two errors. Any breach is sanctioned.
- The supports are recognized and identified: exact name and specifics are indicated.
- The condition of the medium is described: the name of the disorders or pathologies is given.
- The preparation techniques to be implemented are indicated and quoted: exact name and specificities and arguments are indicated.
- The tools and products to be used are cited.
- The elements of prevention of safety are mentioned. Tolerance is two errors.

Practical works and realization

- The support (s) realized or taken corresponds to the expectations: conformed and adapted aspect, absence of defect.
- The procedure is respected: the chronology of the steps is consistent, the drying time is respected, the correct use of tools and materials.
- Organization of work: the work site is properly organized and supplied.
- Health safety prevention: the right rules are respected or implemented.
- Preparation and / or application procedure is respected: the chronology according to the different steps, the drying time is respected, the correct use of tools and materials.
- Organization of work: the work site is properly organized and supplied and respecting the principles of and implementation.
- Health safety prevention: the appropriate rules are respected.

Unit 5. Elaboration and application of templates and moulds in plaster for decorative fittings

GENERAL DESCRIPTION

Cornices, moldings of style, capitals, columns or rosettes: the molding and ornamental plasterer realizes elements of decoration in staff (fibrous plaster) or in stucco to dress up an interior or restore an old building. Colored plasters and sophisticated finishes allow it to create interiors of character.

LEARNING OUTCOMES

On successful completion of the Unit, trainee should:

Knowledge	K1. Identify and know different styles and components of artistic periods.
	K2. Identify different precast elements (gypsum plaster, mouldings, and ornaments).
	K3. Know different types of plaster (coarse plaster, coating plaster, reduced plaster for coating, model gypsum, MOLDA plaster).
	K4. Know the different techniques and types of moulding (fibre drawing plaster or not).
	K5. Know the different types of sealing (for the very thick high dosed plaster or for the plaster where sand is added).
	K6. Know different techniques of assembling and collage (straight laying, oblique laying, bonded laying).
	K7. Know different techniques of raising the dimensions of the support (visual with sketches, taking impression, pictures).
	K8. Identify the manufacturing equipment (zinc template, silicone mould, trowel, brushes, sponges, spatulas) and installation materials (nails, laser, spirit level, CORDEX).
Skills	S1. To perform dragging with zinc patterns. https://www.youtube.com/watch?v=uQHllqakJ-o
	S2. To perform prototypes, models and moulding https://www.youtube.com/watch?v=K5o3CrjDnrc
	S3. To realize objects built with fibrous plaster or tissues, or vegetal or mineral.
	S4. To utilise laying techniques by sealing or gluing.
Competences	C1. Comply with lying manufactured or precast elements following the specific and given characteristics. Replacing or restoring ancient decorative elements taking into account the global style in order to respect the global project of restoration.
	C2. Carrying out and realizing models and / or moulds and / or tests of different complexity. To create or recreate missing or non-existent old decor items. Determining and realizing appropriate mixture respecting the use of the products. Choosing the right technic and putting it in place properly.

OUTLINE OF UNIT CONTENTS

Contents	Description	Learning objective
<p>a) Techniques of fabrication. Manufacturing techniques (molds and / or templates, various plasters)</p>	<p>The unit presents the main existing techniques. It addresses technological and historical aspects. It describes the various materials (types of plaster: coarse plaster of construction, light plasters, plaster of plaster, modeling plaster, plaster of MOLDA type) as well as their characteristics and properties. It describes the operating procedures and the equipment and tools used. (Mixing bowl, brushes, sponges knives It describes the methods of execution for molds (with fiber and without fibers, silicone molds) and templates. It lists the uses, advantages and disadvantages of each technique.</p>	<p>Identify and characterize different manufacturing techniques The trainee must be able to recognize and give the names of the different techniques and describe their components (materials, operating procedures, tools ...).</p>
<p>b) Recording techniques and support analysis.</p>	<p>The unit proposes a discovery of the techniques of reading (taking ribs and measurements, ornamental survey, sketches, impression taking, photography). It also presents a methodology for analyzing the state of existing support.</p>	<p>Collect and restore the data necessary for the construction and installation of a structure. The trainee must be able to collect all the elements (dimensions, ornamental elements, shapes ...) and information necessary for a realization.</p>
<p>c) Installation and fixing techniques</p>	<p>The unit allows to discover the different techniques (bonding, mechanical fixing ...) allowing the maintenance of the decorative elements. The tooling is studied (various tips, cordex, level, laser ...) It allows to discover the prefabricated elements (staff, moldings, ornamentation) It also presents the study of the techniques of scaffolding and supply of the sites.</p>	<p>Identify and characterize the different types of laying and fixing.</p>

Contents	Description	Learning objective
d) Aesthetic awareness / historical cultural, architectural, artistic understanding	<p>This unit lists all the styles, their characteristics and the historical and architectural periods to which they are attached.</p> <p>It deals with decorative elements, artistic and aesthetic trends to situate the different techniques in a historical context or continuity.</p>	<p>Identify the different styles or epochs and the elements that compose it. The trainee must be able to determine the characteristics of a style or an era in order to situate in time the site on which it must intervene.</p>
e) Practical work of realization of elements (cornices, moldings, rosaces ...)	<p>This unit allows the trainee to make different molds and templates from the data provided.</p> <p>The different plasters are implemented through different techniques.</p> <p>The production of different elements in plaster (cornices, rosettes, moldings, etc.) must allow the trainee to become familiar with the techniques, materials and various tools to master the technical gestures and to implement the operating procedures.</p>	<p>Make molds and / or templates</p> <p>Make plaster elements and implement the appropriate techniques.</p> <p>Manufacture the molds and templates and produce the elements according to the data.</p>
f) Works of laying	<p>The unit offers various cases of installation and fixing of manufactured or prefabricated elements supplied. The trainee is confronted with a variety of situations. Diagnosis and possible preparation of the supports are integrated. It focuses on organizing and planning tasks. It also presents the implementation of scaffolding techniques and the supply of construction sites.</p>	<p>Prepare a support</p> <p>Attach plaster elements or parts of elements.</p>

ASSESSMENT

- Technical vocabulary: it is correctly used
- The tools are identified and their use is correctly cited



- The name of each technique: it is correctly given and associated with the corresponding implementation.
- Materials are identified, named and well associated with the corresponding techniques.
- The styles are differentiated and / or identified and well associated with the corresponding epochs
- The supports have been properly prepared.
- The mold and / or template realized corresponds to the expectations: shape, dimensions
- The plaster element meets expectations: shape, dimensions, appearance...
- The finishing is neat: connections almost invisible, perfect harmony of the whole
- Aesthetic coherence: the work carried out is in harmony with the whole place
- The operating mode is respected: good respect of the steps, drying time respected, correct use of tools and materials.
- The organization of work: the work site is properly organized and supplied and respecting the principles of safety prevention.
- Health safety prevention: the right rules are respected or implemented

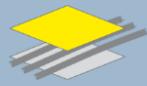
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